74AUP1T45

Low-power dual supply translating transceiver; 3-state

Rev. 5 — 9 August 2012 Product data sheet

1. General description

The 74AUP1T45 is a single bit transceiver featuring two data input-outputs (A and B), a direction control input (DIR) and dual supply pins ($V_{CC(A)}$ and $V_{CC(B)}$) which enable bidirectional level translation. Both $V_{CC(A)}$ and $V_{CC(B)}$ can be supplied at any voltage between 1.1 V and 3.6 V making the device suitable for interfacing between any of the low voltage nodes (1.2 V, 1.5 V, 1.8 V, 2.5 V and 3.3 V). Pins A and DIR are referenced to $V_{CC(A)}$ and pin B is referenced to $V_{CC(B)}$. A HIGH on DIR allows transmission from A to B and a LOW on DIR allows transmission from B to A.

Schmitt trigger action on all inputs makes the circuit tolerant of slower input rise and fall times across the entire $V_{CC(A)}$ and $V_{CC(B)}$ ranges. The device ensures low static and dynamic power consumption and is fully specified for partial power-down applications using I_{OFF}. The I_{OFF} circuitry disables the output, preventing any damaging backflow current through the device when it is powered down. In suspend mode when either $V_{CC(A)}$ or $V_{CC(B)}$ are at GND, both A and B are in the high-impedance OFF-state.

2. Features and benefits

- Wide supply voltage range:
  - $V_{CC(A)}$: 1.1 V to 3.6 V
  - $V_{CC(B)}$: 1.1 V to 3.6 V
- 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)
- 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 μA (maximum)
- Suspend mode
- 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
74AUP1T45GW	–40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74AUP1T45GM	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74AUP1T45GF	–40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm	SOT891
74AUP1T45GN	–40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74AUP1T45GS	–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]
74AUP1T45GW	p5
74AUP1T45GM	p5
74AUP1T45GF	p5
74AUP1T45GN	p5
74AUP1T45GS	p5

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

5. Functional diagram

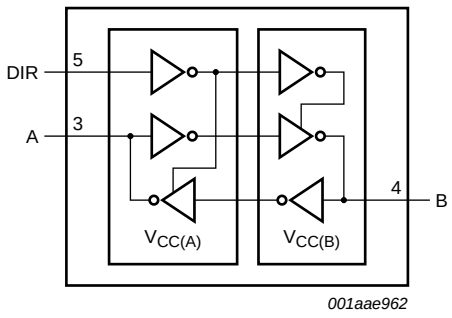


Fig 1. Logic symbol

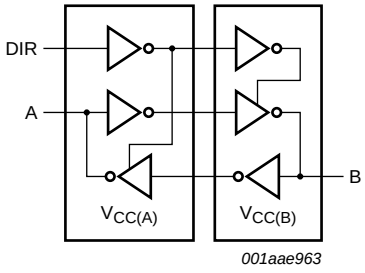


Fig 2. Logic diagram

6. Pinning information

6.1 Pinning

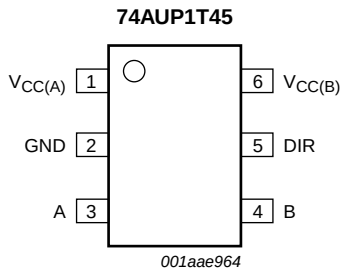


Fig 3. Pin configuration SOT363

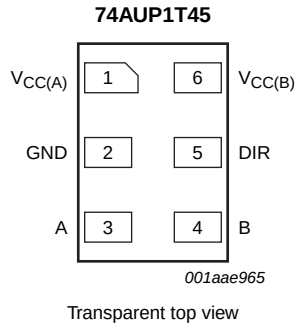


Fig 4. Pin configuration SOT886

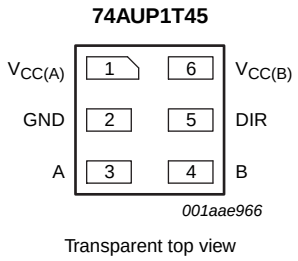


Fig 5. Pin configuration SOT891, SOT1115 and SOT1202

6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
$V_{CC(A)}$	1	supply voltage A
GND	2	ground (0 V)
A	3	data input or output A
B	4	data input or output B
DIR	5	direction control DIR
$V_{CC(B)}$	6	supply voltage B

7. Functional description

Table 4. Function table[1]

Supply voltage	Input[2]	Input/output[3]	
$V_{CC(A)}$, $V_{CC(B)}$	DIR	A	B
1.1 V to 3.6 V	L	A = B	input
1.1 V to 3.6 V	H	input	B = A
GND	X	suspend mode	suspend mode

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care.

[2] The DIR input circuit is referenced to $V_{CC(A)}$.

[3] The input circuit of the data I/Os are always active.

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
$V_{CC(B)}$	supply voltage B			–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				
		A port	[1][2]	–0.5	$V_{CC(A)}$ + 0.5	V
		B port	[1][2]	–0.5	$V_{CC(B)}$ + 0.5	V
		suspend or 3-state mode	[1][2]	–0.5	+4.6	V
I_O	output current	V_O = 0 V to V_{CC}		-	±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	[3]	-	250	mW

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

[2] The values of $V_{CC(A)}$ and $V_{CC(B)}$ are provided in the recommended operating conditions; see Table 6.

[3] For SC-88 packages: above 87.5 °C the value of P_{tot} derates linearly with 4.0 mW/K.
For XSON6 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.

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
$V_{CC(B)}$	supply voltage B			1.1	3.6	V
V_I	input voltage			0	3.6	V
V_O	output voltage		[1]	0	V_{CCO}	V
T_{amb}	ambient temperature			–40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	V_{CCI} =1.1 V to 3.6 V		0	200	ns/V

[1] V_{CCO} is the supply voltage associated with the output port.

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	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		0.65 × V_{CCI}	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		0.65 × $V_{CC(A)}$	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V
V_{IL}	LOW-level input voltage	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	0.35 × V_{CCI}	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	0.35 × $V_{CC(A)}$	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH}					
		I_O = –20 μA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	V_{CCO} – 0.1	-	-	V
		I_O = –1.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V	[2]	0.75 × V_{CCO}	-	-	V
		I_O = –1.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.4 V		1.11	-	-	V
		I_O = –1.9 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.65 V		1.32	-	-	V
		I_O = –2.3 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		2.05	-	-	V
		I_O = –3.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		1.9	-	-	V
		I_O = –2.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		2.72	-	-	V
		I_O = –4.0 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		2.6	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IL}					
		I_O = 20 μA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.1	V
		I_O = 1.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V	[2]	-	-	0.3 × V_{CCO}	V
		I_O = 1.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.4 V		-	-	0.31	V
		I_O = 1.9 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.65 V		-	-	0.31	V
		I_O = 2.3 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		-	-	0.31	V
		I_O = 3.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		-	-	0.44	V
		I_O = 2.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		-	-	0.31	V
		I_O = 4.0 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		-	-	0.44	V
I_I	input leakage current	DIR input; V_I = GND to $V_{CC(A)}$; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.1	μA

Table 7. Static characteristics *...continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{OZ}	OFF-state output current	A or B port; $V_I = V_{IH}$ or V_{IL}; V_O = 0 V to V_{CCO}; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	-	-	±0.1	μA
I_{OFF}	power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
ΔI_{OFF}	additional power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V to 0.2 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.2	μA
I_{CC}	supply current	A port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.5	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	-	0.5	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	0	-	μA
		B port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.5	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	0	-	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	-	0.5	μA
		A plus B port ($I_{CC(A)} + I_{CC(B)}$); I_O = 0 A; V_I = GND or V_{CCI}; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V	[1]	-	-	0.5	μA
ΔI_{CC}	additional supply current	A port; $V_{CC(A)} = V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ − 0.6 V; DIR at $V_{CC(A)}$; B port = open		-	-	40	μA
		B port; $V_{CC(A)} = V_{CC(B)}$ = 3.3 V; B port at $V_{CC(B)}$ − 0.6 V; DIR at GND; A port = open		-	-	40	μA
		DIR input; $V_{CC(A)} = V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ or GND; B port = open; DIR at $V_{CC(A)}$ − 0.6 V		-	-	40	μA
C_I	input capacitance	DIR input; V_I = GND or $V_{CC(A)}$; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V		-	0.9	-	pF
$C_{I/O}$	input/output capacitance	A and B port; suspend mode; V_{CCI} = 0 V; V_{CCO} = 1.1 V to 3.6 V; $V_O = V_{CCO}$ or GND	[1][2]	-	2.0	-	pF

