

74AUP1T34-Q100

Low-power dual supply translating buffer

Rev. 5 — 17 July 2023

Product data sheet

1. General description

The 74AUP1T34-Q100 is a single dual supply translating buffer. Input A is referenced to $V_{CC(A)}$ and output Y is referenced to $V_{CC(Y)}$. Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times. This device ensures very low static and dynamic power consumption across the entire V_{CC} range from 1.1 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 potentially damaging backflow current through the device when it is powered down.

This product has been qualified to the Automotive Electronics Council (AEC) standard Q100 (Grade 1) and is suitable for use in automotive applications.

2. Features and benefits

- Automotive product qualification in accordance with AEC-Q100 (Grade 1)
 - Specified from -40 °C to +85 °C and -40 °C to +125 °C
- Wide supply voltage range from 1.1 V to 3.6 V
- CMOS low power dissipation
- High noise immunity
- Complies with JEDEC standards:
 - 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)
- Wide supply voltage range:
 - $V_{CC(A)}$: 1.1 V to 3.6 V
 - $V_{CC(Y)}$: 1.1 V to 3.6 V
- Low static power consumption; $I_{CC} = 0.9 \mu\text{A}$ (maximum)
- Each port operates over the full 1.1 V to 3.6 V power supply range
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level B
- Overvoltage tolerant inputs to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- I_{OFF} circuitry provides partial Power-down mode operation
- ESD protection:
 - HBM: ANSI/ESDA/JEDEC JS-001 class 3A exceeds 5000 V
 - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1T34GW-Q100	-40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1
74AUP1T34GM-Q100	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886

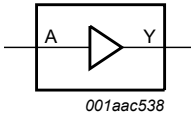

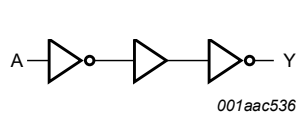
4. Marking

Table 2. Marking

Type number	Marking code ^[1]
74AUP1T34GW-Q100	pQ
74AUP1T34GM-Q100	pQ

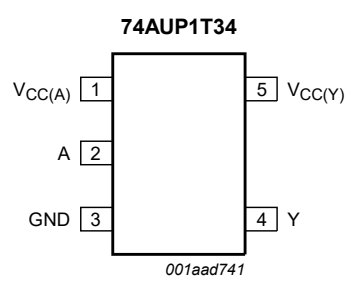
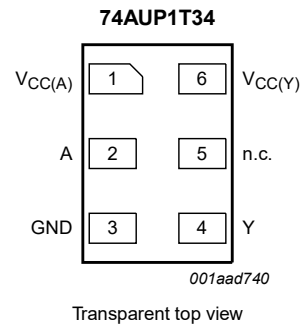
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

5. Functional diagram

 <p>001aac538</p>	 <p>001aac537</p>	 <p>001aac536</p>
Fig. 1. Logic symbol	Fig. 2. IEC logic symbol	Fig. 3. Logic diagram

6. Pinning information

6.1. Pinning

 <p>001aad741</p>	 <p>001aad740</p> <p>Transparent top view</p>
Fig. 4. Pin configuration SOT353-1 (TSSOP5)	Fig. 5. Pin configuration SOT886 (XSON6)

6.2. Pin description

Table 3. Pin description

Symbol	Pin		Description
	TSSOP5	XSON6	
V _{CC(A)}	1	1	supply voltage port A
A	2	2	data input A
GND	3	3	ground (0 V)
Y	4	4	data output Y
n.c.	-	5	not connected
V _{CC(Y)}	5	6	supply voltage port Y

7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level.

