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Block Library

CMOS-N5 Family

CMOS Gate Array

(3.3 V) Ver.1.0

Document No. A15895EJ1V0BL00 (1st edition)
Date Published October 2002 NS CP(K)

[MEMO]

Summary of Contents

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Preface

This library contains the 3.3 V blocks of the CMOS-N5 family. For the 5.0 V blocks, please refer to CMOS-N5 Family (5.0 V) Block Library (A13872E).

When carrying out circuit design, it is requested that the CMOS-N5 Family Design Manual (A13826E) should also be read.

Please observe all items listed in this manual (general matters, cautions, and limitations).

If you don't observe these things, degradation in the quality and performance of LSI's or abnormal operation may occur.

1. Introduction

The composition of this library is as follows.

(1) Preface

The usage of this library, meanings of terminologies and some information are described.

(2) Contents

This Contents is useful when searching a block from its function.

- (3) Chapter 1 Interface Block
- (4) Chapter 2 Function Block
- (5) Chapter 3 Scan Path Block
- (6) Chapter 4 Boundary Scan Block

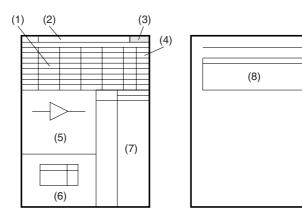
Chapter 1 to 4 list each block by function. Each page describes a logic symbol, a truth table, I/O data and delay time with an integrated format as explained in 2. Data Entered in the Block Library of this Preface.

(7) Index

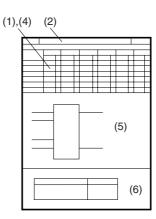
This list is useful when searching a block from its name.

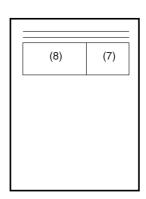
2. Data Entered in the Block Library

(a) Interface Block



(b) Function Block





(1) Block type : Name of function block(2) Function : Function of that block

(3) Interface level : Interface level of that block

(4) No. of int. cells : No. of cells used (internal cell number)

(5) Logic Diagram : Symbol of that block(6) Truth Table : Truth table of that block

(7) Input, Output : Input (Name of input pin, Fan-in), Output (Name of output pin, Fan-out)

(8) Switching speed : Delay time of that block
Furthermore, the symbols of switching speed are as follows

(11) Signal path (input to output)

(12) Input signal change (H : Rise L : Fall Z : High impedance)(13) Output signal change (H : Rise L : Fall Z : High impedance)

Setup time, Hold time, Release time, Removal time, and Minimum pulse width;

MIN : The minimum result at the minimum condition

MAX : The minimum result at the maximum condition

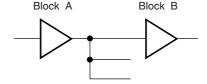
3. Propagation Delay Time (tpd)

The method shown here is a simplified calculation formula. This calculation method will give comparatively accurate results when the load matches the following conditions. The error becomes greater as the load capacitance increases, and the results yielded from the calculation are smaller than the values obtained from the simulator. Therefore, note beforehand that these values should be used mainly as a general guide.

Conditions

The total F/I of the front stage of the block for delay calculation shall be within 15% of the F/O limit of the front stage drive block.

Example



Let block B be the object of the propagation calculation. The accuracy of the simplified calculation formula is high when the sum of the F/I connected to the output of Block A is within 15% of the block A F/O limit.

3.1 Calculating Propagation Delay Time

3.1.1 Delay time of input buffer and internal function block

The delay time of input buffer and internal function block can be estimated from the load (number of fanouts) connected to the block including the memory block and its wiring length (wiring capacitance).

$$t_{PD} = t_{LD0} + (\Sigma F/O + L) \times t_1$$
 (ns)

 t_{LDO} : Delay time of block itself when F/O = 0, L = 0

 $\Sigma F/O\,$: Number of fan-outs of output pin

L : Wiring capacitance of output pin (see 3.1.3 Estimated Wiring Capacitance)

t₁ : Delay coefficient of output pin

3.1.2 Delay time of output buffer

The delay time of an output buffer greatly depends on the load capacitance connected to the output pin. The dependency of delay time on load capacitance varies with the drive capability of the buffer.

The delay time(t_{PD}) of an output buffer can be estimated for the given load capacitance(C_L) using the following formula:

$$t_{PD} = t_{LD0} + T \times C_L$$
 (ns)

tldo : Reference delay time (ns)

T : Delay coefficient

 C_L : Load capacitance (pF) ($C_L \ge 15$ pF)

The delay time of an I/O buffer is obtained as follows.

CMOS level interface : Threshold voltage = 1/2 VDD

3.1.3 Estimated Wiring Capacitance

The values of estimated wiring capacitance (converted to Fan-in mode) of the CMOS-N5 family are shown in the table below.

						(1/2)
Master			Pin I	Pairs		
	1	2	3	4	5	6
μ PD65880	1.621	3.266	4.911	6.556	8.200	9.845
μ PD65881	1.641	3.356	5.070	6.785	8.500	10.214
μ PD65882	1.684	3.552	5.421	7.289	9.158	11.027
μ PD65883	1.730	3.767	5.803	7.840	9.876	11.913
μ PD65884	1.757	3.892	6.026	8.161	10.295	12.430
μ PD65885	1.780	3.997	6.213	8.430	10.647	12.863
μ PD65887	1.819	4.175	6.532	8.889	11.245	13.602
μ PD65889	1.861	4.372	6.883	9.393	11.904	14.414
μ PD65890	1.904	4.569	7.233	9.897	12.562	15.226
μ PD65893	1.943	4.747	7.552	10.356	13.160	15.965

						(2/2)
Master			Pin I	Pairs		
	7	8	9	10	11 to 15	16 to 20
μ PD65880	11.490	13.135	14.779	16.424	24.648	32.871
μ PD65881	11.929	13.644	15.358	17.073	25.647	34.220
μ PD65882	12.895	14.764	16.632	18.501	27.844	37.187
μ PD65883	13.949	15.986	18.022	20.059	30.241	40.424
μ PD65884	14.564	16.699	18.833	20.967	31.640	42.312
μ PD65885	15.080	17.297	19.513	21.730	32.813	43.897
μ PD65887	15.958	18.315	20.672	23.028	34.811	46.594
μ PD65889	16.925	19.435	21.946	24.456	37.009	49.561
μ PD65890	17.891	20.555	23.220	25.884	39.206	52.528
μ PD65893	18.769	21.574	24.378	27.182	41.204	55.226

4. Input Interface Levels

The CMOS-N5 family has the following four types of interface levels.

- (1) CMOS level input
- (2) TTL level input
- (3) CMOS Schmitt input
- (4) TTL Schmitt input

5. Output Drive Capability

The following levels are available for output drive capability.

CMOS level output (Six types): (3.0 mA, 6.0 mA, 9.0 mA, 12.0 mA, 18.0 mA and 24.0 mA)

6. Multifunction Buffers

6.1 Buffers with Pull-up/Pull-down Resistors

The CMOS-N5 family has input/output/bidirectional buffers with the following on-chip pull-up/pull-down resistors. Select one suitable for the specific application.

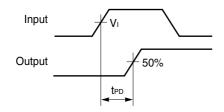
(1) Pull-up resistor : $50 \text{ k}\Omega$ (TYP.) (2) Pull-down resistor : $50 \text{ k}\Omega$ (TYP.) (3) Pull-up resistor : $5 \text{ k}\Omega$ (TYP.)

6.2 Low Slew-Rate Buffers

The CMOS-N5 family has special buffers that satisfy low noise requirement by fixing slew-rate low. These are called low slew-rate buffers. In this library, these buffers are described with a word "Low-noise" at their function description.

7. Definition of Propagation Delays

(1) Input Buffer

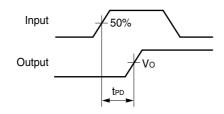


$$V_I = 2.5 \text{ V (CMOS level input)}$$

 $V_I = 1.5 \text{ V (TTL level input)}$

(Internal supply voltage range) × 50 %

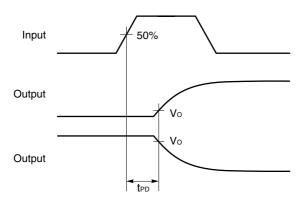
(2) Output Buffer (L \rightarrow H, H \rightarrow L, Z \rightarrow H, Z \rightarrow L)



(Internal supply voltage range) \times 50 % \downarrow Vo= 2.5 V (CMOS level input)

- $Z \rightarrow H$ (The beginning of Vo = L level)
- $Z \rightarrow L$ (The beginning of Vo = H level)

(3) Output Buffer (L→Z, H→Z)

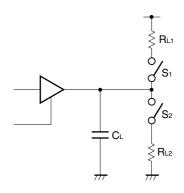


(Internal supply voltage range) \times 50 % \downarrow $Vo = 0.1 \ V \times V_{DD} \ (L \rightarrow Z)$

$$Vo = 0.9~V \times V_{DD}~(H {\rightarrow} Z)$$

8. Measurement Load Conditions

CMOS level output buffer



• Normal Output Voltage

$$R_{L1},\ R_{L2}=\infty,\ C_L=15\ pF$$

(S₁, S₂ : OFF)

• 3-State Output Buffer

$$R_{L1}=2~k\Omega,~R_{L2}=2~K\Omega,~C_{L}=15~pF$$

 $t_{P(HH)}, t_{P(LL)}$: $S_1 = OFF, S_2 = OFF$

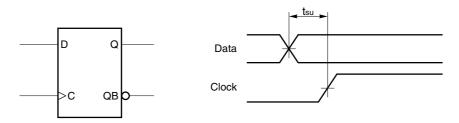
 $t_{P(HH)},\,tp_{(LL)}\qquad :\, S_1=OFF,\,S_2=OFF$

 $t_{P(ZH)}, t_{D(HZ)}$: $S_1 = OFF, S_2 = ON$

9. Timing

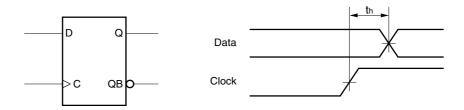
(1) Set up time (tsu)

The data setup time required before arrival of an active edge of a clock to read data correctly.



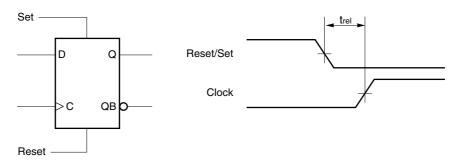
(2) Hold time (th)

The data hold time required after receiving an active edge of the clock to read data correctly.



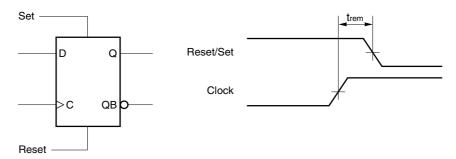
(3) Release time (trel)

The time required from the release of a reset (or set) signal of a latch or flip-flop until the active edge of the next clock pulse becomes valid.



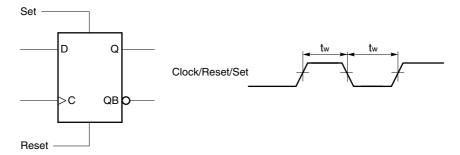
(4) Removal time (trem)

The time required to invalidate an active edge of a clock when a reset (or set) signal of a latch or flip-flop is released.



(5) Minimum Pulse Width (tw)

The minimum pulse width of Clock/Reset/Set required to read data correctly.



Related documents

The related documents indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

CMOS-N5 Family Design Manual
 CMOS-N5 Family Mega Macro Design Manual
 CMOS-N5 Family (5.0 V) Block Library
 CMOS-N5 Family (3.3 V) Block Library
 CMOS-N5 Family Memory Block Library
 This manual
 CMOS-N5 Family Memory Block Library
 A14683E
 Design For Test User's Manual
 SEMICONDUCTOR SELECTION GUIDE Products & Packages (CD-ROM)
 X13769E

When designing your system, be sure to use the latest documents. Contact your local NEC sales office or distributors.

Contents

Chapter 1 Interface Block

1.1 CMOS Level

Function	Block	Description	Cells (I/O)	Page
Input Buffer	FI01	-	3 (1)	1-4
	FID1	50kΩ Pull-down	3 (1)	
	FIU1	50kΩ Pull-up	3 (1)	
	FIW1	5kΩ Pull-up	3 (1)	
	FIS1W	Schmitt	6 (1)	
	FDS1W	Schmitt 50kΩ Pull-down	6 (1)	
	FUS1W	Schmitt 50kΩ Pull-up	6 (1)	
	FWS1W	Schmitt 5kΩ Pull-up	6 (1)	
Input Buffer with failsafe	FIA1	-	3 (1)	1-6
	FDA1	50kΩ Pull-down	3 (1)	
	FIE1W	Schmitt	6 (1)	
	FDE1W	Schmitt 50kΩ Pull-down	6 (1)	
Input Buffer with EN(AND)	FN11	-	6 (1)	1-8
	FN21	50kΩ Pull-down	6 (1)	
Input Buffer with EN(OR)	FN13	-	4 (1)	1-10
	FN23	50kΩ Pull-down	4 (1)	
Output Buffer	FO09	3mA	4 (1)	1-12
	FO04	6mA	4 (1)	
	FO01	9mA	4 (1)	
	FO02	12mA	12 (1)	
	FO03	18mA	12 (1)	
	FO06	24mA	12 (1)	
Low-noise Output Buffer	FE09	3mA	5 (1)	1-14
	FE04	6mA	5 (1)	
	FE01	9mA	5 (1)	
	FE02	12mA	5 (1)	
	FE03	18mA	5 (1)	
	FE06	24mA	5 (1)	

Function	Block	Description	Cells (I/O)	Page
3-State Buffer	Воот	3mA	7 (1)	1-16
	BODT	3mA 50kΩ Pull-down	7 (1)	
	BOUT	3mA 50kΩ Pull-up	7 (1)	
	BOWT	3mA 5kΩ Pull-up	7 (1)	
	B00E	6mA	7 (1)	
	BODE	6mA 50kΩ Pull-down	7 (1)	
	BOUE	6mA 50kΩ Pull-up	7 (1)	
	BOWE	6mA 5kΩ Pull-up	7 (1)	
	B008	9mA	7 (1)	
	B0D8	9mA 50kΩ Pull-down	7 (1)	
	B0U8	9mA 50kΩ Pull-up	7 (1)	
	B0W8	9mA 5kΩ Pull-up	7 (1)	
	B007	12mA	17 (1)	
	B0D7	12mA 50kΩ Pull-down	17 (1)	
	B0U7	12mA 50kΩ Pull-up	17 (1)	
	B0W7	12mA 5kΩ Pull-up	17 (1)	
	B009	18mA	17 (1)	
	B0D9	18mA 50kΩ Pull-down	17 (1)	
	B0U9	18mA 50kΩ Pull-up	17 (1)	
	B0W9	18mA 5kΩ Pull-up	17 (1)	
	В00Н	24mA	17 (1)	
	B0DH	24mA 50kΩ Pull-down	17 (1)	
	B0UH	24mA 50kΩ Pull-up	17 (1)	
	B0WH	24mA 5kΩ Pull-up	17 (1)	

Function	Block	Description	Cells (I/O)	Page
Low-noise 3-State Buffer	BE0T	3mA	7 (1)	1-20
	BEDT	3mA 50kΩ Pull-down	7 (1)	
	BEUT	3mA 50kΩ Pull-up	7 (1)	
	BEWT	3mA 5kΩ Pull-up	7 (1)	
	BE0E	6mA	7 (1)	
	BEDE	6mA 50kΩ Pull-down	7 (1)	
	BEUE	6mA 50kΩ Pull-up	7 (1)	
	BEWE	6mA 5kΩ Pull-up	7 (1)	
	BE08	9mA	7 (1)	
	BED8	9mA 50kΩ Pull-down	7 (1)	
	BEU8	9mA 50kΩ Pull-up	7 (1)	
	BEW8	9mA 5kΩ Pull-up	7 (1)	
	BE07	12mA	7 (1)	
	BED7	12mA 50kΩ Pull-down	7 (1)	
	BEU7	12mA 50kΩ Pull-up	7 (1)	
	BEW7	12mA 5kΩ Pull-up	7 (1)	
	BE09	18mA	7 (1)	
	BED9	18mA 50kΩ Pull-down	7 (1)	
	BEU9	18mA 50kΩ Pull-up	7 (1)	
	BEW9	18mA 5kΩ Pull-up	7 (1)	
	ВЕ0Н	24mA	7 (1)	
	BEDH	24mA 50kΩ Pull-down	7 (1)	
	BEUH	24mA 50kΩ Pull-up	7 (1)	
	BEWH	24mA 5kΩ Pull-up	7 (1)	
N-ch open drain Buffer	EXT1	9mA	4 (1)	1-24
	EXT3	9mA 50kΩ Pull-up	4 (1)	
	EXW3	9mA 5kΩ Pull-up	4 (1)	
	EXT9	12mA	4 (1)	
	EXTB	12mA 50kΩ Pull-up	4 (1)	
	EXWB	12mA 5kΩ Pull-up	4 (1)]
	EXT5	18mA	4 (1)	
	EXT7	18mA 50kΩ Pull-up	4 (1)]
	EXW7	18mA 5kΩ Pull-up	4 (1)]
	EXTD	24mA	4 (1)	
	EXTF	24mA 50kΩ Pull-up	4 (1)	
	EXWF	24mA 5kΩ Pull-up	4 (1)	
N-ch open drain Buffer with failsafe	EXO1	9mA	4 (1)	1-26
	EXO9	12mA	4 (1)	1
	EXO5	18mA	4 (1)	1
	EXOD	24mA	4 (1)	1

Function	Block	Description	Cells (I/O)	Page
N-ch open drain I/O Buffer with failsafe	EBA1	9mA	7 (1)	1-28
	EBA9	12mA	7 (1)	
	EBA5	18mA	7 (1)	
	EBAD	24mA	7 (1)	
N-ch open drain Schmitt I/O Buffer with failsafe	EBE1W	9mA	10 (1)	1-30
	EBE9W	12mA	10 (1)	
	EBE5W	18mA	10 (1)	
	EBEDW	24mA	10 (1)	
I/O Buffer	B00U	3mA	10 (1)	1-32
	B0DU	3mA 50kΩ Pull-down	10 (1)	
	BOUU	3mA 50kΩ Pull-up	10 (1)	
	B0WU	3mA 5kΩ Pull-up	10 (1)	
	B00C	6mA	10 (1)	
	B0DC	6mA 50kΩ Pull-down	10 (1)	
	BOUC	6mA 50kΩ Pull-up	10 (1)	
	BOWC	6mA 5kΩ Pull-up	10 (1)	
	B003	9mA	10 (1)	
	B0D3	9mA 50kΩ Pull-down	10 (1)	
	B0U3	9mA 50kΩ Pull-up	10 (1)	
	B0W3	9mA 5kΩ Pull-up	10 (1)	
	B001	12mA	20 (1)	
	B0D1	12mA 50kΩ Pull-down	20 (1)	
	B0U1	12mA 50kΩ Pull-up	20 (1)	
	B0W1	12mA 5kΩ Pull-up	20 (1)	
	B005	18mA	20 (1)	
	B0D5	18mA 50kΩ Pull-down	20 (1)	
	B0U5	18mA 50kΩ Pull-up	20 (1)	
	B0W5	18mA 5kΩ Pull-up	20 (1)	
	B00F	24mA	20 (1)	
	B0DF	24mA 50kΩ Pull-down	20 (1)	
	B0UF	24mA 50kΩ Pull-up	20 (1)	1
	BOWF	24mA 5kΩ Pull-up	20 (1)	

Function	Block	Description	Cells (I/O)	Page
Low-noise I/O Buffer	BE0U	3mA	10 (1)	1-38
	BEDU	3mA 50kΩ Pull-down	10 (1)	
	BEUU	3mA 50kΩ Pull-up	10 (1)	
	BEWU	3mA 5kΩ Pull-up	10 (1)	
	BE0C	6mA	10 (1)	
	BEDC	6mA 50kΩ Pull-down	10 (1)	
	BEUC	6mA 50kΩ Pull-up	10 (1)	
	BEWC	6mA 5kΩ Pull-up	10 (1)	
	BE03	9mA	10 (1)	
	BED3	9mA 50kΩ Pull-down	10 (1)	
	BEU3	9mA 50kΩ Pull-up	10 (1)	
	BEW3	9mA 5kΩ Pull-up	10 (1)	
	BE01	12mA	10 (1)	
	BED1	12mA 50kΩ Pull-down	10 (1)	
	BEU1	12mA 50kΩ Pull-up	10 (1)	
	BEW1	12mA 5kΩ Pull-up	10 (1)	
	BE05	18mA	10 (1)	
	BED5	18mA 50kΩ Pull-down	10 (1)	
	BEU5	18mA 50kΩ Pull-up	10 (1)	
	BEW5	18mA 5kΩ Pull-up	10 (1)	
	BE0F	24mA	10 (1)	
	BEDF	24mA 50kΩ Pull-down	10 (1)	
	BEUF	24mA 50kΩ Pull-up	10 (1)	
	BEWF	24mA 5kΩ Pull-up	10 (1)	

Function	Block	Description	Cells (I/O)	Page
Schmitt I/O Buffer	BSIUW	3mA	13 (1)	1-44
	BSDUW	3mA 50kΩ Pull-down	13 (1)	
	BSUUW	3mA 50kΩ Pull-up	13 (1)	
	BSWUW	3mA 5kΩ Pull-up	13 (1)	
	BSICW	6mA	13 (1)	
	BSDCW	6mA 50kΩ Pull-down	13 (1)	
	BSUCW	6mA 50kΩ Pull-up	13 (1)	
	BSWCW	6mA 5kΩ Pull-up	13 (1)	
	BSI3W	9mA	13 (1)	
	BSD3W	9mA 50kΩ Pull-down	13 (1)	
	BSU3W	9mA 50kΩ Pull-up	13 (1)	
	BSW3W	9mA 5kΩ Pull-up	13 (1)	
	BSI1W	12mA	23 (1)	
	BSD1W	12mA 50kΩ Pull-down	23 (1)	
	BSU1W	12mA 50kΩ Pull-up	23 (1)	
	BSW1W	12mA 5kΩ Pull-up	23 (1)	
	BSI5W	18mA	23 (1)	
	BSD5W	18mA 50kΩ Pull-down	23 (1)	
	BSU5W	18mA 50kΩ Pull-up	23 (1)	
	BSW5W	18mA 5kΩ Pull-up	23 (1)	
	BSIFW	24mA	23 (1)	
	BSDFW	24mA 50kΩ Pull-down	23 (1)	
	BSUFW	24mA 50kΩ Pull-up	23 (1)	
	BSWFW	24mA 5kΩ Pull-up	23 (1)	

Function	Block	Description	Cells (I/O)	Page
Low-noise Schmitt I/O Buffer	BFIUW	3mA	13 (1)	1-50
	BFDUW	3mA 50kΩ Pull-down	13 (1)	
	BFUUW	3mA 50kΩ Pull-up	13 (1)	
	BFWUW	3mA 5kΩ Pull-up	13 (1)	
	BFICW	6mA	13 (1)	
	BFDCW	6mA 50kΩ Pull-down	13 (1)	
	BFUCW	6mA 50kΩ Pull-up	13 (1)	
	BFWCW	6mA 5kΩ Pull-up	13 (1)	
	BFI3W	9mA	13 (1)	
	BFD3W	9mA 50kΩ Pull-down	13 (1)	
	BFU3W	9mA 50kΩ Pull-up	13 (1)	
	BFW3W	9mA 5kΩ Pull-up	13 (1)	
	BFI1W	12mA	13 (1)	
	BFD1W	12mA 50kΩ Pull-down	13 (1)	
	BFU1W	12mA 50kΩ Pull-up	13 (1)	
	BFW1W	12mA 5kΩ Pull-up	13 (1)	
	BFI5W	18mA	13 (1)	
	BFD5W	18mA 50kΩ Pull-down	13 (1)	
	BFU5W	18mA 50kΩ Pull-up	13 (1)	-
	BFW5W	18mA 5kΩ Pull-up	13 (1)	
	BFIFW	24mA	13 (1)	
	BFDFW	24mA 50kΩ Pull-down	13 (1)	
	BFUFW	24mA 50kΩ Pull-up	13 (1)	
	BFWFW	24mA 5kΩ Pull-up	13 (1)	
O Buffer with EN(AND)	BN2U	3mA	13 (1)	1-56
	BN4U	3mA 50kΩ Pull-down	13 (1)	
	BN2C	6mA	13 (1)	
	BN4C	6mA 50kΩ Pull-down	13 (1)	
	BN23	9mA	13 (1)	
	BN43	9mA 50kΩ Pull-down	13 (1)	
	BN21	12mA	23 (1)	
	BN41	12mA 50kΩ Pull-down	23 (1)	
	BN25	18mA	23 (1)	
	BN45	18mA 50kΩ Pull-down	23 (1)	
	BN2F	24mA	23 (1)	
	BN4F	24mA 50kΩ Pull-down	23 (1)	

Function	Block	Description	Cells (I/O)	Page
I/O Buffer with EN(OR)	BN3U	3mA	11 (1)	1-60
	BN5U	3mA 50kΩ Pull-down	11 (1)	
	BN3C	6mA	11 (1)	
	BN5C	6mA 50kΩ Pull-down	11 (1)	
	BN33	9mA	11 (1)	
	BN53	9mA 50kΩ Pull-down	11 (1)	
	BN31	12mA	21 (1)	
	BN51	12mA 50kΩ Pull-down	21 (1)	
	BN35	18mA	21 (1)	
	BN55	18mA 50kΩ Pull-down	21 (1)	
	BN3F	24mA	21 (1)	
	BN5F	24mA 50kΩ Pull-down	21 (1)	

1.2 TTL Level

Function	Block	Description	Cells (I/O)	Page
Input Buffer	FI02	-	3 (1)	1-68
	FID2	50kΩ Pull-down	3 (1)	
	FIU2	50kΩ Pull-up	3 (1)	
	FIW2	5kΩ Pull-up	3 (1)	
	FIS2W	Schmitt	6 (1)	
	FDS2W	Schmitt 50kΩ Pull-down	6 (1)	
	FUS2W	Schmitt 50kΩ Pull-up	6 (1)	
	FWS2W	Schmitt 5kΩ Pull-up	6 (1)	
Input Buffer with failsafe	FIA2	-	3 (1)	1-70
	FDA2	50 k Ω Pull-down	3 (1)	
	FIE2W	Schmitt	6 (1)	
	FDE2W	Schmitt 50kΩ Pull-down	6 (1)	
Input Buffer with EN(AND)	FN12	-	7 (1)	1-72
	FN22	50 k Ω Pull-down	7 (1)	
Input Buffer with EN(OR)	FN14	-	4 (1)	1-74
	FN24	50 k Ω Pull-down	4 (1)	
N-ch open drain I/O Buffer with failsafe	EBA2	9mA	7 (1)	1-76
	EBAA	12mA	7 (1)	
	EBA6	18mA	7 (1)	
	EBAE	24mA	7 (1)	
N-ch open drain Schmitt I/O Buffer with failsafe	EBE2W	9mA	10 (1)	1-78
	EBEAW	12mA	10 (1)	
	EBE6W	18mA	10 (1)	
	EBEEW	24mA	10 (1)	

Function	Block	Description	Cells (I/O)	Page
I/O Buffer	B00V	3mA	10 (1)	1-80
	B0DV	3mA 50kΩ Pull-down	10 (1)	
	BOUV	3mA 50kΩ Pull-up	10 (1)	
	B0WV	3mA 5kΩ Pull-up	10 (1)	
	B00D	6mA	10 (1)	
	BODD	6mA 50kΩ Pull-down	10 (1)	
	BOUD	6mA 50kΩ Pull-up	10 (1)	
	B0WD	6mA 5kΩ Pull-up	10 (1)	
	B004	9mA	10 (1)	
	B0D4	9mA 50kΩ Pull-down	10 (1)	
	B0U4	9mA 50kΩ Pull-up	10 (1)	
	B0W4	9mA 5kΩ Pull-up	10 (1)	
	B002	12mA	20 (1)	
	B0D2	12mA 50kΩ Pull-down	20 (1)	
	B0U2	12mA 50kΩ Pull-up	20 (1)	
	B0W2	12mA 5kΩ Pull-up	20 (1)	
	B006	18mA	20 (1)	
	B0D6	18mA 50kΩ Pull-down	20 (1)	
	B0U6	18mA 50kΩ Pull-up	20 (1)	
	B0W6	18mA 5kΩ Pull-up	20 (1)	
	B00G	24mA	20 (1)	
	B0DG	24mA 50kΩ Pull-down	20 (1)	
	B0UG	24mA 50kΩ Pull-up	20 (1)	
	B0WG	24mA 5kΩ Pull-up	20 (1)	

Function	Block	Description	Cells (I/O)	Page
Low-noise I/O Buffer	BE0V	3mA	10 (1)	1-86
	BEDV	3mA 50kΩ Pull-down	10 (1)	
	BEUV	3mA 50kΩ Pull-up	10 (1)	
	BEWV	3mA 5kΩ Pull-up	10 (1)	
	BE0D	6mA	10 (1)	
	BEDD	6mA 50kΩ Pull-down	10 (1)	
	BEUD	6mA 50kΩ Pull-up	10 (1)	
	BEWD	6mA 5kΩ Pull-up	10 (1)	
	BE04	9mA	10 (1)	
	BED4	9mA 50kΩ Pull-down	10 (1)	
	BEU4	9mA 50kΩ Pull-up	10 (1)	
	BEW4	9mA 5kΩ Pull-up	10 (1)	
	BE02	12mA	10 (1)	
	BED2	12mA 50kΩ Pull-down	10 (1)	
	BEU2	12mA 50kΩ Pull-up	10 (1)	
	BEW2	12mA 5kΩ Pull-up	10 (1)	
	BE06	18mA	10 (1)	
	BED6	18mA 50kΩ Pull-down	10 (1)	
	BEU6	18mA 50kΩ Pull-up	10 (1)	
	BEW6	18mA 5kΩ Pull-up	10 (1)	
	BE0G	24mA	10 (1)	
	BEDG	24mA 50kΩ Pull-down	10 (1)	
	BEUG	24mA 50kΩ Pull-up	10 (1)	
	BEWG	24mA 5kΩ Pull-up	10 (1)	

Function	Block	Description	Cells (I/O)	Page
Schmitt I/O Buffer	BSIVW	3mA	13 (1)	1-92
	BSDVW	3mA 50kΩ Pull-down	13 (1)	
	BSUVW	3mA 50kΩ Pull-up	13 (1)	
	BSWVW	3mA 5kΩ Pull-up	13 (1)	
	BSIDW	6mA	13 (1)	
	BSDDW	6mA 50kΩ Pull-down	13 (1)	
	BSUDW	6mA 50kΩ Pull-up	13 (1)	
	BSWDW	6mA 5kΩ Pull-up	13 (1)	
	BSI4W	9mA	13 (1)	
	BSD4W	9mA 50kΩ Pull-down	13 (1)	
	BSU4W	9mA 50kΩ Pull-up	13 (1)	
	BSW4W	9mA 5kΩ Pull-up	13 (1)	
	BSI2W	12mA	23 (1)	
	BSD2W	12mA 50kΩ Pull-down	23 (1)	
	BSU2W	12mA 50kΩ Pull-up	23 (1)	
	BSW2W	12mA 5kΩ Pull-up	23 (1)	
	BSI6W	18mA	23 (1)	
	BSD6W	18mA 50kΩ Pull-down	23 (1)	
	BSU6W	18mA 50kΩ Pull-up	23 (1)	
	BSW6W	18mA 5kΩ Pull-up	23 (1)	
	BSIGW	24mA	23 (1)	
	BSDGW	24mA 50kΩ Pull-down	23 (1)	
	BSUGW	24mA 50kΩ Pull-up	23 (1)	
	BSWGW	24mA 5kΩ Pull-up	23 (1)	

Function	Block	Description	Cells (I/O)	Page
Low-noise Schmitt I/O Buffer	BFIVW	3mA	13 (1)	1-98
	BFDVW	3mA 50kΩ Pull-down	13 (1)	
	BFUVW	3mA 50kΩ Pull-up	13 (1)	
	BFWVW	3mA 5kΩ Pull-up	13 (1)	
	BFIDW	6mA	13 (1)	
	BFDDW	6mA 50kΩ Pull-down	13 (1)	
	BFUDW	6mA 50kΩ Pull-up	13 (1)	
	BFWDW	6mA 5kΩ Pull-up	13 (1)	
	BFI4W	9mA	13 (1)	
	BFD4W	9mA 50kΩ Pull-down	13 (1)	
	BFU4W	9mA 50kΩ Pull-up	13 (1)	
	BFW4W	9mA 5kΩ Pull-up	13 (1)	
	BFI2W	12mA	13 (1)	
	BFD2W	12mA 50kΩ Pull-down	13 (1)	
	BFU2W	12mA 50kΩ Pull-up	13 (1)	
	BFW2W	12mA 5kΩ Pull-up	13 (1)	
	BFI6W	18mA	13 (1)	
	BFD6W	18mA 50kΩ Pull-down	13 (1)	
	BFU6W	18mA 50kΩ Pull-up	13 (1)	
	BFW6W	18mA 5kΩ Pull-up	13 (1)	
	BFIGW	24mA	13 (1)	
	BFDGW	24mA 50kΩ Pull-down	13 (1)	
	BFUGW	24mA 50kΩ Pull-up	13 (1)	
	BFWGW	24mA 5kΩ Pull-up	13 (1)	
I/O Buffer with EN(AND)	BN2V	3mA	14 (1)	1-104
	BN4V	3mA 50kΩ Pull-down	14 (1)	
	BN2D	6mA	14 (1)	
	BN4D	6mA 50kΩ Pull-down	14 (1)	
	BN24	9mA	14 (1)	
	BN44	9mA 50kΩ Pull-down	14 (1)	
	BN22	12mA	24 (1)	
	BN42	12mA 50kΩ Pull-down	24 (1)	
	BN26	18mA	24 (1)	
	BN46	18mA 50kΩ Pull-down	24 (1)	
	BN2G	24mA	24 (1)	
	BN4G	24mA 50kΩ Pull-down	24 (1)	

Function	Block	Description	Cells (I/O)	Page
I/O Buffer with EN(OR)	BN3V	3mA	11 (1)	1-108
	BN5V	3mA 50kΩ Pull-down	11 (1)	
	BN3D	6mA	11 (1)	
	BN5D	6mA 50kΩ Pull-down	11 (1)	
	BN34	9mA	11 (1)	
	BN54	9mA 50kΩ Pull-down	11 (1)	
	BN32	12mA	21 (1)	
	BN52	12mA 50kΩ Pull-down	21 (1)	
	BN36	18mA	21 (1)	
	BN56	18mA 50kΩ Pull-down	21 (1)	
	BN3G	24mA	21 (1)	
	BN5G	24mA 50kΩ Pull-down	21 (1)	

1.3 Oscillator

Function	Block	Description	Cells (I/O)	Page
Oscillator Input Buffer	OSI1	-	0 (1)	1-116
Oscillator Input Buffer for Enable	OSI2	-	0 (1)	1-118
Oscillator Input Buffer for OSO9	OSI4	-	0 (1)	1-120
Oscillator Output Buffer (Internal Feedback Resistor)	OSO1	-	0 (1)	1-122
Oscillator Output Buffer (for Enable Type)	OSO7	-	0 (1)	1-124
Oscillator Output Buffer (External Feedback Resistor)	OSO9	-	0 (1)	1-126

Chapter 2 Function Block

2.1 Level Generator

Function	Block	Description	Cells (I/O)	Page
H, L Level Generator	F091	-	1 (-)	2-4

2.2 Inverter, Buffer, CTS Driver, Delay Gate

Function	Block	Description	Cells (I/O)	Page
Inverter	L101	Single Out, Low Power	1 (-)	2-10
	F101	Single Out	1 (-)	
	F102	Single Out, x2-drive	2 (-)	
	F143	Single Out, x3-drive	3 (-)	
	F144	Single Out, x4-drive	4 (-)	
	F145	Single Out, x5-drive	5 (-)	
	F146	Single Out, x6-drive	6 (-)	
	F148	Single Out, x8-drive	12 (-)	
Buffer	L111	Single Out, Low Power	1 (-)	2-12
	F111	Single Out	2 (-)	
	F112	Single Out, x2-drive	3 (-)	
	F153	Single Out, x3-drive	4 (-)	
	F154	Single Out, x4-drive	5 (-)	
	F158	Single Out, x8-drive	11 (-)	
CTS Driver (Inverter Type)	FC42	Single type	80 (-)	2-14
	FC82	Single type, x2-drive	396 (-)	
	FC44	Double type	340 (-)	
	FC84	Double type, x2-drive	1020 (-)	
Delay Gate	F131	-	6 (-)	2-16
	F132	-	10 (-)	

2.3 OR(NOR)

Function	Block	Description	Cells (I/O)	Page
2-Input NOR	L202	Low Power	1 (-)	2-22
	F202	-	2 (-)	
	F222	x2-drive	4 (-)	
	F282	x4-drive	6 (-)	
3-Input NOR	F203	-	3 (-)	2-24
	F223	x2-drive	6 (-)	
4-Input NOR	F204	-	4 (-)	2-26
5-Input NOR	L205	Low Power	4 (-)	2-28
	F205	-	5 (-)	
	F225	x2-drive	6 (-)	
6-Input NOR	F206	-	5 (-)	2-30
	F226	x2-drive	6 (-)	
8-Input NOR	L208	Low Power	7 (-)	2-32
	F208	-	7 (-)	
	F228	x2-drive	8 (-)	
2-Input OR	L212	Low Power	2 (-)	2-34
	F212	-	2 (-)	
	F232	x2-drive	3 (-)	
	F252	x4-drive	6 (-)	
3-Input OR	L213	Low Power	2 (-)	2-36
	F213	-	3 (-)	
	F233	x2-drive	4 (-)	
4-Input OR	L214	Low Power	3 (-)	2-38
	F214	-	3 (-)	
	F234	x2-drive	4 (-)	
5-Input OR	L215	Low Power	4 (-)	2-40
	F215	-	5 (-)	
	F235	x2-drive	7 (-)	
6-Input OR	L216	Low Power	4 (-)	2-42
	F216	-	5 (-)]
	F236	x2-drive	7 (-)]
8-Input OR	L218	Low Power	6 (-)	2-44
	F218	-	8 (-)	1
	F238	x2-drive	9 (-)	1

2.4 AND(NAND)

Function	Block	Description	Cells (I/O)	Page
2-Input NAND	L302	Low Power	1 (-)	2-50
	F302	-	2 (-)	
	F322	x2-drive	4 (-)	
	F382	x4-drive	6 (-)	
3-Input NAND	L303	Low Power	2 (-)	2-52
	F303	-	3 (-)	
	F323	x2-drive	6 (-)	
4-Input NAND	L304	Low Power	2 (-)	2-54
	F304	-	4 (-)	
	F324	x2-drive	8 (-)	
5-Input NAND	F305	-	5 (-)	2-56
	F325	x2-drive	6 (-)	
6-Input NAND	F306	-	5 (-)	2-58
	F326	x2-drive	6 (-)	
8-Input NAND	F308	-	6 (-)	2-60
	F328	x2-drive	7 (-)	
2-Input AND	L312	Low Power	2 (-)	2-62
·	F312	-	2 (-)	
	F332	x2-drive	3 (-)	
	F352	x4-drive	6 (-)	
3-Input AND	L313	Low Power	2 (-)	2-64
	F313	-	3 (-)	1
	F333	x2-drive	4 (-)	
4-Input AND	L314	Low Power	3 (-)	2-66
	F314	-	3 (-)	
	F334	x2-drive	4 (-)	
5-Input AND	L315	Low Power	4 (-)	2-68
	F315	-	5 (-)	
	F335	x2-drive	7 (-)	
6-Input AND	L316	Low Power	4 (-)	2-70
	F316	-	5 (-)	1
	F336	x2-drive	7 (-)	1
8-Input AND	L318	Low Power	5 (-)	2-72
	F318	-	6 (-)	1
	F338	x2-drive	8 (-)	1

2.5 AND-NOR

Function	Block	Description	Cells (I/O)	Page
1-2-Input AND-NOR	L421	Low Power	2 (-)	2-78
	F421	-	3 (-)	
1-1-2-Input AND-NOR	F422	-	4 (-)	2-80
1-3-Input AND-NOR	L423	Low Power	2 (-)	2-82
	F423	-	4 (-)	
2-2-Input AND-NOR	L424	Low Power	2 (-)	2-84
	F424	-	4 (-)	
2-3-Input AND-NOR	F427	-	5 (-)	2-86
1-2-2-Input AND-NOR	F428	-	5 (-)	2-88
2-2-2-Input AND-NOR	L429	Low Power	6 (-)	2-90
	F429	-	6 (-)	
1-4-Input AND-NOR	F440	-	5 (-)	2-92
1-5-Input AND-NOR	L441	Low Power	5 (-)	2-94
	F441	-	7 (-)	
4-4-4-Input AND-NOR	L444	Low Power	8 (-)	2-96
	F444	-	8 (-)	
1-1-1-2-Input AND-NOR	L446	Low Power	4 (-)	2-98
	F446	-	5 (-)	
1-1-1-3-Input AND-NOR	L447	Low Power	5 (-)	2-100
	F447	-	5 (-)	
1-1-2-2-Input AND-NOR	L448	Low Power	5 (-)	2-102
	F448	-	5 (-)	
3-3-3-Input AND-NOR	F449	-	8 (-)	2-104
3-3-3-Input AND-NOR	L460	Low Power	6 (-)	2-106
	F460	-	7 (-)	
1-1-4-Input AND-NOR	L464	Low Power	5 (-)	2-108
	F464	-	5 (-)	
1-1-1-2-Input AND-NOR	F465	-	5 (-)	2-110
4-4-4-Input AND-NOR	F466	-	10 (-)	2-112

2.6 OR-NAND

Function	Block	Description	Cells (I/O)	Page
1-4-Input OR-NAND	L430	Low Power	4 (-)	2-118
	F430	-	5 (-)	
1-2-Input OR-NAND	L431	Low Power	2 (-)	2-120
	F431	-	3 (-)	
1-1-2-Input OR-NAND	L432	Low Power	2 (-)	2-122
	F432	-	4 (-)	
1-3-Input OR-NAND	F433	-	4 (-)	2-124
2-2-Input OR-NAND	F434	-	4 (-)	2-126
1-5-Input OR-NAND	L439	Low Power	5 (-)	2-128
	F439	-	6 (-)	
2-4-Input OR-NAND	L450	Low Power	5 (-)	2-130
	F450	-	6 (-)	
4-4-Input OR-NAND	L451	Low Power	7 (-)	2-132
	F451	-	8 (-)	
1-1-3-Input OR-NAND	L452	Low Power	4 (-)	2-134
	F452	-	5 (-)	
1-1-4-Input OR-NAND	L453	Low Power	5 (-)	2-136
	F453	-	6 (-)	
4-4-4-Input OR-NAND	F457	-	10 (-)	2-138
1-1-1-2-Input OR-NAND	F458	-	5 (-)	2-140
1-1-1-3-Input OR-NAND	L459	Low Power	5 (-)	2-142
	F459	-	5 (-)	
1-1-1-2-Input OR-NAND	F490	-	5 (-)	2-144
1-2-3-Input OR-NAND	L491	Low Power	5 (-)	2-146
	F491	-	5 (-)	
3-3-3-Input OR-NAND	L493	Low Power	6 (-)	2-148
	F493	-	7 (-)	
3-3-3-Input OR-NAND	F496	-	8 (-)	2-150
4-4-4-Input OR-NAND	F498	-	14 (-)	2-152

2.7 Exclusive OR, Exclusive NOR

Function	Block	Description	Cells (I/O)	Page
2-Input Exclusive OR	L511	Low Power	3 (-)	2-158
	F511	-	4 (-)	
3-Input Exclusive OR	L516	Low Power	6 (-)	2-160
	F516	-	7 (-)	•
2-Input Exclusive NOR	L512	Low Power	3 (-)	2-162
	F512	-	4 (-)	
3-Input Exclusive NOR	L517	Low Power	7 (-)	2-164
	F517	-	7 (-)	

2.8 Adder, 3-State Buffer, Decoder, Multiplexer, Generator

Function	Block	Description	Cells (I/O)	Page
1-Bit Full Adder	F521	-	9 (-)	2-170
4-Bit Full Adder	F523	-	32 (-)	2-172
4-Bit Look Ahead Carry Generator	F526	-	34 (-)	2-176
4-Bit Carry Look Ahead Adder	F527	-	69 (-)	2-178
3-State Buffer	L531	with EN, Low Power	4 (-)	2-182
	F531	with EN	5 (-)	
	F533	with EN, x2-drive	7 (-)	
	F53F	with EN, x4-drive	11 (-)	
	L532	with ENB, Low Power	4 (-)	
	F532	with ENB	5 (-)	
	F534	with ENB, x2-drive	7 (-)	
	F53G	with ENB, x4-drive	11 (-)	
	F541	Inverter with EN	6 (-)	
	F543	Inverter with EN, x2-drive	8 (-)	
	F54F	Inverter with EN, x4-drive	12 (-)	
	F542	Inverter with ENB	6 (-)	
	F544	Inverter with ENB, x2-drive	8 (-)	
	F54G	Inverter with ENB, x4-drive	12 (-)	
2 to 4 Decoder	L560	Positive Out, Low Power	6 (-)	2-186
	F560	Positive Out	10 (-)	
	L561	Negative Out, Low Power	6 (-)	
	F561	Negative Out	10 (-)	
2 to 1 Multiplexer (Positive Out)	L565	Low Power	3 (-)	2-190
	F565	-	4 (-)	
	L571	with ENB, Low Power	4 (-)	
	F571	with ENB	6 (-)	
4 to 1 Multiplexer (Positive Out)	F564	-	8 (-)	2-192
	F570	with ENB	10 (-)	
8 to 1 Multiplexer (Positive Out)	F563	-	18 (-)	2-194
	F569	with ENB	18 (-)	
Quad 2 to 1 Multiplexer (Negative Out)	L572	with ENB, Low Power	15 (-)	2-198
	F572	with ENB	17 (-)	
8-Bit Odd Parity Generator	F581	-	19 (-)	2-202
8-Bit Even Parity Generator	F582	-	19 (-)	2-204

2.9 RS-Latch, RS-F/F

Function	Block	Description	Cells (I/O)	Page
RS-Latch	F595	-	5 (-)	2-210
RS-F/F with R, S	F596	-	11 (-)	2-212

2.10 D-Latch

Function	Block	Description	Cells (I/O)	Page
D-Latch	F601	-	6 (-)	2-218
	L601	Q Out, Low Power	4 (-)	
	F601NQ	Q Out	5 (-)	
	F601NB	QB Out	5 (-)	
D-Latch, High Speed	F6R1	-	6 (-)	2-220
D-Latch with R	F602	-	6 (-)	2-222
	L602	Q Out, Low Power	5 (-)	
	F602NQ	Q Out	6 (-)	
	F602NB	QB Out	5 (-)	
D-Latch with R, High Speed	F6R2	-	7 (-)	2-224
D-Latch with RB	F603	-	7 (-)	2-226
	L603	Q Out, Low Power	5 (-)	
	F603NQ	Q Out	5 (-)	
	F603NB	QB Out	6 (-)	
D-Latch with RB, High Speed	F6R5	-	6 (-)	2-228
D-Latch with SB	F60K	-	7 (-)	2-230
	F60KNQ	Q Out	6 (-)	
	F60KNB	QB Out	5 (-)	
D-Latch with RB, SB	F60J	-	7 (-)	2-232
	F60JNQ	Q Out	6 (-)	
	F60JNB	QB Out	6 (-)	
D-Latch (GB)	F604	-	6 (-)	2-236
	L604	Q Out, Low Power	4 (-)	
	F604NQ	Q Out	5 (-)	
	F604NB	QB Out	5 (-)	
D-Latch (GB), High Speed	F6R8	-	6 (-)	2-238
D-Latch (GB) with RB	F605	-	7 (-)	2-240
	L605	Q Out, Low Power	5 (-)	
	F605NQ	Q Out	5 (-)	
	F605NB	QB Out	6 (-)]
D-Latch (GB) with RB, High Speed	F6R9	-	6 (-)	2-242

2.11 D-F/F

Function	Block	Description	Cells (I/O)	Page
D-F/F	F641	-	8 (-)	2-248
	L641	Q Out, Low Power	6 (-)	
	F641NQ	Q Out	7 (-)	
	F641NB	QB Out	7 (-)	
D-F/F with R	F642	-	9 (-)	2-250
	F642NQ	Q Out	8 (-)	
	F642NB	QB Out	8 (-)	
D-F/F with S	F643	-	9 (-)	2-252
	F643NQ	Q Out	8 (-)	
	F643NB	QB Out	8 (-)	
D-F/F with R, S	F644	-	10 (-)	2-254
	L644	Q Out, Low Power	8 (-)	
	F644NQ	Q Out	9 (-)	
	F644NB	QB Out	9 (-)	
D-F/F with RB	F615	-	9 (-)	2-256
	L645	Q Out, Low Power	7 (-)	
	F615NQ	Q Out	8 (-)	
	F615NB	QB Out	8 (-)	
D-F/F with SB	F616	-	9 (-)	2-258
	F616NQ	Q Out	8 (-)	
	F616NB	QB Out	8 (-)	
D-F/F with RB, SB	F647	-	10 (-)	2-260
	L647	Q Out, Low Power	8 (-)	
	F647NQ	Q Out	9 (-)	
	F647NB	QB Out	9 (-)	
D-F/F (CB)	F661	-	8 (-)	2-262
	L661	Q Out, Low Power	6 (-)	
	F661NQ	Q Out	7 (-)	
	F661NB	QB Out	7 (-)	
D-F/F (CB) with RB	F665	-	9 (-)	2-264
	F665NQ	Q Out	8 (-)	
	F665NB	QB Out	8 (-)	
D-F/F (CB) with SB	F666	-	9 (-)	2-266
. ,	F666NQ	Q Out	8 (-)	
	F666NB	QB Out	8 (-)	
D-F/F (CB) with RB, SB	F667	-	10 (-)	2-268
, , , , , ,	L667	Q Out, Low Power	8 (-)	1
	F667NQ	Q Out	9 (-)	1
	F667NB	QB Out	9 (-)	1
D-F/F with 2 to 1 Selector	F641S	-	10 (-)	2-270
	F641SQ	Q Out	9 (-)	<u></u> :
	F641SB	QB Out	9 (-)	1

Function	Block	Description	Cells (I/O)	Page
D-F/F with R, 2 to 1 Selector	F642S	-	11 (-)	2-272
	F642SQ	Q Out	10 (-)	
	F642SB	QB Out	10 (-)	
D-F/F with S, 2 to 1 Selector	F643S	-	11 (-)	2-274
	F643SQ	Q Out	10 (-)	
	F643SB	QB Out	10 (-)	
D-F/F with R, S, 2 to 1 Selector	F644S	-	12 (-)	2-276
	F644SQ	Q Out	11 (-)	
	F644SB	QB Out	11 (-)	
D-F/F with RB, 2 to 1 Selector	F615S	-	11 (-)	2-278
	F615SQ	Q Out	10 (-)	
	F615SB	QB Out	10 (-)	
D-F/F with SB, 2 to 1 Selector	F616S	-	11 (-)	2-280
	F616SQ	Q Out	10 (-)	
	F616SB	QB Out	10 (-)	
D-F/F with RB, SB, 2 to 1 Selector	F647S	-	12 (-)	2-282
	F647SQ	Q Out	11 (-)	
	F647SB	QB Out	11 (-)	
D-F/F (CB) with 2 to 1 Selector	F661S	-	10 (-)	2-284
	F661SQ	Q Out	9 (-)	
	F661SB	QB Out	9 (-)	
D-F/F (CB) with RB, 2 to 1 Selector	F665S	-	11 (-)	2-286
	F665SQ	Q Out	10 (-)	
	F665SB	QB Out	10 (-)	
D-F/F (CB) with SB, 2 to 1 Selector	F666S	-	11 (-)	2-288
	F666SQ	Q Out	10 (-)	
	F666SB	QB Out	10 (-)	
D-F/F (CB) with RB, SB, 2 to 1 Selector	F667S	-	12 (-)	2-290
	F667SQ	Q Out	11 (-)	
	F667SB	QB Out	11 (-)	
D-F/F with Hold	F641H	-	10 (-)	2-292
	F641HQ	Q Out	9 (-)	
	F641HB	QB Out	9 (-)	
D-F/F with RB, Hold	F615H	-	11 (-)	2-294
	F615HQ	Q Out	10 (-)	
	F615HB	QB Out	10 (-)	
D-F/F with SB, Hold	F616H	-	11 (-)	2-296
	F616HQ	Q Out	10 (-)	
	F616HB	QB Out	10 (-)	1
D-F/F with RB, SB, Hold	F647H	-	12 (-)	2-298
	F647HQ	Q Out	11 (-)	1
	F647HB	QB Out	11 (-)	1
D-F/F (CB) with 2 to 1 Selector(2 CTRL), RB	F673	-	11 (-)	2-300
D-F/F (CB) with Hold, 2 to 1 Selector(2 CTRL), RB	F674	-	12 (-)	2-302

2.12 T-F/F, JK-F/F

Function	Block	Description	Cells (I/O)	Page
T-F/F with R, S	F744	-	9 (-)	2-308
	L744	Q Out, Low Power	7 (-)	
	F744NQ	Q Out	8 (-)	
T-F/F with RB	F745	-	8 (-)	2-310
	F745NQ	Q Out	7 (-)	
T-F/F with RB, SB	F747	-	9 (-)	2-312
	L747	Q Out, Low Power	7 (-)	
	F747NQ	Q Out	8 (-)	
T-F/F with Data-Hold R, S	F791	-	12 (-)	2-314
T-F/F (TB) with RB	F765	-	8 (-)	2-316
	F765NQ	Q Out	7 (-)	
T-F/F (TB) with RB, SB	F767	-	9 (-)	2-318
	L767	Q Out, Low Power	7 (-)	
	F767NQ	Q Out	8 (-)	
T-F/F (TB) with Data-Hold RB, SB	F792	-	12 (-)	2-320
JK-F/F	F771	-	10 (-)	2-322
	F771NQ	Q Out	9 (-)	
	F771NB	QB Out	9 (-)	
JK-F/F, High Speed	F7D1	-	10 (-)	2-324
JK-F/F with R, S	F774	-	12 (-)	2-326
	F774NQ	Q Out	11 (-)	
	F774NB	QB Out	11 (-)	
JK-F/F with RB	F775	-	11 (-)	2-328
	F775NQ	Q Out	10 (-)	
	F775NB	QB Out	10 (-)	
JK-F/F with SB	F776	-	11 (-)	2-330
	F776NQ	Q Out	10 (-)	
	F776NB	QB Out	10 (-)	
JK-F/F with RB, SB	F777	-	12 (-)	2-332
	F777NQ	Q Out	11 (-)	
	F777NB	QB Out	11 (-)	
JK-F/F (CB)	F781	-	10 (-)	2-334
	F781NQ	Q Out	9 (-)	
	F781NB	QB Out	9 (-)	
JK-F/F (CB), High Speed	F7E1	-	10 (-)	2-336
JK-F/F (CB) with RB, SB	F787	-	12 (-)	2-338
	F787NQ	Q Out	11 (-)	
	F787NB	QB Out	11 (-)	

Chapter 3 Scan Path Block

3.1 Standard Type

Function	Block	Description	Cells (I/O)	Page
Scan D-F/F with R, S, 2 to 1 Selector	S000	-	12 (-)	3-4
Scan D-F/F with 2 to 1 Selector	S002	-	10 (-)	3-6
Scan D-F/F with 2 to 1 Selector, High Speed	S003	-	11 (-)	3-8
Scan D-F/F with R, S, Hold, 2 to 1 Selector	S050	-	16 (-)	3-10
Scan D-F/F with Hold, 2 to 1 Selector	S052	-	14 (-)	3-12
Scan JK-F/F with R, S, D-F/F Function	S100	-	14 (-)	3-14
Scan JK-F/F with D-F/F Function	S102	-	12 (-)	3-16
Scan JK-F/F with R, S, Hold, D-F/F Function	S150	-	18 (-)	3-18
Scan JK-F/F with Hold, D-F/F Function	S152	-	16 (-)	3-20
Scan D-Latch with R, D-F/F Function	S201	-	13 (-)	3-22
Scan D-Latch with D-F/F Function	S202	-	12 (-)	3-24
Scan D-Latch with D-F/F Function, High Speed	S204	-	12 (-)	3-26
Scan D-Latch with R, Special Function	S301	-	8 (-)	3-28
Scan D-Latch with Special Function	S302	-	7 (-)	3-30
Scan D-Latch with Special Function, High Speed	S303	-	7 (-)	3-32

3.2 NEC Scan

Function	Block	Description	Cells (I/O)	Page
NEC Scan D-Latch	SE601	-	13 (-)	3-38
NEC Scan D-Latch with R	SE602	-	14 (-)	3-40
NEC Scan D-Latch with RB	SE603	-	14 (-)	3-42
NEC Scan D-Latch(GB)	SE604	-	13 (-)	3-44
NEC Scan D-Latch(GB) with RB	SE605	-	14 (-)	3-46
NEC Scan D-F/F	SE611	-	11 (-)	3-48
NEC Scan D-F/F with R, S	SE614	-	13 (-)	3-50
NEC Scan D-F/F with RB	SE615	-	12 (-)	3-52
NEC Scan D-F/F with SB	SE616	-	12 (-)	3-54
NEC Scan D-F/F with RB, SB	SE617	-	13 (-)	3-56
NEC Scan D-F/F (CB)	SE631	-	11 (-)	3-58
NEC Scan D-F/F (CB) with RB, SB	SE637	-	13 (-)	3-60

3.3 Scan Controller

Function	Block	Description	Cells (I/O)	Page
Clock Distributor	SCD1	-	8 (-)	3-66
Clock Distributor with Test (Positive Clock)	SCDC	-	2 (-)	3-68
Clock Distributor with Test (Negative Clock)	SCDD	-	2 (-)	3-70
I/F Control (AMC) with EN	SFEH	-	3 (-)	3-72
I/F Control (AMC) with ENB	SFEL	-	2 (-)	3-74
I/F Control (SMC) with EN	SOEH	-	3 (-)	3-76
I/F Control (SMC) with ENB	SOEL	-	2 (-)	3-78
Mega Macro Skip	SMS1	-	4 (-)	3-80
Set/Reset Control	SRH1	-	2 (-)	3-82
Set-B/Reset-B Control	SRL1	-	2 (-)	3-84
Loop Cut	SRPD	-	12 (-)	3-86
Clock Generator	SCKG	-	16 (-)	3-88
Common Input	SCI1	-	2 (-)	3-90
Common Output	SCO1	-	4 (-)	3-92
GND	SGND	-	2 (-)	3-94

Chapter 4 Boundary Scan Block

4.1 TAP Macro

Function	Block	Description	Cells (I/O)	Page
BScan TAP Macro	SBCJ	-	262 (-)	4-4
BScan TAP Macro with NEC Scan	SBCL	-	315 (-)	4-6

4.2 Level Generator

Function	Block	Description	Cells (I/O)	Page
BScan Level Generator (CLANP)	SBZ1	-	1 (-)	4-12

4.3 Data Register

Function	Block	Description	Cells (I/O)	Page
BScan Data Register for Input	SVRNI2	-	12 (-)	4-18
BScan Data Register for Output	SVRN22	-	24 (-)	4-20
BScan Data Register for 3-state	SVRN32	-	50 (-)	4-22
BScan Data Register for Bid	SVRNB2	-	57 (-)	4-24

4.4 D-latch, Selector, Shift Register

Function	Block	Description	Cells (I/O)	Page
BScan D-Latch with SB Q Out, Low Power	L606	-	5 (-)	4-30
BScan Selector	SBD1	-	4 (-)	4-32
BScan Shift Register	SBR1	-	8 (-)	4-34
BScan Data Selector for Output	SVSNA2	-	7 (-)	4-36
BScan Data Selector for Bid	SVSNB2	-	7 (-)	4-38
BScan Data Enable Selector for 3-state	SVSNC2	-	9 (-)	4-40
BScan Data Enable Selector for Bid	SVSNE2	-	9 (-)	4-42

4.5 Soft Macro

Function	Block	Description	Cells (I/O)	Page
BScan TAP Controller	SBCK	-	392 (-)	4-48
BScan Instruction Register (Internal Circuit)	SBM4	-	46 (-)	4-50
BScan Instruction Register	SBM5	-	140 (-)	4-52
BScan Instruction Decoder	SBM6	-	24 (-)	4-54
BScan Instruction Decoder with NEC Scan	SBMC	-	37 (-)	4-56
BScan Bypass Register	SBS3	-	26 (-)	4-58

Chapter 1 Interface Block

Chapter 1 Interface Block Chapter 1 Interface Block

[MEMO]

1.1 CMOS Level

Chapter 1 Interface Block

Function	Input Buffer						3.3 V
		Blo	ock type				
Function	no resistor	with 50 KΩ P/D	with 50 KΩ P/U	with 5 KΩ	P/U	I/O cells	int. Cells
Normal	FI01	FID1	FIU1	FIW1		1	3
Schmitt	FIS1W	FDS1W	FUS1W	FWS1\	v	1	6
Clock			<u></u>				
АН		>→ N01 Y	Truth Table A Y 1 1 1 0 0				
Logic Diagr	am for "Schmitt"		Disabation	In	put	Out	put
			Block type	Symbol	Fan-In	Symbol	Fan-Out
A H	D1 ←	→ N01 Y	FI01 to FIW1	Α	-	Y	33
Logic Diagr	am for "Clock"		FIS1W to FWS	1W A	-	Y	24

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t	LDO (ns))		t 1			Т	
	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
FI01	A → Y	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
FID1	A → Y	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
FIU1	A → Y	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
FIW1	A → Y	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
FIS1W	A → Y	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
FDS1W	A → Y	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
FUS1W	A → Y	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
FWS1W	A → Y	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

Chapter 1 Interface Block

Function Input Buffer with failsafe 3.3 V											
		Blo	ock type								
Function	no resistor	with 50 KΩ P/D	with 50 KΩ P/U	with 5 KΩ	P/U	I/O cells	int. Cells				
Normal	FIA1	FDA1				1	3				
Schmitt	FIE1W	FDE1W				1	6				
Clock											
АН		>→ N01 Y	Truth Table A Y 1 1 0 0								
Logic Diagr	am for "Schmitt"			In	out	Ou	tput				
			Block type	· —			Fan-Out				
АН	01 ← Д	→ N01 Y	FIA1 to FDA	1 A	-	Υ	33				
Logic Diagr	ram for "Clock"		FIE1W to FDE	A A	-	Y	24				

Chapter 1 Interface Block

	Switching speed													
Block type	Path		tı	LDO (ns)		t 1		Т					
	IN → Ol	N → OUT			MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.			
FIA1	$A \rightarrow Y$	(HH)	0.188	0.308	0.601	0.010	0.014	0.021						
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021						
FDA1	$A \rightarrow Y$	(HH)	0.188	0.308	0.601	0.010	0.014	0.021						
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021						
FIE1W	$A \rightarrow Y$	(HH)	0.780	1.213	2.369	0.011	0.017	0.025						
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022						
FDE1W	$A \rightarrow Y$	(HH)	0.780	1.213	2.369	0.011	0.017	0.025						
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022						

Chapter 1 Interface Block

Function	Input Buffer with EN	N(AND)							3.3 V
		Blo	ock ty	уре					
Function	no resistor	with 50 KΩ P/D	wit	h 50 KΩ P/U	wit	h 5 KΩ	P/U	I/O cells	int. Cells
Normal	FN11	FN21						1	6
Schmitt									
Clock									
	m for "Normal"			Truth Table					
A H01			A EN 0 0	0					
			0 1 1 0 1 1	0 0 1					
					•				
Logic Diagrai	m for "Schmitt"			5		Inp	out	Ou	tput
				Block type		Symbol	Fan-In	Symbol	Fan-Out
Logic Diagrai	m for "Clock"			FN11 to FN21		A EN	3.0	Y	34

Chapter 1 Interface Block

	Switching speed												
Block type	Path		tı	LDO (ns))		t 1		Т				
	IN → OI	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.			
FN11	A → Y	(HH)	0.109	0.219	0.462	0.010	0.014	0.021					
		(LL)	0.253	0.371	0.715	0.011	0.015	0.021					
	EN → Y	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			ĺ		
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021					
FN21	A → Y	(HH)	0.109	0.219	0.462	0.010	0.014	0.021					
		(LL)	0.253	0.371	0.715	0.011	0.015	0.021			ĺ		
	EN → Y	(HH)	0.158	0.244	0.510	0.010	0.014	0.021					
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021					

Chapter 1 Interface Block

Function	Input Buffer with El	N(OR)							3.3 V
		Blo	ock ty	/ре					
Function	no resistor	with 50 KΩ P/D	wit	h 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
Normal	FN13	FN23						1	4
Schmitt									
Clock									
Logic Diag A H0	ram for "Normal"			Truth Table					
		→ N01 Y → H02 EN		A EN 0 0 0 0 1 1 0 1 1	+				
Logic Diag	ram for "Schmitt"			Block type	·		out Fan-In		tput Fan-Out
Logic Diag	ram for "Clock"			FN13 to FN23		A EN	3.0	Y	34

Chapter 1 Interface Block

	Switching speed												
Block type	Path		tı	LDO (ns))		t 1		Т				
	IN → OU	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.			
FN13	$A \rightarrow Y$	(HH)	0.130	0.233	0.450	0.010	0.014	0.021					
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023					
	EN o Y	(HH)	0.138	0.225	0.411	0.010	0.014	0.021					
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023					
FN23	A → Y	(HH)	0.130	0.233	0.450	0.010	0.014	0.021					
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023					
	EN o Y	(HH)	0.138	0.225	0.411	0.010	0.014	0.021					
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023					

Chapter 1 Interface Block

Function	Output Buffer CMOS 3.3 V											
		Blo	ock	type								
Drivability	no resistor	with 50 KΩ P/D	v	vith 50 KΩ P/U	w	ith 5 KΩ	P/U	I/O cell	int. Cells			
1mA												
2mA												
3mA	FO09							1	4			
6mA	FO04							1	4			
9mA	FO01							1	4			
12mA	FO02							1	12			
18mA	FO03							1	12			
24mA	FO06							1	12			
Logic Diag	ram			Block type		Inp			Output			
				F009		Symbol A	6.1	1 Symb	ol Fan-out			
				. 555		,,	0					
АН	01 +	>→ N01 Y		FO04		А	6.1	Y	-			
				FO01			6.1	Y				
	,			1 1001		A	6.1	, T	-			
				FO02		A	18.4	Y	-			
				FO03		A	18.4	Y	-			
				FO06		A	18.4	Y	-			
Truth Table	9											
A Y												
1 1												
0 0												
ı												

Chapter 1 Interface Block

				Switch	ning spe	had					
1						T					
Block type	Path		t t	LD0 (ns))		t 1			Т	
	IN → O	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FO09	$A \rightarrow Y$	(HH)	0.628	0.992	2.011				0.055	0.078	0.113
		(LL)	0.785	1.363	2.737				0.090	0.131	0.193
FO04	A → Y	(HH)	0.620	1.001	2.053				0.037	0.052	0.076
		(LL)	0.644	1.115	2.214				0.045	0.066	0.097
FO01	A → Y	(HH)	0.660	1.111	2.334				0.023	0.032	0.048
		(LL)	0.688	1.196	2.356				0.030	0.045	0.066
FO02	$A \rightarrow Y$	(HH)	0.466	0.785	1.646				0.019	0.027	0.039
		(LL)	0.427	0.784	1.634				0.023	0.033	0.049
FO03	A → Y	(HH)	0.541	0.936	1.987				0.013	0.019	0.030
l		(LL)	0.486	0.912	1.925				0.016	0.023	0.034
FO06	A → Y	(HH)	0.612	1.074	2.300				0.011	0.016	0.026
		(LL)	0.560	1.072	2.277				0.012	0.018	0.027

Chapter 1 Interface Block

Function	Low-noise Output I	Buffer						СМС	OS 3.3 V
		Blo	ock t	уре					
Drivability	no resistor	with 50 KΩ P/D	wi	th 50 KΩ P/U	w	ith 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA	FE09							1	5
6mA	FE04							1	5
9mA	FE01							1	5
12mA	FE02							1	5
18mA	FE03							1	5
24mA	FE06							1	5
Logic Diag	ıram			Block type		Inp Symbol			tput Fan-out
			┢	FE09		A	9.4	Symbol	ran-out
АН	101 +	>→ N01 Y	.	FE04		Α	9.4	Y	-
				FE01		A	9.4	Y	
	•			1 201		_ ^	3.4	'	
				FE02		Α	9.4	Y	-
				FE03		A	9.4	Y	•
				FE06		А	9.4	Y	.
Truth Table	e								
A Y									
0 0									

Chapter 1 Interface Block

				Curito	hing spe	od.					
1				SWILL	illig spe	eu					
Block type	Path		t	LDO (ns))		t 1			Т	
	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
FE09	$A \rightarrow Y$	(HH)	1.277	2.373	5.611				0.057	0.081	0.120
		(LL)	1.556	2.640	5.338				0.091	0.133	0.196
FE04	A → Y	(HH)	1.330	2.554	6.113				0.040	0.058	0.089
		(LL)	1.462	2.543	5.121				0.049	0.071	0.106
FE01	A → Y	(HH)	1.433	2.890	7.130				0.028	0.042	0.070
		(LL)	1.481	2.634	5.334				0.036	0.053	0.079
FE02	$A \rightarrow Y$	(HH)	1.489	3.061	7.646				0.026	0.039	0.066
		(LL)	1.521	2.760	5.639				0.030	0.044	0.068
FE03	A → Y	(HH)	1.659	3.562	9.177				0.023	0.036	0.064
		(LL)	1.687	3.110	6.401				0.024	0.037	0.058
FE06	A → Y	(HH)	1.824	4.045	10.666				0.022	0.035	0.064
		(LL)	1.904	3.537	7.289				0.021	0.033	0.053

Chapter 1 Interface Block

Function	3-State Buffer							C	MC	OS 3.3 V	
Block type											
Drivability	no resistor	with 50 KΩ P/D	v	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O ce	lls	int. Cells	
1mA											
2mA											
3mA	B00T	BODT		BOUT		B0WT		1		7	
6mA	B00E	BODE		B0UE		B0WE		1		7	
9mA	B008	B0D8		B0U8		B0W8		1		7	
12mA	B007	B0D7		B0U7		B0W7		1		17	
18mA	B009	B0D9		B0U9		B0W9		1		17	
24mA	B00H	BODH		B0UH		B0WH		1		17	
Logic Diag	gram			Block type		Inp				tput	
				B00T to B0WT		Symbol	Fan-ir	1 Sym		Fan-out	
				2001 10 2011		EN	1.0	'			
A I	H01 ←	>→ N01 Y		B00E to B0WE		A EN	6.3 1.0	Y	,	-	
EN I	H02 ◆			B008 to B0W8	A 6.3 EN 1.0			Y	Y	-	
				B007 to B0W7		A EN	16.9 1.0	Y	,	-	
Truth Tabl	e			B009 to B0W9		A EN	16.9 1.0	Y	,	-	
A EN 0 1 1 1 X 0 X:Irrelevant Z:High Impeda	0 1 Z			B00H to B0WH		A EN	16.9	Y	,	-	

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B00T	A → Y	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
DODT		(ZL)	1.074 0.839	1.852 1.469	3.792 3.318				0.090	0.131 0.078	0.193 0.114
B0DT	A → Y	(HH) (LL)	0.839	1.638	3.333				0.036	0.076	0.114
	EN → Y	(HZ)	1.259	1.846	3.271				0.003	0.101	0.132
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
B0UT	A → Y	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y	(HZ)	1.259	1.846	3.271	1					
	1	(LZ)	0.469	0.771	1.492	1					ا ا
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
B0WT	A → Y	(ZL) (HH)	1.074 0.839	1.852 1.469	3.792 3.318				0.090	0.131 0.078	0.193 0.114
DUWI	A → Y	(LL)	0.963	1.638	3.333				0.030	0.076	0.114
	EN → Y	(HZ)	1.259	1.846	3.271				0.003	0.101	0.132
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
B00E	A → Y	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038 0.045	0.053 0.066	0.080 0.098
B0DE	A → Y	(ZL) (HH)	0.931	1.622 1.549	3.317 3.541				0.045	0.053	0.098
DODL	A → 1	(LL)	0.857	1.450	2.908				0.030	0.065	0.000
	EN → Y	(HZ)	1.602	2.366	4.209				0.011	0.000	0.007
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
B0UE	A → Y	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y	(HZ)	1.602	2.366	4.209	1					
		(LZ) (ZH)	0.547 1.164	0.906 2.076	1.819 4.626				0.038	0.053	0.080
		(ZH) (ZL)	0.931	1.622	3.317				0.038	0.053	0.080
B0WE	A → Y	(HH)	0.857	1.549	3.541				0.043	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y	(HZ)	1.602	2.366	4.209	1					
	1	(LZ)	0.547	0.906	1.819	1					
	1	(ZH)	1.164	2.076	4.626	1			0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
B008	A → Y	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
	EN	(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(LZ) (ZH)	1.232	2.276	5.174				0.024	0.035	0.056
	1	(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
		()	0.0.0		0.020				3.001	3.0.0	0.007

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OU	Т	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0D8	A → Y	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
B0U8	A → Y	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y	(HZ)	2.160	3.204	5.612						
		(LZ) (ZH)	0.607 1.232	1.003 2.276	2.005 5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.056
B0W8	A → Y	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276 1.619	5.174				0.024 0.031	0.035 0.045	0.056
B007	A → Y	(ZL) (HH)	0.913	1.265	3.323 2.923				0.031	0.045	0.067 0.045
B007	A → 1	(LL)	0.644	1.115	2.283				0.020	0.023	0.048
	EN → Y	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
B0D7	A → Y	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
	EN → Y	(LL) (HZ)	0.644 1.929	1.115 3.060	2.283 5.656				0.022	0.032	0.048
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
B0U7	A → Y	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644 1.929	1.115	2.283				0.022	0.032	0.048
	EN → Y	(HZ) (LZ)	0.770	3.060 1.362	5.656 2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
B0W7	A → Y	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y	(HZ)	1.929 0.770	3.060 1.362	5.656 2.783						
		(LZ) (ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.020	0.029	0.045
B009	A → Y	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031				0.015	0.000	0.000
		(ZH) (ZL)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038 0.037
B0D9	A → Y	(ZL) (HH)	0.837	1.442	3.206				0.017	0.023	0.037
2020	" " '	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208	<u> </u>	<u> </u>		0.017	0.025	0.037

Chapter 1 Interface Block

				Switcl	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → O	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0U9	A → Y	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
B0W9	$A \rightarrow Y$	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
B00H	$A \rightarrow Y$	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN o Y	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
B0DH	$A \rightarrow Y$	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN o Y	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
B0UH	A → Y	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	$EN \rightarrow Y$	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
B0WH	$A \rightarrow Y$	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211			1	0.012	0.018	0.027
	$EN \rightarrow Y$	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031

Chapter 1 Interface Block

Function	Low-noise 3-State	Buffer							СМС	OS 3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	v	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O	cells	int. Cells
1mA										
2mA										
3mA	BE0T	BEDT		BEUT		BEWT			1	7
6mA	BE0E	BEDE		BEUE		BEWE			1	7
9mA	BE08	BED8		BEU8		BEW8			1	7
12mA	BE07	BED7		BEU7		BEW7			1	7
18mA	BE09	BED9		BEU9		BEW9			1	7
24mA	BE0H	BEDH		BEUH		BEWH			1	7
Logic Diag	gram			Block type		Inp				itput
				BE0T to BEWT		Symbol A	6.1	1 5	ymboi Y	Fan-out
				BEOT TO BEWY		EN	4.0		•	
A F	101 ←	>→ N01 Y		BE0E to BEWE		A	6.1		Υ	_
						EN	4.0			
EN H	H02 +			BE08 to BEW8	A 6.1			Y	_	
						EN	4.0			
				BE07 to BEW7		A EN	6.1 4.0		Υ	-
						,				
Truth Table	•			BE09 to BEW9		А	6.1		Υ	-
Truth labi	e					EN	4.0			
A EN	Y			BE0H to BEWH		A	6.1		Υ	.
0 1	0					EN	4.0			
1 1 X 0	1 Z									
L										
X:Irrelevant Z:High Impeda	nce									

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			T	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BE0T	A → Y	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
DEDT	,	(ZL)	1.365	2.279	4.559				0.090	0.131	0.194 0.121
BEDT	A → Y	(HH) (LL)	1.275 1.260	2.099	5.623 4.212				0.057	0.081	0.121
	EN → Y	(LL) (HZ)	0.785	1.011	1.593				0.090	0.131	0.194
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
BEUT	A → Y	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212	1	1		0.090	0.131	0.194
	EN → Y	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
BEWT	A → Y	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
	EN V	(LL)	1.260 0.785	2.099 1.011	4.212 1.593				0.090	0.131	0.194
	EN → Y	(HZ) (LZ)	0.765	1.011	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
BE0E	A → Y	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
5202		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
BEDE	A → Y	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
	- N	(LL) (HZ)	1.185 1.054	1.984 1.423	3.930 2.365				0.046	0.068	0.101
	EN → Y	(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
BEUE	A → Y	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285	1	1		0.040	0.058	0.090
25.115	<u> </u>	(ZL)	1.265	2.149	4.276	<u> </u>	<u> </u>		0.047	0.068	0.101
BEWE	A → Y	(HH)	1.326	2.555	6.105 3.930				0.040 0.046	0.058 0.068	0.090
	EN V	(LL) (HZ)	1.185 1.054	1.984 1.423	2.365				0.046	0.068	0.101
	EN → Y	(HZ) (LZ)	0.927	1.364	2.581	1	1				
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
BE08	A → Y	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323	1	1		0.032	0.047	0.070
	EN → Y	(HZ)	1.476	2.066	3.447	1	1				
		(LZ)	1.086	1.602	3.023						
		(ZH)	1.485	2.941	7.290	1	1		0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.033	0.049	0.073

Chapter 1 Interface Block

Block type Path	0.070 0.070 0.070 0.070 0.073 0.070 0.070 0.073 0.070 0.070
BED8 A → Y (HH) 1.429 2.884 7.106	0.070 0.070 0.073 0.070 0.070 0.070 0.070 0.073
CLL 1.311 2.202 4.323 0.032 0.047 EN → Y	0.070 0.070 0.073 0.070 0.070 0.070 0.073
EN → Y (HZ) 1.476 2.066 3.447	0.070 0.073 0.070 0.070 0.070 0.073
Company Com	0.073 0.070 0.070 0.070 0.073 0.070
CZH	0.073 0.070 0.070 0.070 0.073 0.070
BEU8 A → Y (HH) 1.429 2.884 7.106 0.028 0.042 (LL) 1.311 2.202 4.323 (2H) 1.485 2.941 7.290 (0.028 0.042 0.032 0.047 (2H) 1.485 2.941 7.290 (0.028 0.042 0.033 0.049 0.042 0.032 0.047 (2H) 1.485 2.941 7.290 (0.028 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.042 0.033 0.049 0.	0.073 0.070 0.070 0.070 0.073 0.070
CLL 1.311 2.202 4.323 0.032 0.047	0.070 0.070 0.073 0.070
EN → Y (HZ) 1.476 2.066 3.447	0.070 0.073 0.070
C 1.086 1.602 3.023	0.073 0.070
CZH 1.485 2.941 7.290 0.028 0.042 0.033 0.049 0.028 0.042 0.033 0.049 0.028 0.042 0.033 0.049 0.028 0.042 0.033 0.049 0.028 0.042 0.032 0.042 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.032 0.047 0.033 0.049	0.073 0.070
BEW8 A → Y (HH) 1.429 2.884 7.106 0.033 0.049 (LL) 1.311 2.202 4.323 0.032 0.047 (EN → Y (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 (ZH) 1.485 2.941 7.290 0.028 0.042 0.033 0.049 (ZL) 1.268 2.209 4.413 0.033 0.049 (BEO7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039 (LL) 1.390 2.366 4.674 (EN → Y (HZ) 1.692 2.390 3.993 (LZ) 1.242 1.836 3.457	0.073 0.070
BEW8 A → Y (HH) 1.429 2.884 7.106 0.028 0.042 (LL) 1.311 2.202 4.323 0.047 (LZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 (ZH) 1.485 2.941 7.290 0.032 0.049 (ZL) 1.268 2.209 4.413 0.033 0.049 (BEO7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039 (LL) 1.390 2.366 4.674 (EN → Y (HZ) 1.692 2.390 3.993 (LZ) 1.242 1.836 3.457	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.070
C 1.086 1.602 3.023	
CZH 1.485 2.941 7.290 0.028 0.042 0.033 0.049 0.026 0.033 0.049 0.036 0.042 0.037 0.049 0.037 0.049 0.026 0.037 0.049 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037 0.026 0.037	
CZL) 1.268 2.209 4.413 0.033 0.049	0.070
BE07 A → Y (HH) 1.492 3.051 7.617 0.026 0.039 (LL) 1.390 2.366 4.674 0.025 0.037 (LZ) 1.692 2.390 3.993 (LZ) 1.242 1.836 3.457	0.070
(LL) 1.390 2.366 4.674 EN → Y (HZ) 1.692 2.390 3.993 (LZ) 1.242 1.836 3.457	0.067
(LZ) 1.242 1.836 3.457	0.056
(ZL) 1.288 2.293 4.624 0.027 0.040	0.067 0.061
BED7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039	0.067
(LL) 1.390 2.366 4.674 0.025 0.037	0.056
EN → Y (HZ) 1.692 2.390 3.993	
(LZ) 1.242 1.836 3.457	
(ZH) 1.539 3.109 7.803 0.026 0.039	0.067
(ZL) 1.288 2.293 4.624 0.027 0.040 BEU7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039	0.061 0.067
(LL) 1.390 2.366 4.674 0.025 0.037	0.056
EN -> Y (HZ) 1.692 2.390 3.993	
(LZ) 1.242 1.836 3.457	
(ZH) 1.539 3.109 7.803 0.026 0.039	0.067
(ZL) 1.288 2.293 4.624 0.027 0.040 BEW7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039	0.061
BEW7 A → Y (HH) 1.492 3.051 7.617 0.026 0.039 (LL) 1.390 2.366 4.674 0.025 0.037	0.067 0.056
EN → Y (HZ) 1.692 2.390 3.993	,
(LZ) 1.242 1.836 3.457	
(ZH) 1.539 3.109 7.803 0.026 0.039	0.067
(ZL) 1.288 2.293 4.624 0.027 0.040	0.061
BE09 A → Y (HH) 1.684 3.547 9.136 0.022 0.036 (LL) 1.687 2.913 5.814 0.018 0.028	0.064 0.042
$EN \rightarrow Y$ (HZ) 2.348 3.377 5.634	5.042
(LZ) 1.559 2.307 4.328	
(ZH) 1.706 3.606 9.328 0.023 0.036	0.064
(ZL) 1.353 2.504 5.120 0.022 0.033	0.051
BED9 A - Y (HH) 1.684 3.547 9.136 0.022 0.036	0.064
(LL) 1.687 2.913 5.814 0.018 0.028 EN → Y (HZ) 2.348 3.377 5.634	0.042
(LZ) 1.559 2.307 4.328	
(ZH) 1.706 3.606 9.328 0.023 0.036	
(ZL) 1.353 2.504 5.120 0.022 0.033	0.064

Chapter 1 Interface Block

				Switc	hing spe	ed					
Block type	Path		tı	LD0 (ns)		t 1			Т	
	IN → O	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEU9	A → Y	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307	4.328						
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.022	0.033	0.051
BEW9	$A \rightarrow Y$	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307	4.328						
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.022	0.033	0.051
BE0H	$A \rightarrow Y$	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
BEDH	A → Y	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195					0.005	
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
55		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
BEUH	A → Y	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y	(HZ) (LZ)	3.006 1.877	4.371 2.777	7.283 5.195						
		(LZ) (ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.022	0.035	0.064
BEWH	A → Y	(ZL) (HH)	1.424	4.029	10.615				0.020	0.035	0.047
PEWH	A → Y	(HH)	1.997	3.484	7.016				0.021	0.033	0.005
	EN → Y	(LL) (HZ)	3.006	4.371	7.016				0.013	0.023	0.035
	□ □ N → T	(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.022	0.030	0.047
	l	(ZL)	1.424	2./10	5.054			L	0.020	0.000	0.04/

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Chapter 1 Interface Block

Function	N-ch open drain Bu	uffer						CN	ios	3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	W	vith 50 KΩ P/U	W	ith 5 KΩ	P/U	I/O cells	int	. Cells
1mA										
2mA										
3mA										
6mA										
9mA	EXT1			EXT3		EXW3		1		4
12mA	EXT9			EXTB		EXWB		1		4
18mA	EXT5			EXT7		EXW7		1		4
24mA	EXTD			EXTF		EXWF		1		4
Logic Diag	gram			Block type		Inp			utpu	
				EXT1 to EXW3		Symbol	Fan-ir	n Symbo	DI F	an-out
		→ N01 Y	,	EXTINUEXWS		_ ^	0.1	'		İ
		1 ⊢		EXT9 to EXWB		Α	6.1	Y		-
A HO)1 — > >	⊢ ⊨								
				EXT5 to EXW7		A	6.1	Y		٠
		<u> </u>		EXTD to EXWF		A	6.1	Y		.
T. (1. T. (1.				-						
Truth Tab	ie									
A Y										
1 Z										
0 0										
Z:High Impeda	ance									
Connect a pul	I-up resistor to get a high lev	rel								
				I				-1		

Chapter 1 Interface Block

				Switch	ning spe	ed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
EXT1	A → Y	(LZ) (ZL)	0.377 0.391	0.530 0.712	0.967 1.453				0.030	0.044	0.065
EXT3	A → Y	(LZ) (ZL)	0.377 0.391	0.530 0.712	0.967 1.453				0.030	0.044	0.065
EXW3	A → Y	(LZ) (ZL)	0.377 0.391	0.530 0.712	0.967 1.453				0.030	0.044	0.065
EXT9	A → Y	(LZ) (ZL)	0.438 0.386	0.625 0.719	1.146 1.478				0.023	0.033	0.050
EXTB	A → Y	(LZ) (ZL)	0.438 0.386	0.625 0.719	1.146 1.478				0.023	0.033	0.050
EXWB	A → Y	(LZ) (ZL)	0.438 0.386	0.625 0.719	1.146 1.478				0.023	0.033	0.050
EXT5	A → Y	(LZ) (ZL)	0.562 0.399	0.813 0.768	1.502 1.598				0.016	0.024	0.036
EXT7	A → Y	(LZ) (ZL)	0.562 0.399	0.813 0.768	1.502 1.598				0.016	0.024	0.036
EXW7	A → Y	(LZ) (ZL)	0.562 0.399	0.813 0.768	1.502 1.598				0.016	0.024	0.036
EXTD	A → Y	(LZ) (ZL)	0.684 0.414	1.000 0.817	1.854 1.721				0.013	0.020	0.030
EXTF	A → Y	(LZ) (ZL)	0.684 0.414	1.000 0.817	1.854 1.721				0.013	0.020	0.030
EXWF	A → Y	(LZ) (ZL)	0.684 0.414	1.000 0.817	1.854 1.721				0.013	0.020	0.030

Chapter 1 Interface Block

Function	N-ch open drain Bu	ıffer with failsafe						(CMC	OS 3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	v	vith 50 KΩ P/U	w	th 5 KΩ	P/U	I/O ce	lls	int. Cells
1mA										
2mA										
3mA										
6mA										
9mA	EXO1							1		4
12mA	EXO9							1		4
18mA	EXO5							1		4
24mA	EXOD							1		4
Logic Diag	gram			Block type		Inp				tput
				EXO1		Symbol A	Fan-ir	n Sym		Fan-out
		→ N01 Y		EXOT		_ ^	0.1			
		\sqcap		EXO9		A	6.1	,	1	-
A HO)1 —	⊣ ├ ─┐								
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		EXO5		A	6.1	'	1	-
		<u></u>		EXOD		A	6.1	,	1	-
Truth Tabl	lo.			1						
Trutti Tabi	1									
A Y										
1 Z										
0 0										
Z:High Impeda										
Connect a pull	l-up resistor to get a high lev	el								

Chapter 1 Interface Block

			Switch	ning spe	eed					
Path		tı	LDO (ns)		t 1			Т	
IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A → Y	(LZ)	0.377	0.530	0.967						
	(ZL)	0.391	0.712	1.453				0.030	0.044	0.065
$A \rightarrow Y$	(LZ)	0.438	0.625	1.146						
	(ZL)	0.386	0.719	1.478				0.023	0.033	0.050
A → Y	(LZ)	0.562	0.813	1.502						
	(ZL)	0.399	0.768	1.598				0.016	0.024	0.036
A → Y	(LZ)	0.684	1.000	1.854						
	(ZL)	0.414	0.817	1.721				0.013	0.020	0.030
	$\begin{array}{c} \text{IN} & \rightarrow & \text{OI} \\ \text{A} & \rightarrow & \text{Y} \\ \\ \text{A} & \rightarrow & \text{Y} \\ \\ \text{A} & \rightarrow & \text{Y} \end{array}$	$\begin{array}{cccc} \text{IN} & \rightarrow & \text{OUT} \\ & \text{A} \rightarrow & \text{Y} & \text{(LZ)} \\ & & \text{(ZL)} \\ & \text{A} \rightarrow & \text{Y} & \text{(LZ)} \\ & & \text{(ZL)} \\ & & \text{(A)} & \text{(LZ)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} \\ & & \text{(A)} \\ & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & \text{(A)} & ($	$\begin{array}{c ccccc} IN & \to & OUT & MIN. \\ A \to & Y & (LZ) & 0.377 \\ (ZL) & 0.391 \\ A \to & Y & (LZ) & 0.438 \\ (ZL) & 0.386 \\ A \to & Y & (LZ) & 0.562 \\ (ZL) & 0.399 \\ A \to & Y & (LZ) & 0.684 \\ \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

Chapter 1 Interface Block

Function	N-ch open drain I/C	Buffer with failsafe)					СМС	os 3.3 V
		Blo	ock t	type					
Drivability	no resistor	with 50 KΩ P/D	wi	ith 50 KΩ P/U	wi	th 5 KΩ	P/U I	I/O cells	int. Cells
1mA									
2mA									
3mA									
6mA									
9mA	EBA1							1	7
12mA	EBA9							1	7
18mA	EBA5							1	7
24mA	EBAD							1	7
Logic Diag	ram			Block type		Inp			itput
			+	EBA1		Symbol A	Fan-in 6.1	Symbol	Fan-out
	$\overline{}$			LDAT			0.1	''	
Y1 N02	2	→ N01 Y0		EBA9		А	6.1	Y1	33
	7			EDAS					
A H01	₁⊷ >∞-	- - -		EBA5		A	6.1	Y1	33
		1 - 		EBAD		А	6.1	Y1	33
		<u></u>							
Truth Table	2		_						
A Y0									
1 Z									
0 0									
Z:High Impedar									
Connect a pull-	up resistor to get a high lev	el							
Y0 Y1	\neg								
0 0	7								
1 1									

Chapter 1 Interface Block

				Switch	ning spe	ed					
Block type	Path		tı	LDO (ns)		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
EBA1	A → Y0	(LZ)	0.377	0.530	0.967						
		(ZL)	0.391	0.712	1.453				0.030	0.044	0.065
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021			
EBA9	A → Y0	(LZ)	0.438	0.625	1.146						
		(ZL)	0.386	0.719	1.478				0.023	0.033	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021			
EBA5	A → Y0	(LZ)	0.562	0.813	1.502						
		(ZL)	0.399	0.768	1.598				0.016	0.024	0.036
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021			
EBAD	A → Y0	(LZ)	0.684	1.000	1.854						
		(ZL)	0.414	0.817	1.721				0.013	0.020	0.030
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.444	0.011	0.014	0.021			

Chapter 1 Interface Block

Function	N-ch open drain Sc	hmitt I/O Buffer with	n fail	Isafe				СМ	OS 3.3 V
		Blo	ock t	type					
Drivability	no resistor	with 50 K Ω P/D	wi	ith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA									
6mA									
9mA	EBE1W							1	10
12mA	EBE9W							1	10
18mA	EBE5W							1	10
24mA	EBEDW							1	10
Logic Diag	gram			Block type		Inp			utput
			-	EBE1W		Symbol	Fan-ir	Y1	Fan-out
	. /			232111			0		-
Y1 N0		→ N01 Y0		EBE9W		А	6.1	Y1	24
				EBE5W		A	6.1	Y1	24
A HO	n- >-	│		EDESVV		^	6.1	''	24
		¹ 		EBEDW		А	6.1	Y1	24
		<u> </u>							
Truth Tabl	e								
l	_								
A YO	4								
1 Z									
0 0									
Z:High Impeda		-1							
Connect a pull	-up resistor to get a high leve	2 1							
Y0 Y1	ı								
0 0									
1 1									

Chapter 1 Interface Block

				Switcl	ning spe	ed					
Block type	Path		tı	LDO (ns)		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
EBE1W	A → Y0	(LZ)	0.377	0.530	0.967						
		(ZL)	0.391	0.712	1.453				0.030	0.044	0.065
	Y0 → Y1	(HH)	0.780	1.213	2.369	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
EBE9W	A → Y0	(LZ)	0.438	0.625	1.146						
		(ZL)	0.386	0.719	1.478				0.023	0.033	0.050
	Y0 → Y1	(HH)	0.780	1.213	2.369	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
EBE5W	A → Y0	(LZ)	0.562	0.813	1.502						
		(ZL)	0.399	0.768	1.598				0.016	0.024	0.036
	Y0 → Y1	(HH)	0.780	1.213	2.369	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
EBEDW	A → Y0	(LZ)	0.684	1.000	1.854						
		(ZL)	0.414	0.817	1.721				0.013	0.020	0.030
	Y0 → Y1	(HH)	0.780	1.213	2.369	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

Chapter 1 Interface Block

Function	I/O Buffer								СМС	OS 3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	V	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	1/0	cells	int. Cells
1mA										
2mA										
3mA	B00U	BODU		BOUU		B0WU		1	1	10
6mA	B00C	BODC		BOUC		B0WC		1	1	10
9mA	B003	B0D3		B0U3		B0W3		1	1	10
12mA	B001	B0D1		B0U1		B0W1		1	1	20
18mA	B005	B0D5		B0U5		B0W5		1	1	20
24mA	B00F	BODF		B0UF		B0WF		1	1	20
Logic Diag	ıram			Block type		Inp Symbol				tput
				B00U to B0WU		A	Fan-ir	1 3	Y1	Fan-out
		1		5000 10 20110		EN 1.0				
Y1 N	102 -			B00C to B0WC		А	A 6.3		Y1	33
АН	101	> N01 Y0				EN	1.0			
Α 11	NOT V	- 1101 10		B003 to B0W3		A EN	6.3 1.0		Y1	33
EN H	103 •			B001 to B0W1		A EN	16.9 1.0	Y1		33
Truth Table	e		B005 to B0W5		A 16.9		Y1		33	
						EN	1.0			
A EN		B00F to B0WF		А	16.9		Y1	33		
0 1	0 1					EN	1.0			
X 0	z									
X:Irrelevant										
Z:High Impeda	nce									
Y0 Y1										
0 0										
1 1										
				<u> </u>						

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B00U	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ) (ZH)	0.469 1.149	0.771 2.002	1.492 4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.030	0.076	0.114
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.000	0	000
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0DU	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ) (LZ)	1.259 0.469	1.846 0.771	3.271 1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0UU	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
	FN \/2	(LL) (HZ)	0.963 1.259	1.638 1.846	3.333 3.271				0.089	0.131	0.192
	EN → Y0	(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0WU	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
	EN VO	(LL) (HZ)	0.963 1.259	1.638 1.846	3.333 3.271				0.089	0.131	0.192
	EN → Y0	(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B00C	A → Y0	(HH) (LL)	0.857 0.857	1.549 1.450	3.541 2.908				0.038 0.044	0.053 0.065	0.080 0.097
	EN → Y0	(HZ)	1.602	2.366	4.209				0.044	0.005	0.097
	LIV - 10	(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
B0DC	A → Y0	(LL) (HH)	0.145 0.857	0.239 1.549	0.443 3.541	0.011	0.014	0.021	0.038	0.053	0.080
טטטט	A → YU	(HH) (LL)	0.857	1.450	2.908				0.038	0.053	0.080
	EN → Y0	(HZ)	1.602	2.366	4.209						
	1	(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
l	Y0 → Y1	(HH) (LL)	0.188 0.145	0.308 0.239	0.601 0.443	0.010 0.011	0.014 0.014	0.021 0.021			
B0UC	A → Y0	(HH)	0.145	1.549	3.541	0.011	0.014	0.021	0.038	0.053	0.080
5000	" - " 10	(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209		1				
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317	0.010	0014	0.004	0.045	0.066	0.098
l	Y0 → Y1	(HH) (LL)	0.188 0.145	0.308 0.239	0.601 0.443	0.010 0.011	0.014 0.014	0.021 0.021			
		(LL)	0.143	0.239	0.443	0.011	0.014	0.021			

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns))		t 1			Т	
	$IN \to OL$	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0WC	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602 0.547	2.366 0.906	4.209 1.819						
		(LZ) (ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.036	0.055	0.080
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.043	0.000	0.030
	10 7 11	(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B003	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
	.,,	(ZL)	0.913	1.619	3.323	0.010			0.031	0.045	0.067
	Y0 → Y1	(HH)	0.188 0.145	0.308 0.239	0.601 0.443	0.010 0.011	0.014 0.014	0.021 0.021			
B0D3	A → Y0	(LL) (HH)	0.145	1.751	4.088	0.011	0.014	0.021	0.024	0.036	0.056
בססס	A → 10	(LL)	0.979	1.652	3.277	1	1		0.024	0.030	0.056
	EN → Y0	(HZ)	2.160	3.204	5.612				0.020	0.0.0	0.001
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0U3	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.001	0.040	0.007
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0W3	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
	\/a \/4	(ZL)	0.913 0.188	1.619 0.308	3.323 0.601	0.010	0.014	0.021	0.031	0.045	0.067
	Y0 → Y1	(HH) (LL)	0.166	0.308	0.601	0.010	0.014	0.021			
B001	A → Y0	(HH)	0.143	1.265	2.923	0.011	0.014	0.021	0.020	0.029	0.045
=		(LL)	0.644	1.115	2.283	1	1		0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656	1	1		- /		
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957	1	1		0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091	1	1		0.023	0.034	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
DoD4		(LL)	0.145	0.239	0.443	0.011	0.014	0.021	0.000	0.000	0.045
B0D1	A → Y0	(HH)	0.681 0.644	1.265 1.115	2.923 2.283				0.020 0.022	0.029 0.032	0.045 0.048
	EN → Y0	(LL) (HZ)	1.929	3.060	5.656	1	1		0.022	0.032	0.048
	□IN → YU	(HZ) (LZ)	0.770	1.362	2.783	1	1				
		(ZH)	1.247	2.257	4.957	1	1		0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091	1	1		0.023	0.023	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021		L	

				Switch	ning spe	ed					
Block type	Path		t۱	_D0 (ns)			t 1			Т	
	$IN \to OL$		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0U1	$A \rightarrow Y0$	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
	EN → Y0	(LL) (HZ)	0.644 1.929	1.115 3.060	2.283 5.656				0.022	0.032	0.048
	EIN → TU	(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0W1	$A \rightarrow Y0$	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
	EN VO	(LL)	0.644 1.929	1.115 3.060	2.283 5.656				0.022	0.032	0.048
	EN → Y0	(HZ) (LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B005	$A \rightarrow Y0$	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ) (LZ)	2.463 0.858	3.879 1.497	7.031 3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	••••		
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0D5	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ) (ZH)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.017	0.020	0.007
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0U5	$A \rightarrow Y0$	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ) (ZH)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.015	0.023	0.036
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.017	0.020	0.007
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0W5	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZH) (ZL)	0.837	1.526	3.208				0.015	0.023	0.038
	Y0 → Y1	(ZL) (HH)	0.637	0.308	0.601	0.010	0.014	0.021	0.017	0.025	0.007
	10 -> 11	(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B00F	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	$EN \rightarrow Y0$	(HZ)	3.004	4.704	8.420					1	
		(LZ)	0.945	1.629	3.274					l	
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
	V0 V4	(ZL)	0.847 0.188	1.572 0.308	3.332 0.601	0.010	0.014	0.021	0.013	0.020	0.031
	Y0 → Y1	(HH) (LL)	0.188	0.308	0.601	0.010	0.014	0.021		1	
		(LL)	U.145	0.239	0.443	0.011	0.014	0.021	<u> </u>	L	

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OU	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0DF	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0UF	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
B0WF	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
l		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			

Chapter 1 Interface Block

Function	Low-noise I/O Buff	er							СМС	OS 3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	V	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O	cells	int. Cells
1mA										
2mA										
3mA	BE0U	BEDU		BEUU		BEWU			1	10
6mA	BE0C	BEDC		BEUC		BEWC			1	10
9mA	BE03	BED3		BEU3		BEW3			1	10
12mA	BE01	BED1		BEU1		BEW1			1	10
18mA	BE05	BED5		BEU5		BEW5			1	10
24mA	BE0F	BEDF		BEUF		BEWF		1		10
Logic Diag	ıram			Block type		Input Symbol Fan-				tput
				BEOU to BEWU		A	6.1	1 3	Y1	Fan-out
		1		5200 10 52110		EN 4.0				"
Y1 N	02 -	\vdash								
		J		BE0C to BEWC		A	6.1 4.0		Y1	33
						EN	4.0			
АН	01 ←	> → N01 Y0		BE03 to BEW3					Y1	33
					EN 4.0					
EN H	03 +			BE01 to BEW1		A	6.1		Y1	33
							4.0	''		35
Truth Table	Α.		BE05 to BEW5		Α	6.1		Y1	33	
						EN	4.0			
A EN	YO	BE0F to BEWF		А	6.1		Y1	33		
0 1	0					EN	4.0			
1 1 X 0	1 z									
X:Irrelevant										
Z:High Impeda	nce									
Y0 Y1										
0 0										
1 1										

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BE0U	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ) (ZH)	0.745 1.340	1.089 2.445	2.013 5.805				0.057	0.081	0.121
		(ZL)	1.365	2.445	4.559				0.057	0.081	0.121
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.030	0.101	0.134
	10 -> 11	(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEDU	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
	V0 V4	(ZL)	1.365 0.188	2.279 0.308	4.559 0.601	0.010	0.014	0.021	0.090	0.131	0.194
	Y0 → Y1	(HH) (LL)	0.188	0.308	0.601	0.010	0.014	0.021			
BEUU	A → Y0	(HH)	1.275	2.384	5.623	0.011	0.014	0.021	0.057	0.081	0.121
	" ' '	(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
BEWU	A 1/0	(LL) (HH)	0.145 1.275	0.239 2.384	0.443 5.623	0.011	0.014	0.021	0.057	0.081	0.121
BEWU	A → Y0	(LL)	1.260	2.099	4.212				0.057	0.081	0.121
	EN → Y0	(HZ)	0.785	1.011	1.593				0.030	0.151	0.134
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BE0C	A → Y0	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
	EN → Y0	(LL) (HZ)	1.185 1.054	1.984 1.423	3.930 2.365				0.046	0.068	0.101
	EN → YU	(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEDC	A → Y0	(HH)	1.326	2.555	6.105		1		0.040	0.058	0.090
	EN 1/2	(LL) (HZ)	1.185 1.054	1.984 1.423	3.930 2.365				0.046	0.068	0.101
	EN → Y0	(HZ) (LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEUC	A → Y0	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ) (ZH)	0.927 1.388	1.364 2.613	2.581 6.285				0.040	0.058	0.090
		(ZH) (ZL)	1.265	2.149	4.276				0.040	0.058	0.090
	Y0 → Y1	(ZL) (HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.047	0.000	0.101
	'0 - 11	(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
	l	\/	3.170	0.200	0.170	0.011	0.017	0.021	<u> </u>		

