

EN: This Datasheet is presented by the manufacturer.

Please visit our website for pricing and availability at <u>www.hestore.hu</u>.

Octal D-type transparent latch; 3-state Rev. 4 — 3 September 2010

General description 1.

The 74HC373; 74HCT373 is a high-speed Si-gate CMOS device and is pin compatible with Low-power Schottky TTL. It is specified in compliance with JEDEC standard no. 7A.

The 74HC373; 74HCT373 is an octal D-type transparent latch featuring separate D-type inputs for each latch and 3-state outputs for bus oriented applications. A latch enable (LE) input and an output enable (\overline{OE}) input are common to all latches.

The 74HC373; 74HCT373 consists of eight D-type transparent latches with 3-state true outputs. When LE is HIGH, data at the Dn inputs enters the latches. In this condition the latches are transparent, i.e. a latch output will change state each time its corresponding D input changes.

When LE is LOW the latches store the information that was present at the D inputs a set-up time preceding the HIGH-to-LOW transition of LE. When OE is LOW, the contents of the 8 latches are available at the outputs. When OE is HIGH, the outputs go to the highimpedance OFF-state. Operation of the OE input does not affect the state of the latches.

The 74HC373; 74HCT373 is functionally identical to:

- 74HC563; 74HCT563: but inverted outputs and different pin arrangement
- 74HC573; 74HCT573: but different pin arrangement

Features and benefits 2.

- 3-state non-inverting outputs for bus oriented applications
- Common 3-state output enable input
- Functionally identical to the 74HC563; 74HCT563 and 74HC573; 74HCT573
- 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

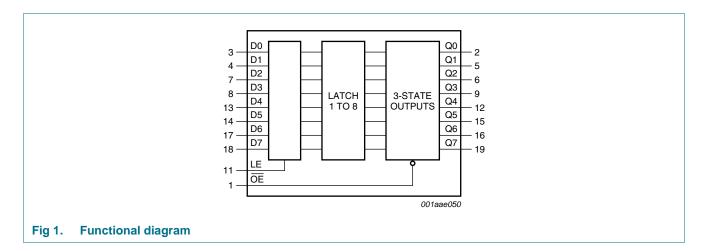


Octal D-type transparent latch; 3-state

3. Ordering information

Table 1. Ord	lering information				
Type number	Package				
	Temperature range	Name	Description	Version	
74HC373N	–40 °C to +125 °C	DIP20	plastic dual in-line package; 20 leads (300 mil)	SOT146-1 SOT163-1 SOT339-1 SOT360-1	
74HCT373N					
74HC373D	–40 °C to +125 °C	SO20	plastic small outline package; 20 leads;	SOT163-1	
74HCT373D			body width 7.5 mm		
74HC373DB	–40 °C to +125 °C	SSOP20	plastic shrink small outline package; 20 leads;	SOT339-1	
74HCT373DB			body width 5.3 mm		
74HC373PW	–40 °C to +125 °C	TSSOP20	plastic thin shrink small outline package; 20 leads;	SOT360-1	
74HCT373PW			body width 4.4 mm		
74HC373BQ	–40 °C to +125 °C	DHVQFN20	plastic dual in-line compatible thermal enhanced very	SOT764-1	
74HCT373BQ			thin quad flat package; no leads; 20 terminals; body $2.5 \times 4.5 \times 0.85$ mm		

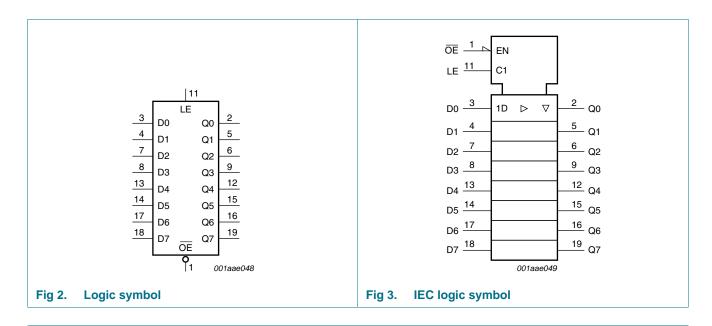
4. Functional diagram



NXP Semiconductors

74HC373; 74HCT373

Octal D-type transparent latch; 3-state



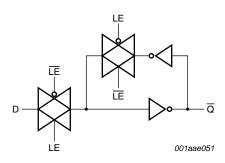
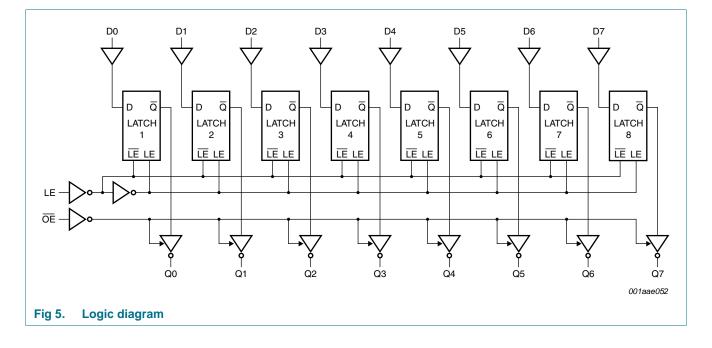


Fig 4. Logic diagram (one latch)

