

# 74LVC1G3157

## 2-channel analog multiplexer/demultiplexer

Rev. 7 — 14 February 2017

Product data sheet

## 1 General description

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The 74LVC1G3157 provides one analog multiplexer/demultiplexer with one digital select input (S), two independent inputs/outputs (Y0, Y1) and a common input/output (Z).

Schmitt trigger action at the select input makes the circuit tolerant of slower input rise and fall times across the entire  $V_{CC}$  range from 1.65 V to 5.5 V.

## 2 Features and benefits

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- Wide supply voltage range from 1.65 V to 5.5 V
- Very low ON resistance:
  - 7.5  $\Omega$  (typical) at  $V_{CC} = 2.7$  V
  - 6.5  $\Omega$  (typical) at  $V_{CC} = 3.3$  V
  - 6  $\Omega$  (typical) at  $V_{CC} = 5$  V
- Switch current capability of 32 mA
- Break-before-make switching
- High noise immunity
- CMOS low power consumption
- TTL interface compatibility at 3.3 V
- Latch-up performance meets requirements of JESD 78 Class I
- ESD protection:
  - HBM JESD22-A114F exceeds 2000 V
  - MM JESD22-A115-A exceeds 200 V
- Control input accepts voltages up to 5.5 V
- Multiple package options
- Specified from -40 °C to +85 °C and from -40 °C to +125 °C

### 3 Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
74LVC1G3157GW	-40 °C to +125 °C	SC-88	plastic surface-mounted package; 6 leads	SOT363
74LVC1G3157GV	-40 °C to +125 °C	SC-74	plastic surface-mounted package (TSOP6); 6 leads	SOT457
74LVC1G3157GM	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1.45 × 0.5 mm	SOT886
74LVC1G3157GF	-40 °C to +125 °C	XSON6	plastic extremely thin small outline package; no leads; 6 terminals; body 1 × 1 × 0.5 mm	SOT891
74LVC1G3157GN	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 0.9 × 1.0 × 0.35 mm	SOT1115
74LVC1G3157GS	-40 °C to +125 °C	XSON6	extremely thin small outline package; no leads; 6 terminals; body 1.0 × 1.0 × 0.35 mm	SOT1202
74LVC1G3157GX	-40 °C to +125 °C	X2SON6	plastic thermal extremely thin small outline package; no leads; 6 terminals; body 1 × 0.8 × 0.35 mm	SOT1255

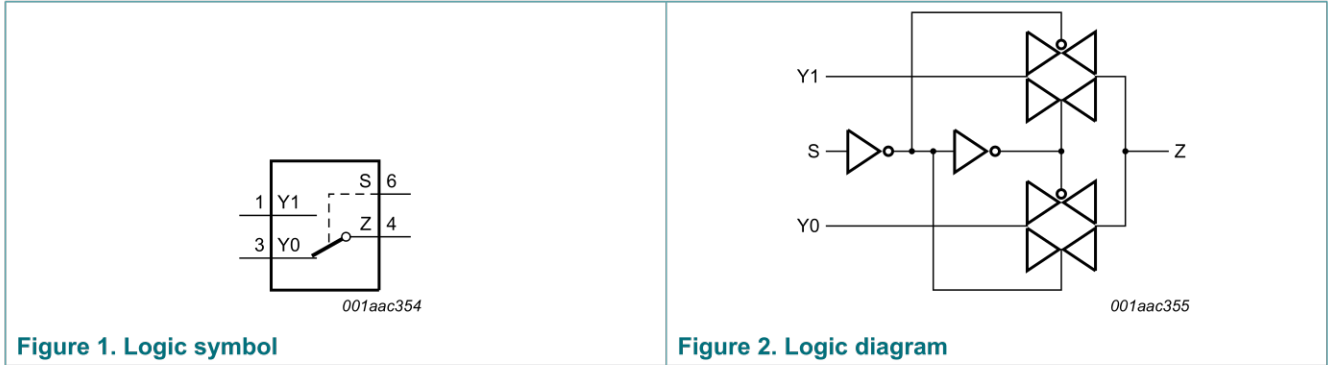
### 4 Marking

Table 2. Marking

Type number	Marking code <sup>[1]</sup>
74LVC1G3157GW	YJ
74LVC1G3157GV	YJ
74LVC1G3157GM	YJ
74LVC1G3157GF	YJ
74LVC1G3157GN	YJ
74LVC1G3157GS	YJ
74LVC1G3157GX	YJ

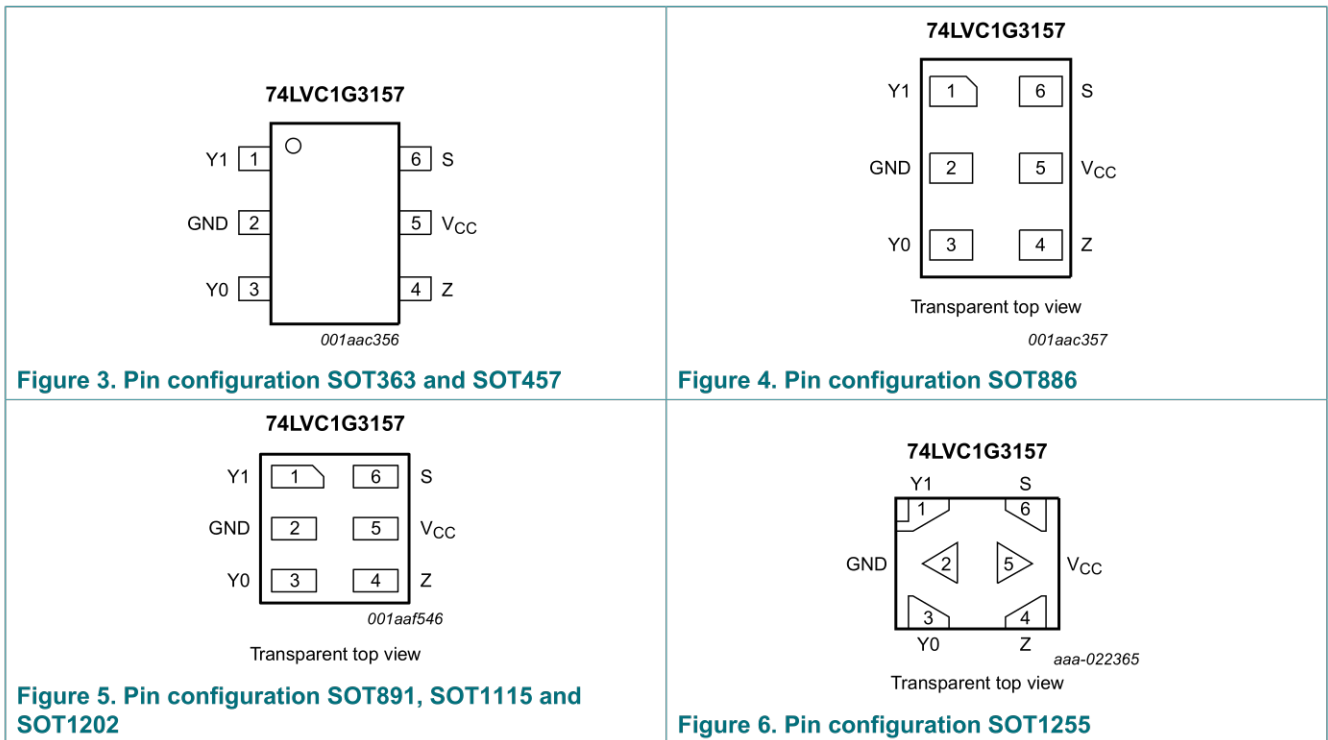
[1] The pin 1 indicator is located on the lower left corner of the device, below the marking code.

**5 Functional diagram**



**6 Pinning information**

**6.1 Pinning**



## 6.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
Y1	1	independent input or output
GND	2	ground (0 V)
Y0	3	independent input or output
Z	4	common output or input
V <sub>CC</sub>	5	supply voltage
S	6	select input

## 7 Functional description

Table 4. Function table <sup>[1]</sup>

Input S	Channel on
L	Y0
H	Y1

[1] H = HIGH voltage level;  
L = LOW voltage level.

## 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 <sub>CC</sub>	supply voltage		-0.5	+6.5	V
V <sub>I</sub>	input voltage		<sup>[1]</sup> -0.5	+6.5	V
I <sub>IK</sub>	input clamping current	V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V	-50	-	mA
I <sub>SK</sub>	switch clamping current	V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V	-	±50	mA
V <sub>SW</sub>	switch voltage	enable and disable mode	<sup>[2]</sup> -0.5	V <sub>CC</sub> + 0.5	V
I <sub>SW</sub>	switch current	V <sub>SW</sub> > -0.5 V or V <sub>SW</sub> < V <sub>CC</sub> + 0.5 V	-	±50	mA
I <sub>CC</sub>	supply current		-	100	mA
I <sub>GND</sub>	ground current		-100	-	mA
T <sub>stg</sub>	storage temperature		-65	+150	°C
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = -40 °C to +125 °C	<sup>[3]</sup> -	250	mW

[1] The minimum input voltage rating may be exceeded if the input current rating is observed.

[2] The minimum and maximum switch voltage ratings may be exceeded if the switch clamping current rating is observed.

[3] For SC-88 and SC-74 packages: above 87.5 °C the value of P<sub>tot</sub> derates linearly with 4.0 mW/K.

For XSON6 and X2SON6 packages: above 118 °C the value of P<sub>tot</sub> derates linearly with 7.8 mW/K.

