

# 74AUP1G373

Low-power D-type transparent latch; 3-state

Rev. 7 — 27 March 2020

Product data sheet

## 1. General description

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The 74AUP1G373 provides the single D-type transparent latch with 3-state output. While the latch-enable (LE) input is high, the Q output follows the data (D) input. When pin LE is LOW, the latch stores the information that was present at the D-input one set-up time preceding the HIGH-to-LOW transition of pin LE. When pin OE is LOW, the contents of the latch is available at the (Q) output. When pin  $\overline{OE}$  is HIGH, the output goes to the high-impedance OFF-state. Operation of input pin  $\overline{OE}$  does not affect the state of the latch.

Schmitt trigger action at all inputs makes the circuit tolerant to slower input rise and fall times across the entire  $V_{CC}$  range from 0.8 V to 3.6 V.

This device ensures a very low static and dynamic power consumption across the entire  $V_{CC}$  range from 0.8 V to 3.6 V.

This device is fully specified for partial power-down applications using  $I_{OFF}$ . The  $I_{OFF}$  circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

## 2. Features and benefits

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- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - HBM JESD22-A114F Class 3A exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM JESD22-C101E exceeds 1000 V
- Low static power consumption;  $I_{CC} = 0.9 \mu\text{A}$  (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of  $V_{CC}$
- $I_{OFF}$  circuitry provides partial Power-down mode operation
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C

### 3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G373GW	-40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74AUP1G373GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP1G373GF	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm	SOT891
74AUP1G373GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AUP1G373GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202

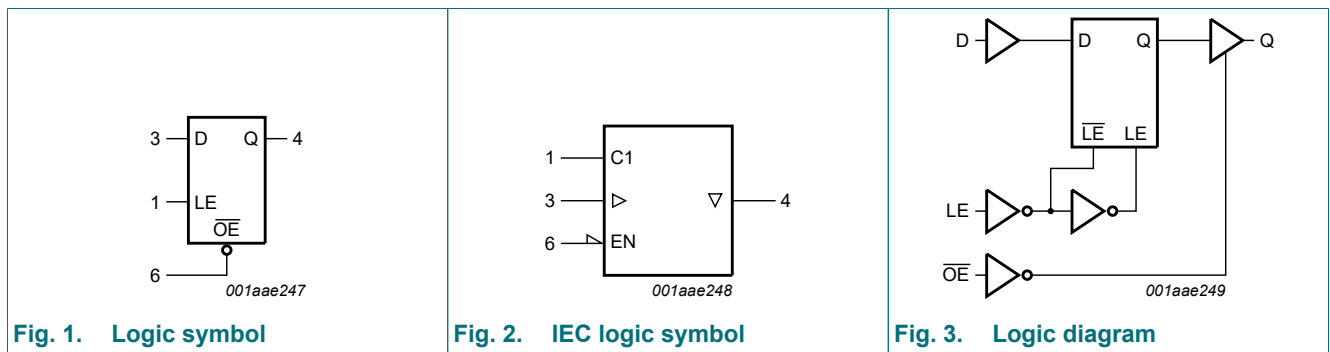
### 4. Marking

Table 2. Marking

Type number	Marking code [1]
74AUP1G373GW	aW
74AUP1G373GM	aW
74AUP1G373GF	aW
74AUP1G373GN	aW
74AUP1G373GS	aW

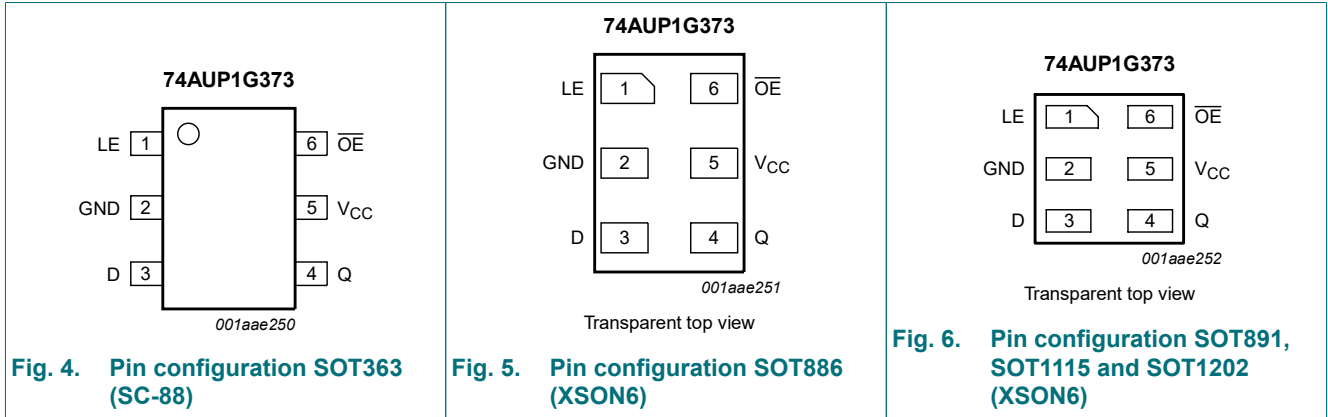
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

### 5. Functional diagram



## 6. Pinning information

### 6.1. Pinning



### 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
LE	1	latch enable input (active HIGH)
GND	2	ground (0 V)
D	3	data input
Q	4	latch output
V <sub>CC</sub>	5	supply voltage
OE	6	output enable input (active LOW)