Input	Output
A	Y
L	L
H	H

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
$V_{CC(A)}$	supply voltage A		-0.5	+4.6	V
$V_{CC(Y)}$	supply voltage Y		-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 $V_{CC(Y)}$	-	±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 minimum input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] For SOT353-1 (TSSOP5) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.
For SOT886 (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
$V_{CC(A)}$	supply voltage A		1.1	3.6	V
$V_{CC(Y)}$	supply voltage Y		1.1	3.6	V
V_I	input voltage		0	3.6	V
V_O	output voltage		0	$V_{CC(Y)}$	V
T_{amb}	ambient temperature		-40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	control and data inputs; $V_{CC(A)} = 1.1$ V to 3.6 V	0	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
T_{amb} = 25 °C						
V _{IH}	HIGH-level input voltage	V _{CC(A)} = 1.1 V to 1.95 V; V _{CC(Y)} = 1.1 V to 3.6 V	0.65 × V _{CC(A)}	-	-	V
		V _{CC(A)} = 2.3 V to 2.7 V; V _{CC(Y)} = 1.1 V to 3.6 V	1.6	-	-	V
		V _{CC(A)} = 3.0 V to 3.6 V; V _{CC(Y)} = 1.1 V to 3.6 V	2.0	-	-	V
V _{IL}	LOW-level input voltage	V _{CC(A)} = 1.1 V to 1.95 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.35 × V _{CC(A)}	V
		V _{CC(A)} = 2.3 V to 2.7 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.7	V
		V _{CC(A)} = 3.0 V to 3.6 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.9	V
V _{OH}	HIGH-level output voltage	V _I = V _{IH}				
		I _O = -20 μA; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	V _{CC(Y)} - 0.1	-	-	V
		I _O = -1.1 mA; V _{CC(A)} = V _{CC(Y)} = 1.1 V	0.75 × V _{CC(Y)}	-	-	V
		I _O = -1.7 mA; V _{CC(A)} = V _{CC(Y)} = 1.4 V	1.11	-	-	V
		I _O = -1.9 mA; V _{CC(A)} = V _{CC(Y)} = 1.65 V	1.32	-	-	V
		I _O = -2.3 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	2.05	-	-	V
		I _O = -3.1 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	1.9	-	-	V
		I _O = -2.7 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	2.72	-	-	V
V _{OL}	LOW-level output voltage	V _I = V _{IL}				
		I _O = 20 μA; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.1	V
		I _O = 1.1 mA; V _{CC(A)} = V _{CC(Y)} = 1.1 V	-	-	0.3 × V _{CC(Y)}	V
		I _O = 1.7 mA; V _{CC(A)} = V _{CC(Y)} = 1.4 V	-	-	0.31	V
		I _O = 1.9 mA; V _{CC(A)} = V _{CC(Y)} = 1.65 V	-	-	0.31	V
		I _O = 2.3 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.31	V
		I _O = 3.1 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.44	V
		I _O = 2.7 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	-	-	0.31	V
I _I	input leakage current	V _I = 0 V to 3.6 V; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	±0.1	μA
I _{OFF}	power-off leakage current	A input; V _I = 0 V to 3.6 V; V _{CC(A)} = 0 V; V _{CC(Y)} = 0 V to 3.6 V	-	-	±0.2	μA
		Y output; V _O = 0 V to 3.6 V; V _{CC(A)} = 0 V to 3.6 V; V _I = 0 V or 3.6 V; V _{CC(Y)} = 0 V	-	-	±0.2	μA
ΔI _{OFF}	additional power-off leakage current	A input; V _I = 0 V to 3.6 V; V _{CC(A)} = 0 V to 0.2 V; V _{CC(Y)} = 0 V to 3.6 V	-	-	±0.2	μA
		Y output; V _O = 0 V to 3.6 V; V _{CC(A)} = 0 V to 3.6 V; V _I = 0 V or 3.6 V; V _{CC(Y)} = 0 V to 0.2 V	-	-	±0.2	μA

Symbol	Parameter	Conditions	Min	Typ	Max	Unit				
I _{CC}	supply current	port A; V _I = GND or V _{CC(A)} ; I _O = 0 A								
		V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.5	μA				
		V _{CC(A)} = 3.6 V; V _{CC(Y)} = 0 V	-	-	0.5	μA				
		V _{CC(A)} = 0 V; V _{CC(Y)} = 3.6 V	-	0.0	-	μA				
		port Y; V _I = GND or V _{CC(A)} ; I _O = 0 A								
		V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.5	μA				
		V _{CC(A)} = 3.6 V; V _{CC(Y)} = 0 V	-	0.0	-	μA				
		V _{CC(A)} = 0 V; V _{CC(Y)} = 3.6 V	-	-	0.5	μA				
ΔI _{CC}	additional supply current	port A and port Y; V _I = GND or V _{CC(A)} ; I _O = 0 A; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.5	μA				
		A input; V _{CC(A)} = 3.3 V; V _{CC(Y)} = 0 V to 3.6 V; V _I = V _{CC(A)} - 0.6 V	-	-	40	μA				
		C _I	input capacitance	A input; V _{CC(A)} = V _{CC(Y)} = 0 V to 3.6 V; V _I = GND or V _{CC(A)}	-	1.0	-	pF		
				C _O	output capacitance	Y output; V _O = GND; V _{CC(Y)} = 0 V; V _{CC(A)} = 0 V to 3.6 V	-	1.8	-	pF
						T_{amb} = -40 °C to +85 °C				
		V _{IH}	HIGH-level input voltage	V _{CC(A)} = 1.1 V to 1.95 V; V _{CC(Y)} = 1.1 V to 3.6 V	0.65 × V _{CC(A)}	-	-	V		
				V _{CC(A)} = 2.3 V to 2.7 V; V _{CC(Y)} = 1.1 V to 3.6 V	1.6	-	-	V		
				V _{CC(A)} = 3.0 V to 3.6 V; V _{CC(Y)} = 1.1 V to 3.6 V	2.0	-	-	V		
V _{IL}	LOW-level input voltage	V _{CC(A)} = 1.1 V to 1.95 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.35 × V _{CC(A)}	V				
		V _{CC(A)} = 2.3 V to 2.7 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.7	V				
		V _{CC(A)} = 3.0 V to 3.6 V; V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.9	V				
V _{OH}	HIGH-level output voltage	V _I = V _{IH}								
		I _O = -20 μA; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	V _{CC(Y)} - 0.1	-	-	V				
		I _O = -1.1 mA; V _{CC(A)} = V _{CC(Y)} = 1.1 V	0.7 × V _{CC(Y)}	-	-	V				
		I _O = -1.7 mA; V _{CC(A)} = V _{CC(Y)} = 1.4 V	1.03	-	-	V				
		I _O = -1.9 mA; V _{CC(A)} = V _{CC(Y)} = 1.65 V	1.30	-	-	V				
		I _O = -2.3 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	1.97	-	-	V				
		I _O = -3.1 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	1.85	-	-	V				
		I _O = -2.7 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	2.67	-	-	V				
I _O = -4.0 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	2.55	-	-	V						
V _{OL}	LOW-level output voltage	V _I = V _{IL}								
		I _O = 20 μA; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.1	V				
		I _O = 1.1 mA; V _{CC(A)} = V _{CC(Y)} = 1.1 V	-	-	0.3 × V _{CC(Y)}	V				
		I _O = 1.7 mA; V _{CC(A)} = V _{CC(Y)} = 1.4 V	-	-	0.37	V				
		I _O = 1.9 mA; V _{CC(A)} = V _{CC(Y)} = 1.65 V	-	-	0.35	V				
		I _O = 2.3 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.33	V				
		I _O = 3.1 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.45	V				
		I _O = 2.7 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	-	-	0.33	V				
I _O = 4.0 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	-	-	0.45	V						