BEWC A → Y0 (HH) 1.326 2.555 6.105 (LU) 1.185 1.984 3.930 (LZ) 1.265 (LZ) 0.927 1.364 2.565 (LZ) 0.927 1.364 2.561 (LZ) 0.047 0.068 0.101 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.022 (LL) 0.066 1.602 0.028 0.042 0.070 0.032 0.047 0.070 (LL) 0.086 1.602 0.028 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 0.022 (LL) 0.066 1.602 0.028 0.042 0.070 0.032 0.047 0.070 (LL) 0.066 1.602 0.028 0.042 0.070 0.032 0.047 0.070 (LL) 0.026 0.042 0.070 0.028 0.042 0.070 0.02					Switch	ning spe	eed					
BEVC A → Y0 (HH) 11.26 2.555 6.105 (LT) 1.186 1.984 3.930 (D.00 0.046 0.068 0.090 0.047 0.068 0.090 (D.00 0.046 0.068 0.090 0.047 0.068 0.090 (D.00 0.046 0.068 0.090 0.042 0.070 (D.00 0.046 0.068 0.090 0.042 0.070 (D.00 0.044 0.021 0.044 0.021 (D.00 0.044 0.021 0.044 0.021 (D.00 0.044 0.021 0.044 0.021 0.044 0.021 0.044 0.021 (D.00 0.044 0.021	Block type	Path		t i	LD0 (ns))		t 1			Т	
EN		IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
EN → Y0	BEWC	A → Y0	(HH)	1.326	2.555							0.090
										0.046	0.068	0.101
REO3		EN → Y0										
Part										0.040		0.000
BEO3												
BEO3		V0 . V1			-		0.010	0.014	0.021	0.047	0.068	0.101
BEO3 A → Y0 (HH) 1.429		10 → 11					1	1				
BED3	BE03	A → Y0								0.028	0.042	0.070
C 1.086 1.002 3.023			(LL)	1.311	2.202	4.323				0.032	0.047	0.070
CZH 1.485 2.941 7.290 N. N. N. N. N. N. N. N		EN → Y0										
BEU3												
BED3 A → Y0 (IH) 1.429 2.884 7.106												
BED3 A → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 EN → Y0 (HZ) 1.476 2.066 3.447 (ZH) 1.485 2.941 7.290 (ZL) 1.288 2.209 4.413 Y0 → Y1 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.001 0.010 0.014 0.021 BEU3 A → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.1455 2.941 7.290 (LL) 1.1456 2.066 3.447 EN → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.447 (ZH) 1.485 2.941 7.290 (ZL) 1.288 2.209 4.413 PO → Y1 (HH) 0.188 0.0801 0.010 0.014 0.021 BEW3 A → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HH) 1.485 2.941 7.290 (ZL) 1.268 2.209 4.413 PO → Y1 (HH) 0.188 0.0801 0.010 0.014 0.021 BEW3 A → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.311 2.202 4.323 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.311 2.202 4.323 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.485 2.941 7.290 (ZL) 1.268 2.209 4.413 PO → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.485 2.941 7.290 (ZL) 1.268 2.209 4.413 PO → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 1.485 2.941 7.290 (ZL) 1.268 2.209 4.413 PO → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.456 2.290 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.456 2.290 0.443 0.011 0.014 0.021 BED1 A → Y0 (HH) 1.492 3.051 7.617 (LL) 1.485 2.941 7.290 (ZL) 1.268 2.290 3.993 (ZL) 1.288 2.293 4.624 PO → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 BED1 A → Y0 (HH) 1.492 3.051 7.617 (LL) 1.485 2.941 0.001 0.001 0.004 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.493 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 0.993 (LZ) 1.288 2.293 4.624 EN → Y0 (HZ) 1.692 2.390 0.993 (LZ) 1.288 2.293 4.624 EN → Y0 (HZ) 1.692 2.390 0.993 (LZ) 1.288 2.293 4.624 E		\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					0.010	0014	0,004	0.033	0.049	0.073
BED3 A → Y0 (HH) 1.429		YU → Y1					1					
EN → Y0	BED3	A → Y0					0.011	0.014	0.021	0.028	0.042	0.070
EN → Y0		" , "										0.070
C 1.268 2.941 7.290		EN → Y0		1.476	2.066	3.447						
No												
BEU3 A → Y0 (HH) 1.429 2.884 7.106												
BEU3 A → Y0 (HH) 1.429 2.884 7.106 (LL) 1.311 2.202 4.323 EN → Y0 (HZ) 1.485 2.941 7.290 (ZL) 1.086 1.602 3.023 Y0 → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.476 2.066 3.447 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 BEW3 A → Y0 (HH) 1.429 2.884 7.106 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 BEW3 A → Y0 (HH) 1.429 2.884 7.106 (LL) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 EN → Y0 (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 EN → Y0 (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 EN → Y0 (HZ) 1.485 2.941 7.290 (ZZ) 1.268 2.209 4.413 Y0 → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 BEO1 A → Y0 (HH) 1.429 2.066 3.447 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 BEO1 A → Y0 (HH) 1.492 3.051 7.617 (LL) 1.390 2.366 4.674 EN → Y0 (HZ) 1.692 2.390 3.993 (LZ) (LZ) 1.288 2.293 0.443 0.011 0.014 0.021 BED1 A → Y0 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 (LL) 1.390 2.366 4.674 EN → Y0 (HZ) 1.692 2.390 3.993 4.624 Y0 → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 3.993 4.624 Y0 → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 3.993 4.624 EN → Y0 (HZ) 1.489 3.299 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 3.993 4.624 EN → Y0 (HZ) 1.692 2.390 3.993 4.6										0.033	0.049	0.073
BEU3 A → Y0 (IH) 1.429 2.884 7.106 (IL) 1.311 2.202 4.323		Y0 → Y1					1					
EN → Y0	DELIO	A 1/0					0.011	0.014	0.021	0.020	0.042	0.070
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	DEUS	A → YU										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		FN → Y0								0.002	0.047	0.070
BEW3		LN -> 10										
BEW3 A → Y0 (HH) (LL) (1.454 (0.239) (0.443 (0.011) (0.014) (0.021) (0.028) (0.042) (0.070) (0.014) (0.021) (0.028) (0.042) (0.070) (0.070) (0.014) (0.021) (0.028) (0.042) (0.070)			(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
BEW3 A → Y0 (HH) 1.429 2.884 7.106 EN → Y0 (HZ) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 Y0 → Y1 (HH) 0.188 0.308 0.601 0.014 0.021 EN → Y0 (HH) 1.492 2.396 4.674 EN → Y0 (HH) 0.188 0.239 0.443 0.011 0.014 0.021 BEO1 A → Y0 (HH) 1.492 3.051 7.617 (LL) 1.390 2.366 4.674 (ZL) 1.288 2.293 4.624 Y0 → Y1 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.422 1.836 3.457 (ZH) 1.539 3.109 7.803 0.601 0.010 0.014 0.021 BED1 A → Y0 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 2.390 3.993 (ZL) 1.242 1.836 3.457 (ZH) 0.145 0.239 0.443 0.011 0.014 0.021 BED1 A → Y0 (HH) 0.188 0.308 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.403 0.601 0.010 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.607 (ZL) 0.145 0.239 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.607 (ZL) 0.145 0.239 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.443 0.011 0.014 0.021 EN → Y0 (HZ) 1.692 0.390 0.493 0.607 (ZL) 1.242 1.836 0.457 (ZH) 1.539 0.443 0.4624 EN → Y0 (HZ) 1.692 0.390 0.493 0.493 EN → Y0 (HZ) 1.692 0.390 0.493 EN → Y0 (HZ) 1.692			(ZL)	1.268	2.209	4.413				0.033	0.049	0.073
BEW3 A → Y0 (HH) 1.429 2.884 7.106 (LL) 1.311 2.202 4.323 (LL) 1.311 2.202 4.323 (2H) 1.476 2.066 3.447 (LZ) 1.086 1.602 3.023 (2H) 1.485 2.941 7.290 (2L) 1.268 2.209 4.413 (0.014 0.021 0.003 0.049 0.073 (2L) 1.268 2.209 4.413 0.011 0.014 0.021 (LL) 0.145 0.239 0.443 0.011 0.014 0.021 (LL) 1.390 2.366 4.674 (2H) 1.539 3.109 7.803 (2H) 1.288 2.293 4.624 (2H) 1.288 2.293 4.624 (2H) 1.288 2.293 4.624 (2H) 1.288 2.293 0.443 0.011 0.014 0.021 (2H) 1.390 2.366 4.674 (2H) 1.539 3.080 0.601 0.010 0.014 0.021 (2H) 1.539 3.093 (2L) 1.288 2.293 4.624 (2H) 1.539 3.093 (2L) 1.288 2.293 4.624 (2H) 1.539 0.443 0.011 0.014 0.021 (2H) 0.021 (2H) 1.539 0.443 0.011 0.014 0.021 (2H) 0.026 0.039 0.067 (2L) 1.288 2.293 4.624 (2H) 0.025 0.037 0.066 (2H) 0.045 0.039 0.067 (2L) 1.288 2.293 0.443 0.011 0.014 0.021 (2H) 0.021 (2H) 0.145 0.239 0.443 0.011 0.014 0.021 (2H) 0.025 0.037 0.066 (2H) 0.445 0.245 (2H) 0.025 0.037 0.066 (2H) 0.445 0.021 (2H) 0.485 0.398 0.601 0.010 0.014 0.021 (2H) 0.021 (2H) 0.485 0.399 0.443 0.011 0.014 0.021 (2H) 0.025 0.037 0.066 (2H) 0.445 0.239 0.443 0.011 0.014 0.021 (2H) 0.025 0.037 0.066 (2H) 0.445 0.245 (2H) 0.245 0.245 (2H) 0.245 0.345 (2H) 0.245 0.345 (2H) 0.245 0.345 (2H) 0.025 0.037 0.066 (2H) 0.245 (2H) 0.245 0.345 (2H) 0.245 0.24		Y0 → Y1					1	1				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	DE11/0						0.011	0.014	0.021	0.000	0.040	0.070
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BEM3	A → Y0										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		EN . VO								0.032	0.047	0.070
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		EN → 10										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$										0.028	0.042	0.070
BEO1				1.268	2.209	4.413				0.033	0.049	0.073
BE01		Y0 → Y1					1	1				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	L						0.011	0.014	0.021		L	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BE01	A → Y0						1				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		EN VO						1		0.025	0.037	0.056
CZH 1.539 3.109 7.803		I EN → YU										
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$										0.026	0.039	0.067
Y0 → Y1												
BED1 A → Y0 (HH) 1.492 3.051 7.617 0.026 0.039 0.067 (LL) 1.390 2.366 4.674 0.025 0.037 0.056 (EN → Y0 (HZ) 1.692 2.390 3.993 (LZ) 1.836 3.457 (ZH) 1.539 3.109 7.803 0.026 0.039 0.067 (ZL) 1.288 2.293 4.624 0.027 0.040 0.061		Y0 → Y1		0.188	0.308	0.601	0.010		0.021			
(LL) 1.390 2.366 4.674 0.025 0.037 0.056 EN → Y0 (HZ) 1.692 2.390 3.993 (LZ) 1.242 1.836 3.457 (ZH) 1.539 3.109 7.803 0.026 0.039 0.067 (ZL) 1.288 2.293 4.624 0.027 0.040 0.061							0.011	0.014	0.021			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BED1	A → Y0						1				
(LZ) 1.242 1.836 3.457 (ZH) 1.539 3.109 7.803 0.026 0.039 0.067 (ZL) 1.288 2.293 4.624 0.027 0.040 0.061		FN						1		0.025	0.037	0.056
(ZH) 1.539 3.109 7.803 0.026 0.039 0.067 (ZL) 1.288 2.293 4.624 0.027 0.040 0.061		EN → Y0						1				
(ZL) 1.288 2.293 4.624 0.027 0.040 0.061								1		0.026	0.030	0.067
		Y0 → Y1					0.010	0.014	0.021	0.52,	5.545	3.301
(LL) 0.145 0.239 0.443 0.011 0.014 0.021		'										

				Switc	hing spe	eed					
Block type	Path		tı	D0 (ns)		t 1			Т	
	IN → OU	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEU1	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242 1.539	1.836 3.109	3.457 7.803				0.026	0.039	0.067
		(ZH) (ZL)	1.288	2.293	4.624				0.026	0.039	0.067
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.027	0.040	0.001
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEW1	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ) (ZH)	1.242 1.539	1.836 3.109	3.457 7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624				0.020	0.039	0.067
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.027	0.040	0.001
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BE05	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZH) (ZL)	1.706	2.504	5.120				0.023	0.036	0.064
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.022	0.000	0.001
	10 -> 11	(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BED5	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307 3.606	4.328				0.023	0.036	0.064
		(ZH) (ZL)	1.706 1.353	2.504	9.328 5.120				0.023	0.036	0.064
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.022	0.000	0.031
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEU5	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.038	0.064
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.022	0.000	0.001
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEW5	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.054
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BE0F	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ) (ZH)	1.877 1.867	2.777 4.086	5.195 10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.022	0.030	0.004
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021	0.020	5.555	""
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
		\ _/									

				Switch	hing spe	ed					
Block type	Path		t	LD0 (ns)		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEDF	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEUF	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			
BEWF	$A \rightarrow Y0$	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
l		(LZ)	1.877	2.777	5.195						
l		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
l		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.188	0.308	0.601	0.010	0.014	0.021			
		(LL)	0.145	0.239	0.443	0.011	0.014	0.021			

Drivability no resistor with 50 KΩ P/D with 50 KΩ P/D with 5 KΩ P/D l/O cells int. Cell 1mA 2mA 3mA 8siuw 8sDW 8sDW 8sUW 8sWW 1 13 13 13 13 14 14 15 15 15 14 15 15	Function	Schmitt I/O Buffer							СМС	OS 3.3 V
1mA 2mA 8siuw 8sbuw 8suw 1 13 3mA 8sicw 8sbcw 8sucw 8sucw 1 13 9mA 8sisw 8sbow 8susw 8swiw 1 13 12mA 8sitw 8sbow 8susw 8swiw 1 23 18mA 8sisw 8sbow 8susw 1 23 24mA 8sifw 8sbfw 8sufw 8swfw 1 23 Logic Diagram Block type 8silw to 8swilw 1 23 24mol feature Output BSILW to 8swilw A 6.3 Y1 24 24 24 EN 1.0 BSIGW to 8swilw A 6.3 Y1 24 EN 1.0 BSIFW to 8swilw A 16.9 Y1 24 EN 1.0 EN 1.0 EN 1.0 EN 1.0 Truth Table BSIFW to 8swifw A 16.9 <t< td=""><td></td><td></td><td>Blo</td><td>ock type</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>			Blo	ock type						
2mA 3mA 8siuw 8sDuw 8sUuw 8sWuw 1 13	Drivability	no resistor	with 50 KΩ P/D	with 50 KΩ P/U	wit	th 5 KΩ	P/U	I/O c	ells	int. Cells
Sama	1mA									
6mA BSICW BSDCW BSUCW BSWCW 1 13 9mA BSI3W BSD9W BSU3W BSW3W 1 13 12mA BSI1W BSDFW BSU1W BSW1W 1 23 18mA BSI5W BSDFW BSUFW BSWFW 1 23 24mA BSIFW BSDFW BSUFW BSWFW 1 23 Logic Diagram Block type Input Symbol Fan-to Symbol	2mA									
9mA BSi3w BSD3W BSU3W BSW3W 1 13 12mA BSHW BSDFW BSU1W BSW1W 1 23 18mA BSISW BSDFW BSU5W BSW5W 1 23 24mA BSIFW BSDFW BSUFW BSWFW 1 23 Logic Diagram Block type Input Symbol Fan-in Symbol Fan-ou Symbol Fan-	3mA	BSIUW	BSDUW	BSUUW		BSWUV	v	1		13
12mA	6mA	BSICW	BSDCW	BSUCW		BSWCV	v	1		13
18mA	9mA	BSI3W	BSD3W	BSU3W		BSW3W	/	1		13
Description	12mA	BSI1W	BSD1W	BSU1W		BSW1W	/	1		23
Block type Symbol Fan-in Symbol Fan-ou	18mA	BSI5W	BSD5W	BSU5W		BSW5W	/	1		23
Block type Symbol Fan-in Symbol Fan-ou	24mA	BSIFW	BSDFW	BSUFW		BSWFW	v	1		23
Symbol Fan-In Symbol Fan-Out Symbol Fan-In Symbol Fan-Out Symbol Fan-In Symbol Fan-Out Symbol Fan-In Symbol Fan-Out Symbol Fan-In Symbol Fan-In Symbol Fan-In Symbol Fan-In Symbol Fan-Out Symbol Fan-In	Logic Diag	gram		Block type						
No2 Sign to BSWCW A 6.3 Y1 24	1									
BSICW to BSWCW A 6.3 Y1 24 EN 1.0 EN H03 EN H03 N01 Y0 BSI3W to BSW3W A 6.3 Y1 24 EN 1.0 BSI1W to BSW1W A 16.9 Y1 24 EN 1.0 BSI5W to BSW5W A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0 CONTROL OF THE PROPERTY OF			1	BSIOW to BSWC	,,,,				11	24
A H02 N01 Y0 BSI3W to BSW3W A 6.3 Y1 24 EN 1.0 BSI1W to BSW1W A 16.9 Y1 24 EN 1.0 Truth Table Truth Table BSI5W to BSW5W A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0 Truth Table EN 1.0 A EN Y0 0 1 0 1 1 1 1 1 X 0 Z X:Irrelevant Z:High Impedance	Y1 N	02 ← ✓ ∏								
A H02 EN H03 EN H03 BSISW to BSWSW A 6.3 EN 1.0 BSISW to BSWSW A 16.9 EN 1.0 BSISW to BSWSW A 16.9 EN 1.0 BSISW to BSWFW A 16.9 EN 1.0 BSIFW to BSWFW A 16.9 EN 1.0 BSIFW to BSWFW A 16.9 EN 1.0 CONTROL OF THE PROPERTY OF THE]	BSICW to BSWC	w				Y1	24
EN H03 • EN 1.0 BSITW to BSW1W A 16.9 Y1 24 EN 1.0 Truth Table A EN Y0 0 1 0 1 1 1 1 X 0 Z X:Irrelevant Z:High Impedance EN 1.0 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0						EN	1.0			
EN H03 • EN 1.0 BSIIW to BSWIW A 16.9 Y1 24 EN 1.0 Truth Table A EN Y0 0 1 0 1 1 1 1 X 0 Z X:Irrelevant Z:High Impedance EN 1.0 BSISW to BSW5W A 16.9 Y1 24 EN 1.0 BSIFW to BSWFW A 16.9 Y1 24 EN 1.0	A H	02 -	> N01 Y0	BSI3W to BSW3	w	Α	6.3		Y1	24
BSITW to BSWTW A 16.9 Y1 24					EN 1.0					
BSITW to BSWTW A 16.9 Y1 24	EN H	03								
Truth Table A EN Y0 0		00 1		BSI1W to BSW1	w				Y1	24
Truth Table A EN Y0						EN	1.0			
A EN Y0				BSI5W to BSW5	w	Α	16.9		Y1	24
BSIFW to BSWFW A 16.9 Y1 24 EN 1.0	Truth Table	е				EN	1.0			
0 1 0 1 1 1 X 0 Z X:trelevant Z:High Impedance	A EN	Y0								
1 1 X 0 Z:High Impedance Y0 Y1 0 0	0 1	0		BSIFW to BSWF	·w				Y1	24
X:Irrelevant Z:High Impedance	1 1	1				Liv	1.0			
Z:High Impedance Y0	X 0	Z								
Y0 Y1 0 0										
	Z:High Impeda	nce								
	l va l v									

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSIUW	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ) (ZH)	0.469 1.149	0.771 2.002	1.492 4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.030	0.078	0.114
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.000	0.101	0.100
	'' ' ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSDUW	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492				0.050	0.070	
		(ZH) (ZL)	1.149 1.074	2.002 1.852	4.411 3.792				0.056 0.090	0.078 0.131	0.114 0.193
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.090	0.131	0.193
	10 7 11	(LL)	1.187	1.883	3.417	0.010	0.017	0.023			
BSUUW	A → Y0	(HH)	0.839	1.469	3.318	T	T	T	0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL) (HH)	1.074 0.780	1.852 1.214	3.792 2.365	0.011	0.017	0.025	0.090	0.131	0.193
	Y0 → Y1	(LL)	1.187	1.883	3.417	0.011	0.017	0.025			
BSWUW	A → Y0	(HH)	0.839	1.469	3.318	0.010	0.010	0.022	0.056	0.078	0.114
50	" ' ' ' '	(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL)	1.074 0.780	1.852 1.214	3.792 2.365	0.011	0.017	0.025	0.090	0.131	0.193
	Y0 → Y1	(HH) (LL)	1.187	1.883	3.417	0.011	0.017	0.025			
BSICW	A → Y0	(HH)	0.857	1.549	3.541	0.010	0.013	0.022	0.038	0.053	0.080
55.511	" ' ' '	(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931 0.780	1.622 1.214	3.317 2.365	0.011	0.017	0.025	0.045	0.066	0.098
	Y0 → Y1	(HH) (LL)	1.187	1.883	3.417	0.011	0.017	0.025			
BSDCW	A → Y0	(HH)	0.857	1.549	3.541	0.010	0.013	0.022	0.038	0.053	0.080
-320	'' '	(LL)	0.857	1.450	2.908				0.044	0.065	0.097
1	EN → Y0	(HZ)	1.602	2.366	4.209		1				
1		(LZ)	0.547	0.906	1.819		1				
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
1		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	Y0 → Y1	(HH) (LL)	0.780 1.187	1.214 1.883	2.365 3.417	0.011 0.010	0.017 0.015	0.025 0.022			
BSUCW	A → Y0	(LL) (HH)	0.857	1.549	3.417	0.010	0.015	0.022	0.038	0.053	0.080
	^ → 10	(LL)	0.857	1.450	2.908				0.036	0.065	0.000
1	EN → Y0	(HZ)	1.602	2.366	4.209		1				
1		(LZ)	0.547	0.906	1.819		1				
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317		l		0.045	0.066	0.098
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022		<u> </u>	

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	$IN \to OL$		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSWCW	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ) (LZ)	1.602 0.547	2.366 0.906	4.209 1.819						
		(LZ) (ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.035	0.066	0.000
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.040	0.000	0.000
	'' ' ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSI3W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
	\ \(\)	(ZL)	0.913 0.780	1.619 1.214	3.323 2.365	0.011	0.017	0.025	0.031	0.045	0.067
	Y0 → Y1	(HH) (LL)	1.187	1.214	3.417	0.011	0.017	0.025			
BSD3W	A → Y0	(HH)	0.927	1.751	4.088	0.010	3.013	0.022	0.024	0.036	0.056
DODOW		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612	1					
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSU3W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
	EN → Y0	(LL) (HZ)	0.979 2.160	1.652 3.204	3.277 5.612				0.029	0.043	0.064
	I EN → fU	(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSW3W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ) (ZH)	0.607 1.232	1.003 2.276	2.005 5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.001	0.0.0	0.007
	'* ' ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSI1W	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
	V0 V4	(ZL)	0.831 0.780	1.483 1.214	3.091 2.365	0.011	0.017	0.025	0.023	0.034	0.050
	Y0 → Y1	(HH) (LL)	1.187	1.214	3.417	0.011	0.017	0.025			
BSD1W	A → Y0	(HH)	0.681	1.265	2.923	0.010	0.013	0.022	0.020	0.029	0.045
2021**		(LL)	0.644	1.115	2.283				0.020	0.023	0.043
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957	1			0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

				Switch	ning spe	ed					
Block type	Path		t۱	_D0 (ns)			t 1			T	
	$IN \to OL$		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSU1W	$A \rightarrow Y0$	(HH)	0.681 0.644	1.265 1.115	2.923 2.283				0.020 0.022	0.029 0.032	0.045
	EN → Y0	(LL) (HZ)	1.929	3.060	5.656				0.022	0.032	0.048
	EIN → TU	(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	$Y0 \rightarrow Y1$	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSW1W	$A \rightarrow Y0$	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
	EN 1/0	(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ) (LZ)	1.929 0.770	3.060 1.362	5.656 2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSI5W	$A \rightarrow Y0$	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ) (ZH)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.017	0.020	0.007
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSD5W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZH) (ZL)	0.837	1.526	3.208				0.015	0.023	0.038
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.017	0.023	0.007
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSU5W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031					l	
		(ZH) (ZL)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038 0.037
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.017	0.025	0.037
	10 -> 11	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSW5W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	$EN \rightarrow Y0$	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031					l	
		(ZH)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038
	Y0 → Y1	(ZL) (HH)	0.837	1.526	2.365	0.011	0.017	0.025	0.017	0.025	0.037
	10 → 11	(HH)	1.187	1.883	3.417	0.011	0.017	0.025		1	
BSIFW	A → Y0	(HH)	0.819	1.598	3.790	- · · · ·			0.013	0.021	0.037
-		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	$EN \rightarrow Y0$	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332	0.611	0.017	0.005	0.013	0.020	0.031
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025		1	
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

				Switch	ning spe	ed					
Block type	Path		tı	LDO (ns))		t 1			T	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSDFW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSUFW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BSWFW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	1		
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

Chapter 1 Interface Block

Function	Low-noise Schmitt	I/O Buffer							СМО	S 3.3 V
		Blo	ock 1	type						
Drivability	no resistor	with 50 KΩ P/D	wi	ith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O c	ells	int. Cells
1mA										
2mA										
3mA	BFIUW	BFDUW		BFUUW		BFWUV	v	1		13
6mA	BFICW	BFDCW		BFUCW		BFWCV	v	1		13
9mA	BFI3W	BFD3W		BFU3W		BFW3V	,	1		13
12mA	BFI1W	BFD1W		BFU1W		BFW1W	,	1		13
18mA	BFI5W	BFD5W		BFU5W		BFW5W	/	1		13
24mA	BFIFW	BFDFW		BFUFW		BFWFV	<i>,</i>	1		13
Logic Diag	gram			Block type		Input Symbol Fan-ii				tput
			ŀ	BFIUW to BFWU\	v	A	Fan-ir	ı jəy	Y1	Fan-out 24
		1		5. 1011 10 51 1101	•	EN	4.0			
Y1 N	02 ~			BFICW to BFWCV	v	A EN	6.1 4.0		Y1	24
АН	02 •		BFI3W to BFW3V	v	A EN	6.1 4.0		Y1	24	
EN H	03 +			BFI1W to BFW1W A 6.1 EN 4.0					Y1	24
Truth Tabl	e		\dashv	BFI5W to BFW5V	V	A EN	6.1 4.0		Y1	24
A EN 0 1 1 1 X 0 X:Irrelevant Z:High Impeda	0 1 Z		BFIFW to BFWFV	V	A EN	6.1 4.0		Y1	24	
Y0 Y1 0 0 1 1										

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LD0 (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFIUW	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ) (ZH)	0.745 1.340	1.089 2.445	2.013 5.805				0.057	0.081	0.121
		(ZL)	1.365	2.445	4.559				0.057	0.081	0.121
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.030	0.151	0.134
	'' ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFDUW	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013					l	
		(ZH)	1.340 1.365	2.445 2.279	5.805 4.559				0.057 0.090	0.081	0.121 0.194
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.090	0.131	0.194
	10 → f1	(LL)	1.187	1.883	3.417	0.011	0.017	0.023			
BFUUW	A → Y0	(HH)	1.275	2.384	5.623	0.0.0	0.0.0	0.022	0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559	0.011	0.047	0.005	0.090	0.131	0.194
	Y0 → Y1	(HH) (LL)	0.780 1.187	1.214 1.883	2.365 3.417	0.011 0.010	0.017 0.015	0.025 0.022			
BFWUW	A → Y0	(HH)	1.107	2.384	5.623	0.010	0.013	0.022	0.057	0.081	0.121
DI WOW	A → 10	(LL)	1.260	2.099	4.212				0.090	0.131	0.121
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
BFICW	A → Y0	(LL) (HH)	1.187	1.883 2.555	3.417 6.105	0.010	0.015	0.022	0.040	0.058	0.090
Bricw	A → 10	(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
BFDCW	A → Y0	(LL) (HH)	1.187 1.326	1.883 2.555	3.417 6.105	0.010	0.015	0.022	0.040	0.058	0.090
DI-DOW	A → 10	(LL)	1.185	1.984	3.930				0.040	0.058	0.090
	EN → Y0	(HZ)	1.054	1.423	2.365		1		0.545	5.500	5.101
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285		1		0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276		1		0.047	0.068	0.101
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
DELICIA	4)/2	(LL)	1.187	1.883 2.555	3.417	0.010	0.015	0.022	0.040	0.058	0.090
BFUCW	A → Y0	(HH) (LL)	1.326	1.984	6.105 3.930		1		0.040	0.058	0.090
	EN → Y0	(LL) (HZ)	1.054	1.423	2.365		1		0.040	0.000	0.101
	-1, -, 10	(LZ)	0.927	1.364	2.581		1				
		(ZH)	1.388	2.613	6.285		1		0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

				Switch	ning spe	eed					
Block type	Path		t i	LD0 (ns)			t 1			Т	
	$IN \to OL$	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFWCW	A → Y0	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ) (LZ)	1.054 0.927	1.423 1.364	2.365 2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.0.7	0.000	0.101
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFI3W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ) (LZ)	1.476 1.086	2.066 1.602	3.447 3.023						
		(LZ) (ZH)	1.485	2.941	7.290				0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.020	0.042	0.073
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.000	0.0.0	0.070
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFD3W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086 1.485	1.602 2.941	3.023 7.290				0.028	0.042	0.070
		(ZH) (ZL)	1.485	2.941	4.413				0.028	0.042	0.070
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.000	0.043	0.075
	10 -7 11	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFU3W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023					0.042	0.070
		(ZH) (ZL)	1.485 1.268	2.941 2.209	7.290 4.413				0.028 0.033	0.042	0.070
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.033	0.049	0.073
	10 7 11	(LL)	1.187	1.883	3.417	0.010	0.017	0.022			
BFW3W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023					l	
		(ZH) (ZL)	1.485 1.268	2.941 2.209	7.290 4.413				0.028	0.042	0.070 0.073
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.000	0.043	0.075
	10 -7 11	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFI1W	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457				0.000	0.000	0.00-
		(ZH) (ZL)	1.539 1.288	3.109 2.293	7.803 4.624		1		0.026 0.027	0.039	0.067 0.061
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.027	0.040	0.061
	'0 → ''	(LL)	1.187	1.883	3.417	0.011	0.017	0.023			
BFD1W	A → Y0	(HH)	1.492	3.051	7.617	T	T		0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993		1				
		(LZ)	1.242	1.836	3.457						
		(ZH)	1.539	3.109	7.803		1		0.026	0.039	0.067
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL)	1.288	2.293	4.624	0.014	0.017	م ممد	0.027	0.040	0.061
	Y0 → Y1	(HH) (LL)	0.780 1.187	1.214 1.883	2.365 3.417	0.011 0.010	0.017 0.015	0.025 0.022			
		(LL)	1.18/	1.883	3.41/	0.010	0.015	0.022	l		

	Switching speed										
Block type	Path		t LDO (ns)		t 1			Т			
	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFU1W	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242 1.539	1.836 3.109	3.457 7.803				0.026	0.039	0.067
		(ZH) (ZL)	1.288	2.293	4.624				0.026	0.039	0.067
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.027	0.040	0.001
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFW1W	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ) (ZH)	1.242 1.539	1.836 3.109	3.457 7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624				0.026	0.039	0.067
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.027	0.040	0.001
	'- ' ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFI5W	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.038	0.064
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.022	0.000	0.001
	10 -> 11	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFD5W	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZH) (ZL)	1.353	2.504	5.120				0.023	0.036	0.064
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.022	0.000	0.001
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFU5W	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.038	0.064
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.022	0.000	0.001
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFW5W	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.004
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	0.022	0.000	0.001
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFIFW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016	1			0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ) (ZH)	1.877 1.867	2.777 4.086	5.195 10.808				0.022	0.035	0.064
		(ZH) (ZL)	1.424	2.718	5.634				0.022	0.035	0.064
	Y0 → Y1	(ZL) (HH)	0.780	1.214	2.365	0.011	0.017	0.025	3.020	0.000	0.047
	'' - ''	(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
	•	` '							•		

	Switching speed										
Block type	Path		t LDO (ns)			t 1			Т		
	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFDFW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFUFW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025			
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			
BFWFW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.780	1.214	2.365	0.011	0.017	0.025	1		1
		(LL)	1.187	1.883	3.417	0.010	0.015	0.022			

Chapter 1 Interface Block

Function	I/O Buffer with E	N(AND)						СМ	OS 3.3 V
		Blo	ock	type					
Drivability	no resistor	with 50 KΩ P/D	W	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA	BN2U	BN4U						1	13
6mA	BN2C	BN4C						1	13
9mA	BN23	BN43						1	13
12mA	BN21	BN41						1	23
18mA	BN25	BN45						1	23
24mA	BN2F	BN4F						1	23
Logic Diag	gram			Block type		Inp	_		utput
				BN2U to BN4U		Symbol	6.3	Y1	I Fan-out
ENI I	104 ←					EN	1.0		"
		—				ENI	3.0		
Y1 1	V02 ←——(BN2C to BN4C		A	6.3	Y1	34
		─ ┣		BINZC 10 BIN4C		EN	1.0	''	34
						ENI	3.0		
ΑI	H01 ←	→ N01 Y0							
				BN23 to BN43		A EN	6.3 1.0	Y1	34
EN I	H03 ←					ENI	3.0		
Truth Tabl	e			BN21 to BN41		A	16.9	Y1	34
						EN ENI	1.0 3.0		
A EN									
0 1	0			BN25 to BN45		Α	16.9	Y1	34
x 0	z					EN ENI	1.0 3.0		
X:Irrelevant						CINI	3.0		
Z:High Impeda	nce			BN2F to BN4F		А	16.9	Y1	34
						EN	1.0		
Y0	ENI Y1					ENI	3.0		
0	0 0								
0	1 0								
1 1	0 0 1								
<u> </u>									

Chapter 1 Interface Block

	Switching speed										
Block type	Path		tı	LDO (ns))		t 1			Т	
1	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN2U	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792	0.010	0014	0.004	0.090	0.131	0.193
	ENI → Y1	(HH) (LL)	0.158 0.342	0.244 0.488	0.510 0.939	0.010 0.011	0.014 0.015	0.021			
	Y0 → Y1	(LL) (HH)	0.342	0.466	0.939	0.011	0.015	0.021			
	10 → 11	(LL)	0.103	0.213	0.715	0.010	0.014	0.021			
BN4U	A → Y0	(HH)	0.839	1.469	3.318	0.011	0.010	0.021	0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(LL) (HH)	0.342	0.488 0.219	0.939 0.462	0.011 0.010	0.015 0.014	0.021 0.021			
	Y0 → Y1	(HH) (LL)	0.109	0.219	0.462	0.010	0.014	0.021			
BN2C	A → Y0	(HH)	0.857	1.549	3.541	0.011	0.013	0.021	0.038	0.053	0.080
DIVEO	7 7 10	(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
BN4C	A → Y0	(LL) (HH)	0.253	0.371 1.549	0.715 3.541	0.011	0.015	0.021	0.038	0.053	0.080
DIV4C	A → 10	(LL)	0.857	1.450	2.908				0.038	0.055	0.080
	EN → Y0	(HZ)	1.602	2.366	4.209				0.044	0.000	0.007
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
BN23	A → Y0	(LL) (HH)	0.253	0.371 1.751	0.715 4.088	0.011	0.015	0.021	0.024	0.036	0.056
טואבט	A → 10	(LL)	0.927	1.652	3.277				0.024	0.036	0.056
	EN → Y0	(HZ)	2.160	3.204	5.612				0.320	5.545	3.304
	/ 10	(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
DNI42	A 1/2	(LL)	0.253	0.371	0.715	0.011	0.015	0.021	0.004	0.000	0.056
BN43	A → Y0	(HH)	0.927 0.979	1.751 1.652	4.088 3.277				0.024 0.029	0.036 0.043	0.056
l	EN → Y0	(LL) (HZ)	2.160	3.204	5.612	1			0.029	0.043	0.004
	LN → 10	(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
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Chapter 1 Interface Block

	Switching speed										
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OL	IT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010 0.011	0.014	0.021			
BN21	A → Y0	(LL) (HH)	0.253	0.371 1.265	0.715 2.923	0.011	0.015	0.021	0.020	0.029	0.045
DINZI	A → 10	(LL)	0.644	1.115	2.283				0.020	0.023	0.043
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091		l		0.023	0.034	0.050
	ENI → Y1	(HH) (LL)	0.158 0.342	0.244 0.488	0.510 0.939	0.010 0.011	0.014 0.015	0.021 0.021			
	Y0 → Y1	(LL) (HH)	0.342	0.466	0.939	0.011	0.015	0.021			
	10 → 11	(LL)	0.253	0.213	0.715	0.011	0.015	0.021			
BN41	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770 1.247	1.362	2.783				0.020	0.029	0.045
		(ZH) (ZL)	0.831	2.257 1.483	4.957 3.091				0.020	0.029	0.045
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021	0.020	0.004	0.000
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
		(LL)	0.253	0.371	0.715	0.011	0.015	0.021			
BN25	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
	EN → Y0	(LL) (HZ)	0.761 2.463	1.339 3.879	2.741 7.031				0.015	0.022	0.033
	LN → 10	(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH) (LL)	0.109 0.253	0.219 0.371	0.462 0.715	0.010 0.011	0.014 0.015	0.021 0.021			
BN45	A → Y0	(HH)	0.754	1.442	3.379	0.011	0.010	0.021	0.015	0.023	0.039
	" ' '	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038 0.037
	ENI → Y1	(ZL) (HH)	0.837	0.244	0.510	0.010	0.014	0.021	0.017	0.025	0.037
	LINI → II	(LL)	0.138	0.488	0.939	0.010	0.014	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
		(LL)	0.253	0.371	0.715	0.011	0.015	0.021			
BN2F	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
	FN \/2	(LL)	0.881 3.004	1.569 4.704	3.211 8.420				0.012	0.018	0.027
	EN → Y0	(HZ) (LZ)	0.945	1.629	3.274		1				
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021			
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021			
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021			
	<u> </u>	(LL)	0.253	0.371	0.715	0.011	0.015	0.021		L	ш

Chapter 1 Interface Block

				Switcl	ning spe	ed						
Block type	Path		tı	LDO (ns))		t 1			Т		
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
BN4F	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037	
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027	
	EN → Y0	(HZ)	3.004	4.704	8.420							
		(LZ)	0.945	1.629	3.274							
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037	
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031	
	ENI → Y1	(HH)	0.158	0.244	0.510	0.010	0.014	0.021				
		(LL)	0.342	0.488	0.939	0.011	0.015	0.021				
	Y0 → Y1	(HH)	0.109	0.219	0.462	0.010	0.014	0.021				
		(LL)	0.253	0.371	0.715	0.011	0.015	0.021				

Chapter 1 Interface Block

Function	I/O Buffer with EN	(OR)						CN	10S 3.3 V
		Blo	ock	type				•	_
Drivability	no resistor	with 50 KΩ P/D	W	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA	BN3U	BN5U						1	11
6mA	BN3C	BN5C						1	11
9mA	BN33	BN53						1	11
12mA	BN31	BN51						1	21
18mA	BN35	BN55						1	21
24mA	BN3F	BN5F						1	21
Logic Diag	ıram			Block type		Inp	_		output
				BN3U to BN5U		Symbol A	6.3	Y1	ol Fan-out
ENI F	104 ←					EN	1.0		
						ENI	3.0		
Y1 N	102 ←──			BN3C to BN5C		A	6.3	Y1	34
		\Box		BN3C to BN5C		EN EN	1.0	11	34
						ENI	3.0		
A H	101 ←	> → N01 Y0							
				BN33 to BN53		A EN	6.3 1.0	Y1	34
EN F	103 ←					ENI	3.0		
Truth Table	e			BN31 to BN51		Α	16.9	Y1	34
						EN ENI	1.0 3.0		
A EN	YO						0.0		
0 1	0			BN35 to BN55		А	16.9	Y1	34
1 1 X 0	1 Z					EN	1.0		
X:Irrelevant						ENI	3.0		
Z:High Impeda	nce			BN3F to BN5F		A	16.9	Y1	34
						EN	1.0		
Y0 I	ENI Y1					ENI	3.0		
0	0 0								
0	1 1								
1 1	0 1 1 1								
	1 1								

Chapter 1 Interface Block

		ning spe	eed								
Block type	Path		tı	LD0 (ns))		t 1		Т		
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN3U	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010 0.011	0.014 0.015	0.021			
BN5U	A → Y0	(LL) (HH)	0.333	0.505 1.469	1.014 3.318	0.011	0.015	0.023	0.056	0.078	0.114
DINOU	A → 10	(LL)	0.963	1.638	3.333				0.030	0.076	0.114
	EN → Y0	(HZ)	1.259	1.846	3.271				0.000	0	002
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			
BN3C	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ) (LZ)	1.602 0.547	2.366 0.906	4.209 1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.036	0.055	0.080
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021	0.040	0.000	0.000
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			
BN5C	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819				0.038	0.053	0.080
		(ZH) (ZL)	1.164 0.931	2.076 1.622	4.626 3.317				0.038	0.053	0.080
	ENI → Y1	(ZL) (HH)	0.138	0.225	0.411	0.010	0.014	0.021	0.045	0.000	0.096
		(LL)	0.309	0.534	1.127	0.010	0.014	0.021			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			
BN33	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277	1			0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612	1					
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174	1			0.024	0.035	0.056
	ENII 1/4	(ZL)	0.913	1.619	3.323	0.010	0.014	0.004	0.031	0.045	0.067
	ENI → Y1	(HH) (LL)	0.138 0.309	0.225 0.534	0.411 1.127	0.010 0.011	0.014 0.015	0.021 0.023			
	Y0 → Y1	(LL) (HH)	0.309	0.534	0.450	0.011	0.015	0.023			
	10 → 11	(LL)	0.333	0.505	1.014	0.010	0.015	0.021			
BN53	A → Y0	(HH)	0.927	1.751	4.088	T	T	1	0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005	1					
		(ZH)	1.232	2.276	5.174	1			0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067

Chapter 1 Interface Block

	Switching speed										
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OL	IT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
BN31	A → Y0	(LL) (HH)	0.333	0.505 1.265	1.014 2.923	0.011	0.015	0.023	0.020	0.029	0.045
DINOT	A → 10	(LL)	0.644	1.115	2.283				0.020	0.029	0.043
	EN → Y0	(HZ)	1.929	3.060	5.656				0.022	0.002	0.0.0
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	ENI → Y1	(HH)	0.138	0.225 0.534	0.411 1.127	0.010 0.011	0.014 0.015	0.021 0.023			
	Y0 → Y1	(LL) (HH)	0.309	0.534	0.450	0.011	0.015	0.023			
	10 → 11	(LL)	0.333	0.505	1.014	0.010	0.014	0.023			
BN51	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783				0.000		0.045
		(ZH) (ZL)	1.247 0.831	2.257 1.483	4.957 3.091				0.020 0.023	0.029 0.034	0.045 0.050
	ENI → Y1	(ZL) (HH)	0.031	0.225	0.411	0.010	0.014	0.021	0.023	0.054	0.030
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			
BN35	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
	EN → Y0	(LL) (HZ)	0.761 2.463	1.339 3.879	2.741 7.031				0.015	0.022	0.033
	EN → TU	(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH) (LL)	0.130 0.333	0.233 0.505	0.450 1.014	0.010 0.011	0.014 0.015	0.021 0.023			
BN55	A → Y0	(HH)	0.754	1.442	3.379	0.011	0.013	0.023	0.015	0.023	0.039
Bittoo	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
	ENI → Y1	(ZL) (HH)	0.837 0.138	1.526 0.225	3.208 0.411	0.010	0.014	0.021	0.017	0.025	0.037
	EINI → TI	(LL)	0.309	0.534	1.127	0.010	0.014	0.021			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.013	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			
BN3F	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ) (LZ)	3.004 0.945	4.704 1.629	8.420 3.274						
	1	(ZH)	1.377	2.588	5.829		1		0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
	1	(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			

Chapter 1 Interface Block

				Switcl	ning spe	ed					
Block type	Path		tı	LDO (ns))	t 1			Т		
	IN → OL	JΤ	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN5F	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	ENI → Y1	(HH)	0.138	0.225	0.411	0.010	0.014	0.021			
		(LL)	0.309	0.534	1.127	0.011	0.015	0.023			
	Y0 → Y1	(HH)	0.130	0.233	0.450	0.010	0.014	0.021			
		(LL)	0.333	0.505	1.014	0.011	0.015	0.023			

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Chapter 1 Interface Block

[MEMO]

I.2 TTL Level

Function	Input Buffer						3.3 V
		Blo	ock type				
Function	no resistor	with 50 KΩ P/D	with 50 KΩ P/U	with 5 KΩ	P/U	I/O cells	int. Cells
Normal	FI02	FID2	FIU2	FIW2		1	3
Schmitt	FIS2W	FDS2W	FUS2W	FWS2\	v	1	6
Clock							
а н		> N01 Y	Truth Table A Y 1 1 0 0				
Logic Diagr	am for "Schmitt"			In	put	Out	put
			Block type	Symbol	Fan-In		Fan-Out
A H	01 ←	→ N01 Y	FI02 to FIW2	2 A	-	Y	22
Logic Diagr	am for "Clock"		FIS2W to FWS	2W A	-	Y	19

Chapter 1 Interface Block

				Switch	ning spe	ed					
Block type	Path		tı	LD0 (ns)			t 1			T	
	IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
FI02	A → Y	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
FID2	A → Y	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
FIU2	A → Y	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
FIW2	A → Y	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
FIS2W	A → Y	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
FDS2W	A → Y	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
FUS2W	A → Y	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
FWS2W	A → Y	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			

Chapter 1 Interface Block

Function	Input Buffer with fa	ilsafe							3.3 V
		Blo	ock ty	/pe					
Function	no resistor	with 50 K Ω P/D	wit	th 50 KΩ P/U	wit	h 5 KΩ	P/U	I/O cells	int. Cells
Normal	FIA2	FDA2						1	3
Schmitt	FIE2W	FDE2W						1	6
Clock									
A H	ram for "Normal"	> N01 Y		Truth Table A Y 1 1 0 0					
Logic Diag	ram for "Schmitt"			Division of		Inp	out	Ou	tput
				Block type		Symbol	Fan-In	Symbol	Fan-Out
АН	l01 ←	→ N01 Y		FIA2 to FDA2	2	A	-	Y	22
Logic Diagi	ram for "Clock"			FIE2W to FDE2	ew	A	-	Y	19

Chapter 1 Interface Block

	Switching speed											
Block type	Path		tı	LDO (ns)		t 1			Т		
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FIA2	$A \rightarrow Y$	(HH)	0.115	0.215	0.422	0.015	0.021	0.031				
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015				
FDA2	$A \rightarrow Y$	(HH)	0.115	0.215	0.422	0.015	0.021	0.031				
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			İ	
FIE2W	A → Y	(HH)	0.672	1.030	1.867	0.010	0.016	0.024				
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			İ	
FDE2W	$A \rightarrow Y$	(HH)	0.672	1.030	1.867	0.010	0.016	0.024				
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030				

Chapter 1 Interface Block

Function	Input Buffer with El	N(AND)							3.3 V
		Blo	ock ty	/pe					
Function	no resistor	with 50 KΩ P/D	wit	h 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
Normal	FN12	FN22						1	7
Schmitt									
Clock									
	ram for "Normal"			Truth Table					
A H0 [.]	1•)→ N01 Y		A EN 0 0	+	_			
		→ H02 EN		0 1 1 0	0				
				1 1	1				
Logic Diagr	am for "Schmitt"					Inr	out	Our	tput
				Block type	•				Fan-Out
				FN12 to FN22		A EN	4.0	Y	22
Logic Diagr	am for "Clock"								

Chapter 1 Interface Block

				Switch	ning spe	ed	Switching speed									
Block type	Path		tı	LDO (ns)			t 1		Т							
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.					
FN12	A → Y	(HH)	0.129	0.245	0.511	0.015	0.021	0.031								
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015								
	EN → Y	(HH)	0.169	0.261	0.554	0.015	0.021	0.031								
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015								
FN22	A → Y	(HH)	0.129	0.245	0.511	0.015	0.021	0.031								
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015								
	EN → Y	(HH)	0.169	0.261	0.554	0.015	0.021	0.031								
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015								

Chapter 1 Interface Block

Chapter 1 Interface Block

	Switching speed											
Block type	Path		t	LD0 (ns)			t 1			Т		
	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
FN14	$A \rightarrow Y$	(HH)	0.124	0.218	0.433	0.015	0.021	0.031				
		(LL)	0.322	0.468	0.960	0.008	0.011	0.017				
	EN → Y	(HH)	0.215	0.314	0.598	0.015	0.021	0.031				
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017				
FN24	A → Y	(HH)	0.124	0.218	0.433	0.015	0.021	0.031				
		(LL)	0.322	0.468	0.960	0.008	0.011	0.017				
	EN → Y	(HH)	0.215	0.314	0.598	0.015	0.021	0.031				
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017				

Chapter 1 Interface Block

Function	N-ch open drain I/C	Buffer with failsafe)					т	TL 3.3 V
		Blo	ock t	уре					
Drivability	no resistor	with 50 KΩ P/D	wi	ith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA									
6mA									
9mA	EBA2							1	7
12mA	EBAA							1	7
18mA	EBA6							1	7
24mA	EBAE							1	7
Logic Diag	gram		\Box	Block type		Inp			utput
			-	EBA2		Symbol	Fan-ir	Symbo	Fan-out
	$\overline{}$			LDAL			0.1		
Y1 N0	2	→ N01 Y0		EBAA		А	6.1	Y1	22
				5040					
A H0	n-1	- - -		EBA6		A	6.1	Y1	22
		1 - 		EBAE		А	6.1	Y1	22
		<u></u>							
Truth Tabl	e								
	_								
A YO	4								
1 Z									
0 0									
Z:High Impeda		-1							
Connect a pull	-up resistor to get a high lev	еі							
Y0 Y1	ı								
0 0									
1 1									

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
EBA2	A → Y0	(LZ)	0.377	0.530	0.967						
		(ZL)	0.391	0.712	1.453				0.030	0.044	0.065
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
EBAA	A → Y0	(LZ)	0.438	0.625	1.146						
		(ZL)	0.386	0.719	1.478				0.023	0.033	0.050
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
EBA6	A → Y0	(LZ)	0.562	0.813	1.502						
		(ZL)	0.399	0.768	1.598				0.016	0.024	0.036
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
EBAE	A → Y0	(LZ)	0.684	1.000	1.854						
l		(ZL)	0.414	0.817	1.721				0.013	0.020	0.030
l	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

Chapter 1 Interface Block

Function	N-ch open drain So	hmitt I/O Buffer with	n fai	Isafe				TT	L 3.3 V
		Blo	ock t	type					
Drivability	no resistor	with 50 KΩ P/D	W	ith 50 KΩ P/U	wi	th 5 KΩ	P/U I	I/O cells	int. Cells
1mA									
2mA									
3mA									
6mA									
9mA	EBE2W							1	10
12mA	EBEAW							1	10
18mA	EBE6W							1	10
24mA	EBEEW							1	10
Logic Diag	gram		\Box	Block type		Inp			itput
			ŀ	EBE2W		Symbol	Fan-in 6.1	Symbol Y1	Fan-out
				EBEZVV		^	6.1	''	19
Y1 N0)2 - 	→ N01 Y0		EBEAW		А	6.1	Y1	19
	7								l I
A H0	o1	∤ ⋤		EBE6W		A	6.1	Y1	19
		I		EBEEW		А	6.1	Y1	19
		<u> </u>							
Truth Tabl	<u> </u>		\dashv						
Trutti Tabi									
A Y0									
1 Z									
0 0									
Z:High Impeda									
Connect a pull	l-up resistor to get a high lev	el							
Y0 Y1	1								
0 0									
1 1									

Chapter 1 Interface Block

				Switch	ning spe	ed							
Block type	Path		tı	LDO (ns)		t 1			Т			
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
EBE2W	A → Y0	(LZ)	0.377	0.530	0.967								
		(ZL)	0.391	0.712	1.453				0.030	0.044	0.065		
	Y0 → Y1	(HH)	0.672	1.030	1.867	0.010	0.016	0.024					
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030					
EBEAW	A → Y0	(LZ)	0.438	0.625	1.146								
		(ZL)	0.386	0.719	1.478				0.023	0.033	0.050		
	Y0 → Y1	(HH)	0.672	1.030	1.867	0.010	0.016	0.024					
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030					
EBE6W	A → Y0	(LZ)	0.562	0.813	1.502								
		(ZL)	0.399	0.768	1.598				0.016	0.024	0.036		
	Y0 → Y1	(HH)	0.672	1.030	1.867	0.010	0.016	0.024					
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030					
EBEEW	A → Y0	(LZ)	0.684	1.000	1.854								
		(ZL)	0.414	0.817	1.721				0.013	0.020	0.030		
	Y0 → Y1	(HH)	0.672	1.030	1.867	0.010	0.016	0.024					
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030					

Chapter 1 Interface Block

Function	I/O Buffer						тт	L 3.3 V
		Blo	ock type					
Drivability	no resistor	with 50 KΩ P/D	with 50 K Ω P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA								
2mA								
3mA	B00V	B0DV	BOUV		B0WV		1	10
6mA	B00D	B0DD	BOUD		B0WD		1	10
9mA	B004	B0D4	B0U4		B0W4		1	10
12mA	B002	B0D2	B0U2	B0W2			1	20
18mA	B006	B0D6	B0U6		B0W6		1	20
24mA	B00G	B0DG	BOUG	B0WG			1	20
Logic Diag	ıram		Block type					utput
			B00V to B0WV	,	· ·			22
		1			EN	1.0		-
Y1 N	102 -							
		J	B00D to B0WD)			Y1	22
					EIN	1.0		
АН	101 ←	> → N01 Y0	B004 to B0W4		А	6.3	Y1	22
					EN	1.0		
EN H	103 +		B002 to B0W2		Δ	16.9	V1	22
			5002 to 50112	Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in Symbol Fan-in F				
Truth Table	e		B006 to B0W6				Y1	22
					EN	1.0		
A EN	YO		B00G to B0WG	i	А	16.9	Y1	22
0 1	0 1				EN	1.0		
x 0	z							
X:Irrelevant								
Z:High Impeda	nce							
Y0 Y1								
0 0								
1 1								

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B00V	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492				0.050	0.078	0.114
		(ZH)	1.149 1.074	2.002 1.852	4.411 3.792				0.056 0.090	0.078	
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.090	0.131	0.193
	10 → 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0DV	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
	Y0 → Y1	(ZL) (HH)	1.074 0.115	1.852 0.215	3.792 0.422	0.015	0.021	0.031	0.090	0.131	0.193
	10 → 11	(LL)	0.115	0.215	0.422	0.015	0.021	0.031			
BOUV	A → Y0	(HH)	0.839	1.469	3.318	0.000	0.010	0.010	0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792	0.045			0.090	0.131	0.193
	Y0 → Y1	(HH) (LL)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021	0.031 0.015			
BOWV	A → Y0	(HH)	0.839	1.469	3.318	0.008	0.010	0.015	0.056	0.078	0.114
DOVVV	A → 10	(LL)	0.963	1.638	3.333				0.089	0.131	0.114
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
B00D	A → Y0	(LL) (HH)	0.240 0.857	0.366 1.549	0.699 3.541	0.008	0.010	0.015	0.038	0.053	0.080
6000	A → 10	(LL)	0.857	1.450	2.908				0.030	0.065	0.000
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317		1		0.045	0.066	0.098
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
B0DD	A → Y0	(LL)	0.240 0.857	0.366 1.549	0.699 3.541	0.008	0.010	0.015	0.038	0.053	0.080
טטטט	A → Y0	(HH) (LL)	0.857	1.450	2.908				0.038	0.053	0.080
	EN → Y0	(HZ)	1.602	2.366	4.209		1		0.044	0.000	0.007
] / /	(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
DOLLD	. ,	(LL)	0.240	0.366	0.699	0.008	0.010	0.015	0.000	0.050	0.000
B0UD	A → Y0	(HH) (LL)	0.857 0.857	1.549 1.450	3.541 2.908				0.038 0.044	0.053 0.065	0.080 0.097
	EN → Y0	(LL) (HZ)	1.602	2.366	4.209		1		0.044	0.005	0.097
	LIN → 10	(LZ)	0.547	0.906	1.819		1				
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317		1		0.045	0.066	0.098
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0WD	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ) (ZH)	0.547 1.164	0.906 2.076	1.819 4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.036	0.053	0.080
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.043	0.000	0.030
	10 -7 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B004	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
	V0 V4	(ZL)	0.913	1.619	3.323	0.015	0.004	0.034	0.031	0.045	0.067
	Y0 → Y1	(HH) (LL)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
B0D4	A → Y0	(HH)	0.240	1.751	4.088	0.008	0.010	0.013	0.024	0.036	0.056
2004	" - "	(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0U4	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
	EN → Y0	(LL) (HZ)	0.979 2.160	1.652 3.204	3.277 5.612				0.029	0.043	0.064
	EN → TU	(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0W4	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(LZ) (ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031	3.001	5.0.0	0.00.
	'- ''	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B002	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783				0.000		0.045
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
	Y0 → Y1	(ZL) (HH)	0.831 0.115	1.483 0.215	3.091 0.422	0.015	0.021	0.031	0.023	0.034	0.050
	TU → YI	(HH) (LL)	0.115	0.215	0.422	0.015	0.021	0.031			
B0D2	A → Y0	(HH)	0.681	1.265	2.923	3.300	0.010	5.515	0.020	0.029	0.045
2022	" - "	(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783	1					
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switch	ning spe	ed					
Block type	Path		tı	D0 (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0U2	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783				0.000		0.045
		(ZH)	1.247 0.831	2.257 1.483	4.957 3.091				0.020 0.023	0.029 0.034	0.045 0.050
	Y0 → Y1	(ZL) (HH)	0.831	0.215	0.422	0.015	0.021	0.031	0.023	0.034	0.050
	10 → 11	(LL)	0.113	0.366	0.699	0.008	0.010	0.031			
B0W2	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
Pooe	A 1/0	(LL) (HH)	0.240	0.366 1.442	0.699 3.379	0.008	0.010	0.015	0.015	0.023	0.039
B006	A → Y0	(HH) (LL)	0.754	1.339	2.741				0.015	0.023	0.039
	EN → Y0	(HZ)	2.463	3.879	7.031				0.010	0.022	0.000
	LN -> 10	(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0D6	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
	=	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463 0.858	3.879 1.497	7.031 3.031						
		(LZ) (ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.017	0.020	0.007
	-	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0U6	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038 0.037
	Y0 → Y1	(ZL) (HH)	0.037	0.215	0.422	0.015	0.021	0.031	0.017	0.025	0.037
	10 → 11	(LL)	0.113	0.366	0.699	0.008	0.010	0.031			
B0W6	A → Y0	(HH)	0.754	1.442	3.379	0.000	0.010	0.010	0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
POOC	A 1/2	(LL)	0.240	0.366 1.598	0.699 3.790	0.008	0.010	0.015	0.013	0.021	0.037
B00G	A → Y0	(HH) (LL)	0.819	1.598	3.790				0.013	0.021	0.037
	EN → Y0	(LL) (HZ)	3.004	4.704	8.420				0.012	0.018	0.027
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
B0DG	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0UG	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
B0WG	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						1
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			1
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

Chapter 1 Interface Block

Function	Low-noise I/O Buff	er							TT	L 3.3 V
		Blo	ock	type						
Drivability	no resistor	with 50 KΩ P/D	W	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O c	ells	int. Cells
1mA										
2mA										
3mA	BE0V	BEDV		BEUV		BEWV		1		10
6mA	BE0D	BEDD		BEUD		BEWD		1		10
9mA	BE04	BED4		BEU4		BEW4		1		10
12mA	BE02	BED2		BEU2		BEW2		1		10
18mA	BE06	BED6		BEU6		BEW6		1		10
24mA	BE0G	BEDG		BEUG		BEWG		1		10
Logic Diag	ram			Block type	Input Symbol Far			_		tput
				BE0V to BEWV		A	Fan-ir		Y1	Fan-out
		1		5207 10 52117		EN	4.0			
Y1 N	02 ←									
			BE0D to BEWD		A	6.1 4.0		Y1	22	
						EN	4.0			
A H01 • N01 Y0				BE04 to BEW4		A 6.1			Y1	22
						EN	4.0			
EN H	03 +			BE02 to BEW2		A	6.1		V1	22
				BLOZ TO BLVVZ		EN	4.0	Y1		22
Truth Table				BE06 to BEW6		A	6.1		Y1	22
						EN	4.0			
A EN	YO			BE0G to BEWG		A	6.1		Y1	22
0 1	0					EN	4.0			
1 1 X 0	1 Z									
X:Irrelevant										
Z:High Impedar	nce									
Y0 Y1	\neg									
0 0										
1 1										

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BE0V	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ) (ZH)	0.745 1.340	1.089 2.445	2.013 5.805				0.057	0.081	0.121
		(ZL)	1.365	2.445	4.559				0.057	0.081	0.121
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.030	0.151	0.134
	10 -7 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEDV	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013					l	
		(ZH)	1.340 1.365	2.445 2.279	5.805 4.559				0.057 0.090	0.081	0.121 0.194
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.090	0.131	0.194
	10 → f1	(LL)	0.113	0.213	0.422	0.008	0.021	0.031			
BEUV	A → Y0	(HH)	1.275	2.384	5.623	0.000	0.0.0	0.0.0	0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559	0.045	0.004	0.004	0.090	0.131	0.194
	Y0 → Y1	(HH) (LL)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
BEWV	A → Y0	(HH)	1.275	2.384	5.623	0.008	0.010	0.013	0.057	0.081	0.121
DEWV	A → 10	(LL)	1.260	2.099	4.212				0.090	0.131	0.121
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
BE0D	A → Y0	(LL) (HH)	0.240 1.326	0.366 2.555	0.699 6.105	0.008	0.010	0.015	0.040	0.058	0.090
BEOD	A → 10	(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
BEDD	A → Y0	(LL) (HH)	0.240 1.326	0.366 2.555	0.699 6.105	0.008	0.010	0.015	0.040	0.058	0.090
	A → 10	(LL)	1.185	1.984	3.930		1		0.040	0.058	0.090
	EN → Y0	(HZ)	1.054	1.423	2.365		1		0.545	5.500	5.101
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285		1		0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
DELID	4)/2	(LL)	0.240	0.366	0.699	0.008	0.010	0.015	0.040	0.058	0.090
BEUD	A → Y0	(HH) (LL)	1.326 1.185	2.555 1.984	6.105 3.930		1		0.040	0.058	0.090
	EN → Y0	(LL) (HZ)	1.054	1.423	2.365		1		0.040	0.000	0.101
	-1, -, 10	(LZ)	0.927	1.364	2.581		1				
		(ZH)	1.388	2.613	6.285		1		0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEWD	A → Y0	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ) (ZH)	0.927 1.388	1.364 2.613	2.581 6.285				0.040	0.058	0.090
		(ZH) (ZL)	1.265	2.149	4.276				0.040	0.058	0.090
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.047	0.000	0.101
	10 → 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BE04	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023						
		(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.033	0.049	0.073
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
BED4	A → Y0	(LL) (HH)	0.240 1.429	0.366 2.884	0.699 7.106	0.008	0.010	0.015	0.028	0.042	0.070
DED4	A → Y0	(LL)	1.311	2.202	4.323				0.028	0.042	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447				0.002	0.047	0.070
		(LZ)	1.086	1.602	3.023						
		(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.033	0.049	0.073
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEU4	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ) (LZ)	1.476 1.086	2.066 1.602	3.447 3.023						
		(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.033	0.049	0.073
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEW4	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023				0.000		0.070
		(ZH) (ZL)	1.485 1.268	2.941 2.209	7.290 4.413				0.028 0.033	0.042 0.049	0.070 0.073
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.033	0.049	0.073
	10 → 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BE02	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457						
		(ZH)	1.539	3.109	7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624		l	l	0.027	0.040	0.061
	Y0 → Y1	(HH)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
BED2	A → Y0	(LL) (HH)	1.492	3.051	7.617	0.008	0.010	0.015	0.026	0.039	0.067
DLUZ	A → 10	(LL)	1.390	2.366	4.674		1		0.025	0.039	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993				0.020	5.557	0.000
		(LZ)	1.242	1.836	3.457						
		(ZH)	1.539	3.109	7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624		1		0.027	0.040	0.061
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switc	hing spe	eed					1
Block type	Path		tι	D0 (ns)		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEU2	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457				0.026	0.039	0.067
		(ZH) (ZL)	1.539 1.288	3.109 2.293	7.803 4.624				0.026	0.039	0.067
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.027	0.040	0.001
	10 -5 11	(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEW2	A → Y0	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457						0.007
		(ZH)	1.539 1.288	3.109 2.293	7.803 4.624				0.026 0.027	0.039	0.067 0.061
	Y0 → Y1	(ZL) (HH)	0.115	0.215	0.422	0.015	0.021	0.031	0.027	0.040	0.061
	10 → F1	(LL)	0.113	0.213	0.422	0.008	0.021	0.031			
BE06	A → Y0	(HH)	1.684	3.547	9.136	1	2.2.0	2.3.0	0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307	4.328						
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL)	1.353 0.115	2.504 0.215	5.120 0.422	0.015	0.021	0.031	0.022	0.033	0.051
	Y0 → Y1	(HH) (LL)	0.115	0.215	0.422	0.015	0.021	0.031			
BED6	A → Y0	(HH)	1.684	3.547	9.136	0.000	0.010	0.010	0.022	0.036	0.064
BEBO	N -> 10	(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307	4.328						
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.022	0.033	0.051
	Y0 → Y1	(HH)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
BEU6	A → Y0	(LL) (HH)	1.684	3.547	9.136	0.006	0.010	0.015	0.022	0.036	0.064
DEOU	A 7 10	(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ)	1.559	2.307	4.328						
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.022	0.033	0.051
	Y0 → Y1	(HH) (LL)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
BEW6	A → Y0	(HH)	1.684	3.547	9.136	0.000	0.010	0.013	0.022	0.036	0.064
520		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634	1				1	
		(LZ)	1.559	2.307	4.328	1				1	
		(ZH)	1.706	3.606	9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.022	0.033	0.051
	Y0 → Y1	(HH) (LL)	0.115 0.240	0.215 0.366	0.422 0.699	0.015 0.008	0.021 0.010	0.031 0.015			
BE0G	A → Y0	(HH)	1.883	4.029	10.615	0.000	0.010	0.015	0.021	0.035	0.065
DLUG	A → 10	(LL)	1.997	3.484	7.016	1			0.021	0.033	0.005
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634	l		l	0.020	0.030	0.047
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031		1	
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

				Switch	ning spe	ed					
Block type	Path		tı	LD0 (ns)		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BEDG	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEUG	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			
BEWG	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
l		(LZ)	1.877	2.777	5.195						
l		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
l		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
I	Y0 → Y1	(HH)	0.115	0.215	0.422	0.015	0.021	0.031			
		(LL)	0.240	0.366	0.699	0.008	0.010	0.015			

Chapter 1 Interface Block

Function	Schmitt I/O Buffer							TT	L 3.3 V
		Blo	ock	type					
Drivability	no resistor	with 50 KΩ P/D	W	vith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA	BSIVW	BSDVW		BSUVW		BSWVV	v	1	13
6mA	BSIDW	BSDDW		BSUDW		BSWDV	v	1	13
9mA	BSI4W	BSD4W		BSU4W		BSW4V	/	1	13
12mA	BSI2W	BSD2W		BSU2W		BSW2V	/	1	23
18mA	BSI6W	BSD6W		BSU6W		BSW6V	/	1	23
24mA	BSIGW	BSDGW		BSUGW			BSWGW		23
Logic Diag	ram			Block type		Inp Symbol			tput Fan-out
				BSIVW to BSWVI	N	A	6.3	Y1	19
		1				EN	1.0		"
Y1 N	02 ←								
		1		BSIDW to BSWD	W	A EN	6.3 1.0	Y1	19
						LIN	1.0		
A H	02 -	> → N01 Y0		BSI4W to BSW4V	٧	Α	6.3	Y1	19
						EN	1.0		
EN H	03 +			BSI2W to BSW2V	v	A	16.9	Y1	19
						EN	1.0	''	"
					.				
Truth Table	е			BSI6W to BSW6V	٧	A EN	16.9 1.0	Y1	19
	Y0					LIN	1.0		
A EN				BSIGW to BSWG	W	Α	16.9	Y1	19
0 1	0 1					EN	1.0		
x 0	z								
X:Irrelevant									
Z:High Impedar	nce								
	_								
Y0 Y1	_								
0 0									
1 1									
				l					

			Switch	ning spe	ed						
Block type	Path		tı	LD0 (ns)		-	t 1			Т	
7.	IN → OL	IT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSIVW	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149 1.074	2.002 1.852	4.411 3.792				0.056 0.090	0.078 0.131	0.114
	Y0 → Y1	(ZL) (HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.090	0.131	0.193
	YU → YI	(LL)	3.005	4.875	8.847	0.010	0.010	0.024			
BSDVW	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
BSUVW	A → Y0	(LL) (HH)	3.005 0.839	4.875 1.469	8.847 3.318	0.014	0.020	0.030	0.056	0.078	0.114
BSOVW	A → 10	(LL)	0.963	1.638	3.333				0.089	0.131	0.114
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
B0148 444		(LL)	3.005	4.875	8.847	0.014	0.020	0.030	0.050	0.078	0.444
BSWVW	A → Y0	(HH) (LL)	0.839	1.469 1.638	3.318 3.333				0.056 0.089	0.078	0.114 0.192
	EN → Y0	(HZ)	1.259	1.846	3.271				0.009	0.131	0.192
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.131	0.193
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSIDW	A → Y0	(HH)	0.857	1.549 1.450	3.541 2.908				0.038 0.044	0.053 0.065	0.080 0.097
	EN → Y0	(LL) (HZ)	0.857 1.602	2.366	4.209				0.044	0.065	0.097
	EIN → fU	(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSDDW	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
	EN → Y0	(LL) (HZ)	0.857 1.602	1.450 2.366	2.908 4.209				0.044	0.065	0.097
	EN → Y0	(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSUDW	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ) (ZH)	0.547 1.164	0.906 2.076	1.819 4.626				0.038	0.053	0.080
		(ZH) (ZL)	0.931	1.622	3.317				0.038	0.053	0.080
	Y0 → Y1	(ZL) (HH)	0.673	1.022	1.867	0.010	0.016	0.024	5.045	3.000	0.030
	'0 -> '1	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
		(/	0.000		0.0 .7	J.J. 1	3.020	0.000			

				Switch	ning spe	eed					
Block type	Path		t i	LD0 (ns)			t 1			Т	
	$IN \to OL$	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSWDW	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ) (LZ)	1.602 0.547	2.366 0.906	4.209 1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.035	0.066	0.000
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.0.0	0.000	0.000
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSI4W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSD4W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ) (ZH)	0.607 1.232	1.003 2.276	2.005 5.174				0.024	0.035	0.056
		(ZH) (ZL)	0.913	1.619	3.323				0.024	0.035	0.056
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.001	0.043	0.007
	10 -7 11	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSU4W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH) (ZL)	1.232 0.913	2.276 1.619	5.174 3.323				0.024 0.031	0.035 0.045	0.056 0.067
	Y0 → Y1	(ZL) (HH)	0.913	1.029	1.867	0.010	0.016	0.024	0.031	0.045	0.067
	10 7 11	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSW4W	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH) (ZL)	1.232 0.913	2.276 1.619	5.174 3.323				0.024	0.035 0.045	0.056 0.067
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.001	0.043	0.007
	10 -7 11	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSI2W	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783				0.000	0.000	0.045
		(ZH) (ZL)	1.247 0.831	2.257 1.483	4.957 3.091		1		0.020 0.023	0.029	0.045 0.050
	Y0 → Y1	(ZL) (HH)	0.831	1.483	1.867	0.010	0.016	0.024	0.023	0.034	0.050
	10 → 11	(LL)	3.005	4.875	8.847	0.010	0.016	0.024			
BSD2W	A → Y0	(HH)	0.681	1.265	2.923	T	T	—	0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656		1				
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957		1		0.020	0.029	0.045
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL)	0.831	1.483	3.091	0.010	0010	0.004	0.023	0.034	0.050
	Y0 → Y1	(HH) (LL)	0.673 3.005	1.029 4.875	1.867 8.847	0.010 0.014	0.016 0.020	0.024			
		(LL)	3.005	4.875	8.84/	0.014	0.020	0.030	l		

	Switching spe										
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OU	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSU2W	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929 0.770	3.060 1.362	5.656 2.783						
		(LZ) (ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.020	0.029	0.043
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.020	0.00	0.000
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSW2W	A → Y0	(HH)	0.681	1.265	2.923				0.020	0.029	0.045
		(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ) (ZH)	0.770 1.247	1.362 2.257	2.783 4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.020	0.029	0.043
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.020	0.00	0.000
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSI6W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ) (ZH)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.038
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.017	0.020	0.007
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSD6W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ) (ZH)	0.858 1.317	1.497 2.435	3.031 5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.017	0.020	0.007
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSU6W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463 0.858	3.879	7.031 3.031						
		(LZ) (ZH)	1.317	1.497 2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.038
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
	-	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSW6W	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463 0.858	3.879 1.497	7.031 3.031						
		(LZ) (ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.013	0.025	0.037
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.017	0.020	0.007
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030		<u></u>	
BSIGW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211	1			0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ) (ZH)	0.945 1.377	1.629 2.588	3.274 5.829				0.013	0.021	0.037
		(ZH) (ZL)	0.847	1.572	3.332				0.013	0.021	0.037
	Y0 → Y1	(ZL) (HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.013	0.020	0.001
	10 7 11	(LL)	3.005	4.875	8.847	0.014	0.020	0.030		1	
	•	\ _/									

				Switcl	ning spe	ed					
Block type	Path		tı	LD0 (ns)		t 1			Т	
	IN → Ol	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BSDGW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSUGW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BSWGW	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			

Chapter 1 Interface Block

Function	Low-noise Schmitt	I/O Buffer					тт	L 3.3 V
		Blo	ock type					
Drivability	no resistor	with 50 KΩ P/D	with 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA								
2mA								
3mA	BFIVW	BFDVW	BFUVW		BFWVV	v	1	13
6mA	BFIDW	BFDDW	BFUDW		BFWDV	v	1	13
9mA	BFI4W	BFD4W	BFU4W		BFW4V	/	1	13
12mA	BFI2W	BFD2W	BFU2W		BFW2W	/	1	13
18mA	BFI6W	BFD6W	BFU6W		BFW6V	1	1	13
24mA	BFIGW	BFDGW	BFUGW		BFWGV	v	1	13
Logic Diag	ıram		Block type)	Inp	_		utput
			BFIVW to BFWV		Symbol	Fan-in	Y1	Fan-out
		1	Bi ivw to bi wv	**	EN	4.0	''	19
Y1 N	02 ←		BFIDW to BFWD	NW.	A	6.1	Y1	19
		1	5.1511 10 5.115		EN		''	"
A H	02 -	> N01 Y0	BFI4W to BFW4	w	A	6.1	Y1	19
					EN	4.0		
EN H	03 +		BFI2W to BFW2	w	A	6.1	Y1	19
					EN	4.0	Y1	
Truth Table	е		BFI6W to BFW6	w	A EN	6.1 4.0	Y1	19
A EN	Yo							
			BFIGW to BFWG	W	Α	6.1	Y1	19
0 1	0 1				EN	4.0		
x 0	z							
X:Irrelevant								
Z:High Impedar	nce							
Y0 Y1								
0 0								
1 1								

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)	1		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFIVW	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013					l	
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
	Y0 → Y1	(ZL) (HH)	1.365 0.673	2.279 1.029	4.559 1.867	0.010	0.016	0.024	0.090	0.131	0.194
	10 → 11	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFDVW	A → Y0	(HH)	1.275	2.384	5.623				0.057	0.081	0.121
		(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
	V0 V4	(ZL)	1.365 0.673	2.279 1.029	4.559 1.867	0.010	0.016	0.024	0.090	0.131	0.194
	Y0 → Y1	(HH) (LL)	3.005	4.875	8.847	0.010	0.016	0.024			
BFUVW	A → Y0	(HH)	1.275	2.384	5.623	0.014	0.020	0.000	0.057	0.081	0.121
5. 0111	" ' ' ' '	(LL)	1.260	2.099	4.212				0.090	0.131	0.194
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH) (LL)	0.673 3.005	1.029 4.875	1.867 8.847	0.010 0.014	0.016 0.020	0.024 0.030			
BFWVW	A → Y0	(HH)	1.275	2.384	5.623	0.014	0.020	0.030	0.057	0.081	0.121
DIWWW	A → 10	(LL)	1.260	2.099	4.212				0.090	0.131	0.121
	EN → Y0	(HZ)	0.785	1.011	1.593						
		(LZ)	0.745	1.089	2.013						
		(ZH)	1.340	2.445	5.805				0.057	0.081	0.121
		(ZL)	1.365	2.279	4.559				0.090	0.131	0.194
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
BFIDW	A → Y0	(LL) (HH)	3.005 1.326	4.875 2.555	8.847 6.105	0.014	0.020	0.030	0.040	0.058	0.090
DIIDW	A → 10	(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.673 3.005	1.029 4.875	1.867 8.847	0.010 0.014	0.016 0.020	0.024 0.030			
BFDDW	A → Y0	(LL) (HH)	1.326	2.555	6.105	0.014	0.020	0.030	0.040	0.058	0.090
D. DD **		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ)	1.054	1.423	2.365						
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016 0.020	0.024			
BFUDW	A → Y0	(LL) (HH)	3.005 1.326	4.875 2.555	8.847 6.105	0.014	0.020	0.030	0.040	0.058	0.090
BLODM	A → YU	(LL)	1.185	1.984	3.930		1		0.040	0.058	0.090
	EN → Y0	(HZ)	1.054	1.423	2.365				3.0.0	"	""
		(LZ)	0.927	1.364	2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns))		t 1			Т	
	IN → OL		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFWDW	A → Y0	(HH)	1.326	2.555	6.105				0.040	0.058	0.090
		(LL)	1.185	1.984	3.930				0.046	0.068	0.101
	EN → Y0	(HZ) (LZ)	1.054 0.927	1.423 1.364	2.365 2.581						
		(ZH)	1.388	2.613	6.285				0.040	0.058	0.090
		(ZL)	1.265	2.149	4.276				0.047	0.068	0.101
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFI4W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ) (ZH)	1.086 1.485	1.602 2.941	3.023 7.290				0.028	0.042	0.070
		(ZL)	1.268	2.209	4.413				0.028	0.042	0.070
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.000	0.043	0.073
	' , , , ,	(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFD4W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023					l	
		(ZH)	1.485 1.268	2.941 2.209	7.290 4.413				0.028 0.033	0.042 0.049	0.070 0.073
	Y0 → Y1	(ZL) (HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.033	0.049	0.073
	10 → 11	(LL)	3.005	4.875	8.847	0.014	0.010	0.024			
BFU4W	A → Y0	(HH)	1.429	2.884	7.106				0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023						
		(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
	Y0 → Y1	(ZL) (HH)	1.268 0.673	2.209 1.029	4.413 1.867	0.010	0.016	0.024	0.033	0.049	0.073
	10 → 11	(LL)	3.005	4.875	8.847	0.010	0.010	0.024			
BFW4W	A → Y0	(HH)	1.429	2.884	7.106	0.011	0.020	0.000	0.028	0.042	0.070
		(LL)	1.311	2.202	4.323				0.032	0.047	0.070
	EN → Y0	(HZ)	1.476	2.066	3.447						
		(LZ)	1.086	1.602	3.023						
		(ZH)	1.485	2.941	7.290				0.028	0.042	0.070
	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	(ZL) (HH)	1.268 0.673	2.209 1.029	4.413 1.867	0.010	0.016	0.024	0.033	0.049	0.073
	Y0 → Y1	(LL)	3.005	4.875	8.847	0.010	0.010	0.024			
BFI2W	A → Y0	(HH)	1.492	3.051	7.617	3.314	0.020	5.500	0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457					l	
		(ZH)	1.539	3.109	7.803				0.026	0.039	0.067
	\ \va	(ZL)	1.288	2.293	4.624	0010	0010	0.004	0.027	0.040	0.061
	Y0 → Y1	(HH) (LL)	0.673 3.005	1.029 4.875	1.867 8.847	0.010 0.014	0.016 0.020	0.024 0.030			
BFD2W	A → Y0	(HH)	1.492	3.051	7.617	0.014	0.020	0.000	0.026	0.039	0.067
J. D	' '	(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692	2.390	3.993						
		(LZ)	1.242	1.836	3.457						
		(ZH)	1.539	3.109	7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624	l			0.027	0.040	0.061
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030		L	

				Switch	ning spe	ed					
Block type	Path		tι	_D0 (ns))		t 1			Т	
	IN → OL	IT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFU2W	$A \rightarrow Y0$	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
	=11 1/4	(LL)	1.390 1.692	2.366 2.390	4.674				0.025	0.037	0.056
	EN → Y0	(HZ) (LZ)	1.092	1.836	3.993 3.457						
		(ZH)	1.539	3.109	7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624				0.027	0.040	0.061
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFW2W	$A \rightarrow Y0$	(HH)	1.492	3.051	7.617				0.026	0.039	0.067
		(LL)	1.390	2.366	4.674				0.025	0.037	0.056
	EN → Y0	(HZ)	1.692 1.242	2.390 1.836	3.993 3.457						
		(LZ) (ZH)	1.539	3.109	7.803				0.026	0.039	0.067
		(ZL)	1.288	2.293	4.624				0.027	0.040	0.061
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFI6W	$A \rightarrow Y0$	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.051
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.022	0.000	0.001
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFD6W	A → Y0	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.051
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.022	0.000	0.001
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFU6W	$A \rightarrow Y0$	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.051
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	***		
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFW6W	$A \rightarrow Y0$	(HH)	1.684	3.547	9.136				0.022	0.036	0.064
		(LL)	1.687	2.913	5.814				0.018	0.028	0.042
	EN → Y0	(HZ)	2.348	3.377	5.634						
		(LZ) (ZH)	1.559 1.706	2.307 3.606	4.328 9.328				0.023	0.036	0.064
		(ZL)	1.353	2.504	5.120				0.023	0.033	0.051
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.022	0.000	0.001
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFIGW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877 1.867	2.777 4.086	5.195 10.808				0.022	0.035	0.064
		(ZH) (ZL)	1.867	2.718	10.808 5.634				0.022	0.035	0.064
	Y0 → Y1	(ZL) (HH)	0.673	1.029	1.867	0.010	0.016	0.024	0.020	0.030	0.047
	10 → 11	(LL)	3.005	4.875	8.847	0.010	0.020	0.024		1	
		(LL)	3.005	4.8/5	8.847	0.014	0.020	0.030	l .		

				Switcl	hing spe	ed					
Block type	Path		t	LD0 (ns)		t 1			Т	
	IN → OU	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BFDGW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFUGW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			
BFWGW	A → Y0	(HH)	1.883	4.029	10.615				0.021	0.035	0.065
		(LL)	1.997	3.484	7.016				0.015	0.023	0.035
	EN → Y0	(HZ)	3.006	4.371	7.283						
		(LZ)	1.877	2.777	5.195						
		(ZH)	1.867	4.086	10.808				0.022	0.035	0.064
		(ZL)	1.424	2.718	5.634				0.020	0.030	0.047
	Y0 → Y1	(HH)	0.673	1.029	1.867	0.010	0.016	0.024			
		(LL)	3.005	4.875	8.847	0.014	0.020	0.030			

Chapter 1 Interface Block

Function	I/O Buffer with EN	I(AND)						TT	L 3.3 V
		Blo	ock 1	type					
Drivability	no resistor	with 50 KΩ P/D	wi	ith 50 KΩ P/U	wi	th 5 KΩ	P/U	I/O cells	int. Cells
1mA									
2mA									
3mA	BN2V	BN4V						1	14
6mA	BN2D	BN4D						1	14
9mA	BN24	BN44						1	14
12mA	BN22	BN42						1	24
18mA	BN26	BN46						1	24
24mA	BN2G	BN4G						1	24
Logic Diag	gram			Block type		Inp			itput
			ŀ	BN2V to BN4V		Symbol A	Fan-in	Y1	Fan-out
ENI I	H04 ←			DI42 10 DI44		EN	1.0	'''	22
						ENI	4.0		
Y1 N	√N02 ←——								
				BN2D to BN4D		A EN	6.3 1.0	Y1	22
	\sim					ENI	4.0		
A H	H01 ←	>→ N01 Y0							
				BN24 to BN44		A EN	6.3 1.0	Y1	22
EN H	+03 ←								
						ENI	4.0		
			\dashv	BN22 to BN42		А	16.9	Y1	22
Truth Table	e 					EN	1.0		
A EN	Y0					ENI	4.0		
0 1	0			BN26 to BN46		A	16.9	Y1	22
1 1	1 _					EN	1.0		
X 0	Z					ENI	4.0		
X:Irrelevant Z:High Impeda	200			BN2G to BN4G		A	16.9	Y1	22
∠.⊓igii iiripedai	ince			DINZG IU DIN4G		EN	1.0	"	44
Y0 I	ENI Y1					ENI	4.0		
0	0 0								
0	1 0								
1	0 0								
1	1 1								

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		t i	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN2V	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ) (ZH)	0.469 1.149	0.771 2.002	1.492 4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792				0.090	0.078	0.114
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031	0.030	0.131	0.133
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN4V	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771 2.002	1.492 4.411				0.056	0.078	0.114
		(ZH) (ZL)	1.149 1.074	1.852	3.792				0.056	0.078	0.114
	ENI → Y1	(ZL) (HH)	0.169	0.261	0.554	0.015	0.021	0.031	0.090	0.131	0.193
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN2D	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819				0.038	0.050	0.080
		(ZH) (ZL)	1.164 0.931	2.076 1.622	4.626 3.317				0.038	0.053 0.066	0.080
	ENI → Y1	(ZL) (HH)	0.169	0.261	0.554	0.015	0.021	0.031	0.045	0.000	0.096
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
	- '	(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN4D	A → Y0	(HH)	0.857	1.549	3.541				0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ) (ZH)	0.547 1.164	0.906 2.076	1.819 4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.036	0.055	0.080
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031	0.040	0.000	0.000
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN24	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
		(LL)	0.979	1.652	3.277				0.029	0.043	0.064
1	EN → Y0	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(LZ) (ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.050
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031			
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN44	A → Y0	(HH)	0.927	1.751	4.088				0.024	0.036	0.056
	FN	(LL)	0.979	1.652	3.277				0.029	0.043	0.064
	EN → Y0	(HZ) (LZ)	2.160 0.607	3.204 1.003	5.612 2.005						
		(LZ) (ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.024	0.035	0.056
	l .	(<u></u> L)	0.313	1.018	0.020				0.001	0.040	0.007

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031			
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
BN22	A → Y0	(LL) (HH)	0.234	0.347 1.265	0.666 2.923	0.007	0.010	0.015	0.020	0.029	0.045
DINZZ	A → YU	(LL)	0.644	1.115	2.923				0.020	0.029	0.045
	EN → Y0	(HZ)	1.929	3.060	5.656				0.022	0.002	0.040
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031			
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH) (LL)	0.129 0.234	0.245 0.347	0.511 0.666	0.015 0.007	0.021 0.010	0.031 0.015			
BN42	A → Y0	(HH)	0.234	1.265	2.923	0.007	0.010	0.015	0.020	0.029	0.045
DIVIE	A 7 10	(LL)	0.644	1.115	2.283				0.022	0.032	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031			
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH) (LL)	0.129	0.245 0.347	0.511 0.666	0.015 0.007	0.021 0.010	0.031 0.015			
BN26	A → Y0	(HH)	0.754	1.442	3.379	0.007	0.010	0.015	0.015	0.023	0.039
DIVEO	A 7 10	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208				0.017	0.025	0.037
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015 0.008	0.021 0.010	0.031 0.015			
	Y0 → Y1	(LL) (HH)	0.241 0.129	0.353 0.245	0.667 0.511	0.008	0.010	0.015			
	10 → 11	(LL)	0.123	0.243	0.666	0.013	0.021	0.031			
BN46	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
	ENI → Y1	(ZL) (HH)	0.837 0.169	1.526 0.261	3.208 0.554	0.015	0.021	0.031	0.017	0.025	0.037
	EINI → TI	(LL)	0.103	0.251	0.667	0.008	0.021	0.031			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			
BN2G	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420		1				
		(LZ)	0.945 1.377	1.629	3.274 5.829		1		0.013	0.021	0.037
		(ZH) (ZL)	0.847	2.588 1.572	3.332				0.013	0.021	0.037
	ENI → Y1	(ZL) (HH)	0.169	0.261	0.554	0.015	0.021	0.031	0.013	0.020	0.001
		(LL)	0.103	0.353	0.667	0.008	0.021	0.031			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN4G	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027
	EN → Y0	(HZ)	3.004	4.704	8.420						
		(LZ)	0.945	1.629	3.274						
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031
	ENI → Y1	(HH)	0.169	0.261	0.554	0.015	0.021	0.031			
		(LL)	0.241	0.353	0.667	0.008	0.010	0.015			
	Y0 → Y1	(HH)	0.129	0.245	0.511	0.015	0.021	0.031			
		(LL)	0.234	0.347	0.666	0.007	0.010	0.015			

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Chapter 1 Interface Block

6mA BN3D BN5D 1 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 1 2	Function	I/O Buffer with EN	(OR)							TT	L 3.3 V
1 mA 2mA 3 mA Bn3V Bn5V 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 2 1 1 2 1 1 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 2 4 1 1 1 1 1 1 2 2 2 2 3 1 1 2 2 2 3 1 1 1 1 1 1				ock	type						
2mA BN3V BN5V 1 2 1 1 2 2 1 1 2 2 2 4 8 9	Drivability	no resistor	with 50 KΩ P/D	v	vith 50 KΩ P/U	w	th 5 KΩ	P/U	I/O	cells	int. Cells
3mA BN3V BN5D 1 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 4 1 1 2 2 4 1 1 2 2 4 1 1 2 2 4 1 1 2 2 4 1 1 2 2 4 1 1 2 2 4 1 1 1 2 2 4 1	1mA										
6mA BN3D BN5D 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 2 2 3 1 2 2 2 2 2 3 1 2 2 2 2 3 1 1 2 2 2 3 1 1 2 2 3 1 2 2 2 3 1 1 2 3 1	2mA										
9mA BN34 BN32 BN52 1 1 2 18mA BN36 BN56 BN56 1 1 2 24mA BN36 BN56 BN56 1 1 2 24mA BN36 BN56 BN56 1 1 2 Logic Diagram Block type BN3V to BN5V A 6.3 Y1 2 ENI H04 BN3V to BN5V A 6.3 Y1 2 EN 1.0	3mA	BN3V	BN5V							1	11
12mA	6mA	BN3D	BN5D							1	11
18mA BN36 BN56 BN5G 1 2 24mA BN3G BN5G 1 1 2 Logic Diagram Block type Input Symbol Fan-in S	9mA	BN34	BN54							1	11
24mA BN3G BN5G 1 2	12mA	BN32	BN52							1	21
Block type Symbol Fan-in Symbol Fan Symbol Fan	18mA	BN36	BN56							1	21
Block type Symbol Fan-in Symbol Fan Symbol	24mA	BN3G	BN5G							1	21
ENI H04 Y1 N02 A H01 EN 1.0	Logic Dia	gram			Block type						
ENI H04 Y1 N02 A H01 N01 Y0 BN30 to BN50 A 6.3 Y1 2 EN 1.0 EN 1.0 EN 1.0 EN 1.0 EN 1.0 EN 1.0 EN 1.0 EN 2.0 BN34 to BN54 A 6.3 Y1 2 EN 1.0									n Sy		Pan-out
Y1 N02 A H01 N01 Y0 BN30 to BN50 A 6.3 Y1 2 EN 1.0 EN 2.0 BN34 to BN54 A 6.3 Y1 2 EN 1.0 EN 1.0 EN 1.0 EN 1.0 EN 2.0 BN32 to BN52 A 16.9 Y1 2 EN 1.0 EN 1.	ENI I	H04 ←			BN3V to BN5V					YI	21
BN3D to BNSD											
BN3D to BNSD	Y1 1	V02 ←									
A H01 N01 Y0 BN34 to BN54 A 6.3 Y1 2 EN 1.0 EN 1.0 EN 2.0 BN32 to BN52 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0 X:Irrelevant Z:High Impedance BN36 to BN56 A 16.9 Y1 2 EN 1.0			\vdash		BN3D to BN5D					Y1	21
A H01											
EN H03 EN H03 BN34 to BN54 A 6.3 Y1 2 EN 1.0 EN 2.0 BN32 to BN52 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0	Δ Ι	-101	N01 Y0				LIVI	2.0			
EN H03 • Truth Table BN32 to BN52 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0 BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0 X:Irrelevant Z:High Impedance BN36 to BN56 A 16.9 Y1 2 EN 1.0 EN 2.0	,, ,		- 1101 10		BN34 to BN54		A	6.3		Y1	21
Truth Table BN32 to BN52							EN	1.0			
Truth Table A EN Y0 ENI 2.0	EN I	103 ←					ENI	2.0			
Truth Table A EN Y0 ENI 2.0					BN32 to BN52		A	16.9		Y1	21
A EN Y0	Truth Tabl	е									
0 1 0 1 1 1 2 ENI 2.0 Shift of BNS6 A 16.9 Y1 2 ENI 2.0 Shift of BNS6 BNS6 A 16.9 Y1 2 ENI 2.0 Shift of BNS6 BNS6 A 16.9 Y1 2 ENI 2.0	A EN	ı Yo					ENI	2.0			
1											
X 0 Z X:Irrelevant ENI 2.0 X:Irrelevant BN3G to BN5G A 16.9 Y1 2 EN 1.0 FNI 2.0 FNI 2.0					BN36 to BN56					Y1	21
X:Irrelevant Z:High Impedance BN3G to BN5G A 16.9 Y1 2 EN 1.0	X 0	z									
EN 1.0	X:Irrelevant										
FNI 20	Z:High Impeda	nce			BN3G to BN5G		А	16.9		Y1	21
YO ENI Y1											
	Y0	ENI Y1					ENI	2.0			
	0	0 0									
0 1 1	0	1 1									
1 0 1											
	1	1 1									
								L			

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns))		t 1			Т	
	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
BN3V	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
	ENII 1/4	(ZL) (HH)	1.074 0.215	1.852 0.314	3.792 0.598	0.015	0.021	0.031	0.090	0.131	0.193
	ENI → Y1	(LL)	0.302	0.514	1.097	0.013	0.021	0.031			
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.000	0.021	0.017			
	10 7 11	(LL)	0.322	0.468	0.960	0.008	0.011	0.017			
BN5V	A → Y0	(HH)	0.839	1.469	3.318				0.056	0.078	0.114
		(LL)	0.963	1.638	3.333				0.089	0.131	0.192
	EN → Y0	(HZ)	1.259	1.846	3.271						
		(LZ)	0.469	0.771	1.492						
		(ZH)	1.149	2.002	4.411				0.056	0.078	0.114
		(ZL)	1.074	1.852	3.792	0.015	0.021	0.004	0.090	0.131	0.193
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015 0.008	0.021	0.031 0.017			
	Y0 → Y1	(LL) (HH)	0.302 0.124	0.519 0.218	1.097 0.433	0.008	0.011	0.017			
	TU → TI	(LL)	0.124	0.468	0.433	0.013	0.021	0.031			
BN3D	A → Y0	(HH)	0.857	1.549	3.541	0.000	0.011	0.017	0.038	0.053	0.080
		(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH) (LL)	0.124 0.322	0.218 0.468	0.433 0.960	0.015 0.008	0.021 0.011	0.031 0.017			
BN5D	A → Y0	(HH)	0.857	1.549	3.541	0.008	0.011	0.017	0.038	0.053	0.080
BINOB	N -> 10	(LL)	0.857	1.450	2.908				0.044	0.065	0.097
	EN → Y0	(HZ)	1.602	2.366	4.209						
		(LZ)	0.547	0.906	1.819						
		(ZH)	1.164	2.076	4.626				0.038	0.053	0.080
		(ZL)	0.931	1.622	3.317				0.045	0.066	0.098
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
		(LL)	0.302	0.519	1.097	0.008	0.011 0.021	0.017			
	Y0 → Y1	(HH) (LL)	0.124 0.322	0.218 0.468	0.433 0.960	0.015 0.008	0.021	0.031 0.017			
BN34	A → Y0	(HH)	0.927	1.751	4.088	0.006	0.011	0.017	0.024	0.036	0.056
5,101	" - "	(LL)	0.979	1.652	3.277				0.024	0.030	0.064
	EN → Y0	(HZ)	2.160	3.204	5.612						
		(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.015	0.021	0.031			
BN54	A → Y0	(LL) (HH)	0.322	0.468 1.751	0.960 4.088	0.008	0.011	0.017	0.024	0.036	0.056
DI404	A → 10	(LL)	0.927	1.652	3.277				0.024	0.036	0.056
	EN → Y0	(HZ)	2.160	3.204	5.612				0.023	5.5-5	0.00-4
	/ /	(LZ)	0.607	1.003	2.005						
		(ZH)	1.232	2.276	5.174				0.024	0.035	0.056
		(ZL)	0.913	1.619	3.323				0.031	0.045	0.067
	•										

Chapter 1 Interface Block

				Switch	ning spe	eed					
Block type	Path		tı	LDO (ns)			t 1			Т	
•	IN → OL	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.015	0.021	0.031			
BN32	A → Y0	(LL) (HH)	0.322	0.468 1.265	0.960 2.923	0.008	0.011	0.017	0.020	0.029	0.045
DINOZ	A → YU	(LL)	0.644	1.115	2.923				0.020	0.029	0.045
	EN → Y0	(HZ)	1.929	3.060	5.656				0.022	0.002	0.040
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH) (LL)	0.124 0.322	0.218 0.468	0.433 0.960	0.015 0.008	0.021 0.011	0.031 0.017			
BN52	A → Y0	(HH)	0.322	1.265	2.923	0.008	0.011	0.017	0.020	0.029	0.045
DINOZ	A → 10	(LL)	0.644	1.115	2.283				0.020	0.023	0.048
	EN → Y0	(HZ)	1.929	3.060	5.656						
		(LZ)	0.770	1.362	2.783						
		(ZH)	1.247	2.257	4.957				0.020	0.029	0.045
		(ZL)	0.831	1.483	3.091				0.023	0.034	0.050
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031			
	\/a \/4	(LL) (HH)	0.302 0.124	0.519 0.218	1.097 0.433	0.008 0.015	0.011 0.021	0.017 0.031			
	Y0 → Y1	(LL)	0.124	0.468	0.433	0.015	0.021	0.031			
BN36	A → Y0	(HH)	0.754	1.442	3.379	0.000	0.011	0.017	0.015	0.023	0.039
B1100	N -> 10	(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031						
		(ZH)	1.317	2.435	5.418				0.015	0.023	0.038
		(ZL)	0.837	1.526	3.208	0.045			0.017	0.025	0.037
	ENI → Y1	(HH) (LL)	0.215	0.314 0.519	0.598 1.097	0.015 0.008	0.021 0.011	0.031 0.017			
	Y0 → Y1	(HH)	0.302	0.319	0.433	0.008	0.011	0.017			
	10 7 11	(LL)	0.322	0.468	0.960	0.008	0.011	0.017			
BN56	A → Y0	(HH)	0.754	1.442	3.379				0.015	0.023	0.039
		(LL)	0.761	1.339	2.741				0.015	0.022	0.033
	EN → Y0	(HZ)	2.463	3.879	7.031						
		(LZ)	0.858	1.497	3.031				0.045		
		(ZH) (ZL)	1.317 0.837	2.435 1.526	5.418 3.208				0.015 0.017	0.023 0.025	0.038 0.037
	ENI → Y1	(ZL) (HH)	0.837	0.314	0.598	0.015	0.021	0.031	0.017	0.025	0.037
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.015	0.021	0.031			
		(LL)	0.322	0.468	0.960	0.008	0.011	0.017			
BN3G	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037
		(LL)	0.881	1.569	3.211		1		0.012	0.018	0.027
	EN → Y0	(HZ)	3.004 0.945	4.704 1.629	8.420 3.274		1				
		(LZ) (ZH)	1.377	2.588	5.829				0.013	0.021	0.037
		(ZL)	0.847	1.572	3.332				0.013	0.021	0.037
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031	0.0.0	5.025	0.00.
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017			
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.015	0.021	0.031			
		(LL)	0.322	0.468	0.960	0.008	0.011	0.017			

Chapter 1 Interface Block

				Switcl	ning spe	ed						
Block type	Path IN → OUT MI		tı	tLDO (ns)			t 1			Т		
			MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
BN5G	A → Y0	(HH)	0.819	1.598	3.790				0.013	0.021	0.037	
		(LL)	0.881	1.569	3.211				0.012	0.018	0.027	
	EN → Y0	(HZ)	3.004	4.704	8.420							
		(LZ)	0.945	1.629	3.274							
		(ZH)	1.377	2.588	5.829				0.013	0.021	0.037	
		(ZL)	0.847	1.572	3.332				0.013	0.020	0.031	
	ENI → Y1	(HH)	0.215	0.314	0.598	0.015	0.021	0.031				
		(LL)	0.302	0.519	1.097	0.008	0.011	0.017				
	Y0 → Y1	(HH)	0.124	0.218	0.433	0.015	0.021	0.031				
		(LL)	0.322	0.468	0.960	0.008	0.011	0.017				

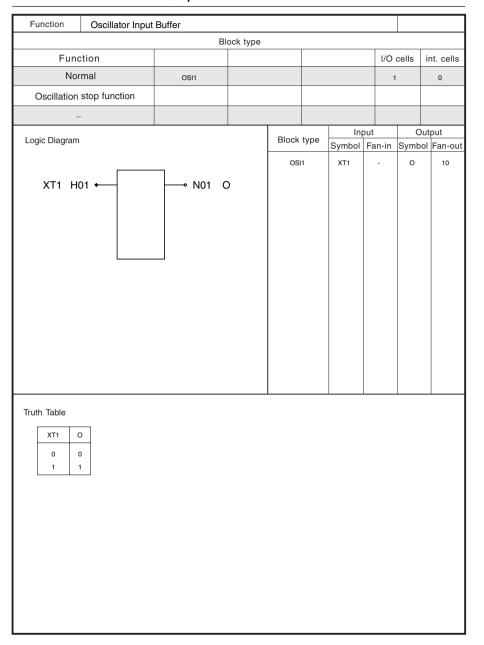
Block Library A15895EJ1V0BL 1 - 110 Block Library A15895EJ1V0BL 1 - 111

Chapter 1 Interface Block	Chapter 1 Interface Block
[MEMO]	[MEMO]

Chapter 1 Interface Block Chapter 1 Interface Block

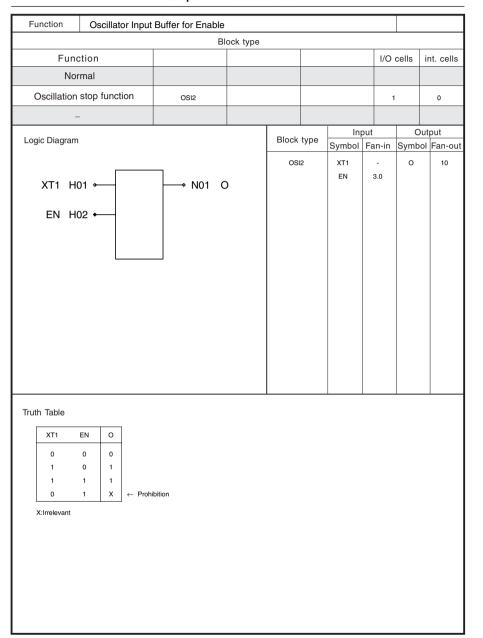
[MEMO]

1.3 Oscillator



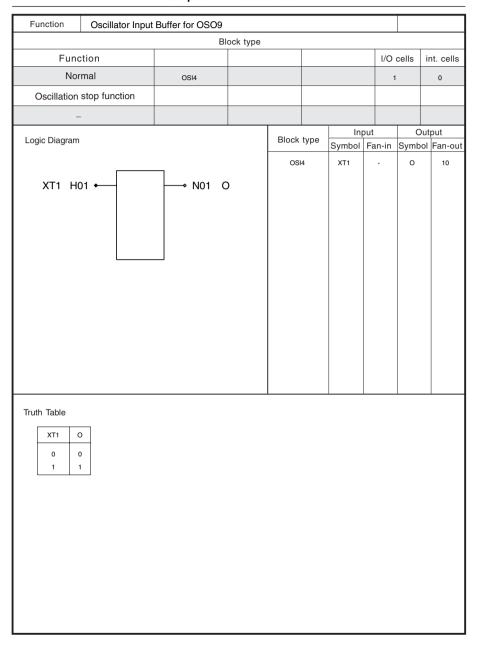
Chapter 1 Interface Block

	Switching speed										
Block type	Path	t LDO (ns)				t 1		Т			
	IN → O	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
OSI1	XT1 → O	(HH)	0.010	0.010	0.010	0.001	0.001	0.001			
		(LL)	0.010	0.010	0.010	0.001	0.001	0.001			



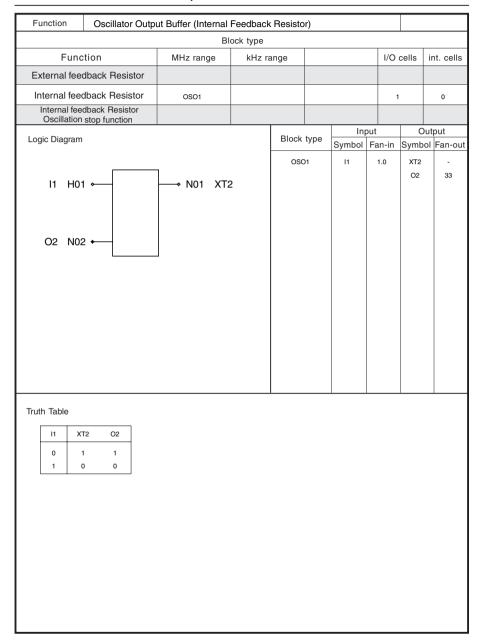
Chapter 1 Interface Block

	Switching speed										
Block type	Path	t LDO (ns)				t 1		Т			
	IN → O	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
OSI2	XT1 → O	(HH)	0.010	0.010	0.010	0.001	0.001	0.001			
		(LL)	0.010	0.010	0.010	0.001	0.001	0.001			



Chapter 1 Interface Block

	Switching speed										
Block type	Path	t LDO (ns)				t 1		Т			
	IN o	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
OSI4	XT1 → O	(HH)	0.010	0.010	0.010	0.001	0.001	0.001			
		(LL)	0.010	0.010	0.010	0.001	0.001	0.001			



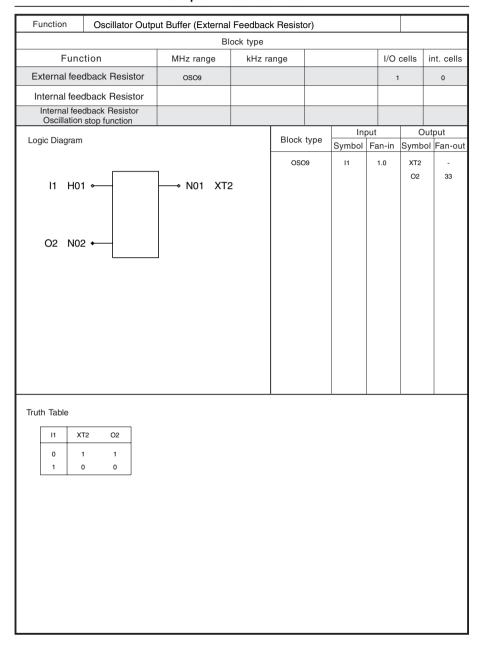
Chapter 1 Interface Block

	Switching speed											
Block type	Path		t	t LDO (ns)			t 1		Т			
	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
OSO1	I1 → XT2	(HL)	0.010	0.010	0.010				0.001	0.001	0.001	
		(LH)	0.010	0.010	0.010				0.001	0.001	0.001	
	I1 → O2	(HL)	9.737	21.997	21.997	0.010	0.022	0.022				
		(LH)	6.164	13.299	13.299	0.011	0.020	0.020				

Function	Oscillat	or Outpu	ut Buffer (for Ena	ble Type)						
			E	Block type		I				
Fund	tion		MHz range	kHz ra	kHz range			I/O	cells	int. cells
External fee	dback Res	sistor								
Internal fee	dback Res	sistor								
Internal fee	dback Resi stop function	stor	OSO7					,		0
		UII			Disale	A	In	put	0	utput
Logic Diagram					Block	туре	Symbol	Fan-in	Symbo	Fan-out
			_		oso	07	I1	1.0	XT2	-
I1 H0	1 ←		→ N01 XT	2			EN	3.0	O2	33
EN HO	2 ←									
00 110										
O2 N0	2 🗕									
Truth Table										
I1 EI	N XT2	02								
0 0	1	1								
1 0		0								
1 1		0								
0 1	Х	Х	← Prohibition							
X:Irrelevant										

Chapter 1 Interface Block

	Switching speed											
Block type	Path		t	t LDO (ns)			t 1		Т			
	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
OSO7	I1 → XT2	(HL)	0.010	0.010	0.010				0.001	0.001	0.001	
		(LH)	0.010	0.010	0.010				0.001	0.001	0.001	
	I1 → O2	(HL)	9.737	21.997	21.997	0.010	0.022	0.022				
		(LH)	6.164	13.299	13.299	0.011	0.020	0.020				



Chapter 1 Interface Block

	Switching speed											
Block type	Path		t	t LDO (ns)			t 1			Т		
	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
OSO9	I1 → XT2	(HL)	0.010	0.010	0.010				0.001	0.001	0.001	
		(LH)	0.010	0.010	0.010				0.001	0.001	0.001	
	I1 → O2	(HL)	9.737	21.997	21.997	0.010	0.022	0.022				
		(LH)	6.164	13.299	13.299	0.011	0.020	0.020				

Chapter 2 Function Block

Chapter 2 Function Block

Chapter 2 Function Block

[MEMO]

2.1 Level Generator

Chapter 2 Function Block

Function	H, L L	evel G	enerator							
Block type					S	tanda	rd type			
Бюск туре	Norma	al	High sp							
Drivability	Name	cells	Name	cells						
-	F091	1								
-										
-										
-										
Logic Diag	gram		→ NO							
Truth Tabl	E L 0									

Chapter 2 Function Block

<u>.</u>				Swite	ching sp	eed							
Block		Path t LD0 (ns)						t 1		l In	put	Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F091												Н	142
												L	142

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Chapter 2 Function Block	Chapter 2 Function Block
[MEMO]	[MEMO]

[MEMO]