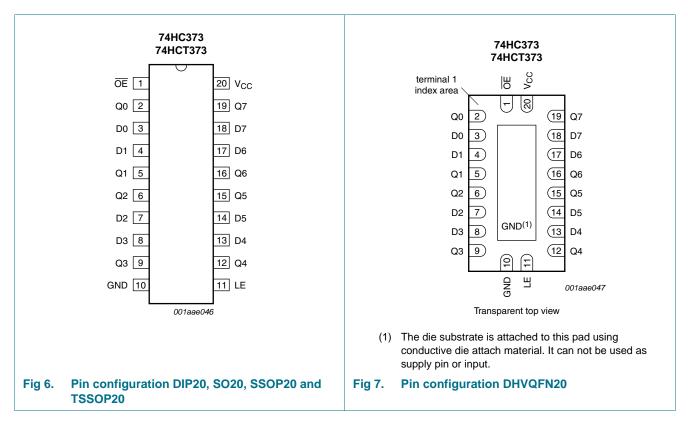


3 of 26

Octal D-type transparent latch; 3-state

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)
Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7	2, 5, 6, 9, 12, 15, 16, 19	3-state latch output
D0, D1, D2, D3, D4, D5, D6, D7	3, 4, 7, 8, 13, 14, 17, 18	data input
GND	10	ground (0 V)
LE	11	latch enable input (active HIGH)
V _{cc}	20	supply voltage

Octal D-type transparent latch; 3-state

6. Functional description

6.1 Function table

Table 3.Function table^[1]

Operating mode	Control		Input	Internal latches	Output
	OE	LE	Dn		Qn
Enable and read register	L	Н	L	L	L
(transparent mode)			Н	Н	Н
Latch and read register	L	L	I	L	L
			h	Н	Н
Latch register and disable outputs	Н	Х	Х	Х	Z

[1] H = HIGH voltage level;

h = HIGH voltage level one set-up time prior to the HIGH-to-LOW LE transition;

L = LOW voltage level;

I = LOW voltage level one set-up time prior to the HIGH-to-LOW LE transition;

X = don't care;

Z = high-impedance OFF-state.

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	$V_{\rm I}$ < –0.5 V or $V_{\rm I}$ > $V_{\rm CC}$ + 0.5 V	-	±20	mA
I _{OK}	output clamping current	$V_{\rm O}$ < –0.5 V or $V_{\rm O}$ > $V_{\rm CC}$ + 0.5 V	-	±20	mA
lo	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				
		DIP20 package	<u>[1]</u> _	750	mW
		SO20 package	[2] _	500	mW
		SSOP20 package	[3]	500	mW
		TSSOP20 package	[3]	500	mW
		DHVQFN20 package	[4] _	500	mW

[1] For DIP20 package: P_{tot} derates linearly with 12 mW/K above 70 °C.

[2] For SO20: P_{tot} derates linearly with 8 mW/K above 70 $^\circ C.$

[3] For SSOP20 and TSSOP20 packages: P_{tot} derates linearly with 5.5 mW/K above 60 $^\circ$ C.

[4] For DHVQFN20 package: P_{tot} derates linearly with 4.5 mW/K above 60 $^\circ C.$

Octal D-type transparent latch; 3-state

8. Recommended operating conditions

Table 5. Recommended operating conditions

Voltages are referenced to GND (ground = 0 V)

Symbol	Parameter	Conditions	-	74HC373	3	7	4HCT37	3	Unit
			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
$\Delta t / \Delta V$	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 74HC373

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

Symbol	Parameter	Conditions	Min	Тур	Мах	Unit
T _{amb} = 25	°C					
V _{IH}	HIGH-level input voltage	$V_{CC} = 2.0 V$	1.5	1.2	-	V
		$V_{CC} = 4.5 V$	3.15	2.4	-	V
		$V_{CC} = 6.0 V$	4.2	3.2	-	V
V _{IL}	LOW-level input voltage	$V_{CC} = 2.0 V$	-	0.8	0.5	V
		$V_{CC} = 4.5 V$	-	2.1	1.35	V
		$V_{CC} = 6.0 V$	-	2.8	1.8	V
V _{OH}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$	-	-	-	
		$I_{O} = -20 \ \mu A; \ V_{CC} = 2.0 \ V$	1.9	2.0	-	V
		$I_{O} = -20 \ \mu A; \ V_{CC} = 4.5 \ V$	4.4	4.5	-	V
		$I_{O} = -20 \ \mu A; \ V_{CC} = 6.0 \ V$	5.9	6.0	-	V
		$I_0 = -6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.98	4.32	-	V
		$I_{O} = -7.8 \text{ mA}; V_{CC} = 6.0 \text{ V}$	5.48	5.81	-	V
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = 20 \ \mu A; \ V_{CC} = 2.0 \ V$	-	0	0.1	V
		$I_{O} = 20 \ \mu A; \ V_{CC} = 4.5 \ V$	-	0	0.1	V
		$I_0 = 20 \ \mu A; \ V_{CC} = 6.0 \ V$	-	0	0.1	V
		I_{O} = 6.0 mA; V_{CC} = 4.5 V	-	0.15	0.26	V
		I_{O} = 7.8 mA; V_{CC} = 6.0 V	-	0.16	0.26	V
lı	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 6.0$ V	-	-	±0.1	μA
I _{OZ}	OFF-state output current	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 6.0 \text{ V};$ $V_O = V_{CC} \text{ or GND}$	-	-	±0.5	μΑ
I _{CC}	supply current	$V_{CC} = 6.0 \text{ V}; I_O = 0 \text{ A};$ $V_I = V_{CC} \text{ or GND}$	-	-	8.0	μA
CI	input capacitance		-	3.5	-	pF
4HC_HCT373		All information provided in this document is subject to legal disclaimers.		C	NXP B.V. 2010.	. All rights reser
Product da	ta sheet	Rev. 4 — 3 September 2010				6 of

