74HC574; 74HCT574

Octal D-type flip-flop; positive edge-trigger; 3-state

Rev. 7 — 4 March 2016 Produ

Product data sheet

1. **General description**

The 74HC574; 74HCT574 is an 8-bit positive-edge triggered D-type flip-flop with 3-state outputs. The device features a clock (CP) and output enable (OE) inputs. The flip-flops will store the state of their individual D-inputs that meet the set-up and hold time requirements on the LOW-to-HIGH clock (CP) transition. A HIGH on OE causes the outputs to assume a high-impedance OFF-state. Operation of the OE input does not affect the state of the flip-flops. Inputs include clamp diodes. This enables the use of current limiting resistors to interface inputs to voltages in excess of V_{CC}.

Features and benefits 2.

- Input levels:
 - ◆ For 74HC574: CMOS level
 - ◆ For 74HCT574: TTL level
- 3-state non-inverting outputs for bus oriented applications
- 8-bit positive, edge-triggered register
- Common 3-state output enable input
- Complies with JEDEC standard no. 7 A
- Multiple package options
- ESD protection:
 - HBM JESD22-A114F exceeds 2 000 V
 - MM JESD22-A115-A exceeds 200 V
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

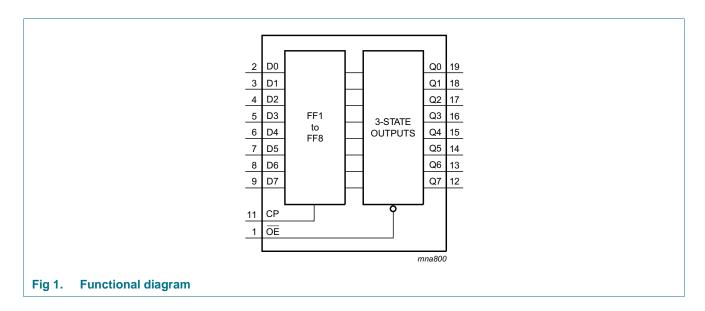
3. Ordering information

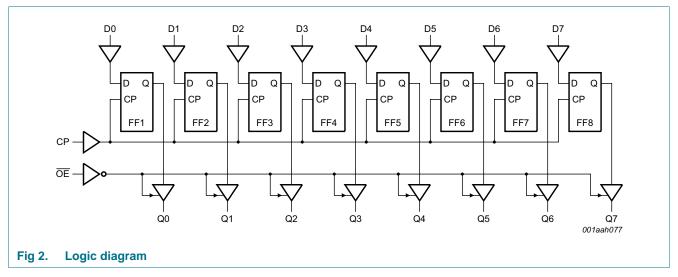
Table 1. **Ordering information**

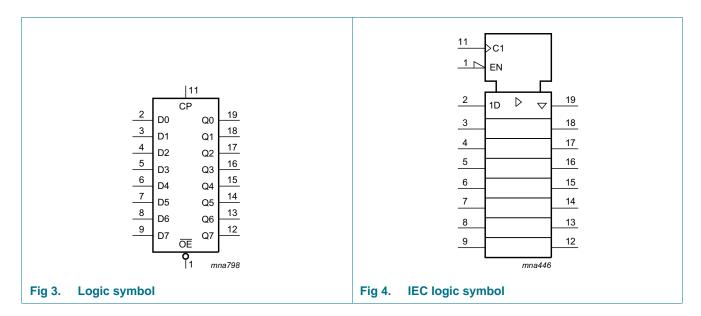
Type number	Package									
	Temperature range	range Name Description								
74HC574D	−40 °C to +125 °C	SO20	plastic small outline package; 20 leads;	SOT163-1						
74HCT574D	-		body width 7.5 mm							
74HC574DB	−40 °C to +125 °C	SSOP20	plastic shrink small outline package; 20 leads;	SOT339-1						
74HCT574DB	-		body width 5.3 mm							
74HC574PW	–40 °C to +125 °C	TSSOP20	plastic thin shrink small outline package; 20 leads;	SOT360-1						
74HCT574PW			body width 4.4 mm							