Table 7. Static characteristics *...continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
T_{amb} = –40 °C to +85 °C							
V_{IH}	HIGH-level input voltage	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		0.65 × V_{CCI}	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		0.65 × $V_{CC(A)}$	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V
V_{IL}	LOW-level input voltage	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	0.35 × V_{CCI}	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	0.35 × $V_{CC(A)}$	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH}					
		I_O = –20 μA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	V_{CCO} – 0.1	-	-	V
		I_O = –1.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V	[2]	0.7 × V_{CCO}	-	-	V
		I_O = –1.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.4 V		1.03	-	-	V
		I_O = –1.9 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.65 V		1.30	-	-	V
		I_O = –2.3 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		1.97	-	-	V
		I_O = –3.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		1.85	-	-	V
		I_O = –2.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		2.67	-	-	V
		I_O = –4.0 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		2.55	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IL}					
		I_O = 20 μA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.1	V
		I_O = 1.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V	[2]	-	-	0.3 × V_{CCO}	V
		I_O = 1.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.4 V		-	-	0.37	V
		I_O = 1.9 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.65 V		-	-	0.35	V
		I_O = 2.3 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		-	-	0.33	V
		I_O = 3.1 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 2.3 V		-	-	0.45	V
		I_O = 2.7 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		-	-	0.33	V
		I_O = 4.0 mA; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.0 V		-	-	0.45	V
I_I	input leakage current	DIR input; V_I = GND to $V_{CC(A)}$; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.5	μA
I_{OZ}	OFF-state output current	A or B port; V_I = V_{IH} or V_{IL}; V_O = 0 V to V_{CCO}; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	-	-	±0.5	μA

Table 7. Static characteristics *…continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{OFF}	power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.5	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.5	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.5	μA
ΔI_{OFF}	additional power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.6	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V to 0.2 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.6	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.6	μA
I_{CC}	supply current	A port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.9	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	-	0.9	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	0	-	μA
		B port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.9	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	0	-	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	-	0.9	μA
		A plus B port ($I_{CC(A)}$ + $I_{CC(B)}$); I_O = 0 A; V_I = GND or V_{CCI}; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V	[1]	-	-	0.9	μA
ΔI_{CC}	additional supply current	A port; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ − 0.6 V; DIR at $V_{CC(A)}$; B port = open		-	-	50	μA
		B port; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; B port at $V_{CC(B)}$ − 0.6 V; DIR at GND; A port = open		-	-	50	μA
		DIR input; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ or GND; B port = open; DIR at $V_{CC(A)}$ − 0.6 V		-	-	50	μA
T_{amb} = –40 °C to +125 °C							
V_{IH}	HIGH-level input voltage	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		0.7 × V_{CCI}	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		0.7 × $V_{CC(A)}$	-	-	V
		V_{CCI} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CCI} = 3.0 V to 3.6 V		2.0	-	-	V

Table 7. Static characteristics *…continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{IL}	LOW-level input voltage	data input	[1][3]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	$0.3 \times V_{CCI}$	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
		DIR input	[1][4]				
		V_{CCI} = 1.1 V to 1.95 V		-	-	$0.3 \times V_{CC(A)}$	V
		V_{CCI} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CCI} = 3.0 V to 3.6 V		-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$					
		I_O = –20 μA; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	V_{CCO} – 0.11	-	-	V
		I_O = –1.1 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V	[2]	$0.6 \times V_{CCO}$	-	-	V
		I_O = –1.7 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.4 V		0.93	-	-	V
		I_O = –1.9 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.65 V		1.17	-	-	V
		I_O = –2.3 mA; $V_{CC(A)} = V_{CC(B)}$ = 2.3 V		1.77	-	-	V
		I_O = –3.1 mA; $V_{CC(A)} = V_{CC(B)}$ = 2.3 V		1.67	-	-	V
		I_O = –2.7 mA; $V_{CC(A)} = V_{CC(B)}$ = 3.0 V		2.40	-	-	V
		I_O = –4.0 mA; $V_{CC(A)} = V_{CC(B)}$ = 3.0 V		2.30	-	-	V
V_{OL}	LOW-level output voltage	$V_I = V_{IL}$					
		I_O = 20 μA; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	0.11	V
		I_O = 1.1 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V	[2]	-	-	$0.33 \times V_{CCO}$	V
		I_O = 1.7 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.4 V		-	-	0.41	V
		I_O = 1.9 mA; $V_{CC(A)} = V_{CC(B)}$ = 1.65 V		-	-	0.39	V
		I_O = 2.3 mA; $V_{CC(A)} = V_{CC(B)}$ = 2.3 V		-	-	0.36	V
		I_O = 3.1 mA; $V_{CC(A)} = V_{CC(B)}$ = 2.3 V		-	-	0.50	V
		I_O = 2.7 mA; $V_{CC(A)} = V_{CC(B)}$ = 3.0 V		-	-	0.36	V
		I_O = 4.0 mA; $V_{CC(A)} = V_{CC(B)}$ = 3.0 V		-	-	0.50	V
I_I	input leakage current	DIR input; V_I = GND to $V_{CC(A)}$; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
I_{OZ}	OFF-state output current	A or B port; $V_I = V_{IH}$ or V_{IL}; V_O = 0 V to V_{CCO}; $V_{CC(A)} = V_{CC(B)}$ = 1.1 V to 3.6 V	[2]	-	-	±0.75	μA
I_{OFF}	power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA

Table 7. Static characteristics *…continued*

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
ΔI_{OFF}	additional power-off leakage current	A port; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
		B port; V_I or V_O = 0 V to 3.6 V; $V_{CC(B)}$ = 0 V to 0.2 V; $V_{CC(A)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
		DIR input; V_I or V_O = 0 V to 3.6 V; $V_{CC(A)}$ = 0 V to 0.2 V; $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	±0.75	μA
I_{CC}	supply current	A port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	1.4	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	-	1.4	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	0	-	μA
		B port; V_I = GND or V_{CCI}; I_O = 0 A	[1]				
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V		-	-	1.4	μA
		$V_{CC(A)}$ = 3.6 V; $V_{CC(B)}$ = 0 V		-	0	-	μA
		$V_{CC(A)}$ = 0 V; $V_{CC(B)}$ = 3.6 V		-	-	1.4	μA
		A plus B port ($I_{CC(A)} + I_{CC(B)}$); I_O = 0 A; V_I = GND or V_{CCI}; $V_{CC(A)}$ = $V_{CC(B)}$ = 1.1 V to 3.6 V	[1]	-	-	1.4	μA
ΔI_{CC}	additional supply current	A port; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ − 0.6 V; DIR at $V_{CC(A)}$; B port = open		-	-	75	μA
		B port; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; B port at $V_{CC(B)}$ − 0.6 V; DIR at GND; A port = open		-	-	75	μA
		DIR input; $V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V; A port at $V_{CC(A)}$ or GND; B port = open; DIR at $V_{CC(A)}$ − 0.6 V		-	-	75	μA

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.

[3] For V_{CCI} values not specified in the data sheet: minimum V_{IH} = 0.7 × V_{CCI} and maximum V_{IL} = 0.3 × V_{CCI}.

[4] For V_{CCI} values not specified in the data sheet: minimum V_{IH} = 0.7 × $V_{CC(A)}$ and maximum V_{IL} = 0.3 × $V_{CC(A)}$.

[5] All unused data inputs of the device must be held at V_{CCI} or GND to ensure proper device operation.

