74AUP1G125-Q100

Low-power buffer/line driver; 3-state

Rev. 1 — 20 March 2013 Product data sheet

1. General description

The 74AUP1G125-Q100 provides a single non-inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input ($\overline{OE}$). A HIGH level at pin $\overline{OE}$ causes the output to assume a high-impedance OFF-state. This device has the input-disable feature, which allows floating input signals. The inputs are disabled when the output enable input $\overline{OE}$) is HIGH.

Schmitt-trigger action at all inputs makes the circuit tolerant to slower input rise and fall times across the entire V_{CC} range from 0.8 V to 3.6 V. This device ensures a very low static and dynamic power consumption across the entire V_{CC} range from 0.8 V to 3.6 V.

This device is fully specified for partial power-down applications using I_{OFF}. The I_{OFF} circuitry disables the output, preventing a 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 from −40 °C to +125 °C
- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- ESD protection:
  - MIL-STD-883, method 3015 Class 3A. Exceeds 5000 V
  - HBM JESD22-A114F Class 3A. Exceeds 5000 V
  - MM JESD22-A115-A exceeds 200 V (C = 200 pF, R = 0 Ω)
- Low static power consumption; I_{CC} = 0.9 μA (maximum)
- Latch-up performance exceeds 100 mA per JESD 78 Class II
- Inputs accept voltages up to 3.6 V
- Low noise overshoot and undershoot < 10 % of V_{CC}
- Input-disable feature allows floating input conditions
- I_{OFF} circuitry provides partial Power-down mode operation

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74AUP1G125GW-Q100	−40 °C to +125 °C	TSSOP5	plastic thin shrink small outline package; 5 leads; body width 1.25 mm	SOT353-1

4. Marking

Table 2. Marking

Type number	Marking code[1]
74AUP1G125GW-Q100	pM

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

5. Functional diagram

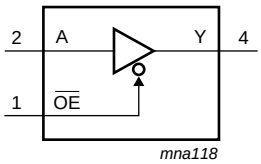


Fig 1. Logic symbol

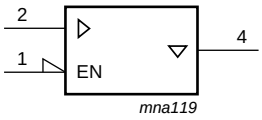


Fig 2. IEC logic symbol

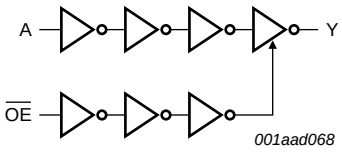


Fig 3. Logic diagram

6. Pinning information

6.1 Pinning

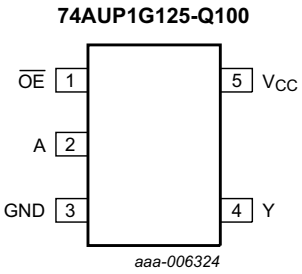


Fig 4. Pin configuration SOT353-1

6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
$\overline{OE}$	1	output enable input
A	2	data input
GND	3	ground (0 V)
Y	4	data output
V_{CC}	5	supply voltage

7. Functional description

Table 4. Function table[1]

Input		Output
$\overline{OE}$	A	Y
L	L	L
L	H	H
H	X	Z

[1] H = HIGH voltage level;
L = LOW voltage level;
X = Don't care;
Z = high-impedance OFF-state.

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CC}	supply voltage			−0.5	+4.6	V
I_{IK}	input clamping current	$V_I < 0$ V		−50	-	mA
V_I	input voltage		[1]	−0.5	+4.6	V
I_{OK}	output clamping current	$V_O < 0$ V		−50	-	mA
V_O	output voltage	Active mode	[1]	−0.5	V_{CC} + 0.5	V
		Power-down mode	[1]	−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	[2]	-	250	mW

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

[2] For TSSOP5 package: above 87.5 °C the value of P_{tot} derates linearly with 4.0 mW/K.

9. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		0.8	3.6	V
V_I	input voltage		0	3.6	V
V_O	output voltage	Active mode	0	V_{CC}	V
		Power-down mode; V_{CC} = 0 V	0	3.6	V
T_{amb}	ambient temperature		−40	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	V_{CC} = 0.8 V to 3.6 V	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} = 0.8 V	0.70 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V	0.65 × V_{CC}	-	-	V
		V_{CC} = 2.3 V to 2.7 V	1.6	-	-	V
		V_{CC} = 3.0 V to 3.6 V	2.0	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 0.8 V	-	-	0.30 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V	-	-	0.35 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V	-	-	0.7	V
		V_{CC} = 3.0 V to 3.6 V	-	-	0.9	V
V_{OH}	HIGH-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = −20 μA; V_{CC} = 0.8 V to 3.6 V	V_{CC} − 0.1	-	-	V
		I_O = −1.1 mA; V_{CC} = 1.1 V	0.75 × V_{CC}	-	-	V
		I_O = −1.7 mA; V_{CC} = 1.4 V	1.11	-	-	V
		I_O = −1.9 mA; V_{CC} = 1.65 V	1.32	-	-	V
		I_O = −2.3 mA; V_{CC} = 2.3 V	2.05	-	-	V
		I_O = −3.1 mA; V_{CC} = 2.3 V	1.9	-	-	V
		I_O = −2.7 mA; V_{CC} = 3.0 V	2.72	-	-	V
		I_O = −4.0 mA; V_{CC} = 3.0 V	2.6	-	-	V
V_{OL}	LOW-level output voltage	V_I = V_{IH} or V_{IL}				
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V	-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V	-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V	-	-	0.31	V
		I_O = 1.9 mA; V_{CC} = 1.65 V	-	-	0.31	V
		I_O = 2.3 mA; V_{CC} = 2.3 V	-	-	0.31	V
		I_O = 3.1 mA; V_{CC} = 2.3 V	-	-	0.44	V
		I_O = 2.7 mA; V_{CC} = 3.0 V	-	-	0.31	V
		I_O = 4.0 mA; V_{CC} = 3.0 V	-	-	0.44	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
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.1	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.1	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V		-	-	±0.2	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V		-	-	±0.2	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V		-	-	0.5	μA
ΔI_{CC}	additional supply current	data input; $V_I = V_{CC} - 0.6$ V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	40	μA
		$\overline{OE}$ input; $V_I = V_{CC} - 0.6$ V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	110	μA
		all inputs; V_I = GND to 3.6 V; $\overline{OE} = V_{CC}$; V_{CC} = 0.8 V to 3.6 V	[2]	-	-	1	μA
C_I	input capacitance	V_{CC} = 0 V to 3.6 V; V_I = GND or V_{CC}		-	0.9	-	pF
C_O	output capacitance						
	output enabled	V_O = GND; V_{CC} = 0 V		-	1.7	-	pF
	output disabled	V_{CC} = 0 V to 3.6 V; V_O = GND or V_{CC}		-	1.5	-	pF
T_{amb} = –40 °C to +85 °C							
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V		0.70 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V		0.65 × V_{CC}	-	-	V
		V_{CC} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CC} = 3.0 V to 3.6 V		2.0	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 0.8 V		-	-	0.30 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V		-	-	0.35 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CC} = 3.0 V to 3.6 V		-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}					
		I_O = –20 μA; V_{CC} = 0.8 V to 3.6 V		V_{CC} – 0.1	-	-	V
		I_O = –1.1 mA; V_{CC} = 1.1 V		0.7 × V_{CC}	-	-	V
		I_O = –1.7 mA; V_{CC} = 1.4 V		1.03	-	-	V
		I_O = –1.9 mA; V_{CC} = 1.65 V		1.30	-	-	V
		I_O = –2.3 mA; V_{CC} = 2.3 V		1.97	-	-	V
		I_O = –3.1 mA; V_{CC} = 2.3 V		1.85	-	-	V