2.2 Inverter, Buffer, CTS Driver, Delay Gate

Chapter 2 Function Block

Function	Invert	er									
Block type		5	Single o	utput ty	ре			Multi outp	out type)	
Drivability	Name	cells				Name	cells				
Low Power	L101	1									
x1	F101	1									
x2	F102	2									
х3	F143	3									
x4	F144	4									
x5	F145	5									
х6	F146	6									
x8	F148	12									
x12											
Logic Diagram											
Logic Diagram	ı ior "Multi (output t	ype 2"								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	D0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L101	$A \rightarrow Y$	(HL)	0.105	0.133	0.204	0.022	0.029	0.041	Α	1.0	Υ	10
		(LH)	0.088	0.130	0.226	0.028	0.042	0.061				
F101	$A \rightarrow Y$	(HL)	0.077	0.101	0.155	0.011	0.015	0.021	Α	2.1	Y	22
		(LH)	0.061	0.095	0.166	0.015	0.021	0.031				
F102	$A \rightarrow Y$	(HL)	0.074	0.099	0.154	0.006	0.007	0.010	Α	4.1	Y	45
		(LH)	0.060	0.093	0.164	0.007	0.011	0.015				
F143	$A \rightarrow Y$	(HL)	0.077	0.102	0.157	0.004	0.005	0.007	Α	6.2	Y	68
		(LH)	0.062	0.096	0.168	0.005	0.007	0.010				
F144	$A \rightarrow Y$	(HL)	0.075	0.100	0.156	0.003	0.004	0.005	Α	8.2	Y	92
		(LH)	0.062	0.095	0.167	0.004	0.005	0.008				
F145	$A \rightarrow Y$	(HL)	0.077	0.101	0.157	0.002	0.003	0.004	Α	10.3	Y	113
		(LH)	0.062	0.096	0.169	0.003	0.004	0.006				
F146	$A \rightarrow Y$	(HL)	0.075	0.100	0.156	0.002	0.002	0.003	Α	12.4	Y	137
		(LH)	0.062	0.095	0.168	0.002	0.004	0.005				
F148	$A \rightarrow Y$	(HL)	0.274	0.485	0.979	0.002	0.002	0.003	Α	4.1	Y	178
		(LH)	0.239	0.426	0.872	0.002	0.003	0.004				

Chapter 2 Function Block

Function	Buffer										
Block type			Single out	put typ	e			Multi outpi	ıt type)	
Drivability	Name	cells				Name	cells				
Low Power	L111	1									
x1	F111	2									
x2	F112	3									
х3	F153	4									
х4	F154	5									
x5											
х6											
x8	F158	11									
x12											
Logic Diagram	for "Single	Output	t tyne"								
Logic Diagram	for "Multi d	output t	ype 1"								
Logic Diagram	for "Multi o	output t	ype 2"								

Chapter 2 Function Block

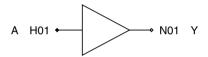
				Swite	ching sp	eed							
Block	F	ath		t	LD0 (ns))		t 1] In	put	l Ou	ıtput
type	IN ·	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L111	Α -	→ Y	(HH)	0.172	0.261	0.489	0.029	0.042	0.061	Α	1.0	Y	10
			(LL)	0.178	0.284	0.550	0.022	0.029	0.043				
F111	Α -	→ Y	(HH)	0.120	0.194	0.363	0.015	0.021	0.031	Α	2.1	Y	23
			(LL)	0.126	0.215	0.412	0.011	0.015	0.021				
F112	Α -	→ Y	(HH)	0.151	0.240	0.442	0.007	0.011	0.016	Α	2.1	Y	45
			(LL)	0.163	0.278	0.537	0.006	0.008	0.011				
F153	Α -	→ Y	(HH)	0.179	0.282	0.523	0.005	0.007	0.011	Α	2.1	Y	67
			(LL)	0.197	0.339	0.665	0.004	0.005	0.008				
F154	Α -	→ Y	(HH)	0.203	0.317	0.593	0.004	0.005	0.008	Α	2.1	Y	89
			(LL)	0.226	0.392	0.776	0.003	0.004	0.006				
F158	Α -	→ Y	(HH)	0.175	0.272	0.498	0.002	0.003	0.004	Α	6.2	Υ	181
			(LL)	0.188	0.320	0.621	0.001	0.002	0.003				

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Chapter 2 Function Block

Function	CTS	Driver	(Inverter T	ype)							
Block type	(S		e type ale circuit)				ard type cale circuit)			e type ale circuit)	
Drivability	Name	cells			Name	cells		Name	cells		
x1	FC42	80						FC44	340		
x2	FC82	396						FC84	1020		
x3											
x4											
x5											
-											
-											
-											

Logic Diagram



Chapter 2 Function Block

			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	$IN \rightarrow$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
FC42	$A \rightarrow Y$	(HH)	0.584	0.947	1.832	0.000	0.001	0.001	Α	8.2	Y	1109
		(LL)	0.745	1.372	2.735	0.001	0.001	0.001				
FC82	$A \ \to Y$	(HH)	0.769	1.369	2.822	0.000	0.000	0.000	Α	4.1	Y	5230
		(LL)	0.843	1.545	3.189	0.000	0.000	0.000				
FC44	$A \ \to \ Y$	(HH)	0.594	1.010	2.004	0.000	0.000	0.000	Α	8.3	Y	4782
		(LL)	0.611	1.090	2.203	0.000	0.000	0.000				
FC84	$A \ \to \ Y$	(HH)	1.048	1.947	4.162	0.000	0.000	0.000	Α	4.1	Y	10353
		(LL)	1.046	1.956	4.195	0.000	0.000	0.000				

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Chapter 2 Function Block

Function	Delay	Gate								
Block type					S	tanda	rd type			
Block type	Norma	al	High sp	eed						
Drivability	Name	cells	Name	cells						
-	F131	6								
-	F132	10								
-										
-										

Logic Diagram



Truth Table

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F131	$A \rightarrow Y$	(HH)	1.285	2.397	5.345	0.016	0.024	0.037	Α	1.0	Υ	18
		(LL)	1.180	2.185	5.017	0.014	0.020	0.032				
F132	$A \rightarrow Y$	(HH)	2.547	4.809	10.970	0.016	0.024	0.037	Α	1.0	Υ	18
		(LL)	2.442	4.597	10.643	0.014	0.020	0.032				

Chapter 2 Function Block	Chapter 2 Function Block
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Chapter 2 Function Block Chapter 2 Function Block

[MEMO]

2.3 OR(NOR)

Chapter 2 Function Block

		t NOF										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L202	1										
x1	F202	2										
x2	F222	4										
x4	F282	6										
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram)→ N0	01 Y		agram for '			Log	ic Diagram	for "v	vith 2 inve	rter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L202	$A \rightarrow Y$	(HL)	0.098	0.134	0.209	0.022	0.029	0.041	Α	1.0	Y	5
		(LH)	0.108	0.170	0.340	0.051	0.078	0.116	В	1.0		
	$B \rightarrow Y$	(HL)	0.112	0.152	0.235	0.022	0.029	0.041				
		(LH)	0.096	0.182	0.398	0.052	0.078	0.116				
F202	$A \rightarrow Y$	(HL)	0.104	0.143	0.223	0.011	0.014	0.021	Α	2.1	Y	10
		(LH)	0.104	0.180	0.375	0.026	0.039	0.058	В	2.1		
	$B \rightarrow Y$	(HL)	0.104	0.143	0.223	0.011	0.014	0.021				
		(LH)	0.104	0.180	0.375	0.026	0.039	0.058				
F222	$A \rightarrow Y$	(HL)	0.103	0.145	0.226	0.006	0.007	0.010	Α	4.2	Y	20
		(LH)	0.111	0.188	0.384	0.013	0.020	0.029	В	4.2		
	$B \rightarrow Y$	(HL)	0.103	0.145	0.226	0.006	0.007	0.010				
		(LH)	0.111	0.188	0.384	0.013	0.020	0.029				
F282	$A \rightarrow Y$	(HL)	0.327	0.569	1.140	0.003	0.004	0.006	Α	1.0	Y	88
		(LH)	0.392	0.713	1.537	0.004	0.005	0.008	В	1.0		
	$B \rightarrow Y$	(HL)	0.342	0.588	1.179	0.003	0.004	0.006				
		(LH)	0.379	0.725	1.595	0.004	0.005	0.008				

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Chapter 2 Function Block

Function	3-Inpu	t NOF	3									
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1	F203	3										
x2	F223	6										
x4												
x8												
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
A H01 B H02 C H03 C H03 Logic Diagram		→ NO		ogic Di	agram for '	'with 4	inverter"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F203	$A \rightarrow Y$	(HL)	0.105	0.143	0.220	0.012	0.015	0.022	Α	2.1	Y	5
		(LH)	0.151	0.254	0.558	0.040	0.060	0.089	В	2.1		
l .	$B \rightarrow Y$	(HL)	0.117	0.160	0.246	0.012	0.015	0.022	С	2.1		
		(LH)	0.174	0.320	0.701	0.040	0.060	0.089				
l .	C → Y	(HL)	0.105	0.143	0.220	0.012	0.015	0.022				
l .		(LH)	0.152	0.256	0.560	0.040	0.060	0.090				
F223	$A \rightarrow Y$	(HL)	0.125	0.166	0.262	0.006	0.007	0.011	Α	4.3	Y	7
l .		(LH)	0.218	0.355	0.768	0.021	0.031	0.046	В	4.2		
	$B \rightarrow Y$	(HL)	0.129	0.173	0.277	0.006	0.007	0.010	С	4.3		
		(LH)	0.207	0.341	0.772	0.021	0.031	0.045				
l .	C → Y	(HL)	0.125	0.166	0.262	0.006	0.007	0.011				
		(LH)	0.218	0.355	0.768	0.021	0.031	0.046				

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Chapter 2 Function Block

Function	4-Inpu	t NOF	3									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1	F204	4										
x2												
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 Logic Diagram)→ N0	11 Y		agram for '			Log	ic Diagram	n for "v	vith 2 inve	rter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F204	$A \rightarrow Y$	(HL)	0.266	0.451	0.904	0.011	0.015	0.023	Α	1.0	Υ	21
		(LH)	0.356	0.642	1.442	0.015	0.022	0.033	В	1.0		
	$B \to Y$	(HL)	0.282	0.472	0.940	0.011	0.015	0.023	С	1.0		
		(LH)	0.344	0.653	1.501	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.295	0.489	0.972	0.011	0.015	0.023				
		(LH)	0.346	0.611	1.370	0.015	0.022	0.033				
	$D \rightarrow Y$	(HL)	0.311	0.510	1.009	0.011	0.015	0.023				
		(LH)	0.333	0.622	1.429	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	5-Inpu	t NOF	3										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter/		-	\neg
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			П
Low Power	L205	4											
x1	F205	5											\neg
x2	F225	6											
x4													\neg
x8													
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter/		-	\neg
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			\neg
Low Power													
x1													\neg
x2													
x4													\neg
x8													
Logic Diagram A H01 B H02 C H03 D H04 E H05 Logic Diagram)→ N0	11 Y		agram for			Log	ic Diagran	n for "v	vith 2	inverter	

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L205	$A \rightarrow Y$	(HL)	0.251	0.417	0.834	0.022	0.029	0.043	Α	1.0	Y	10
		(LH)	0.339	0.595	1.336	0.029	0.043	0.063	В	1.0		
	$B \rightarrow Y$	(HL)	0.268	0.437	0.870	0.022	0.029	0.043	С	1.0		
1		(LH)	0.326	0.606	1.395	0.029	0.043	0.063	D	1.0		
	$C \rightarrow Y$	(HL)	0.308	0.480	0.953	0.022	0.029	0.043	E	1.0		
		(LH)	0.468	0.765	1.729	0.029	0.043	0.063				
	$D \rightarrow Y$	(HL)	0.323	0.501	0.993	0.022	0.029	0.043				
		(LH)	0.484	0.830	1.890	0.029	0.043	0.063				
	$E \rightarrow Y$	(HL)	0.337	0.520	1.033	0.022	0.029	0.043				
		(LH)	0.516	0.918	2.037	0.029	0.043	0.063				
F205	$A \rightarrow Y$	(HL)	0.268	0.455	0.909	0.011	0.015	0.023	Α	1.0	Y	21
1		(LH)	0.355	0.640	1.440	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.284	0.476	0.945	0.011	0.015	0.023	С	1.0		
		(LH)	0.343	0.651	1.499	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.321	0.516	1.025	0.011	0.015	0.023	E	1.0		
		(LH)	0.480	0.802	1.823	0.015	0.022	0.033				
1	$D \rightarrow Y$	(HL)	0.336	0.537	1.066	0.011	0.015	0.023				
		(LH)	0.495	0.867	1.984	0.015	0.022	0.033				
	$E \rightarrow Y$	(HL)	0.349	0.557	1.110	0.011	0.015	0.023				
		(LH)	0.526	0.954	2.130	0.015	0.022	0.033				
F225	$A \rightarrow Y$	(HL)	0.321	0.561	1.131	0.006	0.008	0.012	Α	1.0	Y	40
		(LH)	0.418	0.767	1.736	0.007	0.011	0.017	В	1.0		
	$B \rightarrow Y$	(HL)	0.337	0.581	1.169	0.006	0.008	0.012	С	1.0		
1		(LH)	0.405	0.778	1.795	0.007	0.011	0.017	D	1.0		
1	C → Y	(HL)	0.372	0.618	1.246	0.006	0.008	0.012	E	1.0		
		(LH)	0.541	0.928	2.124	0.007	0.011	0.017				
	$D \rightarrow Y$	(HL)	0.387	0.640	1.288	0.006	0.008	0.012				
		(LH)	0.556	0.992	2.285	0.007	0.011	0.017				
1	$E \rightarrow Y$	(HL)	0.402	0.662	1.337	0.006	0.008	0.012				
		(LH)	0.588	1.080	2.430	0.007	0.011	0.017				

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Chapter 2 Function Block

Function	6-Inpu	it NOF	3									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1	F206	5										
x2	F226	6										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	for "Norm	nal"	Lo	gic Di	agram for '	with 1	inverter"	Log	ic Diagram	for "v	vith 2 in	verter"
A H01 ← B H02 ← C H03 ← D H04 ← E H05 ← F H06 ←)→ NO	01 Y									
Logic Diagram	n for "with \$	3 inver	ter" Lo	gic Dia	agram for '	with 4	inverter"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F206	$A \rightarrow Y$	(HL)	0.290	0.476	0.956	0.011	0.015	0.023	Α	1.0	Y	21
l		(LH)	0.503	0.860	1.971	0.015	0.022	0.033	В	1.0		
l	$B \rightarrow Y$	(HL)	0.305	0.498	0.996	0.011	0.015	0.023	С	1.0		
l		(LH)	0.519	0.925	2.131	0.015	0.022	0.033	D	1.0		
l	$C \rightarrow Y$	(HL)	0.319	0.515	1.036	0.011	0.015	0.023	E	1.0		
l		(LH)	0.551	1.013	2.277	0.015	0.022	0.033	F	1.0		
l	$D \rightarrow Y$	(HL)	0.320	0.513	1.021	0.011	0.015	0.023				
l		(LH)	0.486	0.814	1.840	0.015	0.022	0.033				
l	$E \rightarrow Y$	(HL)	0.335	0.534	1.062	0.011	0.015	0.023				
l		(LH)	0.502	0.878	2.000	0.015	0.022	0.033				
l	$F \rightarrow Y$	(HL)	0.348	0.554	1.106	0.011	0.015	0.023				
		(LH)	0.536	0.968	2.150	0.015	0.022	0.033				
F226	$A \rightarrow Y$	(HL)	0.355	0.599	1.206	0.006	0.008	0.012	Α	1.0	Y	40
l		(LH)	0.582	1.016	2.325	0.007	0.011	0.017	В	1.0		
l	$B \rightarrow Y$	(HL)	0.370	0.620	1.245	0.006	0.008	0.012	С	1.0		
l		(LH)	0.598	1.080	2.486	0.007	0.011	0.017	D	1.0		
l	$C \rightarrow Y$	(HL)	0.385	0.642	1.295	0.006	0.008	0.012	E	1.0		
l		(LH)	0.630	1.168	2.632	0.007	0.011	0.017	F	1.0		
l	$D \rightarrow Y$	(HL)	0.380	0.629	1.262	0.006	0.008	0.012				
l		(LH)	0.543	0.932	2.135	0.007	0.011	0.017				
I	$E \rightarrow Y$	(HL)	0.394	0.651	1.304	0.006	0.008	0.012				
I		(LH)	0.559	0.998	2.296	0.007	0.011	0.017				
I	$F \rightarrow Y$	(HL)	0.409	0.674	1.355	0.006	0.008	0.012				
		(LH)	0.593	1.088	2.447	0.007	0.011	0.017				

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Chapter 2 Function Block

Function	8-Inpu	it NOF	3									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L208	7										
x1	F208	7										
x2	F228	8										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran A H01 B H02 C H03 D H04 F H06 G H07 H H08 Logic Diagran		N01 Y	,		agram for '			Log	ic Diagram	for "v	vith 2 inv	erter"

Chapter 2 Function Block

Divide			Swite	ching sp	eed	_						
Block	Path		t ı	_D0 (ns))		t 1		In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L208	$A \rightarrow Y$	(HL)	0.278	0.470	0.939	0.022	0.030	0.044	Α	1.0	Y	9
		(LH)	0.439	0.815	1.906	0.030	0.045	0.071	В	1.0		
	$B \rightarrow Y$	(HL)	0.295	0.491	0.976	0.022	0.030	0.044	С	1.0		
		(LH)	0.427	0.828	1.965	0.030	0.045	0.071	D	1.0		
	C → Y	(HL)	0.309	0.507	1.006	0.022	0.030	0.044	E	1.0		
		(LH)	0.457	0.833	1.959	0.030	0.046	0.071	F	1.0		
	$D \rightarrow Y$	(HL)	0.325	0.528	1.044	0.022	0.030	0.044	G	1.0		
	_ ,	(LH)	0.445 0.358	0.845 0.562	2.019 1.106	0.030	0.046 0.030	0.071 0.045	Н	1.0		
	E → Y	(HL) (LH)	0.508	0.883	2.089	0.023	0.030	0.045				
	$F \rightarrow Y$	(LII) (HL)	0.374	0.582	1.143	0.030	0.046	0.071				
	F → Y	(HL)	0.374	0.896	2.148	0.023	0.030	0.045				
	$G \rightarrow Y$	(LII) (HL)	0.375	0.582	1.135	0.023	0.040	0.046				
	G → Y	(LH)	0.518	0.891	2.093	0.023	0.031	0.040				
	$H \rightarrow Y$	(LII) (HL)	0.310	0.603	1.173	0.023	0.040	0.046				
	" → "	(LH)	0.506	0.904	2.152	0.020	0.031	0.071				
F208	A → Y	(HL)	0.281	0.488	0.982	0.011	0.015	0.023	A	1.0	Y	19
1 200	^ - '	(LH)	0.452	0.868	2.066	0.016	0.024	0.037	В	1.0	l .	
	$B \rightarrow Y$	(HL)	0.297	0.509	1.019	0.011	0.015	0.023	c	1.0		
	57'	(LH)	0.440	0.879	2.125	0.016	0.024	0.037	Ď	1.0		
	$C \rightarrow Y$	(HL)	0.310	0.525	1.049	0.011	0.015	0.023	E	1.0		
		(LH)	0.471	0.888	2.125	0.016	0.024	0.037	F	1.0		
	$D \rightarrow Y$	(HL)	0.326	0.546	1.087	0.011	0.015	0.023	G	1.0		
		(LH)	0.459	0.899	2.185	0.016	0.024	0.037	н	1.0		
	$E \rightarrow Y$	(HL)	0.358	0.581	1.151	0.012	0.016	0.024				
		(LH)	0.524	0.940	2.257	0.016	0.024	0.037				
	$F \rightarrow Y$	(HL)	0.374	0.602	1.189	0.012	0.016	0.024				
		(LH)	0.511	0.952	2.316	0.016	0.024	0.037				
	$G \rightarrow Y$	(HL)	0.374	0.600	1.180	0.012	0.016	0.024				
		(LH)	0.533	0.946	2.257	0.016	0.024	0.037				
	$H \rightarrow Y$	(HL)	0.389	0.621	1.218	0.012	0.016	0.024				
		(LH)	0.520	0.957	2.317	0.016	0.024	0.037				
F228	$A \rightarrow Y$	(HL)	0.342	0.600	1.212	0.006	0.008	0.013	Α	1.0	Y	32
		(LH)	0.566	1.101	2.644	0.008	0.012	0.020	В	1.0		
	$B \rightarrow Y$	(HL)	0.358	0.621	1.251	0.006	0.008	0.013	С	1.0		
		(LH)	0.554	1.113	2.703	0.008	0.012	0.020	D	1.0		
	C → Y	(HL)	0.366	0.631	1.272	0.006	0.008	0.013	E	1.0		
		(LH)	0.575	1.106	2.682	0.008	0.012	0.020	F	1.0		
	$D \rightarrow Y$	(HL)	0.381	0.652	1.312	0.006	0.008	0.013	G	1.0		
		(LH)	0.562	1.118	2.742	0.008	0.012	0.020	Н	1.0		
	E → Y	(HL)	0.418	0.693	1.386	0.006	0.008	0.013				
		(LH)	0.633	1.167	2.826	0.008	0.012	0.020	1		1	
	$F \rightarrow Y$	(HL)	0.433	0.714	1.424	0.006	0.008	0.013				
	, ,	(LH) (HL)	0.619 0.434	1.179 0.715	2.886 1.420	0.008	0.012 0.008	0.020 0.013				
	G → Y	(HL) (LH)	0.434	1.169	2.821	0.008	0.008	0.013				
	$H \rightarrow Y$	(LII) (HL)	0.639	0.736	1.459	0.006	0.012	0.020				
	¬ → Y	(HL)	0.449	1.180	2.881	0.008	0.008	0.013				
	I	(LH)	0.020	1.100	2.001	0.008	0.012	0.020			L	

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Chapter 2 Function Block

Function	2-Inpu	it OR										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L212	2										
x1	F212	2										
x2	F232	3										
x4	F252	6										
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram		→ NO	01 Y		agram for '			Log	ic Diagram	for "w	ith 2 inv	erter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN o	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L212	$A \ \to Y$	(HH)	0.164	0.263	0.496	0.029	0.042	0.061	Α	1.0	Υ	10
		(LL)	0.239	0.398	0.825	0.023	0.031	0.047	В	1.0		
	$B \ \to Y$	(HH)	0.181	0.283	0.531	0.028	0.042	0.061				
		(LL)	0.227	0.410	0.884	0.023	0.031	0.047				
F212	$A \ \to \ Y$	(HH)	0.170	0.270	0.504	0.015	0.022	0.031	Α	1.0	Y	22
		(LL)	0.264	0.462	0.968	0.012	0.017	0.025	В	1.0		
	$B \rightarrow Y$	(HH)	0.185	0.289	0.540	0.015	0.022	0.031				
		(LL)	0.252	0.474	1.026	0.012	0.017	0.025				
F232	$A \ \to Y$	(HH)	0.219	0.343	0.651	0.007	0.011	0.016	Α	1.0	Y	44
		(LL)	0.359	0.655	1.391	0.006	0.009	0.014	В	1.0		
	$B \ \to Y$	(HH)	0.231	0.362	0.688	0.007	0.011	0.016				
		(LL)	0.348	0.670	1.447	0.006	0.009	0.014				
F252	$A \ \to \ Y$	(HH)	0.228	0.355	0.672	0.004	0.006	0.008	Α	2.0	Y	88
		(LL)	0.353	0.662	1.416	0.003	0.005	0.008	В	2.1		
	$B \ \to Y$	(HH)	0.228	0.355	0.672	0.004	0.006	0.008				
		(LL)	0.353	0.662	1.416	0.003	0.005	0.008				

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Chapter 2 Function Block

Function	3-Inpu	it OR										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L213	2										
x1	F213	3										
x2	F233	4										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
A H01 B H02 C H03 C H03	n for "with 3		on Y	gic Di	agram for '	'with 4	inverter"					

Chapter 2 Function Block

D			Swite	ching sp	eed				l .			
Block	Path	1	t	LDO (ns))		t 1		l In	put	l Ou	ıtput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L213	$A \rightarrow Y$	(HH)	0.188	0.287	0.544	0.029	0.042	0.061	Α	1.0	Υ	10
		(LL)	0.361	0.573	1.253	0.026	0.035	0.055	В	1.0		
	$B \to Y$	(HH)	0.204	0.308	0.583	0.029	0.042	0.062	С	1.0		
		(LL)	0.376	0.637	1.414	0.025	0.035	0.055				
	$C \rightarrow Y$	(HH)	0.215	0.322	0.611	0.029	0.043	0.063				
		(LL)	0.407	0.724	1.560	0.025	0.035	0.055				
F213	$A \rightarrow Y$	(HH)	0.192	0.293	0.551	0.015	0.022	0.032	Α	1.0	Y	22
		(LL)	0.407	0.684	1.494	0.014	0.019	0.030	В	1.0		
	$B \rightarrow Y$	(HH)	0.206	0.313	0.591	0.015	0.022	0.032	С	1.0		
		(LL)	0.423	0.749	1.652	0.014	0.019	0.030				
	$C \rightarrow Y$	(HH)	0.219	0.330	0.623	0.015	0.022	0.032				
		(LL)	0.458	0.839	1.801	0.014	0.019	0.030				
F233	$A \rightarrow Y$	(HH)	0.236	0.361	0.692	0.007	0.011	0.016	Α	1.0	Y	43
		(LL)	0.543	0.966	2.115	0.007	0.011	0.017	В	1.0		
	$B \rightarrow Y$	(HH)	0.248	0.382	0.733	0.007	0.011	0.016	С	1.0		
		(LL)	0.562	1.034	2.269	0.007	0.011	0.017				
	$C \rightarrow Y$	(HH)	0.262	0.402	0.776	0.007	0.011	0.017				
		(LL)	0.597	1.121	2.415	0.007	0.011	0.017				

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Chapter 2 Function Block

Function	4-Inpu	it OR										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L214	3										
x1	F214	3										
x2	F234	4										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 Logic Diagram		→ NO	01 Y		agram for '			Log	ic Diagram			

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L214	$A \rightarrow Y$	(HH)	0.184	0.287	0.547	0.029	0.042	0.061	Α	1.0	Y	10
		(LL)	0.389	0.638	1.442	0.027	0.039	0.061	В	1.0		
	$B \rightarrow Y$	(HH)	0.200	0.309	0.586	0.029	0.042	0.061	С	1.0		
l .		(LL)	0.422	0.741	1.691	0.027	0.039	0.061	D	1.0		
l .	$C \rightarrow Y$	(HH)	0.213	0.326	0.621	0.029	0.043	0.063				
l .		(LL)	0.497	0.916	2.001	0.027	0.039	0.061				
l .	$D \ \to \ Y$	(HH)	0.213	0.325	0.617	0.029	0.043	0.064				
		(LL)	0.503	0.938	2.047	0.027	0.039	0.061				
F214	$A \ \to \ Y$	(HH)	0.187	0.291	0.550	0.015	0.022	0.032	Α	1.0	Y	22
l .		(LL)	0.440	0.768	1.742	0.014	0.021	0.033	В	1.0		
l .	$B \ \to Y$	(HH)	0.201	0.312	0.590	0.015	0.022	0.032	С	1.0		
l .		(LL)	0.476	0.875	1.990	0.014	0.021	0.033	D	1.0		
l .	$C \rightarrow Y$	(HH)	0.215	0.330	0.627	0.015	0.022	0.032				
l .		(LL)	0.556	1.055	2.307	0.014	0.021	0.033				
	$D \rightarrow Y$	(HH)	0.215	0.329	0.623	0.015	0.022	0.033				
		(LL)	0.562	1.076	2.352	0.014	0.021	0.033				
F234	$A \ \to \ Y$	(HH)	0.232	0.360	0.692	0.007	0.011	0.016	Α	1.0	Y	38
		(LL)	0.615	1.135	2.554	0.008	0.012	0.019	В	1.0		
l .	$B \ \to Y$	(HH)	0.245	0.381	0.734	0.007	0.011	0.016	С	1.0		
l .		(LL)	0.653	1.245	2.799	0.008	0.012	0.019	D	1.0		
	$C \rightarrow Y$	(HH)	0.259	0.403	0.781	0.007	0.011	0.017				
		(LL)	0.734	1.420	3.109	0.008	0.012	0.019				
	$D \ \to \ Y$	(HH)	0.260	0.403	0.780	0.007	0.011	0.017				
		(LL)	0.741	1.441	3.155	0.008	0.012	0.019				

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Chapter 2 Function Block

Function	5-Inpu	it OR									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	/erter	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	
Low Power	L215	4									
x1	F215	5									
x2	F235	7									
x4											
x8											
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter/	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	
Low Power											
x1											
x2											
x4											
x8											
A H01	n for "with 3		ot Y	gic Di	agram for '	'with 4	inverter"				

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L215	$A \rightarrow Y$	(HH)	0.163	0.262	0.501	0.029	0.042	0.061	Α	1.0	Υ	8
		(LL)	0.250	0.428	0.930	0.034	0.051	0.085	В	1.0		
	$B \to Y$	(HH)	0.179	0.282	0.536	0.029	0.042	0.061	С	1.0		
		(LL)	0.238	0.440	0.989	0.034	0.051	0.085	D	1.0		
	$C \rightarrow Y$	(HH)	0.206	0.312	0.603	0.029	0.042	0.061	E	1.0		
		(LL)	0.365	0.578	1.290	0.035	0.052	0.087				
	$D \rightarrow Y$	(HH)	0.221	0.333	0.642	0.029	0.042	0.062				
		(LL)	0.380	0.642	1.450	0.035	0.052	0.087				
	$E \to Y$	(HH)	0.235	0.351	0.677	0.029	0.043	0.063				
		(LL)	0.411	0.729	1.596	0.035	0.052	0.087				
F215	$A \rightarrow Y$	(HH)	0.202	0.317	0.608	0.014	0.021	0.031	Α	1.0	Y	15
		(LL)	0.299	0.520	1.120	0.017	0.026	0.043	В	1.0		
	$B \rightarrow Y$	(HH)	0.216	0.336	0.644	0.014	0.021	0.031	С	1.0		
		(LL)	0.287	0.532	1.178	0.017	0.026	0.043	D	1.0		
	$C \rightarrow Y$	(HH)	0.223	0.338	0.655	0.014	0.021	0.031	E	1.0		
		(LL)	0.451	0.752	1.667	0.018	0.027	0.046				
	$D \rightarrow Y$	(HH)	0.237	0.359	0.695	0.014	0.021	0.031				
		(LL)	0.468	0.818	1.825	0.018	0.027	0.046				
	$E \to Y$	(HH)	0.250	0.377	0.732	0.014	0.022	0.032				
		(LL)	0.501	0.906	1.972	0.018	0.027	0.046				
F235	$A \rightarrow Y$	(HH)	0.336	0.591	1.226	0.007	0.011	0.016	Α	1.0	Y	45
		(LL)	0.455	0.833	1.867	0.006	0.008	0.011	В	1.0		
	$B \rightarrow Y$	(HH)	0.352	0.611	1.262	0.007	0.011	0.016	С	1.0		
		(LL)	0.443	0.845	1.926	0.006	0.008	0.011	D	1.0		
l	$C \rightarrow Y$	(HH)	0.387	0.649	1.338	0.007	0.011	0.016	E	1.0		
l		(LL)	0.573	0.985	2.236	0.006	0.008	0.011				
l	$D \rightarrow Y$	(HH)	0.402	0.670	1.378	0.007	0.011	0.016				
l		(LL)	0.588	1.050	2.396	0.006	0.008	0.011				
l	$E \to Y$	(HH)	0.416	0.690	1.423	0.007	0.011	0.016				
		(LL)	0.622	1.140	2.546	0.006	0.008	0.011				

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Chapter 2 Function Block

Function	6-Inpu	it OR										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L216	4										
x1	F216	5										
x2	F236	7										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram		→ N0	11 Y		agram for '			Logg	ic Diagram	n for "v	with 2 inv	erter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns)			t 1] In	put	Ou	tput
type	$ N \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L216	$A \rightarrow Y$	(HH)	0.195	0.297	0.566	0.030	0.044	0.063	Α	1.0	Y	7
		(LL)	0.407	0.655	1.450	0.037	0.056	0.094	В	1.0		
	$B \rightarrow Y$	(HH)	0.210	0.317	0.605	0.030	0.044	0.063	С	1.0		
		(LL)	0.422	0.720	1.611	0.037	0.056	0.094	D	1.0		
	$C \rightarrow Y$	(HH)	0.222	0.333	0.636	0.030	0.044	0.064	E	1.0		
		(LL)	0.455	0.808	1.757	0.037	0.056	0.094	F	1.0		
	$D \rightarrow Y$	(HH)	0.213	0.320	0.615	0.030	0.044	0.063				
		(LL)	0.373	0.590	1.310	0.036	0.053	0.089				
	$E \rightarrow Y$	(HH)	0.228	0.342	0.655	0.030	0.044	0.063				
		(LL)	0.389	0.655	1.471	0.036	0.053	0.089				
	$F \rightarrow Y$	(HH)	0.241	0.359	0.690	0.030	0.044	0.064				
		(LL)	0.422	0.745	1.620	0.036	0.053	0.089				
F216	$A \rightarrow Y$	(HH)	0.233	0.359	0.687	0.015	0.022	0.031	Α	1.0	Y	14
		(LL)	0.466	0.786	1.729	0.019	0.028	0.047	В	1.0		
	$B \rightarrow Y$	(HH)	0.247	0.379	0.727	0.015	0.022	0.031	С	1.0		
		(LL)	0.482	0.851	1.887	0.019	0.028	0.047	D	1.0		
	$C \rightarrow Y$	(HH)	0.259	0.397	0.765	0.015	0.022	0.032	E	1.0		
		(LL)	0.515	0.939	2.034	0.019	0.028	0.047	F	1.0		
	$D \rightarrow Y$	(HH)	0.235	0.361	0.690	0.014	0.021	0.031				
		(LL)	0.477	0.801	1.752	0.019	0.028	0.047				
	$E \rightarrow Y$	(HH)	0.249	0.381	0.730	0.014	0.021	0.031				
		(LL)	0.493	0.867	1.910	0.019	0.028	0.047				
	$F \rightarrow Y$	(HH)	0.261	0.400	0.769	0.015	0.022	0.032				
		(LL)	0.529	0.957	2.060	0.019	0.028	0.047				
F236	$A \rightarrow Y$	(HH)	0.365	0.623	1.290	0.007	0.011	0.016	Α	1.0	Y	45
		(LL)	0.599	1.047	2.392	0.006	0.008	0.011	В	1.0		
	$B \rightarrow Y$	(HH)	0.380	0.644	1.330	0.007	0.011	0.016	С	1.0		
		(LL)	0.615	1.112	2.552	0.006	0.008	0.011	D	1.0		
	$C \rightarrow Y$	(HH)	0.393	0.662	1.372	0.007	0.011	0.016	E	1.0		
l .		(LL)	0.648	1.202	2.701	0.006	0.008	0.011	F	1.0		
	$D \rightarrow Y$	(HH)	0.395	0.659	1.355	0.007	0.011	0.016				
		(LL)	0.578	0.994	2.251	0.006	0.008	0.011				
l	$E \rightarrow Y$	(HH)	0.410	0.681	1.396	0.007	0.011	0.016				
l .		(LL)	0.594	1.058	2.412	0.006	0.008	0.011				
	$F \rightarrow Y$	(HH)	0.424	0.701	1.440	0.007	0.011	0.016				
		(LL)	0.626	1.147	2.558	0.006	0.008	0.011				

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Chapter 2 Function Block

Block type Drivability Low Power x1 x2 x4	Norma Name L218	al cells	with 1 inv	erter	with 2 inv						_	
Low Power x1 x2		colle			WILII Z IIIV	erter	with 3 inv	erter	with 4 inv	erter	-	
x1 x2	I 218	Cella	Name	cells	Name	cells	Name	cells	Name	cells		
x2	2210	6										
	F218	8										
x4	F238	9										
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram for A H01 B H02 C H03 D H04 E H05 F H06 G H07 H H08 Logic Diagram for	<u></u>	N01 `	Y		agram for "			Log	ic Diagram	for "v	vith 2 inve	rter"

Chapter 2 Function Block

Bleed			Swite	ching sp	eed							
Block	Path		t i	LD0 (ns))		t 1		l in	put	Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanou
L218	$A \ \to Y$	(HH)	0.180	0.296	0.570	0.029	0.042	0.061	Α	1.0	Y	2
		(LL)	0.293	0.542	1.252	0.060	0.094	0.167	В	1.0		
	$B \rightarrow Y$	(HH)	0.196	0.317	0.607	0.029	0.042	0.061	C	1.0		
		(LL)	0.281	0.554	1.311	0.060	0.094	0.167	D	1.0		
	$C \rightarrow Y$	(HH)	0.200	0.324	0.625	0.029	0.042	0.061	E	1.0		
		(LL)	0.306	0.555	1.299	0.060	0.094	0.168	F	1.0		
	$D \rightarrow Y$	(HH)	0.216	0.345	0.663	0.029	0.042	0.061	G	1.0		
		(LL)	0.294	0.567	1.359	0.060	0.094	0.168	H	1.0		
	$E \to Y$	(HH)	0.235	0.365	0.700	0.029	0.043	0.062				
		(LL)	0.357	0.605	1.429	0.061	0.094	0.168				
	$F \rightarrow Y$	(HH)	0.250	0.385	0.737	0.029	0.043	0.063				
		(LL)	0.344	0.618	1.488	0.061	0.094	0.168				
	$G \rightarrow Y$	(HH)	0.242	0.374	0.709	0.030	0.043	0.064				
		(LL)	0.363	0.606	1.422	0.061	0.094	0.168				
	H → Y	(HH)	0.257	0.395	0.747	0.030	0.043	0.064				
F040	,	(LL) (HH)	0.349	0.617 0.582	1.481	0.061	0.094	0.168	A	1.0	Y	23
F218	$A \rightarrow Y$	(LL)	0.526	0.562	2.378	0.015	0.021	0.031	B	1.0	'	23
	, ,	(LL)	0.344	0.603	1.246	0.011	0.015	0.022	C	1.0		
	B → Y	(LL)	0.507	1.009	2.437	0.013	0.021	0.031	D	1.0		
	C → Y	(LL)	0.353	0.616	1.272	0.011	0.013	0.022	E	1.0		
	U → f	(LL)	0.533	1.009	2.425	0.013	0.021	0.031	F	1.0		
	$D \to Y$	(HH)	0.369	0.637	1.310	0.011	0.013	0.022	G	1.0		
	D → 1	(LL)	0.521	1.021	2.484	0.011	0.015	0.022	H	1.0		
	$E \to Y$	(HH)	0.408	0.682	1.389	0.015	0.021	0.031	''			
		(LL)	0.599	1.080	2.586	0.011	0.015	0.022				
	$F \rightarrow Y$	(HH)	0.424	0.703	1.427	0.015	0.021	0.031				
		(LL)	0.586	1.092	2.645	0.011	0.015	0.022				
	$G \rightarrow Y$	(HH)	0.419	0.697	1.413	0.015	0.021	0.031				
		(LL)	0.601	1.075	2.570	0.011	0.015	0.022				
	$H \rightarrow Y$	(HH)	0.435	0.718	1.451	0.015	0.021	0.031				
		(LL)	0.588	1.088	2.629	0.011	0.015	0.022				
F238	$A \rightarrow Y$	(HH)	0.357	0.637	1.322	0.007	0.011	0.016	Α	1.0	Υ	45
		(LL)	0.565	1.086	2.570	0.006	0.008	0.011	В	1.0		
	$B \to Y$	(HH)	0.373	0.658	1.360	0.007	0.011	0.016	С	1.0		
[(LL)	0.553	1.097	2.629	0.006	0.008	0.011	D	1.0		
	$C \rightarrow Y$	(HH)	0.384	0.672	1.386	0.007	0.011	0.016	E	1.0		
		(LL)	0.580	1.099	2.619	0.006	0.008	0.011	F	1.0		
	$D \rightarrow Y$	(HH)	0.401	0.693	1.425	0.007	0.011	0.016	G	1.0		
[(LL)	0.567	1.111	2.678	0.006	0.008	0.011	Н	1.0		
[$E \to Y$	(HH)	0.452	0.753	1.527	0.007	0.011	0.016	1	1		
[(LL)	0.645	1.169	2.780	0.006	0.008	0.011	1	1		
	$F \rightarrow Y$	(HH)	0.466	0.773	1.563	0.007	0.011	0.016				
		(LL)	0.632	1.182	2.838	0.006	0.008	0.011				
	$G \rightarrow Y$	(HH)	0.457	0.760	1.539	0.007	0.011	0.016				
		(LL)	0.652	1.172	2.774	0.006	0.008	0.011				
	H → Y	(HH)	0.473	0.781	1.577	0.007	0.011	0.016				
		(LL)	0.638	1.183	2.834	0.006	0.008	0.011				

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	oter 2 Function Block			hapter 2 Function Block	
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Chapter 2 Function Block

Chapter 2 Function Block

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Chapter 2 Function Block

Function	2-Inpu	ıt NAN	ND										
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power	L302	1											
x1	F302	2											
x2	F322	4											
x4	F382	6											
x8													
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	\neg
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power													
x1													
x2													
x4													
x8													
Logic Diagram	for "Norm	nal"	Lo	gic Di	agram for	with 1	inverter"	Log	ic Diagram	n for "w	ith 2	invert	er"
A H01 ←													
):)→ N(01 Y										
B H02 ←													
Logic Diagram	for "with 3	3 inver	ter" Lo	naic Di	agram for '	'with 4	inverter"						
Logic Diagram	i ioi witii c	JIIIVCI	toi Lo	igic Di	agramio	WILLI	IIIVCITOI						
								1					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	1	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L302	$A \rightarrow Y$	(HL)	0.119	0.158	0.287	0.034	0.049	0.082	Α	1.0	Y	9
		(LH)	0.081	0.127	0.232	0.029	0.042	0.061	В	1.0		
	$B \rightarrow Y$	(HL)	0.103	0.143	0.294	0.034	0.049	0.081				
		(LH)	0.105	0.157	0.283	0.028	0.042	0.061				
F302	$A \rightarrow Y$	(HL)	0.111	0.152	0.293	0.017	0.025	0.041	Α	2.1	Y	18
		(LH)	0.094	0.143	0.259	0.014	0.021	0.030	В	2.1		
	$B \rightarrow Y$	(HL)	0.110	0.152	0.293	0.017	0.025	0.041				
		(LH)	0.094	0.143	0.259	0.014	0.021	0.030				
F322	$A \rightarrow Y$	(HL)	0.115	0.158	0.303	0.008	0.012	0.020	Α	4.1	Y	36
		(LH)	0.098	0.148	0.266	0.007	0.011	0.015	В	4.1		
	$B \rightarrow Y$	(HL)	0.115	0.158	0.303	0.008	0.012	0.020				
		(LH)	0.097	0.148	0.266	0.007	0.011	0.015				
F382	$A \rightarrow Y$	(HL)	0.383	0.666	1.431	0.003	0.004	0.006	Α	1.0	Y	89
		(LH)	0.302	0.537	1.120	0.004	0.005	0.008	В	1.0		
	$B \rightarrow Y$	(HL)	0.366	0.650	1.436	0.003	0.004	0.006				
		(LH)	0.333	0.572	1.183	0.004	0.005	0.008				

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Chapter 2 Function Block

Block type Drivability	Norma											
Drivability		al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L303	2										
x1	F303	3										
x2	F323	6										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 Logic Diagram)→ NO	01 Y		agram for "			Log	ic Diagram	for "v	vith 2 inve	rter"

Chapter 2 Function Block

- I			Swite	ching sp	eed				l .			
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L303	$A \rightarrow Y$	(HL)	0.160	0.242	0.514	0.047	0.072	0.125	Α	1.0	Y	4
		(LH)	0.098	0.162	0.297	0.029	0.042	0.061	В	1.0		
	$B \rightarrow Y$	(HL)	0.160	0.253	0.576	0.047	0.072	0.125	С	1.0		
		(LH)	0.121	0.192	0.354	0.029	0.042	0.061				
	$C \rightarrow Y$	(HL)	0.176	0.273	0.633	0.047	0.072	0.125				
		(LH)	0.154	0.229	0.419	0.029	0.042	0.062				
F303	$A \rightarrow Y$	(HL)	0.134	0.204	0.439	0.024	0.036	0.063	Α	2.1	Y	10
		(LH)	0.105	0.168	0.296	0.015	0.022	0.032	В	2.1		
	$B \rightarrow Y$	(HL)	0.149	0.225	0.504	0.024	0.036	0.063	С	2.1		
		(LH)	0.123	0.187	0.339	0.014	0.021	0.031				
	$C \rightarrow Y$	(HL)	0.134	0.205	0.440	0.024	0.036	0.063				
		(LH)	0.106	0.168	0.296	0.015	0.022	0.032				
F323	$A \rightarrow Y$	(HL)	0.177	0.268	0.591	0.012	0.018	0.032	A	4.3	Y	17
		(LH)	0.128	0.199	0.358	0.007	0.011	0.016	В	4.2		
	$B \rightarrow Y$	(HL)	0.166	0.263	0.594	0.012	0.018	0.031	С	4.2		
I		(LH)	0.124	0.197	0.360	0.007	0.011	0.015				
I	$C \rightarrow Y$	(HL)	0.177	0.269	0.591	0.012	0.018	0.032				
		(LH)	0.128	0.199	0.358	0.007	0.011	0.016				

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Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L304	2										
x1	F304	4										
x2	F324	8										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 Logic Diagram)→ N0	11 Y		agram for '			Logg	ic Diagram	n for "v	vith 2 inve	rter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → C	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L304	$A \rightarrow Y$	(HL)	0.158	0.249	0.574	0.060	0.094	0.167	Α	1.0	Υ	2
		(LH)	0.094	0.159	0.295	0.029	0.042	0.061	В	1.0		
	$B \rightarrow Y$	(HL)	0.169	0.281	0.689	0.060	0.094	0.166	С	1.0		
		(LH)	0.118	0.190	0.354	0.029	0.042	0.061	D	1.0		
	$C \rightarrow Y$	(HL)	0.211	0.335	0.829	0.060	0.094	0.166				
		(LH)	0.152	0.229	0.425	0.029	0.043	0.062				
	$D \rightarrow Y$	(HL)	0.208	0.334	0.838	0.060	0.094	0.166				
		(LH)	0.160	0.239	0.435	0.029	0.043	0.064				
F304	$A \rightarrow Y$	(HL)	0.195	0.308	0.734	0.030	0.047	0.084	Α	2.1	Y	5
		(LH)	0.129	0.201	0.363	0.015	0.022	0.032	В	2.1		
	$B \rightarrow Y$	(HL)	0.201	0.324	0.787	0.030	0.047	0.084	С	2.1		
		(LH)	0.139	0.214	0.395	0.015	0.021	0.031	D	2.1		
	$C \rightarrow Y$	(HL)	0.201	0.324	0.787	0.030	0.047	0.084				
		(LH)	0.139	0.214	0.395	0.015	0.021	0.031				
	$D \rightarrow Y$	(HL)	0.195	0.308	0.734	0.030	0.047	0.084				
		(LH)	0.129	0.201	0.363	0.015	0.022	0.032				
F324	$A \rightarrow Y$	(HL)	0.196	0.310	0.737	0.015	0.024	0.042	Α	4.3	Y	10
		(LH)	0.129	0.202	0.364	0.007	0.011	0.016	В	4.3		
	$B \rightarrow Y$	(HL)	0.202	0.326	0.790	0.015	0.024	0.042	С	4.3		
		(LH)	0.139	0.215	0.396	0.007	0.011	0.016	D	4.3		
	$C \rightarrow Y$	(HL)	0.202	0.326	0.790	0.015	0.024	0.042				
		(LH)	0.139	0.215	0.396	0.007	0.011	0.016				
	$D \rightarrow Y$	(HL)	0.196	0.310	0.737	0.015	0.024	0.042				
		(LH)	0.129	0.202	0.364	0.007	0.011	0.016				

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Chapter 2 Function Block

Function	5-Inpu	ıt NAN	1D									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1	F305	5										
x2	F325	6										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
x1												riter

Chapter 2 Function Block

D			Swite	ching sp	eed				<u> </u>			
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F305	$A \rightarrow Y$	(HL)	0.388	0.674	1.449	0.012	0.017	0.026	Α	1.0	Υ	22
		(LH)	0.244	0.428	0.888	0.015	0.022	0.031	В	1.0		
	$B \ \to Y$	(HL)	0.374	0.658	1.456	0.012	0.017	0.026	С	1.0		
		(LH)	0.276	0.463	0.950	0.015	0.022	0.031	D	1.0		
	$C \rightarrow Y$	(HL)	0.458	0.818	1.824	0.012	0.017	0.026	E	1.0		
		(LH)	0.278	0.498	1.030	0.015	0.022	0.031				
	$D \ \to \ Y$	(HL)	0.456	0.828	1.888	0.012	0.017	0.026				
		(LH)	0.310	0.534	1.096	0.015	0.022	0.031				
	$E \to Y$	(HL)	0.473	0.849	1.946	0.012	0.017	0.026				
		(LH)	0.355	0.585	1.192	0.015	0.022	0.031				
F325	$A \ \to \ Y$	(HL)	0.480	0.862	1.860	0.006	0.009	0.014	Α	1.0	Y	44
		(LH)	0.282	0.497	1.036	0.007	0.011	0.016	В	1.0		
	$B \ \to Y$	(HL)	0.466	0.845	1.867	0.006	0.009	0.014	С	1.0		
		(LH)	0.315	0.533	1.099	0.007	0.011	0.016	D	1.0		
	$C \rightarrow Y$	(HL)	0.553	1.011	2.246	0.006	0.009	0.014	E	1.0		
		(LH)	0.322	0.576	1.194	0.007	0.011	0.016				
	$D \ \to Y$	(HL)	0.552	1.021	2.309	0.006	0.009	0.014				
		(LH)	0.353	0.613	1.261	0.007	0.011	0.016				
	$E \to Y$	(HL)	0.568	1.041	2.365	0.006	0.009	0.014				
		(LH)	0.401	0.665	1.359	0.007	0.011	0.016				

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Chapter 2 Function Block

Block type	Function	6-Inpu	ıt NAN	1D									
Name Name Cells	Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
X1	Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
x2 F326 6	Low Power												
x4 x8 Block type Normal with 1 inverter with 2 inverter with 3 inverter with 4 inverter Drivability Name cells Name cells Name cells Name cells Name cells Low Power x1 x2 x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 F H06 With 1 inverter with 2 inverter with 3 inverter with 4 inverter - With 2 inverter with 3 inverter with 4 inverter - Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	x1	F306	5										
Block type Normal with 1 inverter with 2 inverter with 3 inverter with 4 inverter - Drivability Name cells Name cells Name cells Name cells Name cells Low Power x1 x2 x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 F H06 With 1 inverter with 2 inverter with 3 inverter with 4 inverter - Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter" Logic Diagram for "with 2 inverter"	x2	F326	6										
Block type Normal with 1 inverter with 2 inverter with 3 inverter with 4 inverter - Drivability Name cells Name cells Name cells Name cells Name cells Name cells Low Power x1 x2 x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 F H06 with 1 inverter with 2 inverter with 3 inverter with 4 inverter - Logic Diagram for "with 1 inverter" Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	x4												
Drivability Name cells Name	x8												
Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
x1 x2 x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
x2 x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	Low Power												
x4 x8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter" Logic Diagram for "with 2 inverter"	x1												
X8 Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter"	x2												
Logic Diagram for "Normal" A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram for "with 1 inverter" Logic Diagram for "with 2 inverter" Logic Diagram for "with 2 inverter"	x4												
A H01 B H02 C H03 D H04 E H05 F H06	x8												
	A H01)→ N0	11 Y					Log	ic Diagram	i tor "v	vitn 2 Inve	erter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F306	$A \rightarrow Y$	(HL)	0.466	0.824	1.850	0.012	0.017	0.026	Α	1.0	Y	22
l		(LH)	0.266	0.476	0.988	0.015	0.022	0.031	В	1.0		
l	$B \rightarrow Y$	(HL)	0.465	0.834	1.913	0.012	0.017	0.026	С	1.0		
l		(LH)	0.296	0.512	1.054	0.015	0.022	0.031	D	1.0		
l	$C \rightarrow Y$	(HL)	0.481	0.853	1.970	0.012	0.017	0.026	E	1.0		
l		(LH)	0.341	0.562	1.147	0.015	0.022	0.031	F	1.0		
l	$D \rightarrow Y$	(HL)	0.463	0.827	1.841	0.012	0.017	0.026				
l		(LH)	0.282	0.503	1.038	0.015	0.022	0.031				
l	$E \to Y$	(HL)	0.462	0.838	1.905	0.012	0.017	0.026				
l		(LH)	0.313	0.539	1.104	0.015	0.022	0.031				
l	$F \rightarrow Y$	(HL)	0.479	0.859	1.963	0.012	0.017	0.026				
		(LH)	0.360	0.592	1.202	0.015	0.022	0.031				
F326	$A \rightarrow Y$	(HL)	0.562	1.017	2.276	0.006	0.009	0.014	Α	1.0	Y	44
l		(LH)	0.307	0.552	1.148	0.007	0.011	0.016	В	1.0		
l	$B \rightarrow Y$	(HL)	0.562	1.028	2.339	0.006	0.009	0.014	С	1.0		
l		(LH)	0.339	0.589	1.215	0.007	0.011	0.016	D	1.0		
l	$C \rightarrow Y$	(HL)	0.578	1.048	2.398	0.006	0.009	0.014	E	1.0		
l		(LH)	0.388	0.643	1.314	0.007	0.011	0.016	F	1.0		
l	$D \rightarrow Y$	(HL)	0.560	1.024	2.269	0.006	0.009	0.014				
l		(LH)	0.327	0.583	1.203	0.007	0.011	0.016				
I	$E \rightarrow Y$	(HL)	0.559	1.034	2.332	0.006	0.009	0.014				
I		(LH)	0.358	0.620	1.270	0.007	0.011	0.016				
	$F \rightarrow Y$	(HL)	0.575	1.052	2.389	0.006	0.009	0.014				
		(LH)	0.407	0.673	1.370	0.007	0.011	0.016				

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Chapter 2 Function Block

Function	8-Inpu	ıt NAN	1D									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1	F308	6										
x2	F328	7										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
A H01		No1		gic Dia	agram for '	with 4	inverter"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → (OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F308	$A \rightarrow Y$	(HL)	0.486	0.878	2.040	0.012	0.017	0.026	Α	1.0	Υ	22
l		(LH)	0.258	0.468	0.979	0.015	0.022	0.031	В	1.0		
l	$B \rightarrow Y$	(HL)	0.499	0.908	2.156	0.012	0.017	0.026	С	1.0		
l		(LH)	0.290	0.505	1.047	0.015	0.022	0.031	D	1.0		
l	$C \rightarrow Y$	(HL)	0.540	0.963	2.296	0.012	0.017	0.026	E	1.0		
l		(LH)	0.335	0.557	1.147	0.015	0.022	0.031	F	1.0		
l	$D \rightarrow Y$	(HL)	0.537	0.961	2.305	0.012	0.017	0.026	G	1.0		
l		(LH)	0.349	0.575	1.175	0.015	0.022	0.031	Н	1.0		
l	$E \to Y$	(HL)	0.475	0.863	1.987	0.012	0.017	0.026				
l		(LH)	0.273	0.491	1.024	0.015	0.022	0.031				
l	$F \rightarrow Y$	(HL)	0.486	0.893	2.103	0.012	0.017	0.026				
l		(LH)	0.304	0.529	1.093	0.015	0.022	0.031				
l	$G \rightarrow Y$	(HL)	0.526	0.948	2.243	0.012	0.017	0.026				
l		(LH)	0.351	0.582	1.194	0.015	0.022	0.031				
l	$H \rightarrow Y$	(HL)	0.524	0.947	2.252	0.012	0.017	0.026				
		(LH)	0.365	0.601	1.225	0.015	0.022	0.031				
F328	$A \rightarrow Y$	(HL)	0.588	1.080	2.488	0.006	0.009	0.014	Α	1.0	Y	43
l		(LH)	0.301	0.545	1.141	0.007	0.011	0.016	В	1.0		
l	$B \rightarrow Y$	(HL)	0.600	1.111	2.604	0.006	0.009	0.014	С	1.0		
l		(LH)	0.333	0.583	1.210	0.007	0.011	0.016	D	1.0		
l	$C \rightarrow Y$	(HL)	0.642	1.167	2.747	0.006	0.009	0.014	E	1.0		
l		(LH)	0.383	0.639	1.316	0.007	0.011	0.016	F	1.0		
l	$D \rightarrow Y$	(HL)	0.639	1.166	2.756	0.006	0.009	0.014	G	1.0		
l		(LH)	0.398	0.659	1.348	0.007	0.011	0.016	Н	1.0		
l	$E \to Y$	(HL)	0.576	1.066	2.431	0.006	0.009	0.014				
l		(LH)	0.318	0.573	1.192	0.007	0.011	0.016				
l	$F \rightarrow Y$	(HL)	0.586	1.096	2.546	0.006	0.009	0.014				
I		(LH)	0.350	0.611	1.261	0.007	0.011	0.016				
l	$G \rightarrow Y$	(HL)	0.628	1.153	2.689	0.006	0.009	0.014				
I		(LH)	0.401	0.668	1.369	0.007	0.011	0.016				
I	$H \rightarrow Y$	(HL)	0.625	1.151	2.698	0.006	0.009	0.014				
		(LH)	0.417	0.689	1.403	0.007	0.011	0.016				

Chapter 2 Function Block

Function	2-Inpu	it ANE)										
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power	L312	2											
x1	F312	2											
x2	F332	3											
x4	F352	6											
x8													
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power													
x1													
x2													
x4													
x8													
Logic Diagram	for "Norm	nal"	Lo	gic Di	agram for '	with 1	inverter"	Log	ic Diagram	n for "w	vith 2	invert	er"
A H01 ←)-	→ N(01 Y										
B H02 ←													
Logic Diagram	for "with 3	3 inver	ter" Lo	gic Di	agram for '	with 4	inverter"						
I													
I													
													-

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L312	$A \rightarrow Y$	(HH)	0.210	0.329	0.684	0.029	0.042	0.062	Α	1.0	Υ	10
		(LL)	0.171	0.282	0.558	0.022	0.029	0.043	В	1.0		
	$B \ \to Y$	(HH)	0.197	0.313	0.691	0.029	0.043	0.062				
		(LL)	0.204	0.317	0.620	0.022	0.029	0.043				
F312	$A \ \to \ Y$	(HH)	0.221	0.355	0.751	0.015	0.022	0.033	Α	1.0	Y	22
		(LL)	0.184	0.312	0.621	0.011	0.015	0.022	В	1.0		
	$B \ \to Y$	(HH)	0.203	0.339	0.757	0.015	0.022	0.033				
		(LL)	0.214	0.347	0.682	0.011	0.015	0.023				
F332	$A \ \to \ Y$	(HH)	0.284	0.472	1.030	0.007	0.011	0.017	Α	1.0	Y	41
		(LL)	0.242	0.423	0.851	0.006	0.008	0.012	В	1.0		
	$B \ \to Y$	(HH)	0.263	0.456	1.035	0.007	0.011	0.017				
		(LL)	0.269	0.456	0.911	0.006	0.008	0.012				
F352	$A \ \to \ Y$	(HH)	0.275	0.465	1.032	0.004	0.006	0.009	Α	2.1	Y	82
		(LL)	0.256	0.439	0.879	0.003	0.004	0.006	В	2.1		
	$B \ \to Y$	(HH)	0.275	0.465	1.032	0.004	0.006	0.009				
		(LL)	0.256	0.439	0.879	0.003	0.004	0.006				

Chapter 2 Function Block

Function	3-Inpu	t AND)									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L313	2										
x1	F313	3										
x2	F333	4										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram		→ NO	on Y	gic Di	agram for '	'with 4	inverter"					

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanou
L313	$A \rightarrow Y$	(HH)	0.280	0.463	1.039	0.029	0.044	0.066	Α	1.0	Y	10
		(LL)	0.193	0.328	0.651	0.022	0.030	0.044	В	1.0		
	$B \rightarrow Y$	(HH)	0.279	0.473	1.102	0.029	0.044	0.066	С	1.0		
		(LL)	0.225	0.364	0.716	0.022	0.030	0.044				
	$C \rightarrow Y$	(HH)	0.295	0.493	1.158	0.029	0.044	0.066				
		(LL)	0.264	0.407	0.796	0.023	0.030	0.045				
F313	$A \rightarrow Y$	(HH)	0.298	0.512	1.168	0.015	0.023	0.035	Α	1.0	Y	20
		(LL)	0.205	0.356	0.708	0.011	0.016	0.023	В	1.0		
	$B \rightarrow Y$	(HH)	0.296	0.522	1.231	0.015	0.023	0.035	С	1.0		
		(LL)	0.233	0.392	0.772	0.011	0.016	0.023				
	$C \rightarrow Y$	(HH)	0.313	0.543	1.289	0.015	0.023	0.035				
		(LL)	0.277	0.442	0.863	0.012	0.016	0.024				
F333	$A \rightarrow Y$	(HH)	0.375	0.674	1.575	0.008	0.012	0.019	Α	1.0	Y	36
		(LL)	0.259	0.460	0.927	0.006	0.008	0.013	В	1.0		
	$B \rightarrow Y$	(HH)	0.373	0.685	1.637	0.008	0.012	0.019	С	1.0		
l		(LL)	0.286	0.495	0.991	0.006	0.008	0.013				
l	$C \rightarrow Y$	(HH)	0.390	0.704	1.693	0.008	0.012	0.019				
		(LL)	0.329	0.546	1.088	0.006	0.008	0.013				

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Chapter 2 Function Block

Function	4-Inpu	ıt ANE)									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L314	3										
x1	F314	3										
x2	F334	4										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
х4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 Logic Diagram		→ NO	01 Y		agram for '				ic Diagram			

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L314	$A \rightarrow Y$	(HH)	0.305	0.519	1.215	0.030	0.045	0.070	Α	1.0	Υ	9
		(LL)	0.192	0.329	0.655	0.022	0.030	0.044	В	1.0		
	$B \rightarrow Y$	(HH)	0.317	0.551	1.331	0.030	0.045	0.070	С	1.0		
		(LL)	0.223	0.366	0.722	0.022	0.030	0.044	D	1.0		
	$C \rightarrow Y$	(HH)	0.357	0.605	1.470	0.030	0.045	0.070				
		(LL)	0.270	0.417	0.817	0.023	0.030	0.045				
	$D \rightarrow Y$	(HH)	0.355	0.603	1.480	0.030	0.045	0.070				
		(LL)	0.283	0.434	0.842	0.023	0.031	0.046				
F314	$A \rightarrow Y$	(HH)	0.321	0.576	1.383	0.016	0.024	0.037	Α	1.0	Y	19
		(LL)	0.199	0.350	0.702	0.011	0.015	0.023	В	1.0		
	$B \rightarrow Y$	(HH)	0.333	0.607	1.497	0.016	0.024	0.037	С	1.0		
		(LL)	0.228	0.387	0.769	0.011	0.015	0.023	D	1.0		
	$C \rightarrow Y$	(HH)	0.375	0.664	1.640	0.016	0.024	0.037				
		(LL)	0.273	0.439	0.867	0.012	0.016	0.024				
	$D \rightarrow Y$	(HH)	0.372	0.662	1.649	0.016	0.024	0.037				
		(LL)	0.286	0.456	0.894	0.012	0.016	0.024				
F334	$A \rightarrow Y$	(HH)	0.418	0.786	1.929	0.008	0.012	0.020	Α	1.0	Y	32
		(LL)	0.255	0.456	0.924	0.006	0.008	0.013	В	1.0		
	$B \rightarrow Y$	(HH)	0.431	0.819	2.041	0.008	0.012	0.020	С	1.0		
		(LL)	0.282	0.493	0.990	0.006	0.008	0.013	D	1.0		
	$C \rightarrow Y$	(HH)	0.473	0.874	2.181	0.008	0.012	0.020				
		(LL)	0.327	0.546	1.094	0.006	0.008	0.013				
	$D \rightarrow Y$	(HH)	0.471	0.873	2.190	0.008	0.012	0.020				
		(LL)	0.342	0.567	1.128	0.006	0.008	0.013				

Chapter 2 Function Block

Function	5-Inpu	t ANE)									
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		- 1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L315	4										
x1	F315	5										
x2	F335	7										
x4												
x8												
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		- 1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 E H05 Logic Diagram		→ NO	11 Y		agram for '			Log	ic Diagram	for "v	vith 2 ir	verter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L315	$A \rightarrow Y$	(HH)	0.229	0.375	0.803	0.052	0.078	0.117	Α	1.0	Υ	4
l		(LL)	0.171	0.286	0.569	0.022	0.029	0.043	В	1.0		
l	$B \to Y$	(HH)	0.216	0.359	0.810	0.052	0.078	0.117	С	1.0		
l		(LL)	0.203	0.322	0.631	0.022	0.029	0.043	D	1.0		
l	$C \rightarrow Y$	(HH)	0.300	0.518	1.170	0.052	0.079	0.118	E	1.0		
l		(LL)	0.205	0.354	0.703	0.022	0.030	0.044				
l	$D \rightarrow Y$	(HH)	0.299	0.528	1.233	0.052	0.079	0.118				
l		(LL)	0.237	0.390	0.769	0.022	0.030	0.044				
l	$E \to Y$	(HH)	0.315	0.548	1.290	0.052	0.079	0.118				
		(LL)	0.281	0.440	0.858	0.023	0.030	0.045				
F315	$A \rightarrow Y$	(HH)	0.273	0.452	0.970	0.027	0.040	0.061	Α	1.0	Y	8
l		(LL)	0.213	0.359	0.714	0.012	0.016	0.024	В	1.0		
l	$B \to Y$	(HH)	0.255	0.435	0.976	0.027	0.040	0.061	С	1.0		
l		(LL)	0.241	0.393	0.775	0.012	0.016	0.024	D	1.0		
l	$C \rightarrow Y$	(HH)	0.347	0.600	1.375	0.027	0.041	0.063	E	1.0		
l		(LL)	0.229	0.398	0.796	0.012	0.017	0.025				
l	$D \rightarrow Y$	(HH)	0.345	0.610	1.437	0.027	0.041	0.063				
l		(LL)	0.258	0.434	0.860	0.012	0.017	0.025				
l	$E \to Y$	(HH)	0.362	0.631	1.495	0.027	0.041	0.063				
		(LL)	0.300	0.484	0.953	0.013	0.017	0.026				
F335	$A \rightarrow Y$	(HH)	0.461	0.824	1.808	0.007	0.011	0.016	Α	1.0	Y	45
l		(LL)	0.339	0.608	1.280	0.006	0.008	0.011	В	1.0		
l	$B \rightarrow Y$	(HH)	0.446	0.808	1.815	0.007	0.011	0.016	С	1.0		
l		(LL)	0.371	0.644	1.343	0.006	0.008	0.011	D	1.0		
I	$C \rightarrow Y$	(HH)	0.531	0.969	2.184	0.007	0.011	0.016	E	1.0		
I		(LL)	0.374	0.679	1.424	0.006	0.008	0.011				
I	$D \rightarrow Y$	(HH)	0.529	0.979	2.248	0.007	0.011	0.016				
I		(LL)	0.405	0.716	1.491	0.006	0.008	0.011				
I	$E \rightarrow Y$	(HH)	0.546	1.000	2.306	0.007	0.011	0.016				
		(LL)	0.451	0.767	1.586	0.006	0.008	0.011				

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Chapter 2 Function Block

Function	6-Inpu	it ANE)									
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L316	4										
x1	F316	5										
x2	F336	7										
x4												
x8												
Block type	Norma	al	with 1 in	verter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram A H01 B H02 C H03 D H04 E H05 F H06 Logic Diagram		→ NO	01 Y		agram for '			Log	ic Diagram	for "w	vith 2 inv	erter"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		tı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L316	$A \rightarrow Y$	(HH)	0.308	0.521	1.187	0.052	0.079	0.119	Α	1.0	Y	4
		(LL)	0.195	0.337	0.668	0.022	0.030	0.044	В	1.0		
	$B \rightarrow Y$	(HH)	0.308	0.532	1.251	0.052	0.079	0.119	С	1.0		
		(LL)	0.225	0.372	0.733	0.022	0.030	0.044	D	1.0		
	$C \rightarrow Y$	(HH)	0.324	0.553	1.309	0.052	0.079	0.119	E	1.0		
		(LL)	0.270	0.422	0.823	0.023	0.030	0.045	F	1.0		
	$D \rightarrow Y$	(HH)	0.304	0.523	1.180	0.052	0.079	0.118				
		(LL)	0.208	0.358	0.708	0.022	0.030	0.044				
	$E \to Y$	(HH)	0.303	0.534	1.243	0.052	0.079	0.118				
		(LL)	0.239	0.393	0.773	0.022	0.030	0.044				
	$F \rightarrow Y$	(HH)	0.319	0.553	1.299	0.052	0.079	0.118				
		(LL)	0.284	0.444	0.864	0.023	0.030	0.045				
F316	$A \rightarrow Y$	(HH)	0.353	0.612	1.401	0.026	0.040	0.060	A	1.0	Y	9
		(LL)	0.236	0.409	0.816	0.011	0.015	0.023	В	1.0		
	$B \rightarrow Y$	(HH)	0.351	0.622	1.464	0.026	0.040	0.060	С	1.0		
		(LL)	0.264	0.445	0.880	0.011	0.015	0.023	D	1.0		
	$C \rightarrow Y$	(HH)	0.366	0.642	1.520	0.026	0.040	0.060	E	1.0		
		(LL)	0.309	0.496	0.975	0.012	0.015	0.023	F	1.0		
	$D \rightarrow Y$	(HH)	0.354	0.615	1.407	0.026	0.040	0.060				
		(LL)	0.238	0.412	0.820	0.011	0.015	0.023				
	$E \rightarrow Y$	(HH)	0.352	0.625	1.469	0.026	0.040	0.060				
		(LL)	0.266	0.448	0.884	0.011	0.015	0.023				
	$F \rightarrow Y$	(HH)	0.369	0.646	1.528	0.026	0.040	0.060				
		(LL)	0.312	0.500	0.980	0.012	0.015	0.023				
F336	$A \rightarrow Y$	(HH)	0.538	0.975	2.210	0.007	0.011	0.016	A	1.0	Y	45
		(LL)	0.361	0.657	1.381	0.006	0.008	0.011	В	1.0		
	$B \rightarrow Y$	(HH)	0.538	0.985	2.273	0.007	0.011	0.016	С	1.0		
		(LL)	0.391	0.693	1.447	0.006	0.008	0.011	D	1.0		
	$C \rightarrow Y$	(HH)	0.554	1.004	2.330	0.007	0.011	0.016	E	1.0		
		(LL)	0.436	0.744	1.540	0.006	0.008	0.011	F	1.0		
	$D \rightarrow Y$	(HH)	0.536	0.978	2.202	0.007	0.011	0.016				
		(LL)	0.378	0.685	1.433	0.006	0.008	0.011				
	$E \rightarrow Y$	(HH)	0.535	0.989	2.265	0.007	0.011	0.016				
		(LL)	0.408	0.721	1.499	0.006	0.008	0.011				
	$F \rightarrow Y$	(HH)	0.552	1.010	2.324	0.007	0.011	0.016				
		(LL)	0.456	0.774	1.596	0.006	0.008	0.011				

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Chapter 2 Function Block

Function	8-Inpu	8-Input AND											
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power	L318	5											
x1	F318	6											
x2	F338	8											
x4													
x8													
Block type	Norma	al	with 1 inv	erter	with 2 inv	erter	with 3 inv	erter	with 4 inv	erter		-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells			
Low Power													
x1													
x2													
x4													
x8													
Logic Diagram A H01 B H02 C H03 D H04 F H06 G H07 H H08 Logic Diagram		· N01	Y		agram for '			Log	ic Diagram	for "v	vith 2 in	verter"	

Chapter 2 Function Block

- I			Swite	ching sp	eed				Ι.			
Block	Path	ı	t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L318	$A \rightarrow Y$	(HH)	0.330	0.574	1.361	0.053	0.080	0.122	Α	1.0	Y	4
		(LL)	0.189	0.330	0.662	0.022	0.030	0.044	В	1.0		
l	$B \rightarrow Y$	(HH)	0.342	0.604	1.476	0.053	0.080	0.122	С	1.0		
l		(LL)	0.220	0.367	0.729	0.022	0.030	0.044	D	1.0		
l	C → Y	(HH)	0.384	0.660	1.619	0.052	0.080	0.122	E	1.0		
l		(LL)	0.265	0.419	0.825	0.023	0.030	0.045	F	1.0		
	$D \rightarrow Y$	(HH)	0.381	0.659	1.628	0.053	0.080	0.122	G	1.0		
		(LL)	0.278	0.435	0.849	0.023	0.031	0.046	H	1.0		
	$E \rightarrow Y$	(HH)	0.321	0.565	1.329	0.052	0.079	0.120				
		(LL)	0.203	0.353	0.704	0.022	0.030	0.044				
	$F \rightarrow Y$	(HH)	0.331	0.596	1.445	0.052	0.079	0.120				
		(LL)	0.234	0.390	0.772	0.022	0.030	0.044				
	$G \rightarrow Y$	(HH)	0.373	0.652	1.588	0.052	0.079	0.120				
		(LL)	0.281	0.443	0.871	0.023	0.030	0.045				
l	H → Y	(HH)	0.371	0.651	1.597	0.052	0.079	0.120				
		(LL)	0.295	0.461	0.896	0.023	0.031	0.045			L	
F318	$A \rightarrow Y$	(HH)	0.379	0.674	1.609	0.027	0.042	0.065	A	1.0	Y	8
		(LL)	0.226	0.396	0.796	0.012	0.017	0.025	В	1.0		
	$B \rightarrow Y$	(HH)	0.391	0.705	1.723	0.027	0.042	0.065	С	1.0		
		(LL)	0.255	0.433	0.862	0.012	0.017	0.025	D	1.0		
	$C \rightarrow Y$	(HH)	0.432	0.760	1.863	0.027	0.042	0.065	E	1.0		
		(LL)	0.299	0.484	0.961	0.013	0.017	0.026	F	1.0		
l	$D \rightarrow Y$	(HH)	0.429	0.759	1.872	0.027	0.042	0.065	G	1.0		
		(LL)	0.312	0.502	0.989	0.013	0.017	0.026	Н	1.0		
l	E → Y	(HH)	0.380	0.675	1.612	0.027	0.042	0.065				
		(LL)	0.227	0.397	0.798	0.012	0.017	0.025				
l	$F \rightarrow Y$	(HH)	0.392	0.707	1.726	0.027	0.042	0.065				
l		(LL)	0.256	0.434	0.864	0.012 0.027	0.017	0.025				
	$G \rightarrow Y$	(HH)	0.433 0.300	0.762 0.486	1.866 0.963	0.027	0.042 0.017	0.065 0.026				
	H → Y	(LL) (HH)	0.430	0.466	1.875	0.013	0.017	0.026				
l	⊓ → 1	(LL)	0.430	0.701	0.991	0.027	0.042	0.003				
F338	A → Y	(HH)	0.562	1.033	2.409	0.007	0.017	0.026	A	1.0	Y	45
1 330	^ → '	(LL)	0.355	0.651	1.375	0.006	0.008	0.011	В	1.0	l '	40
	$B \rightarrow Y$	(HH)	0.574	1.064	2.525	0.007	0.011	0.016	C	1.0		
	57'	(LL)	0.386	0.688	1.443	0.006	0.008	0.011	D	1.0		
	C → Y	(HH)	0.616	1.118	2.665	0.007	0.011	0.016	E	1.0		
		(LL)	0.432	0.740	1.543	0.006	0.008	0.011	F	1.0		
l	$D \rightarrow Y$	(HH)	0.613	1.117	2.674	0.007	0.011	0.016	G	1.0		
l		(LL)	0.445	0.759	1.572	0.006	0.008	0.011	Н	1.0		
l	E → Y	(HH)	0.559	1.031	2.380	0.007	0.011	0.016				
I		(LL)	0.375	0.683	1.434	0.006	0.008	0.011				
I	$F \rightarrow Y$	(HH)	0.569	1.062	2.495	0.007	0.011	0.016				
I		(LL)	0.406	0.721	1.502	0.006	0.008	0.011				
I	$G \rightarrow Y$	(HH)	0.610	1.116	2.635	0.007	0.011	0.016				
		(LL)	0.453	0.774	1.604	0.006	0.008	0.011			1	
I	$H \rightarrow Y$	(HH)	0.607	1.115	2.644	0.007	0.011	0.016				
		(LL)	0.468	0.794	1.635	0.006	0.008	0.011				

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2.5 AND-NOR

Chapter 2 Function Block

Function	1-2-ln _l	put AN	ID-NOR									
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	. D	with inv	ν. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L421	2										
x1	F421	3										
x2												
x4												
x8												
Block type	with inv	. F	with in	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
C H03- B H02- A H01-)		NO1 Y	gic Dia	agram for "	with ir	v. A type"	Logi	ic Diagram	itor "w	ith inv. B t	ype"
Logic Diagran	n for "with i	nv. C t	ype" Lc	gic Dia	agram for "	with ir	v. D type"	Logi	ic Diagram	ı for "w	vith inv. E t	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

				Swite	ching sp	eed							
Block		Path	1	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L421	Α	→ Y	(HL)	0.100	0.138	0.211	0.022	0.029	0.041	Α	1.0	Y	3
			(LH)	0.097	0.291	0.576	0.040	0.084	0.123	В	1.0		
	В	→ Y	(HL)	0.154	0.227	0.436	0.035	0.052	0.085	С	1.0		
			(LH)	0.115	0.229	0.481	0.052	0.079	0.116				
	С	→ Y	(HL)	0.153	0.229	0.482	0.035	0.052	0.085				
			(LH)	0.209	0.347	0.714	0.057	0.084	0.123				
F421	Α	→ Y	(HL)	0.092	0.123	0.196	0.012	0.015	0.021	Α	2.1	Y	8
			(LH)	0.109	0.196	0.396	0.022	0.042	0.062	В	2.0		
	В	→ Y	(HL)	0.140	0.201	0.408	0.017	0.026	0.043	С	2.0		
			(LH)	0.150	0.260	0.555	0.029	0.043	0.062				
I	С	→ Y	(HL)	0.140	0.201	0.408	0.017	0.026	0.043				
			(LH)	0.150	0.260	0.555	0.029	0.043	0.062				

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Chapter 2 Function Block

Function	1-1-2-	Input /	AND-NOF	3								
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. с	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F422	4										
x2												
x4												
x8												
Block type	with inv	ν. F	with in	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram D H04 C H03 B H02 A H01 Logic Diagram		0-1	NO1 Y		agram for "				ic Diagram			
Logic Diagram	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	ov. G type"	Logi	ic Diagram	n for "w	rith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F422	$A \rightarrow Y$	(HL)	0.100	0.134	0.214	0.012	0.015	0.021	Α	2.1	Υ	3
		(LH)	0.146	0.240	0.545	0.037	0.065	0.095	В	2.0		
l .	$B \to Y$	(HL)	0.125	0.166	0.260	0.012	0.015	0.022	С	2.0		
l .		(LH)	0.192	0.420	0.913	0.038	0.065	0.095	D	2.0		
l .	$C \rightarrow Y$	(HL)	0.157	0.227	0.482	0.018	0.027	0.045				
		(LH)	0.269	0.469	1.012	0.045	0.065	0.095				
	$D \rightarrow Y$	(HL)	0.157	0.227	0.483	0.018	0.027	0.045				
		(LH)	0.269	0.469	1.012	0.045	0.065	0.095				

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Chapter 2 Function Block

Function	1-3-Iոլ	put AN	ID-NOR									
Block type	Norma	al	with inv	. А	with inv	. В	with inv	. С	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L423	2										
x1	F423	4										
x2												
x4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	ith inv. B ty	/pe"
D H04- C H03- B H02- A H01- Logic Diagran	n for "with i		ype" Lo	gic Dia	agram for '	with in	v. D type"	Logi	ic Diagran	ı for "w	ith inv. E ty	/pe"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with in	v. G type"	Logi	ic Diagran	ı for "w	ith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Pa	th	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L423	A →	Y (HL)	0.099	0.138	0.211	0.022	0.029	0.041	Α	1.0	Υ	3
		(LH)	0.094	0.351	0.683	0.036	0.085	0.125	В	1.0		
	В →	Y (HL)	0.167	0.269	0.581	0.047	0.073	0.126	С	1.0		
		(LH)	0.112	0.227	0.480	0.052	0.078	0.116	D	1.0		
	C →	Y (HL)	0.194	0.309	0.713	0.047	0.073	0.126				
		(LH)	0.207	0.350	0.729	0.057	0.084	0.123				
	D →	Y (HL)	0.187	0.305	0.722	0.047	0.073	0.126				
		(LH)	0.242	0.397	0.808	0.057	0.084	0.124				
F423	A →	Y (HL)	0.080	0.114	0.180	0.012	0.015	0.021	Α	2.1	Y	8
		(LH)	0.084	0.253	0.495	0.020	0.043	0.064	В	2.0		
	В →	Y (HL)	0.168	0.263	0.602	0.024	0.038	0.066	С	2.0		
		(LH)	0.172	0.298	0.612	0.029	0.043	0.063	D	2.0		
	C →	Y (HL)	0.186	0.287	0.666	0.024	0.038	0.065				
		(LH)	0.203	0.336	0.695	0.029	0.043	0.063				
	D →	Y (HL)	0.168	0.264	0.604	0.024	0.038	0.066				
		(LH)	0.172	0.299	0.613	0.029	0.043	0.063				

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Chapter 2 Function Block

Function	2-2-Inp	out AN	ID-NOR									
Block type	Norma	al	with inv	. А	with inv	. В	with inv	. С	with inv	. D	with inv	и. Е
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L424	2										
x1	F424	4										
x2												
x4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	n for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	n for "w	rith inv. B ty	ype"
D H04- C H03- B H02- A H01- Logic Diagran	n for "with i		ype" Lo	gic Dia	agram for "	with in	v. D type"	Logi	ic Diagran	ı for "w	rith inv. E t	ype"
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for '	with in	v. G type"	Logi	ic Diagran	ı for "w	rith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L424	$A \ \to Y$	(HL)	0.142	0.193	0.362	0.034	0.050	0.081	Α	1.0	Υ	2
l .		(LH)	0.132	0.273	0.579	0.044	0.084	0.123	В	1.0		
	$B \ \to Y$	(HL)	0.124	0.177	0.367	0.034	0.050	0.081	С	1.0		
		(LH)	0.164	0.331	0.694	0.044	0.084	0.122	D	1.0		
l .	$C \rightarrow Y$	(HL)	0.196	0.302	0.615	0.034	0.051	0.084				
		(LH)	0.151	0.384	0.812	0.044	0.084	0.123				
	$D \ \to Y$	(HL)	0.176	0.286	0.619	0.034	0.051	0.084				
		(LH)	0.184	0.445	0.926	0.043	0.084	0.122				
F424	$A \ \to \ Y$	(HL)	0.161	0.236	0.479	0.017	0.025	0.041	Α	2.1	Y	4
		(LH)	0.179	0.354	0.727	0.022	0.042	0.062	В	2.1		
l .	$B \ \to Y$	(HL)	0.161	0.236	0.479	0.017	0.025	0.041	С	2.0		
l .		(LH)	0.179	0.355	0.728	0.022	0.042	0.062	D	2.0		
	$C \rightarrow Y$	(HL)	0.194	0.310	0.651	0.017	0.025	0.042				
		(LH)	0.182	0.412	0.864	0.022	0.042	0.061				
	$D \ \to Y$	(HL)	0.194	0.310	0.651	0.017	0.025	0.042				
		(LH)	0.182	0.412	0.864	0.022	0.042	0.061				

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Chapter 2 Function Block

Function	2-3-ln	put AN	ID-NOR									
Block type	Norma	al	with in	ıv. A	with inv	и. В	with inv	. C	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F427	5										
x2												
x4												
x8												
Block type	with inv	. F	with ir	ıv. G	with inv	<u>.</u> Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						Ш
Low Power												
x1												ш
x2												
x4												
x8												
Logic Diagram	for "Norm	nal"	L	ogic Dia	agram for '	with in	v. A type"	Logi	c Diagram	n for "w	vith inv. B t	уре"
D H04+ C H03+ B H02+)o- N	N01 Y									
A H01-	<u>ب</u> کر											
Logic Diagram	for "with i	inv C t	vne" I	onic Di	agram for '	with in	v D tvne"	Logi	c Diagram	for "w	ith inv F t	vne"
Logio Diagran	1101 With 1		,,,,,	ogio Di	agram ioi	***************************************	v. D typo	Logi	o Biagian	1101 1	, , , , , , , , , , , , , , , , , , ,	,,,,
			_									
Logic Diagram	for "with i	nv. F ty	/pe" L	ogic Di	agram for '	with in	v. G type"	Logi	c Diagram	for "w	ith inv. H	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F427	$A \rightarrow Y$	(HL)	0.183	0.358	0.752	0.017	0.027	0.045	Α	2.0	Y	5
		(LH)	0.160	0.503	1.032	0.020	0.043	0.063	В	2.0		
l .	$B \ \to Y$	(HL)	0.183	0.358	0.752	0.017	0.027	0.045	С	2.1		
l .		(LH)	0.160	0.503	1.032	0.020	0.043	0.063	D	2.1		
l .	$C \rightarrow Y$	(HL)	0.159	0.242	0.537	0.024	0.036	0.063	E	2.1		
l .		(LH)	0.164	0.304	0.632	0.022	0.042	0.063				
l .	$D \ \to Y$	(HL)	0.175	0.262	0.600	0.024	0.036	0.063				
l .		(LH)	0.187	0.337	0.708	0.022	0.042	0.062				
l .	$E \to Y$	(HL)	0.158	0.241	0.536	0.024	0.036	0.063				
		(LH)	0.164	0.303	0.630	0.022	0.042	0.063				

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Chapter 2 Function Block

Function	1-2-2-	Input /	AND-NOF	₹								
Block type	Norma	al	with in	/. A	with inv	. B	with inv	. С	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F428	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	n for "Norm	nal"	Lo	gic Dia	agram for "	'with ir	v. A type"	Logi	c Diagram	for "w	ith inv. B t	уре"
D H04- C H03- B H02- A H01+)o→ N	N01 Y									
Logic Diagram	n for "with i	nv. C t	ype" Lo	gic Dia	agram for "	with ir	v. D type"	Logi	c Diagram	i for "w	ith inv. E t	ype"
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	c Diagram	n for "w	ith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F428	$A \rightarrow Y$	(HL)	0.113	0.145	0.230	0.012	0.015	0.021	Α	2.1	Y	2
		(LH)	0.155	0.321	0.718	0.030	0.063	0.093	В	2.0		
	$B \to Y$	(HL)	0.166	0.237	0.492	0.017	0.026	0.042	С	2.0		
		(LH)	0.243	0.485	1.071	0.037	0.063	0.093	D	2.0		
	$C \rightarrow Y$	(HL)	0.166	0.237	0.492	0.017	0.026	0.042	E	2.0		
		(LH)	0.243	0.486	1.071	0.037	0.063	0.093				
	$D \rightarrow Y$	(HL)	0.180	0.257	0.563	0.018	0.028	0.047				
		(LH)	0.312	0.622	1.309	0.037	0.064	0.093				
	$E \rightarrow Y$	(HL)	0.180	0.257	0.563	0.018	0.028	0.047				
		(LH)	0.312	0.622	1.310	0.037	0.064	0.093				

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Chapter 2 Function Block

Function	2-2-2-	2-Inpu	t AND-N	OR								
Block type	Norma	al	with ir	v. A	with inv	. В	with inv	. С	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L429	6										
x1	F429	6										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	n for "Norm	nal"	L	ogic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	vith inv. B ty	уре"
H H08- G H07- F H06- E H05- D H04- C H03- B H02- A H01-	O NO	01Y										
Logic Diagram	n for "with i	inv. C ty	ype" L	ogic Dia	agram for "	with ir	v. D type"	Logi	ic Diagram	ı for "w	vith inv. E ty	ype"
Logic Diagram	n for "with i	inv. F ty	/pe" L	ogic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L429	$A \rightarrow Y$	(HL)	0.330	0.545	1.168	0.022	0.029	0.043	Α	1.0	Y	10
l		(LH)	0.365	0.758	1.677	0.029	0.043	0.063	В	1.0		
l	$B \rightarrow Y$	(HL)	0.314	0.529	1.174	0.022	0.029	0.043	С	1.0		
l		(LH)	0.410	0.829	1.802	0.029	0.043	0.063	D	1.0		
	$C \rightarrow Y$	(HL)	0.396	0.649	1.419	0.022	0.029	0.043	E	1.0		
		(LH)	0.387	0.868	1.907	0.029	0.043	0.063	F	1.0		
	$D \rightarrow Y$	(HL)	0.376	0.633	1.423	0.022	0.029	0.043	G	1.0		
		(LH)	0.432	0.942	2.032	0.029	0.043	0.063	Н	1.0		
	$E \rightarrow Y$	(HL)	0.359	0.583	1.239	0.022	0.029	0.043				
l		(LH)	0.355	0.716	1.578	0.029	0.043	0.063				
l	$F \rightarrow Y$	(HL)	0.343	0.566	1.244	0.022	0.029	0.043				
l		(LH)	0.396	0.785	1.698	0.029	0.043	0.063				
	$G \rightarrow Y$	(HL)	0.428	0.687	1.489	0.022	0.029	0.043				
l		(LH)	0.373	0.827	1.808	0.029	0.043	0.063				
l	$H \rightarrow Y$	(HL)	0.407	0.671	1.493	0.022	0.029	0.043				
		(LH)	0.415	0.898	1.930	0.029	0.043	0.063				
F429	$A \rightarrow Y$	(HL)	0.342	0.582	1.250	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.376	0.799	1.777	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.326	0.566	1.256	0.011	0.015	0.023	С	1.0		
		(LH)	0.422	0.870	1.902	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.410	0.686	1.498	0.011	0.015	0.023	E	1.0		
		(LH)	0.400	0.909	2.007	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.390	0.669	1.502	0.011	0.015	0.023	G	1.0		
		(LH)	0.446	0.983	2.132	0.015	0.022	0.033	Н	1.0		
	$E \rightarrow Y$	(HL)	0.369	0.616	1.315	0.011	0.015	0.023				
		(LH)	0.361	0.747	1.660	0.015	0.022	0.033				
	$F \rightarrow Y$	(HL)	0.352	0.599	1.320	0.011	0.015	0.023				
		(LH)	0.403	0.815	1.781	0.015	0.022	0.033				
	$G \rightarrow Y$	(HL)	0.438	0.721	1.563	0.011	0.015	0.023				
		(LH)	0.380	0.858	1.891	0.015	0.022	0.033				
I	$H \rightarrow Y$	(HL)	0.417	0.704	1.567	0.011	0.015	0.023				
		(LH)	0.423	0.929	2.011	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	1-4-ln	put AN	ND-NOR									
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. C	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F440	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						Ш
Low Power												
x1												\Box
x2												
x4												\perp
x8								\sqcup				
Logic Diagran		> • • •	N01 Y		agram for "				ic Diagram			
Logic Diagran	n for "with i	inv. F ty	ype" Lo	ogic Dia	agram for '	with in	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed					_		
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	$IN \rightarrow$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F440	$A \rightarrow Y$	(HL)	0.094	0.126	0.198	0.012	0.015	0.021	Α	2.1	Υ	3
		(LH)	0.101	0.274	0.539	0.019	0.044	0.065	В	2.1		
	$B \to Y$	(HL)	0.238	0.387	0.953	0.031	0.049	0.087	С	2.0		
		(LH)	0.219	0.361	0.727	0.030	0.044	0.064	D	2.0		
	$C \rightarrow Y$	(HL)	0.246	0.404	1.004	0.031	0.049	0.087	E	2.1		
		(LH)	0.232	0.382	0.780	0.029	0.043	0.063				
	$D \ \to Y$	(HL)	0.246	0.404	1.004	0.031	0.049	0.087				
		(LH)	0.232	0.382	0.780	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.238	0.387	0.953	0.031	0.049	0.087				
		(LH)	0.218	0.361	0.728	0.030	0.044	0.064				

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Chapter 2 Function Block

Function	1-5-In	put AN	ID-NOR									
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. C	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L441	5										
x1	F441	7										
x2												
x4												Ш
x8												
Block type	with inv	. F	with in	v. G	with inv	. н	-	.	-		-	
Drivability	Name	cells	Name	cells	Name	cells						ш
Low Power												
x1												ш
x2												
x4												ш
x8												
Logic Diagran	n for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	vith inv. B t	уре"
E H05	n for "with i	nv. C t		ogic Dia	agram for '	with ir	v. D type"	Logi	ic Diagram	ı for "w	/ith inv. E t	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	ogic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L441	$A \rightarrow Y$	(HL)	0.099	0.136	0.210	0.022	0.029	0.041	Α	1.0	Υ	3
		(LH)	0.096	0.287	0.569	0.040	0.084	0.124	В	1.0		
	$B \to Y$	(HL)	0.343	0.585	1.278	0.035	0.052	0.085	С	1.0		
		(LH)	0.298	0.525	1.100	0.052	0.078	0.116	D	1.0		
	$C \rightarrow Y$	(HL)	0.329	0.569	1.285	0.035	0.052	0.085	E	1.0		
		(LH)	0.330	0.561	1.161	0.052	0.078	0.116	F	1.0		
	$D \rightarrow Y$	(HL)	0.434	0.732	1.667	0.035	0.052	0.085				
		(LH)	0.418	0.689	1.429	0.057	0.084	0.123				
	$E \to Y$	(HL)	0.433	0.742	1.731	0.035	0.052	0.085				
		(LH)	0.449	0.726	1.494	0.057	0.084	0.123				
	$F \rightarrow Y$	(HL)	0.448	0.761	1.787	0.035	0.052	0.085				
		(LH)	0.487	0.769	1.574	0.057	0.084	0.123				
F441	$A \rightarrow Y$	(HL)	0.093	0.124	0.197	0.012	0.015	0.021	Α	2.1	Y	8
		(LH)	0.111	0.197	0.398	0.022	0.042	0.062	В	1.0		
	$B \to Y$	(HL)	0.376	0.629	1.375	0.018	0.026	0.044	С	1.0		
		(LH)	0.360	0.602	1.262	0.029	0.043	0.062	D	1.0		
	$C \rightarrow Y$	(HL)	0.363	0.613	1.382	0.018	0.026	0.044	E	1.0		
		(LH)	0.392	0.638	1.324	0.029	0.043	0.062	F	1.0		
	$D \rightarrow Y$	(HL)	0.457	0.784	1.781	0.018	0.026	0.044				
		(LH)	0.386	0.657	1.371	0.029	0.043	0.062				
l .	$E \to Y$	(HL)	0.456	0.794	1.844	0.018	0.026	0.044				
l .		(LH)	0.417	0.692	1.437	0.029	0.043	0.062				
l	$F \rightarrow Y$	(HL)	0.472	0.814	1.902	0.018	0.026	0.044				
		(LH)	0.456	0.737	1.521	0.029	0.043	0.062				

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Chapter 2 Function Block

Function	4-4-4-	Input A	AND-NOF	}								
Block type	Norma	al	with in	/. A	with inv	. B	with inv	. C	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L444	8										
x1	F444	8										
x2												
x4												
x8												
Block type	with inv	. F	with in	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												\perp
x2												
x4												
x8												
Logic Diagram		NO1 Y			agram for '				c Diagram			
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for '	'with in	v. G type"	Logi	c Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

B			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L444	$A \rightarrow Y$	(HL)	0.394	0.683	1.592	0.022	0.030	0.044	Α	1.0	Y	10
		(LH)	0.300	0.535	1.170	0.029	0.042	0.062	В	1.0		
	$B \rightarrow Y$	(HL)	0.406	0.714	1.708	0.022	0.030	0.044	С	1.0		
		(LH)	0.331	0.572	1.237	0.029	0.042	0.062	D	1.0		
	$C \rightarrow Y$	(HL)	0.446	0.768	1.848	0.022	0.030	0.044	E	1.0		
		(LH)	0.379	0.624	1.337	0.029	0.043	0.062	F	1.0		
	$D \rightarrow Y$	(HL)	0.444	0.767	1.857	0.022	0.030	0.044	G	1.0		
		(LH)	0.394	0.643	1.366	0.029	0.043	0.063	H	1.0		
	$E \rightarrow Y$	(HL)	0.479	0.867	1.955	0.022	0.030	0.044	1	1.0		
l .		(LH)	0.362	0.942	1.997	0.029	0.043	0.063	J	1.0		
	$F \rightarrow Y$	(HL)	0.491	0.898	2.068	0.022	0.030	0.044	K	1.0		
		(LH) (HL)	0.398 0.533	1.017 0.952	2.138 2.208	0.029 0.022	0.043	0.063 0.044	L	1.0		
	G → Y		0.555	1.144	2.206	0.022	0.030	0.044				
	$H \rightarrow Y$	(LH) (HL)	0.434	0.951	2.376	0.029	0.043	0.063				
	⊓ → 1	(LH)	0.330	1.197	2.469	0.022	0.030	0.044				
	$I \rightarrow Y$	(LIT) (HL)	0.742	1.348	3.184	0.029	0.043	0.003				
	' → '	(LH)	0.424	1.188	2.487	0.029	0.043	0.063				
	$J \rightarrow Y$	(HL)	0.757	1.380	3.293	0.022	0.030	0.044				
	J J J I	(LH)	0.461	1.265	2.627	0.029	0.043	0.063				
	$K \rightarrow Y$	(HL)	0.803	1.437	3.433	0.022	0.030	0.044				
	" 7 1	(LH)	0.521	1.392	2.865	0.029	0.043	0.063				
	$L \rightarrow Y$	(HL)	0.801	1.436	3.442	0.022	0.030	0.044				
		(LH)	0.544	1.446	2.956	0.029	0.043	0.063				
F444	$A \rightarrow Y$	(HL)	0.406	0.722	1.686	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.301	0.555	1.231	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.418	0.752	1.801	0.011	0.015	0.023	С	1.0		
		(LH)	0.333	0.592	1.299	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.458	0.807	1.941	0.011	0.015	0.023	E	1.0		
		(LH)	0.383	0.646	1.401	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.456	0.805	1.950	0.011	0.015	0.023	G	1.0		
		(LH)	0.399	0.666	1.433	0.015	0.022	0.033	Н	1.0		
l .	$E \rightarrow Y$	(HL)	0.489	0.916	2.073	0.011	0.015	0.023		1.0		
l .		(LH)	0.363	0.971	2.073	0.015	0.022	0.033	J	1.0		
	$F \rightarrow Y$	(HL)	0.501	0.947	2.186	0.011	0.015	0.023	K	1.0		
		(LH)	0.399	1.045	2.214	0.015	0.022	0.033	L	1.0		
	G → Y	(HL)	0.543	1.000	2.326	0.011	0.015	0.023				
		(LH)	0.456	1.173	2.453	0.015	0.022	0.033				
	H → Y	(HL)	0.541 0.478	1.000 1.227	2.336 2.545	0.011 0.015	0.015 0.022	0.023 0.033				
	, ,	(LH)	ı		1							
	$I \rightarrow Y$	(HL)	0.751 0.426	1.385 1.213	3.277 2.559	0.011 0.015	0.015 0.022	0.023 0.033				
	$J \rightarrow Y$	(LH) (HL)	0.426	1.418	3.386	0.015	0.022	0.033				
] J → Y	(HL)	0.765	1.290	2.699	0.011	0.015	0.023				
	$K \rightarrow Y$	(Ln) (HL)	0.464	1.475	3.526	0.015	0.022	0.033				
		(LH)	0.525	1.418	2.937	0.011	0.013	0.023				
	$L \rightarrow Y$	(HL)	0.810	1.474	3.535	0.013	0.022	0.023				
		(LH)	0.548	1.474	3.028	0.011	0.013	0.023				
		(=11)	0.040	1.77.7	0.020	3.010	0.022	5.000				

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Chapter 2 Function Block

Function	1-1-1-	2-Inpu	it AND-N	OR								
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. с	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L446	4										
x1	F446	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram E H05- D H04- C H03- B H02- A H01- Logic Diagram		>	N01 Y		agram for "				ic Diagram			
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	ogic Dia	agram for '	with ir	ov. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns)			t 1] In	put	Ou	tput
type	IN → (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L446	$A \rightarrow Y$	(HL)	0.255	0.422	0.842	0.022	0.029	0.043	Α	1.0	Υ	10
l .		(LH)	0.343	0.602	1.346	0.029	0.043	0.063	В	1.0		
l .	$B \ \to Y$	(HL)	0.271	0.442	0.877	0.022	0.029	0.043	С	1.0		
l .		(LH)	0.331	0.613	1.406	0.029	0.043	0.063	D	1.0		
	$C \rightarrow Y$	(HL)	0.288	0.483	0.950	0.022	0.029	0.043	E	1.0		
		(LH)	0.311	0.744	1.591	0.029	0.043	0.063				
l .	$D \ \to Y$	(HL)	0.378	0.616	1.305	0.022	0.029	0.043				
l .		(LH)	0.349	0.646	1.446	0.029	0.043	0.063				
l .	$E \to Y$	(HL)	0.379	0.618	1.350	0.022	0.029	0.043				
		(LH)	0.475	0.795	1.719	0.029	0.043	0.063				
F446	$A \rightarrow Y$	(HL)	0.265	0.451	0.903	0.011	0.015	0.023	Α	1.0	Y	21
l .		(LH)	0.356	0.641	1.441	0.015	0.022	0.033	В	1.0		
l .	$B \ \to Y$	(HL)	0.281	0.471	0.939	0.011	0.015	0.023	С	1.0		
l .		(LH)	0.344	0.653	1.500	0.015	0.022	0.033	D	1.0		
l .	$C \rightarrow Y$	(HL)	0.295	0.511	1.013	0.011	0.015	0.023	E	1.0		
l .		(LH)	0.316	0.773	1.668	0.015	0.022	0.033				
l .	$D \ \to Y$	(HL)	0.387	0.649	1.378	0.011	0.015	0.023				
		(LH)	0.357	0.677	1.527	0.015	0.022	0.033				
	$E \to Y$	(HL)	0.388	0.651	1.423	0.011	0.015	0.023				
		(LH)	0.481	0.823	1.796	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	1-1-1-	3-Inpu	ıt AND-N	OR								
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. С	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L447	5										
x1	F447	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												\perp
x2												
x4												
x8												
Logic Diagram F H06		>	N01 Y		agram for '				c Diagram			
Logic Diagram	n for "with i	inv. F ty	/pe" Lo	ogic Dia	agram for "	with in	v. G type"	Logi	c Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

B			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns)	ı		t 1		l In	put	Ou	tput
type	IN \rightarrow C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L447	$A \rightarrow Y$	(HL)	0.262	0.430	0.856	0.022	0.029	0.043	Α	1.0	Υ	10
		(LH)	0.349	0.612	1.362	0.030	0.044	0.064	В	1.0		
	$B \ \to Y$	(HL)	0.278	0.451	0.891	0.022	0.029	0.043	С	1.0		
		(LH)	0.337	0.623	1.420	0.030	0.044	0.064	D	1.0		
	$C \rightarrow Y$	(HL)	0.290	0.492	0.967	0.022	0.029	0.043	E	1.0		
		(LH)	0.304	0.818	1.719	0.030	0.044	0.064	F	1.0		
	$D \ \to Y$	(HL)	0.418	0.710	1.582	0.022	0.029	0.043				
		(LH)	0.349	0.649	1.454	0.030	0.044	0.064				
	$E \to Y$	(HL)	0.446	0.749	1.713	0.022	0.029	0.043				
		(LH)	0.472	0.798	1.736	0.030	0.044	0.064				
	$F \rightarrow Y$	(HL)	0.438	0.745	1.722	0.022	0.029	0.043				
		(LH)	0.518	0.855	1.831	0.030	0.044	0.064				
F447	$A \ \to \ Y$	(HL)	0.264	0.450	0.903	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.352	0.636	1.433	0.015	0.022	0.033	В	1.0		
	$B \ \to Y$	(HL)	0.280	0.471	0.939	0.011	0.015	0.023	С	1.0		
		(LH)	0.340	0.647	1.493	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.301	0.527	1.040	0.011	0.015	0.023	E	1.0		
		(LH)	0.313	0.861	1.818	0.015	0.022	0.033	F	1.0		
	$D \ \to Y$	(HL)	0.437	0.760	1.689	0.011	0.015	0.023				
		(LH)	0.364	0.690	1.549	0.015	0.022	0.033				
	$E \to Y$	(HL)	0.466	0.801	1.823	0.011	0.015	0.023				
		(LH)	0.492	0.844	1.837	0.015	0.022	0.033				
	$F \to Y$	(HL)	0.458	0.797	1.832	0.011	0.015	0.023				
		(LH)	0.538	0.902	1.932	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	1-1-2-	2-Inpu	it AND-N	OR								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	. D	with inv	/. Ε
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L448	5										
x1	F448	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	/. G	with inv	. н	-	.	-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran F H06 E H05 D H04 C H03 B H02 A H01 Logic Diagran) 0→ N	N01 Y		agram for '				ic Diagram			
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L448	$A \rightarrow Y$	(HL)	0.254	0.419	0.838	0.022	0.029	0.043	Α	1.0	Y	10
		(LH)	0.343	0.602	1.346	0.029	0.043	0.063	В	1.0		
	$B \rightarrow Y$	(HL)	0.270	0.440	0.873	0.022	0.029	0.043	С	1.0		
l .		(LH)	0.331	0.613	1.405	0.029	0.043	0.063	D	1.0		
	$C \rightarrow Y$	(HL)	0.363	0.587	1.246	0.022	0.029	0.043	E	1.0		
		(LH)	0.359	0.723	1.590	0.029	0.043	0.063	F	1.0		
	$D \rightarrow Y$	(HL)	0.346	0.571	1.252	0.022	0.029	0.043				
		(LH)	0.400	0.791	1.711	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.411	0.691	1.496	0.022	0.029	0.043				
		(LH)	0.377	0.834	1.820	0.029	0.043	0.063				
	$F \rightarrow Y$	(HL)	0.391	0.675	1.500	0.022	0.029	0.043				
		(LH)	0.419	0.905	1.941	0.029	0.043	0.063				
F448	$A \rightarrow Y$	(HL)	0.264	0.450	0.902	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.352	0.635	1.432	0.015	0.022	0.033	В	1.0		
	$B \to Y$	(HL)	0.280	0.470	0.938	0.011	0.015	0.023	С	1.0		
		(LH)	0.340	0.647	1.491	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.383	0.636	1.348	0.011	0.015	0.023	E	1.0		
		(LH)	0.379	0.779	1.707	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.365	0.620	1.353	0.011	0.015	0.023				
		(LH)	0.420	0.846	1.828	0.015	0.022	0.033				
	$E \rightarrow Y$	(HL)	0.432	0.741	1.597	0.011	0.015	0.023				
l .		(LH)	0.398	0.890	1.939	0.015	0.022	0.033				
l .	$F \rightarrow Y$	(HL)	0.411	0.724	1.601	0.011	0.015	0.023				
		(LH)	0.441	0.960	2.059	0.015	0.022	0.033				

 Block Library
 A15895EJ1V0BL
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 Block Library
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Chapter 2 Function Block

