

74LVC1G3157

2-channel analog multiplexer/demultiplexer

Rev. 8 — 4 February 2022

Product data sheet

1. General description

The 74LVC1G3157 is a single-pole double-throw analog switch with a digital select input (S), two independent inputs/outputs (Y0 and Y1) and a common input/output (Z). Control inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments.

Schmitt-trigger action at control inputs makes the circuit tolerant of slower input rise and fall times.

2. Features and benefits

- Wide supply voltage range from 1.65 V to 5.5 V
- Very low ON resistance:
 - 7.5 Ω (typical) at $V_{CC} = 2.7$ V
 - 6.5 Ω (typical) at $V_{CC} = 3.3$ V
 - 6 Ω (typical) at $V_{CC} = 5$ V
- 32 mA continuous switch current
- Break-before-make switching
- High noise immunity
- CMOS low power dissipation
- TTL interface compatibility at 3.3 V
- Latch-up performance meets requirements of JESD 78 Class I
- ESD protection:
 - HBM EIA/JESD22-A114-A exceeds 2000V
 - MM EIA/JESD22-A115-A exceeds 200V
- Overvoltage tolerant control inputs 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 | TSSOP6 | plastic thin shrink small outline package; 6 leads; body width 1.25 mm | SOT363-2 |
| 74LVC1G3157GV | -40 °C to +125 °C | SC-74; TSOP6 | plastic surface-mounted package; 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[1] |
|---------------|-----------------|
| 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

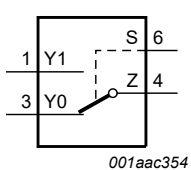


Fig. 1. Logic symbol

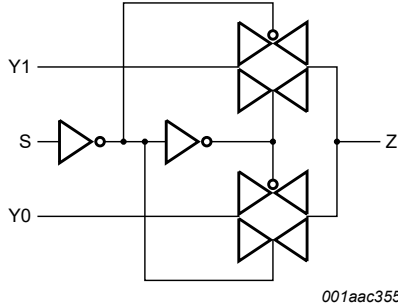
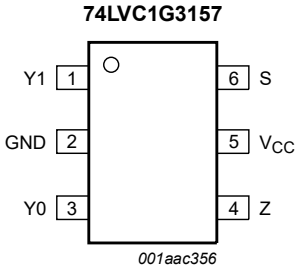
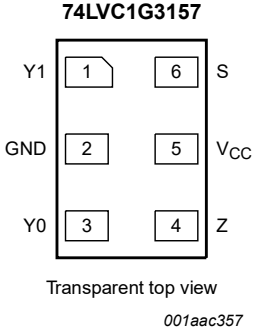
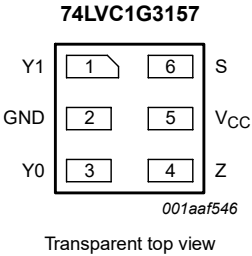
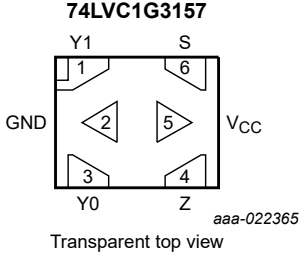


Fig. 2. Logic diagram

6. Pinning information

6.1. Pinning

| | |
|---|--|
|  <p>Fig. 3. Pin configuration SOT363-2 (TSSOP6) and SOT457 (SC-74; TSOP6)</p> |  <p>Fig. 4. Pin configuration SOT886 (XSON6)</p> |
|  <p>Fig. 5. Pin configuration SOT891, SOT1115 and SOT1202 (XSON6)</p> |  <p>Fig. 6. Pin configuration SOT1255 (X2SON6)</p> |

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 _{CC} | 5 | supply voltage |
| S | 6 | select input |

7. Functional description

Table 4. Function table

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

| Input S | Channel on |
|---------|------------|
| L | Y0 |
| H | Y1 |

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 | +6.5 | V |
| V_I | input voltage | [1] | -0.5 | +6.5 | V |
| I_{IK} | input clamping current | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | -50 | - | mA |
| I_{SK} | switch clamping current | $V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$ | - | ± 50 | mA |
| V_{SW} | switch voltage | enable and disable mode [2] | -0.5 | $V_{CC} + 0.5$ | V |
| I_{SW} | switch current | $V_{SW} > -0.5\text{ V}$ or $V_{SW} < V_{CC} + 0.5\text{ V}$ | - | ± 50 | mA |
| I_{CC} | supply current | | - | 100 | mA |
| I_{GND} | ground current | | -100 | - | mA |
| T_{stg} | storage temperature | | -65 | +150 | °C |
| P_{tot} | total power dissipation | $T_{amb} = -40\text{ °C}$ to $+125\text{ °C}$ [3] | - | 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 SOT363-2 (TSSOP6) package: P_{tot} derates linearly with 3.7 mW/K above 83 °C.