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_I	input leakage current	$V_I = 0\text{ V to }3.6\text{ V}; V_{CC(A)} = V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	± 0.5	μA
I_{OFF}	power-off leakage current	A input; $V_I = 0\text{ V to }3.6\text{ V}; V_{CC(A)} = 0\text{ V}; V_{CC(Y)} = 0\text{ V to }3.6\text{ V}$	-	-	± 0.5	μA
		Y output; $V_O = 0\text{ V to }3.6\text{ V}; V_{CC(A)} = 0\text{ V to }3.6\text{ V}; V_I = 0\text{ V or }3.6\text{ V}; V_{CC(Y)} = 0\text{ V}$	-	-	± 0.5	μA
ΔI_{OFF}	additional power-off leakage current	A input; $V_I = 0\text{ V to }3.6\text{ V}; V_{CC(A)} = 0\text{ V to }0.2\text{ V}; V_{CC(Y)} = 0\text{ V to }3.6\text{ V}$	-	-	± 0.6	μA
		Y output; $V_O = 0\text{ V to }3.6\text{ V}; V_{CC(A)} = 0\text{ V to }3.6\text{ V}; V_I = 0\text{ V or }3.6\text{ V}; V_{CC(Y)} = 0\text{ V to }0.2\text{ V}$	-	-	± 0.6	μA
I_{CC}	supply current	port A; $V_I = \text{GND or }V_{CC(A)}; I_O = 0\text{ A}$				
		$V_{CC(A)} = V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	0.9	μA
		$V_{CC(A)} = 3.6\text{ V}; V_{CC(Y)} = 0\text{ V}$	-	-	0.9	μA
		$V_{CC(A)} = 0\text{ V}; V_{CC(Y)} = 3.6\text{ V}$	-	0.0	-	μA
		port Y; $V_I = \text{GND or }V_{CC(A)}; I_O = 0\text{ A}$				
		$V_{CC(A)} = V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	0.9	μA
		$V_{CC(A)} = 3.6\text{ V}; V_{CC(Y)} = 0\text{ V}$	-	0.0	-	μA
		$V_{CC(A)} = 0\text{ V}; V_{CC(Y)} = 3.6\text{ V}$	-	-	0.9	μA
ΔI_{CC}	additional supply current	A input; $V_{CC(A)} = 3.3\text{ V}; V_{CC(Y)} = 0\text{ V to }3.6\text{ V}; V_I = V_{CC(A)} - 0.6\text{ V}$	-	-	50	μA
$T_{amb} = -40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$						
V_{IH}	HIGH-level input voltage	$V_{CC(A)} = 1.1\text{ V to }1.95\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	$0.7 \times V_{CC(A)}$	-	-	V
		$V_{CC(A)} = 2.3\text{ V to }2.7\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	1.6	-	-	V
		$V_{CC(A)} = 3.0\text{ V to }3.6\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	2.0	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC(A)} = 1.1\text{ V to }1.95\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	$0.3 \times V_{CC(A)}$	V
		$V_{CC(A)} = 2.3\text{ V to }2.7\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	0.7	V
		$V_{CC(A)} = 3.0\text{ V to }3.6\text{ V}; V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$				
		$I_O = -20\text{ }\mu\text{A}; V_{CC(A)} = V_{CC(Y)} = 1.1\text{ V to }3.6\text{ V}$	$V_{CC(Y)} - 0.11$	-	-	V
		$I_O = -1.1\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 1.1\text{ V}$	$0.6 \times V_{CC(Y)}$	-	-	V
		$I_O = -1.7\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 1.4\text{ V}$	0.93	-	-	V
		$I_O = -1.9\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 1.65\text{ V}$	1.17	-	-	V
		$I_O = -2.3\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 2.3\text{ V}$	1.77	-	-	V
		$I_O = -3.1\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 2.3\text{ V}$	1.67	-	-	V
		$I_O = -2.7\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 3.0\text{ V}$	2.40	-	-	V
$I_O = -4.0\text{ mA}; V_{CC(A)} = V_{CC(Y)} = 3.0\text{ V}$	2.30	-	-	V		