## 9 Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{CC}$	supply voltage		1.65	-	5.5	V
$V_I$	input voltage		0	-	5.5	V
$V_{SW}$	switch voltage	enable and disable mode <sup>[1]</sup>	0	-	$V_{CC}$	V
$T_{amb}$	ambient temperature		-40	-	+125	°C
$\Delta t/\Delta V$	input transition rise and fall rate	$V_{CC} = 1.65\text{ V to }2.7\text{ V}$ <sup>[2]</sup>	-	-	20	ns/V
		$V_{CC} = 2.7\text{ V to }5.5\text{ V}$ <sup>[2]</sup>	-	-	10	ns/V

[1] To avoid sinking GND current from terminal Z when switch current flows in terminal  $Y_n$ , the voltage drop across the bidirectional switch must not exceed 0.4 V. If the switch current flows into terminal Z, no GND current will flow from terminal  $Y_n$ . In this case, there is no limit for the voltage drop across the switch.

[2] Applies to control signal levels.

## 10 Static characteristics

Table 7. Static characteristics

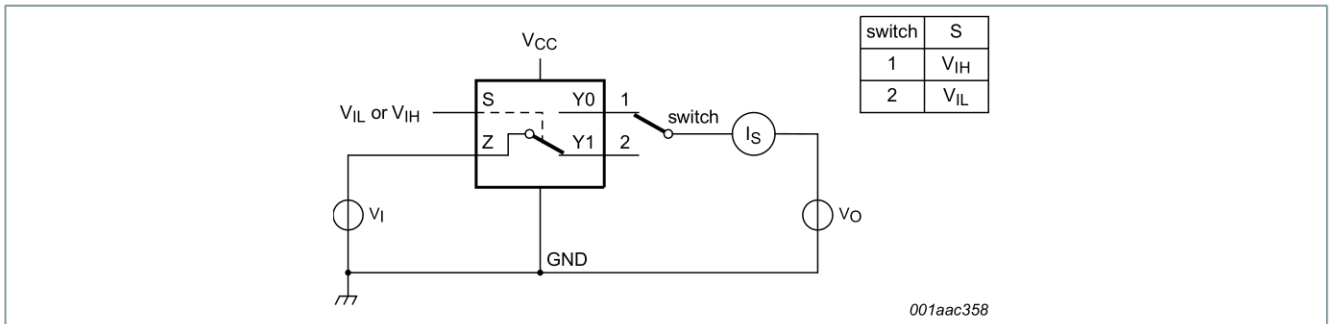
At recommended operating conditions; voltages are referenced to GND (ground 0 V).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max	
$V_{IH}$	HIGH-level input voltage	$V_{CC} = 1.65\text{ V to }1.95\text{ V}$	$0.65V_{CC}$	-	-	$0.65V_{CC}$	-	V
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	1.7	-	-	1.7	-	V
		$V_{CC} = 3\text{ V to }3.6\text{ V}$	2.0	-	-	2.0	-	V
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$	$0.7V_{CC}$	-	-	$0.7V_{CC}$	-	V
$V_{IL}$	LOW-level input voltage	$V_{CC} = 1.65\text{ V to }1.95\text{ V}$	-	-	$0.35V_{CC}$	-	$0.35V_{CC}$	V
		$V_{CC} = 2.3\text{ V to }2.7\text{ V}$	-	-	0.7	-	0.7	V
		$V_{CC} = 3\text{ V to }3.6\text{ V}$	-	-	0.8	-	0.8	V
		$V_{CC} = 4.5\text{ V to }5.5\text{ V}$	-	-	$0.3V_{CC}$	-	$0.3V_{CC}$	V
$I_I$	input leakage current	pin S; $V_I = 5.5\text{ V or GND}$ ; $V_{CC} = 0\text{ V to }5.5\text{ V}$ <sup>[2]</sup>	-	$\pm 0.1$	$\pm 1$	-	$\pm 1$	$\mu\text{A}$
$I_{S(OFF)}$	OFF-state leakage current	$V_{CC} = 5.5\text{ V}$ ; see <a href="#">Figure 7</a> <sup>[2]</sup>	-	$\pm 0.1$	$\pm 0.2$	-	$\pm 0.5$	$\mu\text{A}$
$I_{S(ON)}$	ON-state leakage current	$V_{CC} = 5.5\text{ V}$ ; see <a href="#">Figure 8</a> <sup>[2]</sup>	-	$\pm 0.1$	$\pm 1$	-	$\pm 2$	$\mu\text{A}$
$I_{CC}$	supply current	$V_I = 5.5\text{ V or GND}$ ; $V_{SW} = \text{GND or }V_{CC}$ ; $V_{CC} = 1.65\text{ V to }5.5\text{ V}$ <sup>[2]</sup>	-	0.1	4	-	4	$\mu\text{A}$
$\Delta I_{CC}$	additional supply current	pin S; $V_I = V_{CC} - 0.6\text{ V}$ ; $V_{CC} = 5.5\text{ V}$ ; $V_{SW} = \text{GND or }V_{CC}$ <sup>[2]</sup>	-	5	500	-	500	$\mu\text{A}$
$C_I$	input capacitance		-	2.5	-	-	-	pF

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max	
$C_{S(OFF)}$	OFF-state capacitance		-	6.0	-	-	-	pF
$C_{S(ON)}$	ON-state capacitance		-	18	-	-	-	pF

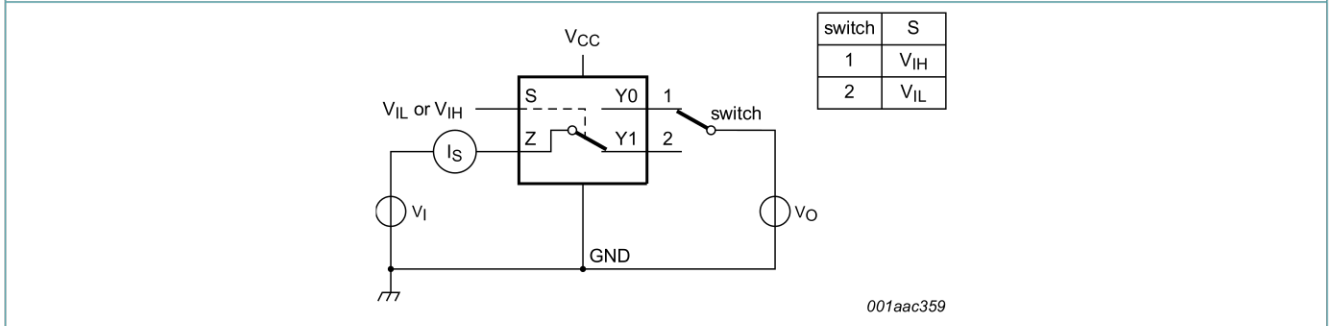
[1] Typical values are measured at  $T_{amb} = 25\text{ °C}$ .  
 [2] These typical values are measured at  $V_{CC} = 3.3\text{ V}$

10.1 Test circuits



$V_I = V_{CC}$  or  $GND$  and  $V_O = GND$  or  $V_{CC}$ .

Figure 7. Test circuit for measuring OFF-state leakage current



$V_I = V_{CC}$  or  $GND$  and  $V_O = \text{open circuit}$ .

Figure 8. Test circuit for measuring ON-state leakage current

10.2 ON resistance

Table 8. ON resistance

At recommended operating conditions; voltages are referenced to GND (ground 0 V); for graphs see Figure 10 to Figure 15.

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max	
R <sub>ON(peak)</sub>	ON resistance (peak)	V <sub>I</sub> = GND to V <sub>CC</sub> ; see Figure 9						
		I <sub>SW</sub> = 4 mA; V <sub>CC</sub> = 1.65 V to 1.95 V	-	34.0	130	-	195	Ω
		I <sub>SW</sub> = 8 mA; V <sub>CC</sub> = 2.3 V to 2.7 V	-	12.0	30	-	45	Ω
		I <sub>SW</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	10.4	25	-	38	Ω
		I <sub>SW</sub> = 24 mA; V <sub>CC</sub> = 3 V to 3.6 V	-	7.8	20	-	30	Ω
		I <sub>SW</sub> = 32 mA; V <sub>CC</sub> = 4.5 V to 5.5 V	-	6.2	15	-	23	Ω
R <sub>ON(rail)</sub>	ON resistance (rail)	V <sub>I</sub> = GND; see Figure 9						
		I <sub>SW</sub> = 4 mA; V <sub>CC</sub> = 1.65 V to 1.95 V	-	8.2	18	-	27	Ω
		I <sub>SW</sub> = 8 mA; V <sub>CC</sub> = 2.3 V to 2.7 V	-	7.1	16	-	24	Ω
		I <sub>SW</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	6.9	14	-	21	Ω
		I <sub>SW</sub> = 24 mA; V <sub>CC</sub> = 3 V to 3.6 V	-	6.5	12	-	18	Ω
		I <sub>SW</sub> = 32 mA; V <sub>CC</sub> = 4.5 V to 5.5 V	-	5.8	10	-	15	Ω
		V <sub>I</sub> = V <sub>CC</sub> ; see Figure 9						
		I <sub>SW</sub> = 4 mA; V <sub>CC</sub> = 1.65 V to 1.95 V	-	10.4	30	-	45	Ω
		I <sub>SW</sub> = 8 mA; V <sub>CC</sub> = 2.3 V to 2.7 V	-	7.6	20	-	30	Ω
		I <sub>SW</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	7.0	18	-	27	Ω
		I <sub>SW</sub> = 24 mA; V <sub>CC</sub> = 3 V to 3.6 V	-	6.1	15	-	23	Ω
		I <sub>SW</sub> = 32 mA; V <sub>CC</sub> = 4.5 V to 5.5 V	-	4.9	10	-	15	Ω
R <sub>ON(flat)</sub>	ON resistance (flatness)	V <sub>I</sub> = GND to V <sub>CC</sub> <sup>[2]</sup>						
		I <sub>SW</sub> = 4 mA; V <sub>CC</sub> = 1.65 V to 1.95 V	-	26.0	-	-	-	Ω
		I <sub>SW</sub> = 8 mA; V <sub>CC</sub> = 2.3 V to 2.7 V	-	5.0	-	-	-	Ω
		I <sub>SW</sub> = 12 mA; V <sub>CC</sub> = 2.7 V	-	3.5	-	-	-	Ω
		I <sub>SW</sub> = 24 mA; V <sub>CC</sub> = 3 V to 3.6 V	-	2.0	-	-	-	Ω
		I <sub>SW</sub> = 32 mA; V <sub>CC</sub> = 4.5 V to 5.5 V	-	1.5	-	-	-	Ω

[1] Typical values are measured at T<sub>amb</sub> = 25 °C and nominal V<sub>CC</sub>.