For SOT457 (SC-74; TSOP6) package: P_{tot} derates linearly with 4.1 mW/K above 89 °C.

For SOT886 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.

For SOT891 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.

For SOT1115 (XSON6) package: P_{tot} derates linearly with 3.2 mW/K above 71 °C.

For SOT1202 (XSON6) package: P_{tot} derates linearly with 3.3 mW/K above 74 °C.

For SOT1255 (X2SON6) package: P_{tot} derates linearly with 3.3 mW/K above 75 °C.

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 [1] | 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 V [2] | - | - | 20 | ns/V |
| | | $V_{CC} = 2.7\text{ V}$ to 5.5 V [2] | - | - | 10 | ns/V |

[1] To avoid sinking GND current from terminal Z when switch current flows in terminal Yn, 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 Yn. In this case, there is no limit for the voltage drop across the switch.

[2] Applies to control signal levels.

10. Static characteristics

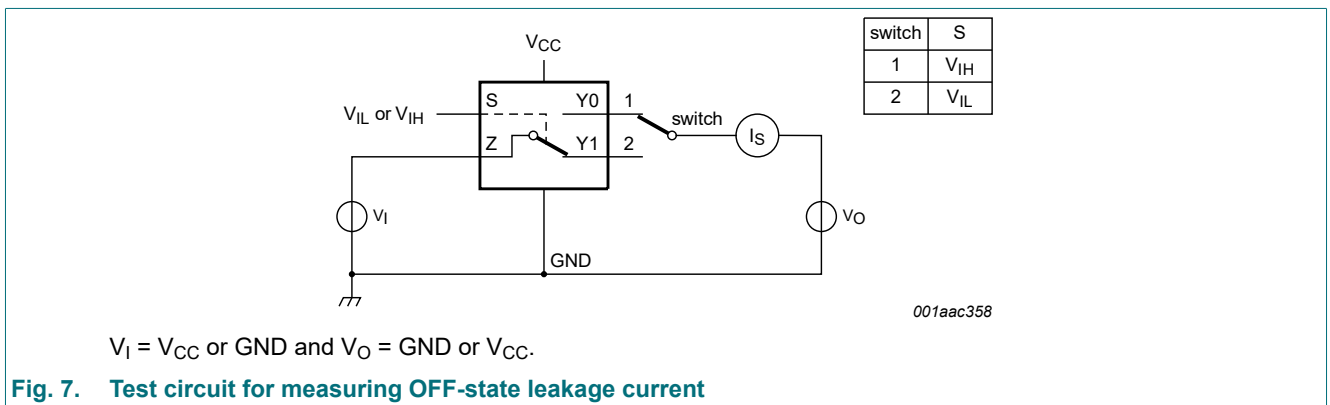
Table 7. Static characteristics

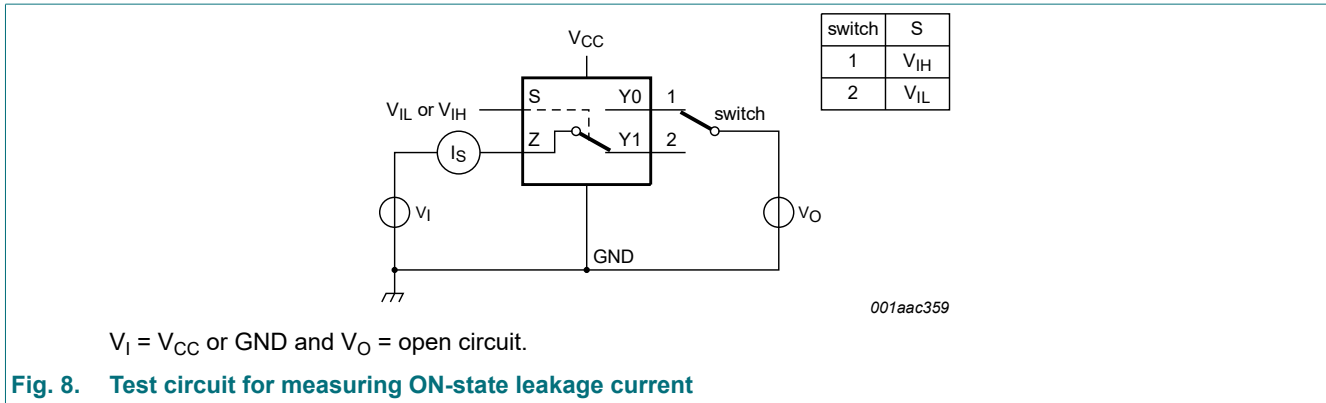
At recommended operating conditions; voltages are referenced to GND (ground 0 V).