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{OL}	LOW-level output voltage	V _I = V _{IL}				
		I _O = 20 μA; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	0.11	V
		I _O = 1.1 mA; V _{CC(A)} = V _{CC(Y)} = 1.1 V	-	-	0.33 × V _{CC(Y)}	V
		I _O = 1.7 mA; V _{CC(A)} = V _{CC(Y)} = 1.4 V	-	-	0.41	V
		I _O = 1.9 mA; V _{CC(A)} = V _{CC(Y)} = 1.65 V	-	-	0.39	V
		I _O = 2.3 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.36	V
		I _O = 3.1 mA; V _{CC(A)} = V _{CC(Y)} = 2.3 V	-	-	0.50	V
		I _O = 2.7 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	-	-	0.36	V
	I _O = 4.0 mA; V _{CC(A)} = V _{CC(Y)} = 3.0 V	-	-	0.50	V	
I _I	input leakage current	V _I = 0 V to 3.6 V; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	±0.75	μA
I _{OFF}	power-off leakage current	A input; V _I = 0 V to 3.6 V; V _{CC(A)} = 0 V; V _{CC(Y)} = 0 V to 3.6 V	-	-	±0.75	μA
		Y output; V _O = 0 V to 3.6 V; V _{CC(A)} = 0 V to 3.6 V; V _I = 0 V or 3.6 V; V _{CC(Y)} = 0 V	-	-	±0.75	μA
ΔI _{OFF}	additional power-off leakage current	A input; V _I = 0 V to 3.6 V; V _{CC(A)} = 0 V to 0.2 V; V _{CC(Y)} = 0 V to 3.6 V	-	-	±0.75	μA
		Y output; V _O = 0 V to 3.6 V; V _{CC(A)} = 0 V to 3.6 V; V _I = 0 V or 3.6 V; V _{CC(Y)} = 0 V to 0.2 V	-	-	±0.75	μA
I _{CC}	supply current	port A; V _I = GND or V _{CC(A)} ; I _O = 0 A				
		V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	1.4	μA
		V _{CC(A)} = 3.6 V; V _{CC(Y)} = 0 V	-	-	1.4	μA
		V _{CC(A)} = 0 V; V _{CC(Y)} = 3.6 V	-	0.0	-	μA
		port Y; V _I = GND or V _{CC(A)} ; I _O = 0 A				
		V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	1.4	μA
		V _{CC(A)} = 3.6 V; V _{CC(Y)} = 0 V	-	0.0	-	μA
		V _{CC(A)} = 0 V; V _{CC(Y)} = 3.6 V	-	-	1.4	μA
	port A and port Y; V _I = GND or V _{CC(A)} ; I _O = 0 A; V _{CC(A)} = V _{CC(Y)} = 1.1 V to 3.6 V	-	-	1.4	μA	
ΔI _{CC}	additional supply current	A input; V _{CC(A)} = 3.3 V; V _{CC(Y)} = 0 V to 3.6 V; V _I = V _{CC(A)} - 0.6 V	-	-	75	μA

11. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Fig. 7.