		I_O = –2.7 mA; V_{CC} = 3.0 V		2.67	-	-	V
		I_O = –4.0 mA; V_{CC} = 3.0 V		2.55	-	-	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_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}					
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V		-	-	0.1	V
		I_O = 1.1 mA; V_{CC} = 1.1 V		-	-	0.3 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V		-	-	0.37	V
		I_O = 1.9 mA; V_{CC} = 1.65 V		-	-	0.35	V
		I_O = 2.3 mA; V_{CC} = 2.3 V		-	-	0.33	V
		I_O = 3.1 mA; V_{CC} = 2.3 V		-	-	0.45	V
		I_O = 2.7 mA; V_{CC} = 3.0 V		-	-	0.33	V
		I_O = 4.0 mA; V_{CC} = 3.0 V		-	-	0.45	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.5	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.5	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V		-	-	±0.5	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V		-	-	±0.6	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V		-	-	0.9	μA
ΔI_{CC}	additional supply current	data input; $V_I = V_{CC}$ − 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	50	μA
		$\overline{OE}$ input; $V_I = V_{CC}$ − 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	120	μA
		all inputs; V_I = GND to 3.6 V; $\overline{OE} = V_{CC}$; V_{CC} = 0.8 V to 3.6 V	[2]	-	-	1	μA
T_{amb} = −40 °C to +125 °C							
V_{IH}	HIGH-level input voltage	V_{CC} = 0.8 V		0.75 × V_{CC}	-	-	V
		V_{CC} = 0.9 V to 1.95 V		0.70 × V_{CC}	-	-	V
		V_{CC} = 2.3 V to 2.7 V		1.6	-	-	V
		V_{CC} = 3.0 V to 3.6 V		2.0	-	-	V
V_{IL}	LOW-level input voltage	V_{CC} = 0.8 V		-	-	0.25 × V_{CC}	V
		V_{CC} = 0.9 V to 1.95 V		-	-	0.30 × V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V		-	-	0.7	V
		V_{CC} = 3.0 V to 3.6 V		-	-	0.9	V
V_{OH}	HIGH-level output voltage	$V_I = V_{IH}$ or V_{IL}					
		I_O = −20 μA; V_{CC} = 0.8 V to 3.6 V		V_{CC} − 0.11	-	-	V
		I_O = −1.1 mA; V_{CC} = 1.1 V		0.6 × V_{CC}	-	-	V
		I_O = −1.7 mA; V_{CC} = 1.4 V		0.93	-	-	V
		I_O = −1.9 mA; V_{CC} = 1.65 V		1.17	-	-	V
		I_O = −2.3 mA; V_{CC} = 2.3 V		1.77	-	-	V
		I_O = −3.1 mA; V_{CC} = 2.3 V		1.67	-	-	V
		I_O = −2.7 mA; V_{CC} = 3.0 V		2.40	-	-	V
		I_O = −4.0 mA; V_{CC} = 3.0 V		2.30	-	-	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_{OL}	LOW-level output voltage	$V_I = V_{IH}$ or V_{IL}					
		I_O = 20 μA; V_{CC} = 0.8 V to 3.6 V		-	-	0.11	V
		I_O = 1.1 mA; V_{CC} = 1.1 V		-	-	0.33 × V_{CC}	V
		I_O = 1.7 mA; V_{CC} = 1.4 V		-	-	0.41	V
		I_O = 1.9 mA; V_{CC} = 1.65 V		-	-	0.39	V
		I_O = 2.3 mA; V_{CC} = 2.3 V		-	-	0.36	V
		I_O = 3.1 mA; V_{CC} = 2.3 V		-	-	0.50	V
		I_O = 2.7 mA; V_{CC} = 3.0 V		-	-	0.36	V
		I_O = 4.0 mA; V_{CC} = 3.0 V		-	-	0.50	V
I_I	input leakage current	V_I = GND to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.75	μA
I_{OZ}	OFF-state output current	$V_I = V_{IH}$ or V_{IL}; V_O = 0 V to 3.6 V; V_{CC} = 0 V to 3.6 V		-	-	±0.75	μA
I_{OFF}	power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V		-	-	±0.75	μA
ΔI_{OFF}	additional power-off leakage current	V_I or V_O = 0 V to 3.6 V; V_{CC} = 0 V to 0.2 V		-	-	±0.75	μA
I_{CC}	supply current	V_I = GND or V_{CC}; I_O = 0 A; V_{CC} = 0.8 V to 3.6 V		-	-	1.4	μA
ΔI_{CC}	additional supply current	data input; $V_I = V_{CC}$ − 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	75	μA
		$\overline{OE}$ input; $V_I = V_{CC}$ − 0.6 V; I_O = 0 A; V_{CC} = 3.3 V	[1]	-	-	180	μA
		all inputs; V_I = GND to 3.6 V; $\overline{OE} = V_{CC}$; V_{CC} = 0.8 V to 3.6 V	[2]	-	-	1	μA