## 7. Functional description

Table 4. Function table

*H = HIGH voltage level; h = HIGH voltage level one setup time prior to the HIGH-to-LOW LE transition;  
 L = LOW voltage level; l = LOW voltage level one setup time prior to the HIGH-to-LOW LE transition;  
 X = Don't care; Z = high-impedance OFF-state.*

Operating modes	Input			Internal latch	Output Q
	OE	LE	D		
Enable and read register (transparent mode)	L	H	L	L	L
	L	H	H	H	H
Latch and read register	L	L	l	L	L
	L	L	h	H	H
Latch register and disable outputs	H	X	X	X	Z

## 8. Limiting values

**Table 5. 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	+4.6	V
$I_{IK}$	input clamping current	$V_I < 0$ V	-50	-	mA
$V_I$	input voltage		[1] -0.5	+4.6	V
$I_{OK}$	output clamping current	$V_O < 0$ V	-50	-	mA
$V_O$	output voltage	Active mode and Power-down mode	[1] -0.5	+4.6	V
$I_O$	output current	$V_O = 0$ V to $V_{CC}$	-	$\pm 20$	mA
$I_{CC}$	supply current		-	50	mA
$I_{GND}$	ground current		-50	-	mA
$T_{stg}$	storage temperature		-65	+150	°C
$P_{tot}$	total power dissipation	$T_{amb} = -40$ °C to +125 °C	[2] -	250	mW

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SOT363 (SC-88) package:  $P_{tot}$  derates linearly with 3.7 mW/K above 83 °C.

For SOT886 (XSON6) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

For SOT891 (XSON6) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

For SOT1115 (XSON6) package:  $P_{tot}$  derates linearly with 3.2 mW/K above 71 °C.

For SOT1202 (XSON6) package:  $P_{tot}$  derates linearly with 3.3 mW/K above 74 °C.

## 9. Recommended operating conditions

**Table 6. Recommended operating conditions**

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{CC}$	supply voltage		0.8	3.6	V
$V_I$	input voltage		0	3.6	V
$V_O$	output voltage	Active mode	0	$V_{CC}$	V
		Power-down mode; $V_{CC} = 0$ V	0	3.6	V
$T_{amb}$	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 0.8$ V to 3.6 V	-	200	ns/V

## 10. Static characteristics

**Table 7. Static characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>T<sub>amb</sub> = 25 °C</b>							
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65 × V <sub>CC</sub>	-	-	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V	
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35 × V <sub>CC</sub>	V	
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V	
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V	
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V	
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.75 × V <sub>CC</sub>	-	-	V	
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.11	-	-	V	
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.32	-	-	V	
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	2.05	-	-	V	
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V	
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.72	-	-	V	
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>					
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V	
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3 × V <sub>CC</sub>	V	
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.31	V	
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.31	V	
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.31	V	
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.44	V	
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.31	V	
	I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
	I <sub>OZ</sub>	OFF-state output current	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
	I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.2	μA
	ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.2	μA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CC}$	supply current	$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.5	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	40	$\mu\text{A}$
$C_I$	input capacitance	$V_{CC} = 0 \text{ V to } 3.6 \text{ V}; V_I = \text{GND or } V_{CC}$	-	0.8	-	pF
$C_O$	output capacitance	output enabled; $V_O = \text{GND}; V_{CC} = 0 \text{ V}$	-	1.7	-	pF
		output disabled; $V_{CC} = 0 \text{ V to } 3.6 \text{ V}; V_O = \text{GND or } V_{CC}$	-	1.5	-	pF
<b><math>T_{\text{amb}} = -40 \text{ }^\circ\text{C to } +85 \text{ }^\circ\text{C}</math></b>						
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 0.8 \text{ V}$	$0.70 \times V_{CC}$	-	-	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	$0.65 \times V_{CC}$	-	-	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.6	-	-	V
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	2.0	-	-	V
$V_{IL}$	LOW-level input voltage	$V_{CC} = 0.8 \text{ V}$	-	-	$0.30 \times V_{CC}$	V
		$V_{CC} = 0.9 \text{ V to } 1.95 \text{ V}$	-	-	$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	-	0.7	V
		$V_{CC} = 3.0 \text{ V to } 3.6 \text{ V}$	-	-	0.9	V
$V_{OH}$	HIGH-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = -20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	$V_{CC} - 0.1$	-	-	V
		$I_O = -1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	$0.7 \times V_{CC}$	-	-	V
		$I_O = -1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	1.03	-	-	V
		$I_O = -1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.30	-	-	V
		$I_O = -2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.97	-	-	V
		$I_O = -3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.85	-	-	V
		$I_O = -2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.67	-	-	V
$V_{OL}$	LOW-level output voltage	$V_I = V_{IH} \text{ or } V_{IL}$				
		$I_O = 20 \mu\text{A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.1	V
		$I_O = 1.1 \text{ mA}; V_{CC} = 1.1 \text{ V}$	-	-	$0.3 \times V_{CC}$	V
		$I_O = 1.7 \text{ mA}; V_{CC} = 1.4 \text{ V}$	-	-	0.37	V
		$I_O = 1.9 \text{ mA}; V_{CC} = 1.65 \text{ V}$	-	-	0.35	V
		$I_O = 2.3 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.33	V
		$I_O = 3.1 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.45	V
		$I_O = 2.7 \text{ mA}; V_{CC} = 3.0 \text{ V}$	-	-	0.33	V
$I_I$	input leakage current	$V_I = \text{GND to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
		$V_I = V_{IH} \text{ or } V_{IL}; V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 3.6 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$I_{OFF}$	power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	$\pm 0.5$	$\mu\text{A}$
$\Delta I_{OFF}$	additional power-off leakage current	$V_I \text{ or } V_O = 0 \text{ V to } 3.6 \text{ V}; V_{CC} = 0 \text{ V to } 0.2 \text{ V}$	-	-	$\pm 0.6$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = \text{GND or } V_{CC}; I_O = 0 \text{ A}; V_{CC} = 0.8 \text{ V to } 3.6 \text{ V}$	-	-	0.9	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	$V_I = V_{CC} - 0.6 \text{ V}; I_O = 0 \text{ A}; V_{CC} = 3.3 \text{ V}$ [1]	-	-	50	$\mu\text{A}$