Octal D-type transparent latch; 3-state

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = -4	0 °C to +85 °C					
VIH	HIGH-level input voltage	$V_{CC} = 2.0 V$	1.5	-	-	V
		$V_{CC} = 4.5 V$	3.15	-	-	V
		$V_{CC} = 6.0 V$	4.2	-	-	V
VIL	LOW-level input voltage	$V_{CC} = 2.0 V$	-	-	0.5	V
		$V_{CC} = 4.5 V$	-	-	1.35	V
		$V_{CC} = 6.0 V$	-	-	1.8	V
V _{он}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = -20 \ \mu A; \ V_{CC} = 2.0 \ V$	1.9	-	-	V
		I_{O} = -20 μ A; V_{CC} = 4.5 V	4.4	-	-	V
		$I_{O} = -20 \ \mu A; \ V_{CC} = 6.0 \ V$	5.9	-	-	V
		$I_{O} = -6.0 \text{ mA}; \text{ V}_{CC} = 4.5 \text{ V}$	3.84	-	-	V
		$I_{O} = -7.8 \text{ mA}; V_{CC} = 6.0 \text{ V}$	5.34	-	-	V
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = 20 \ \mu A; \ V_{CC} = 2.0 \ V$	-	-	0.1	V
		$I_0 = 20 \ \mu A; \ V_{CC} = 4.5 \ V$	-	-	0.1	V
		$I_0 = 20 \ \mu A; \ V_{CC} = 6.0 \ V$	-	-	0.1	V
		$I_0 = 6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	-	0.33	V
		I_0 = 7.8 mA; V_{CC} = 6.0 V	-	-	0.33	V
I	input leakage current	$V_{I} = V_{CC}$ or GND; $V_{CC} = 6.0$ V	-	-	±1.0	μA
l _{oz}	OFF-state output current	$V_I = V_{IH} \text{ or } V_{IL}; V_{CC} = 6.0 \text{ V};$ $V_O = V_{CC} \text{ or GND}$	-	-	±5.0	μA
lcc	supply current	V_{CC} = 6.0 V; I _O = 0 A; V _I = V _{CC} or GND		-	80	μA
T _{amb} = -4	0 °C to +125 °C					
V _{IH}	HIGH-level input voltage	$V_{CC} = 2.0 V$	1.5	-	-	V
		$V_{CC} = 4.5 V$	3.15	-	-	V
		$V_{CC} = 6.0 V$	4.2	-	-	V V
VIL	LOW-level input voltage	$V_{CC} = 2.0 V$	-	-	0.5	V
		$V_{CC} = 4.5 V$	-	-	1.35	V
		$V_{CC} = 6.0 V$	-	-	1.8	V
V _{он}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = -20 \ \mu A; \ V_{CC} = 2.0 \ V$	1.9	-	-	V
		$I_0 = -20 \ \mu A; \ V_{CC} = 4.5 \ V$	4.4	-	-	V
		$I_0 = -20 \ \mu A; \ V_{CC} = 6.0 \ V$	5.9	-	-	V
		$I_0 = -6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.7	-	-	V
		$I_{\rm O} = -7.8$ mA; $V_{\rm CC} = 6.0$ V	5.2	-	-	V

Table 6. Static characteristics 74HC373 ...continued

74HC_HCT373
Product data sheet

Octal D-type transparent latch; 3-state

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = 20 \ \mu A; \ V_{CC} = 2.0 \ V$	-	-	0.1	V
		$I_{O} = 20 \ \mu A; \ V_{CC} = 4.5 \ V$	-	-	0.1	V
		$I_{O} = 20 \ \mu A; \ V_{CC} = 6.0 \ V$	-	-	0.1	V
		I_{O} = 6.0 mA; V_{CC} = 4.5 V	-	-	0.4	V
		I_{O} = 7.8 mA; V_{CC} = 6.0 V	-	-	0.4	V
lı	input leakage current	$V_{I} = V_{CC}$ or GND; $V_{CC} = 6.0$ V	-	-	±1.0	μΑ
I _{OZ}	OFF-state output current	$V_{I} = V_{IH} \text{ or } V_{IL}; V_{CC} = 6.0 \text{ V};$ $V_{O} = V_{CC} \text{ or GND}$	-	-	±10.0	μA
I _{CC}	supply current	$V_{CC} = 6.0 \text{ V}; I_O = 0 \text{ A};$ $V_I = V_{CC} \text{ or GND}$	-	-	160	μA

Table 6. Static characteristics 74HC373 ...continued

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

Table 7. Static characteristics 74HCT373

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

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = 25	°C					
V _{IH}	HIGH-level input voltage	$V_{CC} = 4.5 V$ to 5.5 V	2.0	1.6	-	V
V _{IL}	LOW-level input voltage	$V_{CC} = 4.5 V$ to 5.5 V	-	1.2	0.8	V
V _{OH}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		I_O = –20 $\mu A;~V_{CC}$ = 4.5 V	4.4	4.5	-	V
		$I_{O} = -6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.98	4.32	-	V
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_O = 20 \ \mu\text{A}; \ V_{CC} = 4.5 \ V$	-	0.0	0.1	V
		$I_0 = 6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	0.16	0.26	V
l _l	input leakage current	$V_{I} = V_{CC}$ or GND; $V_{CC} = 5.5$ V	-	-	±0.1	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 per input pin; other inputs at V_{CC} or GND; $I_O = 0$ A	-	-	±0.5	μΑ
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	8.0	μΑ
ΔI_{CC}	additional supply current	$V_{I} = V_{CC} - 2.1 \text{ V};$ other inputs at V _{CC} or GND; V _{CC} = 4.5 V to 5.5 V; I _O = 0 A				
		Dn	-	30	108	μA
		LE	-	150	540	μA
		ŌĒ	-	100	360	μΑ
CI	input capacitance		-	3.5	-	pF
$T_{amb} = -40$	0 °C to +85 °C					
V _{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	V
V _{IL}	LOW-level input voltage	$V_{CC} = 4.5 V \text{ to } 5.5 V$	-	-	0.8	V