4. Functional diagram

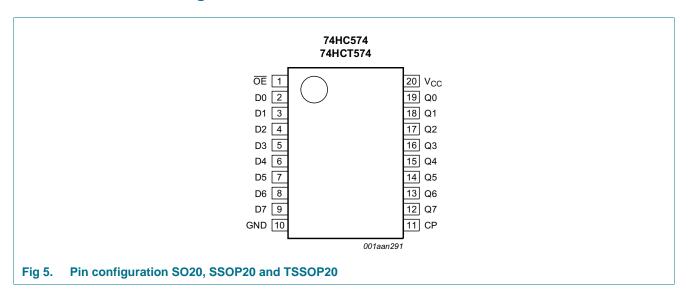






5. Pinning information

5.1 Pinning



5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
ŌĒ	1	3-state output enable input (active LOW)
D[0:7]	2, 3, 4, 5, 6, 7, 8, 9	data input
GND	10	ground (0 V)
СР	11	clock input (LOW-to-HIGH, edge triggered)
Q[0:7]	19, 18, 17, 16, 15, 14, 13, 12	3-state flip-flop output
V _{CC}	20	supply voltage

74HC_HCT574

All information provided in this document is subject to legal disclaimers.

6. Functional description

Table 3. Function table[1]

Operating mode	Input			Internal	Output
	OE	СР	Dn	flip-flop	Qn
Load and read register	L	↑	I	L	L
	L	↑	h	Н	Н
Load register and disable output	Н	↑	I	L	Z
	Н	↑	h	Н	Z

^[1] H = HIGH voltage level;

h = HIGH voltage level one setup time prior to the HIGH-to-LOW CP transition;

L = LOW voltage level;

I = LOW voltage level one setup time prior to the HIGH-to-LOW CP transition;

Z = high-impedance OFF-state;

 \uparrow = LOW-to-HIGH clock transition.

7. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134). Voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CC}	supply voltage		-	-0.5	+7	V
I _{IK}	input clamping current	$V_{I} < -0.5 \text{ V or } V_{I} > V_{CC} + 0.5 \text{ V}$		-	±20	mA
I _{OK}	output clamping current	$V_{O} < -0.5 \text{ V or } V_{O} > V_{CC} + 0.5 \text{ V}$		-	±20	mA
Io	output current	$V_{O} = -0.5 \text{ V to } (V_{CC} + 0.5 \text{ V})$		-	±35	mA
I _{CC}	supply current			-	+70	mA
I _{GND}	ground current			-	-70	mA
T _{stg}	storage temperature			-65	+150	°C
P _{tot}	total power dissipation	SO20, SSOP20 and TSSOP20 packages	[1]	-	500	mW

^[1] For SO20: P_{tot} derates linearly with 8 mW/K above 70 °C.

For SSOP20 and TSSOP20 packages: Ptot derates linearly with 5.5 mW/K above 60 °C.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	7	74HC574			74HCT574			
			Min	Тур	Max	Min	Тур	Max		
V _{CC}	supply voltage		2.0	5.0	6.0	4.5	5.0	5.5	V	
VI	input voltage		0	-	V _{CC}	0	-	V _{CC}	V	
Vo	output voltage		0	-	V _{CC}	0	-	V _{CC}	V	
T _{amb}	ambient temperature		-40	+25	+125	-40	+25	+125	°C	

 Table 5.
 Recommended operating conditions ...continued

Voltages are referenced to GND (ground = 0 V) ...continued

Symbol	Parameter	Conditions	-	74HC574		7	Unit		
			Min	Тур	Max	Min	Тур	Max	
Δt/ΔV	input transition rise and fall rate	V _{CC} = 2.0 V	-	-	625	-	-	-	ns/V
		V _{CC} = 4.5 V	-	1.67	139	-	1.67	139	ns/V
		V _{CC} = 6.0 V	-	-	83	-	-	-	ns/V