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.75 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.70 × V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.25 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.30 × V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.11	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.6 × V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	0.93	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.17	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.77	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.67	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.40	-	-	V
I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.30	-	-	V		
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.11	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.33 × V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.41	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.39	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.36	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.36	V
I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.50	V		
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	μA
I <sub>OZ</sub>	OFF-state output current	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.75	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1.4	μA
ΔI <sub>CC</sub>	additional supply current	V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V [1]	-	-	75	μA

[1] One input at V<sub>CC</sub> - 0.6 V, other input at V<sub>CC</sub> or GND.

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 11.

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 5 pF</b>										
t <sub>pd</sub>	propagation delay	D to Q; see Fig. 7 [2]								
		V <sub>CC</sub> = 0.8 V	-	21.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.8	6.6	13.5	2.6	13.8	2.6	15.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.4	4.6	7.8	2.1	8.3	2.1	9.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.9	3.7	6.2	1.6	6.7	1.6	7.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	2.9	4.1	1.5	4.5	1.5	4.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.5	2.5	3.5	1.2	4.0	1.2	4.5	ns
		LE to Q; see Fig. 8 [2]								
		V <sub>CC</sub> = 0.8 V	-	20.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.7	6.2	13.6	2.5	14.0	2.5	15.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	4.4	7.6	2.0	8.5	2.0	9.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.8	3.5	5.8	1.5	6.7	1.5	7.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.5	2.6	4.0	1.3	4.4	1.3	4.8	ns
V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.2	3.3	1.1	3.8	1.1	4.2	ns		
t <sub>en</sub>	enable time	OE to Q; see Fig. 10 [3]								
		V <sub>CC</sub> = 0.8 V	-	17.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.2	5.1	9.2	3.0	9.2	3.0	10.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.6	3.8	5.8	2.4	6.1	2.4	6.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	3.3	4.8	2.0	5.0	2.0	5.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.0	2.7	3.8	1.8	4.0	1.8	4.4	ns
t <sub>dis</sub>	disable time	OE to Q; see Fig. 10 [4]								
		V <sub>CC</sub> = 0.8 V	-	9.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.9	4.2	7.5	2.8	7.9	2.8	8.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	3.2	4.9	2.1	5.3	2.1	5.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	3.0	4.4	2.1	4.9	2.1	5.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	2.2	3.1	1.5	3.4	1.5	3.7	ns
V <sub>CC</sub> = 3.0 V to 3.6 V	1.9	2.6	3.3	1.8	3.6	1.8	4.0	ns		



## Low-power D-type transparent latch; 3-state

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 10 pF</b>										
t <sub>pd</sub>	propagation delay	D to Q; see Fig. 7 [2]								
		V <sub>CC</sub> = 0.8 V	-	24.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.0	7.5	15.3	2.7	15.9	2.7	17.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.6	5.3	9.0	2.2	9.4	2.2	10.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.5	4.3	6.9	2.1	7.3	2.1	8.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.0	3.5	4.8	1.8	5.3	1.8	5.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.8	3.1	4.2	1.7	4.6	1.7	5.1	ns
		LE to Q; see Fig. 8 [2]								
		V <sub>CC</sub> = 0.8 V	-	23.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.9	7.1	15.4	2.7	16.1	2.7	17.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	5.0	8.8	2.1	9.5	2.1	10.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.1	6.6	2.0	7.3	2.0	8.1	ns
V <sub>CC</sub> = 2.3 V to 2.7 V	1.9	3.1	4.7	1.6	5.2	1.6	5.8	ns		
V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	2.8	4.0	1.4	4.4	1.4	4.9	ns		
t <sub>en</sub>	enable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [3]								
		V <sub>CC</sub> = 0.8 V	-	21.2	-	-	-	-	ns	
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.7	6.0	10.6	3.4	10.6	3.4	11.7	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.1	4.5	6.7	2.8	7.0	2.8	7.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.7	3.9	5.5	2.5	5.8	2.5	6.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.4	3.3	4.5	2.2	4.7	2.2	5.2	ns
t <sub>dis</sub>	disable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [4]								
		V <sub>CC</sub> = 0.8 V	-	11.3	-	-	-	-	ns	
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.9	5.3	8.7	3.8	9.2	3.8	10.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	4.1	5.8	2.9	6.2	2.9	6.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.2	4.2	5.7	3.1	6.0	3.1	6.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.3	3.0	4.0	2.2	4.3	2.2	4.7	ns
V <sub>CC</sub> = 3.0 V to 3.6 V	3.0	3.8	4.7	2.9	5.0	2.9	5.5	ns		