Symbol	Parameter	Conditions	25 °C			-40 °C to +85 °C		-40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
$C_L = 5 \text{ pF}$; $V_{CC(A)} = 1.1 \text{ V to } 1.3 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.6	9.8	25.4	2.3	25.9	2.3	25.9	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.4	7.1	15.3	2.2	16.3	2.2	16.7	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.1	6.0	12.7	1.9	13.8	1.9	14.3	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	2.0	5.1	9.8	2.0	10.5	2.0	10.9	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.1	4.7	8.8	1.9	9.1	1.9	9.3	ns
$C_L = 5 \text{ pF}$; $V_{CC(A)} = 1.4 \text{ V to } 1.6 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.3	9.1	23.9	2.0	24.5	2.0	24.5	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.1	6.4	13.6	1.9	14.7	1.9	15.2	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	1.8	5.3	10.9	1.6	12.1	1.6	12.6	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7	4.3	7.8	1.6	8.7	1.6	9.2	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	1.8	3.9	6.6	1.6	7.1	1.6	7.5	ns
$C_L = 5 \text{ pF}$; $V_{CC(A)} = 1.65 \text{ V to } 1.95 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.2	8.8	23.2	1.9	23.9	1.9	24.0	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.0	6.0	13.0	1.8	14.1	1.8	14.6	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	1.8	4.9	10.3	1.5	11.4	1.5	12.0	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.6	3.9	7.2	1.5	8.0	1.5	8.5	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	1.7	3.5	5.9	1.5	6.4	1.5	6.8	ns
$C_L = 5 \text{ pF}$; $V_{CC(A)} = 2.3 \text{ V to } 2.7 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.2	8.4	22.8	1.9	23.4	1.9	23.4	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	1.9	5.7	12.3	1.8	13.4	1.8	14.0	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	1.7	4.6	9.6	1.5	10.7	1.5	11.2	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.5	3.5	6.3	1.5	7.2	1.5	7.7	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	1.6	3.1	5.1	1.4	5.6	1.4	6.0	ns
$C_L = 5 \text{ pF}$; $V_{CC(A)} = 3.0 \text{ V to } 3.6 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.2	8.1	22.5	1.9	22.9	1.9	22.9	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	1.9	5.4	12.0	1.8	12.9	1.8	13.4	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	1.7	4.3	9.2	1.5	10.2	1.5	10.7	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.5	3.3	6.0	1.5	6.7	1.5	7.2	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	1.6	2.9	4.8	1.4	5.2	1.4	5.5	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	
$C_L = 10 \text{ pF}$; $V_{CC(A)} = 1.1 \text{ V to } 1.3 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.6	10.7	27.1	2.5	27.6	2.5	27.6	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.6	7.7	16.7	2.3	17.5	2.3	17.6	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.7	6.6	13.4	2.4	14.2	2.4	14.7	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	2.2	5.6	10.3	2.2	11.0	2.2	11.4	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.5	5.3	9.5	2.2	9.7	2.2	10.0	ns
$C_L = 10 \text{ pF}$; $V_{CC(A)} = 1.4 \text{ V to } 1.6 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.4	10.0	25.6	2.2	26.1	2.2	26.1	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.4	7.0	15.0	2.0	15.8	2.0	16.4	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.4	5.9	11.6	2.1	12.5	2.1	13.1	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	2.0	4.8	8.4	1.9	9.2	1.9	9.7	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.2	4.4	7.4	1.9	7.7	1.9	8.1	ns
$C_L = 10 \text{ pF}$; $V_{CC(A)} = 1.65 \text{ V to } 1.95 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.3	9.7	24.8	2.1	25.5	2.1	25.7	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.3	6.6	14.3	2.0	15.3	2.0	15.8	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.3	5.5	11.0	2.0	11.9	2.0	12.5	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.9	4.4	7.7	1.8	8.6	1.8	9.0	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.1	4.0	6.6	1.8	7.1	1.8	7.4	ns
$C_L = 10 \text{ pF}$; $V_{CC(A)} = 2.3 \text{ V to } 2.7 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.3	9.3	24.4	2.1	25.1	2.1	25.1	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.2	6.3	13.6	1.9	14.6	1.9	15.1	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.2	5.1	10.3	2.0	11.2	2.0	11.7	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.8	4.1	6.9	1.8	7.7	1.8	8.2	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.0	3.6	5.8	1.7	6.3	1.7	6.6	ns
$C_L = 10 \text{ pF}$; $V_{CC(A)} = 3.0 \text{ V to } 3.6 \text{ V}$										
t_{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		$V_{CC(Y)} = 1.1 \text{ V to } 1.3 \text{ V}$	2.3	9.0	24.2	2.1	24.6	2.1	24.6	ns
		$V_{CC(Y)} = 1.4 \text{ V to } 1.6 \text{ V}$	2.2	6.0	13.3	1.9	14.1	1.9	14.6	ns
		$V_{CC(Y)} = 1.65 \text{ V to } 1.95 \text{ V}$	2.2	4.9	9.9	2.0	10.6	2.0	11.2	ns
		$V_{CC(Y)} = 2.3 \text{ V to } 2.7 \text{ V}$	1.8	3.9	6.5	1.8	7.3	1.8	7.7	ns
		$V_{CC(Y)} = 3.0 \text{ V to } 3.6 \text{ V}$	2.0	3.5	5.4	1.7	5.8	1.7	6.2	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	
C_L = 15 pF; V_{CC(A)} = 1.1 V to 1.3 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.0	11.5	28.6	2.8	29.2	2.8	29.2	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.1	8.3	17.3	2.7	18.6	2.7	19.1	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	2.8	7.1	14.1	2.7	15.2	2.7	15.8	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.6	6.1	11.1	2.7	11.6	2.7	12.1	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	2.9	5.7	9.9	2.6	10.3	2.6	10.6	ns
C_L = 15 pF; V_{CC(A)} = 1.4 V to 1.6 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	2.8	10.8	27.1	2.6	27.7	2.6	27.7	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	2.8	7.6	15.7	2.4	17.0	2.4	17.6	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	2.5	6.3	12.3	2.4	13.5	2.4	14.1	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.3	5.3	9.2	2.4	9.9	2.4	10.3	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	2.6	4.9	7.8	2.3	8.3	2.3	8.7	ns
C_L = 15 pF; V_{CC(A)} = 1.65 V to 1.95 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	2.7	10.5	26.4	2.5	27.1	2.5	27.3	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	2.7	7.2	15.0	2.3	16.4	2.3	17.0	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	2.4	6.0	11.7	2.3	12.8	2.3	13.5	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.2	4.9	8.5	2.2	9.2	2.2	9.7	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	2.5	4.5	7.1	2.2	7.7	2.2	8.0	ns
C_L = 15 pF; V_{CC(A)} = 2.3 V to 2.7 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	2.6	10.1	26.0	2.4	26.7	2.4	26.7	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	2.7	6.9	14.3	2.3	15.7	2.3	16.3	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	2.4	5.6	10.9	2.2	12.1	2.2	12.7	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.1	4.5	7.6	2.2	8.4	2.2	8.9	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	2.4	4.1	6.2	2.1	6.8	2.1	7.2	ns
C_L = 15 pF; V_{CC(A)} = 3.0 V to 3.6 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	2.6	9.8	25.7	2.4	26.2	2.4	26.2	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	2.7	6.6	14.0	2.3	15.2	2.3	15.7	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	2.4	5.4	10.5	2.2	11.6	2.2	12.1	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.1	4.3	7.3	2.2	7.9	2.2	8.4	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	2.4	3.9	5.9	2.1	6.4	2.1	6.8	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	
C_L = 30 pF; V_{CC(A)} = 1.1 V to 1.3 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.7	13.7	32.9	3.5	33.5	3.5	33.5	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.6	9.8	19.5	3.6	20.9	3.6	21.4	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	3.7	8.4	15.9	3.5	17.0	3.5	17.7	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	3.0	7.2	12.2	3.4	12.7	3.4	13.2	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	3.8	6.8	10.9	3.4	12.2	3.4	12.5	ns
C_L = 30 pF; V_{CC(A)} = 1.4 V to 1.6 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.5	13.1	31.5	3.2	32.0	3.2	32.0	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.3	9.1	17.8	3.3	19.2	3.3	19.9	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	3.4	7.6	14.2	3.2	15.4	3.2	16.0	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.8	6.4	10.3	3.1	11.0	3.1	11.5	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	3.5	5.9	8.9	3.1	10.1	3.1	10.5	ns
C_L = 30 pF; V_{CC(A)} = 1.65 V to 1.95 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.4	12.7	30.7	3.1	31.5	3.1	31.5	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.2	8.8	17.2	3.2	18.7	3.2	19.3	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	3.3	7.3	13.5	3.1	14.7	3.1	15.4	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.7	6.0	9.6	3.0	10.4	3.0	10.9	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	3.4	5.6	8.2	2.9	9.4	2.9	9.8	ns
C_L = 30 pF; V_{CC(A)} = 2.3 V to 2.7 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.3	12.4	30.3	3.1	31.0	3.1	31.0	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.2	8.4	16.5	3.1	18.0	3.1	18.7	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	3.2	6.9	12.8	3.0	14.0	3.0	14.6	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.6	5.6	8.8	2.9	9.6	2.9	10.1	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	3.3	5.2	7.3	2.9	8.5	2.9	9.0	ns
C_L = 30 pF; V_{CC(A)} = 3.0 V to 3.6 V										
t _{pd}	propagation delay	A to Y; see Fig. 6 [2]								
		V _{CC(Y)} = 1.1 V to 1.3 V	3.3	12.0	30.0	3.1	30.5	3.1	30.5	ns
		V _{CC(Y)} = 1.4 V to 1.6 V	3.2	8.1	16.2	3.1	17.5	3.1	18.1	ns
		V _{CC(Y)} = 1.65 V to 1.95 V	3.2	6.7	12.4	3.0	13.4	3.0	14.1	ns
		V _{CC(Y)} = 2.3 V to 2.7 V	2.6	5.5	8.5	2.9	9.1	2.9	9.6	ns
		V _{CC(Y)} = 3.0 V to 3.6 V	3.2	5.0	7.0	2.9	8.1	2.9	8.5	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	
C_L = 5 pF, 10 pF, 15 pF and 30 pF										
C _{PD}	power dissipation capacitance	f _i = 1 MHz; [3][4] V _I = GND to V _{CC(A)}								
		V _{CC(A)} = V _{CC(Y)} = 1.2 V	-	3.8	-	-	-	-	-	pF
		V _{CC(A)} = V _{CC(Y)} = 1.5 V	-	3.8	-	-	-	-	-	pF
		V _{CC(A)} = V _{CC(Y)} = 1.8 V	-	4.1	-	-	-	-	-	pF
		V _{CC(A)} = V _{CC(Y)} = 2.5 V	-	4.2	-	-	-	-	-	pF
		V _{CC(A)} = V _{CC(Y)} = 3.3 V	-	4.6	-	-	-	-	pF	