9. Static characteristics

Table 6. Static characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions		25 °C		-40 °C t	o +85 °C	-40 °C to	+125 °C	Unit
			Min	Тур	Max	Min	Max	Min	Max	
74HC574	4							-		
V _{IH}	HIGH-level	V _{CC} = 2.0 V	1.5	1.2	-	1.5	-	1.5	-	V
	input voltage	V _{CC} = 4.5 V	3.15	2.4	-	3.15	-	3.15	-	٧
		V _{CC} = 6.0 V	4.2	3.2	-	4.2	-	4.2	-	V
V _{IL}	LOW-level	V _{CC} = 2.0 V	-	0.8	0.5	-	0.5	-	0.5	V
	input voltage	V _{CC} = 4.5 V	-	2.1	1.35	-	1.35	-	1.35	V
		V _{CC} = 6.0 V	-	2.8	1.8	-	1.8	-	1.8	V
V _{OH}	HIGH-level	$V_I = V_{IH}$ or V_{IL}								
	output voltage	$I_O = -20 \mu A; V_{CC} = 2.0 V$	1.9	2.0	-	1.9	-	1.9	-	V
		$I_O = -20 \mu A; V_{CC} = 4.5 V$	4.4	4.5	-	4.4	-	4.4	-	V
		$I_O = -20 \mu A; V_{CC} = 6.0 V$	5.9	6.0	-	5.9	-	5.9	-	V
		$I_{O} = -6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.98	4.32	-	3.84	-	3.7	-	V
		$I_{O} = -7.8 \text{ mA}; V_{CC} = 6.0 \text{ V}$	5.48	5.81	-	5.34	-	5.2	-	V
V _{OL}	LOW-level	$V_I = V_{IH}$ or V_{IL}								
	output voltage	$I_O = 20 \mu A; V_{CC} = 2.0 V$	-	0	0.1	-	0.1	-	0.1	V
		$I_O = 20 \mu A; V_{CC} = 4.5 V$	-	0	0.1	-	0.1	-	0.1	V
		$I_O = 20 \mu A; V_{CC} = 6.0 \text{ V}$	-	0	0.1	-	0.1	-	0.1	V
		$I_O = 6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	0.15	0.26	-	0.33	-	0.4	V
		$I_O = 7.8 \text{ mA}; V_{CC} = 6.0 \text{ V}$	-	0.16	0.26	-	0.33	-	0.4	V
l _l	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0 \text{ V}$	-	-	±0.1	-	±1.0	-	±1.0	μΑ
I _{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 6.0$ V; $V_O = V_{CC}$ or GND	-	-	±0.5	-	±5.0	-	±10.0	μА
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 6.0 \text{ V}$	-	-	8.0	-	80	-	160	μΑ
Cı	input capacitance		-	3.5	-	-	-	-	-	pF

 Table 6.
 Static characteristics ...continued

At recommended operating conditions; voltages are referenced to GND (ground = 0 V).

Symbol	Parameter	Conditions		25 °C		-40 °C t	o +85 °C	–40 °C t	o +125 °C	Unit
			Min	Тур	Max	Min	Max	Min	Max	
74HCT5	74									
V _{IH}	HIGH-level input voltage	V _{CC} = 4.5 V to 5.5 V	2.0	1.6	-	2.0	-	2.0	-	V
V_{IL}	LOW-level input voltage	V _{CC} = 4.5 V to 5.5 V	-	1.2	8.0	-	0.8	-	0.8	V
V _{OH}	HIGH-level	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$								
	output voltage	$I_{O} = -20 \mu A$	4.4	4.5	-	4.4	-	4.4	-	V
		$I_O = -6 \text{ mA}$	3.98	4.32	-	3.84	-	3.7	-	V
V_{OL}	LOW-level	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 4.5 \text{ V}$								
	output voltage	I _O = 20 μA	-	0	0.1	-	0.1	-	0.1	V
		$I_{O} = 6.0 \text{ mA}$	-	0.16	0.26	-	0.33	-	0.4	V
l _l	input leakage current	$V_1 = V_{CC}$ or GND; $V_{CC} = 5.5 \text{ V}$	-	-	±0.1	-	±1.0	-	±1.0	μΑ
I _{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL} ; $V_{CC} = 5.5$ V; $V_O = V_{CC}$ or GND	-	-	±0.5	-	±5.0	-	±10	μΑ
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5 \text{ V}$	-	-	8.0	-	80	-	160	μА
Δl _{CC}	additional supply current	$\begin{aligned} &V_{I} = V_{CC} - 2.1 \text{ V;} \\ &\text{other inputs at } V_{CC} \text{ or GND;} \\ &V_{CC} = 4.5 \text{ V to } 5.5 \text{ V;} \\ &I_{O} = 0 \text{ A} \end{aligned}$								
		per input pin; Dn inputs	-	50	180	-	225	-	245	μΑ
		per input pin; OE input	-	125	450	-	563	-	613	μΑ
		per input pin; CP input	-	150	540	-	675	-	735	μΑ
Cı	input capacitance		-	3.5	-	-	-	-	-	pF

10. Dynamic characteristics

Table 7. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see Figure 9.