## Low-power D-type transparent latch; 3-state

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 15 pF</b>										
t <sub>pd</sub>	propagation delay	D to Q; see Fig. 7 [2]								
		V <sub>CC</sub> = 0.8 V	-	27.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.5	8.3	16.9	3.2	17.5	3.2	19.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.1	5.9	9.6	2.7	10.5	2.7	11.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.6	4.8	7.6	2.2	8.5	2.2	9.3	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.5	3.9	5.5	2.2	5.9	2.2	6.5	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.2	3.6	4.9	1.8	5.5	1.8	6.0	ns
		LE to Q; see Fig. 8 [2]								
		V <sub>CC</sub> = 0.8 V	-	26.1	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.3	7.9	17.3	3.0	18.0	3.0	19.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.6	9.7	2.5	10.7	2.5	11.8	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.5	4.6	7.4	2.2	8.3	2.2	9.1	ns
V <sub>CC</sub> = 2.3 V to 2.7 V	2.3	3.6	5.3	2.0	5.9	2.0	6.4	ns		
V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	3.2	4.6	1.8	5.1	1.8	5.6	ns		
t <sub>en</sub>	enable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [3]								
		V <sub>CC</sub> = 0.8 V	-	24.6	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.1	6.8	12.1	3.8	12.1	3.8	13.3	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.5	5.1	7.5	3.2	7.9	3.2	8.7	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.1	4.4	6.1	2.8	6.5	2.8	7.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.8	3.7	5.0	2.5	5.3	2.5	5.8	ns
t <sub>dis</sub>	disable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [4]								
		V <sub>CC</sub> = 0.8 V	-	13.1	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.9	6.5	9.8	4.8	10.4	4.8	11.4	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.9	5.0	6.8	3.8	7.3	3.8	8.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	4.2	5.3	6.9	4.1	7.3	4.1	8.0	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.0	3.8	4.8	2.9	5.1	2.9	5.6	ns
V <sub>CC</sub> = 3.0 V to 3.6 V	4.1	5.0	6.1	4.0	6.4	4.0	7.0	ns		

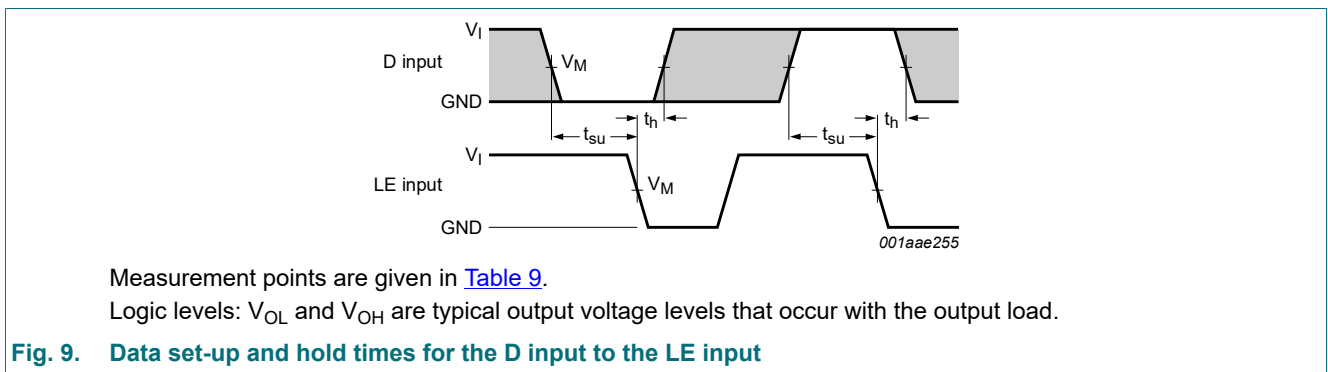
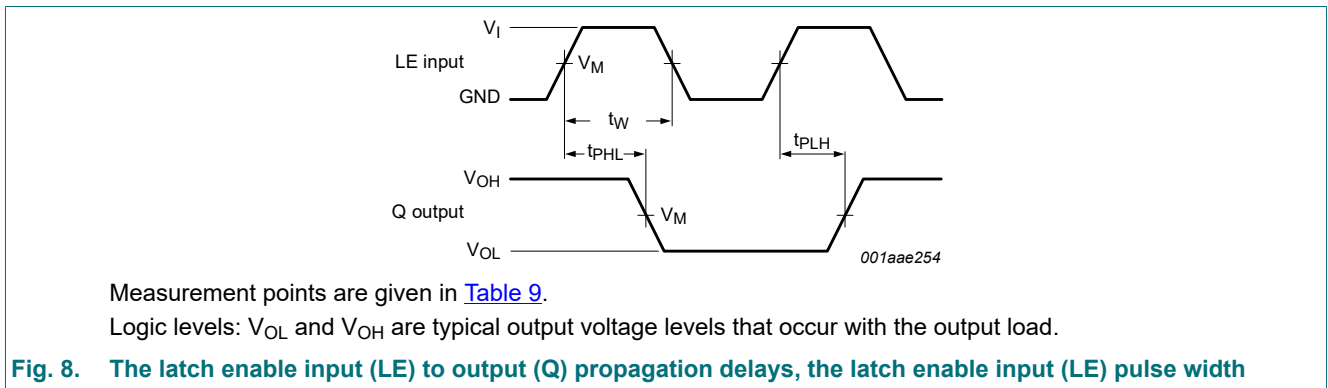
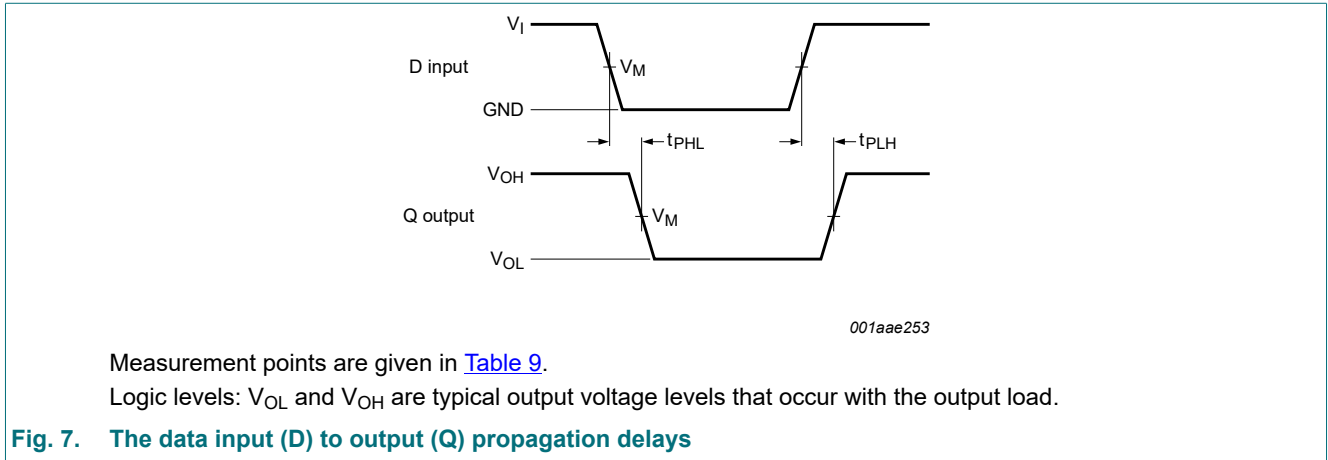
## Low-power D-type transparent latch; 3-state