[2] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V<sub>CC</sub> and temperature.

10.3 ON resistance test circuit and graphs

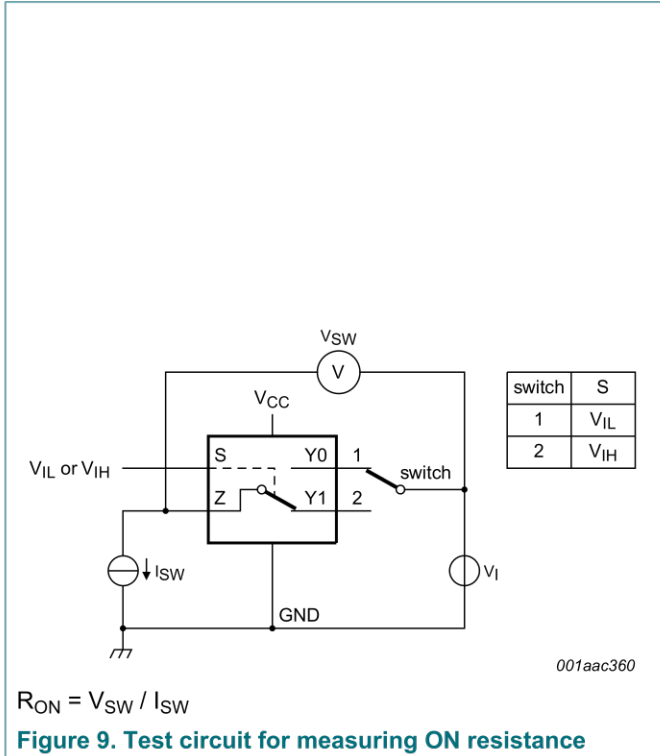
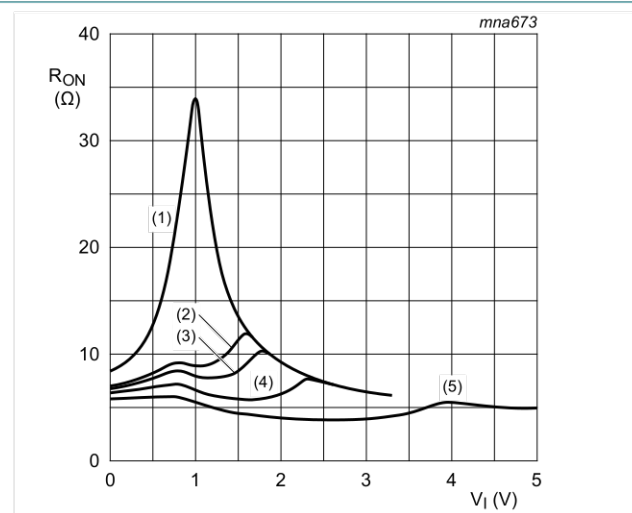
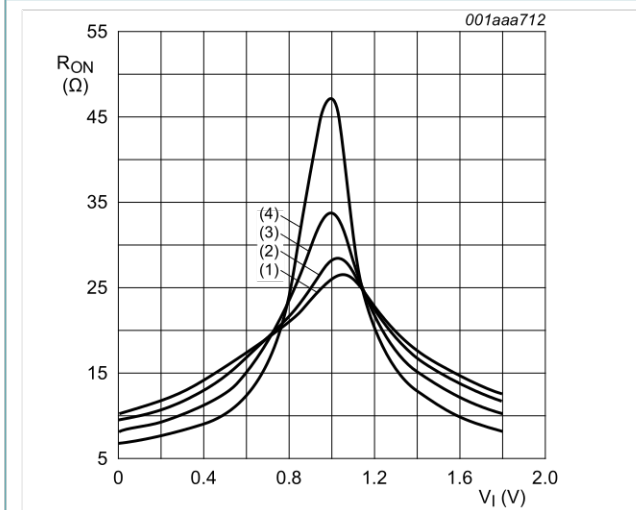


Figure 9. Test circuit for measuring ON resistance



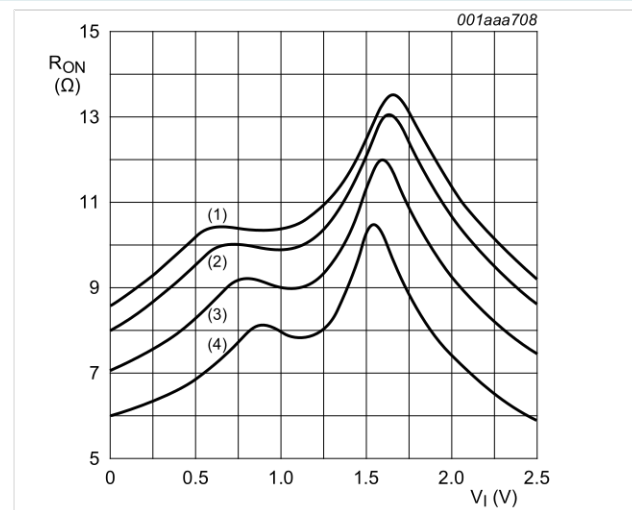
- (1) V<sub>CC</sub> = 1.8 V.
- (2) V<sub>CC</sub> = 2.5 V.
- (3) V<sub>CC</sub> = 2.7 V.
- (4) V<sub>CC</sub> = 3.3 V.
- (5) V<sub>CC</sub> = 5.0 V.

Figure 10. Typical ON resistance as a function of input voltage; T<sub>amb</sub> = 25 °C



- (1) T<sub>amb</sub> = 125 °C.
- (2) T<sub>amb</sub> = 85 °C.
- (3) T<sub>amb</sub> = 25 °C.
- (4) T<sub>amb</sub> = -40 °C.

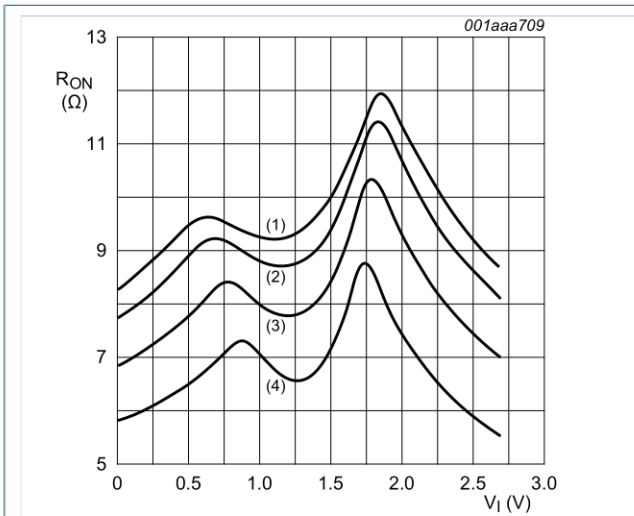
Figure 11. ON resistance as a function of input voltage; V<sub>CC</sub> = 1.8 V



- (1) T<sub>amb</sub> = 125 °C.
- (2) T<sub>amb</sub> = 85 °C.
- (3) T<sub>amb</sub> = 25 °C.
- (4) T<sub>amb</sub> = -40 °C.

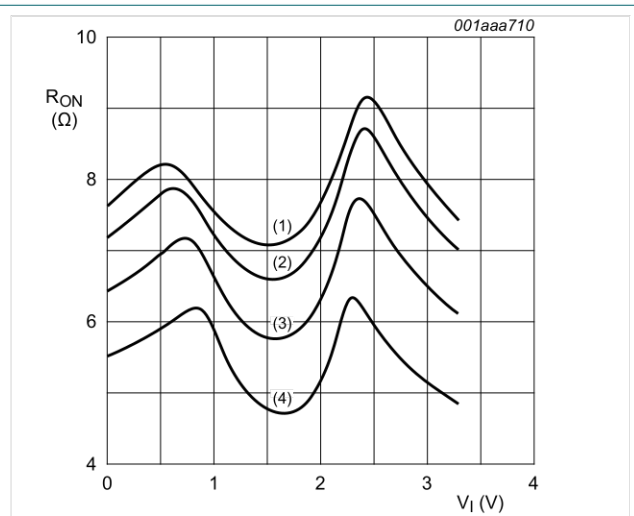
Figure 12. ON resistance as a function of input voltage; V<sub>CC</sub> = 2.5 V





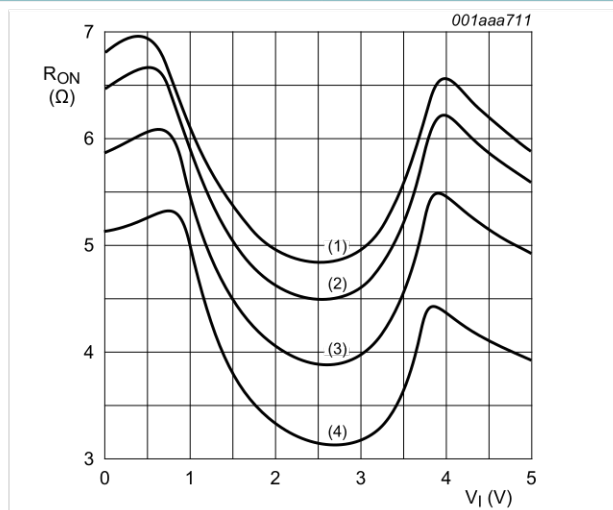
- (1)  $T_{amb} = 125$  °C.
- (2)  $T_{amb} = 85$  °C.
- (3)  $T_{amb} = 25$  °C.
- (4)  $T_{amb} = -40$  °C.