Symbol	Parameter	Conditions		25 °C		-40 °C	to +85 °C	-40 °C t	o +125 °C	Unit
			Min	Тур	Max	Min	Max	Min	Max	
74HC57	4									
t _{pd}	propagation	CP to Qn; see Figure 6	[1]							
	delay	V _{CC} = 2.0 V	-	47	150	-	190	-	225	ns
		V _{CC} = 4.5 V	-	17	30	-	35	-	45	ns
		V _{CC} = 5 V; C _L = 15 pF	-	14	-	-	-	-	-	ns
		V _{CC} = 6.0 V	-	14	26	-	33	-	38	ns
t _{en}	enable time	OE to Qn; see Figure 8	[2]							-
		V _{CC} = 2.0 V	-	44	140	-	175	-	210	ns
		V _{CC} = 4.5 V	-	16	28	-	35	-	42	ns
		V _{CC} = 6.0 V	-	13	24	-	30	-	36	ns
t _{dis}	disable time	OE to Qn; see Figure 8	[3]							-
		V _{CC} = 2.0 V	-	39	125	-	155	-	190	ns
		V _{CC} = 4.5 V	-	14	25	-	31	-	38	ns
		V _{CC} = 6.0 V	-	11	21	-	26	-	32	ns
t _t	transition	Qn; see Figure 6	[4]							-
	time	V _{CC} = 2.0 V	-	14	60	-	75	-	90	ns
		V _{CC} = 4.5 V	-	5	12	-	15	-	18	ns
		V _{CC} = 6.0 V	-	4	10	-	13	-	15	ns
t _W	pulse width	CP HIGH or LOW; see Figure 7								
		V _{CC} = 2.0 V	80	14	-	100	-	120	-	ns
		V _{CC} = 4.5 V	16	5	-	20	-	24	-	ns
		V _{CC} = 6.0 V	14	4	-	17	-	20	-	ns
t _{su}	set-up time	Dn to CP; see Figure 7								
		V _{CC} = 2.0 V	60	6	-	75	-	90	-	ns
		V _{CC} = 4.5 V	12	2	-	15	-	18	-	ns
		V _{CC} = 6.0 V	10	2	-	13	-	15	-	ns
t _h	hold time	Dn to CP; see Figure 7								
		V _{CC} = 2.0 V	5	0	-	5	-	5	-	ns
		V _{CC} = 4.5 V	5	0	-	5	-	5	-	ns
		V _{CC} = 6.0 V	5	0	-	5	-	5	-	ns
f _{max}	maximum	CP; see Figure 6								
	frequency	V _{CC} = 2.0 V	6.0	37	-	4.8	-	4.0	-	MHz
		V _{CC} = 4.5 V	30	112	-	24	-	20	-	MHz
		V _{CC} = 5 V; C _L = 15 pF	-	123	-	-	-	-	-	MHz
		V _{CC} = 6.0 V	35	133	-	28	-	24	-	MHz

 Table 7.
 Dynamic characteristics ...continued

Voltages are referenced to GND (ground = 0 V); $C_L = 50 pF$ unless otherwise specified; for test circuit see <u>Figure 9</u>.

Symbol	Parameter	Conditions			25 °C		-40 °C	to +85 °C	-40 °C t	o +125 °C	Unit
				Min	Тур	Max	Min	Max	Min	Max	
C_{PD}	power dissipation capacitance	$C_L = 50 \text{ pF}; f = 1 \text{ MHz};$ $V_I = \text{GND to } V_{CC}$		-	22	-	-	-	-	-	pF
74HCT5	74										
t _{pd}	propagation	CP to Qn; see Figure 6	<u>[1]</u>								
	delay	V _{CC} = 4.5 V		-	18	33	-	41	-	50	ns
		$V_{CC} = 5 \text{ V}; C_L = 15 \text{ pF}$		-	15	-	-	-	-	-	ns
t _{en}	enable time	OE to Qn; see Figure 8	[2]								
		V _{CC} = 4.5 V		-	19	33	-	41	-	50	ns
t _{dis}	disable time	OE to Qn; see Figure 8	[3]								
		V _{CC} = 4.5 V		-	16	28	-	35	-	42	ns
t _t	transition	Qn; see Figure 6	[4]								
	time	V _{CC} = 4.5 V		-	5	12	-	15	-	18	ns
t _W	pulse width	CP HIGH or LOW; see Figure 7									
		V _{CC} = 4.5 V		16	7	-	20	-	24	-	ns
t _{su}	set-up time	Dn to CP; see Figure 7									
		V _{CC} = 4.5 V		12	3	-	15	-	18	-	ns
t _h	hold time	Dn to CP; see Figure 7									
		V _{CC} = 4.5 V		5	-1	-	5	-	5	-	ns
f _{max}	maximum	CP; see Figure 6									
	frequency	V _{CC} = 4.5 V		30	69	-	24	-	20	-	MHz
		$V_{CC} = 5 \text{ V}; C_L = 15 \text{ pF}$		-	76	-	-	-	-	-	MHz
C _{PD}	power dissipation capacitance	C_L = 50 pF; f = 1 MHz; V _I = GND to V _{CC} - 1.5 V	<u>[5]</u>	-	25	-	-	-	-	-	pF