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 30 pF</b>										
t <sub>pd</sub>	propagation delay	D to Q; see Fig. 7 [2]								
		V <sub>CC</sub> = 0.8 V	-	35.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.0	10.6	22.1	3.7	23.3	3.7	25.6	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.6	7.5	12.3	3.5	13.6	3.5	15.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.5	6.2	9.5	3.2	10.5	3.2	11.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.3	5.1	6.9	2.9	7.6	2.9	8.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	3.0	4.7	6.4	2.9	7.2	2.9	7.9	ns
		LE to Q; see Fig. 8 [2]								
		V <sub>CC</sub> = 0.8 V	-	34.8	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.9	10.2	22.2	3.7	23.5	3.7	25.9	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.5	7.2	12.4	3.4	13.7	3.4	15.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.3	5.9	9.5	3.0	10.5	3.0	11.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.1	4.8	6.8	2.7	7.5	2.7	8.2	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.9	4.4	6.1	2.6	7.0	2.6	7.7	ns
t <sub>en</sub>	enable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [3]								
		V <sub>CC</sub> = 0.8 V	-	34.5	-	-	-	-	ns	
		V <sub>CC</sub> = 1.1 V to 1.3 V	5.5	9.1	16.2	4.9	16.2	4.9	17.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.6	6.7	9.9	4.2	10.5	4.2	11.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	4.2	5.7	7.9	3.7	8.6	3.7	9.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.6	4.9	6.4	3.4	6.9	3.4	7.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	3.4	4.7	6.1	3.3	6.5	3.3	7.2	ns
t <sub>dis</sub>	disable time	$\overline{\text{OE}}$ to Q; see Fig. 10 [4]								
		V <sub>CC</sub> = 0.8 V	-	19.2	-	-	-	-	ns	
		V <sub>CC</sub> = 1.1 V to 1.3 V	8.0	9.9	13.7	7.9	14.5	7.9	16.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	6.3	7.7	9.7	6.2	10.5	6.2	11.6	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	7.3	8.7	10.6	7.2	11.3	7.2	12.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	5.2	6.2	7.5	5.1	7.8	5.1	8.6	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	7.5	8.8	10.2	7.4	10.5	7.4	11.6	ns
<b>C<sub>L</sub> = 5 pF, 10 pF, 15 pF and 30 pF</b>										
t <sub>w</sub>	pulse width	LE HIGH; see Fig. 8								
		V <sub>CC</sub> = 0.8 V	-	4.0	-	-	-	-	ns	
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	0.7	-	2.1	-	2.1	-	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	0.5	-	1.3	-	1.3	-	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	0.4	-	1.0	-	1.0	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	0.3	-	0.8	-	0.8	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	0.2	-	0.8	-	0.8	-	ns

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ [1]	Max	Min	Max	Min	Max	
t <sub>su(H)</sub>	set-up time HIGH	D to LE; see Fig. 9								
		V <sub>CC</sub> = 0.8 V	-	4.6	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	0.9	-	2.2	-	2.2	-	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	0.6	-	1.4	-	1.4	-	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	0.4	-	1.0	-	1.0	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	0	-	0.6	-	0.6	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-0.1	-	0.4	-	0.4	-	ns
t <sub>su(L)</sub>	set-up time LOW	D to LE; see Fig. 9								
		V <sub>CC</sub> = 0.8 V	-	4.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	1.2	-	2.7	-	2.7	-	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	0.7	-	1.5	-	1.5	-	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	0.6	-	1.2	-	1.2	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	0.4	-	0.9	-	0.9	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	0.3	-	0.7	-	0.7	-	ns
t <sub>h</sub>	hold time	D to LE HIGH or LOW; see Fig. 9								
		V <sub>CC</sub> = 0.8 V	-	-4.6	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	-0.9	-	-0.1	-	-0.1	-	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	-0.6	-	-0.1	-	-0.1	-	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	-0.4	-	0	-	0	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-0.2	-	0.2	-	0.2	-	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-0.1	-	0.3	-	0.3	-	ns
C <sub>PD</sub>	power dissipation capacitance	f <sub>i</sub> = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> ; [5] [6] output enabled								
		V <sub>CC</sub> = 0.8 V	-	2.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	2.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	2.1	-	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	2.4	-	-	-	-	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	2.8	-	-	-	-	-	pF