Function	3-3-3-	3-Inpu	t AND-N	IOR								
Block type	Norma	al	with i	nv. A	with inv	. В	with inv	. с	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F449	8										
x2												
x4												
x8												
Block type	with inv	. F	with i	nv. G	with inv	. н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	n for "Norm	nal"	L	ogic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	vith inv. B ty	уре"
L H12 J H109 H H08 H H08 E H06 D H04 B H02 A H01 L H08 L H08 B H02 A H01 L H08 B H02 B H02 B H02 B H02 B H02 B H02 B H02 B H03 B H03 B H03 B H04 B H04		no1 Y	ype" L	ogic Dia	agram for "	with ir	ıv. D type"	Logi	ic Diagram	ı for "w	/ith inv. E t	ype"
Logic Diagran	n for "with i	nv. F ty	/pe" L	ogic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	n for "w	ith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F449	$A \rightarrow Y$	(HL)	0.380	0.731	1.603	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.335	0.952	2.044	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.408	0.771	1.738	0.011	0.015	0.023	С	1.0		
		(LH)	0.424	1.092	2.309	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.401	0.766	1.747	0.011	0.015	0.023	E	1.0		
		(LH)	0.455	1.155	2.420	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.461	0.944	2.149	0.011	0.015	0.023	G	1.0		
		(LH)	0.379	1.103	2.357	0.015	0.022	0.033	Н	1.0		
	$E \rightarrow Y$	(HL)	0.489	0.984	2.280	0.011	0.015	0.023	1	1.0		
		(LH)	0.468	1.245	2.616	0.015	0.022	0.033	J	1.0		
	$F \rightarrow Y$	(HL)	0.481	0.980	2.289	0.011	0.015	0.023	K	1.0		
		(LH)	0.502	1.310	2.727	0.015	0.022	0.033	L	1.0		
	$G \rightarrow Y$	(HL)	0.410	0.777	1.693	0.011	0.015	0.023				
		(LH)	0.328	0.889	1.898	0.015	0.022	0.033				
	$H \rightarrow Y$	(HL)	0.439	0.817	1.828	0.011	0.015	0.023				
		(LH)	0.408	1.023	2.154	0.015	0.022	0.033				
	$I \rightarrow Y$	(HL)	0.431	0.813	1.837	0.011	0.015	0.023				
		(LH)	0.436	1.083	2.259	0.015	0.022	0.033				
	$J \rightarrow Y$	(HL)	0.494	0.986	2.230	0.011	0.015	0.023				
		(LH)	0.362	1.040	2.211	0.015	0.022	0.033				
	$K \rightarrow Y$	(HL)	0.521	1.027	2.361	0.011	0.015	0.023				
		(LH)	0.443	1.177	2.462	0.015	0.022	0.033				
	$L \rightarrow Y$	(HL)	0.514	1.023	2.370	0.011	0.015	0.023				
		(LH)	0.474	1.238	2.566	0.015	0.022	0.033				

 Block Library
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 Block Library
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Chapter 2 Function Block

Function	3-3-3-	Input A	AND-NOF	₹								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	. D	with inv	. Е
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L460	6										
x1	F460	7										
x2												
x4												
x8												
Block type	with inv	/. F	with in	/. G	with inv	. н	-	.	-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												Ш
x2												
x4												Ш
x8												
Logic Diagram	n for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	ı for "w	vith inv. B ty	ype"
F H06+ E H05+ D H04+)o→ M	N01 Y									
C H03+ B H02+ A H01+)_											
Logic Diagran	n for "with i	inv. C t	ype" Lo	gic Dia	agram for "	with ir	v. D type"	Logi	ic Diagram	ı for "w	vith inv. E ty	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

Block	Patl			ching sp	eeu				1.		١ _	
	Pati	n	t I	LD0 (ns))		t 1		l in	put	l Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L460	$A \rightarrow Y$	(HL)	0.373	0.629	1.412	0.022	0.029	0.043	Α	1.0	Y	10
1 1		(LH)	0.301	0.534	1.166	0.029	0.043	0.063	В	1.0		
1 1	$B \rightarrow Y$	(HL)	0.372	0.639	1.475	0.022	0.029	0.043	С	1.0		
1 1		(LH)	0.333	0.571	1.231	0.029	0.043	0.063	D	1.0		
1 1	$C \rightarrow Y$	(HL)	0.388	0.658	1.532	0.022	0.029	0.043	E	1.0		
1 1		(LH)	0.383	0.625	1.329	0.029	0.043	0.063	F	1.0		
1 1	$D \rightarrow Y$	(HL)	0.441	0.815	1.778	0.022	0.029	0.043	G	1.0		
1 1		(LH)	0.350	0.957	2.008	0.029	0.043	0.063	Н	1.0		
1 1	$E \rightarrow Y$	(HL)	0.469	0.855	1.913	0.022	0.029	0.043	1	1.0		
1 1		(LH)	0.432	1.093	2.268	0.029	0.043	0.063				
1 1	$F \rightarrow Y$		0.461	0.851	1.922	0.022	0.029	0.043				
1 1		(LH)	0.461	1.152	2.372	0.029	0.043	0.063				
1 1	$G \rightarrow Y$		0.545	0.970	2.189	0.022	0.029	0.044				
1 1		(LH)	0.371	1.056	2.224	0.029	0.043	0.063				
1 1	$H \rightarrow Y$	(HL)	0.572	1.010	2.319	0.022	0.029	0.044				
1 1		(LH)	0.452	1.191	2.476	0.029	0.043	0.063				
1 1	$I \rightarrow Y$	(HL)	0.565	1.006	2.328	0.022	0.029	0.043				
		(LH)	0.481	1.251	2.579	0.029	0.043	0.063				
F460	$A \rightarrow Y$	(HL)	0.394	0.679	1.519	0.011	0.015	0.023	A	1.0	Y	21
1 1		(LH)	0.313	0.569	1.250	0.015	0.022	0.033	В	1.0		
1 1	$B \rightarrow Y$		0.392	0.689	1.582	0.011	0.015	0.023	С	1.0		
1 1		(LH)	0.344	0.605	1.315	0.015	0.022	0.033	D	1.0		
1 1	$C \rightarrow Y$		0.409	0.710	1.641	0.011	0.015	0.023	E	1.0		
1 1		(LH)	0.393	0.658	1.411	0.015	0.022	0.033	F	1.0		
1 1	$D \rightarrow Y$	(HL)	0.450	0.858	1.883	0.011	0.015	0.023	G	1.0		
1 1		(LH)	0.353	0.990	2.090	0.015	0.022	0.033	Н	1.0		
1 1	$E \to Y$		0.476	0.898	2.015	0.011	0.015	0.023	1	1.0		
1 1		(LH)	0.435	1.123	2.344	0.015	0.022	0.033				
1 1	$F \rightarrow Y$	(HL)	0.469	0.893	2.024	0.011	0.015	0.023				
1 1		(LH)	0.464	1.184	2.449	0.015	0.022	0.033				
1	$G \ \to Y$	(HL)	0.551	1.003	2.269	0.011	0.015	0.023				
1		(LH)	0.373	1.080	2.295	0.015	0.022	0.033				
1	$H \rightarrow Y$	(HL)	0.580	1.045	2.403	0.011	0.015	0.023				
1		(LH)	0.457	1.218	2.550	0.015	0.022	0.033				
	$I \rightarrow Y$	(HL)	0.573	1.041	2.412	0.011	0.015	0.023				
		(LH)	0.486	1.279	2.655	0.015	0.022	0.033				

 Block Library
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 Block Library
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Chapter 2 Function Block

Function	1-1-4-	Input /	AND-NOF	}								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	. D	with inv	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L464	5										
x1	F464	5										
x2												
х4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
F H06- E H05- D H04- C H03- B H02- A H01-	n for "Norm		NO1 Y	gic Dia	agram for "	with ir	v. A type"	Logi	c Diagram	i for "v	vith inv. B t	ype"
Logic Diagram					agram for "						vith inv. E t	
Logic Diagram	i ioi with i	iiv. F t	ype Lo	gic Dia	agram for "	WILLI IF	и. а туре	Logi	с радгап	i iOi "V	viui IIIV. A t	уре

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns))		t 1] In	put	Ou	tput
type	IN → C	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L464	$A \rightarrow Y$	(HL)	0.254	0.419	0.838	0.022	0.029	0.043	Α	1.0	Y	10
		(LH)	0.343	0.602	1.346	0.029	0.043	0.063	В	1.0		
	$B \rightarrow Y$	(HL)	0.270	0.440	0.874	0.022	0.029	0.043	С	1.0		
		(LH)	0.331	0.613	1.405	0.029	0.043	0.063	D	1.0		
	$C \rightarrow Y$	(HL)	0.424	0.721	1.670	0.022	0.029	0.043	E	1.0		
		(LH)	0.292	0.515	1.131	0.029	0.043	0.063	F	1.0		
	$D \rightarrow Y$	(HL)	0.437	0.752	1.785	0.022	0.029	0.043				
		(LH)	0.322	0.550	1.195	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.477	0.806	1.925	0.022	0.029	0.043				
		(LH)	0.365	0.596	1.281	0.029	0.043	0.063				
	$F \rightarrow Y$	(HL)	0.474	0.805	1.934	0.022	0.029	0.043				
		(LH)	0.377	0.611	1.302	0.029	0.043	0.063				
F464	$A \rightarrow Y$	(HL)	0.266	0.452	0.905	0.011	0.015	0.023	Α	1.0	Υ	21
		(LH)	0.358	0.644	1.446	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.282	0.473	0.941	0.011	0.015	0.023	С	1.0		
		(LH)	0.346	0.656	1.505	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.438	0.764	1.768	0.011	0.015	0.023	E	1.0		
		(LH)	0.299	0.544	1.207	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.450	0.794	1.883	0.011	0.015	0.023				
		(LH)	0.329	0.578	1.271	0.015	0.022	0.033				
l .	$E \to Y$	(HL)	0.492	0.851	2.026	0.011	0.015	0.023				
l .		(LH)	0.373	0.626	1.360	0.015	0.022	0.033				
l	$F \rightarrow Y$	(HL)	0.489	0.849	2.035	0.011	0.015	0.023				
		(LH)	0.386	0.641	1.380	0.015	0.022	0.033				

 Block Library
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 Block Library
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Chapter 2 Function Block

Function	1-1-1-	1-2-In	put AND-	NOR								
Block type	Norma	al	with in	v. A	with inv	. B	with inv	. C	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F465	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran F H06 E H05 D H04 C H03 B H02 A H01 Logic Diagran		>	N01 Y		agram for "				ic Diagram			
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	ogic Dia	agram for "	with ir	ov. G type"	Logi	ic Diagram	n for "w	ith inv. H t	ype"

Chapter 2 Function Block

				Swite	ching sp	eed							
Block		Path	1	t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F465	Α	→ Y	(HL)	0.294	0.482	0.965	0.011	0.015	0.023	Α	1.0	Υ	21
			(LH)	0.501	0.858	1.968	0.015	0.022	0.033	В	1.0		
	В	$\to \ Y$	(HL)	0.309	0.503	1.005	0.011	0.015	0.023	С	1.0		
			(LH)	0.517	0.922	2.128	0.015	0.022	0.033	D	1.0		
	С	$\to \ Y$	(HL)	0.322	0.521	1.045	0.011	0.015	0.023	E	1.0		
			(LH)	0.549	1.010	2.274	0.015	0.022	0.033	F	1.0		
	D	$\rightarrow Y$	(HL)	0.295	0.511	1.013	0.011	0.015	0.023				
			(LH)	0.316	0.777	1.675	0.015	0.022	0.033				
	Е	$\rightarrow Y$	(HL)	0.388	0.650	1.380	0.011	0.015	0.023				
I			(LH)	0.359	0.679	1.530	0.015	0.022	0.033				
I	F	$\to \ Y$	(HL)	0.390	0.653	1.427	0.011	0.015	0.023				
			(LH)	0.487	0.831	1.808	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	4-4-4-Input AND-NOR													
Block type	Norma	al	with	inv.	Α	with in	v. B	with inv	. C	with inv	. D	with inv	/. E	
Drivability	Name	cells	Nan	ne	cells	Name	cells	Name	cells	Name	cells	Name	cells	
Low Power														
x1	F466	10												
x2														
x4														
x8														
Block type	with inv	. F	with	inv.	G	with in	v. H	-		-		-		
Drivability	Name	cells	Nan	ne	cells	Name	cells							
Low Power														
x1														
x2														
x4														
Low Power x1												vith inv. E ty	ype"	

Chapter 2 Function Block

Block			Swite	ching sp	eed							ıtını ıt
1	Path		t	LDO (ns))		t 1		l In	put	<u> </u>	ıtput
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F466	$A \rightarrow Y$	(HL)	0.473	0.889	2.017	0.011	0.015	0.023	Α	1.0	Y	21
		(LH)	0.392	1.077	2.297	0.015	0.022	0.033	В	1.0		
	$B \rightarrow Y$	(HL)	0.485	0.920	2.130	0.011	0.015	0.023	С	1.0		
		(LH)	0.430	1.154	2.440	0.015	0.022	0.033	D	1.0		
	$C \rightarrow Y$	(HL)	0.527	0.975	2.270	0.011	0.015	0.023	E	1.0		
1		(LH)	0.494	1.288	2.689	0.015	0.022	0.033	F	1.0		
	$D \rightarrow Y$	(HL)	0.524	0.974	2.280	0.011	0.015	0.023	G	1.0		
		(LH)	0.518	1.346	2.787	0.015	0.022	0.033	Н	1.0		
	$E \rightarrow Y$	(HL)	0.727	1.358	3.222	0.011	0.015	0.023	1	1.0		
		(LH)	0.465	1.317	2.778	0.015	0.022	0.033	J	1.0		
	$F \rightarrow Y$	(HL)	0.741	1.391	3.331	0.011	0.015	0.023	K	1.0		
		(LH)	0.505	1.396	2.921	0.015	0.022	0.033	L	1.0		
	$G \rightarrow Y$	(HL)	0.787	1.447	3.471	0.011	0.015	0.023	M	1.0		
		(LH)	0.572	1.530	3.167	0.015	0.022	0.033	N	1.0		
	$H \rightarrow Y$	(HL)	0.785	1.446	3.480	0.011	0.015	0.023	0	1.0		
		(LH)	0.598	1.589	3.266	0.015	0.022	0.033	Р	1.0		
	$I \rightarrow Y$	(HL)	0.504	0.940	2.115	0.011	0.015	0.023				
		(LH)	0.375	0.995	2.106	0.015	0.022	0.033				
	$J \rightarrow Y$	(HL)	0.516	0.971	2.227	0.011	0.015	0.023				
		(LH)	0.411	1.069	2.246	0.015	0.022	0.033				
	$K \rightarrow Y$	(HL)	0.558	1.025	2.367	0.011	0.015	0.023				
		(LH)	0.469	1.197	2.486	0.015	0.022	0.033				
	$L \rightarrow Y$	(HL)	0.555	1.024	2.377	0.011	0.015	0.023				
		(LH)	0.490	1.251	2.578	0.015	0.022	0.033				
	$M \rightarrow Y$	(HL)	0.762	1.402	3.307	0.011	0.015	0.023				
		(LH)	0.443	1.247	2.608	0.015	0.022	0.033				
	$N \rightarrow Y$	(HL)	0.776	1.435	3.415	0.011	0.015	0.023				
		(LH)	0.481	1.324	2.751	0.015	0.022	0.033				
I	O → Y	(HL)	0.822	1.492	3.555	0.011	0.015	0.023				
1		(LH)	0.544	1.456	2.990	0.015	0.022	0.033				
1	$P \rightarrow Y$	(HL)	0.820	1.490	3.563	0.011	0.015	0.023				
		(LH)	0.557	1.493	3.055	0.015	0.022	0.033				

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[MEMO]

2.6 OR-NAND

Chapter 2 Function Block

Function	1-4-ln	put OF	R-NAND									
Block type	Norma	al	with inv	. A	with inv	. В	with inv	. С	with inv	. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L430	4										
x1	F430	5										
x2												
x4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	n for "Norm	nal"	Lo	gic Dia	agram for "	'with in	ıv. A type"	Logi	ic Diagram	n for "w	rith inv. B t	уре"
D H04- C H03- B H02- A H01-)o- N	I01 Y									
Logic Diagram for "with inv. C type" Logic Diagram for "with inv. D type" Logic Diagram for "with inv. D type" Logic Diagram for "with inv. D type"										i for "w	vith inv. E t	ype"
Logic Diagram	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	n for "w	rith inv. H t	ype"

Chapter 2 Function Block

D			Swite	ching sp	eed				J .			
Block	Path		t I	LDO (ns)	ı		t 1		l In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L430	$A \rightarrow Y$	(HL)	0.119	0.159	0.287	0.034	0.049	0.082	Α	1.0	Υ	9
		(LH)	0.081	0.127	0.231	0.029	0.042	0.061	В	1.0		
	$B \ \to Y$	(HL)	0.264	0.436	0.906	0.034	0.050	0.082	С	1.0		
		(LH)	0.369	0.641	1.428	0.029	0.043	0.062	D	1.0		
	$C \rightarrow Y$	(HL)	0.280	0.456	0.941	0.034	0.050	0.082	E	1.0		
		(LH)	0.356	0.653	1.487	0.029	0.043	0.062				
	$D \ \to \ Y$	(HL)	0.286	0.464	0.958	0.034	0.050	0.082				
		(LH)	0.358	0.610	1.357	0.029	0.043	0.062				
	$E \to Y$	(HL)	0.303	0.484	0.994	0.034	0.050	0.082				
		(LH)	0.345	0.622	1.417	0.029	0.043	0.062				
F430	$A \ \to \ Y$	(HL)	0.111	0.154	0.300	0.017	0.025	0.041	Α	2.1	Y	18
		(LH)	0.093	0.142	0.257	0.014	0.021	0.030	В	1.0		
	$B \ \to Y$	(HL)	0.297	0.503	1.043	0.017	0.025	0.041	С	1.0		
		(LH)	0.394	0.699	1.570	0.014	0.021	0.032	D	1.0		
	$C \rightarrow Y$	(HL)	0.313	0.523	1.079	0.017	0.025	0.041	E	1.0		
		(LH)	0.381	0.711	1.629	0.014	0.021	0.032				
	$D \rightarrow Y$	(HL)	0.322	0.532	1.097	0.017	0.025	0.041				
1		(LH)	0.383	0.667	1.496	0.014	0.021	0.032				
1	$E \to Y$	(HL)	0.338	0.554	1.134	0.017	0.025	0.041				
		(LH)	0.370	0.679	1.555	0.014	0.021	0.032				

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Chapter 2 Function Block

Function	1-2-ln _l	put OF	R-NAND									
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. С	with inv	. D	with inv	ν. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L431	2										
x1	F431	3										
x2												
x4												
x8												
Block type	with inv	. F	with in	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	n for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	vith inv. B ty	уре"
B H02- A H01-	n for "with i) 	N01 Y ype" Lo	gic Dia	agram for "	with ir	ıv. D type"	Logi	ic Diagram	ı for "w	/ith inv. E t	ype"
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type ^s	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L431	$A \ \to \ Y$	(HL)	0.112	0.229	0.431	0.028	0.052	0.085	Α	1.0	Υ	3
		(LH)	0.083	0.131	0.236	0.029	0.043	0.061	В	1.0		
l .	$B \ \to Y$	(HL)	0.119	0.165	0.337	0.034	0.050	0.081	С	1.0		
		(LH)	0.191	0.272	0.561	0.057	0.084	0.123				
l .	$C \rightarrow Y$	(HL)	0.153	0.227	0.476	0.035	0.052	0.085				
l .		(LH)	0.207	0.344	0.713	0.057	0.084	0.123				
F431	$A \ \to Y$	(HL)	0.107	0.189	0.342	0.015	0.026	0.042	Α	2.1	Y	8
		(LH)	0.073	0.129	0.230	0.015	0.022	0.031	В	2.0		
	$B \to Y$	(HL)	0.127	0.192	0.396	0.018	0.026	0.042	С	2.0		
		(LH)	0.172	0.283	0.587	0.026	0.039	0.059				
	$C \rightarrow Y$	(HL)	0.127	0.192	0.396	0.018	0.026	0.042				
		(LH)	0.172	0.283	0.587	0.026	0.039	0.059				

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Chapter 2 Function Block

Function	1-1-2-Input OR-NAND													
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. С	with inv	. D	with inv	/. Ε		
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells		
Low Power	L432	2												
x1	F432	4												
x2														
x4														
x8														
Block type	with inv	. F	with in	. G	with inv	. Н	-		-		-			
Drivability	Name	cells	Name	cells	Name	cells								
Low Power														
x1														
x2														
x4														
x8														
Logic Diagram for "Normal" D H04- C H03- B H02- A H01- Logic Diagram for "with inv. A type" Logic Diagram for "with inv. B type" Logic Diagram for "with inv. B type" Logic Diagram for "with inv. B type" Logic Diagram for "with inv. B type" Logic Diagram for "with inv. B type"														
Logic Diagram	i ior "With i	nv. F ty	/pe- Lo	gic Dia	agram for "	with in	iv. G type"	Logi	ic Diagram	i for "W	vith Inv. H t	ype"		

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	1	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L432	$A \rightarrow Y$	(HL)	0.153	0.300	0.651	0.041	0.072	0.125	Α	1.0	Y	2
l .		(LH)	0.097	0.163	0.297	0.029	0.042	0.061	В	1.0		
l .	$B \rightarrow Y$	(HL)	0.144	0.310	0.714	0.041	0.072	0.125	С	1.0		
l .		(LH)	0.120	0.193	0.355	0.028	0.042	0.061	D	1.0		
	$C \rightarrow Y$	(HL)	0.174	0.278	0.649	0.047	0.072	0.125				
l .		(LH)	0.239	0.373	0.766	0.052	0.078	0.117				
	$D \rightarrow Y$	(HL)	0.199	0.326	0.762	0.047	0.072	0.125				
		(LH)	0.230	0.388	0.816	0.052	0.078	0.117				
F432	$A \ \to Y$	(HL)	0.147	0.272	0.605	0.020	0.036	0.063	Α	2.1	Y	5
		(LH)	0.107	0.175	0.322	0.014	0.021	0.031	В	2.1		
l .	$B \rightarrow Y$	(HL)	0.146	0.272	0.605	0.020	0.036	0.063	С	2.0		
l .		(LH)	0.107	0.175	0.322	0.014	0.021	0.031	D	2.0		
	$C \rightarrow Y$	(HL)	0.187	0.301	0.703	0.024	0.036	0.063				
		(LH)	0.234	0.380	0.786	0.026	0.040	0.060				
	$D \ \to Y$	(HL)	0.187	0.301	0.703	0.024	0.036	0.063				
		(LH)	0.234	0.380	0.786	0.026	0.040	0.060				

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Chapter 2 Function Block

Function	1-3-ln _l	put OF	R-NAND									
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	/. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F433	4										
x2												
x4												
x8												
Block type	with inv	. F	with inv	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
D H04- C H03- B H02- A H01-	n for "Norm		Lo No1 Y	gic Dia	agram for '	'with in	v. A type"	Logi	c Diagran	n for "w	ith inv. B t	ype"
Logic Diagran	n for "with i	inv. C t	ype" Lo	gic Dia	agram for '	'with in	v. D type"	Logi	c Diagram	n for "w	ith inv. E t	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for '	'with in	v. G type"	Logi	c Diagran	ı for "w	ith inv. H t	ype"

Chapter 2 Function Block

<u> </u>			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F433	$A \rightarrow Y$	(HL)	0.089	0.204	0.368	0.014	0.027	0.045	Α	2.1	Υ	3
		(LH)	0.063	0.112	0.201	0.015	0.022	0.031	В	2.0		
	$B \to Y$	(HL)	0.135	0.193	0.394	0.018	0.027	0.045	С	2.0		
		(LH)	0.277	0.432	0.926	0.040	0.060	0.091	D	2.1		
	$C \rightarrow Y$	(HL)	0.152	0.224	0.468	0.018	0.027	0.044				
		(LH)	0.307	0.502	1.066	0.040	0.060	0.090				
	$D \rightarrow Y$	(HL)	0.136	0.193	0.394	0.018	0.027	0.045				
		(LH)	0.279	0.433	0.929	0.040	0.060	0.091				

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Chapter 2 Function Block

Function	2-2-ln	put OF	R-NAND									
Block type	Norma	al	with inv	. A	with inv	. В	with inv	. с	with inv	/. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F434	4										
x2												
x4												\Box
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram D H04- C H03- B H02- A H01- Logic Diagram	>)o- N	N01 Y		agram for "				ic Diagram			
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	n for "w	rith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F434	$A \rightarrow Y$	(HL)	0.137	0.245	0.472	0.014	0.026	0.042	Α	2.1	Υ	4
l		(LH)	0.128	0.238	0.499	0.026	0.039	0.059	В	2.1		
l	$B \rightarrow Y$	(HL)	0.137	0.245	0.472	0.014	0.026	0.042	С	2.0		
l		(LH)	0.128	0.238	0.499	0.026	0.039	0.059	D	2.0		
l	$C \rightarrow Y$	(HL)	0.153	0.269	0.559	0.013	0.026	0.042				
l		(LH)	0.234	0.418	0.863	0.026	0.039	0.059				
l	$D \rightarrow Y$	(HL)	0.153	0.269	0.559	0.013	0.026	0.042				
		(LH)	0.234	0.418	0.863	0.026	0.039	0.059				

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Chapter 2 Function Block

Function	1-5-ln	put OF	R-NAND									
Block type	Norma	al	with ir	v. A	with inv	. В	with inv	. с	with inv	. D	with inv	. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L439	5										
x1	F439	6										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	n for "Norm	nal"	L	ogic Dia	agram for "	with ir	v. A type"	Logi	ic Diagram	for "w	vith inv. B ty	уре"
F H06+ E H05+ D H04+ C H03+ B H02+ A H01+)-1	N01 Y									
Logic Diagram	n for "with i	nv. C t	ype" L	ogic Dia	agram for "	with in	ıv. D type"	Logi	ic Diagram	n for "w	vith inv. E ty	уре"
Logic Diagram	n for "with i	nv. F ty	ype" L	ogic Dia	agram for "	with in	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H ty	уре"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN \rightarrow C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L439	$A \rightarrow Y$	(HL)	0.119	0.159	0.287	0.034	0.049	0.082	Α	1.0	Υ	9
		(LH)	0.081	0.127	0.231	0.029	0.042	0.061	В	1.0		
	$B \ \to Y$	(HL)	0.264	0.437	0.908	0.034	0.050	0.082	С	1.0		
		(LH)	0.366	0.637	1.422	0.029	0.043	0.062	D	1.0		
	$C \rightarrow Y$	(HL)	0.280	0.457	0.942	0.034	0.050	0.082	E	1.0		
		(LH)	0.353	0.648	1.481	0.029	0.043	0.062	F	1.0		
	$D \ \to \ Y$	(HL)	0.319	0.500	1.027	0.034	0.050	0.082				
		(LH)	0.488	0.797	1.802	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.334	0.521	1.067	0.034	0.050	0.082				
		(LH)	0.503	0.862	1.963	0.029	0.043	0.063				
	$F \ \to Y$	(HL)	0.347	0.538	1.104	0.034	0.050	0.082				
		(LH)	0.535	0.950	2.109	0.029	0.043	0.063				
F439	$A \ \to \ Y$	(HL)	0.112	0.155	0.301	0.017	0.025	0.041	Α	2.1	Y	18
		(LH)	0.093	0.142	0.257	0.014	0.021	0.030	В	1.0		
	$B \ \to Y$	(HL)	0.293	0.498	1.038	0.017	0.025	0.041	С	1.0		
		(LH)	0.386	0.688	1.551	0.014	0.021	0.032	D	1.0		
	$C \rightarrow Y$	(HL)	0.309	0.519	1.074	0.017	0.025	0.041	E	1.0		
		(LH)	0.374	0.699	1.610	0.014	0.021	0.032	F	1.0		
	$D \ \to Y$	(HL)	0.350	0.563	1.157	0.017	0.025	0.041				
		(LH)	0.518	0.863	1.955	0.014	0.022	0.032				
	$E \to Y$	(HL)	0.365	0.584	1.198	0.017	0.025	0.041				
		(LH)	0.534	0.927	2.115	0.014	0.022	0.032				
	$F \ \to Y$	(HL)	0.379	0.603	1.241	0.017	0.025	0.041				
		(LH)	0.566	1.015	2.261	0.014	0.022	0.032				

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Chapter 2 Function Block

Function	2-4-ln	put OF	R-NAND									
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. C	with inv	. D	with inv	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L450	5										
x1	F450	6										
x2												
x4												
x8												
Block type	with inv	. F	with in	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram for "Normal" Logic Diagram for "with inv. A type" Logic Diagram for "with inv. B type"												
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	ov. G type"	Logi	c Diagram	n for "v	vith inv. H t	ype"

Chapter 2 Function Block

-			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L450	$A \rightarrow Y$	(HL)	0.152	0.233	0.494	0.035	0.052	0.085	Α	1.0	Y	3
		(LH)	0.205	0.341	0.709	0.057	0.084	0.123	В	1.0		
	$B \ \to Y$	(HL)	0.119	0.170	0.350	0.034	0.050	0.082	С	1.0		
		(LH)	0.188	0.269	0.557	0.057	0.084	0.123	D	1.0		
	$C \rightarrow Y$	(HL)	0.262	0.524	1.097	0.028	0.052	0.086	E	1.0		
		(LH)	0.348	0.615	1.371	0.029	0.043	0.063	F	1.0		
	$D \ \to Y$	(HL)	0.278	0.545	1.132	0.028	0.052	0.086				
		(LH)	0.335	0.626	1.430	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.294	0.562	1.162	0.028	0.052	0.086				
		(LH)	0.346	0.598	1.323	0.029	0.043	0.063				
	$F \rightarrow Y$	(HL)	0.310	0.583	1.198	0.028	0.052	0.086				
		(LH)	0.334	0.610	1.383	0.029	0.043	0.063				
F450	$A \ \to \ Y$	(HL)	0.128	0.205	0.428	0.018	0.026	0.043	Α	2.0	Y	7
		(LH)	0.171	0.282	0.586	0.026	0.039	0.059	В	2.0		
	$B \rightarrow Y$	(HL)	0.128	0.205	0.428	0.018	0.026	0.043	С	1.0		
		(LH)	0.171	0.282	0.586	0.026	0.039	0.059	D	1.0		
	$C \rightarrow Y$	(HL)	0.288	0.538	1.122	0.015	0.026	0.043	E	1.0		
		(LH)	0.372	0.678	1.518	0.015	0.023	0.035	F	1.0		
	$D \ \to \ Y$	(HL)	0.304	0.558	1.158	0.015	0.026	0.043				
		(LH)	0.360	0.690	1.578	0.015	0.023	0.035				
	$E \to Y$	(HL)	0.313	0.569	1.178	0.015	0.026	0.044				
		(LH)	0.360	0.645	1.442	0.015	0.023	0.035				
	$F \rightarrow Y$	(HL)	0.329	0.590	1.215	0.015	0.026	0.044				
		(LH)	0.348	0.657	1.501	0.015	0.023	0.035				

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Chapter 2 Function Block

Function	4-4-ln _l	out OF	R-NAND									
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. с	with inv	. D	with inv	. Е
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L451	7										
x1	F451	8										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												Ш
x2												
x4												Ш
x8												
Logic Diagram H H08- G H07- F H08- E H08- C H03- B H02- A H01- Logic Diagram		0-1	NO1 Y		agram for "				ic Diagram			
Logic Diagran	n for "with i	nv. F ty	/pe" Lo	ogic Dia	agram for "	with ir	ıv. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L451	$A \rightarrow Y$	(HL)	0.260	0.442	0.924	0.034	0.050	0.083	Α	1.0	Υ	9
l		(LH)	0.341	0.599	1.347	0.029	0.043	0.063	В	1.0		
l	$B \rightarrow Y$	(HL)	0.277	0.462	0.960	0.034	0.050	0.083	С	1.0		
l		(LH)	0.328	0.610	1.406	0.029	0.043	0.063	D	1.0		
l	$C \rightarrow Y$	(HL)	0.293	0.479	0.989	0.034	0.050	0.083	E	1.0		
l		(LH)	0.340	0.584	1.301	0.029	0.043	0.063	F	1.0		
l	$D \rightarrow Y$	(HL)	0.309	0.500	1.025	0.034	0.050	0.083	G	1.0		
l		(LH)	0.328	0.596	1.361	0.029	0.043	0.063	Н	1.0		
l	$E \rightarrow Y$	(HL)	0.266	0.442	0.919	0.034	0.050	0.082				
l		(LH)	0.367	0.639	1.426	0.029	0.043	0.063				
l	$F \rightarrow Y$	(HL)	0.282	0.462	0.954	0.034	0.050	0.082				
l		(LH)	0.355	0.651	1.485	0.029	0.043	0.063				
l	$G \rightarrow Y$	(HL)	0.290	0.472	0.974	0.034	0.050	0.082				
l		(LH)	0.361	0.614	1.365	0.029	0.043	0.063				
l	$H \rightarrow Y$	(HL)	0.306	0.492	1.010	0.034	0.050	0.082				
		(LH)	0.348	0.626	1.424	0.029	0.043	0.063				
F451	$A \rightarrow Y$	(HL)	0.299	0.509	1.055	0.017	0.025	0.042	Α	1.0	Y	17
l		(LH)	0.395	0.702	1.573	0.015	0.022	0.032	В	1.0		
l	$B \rightarrow Y$	(HL)	0.315	0.529	1.091	0.017	0.025	0.042	С	1.0		
l		(LH)	0.383	0.713	1.632	0.015	0.022	0.032	D	1.0		
l	$C \rightarrow Y$	(HL)	0.327	0.542	1.114	0.017	0.025	0.042	E	1.0		
l		(LH)	0.390	0.678	1.514	0.015	0.022	0.032	F	1.0		
l	$D \rightarrow Y$	(HL)	0.344	0.565	1.154	0.017	0.025	0.042	G	1.0		
l		(LH)	0.377	0.690	1.573	0.015	0.022	0.032	Н	1.0		
l	$E \rightarrow Y$	(HL)	0.301	0.510	1.057	0.017	0.025	0.042				
l		(LH)	0.397	0.704	1.579	0.014	0.022	0.032				
l	$F \rightarrow Y$	(HL)	0.317	0.530	1.093	0.017	0.025	0.042				
l		(LH)	0.385	0.716	1.638	0.014	0.022	0.032				
I	$G \rightarrow Y$	(HL)	0.326	0.540	1.111	0.017	0.025	0.042				
I		(LH)	0.386	0.672	1.504	0.014	0.022	0.032				
I	$H \rightarrow Y$	(HL)	0.342	0.561	1.148	0.017	0.025	0.042				
		(LH)	0.373	0.684	1.563	0.014	0.022	0.032				

 Block Library
 A15895EJ1V0BL
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 Block Library
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Chapter 2 Function Block

Function	1-1-3-	Input (OR-NAND	1								
Block type	Norma	al	with inv	. A	with inv	. В	with inv	. с	with inv	. D	with inv	<u>.</u> Ε
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L452	4										
x1	F452	5										
x2												
x4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
E H05- D H04- C H03- B H02- A H01-	n for "Norm	nal")o→ N		gic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	ifor "w	rith inv. B t	ype"
Logic Diagran	n for "with i	nv. C ty	/pe" Lo	gic Dia	agram for "	with in	v. D type"	Logi	ic Diagram	n for "w	rith inv. E t	ype"
Logic Diagran	n for "with i	nv. F ty	rpe" Lo	gic Dia	agram for '	with in	v. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

B			Swite	ching sp	eed				Ι.			
Block	Path		t ı	_D0 (ns))		t 1		l In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L452	$A \rightarrow Y$	(HL)	0.320	0.536	1.101	0.023	0.031	0.047	Α	1.0	Υ	10
		(LH)	0.254	0.425	0.866	0.029	0.042	0.061	В	1.0		
	$B \ \to Y$	(HL)	0.340	0.715	1.543	0.023	0.031	0.047	С	1.0		
		(LH)	0.254	0.468	0.968	0.029	0.042	0.061	D	1.0		
	$C \ \to \ Y$	(HL)	0.363	0.631	1.382	0.023	0.031	0.047	E	1.0		
		(LH)	0.493	0.805	1.768	0.029	0.042	0.061				
	$D \ \to \ Y$	(HL)	0.399	0.699	1.548	0.023	0.031	0.047				
		(LH)	0.552	0.964	2.087	0.029	0.042	0.061				
	$E \to Y$	(HL)	0.405	0.709	1.578	0.023	0.031	0.047				
		(LH)	0.555	0.986	2.133	0.029	0.042	0.061				
F452	$A \ \to \ Y$	(HL)	0.349	0.603	1.246	0.012	0.017	0.025	A	1.0	Y	22
		(LH)	0.255	0.435	0.889	0.015	0.022	0.031	В	1.0		
	$B \ \to Y$	(HL)	0.365	0.779	1.686	0.012	0.017	0.025	С	1.0		
		(LH)	0.252	0.481	0.999	0.015	0.022	0.031	D	1.0		
	$C \rightarrow Y$	(HL)	0.388	0.694	1.522	0.012	0.017	0.025	E	1.0		
		(LH)	0.502	0.828	1.815	0.015	0.022	0.031				
	$D \ \to \ Y$	(HL)	0.424	0.762	1.688	0.012	0.017	0.025				
1		(LH)	0.561	0.987	2.134	0.015	0.022	0.031				
1	$E \ \to Y$	(HL)	0.430	0.772	1.720	0.012	0.017	0.026				
		(LH)	0.564	1.009	2.180	0.015	0.022	0.031				

 Block Library
 A15895EJ1V0BL
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 Block Library
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Chapter 2 Function Block

Function	1-1-4-	Input (OR-NANE)								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. с	with inv	. D	with inv	. Е
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L453	5										
x1	F453	6										
x2												
x4												
x8												
Block type	with inv	. F	with in	/. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						Ш
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	n for "Norm	nal"	Lo	gic Dia	agram for "	with ir	ıv. A type"	Logi	ic Diagram	for "w	vith inv. B ty	ype"
E H05- D H04- C H03- B H02- A H01-)o N	NO1 Y									
Logic Diagran	n for "with i	inv. C t	ype" Lc	gic Dia	agram for "	with ir	v. D type"	Logi	ic Diagram	ı for "w	vith inv. E t	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LDO (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L453	$A \rightarrow Y$	(HL)	0.198	0.317	0.685	0.047	0.072	0.125	Α	1.0	Υ	3
		(LH)	0.117	0.196	0.360	0.029	0.042	0.061	В	1.0		
	$B \to Y$	(HL)	0.196	0.328	0.747	0.047	0.072	0.124	С	1.0		
		(LH)	0.140	0.226	0.417	0.028	0.042	0.061	D	1.0		
	$C \rightarrow Y$	(HL)	0.384	0.648	1.420	0.047	0.072	0.125	E	1.0		
		(LH)	0.443	0.761	1.657	0.029	0.043	0.063	F	1.0		
	$D \rightarrow Y$	(HL)	0.400	0.668	1.455	0.047	0.072	0.125				
		(LH)	0.431	0.772	1.716	0.029	0.043	0.063				
	$E \to Y$	(HL)	0.404	0.673	1.469	0.047	0.072	0.125				
		(LH)	0.431	0.727	1.582	0.029	0.043	0.063				
	$F \rightarrow Y$	(HL)	0.420	0.694	1.505	0.047	0.072	0.125				
		(LH)	0.418	0.739	1.642	0.029	0.043	0.063				
F453	$A \rightarrow Y$	(HL)	0.130	0.200	0.434	0.024	0.036	0.063	Α	2.1	Y	10
		(LH)	0.103	0.165	0.292	0.015	0.022	0.032	В	2.1		
	$B \rightarrow Y$	(HL)	0.144	0.220	0.498	0.024	0.036	0.063	С	1.0		
		(LH)	0.121	0.183	0.334	0.015	0.022	0.032	D	1.0		
	$C \rightarrow Y$	(HL)	0.318	0.553	1.180	0.024	0.037	0.063	E	1.0		
		(LH)	0.407	0.726	1.617	0.015	0.023	0.034	F	1.0		
	$D \rightarrow Y$	(HL)	0.334	0.573	1.216	0.024	0.037	0.063				
		(LH)	0.394	0.738	1.676	0.015	0.023	0.034				
	$E \to Y$	(HL)	0.343	0.582	1.234	0.024	0.037	0.063				
		(LH)	0.397	0.695	1.545	0.015	0.023	0.034				
	$F \rightarrow Y$	(HL)	0.359	0.603	1.271	0.024	0.037	0.063				
		(LH)	0.384	0.707	1.605	0.015	0.023	0.034				

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Chapter 2 Function Block

Function	4-4-4-	Input (OR-NAN	D								
Block type	Normal with inv. A				with inv	. В	with inv	. C	with inv	with inv	. Е	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F457	10										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram L H12 K H111 J H109 J H109 J H109 L H08 J H07 J H09 L H08 J H09	n for "with i		yype" L	ogic Di	agram for '	with in	v. D type"	Logi	ic Diagram	for "\	with inv. E ty	/pe"

Chapter 2 Function Block

			Swite	ching sp	eed						.	
Block	Path		t LDO (ns)			t 1			Input		Output	
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F457	$A \rightarrow Y$	(HL)	0.510	0.826	1.716	0.014	0.019	0.030	Α	1.0	Y	19
		(LH)	0.454	0.795	1.785	0.015	0.022	0.034	В	1.0		
	$B \rightarrow Y$	(HL)	0.525	0.845	1.748	0.014	0.019	0.030	С	1.0		
		(LH)	0.442	0.807	1.844	0.015	0.022	0.034	D	1.0		
	$C \rightarrow Y$	(HL)	0.555	0.885	1.830	0.014	0.019	0.030	E	1.0		
		(LH)	0.435	0.751	1.693	0.015	0.023	0.034	F	1.0		
	$D \rightarrow Y$	(HL)	0.570	0.905	1.865	0.014	0.019	0.030	G	1.0		
		(LH)	0.423	0.763	1.752	0.015	0.023	0.034	Н	1.0		
	$E \to Y$	(HL)	0.574	1.311	2.732	0.014	0.021	0.034	- 1	1.0		
		(LH)	0.495	0.906	2.023	0.015	0.023	0.035	J	1.0		
	$F \rightarrow Y$	(HL)	0.587	1.328	2.760	0.014	0.021	0.034	K	1.0		
		(LH)	0.483	0.918	2.082	0.015	0.023	0.035	L	1.0		
	$G \rightarrow Y$	(HL)	0.624	1.401	2.908	0.014	0.022	0.034				
		(LH)	0.479	0.866	1.936	0.015	0.023	0.035				
	$H \rightarrow Y$	(HL)	0.637	1.419	2.939	0.014	0.021	0.034				
		(LH)	0.466	0.878	1.995	0.015	0.023	0.035				
	$I \rightarrow Y$	(HL)	0.635	1.439	2.964	0.014	0.021	0.034				
		(LH)	0.525	1.006	2.254	0.015	0.024	0.037				
	$J \rightarrow Y$	(HL)	0.647	1.456	2.993	0.014	0.021	0.034				
		(LH)	0.513	1.018	2.313	0.015	0.024	0.037				
l	$K \rightarrow Y$	(HL)	0.673	1.518	3.128	0.015	0.022	0.034				
l		(LH)	0.491	0.937	2.124	0.015	0.024	0.037				
l	$L \rightarrow Y$	(HL)	0.688	1.536	3.159	0.015	0.022	0.034				
		(LH)	0.478	0.949	2.184	0.015	0.024	0.037				

 Block Library
 A15895EJ1V0BL
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 Block Library
 A15895EJ1V0BL
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Chapter 2 Function Block

Function	1-1-1-	2-Inpu	t OR-NAN	ND								
Block type	Normal with		with inv	. A	with inv	. В	with inv	with inv. C		with inv. D		/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F458	5										
x2												
x4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
E H05- D H04- C H03- B H02- A H01-	n for "Norm	nal"		gic Dia	agram for "	'with ir	iv. A type"	Logi	ic Diagram	n for "w	rith inv. B t	ype"
Logic Diagran	n for "with i	inv. C ty	ype" Lo	gic Dia	agram for "	'with ir	nv. D type"	Logi	ic Diagram	n for "w	rith inv. E t	ype"
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	nv. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			_		_							
Block	Path	t LD0 (ns)				t 1		Input		Output		
type	IN o	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F458	$A \rightarrow Y$	(HL)	0.181	0.342	0.789	0.029	0.049	0.087	Α	2.1	Υ	2
		(LH)	0.103	0.178	0.328	0.015	0.021	0.031	В	2.0		
l .	$B \ \to Y$	(HL)	0.207	0.401	0.968	0.029	0.049	0.086	С	2.0		
l .		(LH)	0.140	0.222	0.414	0.015	0.022	0.031	D	2.0		
	$C \rightarrow Y$	(HL)	0.210	0.427	1.039	0.029	0.050	0.086	E	2.0		
		(LH)	0.156	0.245	0.452	0.015	0.022	0.032				
	$D \ \to Y$	(HL)	0.278	0.458	1.107	0.032	0.049	0.086				
l .		(LH)	0.291	0.470	0.957	0.027	0.041	0.061				
l .	$E \to Y$	(HL)	0.278	0.458	1.107	0.032	0.049	0.086				
		(LH)	0.291	0.470	0.957	0.027	0.041	0.061				

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Chapter 2 Function Block

Function	1-1-1-	3-Inpu	ıt OR-NA	ND								
Block type	Normal wit		with in	v. A	with inv	. В	with inv. C		with inv. D		with inv. E	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L459	5										
x1	F459	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran)o→1	N01 Y		agram for "				ic Diagram			
Logic Diagran	n for "with i	inv. F ty	/pe" Lo	ogic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	ı for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	t LDO (ns)			t 1			Input		Output		
type	IN \rightarrow C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L459	$A \rightarrow Y$	(HL)	0.360	0.608	1.301	0.023	0.031	0.047	Α	1.0	Υ	10
		(LH)	0.242	0.415	0.864	0.029	0.042	0.061	В	1.0		
	$B \to Y$	(HL)	0.347	0.592	1.308	0.023	0.031	0.047	С	1.0		
		(LH)	0.274	0.451	0.926	0.029	0.042	0.061	D	1.0		
	$C \rightarrow Y$	(HL)	0.345	0.725	1.561	0.023	0.031	0.047	E	1.0		
		(LH)	0.257	0.471	0.973	0.029	0.042	0.061	F	1.0		
	$D \rightarrow Y$	(HL)	0.369	0.641	1.399	0.023	0.031	0.047				
		(LH)	0.499	0.814	1.781	0.028	0.042	0.061				
	$E \to Y$	(HL)	0.405	0.709	1.565	0.023	0.031	0.047				
		(LH)	0.558	0.973	2.100	0.028	0.042	0.061				
	$F \rightarrow Y$	(HL)	0.411	0.719	1.595	0.023	0.031	0.047				
		(LH)	0.561	0.995	2.146	0.028	0.042	0.061				
F459	$A \rightarrow Y$	(HL)	0.387	0.672	1.447	0.012	0.017	0.026	Α	1.0	Y	22
		(LH)	0.243	0.426	0.886	0.015	0.022	0.031	В	1.0		
	$B \to Y$	(HL)	0.372	0.656	1.454	0.012	0.017	0.026	С	1.0		
		(LH)	0.275	0.462	0.949	0.015	0.022	0.031	D	1.0		
	$C \rightarrow Y$	(HL)	0.367	0.784	1.696	0.012	0.017	0.025	E	1.0		
		(LH)	0.253	0.482	1.000	0.015	0.022	0.031	F	1.0		
	$D \rightarrow Y$	(HL)	0.390	0.699	1.533	0.012	0.017	0.026				
		(LH)	0.506	0.833	1.821	0.015	0.022	0.031				
l .	$E \to Y$	(HL)	0.427	0.768	1.701	0.012	0.017	0.026				
l		(LH)	0.567	0.996	2.146	0.015	0.022	0.031				
l	$F \rightarrow Y$	(HL)	0.433	0.779	1.731	0.012	0.017	0.026				
		(LH)	0.570	1.018	2.193	0.015	0.022	0.031				

 Block Library
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Chapter 2 Function Block

Function	1-1-1-	1-2-In	put OR-N	AND								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. С	with inv	ν. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F490	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						Ш
Low Power												
x1												\perp
x2												
x4												\Box
x8												
F H06- E H05- D H04- C H03- B H02- A H01- Logic Diagram		inv. C t			agram for '				ic Diagram			
Logic Diagram	i ior "with I	IIIV. F T	ype Lo	gic Di	agram for	with in	v. a type"	Log	ic Diagram	i iOr "W	nui inv. H t	ype.

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Pa	ath	t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN -	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F490	A →	Y (HL)	0.465	0.823	1.848	0.012	0.017	0.026	Α	1.0	Υ	22
		(LH)	0.265	0.475	0.987	0.015	0.022	0.031	В	1.0		
	B →	Y (HL)	0.465	0.833	1.912	0.012	0.017	0.026	С	1.0		
		(LH)	0.296	0.511	1.053	0.015	0.022	0.031	D	1.0		
	C →	Y (HL)	0.480	0.852	1.968	0.012	0.017	0.026	E	1.0		
		(LH)	0.341	0.562	1.146	0.015	0.022	0.031	F	1.0		
	D →	Y (HL)	0.379	0.778	1.669	0.012	0.017	0.026				
		(LH)	0.260	0.488	1.004	0.015	0.022	0.031				
	E →	Y (HL)	0.401	0.711	1.551	0.012	0.017	0.026				
1		(LH)	0.453	0.727	1.527	0.015	0.022	0.031				
	F →	Y (HL)	0.439	0.777	1.712	0.012	0.017	0.026				
		(LH)	0.469	0.802	1.681	0.015	0.022	0.031				

 Block Library
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 Block Library
 A15895EJ1V0BL
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Chapter 2 Function Block

Function	1-2-3-	Input (OR-NANE)								
Block type	Norma	al	with in	/. A	with inv	. В	with inv	. с	with inv	. D	with inv	. Е
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L491	5										
x1	F491	5										
x2												
x4												
x8												
Block type	with inv	. F	with in	. G	with inv	. н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												Ш
x2												
x4												
x8												
Logic Diagram F H06- E H05- D H04- C H03- B H02- A H01-)o→ 1	N01 Y		agram for "				ic Diagram			
Logic Diagram	n for "with i	inv. F ty	/pe" Lo	gic Dia	agram for "	with ir	v. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L491	$A \rightarrow Y$	(HL)	0.326	0.546	1.115	0.023	0.031	0.047	Α	1.0	Y	10
l .		(LH)	0.258	0.431	0.876	0.029	0.042	0.061	В	1.0		
	$B \to Y$	(HL)	0.367	0.772	1.660	0.023	0.031	0.047	С	1.0		
l .		(LH)	0.356	0.677	1.449	0.029	0.042	0.061	D	1.0		
l .	$C \rightarrow Y$	(HL)	0.383	0.813	1.751	0.023	0.031	0.047	E	1.0		
l .		(LH)	0.343	0.690	1.505	0.029	0.042	0.061	F	1.0		
l .	$D \rightarrow Y$	(HL)	0.404	0.774	1.679	0.023	0.031	0.047				
l .		(LH)	0.684	1.173	2.487	0.029	0.042	0.061				
l .	$E \to Y$	(HL)	0.418	0.812	1.763	0.023	0.031	0.047				
l .		(LH)	0.706	1.243	2.640	0.029	0.042	0.061				
l .	$F \rightarrow Y$	(HL)	0.430	0.859	1.878	0.023	0.031	0.047				
		(LH)	0.745	1.332	2.786	0.029	0.042	0.061				
F491	$A \rightarrow Y$	(HL)	0.347	0.602	1.245	0.012	0.017	0.025	Α	1.0	Y	22
l .		(LH)	0.253	0.433	0.884	0.015	0.022	0.031	В	1.0		
l .	$B \rightarrow Y$	(HL)	0.415	0.873	1.899	0.012	0.017	0.026	С	1.0		
l .		(LH)	0.419	0.770	1.658	0.015	0.022	0.032	D	1.0		
	$C \rightarrow Y$	(HL)	0.430	0.913	1.988	0.012	0.017	0.026	E	1.0		
l .		(LH)	0.407	0.783	1.712	0.015	0.022	0.032	F	1.0		
	$D \rightarrow Y$	(HL)	0.431	0.851	1.865	0.012	0.017	0.026				
l .		(LH)	0.713	1.222	2.607	0.015	0.022	0.031				
l .	$E \to Y$	(HL)	0.445	0.888	1.950	0.012	0.017	0.026				
		(LH)	0.734	1.292	2.758	0.015	0.022	0.031				
	$F \rightarrow Y$	(HL)	0.459	0.940	2.074	0.012	0.017	0.026				
		(LH)	0.775	1.381	2.905	0.015	0.022	0.031				

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Chapter 2 Function Block

Function	3-3-3-	Input (OR-NAND)								
Block type	Norma	al	with inv	. A	with inv	. В	with inv	. C	with inv	. D	with inv	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L493	6										
x1	F493	7										
x2												
х4												
x8												
Block type	with inv	. F	with inv	. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	n for "Norm	nal"	Lo	gic Dia	agram for "	with in	v. A type"	Logi	c Diagram	n for "v	vith inv. B ty	уре"
F H06- E H05- D H04- C H03- B H02- A H01-)o-1	J01 Y									
Logic Diagram for "with inv. C type" Logic Diagram for "with inv. D type" Logic Diagram for "with inv. E type"											ype"	
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	gic Dia	agram for "	with ir	ov. G type"	Logi	c Diagram	n for "v	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L493	$A \rightarrow Y$	(HL)	0.342	0.571	1.169	0.023	0.031	0.047	Α	1.0	Υ	10
		(LH)	0.433	0.724	1.612	0.029	0.043	0.062	В	1.0		
	$B \to Y$	(HL)	0.358	0.592	1.206	0.023	0.031	0.047	С	1.0		
		(LH)	0.448	0.788	1.772	0.029	0.043	0.062	D	1.0		
	$C \rightarrow Y$	(HL)	0.372	0.610	1.245	0.023	0.031	0.047	E	1.0		
		(LH)	0.480	0.876	1.918	0.029	0.043	0.062	F	1.0		
	$D \rightarrow Y$	(HL)	0.391	0.797	1.735	0.023	0.031	0.047	G	1.0		
		(LH)	0.515	0.888	1.986	0.029	0.042	0.061	Н	1.0		
	$E \rightarrow Y$	(HL)	0.421	0.885	1.933	0.023	0.031	0.047		1.0		
		(LH)	0.576	1.047	2.310	0.029	0.042	0.061				
	$F \rightarrow Y$	(HL)	0.424	0.909	1.986	0.023	0.031	0.047				
		(LH)	0.578	1.069	2.355	0.029	0.042	0.061				
	$G \rightarrow Y$	(HL)	0.404	0.826	1.819	0.023	0.031	0.047				
		(LH)	0.714	1.192	2.553	0.029	0.042	0.061				
	$H \rightarrow Y$	(HL)	0.425	0.914	2.013	0.023	0.031	0.047				
		(LH)	0.780	1.353	2.869	0.029	0.042	0.061				
	$I \rightarrow Y$	(HL)	0.428	0.938	2.067	0.023	0.031	0.047				
		(LH)	0.784	1.375	2.916	0.029	0.042	0.061				
F493	$A \rightarrow Y$	(HL)	0.363	0.625	1.297	0.012	0.017	0.025	Α	1.0	Y	22
		(LH)	0.440	0.748	1.666	0.015	0.022	0.031	В	1.0		
	$B \rightarrow Y$	(HL)	0.378	0.646	1.334	0.012	0.017	0.025	С	1.0		
		(LH)	0.455	0.812	1.826	0.015	0.022	0.031	D	1.0		
	$C \rightarrow Y$	(HL)	0.391	0.666	1.377	0.012	0.017	0.026	E	1.0		
		(LH)	0.487	0.899	1.973	0.015	0.022	0.031	F	1.0		
	$D \rightarrow Y$	(HL)	0.441	0.918	2.005	0.012	0.017	0.026	G	1.0		
		(LH)	0.613	1.085	2.370	0.015	0.022	0.032	Н	1.0		
	$E \rightarrow Y$	(HL)	0.455	0.961	2.098	0.012	0.017	0.026	1	1.0		
		(LH)	0.632	1.151	2.522	0.015	0.022	0.032				
	$F \rightarrow Y$	(HL)	0.464	1.011	2.228	0.012	0.017	0.026				
		(LH)	0.668	1.238	2.668	0.015	0.022	0.032				
	$G \rightarrow Y$	(HL)	0.448	0.948	2.088	0.012	0.017	0.026				
		(LH)	0.819	1.405	2.960	0.015	0.022	0.032				
	$H \rightarrow Y$	(HL)	0.460	0.991	2.182	0.012	0.017	0.026				
I		(LH)	0.841	1.475	3.109	0.015	0.022	0.032				
	$I \rightarrow Y$	(HL)	0.472	1.043	2.310	0.012	0.017	0.026				
		(LH)	0.885	1.567	3.258	0.015	0.022	0.032				

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Chapter 2 Function Block

Function	3-3-3-	3-Inpu	t OR-N	AND								
Block type	Norma	al	with	inv. A	with inv	. В	with inv	. с	with inv	. D	with inv	. Ε
Drivability	Name	cells	Nam	e cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F496	8										
x2												
x4												
x8												
Block type	with inv	. F	with	inv. G	with inv	. н	-		-		-	
Drivability	Name	cells	Nam	e cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagran	n for "Norm	nal"		Logic Dia	agram for "	with in	v. A type"	Logi	ic Diagram	for "w	vith inv. B ty	уре"
L H12 S H10 H H08 H H08 H H08 H H08 D H04 C H08 A H01 Logic Diagran		no1 Y	ype"	Logic Dia	agram for 1	with ir	ıv. D type"	Logi	ic Diagram	ı for "w	/ith inv. Ε tι	ype"
Logic Diagran	n for "with i	inv. F ty	/pe"	Logic Dia	agram for "	with ir	ıv. G type"	Logi	ic Diagram	n for "w	vith inv. H t	ype"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F496	$A \rightarrow Y$	(HL)	0.438	0.929	2.043	0.012	0.017	0.026	Α	1.0	Y	22
l		(LH)	0.568	1.005	2.228	0.015	0.022	0.032	В	1.0		
l	$B \rightarrow Y$	(HL)	0.454	0.974	2.142	0.012	0.017	0.026	С	1.0		
l		(LH)	0.587	1.071	2.381	0.015	0.022	0.032	D	1.0		
l	$C \rightarrow Y$	(HL)	0.466	1.033	2.287	0.012	0.017	0.026	E	1.0		
l		(LH)	0.625	1.160	2.530	0.015	0.022	0.032	F	1.0		
l	$D \rightarrow Y$	(HL)	0.452	0.960	2.129	0.012	0.017	0.026	G	1.0		
l		(LH)	0.737	1.329	2.832	0.015	0.022	0.032	Н	1.0		
l	$E \rightarrow Y$	(HL)	0.466	1.006	2.228	0.012	0.017	0.026	1	1.0		
l		(LH)	0.759	1.399	2.981	0.015	0.022	0.032	J	1.0		
l	$F \rightarrow Y$	(HL)	0.480	1.064	2.369	0.012	0.017	0.026	K	1.0		
l		(LH)	0.800	1.488	3.128	0.015	0.022	0.032	L	1.0		
l	$G \rightarrow Y$	(HL)	0.442	0.918	2.002	0.012	0.017	0.026				
l		(LH)	0.608	1.078	2.360	0.015	0.022	0.032				
l	$H \rightarrow Y$	(HL)	0.457	0.960	2.096	0.012	0.017	0.026				
l		(LH)	0.628	1.145	2.513	0.015	0.022	0.032				
l	$I \rightarrow Y$	(HL)	0.465	1.011	2.226	0.012	0.017	0.026				
l		(LH)	0.666	1.234	2.662	0.015	0.022	0.032				
l	$J \rightarrow Y$	(HL)	0.447	0.949	2.088	0.012	0.017	0.026				
l		(LH)	0.775	1.384	2.930	0.015	0.022	0.032				
l	$K \rightarrow Y$	(HL)	0.458	0.989	2.178	0.012	0.017	0.026				
I		(LH)	0.797	1.454	3.080	0.015	0.022	0.032				
I	$L \rightarrow Y$	(HL)	0.468	1.040	2.304	0.012	0.017	0.026				
		(LH)	0.839	1.543	3.226	0.015	0.022	0.032				

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Chapter 2 Function Block

Function	4-4-4-	4-Inpu	ıt OR-NA	ND								
Block type	Norma	al	with in	v. A	with inv	. В	with inv	. С	with inv	ν. D	with in	/. E
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F498	14										
x2												
x4												
x8												
Block type	with inv	. F	with in	v. G	with inv	. Н	-		-		-	
Drivability	Name	cells	Name	cells	Name	cells						
Low Power												
x1												
x2												
x4												
x8												
Logic Diagram	for "Norm	nal"	Lo	gic Di	agram for "	with in	ıv. A type"	Log	ic Diagram	n for "v	vith inv. B t	уре"
	o+ N01 Y											
Logic Diagram	n for "with i	nv. C t	ype" Lc	ogic Di	agram for "	with ir	v. D type"	Log	ic Diagran	n for "v	vith inv. E t	ype"
Logic Diagram	n for "with i	nv. F ty	/pe" Lo	ogic Di	agram for '	with ir	iv. G type"	Log	ic Diagram	n for "v	vith inv. H t	ype"

Chapter 2 Function Block

Disale			Swite	ching sp	eed						0	44
Block	Path		t I	LD0 (ns))		t 1		ın	put	Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F498	$A \rightarrow Y$	(HL)	0.447	0.929	1.924	0.018	0.027	0.045	Α	1.0	Y	16
		(LH)	0.473	0.848	1.878	0.015	0.022	0.034	В	1.0		
	$B \rightarrow Y$	(HL)	0.462	0.948	1.956	0.018	0.027	0.045	С	1.0		
		(LH)	0.461	0.860	1.936	0.015	0.022	0.034	D	1.0		
	$C \rightarrow Y$	(HL)	0.481	0.986	2.033	0.018	0.027	0.045	E	1.0		
		(LH)	0.449	0.796	1.770	0.015	0.022	0.034	F	1.0		
	$D \rightarrow Y$	(HL)	0.496	1.005	2.067	0.018	0.027	0.045	G	1.0		
		(LH)	0.436	0.807	1.830	0.015	0.022	0.034	Н	1.0		
	$E \rightarrow Y$	(HL)	0.473	0.994	2.050	0.018	0.027	0.045		1.0		
		(LH)	0.498	0.919	2.050	0.015	0.022	0.034	J	1.0		
	$F \rightarrow Y$	(HL)	0.487	1.011	2.081	0.018	0.027	0.045	K	1.0		
		(LH)	0.486	0.930	2.109	0.015	0.022	0.034	L	1.0		
	$G \rightarrow Y$	(HL)	0.507	1.050	2.159	0.018	0.027	0.045	M	1.0		
		(LH)	0.471	0.861	1.937	0.015	0.022	0.034	N	1.0		
	$H \rightarrow Y$	(HL)	0.521	1.069	2.191	0.018	0.027	0.045	0	1.0		
		(LH)	0.458	0.873	1.996	0.015	0.022	0.034	Р	1.0		
	$I \rightarrow Y$	(HL)	0.447	0.930	1.925	0.018	0.027	0.045				
		(LH)	0.474	0.850	1.880	0.015	0.022	0.034				
	$J \rightarrow Y$	(HL)	0.462	0.949	1.959	0.018	0.027	0.045				
		(LH)	0.462	0.862	1.939	0.015	0.022	0.034				
	$K \rightarrow Y$	(HL)	0.481	0.987	2.034	0.018	0.027	0.045				
		(LH)	0.449	0.796	1.772	0.015	0.022	0.034				
	$L \rightarrow Y$	(HL)	0.496	1.006	2.068	0.018	0.027	0.045				
		(LH)	0.437	0.808	1.831	0.015	0.022	0.034				
	$M \rightarrow Y$	(HL)	0.473	0.994	2.052	0.018	0.027	0.045				
		(LH)	0.498	0.918	2.049	0.015	0.022	0.034				
	$N \rightarrow Y$	(HL)	0.487	1.011	2.082	0.018	0.027	0.045				
I		(LH)	0.486	0.930	2.109	0.015	0.022	0.034				
	O → Y	(HL)	0.507	1.051	2.161	0.018	0.027	0.045				
I		(LH)	0.473	0.863	1.940	0.015	0.022	0.034				
I	$P \rightarrow Y$	(HL)	0.522	1.070	2.193	0.018	0.027	0.045				
		(LH)	0.460	0.875	1.999	0.015	0.022	0.034				

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Charten C. Function Block	Charten C. Function Black
Chapter 2 Function Block	Chapter 2 Function Block
[MEMO]	[MEMO]

[MEMO]

2.7 Exclusive OR, Exclusive NOR

Chapter 2 Function Block

				Citi	арсе	Z Fund	LIOII	DIOCK			
Function	n	2-Inpu	ıt Excl	usive OR							
		-				St	tanda	rd type			
Block typ	e –	Norm	al	High spe	eed						
Drivabilit	у	Name	cells		cells						
Low Powe	er	L511	3								
x1		F511	4								
x2											
x4											
Logic	Diagran	า									
	A HO	11 🛶	$\overline{}$								
,)	\ 	→	N01 Y					
	3 H0)2 -	1								
		- /.									
Truth	Table										
i i dui	Table										
	A B	Υ									
	0 0	0									
	0 1	1									
	1 0	1									
	1 1	0									

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	1	t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L511	$A \rightarrow Y$	(HH)	0.258	0.420	0.930	0.029	0.043	0.064	Α	2.0	Υ	10
		(HL)	0.301	0.488	1.034	0.022	0.029	0.043	В	1.9		
		(LH)	0.274	0.480	1.052	0.029	0.043	0.063				
		(LL)	0.369	0.602	1.241	0.024	0.032	0.048				
	$B \rightarrow Y$	(HH)	0.218	0.343	0.752	0.029	0.043	0.063				
		(HL)	0.286	0.471	1.038	0.022	0.029	0.043				
		(LH)	0.347	0.588	1.273	0.029	0.043	0.064				
		(LL)	0.354	0.531	1.091	0.024	0.032	0.049				
F511	$A \ \to Y$	(HH)	0.264	0.446	0.998	0.015	0.022	0.033	Α	1.9	Y	21
		(HL)	0.314	0.523	1.108	0.011	0.015	0.023	В	1.9		
		(LH)	0.282	0.508	1.125	0.015	0.022	0.033				
		(LL)	0.393	0.670	1.391	0.013	0.017	0.026				
	$B \rightarrow Y$	(HH)	0.221	0.363	0.810	0.015	0.022	0.033				
1		(HL)	0.299	0.505	1.112	0.011	0.015	0.023				
		(LH)	0.358	0.620	1.349	0.015	0.022	0.033				
		(LL)	0.375	0.596	1.238	0.013	0.017	0.026				

Chapter 2 Function Block

Function	3-Inpu	t Excl	usive OR							
	3pu				S	tanda	rd type			
Block type	Norma	al	High sp	eed						
Drivability	Name	cells	Name	cells						
Low Power	L516	6								
x1	F516	7								
x2										
х4										
Logic Dia	gram									
В	H01 ↔ H02 ↔ H03 ↔			•	N01 Y					
Truth Tab										
A	в с	Y								
0	0 0	0								
0	0 1	1								
0	1 0 1 1	1 0								
1	0 0	1								
1	0 1	0								
1	1 0	0								
1	1 1	1								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L516	$A \rightarrow Y$	(HH)	0.611	1.032	2.258	0.029	0.043	0.063	Α	1.0	Y	10
l		(HL)	0.475	0.778	1.646	0.024	0.032	0.048	В	1.0		
l		(LH)	0.491	0.881	1.927	0.029	0.043	0.063	С	1.0		
l		(LL)	0.654	1.132	2.452	0.024	0.033	0.049				
l	$B \rightarrow Y$	(HH)	0.434	0.751	1.604	0.029	0.043	0.063				
		(HL)	0.469	0.839	1.809	0.024	0.033	0.049				
l		(LH)	0.455	0.855	1.895	0.029	0.043	0.064				
l		(LL)	0.454	0.818	1.753	0.024	0.032	0.049				
l	$C \rightarrow Y$	(HH)	0.307	0.477	0.981	0.029	0.043	0.064				
l		(HL)	0.442	0.720	1.501	0.024	0.033	0.050				
l		(LH)	0.407	0.675	1.446	0.029	0.043	0.063				
		(LL)	0.350	0.598	1.264	0.025	0.034	0.051				
F516	$A \rightarrow Y$	(HH)	0.621	1.057	2.309	0.015	0.022	0.033	A	1.0	Y	21
		(HL)	0.507	0.850	1.798	0.012	0.017	0.026	В	1.0		
l		(LH)	0.513	0.927	2.029	0.015	0.022	0.033	С	1.0		
l		(LL)	0.658	1.169	2.546	0.013	0.017	0.027				
l	$B \rightarrow Y$	(HH)	0.443	0.782	1.685	0.015	0.022	0.033				
l		(HL)	0.478	0.883	1.916	0.012	0.017	0.027				
l		(LH)	0.463	0.881	1.957	0.015	0.022	0.033				
l		(LL)	0.473	0.888	1.907	0.012	0.017	0.027				
I	C → Y	(HH)	0.305	0.489	1.020	0.015	0.022	0.033				
I		(HL)	0.442	0.749	1.592	0.013	0.017	0.027				
I		(LH)	0.404	0.685	1.483	0.015	0.022	0.033				
		(LL)	0.349	0.625	1.355	0.013	0.018	0.027				

Chapter 2 Function Block

Function	2-Inpu	t Excl	usive NOF	3						
Block type					5	Standa	rd type			
Block type	Norma	al	High sp	eed						
Drivability	Name	cells	Name	cells						
Low Power	L512	3								
x1	F512	4								
x2										
x4										
								I.		

Truth Table

Α	В	Υ
0	0	1
0	1	0
1	0	0
1	1	1

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	ı	t I	LD0 (ns))		t 1] In	put	Ou	itput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L512	$A \rightarrow Y$	(HH)	0.256	0.417	0.919	0.029	0.043	0.064	Α	2.0	Y	10
1		(HL)	0.306	0.527	1.087	0.023	0.032	0.048	В	1.9		
1		(LH)	0.307	0.532	1.140	0.029	0.042	0.061				
1		(LL)	0.373	0.613	1.262	0.024	0.032	0.049				
1	$B \rightarrow Y$	(HH)	0.255	0.415	0.874	0.029	0.043	0.064				
1		(HL)	0.436	0.679	1.369	0.024	0.032	0.049				
1		(LH)	0.294	0.542	1.194	0.029	0.042	0.061				
		(LL)	0.249	0.465	0.986	0.023	0.032	0.048				
F512	$A \rightarrow Y$	(HH)	0.262	0.441	0.986	0.015	0.022	0.033	Α	1.9	Y	21
1		(HL)	0.330	0.586	1.220	0.012	0.017	0.026	В	1.9		
1		(LH)	0.314	0.554	1.184	0.015	0.022	0.031				
1		(LL)	0.397	0.682	1.411	0.013	0.017	0.026				
1	$B \rightarrow Y$	(HH)	0.261	0.438	0.939	0.015	0.022	0.033				
1		(HL)	0.461	0.747	1.514	0.013	0.017	0.026				
1		(LH)	0.301	0.563	1.238	0.015	0.022	0.031				
		(LL)	0.270	0.523	1.117	0.012	0.017	0.026				

Chapter 2 Function Block

Function	3-Inpu	t Excl	usive NOF	3								
Block type		Standard type										
Бюск турс	Norma	Normal High speed										
Drivability	Name	cells	Name	cells								
Low Power	L517	7										
x1	F517	7										
x2												
x4												

Logic Diagram



Truth Table

Α	В	С	Υ
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

Chapter 2 Function Block

				Swite	ching sp	eed				Ι.			
Block	F	ath		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN -	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L517	Α -	→ Y	(HH)	0.613	1.030	2.253	0.029	0.043	0.063	Α	1.0	Y	10
			(HL)	0.471	0.783	1.655	0.024	0.032	0.048	В	1.0		
			(LH)	0.493	0.877	1.919	0.029	0.043	0.063	С	1.0		
			(LL)	0.655	1.131	2.452	0.024	0.033	0.049				
	В -	Y	(HH)	0.435	0.749	1.606	0.029	0.043	0.063				
			(HL)	0.470	0.836	1.798	0.024	0.033	0.049				
			(LH)	0.457	0.852	1.889	0.029	0.043	0.064				
			(LL)	0.451	0.827	1.774	0.024	0.032	0.049				
	C -	→ Y	(HH)	0.307	0.477	0.980	0.029	0.043	0.064				
			(HL)	0.442	0.720	1.500	0.024	0.033	0.050				
			(LH)	0.407	0.675	1.447	0.029	0.043	0.063				
			(LL)	0.350	0.599	1.264	0.025	0.034	0.051				
F517	Α -	Y	(HH)	0.623	1.055	2.303	0.015	0.022	0.033	A	1.0	Y	21
			(HL)	0.503	0.855	1.805	0.012	0.017	0.026	В	1.0		
			(LH)	0.514	0.925	2.021	0.015	0.022	0.033	С	1.0		
			(LL)	0.660	1.167	2.545	0.012	0.017	0.027				
	В -	Y	(HH)	0.444	0.780	1.686	0.015	0.022	0.033				
			(HL)	0.480	0.879	1.906	0.012	0.017	0.027				
			(LH)	0.465	0.878	1.951	0.015	0.022	0.033				
			(LL)	0.474	0.893	1.926	0.012	0.017	0.027				
	C -	→ Y	(HH)	0.305	0.489	1.020	0.015	0.022	0.033				
			(HL)	0.443	0.749	1.592	0.013	0.017	0.027				
			(LH)	0.404	0.685	1.483	0.015	0.022	0.033				
			(LL)	0.349	0.625	1.355	0.013	0.018	0.027				

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Chapter 2 Function Block	Chapter 2 Function Block
[MEMO]	[MEMO]

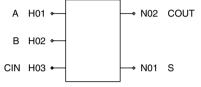
[MEMO]

2.8 Adder, 3-State Buffer, Decoder, Multiplexer, Generator

Chapter 2 Function Block

Function	1-Bit F	ull Ad	der								
Block type					S	tanda	rd type				
Бюск турс	Norma	Normal High speed									
Drivability	Name										
Low Power											
x1	F521	9									
x2											
x4											
Lauria Bira											





Truth Table

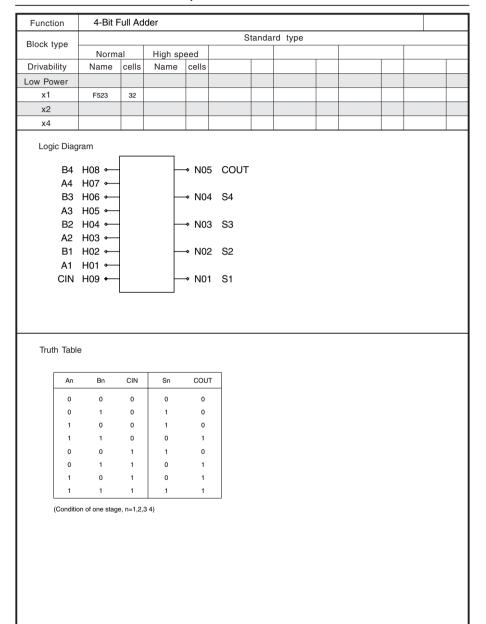
Α	В	CIN	S	COUT
0	0	0	0	0
0	1	0	1	0
1	0	0	1	0
1	1	0	0	1
0	0	1	1	0
0	1	1	0	1
1	0	1	0	1
1	1	1	1	1

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LDO (ns))		t 1		In	put	l Ou	tput
type	IN → OU	Т	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F521	$A \rightarrow S$	(HH)	0.546	1.093	2.452	0.015	0.022	0.033	Α	1.7	S	21
l		(HL)	0.659	1.171	2.597	0.012	0.017	0.026	В	2.0	COUT	20
l		(LH)	0.679	1.541	3.460	0.015	0.022	0.033	CIN	1.0		
l		(LL)	0.723	1.694	3.695	0.011	0.017	0.026				
l	A → COUT	(HH)	0.470	1.092	2.449	0.015	0.023	0.035				
l		(LL)	0.343	1.213	2.561	0.012	0.016	0.026				
l	$B \rightarrow S$	(HH)	0.591	1.079	2.459	0.015	0.022	0.033				
l		(HL)	0.654	1.219	2.671	0.011	0.017	0.026				
l		(LH)	0.698	1.463	3.280	0.015	0.022	0.033				
l		(LL)	0.742	1.621	3.518	0.011	0.017	0.026				
l	B → COUT	(HH)	0.515	1.079	2.457	0.015	0.023	0.036				
l		(LL)	0.335	1.298	2.713	0.012	0.016	0.025				
l	CIN → S	(HH)	0.493	0.830	1.774	0.015	0.022	0.033				
l		(HL)	0.614	0.959	1.967	0.013	0.017	0.026				
l		(LH)	0.480	0.806	1.698	0.015	0.022	0.033				
I		(LL)	0.478	0.830	1.793	0.011	0.015	0.023				
I	CIN → COUT	(HH)	0.335	0.537	1.107	0.015	0.022	0.034				
		(LL)	0.393	0.706	1.506	0.013	0.018	0.027				

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Chapter 2 Function Block



Chapter 2 Function Block

Disale			Swite	ching sp	eed						0	
Block	Path		t	LDO (ns)			t 1		In	put	Ou	tput
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F523	A1 → S1	(HH)	0.566	1.008	2.326	0.015	0.022	0.032	A1	1.7	S1	19
		(HL)	0.686	1.200	2.684	0.011	0.015	0.022	B1	2.0	S2	19
		(LH)	1.085	1.885 1.284	4.066 2.814	0.015	0.022	0.033	A2 B2	1.7 2.0	S3 S4	18 18
	A1 → S2	(LL) (HH)	0.743 0.972	1.711	3.910	0.011	0.015 0.021	0.022 0.032	A3	1.7	COUT	10
	A1 → 52	(HL)	1.554	2.410	5.300	0.014	0.021	0.032	B3	2.0	10001	10
		(LH)	1.114	1.884	3.874	0.015	0.022	0.033	A4	1.7		
		(LL)	0.693	1.213	2.654	0.011	0.015	0.022	B4	2.0		
	A1 → S3	(HH)	1.298	2.298	5.353	0.014	0.022	0.032	CIN	2.1		
		(HL)	1.865	3.109	6.959	0.013	0.017	0.027				
		(LH)	1.339	2.453	5.257	0.015	0.022	0.033				
		(LL)	0.978	1.764	3.925	0.011	0.015	0.022				
	A1 → S4	(HH)	1.651	2.960	7.047	0.014	0.021	0.032				
		(HL)	2.023	3.543	8.192	0.012	0.017	0.026				
		(LH)	1.494	2.888	6.473	0.015	0.022	0.033				
		(LL)	1.267	2.379	5.487	0.011	0.015	0.022				
	A1 → COL		1.664	3.047	7.383	0.020	0.031	0.049				
	D4 04	(LL)	1.260 0.608	2.527 1.093	6.045 2.519	0.022	0.031 0.022	0.044 0.032				
	B1 → S1	(HH) (HL)	0.668	1.186	2.694	0.015	0.022	0.032				
		(LH)	1.049	1.794	3.854	0.011	0.013	0.022				
		(LL)	0.761	1.358	2.964	0.011	0.015	0.022				
	B1 → S2	(HH)	0.954	1.696	3.919	0.014	0.021	0.032				
		(HL)	1.536	2.396	5.310	0.013	0.017	0.026				
		(LH)	1.131	1.898	3.890	0.015	0.022	0.033				
		(LL)	0.721	1.243	2.706	0.011	0.015	0.022				
	B1 → S3	(HH)	1.280	2.284	5.363	0.014	0.022	0.032				
		(HL)	1.847	3.095	6.968	0.013	0.017	0.027				
		(LH)	1.355	2.465	5.272	0.015	0.022	0.033				
		(LL)	0.999	1.776	3.931	0.011	0.015	0.022				
	B1 → S4	(HH)	1.632	2.946	7.056	0.014	0.022	0.032				
		(HL) (LH)	2.005 1.511	3.529 2.901	8.201 6.487	0.012 0.015	0.017 0.022	0.026 0.033				
		(LL)	1.289	2.395	5.513	0.013	0.022	0.022				
	B1 → COU		1.646	3.033	7.392	0.020	0.031	0.049				
	B1 7 000	(LL)	1.277	2.540	6.059	0.022	0.031	0.044				
	A2 → S2	(HH)	0.563	1.003	2.316	0.015	0.022	0.032				
		(HL)	0.676	1.185	2.658	0.011	0.015	0.022				
		(LH)	1.051	1.843	4.017	0.015	0.022	0.033				
		(LL)	0.741	1.279	2.802	0.011	0.015	0.022				
	A2 \rightarrow S3	(HH)	0.985	1.732	3.945	0.014	0.022	0.032				
		(HL)	1.423	2.307	5.068	0.012	0.017	0.026				
		(LH)	0.997	1.703	3.568	0.015	0.022	0.033				
	40 04	(LL)	0.703	1.229	2.679	0.011	0.015	0.022				
	A2 → S4	(HH) (HL)	1.286 1.597	2.280 2.752	5.325 6.228	0.014 0.012	0.021 0.017	0.032 0.026				
		(LH)	1.160	2.149	4.699	0.012	0.017	0.020				
		(LL)	0.967	1.751	3.918	0.013	0.022	0.033				
	A2 → COL		1.266	2.289	5.435	0.018	0.028	0.045				
		(LL)	0.941	1.824	4.273	0.020	0.030	0.044				
	B2 → S2	(HH)	0.605	1.088	2.511	0.015	0.022	0.032				
		(HL)	0.658	1.170	2.667	0.011	0.015	0.022				
		(LH)	1.015	1.752	3.807	0.015	0.022	0.033				
		(LL)	0.760	1.355	2.955	0.011	0.015	0.022				
	$B2 \rightarrow S3$	(HH)	0.967	1.716	3.954	0.014	0.022	0.032				
		(HL)	1.405	2.291	5.077	0.012	0.017	0.026				

Chapter 2 Function Block

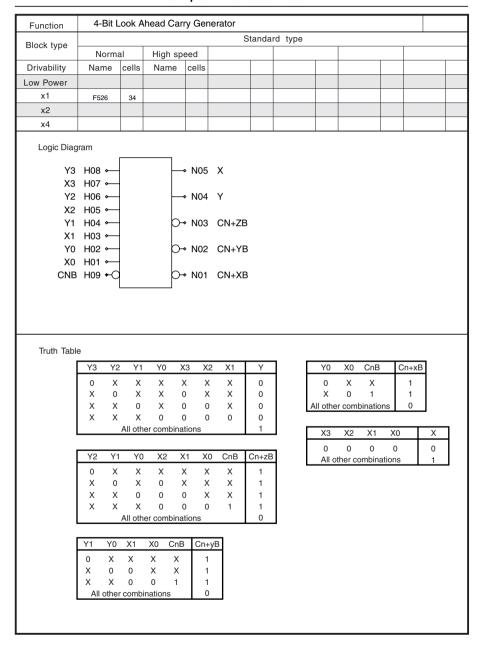
	Doth		Swite	ching sp	eed							
Block	Path			LD0 (ns)			t 1		l In	put	Ou	tput
type	IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
		(LH)	1.028	1.730	3.601	0.015	0.022	0.033				
		(LL)	0.730	1.258	2.731	0.011	0.015	0.022				
	B2 → S4	(HH)	1.268	2.265	5.334	0.014	0.021	0.032				
		(HL)	1.578 1.191	2.737 2.190	6.237 4.790	0.012 0.015	0.017 0.022	0.026 0.033				
		(LH) (LL)	0.989	1.767	3.939	0.015	0.022	0.033				
	B2 → COUT		1.248	2.274	5.445	0.018	0.028	0.045				
	22 , 0001	(LL)	0.968	1.857	4.364	0.021	0.030	0.044				
	A3 → S3	(HH)	0.567	1.008	2.325	0.015	0.022	0.032				
		(HL)	0.686	1.200	2.683	0.011	0.015	0.022				
		(LH)	1.000	1.774	3.905	0.015	0.022	0.033				
		(LL)	0.743	1.283	2.812	0.011	0.015	0.022				
	A3 → S4	(HH) (HL)	0.973 1.232	1.714 2.092	3.916 4.618	0.014 0.012	0.021 0.017	0.032 0.026				
		(LH)	0.829	1.449	3.109	0.012	0.017	0.026				
		(LL)	0.693	1.213	2.655	0.013	0.022	0.022				
	A3 → COUT		0.926	1.651	3.814	0.017	0.026	0.041				
		(LL)	0.658	1.215	2.685	0.016	0.022	0.033				
	B3 → S3	(HH)	0.608	1.093	2.518	0.015	0.022	0.032				
		(HL)	0.668	1.186	2.693	0.011	0.015	0.022				
		(LH)	0.968	1.689	3.707	0.015	0.022	0.033				
		(LL)	0.760	1.357	2.962	0.011	0.015	0.022				
	B3 → S4	(HH)	0.955	1.699	3.926	0.014	0.021	0.032				
		(HL) (LH)	1.214 0.851	2.077 1.463	4.628 3.132	0.012 0.015	0.017 0.022	0.026 0.033				
		(LL)	0.720	1.243	2.706	0.013	0.022	0.022				
	B3 → COUT		0.908	1.636	3.823	0.017	0.026	0.041				
		(LL)	0.682	1.230	2.693	0.016	0.022	0.034				
	A4 \rightarrow S4	(HH)	0.563	1.003	2.317	0.015	0.022	0.032				
		(HL)	0.677	1.186	2.661	0.011	0.015	0.022				
		(LH)	0.885	1.606	3.605	0.014	0.022	0.032				
	A4 00UT	(LL) (HH)	0.741 0.637	1.279 1.122	2.803 2.500	0.011 0.016	0.015 0.024	0.022 0.036				
	A4 → COUT	(LL)	0.397	0.709	1.479	0.013	0.024	0.030				
	B4 → S4	(HH)	0.605	1.089	2.512	0.015	0.022	0.032				
	2. , 0.	(HL)	0.658	1.171	2.671	0.011	0.015	0.022				
		(LH)	0.857	1.527	3.423	0.014	0.022	0.032				
		(LL)	0.760	1.355	2.956	0.011	0.015	0.022				
	B4 → COUT		0.618	1.106	2.510	0.016	0.024	0.036				
		(LL)	0.424	0.739	1.536	0.013	0.017	0.026				
	CIN → S1	(HH) (HL)	0.428 0.580	0.718 0.914	1.541 1.836	0.014 0.012	0.022 0.017	0.032 0.026				
		(HL)	0.380	0.914	1.670	0.012	0.017	0.026				
		(LL)	0.410	0.708	1.530	0.011	0.015	0.022				
	CIN → S2	(HH)	0.566	0.956	2.094	0.014	0.022	0.032				
		(HL)	0.831	1.281	2.678	0.013	0.017	0.026				
		(LH)	0.817	1.471	3.076	0.015	0.022	0.033				
		(LL)	0.558	0.996	2.196	0.011	0.015	0.022				
	CIN → S3	(HH)	0.782	1.348	3.022	0.014	0.022	0.032				
		(HL)	1.150	1.828	3.935	0.012	0.017	0.026				
		(LH) (LL)	1.081 0.778	2.096 1.469	4.561 3.333	0.015 0.011	0.022 0.015	0.033 0.022				
	CIN → S4	(LL) (HH)	1.043	1.834	4.233	0.011	0.015	0.022				
	OII 7 04	(HL)	1.328	2.262	5.027	0.012	0.017	0.026				
		(LH)	1.242	2.537	5.789	0.015	0.022	0.033				
		(LL)	1.032	2.053	4.847	0.011	0.015	0.022				

Chapter 2 Function Block

				Swite	ching sp	eed							
Block		Path	า	t LD0 (ns)				t 1		In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	CIN	→ C	OUT (HH)	1.004	1.807	4.233	0.018	0.028	0.043				
			(LL)	1.007	2.177	5.361	0.022	0.031	0.044				

 Block Library
 A15895EJ1V0BL
 2 - 174
 Block Library
 A15895EJ1V0BL
 2 - 175

Chapter 2 Function Block



Chapter 2 Function Block

	Path		ching sp	eed				Ι.			
Block	Path	t I	LD0 (ns))		t 1		In	put	Ou	tput
type	IN o OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F526	X0 → CN+XB (HL)	0.167	0.237	0.480	0.017	0.025	0.041	X0	6.9	CN+XB	4
	(LH)	0.235	0.355	0.732	0.028	0.042	0.061	Y0	10.5	CN+YB	5
	X0 → CN+YB (HL)	0.427	0.730	1.618	0.011	0.015	0.023	X1	5.3	CN+ZB	21
	(LH)	0.362 0.714	0.634 1.232	1.366 2.923	0.040 0.011	0.060 0.015	0.089 0.023	Y1 X2	8.8 3.8	Y X	14 22
	$X0 \rightarrow CN+ZB (HL)$ (LH)	0.714	1.232	2.746	0.011	0.015	0.023	Y2	7.4	^	22
	X0 → X (HH)	0.780	0.292	0.551	0.015	0.022	0.033	X3	2.7		
	X0 → X (III) (LL)	0.444	0.773	1.749	0.014	0.021	0.033	Y3	4.1		
	Y0 → CN+XB (HL)	0.156	0.324	0.692	0.017	0.025	0.042	CNB	2.1		
	(LH)	0.173	0.364	0.738	0.022	0.033	0.048				
	Y0 → CN+YB (HL)	0.406	0.756	1.685	0.011	0.015	0.023				
	(LH)	0.389	0.700	1.495	0.040	0.060	0.089				
	$Y0 \rightarrow CN+ZB (HL)$	0.458	1.193	2.899	0.011	0.015	0.023				
	(LH)	0.445	1.053	2.282	0.015	0.022	0.033				
	$Y0 \rightarrow Y$ (HH)	0.577	1.088	2.696	0.016	0.025	0.039				
	(LL)	0.492	0.882	1.867	0.018	0.027	0.046				
	X1 → CN+YB (HL)	0.344	0.570	1.204	0.011	0.015	0.023				
	(LH)	0.332	0.576	1.251	0.040	0.060	0.089				
	X1 → CN+ZB (HL)	0.447	0.792	1.773	0.011	0.015	0.023				
1	(LH)	0.400	0.736	1.631	0.015	0.022	0.033				
	$X1 \rightarrow Y$ (HH) (LL)	0.420 0.387	0.726 0.640	1.734 1.377	0.016 0.018	0.024 0.027	0.037 0.046				
	$X1 \rightarrow X$ (HH)	0.202	0.312	0.591	0.015	0.027	0.040				
	(LL)	0.479	0.880	1.996	0.014	0.021	0.033				
	Y1 → CN+YB (HL)	0.325	0.764	1.739	0.011	0.015	0.023				
	(LH)	0.359	0.731	1.555	0.040	0.060	0.088				
	Y1 → CN+ZB (HL)	0.415	1.188	2.846	0.011	0.015	0.023				
	(LH)	0.370	1.106	2.359	0.015	0.022	0.033				
	$Y1 \rightarrow Y$ (HH)	0.421	1.189	2.984	0.016	0.025	0.039				
	(LL)	0.380	0.820	1.717	0.018	0.027	0.045				
	$X2 \rightarrow CN+ZB (HL)$	0.465	0.808	1.749	0.011	0.015	0.023				
	(LH)	0.391	0.745	1.645	0.015	0.022	0.033				
	$X2 \rightarrow Y$ (HH)	0.376	0.669	1.515	0.015	0.023	0.035				
	(LL)	0.374	0.677	1.431	0.018	0.027	0.045				
	X2 → X (HH)	0.215	0.330	0.627	0.015 0.014	0.022 0.021	0.032				
	$\begin{array}{ccc} \text{(LL)} \\ \text{Y2} & \rightarrow \text{CN+ZB (HL)} \end{array}$	0.559 0.452	1.059 1.397	2.312 3.360	0.014	0.021	0.033 0.023				
	12 → CN+2B (IIL) (LH)	0.432	1.313	2.758	0.011	0.013	0.023				
	Y2 → Y (HH)	0.392	1.249	3.126	0.016	0.024	0.039				
	(LL)	0.454	0.907	1.884	0.018	0.027	0.045				
	X3 → Y (HH)	0.386	0.668	1.450	0.015	0.022	0.034				
1	(LL)	0.357	0.666	1.399	0.018	0.027	0.044				
	X3 → X (HH)	0.215	0.329	0.624	0.015	0.022	0.033				
	(LL)	0.565	1.080	2.358	0.014	0.021	0.033				
	Y3 → Y (HH)	0.385	1.246	3.136	0.015	0.025	0.039				
	(LL)	0.431	0.942	1.942	0.018	0.027	0.045				
	$CNB \rightarrow CN+XB (HH)$	0.372	0.591	1.174	0.029	0.042	0.061				
	(LL)	0.298	0.504	1.053	0.017	0.025	0.042				
	CNB → CN+YB (HH)	0.567	0.943	1.962	0.040	0.060	0.088				
	(LL)	0.554	0.970	2.157	0.011	0.015	0.023				
	CNB → CN+ZB (HH)	0.766	1.188	2.533	0.015	0.022	0.033				
	(LL)	0.621	1.081	2.530	0.011	0.015	0.023				

F526

Chapter 2 Function Block

Function	-																
Block type								S	Stand	ard	type						
2.00.1.1,00		Norma	al	Higl	ı spe	eed											
Drivability	N	lame	cells	Nar	ne	cells											
Low Power																	
x1		F527	69														
x2																	
x4																	
Logic Dia	agram																
	3 H																
	3 H					N07											
	2 H(2 H(N06 N05		II ITD									
	1 H					N04											
	1 H					N03											
	0 H				1	N02											
	0 H					N01											
CIN	IB H	09 ←															
					_												
Truth Ta	ble				_												
Truth Ta	ble B0	A1 E	31 A23	B2	A3	B3	*1	S0	S1	S2	\$3	*2	x	Y			
A0 0	B0 0	0	0 0	0	0	0	0	1	0	0	0	1	0	0			
AO	В0	0					_										
0 0 1 1	B0 0 1 0	0 0 1	0 0 1 0 0 1 1 1	0 1 0	0 0 1	0 1 0	0 0 0	1 0 0	0 1 0	0 1 0	0 1 0	1 1 0	0 0 0	0 0 1			
0 0 1	B0 0 1 0	0 0 1 1	0 0 1 0 0 1	0 1 0 1	0 0 1	0 1 0 1	0 0 0 0	1 0 0 1	0 1 0	0 1 0 1	0 1 0 1	1 1 0 0	0 0 0 1	0 0 1 1			
0 0 1 1 0	B0 0 1 0 1 0	0 0 1 1 0	0 0 1 0 0 1 1 1	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1	0 1 0	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0	0 0 1 1 0 0			
AO 0 0 1 1 1 0 0 0 1 1 1 1	B0 0 1 0 1 0 1 0 1 1	0 0 1 1 0 0	0 0 1 0 0 1 1 1 0 0 1 0 1 1 1 1	0 1 0 1 0	0 0 1 1 0	0 1 0 1 0	0 0 0 0 1	1 0 0 1 0	0 1 0 1 0	0 1 0 1 0	0 1 0 1 0	1 1 0 0 1	0 0 0 1 0	0 0 1 1 0			
A0 0 0 1 1 0 0 1 1 (n=0,1,2	B0 1 0 1 0 1 0 1 1 0 1 1 0 1 0 1	0 0 1 1 0 0 1 1 1	0 0 1 0 0 1 1 1 0 0 1 0 1 1 1 1	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
A0 0 0 1 1 0 0 1 1 (n=0.1.2 Sn=(An	B0 0 1 0 1 0 1 0 1 1 0 1 + 0 1 + 0 + 0 1 + 0 1 1 0 1 1 0 1 1 0 1 1 0 1 0	0 0 1 1 0 0 1 1 1	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 0 1 1 0 1 1 0 1 Hn+CinB)	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			
AO 0 0 1 1 0 0 1 (n=0.1,2,3) Sn=(An X=(AoW) Y=1:(An	B0 0 1 0 1 0 1 1 0 1 1 0 1 1	0 0 1 1 0 0 1 1 1 1 hB, *2:CoutE	0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 1 1 1 1 3	0 1 0 1 0	0 0 1 1 0 0	0 1 0 1 0 1	0 0 0 0 1 1	1 0 0 1 0	0 1 0 1 0 0	0 1 0 1 0 1	0 1 0 1 0 1	1 1 0 0 1 1	0 0 0 1 0	0 0 1 1 0 0			

Chapter 2 Function Block

Divide			Swite	ching sp	eed							
Block	Path		t	LDO (ns)			t 1		l in	put	Ou	tput
type		DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F527	A0 → F0	(HH)	0.592	1.232	2.664	0.015	0.023	0.036	A0	2.9	F0	19
		(HL)	0.665	1.296	2.814	0.013	0.018	0.027	B0	2.9	F1	19
		(LH) (LL)	0.664 0.684	1.364 1.363	2.947 2.918	0.015 0.013	0.023 0.018	0.036 0.026	A1 B1	2.9 3.0	F2 F3	19 19
	A0 → F1	(HH)	0.610	1.333	2.980	0.015	0.018	0.020	A2	2.9	COUTB	14
	AU → FI	(HL)	0.626	1.133	2.415	0.013	0.022	0.026	B2	3.0	X	5
		(LH)	0.628	1.152	2.539	0.016	0.023	0.036	A3	2.8	Ϊ́Υ	15
		(LL)	0.652	1.354	2.910	0.013	0.018	0.027	В3	3.0		
	A0 → F2	(HH)	0.921	1.656	3.671	0.015	0.022	0.033	CINB	2.1		
		(HL)	0.941	1.699	3.693	0.012	0.017	0.027				
		(LH)	0.932	1.679	3.668	0.015	0.023	0.036				
		(LL)	0.959	1.753	3.822	0.013	0.017	0.027				
	A0 → F3	(HH)	1.087	1.918	4.319	0.015	0.022	0.033				
		(HL)	1.109	1.966	4.358	0.012	0.017	0.027				
		(LH)	1.108	1.956	4.334	0.015	0.023 0.017	0.036 0.027				
	A0 → COU	(LL)	1.138 1.155	2.029 2.039	4.481 4.627	0.013 0.017	0.017	0.027				
	A0 → C00	(LH)	1.186	2.090	4.664	0.017	0.024	0.030				
	A0 → X	(HH)	0.402	0.699	1.468	0.015	0.023	0.034				
	7.0 7.7	(LL)	0.434	0.750	1.587	0.030	0.047	0.084				
	A0 → Y	(HH)	1.055	1.855	4.137	0.017	0.026	0.043				
		(LL)	1.108	1.949	4.312	0.013	0.018	0.028				
	B0 → F0	(HH)	0.604	1.232	2.664	0.015	0.023	0.036				
		(HL)	0.666	1.316	2.851	0.013	0.018	0.027				
		(LH)	0.633	1.393	2.992	0.015	0.023	0.036				
		(LL)	0.676	1.364	2.917	0.013	0.017	0.027				
	B0 → F1	(HH)	0.621	1.333	2.981	0.015	0.022	0.033				
		(HL) (LH)	0.641 0.616	1.153 1.164	2.453 2.597	0.012 0.016	0.017 0.023	0.026 0.036				
		(LL)	0.639	1.354	2.910	0.013	0.023	0.030				
	B0 → F2	(HH)	0.936	1.676	3.709	0.015	0.010	0.033				
	50 7.2	(HL)	0.956	1.718	3.730	0.012	0.017	0.027				
		(LH)	0.920	1.691	3.726	0.015	0.023	0.036				
		(LL)	0.947	1.765	3.879	0.013	0.017	0.027				
	B0 → F3	(HH)	1.102	1.938	4.357	0.015	0.022	0.033				
		(HL)	1.124	1.986	4.395	0.012	0.017	0.027				
		(LH)	1.096	1.968	4.392	0.015	0.023	0.036				
		(LL)	1.125	2.041	4.539	0.013	0.017	0.027				
	B0 → COU	TB (HL)	1.170 1.174	2.059 2.103	4.665 4.722	0.017 0.014	0.024 0.021	0.039				
	B0 → X	(HH)	0.402	0.700	1.468	0.014	0.021	0.030				
	D0 → X	(LL)	0.434	0.750	1.587	0.030	0.023	0.084				
	B0 → Y	(HH)	1.070	1.875	4.174	0.017	0.026	0.043				
	50 / .	(LL)	1.096	1.961	4.369	0.013	0.018	0.028				
	A1 → F1	(HH)	0.622	1.307	2.803	0.015	0.024	0.037				
		(HL)	0.698	1.346	2.904	0.013	0.018	0.027				
		(LH)	0.710	1.410	3.012	0.015	0.024	0.036				
		(LL)	0.707	1.450	3.088	0.013	0.018	0.027				
	A1 → F2	(HH)	0.678	1.266	2.870	0.015	0.022	0.033	1			
		(HL)	0.698	1.308	2.890	0.012	0.017	0.027				
		(LH)	0.646	1.197	2.644	0.015	0.023	0.036	1			
	A1 . F0	(LL) (HH)	0.672 0.928	1.271 1.702	2.796 3.884	0.013 0.015	0.017 0.022	0.027 0.033	1			
	A1 → F3	(HH)	0.928	1.702	3.884	0.015	0.022	0.033				
		(LH)	0.893	1.614	3.558	0.012	0.017	0.027				
		(LL)	0.919	1.687	3.707	0.013	0.023	0.027				
		(LL)	0.010	1.007	0.707	0.013	0.017	J.UL1				

Chapter 2 Function Block

Division		Swite	ching sp	eed							
Block	Path	t	LD0 (ns))		t 1		In	put	Ou	tput
type	IN o OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	A1 → COUTB (HL)	1.108	1.968	4.500	0.017	0.024	0.039				
	(LH)	1.066	1.882	4.150	0.014	0.021	0.030				
	A1 → X (HH)	0.424	0.715	1.545	0.015	0.022	0.034				
	(LL)	0.446 1.010	0.761 1.784	1.643 4.010	0.030 0.017	0.047 0.026	0.084 0.043				
	$A1 \rightarrow Y$ (HH)	0.988	1.784	3.802	0.017	0.026	0.043				
	B1 → F1 (HH)	0.633	1.306	2.803	0.015	0.017	0.027				
	(HL)	0.700	1.365	2.941	0.013	0.018	0.027				
	(LH)	0.679	1.439	3.057	0.015	0.024	0.036				
	(LL)	0.703	1.447	3.089	0.013	0.018	0.027				
	B1 → F2 (HH)	0.693	1.285	2.907	0.015	0.022	0.033				
	(HL)	0.713	1.328	2.927	0.012	0.017	0.027				
	(LH)	0.634	1.210	2.702	0.015	0.023	0.036				
	(LL)	0.660	1.283	2.854	0.013	0.017	0.027				
	B1 → F3 (HH)	0.943	1.721	3.921	0.015	0.022	0.033				
	(HL)	0.965	1.769	3.960	0.012	0.017	0.027				
	(LH)	0.881	1.627	3.615	0.015	0.023	0.036				
	(LL) B1 → COUTB (HL)	0.907 1.123	1.700 1.987	3.765 4.538	0.013 0.017	0.017 0.024	0.027 0.039				
	(LH)	1.054	1.895	4.208	0.017	0.024	0.039				
	B1 → X (HH)	0.424	0.715	1.545	0.015	0.022	0.034				
	(LL)	0.446	0.761	1.643	0.030	0.047	0.084				
	B1 → Y (HH)	1.025	1.803	4.047	0.017	0.026	0.043				
	(LL)	0.976	1.755	3.860	0.013	0.017	0.027				
	A2 \rightarrow F2 (HH)	0.588	1.240	2.703	0.015	0.024	0.036				
	(HL)	0.671	1.275	2.771	0.013	0.018	0.027				
	(LH)	0.674	1.342	2.890	0.015	0.023	0.036				
	(LL)	0.677	1.382	2.986	0.013	0.018	0.027				
	A2 → F3 (HH)	0.709	1.338	3.087	0.015	0.022	0.033				
	(HL)	0.730 0.645	1.386 1.191	3.125 2.616	0.012 0.015	0.017 0.023	0.027 0.036				
	(LH) (LL)	0.645	1.191	2.772	0.013	0.023	0.036				
	A2 → COUTB (HL)	0.996	1.818	4.182	0.017	0.017	0.027				
	(LH)	0.903	1.610	3.494	0.014	0.021	0.030				
	A2 → X (HH)	0.421	0.711	1.543	0.015	0.022	0.034				
	(LL)	0.438	0.750	1.630	0.030	0.047	0.084				
	A2 \rightarrow Y (HH)	0.899	1.635	3.692	0.017	0.026	0.043				
	(LL)	0.826	1.471	3.150	0.012	0.017	0.027				
	B2 → F2 (HH)	0.599	1.239	2.703	0.015	0.024	0.036				
	(HL)	0.672	1.294	2.808	0.013	0.018	0.027				
	(LH)	0.643	1.372	2.934	0.015	0.023	0.036				
	(LL) B2 \rightarrow F3 (HH)	0.670 0.724	1.381 1.358	2.984 3.123	0.013 0.015	0.018 0.022	0.027 0.033				
	B2 → F3 (FIL)	0.724	1.405	3.162	0.013	0.022	0.033				
	(LH)	0.633	1.203	2.674	0.012	0.017	0.027				
	(LL)	0.662	1.280	2.830	0.013	0.017	0.027				
	B2 → COUTB (HL)	1.011	1.838	4.219	0.017	0.024	0.039				
	(LH)	0.891	1.623	3.551	0.014	0.021	0.030				
	B2 \rightarrow X (HH)		0.711	1.543	0.015	0.022	0.034				
	(LL)	0.438	0.750	1.630	0.030	0.047	0.084				
	B2 → Y (HH)	0.914	1.654	3.729	0.017	0.026	0.043				
	(LL)	0.814	1.483	3.208	0.012	0.017	0.027				
	$A3 \rightarrow F3$ (HH) (HL)	0.545 0.600	1.117 1.190	2.457 2.623	0.015 0.013	0.023 0.017	0.036 0.027				
	(HL) (LH)	0.593	1.190	2.623	0.013	0.017	0.027				
1	(LH) (LL)	0.593	1.268	2.752	0.015	0.023	0.036				
	(LL)	0.042	1.241	2.740	0.013	0.010	0.021				<u> </u>