11. Dynamic characteristics

Table 8. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C_L = 5 pF; $V_{CC(A)}$ = 1.1 V to 1.3 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.8	15.4	28.0	2.4	28.3	31.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.8	10.2	16.2	2.6	17.5	19.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.4	8.1	13.0	2.2	14.4	15.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.5	6.3	10.0	2.1	10.7	11.8	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.3	5.6	9.0	1.9	9.7	10.7	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.7	5.3	8.5	2.5	8.7	9.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.9	5.3	8.4	2.7	8.7	9.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.7	5.3	8.5	2.5	9.0	10.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.7	5.3	8.7	2.5	8.9	9.9	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.9	5.3	8.7	2.5	9.1	10.1	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.1	13.2	22.1	5.4	23.4	25.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.0	9.3	13.9	4.4	15.2	16.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.2	8.1	12.3	3.6	13.5	14.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.3	6.3	9.3	2.9	10.2	11.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.6	6.3	9.2	3.2	9.7	10.7	ns
C_L = 5 pF; $V_{CC(A)}$ = 1.4 V to 1.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.5	14.5	26.6	2.2	27.1	29.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.5	9.4	14.5	2.3	15.9	17.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.1	7.4	11.2	1.9	12.7	14.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.2	5.5	8.0	1.8	8.9	9.8	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.0	4.7	6.8	1.6	7.6	8.4	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	2.0	3.8	5.3	1.9	5.7	6.3	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	2.2	3.8	5.3	2.0	5.7	6.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	2.1	3.8	5.5	1.8	5.9	6.6	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.1	3.8	5.5	1.9	5.9	6.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	2.2	3.8	5.5	1.9	6.0	6.6	ns
		DIR to B; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	5.7	12.7	21.0	5.2	22.3	24.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	4.7	8.7	12.7	4.1	14.1	15.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	3.9	7.4	10.9	3.3	12.3	13.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	3.0	5.6	7.8	2.6	8.8	9.7	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	3.3	5.5	7.4	2.9	8.1	8.9	ns
C_L = 5 pF; $V_{CC(A)}$ = 1.65 V to 1.95 V									
t_{pd}	propagation delay	A to B or B to A; see Figure 6 [2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	2.4	14.2	26.1	2.0	26.5	29.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	2.4	9.1	13.9	2.1	15.4	17.0	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	2.0	7.0	10.7	1.7	12.1	13.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.0	5.1	7.4	1.6	8.2	9.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	1.9	4.3	6.1	1.5	6.9	7.7	ns
t_{dis}	disable time	DIR to A; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	2.0	3.5	4.8	1.8	5.2	5.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	2.1	3.5	4.8	1.9	5.2	5.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	2.0	3.5	5.0	1.8	5.4	6.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.0	3.5	4.9	1.8	5.4	6.0	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	2.1	3.5	4.9	1.8	5.4	6.0	ns
		DIR to B; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	5.8	12.4	20.6	5.1	21.9	24.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	4.6	8.4	12.2	3.9	13.5	14.9	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	3.8	7.1	10.4	3.2	11.8	13.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.9	5.2	7.3	2.5	8.3	9.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	3.1	5.1	6.9	2.7	7.5	8.3	ns
C_L = 5 pF; $V_{CC(A)}$ = 2.3 V to 2.7 V									
t_{pd}	propagation delay	A to B or B to A; see Figure 6 [2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	2.4	13.6	25.5	2.0	25.9	28.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	2.3	8.5	13.3	2.1	14.7	16.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	1.9	6.5	10.0	1.7	11.4	12.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	1.9	4.6	6.7	1.6	7.5	8.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	1.8	3.8	5.3	1.4	6.2	6.8	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	1.4	2.5	3.3	1.3	3.6	4.0	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	1.6	2.5	3.3	1.4	3.6	4.0	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	1.5	2.5	3.4	1.3	3.8	4.2	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	1.4	2.5	3.4	1.3	3.8	4.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	1.6	2.5	3.4	1.3	3.7	4.1	ns
		DIR to B; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	5.8	12.3	20.4	5.1	21.8	24.0	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	4.5	8.3	11.9	4.0	13.2	14.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	3.7	7.0	10.0	3.2	11.3	12.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.8	5.0	6.8	2.5	7.8	8.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	3.1	4.9	6.4	2.7	7.0	7.8	ns
C_L = 5 pF; $V_{CC(A)}$ = 3.0 V to 3.6 V									
t_{pd}	propagation delay	A to B or B to A; see Figure 6 [2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	2.3	13.1	24.9	2.0	25.2	27.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	2.3	8.1	12.8	2.0	14.1	15.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	1.9	6.1	9.5	1.7	10.8	12.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	1.9	4.3	6.2	1.6	7.0	7.7	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	1.7	3.5	5.0	1.4	5.7	6.3	ns
t_{dis}	disable time	DIR to A; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	1.7	2.8	3.5	1.5	3.8	4.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	1.8	2.8	3.5	1.7	3.8	4.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	1.7	2.8	3.6	1.5	4.0	4.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	1.7	2.8	3.6	1.5	3.9	4.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	1.8	2.8	3.6	1.5	3.9	4.3	ns
		DIR to B; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	5.8	12.3	20.6	5.1	22.0	24.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	4.6	8.3	11.8	4.0	13.1	14.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	3.8	6.9	10.0	3.2	11.3	12.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.8	5.0	6.7	2.5	7.6	8.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	3.1	4.9	6.3	2.7	6.9	7.6	ns
C_L = 10 pF; $V_{CC(A)}$ = 1.1 V to 1.3 V									
t_{pd}	propagation delay	A to B or B to A; see Figure 6 [2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	3.0	16.2	29.8	2.7	30.2	33.3	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	3.0	10.8	17.5	2.7	18.6	20.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	3.1	8.7	13.5	2.8	14.6	16.1	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	2.7	6.8	10.5	2.4	11.2	12.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	2.7	6.1	9.6	2.4	10.1	11.1	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.2	6.5	9.9	3.1	10.2	11.3	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.5	6.5	10.0	3.2	10.2	11.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.7	6.5	9.8	3.5	10.1	11.1	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.2	6.5	10.1	3.1	10.2	11.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.6	6.5	10.1	3.2	10.3	11.4	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.4	14.3	23.5	5.8	24.8	27.4	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.3	10.2	15.4	4.6	16.6	18.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.2	9.2	13.6	4.7	14.7	16.2	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.6	7.1	10.1	3.2	11.0	12.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.4	7.6	10.8	3.8	11.4	12.5	ns
C_L = 10 pF; $V_{CC(A)}$ = 1.4 V to 1.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.7	15.3	28.3	2.4	29.0	31.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.7	10.0	15.8	2.5	17.0	18.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.8	7.9	11.8	2.5	13.0	14.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.4	6.0	8.6	2.2	9.4	10.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.4	5.2	7.4	2.1	8.0	8.9	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.5	4.7	6.4	2.3	6.8	7.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.7	4.7	6.5	2.4	6.9	7.6	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.9	4.7	6.5	2.6	6.9	7.6	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.5	4.7	6.5	2.3	6.9	7.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.8	4.7	6.6	2.4	6.9	7.7	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.1	13.7	22.4	5.6	23.8	26.3	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.0	9.6	14.2	4.3	15.5	17.1	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.9	8.5	12.3	4.4	13.4	14.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.3	6.4	8.7	3.0	9.6	10.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.1	6.7	9.1	3.5	9.7	10.8	ns
C_L = 10 pF; $V_{CC(A)}$ = 1.65 V to 1.95 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.6	15.0	27.8	2.3	28.3	31.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.6	9.7	15.2	2.3	16.5	18.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.7	7.5	11.2	2.3	12.4	13.7	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.3	5.6	7.9	2.0	8.8	9.7	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.3	4.8	6.7	1.9	7.4	8.2	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.5	4.6	6.2	2.4	6.6	7.3	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.7	4.6	6.3	2.5	6.7	7.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.9	4.6	6.3	2.7	6.7	7.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.5	4.6	6.2	2.4	6.7	7.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.8	4.6	6.3	2.5	6.7	7.4	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.1	13.5	22.1	5.4	23.4	25.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.0	9.3	13.6	4.2	14.9	16.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.8	8.3	11.8	4.2	13.0	14.3	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.2	6.0	8.1	2.8	9.1	10.0	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.9	6.4	8.5	3.3	9.2	10.2	ns
C_L = 10 pF; $V_{CC(A)}$ = 2.3 V to 2.7 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.5	14.4	27.2	2.3	27.8	30.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.5	9.1	14.6	2.3	15.8	17.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.6	7.0	10.5	2.2	11.7	12.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.2	5.1	7.2	1.9	8.0	8.9	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.2	4.3	5.9	1.9	6.6	7.3	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		1.8	3.3	4.2	1.7	4.6	5.1	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.0	3.3	4.4	1.8	4.7	5.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.1	3.3	4.4	2.0	4.7	5.2	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		1.8	3.3	4.3	1.7	4.7	5.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.1	3.3	4.4	1.8	4.7	5.2	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.1	13.4	21.8	5.4	23.2	25.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.9	9.2	13.3	4.2	14.6	16.1	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.8	8.1	11.4	4.2	12.5	13.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.1	5.8	7.7	2.8	8.6	9.5	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.9	6.2	8.0	3.3	8.7	9.6	ns
C_L = 10 pF; $V_{CC(A)}$ = 3.0 V to 3.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.5	14.0	26.6	2.2	27.0	29.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.5	8.7	14.0	2.3	15.1	16.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.5	6.6	10.1	2.2	11.2	12.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.2	4.8	6.8	1.9	7.5	8.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.1	4.0	5.5	1.9	6.1	6.8	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.3	4.0	5.0	2.2	5.3	5.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.5	4.0	5.2	2.3	5.4	6.0	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.6	4.0	5.2	2.5	5.4	6.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.3	4.0	5.1	2.2	5.4	6.0	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.6	4.0	5.2	2.3	5.4	6.0	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.2	13.5	22.0	5.5	23.4	25.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.9	9.2	13.2	4.2	14.6	16.1	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.8	8.1	11.3	4.3	12.4	13.7	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.1	5.8	7.6	2.8	8.5	9.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.9	6.2	7.9	3.3	8.5	9.5	ns