- [1] All typical values are measured at nominal V_{CC}.
- [2] t_{pd} is the same as t_{PLH} and t_{PHL}.
- [3] All specified values are the average typical values over all stated loads.
- [4] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).
 $P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ 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;
 Σ(C_L × V_{CC}² × f_o) = sum of the outputs.

11.1. Waveforms and test circuit

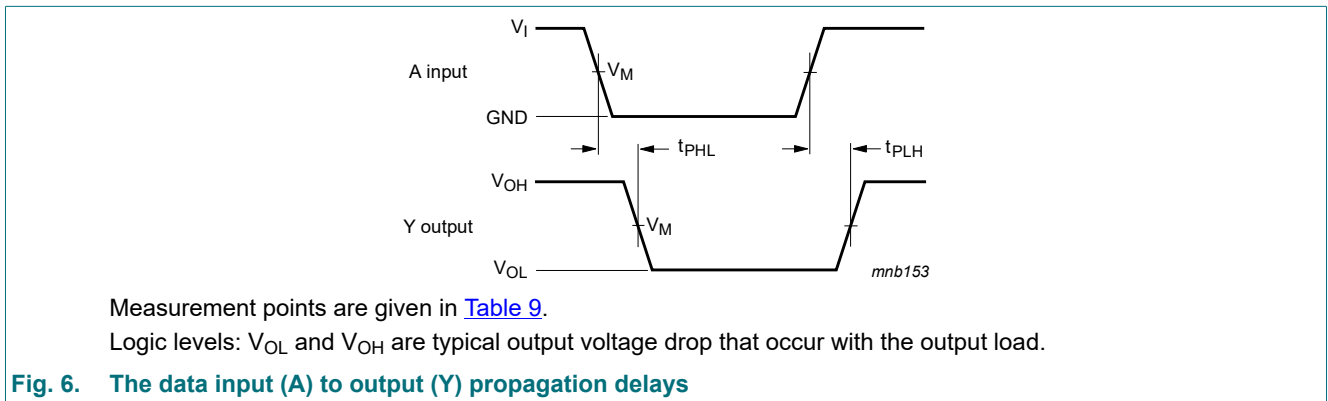
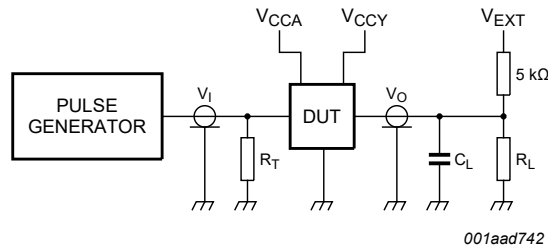