[1] One input at V_{CC} − 0.6 V, other input at V_{CC} or GND.

[2] To show I_{CC} remains very low when the input-disable feature is enabled.

11. Dynamic characteristics

Table 8. Dynamic characteristics

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

Symbol	Parameter	Conditions		Min	Typ [1]	Max	Unit
T_{amb} = 25 °C; C_L = 5 pF							
t_{pd}	propagation delay	A to Y; see Figure 5	[2]				
		V_{CC} = 0.8 V		-	20.6	-	ns
		V_{CC} = 1.1 V to 1.3 V		2.8	5.5	10.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	3.9	6.1	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	3.2	4.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.6	2.6	3.6	ns
		V_{CC} = 3.0 V to 3.6 V		1.4	2.4	3.1	ns

Table 8. Dynamic characteristics *...continued*

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

Symbol	Parameter	Conditions		Min	Typ [1]	Max	Unit
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[3]				
		V_{CC} = 0.8 V		-	69.9	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.1	6.1	11.8	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	4.2	6.6	ns
		V_{CC} = 1.65 V to 1.95 V		2.1	3.4	5.1	ns
		V_{CC} = 2.3 V to 2.7 V		1.8	2.6	3.7	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	2.4	3.1	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[4]				
		V_{CC} = 0.8 V		-	14.3	-	ns
		V_{CC} = 1.1 V to 1.3 V		2.7	4.3	6.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.1	3.2	4.4	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	3.0	4.3	ns
		V_{CC} = 2.3 V to 2.7 V		1.4	2.2	2.9	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	2.5	3.2	ns
T_{amb} = 25 °C; C_L = 10 pF							
t_{pd}	propagation delay	A to Y; see Figure 5	[2]				
		V_{CC} = 0.8 V		-	24.0	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.2	6.4	12.3	ns
		V_{CC} = 1.4 V to 1.6 V		2.1	4.5	7.3	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	3.8	5.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.1	3.2	4.2	ns
		V_{CC} = 3.0 V to 3.6 V		1.8	3.0	3.8	ns
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[3]				
		V_{CC} = 0.8 V		-	73.7	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.6	6.9	13.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.3	4.8	7.7	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	3.9	5.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.8	3.2	4.3	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	3.0	3.9	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[4]				
		V_{CC} = 0.8 V		-	32.7	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.4	5.4	7.9	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	4.1	5.5	ns
		V_{CC} = 1.65 V to 1.95 V		2.2	4.2	5.6	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	3.0	3.8	ns
		V_{CC} = 3.0 V to 3.6 V		2.1	3.8	4.8	ns

Table 8. Dynamic characteristics *...continued*

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

Symbol	Parameter	Conditions		Min	Typ [1]	Max	Unit
T_{amb} = 25 °C; C_L = 15 pF							
t_{pd}	propagation delay	A to Y; see Figure 5	[2]				
		V_{CC} = 0.8 V		-	27.4	-	ns
		V_{CC} = 1.1 V to 1.3 V		3.6	7.2	14.1	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.1	8.1	ns
		V_{CC} = 1.65 V to 1.95 V		2.2	4.3	6.3	ns
		V_{CC} = 2.3 V to 2.7 V		2.0	3.7	4.9	ns
		V_{CC} = 3.0 V to 3.6 V		2.0	3.5	4.4	ns
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[3]				
		V_{CC} = 0.8 V		-	77.5	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.0	7.7	15.2	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.3	8.4	ns
		V_{CC} = 1.65 V to 1.95 V		2.3	4.4	6.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.1	3.6	5.0	ns
		V_{CC} = 3.0 V to 3.6 V		2.0	3.5	4.5	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[4]				
		V_{CC} = 0.8 V		-	60.8	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.3	6.5	9.2	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	5.0	6.5	ns
		V_{CC} = 1.65 V to 1.95 V		3.0	5.3	6.6	ns
		V_{CC} = 2.3 V to 2.7 V		2.1	3.8	4.9	ns
		V_{CC} = 3.0 V to 3.6 V		2.9	5.0	6.2	ns
T_{amb} = 25 °C; C_L = 30 pF							
t_{pd}	propagation delay	A to Y; see Figure 5	[2]				
		V_{CC} = 0.8 V		-	37.4	-	ns
		V_{CC} = 1.1 V to 1.3 V		4.8	9.5	19.0	ns
		V_{CC} = 1.4 V to 1.6 V		4.0	6.7	10.8	ns
		V_{CC} = 1.65 V to 1.95 V		2.9	5.6	8.4	ns
		V_{CC} = 2.3 V to 2.7 V		2.7	4.8	6.3	ns
		V_{CC} = 3.0 V to 3.6 V		2.7	4.6	5.8	ns
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[3]				
		V_{CC} = 0.8 V		-	88.9	-	ns
		V_{CC} = 1.1 V to 1.3 V		5.2	9.9	19.8	ns
		V_{CC} = 1.4 V to 1.6 V		4.0	6.8	10.8	ns
		V_{CC} = 1.65 V to 1.95 V		3.0	5.6	8.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.7	4.8	6.5	ns
		V_{CC} = 3.0 V to 3.6 V		2.7	4.6	6.0	ns