C_L = 15 pF; $V_{CC(A)}$ = 1.1 V to 1.3 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.4	16.9	31.6	3.0	32.0	35.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.7	11.3	18.2	3.1	19.5	21.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.2	9.1	14.3	3.0	15.6	17.2	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.2	7.3	11.2	2.8	12.0	13.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.1	6.5	10.2	2.6	10.7	11.8	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.9	7.6	11.4	3.8	11.7	12.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.5	7.6	11.3	4.1	11.7	12.9	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.2	7.6	11.3	4.1	11.7	12.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.9	7.6	11.7	3.8	11.9	13.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.5	7.6	11.7	4.1	11.9	13.1	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		7.2	15.4	24.9	6.5	26.3	29.0	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		6.3	11.1	16.3	5.4	17.7	19.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.7	10.4	15.0	5.2	16.2	17.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.1	7.9	11.4	3.8	12.1	13.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		5.3	8.8	12.2	4.9	12.7	14.1	ns
C_L = 15 pF; $V_{CC(A)}$ = 1.4 V to 1.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.1	16.1	30.1	2.8	30.7	33.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.4	10.5	16.5	2.8	17.9	19.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.0	8.4	12.6	2.7	13.9	15.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.9	6.4	9.3	2.5	10.1	11.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.8	5.6	8.0	2.3	8.7	9.6	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.1	5.6	7.6	2.9	8.0	8.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.5	5.6	7.5	3.1	8.0	8.8	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.3	5.6	7.6	3.1	8.0	8.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.1	5.6	7.7	2.9	8.1	9.0	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.5	5.6	7.8	3.1	8.1	9.0	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.9	14.9	23.8	6.4	25.3	27.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		6.0	10.5	15.1	5.2	16.6	18.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.4	9.7	13.7	5.0	15.0	16.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.8	7.2	9.9	3.5	10.7	11.9	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		5.0	8.0	10.5	4.6	11.1	12.3	ns
C_L = 15 pF; $V_{CC(A)}$ = 1.65 V to 1.95 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.0	15.8	29.6	2.6	30.1	33.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.2	10.2	15.9	2.6	17.4	19.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.8	8.0	12.0	2.5	13.4	14.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.8	6.0	8.6	2.3	9.5	10.5	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.6	5.2	7.3	2.2	8.0	8.9	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.2	5.8	7.6	3.1	8.0	8.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.7	5.8	7.6	3.3	8.1	8.9	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.5	5.8	7.7	3.3	8.1	9.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.2	5.8	7.8	3.1	8.2	9.0	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.7	5.8	7.8	3.4	8.1	9.0	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.9	14.7	23.4	6.2	24.9	27.4	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.9	10.2	14.6	5.0	16.0	17.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.3	9.4	13.2	4.8	14.5	16.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.7	6.8	9.4	3.4	10.2	11.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.9	7.6	9.9	4.4	10.6	11.7	ns
C_L = 15 pF; $V_{CC(A)}$ = 2.3 V to 2.7 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.0	15.2	29.0	2.6	29.5	32.5	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.1	9.6	15.3	2.6	16.7	18.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.7	7.5	11.3	2.5	12.6	13.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.7	5.5	7.9	2.3	8.7	9.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.5	4.7	6.5	2.1	7.2	8.0	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.4	4.1	5.2	2.2	5.6	6.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		2.7	4.1	5.3	2.4	5.7	6.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.5	4.1	5.4	2.4	5.7	6.3	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.4	4.1	5.4	2.2	5.7	6.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.7	4.1	5.3	2.4	5.6	6.2	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.9	14.6	23.2	6.2	24.7	27.2	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.9	10.1	14.2	5.0	15.6	17.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.3	9.2	12.8	4.8	14.0	15.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.7	6.7	8.9	3.4	9.8	10.8	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.8	7.4	9.4	4.4	10.1	11.2	ns
C_L = 15 pF; $V_{CC(A)}$ = 3.0 V to 3.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		2.9	14.7	28.3	2.6	28.8	31.7	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.1	9.2	14.7	2.6	16.0	17.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		2.7	7.1	10.9	2.4	12.1	13.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		2.7	5.2	7.4	2.2	8.2	9.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		2.5	4.5	6.1	2.1	6.8	7.5	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.1	5.3	6.5	3.0	6.9	7.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.5	5.3	6.6	3.2	7.0	7.7	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.3	5.3	6.7	3.2	7.0	7.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.1	5.3	6.8	3.0	7.1	7.8	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.5	5.3	6.6	3.2	6.9	7.6	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		6.9	14.6	23.4	6.3	24.9	27.4	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.9	10.1	14.2	5.0	15.6	17.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.3	9.2	12.7	4.8	13.9	15.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.7	6.6	8.8	3.4	9.6	10.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.8	7.4	9.3	4.4	10.0	11.0	ns
C_L = 30 pF; $V_{CC(A)}$ = 1.1 V to 1.3 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		4.2	19.1	36.0	3.8	36.8	40.5	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.5	12.8	20.6	4.0	22.0	24.2	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.2	10.4	16.2	3.8	17.4	19.2	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.0	8.3	12.4	3.5	13.2	14.5	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.0	7.5	11.5	3.7	12.5	13.8	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		5.6	11.0	15.7	5.5	16.2	17.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		6.1	11.0	15.6	6.0	15.9	17.5	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		6.6	11.0	15.5	6.5	15.8	17.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		5.6	11.0	15.6	5.5	15.8	17.5	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		7.0	11.0	15.9	6.6	16.7	18.4	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		8.7	18.9	29.0	8.1	30.5	33.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		7.3	13.8	19.3	6.8	20.7	22.8	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		8.1	13.7	19.2	7.7	20.3	22.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		5.2	10.3	14.0	4.9	14.7	16.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		8.1	12.5	16.5	7.5	18.0	19.9	ns
C_L = 30 pF; $V_{CC(A)}$ = 1.4 V to 1.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		4.0	18.2	34.5	3.5	35.5	39.1	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.2	12.0	18.9	3.7	20.3	22.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.9	9.6	14.4	3.5	15.8	17.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.8	7.5	10.4	3.2	11.4	12.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.7	6.7	9.3	3.4	10.4	11.4	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		4.4	8.3	10.8	4.3	11.4	12.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.8	8.3	10.7	4.6	11.2	12.3	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.2	8.3	10.8	5.0	11.2	12.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.4	8.3	10.8	4.3	11.1	12.3	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		5.5	8.3	11.0	5.1	11.8	13.0	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		8.4	18.3	27.9	7.9	29.5	32.5	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		7.1	13.2	18.2	6.6	19.6	21.6	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		7.8	13.1	17.9	7.4	19.1	21.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.9	9.6	12.6	4.6	13.4	14.8	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		7.7	11.7	14.8	7.2	16.3	18.0	ns
C_L = 30 pF; $V_{CC(A)}$ = 1.65 V to 1.95 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.9	18.0	34.0	3.4	34.9	38.4	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.1	11.7	18.3	3.5	19.8	21.9	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.8	9.2	13.9	3.4	15.2	16.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.6	7.1	9.8	3.1	10.8	11.9	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.5	6.3	8.6	3.2	9.7	10.7	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		5.0	9.2	11.7	4.8	12.3	13.6	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		5.4	9.2	11.7	5.3	12.1	13.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		5.8	9.1	11.9	5.7	12.3	13.6	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		5.0	9.1	11.7	4.8	12.1	13.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		6.2	9.2	11.9	5.8	12.7	14.1	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		8.4	18.1	27.6	7.8	29.1	32.0	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		7.0	12.9	17.7	6.4	19.1	21.0	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		7.7	12.8	17.4	7.2	18.6	20.6	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.8	9.3	12.0	4.5	12.9	14.2	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		7.6	11.3	14.2	7.0	15.8	17.4	ns
C_L = 30 pF; $V_{CC(A)}$ = 2.3 V to 2.7 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.8	17.4	33.4	3.4	34.3	37.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		4.0	11.1	17.7	3.5	19.1	21.1	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.7	8.7	13.2	3.3	14.4	15.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.4	6.5	9.1	3.0	10.0	11.1	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.5	5.7	7.8	3.1	8.9	9.8	ns
t_{dis}	disable time	DIR to A; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.6	6.5	8.1	3.5	8.5	9.4	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.9	6.5	8.1	3.8	8.5	9.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		4.2	6.5	8.3	4.1	8.6	9.5	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.6	6.5	8.2	3.5	8.5	9.4	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		4.5	6.5	8.2	4.2	8.9	9.8	ns
		DIR to B; see Figure 7	[3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		8.4	18.0	27.4	7.8	28.8	31.8	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		7.0	12.8	17.3	6.4	18.7	20.6	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		7.7	12.6	17.0	7.2	18.2	20.0	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		4.8	9.1	11.6	4.5	12.4	13.7	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		7.6	11.1	13.7	7.0	15.3	16.9	ns
C_L = 30 pF; $V_{CC(A)}$ = 3.0 V to 3.6 V										
t_{pd}	propagation delay	A to B or B to A; see Figure 6	[2]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V		3.8	16.9	32.8	3.3	33.5	36.9	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V		3.9	10.7	17.1	3.5	18.5	20.4	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V		3.7	8.3	12.7	3.3	13.9	15.4	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V		3.2	6.3	8.6	2.9	9.5	10.5	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V		3.4	5.5	7.4	3.1	8.4	9.3	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions	25 °C			–40 °C to +125 °C			Unit
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{dis}	disable time	DIR to A; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	5.0	9.0	11.0	4.9	11.5	12.7	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	5.4	9.0	11.1	5.3	11.4	12.6	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	5.9	9.0	11.3	5.7	11.6	12.8	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	5.0	9.0	11.2	4.9	11.4	12.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	6.2	9.0	11.2	5.9	11.9	13.2	ns
		DIR to B; see Figure 7 [3]							
		$V_{CC(B)}$ = 1.1 V to 1.3 V	8.4	18.1	27.6	7.8	29.1	32.0	ns
		$V_{CC(B)}$ = 1.4 V to 1.6 V	7.0	12.8	17.3	6.4	18.6	20.6	ns
		$V_{CC(B)}$ = 1.65 V to 1.95 V	7.7	12.6	17.0	7.2	18.1	19.9	ns
		$V_{CC(B)}$ = 2.3 V to 2.7 V	4.8	9.0	11.5	4.5	12.3	13.6	ns
		$V_{CC(B)}$ = 3.0 V to 3.6 V	7.6	11.1	13.6	7.0	15.1	16.7	ns

