

# 74AUP2G240

Low-power dual inverting buffer/line driver; 3-state

Rev. 11 — 27 July 2023

Product data sheet

## 1. General description

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The 74AUP2G240 provides the dual inverting buffer/line driver with 3-state output. The 3-state output is controlled by the output enable input ( $\overline{nOE}$ ). A HIGH level at pin  $\overline{nOE}$  causes the output to assume a high-impedance OFF-state.

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

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

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

This device has the input-disable feature, which allows floating input signals. The inputs are disabled when the output enable input  $\overline{nOE}$  is HIGH.

## 2. Features and benefits

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- Wide supply voltage range from 0.8 V to 3.6 V
- High noise immunity
- Complies with JEDEC standards:
  - JESD8-12 (0.8 V to 1.3 V)
  - JESD8-11 (0.9 V to 1.65 V)
  - JESD8-7 (1.2 V to 1.95 V)
  - JESD8-5 (1.8 V to 2.7 V)
  - JESD8-B (2.7 V to 3.6 V)
- Low static power consumption;  $I_{CC} = 0.9 \mu\text{A}$  (maximum)
- Latch-up performance exceeds 100 mA per JESD78 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
- ESD protection:
  - HBM: ANSI/ESDA/JEDEC JS-001 class 3A exceeds 5000 V
  - CDM: ANSI/ESDA/JEDEC JS-002 class C3 exceeds 1000 V
- 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			Version
	Temperature range	Name	Description	
<a href="#">74AUP2G240DC</a>	-40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	<a href="#">SOT765-1</a>
<a href="#">74AUP2G240GT</a>	-40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm	<a href="#">SOT833-1</a>
<a href="#">74AUP2G240GN</a>	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.2 × 1.0 × 0.35 mm	<a href="#">SOT1116</a>
<a href="#">74AUP2G240GS</a>	-40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body 1.35 × 1.0 × 0.35 mm	<a href="#">SOT1203</a>

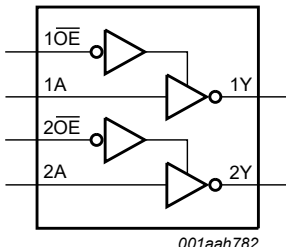
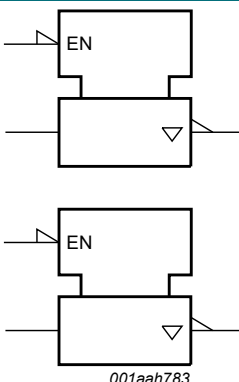
### 4. Marking

Table 2. Marking codes

Type number	Marking code[1]
74AUP2G240DC	p40
74AUP2G240GT	p40
74AUP2G240GN	p2
74AUP2G240GS	p2

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

### 5. Functional diagram

 <p>001aah782</p>	 <p>001aah783</p>
<p><b>Fig. 1. Logic symbol</b></p>	<p><b>Fig. 2. IEC logic symbol</b></p>

## 6. Pinning information

### 6.1. Pinning

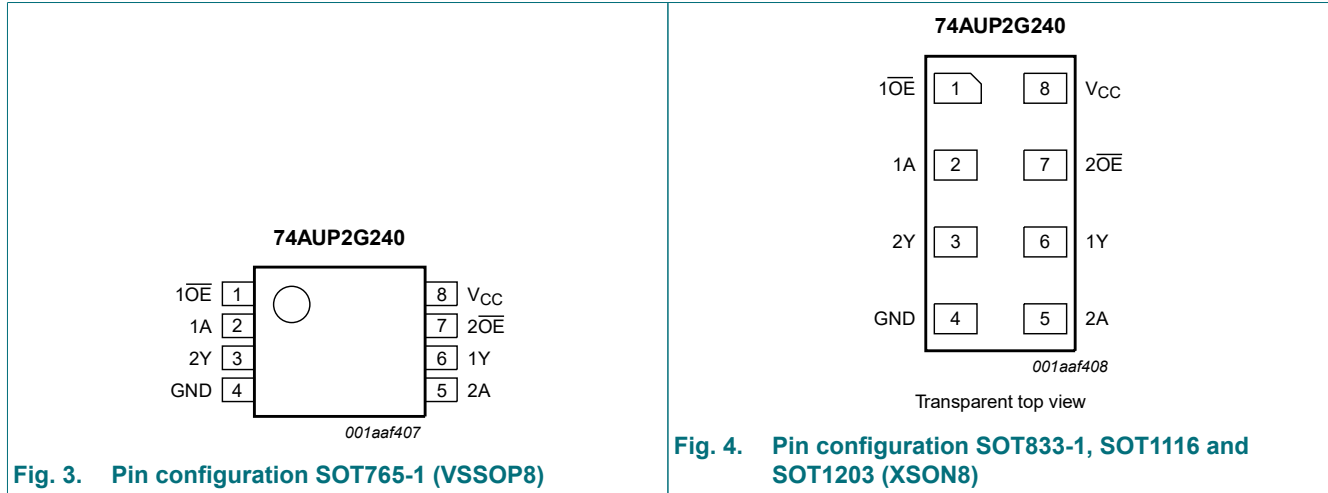


Fig. 3. Pin configuration SOT765-1 (VSSOP8)

Fig. 4. Pin configuration SOT833-1, SOT1116 and SOT1203 (XSON8)

### 6.2. Pin description

Table 3. Pin description

Symbol	Pin	Description
1OE, 2OE	1, 7	output enable input (active LOW)
1A, 2A	2, 5	data input
GND	4	ground (0 V)
1Y, 2Y	6, 3	data output
V <sub>CC</sub>	8	supply voltage

## 7. Functional description

Table 4. Function table

H = HIGH voltage level; L = LOW voltage level; X = don't care; Z = high-impedance OFF-state.