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|---------------------|---------------------------|--|------------------------|---------|------------------------|------------------------|------------------------|------|
| | | | Min | Typ [1] | Max | Min | Max | |
| V _{IH} | HIGH-level input voltage | V _{CC} = 1.65 V to 1.95 V | 0.65 × V _{CC} | - | - | 0.65 × V _{CC} | - | V |
| | | V _{CC} = 2.3 V to 2.7 V | 1.7 | - | - | 1.7 | - | V |
| | | V _{CC} = 3 V to 3.6 V | 2.0 | - | - | 2.0 | - | V |
| | | V _{CC} = 4.5 V to 5.5 V | 0.7 × V _{CC} | - | - | 0.7 × V _{CC} | - | V |
| V _{IL} | LOW-level input voltage | V _{CC} = 1.65 V to 1.95 V | - | - | 0.35 × V _{CC} | - | 0.35 × V _{CC} | V |
| | | V _{CC} = 2.3 V to 2.7 V | - | - | 0.7 | - | 0.7 | V |
| | | V _{CC} = 3 V to 3.6 V | - | - | 0.8 | - | 0.8 | V |
| | | V _{CC} = 4.5 V to 5.5 V | - | - | 0.3 × V _{CC} | - | 0.3 × V _{CC} | V |
| I _I | input leakage current | pin S; V _I = 5.5 V or GND; V _{CC} = 0 V to 5.5 V [2] | - | ±0.1 | ±1 | - | ±1 | µA |
| I _{S(OFF)} | OFF-state leakage current | V _{CC} = 5.5 V; see Fig. 7 [2] | - | ±0.1 | ±0.2 | - | ±0.5 | µA |
| I _{S(ON)} | ON-state leakage current | V _{CC} = 5.5 V; see Fig. 8 [2] | - | ±0.1 | ±1 | - | ±2 | µA |
| I _{CC} | supply current | V _I = 5.5 V or GND; V _{SW} = GND or V _{CC} ; V _{CC} = 1.65 V to 5.5 V [2] | - | 0.1 | 4 | - | 4 | µA |
| ΔI _{CC} | additional supply current | pin S; V _I = V _{CC} - 0.6 V; V _{CC} = 5.5 V; V _{SW} = GND or V _{CC} [2] | - | 5 | 500 | - | 500 | µA |
| C _I | input capacitance | | - | 2.5 | - | - | - | pF |
| 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 °C.
- [2] These typical values are measured at V_{CC} = 3.3 V.