Table 8. Dynamic characteristics *...continued*

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

Symbol	Parameter	Conditions		Min	Typ [1]	Max	Unit
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[4]				
		V_{CC} = 0.8 V		-	49.9	-	ns
		V_{CC} = 1.1 V to 1.3 V		6.0	9.9	13.3	ns
		V_{CC} = 1.4 V to 1.6 V		4.4	7.7	9.6	ns
		V_{CC} = 1.65 V to 1.95 V		5.1	8.7	11.1	ns
		V_{CC} = 2.3 V to 2.7 V		3.6	6.2	7.4	ns
		V_{CC} = 3.0 V to 3.6 V		5.2	8.7	10.5	ns
T_{amb} = 25 °C							
C_{PD}	power dissipation capacitance	f = 1 MHz; V_I = GND to V_{CC}	[5]				
		output enabled					
		V_{CC} = 0.8 V		-	2.7	-	pF
		V_{CC} = 1.1 V to 1.3 V		-	2.8	-	pF
		V_{CC} = 1.4 V to 1.6 V		-	2.9	-	pF
		V_{CC} = 1.65 V to 1.95 V		-	3.0	-	pF
		V_{CC} = 2.3 V to 2.7 V		-	3.6	-	pF
		V_{CC} = 3.0 V to 3.6 V		-	4.2	-	pF

[1] All typical values are measured at nominal V_{CC}.

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

[3] t_{en} is the same as t_{PZH} and t_{PZL}.

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

[5] C_{PD} is used to determine the dynamic power dissipation (P_D in μW).
$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$ 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;
$\Sigma(C_L \times V_{CC}^2 \times f_o)$ = sum of the outputs.

Table 9. Dynamic characteristics

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

Symbol	Parameter	Conditions		–40 °C to +85 °C		–40 °C to +125 °C		Unit
				Min	Max	Min	Max	
C_L = 5 pF								
t_{pd}	propagation delay	A to Y; see Figure 5	[1]					
		V_{CC} = 1.1 V to 1.3 V		2.5	11.7	2.5	12.9	ns
		V_{CC} = 1.4 V to 1.6 V		2.0	7.3	2.0	8.1	ns
		V_{CC} = 1.65 V to 1.95 V		1.7	6.1	1.7	6.7	ns
		V_{CC} = 2.3 V to 2.7 V		1.4	4.3	1.4	4.9	ns
		V_{CC} = 3.0 V to 3.6 V		1.2	3.9	1.2	4.4	ns