Octal D-type transparent latch; 3-state

	nended operating conditions; vo	Itages are referenced to GND (ground = 0 V).				
Symbol	Parameter	Conditions	Min	Тур	Мах	Unit
V _{OH}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_O = -20 \ \mu A; \ V_{CC} = 4.5 \ V$	4.4	-	-	V
		$I_O = -6.0 \ \mu\text{A}; \ V_{CC} = 4.5 \ \text{V}$	3.84	-	-	V
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_O = 20 \ \mu\text{A}; \ V_{CC} = 4.5 \ \text{V}$	-	-	0.1	V
		$I_{O} = 6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	-	-	0.33	V
I _I	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5 V$	-	-	±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 per input pin; other inputs at V_{CC} or GND; $I_O = 0$ A	-	-	±5.0	μΑ
I _{CC}	supply current	$V_I = V_{CC}$ or GND; $I_O = 0$ A; $V_{CC} = 5.5$ V	-	-	80	μΑ
ΔI _{CC}	additional supply current	$\label{eq:VI} \begin{array}{l} V_{I} = V_{CC} - 2.1 \text{ V};\\ \text{other inputs at } V_{CC} \text{ or GND};\\ V_{CC} = 4.5 \text{ V to 5.5 V}; \ I_{O} = 0 \text{ A} \end{array}$				
		Dn	-	-	135	μΑ
		LE	-	-	675	μΑ
		OE	-	-	450	μA
T _{amb} = -4	0 °C to +125 °C					
V _{IH}	HIGH-level input voltage	V_{CC} = 4.5 V to 5.5 V	2.0	-	-	V
V _{IL}	LOW-level input voltage	V_{CC} = 4.5 V to 5.5 V	-	-	0.8	V
V _{OH}	HIGH-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = -20 \ \mu A; \ V_{CC} = 4.5 \ V$	4.4	-	-	V
		$I_{O} = -6.0 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.7	-	-	V
V _{OL}	LOW-level output voltage	$V_{I} = V_{IH} \text{ or } V_{IL}$				
		$I_{O} = 20 \ \mu A; \ V_{CC} = 4.5 \ V$	-	-	0.1	V
		I_{O} = 6.0 mA; V_{CC} = 4.5 V	-	-	0.4	V
lį –	input leakage current	$V_I = V_{CC}$ or GND; $V_{CC} = 5.5$ V	-	-	±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 per input pin; other inputs at V_{CC} or GND; $I_O = 0$ A	-	-	±10	μA
I _{CC}	supply current		-	-	160	μΑ
ΔI _{CC}	additional supply current	$\label{eq:VI} \begin{array}{l} V_{I} = V_{CC} - 2.1 \ V; \\ \text{other inputs at } V_{CC} \ \text{or GND}; \\ V_{CC} = 4.5 \ V \ \text{to } 5.5 \ V; \ I_{O} = 0 \ \text{A} \end{array}$				
		Dn	-	-	147	μA
		LE	-	-	735	μA
		ŌĒ	-	-	490	μA

Static characteristics 74HCT373 ... continued Table 7.

74HC_HCT373 Product data sheet

Octal D-type transparent latch; 3-state

10. Dynamic characteristics

Table 8. Dynamic characteristics 74HC373

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see <u>Figure 12</u>.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = 2	25 °C					
t _{pd}	propagation delay	Dn to Qn; see Figure 8	<u>[1]</u>			
		$V_{CC} = 2.0 V$	-	41	150	ns
		$V_{CC} = 4.5 V$	-	15	30	ns
		$V_{CC} = 5 \text{ V}; \text{ C}_{L} = 15 \text{ pF}$	-	12	-	ns
		$V_{CC} = 6.0 V$	-	12	26	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 2.0 V$	-	50	175	ns
		$V_{CC} = 4.5 V$	-	18	35	ns
		$V_{CC} = 5 \text{ V}; \text{ C}_{L} = 15 \text{ pF}$	-	15	-	ns
		$V_{CC} = 6.0 V$	-	14	30	ns
en	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 2.0 V$	-	44	150	ns
		$V_{CC} = 4.5 V$	-	16	30	ns
		$V_{CC} = 6.0 V$	-	13	26	ns
dis	disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 2.0 V$	-	47	150	ns
		$V_{CC} = 4.5 V$	-	17	30	ns
		$V_{CC} = 6.0 V$	-	14	26	ns
:	transition time	Qn; see <u>Figure 8</u> and <u>Figure 9</u>	[4]			
		$V_{CC} = 2.0 V$	-	14	60	
		$V_{CC} = 4.5 V$	-	5	12	ns
		$V_{CC} = 6.0 V$	-	4	10	ns
W	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 2.0 V$	80	17	-	ns
		$V_{CC} = 4.5 V$	16	6	-	ns ns ns
		$V_{CC} = 6.0 V$	14	5	-	ns
su	set-up time	Dn to LE; see Figure 11				
		$V_{CC} = 2.0 V$	50	14	-	ns
		$V_{CC} = 4.5 V$	10	5	-	ns
		$V_{CC} = 6.0 V$	9	4	-	ns
h	hold time	Dn to LE; see Figure 11				
		$V_{CC} = 2.0 V$	+5	-8	-	ns
		$V_{CC} = 4.5 V$	+5	-3	-	ns
		$V_{CC} = 6.0 V$	+5	-2	-	ns
C _{PD}	power dissipation capacitance	per latch; $V_I = GND$ to V_{CC}	<u>[5]</u> _	45	-	pF

Octal D-type transparent latch; 3-state

Table 8. Dynamic characteristics 74HC373 ... continued

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see Figure 12.

Symb	ol Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} =	= −40 °C to +85 °C					
t _{pd}	propagation delay	Dn to Qn; see Figure 8	<u>[1]</u>			
		$V_{CC} = 2.0 V$	-	-	190	ns
		V_{CC} = 4.5 V	-	-	38	ns
		$V_{CC} = 6.0 V$	-	-	33	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 2.0 V$	-	-	220	ns
		V _{CC} = 4.5 V	-	-	44	ns
		$V_{CC} = 6.0 V$	-	-	37	ns
en	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 2.0 V$	-	-	190	ns
		V _{CC} = 4.5 V	-	-	38	ns
		$V_{CC} = 6.0 V$	-	-	33	ns
t _{dis}	disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 2.0 V$	-	-	190	ns
		V_{CC} = 4.5 V	-	-	38	ns
		$V_{CC} = 6.0 V$	-	-	33	ns
t	transition time	Qn; see Figure 8 and Figure 9	[4]			
		$V_{CC} = 2.0 V$	-	-	75	ns
		V_{CC} = 4.5 V	-	-	15	ns
		$V_{CC} = 6.0 V$	-	-	13	ns
W	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 2.0 V$	100	-	-	ns ns ns ns ns ns ns ns
		$V_{CC} = 4.5 V$	20	-	-	ns
		$V_{CC} = 6.0 V$	17	-	-	ns
su	set-up time	Dn to LE; see Figure 11				
		$V_{CC} = 2.0 V$	65	-	-	ns
		$V_{CC} = 4.5 V$	13	-	-	ns
		$V_{CC} = 6.0 V$	11	-	-	ns
h	hold time	Dn to LE; see Figure 11				
		$V_{CC} = 2.0 V$	5	-	-	ns
		$V_{CC} = 4.5 V$	5	-	-	ns
		V _{CC} = 6.0 V	5	-	-	ns