10.1. Test circuits





10.2. ON resistance

Table 8. ON resistance

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

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|-----------------------|--------------------------|--|------------------|---------|-----|-------------------|-----|------|
| | | | Min | Typ [1] | Max | Min | Max | |
| R _{ON(peak)} | ON resistance (peak) | $V_1 = GND$ to V_{CC} ; see Fig. 9 | | | | | | |
| | | $I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V | - | 34.0 | 130 | - | 195 | Ω |
| | | $I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V | - | 12.0 | 30 | - | 45 | Ω |
| | | $I_{SW} = 12$ mA; $V_{CC} = 2.7$ V | - | 10.4 | 25 | - | 38 | Ω |
| | | $I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V | - | 7.8 | 20 | - | 30 | Ω |
| | | $I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V | - | 6.2 | 15 | - | 23 | Ω |
| R _{ON(rail)} | ON resistance (rail) | $V_1 = GND$; see Fig. 9 | | | | | | |
| | | $I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V | - | 8.2 | 18 | - | 27 | Ω |
| | | $I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V | - | 7.1 | 16 | - | 24 | Ω |
| | | $I_{SW} = 12$ mA; $V_{CC} = 2.7$ V | - | 6.9 | 14 | - | 21 | Ω |
| | | $I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V | - | 6.5 | 12 | - | 18 | Ω |
| | | $I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V | - | 5.8 | 10 | - | 15 | Ω |
| | | $V_1 = V_{CC}$; see Fig. 9 | | | | | | |
| | | $I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V | - | 10.4 | 30 | - | 45 | Ω |
| | | $I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V | - | 7.6 | 20 | - | 30 | Ω |
| | | $I_{SW} = 12$ mA; $V_{CC} = 2.7$ V | - | 7.0 | 18 | - | 27 | Ω |
| | | $I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V | - | 6.1 | 15 | - | 23 | Ω |
| | | $I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V | - | 4.9 | 10 | - | 15 | Ω |
| R _{ON(flat)} | ON resistance (flatness) | $V_1 = GND$ to V_{CC} [2] | | | | | | |
| | | $I_{SW} = 4$ mA; $V_{CC} = 1.65$ V to 1.95 V | - | 26.0 | - | - | - | Ω |
| | | $I_{SW} = 8$ mA; $V_{CC} = 2.3$ V to 2.7 V | - | 5.0 | - | - | - | Ω |
| | | $I_{SW} = 12$ mA; $V_{CC} = 2.7$ V | - | 3.5 | - | - | - | Ω |
| | | $I_{SW} = 24$ mA; $V_{CC} = 3$ V to 3.6 V | - | 2.0 | - | - | - | Ω |
| | | $I_{SW} = 32$ mA; $V_{CC} = 4.5$ V to 5.5 V | - | 1.5 | - | - | - | Ω |

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

[2] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V_{CC} and temperature.