Input		Output
nOE	nA	nY
L	L	H
L	H	L
H	X	Z

## 8. Limiting values

**Table 5. Limiting values**

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

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

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

[2] For SOT765-1 (VSSOP8) package:  $P_{tot}$  derates linearly with 4.9 mW/K above 99 °C.

For SOT833-1 (XSON8) package:  $P_{tot}$  derates linearly with 3.1 mW/K above 68 °C.

For SOT1116 (XSON8) package:  $P_{tot}$  derates linearly with 4.2 mW/K above 90 °C.

For SOT1203 (XSON8) package:  $P_{tot}$  derates linearly with 3.6 mW/K above 81 °C.

## 9. Recommended operating conditions

**Table 6. 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	$0.70V_{CC}$	-	-	V
		$V_{CC} = 0.9$ V to 1.95 V	$0.65V_{CC}$	-	-	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	-	-	$0.30V_{CC}$	V
		$V_{CC} = 0.9$ V to 1.95 V	-	-	$0.35V_{CC}$	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

## Low-power dual inverting buffer/line driver; 3-state

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.75V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.11	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.32	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	2.05	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.9	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.72	-	-	V
		I <sub>O</sub> = -4.0 mA; V <sub>CC</sub> = 3.0 V	2.6	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 μA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.31	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.31	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.31	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.44	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.31	V
		I <sub>O</sub> = 4.0 mA; V <sub>CC</sub> = 3.0 V	-	-	0.44	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
I <sub>OZ</sub>	OFF-state output current	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.1	μA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.2	μA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.2	μA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.5	μA
ΔI <sub>CC</sub>	additional supply current	data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	40	μA
		n $\overline{\text{OE}}$ input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	110	μA
		disabled inputs; V <sub>I</sub> = GND to 3.6 V; n $\overline{\text{OE}}$ = V <sub>CC</sub> ; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1	μA
C <sub>I</sub>	input capacitance	V <sub>CC</sub> = 0 V to 3.6 V; V <sub>I</sub> = GND or V <sub>CC</sub>	-	0.6	-	pF
C <sub>O</sub>	output capacitance	output enabled; V <sub>O</sub> = GND; V <sub>CC</sub> = 0 V	-	1.7	-	pF
		output disabled; V <sub>CC</sub> = 0 V to 3.6 V; V <sub>O</sub> = GND or V <sub>CC</sub>	-	1.5	-	pF

## Low-power dual inverting buffer/line driver; 3-state

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = -40 °C to +85 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.70V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.65V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.30V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.35V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.1	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.7V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	1.03	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.30	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.97	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.85	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.67	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.1	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.3V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.37	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.35	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.33	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.45	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.33	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.5	µA
		V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.5	µA
		V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.5	µA
		V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.6	µA
		V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.9	µA
		data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	50	µA
		n $\overline{\text{OE}}$ input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	120	µA
		disabled inputs; V <sub>I</sub> = GND to 3.6 V; n $\overline{\text{OE}}$ = V <sub>CC</sub> ; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1	µA

## Low-power dual inverting buffer/line driver; 3-state

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>T<sub>amb</sub> = -40 °C to +125 °C</b>						
V <sub>IH</sub>	HIGH-level input voltage	V <sub>CC</sub> = 0.8 V	0.75V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	0.70V <sub>CC</sub>	-	-	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	-	-	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	-	-	V
V <sub>IL</sub>	LOW-level input voltage	V <sub>CC</sub> = 0.8 V	-	-	0.25V <sub>CC</sub>	V
		V <sub>CC</sub> = 0.9 V to 1.95 V	-	-	0.30V <sub>CC</sub>	V
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.7	V
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	-	0.9	V
V <sub>OH</sub>	HIGH-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = -20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V	V <sub>CC</sub> - 0.11	-	-	V
		I <sub>O</sub> = -1.1 mA; V <sub>CC</sub> = 1.1 V	0.6V <sub>CC</sub>	-	-	V
		I <sub>O</sub> = -1.7 mA; V <sub>CC</sub> = 1.4 V	0.93	-	-	V
		I <sub>O</sub> = -1.9 mA; V <sub>CC</sub> = 1.65 V	1.17	-	-	V
		I <sub>O</sub> = -2.3 mA; V <sub>CC</sub> = 2.3 V	1.77	-	-	V
		I <sub>O</sub> = -3.1 mA; V <sub>CC</sub> = 2.3 V	1.67	-	-	V
		I <sub>O</sub> = -2.7 mA; V <sub>CC</sub> = 3.0 V	2.40	-	-	V
V <sub>OL</sub>	LOW-level output voltage	V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub>				
		I <sub>O</sub> = 20 µA; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	0.11	V
		I <sub>O</sub> = 1.1 mA; V <sub>CC</sub> = 1.1 V	-	-	0.33V <sub>CC</sub>	V
		I <sub>O</sub> = 1.7 mA; V <sub>CC</sub> = 1.4 V	-	-	0.41	V
		I <sub>O</sub> = 1.9 mA; V <sub>CC</sub> = 1.65 V	-	-	0.39	V
		I <sub>O</sub> = 2.3 mA; V <sub>CC</sub> = 2.3 V	-	-	0.36	V
		I <sub>O</sub> = 3.1 mA; V <sub>CC</sub> = 2.3 V	-	-	0.50	V
		I <sub>O</sub> = 2.7 mA; V <sub>CC</sub> = 3.0 V	-	-	0.36	V
I <sub>I</sub>	input leakage current	V <sub>I</sub> = GND to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	µA
		V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> ; V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 3.6 V	-	-	±0.75	µA
I <sub>OFF</sub>	power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V	-	-	±0.75	µA
ΔI <sub>OFF</sub>	additional power-off leakage current	V <sub>I</sub> or V <sub>O</sub> = 0 V to 3.6 V; V <sub>CC</sub> = 0 V to 0.2 V	-	-	±0.75	µA
I <sub>CC</sub>	supply current	V <sub>I</sub> = GND or V <sub>CC</sub> ; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1.4	µA
ΔI <sub>CC</sub>	additional supply current	data input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	75	µA
		n $\overline{\text{OE}}$ input; V <sub>I</sub> = V <sub>CC</sub> - 0.6 V; I <sub>O</sub> = 0 A; V <sub>CC</sub> = 3.3 V	[1]	-	180	µA
		disabled inputs; V <sub>I</sub> = GND to 3.6 V; n $\overline{\text{OE}}$ = V <sub>CC</sub> ; V <sub>CC</sub> = 0.8 V to 3.6 V	-	-	1	µA