Octal D-type transparent latch; 3-state

Table 8. Dynamic characteristics 74HC373 ...continued

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see Figure 12.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = -	–40 °C to +125 °C					
t _{pd}	propagation delay	Dn to Qn; see <u>Figure 8</u>	[1]			
		$V_{CC} = 2.0 V$	-	-	225	ns
		$V_{CC} = 4.5 V$	-	-	45	ns
		$V_{CC} = 6.0 V$	-	-	38	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 2.0 V$	-	-	265	ns
		$V_{CC} = 4.5 V$	-	-	53	ns
		$V_{CC} = 6.0 V$	-	-	45	ns
t _{en}	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 2.0 V$	-	-	225	ns
		$V_{CC} = 4.5 V$	-	-	45	ns
		$V_{CC} = 6.0 V$	-	-	38	ns
t _{dis}	disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 2.0 V$	-	-	225	ns
		$V_{CC} = 4.5 V$	-	-	45	ns
		$V_{CC} = 6.0 V$	-	-	38	ns
t	transition time	Qn; see <u>Figure 8</u> and <u>Figure 9</u>	[4]			
		$V_{CC} = 2.0 V$	-	-	90	ns
		$V_{CC} = 4.5 V$	-	-	18	ns
		$V_{CC} = 6.0 V$	-	-	15	ns
w	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 2.0 V$	120	-	-	ns
		$V_{CC} = 4.5 V$	24	-	-	ns
		$V_{CC} = 6.0 V$	20	-	-	ns
su	set-up time	Dn to LE; see Figure 11				
		$V_{CC} = 2.0 V$	75	-	-	ns
		$V_{CC} = 4.5 V$	15	-	-	ns
		$V_{CC} = 6.0 V$	13	-	-	ns

Octal D-type transparent latch; 3-state

vollages	are referenced to GNL	$O (ground = 0 V); C_L = 50 pF unless otherwise specific$		arcuit se	e <u>rigure</u>	<u>12</u> .
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
t _h hold time		Dn to LE; see Figure 11				
	$V_{CC} = 2.0 V$	5	-	-	ns	
	$V_{CC} = 4.5 V$	5	-	-	ns	
		$V_{CC} = 6.0 V$	5	-	-	ns

Table 8. Dynamic characteristics 74HC373 ... continued

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see Figure 12

[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 μ W).

$$\begin{split} P_D &= C_{PD} \times V_{CC}{}^2 \times f_i \times N + \sum (C_L \times V_{CC}{}^2 \times f_o) \text{ where:} \\ f_i &= \text{input frequency in MHz;} \\ f_o &= \text{output frequency in MHz;} \\ C_L &= \text{output load capacitance in pF;} \\ V_{CC} &= \text{supply voltage in V;} \\ N &= \text{number of inputs switching;} \end{split}$$

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

Table 9. Dynamic characteristics 74HCT373

Voltages are referenced to GND (ground = 0 V); $C_L = 50 \text{ pF}$ unless otherwise specified; for test circuit see <u>Figure 12</u>.

-						
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = 2	5 °C					
t _{pd}	propagation delay	Dn to Qn; see Figure 8	<u>[1]</u>			
		$V_{CC} = 4.5 V$	-	17	30	ns
		$V_{CC} = 5 \text{ V}; \text{ C}_{L} = 15 \text{ pF}$	-	14	-	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 4.5 V$	-	16	32	ns
		$V_{CC} = 5 V; C_L = 15 pF$	-	13	-	ns
t _{en}	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 4.5 V$	-	19	32	ns
t _{dis}	_{lis} disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 4.5 V$	-	18	30	ns
t _t	transition time	Qn; see Figure 8 and Figure 9	<u>[4]</u>			
		$V_{CC} = 4.5 V$	-	5	12	ns
tw	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 4.5 V$	16	4	-	ns
t _{su}	set-up time	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	12	6	-	ns
t _h	hold time	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	4	-1	-	ns
C _{PD}	power dissipation capacitance	per latch; V _I = GND to (V _{CC} – 1.5 V)	<u>[5]</u> _	41	-	pF

Octal D-type transparent latch; 3-state

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
T _{amb} = -	40 °C to +85 °C					
t _{pd}	propagation delay	Dn to Qn; see Figure 8	<u>[1]</u>			
		$V_{CC} = 4.5 V$	-	-	38	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 4.5 V$	-	-	40	ns
en	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 4.5 V$	-	-	40	ns
dis	disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 4.5 V$	-	-	38	ns
t	transition time	Qn; see Figure 8 and Figure 9	<u>[4]</u>			
		$V_{CC} = 4.5 V$	-	-	15	ns
W	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 4.5 V$	20	-	-	ns
su	set-up time	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	15	-	-	ns
h	hold time	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	4	-	-	ns
Γ _{amb} = -	40 °C to +125 °C					
pd	propagation delay	Dn to Qn; see Figure 8	<u>[1]</u>			
		$V_{CC} = 4.5 V$	-	-	45	ns
		LE to Qn; see Figure 9				
		$V_{CC} = 4.5 V$	-	-	48	ns
en	enable time	OE to Qn; see Figure 10	[2]			
		$V_{CC} = 4.5 V$	-	-	48	ns
dis	disable time	OE to Qn; see Figure 10	[3]			
		$V_{CC} = 4.5 V$	-	-	45	ns
t	transition time	Qn; see Figure 8 and Figure 9	<u>[4]</u>			
		$V_{CC} = 4.5 V$	-	-	18	ns
N	pulse width	LE HIGH; see Figure 9				
		$V_{CC} = 4.5 V$	24	-	-	ns
su	set-up time Dn to LE	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	18	-	-	ns