- [1] All typical values are measured at nominal V<sub>CC</sub>.
- [2] t<sub>pd</sub> is the same as t<sub>PLH</sub> and t<sub>PHL</sub>.
- [3] t<sub>en</sub> is the same as t<sub>PZH</sub> and t<sub>PZL</sub>.
- [4] t<sub>dis</sub> is the same as t<sub>PHZ</sub> and t<sub>PLZ</sub>.
- [5] All specified values are the average typical values over all stated loads.
- [6] C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW).  
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$  where:  
 f<sub>i</sub> = input frequency in MHz;  
 f<sub>o</sub> = output frequency in MHz;  
 C<sub>L</sub> = output load capacitance in pF;  
 V<sub>CC</sub> = supply voltage in V;  
 $\Sigma(C_L \times V_{CC}^2 \times f_o)$  = sum of the outputs;  
 N = number of inputs switching.

11.1. Waveforms



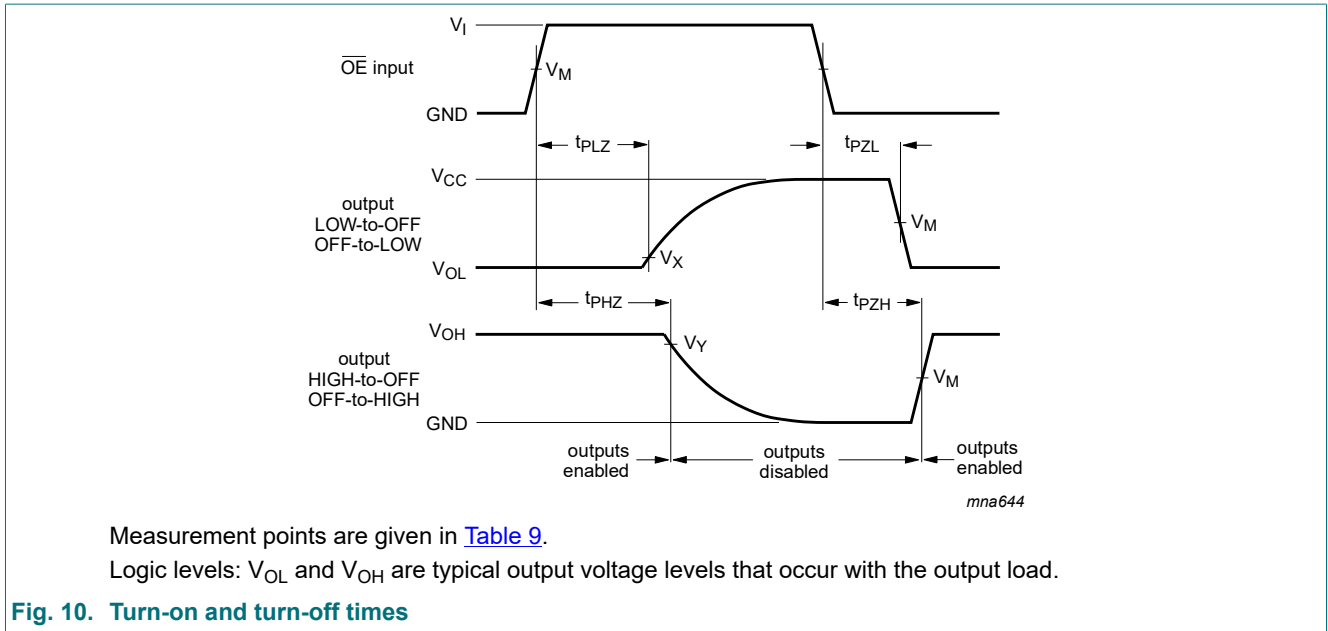


Table 9. Measurement points

Supply voltage	Input			Output		
$V_{CC}$	$V_M$	$V_I$	$t_r = t_f$	$V_M$	$V_X$	$V_Y$
0.8 V to 1.6 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.1$ V	$V_{OH} - 0.1$ V
1.65 V to 2.7 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.15$ V	$V_{OH} - 0.15$ V
3.0 V to 3.6 V	$0.5 \times V_{CC}$	$V_{CC}$	$\leq 3.0$ ns	$0.5 \times V_{CC}$	$V_{OL} + 0.3$ V	$V_{OH} - 0.3$ V