Figure 13. ON resistance as a function of input voltage;  $V_{CC} = 2.7$  V



- (1)  $T_{amb} = 125$  °C.
- (2)  $T_{amb} = 85$  °C.
- (3)  $T_{amb} = 25$  °C.
- (4)  $T_{amb} = -40$  °C.

Figure 14. ON resistance as a function of input voltage;  $V_{CC} = 3.3$  V



- (1)  $T_{amb} = 125$  °C.
- (2)  $T_{amb} = 85$  °C.
- (3)  $T_{amb} = 25$  °C.
- (4)  $T_{amb} = -40$  °C.

Figure 15. ON resistance as a function of input voltage;  $V_{CC} = 5.0$  V

## 11 Dynamic characteristics

**Table 9. Dynamic characteristics**

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see [Figure 19](#).

Symbol	Parameter	Conditions	-40 °C to +85 °C			-40 °C to +125 °C		Unit
			Min	Typ <sup>[1]</sup>	Max	Min	Max	
$t_{pd}$	propagation delay	Z to Yn or Yn to Z; see <a href="#">Figure 16</a> <sup>[2] [3]</sup>						
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	-	-	2	-	3.0	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	-	1.2	-	2.0	ns
		$V_{CC} = 2.7 \text{ V}$	-	-	1.0	-	1.5	ns
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	-	-	0.8	-	1.5	ns
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	-	-	0.6	-	1.0	ns
$t_{en}$	enable time	S to Yn; see <a href="#">Figure 17</a> <sup>[4]</sup>						
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	3.1	8.7	20.8	3.1	22.0	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	2.2	5.3	11.5	2.2	12.5	ns
		$V_{CC} = 2.7 \text{ V}$	2.1	4.9	9.3	2.1	10.2	ns
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	1.8	4.0	7.6	1.8	9.0	ns
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	1.5	3.0	5.7	1.5	6.1	ns
$t_{dis}$	disable time	S to Yn; see <a href="#">Figure 17</a> <sup>[5]</sup>						
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	3.0	6.0	11.4	3.0	11.7	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	2.1	4.4	7.3	2.1	7.6	ns
		$V_{CC} = 2.7 \text{ V}$	2.1	4.2	6.3	2.1	6.6	ns
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	1.7	3.6	5.3	1.7	5.9	ns
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	1.3	2.9	3.8	1.3	4.3	ns
$t_{b-m}$	break-before-make time	see <a href="#">Figure 18</a> <sup>[6]</sup>						
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	0.5	-	-	0.5	-	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	0.5	-	-	0.5	-	ns
		$V_{CC} = 2.7 \text{ V}$	0.5	-	-	0.5	-	ns
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	0.5	-	-	0.5	-	ns
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	0.5	-	-	0.5	-	ns

[1] Typical values are measured at  $T_{amb} = 25 \text{ °C}$  and nominal  $V_{CC}$ .

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

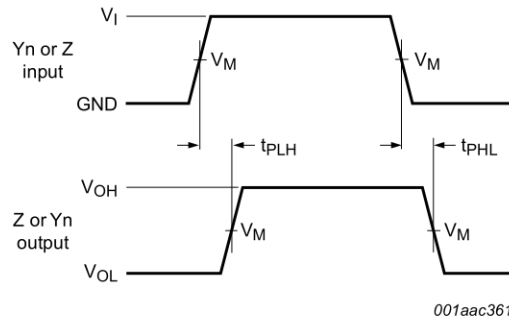
[3] Propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).

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

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

[6] Break-before-make specified by design.

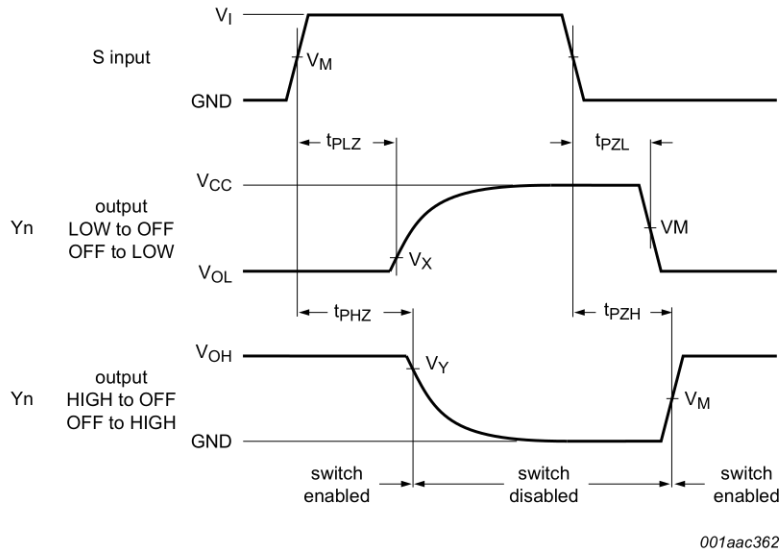
11.1 Waveforms and test circuits



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.

Figure 16. Input (Yn or Z) to output (Z or Yn) 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.

Figure 17. Enable and disable times

Table 10. Measurement points

Supply voltage	Input	Output		
$V_{CC}$	$V_M$	$V_M$	$V_X$	$V_Y$
1.65 V to 5.5 V	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3 \text{ V}$	$V_{OH} - 0.3 \text{ V}$

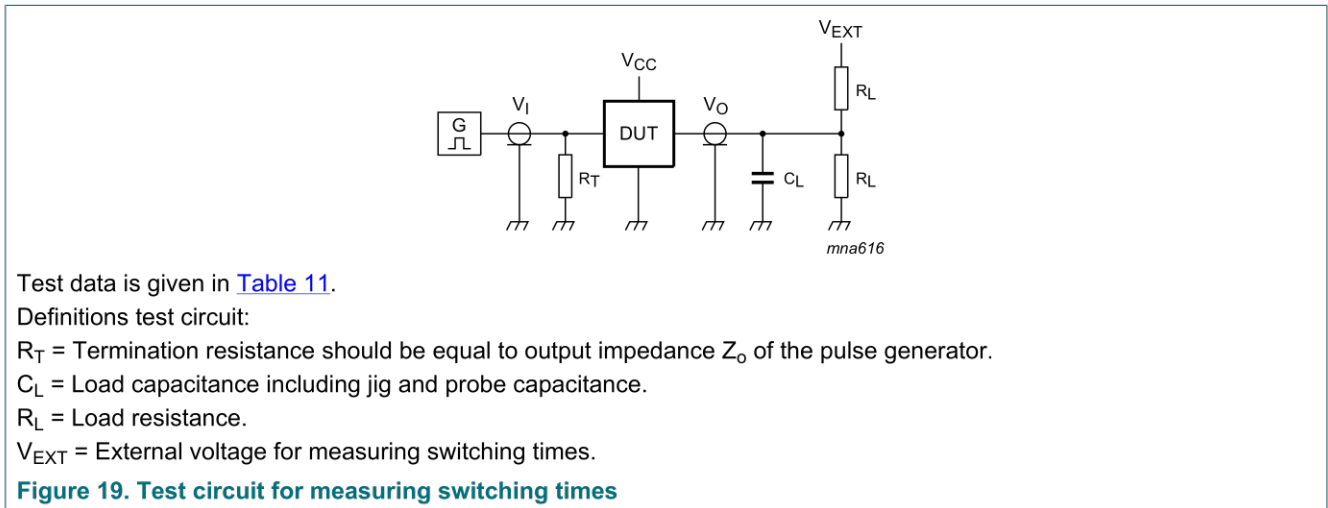
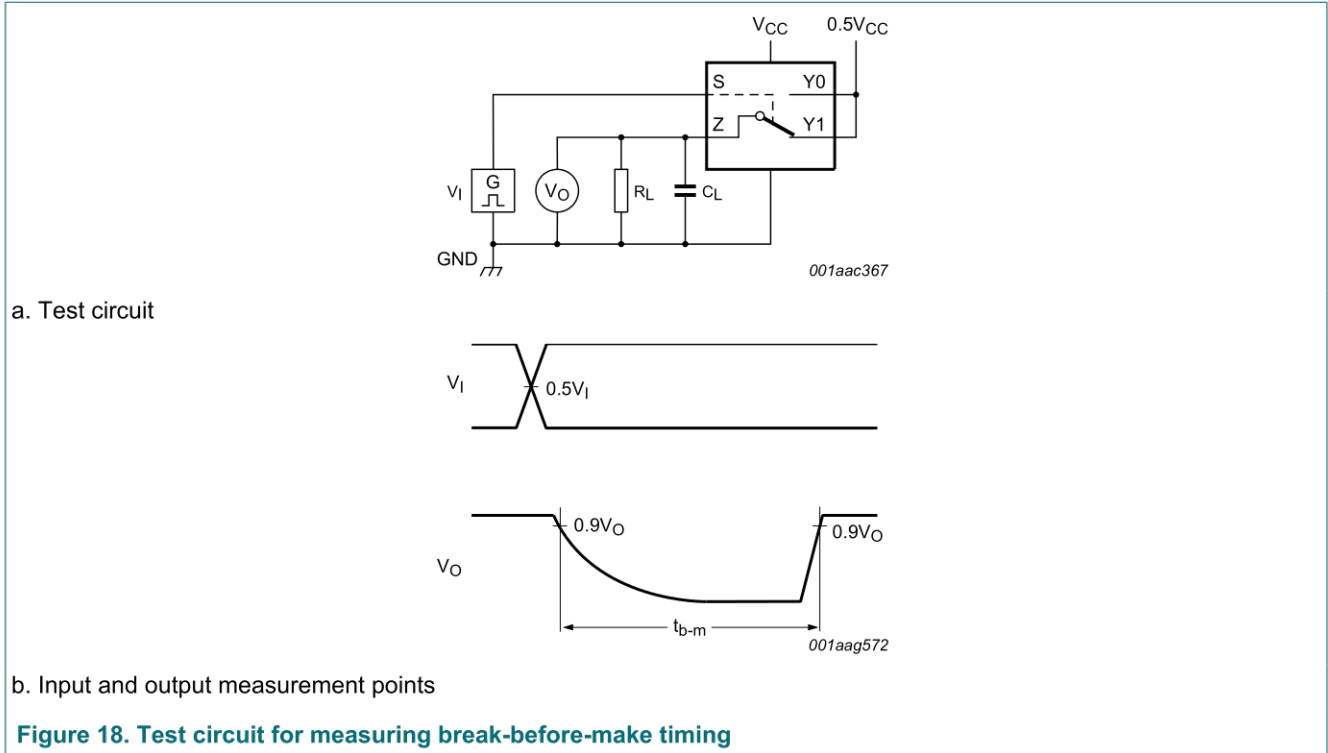