- [1] t_{pd} is the same as t_{PLH} and t_{PHL} .
- [2] t_{en} is the same as t_{PZH} and t_{PZL} .
- [3] t_{dis} is the same as t_{PLZ} and t_{PHZ} .
- [4] t_t is the same as t_{THL} and t_{TLH} .
- [5] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \sum (C_L \times V_{CC}^2 \times f_o)$ where:

f_i = input frequency in MHz;

f_o = output frequency in MHz;

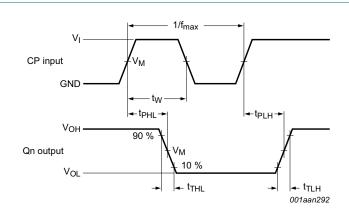
 C_L = output load capacitance in pF;

 V_{CC} = supply voltage in V;

N = number of inputs switching;

 $\sum (C_L \times V_{CC}{}^2 \times f_o)$ = sum of outputs.

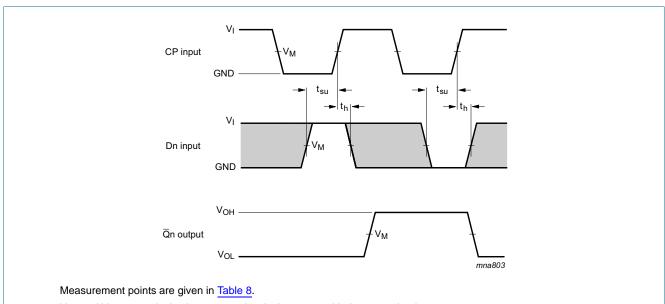
11. Waveforms



Measurement points are given in Table 8.

 V_{OL} and V_{OH} are typical voltage output levels that occur with the output load.

Fig 6. Propagation delay input (CP) to output (Qn), output transition time, clock input (CP) pulse width and the maximum frequency (CP)



 V_{OL} and V_{OH} are typical voltage output levels that occur with the output load.

Fig 7. The data input (D) to clock input (CP) set-up times and clock input (CP) to data input (D) hold times

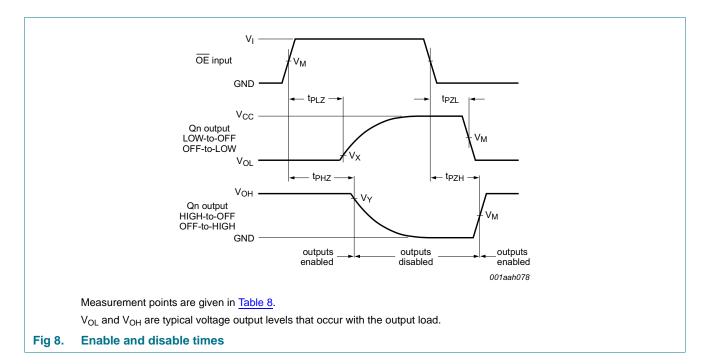
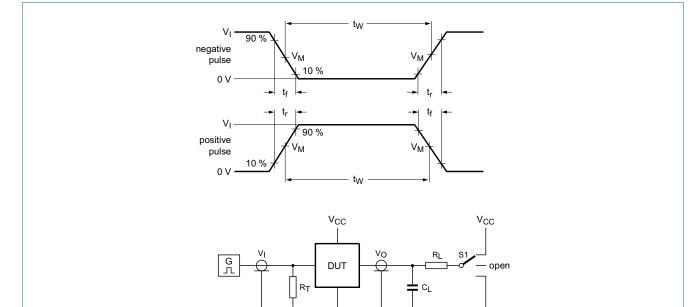


Table 8. Measurement points

Туре	Input	Output		
	V _M	V _M	V _X	V _Y
74HC574	0.5V _{CC}	0.5V _{CC}	0.1V _{CC}	0.9V _{CC}
74HCT574	1.3 V	1.3 V	0.1V _{CC}	0.9V _{CC}

001aad983



Test data is given in Table 9.

