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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HD74LS75

Quadruple Bistable Latches

REJ03D0416-0300

Rev.3.00

May 10, 2006

The HD74LS75 is ideally suited for use as temporary storage for binary information between processing units and input / output or indicator units. Information present at a data (D) input is transferred to the Q output when the enable (G) is high and the Q output will follow the data input as long as the enable remains high. When the enable goes low, the information (that was present at the data input at the time the transition occurred) is retained at the Q output until the enable is permitted to go high. This device features complementary Q and \bar{Q} outputs from a 4-bit latch.

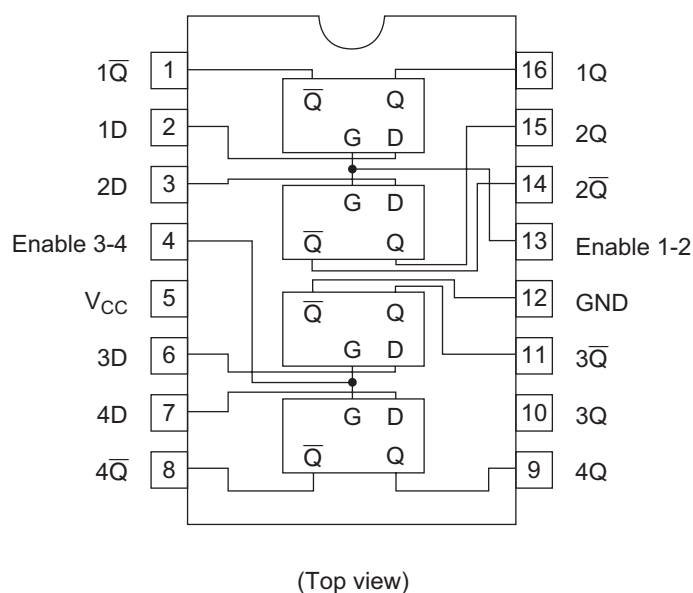
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS75P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS75FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement



Function Table

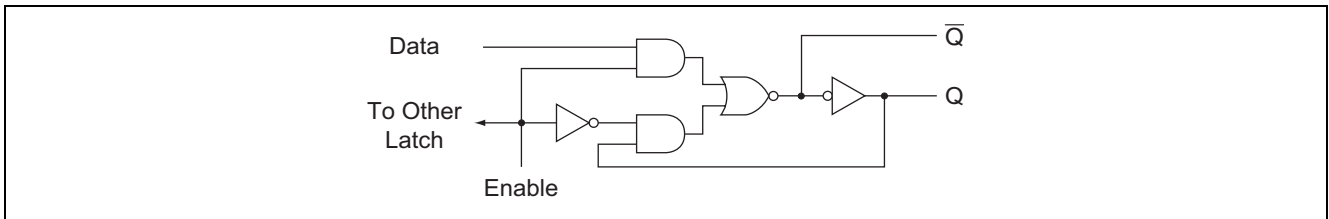
Inputs		Outputs	
D	G	Q	\bar{Q}
L	H	L	H
H	H	H	L
X	L	Q_0	\bar{Q}_0

H; high level, L; low level, X; irrelevant

Q_0 ; level of Q before the indicated steady-state input conditions were established.

\bar{Q}_0 ; complement of Q_0 or level of \bar{Q}_0 before the indicated steady-state input conditions were established.

Circuit Schematic (1/4)



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7	V
Input voltage	V_{IN}	7	V
Power dissipation	P_T	400	mW
Storage temperature	T_{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	-400	μA
	I_{OL}	—	—	8	mA
Operating temperature	T_{opr}	-20	25	75	°C
Pulse width	t_w	20	—	—	ns
Setup time	t_{su}	15	—	—	ns
Hold time	t_h	5	—	—	ns

Electrical Characteristics

(Ta = -20 to +75 °C)