Table 8. Dynamic characteristics *...continued*

Voltages are referenced to GND (ground = 0 V); for test circuit see Figure 8.

Symbol	Parameter	Conditions		25 °C			–40 °C to +125 °C			Unit
				Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
C_L = 5 pF, 10 pF, 15 pF and 30 pF										
C_{PD}	power dissipation capacitance	A port; (direction A to B)	[4][5]							
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.2 V		-	0.6	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.5 V		-	0.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.8 V		-	0.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 2.5 V		-	0.9	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V		-	1.1	-	-	-	-	pF
		A port; (direction B to A)	[4][5]							
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.2 V		-	3.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.5 V		-	3.8	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.8 V		-	4.0	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 2.5 V		-	4.6	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V		-	5.2	-	-	-	-	pF
		B port; (direction A to B)	[4][5]							
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.2 V		-	3.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.5 V		-	3.8	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.8 V		-	4.0	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 2.5 V		-	4.6	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V		-	5.2	-	-	-	-	pF
		B port; (direction B to A)	[4][5]							
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.2 V		-	0.6	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.5 V		-	0.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 1.8 V		-	0.7	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 2.5 V		-	0.9	-	-	-	-	pF
		$V_{CC(A)}$ = $V_{CC(B)}$ = 3.3 V		-	1.1	-	-	-	-	pF

[1] All typical values are measured at nominal $V_{CC(A)}$ and $V_{CC(B)}$.

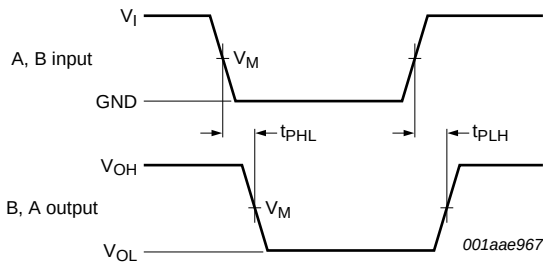
[2] t_{pd} is the same as t_{PLH} and t_{PHL}.

[3] t_{dis} is the same as t_{PLZ} and t_{PHZ}.

[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 = load capacitance in pF;
V_{CC} = supply voltage in V;
N = number of inputs switching;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

[5] f_i = 1 MHz; V_I = GND to V_{CC}

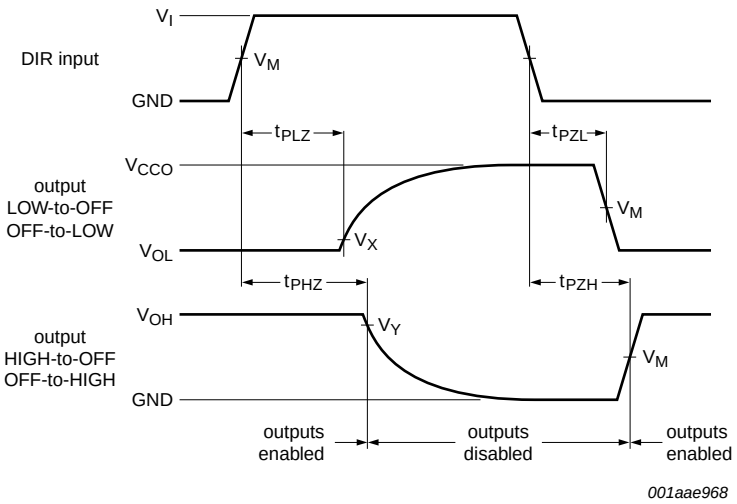
12. Waveforms



Measurement points are given in Table 9.

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

Fig 6. The data input (A, B) to output (B, A) propagation delay times



Measurement points are given in Table 9.

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

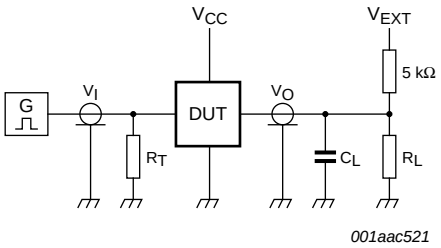
Fig 7. Enable and disable times

Table 9. Measurement points

Supply voltage	Input[1]	Output[2]		
$V_{CC(A)}$, $V_{CC(B)}$	V_M	V_M	V_X	V_Y
1.1 V to 1.6 V	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	V_{OL} + 0.1 V	V_{OH} − 0.1 V
1.65 V to 2.7 V	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	V_{OL} + 0.15 V	V_{OH} − 0.15 V
3.0 V to 3.6 V	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	V_{OL} + 0.3 V	V_{OH} − 0.3 V

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] V_{CCO} is the supply voltage associated with the output port.