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

## 11. Dynamic characteristics

**Table 8. Dynamic characteristics**

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

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
<b>C<sub>L</sub> = 5 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 5 [2]								
		V <sub>CC</sub> = 0.8 V	-	22.3	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.0	5.8	12.6	2.8	14.1	2.8	15.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	4.0	7.3	2.1	8.5	2.1	9.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.2	5.5	1.9	6.7	1.9	7.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	2.6	4.1	1.5	4.8	1.5	5.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.4	2.3	3.6	1.3	4.1	1.3	4.6	ns
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 6 [3]								
		V <sub>CC</sub> = 0.8 V	-	70.2	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.1	6.4	14.3	2.8	15.9	2.8	17.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.5	4.4	8.1	2.2	9.5	2.2	10.5	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.1	3.6	6.2	1.9	7.4	1.9	8.2	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	2.8	4.6	1.7	5.4	1.7	6.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	2.5	4.0	1.7	4.7	1.7	5.3	ns
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 6 [4]								
		V <sub>CC</sub> = 0.8 V	-	14.8	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	2.0	4.3	7.4	2.3	8.3	2.3	9.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	1.6	3.2	5.2	1.7	5.9	1.7	6.5	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	1.5	3.0	4.8	1.5	5.5	1.5	6.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.1	2.2	3.5	1.4	4.0	1.4	4.5	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.3	2.5	3.9	1.4	4.5	1.4	5.0	ns
<b>C<sub>L</sub> = 10 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 5 [2]								
		V <sub>CC</sub> = 0.8 V	-	25.7	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.5	6.6	14.5	3.2	16.3	3.2	18.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.2	4.6	8.4	2.0	9.9	2.0	10.9	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	3.8	6.4	1.8	7.7	1.8	8.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.1	4.8	1.7	5.7	1.7	6.4	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.7	2.8	4.3	1.7	5.0	1.7	5.5	ns
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 6 [3]								
		V <sub>CC</sub> = 0.8 V	-	74.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.6	7.4	16.3	3.2	18.2	3.2	20.1	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.3	5.1	9.2	2.1	10.9	2.1	12.0	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.0	4.1	7.1	1.8	8.5	1.8	9.4	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.8	3.4	5.4	1.7	6.4	1.7	7.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	1.8	3.1	4.8	1.7	5.7	1.7	6.3	ns



Low-power dual inverting buffer/line driver; 3-state

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 6 [4]								
		V <sub>CC</sub> = 0.8 V	-	33.7	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.4	5.4	9.0	3.2	10.0	3.2	11.0	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	2.1	4.1	6.3	2.1	7.1	2.1	7.9	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.2	6.3	1.8	7.1	1.8	7.9	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.6	3.0	4.6	1.7	5.2	1.7	5.7	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	3.8	5.7	1.7	6.4	1.7	7.1	ns
<b>C<sub>L</sub> = 15 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 5 [2]								
		V <sub>CC</sub> = 0.8 V	-	29.0	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	3.9	7.4	16.3	3.6	18.4	3.6	20.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.1	9.4	2.5	11.1	2.5	12.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.2	4.2	7.2	2.1	8.7	2.1	9.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.0	3.5	5.4	1.9	6.5	1.9	7.2	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.0	3.3	4.9	1.9	5.7	1.9	6.4	ns
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 6 [3]								
		V <sub>CC</sub> = 0.8 V	-	77.8	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.0	8.2	18.2	3.6	20.4	3.6	22.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.6	10.3	2.5	12.2	2.5	13.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.3	4.6	7.9	2.1	9.5	2.1	10.5	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.9	6.0	2.0	7.2	2.0	7.9	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.1	3.6	5.5	1.9	6.4	1.9	7.1	ns
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 6 [4]								
		V <sub>CC</sub> = 0.8 V	-	62.5	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	4.3	6.6	10.4	3.6	11.6	3.6	12.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	3.0	5.0	7.4	2.5	8.4	2.5	9.3	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	5.3	7.8	2.1	8.7	2.1	9.7	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.1	3.8	5.7	2.0	6.4	2.0	7.1	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.9	5.0	7.4	1.9	8.3	1.9	9.1	ns
<b>C<sub>L</sub> = 30 pF</b>										
t <sub>pd</sub>	propagation delay	nA to nY; see Fig. 5 [2]								
		V <sub>CC</sub> = 0.8 V	-	39.1	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	5.0	9.7	21.6	4.6	24.3	4.6	26.8	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.0	6.7	12.3	3.0	14.6	3.0	16.1	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	2.9	5.5	9.5	2.7	11.5	2.7	12.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.7	4.6	7.1	2.5	8.6	2.5	9.5	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.6	4.3	6.4	2.5	7.7	2.5	8.5	ns