Table 11. Test data

Supply voltage	Input		Load		V <sub>EXT</sub>		
V <sub>CC</sub>	V <sub>I</sub>	t <sub>r</sub> , t <sub>f</sub>	C <sub>L</sub>	R <sub>L</sub>	t <sub>PLH</sub> , t <sub>PHL</sub>	t <sub>PZH</sub> , t <sub>PHZ</sub>	t <sub>PZL</sub> , t <sub>PLZ</sub>
1.65 V to 1.95 V	V <sub>CC</sub>	≤ 2.0 ns	50 pF	500 Ω	open	GND	2 × V <sub>CC</sub>
2.3 V to 2.7 V	V <sub>CC</sub>	≤ 2.0 ns	50 pF	500 Ω	open	GND	2 × V <sub>CC</sub>
2.7 V	V <sub>CC</sub>	≤ 2.5 ns	50 pF	500 Ω	open	GND	2 × V <sub>CC</sub>
3 V to 3.6 V	V <sub>CC</sub>	≤ 2.5 ns	50 pF	500 Ω	open	GND	2 × V <sub>CC</sub>
4.5 V to 5.5 V	V <sub>CC</sub>	≤ 2.5 ns	50 pF	500 Ω	open	GND	2 × V <sub>CC</sub>

## 11.2 Additional dynamic characteristics

Table 12. Additional dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); T<sub>amb</sub> = 25 °C.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
THD	total harmonic distortion	f <sub>i</sub> = 600 Hz to 20 kHz; R <sub>L</sub> = 600 Ω; C <sub>L</sub> = 50 pF; V <sub>I</sub> = 0.5 V (p-p); see <a href="#">Figure 20</a>				
		V <sub>CC</sub> = 1.65 V	-	0.260	-	%
		V <sub>CC</sub> = 2.3 V	-	0.078	-	%
		V <sub>CC</sub> = 3.0 V	-	0.078	-	%
		V <sub>CC</sub> = 4.5 V	-	0.078	-	%
f <sub>(-3dB)</sub>	-3 dB frequency response	R <sub>L</sub> = 50 Ω; see <a href="#">Figure 21</a>				
		V <sub>CC</sub> = 1.65 V	-	200	-	MHz
		V <sub>CC</sub> = 2.3 V	-	300	-	MHz
		V <sub>CC</sub> = 3.0 V	-	300	-	MHz
		V <sub>CC</sub> = 4.5 V	-	300	-	MHz
α <sub>iso</sub>	isolation (OFF-state)	R <sub>L</sub> = 50 Ω; C <sub>L</sub> = 5 pF; f <sub>i</sub> = 10 MHz; see <a href="#">Figure 22</a>				
		V <sub>CC</sub> = 1.65 V	-	-42	-	dB
		V <sub>CC</sub> = 2.3 V	-	-42	-	dB
		V <sub>CC</sub> = 3.0 V	-	-40	-	dB
		V <sub>CC</sub> = 4.5 V	-	-40	-	dB
Q <sub>inj</sub>	charge injection	C <sub>L</sub> = 0.1 nF; V <sub>gen</sub> = 0 V; R <sub>gen</sub> = 0 Ω; f <sub>i</sub> = 1 MHz; R <sub>L</sub> = 1 MΩ; see <a href="#">Figure 23</a>				
		V <sub>CC</sub> = 1.8 V	-	3.3	-	pC
		V <sub>CC</sub> = 2.5 V	-	4.1	-	pC
		V <sub>CC</sub> = 3.3 V	-	5.0	-	pC
		V <sub>CC</sub> = 4.5 V	-	6.4	-	pC
	V <sub>CC</sub> = 5.5 V	-	7.5	-	pC	

11.3 Test circuits

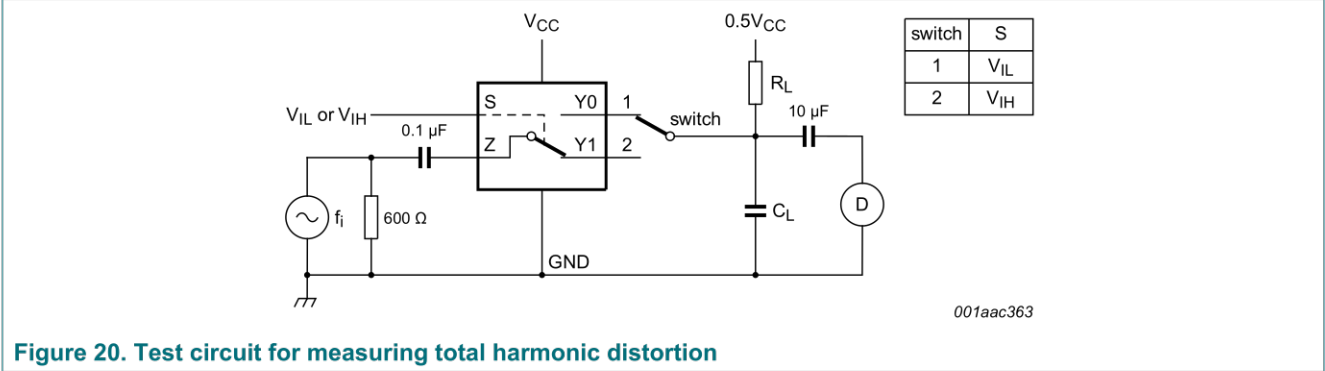
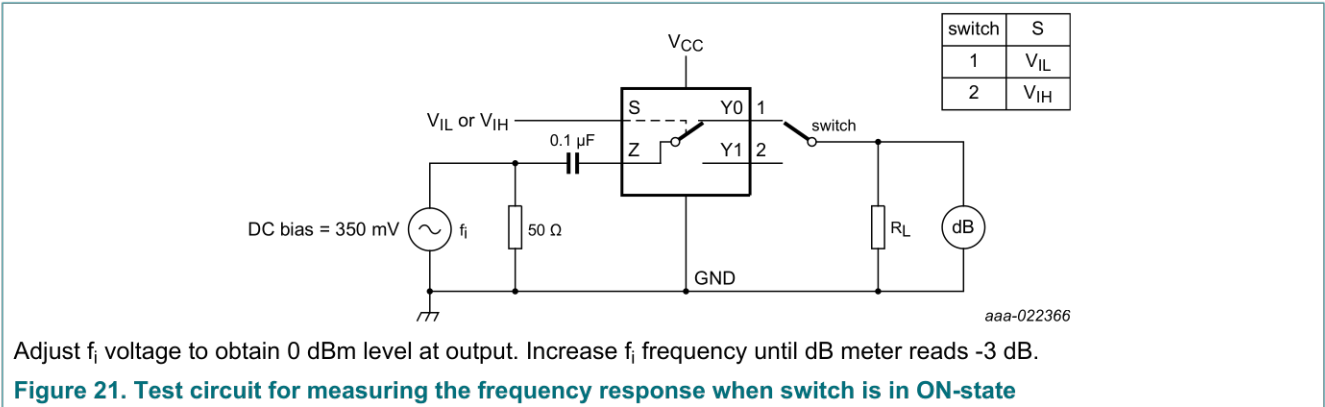
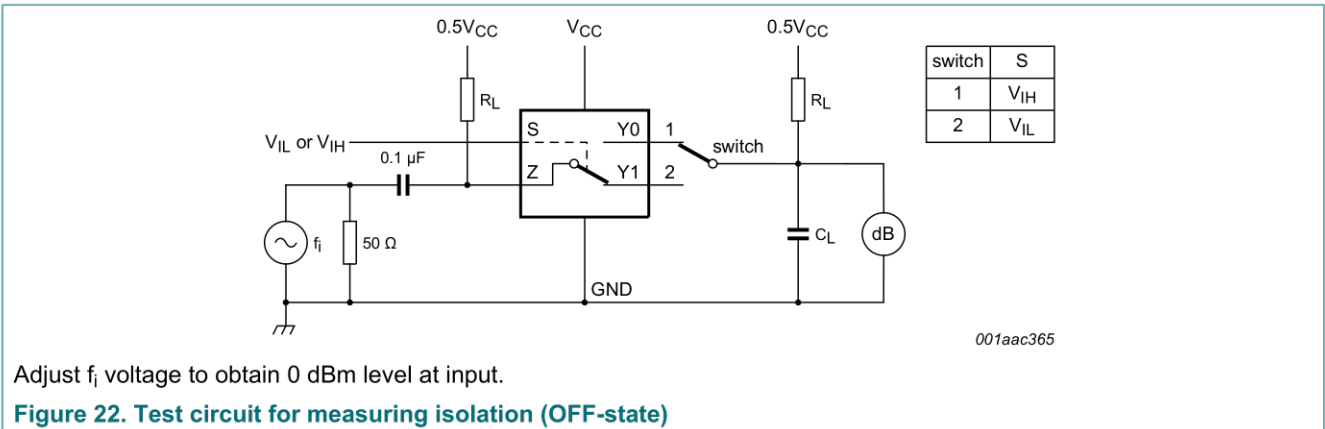