Test data is given in Table 10.

R_L = Load resistance.

C_L = Load capacitance including jig and probe capacitance.

R_T = Termination resistance.

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

Fig 8. Test circuit for measuring switching times

Table 10. Test data

Supply voltage	Input		Load		V_{EXT}		
$V_{CC(A)}$, $V_{CC(B)}$	V_I[1]	$t_r = t_f$	C_L	R_L[2]	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}[3]
1.1 V to 3.6 V	V_{CCI}	≤ 3.0 ns	5 pF, 10 pF, 15 pF and 30 pF	5 kΩ or 1 MΩ	open	GND	2 × V_{CCO}

[1] V_{CCI} is the supply voltage associated with the data input port.

[2] 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.

[3] V_{CCO} is the supply voltage associated with the output port.

13. Application information

13.1 Unidirectional logic level-shifting application

The circuit given in Figure 9 is an example of the 74AUP1T45 being used in an unidirectional logic level-shifting application.

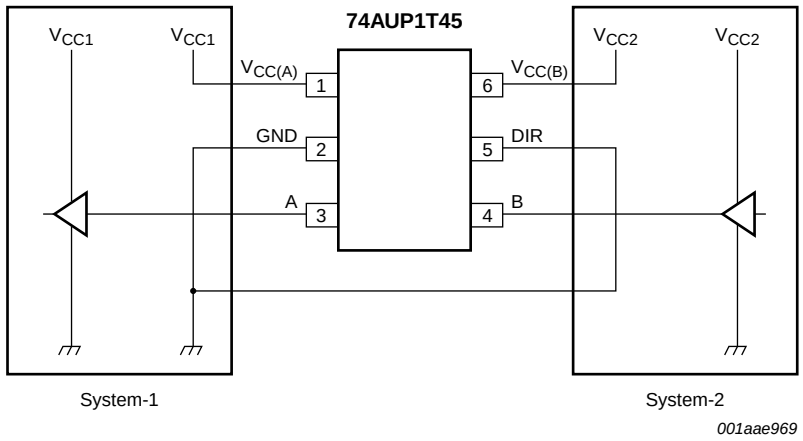


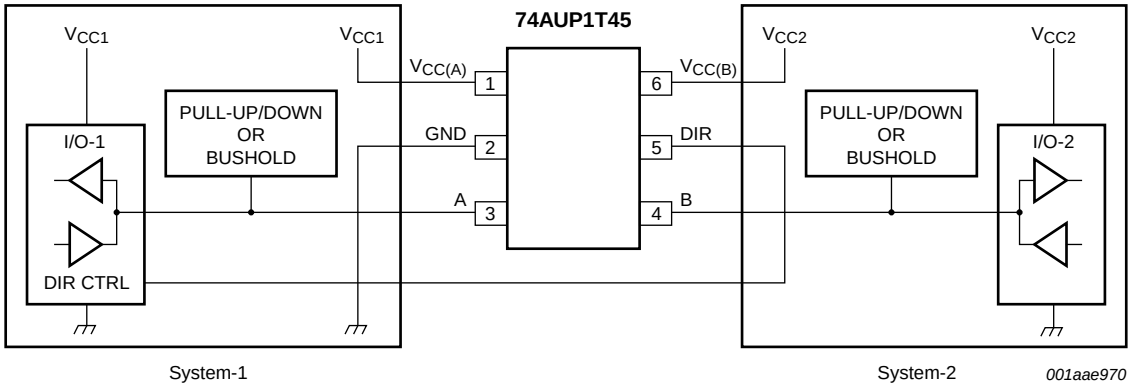
Fig 9. Unidirectional logic level-shifting application

Table 11. Description unidirectional logic level-shifting application

Pin	Name	Function	Description
1	$V_{CC(A)}$	V_{CC1}	supply voltage of system-1 (1.1 V to 3.6 V)
2	GND	GND	device ground (0 V)
3	A	OUT	output level depends on V_{CC1} voltage
4	B	IN	input threshold value depends on V_{CC2} voltage
5	DIR	DIR	the GND (LOW level) determines B port to A port direction
6	$V_{CC(B)}$	V_{CC2}	supply voltage of system-2 (1.1 V to 3.6 V)

13.2 Bidirectional logic level-shifting application

Figure 10 shows the 74AUP1T45 being used in a bidirectional logic level-shifting application. Since the device does not have an output enable (OE) pin, the system designer should take precautions to avoid bus contention between system-1 and system-2 when changing directions.



System-1 and system-2 must use the same conditions, i.e., both pull-up or both pull-down.

Fig 10. Bidirectional logic level-shifting application

Table 12 gives a sequence that will illustrate data transmission from system-1 to system-2 and then from system-2 to system-1.

Table 12. Description bidirectional logic level-shifting application[1][2]

State	DIR CTRL	I/O-1	I/O-2	Description
1	H	output	input	system-1 data to system-2
2	H	Z	Z	system-2 is getting ready to send data to system-1. I/O-1 and I/O-2 are disabled. The bus-line state depends on the pull-up or pull-down.
3	L	Z	Z	DIR bit is flipped. I/O-1 and I/O-2 still are disabled. The bus-line state depends on the pull-up or pull-down.
4	L	input	output	system-2 data to system-1

[1] System-1 and system-2 must use the same conditions, i.e., both pull-up or both pull-down.

[2] H = HIGH voltage level;
L = LOW voltage level;
Z = high-impedance OFF-state.

13.3 Power-up considerations

A proper power-up sequence always should be followed to avoid excessive supply current, bus contention, oscillations, or other anomalies. Take the following precautions to guard against such power-up problems:

- Connect ground before any supply voltage is applied.
- Power-up $V_{CC(A)}$.
- $V_{CC(B)}$ can be ramped up along with or after $V_{CC(A)}$.

13.4 Enable times

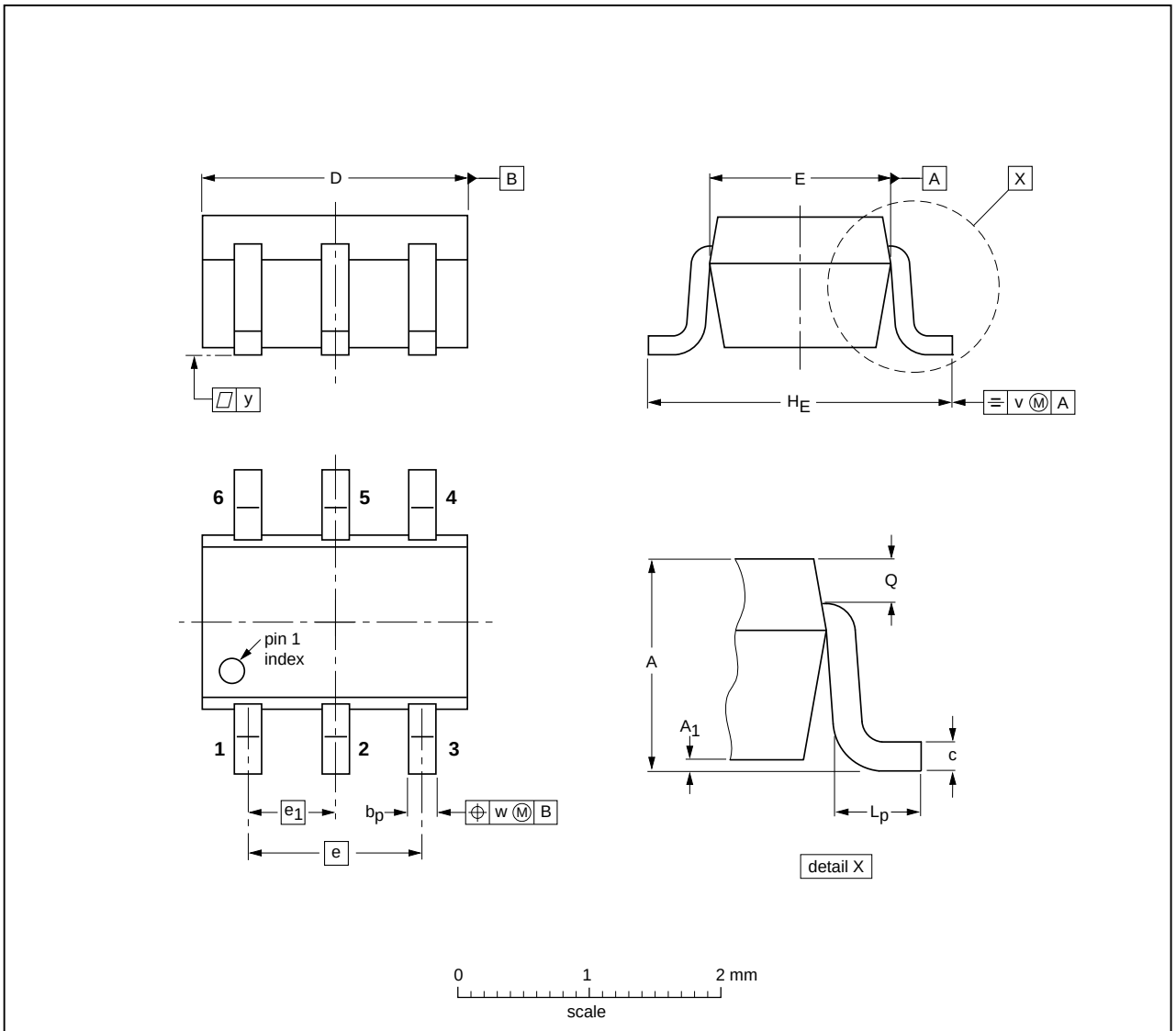
Calculate the enable times for the 74AUP1T45 using the following formulas:

- t_{PZH} (DIR to A) = t_{PLZ} (DIR to B) + t_{PLH} (B to A)
- t_{PZL} (DIR to A) = t_{PHZ} (DIR to B) + t_{PHL} (B to A)
- t_{PZH} (DIR to B) = t_{PLZ} (DIR to A) + t_{PLH} (A to B)
- t_{PZL} (DIR to B) = t_{PHZ} (DIR to A) + t_{PHL} (A to B)

In a bidirectional application, these enable times provide the maximum delay from the time the DIR bit is switched until an output is expected. For example, if the 74AUP1T45 initially is transmitting from A to B, then the DIR bit is switched, the B port of the device must be disabled before presenting it with an input. After the B port has been disabled, an input signal applied to it appears on the corresponding A port after the specified propagation delay.

14. Package outline

Plastic surface-mounted package; 6 leads **SOT363**



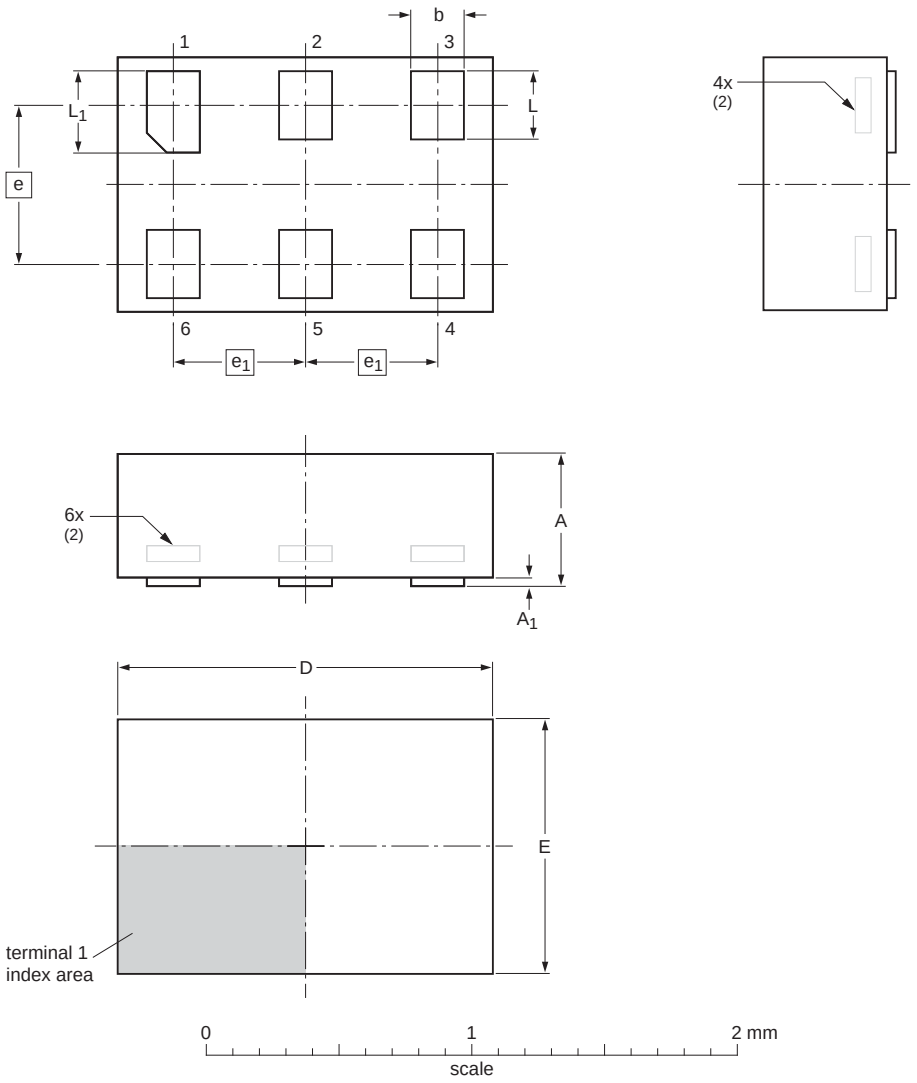
DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT363			SC-88			~~04-11-08~~ 06-03-16

Fig 11. 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



Dimensions (mm are the original dimensions)

Unit		A(1)	A_1	b	D	E	e	e_1	L	L_1
	max	0.5	0.04	0.25	1.50	1.05			0.35	0.40
mm	nom			0.20	1.45	1.00	0.6	0.5	0.30	0.35
	min			0.17	1.40	0.95			0.27	0.32

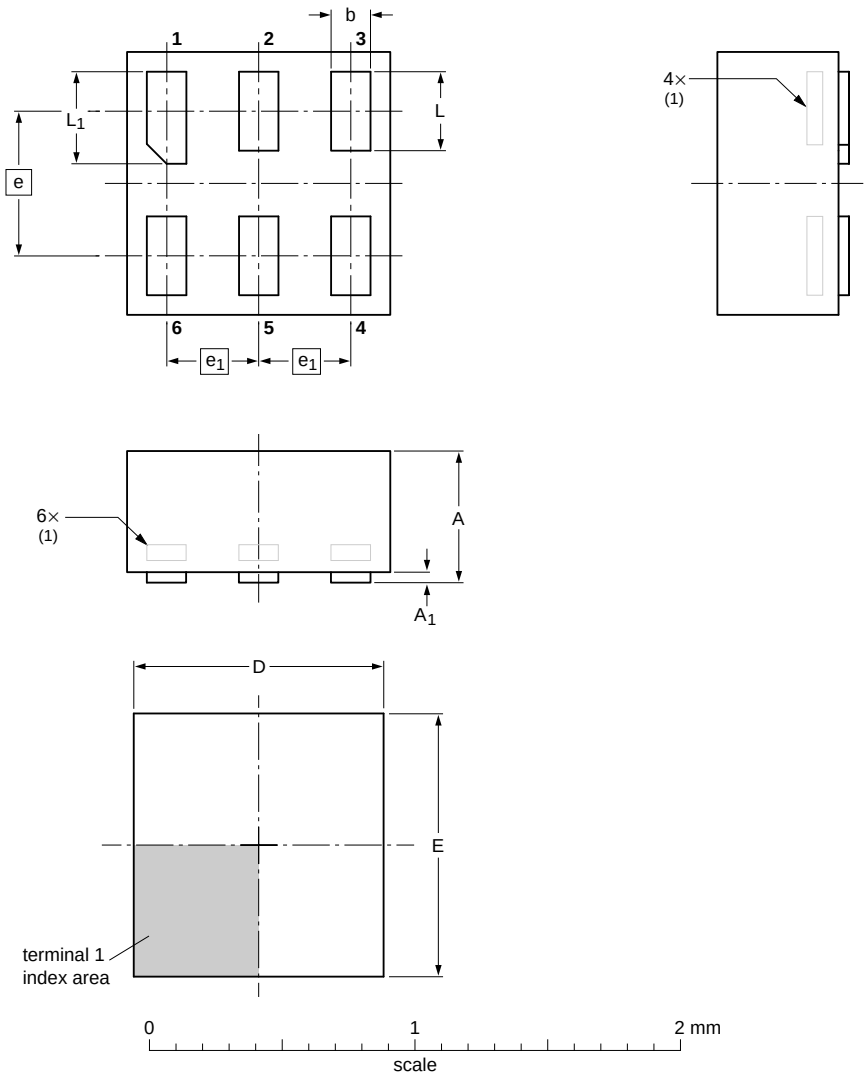
Notes
1. Including plating thickness.
2. Can be visible in some manufacturing processes.