Fig. 6. The data input (A) to output (Y) propagation delays

Table 9. Measurement points

Supply voltage	Output	Input		
V _{CC(A)} /V _{CC(Y)}	V _M	V _M	V _I	t _r = t _f
1.1 V to 3.6 V	0.5 × V _{CC(Y)}	0.5 × V _{CC(A)}	V _{CC(A)}	≤ 3.0 ns



Test data is given in [Table 10](#).

Definitions for test circuit:

R_L = Load resistance;

C_L = Load capacitance including jig and probe capacitance;

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

V_{EXT} = External voltage for measuring switching times.

Fig. 7. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Load		V_{EXT}
$V_{CC(A)}/V_{CC(Y)}$	C_L	R_L [1]	t_{PLH} , t_{PHL}
1.1 V to 3.6 V	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open

- [1] For measuring enable and disable times $R_L = 5\text{ k}\Omega$.
For measuring propagation delays, setup and hold times and pulse width $R_L = 1\text{ M}\Omega$.

12. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm

SOT353-1

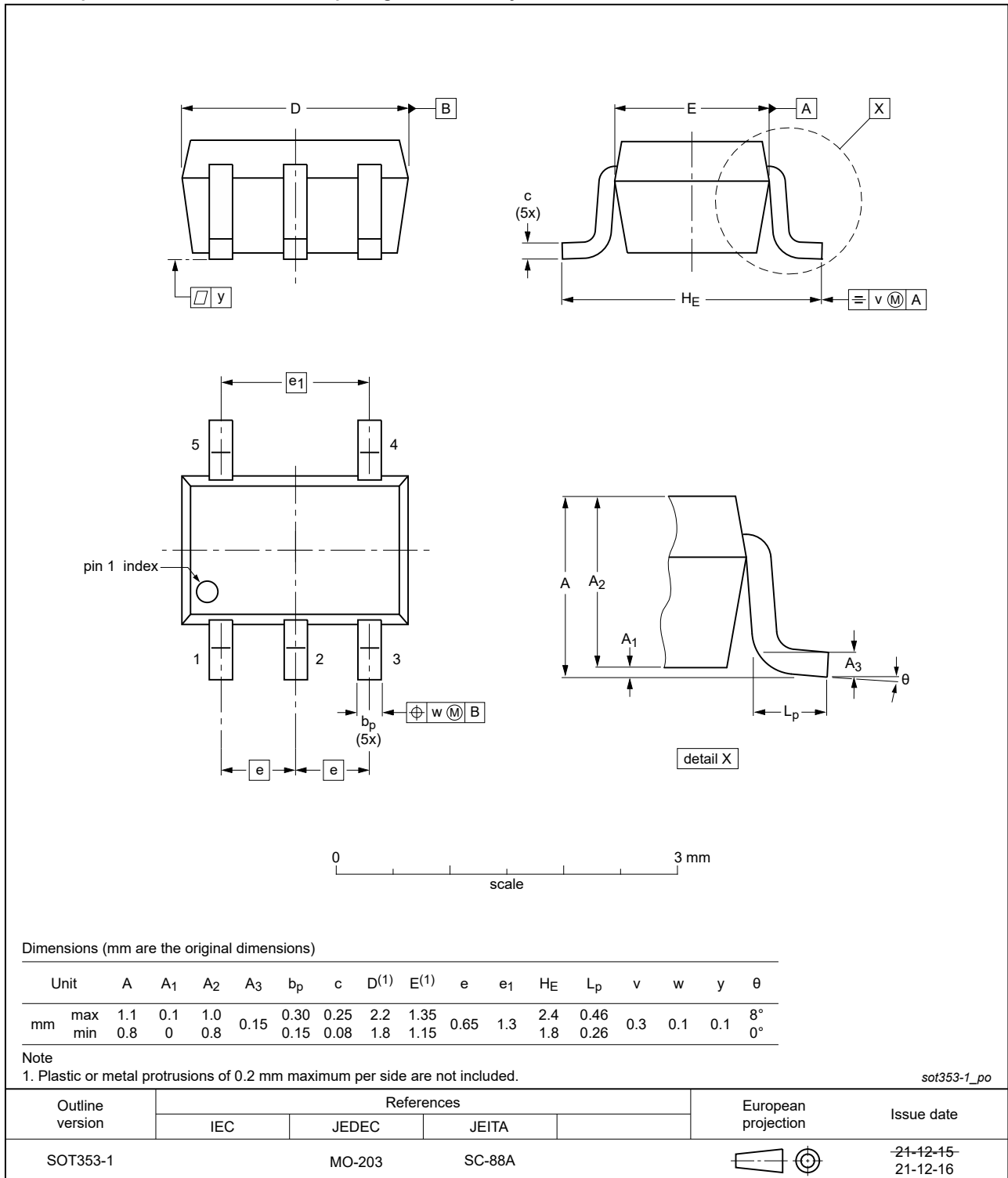


Fig. 8. Package outline SOT353-1 (TSSOP5)