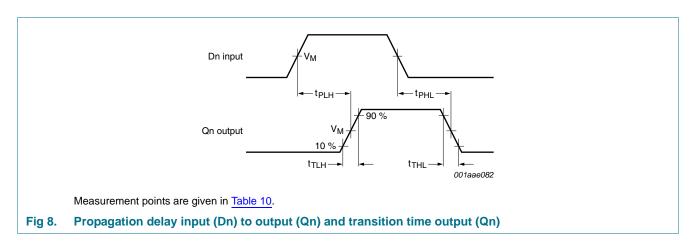
Table 9. Dynamic characteristics 74HCT373 ... continued

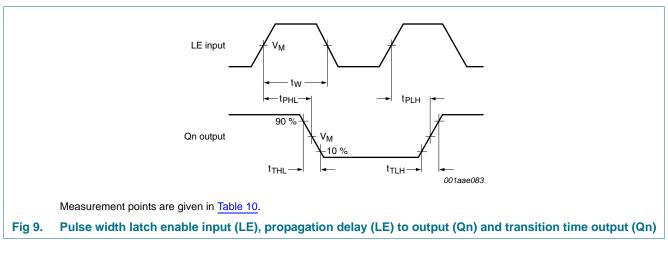
Octal D-type transparent latch; 3-state

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
t _h	hold time Dn to LE	Dn to LE; see Figure 11				
		$V_{CC} = 4.5 V$	4	-	-	ns
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 t	he same as t_{THL} and t_{TLH} .					
5] C _{PD} i	s used to determine the dynamic p	power dissipation (P _D in μ W).				
P _D =	$C_{PD} \times {V_{CC}}^2 \times f_i \times N + \Sigma (C_L \times {V_{CC}}^2$	$^{2} \times f_{o}$) where:				
f _i = ir	nput frequency in MHz;					
$f_0 = c$	output frequency in MHz;					
C _L =	output load capacitance in pF;					
V _{CC}	= supply voltage in V;					
N = 1	number of inputs switching;					
	$\times V_{CC}^2 \times f_0$ = sum of outputs.					

nie skonseteristice 74UCT272

11. Waveforms



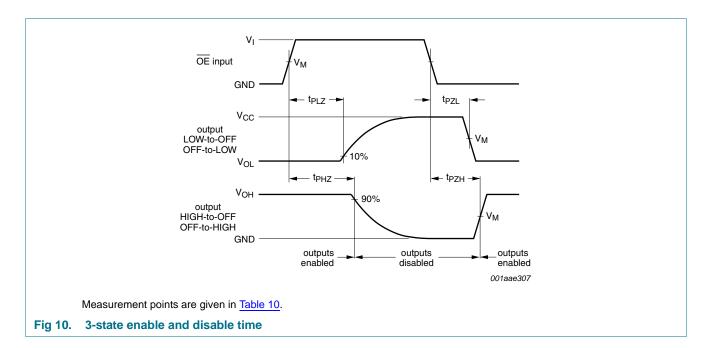


All information provided in this document is subject to legal disclaimers.

NXP Semiconductors

74HC373; 74HCT373

Octal D-type transparent latch; 3-state



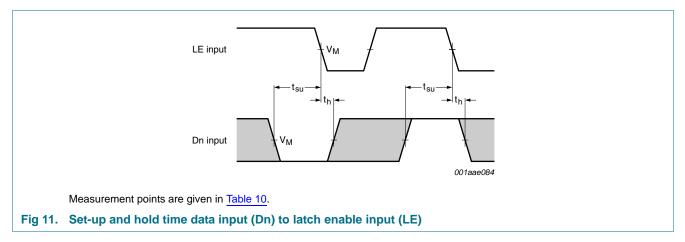


Table 10.Measurement points

Туре	Input	Output
	V _M	V _M
74HC373	0.5V _{CC}	0.5V _{CC}
74HCT373	1.3 V	1.3 V

NXP Semiconductors

74HC373; 74HCT373

Octal D-type transparent latch; 3-state

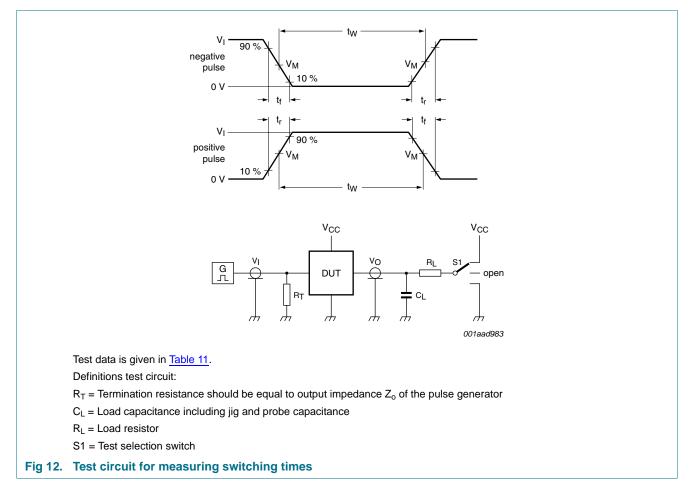


Table 11. Test data

Туре	Input		Load		S1 position		
	VI	t _r , t _f	CL	RL	t _{PHL} , t _{PLH}	t _{PZH} , t _{PHZ}	t _{PZL} , t _{PLZ}
74HC373	V _{CC}	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}
74HCT373	3 V	6 ns	15 pF, 50 pF	1 kΩ	open	GND	V _{CC}