Figure 20. Test circuit for measuring total harmonic distortion



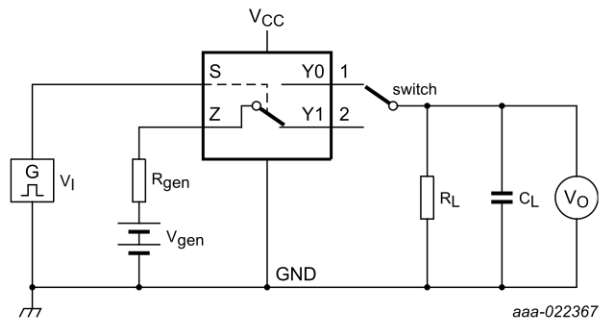
Adjust  $f_i$  voltage to obtain 0 dBm level at output. Increase  $f_i$  frequency until dB meter reads -3 dB.

Figure 21. Test circuit for measuring the frequency response when switch is in ON-state

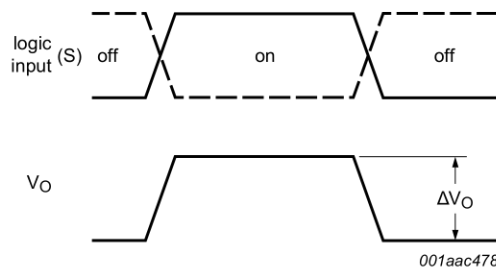


Adjust  $f_i$  voltage to obtain 0 dBm level at input.

Figure 22. Test circuit for measuring isolation (OFF-state)



a. Test circuit



b. Input and output pulse definitions

$$Q_{inj} = \Delta V_O \times C_L$$

$\Delta V_O$  = output voltage variation.

$R_{gen}$  = generator resistance.

$V_{gen}$  = generator voltage.

**Figure 23. Test circuit for measuring charge injection**

12 Package outline

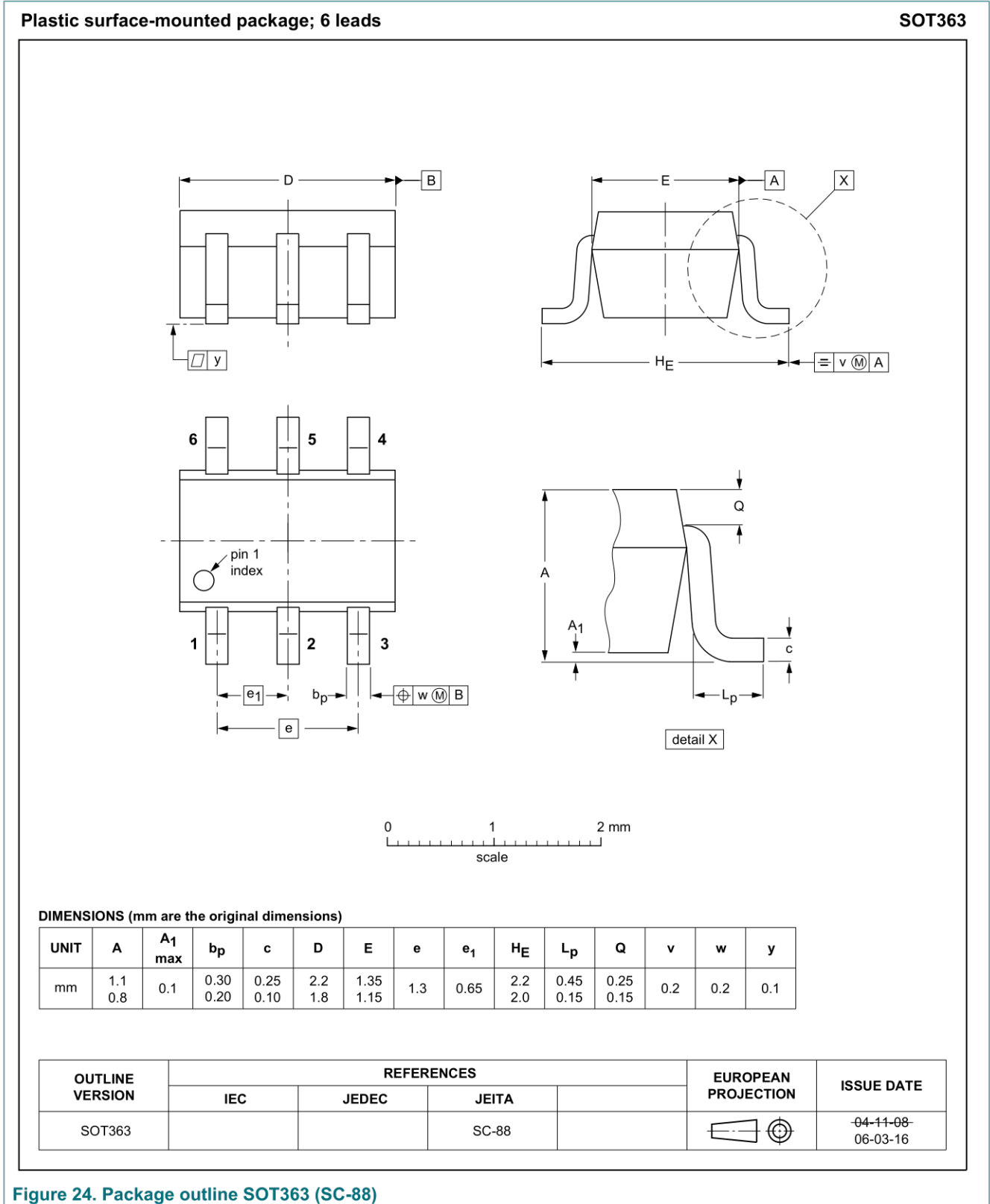
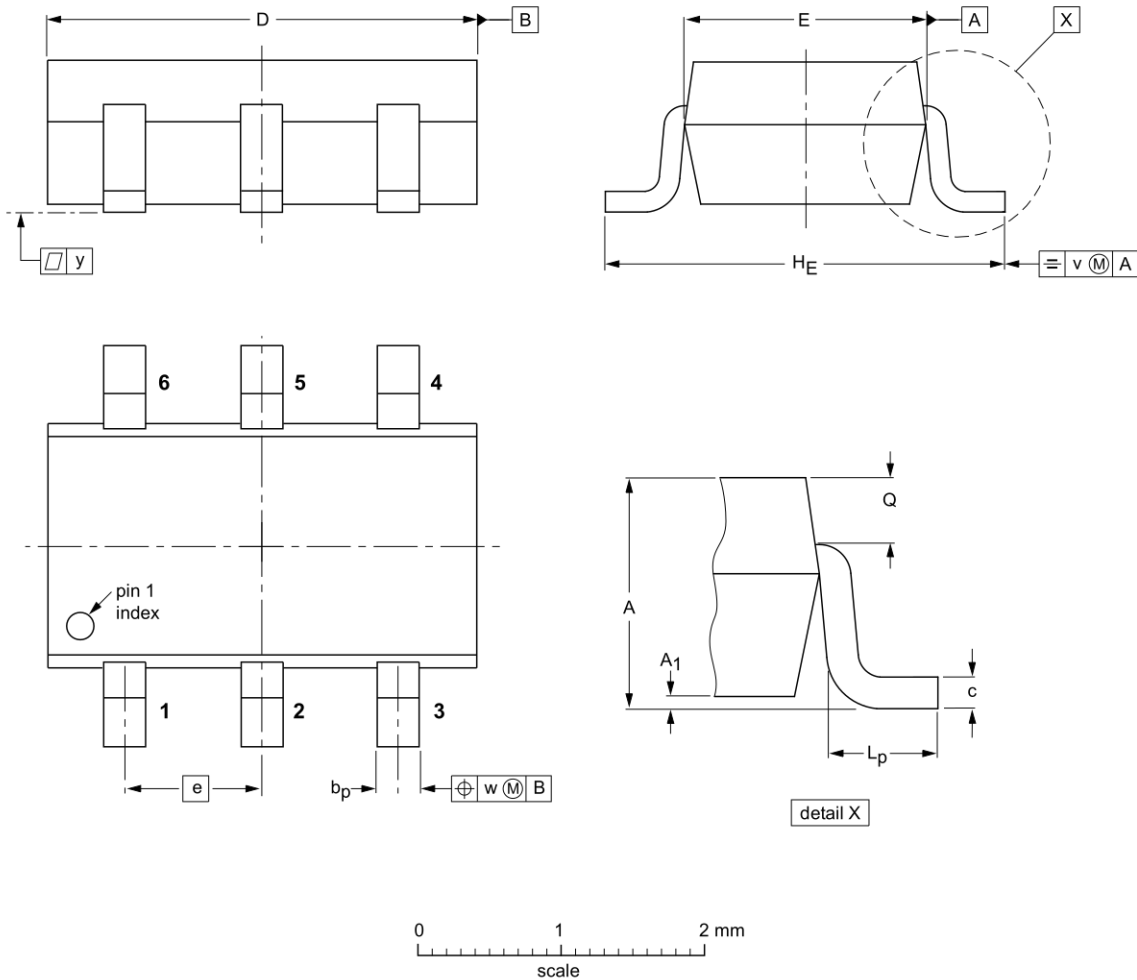