Item		Symbol	min.	typ.*	max.	Unit	Condition
Input voltage		V _{IH}	2.0	—	—	V	
		V _{IL}	—	—	0.8	V	
Output voltage		V _{OH}	2.7	—	—	V	V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = -400 μA
		V _{OL}	—	—	0.4	V	V _{CC} = 4.75 V, V _{IH} = 2 V, V _{IL} = 0.8 V
			—	—	0.5		
							I _{OL} = 4 mA I _{OL} = 8 mA
Input current	D input	I _{IH}	—	—	20	μA	V _{CC} = 5.25 V, V _I = 2.7 V
	G input		—	—	80		
	D input	I _{IL}	—	—	-0.4	mA	V _{CC} = 5.25 V, V _I = 0.4 V
	G input		—	—	-1.6		
	D input	I _I	—	—	0.1	mA	V _{CC} = 5.25 V, V _I = 7 V
	G input		—	—	0.4		
Short-circuit output current		I _{OS}	-20	—	-100	mA	V _{CC} = 5.25 V
Supply current**		I _{CC}	—	6.3	12	mA	V _{CC} = 5.25 V
Input clamp voltage		V _{IK}	—	—	-1.5	V	V _{CC} = 4.75 V, I _{IN} = -18 mA

Notes: * V_{CC} = 5 V, Ta = 25°C** I_{CC} is measured with all outputs open and all inputs grounded.

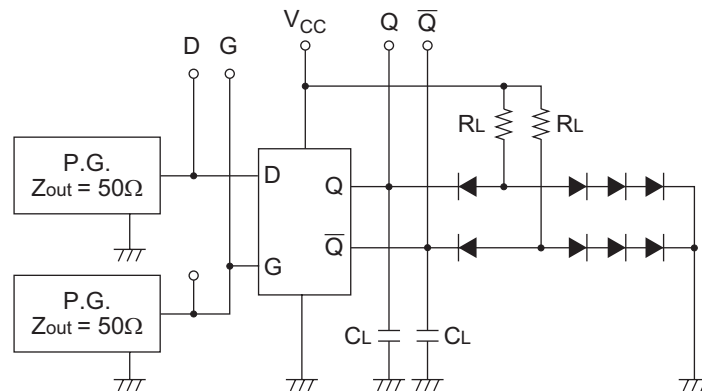
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t _{PLH}	D	Q	—	15	27	ns	C _L = 15 pF, R _L = 2 kΩ
	t _{PHL}			—	9	17		
	t _{PLH}	D	\overline{Q}	—	12	20	ns	
	t _{PHL}			—	7	15		
	t _{PLH}	G	Q	—	15	27	ns	
	t _{PHL}			—	14	25		
	t _{PLH}	G	\overline{Q}	—	16	30	ns	
	t _{PHL}			—	7	15		