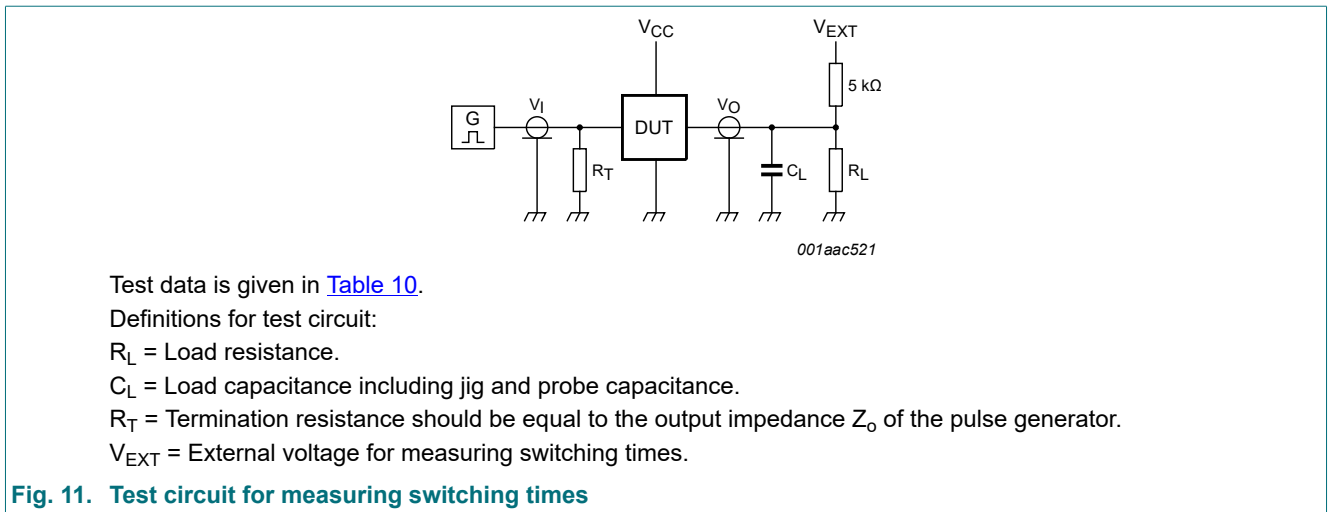


Table 10. Test data

Supply voltage	Load		$V_{EXT}$		
$V_{CC}$	$C_L$	$R_L$ [1]	$t_{PLH}, t_{PHL}$	$t_{PZH}, t_{PHZ}$	$t_{PZL}, t_{PLZ}$
0.8 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	$2 \times V_{CC}$

[1] For measuring enable and disable times  $R_L = 5$  kΩ.  
 For measuring propagation delays, setup and hold times and pulse width  $R_L = 1$  MΩ.

12. Package outline

Plastic surface-mounted package; 6 leads

SOT363

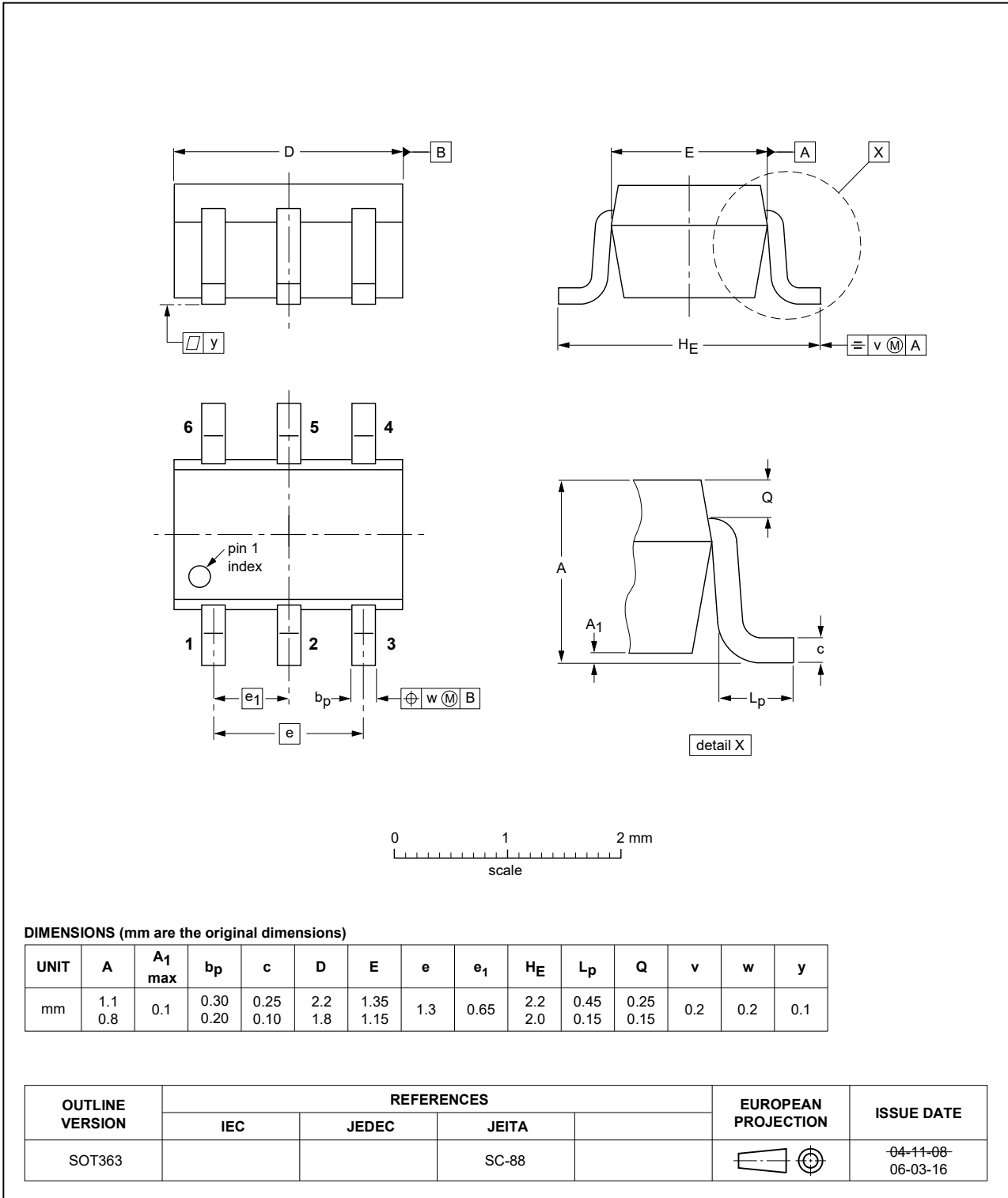


Fig. 12. Package outline SOT363 (SC-88)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1.45 x 0.5 mm