Low-power dual inverting buffer/line driver; 3-state

Symbol	Parameter	Conditions	T <sub>amb</sub> = 25 °C			T <sub>amb</sub> = -40 °C to +85 °C		T <sub>amb</sub> = -40 °C to +125 °C		Unit
			Min	Typ[1]	Max	Min	Max	Min	Max	
t <sub>en</sub>	enable time	n $\overline{O}E$ to nY; see Fig. 6 [3]								
		V <sub>CC</sub> = 0.8 V	-	89.4	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	5.2	10.6	23.8	4.6	26.7	4.6	29.5	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.0	7.3	13.2	3.0	15.7	3.0	17.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	3.0	6.0	10.2	2.7	12.3	2.7	13.6	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	2.8	5.0	7.8	2.6	9.3	2.6	10.3	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	2.8	4.8	7.1	2.6	8.4	2.6	9.3	ns
t <sub>dis</sub>	disable time	n $\overline{O}E$ to nY; see Fig. 6 [4]								
		V <sub>CC</sub> = 0.8 V	-	68.9	-	-	-	-	-	ns
		V <sub>CC</sub> = 1.1 V to 1.3 V	6.0	9.3	15.0	4.6	16.5	4.6	18.2	ns
		V <sub>CC</sub> = 1.4 V to 1.6 V	4.4	7.7	11.0	3.0	12.2	3.0	13.4	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	5.1	8.8	12.4	2.7	13.7	2.7	15.1	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	3.6	6.2	9.0	2.6	10.0	2.6	11.0	ns
		V <sub>CC</sub> = 3.0 V to 3.6 V	5.2	8.8	12.7	2.6	14.0	2.6	15.4	ns
<b>C<sub>L</sub> = 5 pF, 10 pF, 15 pF and 30 pF</b>										
C <sub>PD</sub>	power dissipation capacitance	f = 1 MHz; V <sub>I</sub> = GND to V <sub>CC</sub> [5]								
		V <sub>CC</sub> = 0.8 V	-	2.7	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.1 V to 1.3 V	-	2.9	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	3.0	-	-	-	-	-	pF
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	3.2	-	-	-	-	-	pF
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	3.7	-	-	-	-	-	pF
		V <sub>CC</sub> = 3.0 V to 3.6 V	-	4.2	-	-	-	-	-	pF