Definitions test circuit:

 R_T = Termination resistance should be equal to output impedance Z_o of the pulse generator.

 C_L = Load capacitance including jig and probe capacitance.

 R_L = Load resistance.

S1 = Test selection switch.

Fig 9. Test circuit for measuring switching times

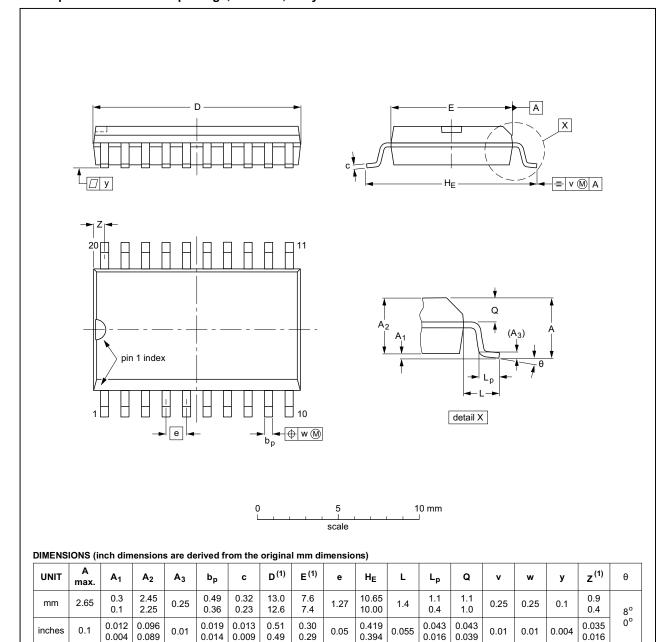
Table 9. Test data

Туре	Input		Load		S1 position			
	VI	t _r , t _f	CL	R _L	t _{PHL} , t _{PLH}	t _{PZH} , t _{PHZ}	t _{PZL} , t _{PLZ}	
74HC574	V _{CC}	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}	
74HCT574	3 V	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}	

12. Package outline

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1



Note

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	1330E DATE
SOT163-1	075E04	MS-013			99-12-27 03-02-19

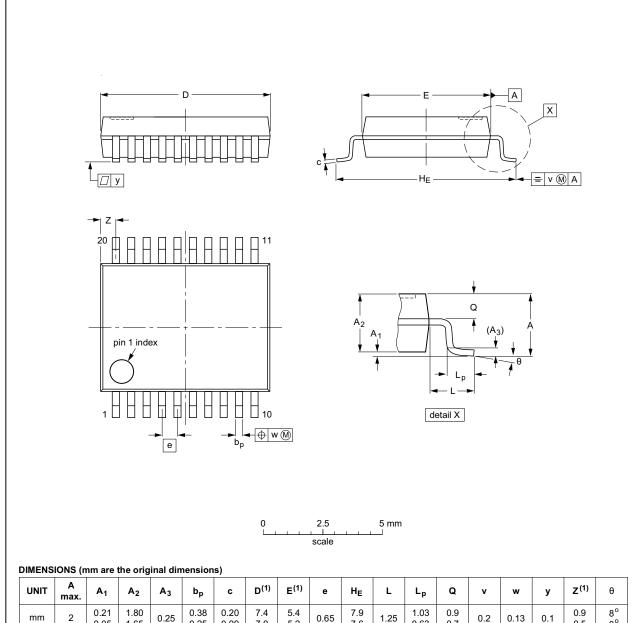
Fig 10. Package outline SOT163-1 (SO20)

74HC_HCT574

All information provided in this document is subject to legal disclaimers.