Octal D-type transparent latch; 3-state

12. Package outline

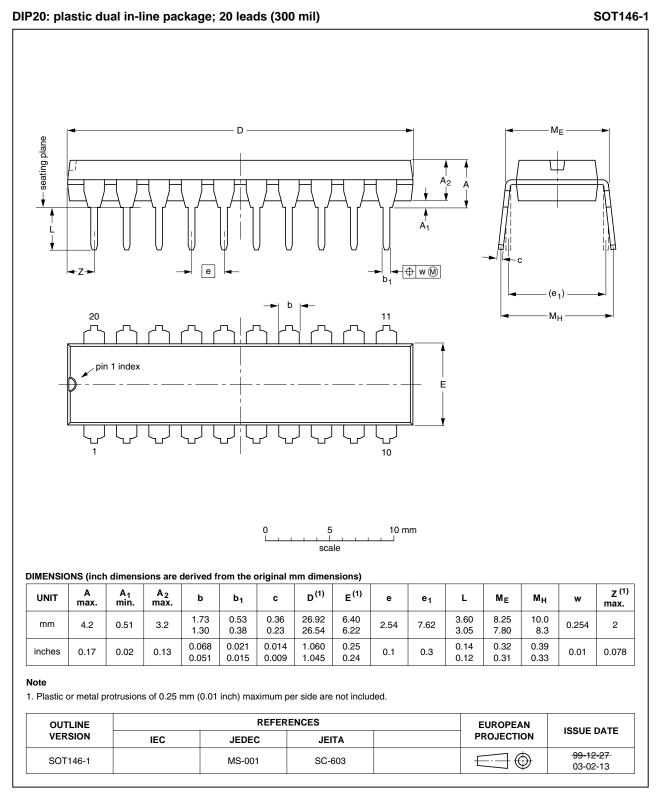


Fig 13. Package outline SOT146-1 (DIP20)

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

Octal D-type transparent latch; 3-state

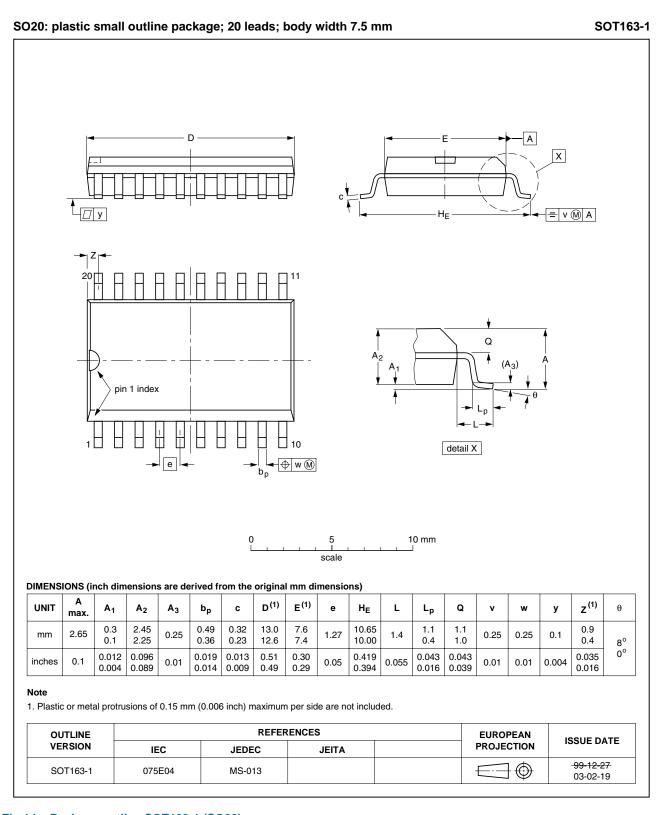


Fig 14. Package outline SOT163-1 (SO20)

Octal D-type transparent latch; 3-state

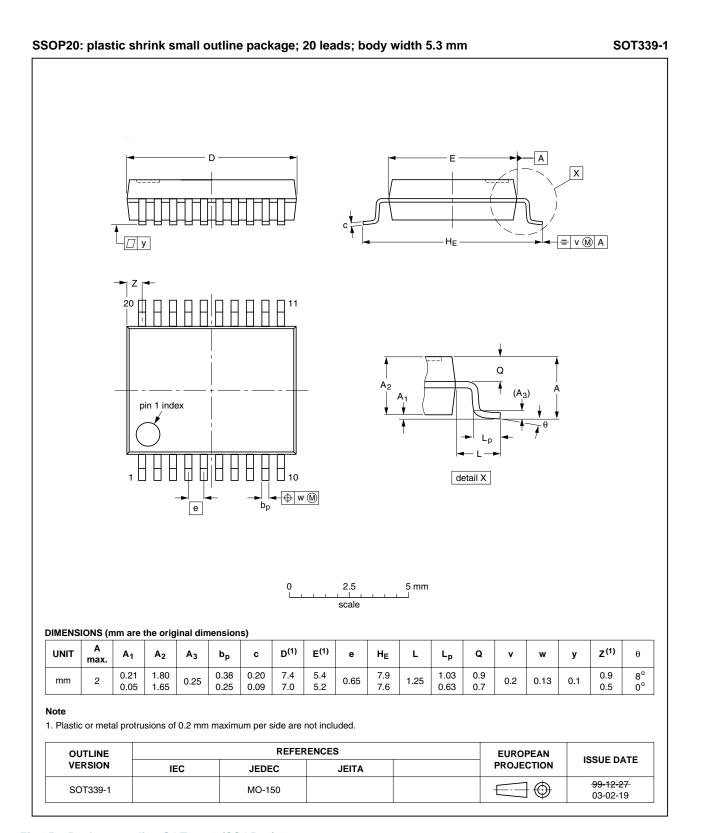


Fig 15. Package outline SOT339-1 (SSOP20)