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

11.1. Waveforms and test circuit

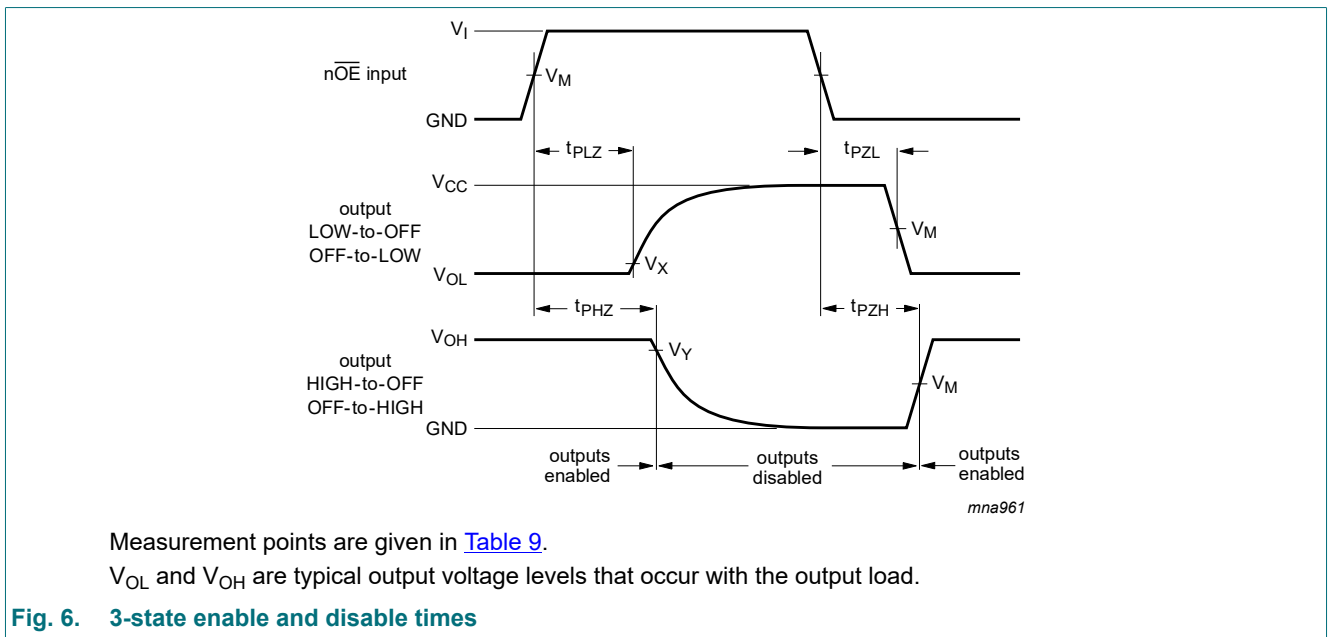
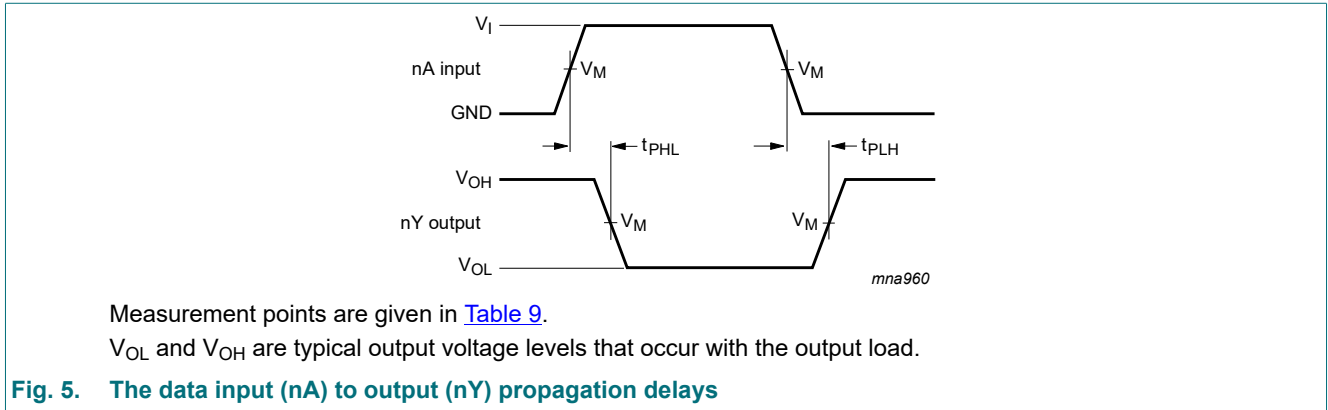
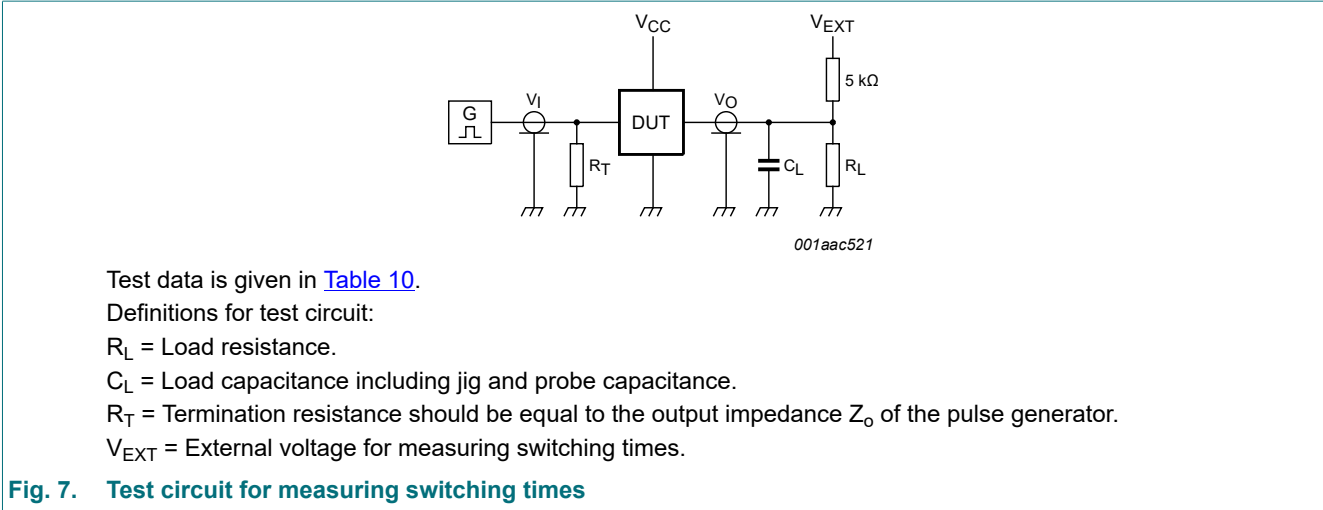


Table 9. Measurement points

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



**Fig. 7. Test circuit for measuring switching times**

**Table 10. Test data**

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

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

## 12. Package outline

VSSOP8: plastic very thin shrink small outline package; 8 leads; body width 2.3 mm