SSOP20: plastic shrink small outline package; 20 leads; body width 5.3 mm

SOT339-1



UNIT	A max.	A ₁	A ₂	A ₃	bp	С	D ⁽¹⁾	E ⁽¹⁾	е	HE	L	Lp	ø	v	¥	у	Z ⁽¹⁾	θ
mm	2	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	7.4 7.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	0.9 0.5	8° 0°

Note

1. Plastic or metal protrusions of 0.2 mm maximum per side are not included.

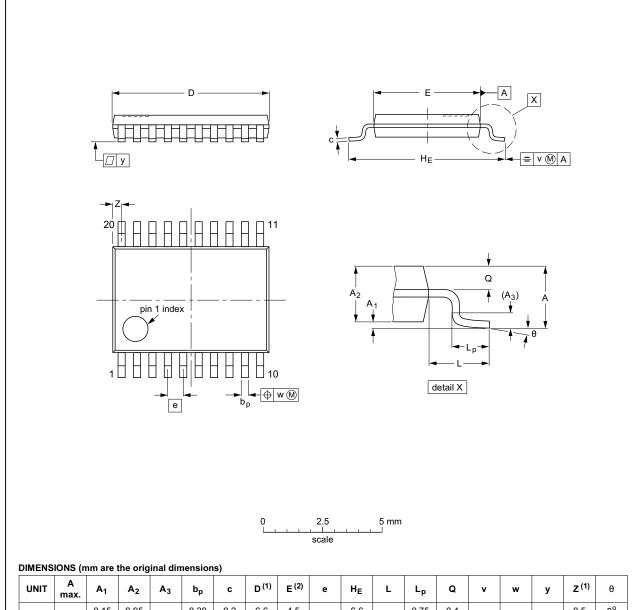
OUTLINE		REFER	ENCES	EUROPEAN	ISSUE DATE
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE
SOT339-1		MO-150			99-12-27 03-02-19

Fig 11. Package outline SOT339-1 (SSOP20)

74HC_HCT574 All information provided in this document is subject to legal disclaimers.

TSSOP20: plastic thin shrink small outline package; 20 leads; body width 4.4 mm

SOT360-1



UNIT	A max.	A ₁	A ₂	A ₃	bp	С	D ⁽¹⁾	E (2)	е	HE	L	Lp	Q	٧	w	у	Z ⁽¹⁾	θ
mm	1.1	0.15 0.05	0.95 0.80	0.25	0.30 0.19	0.2 0.1	6.6 6.4	4.5 4.3	0.65	6.6 6.2	1	0.75 0.50	0.4 0.3	0.2	0.13	0.1	0.5 0.2	8° 0°

Notes

- 1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
- 2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

	OUTLINE		REFER	RENCES	EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	JEITA	PROJECTION	ISSUE DATE		
	SOT360-1		MO-153			-99-12-27 03-02-19	

Fig 12. Package outline SOT360-1 (TSSOP20)

74HC_HCT574

All information provided in this document is subject to legal disclaimers.

13. Abbreviations

Table 10. Abbreviations

Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
НВМ	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

14. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT574 v.7	20160304	Product data sheet	-	74HC_HCT574 v.6
Modifications:	Type numb	ers 74HC574N and 74HC	CT574N (SOT146-1)	removed.
74HC_HCT574 v.6	20150126	Product data sheet	-	74HC_HCT574 v.5
Modifications:	• <u>Table 7</u> : Po	ower dissipation capacitan	ce condition for 74H0	CT574 is corrected.
74HC_HCT574 v.5	20120425	Product data sheet	-	74HC_HCT574 v.4
Modifications:	 V_X and V_Y 	measurement points adde	ed to Table 8.	
74HC_HCT574 v.4	20111219	Product data sheet	-	74HC_HCT574 v.3
Modifications:	Legal page	s updated.		'
74HC_HCT574 v.3	20101215	Product data sheet	-	74HC_HCT574_CNV v.2
74HC_HCT574_CNV v.2	19970827	Product specification	-	-

15. Legal information

15.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions"
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

15.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

15.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

74HC HCT574

All information provided in this document is subject to legal disclaimers.

74HC574; 74HCT574

Octal D-type flip-flop; positive edge-trigger; 3-state

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond

NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

15.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

16. Contact information

For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com

17. Contents

1	General description
2	Features and benefits
3	Ordering information
4	Functional diagram 2
5	Pinning information
5.1	Pinning
5.2	Pin description
6	Functional description 4
7	Limiting values 4
8	Recommended operating conditions 4
9	Static characteristics 5
10	Dynamic characteristics
11	Waveforms
12	Package outline
13	Abbreviations
14	Revision history
15	Legal information
15.1	Data sheet status
15.2	Definitions
15.3	Disclaimers
15.4	Trademarks17
16	Contact information 17
17	Contents

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.