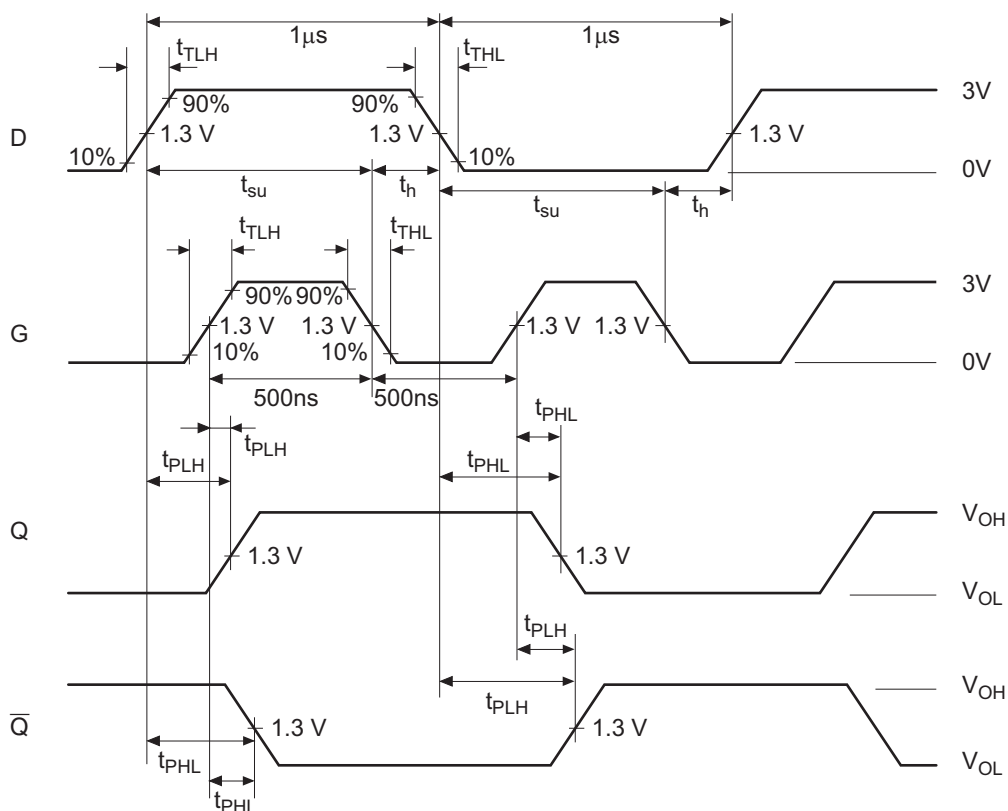
Testing Method

Test Circuit



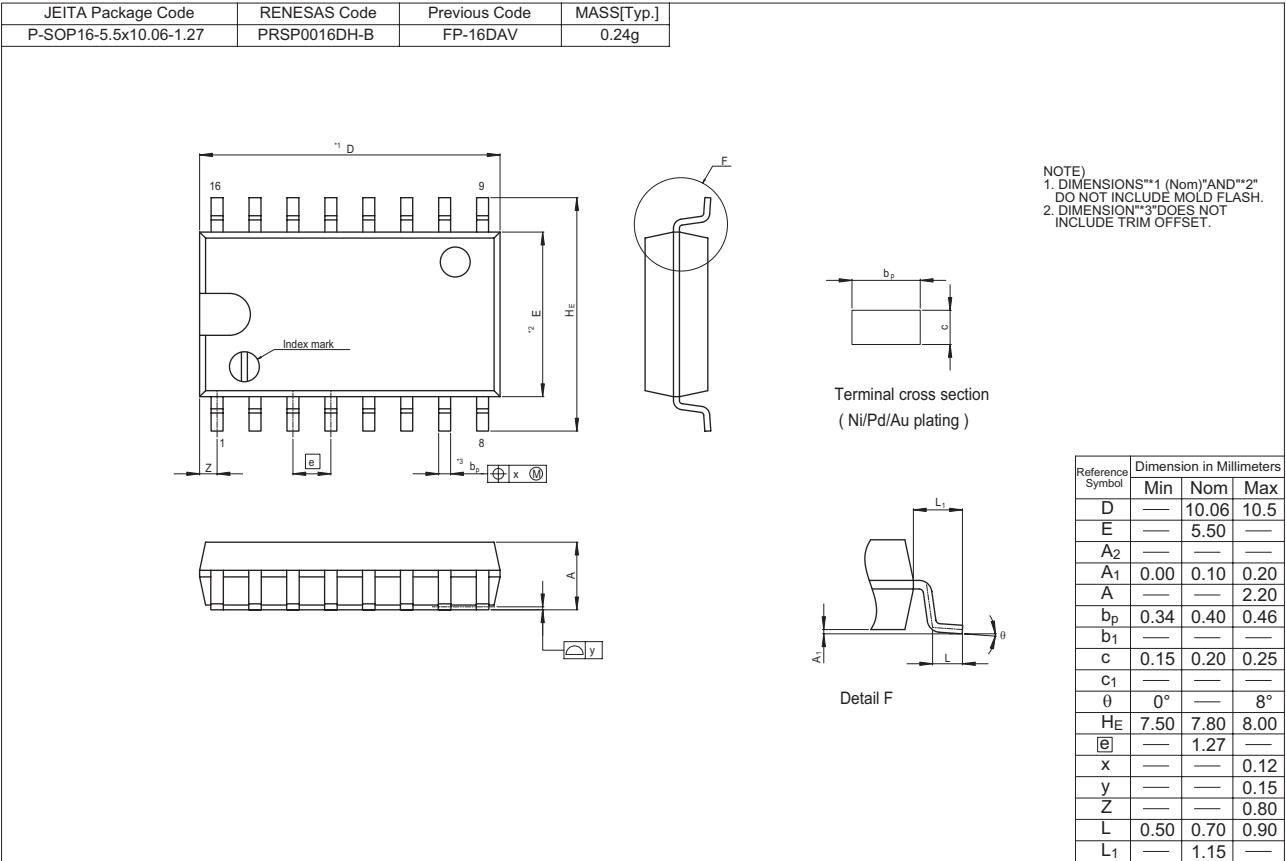
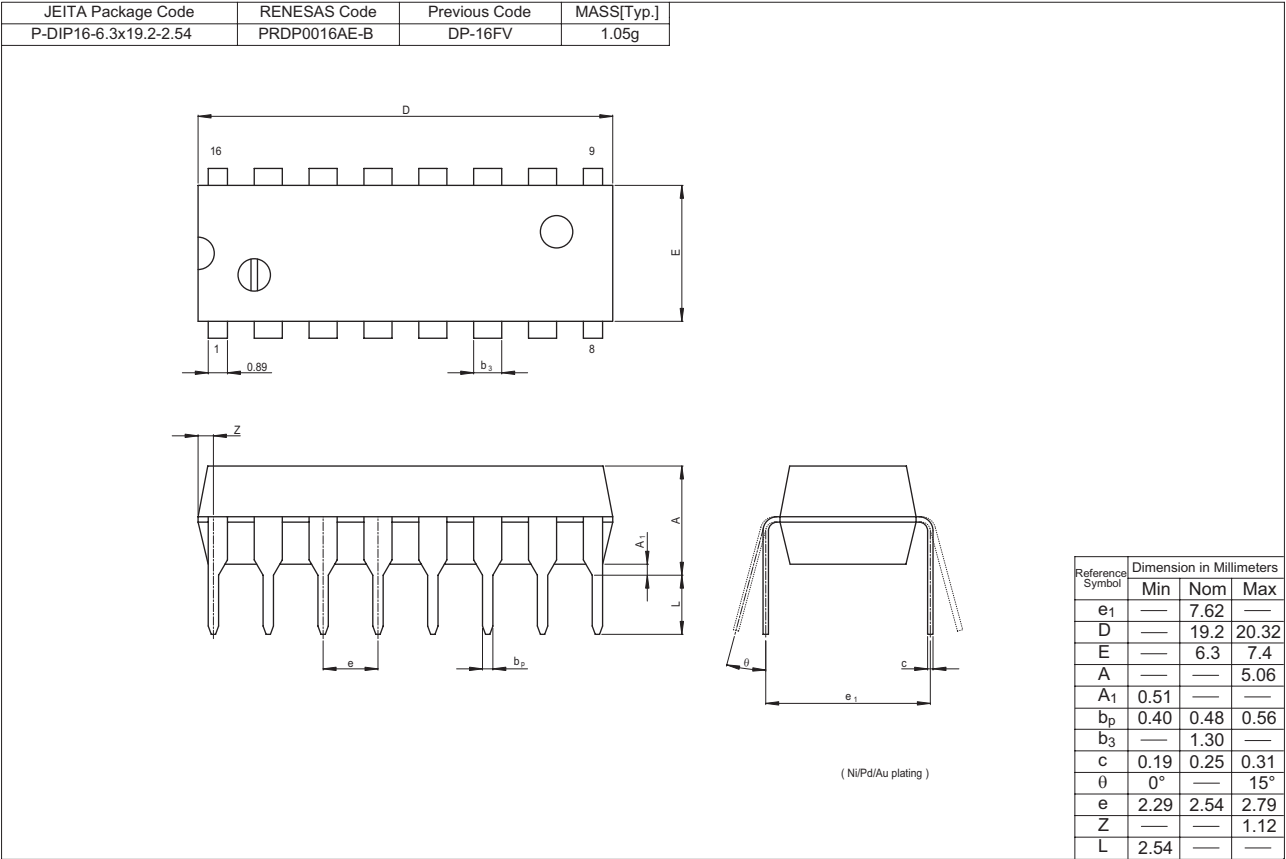
- Notes:
1. Test is put into the each flip-flop.
 2. C_L includes probe and jig capacitance.
 3. All diodes are 1S2074(H).

Waveform



- Notes:
1. Input pulse; D input: PRR = 500 kHz, G input: PRR = 1 MHz, $t_{THL} \leq 10$ ns, $t_{TLH} \leq 10$ ns.
 2. When measuring propagation delay times from the D input, the corresponding G input must be held high.

Package Dimensions



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