SOT765-1

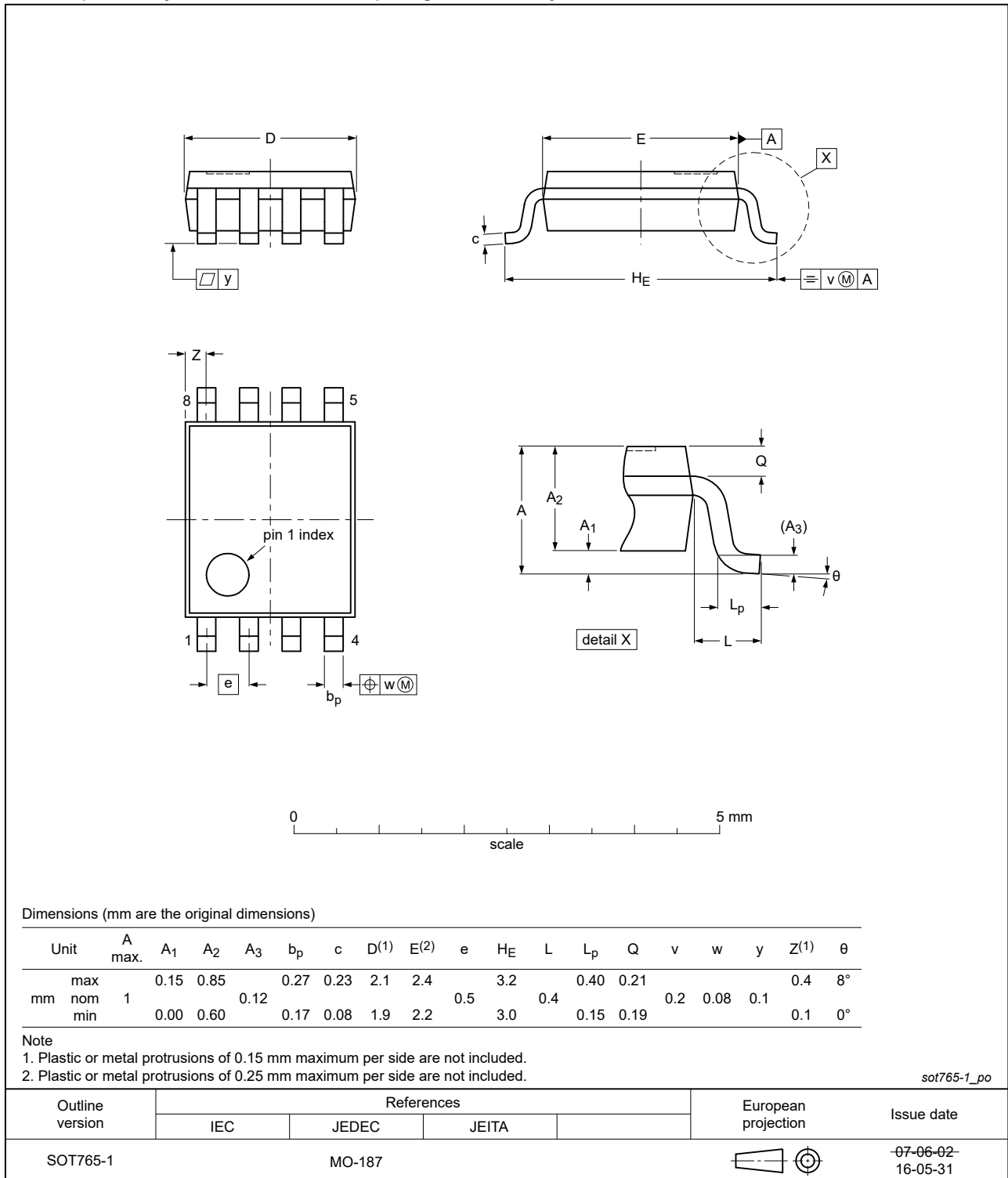


Fig. 8. Package outline SOT765-1 (VSSOP8)

XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm

SOT833-1

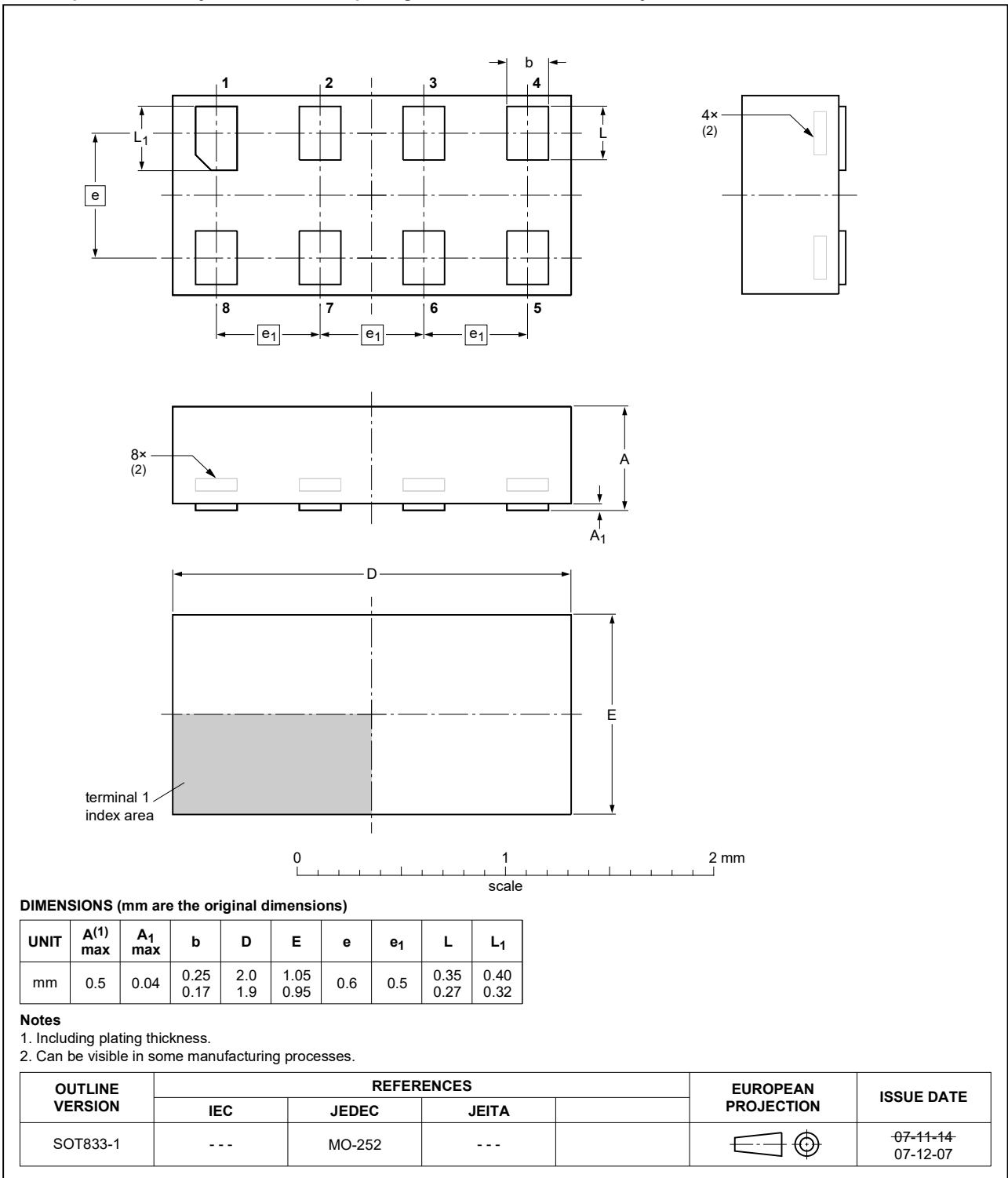


Fig. 9. Package outline SOT833-1 (XSON8)