Table 9. Dynamic characteristics *...continued*

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

Symbol	Parameter	Conditions		–40 °C to +85 °C		–40 °C to +125 °C		Unit
				Min	Max	Min	Max	
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[2]					
		V_{CC} = 1.1 V to 1.3 V		2.9	13.9	2.9	15.4	ns
		V_{CC} = 1.4 V to 1.6 V		2.3	7.7	2.3	8.3	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	6.2	2.0	6.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	4.5	1.7	5.0	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	3.5	1.7	3.9	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[3]					
		V_{CC} = 1.1 V to 1.3 V		2.7	7.3	2.7	8.2	ns
		V_{CC} = 1.4 V to 1.6 V		2.1	5.1	2.1	5.7	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	5.0	2.0	5.7	ns
		V_{CC} = 2.3 V to 2.7 V		1.4	3.3	1.4	4.1	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	3.4	1.7	3.9	ns
C_L = 10 pF								
t_{pd}	propagation delay	A to Y; see Figure 5	[1]					
		V_{CC} = 1.1 V to 1.3 V		3.0	13.8	3.0	15.2	ns
		V_{CC} = 1.4 V to 1.6 V		1.9	8.5	1.9	9.4	ns
		V_{CC} = 1.65 V to 1.95 V		1.7	6.8	1.7	7.6	ns
		V_{CC} = 2.3 V to 2.7 V		1.6	5.3	1.6	5.9	ns
		V_{CC} = 3.0 V to 3.6 V		1.6	4.6	1.6	5.2	ns
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[2]					
		V_{CC} = 1.1 V to 1.3 V		3.4	15.8	3.4	17.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	8.6	2.2	9.4	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	6.8	1.9	7.4	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	5.3	1.7	5.9	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	4.3	1.7	4.8	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[3]					
		V_{CC} = 1.1 V to 1.3 V		3.4	8.8	3.4	9.9	ns
		V_{CC} = 1.4 V to 1.6 V		2.2	6.2	2.2	7.1	ns
		V_{CC} = 1.65 V to 1.95 V		1.9	6.3	1.9	7.1	ns
		V_{CC} = 2.3 V to 2.7 V		1.7	4.5	1.7	5.1	ns
		V_{CC} = 3.0 V to 3.6 V		1.7	5.0	1.7	5.6	ns
C_L = 15 pF								
t_{pd}	propagation delay	A to Y; see Figure 5	[1]					
		V_{CC} = 1.1 V to 1.3 V		3.3	15.8	3.3	17.5	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	9.8	2.5	10.9	ns
		V_{CC} = 1.65 V to 1.95 V		2.0	7.9	2.0	8.8	ns
		V_{CC} = 2.3 V to 2.7 V		1.8	6.0	1.8	6.7	ns
		V_{CC} = 3.0 V to 3.6 V		1.8	5.4	1.8	6.1	ns

Table 9. Dynamic characteristics *...continued*

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

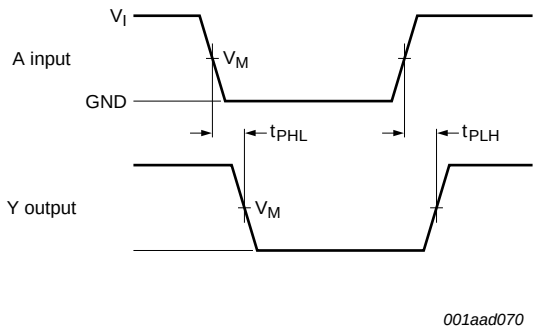
Symbol	Parameter	Conditions		–40 °C to +85 °C		–40 °C to +125 °C		Unit
				Min	Max	Min	Max	
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[2]					
		V_{CC} = 1.1 V to 1.3 V		3.7	17.6	3.7	19.6	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	9.8	2.5	10.7	ns
		V_{CC} = 1.65 V to 1.95 V		2.1	7.7	2.1	8.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.0	6.1	2.0	6.8	ns
		V_{CC} = 3.0 V to 3.6 V		1.9	4.9	1.9	5.5	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[3]					
		V_{CC} = 1.1 V to 1.3 V		3.7	10.3	3.7	11.6	ns
		V_{CC} = 1.4 V to 1.6 V		2.5	7.4	2.5	8.4	ns
		V_{CC} = 1.65 V to 1.95 V		2.1	7.4	2.1	8.9	ns
		V_{CC} = 2.3 V to 2.7 V		2.0	5.1	2.0	6.4	ns
		V_{CC} = 3.0 V to 3.6 V		1.9	6.6	1.9	7.4	ns
C_L = 30 pF								
t_{pd}	propagation delay	A to Y; see Figure 5	[1]					
		V_{CC} = 1.1 V to 1.3 V		4.4	21.6	4.4	24.0	ns
		V_{CC} = 1.4 V to 1.6 V		3.0	13.0	3.0	14.5	ns
		V_{CC} = 1.65 V to 1.95 V		2.6	10.3	2.6	11.5	ns
		V_{CC} = 2.3 V to 2.7 V		2.5	7.8	2.5	8.7	ns
		V_{CC} = 3.0 V to 3.6 V		2.5	7.5	2.5	8.3	ns
t_{en}	enable time	$\overline{OE}$ to Y; see Figure 6	[2]					
		V_{CC} = 1.1 V to 1.3 V		4.8	22.8	4.8	25.3	ns
		V_{CC} = 1.4 V to 1.6 V		3.1	12.6	3.1	14.1	ns
		V_{CC} = 1.65 V to 1.95 V		2.8	10.2	2.8	11.3	ns
		V_{CC} = 2.3 V to 2.7 V		2.6	7.8	2.6	8.8	ns
		V_{CC} = 3.0 V to 3.6 V		2.6	6.9	2.6	7.7	ns
t_{dis}	disable time	$\overline{OE}$ to Y; see Figure 6	[3]					
		V_{CC} = 1.1 V to 1.3 V		4.8	14.8	4.8	16.5	ns
		V_{CC} = 1.4 V to 1.6 V		3.1	10.7	3.1	12.1	ns
		V_{CC} = 1.65 V to 1.95 V		2.8	12.4	2.8	13.8	ns
		V_{CC} = 2.3 V to 2.7 V		2.6	8.6	2.6	9.6	ns
		V_{CC} = 3.0 V to 3.6 V		2.6	10.8	2.6	13.1	ns