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

SOT886

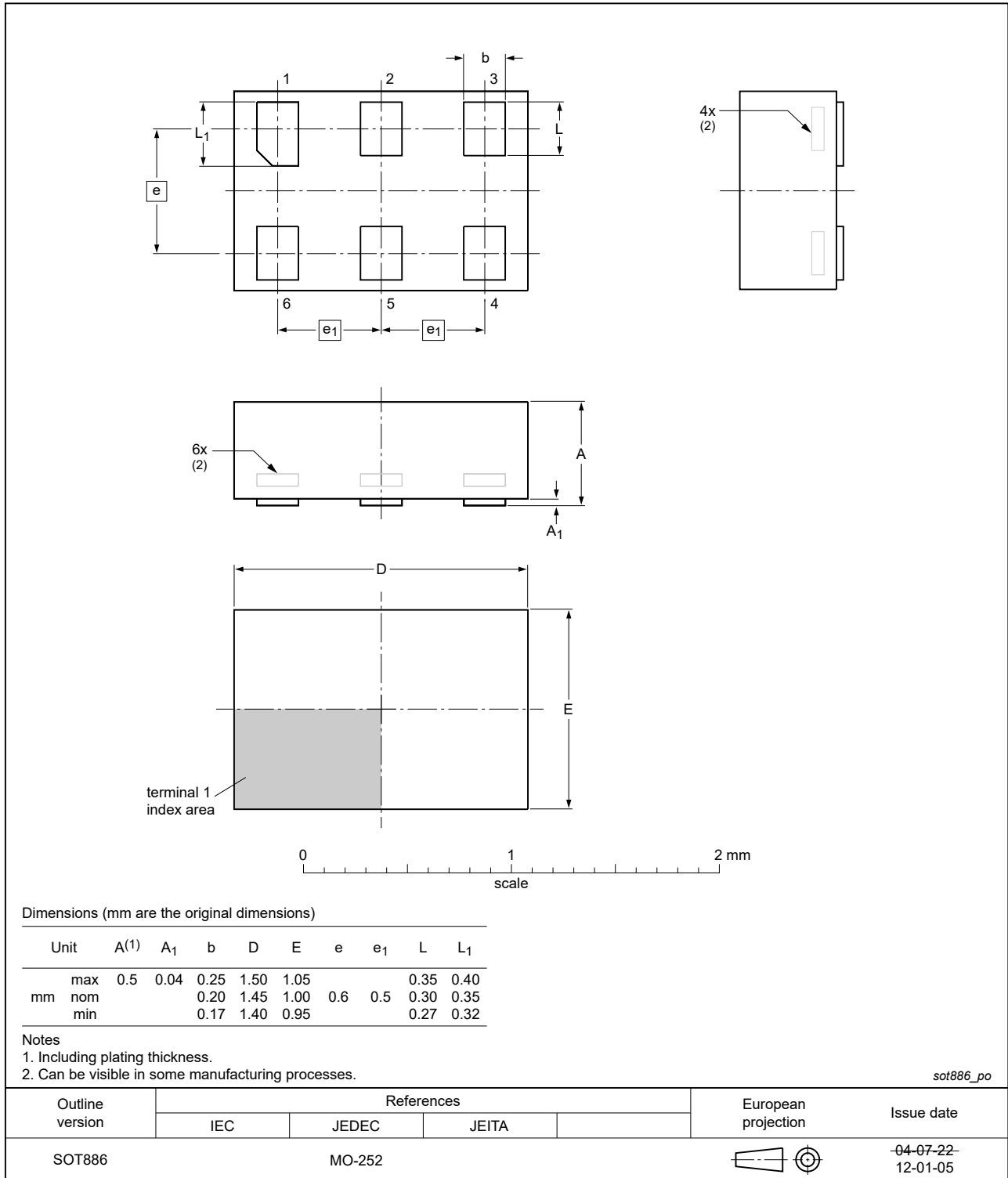


Fig. 9. Package outline SOT886 (XSON6)

13. Abbreviations

Table 11. Abbreviations

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

14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1T34_Q100 v.5	20230717	Product data sheet	-	74AUP1T34_Q100 v.4
Modifications:	<ul style="list-style-type: none"> • Section 2: ESD specification updated according to the latest JEDEC standard. 			
74AUP1T34_Q100 v.4	20220125	Product data sheet	-	74AUP1T34_Q100 v.3
Modifications:	<ul style="list-style-type: none"> • Section 2 updated. • Fig. 8: Package outline drawing for SOT353-1 has changed. 			
74AUP1T34_Q100 v.3	20210518	Product data sheet	-	74AUP1T34_Q100 v.2
Modifications:	<ul style="list-style-type: none"> • Section 1 updated. • Table 5: Derating values for P_{tot} total power dissipation updated. 			
74AUP1T34_Q100 v.2	20190128	Product data sheet	-	74AUP1T34_Q100 v.1
Modifications:	<ul style="list-style-type: none"> • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Type number 74AUP1T34GM-Q100 (SOT886) added. 			
74AUP1T34_Q100 v.1	20130605	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.
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".
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