Figure 24. Package outline SOT363 (SC-88)



Plastic surface-mounted package (TSOP6); 6 leads

SOT457



**DIMENSIONS (mm are the original dimensions)**

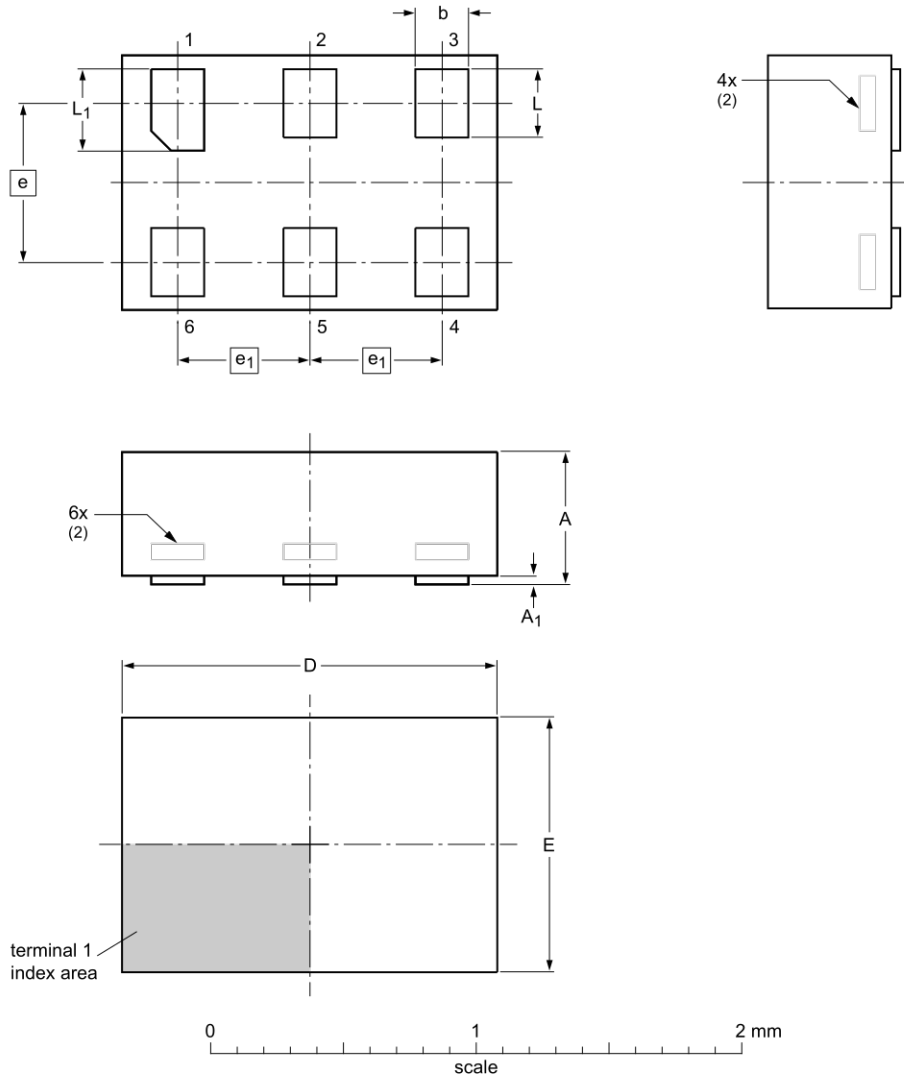
UNIT	A	A <sub>1</sub>	b <sub>p</sub>	c	D	E	e	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.1 0.9	0.1 0.013	0.40 0.25	0.26 0.10	3.1 2.7	1.7 1.3	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT457			SC-74		-05-11-07- 06-03-16

Figure 25. Package outline SOT457 (SC-74)

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 <sup>(1)</sup>	A <sub>1</sub>	b	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
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

- Including plating thickness.
- Can be visible in some manufacturing processes.

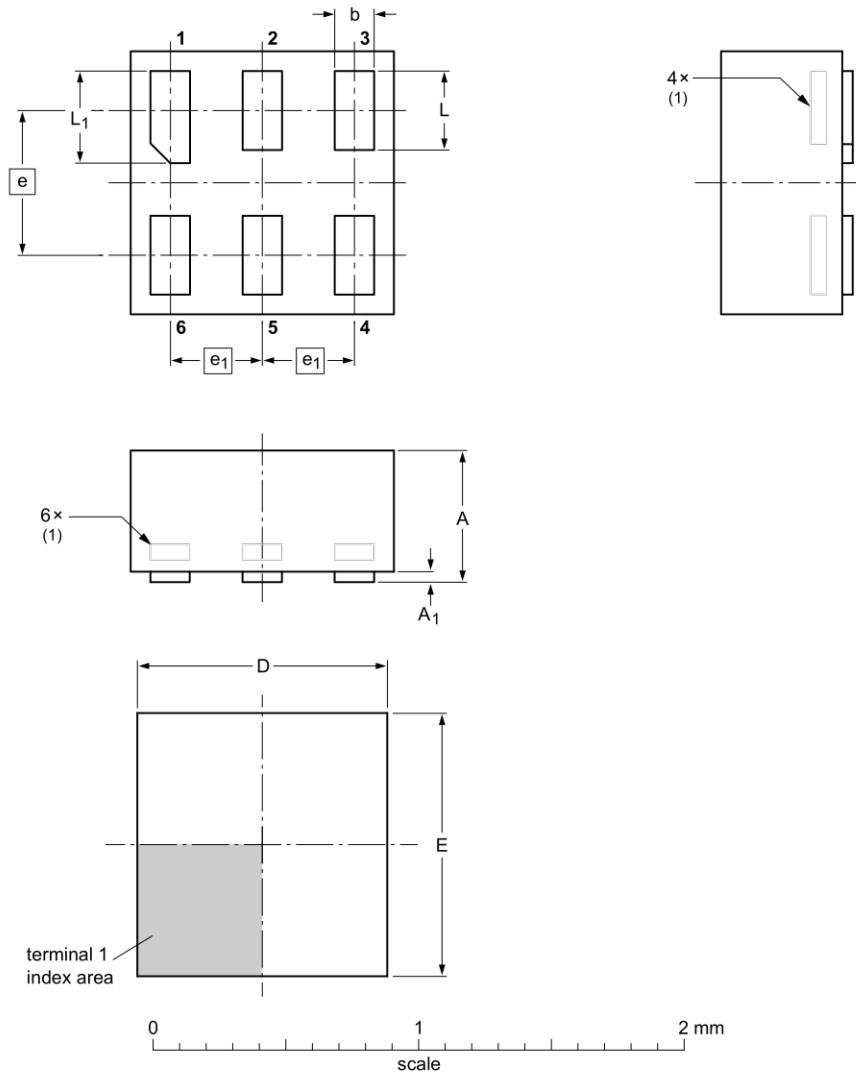
sot886\_po

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

Figure 26. 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 <sub>1</sub> max	b	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
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**

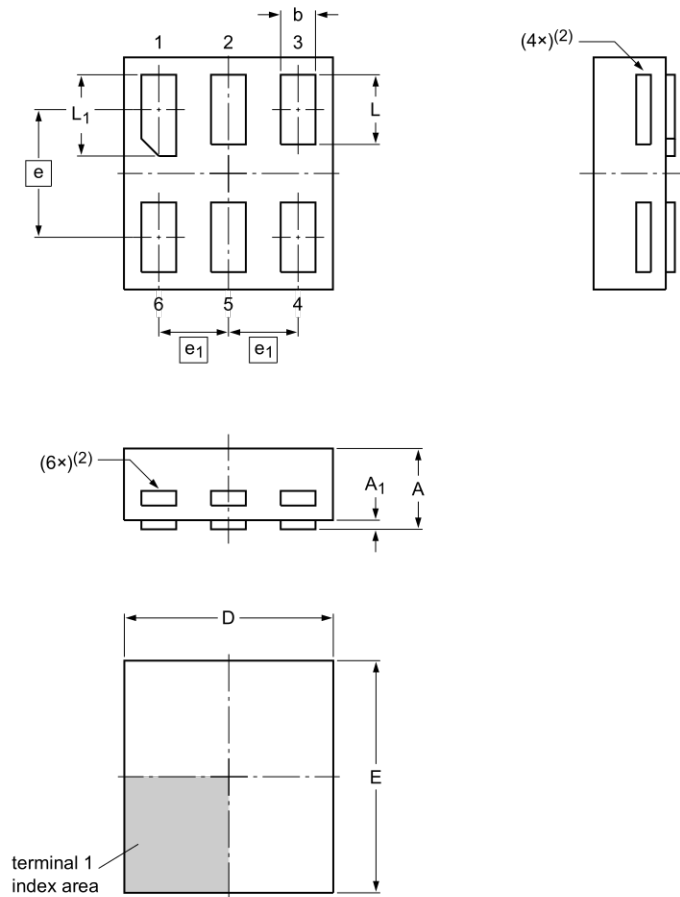
1. Can be visible in some manufacturing processes.