XSON8: extremely thin small outline package; no leads;  
8 terminals; body 1.2 x 1.0 x 0.35 mm

SOT1116

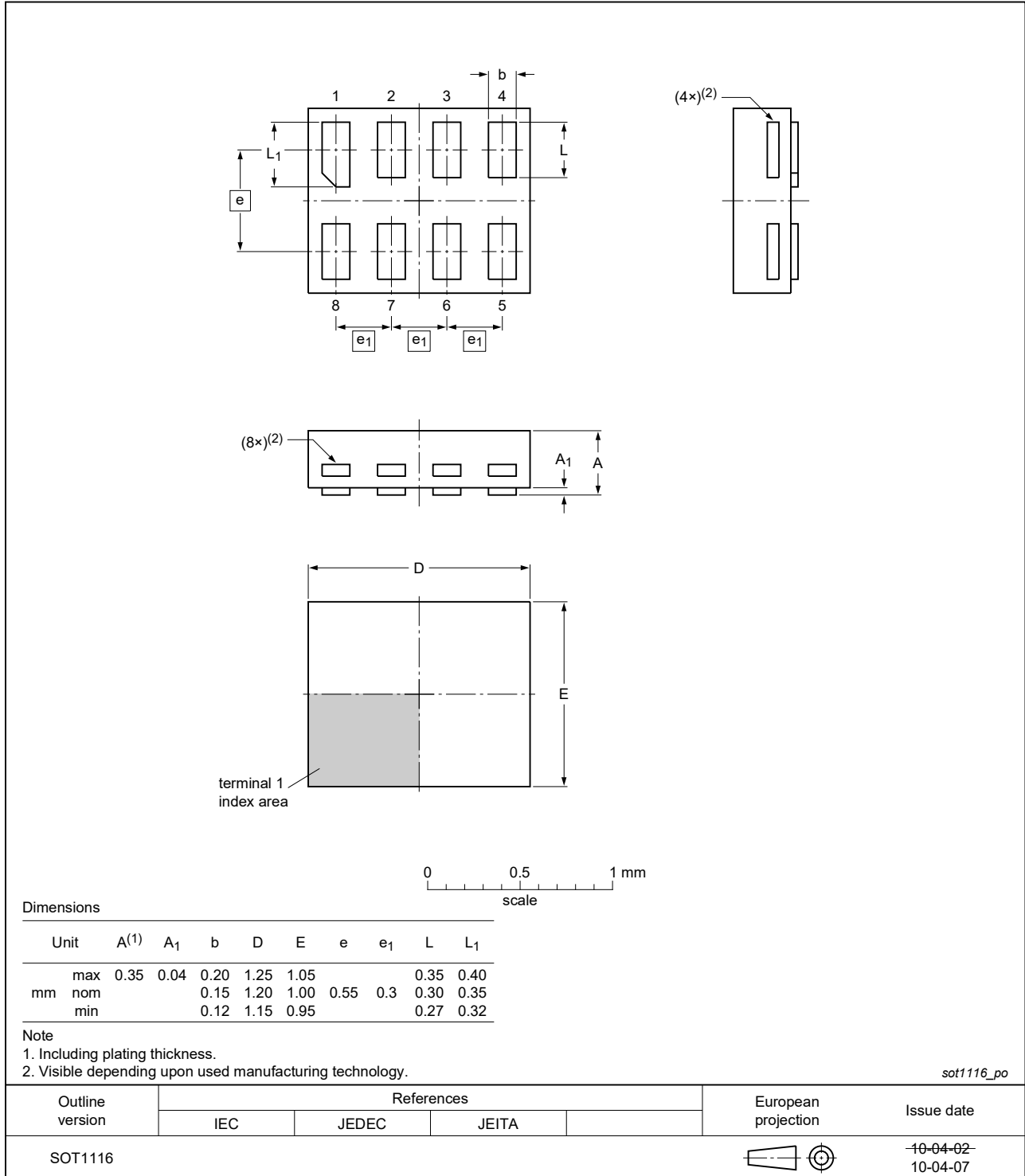


Fig. 10. Package outline SOT1116 (XSON8)

XSON8: extremely thin small outline package; no leads;  
8 terminals; body 1.35 x 1.0 x 0.35 mm