Chapter 2 Function Block

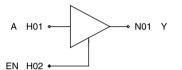
		Swite	ching sp	eed				<u> </u>			
Block	Path	t	LD0 (ns))		t 1		l In	put	Ou	tput
type	IN → OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	A3 → COUTB (HL)	0.730	1.384	3.259	0.017	0.024	0.039				
	(LH)	0.626	1.136	2.441	0.014	0.021	0.030				
	A3 → X (HH)	0.360	0.605	1.312	0.015	0.022	0.034				
	(LL)	0.383	0.658	1.452	0.030	0.047	0.084				
	A3 → Y (HH)	0.632	1.201	2.769	0.017	0.026	0.043				
	(LL)	0.552	0.996	2.098	0.012	0.017	0.027				
	B3 → F3 (HH)	0.556	1.116	2.457	0.015	0.023	0.036				
	(HL)	0.601	1.209	2.660	0.013	0.017	0.027				
	(LH)	0.562	1.296	2.796	0.015	0.023	0.036				
	(LL)	0.634	1.242	2.739	0.013	0.017	0.027				
	B3 → COUTB (HL)	0.745	1.403	3.295	0.017	0.024	0.039				
	(LH)	0.614	1.148	2.499	0.014	0.021	0.030				
	B3 → X (HH)	0.360	0.605	1.312	0.015	0.022	0.034				
	(LL)	0.383	0.659	1.452	0.030	0.047	0.084				
	B3 → Y (HH)	0.647	1.220	2.805	0.017	0.026	0.043				
	(LL)	0.540	1.009	2.157	0.012	0.017	0.027				
	CINB → F0 (HH)	0.485	0.857	1.757	0.015	0.023	0.036				
	(HL)	0.529	0.947	1.926	0.013	0.017	0.027				
	(LH)	0.457	0.811	1.711	0.015	0.022	0.033				
	(LL)	0.457	0.813	1.649	0.012	0.017	0.026				
	CINB → F1 (HH)	0.724	1.271	2.720	0.016	0.023	0.036				
	(HL)	0.749	1.340	2.873	0.013	0.018	0.027				
	(LH)	0.709	1.257	2.756	0.015	0.022	0.033				
	(LL)	0.717	1.276	2.731	0.012	0.017	0.026				
	CINB → F2 (HH)	0.922	1.596	3.488	0.015	0.023	0.036				
	(HL)	0.952	1.670	3.640	0.013	0.017	0.027				
	(LH)	0.883	1.560	3.494	0.015	0.022	0.033				
	(LL)	0.903	1.602	3.514	0.012	0.017	0.027				
	CINB → F3 (HH)	1.020	1.763	3.923	0.015	0.023	0.036				
1	(HL)	1.051	1.836	4.065	0.013	0.017	0.027				
1	(LH)	0.983	1.738	3.965	0.015	0.022	0.033				
1	(LL)	1.004	1.786	4.003	0.012	0.017	0.027			1	
	CINB → COUTB (HH)	0.842	1.471	3.410	0.016	0.025	0.039				
	(LL)	0.595	0.982	1.995	0.018	0.026	0.043				

Block Library A15895EJ1V0BL 2 - 180 Block Library A15895EJ1V0BL 2 - 181

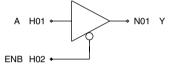
Chapter 2 Function Block

Function	3-Stat	3-State Buffer									
Block type			Buffer	type					Inverter	type	
Block type	with EN		with ENB				with E	N	with El	NB	
Drivability	Name cells Name cells					Name	cells	Name	cells		
Low Power	L531	4	L532	4							
x1	F531	5	F532	5			F541	6	F542	6	
x2	F533	7	F534	7			F543	8	F544	8	
x4	F53F	11	F53G	11			F54F	12	F54G	12	
x8											

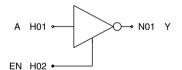
Logic Diagram for "Buffer with EN"



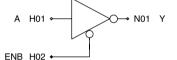
Logic Diagram for "Buffer with ENB"



Logic Diagram for "Inverter with EN"



Logic Diagram for "Inverter with ENB"



Truth Table

With EN

А	EN	Υ	Y*
0	1	0	1
1	1	1	0
х	0	Z	Z

With ENB

Α	ENB	Υ	Y*
0	0	0	1
1	0	1	0
х	1	z	Z

X:Irrelevant

Z:High Impedance

*:Inverter type

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L531	$A \ \to Y$	(HH)	0.218	0.343	0.712	0.029	0.043	0.062	A	2.1	Ý	10
1		(LL)	0.232	0.390	0.813	0.023	0.031	0.047	EN	1.0		
1	$EN \rightarrow Y$	(HZ)	0.441	0.667	1.283				Y	0.5		
1		(LZ)	0.276	0.454	0.881							
1		(ZH)	0.396	0.650	1.375	0.029	0.042	0.062				
		(ZL)	0.343	0.585	1.191	0.023	0.031	0.047		0.1	Y	
F531	$A \rightarrow Y$	(HH) (LL)	0.181 0.213	0.293 0.363	0.612 0.752	0.015 0.012	0.022 0.016	0.032 0.025	A EN	2.1 1.0	*	22
	EN → Y	(HZ)	0.435	0.662	1.280	0.012	0.010	0.025	Y	0.5		
1		(LZ)	0.288	0.469	0.901				l .	0.0		
		(ZH)	0.362	0.603	1.284	0.015	0.022	0.032				
		(ZL)	0.323	0.560	1.135	0.012	0.016	0.024				
F533	$A \rightarrow Y$	(HH)	0.213	0.348	0.742	0.008	0.011	0.017	Α	2.1	Υ	43
		(LL)	0.250	0.439	0.925	0.006	0.009	0.014	EN	1.0		
	$EN \rightarrow Y$	(HZ)	0.500	0.757	1.436				Y	0.9		
		(LZ)	0.317	0.516	0.993							
		(ZH)	0.387	0.661	1.423	0.008	0.011	0.017				
5505		(ZL)	0.352	0.633	1.304	0.006	0.009	0.013	_	0.1	Y	60
F53F	$A \rightarrow Y$	(HH) (LL)	0.271 0.327	0.452 0.599	0.989 1.275	0.004 0.004	0.006 0.005	0.009	A EN	2.1 1.0	Y	80
	EN → Y	(LL) (HZ)	0.628	0.599	1.747	0.004	0.005	0.006	Y	2.4		
	EIN → f	(LZ)	0.028	0.625	1.189				'	2.4		
		(ZH)	0.434	0.764	1.674	0.004	0.006	0.009				
1		(ZL)	0.419	0.788	1.653	0.004	0.005	0.008				
L532	$A \rightarrow Y$	(HH)	0.207	0.328	0.685	0.029	0.043	0.062	Α	2.1	Y	10
		(LL)	0.246	0.414	0.850	0.023	0.032	0.047	ENB	1.0		
	ENB → Y	(HZ)	0.342	0.481	0.870				Y	0.5		
		(LZ)	0.360	0.566	1.093							
1		(ZH)	0.307	0.521	1.122	0.029	0.042	0.062				
L		(ZL)	0.446	0.782	1.627	0.023	0.032	0.047				
F532	$A \rightarrow Y$	(HH)	0.177	0.286	0.601	0.015	0.022	0.032	A	2.1	Y	22
	ENB → Y	(LL) (HZ)	0.217 0.347	0.371 0.488	0.764 0.881	0.012	0.016	0.025	ENB Y	1.0 0.4		
	EIND → f	(LZ)	0.368	0.578	1.109				'	0.4		
		(ZH)	0.277	0.481	1.044	0.015	0.022	0.032				
		(ZL)	0.418	0.744	1.554	0.012	0.016	0.025				
F534	$A \rightarrow Y$	(HH)	0.207	0.337	0.721	0.007	0.011	0.017	Α	2.1	Υ	43
		(LL)	0.258	0.455	0.951	0.006	0.009	0.014	ENB	1.0		
	$ENB \ \to \ Y$	(HZ)	0.397	0.568	1.020				Y	0.9		
		(LZ)	0.404	0.634	1.209	l						
		(ZH)	0.293	0.523	1.160	0.008	0.011	0.017				
EE 20	A V	(ZL)	0.455	0.826	1.735	0.006	0.009	0.014	A	2.1	Y	81
F53G	$A \rightarrow Y$	(HH) (LL)	0.264 0.341	0.433 0.630	0.950 1.329	0.004 0.004	0.006 0.005	0.009	ENB	1.0	*	81
	ENB → Y	(LL) (HZ)	0.507	0.630	1.308	0.004	0.003	0.003	Y	2.4		
	EIND → T	(LZ)	0.481	0.749	1.408				'	2.7		
		(ZH)	0.332	0.616	1.395	0.004	0.006	0.009				
		(ZL)	0.535	1.000	2.111	0.004	0.005	0.009				
F541	$A \ \to Y$	(HL)	0.322	0.542	1.106	0.012	0.016	0.025	Α	1.0	Y	22
		(LH)	0.291	0.513	1.120	0.015	0.022	0.032	EN	1.0		
	$EN \rightarrow Y$	(HZ)	0.445	0.675	1.299				Y	0.5		
		(LZ)	0.290	0.472	0.906							
		(ZH)	0.372	0.619	1.312	0.015	0.022	0.032				
		(ZL)	0.326	0.565	1.147	0.012	0.016	0.025				

[MEMO]

					- unou							
			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F543	$A \rightarrow Y$	(HL)	0.364	0.628	1.296	0.006	0.009	0.014	Α	1.0	Υ	43
		(LH)	0.316	0.565	1.246	0.007	0.011	0.017	EN	1.0		
l	EN → Y	(HZ)	0.498	0.758	1.441				Y	0.9		
		(LZ)	0.331	0.535	1.020							
		(ZH)	0.391	0.666	1.434	0.008	0.011	0.017				
		(ZL)	0.365	0.652	1.337	0.006	0.009	0.014				
F54F	$A \rightarrow Y$	(HL)	0.446	0.796	1.661	0.004	0.005	0.009	Α	1.0	Y	81
		(LH)	0.370	0.667	1.486	0.004	0.006	0.009	EN	1.0		
	$EN \rightarrow Y$	(HZ)	0.608	0.927	1.726				Y	2.4		
		(LZ)	0.406	0.651	1.227							
		(ZH)	0.431	0.759	1.668	0.004	0.006	0.009				
		(ZL)	0.439	0.818	1.701	0.004	0.005	0.009				
F542	$A \rightarrow Y$	(HL)	0.322	0.542	1.106	0.012	0.016	0.025	Α	1.0	Y	22
l		(LH)	0.291	0.513	1.120	0.015	0.022	0.032	ENB	1.0		
	$ENB \rightarrow Y$	(HZ)	0.354	0.496	0.890				Y	0.5		
		(LZ)	0.372	0.585	1.120							
		(ZH)	0.283	0.491	1.065	0.015	0.022	0.032				
		(ZL)	0.419	0.747	1.563	0.012	0.016	0.024				
F544	$A \rightarrow Y$	(HL)	0.364	0.628	1.296	0.006	0.009	0.014	A	1.0	Y	43
		(LH)	0.316	0.565	1.246	0.007	0.011	0.017	ENB	1.0		
	ENB → Y	(HZ)	0.408	0.580	1.036				Y	0.9		
		(LZ)	0.410	0.643	1.222							
		(ZH)	0.302	0.539	1.190	0.008	0.011	0.017				
		(ZL)	0.459	0.834	1.751	0.006	0.009	0.014				
F54G	$A \rightarrow Y$	(HL)	0.446	0.796	1.661	0.004	0.005	0.009	A	1.0	Y	81
l		(LH)	0.370	0.667	1.486	0.004	0.006	0.009	ENB	1.0		
l	ENB → Y	(HZ)	0.518	0.750	1.326				Y	2.4		l
l		(LZ)	0.483	0.753	1.415							
l		(ZH)	0.342	0.633	1.428	0.004	0.006	0.009				l
		(ZL)	0.533	0.999	2.114	0.004	0.005	0.009				

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 Block Library
 A15895EJ1V0BL
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Chapter 2 Function Block

Block type	2104	Deco	der									
		Po	sitive out	put ty	ре			Ne	gative out	tput typ	е	
	Norma	al	with El	NΒ	with E	N.	Norm	al	with El	NB	with E	ΞN
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L560	6					L561	6				
x1	F560	10					F561	10				
x2												
x4												
Logic Diagram	ve output ty	/pe" → N01 → N02 → N03 → N04	Y1 Y2	for "F	Positive out	put wit	h ENB"		for "Positiv	re outpu	ut with EN	
for "Negat A H01 ← B H02 ←	0	type" → N01 → N02 → N03 → N04	Y1B Y2B	for "l	Negative ou	utput w	ith ENB"		for "Negat	ive outp	out with El	N"
Truth Table	3 ENB	YO) Y1	Y2	2 Y3	YOE	3 Y1B	Y2B	3 Y3B			
										+		
1 0	0 0	1		0		0		1	1			
	0	0		0		1	0	1	1			
1 (1 0	0		1		1	1	0	1			
1 0				0	1	1	1	1	0	1		
1 0 1	1 0	0										
1 0 1 1 1 1	1 0 K 1	0		0		1	1	1	1			

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	IN → OI	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L560	A → Y0	(HL)	0.349	0.566	1.119	0.022	0.030	0.044	Α	1.0	Y0	5
		(LH)	0.359	0.625	1.311	0.052	0.078	0.116	В	1.0	Y1	5
	$A \rightarrow Y1$	(HH)	0.244	0.387	0.764	0.052	0.078	0.117			Y2	5
		(LL)	0.242	0.406	0.801	0.023	0.031	0.047			Y3	5
	A → Y2	(HL) (LH)	0.352 0.363	0.569 0.631	1.123 1.320	0.022 0.052	0.030 0.078	0.044 0.116				
	A → Y3	(LH)	0.363	0.831	0.764	0.052	0.078	0.116				
	A → 13	(LL)	0.242	0.407	0.801	0.023	0.070	0.047				
	B → Y0	(HL)	0.369	0.597	1.177	0.022	0.030	0.044				
		(LH)	0.372	0.652	1.356	0.052	0.078	0.115				
	$B \rightarrow Y1$	(HL)	0.369	0.597	1.177	0.022	0.030	0.044				
		(LH)	0.372	0.652	1.355	0.052	0.078	0.115				
	$B \ \to Y2$	(HH)	0.254	0.413	0.812	0.052	0.078	0.115				
		(LL)	0.261	0.438	0.860	0.023	0.031	0.047				
	B → Y3	(HH)	0.250	0.408	0.803	0.052	0.078	0.115				
F560	A → Y0	(LL) (HL)	0.259	0.435 0.533	0.855 1.066	0.023	0.031	0.047	A	1.0	Y0	21
L200	A → YU	(DL)	0.326	0.655	1.420	0.011	0.015	0.023	В	1.0	Y1	21
	A → Y1	(HH)	0.479	0.819	1.735	0.015	0.022	0.033		1.0	Y2	21
	N -> 11	(LL)	0.452	0.788	1.632	0.011	0.015	0.023			Y3	22
	$A \rightarrow Y2$	(HL)	0.332	0.541	1.078	0.011	0.015	0.023				
		(LH)	0.373	0.664	1.436	0.015	0.022	0.033				
	$A \rightarrow Y3$	(HH)	0.474	0.812	1.723	0.015	0.022	0.033				
		(LL)	0.448	0.782	1.623	0.011	0.015	0.023				
	$B \rightarrow Y0$	(HL)	0.370	0.587	1.158	0.011	0.015	0.023				
		(LH)	0.371	0.642	1.372	0.015	0.022	0.033				
	B → Y1	(HL)	0.373	0.592	1.165	0.011	0.015	0.023				
	D VO	(LH) (HH)	0.375 0.477	0.649 0.795	1.384 1.679	0.015 0.015	0.022 0.022	0.033 0.033				
	B → Y2	(LL)	0.477	0.793	1.723	0.013	0.022	0.033				
	B → Y3	(HH)	0.471	0.787	1.665	0.015	0.022	0.033				
	2 , .0	(LL)	0.487	0.833	1.711	0.011	0.015	0.023				
L561	A → Y0B	(HH)	0.221	0.339	0.649	0.029	0.043	0.063	Α	1.0	Y0B	9
		(LL)	0.261	0.443	0.912	0.034	0.051	0.085	В	1.0	Y1B	9
	$A \rightarrow Y1B$	(HL)	0.365	0.599	1.226	0.034	0.050	0.083			Y2B	8
		(LH)	0.338	0.581	1.201	0.029	0.042	0.061			Y3B	9
	A → Y2B	(HH)	0.221	0.339	0.649	0.029	0.043	0.063				
	A → Y3B	(LL) (HL)	0.261 0.362	0.443 0.595	0.912 1.218	0.034	0.051 0.050	0.085 0.083				
	A → 13D	(LH)	0.336	0.578	1.195	0.029	0.030	0.061				
	B → Y0B	(HH)	0.247	0.373	0.713	0.029	0.043	0.062				
		(LL)	0.252	0.415	0.850	0.034	0.050	0.083				
	$B \rightarrow Y1B$	(HH)	0.249	0.376	0.718	0.029	0.043	0.062			1	
		(LL)	0.255	0.419	0.858	0.034	0.050	0.083				
	$B \rightarrow Y2B$	(HL)	0.363	0.578	1.174	0.034	0.050	0.082				
		(LH)	0.367	0.619	1.272	0.029	0.042	0.061				
	B → Y3B	(HL)	0.362	0.579	1.175	0.034	0.050	0.082				
F561	A → Y0B	(LH) (HH)	0.366 0.427	0.618 0.715	1.271 1.454	0.029	0.042	0.061	A	1.0	Y0B	22
1 301	A → TUB	(LL)	0.521	0.713	1.956	0.013	0.022	0.031	В	1.0	Y1B	22
	A → Y1B	(HL)	0.403	0.686	1.407	0.012	0.017	0.025			Y2B	22
		(LH)	0.317	0.556	1.146	0.015	0.022	0.031			Y3B	22
	$A \ \to \ Y2B$	(HH)	0.427	0.715	1.454	0.015	0.022	0.031			1	
		(LL)	0.521	0.929	1.956	0.012	0.017	0.025			1	
	$A \ \to \ Y3B$	(HL)	0.403	0.686	1.407	0.012	0.017	0.025			1	
		(LH)	0.317	0.556	1.147	0.015	0.022	0.031				

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path)		t 1] In	put	Ou	itput
type	IN → OI	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	B → Y0B	(HH)	0.462	0.770	1.551	0.015	0.022	0.031				
l		(LL)	0.544	0.972	2.028	0.012	0.017	0.025				
l	B → Y1B	(HH)	0.462	0.770	1.551	0.015	0.022	0.031				
l		(LL)	0.545	0.972	2.026	0.012	0.017	0.025				
l	B → Y2B	(HL)	0.411	0.709	1.446	0.012	0.017	0.025				
l		(LH)	0.345	0.600	1.225	0.015	0.022	0.031				
l	B → Y3B	(HL)	0.411	0.709	1.446	0.012	0.017	0.025				
ı		(LH)	0.345	0.600	1.225	0.015	0.022	0.031				

Chapter 2 Function Block

[MEMO]

 Block Library
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 Block Library
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Chapter 2 Function Block

Function	2 to 1	Multip	lexer (Po	sitive o	out)							
Block type			Standar	d type					High-spee	ed type		
Diook type	Norma	al	with E	NB	with E	N	Norm	al	with E	NB	with E	ΕN
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	L565	3	L571	4								
x1	F565	4	F571	6								
x2												
x4												
Logic Diagram for "Stand D0 H01 4 D1 H02 4 A H03 4	dard type"	N	101 Y	for "S D0 H01 D1 H02 A H03 NB H04	-	ype wil	th ENB" N01 Y		for "Stand	lard typ	e with EN	п
for "High-	speed type	e"		for "H	liah anaad							
					пун-ѕрееч	type v	vith ENB"		for "High-s	speed ty	pe with E	N"
X	D1 A X X X	EN 1 0	0	YB 1 AB	igirspeed	type v	vith ENB"		for "High-s	speed ty	ype with E	N"
X A	х х	1	0 A	YB 1	igirspeed	type v	vith ENB"		for "High-s	speed ty	ype with E	N"

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		tı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L565	D0 → Y	(HH)	0.291	0.446	0.908	0.029	0.043	0.063	D0	1.0	Y	10
l		(LL)	0.326	0.541	1.119	0.024	0.033	0.049	D1	1.0		
l	D1 \rightarrow Y	(HH)	0.290	0.441	0.892	0.029	0.043	0.063	Α	2.1		
I		(LL)	0.322	0.541	1.126	0.024	0.032	0.049				
I	$A \ \to \ Y$	(HH)	0.208	0.324	0.631	0.029	0.043	0.063				
I		(HL)	0.274	0.443	0.897	0.024	0.032	0.049				
I		(LH)	0.259	0.435	0.908	0.029	0.043	0.063				
		(LL)	0.237	0.373	0.733	0.024	0.032	0.049				
F565	$D0 \ \rightarrow \ Y$	(HH)	0.287	0.452	0.935	0.015	0.022	0.033	D0	1.0	Y	21
I		(LL)	0.325	0.570	1.215	0.013	0.017	0.027	D1	1.0		
I	D1 \rightarrow Y	(HH)	0.284	0.450	0.931	0.015	0.022	0.033	Α	1.0		
I		(LL)	0.322	0.566	1.206	0.013	0.017	0.027				
I	$A \ \to \ Y$	(HH)	0.357	0.608	1.277	0.015	0.022	0.033				
I		(HL)	0.358	0.610	1.222	0.012	0.017	0.026				
I		(LH)	0.327	0.574	1.219	0.015	0.022	0.033				
		(LL)	0.373	0.691	1.481	0.013	0.017	0.026				
L571	$D0 \ \rightarrow \ Y$	(HH)	0.299	0.476	1.002	0.052	0.078	0.117	D0	1.0	Y	4
I		(LL)	0.310	0.530	1.115	0.024	0.033	0.049	D1	1.0		
I	D1 \rightarrow Y	(HH)	0.304	0.483	1.013	0.052	0.078	0.117	Α	1.0		
I		(LL)	0.316	0.539	1.130	0.024	0.033	0.050	ENB	1.0		
I	$A \rightarrow Y$	(HH)	0.370	0.634	1.354	0.052	0.078	0.117				
I		(HL)	0.333	0.541	1.080	0.024	0.032	0.049				
I		(LH)	0.333	0.583	1.252	0.052	0.078	0.117				
I		(LL)	0.363	0.656	1.398	0.024	0.032	0.049				
I	$ENB \ \to \ Y$	(HL)	0.111	0.151	0.232	0.022	0.029	0.041				
		(LH)	0.097	0.186	0.413	0.052	0.078	0.116				
F571	D0 \rightarrow Y	(HH)	0.493	0.832	1.826	0.015	0.022	0.033	D0	1.0	Y	21
I		(LL)	0.492	0.860	1.847	0.011	0.015	0.023	D1	1.0		
l	D1 \rightarrow Y	(HH)	0.491	0.830	1.823	0.015	0.022	0.033	Α	1.0		
		(LL)	0.489	0.857	1.840	0.011	0.015	0.023	ENB	1.0		
 	$A \rightarrow Y$	(HH)	0.558	0.983	2.166	0.015	0.022	0.033				
		(HL)	0.512	0.865	1.801	0.011	0.015	0.023				
I		(LH)	0.522	0.934	2.068	0.015	0.022	0.033				
 		(LL)	0.537	0.975	2.111	0.011	0.015	0.023				
I	$ENB \ \to \ Y$	(HL)	0.303	0.487	0.962	0.011	0.015	0.023				
		(LH)	0.297	0.517	1.129	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	7.01	winip	lexer (Po		<i>-</i>				Lliab or	al turn -		
Block type		. 1	Standar						High-spee			
5	Norma		with El	1	with E		Norma		with E		with E	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power	FFC4	8	F570	10								
x1	F564	8	F570	10								
x2 x4												
D0 H01 D1 H02 D2 H03 D3 H04 A H05 B H06	n dard type"		01 Y	00 H01 01 H02 02 H03 3 H04 A H05 B H06 NB H07			→ N01 Y		for "Stand			
Truth Table D0 X A X X	D1 D2 X X X X B X X X	DX X X X	X 0 1	B X 0 0 1	1 0 0	Y 0 A B C	YB 1 AB BB CB					
х	х х	D	1	1	0	D	DB					
X:Irrelevant						1						

Chapter 2 Function Block

.			Swite	ching sp	eed							
Block	Path		t I	LD0 (ns))		t 1		l in	put	l Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F564	D0 → Y	(HH)	0.429	0.711	1.572	0.015	0.023	0.036	D0	1.0	Υ	20
		(LL)	0.482	0.896	2.029	0.015	0.021	0.031	D1	1.0		
	D1 \rightarrow Y	(HH)	0.426	0.707	1.566	0.015	0.023	0.036	D2	1.0		
		(LL)	0.478	0.890	2.020	0.015	0.021	0.031	D3	1.0		
	D2 → Y	(HH)	0.427	0.708	1.565	0.015	0.023	0.036	A	1.0		
		(LL)	0.481	0.894	2.023	0.015	0.020	0.031	В	1.0		
	D3 → Y	(HH)	0.422	0.700	1.555	0.015	0.023	0.036				
		(LL)	0.473	0.881	2.007	0.015	0.020	0.031				
	$A \rightarrow Y$	(HH)	0.533	0.935	2.054	0.015	0.023	0.036				
		(HL)	0.546	1.025	2.236	0.015	0.020	0.031				
		(LH)	0.501	0.907	2.020	0.015	0.023	0.036				
		(LL)	0.549	1.084	2.460	0.015	0.020	0.031				
	$B \rightarrow Y$	(HH)	0.376	0.651	1.398	0.015	0.023	0.036				
		(HL)	0.366	0.647	1.329	0.014	0.019	0.030				
		(LH)	0.343	0.611	1.323	0.015	0.023	0.036				
F570		(LL)	0.381	0.733	1.609	0.014	0.020	0.031	D0	1.0	Y	21
F570	D0 → Y	(HH)	0.634 0.654	1.082 1.188	2.441 2.639	0.015	0.022 0.015	0.033 0.023	D0 D1	1.0 1.0	Y	21
		(LL)							1			
	D1 → Y	(HH) (LL)	0.633 0.652	1.081 1.186	2.440 2.636	0.015 0.011	0.022 0.015	0.033 0.023	D2 D3	1.0 1.0		
	D0 V	(LL) (HH)	0.628	1.073	2.636	0.011	0.015	0.023	A A	1.0		
	D2 → Y	(LL)	0.626	1.176	2.620	0.015	0.022	0.033	B	1.0		
	D3 → Y	(HH)	0.630	1.077	2.432	0.015	0.013	0.023	ENB	1.0		
	D3 → f	(LL)	0.650	1.182	2.629	0.013	0.022	0.023	LIND	1.0		
	$A \rightarrow Y$	(HH)	0.738	1.310	2.932	0.015	0.022	0.023				
	^ → '	(HL)	0.718	1.312	2.825	0.011	0.015	0.023				
		(LH)	0.705	1.277	2.885	0.015	0.013	0.023				
		(LL)	0.724	1.381	3.078	0.011	0.015	0.023				
	$B \rightarrow Y$	(HH)	0.587	1.037	2.298	0.015	0.022	0.033				
	5 / .	(HL)	0.534	0.908	1.898	0.011	0.015	0.023				
		(LH)	0.546	0.980	2.182	0.015	0.022	0.033				
		(LL)	0.559	1.030	2.243	0.011	0.015	0.023				
	ENB → Y	(HL)	0.303	0.486	0.961	0.011	0.015	0.023				
I		(LH)	0.297	0.516	1.128	0.015	0.022	0.033				

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Chapter 2 Function Block

Function	8 to 1											
Block type			Standar	d type					High-spe	d type		
	Norm		with E	NB	with E	N	Norm		with E	NB	with E	N
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F563	18	F569	18								
x2												
x4												
D0 H01 D1 H02	ndard type"			D0 H0 D1 H0	2 ←	ype wi	th ENB"		for "Stanc	ard typ	e with EN	ıı
D2 H03 D3 H04 D4 H05 D5 H06 D6 H07 D7 H08 A H09 B H10		→ N	01 Y	D2 H0 D3 H0 D4 H0 D5 H0 D6 H0 D7 H0 A H0 B H1 C H1	4		→ N01 Y					
C H11 for "High	n-speed type	ee"	E	NB H1		I type v	vith ENB"		for "High-	speed ty	rpe with E	N"
		ee"	E	NB H1		I type v	vith ENB"		for "High-«	speed ty	vpe with E	N"
for "High		ee"	E	NB H1		I type v	vith ENB"		for "High-s	speed ty	rpe with E	N"
	n-speed type	ee"	D4 D5	NB H1		I I type v	vith ENB"	ENB	for "High-s		rpe with E	N"
for "High	n-speed type			for "I	High-speed				YY		rpe with E	N"
for "High	D2 X X	D3 X X	D4 D5 X X X X X X	for "I	-ligh-speed	A X 0	B C X X 0 0	ENB 1 0	Y Y O A A	<u>В</u>	rpe with E	N"
for "High	D2 x x x	D3 X X X	D4 D5 X X X X X X X X	for "I	High-speed	A X 0 1	B C X X 0 0 0 0	ENB 1 0 0	Y Y Y A A B E	B B B	rpe with E	N"
for "High	D2 X X C	D3	D4 D5 X X X X X X X X X	D6 X X X X	High-speed	A X 0 1 0	B C X X X 0 0 0 0 0 1 0	ENB 1 0 0 0 0	Y Y O A A A B B C C C C	В В В В	rpe with E	N"
for "High	D2 x x x	D3 X X X	D4 D5 X X X X X X X X	for "I	High-speed	A X 0 1	B C X X 0 0 0 0	ENB 1 0 0	Y Y O A A A B B C C C C	B B B B B	rpe with E	N"
for "High	D2 X X X C X X	D3	D4 D5 X X X X X X X X X X X X X X X X X X	D6 X X X X X X X X X X X X X X X X X X X	-ligh-speed	A X 0 0 1 1 0 0 1 1	B C X X 0 0 0 0 1 0 1 0 1	ENB 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Y Y Y A A A B E C C C C D C E E F F F	B B B B B B B B B B B B B B B B B B B	rpe with E	N"
for "High	D2 X X C X X X	D3	D4	D6 X X X X X	-ligh-speed	A X 0 0 1 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0	B C X X 0 0 0 1 1 0 0 1	ENB: 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Y Y Y A A A B E C C C C D C E E F F F	B	rpe with E	N"

Chapter 2 Function Block

			Swite	ching sp	eed							1
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F563	D0 → Y	(HH)	0.641	1.093	2.454	0.015	0.022	0.032	D0	1.0	Y	22
		(LL)	0.763	1.382	3.087	0.011	0.015	0.022	D1	1.0		
	D1 → Y	(HH)	0.638	1.089	2.449	0.015	0.022	0.032	D2	1.0		
		(LL)	0.758	1.377	3.076	0.011	0.015	0.022	D3	1.0		
	D2 → Y	(HH)	0.639 0.761	1.090 1.378	2.448 3.078	0.015 0.011	0.022 0.015	0.032 0.022	D4 D5	1.0 1.0		
	D3 → Y	(LL) (HH)	0.761	1.082	2.438	0.011	0.015	0.022	D5	1.0		
	D3 → f	(LL)	0.754	1.364	3.061	0.013	0.022	0.032	D7	1.0		
	D4 → Y	(HH)	0.638	1.087	2.439	0.015	0.022	0.032	A	1.0		
	5. / .	(LL)	0.760	1.370	3.066	0.011	0.015	0.022	В	1.0		
	D5 → Y	(HH)	0.633	1.079	2.428	0.015	0.022	0.032	С	1.0		
		(LL)	0.752	1.357	3.047	0.011	0.015	0.022				
	D6 → Y	(HH)	0.633	1.080	2.428	0.015	0.022	0.032				
		(LL)	0.754	1.360	3.049	0.011	0.015	0.022				
	D7 → Y	(HH)	0.628	1.073	2.417	0.015	0.022	0.032				
		(LL)	0.746	1.347	3.030	0.011	0.015	0.022				
	$A \rightarrow Y$	(HH)	0.822	1.479	3.290	0.015	0.022	0.032				
		(HL) (LH)	0.887 0.768	1.592 1.416	3.433 3.166	0.011 0.015	0.015 0.022	0.022 0.032				
		(LH)	0.766	1.742	3.897	0.015	0.022	0.032				
	$B \rightarrow Y$	(LL)	0.616	1.101	2.441	0.011	0.013	0.022				
] 57'	(HL)	0.610	1.068	2.337	0.011	0.015	0.022				
		(LH)	0.567	1.026	2.281	0.015	0.022	0.032				
		(LL)	0.664	1.246	2.801	0.011	0.015	0.022				
	$C \rightarrow Y$	(HH)	0.427	0.713	1.518	0.015	0.022	0.032				
		(HL)	0.523	0.883	1.904	0.011	0.015	0.022				
		(LH)	0.519	0.894	1.928	0.015	0.022	0.032				
		(LL)	0.432	0.752	1.651	0.011	0.015	0.022			L	
F569	D0 → Y	(HH)	0.825	1.422	3.193	0.015	0.022	0.033	D0	1.0	Y	21
	D1 → Y	(LL) (HH)	0.827 0.824	1.480 1.421	3.262 3.191	0.011 0.015	0.015 0.022	0.023 0.033	D1 D2	1.0 1.0		
	D1 → Y	(LL)	0.826	1.479	3.191	0.015	0.022	0.033	D2	1.0		
	D2 → Y	(HH)	0.817	1.410	3.174	0.011	0.013	0.023	D4	1.0		
	52 7 1	(LL)	0.818	1.465	3.238	0.011	0.015	0.023	D5	1.0		
	D3 → Y	(HH)	0.819	1.413	3.178	0.015	0.022	0.033	D6	1.0		
		(LL)	0.820	1.467	3.242	0.011	0.015	0.023	D7	1.0		
	D4 → Y	(HH)	0.807	1.395	3.148	0.015	0.022	0.033	Α	1.0		
		(LL)	0.811	1.451	3.217	0.011	0.015	0.023	В	1.0		
	D5 → Y	(HH)	0.805	1.393	3.146	0.015	0.022	0.033	С	1.0		
		(LL)	0.808	1.448	3.210	0.011	0.015	0.023	ENB	1.0		
	D6 → Y	(HH)	0.803	1.389	3.138	0.015	0.022	0.033				
	D7 V	(LL) (HH)	0.803 0.805	1.439 1.392	3.196 3.142	0.011 0.015	0.015 0.022	0.023 0.033				
	D7 → Y	(LL)	0.805	1.442	3.200	0.013	0.022	0.033				
	$A \rightarrow Y$	(HH)	1.024	1.821	4.047	0.011	0.013	0.023				
		(HL)	0.975	1.696	3.617	0.011	0.015	0.023				
		(LH)	0.971	1.751	3.914	0.015	0.022	0.033				
		(LL)	0.991	1.856	4.096	0.011	0.015	0.023				
	$B \rightarrow Y$	(HH)	0.813	1.445	3.208	0.015	0.022	0.033				
		(HL)	0.726	1.236	2.605	0.011	0.015	0.023				
		(LH)	0.766	1.379	3.060	0.015	0.022	0.033				
	_	(LL)	0.758	1.394	3.048	0.011	0.015	0.023				
	C → Y	(HH)	0.460	0.794	1.712	0.015	0.022	0.033				
		(HL)	0.455	0.785	1.667	0.011	0.015	0.023				
		(LH)	0.487	0.903	2.019	0.015	0.022	0.033				
	I	(LL)	0.420	0.738	1.572	0.011	0.015	0.023				

Chapter 2 Function Block

				Swite	ching sp	eed						_	
Block		Path	1	t ı	_D0 (ns)			t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	ENB	\rightarrow Y	(HL)	0.296	0.478	0.950	0.011	0.015	0.023				
			(LH)	0.288	0.504	1.111	0.015	0.022	0.033				

Chapter 2 Function Block

[MEMO]

Chapter 2 Function Block

	unction	Quad	2 to 1	Multiplex	er (Ne	gative out)						
Bl	ock type			Standard	type					High-spee	d type		
	31.	Norm	al	with Ef	NΒ	with E	N	Norma	al	with Ef	NB	with E	N
	rivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Lo	w Power			L572	15								
	x1			F572	17								
	x2												
Log	x4 gic Diagram for "Stan	dard type"			for "S	Standard ty	ype wi	th ENB"		for "Stand	ard typ	e with EN	
D0 H01 ← D1 H02 ← D2 H03 ← D3 H04 ← D5 H06 ← D5 H06 ← D7 H08 ← A H09 ← ENB H10 +○ This proper is a second of the													
Tru	th Table												
Tru	th Table	Da+1	A	ENB	Yn	YnB							
Tru	Da												
Tru		Da+1 X B	A 0 1	ENB 0	Yn A B	YnB AB BB							
Tru	Da A	Х	0	0	Α	AB							

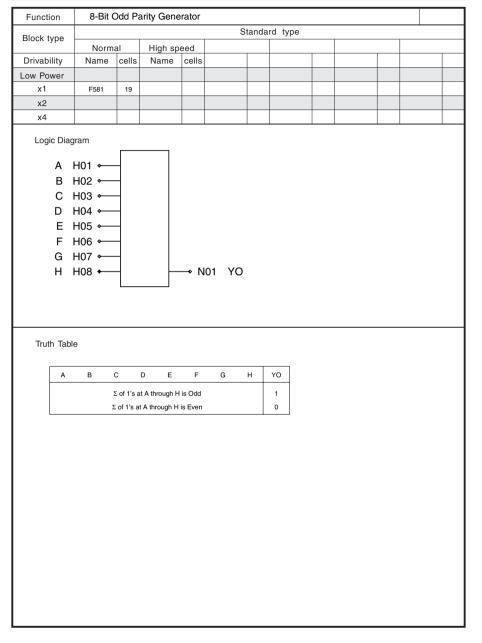
Chapter 2 Function Block

Disale			Swite	ching sp	eed						0	44
Block	Path		t I	LDO (ns)			t 1		In	put	Ou	tput
type	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L572	D0 → Y0B	(HL)	0.431	0.709	1.500	0.023	0.031	0.047	D0	1.0	Y0B	10
		(LH)	0.377	0.662	1.428	0.029	0.042	0.061	D1	1.0	Y1B	10
	D1 → Y0B	(HL)	0.435	0.714	1.509 1.440	0.023 0.029	0.031 0.042	0.047	D2	1.0	Y2B Y3B	10 10
	D2 → Y1B	(LH) (HL)	0.382 0.430	0.669 0.708	1.440	0.029	0.042	0.061 0.047	D3 D4	1.0 1.0	138	10
	D2 → 11B	(LH)	0.430	0.768	1.434	0.023	0.031	0.047	D5	1.0		
	D3 → Y1B	(HL)	0.437	0.717	1.513	0.023	0.042	0.047	D6	1.0		
	00 7 116	(LH)	0.386	0.676	1.452	0.029	0.042	0.061	D7	1.0		
	D4 → Y2B	(HL)	0.430	0.708	1.499	0.023	0.031	0.047	A	1.0		
		(LH)	0.378	0.664	1.433	0.029	0.042	0.061	ENB	4.6		
	D5 → Y2B	(HL)	0.436	0.716	1.512	0.023	0.031	0.047				
		(LH)	0.385	0.675	1.451	0.029	0.042	0.061				
	D6 → Y3B	(HL)	0.431	0.709	1.500	0.023	0.031	0.047				
		(LH)	0.377	0.662	1.429	0.029	0.042	0.061				
	D7 → Y3B	(HL)	0.435	0.714	1.509	0.023	0.031	0.047				
	A VOD	(LH) (HH)	0.382 0.490	0.669 0.816	1.440 1.687	0.029	0.042 0.045	0.061 0.064				
	A → Y0B	(HL)	0.450	1.154	2.464	0.031	0.043	0.048				
		(LH)	0.577	1.082	2.346	0.031	0.045	0.064				
		(LL)	0.577	1.032	2.194	0.023	0.032	0.048				
	A → Y1B	(HH)	0.497	0.826	1.702	0.031	0.045	0.064				
		(HL)	0.654	1.156	2.467	0.023	0.032	0.048				
		(LH)	0.579	1.087	2.354	0.031	0.045	0.064				
		(LL)	0.580	1.037	2.204	0.023	0.032	0.048				
	A → Y2B	(HH)	0.495	0.824	1.699	0.031	0.045	0.064				
		(HL)	0.654	1.156	2.467	0.023	0.032	0.048				
		(LH) (LL)	0.579 0.579	1.086 1.036	2.353 2.202	0.031	0.045 0.032	0.064 0.048				
	A → Y3B	(HH)	0.490	0.816	1.687	0.023	0.032	0.048				
	A → 13D	(HL)	0.653	1.154	2.464	0.023	0.032	0.048				
		(LH)	0.577	1.082	2.346	0.031	0.045	0.064				
		(LL)	0.577	1.032	2.194	0.023	0.032	0.048				
	ENB → Y0B	(HH)	0.186	0.289	0.539	0.031	0.045	0.064				
		(LL)	0.232	0.421	0.910	0.023	0.032	0.048				
	ENB → Y1B	(HH)	0.184	0.287	0.537	0.031	0.045	0.064				
		(LL)	0.228	0.415	0.902	0.023	0.032	0.048				
	ENB → Y2B	(HH)	0.184	0.288 0.416	0.538 0.904	0.031	0.045 0.032	0.064 0.048				
	ENB → Y3B	(LL) (HH)	0.229 0.186	0.416	0.539	0.023	0.032	0.048				
	EIND → 13D	(LL)	0.232	0.421	0.910	0.023	0.032	0.048				
F572	D0 → Y0B	(HL)	0.459	0.777	1.650	0.012	0.017	0.026	D0	1.0	Y0B	22
		(LH)	0.386	0.685	1.472	0.015	0.022	0.031	D1	1.0	Y1B	22
	D1 → Y0B	(HL)	0.463	0.783	1.660	0.012	0.017	0.026	D2	1.0	Y2B	22
		(LH)	0.391	0.692	1.484	0.015	0.022	0.031	D3	1.0	Y3B	22
	D2 → Y1B	(HL)	0.462	0.782	1.657	0.012	0.017	0.026	D4	1.0		
		(LH)	0.389	0.689	1.480	0.015	0.022	0.031	D5	1.0		
	D3 → Y1B	(HL) (LH)	0.469 0.397	0.791 0.703	1.672 1.501	0.012 0.015	0.017 0.022	0.026 0.031	D6 D7	1.0 1.0		
	D4 → Y2B	(LH)	0.397	0.703	1.651	0.015	0.022	0.031	A A	1.0		
	D4 → Y2B	(LH)	0.459	0.777	1.473	0.012	0.017	0.026	ENB	4.6	1	
	D5 → Y2B	(HL)	0.464	0.784	1.661	0.013	0.022	0.026		4.0		
]	(LH)	0.391	0.693	1.485	0.015	0.022	0.020			1	
	D6 → Y3B	(HL)	0.462	0.782	1.657	0.012	0.017	0.026			1	
		(LH)	0.389	0.689	1.481	0.015	0.022	0.031				
	D7 → Y3B	(HL)	0.466	0.787	1.666	0.012	0.017	0.026				
		(LH)	0.394	0.697	1.492	0.015	0.022	0.031				

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					- unou							
			Swite	ching sp	eed							
Block	Path		t	LDO (ns))		t 1] In	put	Ou	tput
type	IN → OI	JT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	A → Y0B	(HH)	0.496	0.835	1.726	0.015	0.022	0.031				
		(HL)	0.689	1.233	2.628	0.012	0.017	0.026				
1		(LH)	0.591	1.113	2.401	0.015	0.022	0.031				
1		(LL)	0.609	1.105	2.352	0.012	0.017	0.026				
1	A → Y1B	(HH)	0.500	0.841	1.735	0.015	0.022	0.031				
		(HL)	0.691	1.237	2.635	0.012	0.017	0.026				
1		(LH)	0.593	1.117	2.408	0.015	0.022	0.031				
1		(LL)	0.613	1.112	2.363	0.012	0.017	0.026				
	A → Y2B	(HH)	0.496	0.836	1.726	0.015	0.022	0.031				
		(HL)	0.689	1.233	2.629	0.012	0.017	0.026				
		(LH)	0.591	1.113	2.401	0.015	0.022	0.031				
		(LL)	0.609	1.106	2.353	0.012	0.017	0.026				
	A → Y3B	(HH)	0.501	0.843	1.737	0.015	0.022	0.031				
		(HL)	0.691	1.237	2.635	0.012	0.017	0.026				
l		(LH)	0.593	1.117	2.408	0.015	0.022	0.031				
l		(LL)	0.613	1.112	2.363	0.012	0.017	0.026				
l	ENB → Y0B	(HH)	0.186	0.291	0.542	0.015	0.022	0.031				
l		(LL)	0.257	0.485	1.053	0.012	0.017	0.026				
l	ENB → Y1B	(HH)	0.186	0.291	0.542	0.015	0.022	0.031				
I		(LL)	0.257	0.485	1.052	0.012	0.017	0.026				
I	ENB → Y2B	(HH)	0.186	0.291	0.542	0.015	0.022	0.031				l
I		(LL)	0.257	0.485	1.053	0.012	0.017	0.026				
I	ENB → Y3B	(HH)	0.186	0.291	0.542	0.015	0.022	0.031				l
		(LL)	0.257	0.485	1.052	0.012	0.017	0.026				

Chapter 2 Function Block

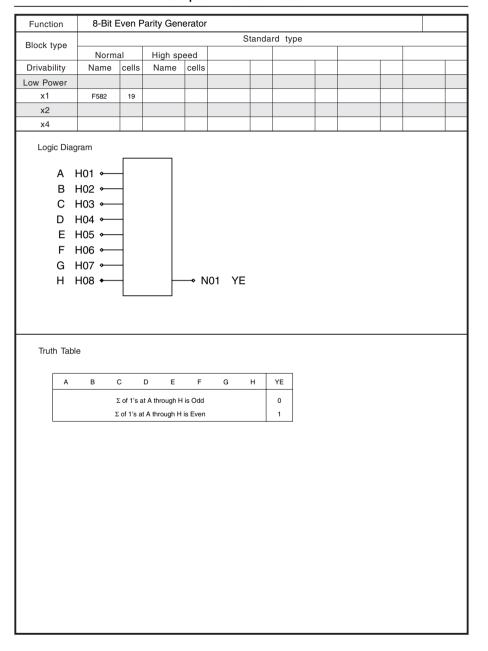


Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t I	LD0 (ns))		t 1		l in	put	Ou	ıtput
type	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F581	$A \rightarrow YO$	(HH)	0.759	1.362	3.137	0.015	0.022	0.033	Α	1.7	YO	21
		(HL)	0.747	1.335	3.022	0.011	0.015	0.023	В	2.0		
		(LH)	0.851	1.567	3.589	0.015	0.022	0.033	С	1.7		
l		(LL)	0.843	1.450	3.237	0.011	0.015	0.023	D	2.0		
	$B \rightarrow YO$	(HH)	0.800	1.442	3.318	0.015	0.022	0.033	E	1.7		
		(HL)	0.735	1.321	3.033	0.011	0.015	0.023	F	2.0		
		(LH)	0.845	1.531	3.493	0.015	0.022	0.033	G	1.7		
		(LL)	0.861	1.526	3.391	0.011	0.015	0.023	Н	2.0		
	C → YO	(HH)	0.746	1.320	3.034	0.015	0.022	0.033				
		(HL)	0.752	1.329	2.999	0.011	0.015	0.023				
		(LH)	0.841	1.531	3.496	0.015	0.022	0.033				
		(LL)	0.827	1.416	3.147	0.011	0.015	0.023				
	$D \rightarrow YO$	(HH)	0.787	1.400	3.217	0.015	0.022	0.033				
		(HL)	0.738	1.314	3.010	0.011	0.015	0.023				
		(LH)	0.835	1.493	3.397	0.015	0.022	0.033				
		(LL)	0.844	1.489	3.300	0.011	0.015	0.023				
	E → YO	(HH)	0.756	1.336	3.061	0.015	0.022	0.033				
		(HL)	0.756	1.336	3.009	0.011	0.015	0.023				
		(LH)	0.846	1.538	3.513	0.015	0.022	0.033				
		(LL)	0.843	1.439	3.206	0.011	0.015	0.023				
	F → YO	(HH)	0.796	1.414	3.241	0.015	0.022	0.033				
		(HL)	0.743	1.322	3.020	0.011	0.015	0.023				
		(LH)	0.842	1.503	3.417	0.015	0.022	0.033				
		(LL)	0.861	1.514	3.361	0.011	0.015	0.023				
	$G \rightarrow YO$	(HH)	0.756	1.313	2.993	0.015	0.022	0.033				
		(HL)	0.774	1.349	3.015	0.011	0.015	0.023				
		(LH)	0.850	1.521	3.452	0.015	0.022	0.033				
I		(LL)	0.858	1.448	3.180	0.011	0.015	0.023				
I	H → YO	(HH)	0.799	1.395	3.179	0.015	0.022	0.033				
I		(HL)	0.761	1.335	3.026	0.011	0.015	0.023				
I		(LH)	0.843	1.483	3.352	0.015	0.022	0.033				
		(LL)	0.876	1.523	3.334	0.011	0.015	0.023				

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Chapter 2 Function Block



Chapter 2 Function Block

Disale			Swite	ching sp	eed						0	44
Block	Path		t I	LD0 (ns))		t 1		ın	put	Ou	tput
type	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F582	$A \rightarrow YE$	(HH)	0.703	1.276	2.896	0.015	0.022	0.033	Α	1.7	YE	21
		(HL)	0.720	1.306	2.923	0.012	0.017	0.026	В	2.0		
		(LH)	0.799	1.392	3.111	0.015	0.022	0.033	С	1.7		
		(LL)	0.812	1.510	3.375	0.012	0.017	0.026	D	2.0		
	$B \to YE$	(HH)	0.691	1.262	2.907	0.015	0.022	0.033	E	1.7		
		(HL)	0.761	1.385	3.105	0.012	0.017	0.026	F	2.0		
		(LH)	0.817	1.467	3.265	0.015	0.022	0.033	G	1.7		
		(LL)	0.806	1.474	3.278	0.012	0.017	0.026	Н	2.0		
	$C \rightarrow YE$	(HH)	0.708	1.270	2.873	0.015	0.022	0.033				
		(HL)	0.715	1.275	2.839	0.012	0.017	0.026				
		(LH)	0.783	1.357	3.021	0.015	0.022	0.033				
		(LL)	0.810	1.485	3.301	0.012	0.017	0.026				
	$D \rightarrow YE$	(HH)	0.694	1.255	2.884	0.015	0.022	0.033				
		(HL)	0.757	1.356	3.022	0.012	0.017	0.026				
		(LH)	0.800	1.430	3.174	0.015	0.022	0.033				
		(LL)	0.805	1.448	3.201	0.012	0.017	0.026				
	$E \rightarrow YE$	(HH)	0.733	1.293	2.923	0.015	0.022	0.033				
		(HL)	0.862	1.478	3.242	0.013	0.017	0.027				
		(LH)	0.821	1.398	3.121	0.015	0.022	0.033				
		(LL)	0.953	1.683	3.694	0.013	0.017	0.027				
	$F \rightarrow YE$	(HH)	0.720	1.279	2.933	0.015	0.022	0.033				
		(HL)	0.903	1.556	3.421	0.013	0.017	0.027				
		(LH)	0.839	1.473	3.276	0.015	0.022	0.033				
		(LL)	0.947	1.648	3.597	0.013	0.017	0.027				
	$G \rightarrow YE$	(HH)	0.748	1.303	2.923	0.015	0.022	0.033				
		(HL)	0.868	1.464	3.186	0.013	0.017	0.027				
		(LH)	0.832	1.402	3.088	0.015	0.022	0.033				
		(LL)	0.961	1.671	3.645	0.013	0.017	0.027				
I	H → YE	(HH)	0.736	1.289	2.935	0.015	0.022	0.033				
I		(HL)	0.910	1.546	3.372	0.013	0.017	0.027				
I		(LH)	0.850	1.477	3.242	0.015	0.022	0.033				
		(LL)	0.955	1.632	3.545	0.013	0.017	0.027				<u> </u>

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Chapter 2 Function Block	Chapter 2 Function Block
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Chapter 2 Function Block

Chapter 2 Function Block

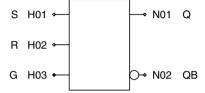
[MEMO]

2.9 RS-Latch, RS-F/F

Chapter 2 Function Block

Function	RS-La	tch											
Block type					S	tanda	rd type						
Block type	Norma	Normal High speed											
Drivability	Name												
Low Power		Name Cens Name Cens											
x1	F595	5											
x2													
x4													

Logic Diagram



Truth Table

s	R	G	Q	QB
0	0	1	La	itch
0	1	1	0	1
1	0	1	1	0
1	1	1	1	1
1	1	1->0	Unde	efined
х	Х	0	La	itch

X:Irrelevant

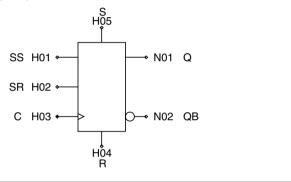
Chapter 2 Function Block

			Swite	ching sp	eed				Ι.			
Block	Path		t ı	LDO (ns)	ı		t 1		l In	put	Ou	ıtput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F595	$S \rightarrow Q$	(HH)	0.296	0.509	1.134	0.015	0.022	0.034	S	1.0	Q	21
		(LL)	0.444	0.774	1.610	0.013	0.018	0.028	R	1.0	QB	21
	$S \rightarrow QB$	(HL)	0.704	1.209	2.668	0.013	0.018	0.027	G	1.6		
	$R \rightarrow Q$	(HL)	0.703	1.208	2.666	0.013	0.018	0.026				
	$R \rightarrow QB$	(HH)	0.297	0.509	1.135	0.015	0.022	0.034				
		(LL)	0.443	0.774	1.611	0.013	0.018	0.028				
	$G \ \to \ Q$	(HH)	0.297	0.505	1.088	0.015	0.022	0.034				
		(HL)	0.697	1.201	2.614	0.013	0.018	0.026				
	$G \rightarrow QB$	(HH)	0.298	0.507	1.090	0.015	0.022	0.034				
		(HL)	0.697	1.202	2.614	0.013	0.018	0.027				
	Set up time	S	1.170		2.150							
	Set up time	R	1.170		2.180							
	Hold time	S	0.080		0.000							
1	Hold time	R	0.040		0.000							
	Min Pulse	G	1.081		3.300							

Chapter 2 Function Block

Function	RS-F/I	F with	R, S									
Block type					S	tanda	rd type					
Бюск турс	Norma	Normal High speed										
Drivability	Name											
Low Power												
x1	F596	11										
x2												
x4												

Logic Diagram



Truth Table

SS	SR	С	R	S	Q	QB	
0	0	1	0	0	н	old	
1	0	1	0	0	1	0	
Х	1	1	0	0	0	1	
Х	Х	>	0	0	н	old	
Х	Х	Х	0	1	1	0	
Х	Х	Х	1	0	0	1	
Х	Х	Χ	1	1	1	1	← Prohi

X:Irrelevant

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F596	$C \rightarrow Q$	(HH)	0.470	0.802	1.677	0.015	0.022	0.032	SS	1.0	Q	22
1		(HL)	0.625	1.115	2.377	0.012	0.018	0.028	SR	1.0	QB	21
1	$C \rightarrow QB$	(HH)	0.814	1.483	3.222	0.015	0.021	0.030	С	1.0		
1		(HL)	0.834	1.455	3.078	0.013	0.019	0.029	R	2.1		
1	$R \rightarrow Q$	(HL)	0.532	1.048	2.248	0.012	0.017	0.027	S	2.2		
1	$R \rightarrow QB$	(HH)	0.261	0.462	0.866	0.015	0.023	0.034				
1	$S \rightarrow Q$	(HH)	0.208	0.324	0.608	0.015	0.022	0.032				
1	$S \rightarrow QB$	(HL)	0.570	1.229	2.537	0.014	0.021	0.033				
1	Set up time	SS	1.000		3.260							
1	Set up time	SR	1.020		3.590							
	Hold time	SS	0.270		0.000							
1	Hold time	SR	0.450		0.070							
1	Release time	R	0.670		2.080							
1	Release time	S	0.220		0.000							
1	Removal time	R	0.620		0.410							
I	Removal time	S	1.050		1.860							
I	Min Pulse	С	1.133		3.796							
I	Min Pulse	R	1.005		2.983							
	Min Pulse	S	0.961		3.123							

Chapter 2 Function Block	Chapter 2 Function Block
[MEMO]	[MEMO]

Chapter 2 Function Block Chapter 2 Function Block

[MEMO]

2.10 D-Latch

Chapter 2 Function Block

Function	D-Late	ch										
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out	1	Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L601	4		
x1	F601	6	F601NQ	5	F601NB	5						
x2												
x4												
Logic Diagram	for "Norma	l"		Trut	th Table for	"Norm	ıal"					
D H01 ←— G H02 ←—			N01 Q N02 QB	0 1 X	1 1	Q 0 1 Latch	QB 1 0					
D H01 ← G H02 ←	for "Q outp	7	N01 Q	0 1 X	1 1	"Q out Q 0 1 Latch	tput"					
Logic Diagram D H01 ←— G H02 ←—			N01 QB	0 1 X	1 1	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F601	$D \rightarrow Q$	(HH)	0.583	0.979	2.089	0.015	0.022	0.031	D	1.0	Q	20
		(LL)	0.624	1.082	2.317	0.012	0.016	0.023	G	1.0	QB	20
	$D \ \to QB$	(HL)	0.445	0.727	1.510	0.012	0.016	0.024				
		(LH)	0.448	0.773	1.648	0.015	0.023	0.033				
	$G \ \to Q$	(HH)	0.653	1.137	2.440	0.015	0.022	0.031				
		(HL)	0.640	1.083	2.266	0.012	0.016	0.023				
	$G \ \to QB$	(HH)	0.464	0.775	1.599	0.015	0.023	0.033				
		(HL)	0.517	0.886	1.862	0.012	0.016	0.024				
	Set up time	D	0.880		1.560							
	Hold time	D	0.420		0.120							
	Min Pulse	G	0.894		2.953							
L601	$D \rightarrow Q$	(HH)	0.322	0.505	1.040	0.030	0.044	0.067	D	1.0	Q	10
		(LL)	0.361	0.624	1.311	0.026	0.036	0.055	G	1.0		
	$G \ \to Q$	(HH)	0.386	0.652	1.369	0.030	0.044	0.067				
		(HL)	0.386	0.656	1.311	0.025	0.035	0.055				
	Set up time	D	0.880		1.580							
	Hold time	D	0.450		0.270							
	Min Pulse	G	0.633		1.879							
F601NQ	$D \rightarrow Q$	(HH)	0.345	0.553	1.158	0.016	0.023	0.035	D	1.0	Q	18
		(LL)	0.391	0.694	1.480	0.013	0.018	0.028	G	1.0		
	$G \rightarrow Q$	(HH)	0.416	0.708	1.495	0.016	0.023	0.035				
		(HL)	0.427	0.754	1.545	0.013	0.018	0.028				
	Set up time	D	0.900		1.750							
	Hold time	D	0.440		0.190							
	Min Pulse	G	0.679		2.056							
F601NB	$D \ \to QB$	(HL)	0.441	0.724	1.507	0.012	0.016	0.024	D	1.0	QB	20
		(LH)	0.444	0.768	1.644	0.015	0.023	0.033	G	1.0		
	$G \ \to QB$	(HH)	0.465	0.778	1.606	0.015	0.023	0.033				
	0-4	(HL)	0.514	0.884	1.861	0.012	0.016	0.024				
	Set up time	D	0.870		1.490							
	Hold time	D	0.450		0.220							
	Min Pulse	G	0.746	l	2.374							

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Chapter 2 Function Block

Function	D-Late	h, Hi	gh Speed									
Block type			Standard						Low Gate	type		
	Norma		Q outp		QB out	_	Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F6R1	6										\perp
x2												
x4												
Logic Diagram	for "Normal	"		Tru	th Table for	"Norm	ıal"					
D H01 ←	-	<u> </u>	N01 Q	D	G	Q	QB					
				0	1	0	1					
				1	1	1	0					
G H02 ←	4	b⊸	N02 QB		0	Latch						
]		X:Irr	elevant							
Logic Diagram	for "Q outpi	ıt"		Trut	th Table for	"O out	tput"					-
Logio Biagiam	ioi & outpi	at .		"	iii iabic ioi	G Ou	put					
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed					_		
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F6R1	$D \rightarrow Q$	(HH)	0.320	0.513	1.067	0.015	0.023	0.035	D	1.0	Q	21
		(LL)	0.363	0.649	1.384	0.013	0.019	0.029	G	1.0	QB	22
	$D \rightarrow QB$	(HL)	0.486	0.828	1.777	0.011	0.015	0.023				
		(LH)	0.507	0.940	2.062	0.014	0.021	0.030				
	$G \rightarrow Q$	(HH)	0.388	0.665	1.397	0.015	0.023	0.034				
		(HL)	0.397	0.707	1.447	0.013	0.019	0.029				
	$G \rightarrow QB$	(HH)	0.538	0.994	2.123	0.014	0.021	0.030				
		(HL)	0.555	0.979	2.107	0.011	0.015	0.023				
	Set up time	D	0.950		1.960							
	Hold time	D	0.460		0.230							
	Min Pulse	G	0.790		2.635							

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Chapter 2 Function Block

Function	D-Late	h with	n R									
Block type			Standard	type					Low Gate	type		
	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L602	5		
x1	F602	6	F602NQ	6	F602NB	5						
x2												
x4												
Logic Diagram	for "Norma	"		Trut	h Table for	"Norm	ıal"					
ĺ		1				-		1				
D H01 ←	+	├	N01 Q	D	G I	3 (Q QB					
				1	1 () .	0					
				0	1 () () 1					
G H02 ←	_	b⊸	N02 QB	x			Latch					
]		Lx	X	1 (1					
	H03 R			X:Irr	elevant							
	R											
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q ou	tput"					
D H01 ←			N01 Q	D	G I	3	Q					
				1	1 (,	1					
							0					
							Latch					
G H02 ←	1				x	ı	0					
		_		X-lrr	elevant							
	HĎ3 R			X.III	Cicvani							
	•••											
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					
		1		I —								
D H01 ←	-			D	G I	3	QB					
				1	1 (0					
1				0	1 (1					
G H02 ←	4	b⊸	N01 QB	x			Latch					
]		Lx	Х	1	1					
	↓ H03 R			X:Irr	elevant							
i	Ř											
1												
<u> </u>												

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t I	LD0 (ns)	1		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F602	$D \ \to \ Q$	(HH)	0.684	1.203	2.605	0.014	0.021	0.030	D	1.0	Q	22
		(LL)	0.608	1.066	2.280	0.012	0.016	0.023	G	1.0	QB	22
	$D \ \to \ QB$	(HL)	0.518	0.889 0.736	1.873	0.013	0.018 0.022	0.028	R	1.0		
	$G \rightarrow Q$	(LH) (HH)	0.418 0.754	1.358	1.573 2.951	0.015 0.014	0.022	0.032 0.030				
	G → Q	(HL)	0.754	1.062	2.223	0.014	0.021	0.030				
	$G \rightarrow QB$	(HH)	0.432	0.734	1.519	0.015	0.022	0.032				
	ŭ / Q 2	(HL)	0.589	1.044	2.219	0.013	0.018	0.028				
	$R \rightarrow Q$	(HL)	0.400	0.787	1.582	0.012	0.017	0.026				
		(LH)	0.481	0.910	2.004	0.014	0.021	0.030				
	$R \rightarrow QB$	(HH)	0.214	0.332	0.622	0.015	0.022	0.032				
		(LL)	0.316	0.596	1.273	0.013	0.018	0.028				
	Set up time	D	0.900		1.610							
	Hold time	D	0.330		0.000							
	Release time	R	0.660		0.920							
	Removal time Min Pulse	R G	0.550 0.986		0.320 3.464						1	
	Min Pulse	R	0.966		2.285							
L602	D → Q	(HH)	0.751	0.933	1.997	0.029	0.042	0.062	D	1.0	Q	10
2002	D → Q	(LL)	0.544	0.934	1.987	0.023	0.031	0.045	G	1.0	~	
	$G \ \to Q$	(HH)	0.620	1.077	2.328	0.029	0.042	0.062	R	1.0		
		(HL)	0.561	0.934	1.932	0.023	0.031	0.045				
	$R \rightarrow Q$	(HL)	0.336	0.681	1.341	0.023	0.033	0.051				
		(LH)	0.353	0.632	1.384	0.029	0.042	0.062				
	Set up time	D	0.840		1.440							
	Hold time	D	0.410		0.120							
	Release time	R	0.550		0.430							
	Removal time Min Pulse	R G	0.660		0.800 2.835							
	Min Pulse	R	0.846 0.594		1.808							
F602NQ	D → Q	(HH)	0.457	0.781	1.747	0.017	0.026	0.042	D	1.0	Q	17
1 302.14	5 / 4	(LL)	0.391	0.712	1.518	0.014	0.020	0.031	G	1.0	~	
	$G \rightarrow Q$	(HH)	0.469	0.819	1.751	0.017	0.026	0.042	R	1.0		
		(HL)	0.429	0.777	1.607	0.014	0.020	0.031				
	$R \rightarrow Q$	(HL)	0.463	0.806	1.529	0.012	0.019	0.030				
		(LH)	0.531	0.937	2.123	0.017	0.026	0.042				
	Set up time	D	0.980		1.980							
	Hold time	D	0.330		0.000							
	Release time Removal time	R R	0.980 0.300		2.330 0.000							
	Min Pulse	G	0.300		2.272							
	Min Pulse	R	0.705		2.493						1	
F602NB	D → QB	(HL)	0.519	0.892	1.881	0.013	0.018	0.028	D	1.0	QB	22
		(LH)	0.418	0.737	1.575	0.015	0.022	0.032	G	1.0		
	$G \ \to \ QB$	(HH)	0.432	0.736	1.524	0.015	0.022	0.032	R	1.0	1	
		(HL)	0.588	1.046	2.226	0.013	0.018	0.028			1	
	$R \ \to \ QB$	(HH)	0.214	0.333	0.624	0.015	0.022	0.032				
	0	(LL)	0.317	0.599	1.281	0.013	0.018	0.028				
	Set up time	D	0.870		1.520							
	Hold time Release time	D R	0.350 0.630		0.000 0.860							
	Release time Removal time	н R	0.630		0.860						1	
	Min Pulse	G	0.821		2.739						1	
	Min Pulse	R	0.571		1.550						1	
	aloc		0.57 1									

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Chapter 2 Function Block

Standard type	Function	D-Late	h with	h R, High	Spe	eed								
Normal Q output QB output Normal Q output QB output	Block type					$\overline{}$								
Low Power x1 F6R2 7 x2 x4 x4 x4 x4 Logic Diagram for "Normal" Truth Table for "Normal" D H01 ← N02 QB N01 Q N02 QB N02 QB N02 QB 1 1 0 1 0 0 1 Name N03 Name N03 Name N03 Name N03 Name Karrelevant Xarrelevant Name Name </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>														
X1 F6R2 7 Image: Control of the co		Name	cells	Name	CE	ells	Name	cells	Name	cells	Name	cells	Name	cells
x2 x4 Logic Diagram for "Normal" D H01 → N01 Q G H02 → N02 QB H03 R Truth Table for "Normal" Truth Table for "Normal" Truth Table for "Q output" Truth Table for "Q output" Truth Table for "Q output"														
x4 Logic Diagram for "Normal" Truth Table for "Normal" D H01 → N01 Q N01 Q D G R Q OB 1 1 0 1 0 0 1 0 0 1 0 0 1 X 0 0 Latch X X 1 0 1 X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"		F6R2	7											
Logic Diagram for "Normal" D H01 → N01 Q G H02 → N02 QB H03 R Truth Table for "Normal" D G R Q QB 1 1 0 1 0 0 1 0 0 1 X x 0 0 Latch X X 1 0 1 X:Irrelevant Truth Table for "Q output"														
D H01 → N01 Q G H02 → N02 QB H03 R D G R Q OB 1 1 0 0 1 0 0 1					╁									\perp
G H02 ← N02 QB	Logic Diagram	tor "Norma	l"			Irut	h lable for	"Norr	nal"					
G H02 ← N02 QB			1			П	G F	.	O OB]				
G H02 N02 QB N02 QB N03 R N04 N05 QB N05 QB N05 QB N05 QB N06 QB N07 Q Output" N07 Q Output" N08 QB N09 Q	D H01 ←		$\overline{}$	N01 Q				_						
G H02 N02 QB X 0 0 Latch X X 1 0 1 X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"														
X X 1 0 1 X:Irrelevant Logic Diagram for "Q output" Truth Table for "Q output"						1								
Logic Diagram for "Q output" Truth Table for "Q output"	G H02 ←		\bigcirc	N02 QB				- 1						
Logic Diagram for "Q output" Truth Table for "Q output"			J							J				
Logic Diagram for "Q output" Truth Table for "Q output"		H ₀ 3				X:Irre	elevant							
					L									
Logic Diagram for "QB output" Truth Table for "QB output"	Logic Diagram	for "Q outp	ut"			Trut	h Table for	"Q ou	tput"					
Logic Diagram for "QB output" Truth Table for "QB output"														
Logic Diagram for "QB output" Truth Table for "QB output"														
Logic Diagram for "QB output" Truth Table for "QB output"														
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Logic Diagram for "QB output" Truth Table for "QB output"														
Logic Diagram for "QB output" Truth Table for "QB output"														
Logic Diagram for "QB output" Truth Table for "QB output"														
	Logic Diagram	for "QB out	nut"		t	Trut	h Table for	"OB	output"					\neg
	20gio 2 lagrain	42 041	put					Ψ.	raipai					

Chapter 2 Function Block

			Swite	ching sp	eed					_		
Block	Path		t	LD0 (ns))		t 1] In	put	l Ou	itput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F6R2	$D \rightarrow Q$	(HH)	0.452	0.772	1.733	0.017	0.026	0.041	D	1.0	Q	17
		(LL)	0.388	0.705	1.503	0.014	0.020	0.031	G	1.0	QB	22
	$D \rightarrow QB$	(HL)	0.651	1.147	2.590	0.012	0.016	0.023	R	1.0		
		(LH)	0.555	1.033	2.244	0.014	0.021	0.030				
	$G \rightarrow Q$	(HH)	0.448	0.789	1.705	0.017	0.026	0.041				
		(HL)	0.411	0.749	1.564	0.014	0.020	0.031				
	$G \rightarrow QB$	(HH)	0.575	1.074	2.303	0.015	0.021	0.030				
		(HL)	0.646	1.164	2.563	0.012	0.016	0.023				
	$R \rightarrow Q$	(HL)	0.458	0.797	1.512	0.012	0.019	0.030				
		(LH)	0.523	0.924	2.102	0.017	0.026	0.041				
	$R \rightarrow QB$	(HH)	0.614	1.108	2.218	0.014	0.021	0.031				
		(LL)	0.721	1.299	2.959	0.012	0.016	0.023				
	Set up time	D	1.050		2.230							
	Hold time	D	0.330		0.000							
	Release time	R	1.050		2.580							
	Removal time	R	0.290		0.000							
	Min Pulse	G	0.872		3.074							
	Min Pulse	R	0.893		3.330							

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Chapter 2 Function Block

Function	D-Late	ch with	n RB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norma		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L603	5		
x1	F603	7	F603NQ	5	F603NB	6						
x2												
x4												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←			N01 Q) G	RB	Q C	βВ				
					1 1	1	1	0				
					0 1	1	0	1				
G H02 ←		h	N02 QB	;	X 0	1	Latch					
G 1.02		Γ	42	;	x x	0	0	1				
	H03 RB			X:lrr	elevant							
Logic Diagram	for "Q outp	ut"		Trui	th Table for	"Q out	put"					
D H01 ←	_	-	N01 Q		O G	RB	Q					
					1 1	1	1					
				'	0 1	1	0					
G H02 ←				;	K 0	1	Latch					
4 1.02		_		[_;	х х	0	0					
	HÖ3 RB			X:lrr	elevant							
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					
D H01 ←) G	RB	QB					
				-	1 1	1	0					
					0 1	1	1					
G H02 ←		\bigcirc	N01 QB	;	K 0	1	Latch					
G 1102 Y		ΓŢ.	ויייו עט	;	х х	0	1					
	H03 RB			X:lrr	elevant			_				

Chapter 2 Function Block

Division			Swite	ching sp	eed							
Block	Path		t I	_D0 (ns)			t 1		ın	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F603	$D \ \to \ Q$	(HH)	0.691	1.213	2.620	0.014	0.021	0.030	D	1.0	Q	22
		(LL)	0.613	1.073	2.291	0.012	0.016	0.023	G	1.0	QB	22
	$D \ \to \ QB$	(HL)	0.521	0.893 0.738	1.880	0.013	0.018 0.022	0.028	RB	1.0		
	$G \rightarrow Q$	(LH) (HH)	0.419 0.761	1.368	1.576 2.966	0.015 0.014	0.022	0.032 0.030				
	G → Q	(HL)	0.626	1.069	2.234	0.014	0.021	0.030				
	$G \ \to QB$	(HH)	0.433	0.736	1.522	0.015	0.022	0.032				
	ŭ / Q 2	(HL)	0.592	1.049	2.226	0.013	0.018	0.028				
	$RB \rightarrow Q$	(HH)	0.596	1.076	2.284	0.014	0.021	0.030				
		(LL)	0.480	0.956	1.973	0.012	0.017	0.026				
	$RB \ \to \ QB$	(HL)	0.427	0.757	1.545	0.013	0.018	0.028				
		(LH)	0.290	0.496	1.008	0.015	0.022	0.032				
	Set up time	D	0.910		1.620							
	Hold time	D	0.330		0.000							
	Release time	RB	0.780		1.270							
	Removal time Min Pulse	RB G	0.430 0.993		0.000 3.479							
	Min Pulse	G RB	0.993		2.683						1	
L603	D → Q	(HH)	0.762	0.952	2.026	0.029	0.042	0.062	D	1.0	Q	10
1 2000	D → Q	(LL)	0.564	0.966	2.047	0.023	0.031	0.045	G	1.0	~	
	$G \ \to Q$	(HH)	0.627	1.097	2.357	0.029	0.042	0.062	RB	1.0		
		(HL)	0.579	0.965	1.992	0.023	0.031	0.045				
	$RB \rightarrow Q$	(HH)	0.449	0.757	1.589	0.029	0.042	0.062				
		(LL)	0.407	0.810	1.638	0.022	0.033	0.051				
	Set up time	D	0.860		1.470							
	Hold time	D	0.430		0.170							
	Release time	RB	0.630		0.590							
	Removal time Min Pulse	RB G	0.580		0.640 2.865							
	Min Pulse	RB	0.853 0.676		2.036							
F603NQ	D → Q	(HH)	0.454	0.775	1.738	0.018	0.027	0.043	D	1.0	Q	16
1 . 555.14	5 / 4	(LL)	0.385	0.702	1.503	0.014	0.020	0.031	G	1.0	~	
	$G \rightarrow Q$	(HH)	0.462	0.810	1.737	0.018	0.027	0.043	RB	1.0		
		(HL)	0.420	0.762	1.585	0.014	0.020	0.031				
	$RB \ \to \ Q$	(HH)	0.452	0.785	1.798	0.018	0.027	0.043				
		(LL)	0.371	0.668	1.254	0.012	0.019	0.030				
	Set up time	D	0.970		1.960							
	Hold time	D	0.340		0.000							
	Release time Removal time	RB RB	0.920 0.360		1.970 0.000							
	Min Pulse	G	0.697		2.257							
	Min Pulse	RB	0.037		2.208						1	
F603NB	D → QB	(HL)	0.522	0.897	1.889	0.013	0.018	0.029	D	1.0	QB	22
		(LH)	0.420	0.739	1.579	0.015	0.022	0.032	G	1.0		
	$G \ \to \ QB$	(HH)	0.434	0.738	1.527	0.015	0.022	0.032	RB	1.0		
		(HL)	0.592	1.051	2.233	0.013	0.018	0.029			1	
	$RB \ \to \ QB$	(HL)	0.427	0.760	1.553	0.013	0.018	0.029				
	0	(LH)	0.290	0.497	1.010	0.015	0.022	0.032				
	Set up time	D	0.870		1.530							
	Hold time Release time	D RB	0.350 0.740		0.000 1.210							
	Release time Removal time	RB	0.740		0.130						1	
	Min Pulse	G	0.470		2.747						1	
	Min Pulse	RB	0.613		1.951						1	
	1 0.00	. 10	3.010		1.001							

Chapter 2 Function Block

Standard type	Function	D-Late	h with	h RB, High	Spe	ed							
Normal Q output QB output Normal Q output QB output	Block type					•							
Low Power x1 F6R5 6 6 x2 x4							_						
X1 F6R5 6 Image: Reference of the content of the		Name	cells	Name	cell	Name	cells	Name	cells	Name	cells	Name	cells
x2 x4 Logic Diagram for "Normal" D H01 → N01 Q G H02 → N02 QB H03 RB Truth Table for "Normal" Truth Table for "Normal" D G RB Q QB 1 1 1 1 0 1 X 0 1 Latch X X 0 0 1 X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"													
x4 Logic Diagram for "Normal" Truth Table for "Normal" D H01 → N01 Q D G RB Q OB 1 1 1 1 0 0 1 1 0 1 0 1 1 Latch X X 0 1 Latch X X X 0 0 1 X:Irrelevant Truth Table for "Q output"		F6R5	6										
Logic Diagram for "Normal" D H01 N01 Q G H02 N02 QB N02 QB N03 RB N04 QB Truth Table for "Normal" D G RB Q OB 1 1 1 1 0 0 0 1 1 0 1 X X X 0 0 1 X X X 0 0 0 1 X.Irrelevant Truth Table for "Q output"													
D H01 ← N01 Q G H02 ← N02 QB H03 RB Compared to the compared					<u> </u>								\perp
G H02 ← N02 QB 1	Logic Diagram	for "Normal	"		Tr	uth Table for	"Norm	ıal"					
G H02 ← N02 QB 1	D H01		L	NO1 O	Ιг	D G	RB	Q (ΩВ				
G H02 N02 QB N02 QB N02 QB X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"	D HOI V			NOT Q					_				
G H02 N02 QB X													
X x 0 0 1 X:Irrelevant X X X X X X X X X									'				
H03 RB X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"	G H02 ←	1	p ⊸	N02 QB					1				
Logic Diagram for "Q output" Truth Table for "Q output"		Ò						_					
Logic Diagram for "Q output" Truth Table for "Q output"		HÓ3 BB			X:	rrelevant							
					<u> </u>								
Logic Diagram for "QB output" Truth Table for "QB output"	Logic Diagram	for "Q outp	ut"		Tr	uth Table for	"Q out	tput"					
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
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Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
	Logic Diagram	for "QB out	put"		Tr	uth Table for	"QB o	utput"					\neg
								·					

Chapter 2 Function Block

			Swite	ching sp	eed				Ι.			
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	ıtput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F6R5	$D \to Q$	(HH)	0.450	0.769	1.727	0.017	0.026	0.041	D	1.0	Q	17
		(LL)	0.387	0.703	1.499	0.014	0.020	0.031	G	1.0	QB	22
l .	$D \rightarrow QB$	(HL)	0.632	1.119	2.547	0.012	0.016	0.023	RB	1.0		
l .		(LH)	0.539	1.010	2.210	0.014	0.021	0.030				
	$G \rightarrow Q$	(HH)	0.446	0.786	1.700	0.017	0.026	0.041				
		(HL)	0.409	0.747	1.559	0.014	0.020	0.031				
l .	$G \rightarrow QB$	(HH)	0.560	1.051	2.268	0.014	0.021	0.030				
l .		(HL)	0.628	1.136	2.520	0.012	0.016	0.023				
l .	$RB \rightarrow Q$	(HH)	0.441	0.770	1.776	0.017	0.026	0.041				
l .		(LL)	0.368	0.662	1.242	0.012	0.019	0.030				
l .	$RB \rightarrow QB$	(HL)	0.623	1.120	2.596	0.012	0.016	0.023				
l .		(LH)	0.500	0.939	1.899	0.014	0.021	0.030				
l .	Set up time	D	1.040		2.210							
l .	Hold time	D	0.330		0.000							
l .	Release time	RB	0.980		2.200							
	Removal time	RB	0.350		0.000							
	Min Pulse	G	0.854		3.031							
	Min Pulse	RB	0.967		3.005							

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Chapter 2 Function Block

Function	D-Late	ch with	n SB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norma		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F60K	7	F60KNQ	6	F60KNB	5						\perp
x2												
x4 Logic Diagram	for "Normal	 "		Trut	h Table for	"Norm	al"					\vdash
Logio Diagram				""	iii iabic ioi	140111	iai					
	SB H03) G	SB	Q C	В				
		1) 1	1	0	1				
D H01 ←	-	-	N01 Q			1		0				
					(0	1	Latch					
				>	× x	0	1 (0				
G H02 ←	4	→	N02 QB	X:Irre	elevant		•					
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
	SB			 				7				
	SB H03) G	SB	Q					
	_ •	7) 1	1	0					
D H01 ←		├	N01 Q	1	1 1	1	1					
					(0	1	Latch					
					K X	0	1					
G H02 ←				X:Irr	elevant							
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					
	SB							7				
	SB H03				G G	SB	QB					
		1) 1	1	1					
D H01 ←	1			1	1 1	1	0					
					(0	1	Latch					
					Х X	0	0					
G H02 ←	-	\triangleright	N01 QB	X:Irr	elevant							
		J										
				•								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F60K	$D \ \to \ Q$	(HH)	0.346	0.549	1.147	0.015	0.023	0.035	D	1.0	Q	20
1		(LL)	0.611	1.054	2.315	0.017	0.025	0.039	G	1.0	QB	21
	$D \ \to \ QB$	(HL)	0.528	0.887	1.900	0.012	0.016	0.023	SB	1.0		
1		(LH)	0.807	1.443	3.195	0.014	0.021	0.029				
1	$G \rightarrow Q$	(HH)	0.414	0.696	1.466	0.015	0.023	0.035				
1		(HL)	0.464	0.844	1.830	0.017	0.025	0.039				
1	$G \ \to QB$	(HH)	0.655	1.227	2.707	0.014	0.021	0.029				
1		(HL)	0.596	1.033	2.216	0.012	0.016	0.023				
1	$SB \ \to \ Q$	(HL)	0.738	1.272	2.732	0.017	0.025	0.039				
		(LH)	0.361	0.580	1.165	0.015	0.024	0.037				
	$SB \rightarrow QB$	(HH)	0.933	1.660	3.612	0.014	0.021	0.029				
	0:	(LL)	0.552	0.944	1.978	0.012	0.016	0.024				
	Set up time	D	1.280		3.160							
	Hold time	D	0.440		0.160							
	Release time Removal time	SB SB	1.360		3.610							
1	Min Pulse	G G	0.010 0.909		0.000 3.214							
1	Min Pulse	SB	1.095		4.013							
F60KNQ	D → Q	(HH)	0.347	0.551	1.151	0.015	0.023	0.035	D	1.0	Q	20
TOOKING	D → Q	(LL)	0.615	1.065	2.331	0.018	0.026	0.041	G	1.0	~	20
1	$G \rightarrow Q$	(HH)	0.411	0.693	1.464	0.015	0.023	0.035	SB	1.0		
	G → G	(HL)	0.464	0.850	1.842	0.018	0.025	0.041	"	1.0		
	$SB \rightarrow Q$	(HL)	0.742	1.282	2.749	0.018	0.026	0.041				
1	05 / 4	(LH)	0.360	0.582	1.169	0.015	0.023	0.036				
	Set up time	D `	1.220		2.920							
1	Hold time	D	0.430		0.150							
	Release time	SB	1.300		3.370							
	Removal time	SB	0.010		0.000							
1	Min Pulse	G	0.715		2.346							
	Min Pulse	SB	0.903		3.149							
F60KNB	$D \ \to QB$	(HL)	0.422	0.699	1.455	0.012	0.016	0.024	D	1.0	QB	21
		(LH)	0.485	0.865	1.919	0.015	0.022	0.034	G	1.0		
	$G \ \to QB$	(HH)	0.500	0.870	1.881	0.015	0.022	0.034	SB	1.0		
1		(HL)	0.494	0.856	1.804	0.012	0.016	0.024				
	$SB \ \to \ QB$	(HH)	0.245	0.421	0.946	0.015	0.022	0.034				
1		(LL)	0.249	0.413	0.812	0.012	0.016	0.024				
1	Set up time	D	0.920		1.710							
1	Hold time	D	0.450		0.200							
1	Release time	SB	0.600		0.620							
1	Removal time	SB	0.610		0.610							
1	Min Pulse	G	0.753		2.397							
	Min Pulse	SB	0.525		1.333							

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Chapter 2 Function Block

Function	D-Late	ch with	n RB, SB												
Block type			Standard	typ	е						Lov	v Gate	type		
	Norma	_	Q outp			utput	t	No	rma	I	(Q outp	ut	QB ou	tput
Drivability	Name	cells	Name	cell	s Nam	e ce	ells	Nam	ie	cells	N	ame	cells	Name	cells
Low Power															
x1	F60J	7	F60JNQ	6	F60JN	В	6								
x2															
x4															
Logic Diagram	for "Norma	l"		Tr	ruth Table	for "N	lorm	al"							
	SB H04				D G	F	RB	SB	Q	! (ΩВ				
		1			0 1		1	1	0		1				
D H01 ←			N01 Q		1 1		1	1	1		0				
					X 0		1	1		Latch					
					x x		0	1 .	0		1				
G H02 ←		b⊸ i	N02 QB		X X		1	0	1		0				
	L-0]		L	х х		0	0	0		1	→ Pro	hibition		
	H03 RB			X:	Irrelevant										
Logic Diagram	for "Q outp	ut"		Tr	ruth Table	for "Q	out	put"							
	SB H04				D G	F	RB	SB		Q					
		7			0 1		1	1		0					
D H01 ←	-	-	N01 Q		1 1		1	1		1					
					X 0		1	1	L	atch					
					х х		0	1		0					
G H02 ←					х х		1	0		1					
G 1102				L	х х		0	0		0		- Prohib	ition		
	H03 RB			X:	Irrelevant										
Logic Diagram	for "QB out	tput"		Tr	ruth Table	for "Q)B o	utput"							
	SB H04				D G	F	RB	SB		QB					
		1			0 1		1	1		1					
D H01 ←					1 1		1	1		0					
					X 0		1	1	L	atch					
					x x		0	1		1					
G H02 ←]	h	N01 QB		x x		1	0		0					
G 1102 ₹			ויייו עם		х х		0	0		1	_ ←	- Prohib	ition		
	H03 RB			X:	Irrelevant										

Chapter 2 Function Block

Blook			Swite	ching sp	eed							
Block	Path		t	LDO (ns)			t 1		In	put	Ou	tput
type	IN \rightarrow C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F60J	$D \rightarrow Q$	(HH)	0.480	0.808	1.829	0.017	0.026	0.042	D	1.0	Q	15
	D 0D	(LL) (HL)	0.644 0.684	1.132 1.191	2.485 2.703	0.018 0.012	0.026 0.016	0.040 0.023	G RB	1.0 1.0	QB	21
	$D \rightarrow QB$	(LH)	0.851	1.541	3.402	0.012	0.016	0.023	SB	1.0		
	$G \rightarrow Q$	(HH)	0.476	0.821	1.788	0.017	0.026	0.042	05	1.0		
		(HL)	0.477	0.890	1.959	0.018	0.026	0.040				
1	$G \rightarrow QB$	(HH)	0.681	1.296	2.876	0.015	0.021	0.029				
1		(HL)	0.679	1.203	2.660	0.012	0.016	0.023				
	$RB \rightarrow Q$	(HH)	0.464	0.802	1.868	0.017	0.026	0.042				
1	DD OD	(LL) (HL)	0.390 0.668	0.692 1.185	1.315 2.741	0.013 0.012	0.019 0.016	0.031 0.023				
	RB → QB	(LH)	0.549	1.004	2.741	0.012	0.016	0.023				
1	SB → Q	(HL)	0.779	1.355	2.906	0.018	0.026	0.040				
		(LH)	0.529	0.893	1.953	0.016	0.027	0.044				
	$SB \rightarrow QB$	(HH)	0.986	1.764	3.823	0.014	0.021	0.029				
		(LL)	0.745	1.310	2.916	0.012	0.016	0.024				
	Set up time	D	1.310		3.350							
1	Hold time Release time	D RB	0.270 1.000		0.000 2.290							
1	Release time	SB	1.410		3.800							
1	Removal time	RB	0.330		0.000							
1	Removal time	SB	0.000		0.000							
1	Min Pulse	G	0.925		3.382							
1	Min Pulse	RB	1.024		3.149							
FOOTING	Min Pulse	SB	1.144	0.010	4.231	0.047	0.000	0.040		1.0		45
F60JNQ	$D \to Q$	(HH) (LL)	0.483 0.648	0.816 1.143	1.841 2.501	0.017 0.018	0.026 0.026	0.043 0.042	D G	1.0 1.0	Q	15
1	$G \rightarrow Q$	(HH)	0.478	0.827	1.797	0.017	0.026	0.042	RB	1.0		
1	u - 4	(HL)	0.480	0.900	1.975	0.018	0.026	0.042	SB	1.0		
1	$RB \rightarrow Q$	(HH)	0.468	0.810	1.880	0.017	0.026	0.043				
1		(LL)	0.390	0.696	1.324	0.013	0.019	0.030				
1	SB → Q	(HL)	0.783	1.365	2.921	0.018	0.026	0.042				
1	Set up time	(LH) D	0.530 1.230	0.901	1.969 3.100	0.016	0.027	0.045				
1	Hold time	D	0.270		0.000							
1	Release time	RB	0.950		2.090							
1	Release time	SB	1.340		3.550							
	Removal time	RB	0.330		0.000							
	Removal time	SB	0.000		0.000							
	Min Pulse Min Pulse	G RB	0.726 0.813		2.482 2.288							
	Min Pulse	SB	0.813		3.328							
F60JNB	D → QB	(HL)	0.548	0.945	2.093	0.012	0.016	0.025	D	1.0	QB	21
		(LH)	0.528	0.958	2.114	0.015	0.022	0.034	G	1.0		
	$G \rightarrow QB$	(HH)	0.560	0.998	2.125	0.015	0.022	0.034	RB	1.0		
	DD 5-	(HL)	0.565	0.995	2.130	0.012	0.016	0.025	SB	1.0		
	RB → QB	(HL) (LH)	0.544 0.513	0.950 0.949	2.148 1.990	0.012 0.015	0.016 0.022	0.025 0.034				
	SB → QB	(LH)	0.513	0.949	0.937	0.015	0.022	0.034				
	J 35 → QB	(LL)	0.246	0.417	0.799	0.013	0.022	0.024				
	Set up time	D (,	0.940		1.860							
	Hold time	D	0.290		0.000							
	Release time	RB	0.880		1.750							
	Release time	SB	0.560		0.540							
	Removal time	RB SB	0.340		0.000							
	Removal time	9B	0.660	l	0.760				l .		L	

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Chapter 2 Function Block

				0									
Block					ching sp					l in	put	<u>ا</u> ا	tput
	F	ath		t ı	_D0 (ns)			t 1		"'	put	l Ou	ιραι
type	IN -	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	Min Pulse	9	G	0.814		2.651							
	Min Pulse	Э	RB	0.903		2.572							
	Min Pulse	Э	SB	0.524		1.318							

Chapter 2 Function Block

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Chapter 2 Function Block

Function	D-Late	ch (GE	3)									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out	·	Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L604	4		
x1	F604	6	F604NQ	5	F604NB	5						
x2												
x4												
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norm	al"					
		1		l –.								
D H01 ←		-	N01 Q	- ') GB	Q	QB					
				'	1 0	1	0					
				1 1	0	0	1					
GB H02 ←	q	\triangleright	N02 QB		(1	La	itch					
		_		X:Irr	elevant							
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
		_		l								
D H01 ←		\vdash	N01 Q		GB	Q						
					1 0	1						
				(0	0						
GB H02 ←				,	(1	Late	:h					
G2 1.02	<u> </u>			X:lrr	elevant							
5.				- .		"00						
Logic Diagram	tor "QB out	put"		Irut	h Table for	"QB o	utput"					
D 1104		7			O GB	QE						
D H01 ←							<u>'</u>					
				1 1	1 0	0						
				1 1	0	1						
GB H02 ←	q	р	N01 QB	<u>ا</u> ا ر	1	Late	ch					
	,	_		X:Irr	elevant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F604	$D \rightarrow Q$	(HH)	0.557	0.943	2.017	0.015	0.021	0.031	D	1.0	Q	22
		(LL)	0.600	1.048	2.248	0.012	0.016	0.023	GB	1.0	QB	22
	$D \ \to \ QB$	(HL)	0.420	0.690	1.433	0.012	0.016	0.024				
		(LH)	0.421	0.734	1.565	0.015	0.022	0.032				
	$GB \rightarrow Q$	(LH)	0.589	1.049	2.263	0.015	0.021	0.031				
		(LL)	0.647	1.165	2.519	0.012	0.016	0.023				
	$GB \rightarrow QB$	(LH)	0.469	0.852	1.837	0.015	0.022	0.032				
		(LL)	0.452	0.795	1.679	0.012	0.016	0.024				
	Set up time	D	0.850		1.450							
	Hold time	D	0.410		0.000							
	Min Pulse	GB	0.881		2.985							
L604	$D \rightarrow Q$	(HH)	0.324	0.508	1.044	0.030	0.044	0.067	D	1.0	Q	10
		(LL)	0.364	0.628	1.317	0.026	0.036	0.055	GB	1.0		
	$GB \rightarrow Q$	(LH)	0.358	0.619	1.314	0.030	0.044	0.067				
		(LL)	0.400	0.732	1.562	0.025	0.035	0.055				
	Set up time	D	0.870		1.380							
	Hold time	D	0.400		0.000							
	Min Pulse	GB	0.637		2.030							
F604NQ	$D \rightarrow Q$	(HH)	0.345	0.553	1.158	0.016	0.023	0.035	D	1.0	Q	18
		(LL)	0.391	0.694	1.479	0.013	0.018	0.028	GB	1.0		
	$GB \rightarrow Q$	(LH)	0.389	0.682	1.461	0.016	0.023	0.035				
		(LL)	0.436	0.812	1.745	0.013	0.018	0.028				
	Set up time	D	0.880		1.520							
	Hold time	D	0.390		0.000							
	Min Pulse	GB	0.682		2.219							
F604NB	$D \rightarrow QB$	(HL)	0.441	0.723	1.506	0.012	0.016	0.024	D	1.0	QB	20
		(LH)	0.444	0.768	1.644	0.015	0.023	0.033	GB	1.0		
	$GB \rightarrow QB$	(LH)	0.495	0.893	1.924	0.015	0.023	0.033				
	0-4	(LL)	0.477	0.834	1.761	0.012	0.016	0.024				
	Set up time	D	0.840		1.390							
	Hold time	D	0.430		0.000							
	Min Pulse	GB	0.730		2.391							

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Function	D-Late	h (GE	3), High S _l	peed								
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norm	_	Q outp		QB ou	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F6R8	6										
x2												
x4 Logic Diagram	for "Normal			Teut	h Table for	"Norm	ol"					
Logic Diagram				IIIII	II Iable Ioi	NOIII	aı					
D H01 ←		<u> </u>	N01 Q) GB	Q	QB					
					. 0	1	0					
				(0	0	1					
GB H02 ←	d	b	N02 QB	,	(1	La	itch					
]		X:Irr	elevant							
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
				_								
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanou
F6R8	$D \rightarrow Q$	(HH)	0.323	0.517	1.072	0.015	0.023	0.035	D	1.0	Q	21
		(LL)	0.368	0.656	1.394	0.013	0.019	0.029	GB	1.0	QB	22
	$D \rightarrow QB$	(HL)	0.490	0.832	1.783	0.011	0.015	0.023				
		(LH)	0.512	0.947	2.073	0.014	0.021	0.030				
	$GB \rightarrow Q$	(LH)	0.362	0.640	1.365	0.015	0.023	0.035				
		(LL)	0.404	0.761	1.640	0.013	0.019	0.029				
	$GB \rightarrow QB$	(LH)	0.546	1.050	2.317	0.014	0.021	0.030				
		(LL)	0.529	0.955	2.077	0.011	0.015	0.023				
	Set up time	D	0.920		1.750							
	Hold time	D	0.390		0.000							
	Min Pulse	GB	0.792		2.792							

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Chapter 2 Function Block

Function	D-Late	ch (GE	3) with RB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out	$\overline{}$	Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L605	5		
x1	F605	7	F605NQ	5	F605NB	6						
x2												
x4												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←		-	N01 Q		O GB	RB	Q C	QВ				
					1 0	1	1	0				
					0 0	1	0	1				
GB H02 ←	d	b	N02 QB	1 1	X 1	1	Latch					
	<u></u>	J			х х	0	0	1				
	H03 RB			X:Irr	elevant							
	нв											
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
		_						_				
D H01 ←		<u> </u>	• N01 Q	1	O GB	RB	Q					
					1 0	1	1					
					0 0	1	0					
00 1100				1 1	K 1	1	Latch					
GB H02 ←	٩			;	х х	0	0					
	Ŷ			V:lrr	elevant		1	_				
	HÓ3 RB			^	cicvarii							
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
D H01 ←					O GB	RB	QB					
					1 0	1	0					
					0 0	1	1					
GB H02 ←	d	b	N01 QB	;	X 1	1	Latch					
		٦			х х	0	1	_				
	H03			X:Irr	elevant							
	RB											

Chapter 2 Function Block

			Switc	ching sp	eed							
Block	Path		t ı	_D0 (ns)			t 1] In	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F605	$D \ \to \ Q$	(HH)	0.691	1.212	2.619	0.014	0.021	0.030	D	1.0	Q	22
1 1	$D \to QB$	(LL) (HL)	0.613 0.521	1.073 0.892	2.291 1.879	0.012 0.013	0.016 0.018	0.023 0.028	GB RB	1.0 1.0	QB	22
1 1	D → QB	(LH)	0.419	0.738	1.577	0.015	0.010	0.020	110	1.0		
1 1	$GB \ \to \ Q$	(LH)	0.724	1.318	2.866	0.014	0.021	0.030				
1 1		(LL)	0.662	1.192	2.563	0.012	0.016	0.023				
1 1	$GB \ \to \ QB$	(LH)	0.469	0.858	1.850	0.015	0.022	0.032				
1 1		(LL)	0.554	0.998	2.126	0.013	0.018	0.028				
1 1	$RB \rightarrow Q$	(HH) (LL)	0.596 0.480	1.076 0.956	2.284 1.973	0.014 0.012	0.021 0.017	0.030 0.026				
1 1	$RB \rightarrow QB$	(LL) (HL)	0.427	0.950	1.545	0.012	0.017	0.028				
1 1	TID 7 QD	(LH)	0.290	0.496	1.008	0.015	0.022	0.032				
1 1	Set up time	D	0.940		1.870							
1 1	Hold time	D	0.420		0.000							
1 1	Release time	RB	0.790		1.500							
1 1	Removal time Min Pulse	RB	0.420		0.000							
1 1	Min Pulse	GB RB	0.957 0.782		3.339 2.683							
L605	D → Q	(HH)	0.762	0.948	2.003	0.029	0.042	0.062	D	1.0	Q	10
	5 , 4	(LL)	0.562	0.963	2.042	0.023	0.031	0.045	GB	1.0		
1 1	$GB \ \to \ Q$	(LH)	0.593	1.049	2.260	0.029	0.042	0.062	RB	1.0		
1 1		(LL)	0.601	1.069	2.293	0.023	0.031	0.045				
1 1	$RB \ \to \ Q$	(HH)	0.445	0.752	1.583	0.029	0.042	0.062				
1 1	0-4	(LL)	0.405	0.805	1.632 1.400	0.022	0.033	0.051				
1 1	Set up time Hold time	D D	0.850 0.430		0.000							
1 1	Release time	RB	0.450		0.860							
1 1	Removal time	RB	0.560		0.370							
1 1	Min Pulse	GB	0.832		2.756							
	Min Pulse	RB	0.672		2.027							
F605NQ	$D \ \to \ Q$	(HH)	0.448	0.766	1.723	0.017	0.026	0.042	D	1.0	Q	17
1 1	OD 0	(LL) (LH)	0.383 0.428	0.700 0.778	1.499 1.697	0.014 0.017	0.020 0.026	0.031 0.042	GB RB	1.0 1.0		
1 1	$GB \rightarrow Q$	(LL)	0.422	0.805	1.741	0.017	0.020	0.042	""	1.0		
1 1	$RB \ \to \ Q$	(HH)	0.445	0.776	1.783	0.017	0.026	0.042				
1 1		(LL)	0.370	0.666	1.251	0.012	0.019	0.030				
1 1	Set up time	D	1.060		2.300							
1	Hold time	D	0.390		0.000						1	
	Release time	RB	1.010		2.310							
1	Removal time Min Pulse	RB GB	0.240 0.676		0.000 2.218							
1	Min Pulse	RB	0.076		2.193							
F605NB	D → QB	(HL)	0.522	0.896	1.887	0.013	0.018	0.029	D	1.0	QB	22
1		(LH)	0.420	0.739	1.579	0.015	0.022	0.032	GB	1.0		
1	$GB \ \to \ QB$	(LH)	0.468	0.858	1.850	0.015	0.022	0.032	RB	1.0		
		(LL)	0.555	1.002	2.136	0.013	0.018	0.029				
1	$RB \rightarrow QB$	(HL) (LH)	0.427 0.290	0.760 0.497	1.553 1.010	0.013 0.015	0.018 0.022	0.029 0.032				
1	Set up time	D (LII)	0.290	0.431	1.710	0.015	0.022	0.002			1	
	Hold time	D	0.430		0.000							
1	Release time	RB	0.760		1.330						1	
1	Removal time	RB	0.460		0.000							
1	Min Pulse	GB	0.787		2.607							
	Min Pulse	RB	0.613		1.951						L	

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Chapter 2 Function Block

Function	D-Late	h (GE	3) with RB	, High	Speed							
Block type			Standard						Low Gate	type		
	Norma		Q outp		QB out	_	Norm		Q outp		QB out	1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F6R9	6										
x2												
x4				_								
Logic Diagram	for "Norma			Tru	th Table for	"Norm	ıal"					
D H01 ←		-	N01 Q		D GB	RB	Q C	QB				
					1 0	1	1	0				
					0 0	1		1				
GB H02 ←	d	\triangleright	N02 QB	1 1	X 1	1	Latch					
	þ	J			х х	0	0	1				
	H03 RB			X:Ir	relevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"					
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
				_								

Chapter 2 Function Block

			Swite	ching sp	eed				Ι.			
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F6R9	$D \rightarrow Q$	(HH)	0.450	0.769	1.727	0.017	0.026	0.041	D	1.0	Q	17
		(LL)	0.387	0.702	1.499	0.014	0.020	0.031	GB	1.0	QB	22
	$D \rightarrow QB$	(HL)	0.632	1.119	2.547	0.012	0.016	0.023	RB	1.0		
		(LH)	0.539	1.010	2.209	0.014	0.021	0.030				
	$GB \rightarrow Q$	(LH)	0.420	0.765	1.676	0.017	0.026	0.041				
		(LL)	0.414	0.790	1.715	0.014	0.020	0.031				
	$GB \rightarrow QB$	(LH)	0.565	1.095	2.424	0.014	0.021	0.030				
		(LL)	0.602	1.115	2.496	0.012	0.016	0.023				
	$RB \rightarrow Q$	(HH)	0.441	0.770	1.776	0.017	0.026	0.041				
		(LL)	0.368	0.661	1.242	0.012	0.019	0.030				
	$RB \rightarrow QB$	(HL)	0.623	1.120	2.596	0.012	0.016	0.023				
		(LH)	0.501	0.939	1.899	0.014	0.021	0.030				
	Set up time	D	1.110		2.530							
	Hold time	D	0.380		0.000							
	Release time	RB	1.040		2.530							
	Removal time	RB	0.240		0.000							
	Min Pulse	GB	0.845		2.971							
	Min Pulse	RB	0.967		3.005							

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2.11 D-F/F

Chapter 2 Function Block

Function	D-F/F											
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L641	6		
x1	F641	8	F641NQ	7	F641NB	7						
x2												
x4												ш
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norm	al"					
D H01 ←— C H02 ←—	-		N01 Q	0 1 X	1	Q 0 1 Hold	QB 1 0					
Logic Diagram D H01 ← C H02 ←		7	N01 Q	0 1 X	1	"Q out Q 0 1 Hold	put"					
Logic Diagram D H01 ← C H02 ←	for "QB out		N01 QB	0 1 X	1	"QB o QB 1 0 Hold	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F641	$C \rightarrow Q$	(HH)	0.452	0.759	1.570	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.530	0.926	1.955	0.012	0.016	0.024	С	1.0	QB	22
	$C \rightarrow QB$	(HH)	0.663	1.174	2.533	0.015	0.021	0.031				
		(HL)	0.627	1.066	2.241	0.012	0.016	0.023				
	Set up time	D	0.820		1.760							
	Hold time	D	0.530		0.400							
	Min Pulse	С	0.929		3.105							
L641	$C \rightarrow Q$	(HH)	0.461	0.763	1.571	0.029	0.043	0.063	D	1.0	Q	10
		(HL)	0.536	0.920	1.928	0.023	0.031	0.046	С	1.0		
	Set up time	D	0.820		1.760							
	Hold time	D	0.530		0.400							
	Min Pulse	С	0.802		2.501							
F641NQ	$C \rightarrow Q$	(HH)	0.451	0.759	1.571	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.530	0.926	1.955	0.012	0.016	0.024	С	1.0		
	Set up time	D	0.820		1.770							
	Hold time	D	0.530		0.400							
	Min Pulse	С	0.796		2.528							
F641NB	$C \rightarrow QB$	(HH)	0.427	0.741	1.566	0.015	0.023	0.035	D	1.0	QB	21
		(HL)	0.430	0.742	1.492	0.013	0.019	0.029	С	1.0		
	Set up time	D	0.820		1.810							
	Hold time	D	0.510		0.440							
	Min Pulse	С	0.718		2.142							

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Chapter 2 Function Block

Function	D-F/F	with F	3									
Block type			Standard	type					Low Gate	type		
Diook type	Norma	al	Q outp	ut	QB out		Norm	al	Q outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F642	9	F642NQ	8	F642NB	8						
x2												
x4												
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norn	nal"					
D H01 ←		-	N01 Q	D	C I	٦ (Q QB					
				0	/ ()	0 1					
				1	/		1 0					
C H02 ←	→	b	N02 QB	x			Hold					
		_		X	Х	1	0 1					
	HÖ3 R			X:Irr	elevant							
	н											
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q ou	tput"					
		7				_						
D H01 ←	_	├	N01 Q	D	C I	3	Q					
				0	/		0					
				1	/ (1					
C H02 ←	_			x			Hold					
0 1.02				Lx	Х	1	0					
	H03 R			X:Irr	elevant							
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					
3				_								
D H01 ←				D	C I	3	QB					
						,	1					
				1 1			0					
0 1100			NO4 OF	x			Hold					
C H02 ←	٢	Γ	N01 QB	x	x	1	1					
	H03 R			X:Irr	elevant							
1												
ĺ												

Chapter 2 Function Block

			Swite	ching sp	eed				Ι.			
Block	Path		t ı	LDO (ns))		t 1		l In	put	Ou	ıtput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F642	$C \rightarrow Q$	(HH)	0.468	0.789	1.653	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.534	0.930	1.957	0.012	0.016	0.024	С	1.0	QB	21
	$C \rightarrow QB$	(HH)	0.672	1.192	2.559	0.015	0.021	0.031	R	2.2		
		(HL)	0.762	1.319	2.819	0.013	0.018	0.027				
	$R \rightarrow Q$	(HL)	0.457	0.820	1.728	0.011	0.016	0.024				
	$R \rightarrow QB$	(HH)	0.230	0.411	0.772	0.015	0.022	0.034				
	Set up time	D	0.920		2.790							
	Hold time	D	0.540		0.380							
	Release time	R	0.690		2.090							
	Removal time	R	0.600		0.380							
	Min Pulse	С	1.062		3.404							
	Min Pulse	R	0.839		2.424							
F642NQ	$C \rightarrow Q$	(HH)	0.468	0.790	1.656	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.532	0.928	1.954	0.012	0.016	0.024	С	1.0		
	$R \rightarrow Q$	(HL)	0.434	0.763	1.595	0.012	0.016	0.024	R	2.2		
	Set up time	D	0.920		2.780							
	Hold time	D	0.540		0.380							
	Release time	R	0.690		2.090							
	Removal time	R	0.600		0.390							
	Min Pulse	С	0.800		2.529							
	Min Pulse	R	0.781		2.256							
F642NB	$C \rightarrow QB$	(HH)	0.431	0.746	1.570	0.015	0.023	0.035	D	1.0	QB	21
		(HL)	0.457	0.818	1.676	0.015	0.021	0.034	C	1.0		
	$R \rightarrow QB$	(HH)	0.328	0.574	1.204	0.015	0.023	0.034	R	2.2		
	Set up time	D	0.890		2.910							
	Hold time	D	0.530		0.430							
	Release time	R	0.640		2.220							
	Removal time	R	0.590		0.350							
	Min Pulse	С	0.753		2.247							
	Min Pulse	R	0.715		1.900							