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

[2] t_{en} is the same as t_{PZH} and t_{PZL}.

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

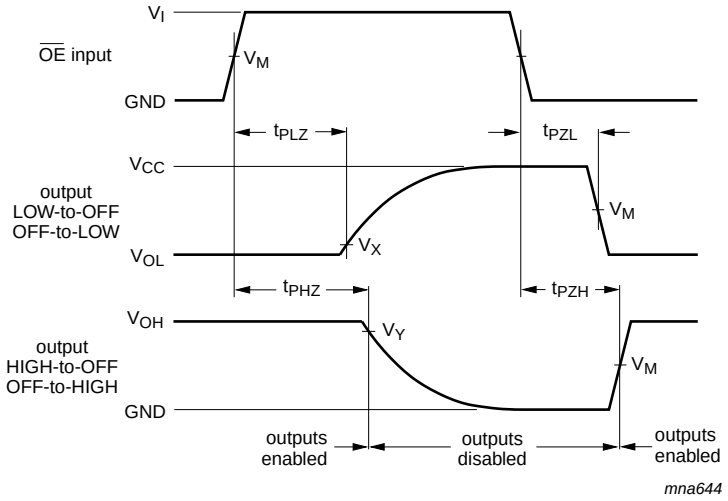
12. Waveforms



Measurement points are given in Table 10.

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

Fig 5. The data input (A) to output (Y) propagation delays



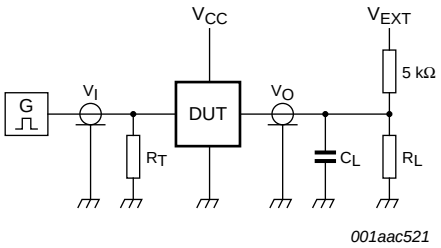
Measurement points are given in Table 10.

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

Fig 6. Enable and disable times

Table 10. Measurement points

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



Test data is given in Table 11.