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

Figure 27. 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 <sup>(1)</sup>	A <sub>1</sub>	b	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
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

- Including plating thickness.
- Visible depending upon used manufacturing technology.

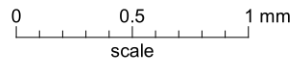
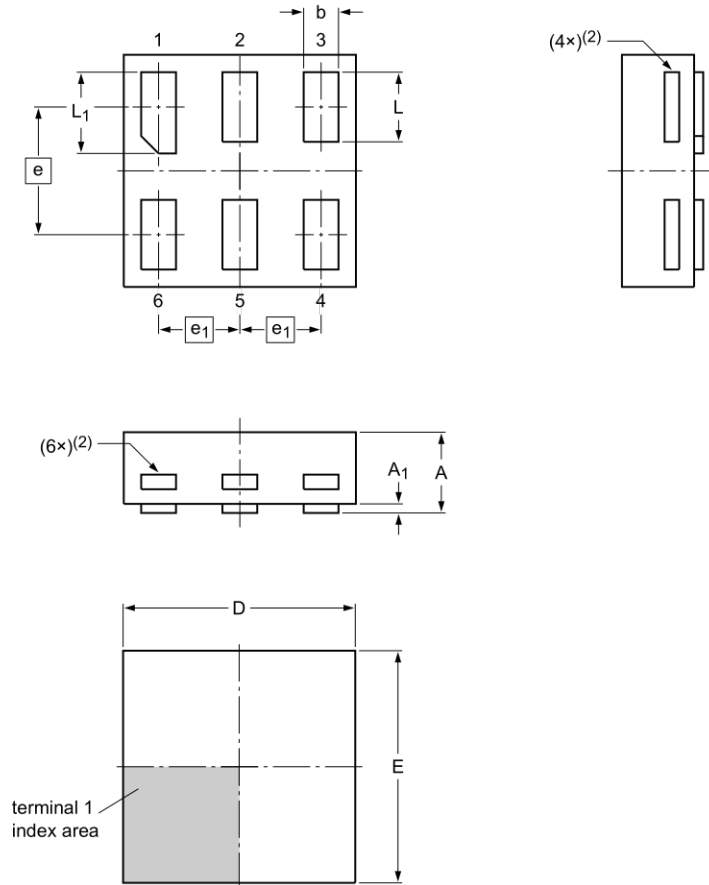
sot1115\_po

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

Figure 28. 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 <sup>(1)</sup>	A <sub>1</sub>	b	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
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

- Including plating thickness.
- 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

Figure 29. Package outline SOT1202 (XSON6)

X2SON6: plastic thermal enhanced extremely thin small outline package; no leads;  
6 terminals; body 1.0 x 0.8 x 0.35 mm

SOT1255

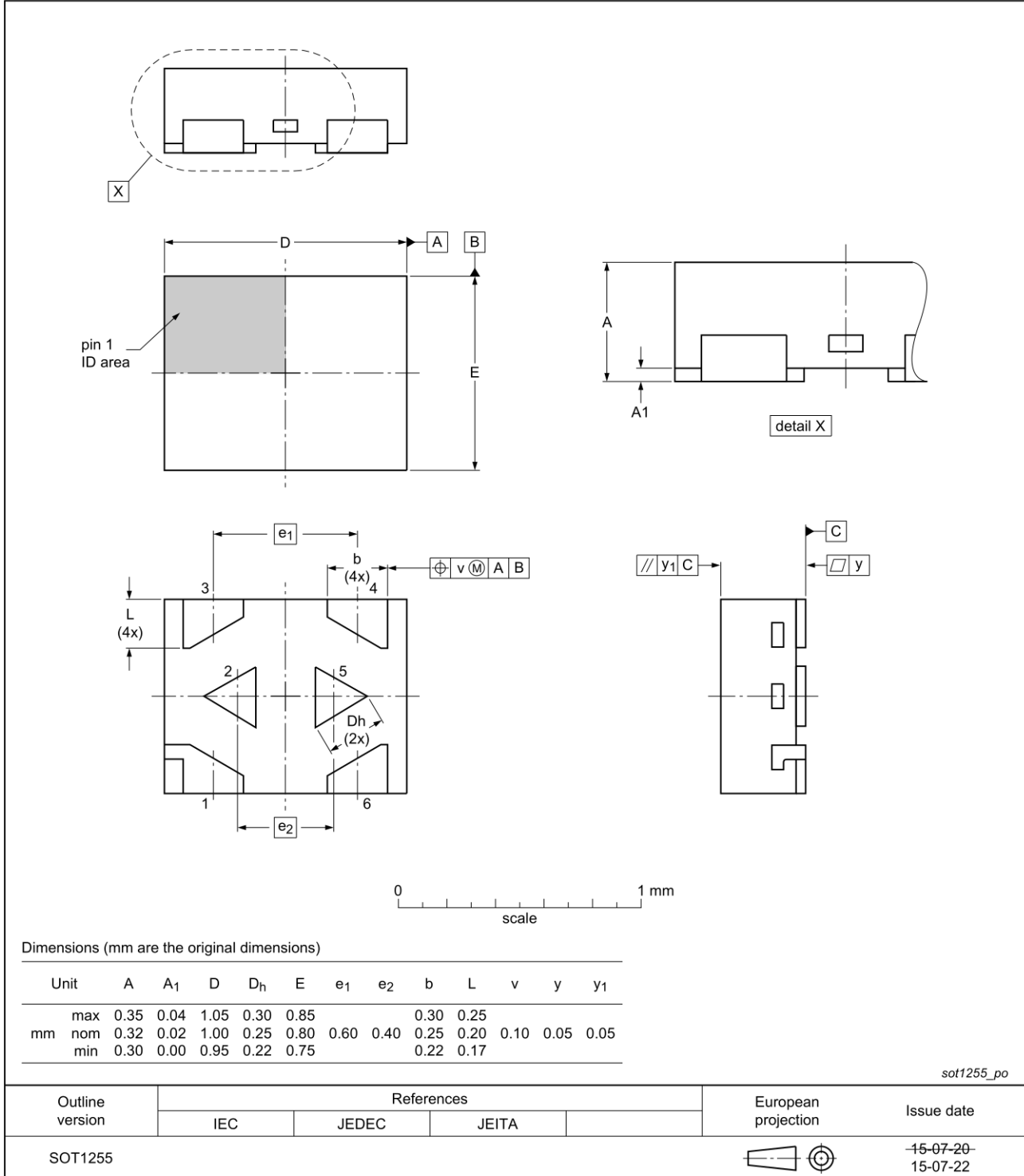


Figure 30. Package outline SOT1255 (X2SON6)

## 13 Abbreviations

Table 13. Abbreviations

Acronym	Description
CMOS	Complementary Metal-Oxide Semiconductor
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model
TTL	Transistor-Transistor Logic

## 14 Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC1G3157 v.7	20170214	Product data sheet	-	74LVC1G3157 v.6
Modifications:	<ul style="list-style-type: none"> <li>• <a href="#">Table 7</a>: The maximum limits for leakage current and supply current have changed.</li> <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> </ul>			
74LVC1G3157 v.6	20160512	Product data sheet	-	74LVC1G3157 v.5
Modifications:	<ul style="list-style-type: none"> <li>• Added type number 74LVC1G3157GX (SOT1255 package)</li> <li>• <a href="#">Table 9</a>: Minimum and maximum values enable and disable times revised.</li> <li>• <a href="#">Table 12</a> and <a href="#">Figure 21</a>: Condition and test circuit for <math>f_{(-3dB)}</math> revised.</li> <li>• <a href="#">Figure 23</a>: Test circuit for charge injection revised.</li> </ul>			
74LVC1G3157 v.5	20121206	Product data sheet	-	74LVC1G3157 v.4
Modifications:	<ul style="list-style-type: none"> <li>• Package outline drawing of SOT886 (<a href="#">Figure 26</a>) modified.</li> </ul>			
74LVC1G3157 v.4	20111206	Product data sheet	-	74LVC1G3157 v.3
74LVC1G3157 v.3	20100916	Product data sheet	-	74LVC1G3157 v.2
74LVC1G3157 v.2	20070918	Product data sheet	-	74LVC1G3157 v.1
74LVC1G3157 v.1	20050207	Product data sheet	-	-

## 15 Legal information

### 15.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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## Contents

<b>1</b>	<b>General description</b> .....	<b>1</b>
<b>2</b>	<b>Features and benefits</b> .....	<b>1</b>
<b>3</b>	<b>Ordering information</b> .....	<b>2</b>
<b>4</b>	<b>Marking</b> .....	<b>2</b>
<b>5</b>	<b>Functional diagram</b> .....	<b>3</b>
<b>6</b>	<b>Pinning information</b> .....	<b>3</b>
6.1	Pinning .....	3
6.2	Pin description .....	4
<b>7</b>	<b>Functional description</b> .....	<b>4</b>
<b>8</b>	<b>Limiting values</b> .....	<b>4</b>
<b>9</b>	<b>Recommended operating conditions</b> .....	<b>5</b>
<b>10</b>	<b>Static characteristics</b> .....	<b>5</b>
10.1	Test circuits .....	6
10.2	ON resistance .....	7
10.3	ON resistance test circuit and graphs .....	8
<b>11</b>	<b>Dynamic characteristics</b> .....	<b>10</b>
11.1	Waveforms and test circuits .....	11
11.2	Additional dynamic characteristics .....	13
11.3	Test circuits .....	14
<b>12</b>	<b>Package outline</b> .....	<b>16</b>
<b>13</b>	<b>Abbreviations</b> .....	<b>23</b>
<b>14</b>	<b>Revision history</b> .....	<b>23</b>
<b>15</b>	<b>Legal information</b> .....	<b>24</b>

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