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Chapter 2 Function Block

Function	D-F/F	with S	3									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norm		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F643	9	F643NQ	8	F643NB	8						
x2												
x4		<u> </u>		L								
Logic Diagram	tor "Norma	l"		Tru	th Table for	"Norn	nal"					
	S H03) C :	3 (Q QB					
	1103											
D H01 ←			N01 Q	0			1					
D Hor		'	NOT Q	1 x			1 0 Hold					
				^			1 0					
0 1100			NIGO OD	-			•					
C H02 ←			N02 QB	X:Irr	elevant							
				<u> </u>								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q ou	tput"					
	S H03				C :	3	Q					
	HQ3					_						
D 1104		٦.	Not 0	0)	0					
D H01 ←			N01 Q	1 x			1					
				^		,	Hold 1					
				-		<u> </u>						
C H02 ←	\rightarrow			X:Irr	elevant							
		_										
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB c	utput"					
	S			_								
	S H03 Î				С :	3	QB					
		1		0	1		1					
D H01 ←	1			1	/		0					
				x			Hold					
				L X	X .	1	0					
C H02 ←	→	þ⊸	N01 QB	X:Irr	elevant							
		J										
1												

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F643	$C \rightarrow Q$	(HH)	0.459	0.776	1.600	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.638	1.136	2.412	0.013	0.018	0.028	С	1.0	QB	22
	$C \rightarrow QB$	(HH)	0.801	1.446	3.139	0.014	0.021	0.030	S	2.2		
		(HL)	0.647	1.101	2.299	0.012	0.016	0.023				
	$S \rightarrow Q$	(HH)	0.214	0.331	0.620	0.015	0.022	0.032				
	$S \rightarrow QB$	(HL)	0.407	0.789	1.581	0.012	0.017	0.026				
	Set up time	D	0.830		1.820							
	Hold time	D	0.520		0.400							
	Release time	S	0.220		0.000							
	Removal time	S	1.040		1.830							
	Min Pulse	С	1.070		3.713							
	Min Pulse	S	0.737		2.194							
F643NQ	$C \rightarrow Q$	(HH)	0.459	0.778	1.605	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.638	1.138	2.420	0.013	0.018	0.028	С	1.0		
	$S \rightarrow Q$	(HH)	0.215	0.333	0.623	0.015	0.022	0.032	S	2.2		
	Set up time	D	0.830		1.820							
	Hold time	D	0.520		0.400							
	Release time	S	0.220		0.000							
	Removal time	S	1.040		1.830							
	Min Pulse	С	0.907		2.994							
	Min Pulse	S	0.468		1.231							
F643NB	$C \rightarrow QB$	(HH)	0.430	0.744	1.566	0.015	0.023	0.035	D	1.0	QB	21
		(HL)	0.433	0.743	1.493	0.013	0.019	0.030	С	1.0		
	$S \rightarrow QB$	(HL)	0.462	1.071	2.325	0.013	0.019	0.028	S	2.2		
1	Set up time	D	0.830		1.860							
1	Hold time	D	0.510		0.440							
	Release time	S	0.200		0.000							
	Removal time	S	1.000		1.770							
1	Min Pulse	С	0.724		2.143							
	Min Pulse	S	0.903		2.930							

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Chapter 2 Function Block

Function	D-F/F	with F	R, S									
Block type			Standard	type					Low Gate	type		
	Norm	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	tput
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L644	8		
x1	F644	10	F644NQ	9	F644NB	9						
x2												
x4												
Logic Diagram	for "Norma	l"		Tru	h Table for	"Norm	al"					
	S H04			D		R S		QB				
		1		0		0 0		1				
D H01 ←	1		N01 Q	1 1		0 0		0				
				x		0 0						
				^		0 1 1 0	0	0				
C H02 ←	→	þ⊸ i	N02 QB	$ \hat{x}$		1 1	1	1	← Prohibition	1		
	H03 R	J			elevant				· · · · · · · · · · · · · · · · · · ·			
Logic Diagram		ut"		Trut	h Table for	"Q ou	put"					
								_				
	S H04				С	R S	Q					
		_		0	1	0 0	0					
D H01 ←			N01 Q	1	1	0 0	1					
					>	0 0	Hold					
					x	0 1	1					
0.1100				x	x	1 0	0					
C H02 ←	T			L	х	1 1	1	_ ← F	Prohibition			
	H03 R			X:lrr	elevant							
Logic Diagram	for "QB out	tput"		Tru	h Table for	"QB o	utput"					
	S H04				С	R S	QB					
		7		0	1	0 0	1					
D H01 ←	4			1	1	0 0	0					
				x	`	0 0	Hold					
				x	Х	0 1	0					
С ноо .		h .	NO1 OP	x	х	1 0	1					
C H02 ←	۲	٦	N01 QB	x	x	1 1	1	← F	Prohibition			
	H03 R			X:Irr	elevant			_				

Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t	LDO (ns)			t 1		In	put	Ou	tput
type		DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F644	$C \rightarrow Q$	(HH)	0.482	0.820	1.705	0.015	0.022	0.032	D	1.0	Q	22
	0 00	(HL) (HH)	0.633 0.782	1.126 1.426	2.394 3.110	0.012 0.014	0.018 0.021	0.028 0.030	C R	1.0 2.1	QB	21
	$C \rightarrow QB$	(HL)	0.762	1.426	2.869	0.014	0.021	0.030	s	2.1		
	$R \rightarrow Q$	(HL)	0.774	1.001	2.150	0.013	0.018	0.027	"	2.3		
	$R \rightarrow QB$	(HH)	0.229	0.414	0.775	0.015	0.022	0.034				
	S → Q	(HH)	0.210	0.327	0.612	0.015	0.022	0.032				
	S → QB	(HL)	0.500	1.109	2.300	0.013	0.020	0.031				
	Set up time	D	0.900		2.780							
	Hold time	D	0.540		0.390							
	Release time	R	0.670		2.080							
	Release time	S	0.210		0.000							
	Removal time	R	0.620		0.420							
	Removal time	S C	1.050		1.870							
	Min Pulse Min Pulse	R	1.073 0.944		3.684 2.854							
	Min Pulse	S	0.944		2.889							
L644	C → Q	(HH)	0.490	0.821	1.698	0.029	0.043	0.063	D	1.0	Q	10
	ر ت	(HL)	0.636	1.107	2.326	0.024	0.034	0.053	l c	1.0		
	$R \rightarrow Q$	(HL)	0.521	0.903	1.899	0.024	0.033	0.051	R	2.1		
	$S \rightarrow Q$	(HH)	0.221	0.338	0.628	0.029	0.043	0.063	s	2.2		
	Set up time	D	0.890		2.750							
	Hold time	D	0.540		0.390							
	Release time	R	0.660		2.060							
	Release time	S	0.210		0.000							
	Removal time	R	0.620		0.420							
	Removal time Min Pulse	S C	1.050 0.906		1.870 2.903							
	Min Pulse	R	0.867		2.553							
	Min Pulse	s	0.451		1.189							
F644NQ	C → Q	(HH)	0.481	0.818	1.704	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.633	1.129	2.401	0.013	0.018	0.028	С	1.0		
	$R \rightarrow Q$	(HL)	0.520	0.929	1.985	0.012	0.017	0.027	R	2.1		
	$S \ \to \ Q$	(HH)	0.209	0.326	0.610	0.015	0.022	0.032	S	2.2		
	Set up time	D -	0.900		2.770							
	Hold time	D	0.540		0.390							
	Release time Release time	R S	0.660 0.210		2.070 0.000							
	Removal time	R	0.620		0.420							
	Removal time	s	1.050		1.870							
	Min Pulse	C	0.904		2.978							
	Min Pulse	R	0.867		2.637							
	Min Pulse	S	0.455		1.212							
F644NB	$C \rightarrow QB$	(HH)	0.434	0.750	1.572	0.015	0.023	0.035	D	1.0	QB	20
	_	(HL)	0.467	0.837	1.706	0.015	0.021	0.034	С	1.0		
	$R \rightarrow QB$	(HH)	0.330	0.570	1.188	0.015	0.023	0.035	R	2.1		
1	$S \rightarrow QB$ Set up time	(HL) D	0.626 0.880	1.387	3.098 2.890	0.015	0.021	0.033	S	2.2		
1	Hold time	D	0.530		0.440							
	Release time	R	0.620		2.190							
	Release time	s	0.190		0.000							
	Removal time	R	0.610		0.390							
	Removal time	S	1.010		1.800							
	Min Pulse	С	0.765		2.279							
	Min Pulse	R	0.711		1.880							
	Min Pulse	S	1.057		3.680							

Chapter 2 Function Block

Function	D-F/F	with F	RB									
Block type			Standard	type					Low Gate	type		
2.00.11,000	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	tput
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L645	7		
x1	F615	9	F615NQ	8	F615NB	8						
x2												
x4												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←			N01 Q		о с	RB	Q C	ΩВ				
i) /	1	0	1				
					1 /	1	1	0				
C H02 ←	→	h-	N02 QB	;	x >	1	Hold					
0 1.02	1	Γ	45	;	х х	0	0	1				
	H03 RB			X:Irr	elevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
D H01 ←		\	N01 Q		о с	RB	Q					
				() /	1	0					
					1 /	1	1					
C H02 ←	\rightarrow				κ ,	1	Hold					
				L	x x	0	0					
	H03 RB			X:lrr	elevant							
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
D H01 ←) C	RB	QB					
) /	1	1					
					1 /	1	0					
C H02 ←	\rightarrow	þ→	N01 QB	1 1	х <u>у</u>	1	Hold 1					
	H03 RB	J			elevant	U	1					
	110											

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F615	C → Q	(HH)	0.543	0.935	2.024	0.016	0.023	0.034	D	1.0	Q	18
		(HL)	0.564	0.977	2.059	0.012	0.016	0.024	С	1.0	QB	19
	$C \rightarrow QB$	(HH)	0.709	1.239	2.655	0.015	0.022	0.031	RB	2.2		
		(HL)	0.733	1.269	2.762	0.012	0.016	0.023				
	$RB \rightarrow Q$	(LL)	0.273	0.447	0.879	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.424	0.810	1.678	0.015	0.023	0.033				
	Set up time	D	0.840		1.830							
	Hold time	D	0.530		0.410							
	Release time	RB	0.310		0.090							
	Removal time	RB	0.940		1.510							
	Min Pulse	С	1.023		3.345							
	Min Pulse	RB	0.757		2.216							
L645	$C \rightarrow Q$	(HH)	0.519	0.883	1.891	0.029	0.044	0.066	D	1.0	Q	10
		(HL)	0.542	0.931	1.953	0.023	0.031	0.046	С	1.0		
	$RB \rightarrow Q$	(LL)	0.254	0.405	0.783	0.023	0.031	0.047	RB	2.2		
	Set up time	D	0.830		1.830							
	Hold time	D	0.530		0.400							
	Release time	RB	0.310		0.060							
	Removal time	RB	0.940		1.510							
	Min Pulse	С	0.813		2.530							
	Min Pulse	RB	0.503		1.273							
F615NQ	$C \rightarrow Q$	(HH)	0.546	0.941	2.037	0.016	0.023	0.035	D	1.0	Q	18
		(HL)	0.566	0.981	2.067	0.012	0.016	0.024	С	1.0		
	RB → Q	(LL)	0.275	0.451	0.888	0.012	0.016	0.024	RB	2.2		
	Set up time	D	0.840		1.830							
	Hold time	D	0.530		0.410							
	Release time	RB	0.310		0.100							
	Removal time	RB	0.940		1.510							
	Min Pulse	С	0.837		2.644							
F615NB	Min Pulse	RB	0.542	0.796	1.415	0.016	0.023	0.035	D	1.0	QB	18
FOISINB	$C \rightarrow QB$	(HH)	0.464 0.462		1.678		0.023	0.035	ı	1.0	l QB	18
	DD 00	(HL) (LH)	0.462	0.781 1.090	1.571 2.382	0.013 0.016	0.019	0.029	C RB	1.0 2.2		
	$RB \rightarrow QB$ Set up time	D (LH)	0.454	1.090	1.890	0.016	0.023	0.034	no	2.2		
	Hold time	D	0.830		0.440							
	Release time	RB	0.520		0.440							
	Removal time	RB	0.290		1.450							
	Min Pulse	С	0.910		2.257							
	Min Pulse	RB	0.754		2.237							
	WIII Fulse	טרו	0.500		2.313							

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Chapter 2 Function Block

Function	D-F/F	with S	SB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp	ut	QB out		Norm	al	Q outp	ut	QB ou	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F616	9	F616NQ	8	F616NB	8						
x2												
x4		<u> </u>										
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
	SB H03				D C	SB	Q C	QB				
	H03											
D H01 ←		L.	N01 Q		0 /	1		1				
		'	NOT Q		1 / K \	1	1 Hold	0				
				1 1	x x	0		0				
				-			<u> </u>					
C H02 ←	7	\triangleright	N02 QB	X:lrr	elevant							
		_										
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
	SB			l —								
	SB H03				о с	SB	Q					
) /	1	0					
D H01 ←			N01 Q	1 1	1 /	1	1					
					×	1	Hold					
					x x	0	1					
C H02 ←	\rightarrow			X:Irr	elevant							
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
		-										
	SB H03) С	SB	QB					
		,) /	1	1					
D H01 ←	4				1 /	1	0					
				1 1	× \	1	Hold					
				;	х х	0	0					
C H02 ←	\downarrow	b	N01 QB	X:Irr	elevant							
			-	"								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN → (DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F616	$C \rightarrow Q$	(HH)	0.454	0.762	1.573	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.556	0.979	2.096	0.012	0.016	0.024	С	1.0	QB	21
	$C \rightarrow QB$	(HH)	0.767	1.386	3.089	0.015	0.022	0.032	SB	2.2		
		(HL)	0.639	1.085	2.276	0.012	0.016	0.023				
	$SB \rightarrow Q$	(LH)	0.477	0.937	2.018	0.015	0.022	0.032				
	$SB \rightarrow QB$	(LL)	0.271	0.549	1.064	0.012	0.017	0.027				
	Set up time	D	0.870		2.000							
	Hold time	D	0.520		0.400							
	Release time	SB	0.620		0.980							
	Removal time	SB	0.600		0.570							
	Min Pulse	С	1.035		3.663							
	Min Pulse	SB	0.836		2.600							
F616NQ	$C \rightarrow Q$	(HH)	0.454	0.764	1.579	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.555	0.978	2.094	0.012	0.016	0.024	С	1.0		
	$SB \rightarrow Q$	(LH)	0.449	0.845	1.809	0.015	0.022	0.032	SB	2.2		
	Set up time	D	0.870		2.010							
	Hold time	D	0.510		0.400							
	Release time	SB	0.620		0.990							
	Removal time	SB	0.600		0.570							
	Min Pulse	С	0.822		2.668							
	Min Pulse	SB	0.782		2.377							
F616NB	$C \rightarrow QB$	(HH)	0.465	0.817	1.756	0.016	0.024	0.038	D	1.0	QB	19
		(HL)	0.434	0.750	1.505	0.013	0.019	0.030	С	1.0		
	$SB \rightarrow QB$	(LL)	0.394	0.767	1.644	0.013	0.018	0.028	SB	2.2		
	Set up time	D	0.890		2.040							
I	Hold time	D	0.490		0.440							
1	Release time	SB	0.630		1.020					l		
I	Removal time	SB	0.580		0.490							
1	Min Pulse	С	0.733		2.332					l		
	Min Pulse	SB	0.743	<u> </u>	2.232	L_				<u> </u>		

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Chapter 2 Function Block

Function	D-F/F	with F	RB, SB												
Block type			Standard	typ	е						Low	/ Gate	type	·	
Diodic type	Norma	al	Q outp	ut	Q	B out	put	No	rma	.I	(Q outp	ut	QB out	put
Drivability	Name	cells	Name	cell	s Na	ame	cells	Nam	ne	cells	N	ame	cells	Name	cells
Low Power											L	647	8		
x1	F647	10	F647NQ	9	F6	47NB	9								
x2															
x4				_											
Logic Diagram	for "Norma	l"		Tr	ruth Tal	ole for	"Norm	al"							
	SB H04				D	С	RB	SB	Q) (QВ				
	_	1			0	/	1	1	0		1				
D H01 ←	-	-	N01 Q		1	1	1	1	1		0				
ı					Х	>	1	1		Hold					
					Χ	Х	0	1	0		1				
C H02 ←	→	b⊸ i	N02 QB		X	X	1	0	1		0	_			
	L	J			Х	Х	0	0	0	1	0	← Pro	hibition		
	H03 RB			X:	:Irrelevar	t									
Logic Diagram	for "Q outp	ut"		Tr	ruth Tal	ole for	"Q out	put"							
	SB H04				D	С	RB	SB		Q]				
		,			0	1	1	1		0					
D H01 ←		-	N01 Q		1	1	1	1		1					
					x	`	1	1	F	lold					
					х	X	0	1		0					
0 1100					х	X	1	0		1					
C H02 ←	_>			IL	х	Х	0	0		0	←	Prohibiti	on		
	H03 RB			X :	:Irrelevar	t									
Logic Diagram	for "QB out	put"		Tr	ruth Tal	ole for	"QB o	utput"							
	SB H04				D	С	RB	SB	(QB					
					0	/	1	1		1					
D H01 ←	4				1	1	1	1		0					
					Х	\	1	1	H	lold					
					Х	х	0	1		1					
C H00 :		L.,	NO1 OF		X	х	1	0		0					
C H02 ←	٢	ا س ا	N01 QB		X	Х	0	0		0	←	Prohibiti	on		
	H03 RB			X:	Irrelevar	t			•		•				

Chapter 2 Function Block

			Swite	ching sp	eed				Ι.			1
Block	Path		t ı	LDO (ns)			t 1		In	put	Ou	tput
type		DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F647	$C \rightarrow Q$	(HH)	0.520	0.900	1.941	0.015	0.022	0.034	D	1.0	Q	21
	0 00	(HL) (HH)	0.563 0.769	0.992 1.390	2.125 3.104	0.012 0.015	0.016 0.022	0.024 0.032	C RB	1.0 2.2	QB	20
	$C \rightarrow QB$	(HL)	0.703	1.237	2.707	0.013	0.022	0.032	SB	2.1		
	RB → Q	(LL)	0.239	0.397	0.783	0.012	0.016	0.024	05	,		
	RB → QB	(LH)	0.448	0.949	2.093	0.015	0.023	0.036				
	$SB \rightarrow Q$	(LH)	0.535	1.071	2.377	0.015	0.022	0.033				
	$SB \ \to \ QB$	(LL)	0.266	0.546	1.058	0.012	0.017	0.027				
	Set up time	D	0.860		1.960							
	Hold time	D	0.520		0.410							
	Release time	RB	0.300		0.100							
	Release time Removal time	SB RB	0.590 0.950		0.930 1.590							
	Removal time	SB	0.630		0.630							
	Min Pulse	C	1.038		3.679							
	Min Pulse	RB	0.812		2.625							
	Min Pulse	SB	0.916		2.959							
L647	$C \rightarrow Q$	(HH)	0.530	0.901	1.919	0.029	0.044	0.066	D	1.0	Q	10
		(HL)	0.570	0.986	2.092	0.023	0.031	0.047	С	1.0		
	$RB \rightarrow Q$	(LL)	0.255	0.404	0.778	0.023	0.031	0.047	RB	2.2		
	SB → Q	(LH)	0.516	0.962	2.103	0.029	0.043	0.064	SB	2.1		
	Set up time Hold time	D D	0.870 0.520		1.990 0.400							
	Release time	RB	0.300		0.400							
	Release time	SB	0.600		0.070							
	Removal time	RB	0.960		1.600							
	Removal time	SB	0.620		0.620							
	Min Pulse	С	0.840		2.668							
	Min Pulse	RB	0.501		1.266							
	Min Pulse	SB	0.861		2.669							
F647NQ	$C \rightarrow Q$	(HH)	0.517	0.898 0.987	1.942	0.015	0.022	0.034 0.024	D C	1.0	Q	21
	RB → Q	(HL) (LL)	0.559 0.241	0.400	2.116 0.789	0.012 0.012	0.016 0.016	0.024	RB	1.0 2.2		
	$SB \rightarrow Q$	(LH)	0.504	0.963	2.136	0.015	0.022	0.033	SB	2.1		
	Set up time	D (=,	0.860		1.990		****					
	Hold time	D	0.520		0.410							
	Release time	RB	0.300		0.100							
	Release time	SB	0.600		0.960							
	Removal time	RB	0.960		1.600							
	Removal time Min Pulse	SB C	0.620 0.829		0.620 2.692							
	Min Pulse Min Pulse	RB	0.829		1.304							
	Min Pulse	SB	0.454		2.701							
F647NB	C → QB	(HH)	0.472	0.827	1.772	0.016	0.024	0.038	D	1.0	QB	19
		(HL)	0.437	0.752	1.500	0.013	0.019	0.030	С	1.0		
	$RB \ \to \ QB$	(LH)	0.503	1.271	2.914	0.015	0.024	0.037	RB	2.2		
	SB → QB	(LL)	0.388	0.753	1.601	0.013	0.019	0.030	SB	2.1		
	Set up time	D	0.880		2.020							
	Hold time Release time	D RB	0.500 0.280		0.440 0.160							
	Release time	SB	0.260		0.160							
	Removal time	RB	0.920		1.500							
	Removal time	SB	0.610		0.550							
	Min Pulse	С	0.742		2.350							
	Min Pulse	RB	0.994		3.436							
	Min Pulse	SB	0.735		2.188							

Chapter 2 Function Block

Function	D-F/F	(CB)										
Block type			Standard	type					Low Gate	type		
Diook type	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	tput
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L661	6		
x1	F661	8	F661NQ	7	F661NB	7						
x2												
x4												
Logic Diagram	for "Norma	l"		Tru	h Table for	"Norm	ıal"					
D H01 ←			N01 Q		о св	Q	QB					
				H,) \ <u>`</u>	0	1					
					1 5	1	0					
CB H02 ←		h	N02 QB				old					
05 1102	٢	Γ.	NOZ QD									
				X:Irr	elevant							
Logic Diagram	for "Q outp	ut"		Tru	h Table for	"Q out	tput"					
		7		٦,			_					
D H01 ←		\vdash	N01 Q		О СВ	Q						
				() \	0						
					۱ 😼	1						
CB H02 ←	→			;	· /	Holo	ı					
				X:Irr	elevant							
Logic Diagram	for "QB out	put"		Tru	h Table for	"QB o	utput"					
		7		l —								
D H01 ←				- '	О СВ	QB						
) <i>\</i>	1						
					١ 😼	0						
CB H02 ←	\diamond	þ⊸	N01 QB		<i>/</i>	Holo	i					
		_		X:Irr	elevant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F661	CB → Q	(LH)	0.513	0.938	2.023	0.015	0.022	0.032	D	1.0	Q	22
		(LL)	0.475	0.843	1.782	0.012	0.016	0.024	СВ	1.0	QB	22
	CB → QB	(LH)	0.612	1.097	2.366	0.015	0.021	0.031				
		(LL)	0.691	1.251	2.705	0.012	0.016	0.023				
	Set up time	D	0.850		1.600							
	Hold time	D	0.570		0.700							
	Min Pulse	CB	0.954		3.220							
L661	CB → Q	(LH)	0.520	0.939	2.019	0.029	0.043	0.063	D	1.0	Q	10
		(LL)	0.481	0.838	1.758	0.023	0.031	0.046	СВ	1.0		
	Set up time	D	0.850		1.590							
	Hold time	D	0.570		0.700							
	Min Pulse	CB	0.784		2.535							
F661NQ	CB → Q	(LH)	0.512	0.936	2.021	0.015	0.022	0.032	D	1.0	Q	22
		(LL)	0.475	0.845	1.787	0.012	0.016	0.024	СВ	1.0		
	Set up time	D	0.850		1.600							
	Hold time	D	0.570		0.700							
	Min Pulse	CB	0.774		2.536							
F661NB	$CB \rightarrow QB$	(LH)	0.388	0.698	1.488	0.015	0.023	0.035	D	1.0	QB	21
1		(LL)	0.446	0.845	1.822	0.013	0.019	0.029	СВ	1.0		
1	Set up time	D	0.850		1.580							
I	Hold time	D	0.570		0.720							
	Min Pulse	CB	0.720		2.344							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with RB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out	T	Norm		Q outp		QB out	1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F665	9	F665NQ	8	F665NB	8						
x2												
x4				_								
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	ıal"					
D H01 ←			N01 Q		о св	RB	Q C	QВ				
2			٠	11) \	1	0	1				
					1 \	1	1	0				
CB H02 ←	\bigcirc	b	N02 QB	;	x /	1	Hold					
		J		;	x x	0	0	1				
	HÖ3 RB			X:lrr	elevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"					
		7		 								
D H01 ←		\vdash	N01 Q		О СВ	RB	Q					
					· · ·	1	0					
					1 5	1	1					
CB H02 ←	-				× /	1	Hold					
				[_;	x x	0	0					
	H03			X:Irr	elevant							
	RB											
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
		7			D CB	RB	QB					
D H01 ←	7											
						1	1					
					1 \	1	0					
CB H02 ←		þ→	N01 QB		х <i>7</i> х х	1	Hold 1					
	H03			-	elevant							
	HĎ3 RB											

Chapter 2 Function Block

- I			Swite	ching sp	eed				Ι.			
Block	Path		t I	LD0 (ns))		t 1		l in	put	l Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F665	CB → Q	(LH)	0.610	1.121	2.487	0.016	0.023	0.034	D	1.0	Q	18
		(LL)	0.508	0.895	1.888	0.012	0.016	0.024	СВ	1.0	QB	19
	$CB \rightarrow QB$	(LH)	0.654	1.157	2.483	0.015	0.022	0.031	RB	2.2		
		(LL)	0.799	1.455	3.224	0.012	0.015	0.023				
	$RB \rightarrow Q$	(LL)	0.272	0.446	0.877	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.422	0.808	1.674	0.015	0.023	0.033				
	Set up time	D	0.860		1.630							
	Hold time	D	0.570		0.710							
	Release time	RB	0.290		0.000							
	Removal time	RB	0.960		1.910							
	Min Pulse	CB	1.065		3.743							
	Min Pulse	RB	0.755		2.213							
F665NQ	$CB \rightarrow Q$	(LH)	0.611	1.124	2.494	0.016	0.023	0.035	D	1.0	Q	18
		(LL)	0.510	0.898	1.896	0.012	0.016	0.024	CB	1.0		
	$RB \rightarrow Q$	(LL)	0.273	0.448	0.884	0.012	0.016	0.024	RB	2.2		
	Set up time	D	0.860		1.630							
	Hold time	D	0.570		0.710							
	Release time	RB	0.290		0.000							
	Removal time	RB	0.960		1.910							
	Min Pulse	CB	0.878		3.012							
	Min Pulse	RB	0.539		1.409							
F665NB	$CB \rightarrow QB$	(LH)	0.425	0.752	1.600	0.016	0.023	0.035	D	1.0	QB	18
		(LL)	0.484	0.898	1.917	0.013	0.019	0.029	CB	1.0		
	$RB \rightarrow QB$	(LH)	0.452	1.096	2.393	0.016	0.023	0.034	RB	2.2		
	Set up time	D	0.860		1.620							
	Hold time	D	0.570	1	0.730		1					
	Release time	RB	0.280		0.000							
	Removal time	RB	0.920	1	1.840		1					
	Min Pulse	CB	0.762		2.443							
	Min Pulse	RB	0.914		2.925							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with SB									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norm		Q outp		QB out	1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F666	9	F666NQ	8	F666NB	8						
x2												
x4 Logic Diagram	for "Norma			Trut	th Table for	"Norm	 					
Logic Diagram		ı		III	iii iable ioi	NOIII	iai					
	SB H03 I				О СВ	SB	Q C	QΒ				
		7			o 🗸	1	0	1				
D H01 ←	1		N01 Q		1 🐪	1	1	0				
				;	x /	1	Hold					
					х х	0	1	0				
CB H02 ←	\diamond	þ	N02 QB	X:Irr	elevant							
Logic Diagram	for "O outn	ut"		Tru	th Table for	"O out	tnut"					
Logio Diagram	·	ut		110	iii iabio ioi	Q Ou	put					
	SB H03				о св	SB	Q					
		_			D \	1	0					
D H01 ←			N01 Q		1 5	1	1					
					 x /	1	Hold					
					x x	0	1					
				\ _								
CB H02 ←	٧			X:III	elevant							
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
	SB H03				о св	SB	QB					
		7			D \	1	1					
D H01 ←	-				1 \	1	0					
				1 1		1	Hold					
				;	х х	0	0					
CB H02 ←	\rightarrow	\triangleright	N01 QB	X:Irr	elevant							
		_										

Chapter 2 Function Block

Disale			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	itput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F666	CB → Q	(LH)	0.510	0.932	2.010	0.015	0.022	0.032	D	1.0	Q	22
		(LL)	0.493	0.882	1.886	0.012	0.016	0.024	CB	1.0	QB	21
	$CB \rightarrow QB$	(LH)	0.704	1.286	2.874	0.015	0.022	0.032	SB	2.2		
		(LL)	0.691	1.251	2.709	0.012	0.016	0.023				
	$SB \rightarrow Q$	(LH)	0.474	0.992	2.113	0.015	0.022	0.032				
	$SB \rightarrow QB$	(LL)	0.297	0.595	1.136	0.012	0.017	0.027				
	Set up time	D	0.900		2.240							
	Hold time	D	0.580		0.700							
	Release time	SB	0.610		1.260							
	Removal time	SB	0.620		0.720							
	Min Pulse	CB	0.967		3.396							
	Min Pulse	SB	0.914		2.694							
F666NQ	$CB \rightarrow Q$	(LH)	0.509	0.931	2.008	0.015	0.022	0.032	D	1.0	Q	22
		(LL)	0.493	0.883	1.890	0.012	0.016	0.024	CB	1.0		
	$SB \rightarrow Q$	(LH)	0.447	0.836	1.794	0.015	0.022	0.032	SB	2.2		
	Set up time	D	0.900		2.240							
	Hold time	D	0.580		0.700							
	Release time	SB	0.610		1.270							
	Removal time	SB	0.620		0.720							
	Min Pulse	CB	0.771		2.524							
	Min Pulse	SB	0.775		2.360							
F666NB	CB → QB	(LH)	0.421	0.765	1.660	0.016	0.024	0.038	D	1.0	QB	19
		(LL)	0.446	0.843	1.816	0.013	0.019	0.029	CB	1.0		
	$SB \rightarrow QB$	(LL)	0.392	0.758	1.630	0.013	0.018	0.028	SB	2.2		
	Set up time	D	0.900		2.200							
	Hold time	D	0.580		0.720							
	Release time	SB	0.610		1.240							
	Removal time	SB	0.610		0.700							
	Min Pulse	CB	0.718		2.338							
	Min Pulse	SB	0.737		2.217							

Chapter 2 Function Block

Function	D-F/F	(CB)	with RB, S	BB									
Block type			Standard	type					L	ow Gate	type		
	Norma	al	Q outp	ut	QB out	put	No	rmal		Q outp	ut	QB ou	tput
Drivability	Name	cells	Name	cells	Name	cells	Nam	ne ce	lls	Name	cells	Name	cells
Low Power										L667	8		
x1	F667	10	F667NQ	9	F667NB	9							
x2													
x4													
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	ıal"						
	SB H04				D CB	RB	SB	Q	QB				
		_			0 \	1	1	0	1				
D H01 ←			N01 Q		1 \	1	1	1	0				
					x /	1	1	н	old				
					х х	0	1	0	1				
CB H02 ←		h_	N02 QB		х х	1	0	1	0				
05 1102	<u> </u>	Γ	NOL QD		х х	0	0	0	0	← Pro	ohibition		
	H03 RB			X:lr	relevant								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"						
	SB H04				D CB	RB	SB	Q					
		_			0 \	1	1	0					
D H01 ←	_	⊢ ⊸	N01 Q		1 \	1	1	1					
					x ∕	1	1	Hold					
					x x	0	1	0					
CB H02 ←	\downarrow				x x	1	0	1					
OB 1102 V	4				х х	0	0	0	•	Prohibiti	ion		
	H03 RB			X:lr	relevant								
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"						
	SB H04				D CB	RB	SB	QB					
		7			0 \	1	1	1					
D H01 ←	\dashv				1 \	1	1	0					
					x /	1	1	Hold					
					х х	0	1	1					
CB H02 ←	→	b	N01 QB		х х	1	0	0					
0202		ľ	45		х х	0	0	0		Prohibiti	ion		
	H03 RB			X:lr	relevant				_				

Chapter 2 Function Block

Divide			Swite	ching sp	eed	_			Ι.			
Block	Path		t i	LD0 (ns))		t 1		l in	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F667	$CB \rightarrow Q$	(LH)	0.574	1.067	2.372	0.015	0.022	0.034	D	1.0	Q	21
		(LL)	0.502	0.899	1.923	0.012	0.016	0.024	СВ	1.0	QB	20
	$CB \rightarrow QB$	(LH)	0.709	1.298	2.903	0.015	0.022	0.032	RB	2.2		
	DD O	(LL)	0.760	1.404	3.139	0.012	0.016	0.023	SB	2.1		
	$RB \rightarrow Q$ $RB \rightarrow QB$	(LL) (LH)	0.241 0.451	0.400 0.953	0.788 2.100	0.012 0.015	0.016 0.023	0.024 0.036				
	SB → QB	(LH)	0.539	1.069	2.374	0.015	0.023	0.033				
	$SB \rightarrow Q$ $SB \rightarrow QB$	(LL)	0.266	0.546	1.058	0.012	0.017	0.027				
	Set up time	D` ´	0.900		2.240							
	Hold time	D	0.580		0.700							
	Release time	RB	0.280		0.000							
	Release time	SB	0.600		1.260							
	Removal time	RB	0.980		1.960							
	Removal time	SB	0.640		0.750							
	Min Pulse Min Pulse	CB RB	1.023		3.656							
	Min Pulse	SB	0.820 0.915		2.633 2.956							
L667	CB → Q	(LH)	0.585	1.066	2.346	0.029	0.044	0.066	D	1.0	Q	10
2007	0b → Q	(LL)	0.512	0.898	1.900	0.023	0.031	0.047	СВ	1.0	~	
	$RB \rightarrow Q$	(LL)	0.253	0.402	0.776	0.023	0.031	0.047	RB	2.2		
	$SB \ \to \ Q$	(LH)	0.515	0.960	2.099	0.029	0.043	0.064	SB	2.1		
	Set up time	D	0.900		2.250							
	Hold time	D	0.580		0.700							
	Release time	RB	0.280		0.000							
	Release time	SB	0.600		1.260							
	Removal time Removal time	RB SB	0.980 0.640		1.970 0.750							
	Min Pulse	CB	0.848		2.862							
	Min Pulse	RB	0.499		1.264							
	Min Pulse	SB	0.859		2.666							
F667NQ	CB → Q	(LH)	0.573	1.066	2.373	0.015	0.022	0.034	D	1.0	Q	21
		(LL)	0.502	0.900	1.926	0.012	0.016	0.024	СВ	1.0		
	$RB \rightarrow Q$	(LL)	0.241	0.400	0.789	0.012	0.016	0.024	RB	2.2		
	SB → Q	(LH)	0.504	0.963	2.135	0.015	0.022	0.033	SB	2.1		
	Set up time Hold time	D D	0.900 0.580		2.250 0.700							
	Release time	RB	0.380		0.000							
	Release time	SB	0.600		1.260							
	Removal time	RB	0.980		1.970							
	Removal time	SB	0.640		0.750							
	Min Pulse	CB	0.836		2.889							
	Min Pulse	RB	0.494		1.304							
FOOTNIB	Min Pulse	SB	0.851	0.770	2.700	0.010	0.024	0.000	D	1.0	QB	10
F667NB	$CB \rightarrow QB$	(LH) (LL)	0.428 0.448	0.776 0.844	1.679 1.811	0.016 0.013	0.024	0.038	CB	1.0 1.0	l QB	19
	$RB \rightarrow QB$	(LL) (LH)	0.503	1.270	2.912	0.013	0.019	0.030	RB	2.2		
	$SB \rightarrow QB$	(LL)	0.387	0.751	1.599	0.013	0.019	0.030	SB	2.1		
	Set up time	D`´	0.900		2.210							
	Hold time	D	0.580		0.720							
	Release time	RB	0.270		0.000							
	Release time	SB	0.600		1.230							
	Removal time	RB	0.930		1.880							
	Removal time Min Pulse	SB CB	0.630 0.722		0.730 2.335							
	Min Pulse	RB	0.722		3.434							
	Min Pulse	SB	0.993		2.186							
	IVIIN Puise	SB	0.735	l	2.186							

Chapter 2 Function Block

Function	D-F/F	with 2	2 to 1 Sele	cto	r										
Block type			Standard	ty	ре					Low G	ate	type			
	Norma		Q outp			QB out			rmal	Qο		ut		out	out
Drivability	Name	cells	Name	се	lls	Name	cells	Nam	e cells	Nam	ie	cells	Nan	ne	cells
Low Power															
x1	F641S	10	F641SQ	!	9	F641SB	9								
x2															
x4				Ļ											
Logic Diagram	for "Norma	l"		-	Truth	n Table for	"Norm	ıal"							
D0 H01 ←		-	N01 Q		DO	D1	С	Α	Q	QB					
D1 H02 ←					0	Х	1	0	0	1					
C H03 ←	\rightarrow				1		1	0	1	0					
A H04 ←	-	þ⊸	N02 QB		Х		/	1	0	1					
		J			X		/	1	1	0					
					X		,	0	Hold						
					Х	Х		1	Hold						
				,	K:Irre	levant									
Logic Diagram	for "Q outp	ut"		-	Truth	n Table for	"Q out	tput"							
D0 H01 ←		}	N01 Q		DO) D1	С	Α	Q						
D1 H02 ←					0	Х	1	0	0						
C H03 ←	\rightarrow				1	Х	1	0	1						
A H04 ←					Х	0	1	1	0						
					Х		/	1	1						
					Х		/	0	Hold						
					Х	Х	`	1	Hold						
				,	K:Irre	levant									
Logic Diagram	for "QB out	put"		-	Truth	n Table for	"QB o	utput"							
		1								1					
D0 H01 ←	\dashv				DO	D1	С	Α	QB	-					
D1 H02 ←					0	Х	1	0	1						
C H03 ←	\rightarrow				1		/	0	0						
A H04 ←	\dashv	b⊸	N01 QB		Х		1	1	1						
		J			Х		1	1	0						
					Х		>	0	Hold						
					Х	Х	`	1	Hold						
				,	K:Irre	levant									

Chapter 2 Function Block

									_			
I Black			Swite	ching sp	eed						_	
Block	Path		t ı	LD0 (ns))		t 1		l in	put	l Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F641S	$C \rightarrow Q$	(HH)	0.456	0.764	1.577	0.015	0.022	0.032	D0	1.0	Q	22
		(HL)	0.541	0.940	1.977	0.012	0.016	0.024	D1	1.0	QB	22
	$C \ \to QB$	(HH)	0.677	1.194	2.562	0.015	0.021	0.031	С	1.0		
		(HL)	0.635	1.077	2.257	0.012	0.016	0.023	A	1.0		
	Set up time	D0	0.980		2.400							
	Set up time	D1	0.980		2.400							
	Set up time	Α	1.000		2.720							
	Hold time	D0	0.380		0.000							
	Hold time	D1	0.380		0.000							
	Hold time	Α	0.360		0.000							
	Min Pulse	С	0.952		3.141							
F641SQ	$C \rightarrow Q$	(HH)	0.457	0.766	1.582	0.015	0.022	0.032	D0	1.0	Q	22
		(HL)	0.541	0.941	1.979	0.012	0.016	0.024	D1	1.0		
	Set up time	D0	0.980		2.390				С	1.0		
	Set up time	D1	0.980		2.390				A	1.0		
	Set up time	Α	1.000		2.720							
	Hold time	D0	0.380		0.000							
	Hold time	D1	0.380		0.000							
	Hold time	A	0.360		0.000							
501105	Min Pulse	С	0.816		2.558							
F641SB	$C \rightarrow QB$	(HH)	0.438 0.438	0.757	1.590	0.015	0.023	0.035	D0	1.0	QB	21
	0	(HL)		0.749	1.502	0.013	0.019	0.029	D1	1.0		
	Set up time	D0	0.990		2.450				C	1.0		
	Set up time	D1	0.990		2.440				A	1.0		
	Set up time Hold time	A D0	1.010		2.770							
	Hold time	D0 D1	0.360 0.360		0.000							
	Hold time	A A	0.360		0.000							
	Min Pulse	C	0.340		2.172							
\Box	WIIII FUISE	U	0.735	<u> </u>	2.172		<u> </u>		<u> </u>			L

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Chapter 2 Function Block

Function	D-F/F	with F	R, 2 to 1 S	eled	ctor									
Block type			Standard	typ	ре						Low Gate	type		
	Norma		Q outp			QB out			rma		Q outp	out	QB out	1
Drivability	Name	cells	Name	cel	lls	Name	cells	Nam	е	cells	Name	cells	Name	cells
Low Power														
x1	F642S	11	F642SQ	1	0	F642SB	10							
x2														
x4				_										
Logic Diagram	for "Norma	l"		Τ	Γruth	Table for	"Norm	al"						
D0 H01 ←		-	N01 Q		D0	D1	С	R	Α		Q QB			
D1 H02 ←	7				0	х	1	0	0		0 1			
C H03 ←	\rightarrow				1	Х	1	0	0		1 0			
A H05 ←	_	b →	N02 QB		Х	Х	/	0	0		Hold			
ı					Х	0	1	0	1		0 1			
	H04				Х	1	/	0	1		1 0			
	R				X X	X X	×	0	1 X		Hold			
					K:Irrele		^	'	_^		0 1			
Lania Diagram	f Ot						IIO							
Logic Diagram	ior Q outp	ut		' ا	irutn	Table for	Q out	put		-				
D0 H01 ← D1 H02 ←			N01 Q	╟	D0		С	R	A		Q			
D1 1102 +					0	X	/	0	0		0			
C H03 ←	\rightarrow				1	X X	/	0	0		1			
A H05 ←					X	0	\ 	0	0		Hold 0			
					X	1	,	0	1		1			
	H04				х	×	Ś	0	1		Hold			
	R				х	х	X	1	Х		0			
				×	K:Irrele	evant								
Logic Diagram	for "QB out	tput"		1	Γruth	Table for	"QB o	utput"						
D0 H01 ←		1			D0	D1	С	R	A		QB			
D0 H01 ← D1 H02 ←	_				0	Х		0	0		1			
					1	X	,	0	0		0			
C H03 ←	→				X	X	Ś	0	0		Hold			
A H05 ←	1	ρ⊸	N01 QB		Х	0	,	0	1		1			
		_			х	1	,	0	1		0			
	HÖ4 R				х	x	\	0	1		Hold			
	••				х	x	х	1	Х		1			
				×	K:Irrele	evant								
									_					

Chapter 2 Function Block

type N → OUT MIN. TYP. MAX. MIN. TYP. MAX. Symbol Fanin Symbol Facin Facin Symbol Symbol Facin Symbol Facin Symbol Facin Symbol Facin	B			Swite	ching sp	eed							
F642S	Block	Path		t I	LD0 (ns))		t 1		l In	put	Ou	tput
C → QB	type	IN \rightarrow (MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
C → QB (HH) 0.674 1.195 2.565 0.015 0.021 0.030 C 1.0 1.0 A 1.0 R Q (HL) 0.756 1.311 2.808 0.013 0.018 0.027 R 2.2 2 2 2 0.012 0.013 0.018 0.027 R 2.2 2 0.012 0.013 0.018 0.022 A 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 3 4 1.0 3 4 1.0 3 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 4 1.0 1.0 2.2 2.0 <td< td=""><td>F642S</td><td>$C \rightarrow Q$</td><td>. ,</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>22</td></td<>	F642S	$C \rightarrow Q$. ,	-							-		22
R → Q (HL) 0.756 1.311 2.808 0.013 0.018 0.027 R 2.2						1						QB	21
R → Q		$C \rightarrow QB$	٠, ,								-		
R → QB		Б 6	٠,										
Set up time D0 1.080 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 3.420 4.42										^	1.0		
Set up time D1 1.080 3.420 Set up time A 1.110 3.740 Hold time D0 0.390 0.000 Hold time D1 0.390 0.000 Hold time A 0.370 0.000 Release time R 0.700 2.110 Removal time R 0.600 0.370 Min Pulse C 1.060 3.390 Min Pulse R 0.837 2.424 F642SQ C → Q (HH) 0.467 0.790 1.655 0.015 0.022 0.032 D0 1.0 Q F642SQ C → Q (HH) 0.467 0.790 1.655 0.012 0.016 0.024 D1 1.0 Q Set up time D0 1.090 3.440 R 2.2 A 1.0 R 2.2 A 1.0 R 2.2 A 1.0 A 1.0 A 1.0 A 1.0<			. ,		0.406		0.015	0.022	0.034				
Set up time													
Hold time		•				1							
Hold time D1 0.390 0.000 0.000													
Release time			D1	0.390		0.000							
Removal time		Hold time	Α	0.370		0.000							
Min Pulse		Release time	R	0.700		2.110							
Min Pulse R 0.837 2.424		Removal time	R	0.600		0.370							
F642SQ													
R → Q (HL) 0.532 0.929 1.956 0.012 0.016 0.024 D1 1.0													
R → Q (HL) 0.436 0.766 1.600 0.012 0.016 0.024 C 1.0 Set up time D0 1.090 3.440 A 1.0 Set up time D1 1.080 3.430 A 1.0 Set up time D1 0.380 0.000 Hold time D1 0.380 0.000 Hold time D1 0.380 0.000 Hold time R 0.590 0.370 Min Pulse C 0.798 2.527 Min Pulse R 0.784 2.261	F642SQ	$C \rightarrow Q$									-	Q	22
Set up time D0 1.090 3.440 R 2.2 Set up time D1 1.080 3.430 A 1.0 Set up time A 1.110 3.750 Hold time D0 0.380 0.000 Hold time A 0.370 0.000 Hold time A 0.700 2.110 Removal time R 0.590 0.370 Min Pulse C 0.798 2.527 Min Pulse R 0.784 2.261 F642SB C → QB (HH) 0.427 0.741 1.562 0.015 0.023 0.035 D0 1.0 QB F642SB C → QB (HH) 0.327 0.574 1.203 0.015 0.023 0.035 D0 1.0 QB F642SB C → QB (HH) 0.327 0.574 1.203 0.015 0.023 0.035 D0 1.0 QB R → QB (HH) 0.327 <t< td=""><td></td><td></td><td>٠,</td><td></td><td></td><td></td><td></td><td></td><td></td><td>ı</td><td></td><td></td><td></td></t<>			٠,							ı			
Set up time					0.766		0.012	0.016	0.024				
Set up time										ı			
Hold time										^	1.0		
Hold time D1 0.380 0.000 0.000													
Hold time A 0.370 0.000 0.000													
Release time						1							
Min Pulse		Release time	R			1							
Min Pulse R 0.784 2.261		Removal time	R	0.590		0.370							
F642SB		Min Pulse	С	0.798		2.527							
(HL) 0.453 0.813 1.670 0.015 0.021 0.034 D1 1.0 R → QB (HH) 0.327 0.574 1.203 0.015 0.023 0.034 C 1.0 Set up time D0 1.060 3.570 Set up time D1 1.050 3.560 A 1.0 Set up time A 1.080 3.880 Hold time D0 0.360 0.000 Hold time D1 0.370 0.000 Hold time A 0.350 0.000		Min Pulse	R	0.784		2.261							
R → QB (HH) 0.327 0.574 1.203 0.015 0.023 0.034 C 1.0 Set up time D0 1.060 3.570 R 2.2 Set up time D1 1.050 3.560 A 1.0 Set up time A 1.080 3.880 Hold time D0 0.360 0.000 Hold time D1 0.370 0.000 Hold time A 0.350 0.000	F642SB	$C \rightarrow QB$. ,		-						-	QB	21
Set up time D0 1.060 3.570 R 2.2 Set up time D1 1.050 3.560 A 1.0 Set up time A 1.080 3.880 Hold time D0 0.360 0.000 Hold time D1 0.370 0.000 0.000 Hold time A 0.350 0.000			٠,			1							
Set up time					0.574		0.015	0.023	0.034		-		
Set up time A 1.080 3.880 Hold time D0 0.360 0.000 Hold time D1 0.370 0.000 Hold time A 0.350 0.000													
Hold time D0 0.360 0.000 Hold time D1 0.370 0.000 Hold time A 0.350 0.000										A	1.0		
Hold time D1 0.370 0.000 Hold time A 0.350 0.000													
Hold time A 0.350 0.000													
Release time R 0.640 2.240			R	0.640		2.240							
Removal time R 0.580 0.330						1							
Min Pulse C 0.753 2.239													
Min Pulse R 0.714 1.900		Min Pulse	R	0.714	L	1.900							

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Low Power x1 F x2 x4 Logic Diagram for "	S H04	Standard Q outp Name F643SQ N01 Q N02 QB	tut cells	QB out Name F643SB th Table for X X X	cells 10	Name	mal e co	ells	Q outp Name		QB out	cells
Drivability N Low Power x1 F x2 x4 Logic Diagram for "	F643S 11 'Normal" S H04	Name F643SQ	tells	F643SB th Table for 0 D1 0 X 1 X	cells 10 "Norm	Name	A	Q	Name			
Low Power x1 x2 x4 Logic Diagram for " D0 H01 D1 H02 C H03 C H03	"Normal" S H04	F643SQ	Tru	th Table for	"Norm	al" S 0	A	Q	QB	cells	Name	cells
x1 r x2 x4 Logic Diagram for " D0 H01 D1 H02 C H03 C H03	"Normal" S H04	N01 Q	Tru	th Table for	"Norm	S 0		-				
x2 x4 Logic Diagram for " D0 H01 D1 H02 C H03	"Normal" S H04	N01 Q	Tru	th Table for	"Norm	S 0		-				
x4 Logic Diagram for " D0 H01 ← D1 H02 ← C H03 ←	S H04			D0 D1 X 1 X	C /	S 0		-				
Logic Diagram for " D0 H01 ← D1 H02 ← C H03 ←	S H04			D0 D1 X 1 X	C /	S 0		-				
D0 H01 ← D1 H02 ← C H03 ← →	S H04			D0 D1 X 1 X	C /	S 0		-				
D0 H01 ← D1 H02 ← C H03 ← →			3	0 X 1 X	1	0		-				
D1 H02 ←— C H03 ←—>				1 X			0	0				
D1 H02 ←————————————————————————————————————					/				1	1		
C H03 ←	o→	N02 QB	:	x X		0	0	1	0			
	○	N02 QB		x 0	\ 	0	0	0	Hold 1			
A H05 ←	P→	N02 QB	1 1 '	x 0 X 1	/	0	1	1	0			
				x x	΄.	0	1	'	Hold			
				x x	x	1	Х	1	0			
			X:Irr	elevant						ı		
Logic Diagram for "	'Q output"		Tru	th Table for	"Q out	put"						
	S H04			00 D1	С	S	Α	(2			
_				0 X	1	0	0	(o			
D0 H01 ←	├	N01 Q		1 X	1	0	0		1			
D1 H02 ←				x x	>	0	0		old			
C H03 ↔			1 1	X 0	1	0	1		0			
A H05 ←				X 1	/	0	1		1			
				x x	`.	0	1		old			
			-	X X relevant	Х	1	Х		1			
	100 : :::											
Logic Diagram for "			Tru	th Table for	"QB o	utput"						
	S H04			00 D1	С	S	Α	C)B			
				D X	1	0	0		1			
D0 H01 ←				1 X	1	0	0		0			
D1 H02 ←			1 1	x x	`	0	0		old			
C H03 ↔				X 0	/	0	1		1			
A H05 ←	þ⊸	N01 QB	1 1	X 1 X X	/	0	1		old			
				х х х х	X	0	1 X		0			
			-		^	'	^					
			X:Irr	elevant								

Chapter 2 Function Block

			Swite	ching sp	eed						_	
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F643S	$C \ \to \ Q$	(HH)	0.463	0.782	1.608	0.015	0.022	0.032	D0	1.0	Q	22
		(HL)	0.648	1.150	2.433	0.013	0.018	0.028	D1	1.0	QB	22
	$C \rightarrow QB$	(HH) (HL)	0.811 0.651	1.460 1.107	3.160 2.307	0.014	0.021 0.016	0.030 0.023	C S	1.0 2.2		
	$S \rightarrow Q$	(HH)	0.651	0.332	0.621	0.012	0.016	0.023	A	1.0		
	$S \rightarrow QB$	(HL)	0.408	0.790	1.583	0.012	0.017	0.026	^	1.0		
	Set up time	D0	1.010		2.460							
	Set up time	D1	1.010		2.460							
	Set up time	Α	1.020		2.780							
	Hold time	D0	0.370		0.000							
	Hold time	D1	0.380		0.000							
	Hold time	A	0.360		0.000							
	Release time Removal time	S S	0.210		0.000							
	Min Pulse	C	1.040 1.086		1.830 3.739							
	Min Pulse	S	0.739		2.197							
F643SQ	C → Q	(HH)	0.463	0.783	1.612	0.015	0.022	0.032	D0	1.0	Q	22
		(HL)	0.647	1.151	2.439	0.013	0.018	0.028	D1	1.0		
	$S \rightarrow Q$	(HH)	0.214	0.333	0.623	0.015	0.022	0.032	С	1.0		
	Set up time	D0	1.010		2.460				S	2.2		
	Set up time	D1	1.000		2.460				A	1.0		
	Set up time	A	1.020		2.780							
	Hold time	D0	0.370		0.000							
	Hold time Hold time	D1 A	0.380 0.360		0.000							
	Release time	S	0.300		0.000							
	Removal time	S	1.040		1.830							
	Min Pulse	С	0.923		3.019							
	Min Pulse	S	0.467		1.230							
F643SB	$C \rightarrow QB$	(HH)	0.440	0.758	1.588	0.015	0.023	0.035	D0	1.0	QB	21
		(HL)	0.440	0.748	1.500	0.013	0.019	0.030	D1	1.0		
	$S \rightarrow QB$	(HL)	0.462	1.071	2.325	0.013	0.019	0.028	C	1.0		
	Set up time Set up time	D0 D1	1.020 1.010		2.500 2.500				S A	2.2 1.0		
	Set up time Set up time	A	1.010		2.830				^	1.0		
	Hold time	D0	0.350		0.000							
	Hold time	D1	0.350		0.000							
	Hold time	Α	0.330		0.000							
	Release time	S	0.200		0.000							
	Removal time	S	1.000		1.780							
	Min Pulse	С	0.737		2.170							
	Min Pulse	S	0.903		2.930							

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Chapter 2 Function Block

Function	D-F/F	with F	R, S, 2 to 1	Se	elec	ctor									
Block type			Standard	ty	ре						Low G	ate ty	ре		
2.001. 1,70	Norma	al	Q outp	ut		QB out	put	Norr	nal		Q o	utput		QB out	put
Drivability	Name	cells	Name	ce	lls	Name	cells	Name	С	ells	Nam	e ce	ells	Name	cells
Low Power															
x1	F644S	12	F644SQ	1	1	F644SB	11								
x2															
x4				Ļ											
Logic Diagram	for "Norma	l"		1	Γrutl	h Table for	"Norm	ıal"							
	S H05	_			D0 0		C F		A 0	0					
D0 H01 ← D1 H02 ←		-	N01 Q		1 X X	X	/ (\	0	0 0 1	1	Hold				
C H03 ←	→				X X	1	/ c	0	1	1					
A H06 ←		þ→	N02 QB		x x		X 0		x x	1					
	H04 R			L	X C:Irrele	X evant	X 1	1	Х	1	1	← Pro	ohibitio	on	
Logic Diagram	for "Q outp	ut"		7	Γrutl	h Table for	"Q ou	tput"							
	S H ₀ 5				D0	D1	C F	ı s	Α		Q				
		_			0		<i>?</i> (0		0				
D0 H01 ←		\vdash	N01 Q		Х		` .		0		lold				
D1 H02 ←					Х	0	/ (0	1		0				
C H03 ←					X		, ,		1		1				
A H06 ←	7			П	X		\. с х с		1 X	1	fold 1				
A 1100 ·				П	X		X 1		x		0				
	H04 R				X C:Irrele	X	X 1	1	х		1 ←	Prohibiti	ion		
Logic Diagram		tput"		_		h Table for	"QB o	utput"							
- •	S H05				D0		C F		A		QB				
	пus				0	х	, (0	0		1				
D0 1104		7			1		, (0		0				
D0 H01 ←		1			Х		\	0	0	1	fold				
D1 H02 ←					Х		<i>></i> 0		1		1				
C H03 ←	\rightarrow	1			X		, ,		1		0				
A H06 ←	_	b	N01 QB		X		\		1 X	'	fold 0				
		ľ	👊		X		х с х 1		X		1				
	 H04				X		X 1		х			Prohibiti	ion		
	R			×	(:Irrele	evant									

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t۱	LD0 (ns))		t 1] In	put	Ou	tput
type	IN \rightarrow C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F644S	$C \rightarrow Q$	(HH)	0.476	0.811	1.691	0.015	0.022	0.032	D0	1.0	Q	22
	0 00	(HL) (HH)	0.627 0.778	1.118 1.420	2.382 3.100	0.012 0.014	0.018 0.021	0.028 0.030	D1 C	1.0 1.0	QB	21
	$C \rightarrow QB$	(HL)	0.776	1.339	2.855	0.014	0.021	0.030	R	2.1		
	$R \rightarrow Q$	(HL)	0.703	0.996	2.143	0.013	0.017	0.027	s	2.3		
	$R \rightarrow QB$	(HH)	0.231	0.414	0.776	0.015	0.022	0.034	l ă	1.0		
	S → Q	(HH)	0.209	0.326	0.610	0.015	0.022	0.032	''			
l	$S \rightarrow QB$	(HL)	0.500	1.102	2.288	0.013	0.020	0.031				
l	Set up time	D0	1.060		3.410							
l	Set up time	D1	1.060		3.420							
l	Set up time	Α	1.090		3.730							
l	Hold time	D0	0.380		0.000							
l	Hold time	D1	0.370		0.000							
l	Hold time	A	0.360		0.000							
l	Release time Release time	R S	0.660 0.220		2.080 0.000							
l	Removal time	R	0.620		0.000							
l	Removal time	s	1.050		1.850							
l	Min Pulse	C	1.069		3.675							
l	Min Pulse	R	0.943		2.846							
l	Min Pulse	S	0.898		2.877							
F644SQ	$C \rightarrow Q$	(HH)	0.476	0.811	1.693	0.015	0.022	0.032	D0	1.0	Q	22
l		(HL)	0.629	1.122	2.390	0.013	0.018	0.028	D1	1.0		
l	$R \rightarrow Q$	(HL)	0.518	0.924	1.977	0.012	0.017	0.027	C	1.0		
	$S \rightarrow Q$	(HH)	0.209	0.325	0.610	0.015	0.022	0.032	R	2.1		
	Set up time	D0	1.060		3.410 3.420				S	2.3		
	Set up time Set up time	D1 A	1.060 1.090		3.420				A	1.0		
	Hold time	D0	0.380		0.000							
	Hold time	D1	0.370		0.000							
	Hold time	Α	0.360		0.000							
	Release time	R	0.660		2.080							
l	Release time	S	0.220		0.000							
l	Removal time	R	0.620		0.420							
l	Removal time	S	1.050		1.850							
l	Min Pulse	С	0.897		2.965							
l	Min Pulse Min Pulse	R S	0.859 0.454		2.626 1.211							
F644SB	C → QB	(HH)	0.429	0.742	1.561	0.015	0.023	0.034	D0	1.0	QB	20
1 101105	0 → QB	(HL)	0.460	0.825	1.689	0.015	0.021	0.034	D1	1.0		
l	$R \rightarrow QB$	(HH)	0.327	0.564	1.179	0.015	0.023	0.035	С	1.0		
l	$S \rightarrow QB$	(HL)	0.620	1.378	3.084	0.015	0.021	0.033	R	2.1		
l	Set up time	D0	1.040		3.540				S	2.2		
l	Set up time	D1	1.050		3.550				A	1.0		
	Set up time	A	1.070		3.860							
	Hold time	D0	0.360		0.000						1	
	Hold time Hold time	D1 A	0.360 0.350		0.000							
 	Release time	R	0.620		2.200						1	
 	Release time	S	0.020		0.000						1	
	Removal time	R	0.610		0.380							
	Removal time	S	1.000		1.780						1	
	Min Pulse	С	0.757		2.260							
	Min Pulse	R	0.703		1.870							
	Min Pulse	S	1.052		3.668							

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Chapter 2 Function Block

Function	D-F/F	with F	RB, 2 to 1	Se	lecto	or								
Block type			Standard	ty	ре						Low Ga	te type		
	Norma		Q outp			QB out			orma		Q ou		QB out	
Drivability	Name	cells	Name	се	lls	Name	cells	Nan	ne	cells	Name	cells	Name	cells
Low Power														
x1	F615S	11	F615SQ		10	F615SB	10							
x2														
x4				_										Щ
Logic Diagram	for "Norma	l"			Truth	Table for	"Norm	ıal"						
D0 H01 ←		-	N01 Q		D0		С	RB	А	_	Q QB			
D1 H02 ←				Ш	0	Х	1	1	0		0 1			
C H03 ←	\rightarrow				1	X		1	0		1 0			
A H05 ←	-	þ⊸	N02 QB		X	X 0	\ 	1	0		Hold 0 1			
	Ϋ́	J		Ш	×	1	/	1	1		1 0			
	H04 RB			Ш	×	X	(1	1		Hold			
	RD			Ш	X	X	x	0	X		0 1			
					X:Irrel	evant						_		
Logic Diagram	for "Q outp	ut"		+	Truth	Table for	"Q out	tput"						
DO HOL		٦.	Not 0		D0	D1	С	RB	A		Q			
D0 H01 ← D1 H02 ←			N01 Q	Н										
]				Ш	0	X X	,	1	0		0			
C H03 ←	\rightarrow			Ш	X	X	΄,	1	0		Hold			
A H05 ←	_			Ш	X	0	,	1	1		0			
	Ò			Ш	х	1	1	1	1		1			
	HÕ4 RB			Ш	х	Х	\	1	1		Hold			
	ND			Ш	х	x	Х	0	Х		0			
					X:Irrel	evant								
Logic Diagram	for "QB out	put"		+	Truth	Table for	"QB o	utput"						
D0 H01 ←		7			D0	D1	С	RB	A		QB			
D1 H02 ←	4				0	Х		1	0		1			
					1	×	,	1	0		0			
C H03 ←	\rightarrow		No		X	X	`	1	0		Hold			
A H05 ←		p⊸	N01 QB		х	0	1	1	1		1			
	Q				х	1	1	1	1		0			
	HÖ4 RB				х	х	\	1	1		Hold			
					х	x	Х	0	Х		1			
					X:Irrel	evant								

Chapter 2 Function Block

Disale			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1		l in	put	l Ou	tput
type	IN \rightarrow (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F615S	$C \rightarrow Q$	(HH)	0.542	0.933	2.019	0.016	0.023	0.034	D0	1.0	Q	18
		(HL)	0.562	0.974	2.054	0.012	0.016	0.024	D1	1.0	QB	19
	$C \rightarrow QB$	(HH)	0.706	1.235	2.649	0.015	0.022	0.031	С	1.0		
		(HL)	0.730	1.265	2.755	0.012	0.015	0.023	RB	2.2		
	RB → Q	(LL)	0.273	0.447	0.879	0.012	0.016	0.024	A	1.0		
	$RB \rightarrow QB$ Set up time	(LH) D0	0.423 1.000	0.810	1.677 2.490	0.015	0.023	0.033				
	Set up time	D0	1.000		2.490							
	Set up time	A	1.030		2.490							
	Hold time	D0	0.370		0.000							
	Hold time	D1	0.370		0.000							
	Hold time	A	0.350		0.000							
	Release time	RB	0.310		0.090							
	Removal time	RB	0.930		1.510							
	Min Pulse	С	1.018		3.335							
	Min Pulse	RB	0.756		2.216							
F615SQ	$C \rightarrow Q$	(HH)	0.542	0.935	2.027	0.016	0.023	0.035	D0	1.0	Q	18
		(HL)	0.561	0.975	2.058	0.012	0.016	0.024	D1	1.0		
	$RB \ \to \ Q$	(LL)	0.274	0.449	0.885	0.012	0.016	0.024	С	1.0		
	Set up time	D0	1.000		2.490				RB	2.2		
	Set up time	D1	1.000		2.490				A	1.0		
	Set up time	A	1.030		2.810							
	Hold time Hold time	D0 D1	0.370		0.000							
	Hold time	A	0.360 0.350		0.000							
	Release time	RB	0.310		0.100							
	Removal time	RB	0.930		1.510							
	Min Pulse	C	0.830		2.632							
	Min Pulse	RB	0.539		1.410							
F615SB	$C \rightarrow QB$	(HH)	0.461	0.792	1.673	0.016	0.023	0.035	D0	1.0	QB	18
		(HL)	0.459	0.778	1.567	0.013	0.019	0.029	D1	1.0		
	$RB \rightarrow QB$	(LH)	0.453	1.087	2.377	0.016	0.023	0.034	С	1.0		
	Set up time	D0	1.010		2.550				RB	2.2		
	Set up time	D1	1.010		2.550				A	1.0		
	Set up time	Α	1.020		2.870							
	Hold time	D0	0.340		0.000							
	Hold time	D1	0.340		0.000							
	Hold time	A	0.330		0.000							
	Release time	RB	0.300		0.160							
	Removal time	RB	0.900		1.450							
	Min Pulse Min Pulse	C RB	0.749 0.905		2.249 2.908							
	will Fulse	ND	0.905		2.908							

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Chapter 2 Function Block

Function	D-F/F	with S	SB, 2 to 1	Selec	tor								
Block type			Standard	type						Low Gate	type		
Blook type	Norma	al	Q outp	ut	QB out	put	Nor	mal	I	Q outp	out	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name		cells	Name	cells	Name	cells
Low Power													
x1	F616S	11	F616SQ	10	F616SB	10							
x2													
x4													
Logic Diagram	for "Norma	l"		Tru	ith Table for	"Norm	ıal"						
	SB H04				D0 D1	С	SB	Α	C	QB			
	<u> </u>	7			0 X	1	1	0	c) 1			
D0 H01 ←	_	-	N01 Q		1 X	1	1	0	1	0			
D1 H02 ←	7				х х	`	1	0		Hold			
C H03 ←	\rightarrow				X 0	/	1	1	0				
A H05 ←	\dashv	b→	N02 QB		X 1	/	1	1	1				
		_			x x x x	×	1	1 X	1	Hold 0			
				X:Ir	relevant						l		
Logic Diagram	for "Q outp	ut"		Tru	ıth Table for	"Q out	tput"						
3 - 3													
	SB H04				D0 D1	С	SB	Α		Q			
		_			0 X	1	1	0		0			
D0 H01 ←	-	\vdash	N01 Q		1 X	1	1	0		1			
D1 H02 ←					х х	>	1	0	ŀ	Hold			
C H03 ←	\rightarrow				X 0	1	1	1		0			
A H05 ←	_[X 1		1	1		1			
					x x	``	1	1	1	Hold			
					х х	Х	0	Х		1			
				X:Ir	relevant								
Logic Diagram	for "QB out	put"		Tru	ıth Table for	"QB o	utput"						
	SB H04				D0 D1	С	SB	Α		QB			
		٦			0 X	1	1	0		1			
D0 H01 ←	+				1 X	1	1	0		0			
D1 H02 ←					х х	>	1	0	H	Hold			
C H03 ←	\rightarrow				X 0	1	1	1		1			
A H05 ←	\dashv	b→	N01 QB		X 1	/	1	1		0			
		J			х х	/	1	1	ŀ	Hold			
					х х	Х	0	Х		0			
				X:Ir	relevant								

Chapter 2 Function Block

1 5			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	itput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F616S	$C \ \to \ Q$	(HH)	0.460	0.770	1.585	0.015	0.022	0.032	D0	1.0	Q	22
1		(HL)	0.567	0.993	2.119	0.012	0.016	0.024	D1	1.0	QB	21
1	$C \ \to \ QB$	(HH)	0.777	1.398	3.108	0.015	0.022	0.032	С	1.0		
1		(HL)	0.643	1.090	2.283	0.012	0.016	0.023	SB	2.2		
1	SB → Q	(LH)	0.475	0.937	2.018	0.015	0.022	0.032	A	1.0		
1	SB → QB	(LL)	0.269 1.080	0.547	1.061 2.870	0.012	0.017	0.027				
1	Set up time Set up time	D0 D1	1.080		2.870							
1	Set up time	A	1.090		3.120							
1	Hold time	D0	0.360		0.000							
1	Hold time	D1	0.360		0.000							
1	Hold time	A	0.350		0.000							
1	Release time	SB	0.610		0.970							
1	Removal time	SB	0.610		0.570							
1	Min Pulse	C	1.051		3.687							
1	Min Pulse	SB	0.836		2.599							
F616SQ	$C \rightarrow Q$	(HH)	0.461	0.772	1.591	0.015	0.022	0.032	D0	1.0	Q	22
1		(HL)	0.565	0.992	2.115	0.012	0.016	0.024	D1	1.0		
1	$SB \ \to \ Q$	(LH)	0.452	0.838	1.799	0.015	0.022	0.032	С	1.0		
1	Set up time	D0	1.070		2.860				SB	2.2		
1	Set up time	D1	1.070		2.860				A	1.0		
1	Set up time	Α	1.090		3.120							
1	Hold time	D0	0.360		0.000							
1	Hold time	D1	0.370		0.000							
1	Hold time	Α	0.350		0.000							
1	Release time	SB	0.610		0.970							
1	Removal time	SB	0.610		0.580							
1	Min Pulse	С	0.840		2.696							
FOLCOD	Min Pulse	SB (HH)	0.774	0.000	2.363	0.015	0.004	0.007	- DO	1.0	QB	19
F616SB	$C \rightarrow QB$	(HH)	0.476 0.445	0.833 0.764	1.780 1.524	0.015 0.013	0.024 0.019	0.037 0.030	D0 D1	1.0 1.0	QB	19
1	SB → QB	(LL)	0.445	0.764	1.628	0.013	0.019	0.030	C	1.0		
1	Set up time	D0	1.090	0.757	2.890	0.013	0.016	0.029	SB	2.2		
1	Set up time	D1	1.080		2.880				A	1.0		
1	Set up time	A	1.100		3.140				^`			
1	Hold time	D0	0.320		0.000							
1	Hold time	D1	0.330		0.000							
1	Hold time	A	0.310		0.000							
1	Release time	SB	0.620		0.990							
1	Removal time	SB	0.590		0.500							
1	Min Pulse	С	0.752		2.363							
L	Min Pulse	SB	0.737	L	2.215		L				<u> </u>	<u> </u>

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Chapter 2 Function Block

Function	D-F/F	with F	RB, SB, 21	to 1	Sel	ector										
Block type			Standard	typ	е					L	ow Ga	ite type				
	Norma		Q outp			QB out		Normal			Q ou		QB out	T I		
Drivability	Name	cells	Name	cell	ls	Name	cells	Name	ce	ells	Name	cells	Name	cells		
Low Power																
x1	F647S	12	F647SQ	11	1	F647SB	11		_							
x2																
x4				Ļ												
Logic Diagram	for "Norma	l"		Ti	ruth	Table for	"Norm	al"								
	SB H05						C RE	3 SB	Α	Q	QB					
İ		_	N01 Q		0	х .	· 1	1	0	0	1					
D0 H01 ←					1		/ 1		0	1	0					
D1 H02 ←	\dashv				X X		\ 1 2 1		0	0	fold 1					
			N02 QB		x		· 1	1	1	1	0					
C H03 ←	\rightarrow				х	х .	\ 1	1	1	F	Hold					
A H06 ←		٣			X		X 0		X	0	1					
	↔ H04				X X		X 1 X 0		X X	0	0	← Prohibiti	on			
	X:	Irrelev														
Logic Diagram	for "Q outp	ut"		Truth Table for "Q output"												
	_ ا							\neg								
	SB H05				D0		C RE		Α	Q	_					
)		0		7 1 7 1		0	0							
D0 H01 ←	-	\vdash	N01 Q		x	x .	\ \ 1	1	0	Hol	d					
D1 H02 ←					х	0 .	<i>></i> 1	1	1	0						
C H03 ←					Х		/ 1		1	1						
A H06 ←	7				X X		` 1 X 0		1 X	Hol 0	d					
1					X		X 1		X	1						
ı	H04				х	x	х о	0	х	0	← F	Prohibition				
	RB			X:	Irrelev	/ant										
Logic Diagram	for "QB out	put"		Tı	ruth	Table for	"QB o	utput"								
	SB H05			[D0	D1	C RE	3 SB	A	QE	3					
		_			0	х .	<i>7</i> 1	1	0	1						
D0 H01 ←					1		/ 1	1	0	0						
D1 H02 ←	4				X X		\ 1		0	Holi 1	d					
					x		, I		1	0						
C H03 ←	\rightarrow		No. 05		х	x	\ 1	1	1	Hol	d					
A H06 ←		ightharpoons	N01 QB		Х		X 0		Х	1						
	Q				X		X 1 X 0		x x	0		Prohibition				
	HĎ4 RB			L	Irrelev		. 0	-	^	1 0	` '	· · or indition				

Chapter 2 Function Block

B			Swite	ching sp	eed				<u> </u>			1
Block	Path		t ı	LD0 (ns))		t 1] In	put	Output	
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F647S	$C \rightarrow Q$	(HH)	0.522	0.902	1.944	0.015	0.022	0.034	D0	1.0	Q	21
		(HL)	0.572	1.004	2.143	0.012	0.016	0.024	D1	1.0	QB	20
	$C \rightarrow QB$	(HH)	0.779	1.403	3.125	0.015	0.022	0.032	С	1.0		
		(HL)	0.710	1.241	2.712	0.012	0.016	0.023	RB	2.2		
	RB → Q	(LL)	0.241	0.400	0.788	0.012	0.016	0.024	SB	2.1		
	$RB \rightarrow QB$ $SB \rightarrow Q$	(LH) (LH)	0.452 0.539	0.954 1.070	2.103 2.375	0.015 0.015	0.023 0.022	0.036 0.033	A	1.0		
	$SB \rightarrow Q$ $SB \rightarrow QB$	(LL)	0.339	0.547	1.060	0.013	0.022	0.033				
	Set up time	D0	1.070	0.047	2.870	0.012	0.017	0.027				
	Set up time	D1	1.070		2.870							
	Set up time	Α	1.090		3.130							
	Hold time	D0	0.370		0.000							
	Hold time	D1	0.370		0.000							
	Hold time	Α	0.350		0.000							
	Release time	RB	0.290		0.080							
	Release time	SB	0.600		0.960							
	Removal time	RB	0.970		1.620							
	Removal time Min Pulse	SB C	0.630 1.056		0.610 3.707							
	Min Pulse	RB	0.821		2.636							
	Min Pulse	SB	0.916		2.958							
F647SQ	C → Q	(HH)	0.522	0.905	1.952	0.015	0.022	0.034	D0	1.0	Q	21
1	, ,	(HL)	0.571	1.003	2.140	0.012	0.016	0.024	D1	1.0		
	$RB \rightarrow Q$	(LL)	0.241	0.400	0.789	0.012	0.016	0.024	С	1.0		
	$SB \ \to \ Q$	(LH)	0.504	0.963	2.136	0.015	0.022	0.033	RB	2.2		
	Set up time	D0	1.070		2.870				SB	2.1		
	Set up time	D1	1.070		2.860				A	1.0		
	Set up time	A	1.090		3.130							
	Hold time	D0 D1	0.370		0.000							
	Hold time Hold time	A	0.370 0.350		0.000							
	Release time	RB	0.290		0.000							
	Release time	SB	0.590		0.950							
	Removal time	RB	0.970		1.620							
	Removal time	SB	0.630		0.620							
	Min Pulse	С	0.848		2.723							
	Min Pulse	RB	0.494		1.304							
	Min Pulse	SB	0.850		2.700							
F647SB	$C \rightarrow QB$	(HH)	0.484	0.843	1.796	0.016	0.024	0.038	D0	1.0	QB	19
	RB → QB	(HL) (LH)	0.446 0.503	0.758 1.271	1.510 2.914	0.013 0.015	0.019 0.024	0.030 0.037	D1 C	1.0 1.0		
	SB → QB	(LL)	0.388	0.752	1.601	0.013	0.024	0.037	RB	2.2		
	Set up time	D0	1.090	0.732	2.900	0.013	0.013	0.000	SB	2.1		
	Set up time	D1	1.080		2.900				A	1.0		
	Set up time	Α	1.100		3.160							
	Hold time	D0	0.330		0.000							
	Hold time	D1	0.330		0.000							
	Hold time	A	0.310		0.000						1	
	Release time	RB	0.270		0.140				1		1	
	Release time	SB	0.610		0.990							
	Removal time	RB	0.930		1.520							
	Removal time Min Pulse	SB C	0.610 0.762		0.540 2.381				1		1	
	Min Pulse	RB	0.702		3.436							
	Min Pulse	SB	0.735		2.188				1		1	
	IVIII I UISE	CD	0.700		2.100							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with 2 to 1	Sele	ctor							
Block type			Standard	type					e type			
	Norma		Q outp		QB out	`T	Normal		Q out		out QB ou	
Drivability	Name	cells	Name	cells	Name	cells	Nam	e cells	Name	cells	Name	cells
Low Power												
x1	F661S	10	F661SQ	9	F661SB	9						
x2												
x4				_								
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	nal"					
D0 H01 ←	_	-	N01 Q		00 D1	СВ	Α	Q	QB			
D1 H02 ←	1				0 X	`	0	0	1			
CB H03 ⊶	\Rightarrow				1 X	>	0	1	0			
A H04 ←	\exists	b→	N02 QB		х х	1	0	Hold				
		J			X 0	>	1	0	1			
					X 1	`	1	1	0			
					х х		1	Hold				
				X:Ir	relevant							
				<u> </u>								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q ou	tput"					
D0 H01 ←	1	\vdash	N01 Q		00 D1	СВ	Α	Q				
D1 H02 ←					0 X	>	0	0				
CB H03 ←	-				1 X	>	0	1				
A H04 ←	Ä				х х	1	0	Hold				
					X 0	`	1	0				
					X 1	`,	1	1				
					х х		1	Hold]			
				X:In	relevant							
				_								
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
D0 H01 ←					00 D1	СВ	Α	QB				
D1 H02 ←	1				0 X	`	0	1				
CB H03 ←					1 X	`	0	0				
A H04 ←	\exists	b →	N01 QB		х х	1	0	Hold				
		J			X 0	`	1	1				
					X 1	>	1	0				
				-	х х		1	Hold]			
				X:In	relevant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path	t LD0 (ns)				t 1		Input		Output		
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F661S	CB → Q	(LH)	0.525	0.955	2.049	0.015	0.022	0.032	D0	1.0	Q	22
		(LL)	0.482	0.853	1.797	0.012	0.016	0.024	D1	1.0	QB	22
	$CB \rightarrow QB$	(LH)	0.619	1.106	2.381	0.015	0.021	0.031	СВ	1.0		
		(LL)	0.703	1.269	2.731	0.012	0.016	0.023	Α	1.0		
	Set up time	D0	1.020		2.460							
	Set up time	D1	1.020		2.450							
	Set up time	Α	1.040		2.720							
	Hold time	D0	0.450		0.220							
	Hold time	D1	0.450		0.220							
	Hold time	Α	0.440		0.000							
	Min Pulse	CB	0.972		3.251							
F661SQ	$CB \ \to \ Q$	(LH)	0.524	0.955	2.049	0.015	0.022	0.032	D0	1.0	Q	22
		(LL)	0.482	0.855	1.802	0.012	0.016	0.024	D1	1.0		
	Set up time	D0	1.020		2.460				CB	1.0		
	Set up time	D1	1.020		2.460				Α	1.0		
	Set up time	Α	1.040		2.720							
	Hold time	D0	0.450		0.220							
	Hold time	D1	0.450		0.220							
	Hold time	Α	0.440		0.000							
	Min Pulse	CB	0.794		2.569							
F661SB	$CB \rightarrow QB$	(LH)	0.396	0.709	1.504	0.015	0.023	0.035	D0	1.0	QB	21
		(LL)	0.459	0.863	1.849	0.013	0.019	0.029	D1	1.0		
	Set up time	D0	1.020		2.460				СВ	1.0		
	Set up time	D1	1.020		2.450				A	1.0		
	Set up time	Α	1.040		2.710							
	Hold time	D0	0.450		0.240							
l	Hold time	D1	0.450		0.250							
	Hold time	A	0.440		0.000							
	Min Pulse	CB	0.739		2.376							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with RB, 2	to 1	Selector									
Block type			Standard	type	e		Low Gate type							
	Norma	al	Q outp	ut	QB out	put	Normal			Q outp	Q output		put	
Drivability	Name	cells	Name	cells	Name	cells	Name	С	ells	Name	cells	Name	cells	
Low Power														
x1	F665S	11	F665SQ	10	F665SB	10								
x2														
x4														
Logic Diagram	for "Norma	l"		Tru	uth Table for	"Norm	ıal"							
D0 H01 ←		-	N01 Q		D0 D1	СВ	RB	Α	Q	QB				
D1 H02 ←					0 X	>	1	0	0	1				
CB H03 ←	\rightarrow				1 X	>	1	0	1					
A H05 ←	Ĭ	b	N02 QB		х х	/	1	0		Hold				
		J			X 0	`	1	1	0					
	T H04				X 1	`.	1	1	1					
	RB				x x x	×	1 0	1 X	0	Hold				
						^	U	^	1 0	1				
				X:I	rrelevant									
Logic Diagram	for "Q outp	ut"		Truth Table for "Q output"										
D0 H01 ←		_	N01 Q		D0 D1	СВ	RB	Α		Q				
D1 H02 ←					0 X	>	1	0		0				
CB H03 ←	\rightarrow				1 X	>	1	0		1				
A H05 ←	7				X X	1	1	0	H	fold				
7. 1.00					X 0	>	1	1		0				
	HÔ4				X 1	`	1	1		1				
	RB				X X	/	1	1	F	lold				
					х х	Х	0	Х		0				
				X:I	rrelevant									
Logic Diagram	for "QB out	put"		Tru	uth Table for	"QB o	utput"							
D0 H01 ←]			D0 D1	СВ	RB	Α	(QB				
D1 H02 ←	\dashv				0 X	`	1	0		1				
CB Hos -	\downarrow				1 X	>	1	0		0				
CB H03 ← A H05 ←	\preceq	b-	N01 QB		x x	1	1	0	F	lold				
7, 1105 ,		Ĭ ĺ	00		X 0	>	1	1		1				
	H04				X 1	>	1	1		0				
	RB				x x	1	1	1	F	lold				
				ΙL	х х	Х	0	Х		1				
				X:I	rrelevant									
				X:I	rrelevant									

Chapter 2 Function Block

Disale			Swite	ching sp	eed						_	Output	
Block	Path		t i	LD0 (ns))		t 1		l in	put	Ou	tput	
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout	
F665S	$CB \ \to Q$	(LH)	0.606	1.116	2.479	0.016	0.023	0.034	D0	1.0	Q	18	
		(LL)	0.506	0.891	1.882	0.012	0.016	0.024	D1	1.0	QB	19	
	$CB \rightarrow QB$	(LH)	0.652	1.154	2.478	0.015	0.022	0.031	CB	1.0			
		(LL)	0.796	1.451	3.219	0.012	0.016	0.023	RB	2.2			
	$RB \rightarrow Q$	(LL)	0.272	0.446	0.877	0.012	0.016	0.024	A	1.0			
	$RB \rightarrow QB$	(LH)	0.423	0.809	1.675	0.015	0.023	0.033					
	Set up time	D0	1.040		2.530								
	Set up time	D1	1.040		2.520								
	Set up time Hold time	A D0	1.060 0.420		2.770 0.180								
	Hold time	D0 D1	0.420		0.180								
	Hold time	A	0.430		0.000								
	Release time	RB	0.300		0.000								
	Removal time	RB	0.950		1.880								
	Min Pulse	CB	1.060		3.735								
	Min Pulse	RB	0.755		2.213								
F665SQ	CB → Q	(LH)	0.607	1.117	2.484	0.016	0.023	0.034	D0	1.0	Q	18	
1	05 / 4	(LL)	0.507	0.894	1.889	0.012	0.016	0.024	D1	1.0			
	$RB \rightarrow Q$	(LL)	0.273	0.447	0.883	0.011	0.016	0.024	СВ	1.0			
	Set up time	D0	1.040		2.530				RB	2.2			
	Set up time	D1	1.040		2.520				A	1.0			
	Set up time	Α	1.060		2.770								
	Hold time	D0	0.420		0.180								
	Hold time	D1	0.430		0.190								
	Hold time	Α	0.430		0.000								
	Release time	RB	0.300		0.000								
	Removal time	RB	0.950		1.880								
	Min Pulse	CB	0.871		3.000								
	Min Pulse	RB	0.537		1.407								
F665SB	$CB \rightarrow QB$	(LH)	0.427	0.754	1.603	0.016	0.023	0.035	D0	1.0	QB	18	
		(LL)	0.484	0.898	1.918	0.013	0.019	0.029	D1	1.0			
	RB → QB	(LH)	0.455	1.100	2.397	0.016	0.023	0.034	CB RB	1.0			
	Set up time	D0 D1	1.040		2.530 2.520				A A	2.2 1.0			
	Set up time Set up time	A	1.040 1.060		2.520				^	1.0			
1	Hold time	D0	0.430		0.210								
	Hold time	D0	0.430		0.210								
1	Hold time	A	0.430		0.000								
	Release time	RB	0.300		0.000								
1	Removal time	RB	0.910		1.810								
	Min Pulse	CB	0.760		2.442								
1	Min Pulse	RB	0.915		2.928								
			0.0.0										

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Chapter 2 Function Block

Function	D-F/F	(CB)	with SB, 2	to 1	Selector								
Block type			Standard	type						Low Gate	e type		
Diock type	Norma	al	Q outp	ut	QB out	put	Nor	ma	ı	Q out	out	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	9	cells	Name	cells	Name	cells
Low Power													
x1	F666S	11	F666SQ	10	F666SB	10							
x2													
x4													
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"						
I	SB H04			[00 D1	СВ	SB	Α	(Q QB			
		7			0 X	\	1	0		0 1			
D0 H01 ←	_	-	N01 Q		1 X	`	1	0		1 0			
D1 H02 ←					х х	/	1	0		Hold			
CB H03 ←	\$				X 0	>	1	1		0 1			
A H05 ←	1	b⊸	N02 QB		X 1	`	1	1		1 0			
					х х	/	1	1		Hold			
					х х	Х	0	Х		1 0]		
				X:Ir	relevant								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"						
	SB H04				00 D1	СВ	SB	Α		Q			
l -					0 X	`	1	0		0			
D0 H01 ←	\vdash	→ N(01 Q		1 X	`	1	0		1			
D1 H02 ←					х х	/	1	0		Hold			
CD U02					X 0	>	1	1		0			
CB H03 ← ○ A H05 ←					X 1	>	1	1		1			
/ · · · · · L					x x	1	1	1		Hold			
					х х	Х	0	Х		1			
I				X:Ir	relevant								
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"						
	SB H04				00 D1	СВ	SB	Α		QB			
		1			0 X	`	1	0		1			
D0 H01 ←	\dashv				1 X	\ <u></u>	1	0		0			
D1 H02 ←	1				х х	1	1	0		Hold			
CB H03 ←	\downarrow				X 0	>	1	1		1			
A H05 ←	7	b→	N01 QB		X 1	>	1	1		0			
		<u> </u>			х х	1	1	1		Hold			
				ΙL	х х	Х	0	Х		0			
				X:Ir	relevant								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns)			t 1] In	put	Ou	tput
type	IN \rightarrow C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F666S	$CB \rightarrow Q$	(LH)	0.522	0.949	2.036	0.015	0.022	0.032	D0	1.0	Q	22
		(LL)	0.502	0.895	1.907	0.012	0.016	0.024	D1	1.0	QB	21
	$CB \rightarrow QB$	(LH)	0.713	1.299	2.895	0.015	0.022	0.032	CB	1.0		
	CD O	(LL)	0.703	1.269	2.735 2.013	0.012 0.015	0.016 0.022	0.023 0.032	SB A	2.2 1.0		
	$SB \rightarrow Q$ $SB \rightarrow QB$	(LH) (LL)	0.470 0.269	0.934 0.545	1.058	0.015	0.022	0.032	A	1.0		
	SB → QB Set up time	D0	1.080	0.545	3.060	0.012	0.017	0.027				
	Set up time	D1	1.080		3.060							
	Set up time	A	1.100		3.320							
	Hold time	D0	0.460		0.220							
	Hold time	D1	0.460		0.220							
	Hold time	Α	0.450		0.000							
	Release time	SB	0.600		1.230							
	Removal time	SB	0.630		0.750							
	Min Pulse	CB	0.981		3.421							
	Min Pulse	SB	0.833		2.593							
F666SQ	$CB \rightarrow Q$	(LH)	0.521	0.949	2.035	0.015	0.022	0.032	D0	1.0	Q	22
		(LL)	0.502	0.897	1.911	0.012	0.016	0.024	D1	1.0		
	SB → Q	(LH)	0.450	0.829	1.785	0.015	0.022	0.032	СВ	1.0		
	Set up time	D0	1.080		3.070				SB	2.2		
	Set up time	D1	1.080		3.060				A	1.0		
	Set up time Hold time	A D0	1.100 0.460		3.320 0.220							
	Hold time	D0 D1	0.460		0.220							
	Hold time	A	0.450		0.220							
	Release time	SB	0.600		1.240							
	Removal time	SB	0.630		0.750							
	Min Pulse	CB	0.789		2.556							
	Min Pulse	SB	0.766		2.348							
F666SB	CB → QB	(LH)	0.433	0.783	1.688	0.016	0.024	0.038	D0	1.0	QB	19
		(LL)	0.458	0.862	1.844	0.013	0.019	0.030	D1	1.0		
	$SB \ \to \ QB$	(LL)	0.394	0.749	1.615	0.013	0.018	0.029	CB	1.0		
	Set up time	D0	1.090		3.040				SB	2.2		
	Set up time	D1	1.090		3.030				A	1.0		
	Set up time	Α	1.110		3.290							
	Hold time	D0	0.460		0.240							
	Hold time	D1	0.460		0.250							
	Hold time	A	0.450		0.000							
	Release time Removal time	SB SB	0.600 0.620		1.210							
	Min Pulse	CB	0.620		0.730 2.372							
	Min Pulse	SB	0.736		2.372							
	WIII FUISE	SD	0.730		2.201							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with RB, S	B, 2	2 to	1 Selec	tor							
Block type			Standard	typ	е						Low G	ate typ	е	
	Norma		Q outp			QB out	1		rmal			utput	QB o	
Drivability	Name	cells	Name	cell	ls	Name	cells	Nam	e c	ells	Name	e cell	s Name	cells
Low Power														
x1	F667S	12	F667SQ	11	1	F667SB	11							
x2														
x4				_										
Logic Diagram	for "Norma	l"		Ti	ruth	Table for	"Norm	ıal"						
	SB H05				D0	D1 (CB R	B SB	Α	G	QB]		
		_			0	x	> 1	1	0	0	1			
D0 H01 ←			N01 Q		1		<u>/</u> 1		0	1	-			
D1 H02 ←	\dashv				X X	X 0	Z 1 √ 1		0	0	Hold 1			
					x	1	\ \ 1		1	1				
CB H03 ← A H06 ←	9	h .	N02 QB		х		Z 1		1		Hold			
A 1100 -			NUZ QB		X X		X (X	1				
	H04				x		х (X	0		← Prohi	ibition	
	RB			X:	Irrelev							J		
Logic Diagram	for "Q outp	ut"		Ti	ruth	Table for	"Q ou	tput"						
	SB			٦										
	SB H05			-	D0		CB R		Α		Q			
		\neg			0	x x	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		0		0			
D0 H01 ←		-	• N01 Q		x	×	/ / 1		0	F	lold			
D1 H02 ←					х	0	> 1	1	1		0			
CB H03 ←					Х	1	<u>\</u> 1		1		1			
A H06 ←					X X		/ 1 X (1 X		lold 0			
					х		X 1		х		1			
	H04				х	х	х (0	Х		0 ←	Prohibition	ı	
	RB			X:	Irrelev	vant .								
Logic Diagram	for "QB out	put"		Ti	ruth	Table for	"QB o	utput"						
	SB H05				D0	D1 (CB R	B SB	А		ΩВ			
	Ò				0	х	\ 1	1	0		1			
D0 H01 ←					1	Х	<i>?</i> 1		0		0			
D1 H02 ←					X X	X 0	Z 1 √ 1		0	-	lold 1			
	_[X	1	` 1		1		0			
CB H03 ←	9		NO1 OD		х	х	∕ 1	1	1	F	lold			
A H06 ←		\bigcap	N01 QB		х		X (X		1			
	Q				X		X 1		X X		0 0 ←	Prohibition		
ı	HÒ4 RB			L	Irrelev		(. 0				. 101110111		

Chapter 2 Function Block

type	Fanout 21 20
F667S	21
CB → QB (LH) 0.509 0.909 1.939 0.012 0.016 0.024 D1 1.0 QB (LH) 0.776 1.308 2.918 0.015 0.022 0.032 CB 1.0 (LH) 0.776 1.421 3.165 0.012 0.016 0.023 RB 2.2 RB → QB (LH) 0.451 0.953 2.100 0.015 0.023 0.036 A 1.0 RB → QB (LH) 0.451 0.953 2.100 0.015 0.023 0.036 A 1.0 RB → QB (LH) 0.539 1.069 2.373 0.015 0.022 0.033 SB → QB (LL) 0.266 0.546 1.058 0.012 0.016 0.024 SB 2.1 RB → QB (LL) 0.266 0.546 1.058 0.012 0.017 0.027 0.037 SB → QB (LL) 0.266 0.546 1.058 0.012 0.017 0.027	
CB → QB (LH) 0.716 1.308 2.918 0.015 0.022 0.032 CB 1.0 RB → Q (LL) 0.2772 1.421 3.165 0.012 0.016 0.023 RB 2.2 RB → QB (LH) 0.451 0.953 2.100 0.015 0.023 0.036 A 1.0 SB → QB (LH) 0.451 0.953 2.100 0.015 0.023 0.036 A 1.0 SB → QB (LH) 0.539 1.069 2.373 0.015 0.022 0.033 A 1.0 Set up time D1 1.090 3.120 3.120 3.120 0.017 0.027 0.027 Set up time D1 1.090 3.310 3.310 0.017 0.027 0.027 0.016 0.024 0.027 0.016 0.024 0.027 0.016 0.024 0.034 0.016 0.024 0.016 0.024 0.016 0.024 0.016 0.024	20
RB → Q	
RB → Q (LH)	
RB → QB	
SB → Q	
SB → QB (LL) 0.266	
Set up time	
Set up time	
Set up time	
Hold time D1 0.450 0.210 0.000 Release time RB 0.280 0.000 Release time RB 0.890 1.260 0.770 Min Pulse CB 1.040 0.770 Min Pulse SB 0.915 2.956 0.015 0.022 0.034 D0 1.0 Q (LL) 0.509 0.911 1.942 0.012 0.016 0.024 D1 1.0 RB → Q (LL) 0.241 0.400 0.789 0.012 0.016 0.024 D1 1.0 SB → Q (LH) 0.504 0.963 2.135 0.015 0.022 0.033 RB 2.2 Set up time D0 1.090 3.120 Set up time D1 1.090 3.120 Set up time D1 1.090 3.380 Hold time D0 0.450 0.210 Hold time D1 0.450 0.210 Hold time D1 0.450 0.210 Release time RB 0.280 Removal time RB 0.980 1.970 Removal time RB 0.980 1.970 Min Pulse CB 0.853 2.920	
Hold time	
Release time	
Release time	
Removal time	
Removal time	
Min Pulse	ļ
Min Pulse RB 0.820 2.633 2.956	
Min Pulse	İ
F667SQ	
Continue Continue	21
RB → Q (LL) 0.241 0.400 0.789 0.012 0.016 0.024 CB 1.0 SB → Q (LH) 0.504 0.963 2.135 0.015 0.022 0.033 RB 2.2 Set up time D0 1.090 3.120 Set up time D1 1.090 3.120 Set up time A 1.110 3.380 Hold time D0 0.450 0.210 Hold time D1 0.450 0.210 Hold time A 0.440 0.000 Release time RB 0.280 0.000 Release time SB 0.590 1.260 Removal time SB 0.640 0.770 Min Pulse CB 0.853 2.190.012 0.012 0.022 0.033 RB 2.2 SB 2.1 SB	-
SB → Q (LH) 0.504 0.963 2.135 0.015 0.022 0.033 RB 2.2 Set up time D0 1.090 3.120 SB 2.1 Set up time D1 1.090 3.120 A 1.0 Set up time A 1.110 3.380 Hold time D0 0.450 0.210 Hold time D1 0.450 0.210 Hold time A 0.440 0.000 Release time RB 0.280 0.000 Release time SB 0.590 1.260 Removal time RB 0.980 1.970 Removal time SB 0.640 0.770 Min Pulse CB 0.853 2.920	İ
Set up time	İ
Set up time	
Hold time D0 0.450 0.210 Hold time D1 0.450 0.210 Hold time A 0.440 0.000 Release time RB 0.280 0.000 Release time SB 0.590 1.260 Removal time RB 0.980 1.970 Removal time SB 0.640 0.770 Min Pulse CB 0.853 2.920	
Hold time D1 0.450 0.210 Hold time A 0.440 0.000 Release time RB 0.280 0.000 Release time RB 1.260 Removal time RB 0.980 1.970 Removal time SB 0.640 0.770 Min Pulse CB 0.853 2.920	İ
Hold time A 0.440 0.000 Release time RB 0.280 0.000 Release time SB 0.590 1.260 Removal time RB 0.980 1.970 Removal time SB 0.640 0.770 Min Pulse CB 0.853 2.920	
Release time	İ
Release time SB 0.590 1.260	İ
Removal time	İ
Removal time SB 0.640 0.770	İ
Min Pulse CB 0.853 2.920	
Min Pulse RB 0.494 1.304	İ
Min Pulse SB 0.850 2.700	
F667SB CB → QB (LH) 0.437 0.789 1.697 0.016 0.024 0.038 D0 1.0 QB	19
(LL) 0.460 0.862 1.837 0.013 0.019 0.030 D1 1.0	İ
RB \rightarrow QB (LH) 0.503 1.269 2.912 0.015 0.024 0.037 CB 1.0	İ
SB → QB (LL) 0.387 0.751 1.598 0.013 0.019 0.030 RB 2.2	İ
Set up time D0 1.090 3.090 SB 2.1	
Set up time D1 1.090 3.090 A 1.0	Í
Set up time A 1.110 3.350	İ
Hold time D0 0.450 0.240	
Hold time D1 0.460 0.250	
Hold time	
Release time RB 0.270 0.000 0.000	1
Removal time RB 0.930 1.890	Į.
Removal time SB 0.640 0.750	
Min Pulse CB 0.740 2.365	
Min Pulse RB 0.993 3.434	
Min Pulse SB 0.735 2.186	

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Chapter 2 Function Block

Function	D-F/F	with H	Hold									
Block type			Standard	type					Low Gate	type		
Diook type	Norma	al	Q outp	ut	QB out	put	Nori	nal	Q outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F641H	10	F641HQ	9	F641HB	9						
x2												
x4												
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norm	ıal"					
D H01 ←		-	N01 Q	D	C F	1 (Q QB					
C H02 ←				0	/ () 1					
C H02 V	T			1	/ () .	0					
н ноз ←	4	b →	N02 QB	x			Hold					
		J		L X	\ \ \	(Hold					
				X:Irr	elevant							
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"O ou	tout"					
		_										
D H01 ←		-	N01 Q	D	C H	4	Q					
				0	/ (,	0					
C H02 ←	→			1			1					
				x	∕ 1	. .	Hold					
H H03 ←				x	\ \ \	(1	Hold					
		_		Y-Irr	elevant							
				7	olovani							
												-
Logic Diagram	tor "QB out	put"		Trut	h Table for	"QB o	utput"					
D 1104		1		Б	C H	,	QB					
D H01 ←						_	-					
C H02 ←				0			1					
				1			0					
н ноз ←	\dashv	\triangleright	N01 QB	X			Hold					
		J		L×	\ \ \ \		Hold					
				X:Irre	elevant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F641H	$C \rightarrow Q$	(HH)	0.455	0.763	1.574	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.540	0.939	1.974	0.012	0.016	0.024	С	1.0	QB	22
	$C \rightarrow QB$	(HH)	0.706	1.245	2.663	0.015	0.021	0.031	Н	1.0		
		(HL)	0.674	1.147	2.391	0.012	0.016	0.025				
	Set up time	D	0.980		2.410							
	Set up time	Н	1.000		2.680							
	Hold time	D	0.380		0.000							
	Hold time	Н	0.360		0.000							
	Min Pulse	С	0.979		3.240							
F641HQ	$C \rightarrow Q$	(HH)	0.455	0.763	1.576	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.539	0.938	1.973	0.012	0.016	0.024	С	1.0		
	Set up time	D	0.980		2.410				Н	1.0		
	Set up time	Н	1.000		2.680							
	Hold time	D	0.380		0.000							
	Hold time	Н	0.360		0.000							
	Min Pulse	С	0.812		2.550							
F641HB	$C \rightarrow QB$	(HH)	0.437	0.755	1.587	0.015	0.023	0.035	D	1.0	QB	21
		(HL)	0.437	0.746	1.498	0.013	0.019	0.029	С	1.0		
	Set up time	D	0.990		2.450				Н	1.0		
	Set up time	Н	1.010		2.720							
	Hold time	D	0.350		0.000							
	Hold time	Н	0.340		0.000							
	Min Pulse	С	0.731		2.167							

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Chapter 2 Function Block

Function	D-F/F	with F	RB, Hold											
Block type			Standard	typ	ре					Low	Gate	type		
	Norma		Q outp			QB out			rmal		outp		QB out	
Drivability	Name	cells	Name	cel	ls	Name	cells	Nam	e cells	Na	me	cells	Name	cells
Low Power					_									
x1	F615H	11	F615HQ	10	0	F615HB	10							
x2					-									
x4				_										Ш
Logic Diagran	n for "Norma	l"		Т	ruth	Table for	"Norm	al"						
D H01 ←			N01 Q		D	С	RB	Н	Q	QB				
					0	1	1	0	0	1				
C H02 ←	\rightarrow				1	1	1	0	1	0				
H H04 ←		b →	N02 QB		Х	1	1	1	Hold					
		ſ			Х	>	1	Х	Hold					
	H03			L	Х	Х	0	Х	0	1				
	HÕ3 RB			×	:Irrele	evant								
Logic Diagran	n for "Q outp	ut"		Т	ruth	Table for	"Q out	put"						
		-		l ـ						1				
D H01 ←		├	N01 Q	ΙL	D	С	RB	Н	Q					
					0	1	1	0	0					
C H02 ←	\rightarrow				1	1	1	0	1					
H H04 ←					Х	1	1	1	Hold					
11 1101					Х	>	1	Х	Hold					
	H03			L	Х	Х	0	Х	0					
	RB			×	:Irrele	evant								
Logic Diagran	n for "QB out	put"		Т	ruth	Table for	"QB o	utput"						
		7		_						1				
D H01 ↔					D	С	RB	Н	QB	-				
C H02 ←		1			0	1	1	0	1					
U ⊓02 ►					1	1	1	0	0					
H H04 ←		b	N01 QB		X	/	1	1	Hold					
		J			X	×	1	X	Hold					
	Hos			L	Х		0	Х	1]				
	RB			X	:Irrele	evant								
				L										

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F615H	$C \rightarrow Q$	(HH)	0.550	0.943	2.034	0.016	0.023	0.034	D	1.0	Q	18
		(HL)	0.578	0.996	2.088	0.012	0.016	0.024	С	1.0	QB	18
	$C \rightarrow QB$	(HH)	0.753	1.313	2.793	0.015	0.022	0.032	RB	2.2		
		(HL)	0.782	1.355	2.928	0.012	0.016	0.024	Н	1.0		
	$RB \rightarrow Q$	(LL)	0.273	0.446	0.878	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.456	0.863	1.781	0.015	0.023	0.033				
	Set up time	D	0.980		2.470							
	Set up time	Н	1.000		2.740							
	Hold time	D	0.390		0.000							
	Hold time	Н	0.370		0.000							
	Release time	RB	0.300		0.070							
	Removal time	RB	0.950		1.540							
	Min Pulse	С	1.082		3.520							
	Min Pulse	RB	0.789		2.322							
F615HQ	$C \rightarrow Q$	(HH)	0.551	0.945	2.039	0.016	0.023	0.034	D	1.0	Q	18
		(HL)	0.578	0.996	2.089	0.012	0.016	0.024	С	1.0		
	$RB \rightarrow Q$	(LL)	0.273	0.448	0.881	0.012	0.016	0.024	RB	2.2		
	Set up time	D	0.980		2.470				Н	1.0		
	Set up time	Н	1.000		2.740							
	Hold time	D	0.390		0.000							
	Hold time	Н	0.370		0.000							
	Release time	RB	0.300		0.070							
	Removal time	RB	0.950		1.540							
	Min Pulse	С	0.859		2.674							
	Min Pulse	RB	0.538		1.405							
F615HB	$C \rightarrow QB$	(HH)	0.480	0.818	1.711	0.016	0.023	0.035	D	1.0	QB	18
		(HL)	0.472	0.789	1.582	0.013	0.019	0.029	С	1.0		
	$RB \rightarrow QB$	(LH)	0.480	1.093	2.386	0.016	0.023	0.035	RB	2.2		
	Set up time	D	0.990		2.520				Н	1.0		
	Set up time	Н	1.010		2.790							
	Hold time	D	0.370		0.000							
	Hold time	Н	0.350		0.000							
	Release time	RB	0.280		0.140							
1	Removal time	RB	0.920	1	1.470							
	Min Pulse	С	0.774		2.298							
	Min Pulse	RB	0.910		2.916							

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Chapter 2 Function Block

Function	D-F/F	with S	SB, Hold										
Block type			Standard	type					Low	Gate	type		
block type	Norma	al	Q outp	ut	QB out	put	No	rmal	Q	outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Nam	e cells	Na	me	cells	Name	cells
Low Power													
x1	F616H	11	F616HQ	10	F616HB	10							
x2													
x4													
Logic Diagram	for "Norma	l"		Tru	h Table for	"Norm	al"						
ı	SB H03) C	SB	н	Q	ΩВ				
		,) /	1	0	0	1				
D H01 ←	4	-	N01 Q			1	0	1	0				
ı				;	< \ \	1	0	Hold					
C H02 ←	ightharpoons			;	κ x	1	1	Hold					
H H04 ←		h	N02 QB	;	х	0	Х	1	0				
		<u></u>		X:Irr	elevant								
Logic Diagram	for "Q outp	ut"		Tru	h Table for	"Q out	put"						
	SB H03			l –) C	SB	н	Q]				
	H03												
		7) /	1	0	0					
D H01 ←			N01 Q	1 1	1 /	1	0	1					
C H02 ←	→				(<u>`</u>	1	0	Hold Hold					
					\	0	X	1					
H H04 ←				-					J				
				X:Irr	elevant								
				_		"00							
Logic Diagram		put"		Tru	h Table for	"QB o	utput"						
	SB H03				ОС	SB	Н	QB					
		1) /	1	0	1					
D H01 ←	+				1 /	1	0	0					
0 1100 :				;	< >	1	0	Hold					
C H02 ←	7			;	× x	1	1	Hold					
H H04 ←	4	b	N01 QB		× x	0	Х	0					
		J		X:Irr	elevant								

Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t ı	_D0 (ns))		t 1		l In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F616H	$C \rightarrow Q$	(HH)	0.460	0.768	1.582	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.566	0.992	2.117	0.012	0.016	0.024	С	1.0	QB	20
	$C \rightarrow QB$	(HH)	0.822	1.482	3.286	0.015	0.022	0.034	SB	2.2		
		(HL)	0.686	1.166	2.426	0.012	0.017	0.025	Н	1.0		
	$SB \rightarrow Q$	(LH)	0.476	1.026	2.207	0.015	0.022	0.032				
	$SB \rightarrow QB$	(LL)	0.311	0.622	1.202	0.012	0.018	0.028				
	Set up time	D	1.080		2.870							
	Set up time	Н	1.090		3.120							
	Hold time	D	0.360		0.000							
	Hold time	Н	0.350		0.000							
	Release time	SB	0.610		0.980							
	Removal time	SB	0.610		0.570							
	Min Pulse	С	1.097		3.866							
	Min Pulse	SB	0.900		2.796							
F616HQ	$C \rightarrow Q$	(HH)	0.461	0.771	1.588	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.566	0.992	2.115	0.012	0.016	0.024	С	1.0		
	$SB \ \to \ Q$	(LH)	0.478	0.875	1.858	0.015	0.022	0.032	SB	2.2		
	Set up time	D	1.070		2.860				Н	1.0		
	Set up time	Н	1.090		3.120							
	Hold time	D	0.360		0.000							
	Hold time	Н	0.350		0.000							
	Release time	SB	0.610		0.970							
	Removal time	SB	0.610		0.570							
	Min Pulse	С	0.842		2.696							
	Min Pulse	SB	0.802		2.433							
F616HB	$C \rightarrow QB$	(HH)	0.479	0.836	1.786	0.016	0.024	0.038	D	1.0	QB	19
		(HL)	0.446	0.764	1.524	0.013	0.019	0.030	С	1.0		
	$SB \rightarrow QB$	(LL)	0.420	0.793	1.692	0.013	0.018	0.029	SB	2.2		
	Set up time	D	1.090		2.890				н	1.0		
	Set up time	H	1.100		3.140							
	Hold time	D	0.320		0.000							
	Hold time	Н	0.310		0.000							
	Release time	SB	0.620		0.990							
	Removal time	SB	0.590		0.500							
	Min Pulse	С	0.755		2.370							
	Min Pulse	SB	0.761		2.284							

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Chapter 2 Function Block

Function	D-F/F	with F	RB, SB, Ho	old											
Block type			Standard	typ	ре						Low (Gate	type		
	Norma		Q outp			QB out		No	rma		Q	outp	ut	QB out	put
Drivability	Name	cells	Name	cel	ls	Name	cells	Nam	е	cells	Nar	ne	cells	Name	cells
Low Power															
x1	F647H	12	F647HQ	11	1	F647HB	11								
x2															
x4				_											
Logic Diagram	for "Norma	l"		Т	ruth	Table for	"Norm	al"							
	SB H04 Î				D	С	RB	SB	Н		Q C	βВ			
		1			0	1	1	1	0		0	1			
D H01 ←	-	-	N01 Q		1	1	1	1	0			0			
C H02 ←					Х	`	1	1	0		Hold				
O 1102	ľ				X	X	1	1	1		Hold				
H H05 ←	4	b⊸	N02 QB		X X	X X	0	1 0	X			0			
		J			X	X	0	0	X			0	← Pro	hibition	
	НÓЗ												(- 110	TIIDIGOT	
	RB			×	(:Irrele	evant									
Logic Diagram	for "Q outp	ut"		Т	ruth	Table for	"Q out	put"							
	SB H04				D	С	RB	SB	Н		Q				
		_			0	1	1	1	0		0				
D H01 ←	-	-	N01 Q		1	1	1	1	0		1				
					Χ	`	1	1	0		Hold				
C H02 ←	\rightarrow				Х	X	1	1	1		Hold				
H H05 ←					Х	Х	0	1	Х		0				
п поэ •					Х	Х	1	0	Х		1				
	H03			L	Х	Х	0	0	Х		0	← 1	Prohibition	on	
	RB			×	(:Irrele	evant									
Logic Diagram	for "QB out	tput"		Т	ruth	Table for	"QB o	utput"							
	SB H04				D	С	RB	SB	Н		QB				
	حک	,			0	1	1	1	0		1				
D H01 ←	4				1	1	1	1	0		0				
					Х	`	1	1	0		Hold				
C H02 ←	\Rightarrow				Х	Χ	1	1	1		Hold				
H H05 ←		h	N01 QB		Х	Х	0	1	Х		1				
H H05 ←		ب	INUI QB		Х	Х	1	0	Х		0				
	Ϋ́			L	Х	Х	0	0	Х		0	← I	Prohibitio	on	
	HĎ3 RB			x	(:Irrele	evant									

Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t I	LD0 (ns))		t 1		l in	put	l Ou	itput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F647H	$C \rightarrow Q$	(HH)	0.523	0.903	1.944	0.015	0.022	0.034	D	1.0	Q	21
		(HL)	0.573	1.005	2.146	0.012	0.016	0.024	С	1.0	QB	19
	$C \rightarrow QB$	(HH)	0.828	1.493	3.312	0.015	0.022	0.034	RB	2.3		
		(HL)	0.758	1.326	2.874	0.012	0.016	0.024	SB	2.1		
	RB → Q	(LL)	0.241	0.400	0.789	0.012	0.016	0.024	Н	1.0		
	RB → QB	(LH)	0.502	1.045	2.291	0.015	0.024	0.037				
	SB → Q	(LH)	0.541 0.311	1.173 0.625	2.584 1.205	0.015 0.012	0.022 0.018	0.033 0.029				
	$SB \rightarrow QB$ Set up time	(LL) D	1.080	0.625	2.870	0.012	0.016	0.029				
	Set up time	Н	1.090		3.130							
	Hold time	D	0.360		0.000							
	Hold time	Н	0.350		0.000							
	Release time	RB	0.290		0.080							
	Release time	SB	0.600		0.960							
	Removal time	RB	0.970		1.620							
	Removal time	SB	0.630		0.610							
	Min Pulse	С	1.105		3.894							
	Min Pulse	RB	0.871		2.824							
	Min Pulse	SB	0.989		3.176							
F647HQ	$C \rightarrow Q$	(HH)	0.522	0.902	1.945	0.015	0.022	0.034	D	1.0	Q	21
		(HL)	0.570	1.001	2.139	0.012	0.016	0.024	С	1.0		
	$RB \rightarrow Q$	(LL)	0.241	0.399	0.787	0.012	0.016	0.024	RB	2.2		
	$SB \rightarrow Q$	(LH)	0.541	1.002	2.211	0.015	0.022	0.033	SB	2.1		
	Set up time	D	1.070		2.870				Н	1.0		
	Set up time	Н	1.090		3.130							
	Hold time	D	0.360		0.000							
	Hold time Release time	H RB	0.350 0.290		0.000							
	Release time	SB	0.600		0.060							
	Removal time	RB	0.970		1.620							
	Removal time	SB	0.630		0.610							
	Min Pulse	C	0.848		2.721							
	Min Pulse	RB	0.493		1.302							
	Min Pulse	SB	0.878		2.785							
F647HB	$C \rightarrow QB$	(HH)	0.483	0.843	1.797	0.016	0.024	0.038	D	1.0	QB	19
1		(HL)	0.445	0.756	1.506	0.013	0.019	0.030	С	1.0	1	
	$RB \ \to \ QB$	(LH)	0.552	1.272	2.917	0.016	0.024	0.037	RB	2.2	1	
	$SB \ \to \ QB$	(LL)	0.421	0.781	1.659	0.013	0.019	0.030	SB	2.1		
	Set up time	D	1.090		2.910				Н	1.0		
	Set up time	H	1.100		3.170							
	Hold time	D	0.330	1	0.000	1		1		1	1	
	Hold time	H	0.310	1	0.000	1		1		1	1	
	Release time	RB	0.270		0.140							
	Release time Removal time	SB RB	0.610 0.930		0.990 1.520							
	Removal time	SB	0.930		0.540							
	Min Pulse	C	0.610		2.381							
	Min Pulse	RB	0.761		3.437							
	Min Pulse	SB	0.755		2.250							
	3100	0.5	000		00							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with 2 to 1	Selec	ctor(2 CTF	RL), R	В							
Block type			Standard	type						Low	Gate	type		
Dioon type	Norma	al	Q outp	ut	QB out	put		Norma	al	Q	outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	N	lame	cells	Na	me	cells	Name	cells
Low Power														
x1	F673	11												
x2														
x4														
Logic Diagram	for "Normal	"		Tru	th Table for	"Norm	nal"							
D0 H01 ← D1 H02 ←		-	N01 Q	D		S0 1	S1 0	СВ	RB 1	Q 0	QB 1			
S0 H05 ←						1	0	`		1	0			
S1 H06 ←				,	0	0	1	\	1	0	1			
CB H03 ←	>	þ⊸	N02 QB	>	(1	0	1	>	1	1	0			
	9	_		>		0	0	>	1	0	1			
	HÕ4 RB			`		1	1	`	1	х	X			
	ND					X X	X X	X	1 0	0 0	old 1			
												_		
				X:Irre	elevant									
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utpu	rt"						

Chapter 2 Function Block

D			Swite	ching sp	eed				J .			
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	ıtput
type	IN → C	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F673	CB → Q	(LH)	0.614	1.143	2.541	0.015	0.023	0.036	D0	1.0	Q	20
		(LL)	0.509	0.911	1.922	0.012	0.017	0.026	D1	1.0	QB	22
	CB → QB	(LH)	0.612	1.111	2.396	0.015	0.021	0.030	СВ	1.0		
		(LL)	0.758	1.409	3.152	0.011	0.015	0.022	RB	2.1		
	$RB \rightarrow Q$	(LL)	0.277	0.467	0.919	0.012	0.017	0.026	S0	1.0		
	$RB \rightarrow QB$	(LH)	0.382	0.668	1.394	0.015	0.021	0.030	S1	1.0		
	Set up time	D0	1.000		2.150							
	Set up time	D1	1.040		2.360							
	Set up time	S0	1.040		2.250							
	Set up time	S1	1.030		2.440							
	Hold time	D0	0.470		0.280							
	Hold time	D1	0.380		0.000							
	Hold time	S0	0.530		0.330							
	Hold time	S1	0.450		0.030							
	Release time	RB	0.290		0.000							
1	Removal time	RB	0.960		1.890							
1	Min Pulse	CB	1.025		3.671							
	Min Pulse	RB	0.674		1.965							

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Chapter 2 Function Block

Function	D-F/F	(CB)	with Hold,	2 to 1	Selector(2 CTF	RL), RB					
Block type			Standard	type					Low Gate	e type		
	Norma		Q outp		QB out	out	Norm	al	Q out	out	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F674	12										
x2												
x4				igwdow								
DO H01 ← D1 H02 ← S0 H05 ← S1 H06 ← H H07 ← CB H03 ← Logic Diagram	H04 RB		N01 Q N02 QB	D0 0 1 X X X X X X X X X X X:Irrela	X 1 X 1 X 1 0 0 1 0 X 0 X 0 X 1 X 1 X X	S1 0 0 0 1 1 1 0 0 1 1 X X	CB RB \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \		1 0 X 1 0 X 1 Hold X Hold			
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t i	LDO (ns))		t 1		l In	put	Ou	ıtput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F674	CB → Q	(LH)	0.619	1.150	2.551	0.015	0.023	0.035	D0	1.0	Q	20
		(LL)	0.512	0.914	1.927	0.012	0.017	0.026	D1	1.0	QB	22
	CB → QB	(LH)	0.661	1.192	2.548	0.015	0.021	0.030	СВ	1.0		
		(LL)	0.822	1.519	3.359	0.012	0.016	0.023	RB	2.0		
	$RB \rightarrow Q$	(LL)	0.271	0.458	0.904	0.012	0.017	0.026	S0	1.0		
	$RB \rightarrow QB$	(LH)	0.423	0.738	1.528	0.015	0.021	0.031	S1	1.0		
	Set up time	D0	1.260		3.240				Н	1.0		
	Set up time	D1	1.290		3.560							
	Set up time	S0	1.320		3.400							
	Set up time	S1	1.360		3.720							
	Set up time	Н	1.200		3.310							
	Hold time	D0	0.410		0.070							
	Hold time	D1	0.350		0.000							
	Hold time	S0	0.480		0.120							
	Hold time	S1	0.430		0.000							
	Hold time	Н	0.300		0.000							
	Release time	RB	0.300		0.000							
	Removal time	RB	0.950		1.880							
	Min Pulse	CB	1.090		3.879							
	Min Pulse	RB	0.713		2.100							

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Chapter 2 Function Block

Chapter 2 Function Block

[MEMO]

2.12 T-F/F, JK-F/F

Chapter 2 Function Block

Function	T-F/F	with F	R, S									
Block type			Standard	type					Low Gate	type		
	Norma		Q outp	ut	QB out		Norm		Q outp	ut	QB ou	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L744	7		1
x1	F744	9	F744NQ	8								
x2												
x4				\vdash								\perp
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norn	nal"					
	S H03			Т	R	s	Q QB					
		1		/	0	0	Invert					
		-	N01 Q		. 0	0	Hold					
				x	1	0	0 1					
				x	0	1	1 0					
T H01 ←		h	N02 QB	X	1	1	1 1	← Pro	hibition			
1 1101		Γ.	HOL QD	X:Irr	elevant							
	↓ H <u>0</u> 2											
	R											
Logic Diagram	for "Q outp	ut"		Trut	th Table for	"Q ou	tput"					
	H <mark>0</mark> 3			Т	R	s	Q					
		1		/	0	0	Invert					
			N01 Q	\	. 0	0	Hold					
				x	1	0	0					
						1	1					
T H01 ←				Lx	1	1	1	← Proh	ibition			
		J		X:Irr	elevant							
	H02 R											
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	output"					

Chapter 2 Function Block

D			Swite	ching sp	eed							
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F744	$T \rightarrow Q$	(HH)	0.475	0.811	1.694	0.015	0.022	0.032	Ť	1.0	Q	22
1		(HL)	0.625	1.114	2.376	0.012	0.018	0.028	R	2.1	QB	20
	$T \to QB$	(HH)	0.823	1.492	3.254	0.015	0.021	0.030	S	2.2		
		(HL)	0.854	1.471	3.136	0.014	0.019	0.029				
1	$R \rightarrow Q$	(HL)	0.530	1.135	2.450	0.012	0.017	0.027				
1	$R \rightarrow QB$	(HH)	0.267	0.537	1.012	0.015	0.023	0.036				
	$S \rightarrow Q$	(HH)	0.207	0.323	0.606	0.015	0.022	0.032				
	$S \rightarrow QB$	(HL)	0.583	1.456	3.003	0.014	0.023	0.037				
	Release time	R	0.650		2.020							
	Release time	S	0.220		0.000							
	Removal time	R	0.630		0.440							
1	Removal time	S	1.040		1.840							
1	Min Pulse	Т	1.152		3.827							
1	Min Pulse	R	1.124		3.226							
	Min Pulse	S	1.097		3.580							
L744	$T \rightarrow Q$	(HH)	0.457	0.797	1.698	0.052	0.078	0.117	T	1.0	Q	3
1		(HL)	0.400	0.655	1.325	0.025	0.035	0.053	R	2.2		
1	$R \rightarrow Q$	(HL)	0.137	0.181	0.286	0.021	0.029	0.042	S	2.1		
1	$S \rightarrow Q$	(HH)	0.364	0.723	1.542	0.053	0.080	0.121				
1	Release time	R	0.210		0.000							
1	Release time	S	0.640		1.990							
	Removal time	R	1.040		1.830							
	Removal time	S	0.630		0.440							
	Min Pulse	Т	0.724		2.271							
	Min Pulse	R	0.325		0.789							
	Min Pulse	S	0.861		2.285							
F744NQ	$T \rightarrow Q$	(HH)	0.476	0.813	1.698	0.015	0.022	0.032	T	1.0	Q	22
1		(HL)	0.625	1.115	2.379	0.012	0.018	0.028	R	2.1		
	$R \rightarrow Q$	(HL)	0.526	1.036	2.225	0.012	0.017	0.027	8	2.2		
1	S → Q	(HH)	0.207	0.323	0.606	0.015	0.022	0.032				
1	Release time	R	0.650		2.020							
1	Release time Removal time	S R	0.220 0.630		0.000 0.440							
1	Removal time	S	1.040		1.830							
1	Min Pulse	S T	0.892		2.951							
	Min Pulse	I R	1.027		2.951							
1	Min Pulse	S	0.447		1.203							
	win Pulse	3	0.447	l	1.203	I			I		I	l

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Chapter 2 Function Block

Function	T-F/F with RB											
Block type			Standard	type					Low Gate	type		
	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	out	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F745	8	F745NQ	7								
x2												
x4												
Logic Diagram	for "Norma	I"		Tru	th Table for	"Norm	ıal"					
		1		1 -								
		├	N01 Q		T RB	Q	QB					
				,	⁷ 1	In	vert					
				`	1	н	old					
T H01 ←	→	b⊸	N02 QB	[_;	K 0	0	1					
]		X:Irr	elevant							
	I H02 RB											
	RB											
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"					
		_										
		├	N01 Q		T RB	C	2					
					<i>7</i> 1	Inv	ert					
				`	\ 1	Но	old					
T H01 ←	→			[;	к о	(
T H01 ←				X:Irr	elevant							
	Ų											
	HÓ2 RB											
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					
Logio Diagram	.0. 42 04.	put				450	atpat					

Chapter 2 Function Block

			Swite	ching sp	eed				l .			
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	tput
type	IN → (TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F745	$T \rightarrow Q$	(HH)	0.508	0.883	1.917	0.015	0.022	0.034	Т	1.0	Q	21
1		(HL)	0.534	0.931	1.969	0.012	0.016	0.024	RB	2.1	QB	20
1	T → QB	(HH)	0.716	1.257	2.700	0.015	0.021	0.031				
1		(HL)	0.752	1.307	2.858	0.012	0.016	0.024				
1	$RB \rightarrow Q$	(LL)	0.248	0.412	0.805	0.012	0.016	0.024				
1	$RB \rightarrow QB$	(LH)	0.438	0.900	1.845	0.015	0.023	0.035				
1	Release time	RB	0.310		0.090							
1	Removal time	RB	0.930		1.510							
1	Min Pulse	T	1.041		3.439							
	Min Pulse	RB	0.822		2.392							
F745NQ	$T \rightarrow Q$	(HH)	0.507	0.883	1.919	0.015	0.022	0.034	Т	1.0	Q	21
1		(HL)	0.532	0.930	1.968	0.012	0.016	0.024	RB	2.1		
1	$RB \rightarrow Q$	(LL)	0.247	0.411	0.804	0.012	0.016	0.024				
1	Release time	RB	0.310		0.080							
1	Removal time	RB	0.930		1.510							
1	Min Pulse	T	0.800		2.542							
	Min Pulse	RB	0.506		1.325							

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Chapter 2 Function Block

Function	T-F/F	with F	RB, SB									
Block type			Standard	type					Low Gate	type		
Вюск турс	Norma	al	Q outp	ut	QB out	put	Norma	al	Q outp	ut	QB ou	tput
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L747	7		
x1	F747	9	F747NQ	8								
x2												
x4												
Logic Diagram		"			h Table for							
	SB H03				Γ RB	SB	Q C	₽B				
				/	⁷ 1	1	Invert					
			N01 Q	`	1	1	Hold					
				1 1	(0	1		1				
				1 1	(1	0		0				
T H01 ←	→	→ 1	N02 QB		(0	0	0	0 +	- Prohibition			
				X:Irr	elevant							
	H02 RB											
Logic Diagram	gic Diagram for "Q output"					"Q out	put"					
	SB Ho3				г пв	SB	Q					
		_			· 1	1	Invert					
			N01 Q	$ \ \ $	1	1	Hold					
				,	(0	1	0					
				,	(1	0	1					
				,	(0	0	0	_ ←	Prohibition			
T H01 ←	7			X-Irr	elevant		•					
	H02 RB	_		7	olovani							
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					
							·					
				<u> </u>								

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F747	$T \rightarrow Q$	(HH)	0.516	0.894	1.932	0.015	0.022	0.034	Т	1.0	Q	21
		(HL)	0.558	0.983	2.114	0.012	0.016	0.024	RB	2.2	QB	17
	$T \to QB$	(HH)	0.822	1.480	3.314	0.015	0.022	0.034	SB	2.0		
		(HL)	0.759	1.316	2.877	0.012	0.016	0.024				
	$RB \rightarrow Q$	(LL)	0.239	0.397	0.784	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.507	1.176	2.584	0.015	0.025	0.040				
	$SB \ \to \ Q$	(LH)	0.528	1.289	2.843	0.015	0.022	0.033				
	$SB \ \to \ QB$	(LL)	0.317	0.736	1.430	0.012	0.019	0.030				
	Release time	RB	0.300		0.090							
	Release time	SB	0.590		0.860							
	Removal time	RB	0.950		1.600							
	Removal time	SB	0.630		0.650							
	Min Pulse	Т	1.090		3.888							
	Min Pulse	RB	0.954		3.117							
	Min Pulse	SB	1.087		3.443							
L747	$T \rightarrow Q$	(HH)	0.448	0.775	1.652	0.030	0.044	0.067	T	1.0	Q	6
		(HL)	0.414	0.685	1.421	0.035	0.052	0.086	RB	2.0		
	$RB \rightarrow Q$	(LL)	0.427	0.900	1.931	0.035	0.055	0.092	SB	2.2		
	$SB \rightarrow Q$	(LH)	0.140	0.194	0.356	0.024	0.042	0.062				
	Release time	RB	0.590		0.850							
	Release time	SB	0.300		0.010							
	Removal time	RB	0.630		0.650							
	Removal time	SB	0.950		1.600							
	Min Pulse	T	0.716		2.227							
	Min Pulse	RB	0.877		2.536							
	Min Pulse	SB	0.323		0.785							
F747NQ	$T \rightarrow Q$	(HH)	0.518	0.898	1.940	0.015	0.022	0.034	T	1.0	Q	21
		(HL)	0.558	0.983	2.112	0.012	0.016	0.024	RB	2.2		
	$RB \rightarrow Q$	(LL)	0.239	0.398	0.784	0.012	0.016	0.024	SB	2.0		
	SB → Q	(LH)	0.529	1.122	2.477	0.015	0.022	0.033				
	Release time	RB	0.300		0.080							
	Release time	SB	0.590		0.860							
1	Removal time	RB	0.950		1.600							
	Removal time	SB	0.630		0.650							
	Min Pulse	T	0.826		2.687							
	Min Pulse	RB	0.491		1.298							
	Min Pulse	SB	0.984	<u> </u>	3.080							

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Chapter 2 Function Block

Function	T-F/F	with E	ata-Hold	R, S									
Block type			Standard	type					Low	Gate	type	'	
Blook type	Norma	al	Q outp	ut	QB out	put	No	rmal	Q	outp	ut	QB ou	tput
Drivability	Name	cells	Name	cells	Name	cells	Nam	e cells	Na	me	cells	Name	cells
Low Power													
x1	F791	12											
x2													
x4													
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"						
T H01 ← TE H02 ← Logic Diagram	H03 R	→ ut"	N01 Q	X:Irrul	T TE 1 1 0 0 X X X X Elevant The Table for	8 0 0 0 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1	S 0 0 0 0 1 1 1 2 put"	Q Invert Hold Hold 0 1 1	1 0	← Pro	phibition		
				ماذ ا نام		-0055	111/00						014

Chapter 2 Function Block

- I			Swite	ching sp	eed							
Block	Path		t	LDO (ns))		t 1		l In	put	Ou	ıtput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F791	$T \rightarrow Q$	(HH)	0.534	0.911	1.893	0.015	0.022	0.033	Т	1.0	Q	21
		(HL)	0.733	1.314	2.781	0.014	0.020	0.032	TE	1.7	QB	21
	$T \rightarrow QB$	(HH)	0.901	1.651	3.576	0.014	0.021	0.030	R	2.1		
		(HL)	0.841	1.466	3.110	0.013	0.018	0.027	S	2.2		
	$R \rightarrow Q$	(HL)	0.639	1.205	2.564	0.013	0.019	0.030				
	$R \rightarrow QB$	(HH)	0.234	0.420	0.784	0.015	0.022	0.034				
	$S \rightarrow Q$	(HH)	0.257	0.402	0.761	0.015	0.022	0.033				
	$S \rightarrow QB$	(HL)	0.562	1.199	2.481	0.013	0.020	0.031				
	Set up time	TE	1.140		3.520							
	Hold time	TE	0.410		0.000							
	Release time	R	0.670		2.090							
	Release time	S	0.220		0.000							
	Removal time	R	0.620		0.420							
	Removal time	S	1.040		1.850							
	Min Pulse	Т	1.166		4.149							
	Min Pulse	R	1.055		3.266							
	Min Pulse	S	1.028		3.162							

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Chapter 2 Function Block

Function	T-F/F	(TB) v	vith RB									
Block type			Standard	type					Low Gate	type		
	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F765	8	F765NQ	7								
x2												
x4												
Logic Diagram	for "Normal	"		Tru	th Table for	"Norm	ıal"					
TB H01 ←		-	N01 Q N02 QB		T RB 1 1 1 X 0		QB vert old 1					
Logic Diagram	for "Q outpo	٦	Not 0		th Table for		tput"					
TB H01 ←-	H02 RB		N01 Q		1 / 1 X 0		ert old					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed				l .			
Block	Path		l ti	LDO (ns))		t 1		l In	put	l Ou	itput
type	IN → C	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F765	TB → Q	(LH)	0.573	1.064	2.370	0.015	0.022	0.034	TB	1.0	Q	21
1		(LL)	0.476	0.847	1.795	0.012	0.016	0.024	RB	2.1	QB	20
1	TB → QB	(LH)	0.661	1.173	2.525	0.015	0.021	0.031				
1		(LL)	0.818	1.490	3.315	0.012	0.016	0.024				
1	$RB \rightarrow Q$	(LL)	0.248	0.412	0.805	0.012	0.016	0.024				
1	$RB \rightarrow QB$	(LH)	0.438	0.900	1.844	0.015	0.023	0.035				
1	Release time	RB	0.300		0.000							
1	Removal time	RB	0.940		1.870							
1	Min Pulse	TB	1.077		3.830							
	Min Pulse	RB	0.822		2.392							
F765NQ	TB → Q	(LH)	0.571	1.063	2.370	0.015	0.022	0.034	TB	1.0	Q	21
1		(LL)	0.476	0.847	1.797	0.012	0.016	0.024	RB	2.1		
1	$RB \rightarrow Q$	(LL)	0.247	0.411	0.804	0.012	0.016	0.024				
1	Release time	RB	0.300		0.000							
1	Removal time	RB	0.940		1.860							
1	Min Pulse	TB	0.831		2.884							
	Min Pulse	RB	0.506		1.325							

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Chapter 2 Function Block

Function	T-F/F	(TB) v	vith RB, S	В								
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norm	al	Q outp		QB out	1
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power									L767	7		
x1	F767	9	F767NQ	8								
x2												
x4												
Logic Diagram	SB H03			_	th Table for	"Norm	Q C	βB				
		1		`	, 1	1	Invert					
ı		-	N01 Q		7 1	1	Hold					
					(0	1		1				
					(1	0		0	B. I. T. W.			
TB H01 ←	\diamond	þ⊸	N02 QB	[_'	(0	0	0	0 +	 Prohibition 			
	H02 RB	_		X:lrr	elevant							
Logic Diagram	for "Q outpo	ut"		Trut	h Table for	"Q out	tput"					
	SB H03			Т	B RB	SB	Q					
	ب	7		$ \cdot $	s 1	1	Invert					
		├	N01 Q	/	1	1	Hold					
					< 0	1	0					
					(1	0	1					
TB H01 ←	- d			[_'	(0	0	0	←	Prohibition			
	H02 RB			X:lm	elevant							
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F767	TB → Q	(LH)	0.572	1.064	2.366	0.015	0.022	0.034	TB	1.0	Q	21
		(LL)	0.499	0.895	1.921	0.012	0.016	0.024	RB	2.2	QB	17
	$TB \to QB$	(LH)	0.765	1.392	3.119	0.015	0.022	0.034	SB	2.0		
		(LL)	0.813	1.486	3.313	0.012	0.016	0.024				
	$RB \rightarrow Q$	(LL)	0.239	0.397	0.784	0.012	0.016	0.024				
1	$RB \rightarrow QB$	(LH)	0.507	1.176	2.585	0.015	0.025	0.040				
1	$SB \rightarrow Q$	(LH)	0.528	1.290	2.843	0.015	0.022	0.033				
	$SB \rightarrow QB$	(LL)	0.317	0.736	1.430	0.012	0.019	0.030				
	Release time	RB	0.290		0.000							
1	Release time	SB	0.580		1.170							
1	Removal time	RB	0.960		1.920							
1	Removal time	SB	0.640		0.780							
1	Min Pulse	TB	1.073		3.827							
1	Min Pulse	RB	0.954		3.117							
	Min Pulse	SB	1.087		3.444							
L767	$TB \ \to \ Q$	(LH)	0.391	0.689	1.466	0.030	0.044	0.067	TB	1.0	Q	6
1		(LL)	0.468	0.850	1.845	0.035	0.052	0.086	RB	2.0		
1	$RB \rightarrow Q$	(LL)	0.427	0.901	1.932	0.035	0.055	0.092	SB	2.2		
1	$SB \ \to \ Q$	(LH)	0.140	0.194	0.356	0.024	0.042	0.062				
1	Release time	RB	0.580		1.160							
1	Release time	SB	0.290		0.000							
1	Removal time	RB	0.640		0.780							
1	Removal time	SB	0.960		1.920							
1	Min Pulse	TB	0.728		2.360							
1	Min Pulse	RB	0.876		2.535							
	Min Pulse	SB	0.323		0.785							
F767NQ	$TB \ \to \ Q$	(LH)	0.572	1.064	2.368	0.015	0.022	0.034	ТВ	1.0	Q	21
1		(LL)	0.500	0.897	1.925	0.012	0.016	0.024	RB	2.2		
1	$RB \rightarrow Q$	(LL)	0.239	0.398	0.784	0.012	0.016	0.024	SB	2.0		
	$SB \rightarrow Q$	(LH)	0.529	1.122	2.477	0.015	0.022	0.033				
	Release time	RB	0.290		0.000							
1	Release time	SB	0.580		1.170							
1	Removal time	RB	0.960		1.920							
1	Removal time	SB	0.640		0.780							
1	Min Pulse	TB	0.832		2.882							
1	Min Pulse	RB	0.490		1.298							
	Min Pulse	SB	0.985	l	3.080	l	l					l

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Chapter 2 Function Block

5					RB, SB							
Block type -			Standard	type					Low Gate	type		
	Norma		Q outp		QB out		Norma		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F792	12										
x2												
x4												
Logic Diagram fo	or "Normal	"		Tru	th Table for	"Norm	al"					
	SB H04				TB TEB	F	RB SB		Q QB			
	Ò				` 0		1 1		Invert			
TB H01 ←C	>		N01 Q	1 1	/ 0		1 1		Hold			
					X 1		1 1		Hold			
				1 1	х х		0 1					
TEB H02 ←C	1	h	N02 QB		х х		1 0	.	. 0			
120 1102 + 0			NOZ QD		х х		0 0		0	← Prol	hibition	
	H03 RB			X:Irr	elevant							
	RB											
Logic Diagram fo	10	.411		T	th Table for	10						
Logic Diagram ic	or Q outpo	ut		""	iii iabie ioi	Q Out	.put					
Logic Diagram fo	or "QB out	put"		Tru	th Table for	"QB o	utput"					
							·					

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F792	TB → Q	(LH)	0.648	1.205	2.676	0.015	0.023	0.036	TB	1.0	Q	20
1		(LL)	0.569	1.022	2.171	0.012	0.017	0.026	TEB	1.7	QB	19
1	TB → QB	(LH)	0.801	1.465	3.239	0.015	0.022	0.032	RB	2.2		
1		(LL)	0.847	1.567	3.501	0.012	0.016	0.023	SB	2.0		
1	$RB \rightarrow Q$	(LL)	0.304	0.516	1.015	0.012	0.017	0.026				
1	$RB \rightarrow QB$	(LH)	0.539	1.113	2.417	0.015	0.023	0.036				
1	$SB \rightarrow Q$	(LH)	0.613	1.230	2.715	0.015	0.023	0.035				
1	$SB \rightarrow QB$	(LL)	0.273	0.554	1.070	0.012	0.017	0.027				
1	Set up time	TEB	1.250		3.300							
1	Hold time	TEB	0.510		0.290							
1	Release time	RB	0.300		0.000							
1	Release time	SB	0.590		1.240							
1	Removal time	RB	0.960		1.930							
1	Removal time	SB	0.640		0.760							
I	Min Pulse	TB	1.106		4.013							
I	Min Pulse	RB	0.951		2.998							
	Min Pulse	SB	1.011		3.294							

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Chapter 2 Function Block

Function	JK-F/F	-										
Block type			Standard	type					Low Gate	type		
	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F771	10	F771NQ	9	F771NB	9						
x2												
x4 Logic Diagram	for "Norma	 "		Tru	th Table for	"Norm	l nal"					
J H01 ←		<u></u>	N01 Q		K		Q QB					
C H03 ←	- >					/	Hold					
							0 1 1 0					
K H02 ←	1	þ⊸	N02 QB	1 1		/ /	Invert					
		1		,			Hold					
				X:In	relevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q ou	tput"					
J H01 ←		-	N01 Q	J	K	0	Q					
C H03 ←						/	Hold					
0 1100						(0					
K H02 ←	_			1 1		,	1 Invert					
		J					Hold					
				-			Tiold					
				X:In	relevant							
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
J H01 ←					l K		QB					
				C	0 /	,	Hold					
C H03 ←	7				1 /	<i>></i>	1					
K H02 ←	_	b⊸	N01 QB	1	0 ,	7	0					
]	- · · ·	1	1 /	^	Invert					
				×	(x)	`-	Hold					
				X:In	relevant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F771	$C \rightarrow Q$	(HH)	0.451	0.757	1.565	0.015	0.022	0.032	J	1.0	Q	22
		(HL)	0.526	0.919	1.944	0.012	0.016	0.024	K	1.0	QB	22
	$C \rightarrow QB$	(HH)	0.709	1.258	2.702	0.015	0.022	0.031	С	1.0		
		(HL)	0.692	1.183	2.469	0.012	0.017	0.025				
	Set up time	J	1.040		2.280							
	Set up time	K	0.950		2.200							
	Hold time	J	0.310		0.000							
	Hold time	K	0.350		0.000							
	Min Pulse	С	0.976		3.272							
F771NQ	$C \rightarrow Q$	(HH)	0.421	0.734	1.555	0.015	0.023	0.034	J	1.0	Q	21
		(HL)	0.423	0.734	1.479	0.013	0.019	0.029	K	1.0		
	Set up time	J	0.980		2.180				С	1.0		
	Set up time	K	1.020		2.340							
	Hold time	J	0.260		0.000							
	Hold time	K	0.310		0.000							
	Min Pulse	С	0.710		2.128							
F771NB	$C \rightarrow QB$	(HH)	0.421	0.734	1.555	0.015	0.023	0.034	J	1.0	QB	21
		(HL)	0.423	0.734	1.479	0.013	0.019	0.029	K	1.0		
	Set up time	J	1.020		2.330				С	1.0		
l	Set up time	K	0.950	1	2.180							
l .	Hold time	J	0.310		0.000							
	Hold time	K	0.350		0.000							
	Min Pulse	С	0.710		2.128							

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Chapter 2 Function Block

Function	JK-F/F	F, Higl	h Speed									
Block type			Standard						Low Gate	type		
	Norma	al	Q outp	ut	QB out	put	Norm	al	Q outp	out	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cell
Low Power												
x1	F7D1	10										
x2												
х4												
Logic Diagram	for "Normal	l" -		Trut	h Table for	"Norm	nal"					
J H01 ←	_	-	N01 Q	J	К		Q QB					
C H03 ←				0	0 /	^	Hold					
0 1100	ſ			0) 1					
K H02 ←	-	\bigcirc	N02 QB	1			1 0					
		J		1		^	Invert					
				Lx	x `	`	Hold					
				X:Irr	elevant							
Logic Diagram	for "Q outpi	ut"		Trut	h Table for	"O ou	tout"					
0 0												
						Q 00	.,					
						Q 00						
						4 04						
						4 00						
						4 00	,					
						4 00	,					
							,,					
							,					
							,					
							,					
							,					
Logic Diagram	for "OB out	put"										
Logic Diagram	for "QB out	put"			h Table for							
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										
Logic Diagram	for "QB out	put"										

Chapter 2 Function Block

			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow 0$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F7D1	$C \rightarrow Q$	(HH)	0.430	0.745	1.570	0.015	0.023	0.035	J	1.0	Q	21
		(HL)	0.434	0.755	1.506	0.013	0.019	0.030	K	1.0	QB	22
	$C \rightarrow QB$	(HH)	0.575	1.041	2.182	0.014	0.021	0.030	С	1.0		
		(HL)	0.596	1.058	2.276	0.011	0.015	0.023				
	Set up time	J	0.980		2.180							
	Set up time	K	1.020		2.340							
	Hold time	J	0.260		0.000							
	Hold time	K	0.310		0.000							
	Min Pulse	С	0.861		2.848							

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Chapter 2 Function Block

Block type – Drivability Low Power x1	Norma Name		Standard	tv											
Drivability Low Power				ιy	pe,							Low Gate	type		
Low Power	Name	al	Q outp	ut		QB	outp	out		Norma	al	Q outp	ut	QB out	put
		cells	Name	се	lls	Nan	ne	cells	N	ame	cells	Name	cells	Name	cells
x1															
	F774	12	F774NQ	1	11	F774	NB	11							
x2															
x4															
Logic Diagram fo	or "Normal	l"		-	Truth	h Table	e for	"Norm	al"						
	S H05				J	К	С	R	S	Q	QB				
		1			0	0	1	0	0	Ho					
J H01 ←—	-		N01 Q	Ш	0	1	/	0	0	0	1				
				Ш	1	0	1	0	0	1 Inv	0 ort				
C H03 ←	7				X	X	΄,	0	0	Ho					
K H02 ←			N02 QB		х	х	Х	1	0	0	1				
102	Ц,	_	NOL QD	Ш	Х	Х	Х	0	1	1	0				
	ļ H04				Х	Х	Х	1	1	1	1	← Prohibition	1		
	R				X:Irrel	levant									
Logic Diagram fo	or "Q outp	ut"		-	Truth	h Table	e for	"Q ou	put"						
	S H05				J	К	С	R	s	Q					
		_			0	0	1	0	0	Hol	d				
J H01 ←—			N01 Q	Ш	0	1	1	0	0	0					
				Ш	1	0	/	0	0	. 1					
C H03 ←	>			Ш	1 X	1 X	<i>/</i>	0	0	Inve Hol					
				Ш	×	×	X	1	0	0	۱ ا				
K H02 ←	1				х	х	Х	0	1	1					
		_			х	Х	Х	1	1	1		← Prohibition			
	H04 R				X:Irrel	levant									
Logic Diagram fo	or "QB out	put"		ŀ	Truth	h Table	e for	"QB o	utput	t"					
	S H05				J	К	С	R	s	QE	3				
					0	0	/	0	0	Hol	d				
J H01 ←					0	1	1	0	0	1					
0 1101 -					1	0	/	0	0	0					
C H03 ←	b				1	1	/	0	0	Inve					
					X	X	>	0	0	Hol	d				
K H02 ←	1	р⊸	N01 QB		X	X X	X	1	0	1 0					
					X	×	X	1	1	1		← Prohibition			
	H04 R			;	X:Irrel	levant									

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F774	$C \rightarrow Q$	(HH)	0.471	0.803	1.679	0.015	0.022	0.032	J	1.0	Q	22
		(HL)	0.623	1.111	2.372	0.012	0.018	0.028	K	1.0	QB	21
	$C \rightarrow QB$	(HH)	0.826	1.511	3.290	0.015	0.021	0.030	C	1.0		
		(HL)	0.862	1.516	3.218	0.014	0.019	0.030	R	2.1		
	$R \rightarrow Q$	(HL)	0.530	1.070	2.305	0.012	0.017	0.027	S	2.2		
	$R \rightarrow QB$	(HH)	0.273 0.207	0.488 0.322	0.922 0.606	0.015 0.015	0.023 0.022	0.035 0.032				
	S → Q	(HH)				0.015		0.032				
	$S \rightarrow QB$ Set up time	(HL)	0.596 1.030	1.289	2.679 3.300	0.014	0.021	0.034				
	Set up time	K	0.980		2.370							
	Hold time	J	0.980		0.000							
	Hold time	K	0.230		0.000							
	Release time	R	0.660		2.070							
	Release time	S	0.220		0.000							
	Removal time	R	0.620		0.420							
	Removal time	S	1.050		1.860							
	Min Pulse	C	1.160		3.863							
	Min Pulse	R	1.032		3.056							
	Min Pulse	S	0.986		3.262							
F774NQ	$C \rightarrow Q$	(HH)	0.471	0.804	1.681	0.015	0.022	0.032	J	1.0	Q	22
		(HL)	0.622	1.111	2.371	0.012	0.018	0.028	K	1.0		
	$R \rightarrow Q$	(HL)	0.527	0.981	2.095	0.012	0.017	0.027	С	1.0		
	$S \rightarrow Q$	(HH)	0.207	0.323	0.606	0.015	0.022	0.032	R	2.1		
	Set up time	J	1.030		3.290				S	2.2		
	Set up time	K	0.980		2.380							
	Hold time	J	0.250		0.000							
	Hold time	K	0.330		0.000							
	Release time Release time	R S	0.660 0.210		2.070 0.000							
	Removal time	R	0.620		0.000							
	Removal time	S	1.050		1.870							
	Min Pulse	C	0.888		2.944							
	Min Pulse	R	0.938		2.801							
	Min Pulse	S	0.447		1.203							
F774NB	$C \rightarrow QB$	(HH)	0.426	0.738	1.557	0.015	0.023	0.034	J	1.0	QB	20
		(HL)	0.454	0.814	1.669	0.014	0.021	0.034	K	1.0		
	$R \rightarrow QB$	(HH)	0.340	0.615	1.278	0.015	0.023	0.035	С	1.0		
	$S \rightarrow QB$	(HL)	0.727	1.373	3.073	0.015	0.022	0.034	R	2.1		
	Set up time	J	1.020		3.420				S	2.2		
	Set up time	K	0.970		2.330							
	Hold time	J	0.240		0.000							
	Hold time	K	0.340	1	0.000	1	1	1		1	1	1
	Release time	R	0.620	1	2.200	1	1	1		1	1	
	Release time	S	0.190		0.000							
	Removal time	R	0.610	1	0.380	1	1	1		1	1	
	Removal time Min Pulse	S C	1.010	1	1.800 2.242	1	1	1		1	1	
	Min Pulse Min Pulse	R	0.749 0.769		2.242							
	Min Pulse	S	1.040		3.647							
	IVIIII FUISE	J	1.040		3.047							

 Block Library
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Chapter 2 Function Block

Function	JK-F/F	with	RB												
Block type			Standard	typ	е					Ī	Low G	ate ty	/pe		
	Norma		Q outp			QB out			rmal			utput		QB out	`
Drivability	Name	cells	Name	cell	ls I	Vame	cells	Nam	e ce	lls	Nam	e c	ells	Name	cells
Low Power										_			_		
x1	F775	11	F775NQ	10) F	775NB	10								
x2															
х4				_											
Logic Diagram	for "Norma	l"		Ti	ruth T	able for	"Norm	al"							
J H01 ←		<u></u>	N01 Q		J	K	С	RB	Q	QI	В				
					0	0	1	1	н	old					
C H03 ←	7				0	1	1	1	0	1					
K H02 ←		b⊸	N02 QB		1	0	1	1	1	0	١ -				
]			1	1	/	1		vert					
	О Н <u>04</u>				X	X	``	1		old					
	RB			L	Х	Х	Х	0	0	1					
				X	:Irrelev	ant									
Logic Diagram	for "Q outp	ut"		Ti	ruth T	able for	"Q out	put"							
J H01 ←		<u></u>	N01 Q		J	K	С	RB	C)					
0.1100					0	0	1	1	Ho	ld					
C H03 ←	7				0	1	1	1	c						
K H02 ←	_				1	0	1	1	1						
					1	1	/	1	Inv						
	H04				X X	X X	X	1	Ho						
	RB							- 0							
				X	:Irrelev	ant									
Logic Diagram	for "QB out	put"		Ti	ruth T	able for	"QB o	utput"							
J H01 ←]			J	K	С	RB	Q	В					
					0	0	/	1	Но	ıld					
C H03 ←	\rightarrow				0	1	1	1	1						
K H02 ←		<u>_</u>	N01 QB		1	0	1	1	c)					
N 1102 *		$rac{1}{2}$	INUI QD		1	1	1	1	Inv	ert					
	О Н04				Χ	Х	>	1	Ho	ld					
	RB			L	Х	Х	Х	0	1						
				x	:Irrelev	ant									

Chapter 2 Function Block

Block type F775	Path IN → 0											
	IN → C		T I	_D0 (ns)	ı		t 1		l In	put	Ou	tput
F775		TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
	$C \rightarrow Q$	(HH)	0.504	0.876	1.904	0.015	0.022	0.034	J	1.0	Q	21
		(HL)	0.532	0.930	1.966	0.012	0.016	0.024	K	1.0	QB	21
	$C \rightarrow QB$	(HH)	0.720	1.275	2.734	0.015	0.022	0.031	С	1.0		
		(HL)	0.759	1.334	2.907	0.012	0.016	0.024	RB	2.1		
	$RB \rightarrow Q$	(LL)	0.248	0.412	0.804	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.445	0.847	1.751	0.015	0.022	0.033				
	Set up time	J	1.040		2.350							
	Set up time	K	0.960		2.260							
	Hold time	J	0.300		0.000							
	Hold time	K	0.340		0.000							
	Release time	RB	0.310		0.090							
	Removal time	RB	0.930		1.510							
	Min Pulse	С	1.046		3.488							
	Min Pulse	RB	0.776		2.297							
F775NQ	$C \rightarrow Q$	(HH)	0.505	0.878	1.908	0.015	0.022	0.034	۲	1.0	Q	21
		(HL)	0.531	0.929	1.966	0.012	0.016	0.024	K	1.0		
	$RB \rightarrow Q$	(LL)	0.249	0.412	0.806	0.012	0.016	0.024	С	1.0		
	Set up time	J	1.040		2.350				RB	2.1		
	Set up time	K	0.960		2.260							
	Hold time	J	0.300		0.000							
	Hold time	K	0.340		0.000							
	Release time	RB	0.310		0.090							
	Removal time	RB	0.930		1.510							
	Min Pulse	С	0.799		2.540							
	Min Pulse	RB	0.508		1.326							
F775NB	$C \rightarrow QB$	(HH)	0.426	0.740	1.564	0.015	0.023	0.035	٦	1.0	QB	21
		(HL)	0.422	0.722	1.455	0.013	0.019	0.030	K	1.0		
	$RB \rightarrow QB$	(LH)	0.465	1.032	2.263	0.015	0.023	0.034	С	1.0		
	Set up time	J	1.020		2.400				RB	2.1		
1	Set up time	K	0.960		2.240							
1	Hold time	J	0.290		0.000							l
1	Hold time	K	0.340		0.000							
1	Release time	RB	0.300		0.140							l
1	Removal time	RB	0.900		1.450							
1	Min Pulse	С	0.711		2.141							l
	Min Pulse	RB	0.867		2.792							

 Block Library
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Chapter 2 Function Block

Function	JK-F/F	with	SB										
Block type			Standard	type					Low (Gate	type		
2.0011 1,700	Norma	al	Q outp	ut	QB out	put	No	rmal	Q	outpu	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	Nam	e cells	Nan	ne	cells	Name	cells
Low Power													
x1	F776	11	F776NQ	10	F776NB	10							
x2													
x4													
Logic Diagram		l"		Tru	th Table for	"Norm	al"						
	SB H04				Ј К	С	SB	Q	QB				
	<u> </u>	1			0 0	1	1	Hold					
J H01 ←	\dashv	─	N01 Q		0 1	1	1	0	1				
C H03 ~					1 0	1	1	1	0				
C H03 ←	ľ				1 1	1	1	Invert					
K H02 ←	4	b⊸	N02 QB		x x	1	1	Hold					
		J			x x	Х	0	1	0				
				X:lrr	elevant								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"						
	SB H04				J K	С	SB	Q					
		7			0 0	1	1	Hold					
J H01 ←	-		N01 Q		0 1	1	1	0					
					1 0	1	1	1					
C H03 ←	→				1 1	1	1	Invert					
K H02 ←				:	х х	>	1	Hold					
K ⊓02 ₩					x x	Х	0	1					
				X:Irr	elevant								
Logic Diagram		put"		Tru	th Table for	"QB o	utput"						
	SB H04				Ј К	С	SB	QB					
]			0 0	1	1	Hold					
J H01 ←	1				0 1	/	1	1					
C H03 ←	\downarrow				1 0	1	1 .	0					
3 .100					1 1	/	1	Invert					
K H02 ←	\dashv	þ→	N01 QB		x x	X	1	Hold 0					
		1		_	elevant								

Chapter 2 Function Block

type				Swite	ching sp	eed							
F776NQ C → Q (HH) 0.481 0.802 1.654 0.014 0.021 0.031 J 1.0 Q 21 0.031 SB → Q (LL) 0.580 1.014 0.580 0.015 0.023 0.035 C 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.025 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.025 D 1.0 QB 0.015 0.023 0.036 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 QB 0.025 D 1.0 D 1	Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
C → QB (HH) 0.580 1.014 2.173 0.011 0.016 0.023 K 1.0 QB 20	type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
C → QB (HH) 0.830 1.506 3.360 0.015 0.023 0.035 C 1.0 SB → Q (LH) 0.698 1.193 2.488 0.012 0.017 0.025 SB 2.0 SB → QB (LL) 0.325 0.654 1.274 0.012 0.018 0.029 SB 2.0 Set up time J 1.100 2.310 2.310 0.012 0.018 0.029 SB 2.0 Hold time J 0.310 0.000 0.940 0.000 <td>F776</td> <td>$C \rightarrow Q$</td> <td>(HH)</td> <td>0.481</td> <td>0.802</td> <td>1.654</td> <td>0.014</td> <td>0.021</td> <td>0.031</td> <td>J</td> <td>1.0</td> <td>Q</td> <td>21</td>	F776	$C \rightarrow Q$	(HH)	0.481	0.802	1.654	0.014	0.021	0.031	J	1.0	Q	21
SB → Q			(HL)	0.580	1.014	2.173	0.011	0.016	0.023	K	1.0	QB	20
SB → Q (LH) 0.494 1.088 2.345 0.014 0.021 0.031 0.029 SB DB (LL) 0.325 0.654 1.274 0.012 0.018 0.029		$C \rightarrow QB$	(HH)	0.830	1.506	3.360	0.015	0.023	0.035	С	1.0		
SB → QB (LL) 0.325			(HL)	0.698	1.193	2.488	0.012	0.017	0.025	SB	2.0		
Set up time J 1.100 2.310 Set up time K 1.020 2.530 Hold time J 0.310 0.000 Hold time K 0.350 0.000 Release time SB 0.600 0.940 Removal time SB 0.610 0.580 Min Pulse C 1.097 3.933 Min Pulse SB 0.941 2.938 F776NQ C → Q (HH) 0.482 0.803 1.658 0.014 0.021 0.031 J 1.0 Q 21 SB → Q (LH) 0.482 0.803 1.658 0.014 0.021 0.031 J 1.0 Q 21 SB → Q (LH) 0.496 0.941 2.095 0.014 0.021 0.031 C 1.0 SB 2.0 SB 2.0 SB 2.0 SB 2.0 SB 2.0 SB 2.0 SB 2.0 SB 2.0		$SB \rightarrow Q$	(LH)	0.494	1.088	2.345	0.014	0.021	0.031				
Set up time		$SB \rightarrow QB$	(LL)	0.325	0.654	1.274	0.012	0.018	0.029				
Hold time		Set up time	J	1.100		2.310							
Hold time K 0.350 0.000 0.940 Release time SB 0.600 0.940 Nin Pulse C 1.097 3.933 Nin Pulse SB 0.941 0.994 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.941 0.998 Nin Pulse SB 0.600 0.930 Removal time SB 0.610 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.849 0.9980 Nin Pulse SB 0.8490 0.9980 Nin Pulse SB 0.8490 0.9980 Nin Pulse SB 0.8490 0.9980 Nin Pulse SB 0.8490 Nin Pulse SB 0.8490 Ni		Set up time	K	1.020		2.530							
Release time SB 0.600 0.940 0.580 Min Pulse C 1.097 3.933 2.938		Hold time	J	0.310		0.000							
Removal time		Hold time				0.000							
Min Pulse		Release time	SB	0.600		0.940							
Min Pulse SB 0.941 2.938		Removal time		0.610		0.580							
F776NQ C → Q (HH) 0.482 0.803 1.658 0.014 0.021 0.031 J 1.0 Q 21 SB → Q (LH) 0.579 1.013 2.170 0.011 0.016 0.023 K 1.0 SE up time J 1.100 Set up time K 1.020 2.530 Hold time K 0.350 0.000 Release time SB 0.600 0.930 Removal time SB 0.849 2.592 F776NB C → QB (HH) 0.496 0.863 1.860 0.013 0.018 0.028 K 1.0 QB 17 SE up time J 1.800 0.000 Set up time SB 0.600 0.000 New Yellow SE U.0 SE U.0 SE U.0 New Yellow New Yellow New Yello		Min Pulse		1.097		3.933							
SB → Q (LH) 0.496 0.941 2.005 0.014 0.016 0.023 K 1.0		Min Pulse	SB	0.941		2.938							
SB → Q (LH) 0.496 0.941 2.005 0.014 0.021 0.031 C 1.0 Set up time J 1.100 2.310 2.530 0.014 0.021 0.031 C 1.0 Set up time K 1.020 2.530 0.000	F776NQ	$C \rightarrow Q$. ,	0.482	0.803	1.658	0.014	0.021	0.031		-	Q	21
Set up time J 1.100 2.310													
Set up time			(LH)		0.941		0.014	0.021	0.031				
Hold time J 0.310 0.000 Hold time K 0.350 0.000 Release time SB 0.600 0.930 Min Pulse C 0.847 2.744 Min Pulse SB 0.849 2.592 F776NB C → QB (HH) 0.496 0.863 1.860 0.015 0.023 0.036 J 1.0 QB 17 SB → QB (LL) 0.447 0.871 1.850 0.013 0.018 0.028 K 1.0 Set up time J 1.080 2.350 Set up time K 1.030 2.560 Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437										SB	2.0		
Hold time K 0.350 0.000 0.930 Release time SB 0.600 0.930 Removal time SB 0.610 0.590 0.590 Min Pulse C 0.847 2.744 Min Pulse SB 0.849 2.592 F776NB													
Release time		Hold time	J			0.000							
Removal time SB 0.610 0.590 2.744 Min Pulse C 0.847 2.744 Min Pulse SB 0.849 2.592 Min Pulse SB 0.849 2.592 Min Pulse SB 0.849 2.592 Min Pulse SB 0.849 0.863 1.860 0.015 0.023 0.036 J 1.0 QB 17 C C C C C C C C C													
Min Pulse													
Min Pulse SB 0.849 2.592													
F776NB													
(HL) 0.462 0.790 1.590 0.013 0.018 0.028 K 1.0 SB → QB (LL) 0.447 0.871 1.850 0.013 0.018 0.028 C 1.0 Set up time J 1.080 2.350 Set up time K 1.030 2.560 Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437													
SB → QB (LL) 0.447 0.871 1.850 0.013 0.018 0.028 C 1.0 Set up time J 1.080 2.350 Set up time K 1.030 2.560 Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437	F776NB	$C \rightarrow QB$. ,			1						QB	17
Set up time J 1.080 2.350 Set up time K 1.030 2.560 Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437											-		
Set up time K 1.030 2.560 Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437			. ,		0.871	1	0.013	0.018	0.028	1 '			
Hold time J 0.300 0.000 Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437										SB	2.0		
Hold time K 0.360 0.000 Release time SB 0.610 0.960 Removal time SB 0.600 0.520 Min Pulse C 0.765 2.437													
Release time													
Removal time SB													
Min Pulse C 0.765 2.437	1				1	1							
Min Pulse SB 0.814 2.449													
		Min Pulse	SB	0.814		2.449							

Chapter 2 Function Block

Function	JK-F/F	Fwith	RB, SB											
Block type			Standard	type						Low	Gate	type		
2.0011170	Norma	al	Q outp	ut	QB out	put		Norm	al	Q	outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	N	ame	cells	Na	me	cells	Name	cells
Low Power														
x1	F777	12	F777NQ	11	F777NB	11								
x2														
x4														
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	nal"							
	SB H05				J K	С	RB	SB	Q	QB				
	-	1			0 0	1	1	1	Ho					
J H01 ←	-	-	N01 Q		0 1	/	1	1 .	0	1				
İ					1 0 1 1	/	1	1	1 Inv	0 rent				
C H03 ←	7				 x x	Ś	1	1	Ho					
K H02 ←		ا ا	N02 QB		х х	х	0	1	0	1				
102		<u></u>	NOL QD		x x	Х	1	0	1	0				
	H04				х х	Х	0	0	0	0	← F	Prohibition		
	RB			X:Irr	relevant									
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q ou	tput"							
	SB H05				J K	С	RB	SB	٥					
		_			0 0	1	1	1	Ho	ld				
J H01 ←	4		N01 Q		0 1	1	1	1	0					
					1 0 1 1	1	1	1	1 Inve					
C H03 ←	→				т т х х	΄,	1	1	Hol					
14 1100					x x	x	0	1	0					
K H02 ←					x x	х	1	0	1					
	Ŷ				х х	Х	0	0	0		← Pro	hibition		
l	H04 RB			X:In	relevant									
Logic Diagram	for "QB out	tput"		Tru	th Table for	"QB o	utpu	t"						
	SB H05				J K	С	RB	SB	QE	3				
		1			0 0	/	1	1	Ho					
J H01 ←	4				0 1	/	1	1	1					
					1 0	/	1	1	0					
C H03 ←	→				1 1 X X	<u> </u>	1	1	Inve					
И Ноо .		h .	NO1 OF		х х	X	0	1	1	-				
K H02 ←	L	Υ	N01 QB		х х	х	1	0	0					
	φ. –			L	х х	х	0	0	0		← Pro	hibition		
	HĎ4 RB			X:Irr	relevant									

Chapter 2 Function Block

			Switc	ching sp	eed						_	
Block	Path		t ı	_D0 (ns)			t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F777	$C \rightarrow Q$	(HH)	0.512	0.887	1.918	0.015	0.022	0.034	J	1.0	Q	21
		(HL)	0.556	0.981	2.110	0.012	0.016	0.024	K	1.0	QB	19
	$C \rightarrow QB$	(HH)	0.828	1.509	3.375	0.015	0.023	0.035	С	1.0		
		(HL)	0.763	1.341	2.923	0.012	0.016	0.024	RB	2.2		
	$RB \rightarrow Q$	(LL)	0.239	0.397	0.784	0.012	0.016	0.024	SB	2.0		
	RB → QB	(LH)	0.517	1.078	2.383	0.015	0.024	0.037				
	SB → Q	(LH)	0.529	1.197	2.639	0.015	0.022	0.033				
	SB → QB	(LL)	0.326	0.654	1.275	0.012	0.018	0.029				
	Set up time	J	1.100		2.360							
	Set up time	K	1.020		2.540							
	Hold time Hold time	J K	0.300 0.350		0.000							
	Release time	RB	0.310		0.100							
	Release time	SB	0.600		0.100							
	Removal time	RB	0.950		1.600							
	Removal time	SB	0.630		0.620							
	Min Pulse	C	1.096		3.949							
	Min Pulse	RB	0.884		2.915							
	Min Pulse	SB	1.007		3.235							
F777NQ	$C \rightarrow Q$	(HH)	0.512	0.889	1.923	0.015	0.022	0.034	J	1.0	Q	21
		(HL)	0.555	0.980	2.107	0.012	0.016	0.024	K	1.0		
	$RB \ \to \ Q$	(LL)	0.239	0.397	0.784	0.012	0.016	0.024	С	1.0		
	$SB \rightarrow Q$	(LH)	0.531	1.041	2.290	0.015	0.022	0.033	RB	2.2		
	Set up time	J	1.090		2.360				SB	2.0		
	Set up time	K	1.010		2.540							
	Hold time	J	0.300		0.000							
	Hold time	K RB	0.350 0.310		0.000 0.100							
	Release time Release time	SB	0.600		0.100							
	Removal time	RB	0.950		1.590							
	Removal time	SB	0.630		0.630							
	Min Pulse	C	0.823		2.681							
	Min Pulse	RB	0.490		1.297							
	Min Pulse	SB	0.909		2.878							
F777NB	$C \rightarrow QB$	(HH)	0.465	0.817	1.758	0.016	0.024	0.038	J	1.0	QB	19
		(HL)	0.428	0.736	1.475	0.013	0.019	0.029	К	1.0		
	$RB \rightarrow QB$	(LH)	0.569	1.241	2.861	0.016	0.024	0.037	С	1.0		
	$SB \ \to \ QB$	(LL)	0.408	0.813	1.726	0.013	0.019	0.029	RB	2.2		
	Set up time	J	1.070		2.410	1			SB	2.0		1
	Set up time	K	1.020		2.560	1				1		1
	Hold time	J	0.290		0.000	1				1		1
	Hold time	K	0.350		0.000	1				1		1
	Release time	RB	0.290		0.150	1				1		1
	Release time	SB	0.610		0.960							
	Removal time	RB	0.910		1.500	1				1		1
	Removal time	SB	0.610		0.560							
	Min Pulse Min Pulse	C RB	0.733		2.334 3.381							
	Min Pulse Min Pulse	SB	0.971		2.326	1						
	willi Fuise	SD	0.777		2.320							

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Chapter 2 Function Block

Function	JK-F/F	(CB)										
Block type			Standard	type					Low Gate	type		
	Norma		Q outp	T	QB out	1	Norma		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F781	10	F781NQ	9	F781NB	9						
x2												
х4				_								
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	ıal"					
J H01 ←		-	N01 Q		J K	СВ	Q C	рВ				
CB H03 ←	\downarrow				0 0	`	Hold					
OB 1103 *	4				0 1	>	0	1				
K H02 ←		$\triangleright \rightarrow$	N02 QB		1 0	>		0				
		_			1 1	`	Invert					
					х х		Hold					
				X:In	relevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"					
		_						_				
J H01 ←	_	├ ~	N01 Q		J K	СВ	Q					
					0 0	\	Hold					
CB H03 ←	9				0 1	\	0					
K H02 ←					1 0	>	1					
					1 1	>	Invert					
					х х	/	Hold					
				X:In	relevant							
ı												
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					
J H01 ←		7			J K	СВ	QB					
3 1101 4								\dashv				
CB H03 ←	\diamond				0 0 0 1	,	Hold 1					
K 1100		h .	NO1 OF		1 0	,	0					
K H02 ←		þ→	N01 QB		1 1	`	Invert					
					x x	,	Hold					
				Y-lr	relevant		1					
				^	o.ovant							

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F781	$CB \rightarrow Q$	(LH)	0.506	0.930	2.011	0.015	0.022	0.032	J	1.0	Q	22
		(LL)	0.470	0.835	1.769	0.012	0.016	0.024	K	1.0	QB	22
	$CB \rightarrow QB$	(LH)	0.656	1.177	2.531	0.015	0.022	0.032	CB	1.0		
		(LL)	0.747	1.356	2.918	0.012	0.017	0.025				
	Set up time	J	1.080		2.250							
	Set up time	K	1.000		2.170							
	Hold time	J	0.320		0.000							
	Hold time	K	0.510		0.170							
	Min Pulse	CB	1.006		3.428							
F781NQ	$CB \rightarrow Q$	(LH)	0.381	0.686	1.470	0.015	0.023	0.035	J	1.0	Q	21
		(LL)	0.438	0.834	1.806	0.013	0.019	0.029	K	1.0		
	Set up time	J	1.030		2.270				CB	1.0		
	Set up time	K	1.070		2.230							
	Hold time	J	0.430		0.000							
	Hold time	K	0.300		0.000							
	Min Pulse	CB	0.708		2.324							
F781NB	$CB \rightarrow QB$	(LH)	0.381	0.686	1.470	0.015	0.023	0.035	J	1.0	QB	21
		(LL)	0.438	0.834	1.806	0.013	0.019	0.029	K	1.0		
	Set up time	J	1.070		2.230				СВ	1.0		
I	Set up time	K	1.000		2.150							
	Hold time	J	0.300		0.000							
	Hold time	K	0.510		0.190							
	Min Pulse	CB	0.708		2.324							

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Chapter 2 Function Block

Function	JK-F/F	(CB)	, High Sp	eed								
Block type			Standard	type					Low Gate	type		
	Norma		Q outp		QB out	put	Norma		Q outp		QB out	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
Low Power												
x1	F7E1	10										
x2												
x4												
Logic Diagram	for "Normal	"		Trut	h Table for	"Norm	al"					
J H01 ←		-	N01 Q		Ј К	СВ	Q C	QВ				
CB H03 ←	\diamond				0	>	Hold					
	1) 1	>	0					
K H02 ←	-	þ	N02 QB		1 0	`		0				
		J			1 1	`	Invert					
					× ×	1	Hold					
				X:Irr	elevant							
Logic Diagram	for "Q outpu	ut"		Trut	h Table for	"Q out	put"					
				_								
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 2 Function Block

			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	itput
type	$IN \rightarrow 0$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F7E1	CB → Q	(LH)	0.391	0.701	1.492	0.015	0.023	0.035	J	1.0	Q	21
		(LL)	0.446	0.845	1.819	0.013	0.019	0.030	K	1.0	QB	22
	CB → QB	(LH)	0.589	1.134	2.497	0.014	0.021	0.030	СВ	1.0		
		(LL)	0.558	1.016	2.203	0.011	0.015	0.023				
	Set up time	J	1.030		2.280							
	Set up time	K	1.070		2.230							
	Hold time	J	0.430		0.000							
	Hold time	K	0.300		0.000							
	Min Pulse	CB	0.860		3.015							

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Chapter 2 Function Block

Function	JK-F/F	(CB)	with RB,	SB										
Block type			Standard	type						Low	Gate	type		
2.0011.790	Norma	al	Q outp	ut	QB out	put		Norma	al	Q	outp	ut	QB out	put
Drivability	Name	cells	Name	cells	Name	cells	N	lame	cells	Na	me	cells	Name	cells
Low Power														
x1	F787	12	F787NQ	11	F787NB	11								
x2														
x4														
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	nal"							
	SB H05				J K	СВ	RB	SB	Q	QB				
		7			0 0	`	1	1	Ho					
J H01 ←	-	\vdash	N01 Q		0 1	`	1	1	0	1				
05 1100					1 0 1 1	,	1	1	1 Inv	0 vert				
CB H03 ←	4				 x x	,	1	1	Ho					
K H02 ←		b	N02 QB		х х	х	0	1	0	1				
ı		_			x x	Х	1	0	1	0				
	Т Н04				х х	Х	0	0	0	0	← F	rohibition		
	RB			X:Irr	relevant									
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q ou	tput"							
	SB H05				J K	СВ	RB	SB	Q					
		_			0 0	`	1	1	Hol	ld				
J H01 ←			N01 Q		0 1	>	1	1	0					
					1 0	`	1	1	1					
CB H03 ←	\Rightarrow				1 1 X X	>	1	1	Inve					
14 1100					х х	x	0	1	0					
K H02 ←					х х	х	1	0	1					
	Q				х х	х	0	0	0		← Pro	hibition		
	H04 RB			X:Irr	relevant									
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utpu	t"						
	SB H05				J K	СВ	RB	SB	QE	3				
	حک	7			0 0	`	1	1	Hol	ld				
J H01 ←	\dashv				0 1	>	1	1	1					
					1 0	`	1	1	0					
CB H03 ←	9				1 1 X X	>	1	1	Inve					
K H02 ←		h-	N01 QB		х х х х	x	0	1	HOI 1	-				
1 1102		Γ'	ויייו עם		x x	x	1	0	0					
	О Н04				x x	х	0	0	0		← Pro	hibition		
	RB			X:In	relevant									

Chapter 2 Function Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] Ir	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
F787	$CB \rightarrow Q$	(LH)	0.568	1.057	2.358	0.015	0.022	0.034	J	1.0	Q	21
		(LL)	0.496	0.889	1.909	0.012	0.016	0.024	K	1.0	QB	19
	$CB \rightarrow QB$	(LH)	0.771	1.420	3.177	0.015	0.023	0.035	СВ	1.0		
		(LL)	0.816	1.510	3.361	0.012	0.016	0.024	RB	2.2		
	RB → Q	(LL)	0.239	0.397	0.784	0.012	0.016	0.024	SB	2.0		
	RB → QB	(LH)	0.517	1.078 1.197	2.383 2.641	0.015 0.015	0.024 0.022	0.037 0.033				
	SB → Q	(LH)	0.529	0.654		0.015	0.022	0.033				
	$SB \rightarrow QB$ Set up time	(LL) J	0.326 1.150	0.654	1.275 2.450	0.012	0.016	0.029				
	Set up time	K	1.050		2.780							
	Hold time	J	0.310		0.000							
	Hold time	K	0.510		0.150							
	Release time	RB	0.300		0.000							
	Release time	SB	0.590		1.230							
	Removal time	RB	0.960		1.930							
	Removal time	SB	0.640		0.760							
	Min Pulse	СВ	1.076		3.873							
	Min Pulse	RB	0.884		2.914							
	Min Pulse	SB	1.007		3.235							
F787NQ	CB → Q	(LH)	0.567	1.056	2.357	0.015	0.022	0.034	J	1.0	Q	21
		(LL)	0.496	0.890	1.911	0.012	0.016	0.024	K	1.0		
	$RB \rightarrow Q$	(LL)	0.239	0.397	0.784	0.012	0.016	0.024	CB	1.0		
	$SB \rightarrow Q$	(LH)	0.531	1.042	2.290	0.015	0.022	0.033	RB	2.2		
	Set up time	J	1.150		2.450				SB	2.0		
	Set up time	K	1.050		2.780							
	Hold time	J	0.310		0.000							
	Hold time	K RB	0.510 0.300		0.150 0.000							
	Release time Release time	SB	0.590		1.230							
	Removal time	RB	0.960		1.930							
	Removal time	SB	0.640		0.760							
	Min Pulse	CB	0.827		2.869							
	Min Pulse	RB	0.490		1.297							
	Min Pulse	SB	0.909		2.878							
F787NB	CB → QB	(LH)	0.419	0.762	1.656	0.016	0.024	0.038	J	1.0	QB	19
		(LL)	0.441	0.834	1.796	0.013	0.019	0.029	K	1.0		
	$RB \rightarrow QB$	(LH)	0.569	1.240	2.861	0.016	0.024	0.037	СВ	1.0		
	$SB \ \to \ QB$	(LL)	0.407	0.814	1.727	0.013	0.019	0.029	RB	2.2		
	Set up time	J	1.140		2.410				SB	2.0		
	Set up time	K	1.050		2.740							
	Hold time	J	0.290		0.000							l
	Hold time	K	0.520		0.180							l
	Release time	RB	0.290		0.000							
	Release time	SB	0.600	1	1.200	1		1		1		1
	Removal time	RB	0.910		1.840							
	Removal time Min Pulse	SB CB	0.630	1	0.730	1		1		1		1
	Min Pulse Min Pulse	RB	0.712 0.971		2.316 3.381							
	Min Pulse	SB	0.971		2.326							
	WIIII FUISE	SD	0.777		2.320							

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Chapter 3 Scan Path Block

Chapter 3 Scan Path Block

Chapter 3 Scan Path Block

[MEMO]

3.1 Standard Type

Chapter 3 Scan Path Block

Function	Scan I	D-F/F	with R, S,	2 to 1	Selector							
Block type					St		d type					
Dicon type		Nor	mal			Q ou	tput	,		QB ou	ıtput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S000	12										
x2												
x4												
x8				\vdash								
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norm	ıal"					
	S H04				IN SCK	SMC	c s	R	D	Q	QB	
	П <u>0</u> 4											
SIN H01 ←		↴	N01 Q	1 1	x x x x	X X	1	0	x x	1	0	
SCK H02 ←	→			1 1	A /	0	0	0	x		AB	
SMC H03 ←					x /	1	0	0	В	В	вв	
D H06 ←			N02 QB	1 1	х 🔍	Х	0	0	x	Hold		
	HÔE				х х	Х	1	1	х	1	1 ← F	rohibition
	HÕ5 R			X:Irre	elevant							
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S000	SCK → Q	(HH)	0.472	0.806	1.683	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.625	1.116	2.379	0.012	0.018	0.028	SCK	1.0	QB	21
	SCK → QB	(HH)	0.774	1.414	3.092	0.014	0.021	0.030	SMC	1.0		
		(HL)	0.762	1.329	2.841	0.013	0.018	0.027	S	2.2		
	$S \rightarrow Q$	(HH)	0.209	0.325	0.609	0.015	0.022	0.032	R	2.1		
	$S \rightarrow QB$	(HL)	0.496	1.098	2.284	0.013	0.020	0.031	D	1.0		
	$R \rightarrow Q$	(HL)	0.531	0.993	2.137	0.012	0.017	0.027				
	$R \rightarrow QB$	(HH)	0.228	0.411	0.772	0.015	0.022	0.034				
	Set up time	SIN	1.070		3.450							
	Set up time	SMC	1.100		3.760							
	Set up time	D	1.070		3.460							
	Hold time	SIN	0.370		0.000							
	Hold time	SMC	0.350		0.000							
	Hold time	D	0.360		0.000							
	Release time	S	0.220		0.000							
	Release time	R	0.670		2.090							
	Removal time	S	1.050		1.860							
	Removal time	R	0.620		0.430							
	Min Pulse	SCK	1.059		3.664							
l .	Min Pulse	S	0.891		2.872							
	Min Pulse	R	0.935		2.840							

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Chapter 3 Scan Path Block

			with 2 to 1	OCIC	ClOi							
Block type					St		d type					
Blook type		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S002	10										
x2												
x4												
x8												
Logic Diagram fo	or "Normal	"		Trut	h Table for	"Norm	ıal"					
SIN H01 ←		-	N01 Q	5	SIN SCK	S	MC D	0	QB			
SCK H02 ←	\rightarrow				x /		1 B	E	в вв			
SMC H03 ←		h.,	NOO OR	1 1	A /		0 X	_ A				
D H04 ←			N02 QB	1 1	x \		x x		Hold			
				V.1	elevant							
				X:III	elevanı							
Logic Diagram fo	or "Q outpi	ut"		Trut	h Table for	"Q out	tput"					
Logic Diagram fo	or "OB out	nut"		Trut	h Table for	"OB o	utout"					
Logic Diagram ic	JI QD OUL	pui		liui	II Table IOI	QD 0	шриг					
I												

Chapter 3 Scan Path Block

			Swite	ching sp	eed				l .			
Block	Path		t I	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S002	SCK → Q	(HH)	0.451	0.758	1.566	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.527	0.921	1.947	0.012	0.016	0.024	SCK	1.0	QB	22
	SCK → QB	(HH)	0.662	1.173	2.531	0.015	0.021	0.031	SMC	1.0		
		(HL)	0.629	1.069	2.245	0.012	0.016	0.023	D	1.0		
	Set up time	SIN	1.000		2.420							
	Set up time	SMC	1.010		2.730							
	Set up time	D	1.010		2.430							
	Hold time	SIN	0.360		0.000							
	Hold time	SMC	0.350		0.000							
I	Hold time	D	0.350		0.000							
I	Min Pulse	SCK	0.926		3.101							

Chapter 3 Scan Path Block

Function	Scan I	D-F/F	with 2 to	1 Sele	ctor, High	Spee	d					
Block type					St		d type					
2.0011 1,700		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S003	11										
x2												
x4												
x8 Logic Diagram	for "Norma			Trut	h Table for	"Norm	l nal"					
SIN H01 ← SCK H02 ← SMC H03 ← D H04 ←			N01 Q N02 QB		SIN SCK X / A / X \ elevant		MC D 1 B 0 X X X	E A	в вв			
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	tput"					
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S003	SCK → Q	$SCK \rightarrow Q$ (HH) (HL)		0.735	1.553	0.015	0.023	0.034	SIN	1.0	Q	21
l .		(HL)	0.426	0.738	1.482	0.013	0.019	0.029	SCK	1.0	QB	22
l .	SCK → QB	(HH)	0.566	1.022	2.157	0.014	0.021	0.030	SMC	1.0		
l .		(HL)	0.588	1.049	2.262	0.011	0.015	0.023	D	1.0		
l .	Set up time	SIN	1.050		2.810							
l .	Set up time	SMC	1.090		3.080							
l .	Set up time	D	1.040		2.790							
	Hold time	SIN	0.280		0.000							
l .	Hold time	SMC	0.270		0.000							
	Hold time	D	0.280		0.000							
	Min Pulse	SCK	0.852		2.834							

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Chapter 3 Scan Path Block

Function	Scan	D-F/F	with R, S,	Hold	2 to 1 Se	lector						
Block type					St		d type					
Blook type		Nor	mal			Q ou	tput			QB ou	itput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S050	16										
x2												
x4												
x8				_								
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
	S H06			8	IN SCK	SMC	SDH	S F	D	Q	QB	
		_		1 1	x /	х		0 0		Hold		
SIN H01 ←		├	N01 Q	1 1	A /	0		0 0 0 0			AB BB	
SCK H02 ←				1 1	x \	x		0 0		Hold		
SMC H03 ← SDH H04 ←					x x	х		0 1		0	1	
D H07 ←		b	N02 QB	1 1	x x x x	X X		1 0		1	0 1 ← Pro	hibition
				1 -	elevant			1 1	^	'	1 ← Pro	nibition
Logic Diagram					th Table for							
Logic Diagram	IOI QBOUT	ματ		iru	th Table for	0 0 0	uput-					

Chapter 3 Scan Path Block

			Swite	ching sp	eed				Ι.			
Block	Path		t i	LD0 (ns))		t 1		l In	put	Ou	ıtput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S050	SCK → Q	(HH)	0.516	0.878	1.820	0.015	0.022	0.033	SIN	1.0	Q	21
		(HL)	0.707	1.260	2.650	0.013	0.019	0.031	SCK	1.0	QB	21
	SCK → QB	(HH)	0.863	1.581	3.428	0.014	0.021	0.030	SMC	1.0		
		(HL)	0.809	1.412	3.007	0.013	0.018	0.027	SDH	1.0		
	$R \rightarrow Q$	(HL)	0.615	1.142	2.418	0.013	0.019	0.030	R	2.2		
	$R \rightarrow QB$	(HH)	0.228	0.411	0.772	0.015	0.022	0.034	S	2.4		
	$S \rightarrow Q$	(HH)	0.245	0.379	0.710	0.015	0.022	0.033	D	1.0		
	$S \rightarrow QB$	(HL)	0.536	1.158	2.402	0.013	0.020	0.031				
	Set up time	SIN	1.350		4.560							
	Set up time	SMC	1.390		4.880							
	Set up time	SDH	1.170		4.070							
	Set up time	D	1.350		4.550							
	Hold time	SIN	0.080		0.000							
	Hold time	SMC	0.080		0.000							
	Hold time	SDH	0.260		0.000							
	Hold time	D	0.090		0.000							
	Release time	R	0.680		2.100							
	Release time	S	0.220		0.000							
1	Removal time	R	0.620		0.420							
	Removal time	S	1.050		1.870							
1	Min Pulse	SCK	1.127		3.999							
1	Min Pulse	R	1.017	1	3.118							
	Min Pulse	S	0.986		3.057							

Chapter 3 Scan Path Block

Function	Scan I	D-F/F	with Hold	2 to	1 Selector								
Block type					St		d type						
			mal			Q ou					QB ou		
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Na	ıme	cells	Name	cells
x1	S052	14											
x2													
x4													
x8				<u> </u>									Ш
Logic Diagram	for "Norma	_		Tru	th Table for	"Norm	ıal"						
SIN H01 ←	_		N01 Q		SIN SCK	S	MC SDH		D	Q	QB		
SCK H02 ← SMC H03 ←	ightharpoons				x /		X 1		x	Н	lold		
SDH H04 ←					A /		0 0	:	×	Α	AB		
D H05 ←	\dashv	þ⊸	N02 QB		x /		1 0		В	В	BB		
		_			x 🗸		х х		x	Н	lold		
				X:Irr	elevant								
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	tput"						
				-									
Logic Diagram	tor "QB out	put"		Tru	th Table for	"QB o	utput"						

Chapter 3 Scan Path Block

			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S052	SCK → Q	(HH)	0.489	0.821	1.685	0.015	0.022	0.033	SIN	1.0	Q	22
		(HL)	0.575	1.005	2.102	0.012	0.017	0.026	SCK	1.0	QB	22
	$SCK \rightarrow QB$	(HH)	0.716	1.271	2.724	0.015	0.021	0.031	SMC	1.0		
		(HL)	0.669	1.140	2.386	0.012	0.016	0.023	SDH	1.0		
	Set up time	SIN	1.270		3.530				D	1.0		
	Set up time	SMC	1.310		3.860							
	Set up time	SDH	1.080		3.040							
	Set up time	D	1.260		3.530							
	Hold time	SIN	0.080		0.000							
	Hold time	SMC	0.070		0.000							
	Hold time	SDH	0.260		0.000							
	Hold time	D	0.080		0.000							
	Min Pulse	SCK	0.978		3.293							

Chapter 3 Scan Path Block

Function	Scan .	JK-F/F	with R, S	6, D-F/	F Function	n						
Block type					St		d type					
2.0011 1,700		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S100	14										
x2												
x4												
x8				Ļ								Ш
Logic Diagram		!"		Tru	th Table for	"Norm	ıal"					
SIN H01 ↔ SCK H02 ↔ SMC H03 ↔ J H06 ↔ K H07 ↔	\rightarrow		N01 Q N02 QB	SIN X X X A X X X X X X X X X X X X X X X	SCK SMC X	S 1 0 0 0 0 0	0 X 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C Qn X X X X X X X X X X X X X X X X X X	X X X 1 0 0 X X X	1 0 A B CB	Bn+1 0 1 AB BB C 1 4- Prohibiti	on
Logic Diagram	ior Q outp	ut		iru	th Table for	"Q ou	put					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block type	Path	Path			t LD0 (ns)				Input		Output	
	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S100	SCK → Q	(HH)	0.472	0.804	1.680	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.626	1.117	2.381	0.012	0.018	0.028	SCK	1.0	QB	21
	SCK → QB	(HH)	0.846	1.539	3.333	0.015	0.021	0.030	SMC	1.0		
		(HL)	0.893	1.564	3.293	0.014	0.020	0.031	S	2.2		
	$S \rightarrow Q$	(HH)	0.209	0.325	0.610	0.015	0.022	0.032	R	2.1		
	$S \rightarrow QB$	(HL)	0.629	1.337	2.750	0.014	0.022	0.035	J	1.0		
	$R \rightarrow Q$	(HL)	0.537	1.097	2.346	0.012	0.017	0.027	K	1.0		
	$R \rightarrow QB$	(HH)	0.286	0.505	0.948	0.015	0.023	0.035				
	Set up time	SIN	1.060		3.440							
	Set up time	SMC	1.170		4.130							
	Set up time	J	1.240		4.150							
	Set up time	K	1.160		3.190							
	Hold time	SIN	0.370		0.000							
	Hold time	SMC	0.360		0.000							
	Hold time	J	0.070		0.000							
	Hold time	K	0.080		0.000							
	Release time	S	0.220		0.000							
	Release time	R	0.670		2.090							
	Removal time	S	1.050		1.860							
	Removal time	R	0.620		0.420							
	Min Pulse	SCK	1.190		3.904							
	Min Pulse	S	1.021		3.335							
	Min Pulse	R	1.064		3.105							

Chapter 3 Scan Path Block

Function	n Scan JK-F/F with D-F/F Function											
Block type					St	andar Q ou	d type					
		Nor					B output					
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name cells		Name	cells
x1	S102	12										
x2 x4												
x4 x8												
Logic Diagram	for "Norma	 "		Trut	h Table for	"Norm	al"	<u> </u>				
SIN H01 ← SCK H02 ← SMC H03 ← J H04 ← K H05 ←	\rightarrow		N01 Q	SINN A X X X X:trrele	/ 1 / 1 / 2) X	x x c	X 0 1 X	X A 1 B 0 CB X	Al Bi	3	
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

Block												
	Path	t LD0 (ns)				t 1		Input		Output		
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S102	SCK → Q	(HH)	0.451	0.757	1.564	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.529	0.923	1.951	0.012	0.016	0.024	SCK	1.0	QB	22
	SCK → QB	(HH)	0.716	1.268	2.716	0.015	0.022	0.031	SMC	1.0		
		(HL)	0.697	1.191	2.482	0.012	0.017	0.025	J	1.0		
	Set up time	SIN	1.010		2.450				K	1.0		
	Set up time	SMC	1.080		3.130							
	Set up time	J	1.270		3.150							
	Set up time	K	1.170		3.060							
	Hold time	SIN	0.350		0.000							
	Hold time	SMC	0.350		0.000							
I	Hold time	J	0.130		0.000							
I	Hold time	K	0.080		0.000							
	Min Pulse	SCK	0.981		3.286							

Chapter 3 Scan Path Block

Function	Scan JK-F/F with R, S, Hold, D-F/F Function											
Block type					St		d type					
			mal			Q ou				QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	Name	cells	
x1	S150	18										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
SIN H01 SCK H02 SMC H03 SDH H04 J H07 K H08 H05 R					SCK SMC	SDH S 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	R J 0 X 0 X 0 B 0 X 0 X 1 X 0 X	x x x c x x	Con OBn X X X X X 0 1 1 0 0 X X X X X X X X X X X X X	Hold A B	BBn+1 AB BB C C 1 0 1 Prohibits	n
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 3 Scan Path Block

- I			Swite	ching sp	eed						0.1.1	
Block	Path	t LD0 (ns)				t 1		Input		Output		
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S150	SCK → Q	(HH)	0.472	0.805	1.679	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.629	1.120	2.386	0.012	0.018	0.028	SCK	1.0	QB	21
	SCK → QB	(HH)	0.874	1.590	3.435	0.015	0.021	0.031	SMC	1.0		
		(HL)	0.948	1.669	3.503	0.015	0.021	0.034	SDH	1.0		
	$R \rightarrow Q$	(HL)	0.539	1.143	2.449	0.012	0.017	0.027	R	2.2		
	$R \rightarrow QB$	(HH)	0.308	0.545	1.026	0.015	0.023	0.035	S	2.3		
	$S \rightarrow Q$	(HH)	0.209	0.325	0.610	0.015	0.022	0.032	J	1.0		
	$S \rightarrow QB$	(HL)	0.683	1.443	2.966	0.015	0.023	0.037	K	1.0		
	Set up time	SIN	1.320		4.520							
	Set up time	SMC	1.390		4.980							
	Set up time	SDH	1.070		3.710							
	Set up time	J	1.470		4.970							
	Set up time	K	1.450		4.320							
	Hold time	SIN	0.070		0.000							
	Hold time	SMC	0.040		0.000							
	Hold time	SDH	0.350		0.000							
	Hold time	J	0.000		0.000							
	Hold time	K	0.000		0.000							
	Release time	R	0.670		2.100							
	Release time	S	0.220		0.000							
	Removal time	R	0.620		0.420							
	Removal time	S	1.040	1	1.850		1			l		
	Min Pulse	SCK	1.246		4.089							
	Min Pulse	R	1.112		3.228							
	Min Pulse	S	1.075		3.550							

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Chapter 3 Scan Path Block

Function	Scan	JK-F/I	with Hold	d, D-F	F Functio	n						
Block type					St		d type					
		Nor	mal			Q ou	tput			QB ou	ıtput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S152	16										
x2												
x4												
x8 Logic Diagram	for "Norma	 "		Trut	h Table for	"Norm	al"					
SIN H01 ← SCK H02 ← SMC H03 ← SDH H04 ← J H05 ← K H06 ←	→		N01 Q	SIN X A X X X X:Irrele	/ X / 0 / 1 / 1 \ X	SDH 1 0 0 0 X	J K X X X X B X X C X X	Qn X X Q 0 1 X X	X X 1	Hold A	3n+1 AB BB C	
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S152	SCK → Q	(HH)	0.451	0.757	1.563	0.015	0.022	0.032	SIN	1.0	Q	22
		(HL)	0.530	0.926	1.954	0.012	0.016	0.024	SCK	1.0	QB	21
	SCK → QB	(HH)	0.746	1.318	2.813	0.015	0.022	0.032	SMC	1.0		
		(HL)	0.734	1.259	2.611	0.013	0.018	0.027	SDH	1.0		
	Set up time	SIN	1.300		3.610				J	1.0		
	Set up time	SMC	1.330		3.970				K	1.0		
	Set up time	SDH	1.020		2.700							
	Set up time	J	1.480		4.030							
	Set up time	K	1.450		4.230							
	Hold time	SIN	0.060		0.000							
	Hold time	SMC	0.030		0.000							
	Hold time	SDH	0.340		0.000							
	Hold time	J	0.000		0.000							
	Hold time	K	0.000		0.000							
	Min Pulse	SCK	1.020		3.384							

Chapter 3 Scan Path Block

Function	Scan I	D-Late	h with R,	D-F/F	Function							
Block type					St		d type					
			mal			Q ou				QB ou	-	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S201	13										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
SIN H01 ←		-	N01 Q	5	SIN SCK	SM	C R	D	G	Q	QB	
SCK H02 ↔	→				х х	х	1	х	х	0	1	
SMC H03 ↔				1 1	A /	0	0	Х	х		AB	
D H05 ↔ G H06 ↔		\sim	N02 QB	1 1	x	0	0	X B	X 1	Hold B	BB	
G 1100 ¥			NOZ QD	1 1	x x	1	0	х	0	Latch		
	Į H04				X 1	Dow	m 0	1	1	Х	X ← Proi	nibition
Logic Diagram	for "Q outp	ut"		Trui	th Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB or	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S201	SCK → Q	(HH)	0.964	1.736	3.861	0.014	0.021	0.029	SIN	1.0	Q	22
l		(HL)	0.804	1.388	2.995	0.012	0.016	0.023	SCK	1.0	QB	22
l	SCK → QB	(HH)	0.622	1.069	2.301	0.015	0.022	0.032	SMC	1.0		
l		(HL)	0.803	1.429	3.137	0.013	0.018	0.028	R	2.1		
l	$R \rightarrow Q$	(HL)	0.474	0.788	1.581	0.012	0.017	0.026	D	1.0		
l	$R \rightarrow QB$	(HH)	0.214	0.331	0.620	0.015	0.022	0.032	G	1.0		
l	$D \rightarrow Q$	(HH)	0.838	1.471	3.262	0.014	0.021	0.029				
l		(LL)	0.779	1.421	3.129	0.012	0.016	0.023				
l	$D \rightarrow QB$	(HL)	0.676	1.163	2.537	0.013	0.018	0.028				
l		(LH)	0.596	1.099	2.428	0.015	0.022	0.032				
l	$G \rightarrow Q$	(HH)	0.958	1.733	3.858	0.014	0.021	0.029				
l		(HL)	0.801	1.386	3.003	0.012	0.016	0.023				
l	$G \rightarrow QB$	(HH)	0.619	1.067	2.308	0.015	0.022	0.032				
l		(HL)	0.797	1.426	3.134	0.013	0.018	0.028				
l	Set up time	SIN	0.970		3.250							
l	Set up time	SMC	1.270		2.790							
l	Set up time	D	0.920		2.000							
l	Hold time	SIN	0.600		0.620							
l	Hold time	SMC	0.000		0.000							
l	Hold time	D	0.370		0.000							
l	Release time	R	0.570		1.320							
I	Removal time	R	0.790		1.270							
I	Min Pulse	SCK	1.342		4.510							
I	Min Pulse	R	0.732		2.188							
	Min Pulse	G	1.329		4.501							

Chapter 3 Scan Path Block

Function	Scan	D-Late	ch with D-I	/F Fu	nction							
Block type					St		d type					
		_	mal			Q ou	tput			QB or	ıtput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S202	12										
x2												
x4												
x8 Logic Diagram	for "Norma			Two	h Tabla for	"Nlorm						
Logic Diagram	ioi ivoiiiia	ı		Irui	h Table for	INOIT	iai					
SIN H01 ←		ightharpoonup	N01 Q		SIN SC	K	SMC	D	G	Q	QB	
SCK H02 ←	→				A /		0	х	Х	A	AB	
SMC H03 ←					x \		0	х	Х	Hold		
D H04 ← G H05 ←		b⊸	N02 QB		x x		1	В	1	В	вв	
		_ĭ			x x		1	Х	0	Latch		
					X 1		Down	1	1	Х	X ← P	rohibition
				X:Irre	elevant							
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t	D0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S202	SCK → Q	(HH)	0.833	1.476	3.269	0.015	0.021	0.030	SIN	1.0	Q	22
l		(HL)	0.783	1.350	2.932	0.012	0.016	0.023	SCK	1.0	QB	22
l	SCK → QB	(HH)	0.608	1.041	2.253	0.015	0.022	0.032	SMC	1.0		
l		(HL)	0.699	1.225	2.683	0.012	0.016	0.024	D	1.0		
l	$D \rightarrow Q$	(HH)	0.699	1.199	2.653	0.015	0.021	0.030	G	1.0		
l		(LL)	0.775	1.401	3.085	0.012	0.016	0.023				
l	$D \rightarrow QB$	(HL)	0.564	0.946	2.065	0.012	0.016	0.024				
l		(LH)	0.598	1.089	2.399	0.015	0.022	0.032				
l	$G \rightarrow Q$	(HH)	0.827	1.472	3.266	0.015	0.021	0.030				
l		(HL)	0.785	1.354	2.950	0.012	0.016	0.023				
l	$G \rightarrow QB$	(HH)	0.610	1.045	2.270	0.015	0.022	0.032				
l		(HL)	0.693	1.221	2.680	0.012	0.016	0.024				
l	Set up time	SIN	0.990		3.180							
l	Set up time	SMC	1.270		2.780							
l	Set up time	D	0.930		1.980							
l	Hold time	SIN	0.620		0.670							
I	Hold time	SMC	0.020		0.000							
I	Hold time	D	0.490		0.360							
I	Min Pulse	SCK	1.214		3.918							
	Min Pulse	G	1.200		3.909							

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Chapter 3 Scan Path Block

Function	Scan	D-Late	ch with D-I	F/F Fu	nction, Hi	gh Sp	eed					
Block type					St		d type					
Dicon type		Nor	mal			Q ou	tput			QB o	utput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Nan	ne cells
x1	S204	12										
x2												
x4												
x8				\perp								
Logic Diagram	for "Norma	l" 		Trut	h Table for	"Norm	ıal"					
SIN H01 ↔		-	N01 Q	:	SIN SC	K	SMC	D	G	Q	QB	
SCK H02 +					A /		0	х	х	Α	АВ	
SMC H03 ↔ D H04 ↔					х \		0	X	Х	Hold		
G H05 ◆		\triangleright	N02 QB		х х		1	В	1	В	ВВ	
					X X X X		1	X 1	0	Latch X		- Prohibition
							Down	1	1	Х	X	Pronibition
				X:Irre	elevant							
Logic Diagram					h Table for							
Logic Diagram	for "QB out	put"		Trut	h Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	IN → C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S204	SCK → Q	(HH)	0.607	1.062	2.345	0.016	0.024	0.038	SIN	1.0	Q	19
1		(HL)	0.596	1.074	2.291	0.015	0.021	0.034	SCK	1.0	QB	22
1	$SCK \rightarrow QB$	(HH)	0.752	1.403	3.084	0.014	0.021	0.028	SMC	1.0		
1		(HL)	0.786	1.405	3.140	0.011	0.015	0.023	D	1.0		
1	$D \ \to \ Q$	(HH)	0.472	0.793	1.755	0.016	0.024	0.038	G	1.0		
1		(LL)	0.532	1.012	2.280	0.016	0.022	0.035				
1	$D \ \to QB$	(HL)	0.653	1.138	2.556	0.011	0.015	0.023				
1		(LH)	0.703	1.367	3.099	0.014	0.020	0.028				
1	$G \ \to Q$	(HH)	0.600	1.057	2.339	0.016	0.024	0.038				
1		(HL)	0.599	1.083	2.318	0.015	0.021	0.034				
1	$G \rightarrow QB$	(HH)	0.757	1.415	3.114	0.014	0.021	0.028				
1		(HL)	0.780	1.400	3.134	0.011	0.015	0.023				
1	Set up time	SIN	0.810		3.260							
1	Set up time	SMC	1.310		3.390							
1	Set up time	D	1.010		2.560							
1	Hold time	SIN	0.620		0.680							
1	Hold time	SMC	0.020		0.000							
1	Hold time	D	0.500		0.270							
1	Min Pulse	SCK	1.168		3.790							
	Min Pulse	G	1.154		3.778							

Chapter 3 Scan Path Block

Function	Scan I	D-Late	h with R,	Speci	al Functio	n						
Block type					St		d type					
			mal			Q ou				QB ou		
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	S301	8										
x2												
x4												
x8				_								Щ
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
AMC H01 ←		-	N01 Q		MC R	D	GB	Q	QB			
D H03 ←				1 1	1 0	0	0	0	1			
				1 1	1 0 1 0	1 X	0	1 Lato	0 h			
GB H04 ←	-d	þ⊸	N02 QB		X 1	X	×	0	1			
		_			0 0	0	0	0	1			
	HĎ2 R				0 0	0	1	0	1			
				1 1	0 0 0 0	1	0	0	1 0			
				-	elevant		'	<u> </u>				
Logic Diagram	for "Q outp	ut"		Trut	th Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trui	th Table for	"QB or	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S301	$AMC \rightarrow Q$	(HH)	0.755	1.349	3.082	0.014	0.021	0.029	AMC	1.8	Q	22
l		(LH)	0.754	1.394	3.075	0.014	0.021	0.029	R	1.0	QB	22
l		(LL)	0.856	1.463	3.182	0.012	0.016	0.023	D	1.0		
l	$AMC \rightarrow QB$	(HL)	0.592	1.038	2.352	0.013	0.018	0.028	GB	1.9		
l		(LH)	0.670	1.138	2.477	0.015	0.022	0.032				
l		(LL)	0.590	1.082	2.346	0.013	0.018	0.028				
l	$R \rightarrow Q$	(HL)	0.396	0.650	1.308	0.012	0.016	0.023				
l		(LH)	0.474	0.901	1.992	0.014	0.021	0.030				
l	$R \rightarrow QB$	(HH)	0.212	0.330	0.619	0.015	0.022	0.032				
l		(LL)	0.311	0.591	1.267	0.013	0.018	0.028				
l	$D \rightarrow Q$	(HH)	0.755	1.340	3.023	0.014	0.021	0.029				
l		(LL)	0.595	1.054	2.273	0.012	0.016	0.023				
l	$D \rightarrow QB$	(HL)	0.591	1.029	2.294	0.013	0.018	0.028				
l		(LH)	0.411	0.733	1.578	0.015	0.022	0.032				
l	$GB \rightarrow Q$	(HH)	0.804	1.443	3.292	0.014	0.021	0.029				
l		(LH)	0.765	1.392	3.056	0.014	0.021	0.029				
		(LL)	0.637	1.572	3.366	0.012	0.016	0.023				
l	$GB \rightarrow QB$	(HL)	0.640	1.132	2.562	0.013	0.018	0.028				
l		(LH)	0.455	1.244	2.654	0.015	0.022	0.032				
l		(LL)	0.602	1.082	2.327	0.013	0.018	0.028				
l	Set up time	D	0.990		2.080							
l	Hold time	D	0.470		0.120							
I	Release time	R	0.640		0.910							
I	Removal time	R	0.570		0.320							
l	Min Pulse	R	0.743	1	2.271		1					
	Min Pulse	GB	1.162		3.847							

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Chapter 3 Scan Path Block

Function	Scan I	D-Late	ch with Sp	ecial F	unction								
Block type					St	andar							
			mal			Q ou	_				QB ou		
Drivability	Name	cells	Name	cells	Name	cells	N	lame	cells	Name	cells	Name	cells
x1	S302	7											
x2													
x4													
х8													\perp
Logic Diagram	for "Norma	l" 		Trut	h Table for	"Norm	al"						
AMC H01 ←		-	N01 Q	А	MC D	G	В	Q	QB				
D H02 ←					1 0	()	0	1				
				1 1	1 1)	1	0				
GB H03 ←	-9	_p→	N02 QB	1 1	1 X		1		tch				
				1 1	0 0		1	0	1				
				1 1	0 1			0	1				
				1 1	0 1		1	1	0				
				X:Irr	elevant					J			
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"	1					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utpu	t"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S302	$AMC \rightarrow Q$	(HH)	0.626	1.092	2.496	0.015	0.021	0.030	AMC	1.8	Q	22
l		(LH)	0.625	1.133	2.483	0.015	0.021	0.030	D	1.0	QB	22
l		(LL)	0.861	1.453	3.159	0.012	0.016	0.023	GB	1.9		
l	$AMC \rightarrow QB$	(HL)	0.486	0.834	1.899	0.012	0.016	0.024				
l		(LH)	0.678	1.133	2.460	0.015	0.022	0.032				
l		(LL)	0.485	0.874	1.886	0.012	0.016	0.024				
l	$D \rightarrow Q$	(HH)	0.626	1.083	2.437	0.015	0.021	0.030				
l		(LL)	0.591	1.039	2.245	0.012	0.016	0.023				
l	$D \rightarrow QB$	(HL)	0.486	0.824	1.841	0.012	0.016	0.024				
l		(LH)	0.410	0.722	1.557	0.015	0.022	0.032				
l	$GB \rightarrow Q$	(HH)	0.673	1.185	2.706	0.015	0.021	0.030				
l		(LH)	0.637	1.133	2.464	0.015	0.021	0.030				
l		(LL)	0.632	1.562	3.343	0.012	0.016	0.023				
l	$GB \rightarrow QB$	(HL)	0.533	0.926	2.108	0.012	0.016	0.024				
l		(LH)	0.452	1.238	2.637	0.015	0.022	0.032				
l		(LL)	0.497	0.875	1.869	0.012	0.016	0.024				
I	Set up time	D	0.910		1.700							
I	Hold time	D	0.460		0.120							
	Min Pulse	GB	1.167		3.823							

Chapter 3 Scan Path Block

Function	Scan	D-Late	ch with Sp	ecial	Function, I	рее	ed						
Block type					St	andar							
Diodic type		Nor	mal			Q ou	tput	:			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	N	lame	cells	Name	cells	Name	cells
x1	S303	7											
x2													\perp
x4													
x8				<u> </u>									\perp
Logic Diagram	for "Norma	l"		Tru	ith Table for	"Norm	ıal"						
AMC H01 ←		}⊸	N01 Q		AMC D	G	В	Q	QB				
D H02 ←					1 0	(0	0	1				
					1 1		0	1	0				
GB H03 ←	-9	p→	N02 QB		1 X		1		itch				
		_			0 0		0	0	1				
					0 0 0		1 D	0	1				
					0 1		1	1	0				
				X:Ir	relevant					J			
	f Q .			-	U. T. I. I. C.	10							\dashv
Logic Diagram	tor "Q outp	ut"		Iru	ith Table for	"Q ou	tput"						
Logic Diagram	for "QB out	put"		Tru	ıth Table for	"QB o	utpu	ıt"					
				•									

Chapter 3 Scan Path Block

- I			Swite	ching sp	eed							
Block	Path		t I	LDO (ns))		t 1		l In	put	Ou	tput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
S303	$AMC \rightarrow Q$	(HH)	0.399	0.686	1.602	0.016	0.024	0.037	AMC	1.8	Q	19
l		(LH)	0.404	0.740	1.620	0.016	0.024	0.038	D	1.0	QB	21
l		(LL)	0.643	1.102	2.404	0.016	0.022	0.034	GB	1.9		
l	$AMC \rightarrow QB$	(HL)	0.575	1.024	2.390	0.011	0.015	0.023				
l		(LH)	0.816	1.449	3.212	0.014	0.020	0.028				
l		(LL)	0.582	1.080	2.414	0.011	0.015	0.023				
l	$D \rightarrow Q$	(HH)	0.398	0.676	1.543	0.016	0.024	0.037				
l		(LL)	0.352	0.637	1.372	0.013	0.019	0.029				
l	$D \rightarrow QB$	(HL)	0.575	1.014	2.331	0.011	0.015	0.023				
l		(LH)	0.495	0.926	2.048	0.014	0.021	0.030				
l	$GB \rightarrow Q$	(HH)	0.447	0.782	1.818	0.016	0.024	0.037				
l		(LH)	0.417	0.740	1.607	0.016	0.024	0.037				
l		(LL)	0.408	1.189	2.566	0.014	0.022	0.034				
l	$GB \rightarrow QB$	(HL)	0.625	1.124	2.613	0.011	0.015	0.023				
l		(LH)	0.528	1.558	3.403	0.014	0.021	0.030				
l		(LL)	0.593	1.078	2.395	0.011	0.015	0.023				
I	Set up time	D	0.980		2.070							
I	Hold time	D	0.450		0.070							
	Min Pulse	GB	1.132		3.892							

Chapter 3 Scan Path Block	Chapter 3 Scan Path Block
[MEMO]	[MEMO]

Chapter 3 Scan Path Block

Chapter 3 Scan Path Block

[MEMO]

3.2 NEC Scan

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-Latch									
Block type					S		d type					
		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE601	13										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Trut	th Table for	"Norm	ıal"					
D H01 ←			N01 Q	Ь	G	Q	QB					
				0		0	1					
				1 1		1	0					
						Latch						
G H02 ←		\bigcirc	N02 QB			Laton						
				X:lrr	elevant							
Logic Diagram	for "Q outp	ut"		Trut	th Table for	"Q out	tput"					
Logic Diagram	for "OB out	nut"		Trus	th Table for	"OB ^	utout"					\dashv
Logic Diagram	וטו עם טעו	pui		""	iii iable i0l	Q D 0	αιραι					