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

Octal D-type transparent latch; 3-state

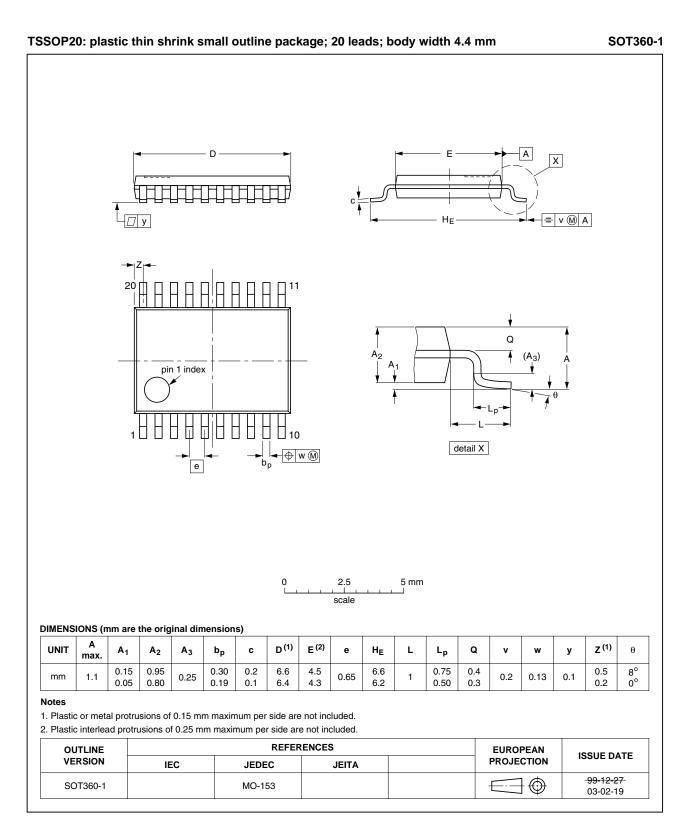
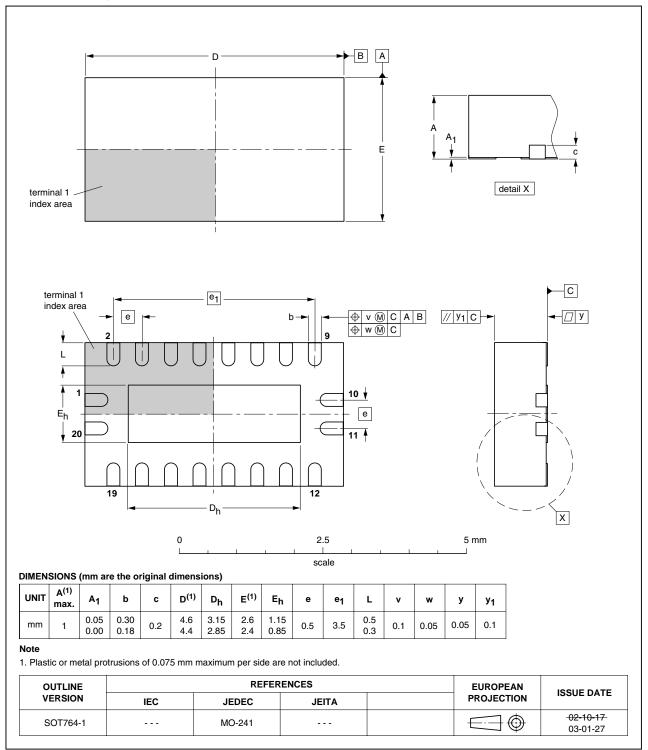


Fig 16. Package outline SOT360-1 (TSSOP20)

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

Octal D-type transparent latch; 3-state



DHVQFN20: plastic dual in-line compatible thermal enhanced very thin quad flat package; no leads; 20 terminals; body 2.5 x 4.5 x 0.85 mm SOT764-1

Fig 17. Package outline SOT764-1 (DHVQFN20)

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

Octal D-type transparent latch; 3-state

13. Abbreviations

Table 12.	Abbreviations
Acronym	Description
CMOS	Complementary Metal Oxide Semiconductor
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

14. Revision history

Table 13. Revision histo	ory			
Document ID	Release date	Data sheet status	Change notice	Supersedes
74HC_HCT373 v.4	20100903	Product data sheet	-	74HC_HCT373 v.3
Modifications:		t of this data sheet has be of NXP Semiconductors.	een redesigned to con	nply with the new identity
	 Legal texts 	have been adapted to th	e new company name	e where appropriate.
	• Figure 5 cl	nanged: inversion sign ad	ded to the output buff	ers.
74HC_HCT373 v.3	20060120	Product data sheet	-	74HC_HCT373_CNV v.2
74HC_HCT373_CNV v.2	19970827	Product specification	-	-

Octal D-type transparent latch; 3-state

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.

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 in automotive applications — This NXP Semiconductors product has been qualified for use in automotive applications. The product is not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support 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 accepts 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.

Octal D-type transparent latch; 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 national authorities.

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

25 of 26

Octal D-type transparent latch; 3-state

17. Contents

1	General description 1
2	Features and benefits 1
3	Ordering information 2
4	Functional diagram 2
5	Pinning information 4
5.1	Pinning
5.2	Pin description 4
6	Functional description 5
6.1	Function table 5
7	Limiting values 5
8	Recommended operating conditions 6
9	Static characteristics 6
10	Dynamic characteristics 10
11	Waveforms 15
12	Package outline 18
13	Abbreviations 23
14	Revision history 23
15	Legal information 24
15.1	Data sheet status 24
15.2	Definitions 24
15.3	Disclaimers
15.4	Trademarks 25
16	Contact information 25
17	Contents 26

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

© NXP B.V. 2010.

All rights reserved.

For more information, please visit: http://www.nxp.com For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 3 September 2010 Document identifier: 74HC_HCT373