sot886_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT886		MO-252				~~04-07-22~~ 12-01-05

Fig 12. Package outline SOT886 (XSON6)

XSON6: plastic extremely thin small outline package; no leads; 6 terminals; body 1 x 1 x 0.5 mm **SOT891**



DIMENSIONS (mm are the original dimensions)

UNIT	A max	A_1 max	b	D	E	e	e_1	L	L_1
mm	0.5	0.04	0.20 0.12	1.05 0.95	1.05 0.95	0.55	0.35	0.35 0.27	0.40 0.32

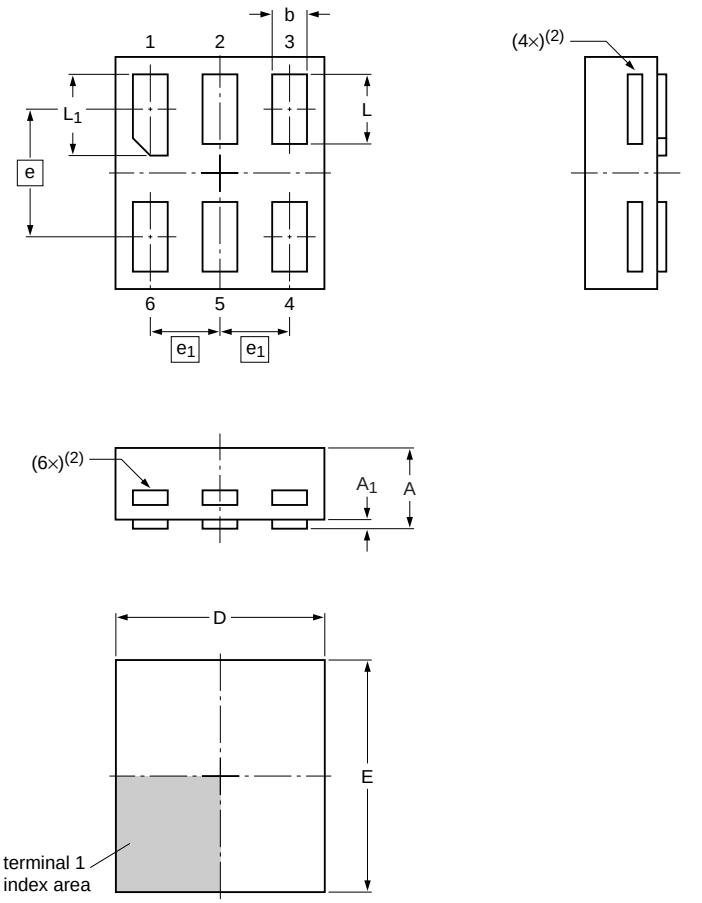
Note

1. Can be visible in some manufacturing processes.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT891						~~05-04-06~~ 07-05-15

Fig 13. 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**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	0.95	1.05			0.35	0.40
	nom			0.15	0.90	1.00	0.55	0.3	0.30	0.35
	min			0.12	0.85	0.95			0.27	0.32

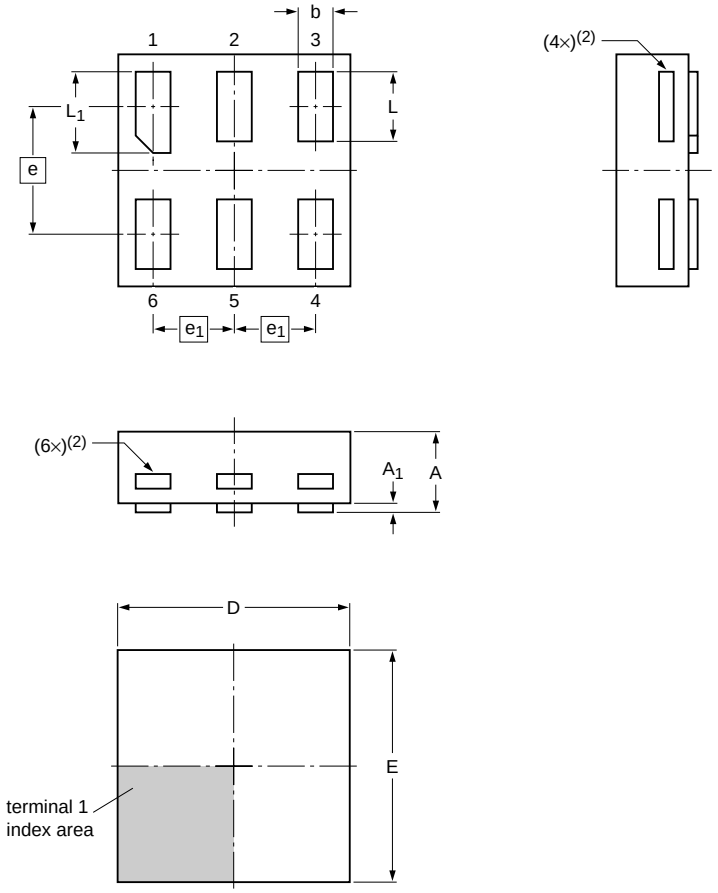
Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1115_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1115						~~10-04-02~~ 10-04-07

Fig 14. 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**



Dimensions

Unit		$A^{(1)}$	A_1	b	D	E	e	e_1	L	L_1
mm	max	0.35	0.04	0.20	1.05	1.05			0.35	0.40
	nom			0.15	1.00	1.00	0.55	0.35	0.30	0.35
	min			0.12	0.95	0.95			0.27	0.32

Note
1. Including plating thickness.
2. Visible depending upon used manufacturing technology.

sot1202_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1202						~~10-04-02~~ 10-04-06

Fig 15. Package outline SOT1202 (XSON6)

15. Abbreviations

Table 13. Abbreviations

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

16. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1T45 v.5	20120809	Product data sheet	-	74AUP1T45 v.4
Modifications:	• Package outline drawing of SOT886 (Figure 12) modified.			
74AUP1T45 v.4	20111128	Product data sheet	-	74AUP1T45 v.3
Modifications:	• Legal pages updated.			
74AUP1T45 v.3	20101104	Product data sheet	-	74AUP1T45 v.2
74AUP1T45 v.2	20090803	Product data sheet	-	74AUP1T45 v.1
74AUP1T45 v.1	20061018	Product data sheet	-	-

17. Legal information

17.1 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.nexperia.com.

17.2 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. Nexperia 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 Nexperia 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 Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

17.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia 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. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia 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, Nexperia's 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 Nexperia.

Right to make changes — Nexperia 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 — Nexperia products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of a Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia 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. Nexperia 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 Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia 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.

Nexperia 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 Nexperia 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). Nexperia 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 — Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nexperia.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. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia 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.

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

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

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without Nexperia's warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond Nexperia's specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies Nexperia for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond Nexperia's standard warranty and Nexperia's product specifications.

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

17.4 Trademarks

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

18. Contact information

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

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

19. Contents

For more information, please visit: http://www.nexperia.com
For sales office addresses, please send an email to: salesaddresses@nexperia.com
Date of release: 09 August 2012

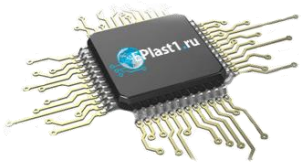
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.