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

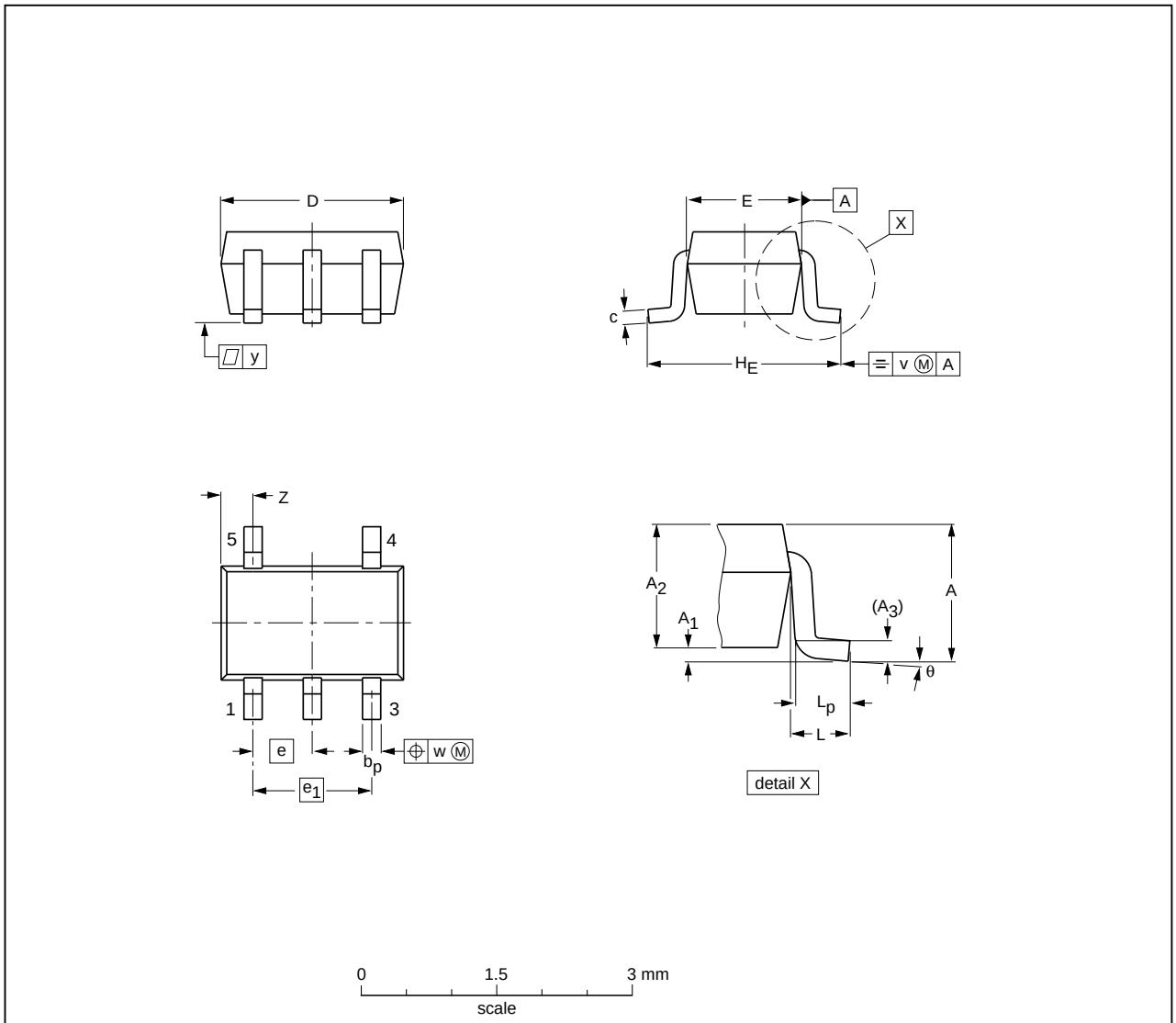
Table 11. Test data

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

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

13. Package outline

TSSOP5: plastic thin shrink small outline package; 5 leads; body width 1.25 mm **SOT353-1**



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	e_1	H_E	L	L_p	v	w	y	$Z^{(1)}$	θ
mm	1.1	0.1 0	1.0 0.8	0.15	0.30 0.15	0.25 0.08	2.25 1.85	1.35 1.15	0.65	1.3	2.25 2.0	0.425	0.46 0.21	0.3	0.1	0.1	0.60 0.15	7° 0°

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT353-1		MO-203	SC-88A			~~00-09-01~~ 03-02-19

Fig 8. Package outline SOT353-1 (TSSOP5)

14. Abbreviations

Table 12. Abbreviations

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

15. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP1G125_Q100 v.1	20130320	Product data sheet	-	-

16. Legal information

16.1 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".

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18. Contents

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