SOT886



Fig. 13. Package outline SOT886 (XSON6)



XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm

SOT891

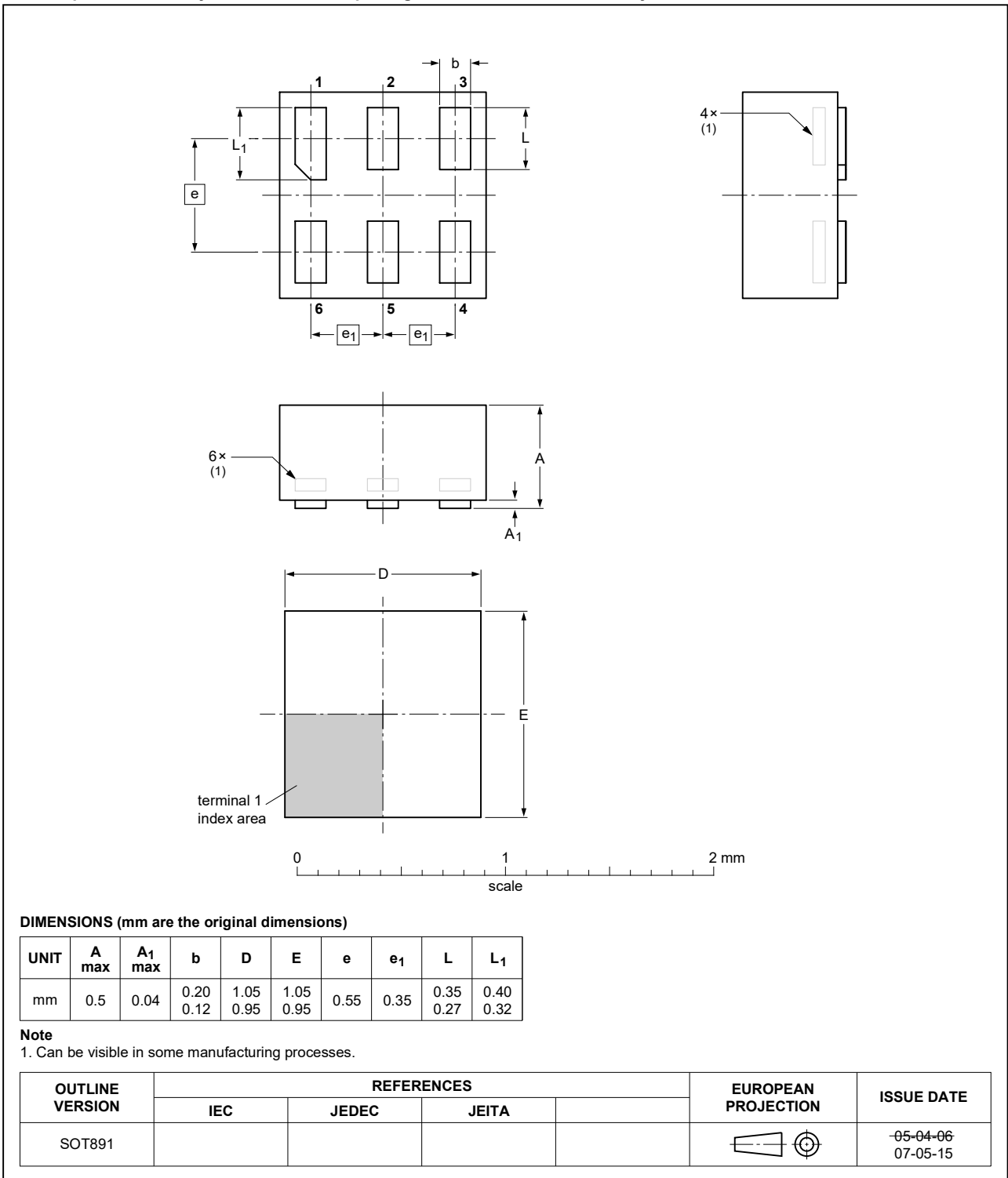


Fig. 14. Package outline SOT891 (XSON6)

XSON6: extremely thin small outline package; no leads;  
6 terminals; body 0.9 x 1.0 x 0.35 mm

SOT1115



Fig. 15. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads;  
6 terminals; body 1.0 x 1.0 x 0.35 mm

SOT1202



Fig. 16. Package outline SOT1202 (XSON6)

## 13. Abbreviations

Table 11. Abbreviations

Acronym	Description
CDM	Charged Device Model
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model

## 14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G373 v.7	20200327	Product data sheet	-	74AUP1G373 v.6
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li><a href="#">Table 5</a>: Derating values for <math>P_{tot}</math> total power dissipation updated.</li> </ul>			
74AUP1G373 v.6	20120704	Product data sheet	-	74AUP1G373 v.5
Modifications:	<ul style="list-style-type: none"> <li>Package outline drawing of SOT886 (<a href="#">Fig. 13</a>) modified.</li> </ul>			
74AUP1G373 v.5	20111125	Product data sheet	-	74AUP1G373 v.4
Modifications:	<ul style="list-style-type: none"> <li>Legal pages updated.</li> </ul>			
74AUP1G373 v.4	20100715	Product data sheet	-	74AUP1G373 v.3
74AUP1G373 v.3	20080109	Product data sheet	-	74AUP1G373 v.2
74AUP1G373 v.2	20070720	Product data sheet	-	74AUP1G373 v.1
74AUP1G373 v.1	20061129	Product data sheet	-	-

## 15. Legal information

### 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.
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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".
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