Chapter 3 Scan Path Block

			Swite	ching sp	eed						_	
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE601	$D \rightarrow Q$	(HH)	0.794	1.425	3.117	0.014	0.021	0.030	D	1.0	Q	22
l		(LL)	0.788	1.404	3.071	0.012	0.016	0.024	G	2.0	QB	20
l	$D \rightarrow QB$	(HL)	0.610	1.059	2.289	0.014	0.019	0.030				
l		(LH)	0.585	1.018	2.208	0.015	0.023	0.035				
l	$G \rightarrow Q$	(HH)	0.609	1.134	2.511	0.014	0.021	0.030				
l		(HL)	0.628	1.126	2.507	0.012	0.016	0.024				
l	$G \rightarrow QB$	(HH)	0.427	0.744	1.657	0.015	0.023	0.035				
l		(HL)	0.435	0.785	1.708	0.013	0.019	0.030				
I	Set up time	D	1.270		3.030							
I	Hold time	D	0.090		0.000							
	Min Pulse	G	1.056		3.301							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-Latch wi	th F	}								
Block type						St		rd type					
			mal				Qο	utput			QB ou	tput	
Drivability	Name	cells	Name	cel	ls	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE602	14											
x2													
x4													
x8													Ш
Logic Diagram f	for "Norma			Т	rutl	h Table for	"Nor	nal"					
D H01 ←		<u></u>	N01 Q		D	G F	3	Q QB]				
					1	1 ()	1 0					
					0	1 (0 1					
G H02 ←		b⊸	N02 QB		Χ	0 0		Latch					
]		l L	Х	Х .		0 1					
	H03 R			x	:Irre	elevant							
	н												
Logic Diagram f	for "Q outp	ut"		Т	rutl	h Table for	"Q oı	ıtput"					
Logic Diagram f	for "QB out	put"		Т	ruth	h Table for	"QB	output"					\dashv
				'	J. 1.			-					

Chapter 3 Scan Path Block

			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	l Ou	itput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE602	$D \rightarrow Q$	(HH)	0.998	1.839	4.088	0.014	0.020	0.028	D	1.0	Q	21
1		(LL)	0.782	1.403	3.074	0.012	0.016	0.024	G	1.9	QB	20
1	$D \ \to QB$	(HL)	0.793	1.412	3.114	0.015	0.023	0.035	R	2.4		
1		(LH)	0.580	1.018	2.215	0.015	0.023	0.035				
1	$G \ \to Q$	(HH)	0.636	1.224	2.775	0.014	0.021	0.029				
1		(HL)	0.625	1.121	2.495	0.012	0.016	0.024				
1	$G \ \to QB$	(HH)	0.425	0.741	1.649	0.015	0.023	0.035				
1		(HL)	0.449	0.832	1.858	0.015	0.021	0.034				
1	$R \rightarrow Q$	(HL)	0.522	0.954	2.047	0.012	0.016	0.023				
1		(LH)	0.787	1.540	3.471	0.014	0.020	0.028				
1	$R \rightarrow QB$	(HH)	0.330	0.587	1.214	0.015	0.023	0.035				
1		(LL)	0.582	1.113	2.497	0.015	0.023	0.035				
1	Set up time	D	1.480		4.050							
1	Hold time	D	0.110		0.000							
1	Release time	R	1.220		3.340							
1	Removal time	R	0.000		0.000							
1	Min Pulse	G	1.076		3.533							
	Min Pulse	R	1.097		3.873							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-Latch wi	th RE	1							
Block type					St		d type					
		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE603	14										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←		-	N01 Q		D G	RB	Q C	QΒ				
					1 1	1	1	0				
					0 1	1	0	1				
G H02 ←	4	b	N02 QB		X 0	1	Latch					
	L-0				х х	0	0	1				
	H03 RB			X:Ir	relevant							
	HB											
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
Lania D'ann	f CD				AL TALL C	IOD						
Logic Diagram	ior "QB out	put"		Iru	th Table for	GR 0	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed				l .			
Block	Path		t i	LDO (ns))		t 1		l In	put	l Ou	itput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE603	$D \rightarrow Q$	(HH)	0.769	1.345	2.969	0.015	0.023	0.035	D	1.0	Q	20
		(LL)	0.714	1.253	2.707	0.012	0.016	0.025	G	1.9	QB	21
	$D \rightarrow QB$	(HL)	0.976	1.713	3.798	0.012	0.016	0.023	RB	2.5		
		(LH)	0.866	1.534	3.352	0.015	0.021	0.030				
	$G \rightarrow Q$	(HH)	0.565	1.005	2.273	0.015	0.023	0.035				
		(HL)	0.559	0.987	2.169	0.012	0.016	0.025				
	$G \rightarrow QB$	(HH)	0.710	1.267	2.812	0.015	0.021	0.030				
		(HL)	0.772	1.373	3.101	0.012	0.016	0.023				
	$RB \rightarrow Q$	(HH)	0.270	0.478	1.215	0.015	0.023	0.035				
		(LL)	0.271	0.458	0.907	0.012	0.016	0.025				
	$RB \rightarrow QB$	(HL)	0.477	0.845	2.044	0.012	0.016	0.023				
		(LH)	0.426	0.839	1.747	0.015	0.022	0.032				
	Set up time	D	1.250		2.880							
	Hold time	D	0.140		0.000							
	Release time	RB	0.680		0.860							
1	Removal time	RB	0.550		0.450							
1	Min Pulse	G	1.185		3.744							
	Min Pulse	RB	0.793		2.315							

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Chapter 3 Scan Path Block

Function	NEC S	Scan [D-Latch(G	В)								
Block type					St		d type					
		_	mal			Q ou		,		QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE604	13										
x2												
х4												
x8												
Logic Diagram	for "Norma	l"		Trut	th Table for	"Norm	al"					
D H01 ←			N01 Q		O GB	Q	QB					
					1 0	1	0					
				1 1	0	0	1					
GB H02 ←		h	N02 QB	1 1	X 1		ıtch					
GB 1102 *		Γ,	INOL QD	V-lrr	elevant							
				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	elevani							
Logio Diogram	for "O outp			Territ	th Toble for	"O aut						-
Logic Diagram	for "Q outp	ut		Irui	th Table for	Q out	put					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → C	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE604	$D \rightarrow Q$	(HH)	0.791	1.418	3.103	0.014	0.021	0.030	D	1.0	Q	22
		(LL)	0.790	1.409	3.086	0.012	0.016	0.024	GB	2.0	QB	20
	$D \to QB$	(HL)	0.608	1.051	2.273	0.014	0.019	0.030				
		(LH)	0.587	1.023	2.222	0.015	0.023	0.035				
	$GB \to Q$	(LH)	0.668	1.283	2.842	0.014	0.021	0.030				
		(LL)	0.651	1.207	2.666	0.012	0.016	0.024				
	$GB \to QB$	(LH)	0.449	0.823	1.808	0.015	0.023	0.035				
		(LL)	0.491	0.935	2.040	0.013	0.019	0.029				
	Set up time	D	1.200		2.920							
I	Hold time	D	0.020		0.000							
	Min Pulse	GB	1.108		3.512							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-Latch(G	B) wit	h RB							
Block type					St		d type					
		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE605	14										
x2												
x4												
x8				Ļ								
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←		_	N01 Q		D GB	RB	Q (ΩВ				
					1 0	1	1	0				
					0 0	1	0	1				
GB H02 ←	d	b⊸	N02 QB		X 1	1	Latch					
		J			х х	0	0	1				
	H03 RB			X:In	relevant							
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
Logio Diagra	for "OP and	nut"		Turr	th Toble for	"OP ==	utout"					\dashv
Logic Diagram	וטו עם טעו	μuι		l "u	th Table for	QD 01	μιραι					

Chapter 3 Scan Path Block

- I			Swite	ching sp	eed				J .			
Block	Path		t	LDO (ns))		t 1		l In	put	l Ou	ıtput
type	IN → C	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE605	$D \rightarrow Q$	(HH)	0.768	1.342	2.961	0.015	0.023	0.035	D	1.0	Q	20
		(LL)	0.714	1.254	2.713	0.012	0.016	0.025	GB	1.9	QB	21
	$D \rightarrow QB$	(HL)	0.974	1.711	3.791	0.012	0.016	0.023	RB	2.5		
		(LH)	0.866	1.535	3.359	0.015	0.021	0.030				
	$GB \rightarrow Q$	(LH)	0.642	1.204	2.721	0.015	0.023	0.035				
		(LL)	0.570	1.033	2.232	0.012	0.016	0.025				
	$GB \rightarrow QB$	(LH)	0.722	1.314	2.877	0.015	0.021	0.030				
		(LL)	0.849	1.571	3.549	0.012	0.016	0.023				
	$RB \rightarrow Q$	(HH)	0.270	0.478	1.213	0.015	0.023	0.035				
		(LL)	0.272	0.457	0.907	0.012	0.016	0.025				
	$RB \rightarrow QB$	(HL)	0.477	0.845	2.042	0.012	0.016	0.023				
		(LH)	0.426	0.838	1.747	0.015	0.022	0.032				
	Set up time	D	1.170		2.740							
	Hold time	D	0.080		0.000							
	Release time	RB	0.630		0.810							
I	Removal time	RB	0.590		0.500							
I	Min Pulse	GB	1.246		4.083							
	Min Pulse	RB	0.792		2.315							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-F/F									
Block type					St	andar	d type					
		Nor	mal			Q ou	tput			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE611	11										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Trut	h Table for	"Norm	al"					
D H01 ← C H02 ←			N01 Q N02 QB	0 1 X	7	Q 0 1 Hold	QB 1 0					
. C ⊓u2 -	7	,	INUZ QB		elevant							
Logic Diagram	for "Q outp	ut"		Trut	h Table for	"Q out	put"					
Logic Diagram	for "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN \rightarrow C	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE611	$C \rightarrow Q$	(HH)	0.484	0.824	1.788	0.015	0.022	0.032	D	1.0	Q	22
l .		(HL)	0.536	0.936	2.055	0.012	0.016	0.024	С	2.3	QB	22
	$C \rightarrow QB$	(HH)	0.692	1.228	2.722	0.015	0.021	0.031				
l .		(HL)	0.690	1.191	2.581	0.012	0.016	0.024				
l .	Set up time	D	0.880		1.870							
l .	Hold time	D	0.430		0.270							
	Min Pulse	С	1.151		3.472							

Chapter 3 Scan Path Block

Function	NEC S	Scan [O-F/F with	R, S								
Block type					St		d type					
		_	mal			Q ou	tput			QB ou	itput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE614	13										
x2												
x4												
x8				_								ш
Logic Diagram		l"		Tru	th Table for	"Norm	al"					
	S H04			0		R S		QB				
		1				0		1				
D H01 ←			N01 Q	1		0		0				
				×		0						
				′,		1 0		0				
C H02 ←	→	þ⊸	N02 QB	^		1 1		1	← Prohibitio	n		
		J		-			1 '		· · · · · · · · · · · · · · · · · · ·			
	H <mark>0</mark> 3 R			X:In	relevant							
Logic Diagram	for "O outn	ut"		Tru	th Table for	"O out	nut"					-
Logio Diagram	ioi & outp	ut		""	iii iabio ioi	Q out	put					
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"					- 1

Chapter 3 Scan Path Block

Б			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	$IN \rightarrow C$	DUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE614	$C \rightarrow Q$	(HH)	0.494	0.857	1.879	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.628	1.124	2.474	0.013	0.018	0.028	С	2.4	QB	21
	$C \rightarrow QB$	(HH)	0.803	1.474	3.296	0.014	0.021	0.030	R	2.2		
		(HL)	0.834	1.478	3.241	0.013	0.018	0.028	S	2.4		
	$R \rightarrow Q$	(HL)	0.539	1.039	2.245	0.012	0.017	0.027				
	$R \rightarrow QB$	(HH)	0.250	0.448	0.846	0.015	0.022	0.034				
	$S \rightarrow Q$	(HH)	0.209	0.325	0.611	0.015	0.022	0.032				
	$S \rightarrow QB$	(HL)	0.547	1.196	2.494	0.013	0.020	0.032				
	Set up time	D	0.980		2.890							
	Hold time	D	0.450		0.270							
	Release time	R	0.720		2.170							
	Release time	S	0.370		0.580							
	Removal time	R	0.520		0.130							
	Removal time	S	0.900		1.480							
	Min Pulse	С	1.313		4.110							
	Min Pulse	R	0.984		2.969							
	Min Pulse	S	1.010		3.327							

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Chapter 3 Scan Path Block

Standard type	Function	NEC S	Scan [D-F/F with	RB								
Drivability Name cells Name	Block type					St	andar	d type					
x1 SE615 12 12 12 13 14			_				Q ou	tput			QB ou	tput	
x2 x4 x8 Logic Diagram for "Normal" D H01 → N02 QB H03 RB C H02 → N02 QB Truth Table for "Q output" Truth Table for "Q output" Truth Table for "Q output"	Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x4 x8 Logic Diagram for "Normal" D H01 → N02 QB H03 RB C H02 → N02 QB Truth Table for "Q output" Truth Table for "Q output" Truth Table for "Q output"	x1	SE615	12										
X8													
Logic Diagram for "Normal" D H01 N01 Q D C RB Q OB O / 1 0 1 1 / 1 1 0 X X 1 Hold X X 0 0 1 X:Irrelevant Logic Diagram for "Q output" Truth Table for "Normal" Truth Table for "Normal" D C RB Q OB O / 1 0 1 1 / 1 1 0 X X 1 Hold X X Q O 0 1 Truth Table for "Q output"	x4												
D H01 N01 Q C H02 N02 QB H03 RB NO1 Q X													Щ
C H02 N02 QB N03 RB N02 QB X	Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
C H02 N02 QB H03 RB N02 QB X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"	D H01 ←		├	N01 Q		D C	RB	Q C	QB				
C H02 N02 QB N02 QB X 1 Hold X X 0 0 1 X:Irrelevant Truth Table for "Q output"							1	0	1				
Logic Diagram for "Q output" Truth Table for "Q output" Truth Table for "Q output"					1 1		1	1	0				
H03 RB X:Irrelevant Truth Table for "Q output" Truth Table for "Q output"	C H02 ←	→	→	N02 QB	1 1								
Logic Diagram for "Q output" Truth Table for "Q output"			J			X X	0	0	1				
Logic Diagram for "Q output" Truth Table for "Q output"		H03 RB			X:In	relevant							
	Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	:put"					-
Logic Diagram for "QB output" Truth Table for "QB output"								,					
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram for "QB output" Truth Table for "QB output"													
Logic Diagram of QB output	Logic Diogram	for "OP out	nut"		Terr	th Tabla for	"OP 0	utput"					
	Logic Diagram	וטו עם טעו	ρuι		""u	iii iable i0l	ان طیب	αιραι					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE615	$C \rightarrow Q$	(HH)	0.554	0.970	2.166	0.015	0.022	0.034	D	1.0	Q	21
1		(HL)	0.547	0.956	2.092	0.012	0.016	0.024	С	2.4	QB	21
	$C \rightarrow QB$	(HH)	0.707	1.252	2.765	0.015	0.021	0.031	RB	2.5		
1		(HL)	0.768	1.358	3.041	0.012	0.016	0.023				
	$RB \rightarrow Q$	(LL)	0.246	0.407	0.800	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.410	0.802	1.662	0.015	0.022	0.033				
1	Set up time	D	0.920		2.060							
	Hold time	D	0.440		0.290							
	Release time	RB	0.490		0.500							
	Removal time	RB	0.760		1.120							
	Min Pulse	С	1.218		3.823							
	Min Pulse	RB	0.777		2.334							

Chapter 3 Scan Path Block

Function	NEC S	Scan (D-F/F with	SB								
Block type					St	andar	d type					
		Nor	mal			Q ou	-			QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE616	12										
x2												
x4												
х8												\perp
Logic Diagram	for "Norma	l"		Trut	th Table for	"Norm	al"					
	SB			l —				_				
	SB H03 Î) C	SB	Q C	βB				
		1) /	1	0	1				
D H01 ←			N01 Q		1 /	1	1	0				
				1 1	χ >	1	Hold					
					x x	0	1	0				
C H02 ←	\rightarrow	þ⊸	N02 QB	X:Irr	elevant							
		J										
Logic Diagram	for "Q outp	ut"		Trut	th Table for	"Q out	put"					
				-								
Logic Diagram	tor "QB out	put"		Trut	th Table for	"QB o	utput"					

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	$IN \rightarrow 0$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE616	$C \rightarrow Q$	(HH)	0.488	0.830	1.796	0.015	0.022	0.032	D	1.0	Q	22
		(HL)	0.562	0.992	2.199	0.012	0.016	0.024	С	2.4	QB	21
	$C \rightarrow QB$	(HH)	0.799	1.451	3.316	0.015	0.022	0.033	SB	2.3		
		(HL)	0.694	1.199	2.600	0.012	0.016	0.024				
	SB → Q	(LH)	0.485	1.007	2.183	0.015	0.022	0.032				
	$SB \rightarrow QB$	(LL)	0.290	0.593	1.159	0.012	0.017	0.028				
	Set up time	D	0.950		2.290							
	Hold time	D	0.400		0.250							
	Release time	SB	0.680		1.240							
I	Removal time	SB	0.560		0.460							
	Min Pulse	С	1.221		4.105							
	Min Pulse	SB	0.878		2.767							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-F/F with	RB, S	SB								
Block type					St	andar	d type						
		Nor	mal			Q ou	tput				QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	e cells	N	ame	cells	Name	cells
x1	SE617	13											
x2													
x4													
x8													Ш
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"						
	SB H04				D C	RB	SB		QB				
		1		1 1	0 /	1	1	0	1				
D H01 ←	1	├	N01 Q		1 /	1	1	1	0				
				1 1	x \script	1	1	Hold					
					x x x x	0	0	0 1	1 0				
C H02 ←	\rightarrow	þ⊸	N02 QB	1 1	х х	0	0	0	0	∠ Pr	ohibition		
	LQ.	ı		-			Ů		ـــــا		31110111011		
	HÕ3 RB			X:Irr	relevant								
Logic Diagram	for "O outp	ut"		Tru	th Table for	"O out	nut"						\dashv
Logic Diagram	for "QB out	put"		Tru	th Table for	"QB o	utput"						

Chapter 3 Scan Path Block

Б			Swite	ching sp	eed				l .			
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	ıtput
type	$IN \rightarrow C$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE617	$C \rightarrow Q$	(HH)	0.536	0.944	2.125	0.015	0.022	0.034	D	1.0	Q	21
		(HL)	0.554	0.981	2.189	0.012	0.016	0.024	С	2.4	QB	19
	$C \rightarrow QB$	(HH)	0.789	1.440	3.307	0.015	0.022	0.033	RB	2.3		
		(HL)	0.752	1.338	3.015	0.012	0.016	0.023	SB	2.2		
	$RB \rightarrow Q$	(LL)	0.240	0.398	0.786	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.480	1.010	2.236	0.015	0.023	0.036				
	$SB \rightarrow Q$	(LH)	0.537	1.137	2.534	0.015	0.022	0.033				
	$SB \rightarrow QB$	(LL)	0.294	0.596	1.164	0.012	0.018	0.028				
	Set up time	D	0.940		2.240							
	Hold time	D	0.400		0.250							
	Release time	RB	0.460		0.470							
	Release time	SB	0.660		1.190							
	Removal time	RB	0.810		1.260							
	Removal time	SB	0.570		0.480							
	Min Pulse	С	1.210		4.094							
	Min Pulse	RB	0.888		2.955							
	Min Pulse	SB	0.957		3.121							

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Chapter 3 Scan Path Block

Function	NEC S	Scan [D-F/F (CB)								
Block type					St	andar	d type					
		Nor	mal			Q ou	tput	, .		QB ou	tput	
Drivability	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells	Name	cells
x1	SE631	11										
x2												
x4												
x8												
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"					
D H01 ←		-	N01 Q		о св	Q	QB					
i) \	0	1					
					1 \	1	0					
CB H02 ←	\$	b →	N02 QB	;	x /	н	old					
		J		X:Irr	elevant							
				+_								-
Logic Diagram	for "Q outp	ut"		Tru	th Table for	"Q out	put"					
Lania Diamon	f OD			Total	ub Tabla fau	OD -						-
Logic Diagram	for "QB out	put		Iru	th Table for	QB 0	utput					
1												
i												
1												
1												
				1								

Chapter 3 Scan Path Block

Block	Path	t LD0 (ns)			t 1] In	put	Output		
type	IN → OUT		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE631	$CB \rightarrow Q$	(LH)	0.553	1.016	2.226	0.015	0.022	0.032	D	1.0	Q	22
l .		(LL)	0.536	0.966	2.092	0.012	0.016	0.024	CB	2.3	QB	22
	CB → QB	(LH)	0.693	1.260	2.763	0.015	0.021	0.031				
l .		(LL)	0.759	1.382	3.019	0.012	0.016	0.024				
l .	Set up time	D	0.910		1.910							
l .	Hold time	D	0.460		0.520							
	Min Pulse	CB	1.196		3.697							

Chapter 3 Scan Path Block

Function	NEC S	Scan [D-F/F (CB)) with	RB, SB								
Block type					St		d type						
		_	mal			Q ou					QB ou		
Drivability	Name	cells	Name	cells	Name	cells	Nam	e cells	N	ame	cells	Name	cells
x1	SE637	13											
x2													
x4													
x8				<u> </u>									ш
Logic Diagram	for "Norma	l"		Tru	th Table for	"Norm	al"						
	SB H04				D CB	RB	SB	Q	QB]			
	H04												
D H01 ←		L.	N01 Q	1 1	0 \ 1 \	1	1	0	1				
D 1101 ·		'	NOT Q		x /	1	1	Hold					
				1 1	x x	0	1	0	1				
OD 1100 :		h .	NOO OD		х х	1	0	1	0				
CB H02 ←	4		N02 QB	1 1	х х	0	0	0	0	← Pr	ohibition		
	Hůs			X:In	relevant					J			
	HÕ3 RB												
Logic Diagram	for "O outo			Tru	th Table for	"O out	'nut"						-
Logic Diagram	ioi Q outp	ut		liiu	III Iable Ioi	Q out	.put						
5.				-									\dashv
Logic Diagram	for "QB out	put"		Iru	th Table for	"QB o	utput"						
													_

Chapter 3 Scan Path Block

- I			Swite	ching sp	eed							
Block	Path		t	LDO (ns))		t 1		l In	put	l Ou	ıtput
type	$IN \rightarrow C$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SE637	CB → Q	(LH)	0.601	1.126	2.547	0.015	0.022	0.034	D	1.0	Q	21
		(LL)	0.551	1.005	2.212	0.012	0.016	0.024	СВ	2.4	QB	19
	CB → QB	(LH)	0.788	1.466	3.334	0.015	0.022	0.033	RB	2.3		
		(LL)	0.816	1.519	3.433	0.012	0.016	0.023	SB	2.2		
	$RB \rightarrow Q$	(LL)	0.240	0.398	0.786	0.012	0.016	0.024				
	$RB \rightarrow QB$	(LH)	0.480	1.009	2.234	0.015	0.023	0.036				
	$SB \rightarrow Q$	(LH)	0.535	1.137	2.534	0.015	0.022	0.033				
	$SB \rightarrow QB$	(LL)	0.293	0.596	1.164	0.012	0.018	0.028				
	Set up time	D	0.970		2.390							
	Hold time	D	0.480		0.530							
	Release time	RB	0.460		0.400							
	Release time	SB	0.680		1.350							
	Removal time	RB	0.810		1.550							
	Removal time	SB	0.570		0.510							
	Min Pulse	CB	1.248		4.112							
	Min Pulse	RB	0.888		2.955							
	Min Pulse	SB	0.957		3.121							

Chapter 3 Scan Path Block	Chapter 3 Scan Path Block
[MEMO]	[MEMO]



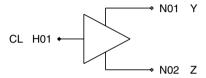
Chapter 3 Scan Path Block

[MEMO]

3.3 Scan Controller

Chapter 3 Scan Path Block

Function	Clock	Clock Distributor											
		Standard type											
Block type	Norma	al	High sp	eed									
Drivability	Name	cells		cells									
x1	SCD1	8											
x2													
x4													
x8													



Truth Table

CL	Υ	Z
1	1	1
0	0	0

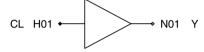
Y:Must be connected to the clock of Negative edge triggered F/F or the gate of Low enable Latch Z:Must be connected to the clock of Positice edge triggered F/F or the gate of High enable Latch

Chapter 3 Scan Path Block

Block	Path		t	t LD0 (ns)			t 1			put	Output	
type	$IN \rightarrow$	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SCD1	$CL \rightarrow Y$	(HH)	0.269	0.432	0.895	0.015	0.022	0.033	CL	2.1	Y	21
		(LL)	0.302	0.532	1.136	0.013	0.018	0.027			Z	21
	$CL \rightarrow Z$	(HH)	0.268	0.431	0.893	0.015	0.022	0.033				
		(LL)	0.301	0.531	1.134	0.013	0.018	0.027				

Chapter 3 Scan Path Block

Function	Clock	Clock Distributor with Test (Positive Clock)										
Block type		Standard type										
Бюск туре	Norma	mal High speed										
Drivability	Name	cells	Name	cells								
x1	SCDC	2										
x2												
х4												
x8												



Truth Table

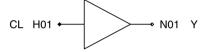
CL	Υ
1	1
0	0

Chapter 3 Scan Path Block

Block	Path			t LD0 (ns)				t 1		Input		Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SCDC	CL	→ Y	(HH)	0.170	0.270	0.504	0.015	0.022	0.031	CL	1.0	Υ	22
			(LL)	0.265	0.462	0.969	0.012	0.017	0.025				

Chapter 3 Scan Path Block

Function	Clock	Clock Distributor with Test (Negative Clock)										
Block type		Standard type										
Бюск турс	Norma	rmal High speed										
Drivability	Name	cells	Name	cells								
x1	SCDD	2										
x2												
x4												
x8												



Truth Table

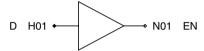
CL	Υ
1	1
0	0

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Path		t LDO (ns)				t 1		Input		Output	
type	IN →	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout	
SCDD	CL → Y	(HH)	0.221	0.355	0.751	0.015	0.022	0.033	CL	1.0	Y	22
		(LL)	0.184	0.312	0.621	0.011	0.015	0.022				

Chapter 3 Scan Path Block

Function	I/F Co	ntrol (AMC) with	ı EN										
Block type		Standard type												
Бюск турс	Norma	al	High sp	eed										
Drivability	Name	cells	Name	cells										
x1	SFEH	3												
x2														
x4														
x8														



Truth Table

D	EN
1	1
0	0

Chapter 3 Scan Path Block

				Swite	ching sp	eed							
Block		Path	l	t LD0 (ns)				t 1		l In	put	Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SFEH	D	→ E1	(HH)	0.221	0.355	0.751	0.015	0.022	0.033	D	1.0	EN	22
			(LL)	0.184	0.313	0.621	0.011	0.015	0.022				

Chapter 3 Scan Path Block

Function	I/F Co	ntrol (AMC) with	ENB						
Block type					S	tanda	rd type			
Вюск турс	Norma	al	High sp	eed						
Drivability	Name	cells	Name	cells						
x1	SFEL	2								
x2										
x4										
x8										



Truth Table

D	ENB
1	1
0	0

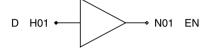
Chapter 3 Scan Path Block

				Swite	ching sp	eed							
Block		Path		t	D0 (ns)			t 1		Input		Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN. TYP.		MAX.	Symbol	Fanin	Symbol	Fanout
SFEL	D	\rightarrow EN	B (HH)	0.170	0.270	0.504	0.015	0.022	0.031	D	1.0	ENB	22
			(LL)	0.265	0.462	0.969	0.012	0.017	0.025				

 Block Library
 A15895EJ1V0BL
 3 - 74
 Block Library
 A15895EJ1V0BL
 3 - 75

Chapter 3 Scan Path Block

Function	I/F Co	I/F Control (SMC) with EN											
Block type		Standard type											
Block type	Norma	lormal High speed											
Drivability	Name	cells	Name	cells									
x1	SOEH	3											
x2													
x4													
x8													



Truth Table

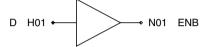
D	EN
1	1
0	0

Chapter 3 Scan Path Block

				Swite	ching sp	eed		_	0				
Block		Path		t ı	LD0 (ns))		t 1		Input		Output	
type	oe IN → OUT				TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanou
SOEH	D	→ EN	(HH)	0.221	0.355	0.751	0.015	0.022	0.033	D	1.0	EN	22
			(LL)	0.184	0.313	0.621	0.011	0.015	0.022				

Chapter 3 Scan Path Block

Function	I/F Co	ntrol (SMC) with	ı ENB										
Block type		Standard type												
Бюск турс	Norma	al	High sp	eed										
Drivability	Name	cells	Name	cells										
x1	SOEL	2												
x2														
x4														
x8														



Truth Table

Chapter 3 Scan Path Block

Block type				Swite	ching sp	eed							
		Path		t	LD0 (ns)			t 1		l In	put	Ou	tput
	IN	\rightarrow	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SOEL	D	→ ENI	3 (HH)	0.170	0.270	0.504	0.015	0.022	0.031	D	1.0	ENB	22
			(LL)	0.265	0.462	0.969	0.012	0.017	0.025				

 Block Library
 A15895EJ1V0BL
 3 - 78
 Block Library
 A15895EJ1V0BL
 3 - 79

Chapter 3 Scan Path Block

Function	Mega	Macro	Skip										\neg		
Block type					S	tanda	rd type						\neg		
ыоск туре	Norma	al	High sp	eed									П		
Drivability	Name	cells	Name	cells											
x1	SMS1	4													
x2															
x4															
x8													_		
Logic Diag	ıram														
	A H01 ← → N01 Y B H02 ←														
Truth Tabl	1 1														
1 0 Note:HC	is a pin of so	can													

Chapter 3 Scan Path Block

Block type				Swite	ching sp	eed							
		Path	l	t ı	D0 (ns)			t 1		l In	put	Ou	tput
	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SMS1	Α	\rightarrow Y	(HH)	0.288	0.455	0.939	0.015	0.022	0.033	Α	1.0	Υ	21
			(LL)	0.327	0.575	1.221	0.013	0.017	0.027	В	1.0		

Chapter 3 Scan Path Block

Function	Set/Re	eset C	ontrol							
Block type					S	tanda	rd type			
ыоск туре	Norma	al	High spe	eed						
Drivability	Name	cells	Name	cells						
x1	SRH1	2								
x2										
x4										
x8										
Logic Diag	ram · H01 ←			•	NO1 S					
Truth Tabl										

Chapter 3 Scan Path Block

Block type				Swite	ching sp	eed							
		Path	l	t	LD0 (ns)			t 1] In	put	Ou	tput
	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SRH1	SET	\rightarrow S	(HH)	0.221	0.355	0.751	0.015	0.022	0.033	SET	1.0	S	22
			(LL)	0.184	0.312	0.621	0.011	0.015	0.022				

Chapter 3 Scan Path Block

Function	Set-B/	Reset	-B Contro	ı										
Block type					S	tanda	rd type							
Вюск турс	Norma	al	High sp	eed										
Drivability	Name	cells	Name	cells										
x1	SRL1	2												
x2														
x4														
x8														
Logic Diag	Logic Diagram													
SET	B H01 +				N01 S									

Truth Table



Chapter 3 Scan Path Block

Block type				Swite	ching sp	eed							
		Path	l	t ı	D0 (ns)			t 1		l In	put	Ou	tput
	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SRL1	SETB	\rightarrow S	(HH)	0.170	0.270	0.504	0.015	0.022	0.031	SETB	1.0	S	22
			(LL)	0.265	0.462	0.969	0.012	0.017	0.025				

Chapter 3 Scan Path Block

Function	Loop (Cut								
Block type					S	tanda	rd type			
Вюск турс	Norma	al	High sp	eed						
Drivability	Name	cells	Name	cells						
x1	SRPD	12								
x2										
x4										
x8										



Truth Table

ROUT
1
0

Chapter 3 Scan Path Block

		Switc	hing sp	eed				l .			
Block	Path	tι	D0 (ns)			t 1] In	put	Ou	tput
type	$IN \ \to \ OUT$	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SRPD	RIN → ROUT (HH)	0.387	0.609	1.263	0.015	0.023	0.035	RIN	1.0	ROUT	20
	(LL)	0.462	0.803	1.699	0.014	0.019	0.030				

Chapter 3 Scan Path Block

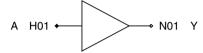
Function Clock Generator Standard type														
Block type					St	tanda	rd type							
Diock type	Norma	al	High spe	eed										
Drivability		cells	Name	cells										
x1	SCKG	16												
x2														
x4														
х8														
Logic Diagram CL H01 ← N01 SC														
Truth Table CL 1 0	9 SC 1 0													

Chapter 3 Scan Path Block

Block type				Swite	ching sp	eed						_	
		Path	1	t ı	D0 (ns)			t 1		l In	put	Ou	tput
	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SCKG										CL	2.1	SC	21

Chapter 3 Scan Path Block

Function	Common Input											
Block type	Standard type											
	Normal		High speed									
Drivability	Name	cells	Name	cells								
x1	SCI1	2										
x2												
x4												
x8												



Truth Table

Α	Υ
1	1
0	0

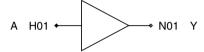
Chapter 3 Scan Path Block

Block type				Input		Output							
	Path							t LDO (ns)			t 1		
	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanou
SCI1	A	→ Y	(HH)	0.177	0.269	0.498	0.015	0.022	0.031	Α	1.0	Y	22
			(LL)	0.191	0.315	0.615	0.011	0.015	0.023				

Chapter 3 Scan Path Block

Function	Comm	ion Ou	ıtput										
Block type		Standard type											
Block type	Norma	al	High sp	eed									
Drivability	Name	cells	Name	cells									
x1	SCO1	4											
x2													
x4													
x8													

Logic Diagram



Truth Table

Α	Υ
1	1
0	0

Chapter 3 Scan Path Block

			Swite	ching sp	eed							
Block	Pat	h	t LD0 (ns)				t 1		Input		Output	
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SCO1	A → \	(HH)	0.288	0.454	0.937	0.015	0.022	0.033	Α	1.0	Υ	21
		(LL)	0.326	0.574	1.219	0.013	0.017	0.027				

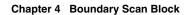
Chapter 3 Scan Path Block

Function	GND									
Block type					St	anda	rd type			
	Norma	al	High spe	eed						
Drivability	Name	cells	Name	cells						
x1	SGND	2								
x2										
х4										
x8										
Logic Diag	ram									
				N0	1 Y					
Truth Table	9									

Chapter 3 Scan Path Block

-: ·				Swite	ching sp	eed							
Block	Path			t LDO (ns)				t 1] In	put	Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SGND												Υ	22

Chapter 4 Boundary Scan Block

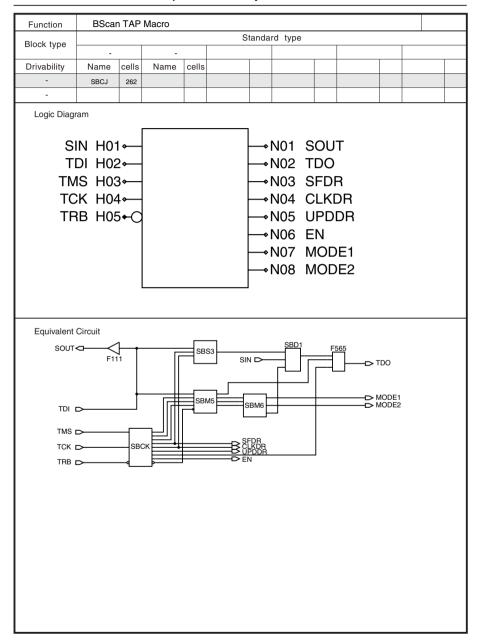


Chapter 4 Boundary Scan Block

[MEMO]

4.1 TAP Macro

Chapter 4 Boundary Scan Block



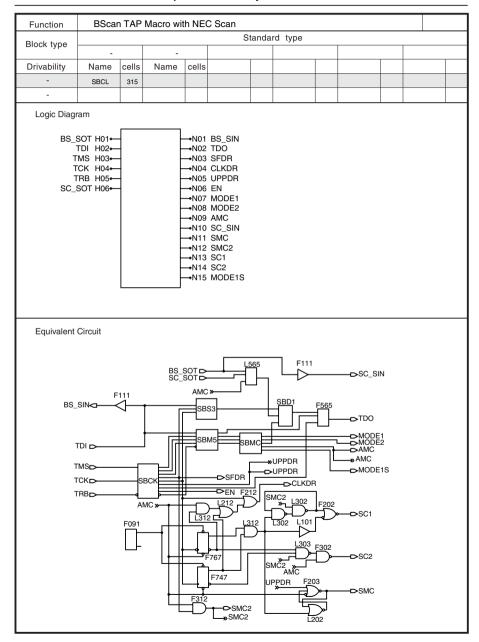
Chapter 4 Boundary Scan Block

type Patri t LD0 (ns) t 1					Swite	ching sp	eed							
I type I I I I I I I I I I I I I I I I I I I	Block		Path	n	t	LD0 (ns))	t 1] In	put	Ou	tput
\square IN \rightarrow OUT \square MIN. \square TYP. \square MAX. \square MIN. \square TYP. \square MAX. \square Symbol \square Fanin \square Symbol \square	type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout

SBCJ

 Block Library
 A15895EJ1V0BL
 4 - 4
 Block Library
 A15895EJ1V0BL
 4 - 5

Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

				Swite									
Block		Path	ı	t LDO (ns)				t 1] In	put	Output	
type	$IN \ \to \ OUT \ MIN. \ TYP. \ MAX.$						MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
0001													

SBCL

 Block Library
 A15895EJ1V0BL
 4 - 6
 Block Library
 A15895EJ1V0BL
 4 - 7

Chapter 4 Boundary Scan Block	Chapter 4 Boundary Scan Block
[MEMO]	[MEMO]

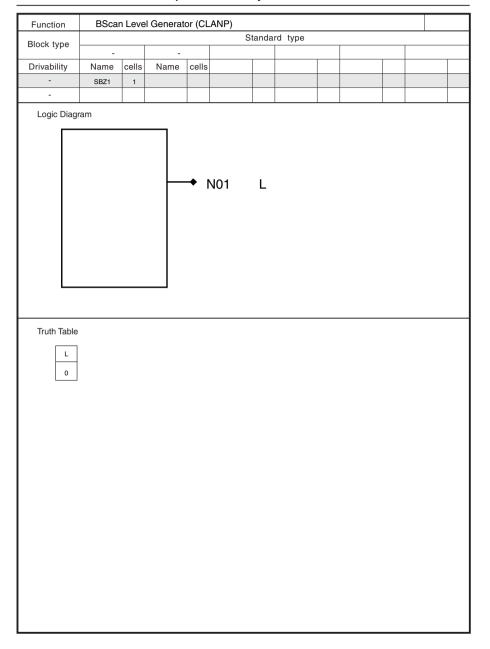


Chapter 4 Boundary Scan Block

[MEMO]

4.2 Level Generator

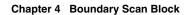
Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

				Swite	ching sp	eed							
Block	Path			t LD0 (ns)				t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SBZ1												L	142

	Chapter 4 Roundary Sean Black	
	Chapter 4 Boundary Scan Block	
[MEMO]		
	[MEMO]	[MEMO]

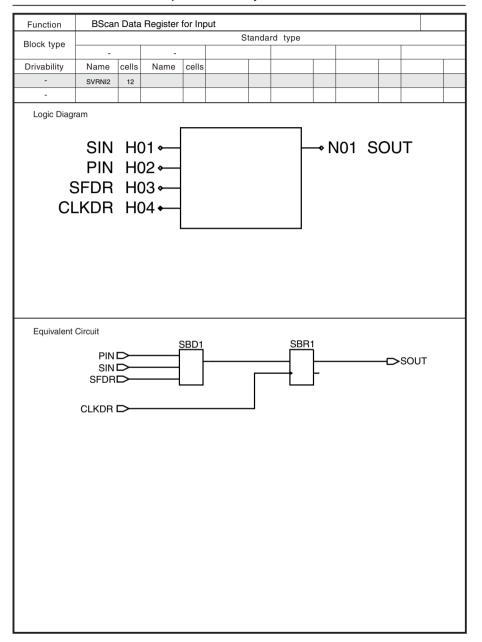


Chapter 4 Boundary Scan Block

[MEMO]

4.3 Data Register

Chapter 4 Boundary Scan Block

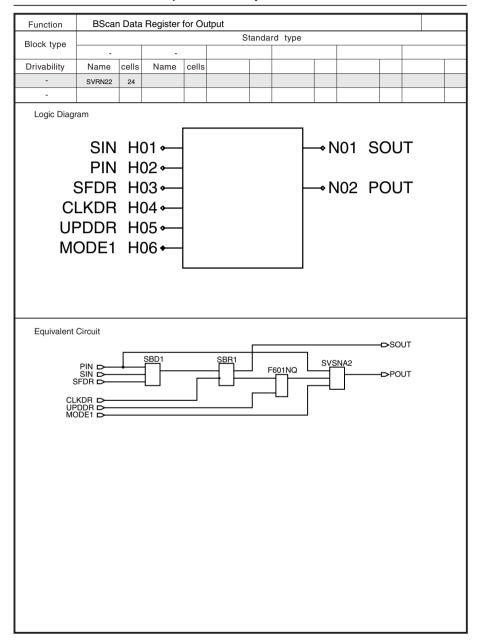


Chapter 4 Boundary Scan Block

-													
Block		Path	1	t	LD0 (ns)			t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	MIN. TYP. MAX.			TYP.	MAX.	Symbol	Fanin	Symbol	Fanout

SVRNI2

Chapter 4 Boundary Scan Block



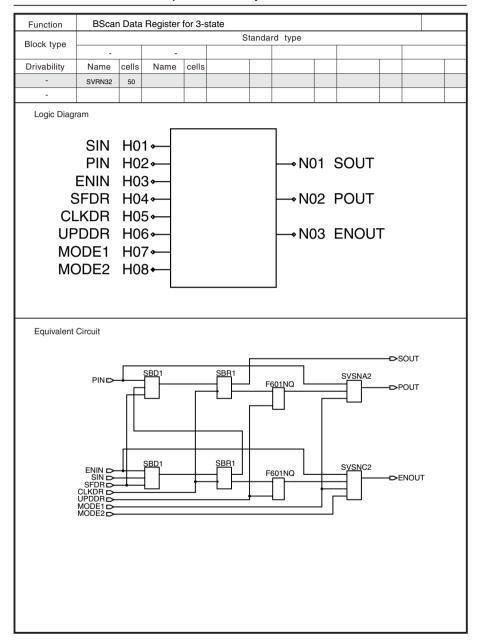
Chapter 4 Boundary Scan Block

·				Swite	ching sp	eed							
Block		Path	1	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout

SVRN22

 Block Library
 A15895EJ1V0BL
 4 - 20
 Block Library
 A15895EJ1V0BL
 4 - 21

Chapter 4 Boundary Scan Block

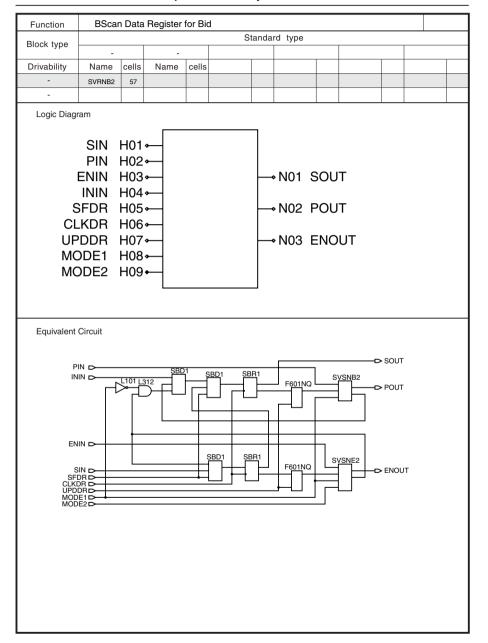


Chapter 4 Boundary Scan Block

l [Swite									
Block		Path	1	t ı	LD0 (ns)		t ı] In	put	Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout

SVRN32

Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

				Swite	ching sp	eed							
Block		Path	1	t	LD0 (ns)		t 1] In	put	Ou	tput
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout

SVRNB2

	Chapter 4 Roundary Sean Black	
	Chapter 4 Boundary Scan Block	
[MEMO]		
	[MEMO]	[MEMO]



Chapter 4 Boundary Scan Block

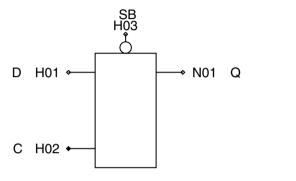
[MEMO]

4.4 D-latch, Selector, Shift Register

Chapter 4 Boundary Scan Block

Function	BScar	n D-La	tch with S	BQC	Out, Low P	ower				
Block type					S	tanda	rd type			
Вюск турс	-									
Drivability	Name	cells	Name	cells						
-	L606	5								
-										

Logic Diagram



Truth Table

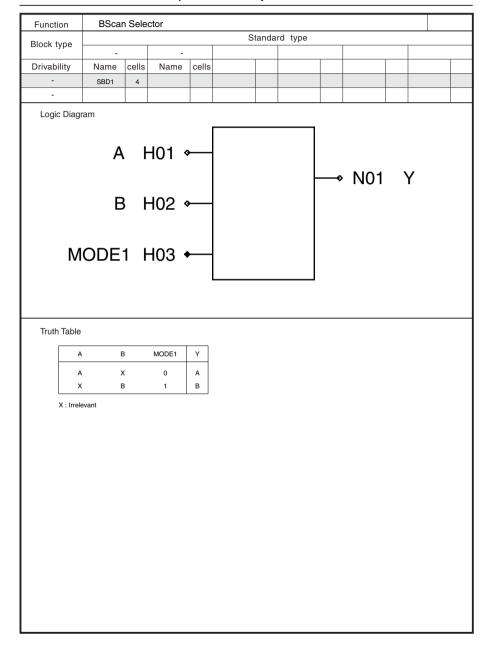
D	С	SB	Q
1	0	1	1
0	0	1	0
х	1	1	Latch
х	Х	0	1

X:Irrelevant

Chapter 4 Boundary Scan Block

			Swite	ching sp	eed							
Block	Path		t ı	D0 (ns)			t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
L606	$D \rightarrow Q$	(HH)	0.259	0.437	0.889	0.029	0.043	0.063	D	3.7	Q	10
l		(LL)	0.322	0.614	1.311	0.024	0.034	0.053	С	1.0		
l	$C \rightarrow Q$	(HH)	0.396	0.656	1.333	0.029	0.043	0.063	SB	1.0		
l		(HL)	0.534	0.938	1.961	0.024	0.034	0.053				
l	$SB \rightarrow Q$	(HL)	0.378	0.648	1.333	0.024	0.034	0.053				
l		(LH)	0.281	0.473	0.964	0.029	0.044	0.064				
	Set up time	D	0.690		0.830							
	Hold time	D	0.590		0.640							
	Release time	SB	0.650		0.760							
l	Removal time	SB	0.570		0.570							
I	Min Pulse	С	0.761		2.468							
	Min Pulse	SB	0.592		1.751							

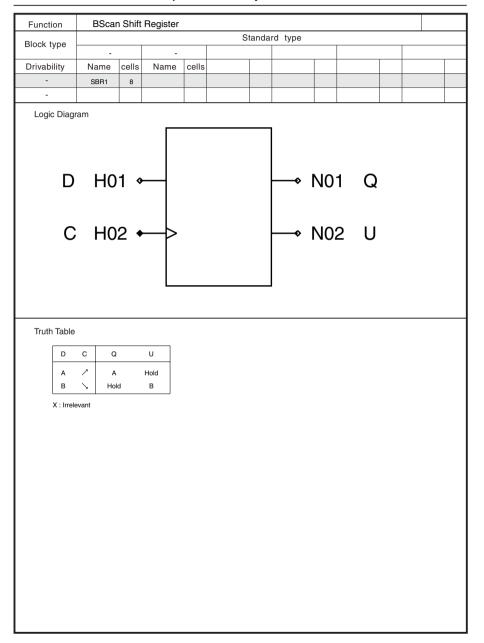
Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Ou	tput
type	IN →	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SBD1	$A \rightarrow Y$	(HH)	0.287	0.441	0.906	0.028	0.042	0.061	Α	1.0	Υ	10
		(LL)	0.331	0.554	1.152	0.023	0.030	0.045	В	1.0		
	$B \rightarrow Y$	(HH)	0.291	0.448	0.915	0.029	0.042	0.061	MODE1	1.0		
		(LL)	0.337	0.563	1.166	0.023	0.030	0.045				
	MODE1 → Y	(HH)	0.351	0.591	1.244	0.029	0.042	0.061				
		(HL)	0.344	0.554	1.103	0.022	0.030	0.044				
		(LH)	0.316	0.542	1.144	0.029	0.042	0.061				
		(LL)	0.372	0.665	1.412	0.022	0.030	0.044				

Chapter 4 Boundary Scan Block

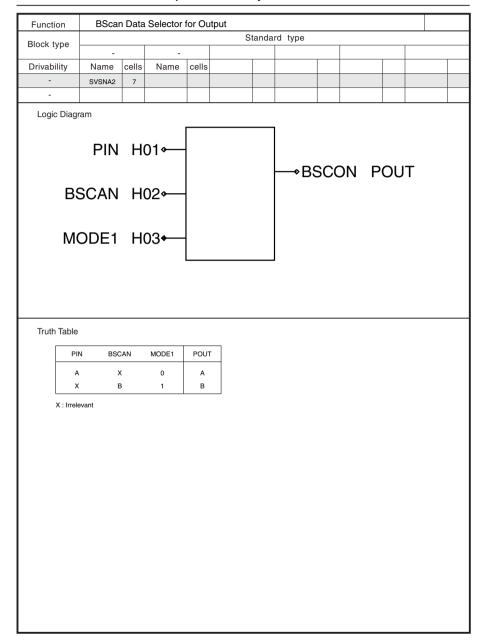


Chapter 4 Boundary Scan Block

			Swite	ching sp	eed							
Block	Path		t ı	LD0 (ns))		t 1] In	put	Output	
type	$IN \rightarrow 0$	TUC	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SBR1	$C \rightarrow Q$	(LH)	0.501	0.894	1.929	0.026	0.038	0.054	D	3.6	Q	9
l .		(LL)	0.441	0.752	1.589	0.021	0.027	0.038	С	1.0	U	7
	C → U	(HH)	0.687	1.190	2.530	0.029	0.043	0.062				
l .		(HL)	0.641	1.083	2.235	0.023	0.031	0.046				
l .	Set up time	D	0.410		0.350							
	Hold time	D	0.950		1.880							
	Min Pulse	С	0.949		3.064							

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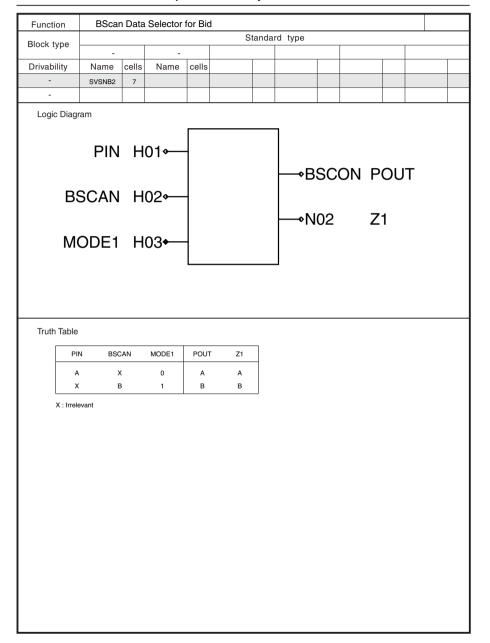
Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

				Swite	ching sp	eed				Input			
Block		Path		t ı	LD0 (ns)			t 1] In	put	Ou	tput
type	IN	→ OU	Т	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SVSNA2	PIN	\rightarrow POUT	(HH)	0.217	0.373	0.781	0.007	0.011	0.016	PIN	4.1	POUT	40
			(LL)	0.227	0.434	0.950	0.006	0.009	0.013	BSCAN	1.0		
	BSCAN	\rightarrow POUT	(HH)	0.354	0.577	1.206	0.008	0.011	0.017	MODE1	1.0		
			(LL)	0.402	0.736	1.588	0.007	0.010	0.015				
	MODE1	$\to \ POUT$	(HH)	0.409	0.709	1.510	0.008	0.011	0.017				
			(HL)	0.414	0.764	1.624	0.007	0.010	0.015				
			(LH)	0.343	0.601	1.260	0.007	0.011	0.016				
			(LL)	0.371	0.691	1.492	0.006	0.009	0.013				

Chapter 4 Boundary Scan Block

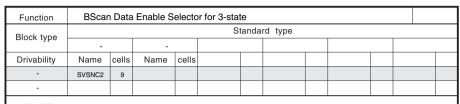


Chapter 4 Boundary Scan Block

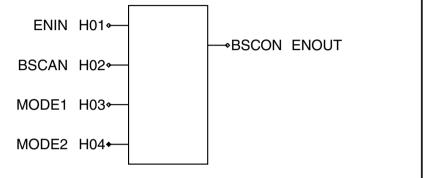
			Swite	ching sp	eed							
Block	Path		t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → OL	JΤ	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SVSNB2	PIN → POUT	(HH)	0.234	0.406	0.852	0.007	0.011	0.017	PIN	4.1	POUT	39
		(LL)	0.244	0.471	1.039	0.006	0.009	0.014	BSCAN	1.0	Z1	8
	PIN → Z1	(HH)	0.269	0.474	1.026	0.029	0.042	0.061	MODE1	1.0		
		(LL)	0.306	0.600	1.325	0.022	0.030	0.043				
	BSCAN → POUT	(HH)	0.379	0.624	1.317	0.008	0.012	0.018				
		(LL)	0.433	0.800	1.735	0.007	0.010	0.015				
	BSCAN → Z1	(HH)	0.420	0.714	1.555	0.029	0.042	0.062				
		(LL)	0.513	0.970	2.114	0.023	0.031	0.046				
	MODE1 → POUT	(HH)	0.433	0.754	1.613	0.008	0.012	0.018				
		(HL)	0.441	0.828	1.784	0.007	0.010	0.016				
		(LH)	0.362	0.636	1.339	0.007	0.011	0.017				
		(LL)	0.388	0.730	1.581	0.006	0.009	0.014				
	MODE1 → Z1	(HH)	0.475	0.844	1.852	0.029	0.042	0.062				
		(HL)	0.524	1.002	2.171	0.023	0.031	0.046				
		(LH)	0.396	0.705	1.512	0.029	0.042	0.061				
		(LL)	0.450	0.858	1.866	0.022	0.030	0.043				

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Chapter 4 Boundary Scan Block



Logic Diagram



Truth Table

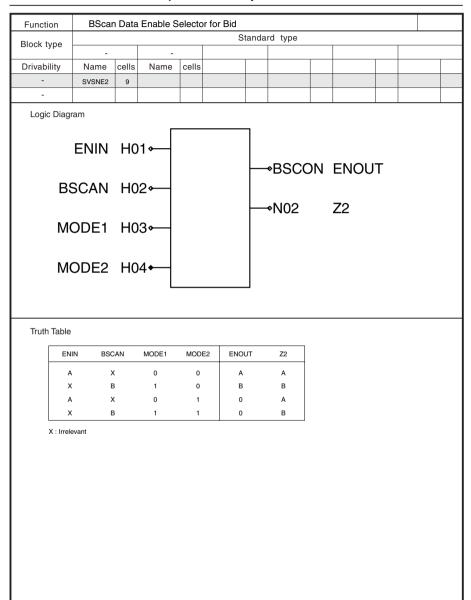
ENIN	BSCAN	MODE1	MODE2	ENOUT
А	х	0	0	А
х	В	1	0	В
х	X	X	1	0

X : Irrelevant

Chapter 4 Boundary Scan Block

-		Swite	ching sp	eed						_	
Block	Path	t	LD0 (ns))		t 1] In	put	Ou	tput
type	IN → OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SVSNC2	ENIN → ENOUT (HH)	0.267	0.467	0.995	0.013	0.020	0.030	ENIN	4.1	ENOUT	17
	(LL)	0.257	0.488	1.061	0.007	0.009	0.014	BSCAN	1.0		
	BSCAN → ENOUT (HH)	0.406	0.669	1.418	0.013	0.020	0.031	MODE1	1.0		
	(LL)	0.433	0.794	1.708	0.008	0.011	0.017	MODE2	4.2		
	MODE1 → ENOUT (HH)	0.461	0.801	1.721	0.013	0.020	0.031				
	(HL)	0.446	0.824	1.749	0.008	0.011	0.016				
	(LH)	0.393	0.694	1.472	0.013	0.020	0.030				
	(LL)	0.401	0.746	1.603	0.007	0.009	0.014				
	MODE2 → ENOUT (HL)	0.101	0.141	0.221	0.006	0.007	0.010				
	(LH)	0.109	0.188	0.386	0.013	0.020	0.030				

Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

D			Swite	ching sp	eed							
Block	Path		t i	LDO (ns))		t 1		l In	put	Ou	ıtput
type	IN → O	UT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
SVSNE2	ENIN → ENOU	JT (HH)	0.284	0.500	1.069	0.013	0.020	0.030	ENIN	4.1	ENOUT	17
		(LL)	0.274	0.529	1.161	0.007	0.010	0.015	BSCAN	1.0	Z2	8
	ENIN → Z2	(HH)	0.260	0.458	0.968	0.029	0.043	0.063	MODE1	1.0		
		(LL)	0.279	0.567	1.224	0.023	0.032	0.048	MODE2	4.2		
	BSCAN → ENOU	JT (HH)	0.432	0.719	1.535	0.013	0.020	0.031				
		(LL)	0.463	0.861	1.868	0.008	0.011	0.017				
	BSCAN → Z2	(HH)	0.407	0.688	1.460	0.029	0.043	0.065				
		(LL)	0.467	0.919	1.967	0.024	0.034	0.053				
	MODE1 → ENOU	JT (HH)	0.486	0.848	1.830	0.013	0.020	0.031				
		(HL)	0.473	0.890	1.921	0.008	0.011	0.017				
		(LH)	0.412	0.730	1.554	0.013	0.020	0.030				
		(LL)	0.418	0.787	1.702	0.007	0.010	0.015				
	MODE1 → Z2	(HH)	0.462	0.818	1.756	0.029	0.043	0.065				
		(HL)	0.479	0.950	2.021	0.024	0.034	0.053				
I		(LH)	0.387	0.688	1.454	0.029	0.043	0.063				
I		(LL)	0.423	0.825	1.765	0.023	0.031	0.048				
I	MODE2 → ENOU	JT (HL)	0.101	0.142	0.222	0.006	0.007	0.010				
		(LH)	0.109	0.188	0.385	0.013	0.020	0.030				

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[MEMO]	[MEMO]		

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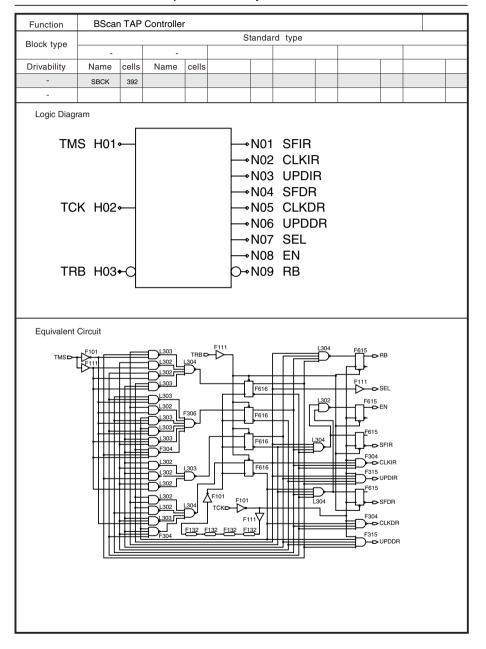


Chapter 4 Boundary Scan Block

[MEMO]

4.5 Soft Macro

Chapter 4 Boundary Scan Block



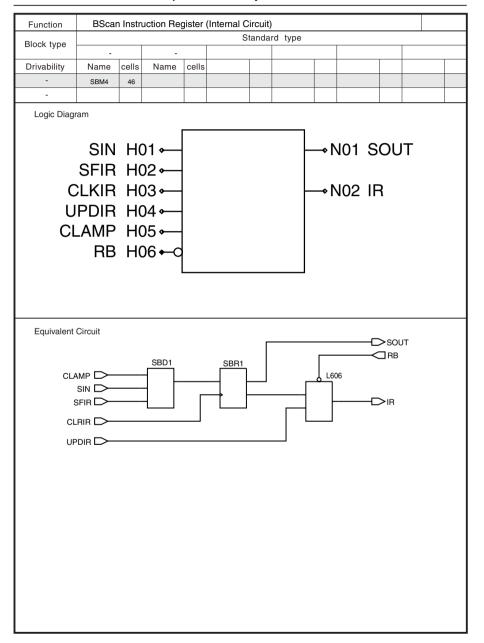
Chapter 4 Boundary Scan Block

Switching speed											0		
Block		Path	ı	t LDO (ns)			t 1			Input		Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
00014	•			•	•								

SBCK

 Block Library
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 Block Library
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Chapter 4 Boundary Scan Block



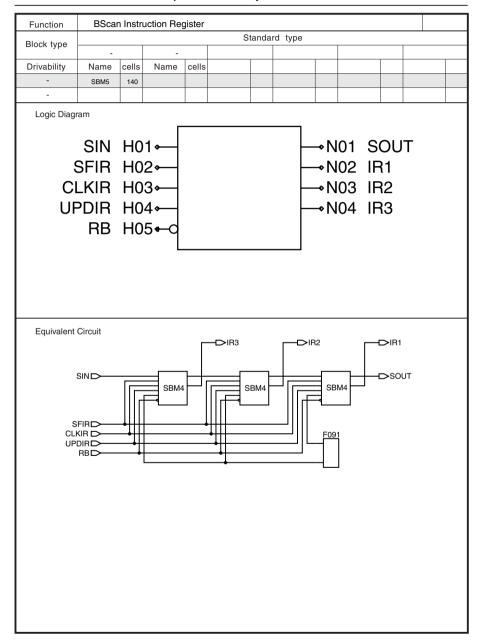
Chapter 4 Boundary Scan Block

Block Path t LD0 (ns) t 1 Input		
	Output	
type IN $ ightarrow$ OUT MIN. TYP. MAX. MIN. TYP. MAX. Symbol Fanin Sy	ymbol Fanout	

SBM4

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 Block Library
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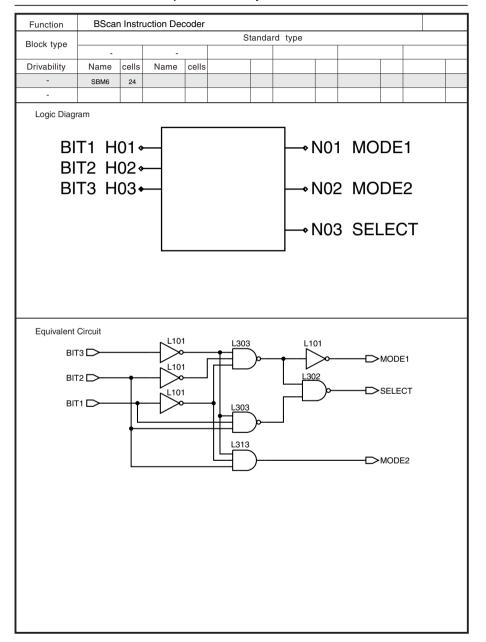


Chapter 4 Boundary Scan Block

		Switching speed												
Block		Path	1	t LD0 (ns)			t 1		Input		Output			
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout	
00145														

SBM5

Chapter 4 Boundary Scan Block



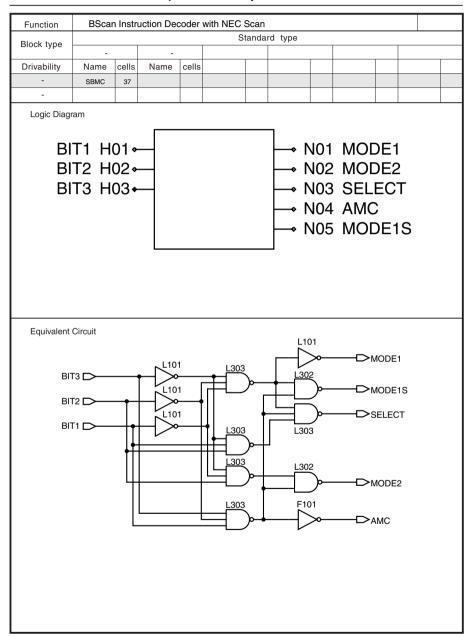
Chapter 4 Boundary Scan Block

		Switching speed												
Block		Path	ı	t	LD0 (ns))		t 1] In	Input		Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout	
ODMA														

SBM6

 Block Library
 A15895EJ1V0BL
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 Block Library
 A15895EJ1V0BL
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Chapter 4 Boundary Scan Block



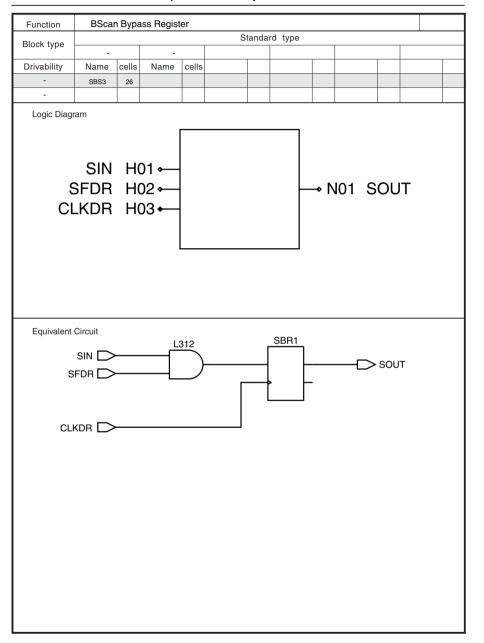
Chapter 4 Boundary Scan Block

		Switching speed												
Block		Path	ı	t	LD0 (ns))		t 1] In	Input		tput	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout	
				_	•									

SBMC

 Block Library
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 Block Library
 A15895EJ1V0BL
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Chapter 4 Boundary Scan Block



Chapter 4 Boundary Scan Block

Switching speed													
Block		Path	ath t LDO (ns)		t 1		Input		Output	
type	IN	\rightarrow	OUT	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	Symbol	Fanin	Symbol	Fanout
0000	•			•	•								

SBS3

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Block	Function	Cells (I/O)	Page
B001	I/O Buffer 12mA	20 (1)	1-32
B002	I/O Buffer 12mA	20 (1)	1-80
B003	I/O Buffer 9mA	10 (1)	1-32
B004	I/O Buffer 9mA	10 (1)	1-80
B005	I/O Buffer 18mA	20 (1)	1-32
B006	I/O Buffer 18mA	20 (1)	1-80
B007	3-State Buffer 12mA	17 (1)	1-16
B008	3-State Buffer 9mA	7 (1)	1-16
B009	3-State Buffer 18mA	17 (1)	1-16
B00C	I/O Buffer 6mA	10 (1)	1-32
B00D	I/O Buffer 6mA	10 (1)	1-80
B00E	3-State Buffer 6mA	7 (1)	1-16
B00F	I/O Buffer 24mA	20 (1)	1-32
B00G	I/O Buffer 24mA	20 (1)	1-80
B00H	3-State Buffer 24mA	17 (1)	1-16
B00T	3-State Buffer 3mA	7 (1)	1-16
B00U	I/O Buffer 3mA	10 (1)	1-32
B00V	I/O Buffer 3mA	10 (1)	1-80
B0D1	I/O Buffer 12mA 50kΩ Pull-down	20 (1)	1-32
B0D2	I/O Buffer 12mA 50kΩ Pull-down	20 (1)	1-80
B0D3	I/O Buffer 9mA 50kΩ Pull-down	10 (1)	1-32
B0D4	I/O Buffer 9mA 50kΩ Pull-down	10 (1)	1-80
B0D5	I/O Buffer 18mA 50kΩ Pull-down	20 (1)	1-32
B0D6	I/O Buffer 18mA 50kΩ Pull-down	20 (1)	1-80
B0D7	3-State Buffer 12mA 50kΩ Pull-down	17 (1)	1-16
B0D8	3-State Buffer 9mA 50kΩ Pull-down	7 (1)	1-16
B0D9	3-State Buffer 18mA 50kΩ Pull-down	17 (1)	1-16
B0DC	I/O Buffer 6mA 50kΩ Pull-down	10 (1)	1-32
B0DD	I/O Buffer 6mA 50kΩ Pull-down	10 (1)	1-80
B0DE	3-State Buffer 6mA 50kΩ Pull-down	7 (1)	1-16
B0DF	I/O Buffer 24mA 50kΩ Pull-down	20 (1)	1-32
B0DG	I/O Buffer 24mA 50kΩ Pull-down	20 (1)	1-80
B0DH	3-State Buffer 24mA 50kΩ Pull-down	17 (1)	1-16
B0DT	3-State Buffer 3mA 50kΩ Pull-down	7 (1)	1-16
B0DU	I/O Buffer 3mA 50kΩ Pull-down	10 (1)	1-32
B0DV	I/O Buffer 3mA 50kΩ Pull-down	10 (1)	1-80
B0U1	I/O Buffer 12mA 50kΩ Pull-up	20 (1)	1-32
B0U2	I/O Buffer 12mA 50kΩ Pull-up	20 (1)	1-80
B0U3	I/O Buffer 9mA 50kΩ Pull-up	10 (1)	1-32
B0U4	I/O Buffer 9mA 50kΩ Pull-up	10 (1)	1-80
B0U5	I/O Buffer 18mA 50kΩ Pull-up	20 (1)	1-32

Block	Function	Cells (I/O)	Page
B0U6	I/O Buffer 18mA 50kΩ Pull-up	20 (1)	1-80
B0U7	3-State Buffer 12mA 50kΩ Pull-up	17 (1)	1-16
B0U8	3-State Buffer 9mA 50kΩ Pull-up	7 (1)	1-16
B0U9	3-State Buffer 18mA 50kΩ Pull-up	17 (1)	1-16
B0UC	I/O Buffer 6mA 50kΩ Pull-up	10 (1)	1-32
B0UD	I/O Buffer 6mA 50kΩ Pull-up	10 (1)	1-80
B0UE	3-State Buffer 6mA 50kΩ Pull-up	7 (1)	1-16
B0UF	I/O Buffer 24mA 50kΩ Pull-up	20 (1)	1-32
B0UG	I/O Buffer 24mA 50kΩ Pull-up	20 (1)	1-80
B0UH	3-State Buffer 24mA 50kΩ Pull-up	17 (1)	1-16
B0UT	3-State Buffer 3mA 50kΩ Pull-up	7 (1)	1-16
B0UU	I/O Buffer 3mA 50kΩ Pull-up	10 (1)	1-32
B0UV	I/O Buffer 3mA 50kΩ Pull-up	10 (1)	1-80
B0W1	I/O Buffer 12mA 5kΩ Pull-up	20 (1)	1-32
B0W2	I/O Buffer 12mA 5kΩ Pull-up	20 (1)	1-80
B0W3	I/O Buffer 9mA 5kΩ Pull-up	10 (1)	1-32
B0W4	I/O Buffer 9mA 5kΩ Pull-up	10 (1)	1-80
B0W5	I/O Buffer 18mA 5kΩ Pull-up	20 (1)	1-32
B0W6	I/O Buffer 18mA 5kΩ Pull-up	20 (1)	1-80
B0W7	3-State Buffer 12mA 5kΩ Pull-up	17 (1)	1-16
B0W8	3-State Buffer 9mA 5kΩ Pull-up	7 (1)	1-16
B0W9	3-State Buffer 18mA 5kΩ Pull-up	17 (1)	1-16
B0WC	I/O Buffer 6mA 5kΩ Pull-up	10 (1)	1-32
B0WD	I/O Buffer 6mA 5kΩ Pull-up	10 (1)	1-80
B0WE	3-State Buffer 6mA 5kΩ Pull-up	7 (1)	1-16
B0WF	I/O Buffer 24mA 5kΩ Pull-up	20 (1)	1-32
B0WG	I/O Buffer 24mA 5kΩ Pull-up	20 (1)	1-80
B0WH	3-State Buffer 24mA 5kΩ Pull-up	17 (1)	1-16
B0WT	3-State Buffer 3mA 5kΩ Pull-up	7 (1)	1-16
B0WU	I/O Buffer 3mA 5kΩ Pull-up	10 (1)	1-32
B0WV	I/O Buffer 3mA 5kΩ Pull-up	10 (1)	1-80
BE01	Low-noise I/O Buffer 12mA	10 (1)	1-38
BE02	Low-noise I/O Buffer 12mA	10 (1)	1-86
BE03	Low-noise I/O Buffer 9mA	10 (1)	1-38
BE04	Low-noise I/O Buffer 9mA	10 (1)	1-86
BE05	Low-noise I/O Buffer 18mA	10 (1)	1-38
BE06	Low-noise I/O Buffer 18mA	10 (1)	1-86
BE07	Low-noise 3-State Buffer 12mA	7 (1)	1-20
BE08	Low-noise 3-State Buffer 9mA	7 (1)	1-20
BE09	Low-noise 3-State Buffer 18mA	7 (1)	1-20
BE0C	Low-noise I/O Buffer 6mA	10 (1)	1-38
BE0D	Low-noise I/O Buffer 6mA	10 (1)	1-86
BE0E	Low-noise 3-State Buffer 6mA	7 (1)	1-20

Block	Function	Cells (I/O)	Page
BE0F	Low-noise I/O Buffer 24mA	10 (1)	1-38
BE0G	Low-noise I/O Buffer 24mA	10 (1)	1-86
ВЕ0Н	Low-noise 3-State Buffer 24mA	7 (1)	1-20
BE0T	Low-noise 3-State Buffer 3mA	7 (1)	1-20
BE0U	Low-noise I/O Buffer 3mA	10 (1)	1-38
BE0V	Low-noise I/O Buffer 3mA	10 (1)	1-86
BED1	Low-noise I/O Buffer 12mA 50kΩ Pull-down	10 (1)	1-38
BED2	Low-noise I/O Buffer 12mA 50kΩ Pull-down	10 (1)	1-86
BED3	Low-noise I/O Buffer 9mA 50kΩ Pull-down	10 (1)	1-38
BED4	Low-noise I/O Buffer 9mA 50kΩ Pull-down	10 (1)	1-86
BED5	Low-noise I/O Buffer 18mA 50kΩ Pull-down	10 (1)	1-38
BED6	Low-noise I/O Buffer 18mA 50kΩ Pull-down	10 (1)	1-86
BED7	Low-noise 3-State Buffer 12mA 50kΩ Pull-down	7 (1)	1-20
BED8	Low-noise 3-State Buffer 9mA 50kΩ Pull-down	7 (1)	1-20
BED9	Low-noise 3-State Buffer 18mA 50kΩ Pull-down	7 (1)	1-20
BEDC	Low-noise I/O Buffer 6mA 50kΩ Pull-down	10 (1)	1-38
BEDD	Low-noise I/O Buffer 6mA 50kΩ Pull-down	10 (1)	1-86
BEDE	Low-noise 3-State Buffer 6mA 50kΩ Pull-down	7 (1)	1-20
BEDF	Low-noise I/O Buffer 24mA 50kΩ Pull-down	10 (1)	1-38
BEDG	Low-noise I/O Buffer 24mA 50kΩ Pull-down	10 (1)	1-86
BEDH	Low-noise 3-State Buffer 24mA 50kΩ Pull-down	7 (1)	1-20
BEDT	Low-noise 3-State Buffer 3mA 50kΩ Pull-down	7 (1)	1-20
BEDU	Low-noise I/O Buffer 3mA 50kΩ Pull-down	10 (1)	1-38
BEDV	Low-noise I/O Buffer 3mA 50kΩ Pull-down	10 (1)	1-86
BEU1	Low-noise I/O Buffer 12mA 50kΩ Pull-up	10 (1)	1-38
BEU2	Low-noise I/O Buffer 12mA 50kΩ Pull-up	10 (1)	1-86
BEU3	Low-noise I/O Buffer 9mA 50kΩ Pull-up	10 (1)	1-38
BEU4	Low-noise I/O Buffer 9mA 50kΩ Pull-up	10 (1)	1-86
BEU5	Low-noise I/O Buffer 18mA 50kΩ Pull-up	10 (1)	1-38
BEU6	Low-noise I/O Buffer 18mA 50kΩ Pull-up	10 (1)	1-86
BEU7	Low-noise 3-State Buffer 12mA 50kΩ Pull-up	7 (1)	1-20
BEU8	Low-noise 3-State Buffer 9mA 50kΩ Pull-up	7 (1)	1-20
BEU9	Low-noise 3-State Buffer 18mA 50kΩ Pull-up	7 (1)	1-20
BEUC	Low-noise I/O Buffer 6mA 50kΩ Pull-up	10 (1)	1-38
BEUD	Low-noise I/O Buffer 6mA 50kΩ Pull-up	10 (1)	1-86
BEUE	Low-noise 3-State Buffer 6mA 50kΩ Pull-up	7 (1)	1-20
BEUF	Low-noise I/O Buffer 24mA 50kΩ Pull-up	10 (1)	1-38
BEUG	Low-noise I/O Buffer 24mA 50kΩ Pull-up	10 (1)	1-86
BEUH	Low-noise 3-State Buffer 24mA 50kΩ Pull-up	7 (1)	1-20
BEUT	Low-noise 3-State Buffer 3mA 50kΩ Pull-up	7 (1)	1-20
BEUU	Low-noise I/O Buffer 3mA 50kΩ Pull-up	10 (1)	1-38
BEUV	Low-noise I/O Buffer 3mA 50kΩ Pull-up	10 (1)	1-86
BEW1	Low-noise I/O Buffer 12mA 5kΩ Pull-up	10 (1)	1-38

Block	Function	Cells (I/O)	Page
BEW2	Low-noise I/O Buffer 12mA 5kΩ Pull-up	10 (1)	1-86
BEW3	Low-noise I/O Buffer 9mA 5kΩ Pull-up	10 (1)	1-38
BEW4	Low-noise I/O Buffer 9mA 5kΩ Pull-up	10 (1)	1-86
BEW5	Low-noise I/O Buffer 18mA 5kΩ Pull-up	10 (1)	1-38
BEW6	Low-noise I/O Buffer 18mA 5kΩ Pull-up	10 (1)	1-86
BEW7	Low-noise 3-State Buffer 12mA 5kΩ Pull-up	7 (1)	1-20
BEW8	Low-noise 3-State Buffer 9mA 5kΩ Pull-up	7 (1)	1-20
BEW9	Low-noise 3-State Buffer 18mA 5kΩ Pull-up	7 (1)	1-20
BEWC	Low-noise I/O Buffer 6mA 5kΩ Pull-up	10 (1)	1-38
BEWD	Low-noise I/O Buffer 6mA 5kΩ Pull-up	10 (1)	1-86
BEWE	Low-noise 3-State Buffer 6mA 5kΩ Pull-up	7 (1)	1-20
BEWF	Low-noise I/O Buffer 24mA 5kΩ Pull-up	10 (1)	1-38
BEWG	Low-noise I/O Buffer 24mA 5kΩ Pull-up	10 (1)	1-86
BEWH	Low-noise 3-State Buffer 24mA 5kΩ Pull-up	7 (1)	1-20
BEWT	Low-noise 3-State Buffer 3mA 5kΩ Pull-up	7 (1)	1-20
BEWU	Low-noise I/O Buffer 3mA 5kΩ Pull-up	10 (1)	1-38
BEWV	Low-noise I/O Buffer 3mA 5kΩ Pull-up	10 (1)	1-86
BFD1W	Low-noise Schmitt I/O Buffer 12mA 50kΩ Pull-down	13 (1)	1-50
BFD2W	Low-noise Schmitt I/O Buffer 12mA 50kΩ Pull-down	13 (1)	1-98
BFD3W	Low-noise Schmitt I/O Buffer 9mA 50kΩ Pull-down	13 (1)	1-50
BFD4W	Low-noise Schmitt I/O Buffer 9mA 50kΩ Pull-down	13 (1)	1-98
BFD5W	Low-noise Schmitt I/O Buffer 18mA 50kΩ Pull-down	13 (1)	1-50
BFD6W	Low-noise Schmitt I/O Buffer 18mA 50kΩ Pull-down	13 (1)	1-98
BFDCW	Low-noise Schmitt I/O Buffer 6mA 50kΩ Pull-down	13 (1)	1-50
BFDDW	Low-noise Schmitt I/O Buffer 6mA 50kΩ Pull-down	13 (1)	1-98
BFDFW	Low-noise Schmitt I/O Buffer 24mA 50kΩ Pull-down	13 (1)	1-50
BFDGW	Low-noise Schmitt I/O Buffer 24mA 50kΩ Pull-down	13 (1)	1-98
BFDUW	Low-noise Schmitt I/O Buffer 3mA 50kΩ Pull-down	13 (1)	1-50
BFDVW	Low-noise Schmitt I/O Buffer 3mA 50kΩ Pull-down	13 (1)	1-98
BFI1W	Low-noise Schmitt I/O Buffer 12mA	13 (1)	1-50
BFI2W	Low-noise Schmitt I/O Buffer 12mA	13 (1)	1-98
BFI3W	Low-noise Schmitt I/O Buffer 9mA	13 (1)	1-50
BFI4W	Low-noise Schmitt I/O Buffer 9mA	13 (1)	1-98
BFI5W	Low-noise Schmitt I/O Buffer 18mA	13 (1)	1-50
BFI6W	Low-noise Schmitt I/O Buffer 18mA	13 (1)	1-98
BFICW	Low-noise Schmitt I/O Buffer 6mA	13 (1)	1-50
BFIDW	Low-noise Schmitt I/O Buffer 6mA	13 (1)	1-98
BFIFW	Low-noise Schmitt I/O Buffer 24mA	13 (1)	1-50
BFIGW	Low-noise Schmitt I/O Buffer 24mA	13 (1)	1-98
BFIUW	Low-noise Schmitt I/O Buffer 3mA	13 (1)	1-50
BFIVW	Low-noise Schmitt I/O Buffer 3mA	13 (1)	1-98
BFU1W	Low-noise Schmitt I/O Buffer 12mA 50kΩ Pull-up	13 (1)	1-50
BFU2W	Low-noise Schmitt I/O Buffer 12mA 50kΩ Pull-up	13 (1)	1-98

Block	Function	Cells (I/O)	Page
BFU3W	Low-noise Schmitt I/O Buffer 9mA 50kΩ Pull-up	13 (1)	1-50
BFU4W	Low-noise Schmitt I/O Buffer 9mA 50kΩ Pull-up	13 (1)	1-98
BFU5W	Low-noise Schmitt I/O Buffer 18mA 50kΩ Pull-up	13 (1)	1-50
BFU6W	Low-noise Schmitt I/O Buffer 18mA 50kΩ Pull-up	13 (1)	1-98
BFUCW	Low-noise Schmitt I/O Buffer 6mA 50kΩ Pull-up	13 (1)	1-50
BFUDW	Low-noise Schmitt I/O Buffer 6mA 50kΩ Pull-up	13 (1)	1-98
BFUFW	Low-noise Schmitt I/O Buffer 24mA 50kΩ Pull-up	13 (1)	1-50
BFUGW	Low-noise Schmitt I/O Buffer 24mA 50kΩ Pull-up	13 (1)	1-98
BFUUW	Low-noise Schmitt I/O Buffer 3mA 50kΩ Pull-up	13 (1)	1-50
BFUVW	Low-noise Schmitt I/O Buffer 3mA 50kΩ Pull-up	13 (1)	1-98
BFW1W	Low-noise Schmitt I/O Buffer 12mA 5kΩ Pull-up	13 (1)	1-50
BFW2W	Low-noise Schmitt I/O Buffer 12mA 5kΩ Pull-up	13 (1)	1-98
BFW3W	Low-noise Schmitt I/O Buffer 9mA 5kΩ Pull-up	13 (1)	1-50
BFW4W	Low-noise Schmitt I/O Buffer 9mA 5kΩ Pull-up	13 (1)	1-98
BFW5W	Low-noise Schmitt I/O Buffer 18mA 5kΩ Pull-up	13 (1)	1-50
BFW6W	Low-noise Schmitt I/O Buffer 18mA 5kΩ Pull-up	13 (1)	1-98
BFWCW	Low-noise Schmitt I/O Buffer 6mA 5kΩ Pull-up	13 (1)	1-50
BFWDW	Low-noise Schmitt I/O Buffer 6mA 5kΩ Pull-up	13 (1)	1-98
BFWFW	Low-noise Schmitt I/O Buffer 24mA 5kΩ Pull-up	13 (1)	1-50
BFWGW	Low-noise Schmitt I/O Buffer 24mA 5kΩ Pull-up	13 (1)	1-98
BFWUW	Low-noise Schmitt I/O Buffer 3mA 5kΩ Pull-up	13 (1)	1-50
BFWVW	Low-noise Schmitt I/O Buffer 3mA 5kΩ Pull-up	13 (1)	1-98
BN21	I/O Buffer with EN(AND) 12mA	23 (1)	1-56
BN22	I/O Buffer with EN(AND) 12mA	24 (1)	1-104
BN23	I/O Buffer with EN(AND) 9mA	13 (1)	1-56
BN24	I/O Buffer with EN(AND) 9mA	14 (1)	1-104
BN25	I/O Buffer with EN(AND) 18mA	23 (1)	1-56
BN26	I/O Buffer with EN(AND) 18mA	24 (1)	1-104
BN2C	I/O Buffer with EN(AND) 6mA	13 (1)	1-56
BN2D	I/O Buffer with EN(AND) 6mA	14 (1)	1-104
BN2F	I/O Buffer with EN(AND) 24mA	23 (1)	1-56
BN2G	I/O Buffer with EN(AND) 24mA	24 (1)	1-104
BN2U	I/O Buffer with EN(AND) 3mA	13 (1)	1-56
BN2V	I/O Buffer with EN(AND) 3mA	14 (1)	1-104
BN31	I/O Buffer with EN(OR) 12mA	21 (1)	1-60
BN32	I/O Buffer with EN(OR) 12mA	21 (1)	1-108
BN33	I/O Buffer with EN(OR) 9mA	11 (1)	1-60
BN34	I/O Buffer with EN(OR) 9mA	11 (1)	1-108
BN35	I/O Buffer with EN(OR) 18mA	21 (1)	1-60
BN36	I/O Buffer with EN(OR) 18mA	21 (1)	1-108
BN3C	I/O Buffer with EN(OR) 6mA	11 (1)	1-60
BN3D	I/O Buffer with EN(OR) 6mA	11 (1)	1-108
BN3F	I/O Buffer with EN(OR) 24mA	21 (1)	1-60

Block	Function	Cells (I/O)	Page
BN3G	I/O Buffer with EN(OR) 24mA	21 (1)	1-108
BN3U	I/O Buffer with EN(OR) 3mA	11 (1)	1-60
BN3V	I/O Buffer with EN(OR) 3mA	11 (1)	1-108
BN41	I/O Buffer with EN(AND) 12mA 50kΩ Pull-down	23 (1)	1-56
BN42	I/O Buffer with EN(AND) 12mA 50kΩ Pull-down	24 (1)	1-104
BN43	I/O Buffer with EN(AND) 9mA 50kΩ Pull-down	13 (1)	1-56
BN44	I/O Buffer with EN(AND) 9mA 50kΩ Pull-down	14 (1)	1-104
BN45	I/O Buffer with EN(AND) 18mA 50kΩ Pull-down	23 (1)	1-56
BN46	I/O Buffer with EN(AND) 18mA 50kΩ Pull-down	24 (1)	1-104
BN4C	I/O Buffer with EN(AND) 6mA 50kΩ Pull-down	13 (1)	1-56
BN4D	I/O Buffer with EN(AND) 6mA 50kΩ Pull-down	14 (1)	1-104
BN4F	I/O Buffer with EN(AND) 24mA 50kΩ Pull-down	23 (1)	1-56
BN4G	I/O Buffer with EN(AND) 24mA 50kΩ Pull-down	24 (1)	1-104
BN4U	I/O Buffer with EN(AND) 3mA 50kΩ Pull-down	13 (1)	1-56
BN4V	I/O Buffer with EN(AND) 3mA 50kΩ Pull-down	14 (1)	1-104
BN51	I/O Buffer with EN(OR) 12mA 50kΩ Pull-down	21 (1)	1-60
BN52	I/O Buffer with EN(OR) 12mA 50kΩ Pull-down	21 (1)	1-108
BN53	I/O Buffer with EN(OR) 9mA 50kΩ Pull-down	11 (1)	1-60
BN54	I/O Buffer with EN(OR) 9mA 50kΩ Pull-down	11 (1)	1-108
BN55	I/O Buffer with EN(OR) 18mA 50kΩ Pull-down	21 (1)	1-60
BN56	I/O Buffer with EN(OR) 18mA 50kΩ Pull-down	21 (1)	1-108
BN5C	I/O Buffer with EN(OR) 6mA 50kΩ Pull-down	11 (1)	1-60
BN5D	I/O Buffer with EN(OR) 6mA 50kΩ Pull-down	11 (1)	1-108
BN5F	I/O Buffer with EN(OR) 24mA 50kΩ Pull-down	21 (1)	1-60
BN5G	I/O Buffer with EN(OR) 24mA 50kΩ Pull-down	21 (1)	1-108
BN5U	I/O Buffer with EN(OR) 3mA 50kΩ Pull-down	11 (1)	1-60
BN5V	I/O Buffer with EN(OR) 3mA 50kΩ Pull-down	11 (1)	1-108
BSD1W	Schmitt I/O Buffer 12mA 50kΩ Pull-down	23 (1)	1-44
BSD2W	Schmitt I/O Buffer 12mA 50kΩ Pull-down	23 (1)	1-92
BSD3W	Schmitt I/O Buffer 9mA 50kΩ Pull-down	13 (1)	1-44
BSD4W	Schmitt I/O Buffer 9mA 50kΩ Pull-down	13 (1)	1-92
BSD5W	Schmitt I/O Buffer 18mA 50kΩ Pull-down	23 (1)	1-44
BSD6W	Schmitt I/O Buffer 18mA 50kΩ Pull-down	23 (1)	1-92
BSDCW	Schmitt I/O Buffer 6mA 50kΩ Pull-down	13 (1)	1-44
BSDDW	Schmitt I/O Buffer 6mA 50kΩ Pull-down	13 (1)	1-92
BSDFW	Schmitt I/O Buffer 24mA 50kΩ Pull-down	23 (1)	1-44
BSDGW	Schmitt I/O Buffer 24mA 50kΩ Pull-down	23 (1)	1-92
BSDUW	Schmitt I/O Buffer 3mA 50kΩ Pull-down	13 (1)	1-44
BSDVW	Schmitt I/O Buffer 3mA 50kΩ Pull-down	13 (1)	1-92
BSI1W	Schmitt I/O Buffer 12mA	23 (1)	1-44
BSI2W	Schmitt I/O Buffer 12mA	23 (1)	1-92
BSI3W	Schmitt I/O Buffer 9mA	13 (1)	1-44
BSI4W	Schmitt I/O Buffer 9mA	13 (1)	1-92

Block	Function	Cells (I/O)	Page
BSI5W	Schmitt I/O Buffer 18mA	23 (1)	1-44
BSI6W	Schmitt I/O Buffer 18mA	23 (1)	1-92
BSICW	Schmitt I/O Buffer 6mA	13 (1)	1-44
BSIDW	Schmitt I/O Buffer 6mA	13 (1)	1-92
BSIFW	Schmitt I/O Buffer 24mA	23 (1)	1-44
BSIGW	Schmitt I/O Buffer 24mA	23 (1)	1-92
BSIUW	Schmitt I/O Buffer 3mA	13 (1)	1-44
BSIVW	Schmitt I/O Buffer 3mA	13 (1)	1-92
BSU1W	Schmitt I/O Buffer 12mA 50kΩ Pull-up	23 (1)	1-44
BSU2W	Schmitt I/O Buffer 12mA 50kΩ Pull-up	23 (1)	1-92
BSU3W	Schmitt I/O Buffer 9mA 50kΩ Pull-up	13 (1)	1-44
BSU4W	Schmitt I/O Buffer 9mA 50kΩ Pull-up	13 (1)	1-92
BSU5W	Schmitt I/O Buffer 18mA 50kΩ Pull-up	23 (1)	1-44
BSU6W	Schmitt I/O Buffer 18mA 50kΩ Pull-up	23 (1)	1-92
BSUCW	Schmitt I/O Buffer 6mA 50kΩ Pull-up	13 (1)	1-44
BSUDW	Schmitt I/O Buffer 6mA 50kΩ Pull-up	13 (1)	1-92
BSUFW	Schmitt I/O Buffer 24mA 50kΩ Pull-up	23 (1)	1-44
BSUGW	Schmitt I/O Buffer 24mA 50kΩ Pull-up	23 (1)	1-92
BSUUW	Schmitt I/O Buffer 3mA 50kΩ Pull-up	13 (1)	1-44
BSUVW	Schmitt I/O Buffer 3mA 50kΩ Pull-up	13 (1)	1-92
BSW1W	Schmitt I/O Buffer 12mA 5kΩ Pull-up	23 (1)	1-44
BSW2W	Schmitt I/O Buffer 12mA 5kΩ Pull-up	23 (1)	1-92
BSW3W	Schmitt I/O Buffer 9mA 5kΩ Pull-up	13 (1)	1-44
BSW4W	Schmitt I/O Buffer 9mA 5kΩ Pull-up	13 (1)	1-92
BSW5W	Schmitt I/O Buffer 18mA 5kΩ Pull-up	23 (1)	1-44
BSW6W	Schmitt I/O Buffer 18mA 5kΩ Pull-up	23 (1)	1-92
BSWCW	Schmitt I/O Buffer 6mA 5kΩ Pull-up	13 (1)	1-44
BSWDW	Schmitt I/O Buffer 6mA 5kΩ Pull-up	13 (1)	1-92
BSWFW	Schmitt I/O Buffer 24mA 5kΩ Pull-up	23 (1)	1-44
BSWGW	Schmitt I/O Buffer 24mA 5kΩ Pull-up	23 (1)	1-92
BSWUW	Schmitt I/O Buffer 3mA 5kΩ Pull-up	13 (1)	1-44
BSWVW	Schmitt I/O Buffer 3mA 5kΩ Pull-up	13 (1)	1-92
EBA1	N-ch open drain I/O Buffer with failsafe 9mA	7 (1)	1-28
EBA2	N-ch open drain I/O Buffer with failsafe 9mA	7 (1)	1-76
EBA5	N-ch open drain I/O Buffer with failsafe 18mA	7 (1)	1-28
EBA6	N-ch open drain I/O Buffer with failsafe 18mA	7 (1)	1-76
EBA9	N-ch open drain I/O Buffer with failsafe 12mA	7 (1)	1-28
EBAA	N-ch open drain I/O Buffer with failsafe 12mA	7 (1)	1-76
EBAD	N-ch open drain I/O Buffer with failsafe 24mA	7 (1)	1-28
EBAE	N-ch open drain I/O Buffer with failsafe 24mA	7 (1)	1-76
EBE1W	N-ch open drain Schmitt I/O Buffer with failsafe 9mA	10 (1)	1-30
EBE2W	N-ch open drain Schmitt I/O Buffer with failsafe 9mA	10 (1)	1-78
EBE5W	N-ch open drain Schmitt I/O Buffer with failsafe 18mA	10 (1)	1-30

Block	Function	Cells (I/O)	Page
EBE6W	N-ch open drain Schmitt I/O Buffer with failsafe 18mA	10 (1)	1-78
EBE9W	N-ch open drain Schmitt I/O Buffer with failsafe 12mA	10 (1)	1-30
EBEAW	N-ch open drain Schmitt I/O Buffer with failsafe 12mA	10 (1)	1-78
EBEDW	N-ch open drain Schmitt I/O Buffer with failsafe 24mA	10 (1)	1-30
EBEEW	N-ch open drain Schmitt I/O Buffer with failsafe 24mA	10 (1)	1-78
EXO1	N-ch open drain Buffer with failsafe 9mA	4 (1)	1-26
EXO5	N-ch open drain Buffer with failsafe 18mA	4 (1)	1-26
EXO9	N-ch open drain Buffer with failsafe 12mA	4 (1)	1-26
EXOD	N-ch open drain Buffer with failsafe 24mA	4 (1)	1-26
EXT1	N-ch open drain Buffer 9mA	4 (1)	1-24
EXT3	N-ch open drain Buffer 9mA 50kΩ Pull-up	4 (1)	1-24
EXT5	N-ch open drain Buffer 18mA	4 (1)	1-24
EXT7	N-ch open drain Buffer 18mA 50kΩ Pull-up	4 (1)	1-24
EXT9	N-ch open drain Buffer 12mA	4 (1)	1-24
EXTB	N-ch open drain Buffer 12mA 50kΩ Pull-up	4 (1)	1-24
EXTD	N-ch open drain Buffer 24mA	4 (1)	1-24
EXTF	N-ch open drain Buffer 24mA 50kΩ Pull-up	4 (1)	1-24
EXW3	N-ch open drain Buffer 9mA 5kΩ Pull-up	4 (1)	1-24
EXW7	N-ch open drain Buffer 18mA 5kΩ Pull-up	4 (1)	1-24
EXWB	N-ch open drain Buffer 12mA 5kΩ Pull-up	4 (1)	1-24
EXWF	N-ch open drain Buffer 24mA 5kΩ Pull-up	4 (1)	1-24
F091	H, L Level Generator	1 (-)	2-4
F101	Inverter Single Out	1 (-)	2-10
F102	Inverter Single Out, x2-drive	2 (-)	2-10
F111	Buffer Single Out	2 (-)	2-12
F112	Buffer Single Out, x2-drive	3 (-)	2-12
F131	Delay Gate	6 (-)	2-16
F132	Delay Gate	10 (-)	2-16
F143	Inverter Single Out, x3-drive	3 (-)	2-10
F144	Inverter Single Out, x4-drive	4 (-)	2-10
F145	Inverter Single Out, x5-drive	5 (-)	2-10
F146	Inverter Single Out, x6-drive	6 (-)	2-10
F148	Inverter Single Out, x8-drive	12 (-)	2-10
F153	Buffer Single Out, x3-drive	4 (-)	2-12
F154	Buffer Single Out, x4-drive	5 (-)	2-12
F158	Buffer Single Out, x8-drive	11 (-)	2-12
F202	2-Input NOR	2 (-)	2-22
F203	3-Input NOR	3 (-)	2-24
F204	4-Input NOR	4 (-)	2-26
F205	5-Input NOR	5 (-)	2-28
F206	6-Input NOR	5 (-)	2-30
F208	8-Input NOR	7 (-)	2-32
F212	2-Input OR	2 (-)	2-34

Block	Function	Cells (I/O)	Page
F213	3-Input OR	3 (-)	2-36
F214	4-Input OR	3 (-)	2-38
F215	5-Input OR	5 (-)	2-40
F216	6-Input OR	5 (-)	2-42
F218	8-Input OR	8 (-)	2-44
F222	2-Input NOR x2-drive	4 (-)	2-22
F223	3-Input NOR x2-drive	6 (-)	2-24
F225	5-Input NOR x2-drive	6 (-)	2-28
F226	6-Input NOR x2-drive	6 (-)	2-30
F228	8-Input NOR x2-drive	8 (-)	2-32
F232	2-Input OR x2-drive	3 (-)	2-34
F233	3-Input OR x2-drive	4 (-)	2-36
F234	4-Input OR x2-drive	4 (-)	2-38
F235	5-Input OR x2-drive	7 (-)	2-40
F236	6-Input OR x2-drive	7 (-)	2-42
F238	8-Input OR x2-drive	9 (-)	2-44
F252	2-Input OR x4-drive	6 (-)	2-34
F282	2-Input NOR x4-drive	6 (-)	2-22
F302	2-Input NAND	2 (-)	2-50
F303	3-Input NAND	3 (-)	2-52
F304	4-Input NAND	4 (-)	2-54
F305	5-Input NAND	5 (-)	2-56
F306	6-Input NAND	5 (-)	2-58
F308	8-Input NAND	6 (-)	2-60
F312	2-Input AND	2 (-)	2-62
F313	3-Input AND	3 (-)	2-64
F314	4-Input AND	3 (-)	2-66
F315	5-Input AND	5 (-)	2-68
F316	6-Input AND	5 (-)	2-70
F318	8-Input AND	6 (-)	2-72
F322	2-Input NAND x2-drive	4 (-)	2-50
F323	3-Input NAND x2-drive	6 (-)	2-52
F324	4-Input NAND x2-drive	8 (-)	2-54
F325	5-Input NAND x2-drive	6 (-)	2-56
F326	6-Input NAND x2-drive	6 (-)	2-58
F328	8-Input NAND x2-drive	7 (-)	2-60
F332	2-Input AND x2-drive	3 (-)	2-62
F333	3-Input AND x2-drive	4 (-)	2-64
F334	4-Input AND x2-drive	4 (-)	2-66
F335	5-Input AND x2-drive	7 (-)	2-68
F336	6-Input AND x2-drive	7 (-)	2-70
F338	8-Input AND x2-drive	8 (-)	2-72
F352	2-Input AND x4-drive	6 (-)	2-62

Block	Function	Cells (I/O)	Page
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F421	1-2-Input AND-NOR	3 (-)	2-78
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F616S	D-F/F with SB, 2 to 1 Selector	11 (-)	2-280
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F644SQ	D-F/F with R, S, 2 to 1 Selector Q Out	11 (-)	2-276
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F647NB	D-F/F with RB, SB QB Out	9 (-)	2-260
F647NQ	D-F/F with RB, SB Q Out	9 (-)	2-260
F647S	D-F/F with RB, SB, 2 to 1 Selector	12 (-)	2-282
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F647SQ	D-F/F with RB, SB, 2 to 1 Selector Q Out	11 (-)	2-282
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F661S	D-F/F (CB) with 2 to 1 Selector	10 (-)	2-284
F661SB	D-F/F (CB) with 2 to 1 Selector QB Out	9 (-)	2-284
F661SQ	D-F/F (CB) with 2 to 1 Selector Q Out	9 (-)	2-284
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F666SQ	D-F/F (CB) with SB, 2 to 1 Selector Q Out	10 (-)	2-288
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F767	T-F/F (TB) with RB, SB	9 (-)	2-318
F767NQ	T-F/F (TB) with RB, SB Q Out	8 (-)	2-318
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F771NQ	JK-F/F Q Out	9 (-)	2-322
F774	JK-F/F with R, S	12 (-)	2-326
F774NB	JK-F/F with R, S QB Out	11 (-)	2-326
F774NQ	JK-F/F with R, S Q Out	11 (-)	2-326
F775	JK-F/F with RB	11 (-)	2-328
F775NB	JK-F/F with RB QB Out	10 (-)	2-328
F775NQ	JK-F/F with RB Q Out	10 (-)	2-328
F776	JK-F/F with SB	11 (-)	2-330
F776NB	JK-F/F with SB QB Out	10 (-)	2-330
F776NQ	JK-F/F with SB Q Out	10 (-)	2-330
F777	JK-F/F with RB, SB	12 (-)	2-332
F777NB	JK-F/F with RB, SB QB Out	11 (-)	2-332
F777NQ	JK-F/F with RB, SB Q Out	11 (-)	2-332
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FI01	Input Buffer	3 (1)	1-4
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FIA1	Input Buffer with failsafe	3 (1)	1-6
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FID1	Input Buffer 50kΩ Pull-down	3 (1)	1-4
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FIS1W	Input Buffer Schmitt	6 (1)	1-4
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FIW1	Input Buffer 5kΩ Pull-up	3 (1)	1-4
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FN21	Input Buffer with EN(AND) 50kΩ Pull-down	6 (1)	1-8
FN22	Input Buffer with EN(AND) 50kΩ Pull-down	7 (1)	1-72
FN23	Input Buffer with EN(OR) 50kΩ Pull-down	4 (1)	1-10
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FO02	Output Buffer 12mA	12 (1)	1-12
FO03	Output Buffer 18mA	12 (1)	1-12
FO04	Output Buffer 6mA	4 (1)	1-12
FO06	Output Buffer 24mA	12 (1)	1-12
FO09	Output Buffer 3mA	4 (1)	1-12
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L213	3-Input OR Low Power	2 (-)	2-36
L214	4-Input OR Low Power	3 (-)	2-38
L215	5-Input OR Low Power	4 (-)	2-40
L216	6-Input OR Low Power	4 (-)	2-42
L218	8-Input OR Low Power	6 (-)	2-44
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L303	3-Input NAND Low Power	2 (-)	2-52
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L313	3-Input AND Low Power	2 (-)	2-64
L314	4-Input AND Low Power	3 (-)	2-66
L315	5-Input AND Low Power	4 (-)	2-68
L316	6-Input AND Low Power	4 (-)	2-70
L318	8-Input AND Low Power	5 (-)	2-72
L421	1-2-Input AND-NOR Low Power	2 (-)	2-78
L423	1-3-Input AND-NOR Low Power	2 (-)	2-82
L424	2-2-Input AND-NOR Low Power	2 (-)	2-84
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L430	1-4-Input OR-NAND Low Power	4 (-)	2-118
L431	1-2-Input OR-NAND Low Power	2 (-)	2-120
L432	1-1-2-Input OR-NAND Low Power	2 (-)	2-122
L439	1-5-Input OR-NAND Low Power	5 (-)	2-128
L441	1-5-Input AND-NOR Low Power	5 (-)	2-94
L444	4-4-4-Input AND-NOR Low Power	8 (-)	2-96
L446	1-1-1-2-Input AND-NOR Low Power	4 (-)	2-98
L447	1-1-1-3-Input AND-NOR Low Power	5 (-)	2-100
L448	1-1-2-2-Input AND-NOR Low Power	5 (-)	2-102
L450	2-4-Input OR-NAND Low Power	5 (-)	2-130
L451	4-4-Input OR-NAND Low Power	7 (-)	2-132
L452	1-1-3-Input OR-NAND Low Power	4 (-)	2-134
L453	1-1-4-Input OR-NAND Low Power	5 (-)	2-136
L459	1-1-1-3-Input OR-NAND Low Power	5 (-)	2-142
L460	3-3-3-Input AND-NOR Low Power	6 (-)	2-106
L464	1-1-4-Input AND-NOR Low Power	5 (-)	2-108
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L516	3-Input Exclusive OR Low Power	6 (-)	2-160
L517	3-Input Exclusive NOR Low Power	7 (-)	2-164
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L561	2 to 4 Decoder Negative Out, Low Power	6 (-)	2-186
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L571	2 to 1 Multiplexer (Positive Out) with ENB, Low Power	4 (-)	2-190
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L601	D-Latch Q Out, Low Power	4 (-)	2-218
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L604	D-Latch (GB) Q Out, Low Power	4 (-)	2-236
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L606	BScan D-Latch with SB Q Out, Low Power	5 (-)	4-30
L641	D-F/F Q Out, Low Power	6 (-)	2-248
L644	D-F/F with R, S Q Out, Low Power	8 (-)	2-254
L645	D-F/F with RB Q Out, Low Power	7 (-)	2-256
L647	D-F/F with RB, SB Q Out, Low Power	8 (-)	2-260
L661	D-F/F (CB) Q Out, Low Power	6 (-)	2-262
L667	D-F/F (CB) with RB, SB Q Out, Low Power	8 (-)	2-268
L744	T-F/F with R, S Q Out, Low Power	7 (-)	2-308
L747	T-F/F with RB, SB Q Out, Low Power	7 (-)	2-312
L767	T-F/F (TB) with RB, SB Q Out, Low Power	7 (-)	2-318
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OSI2	Oscillator Input Buffer for Enable	0 (1)	1-118
OSI4	Oscillator Input Buffer for OSO9	0 (1)	1-120
OSO1	Oscillator Output Buffer (Internal Feedback Resistor)	0 (1)	1-122
OS07	Oscillator Output Buffer (for Enable Type)	0 (1)	1-124
OSO9	Oscillator Output Buffer (External Feedback Resistor)	0 (1)	1-126
S000	Scan D-F/F with R, S, 2 to 1 Selector	12 (-)	3-4
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