SOT1203

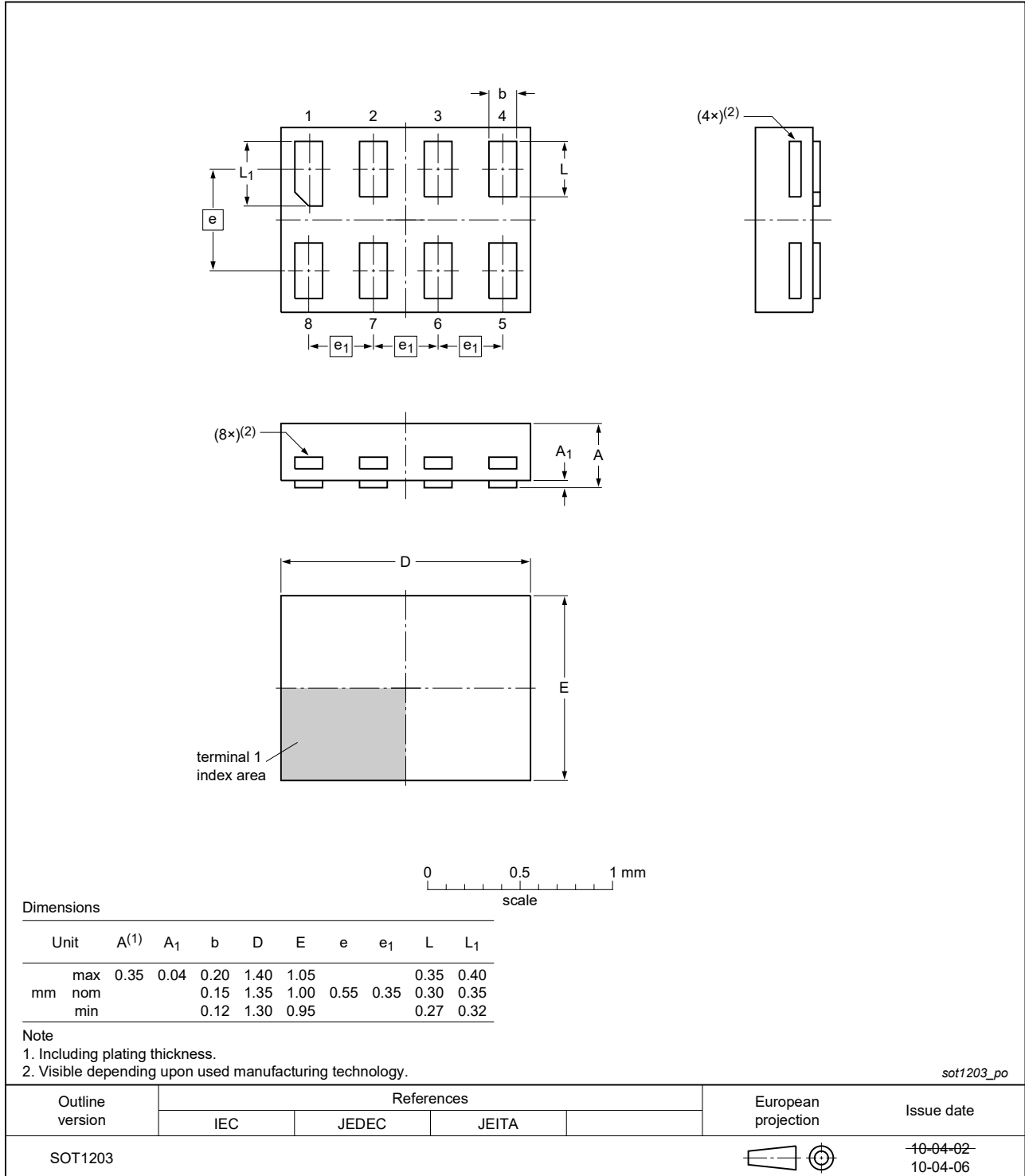


Fig. 11. Package outline SOT1203 (XSON8)



## 13. Abbreviations

Table 11. Abbreviations

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

## 14. Revision history

Table 12. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74AUP2G240 v.11	20230727	Product data sheet	-	74AUP2G240 v.10
Modifications:	<ul style="list-style-type: none"> <li><a href="#">Section 2</a>: ESD specification updated according to the latest JEDEC standard.</li> </ul>			
74AUP2G240 v.10	20201201	Product data sheet	-	74AUP2G240 v.9
Modifications:	<ul style="list-style-type: none"> <li><a href="#">Section 8</a>: Derating values for <math>P_{tot}</math> total power dissipation have been updated.</li> <li>Type numbers 74AUP2G240GF (SOT1089/XSON8) and 74AUP2G240GM (SOT902-2/XQFN8) removed.</li> </ul>			
74AUP2G240 v.9	20190319	Product data sheet	-	74AUP2G240 v.8
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Type number 74AUP2G240GD (SOT996-2) removed.</li> <li>Package outline drawing <a href="#">SOT765-1</a> (VSSOP8) updated.</li> <li>Package outline drawing <a href="#">SOT902-2</a> (XQFN8) updated.</li> </ul>			
74AUP2G240 v.8	20130124	Product data sheet	-	74AUP2G240 v.7
Modifications:	<ul style="list-style-type: none"> <li>For type number 74AUP2G240GD XSON8U has changed to XSON8.</li> </ul>			
74AUP2G240 v.7	20120606	Product data sheet	-	74AUP2G240 v.6
74AUP2G240 v.6	20111205	Product data sheet	-	74AUP2G240 v.5
74AUP2G240 v.5	20100913	Product data sheet	-	74AUP2G240 v.4
74AUP2G240 v.4	20090630	Product data sheet	-	74AUP2G240 v.3
74AUP2G240 v.3	20090407	Product data sheet	-	74AUP2G240 v.2
74AUP2G240 v.2	20080222	Product data sheet	-	74AUP2G240 v.1
74AUP2G240 v.1	20061006	Product data sheet	-	-

## 15. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
- [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 <https://www.nexperia.com>.

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For sales office addresses, please send an email to: [salesaddresses@nexperia.com](mailto:salesaddresses@nexperia.com)

Date of release: 27 July 2023