10.3. ON resistance test circuit and graphs

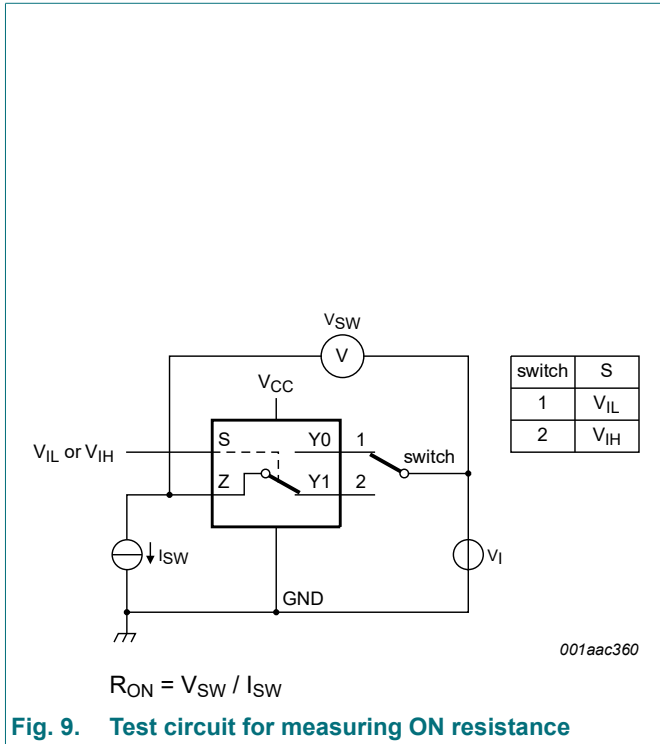


Fig. 9. Test circuit for measuring ON resistance

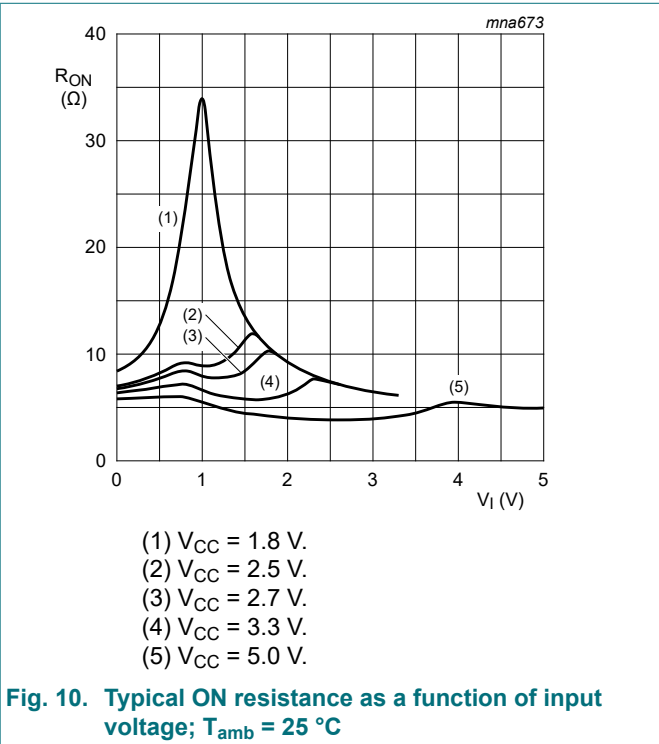


Fig. 10. Typical ON resistance as a function of input voltage; $T_{amb} = 25 \text{ }^\circ\text{C}$

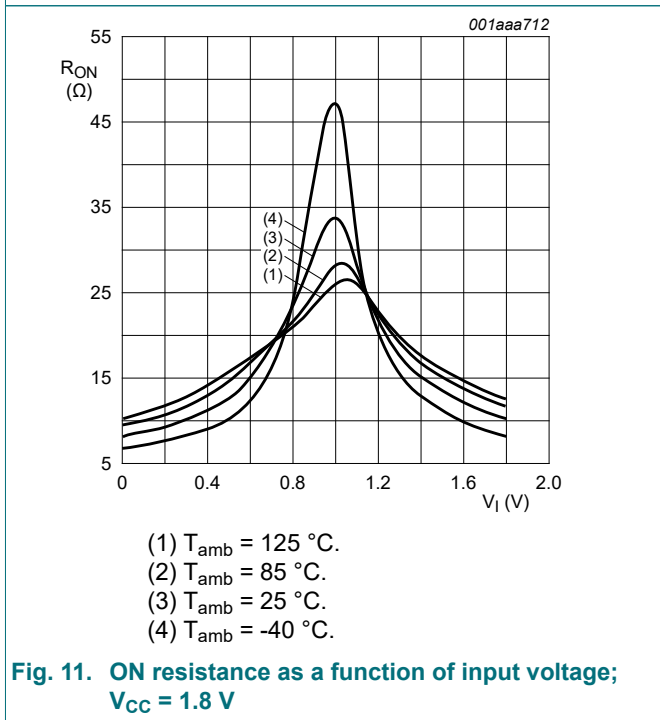


Fig. 11. ON resistance as a function of input voltage; $V_{CC} = 1.8 \text{ V}$

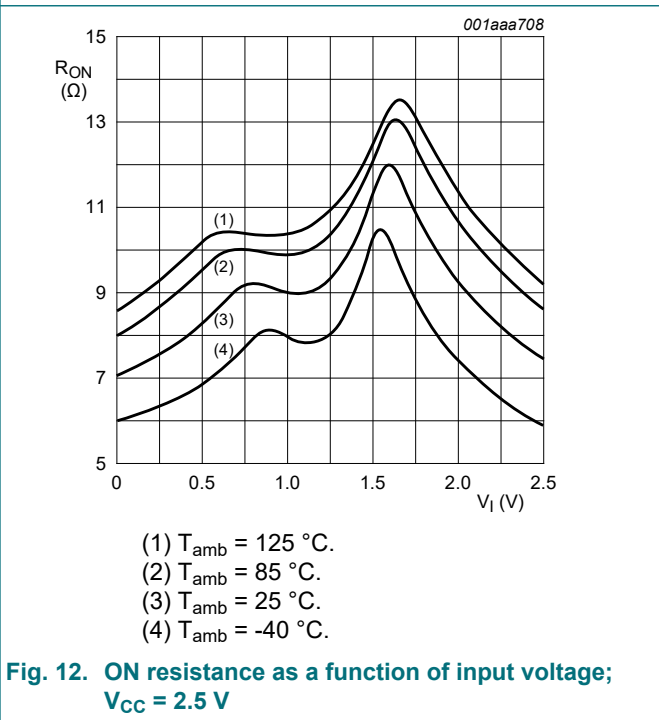
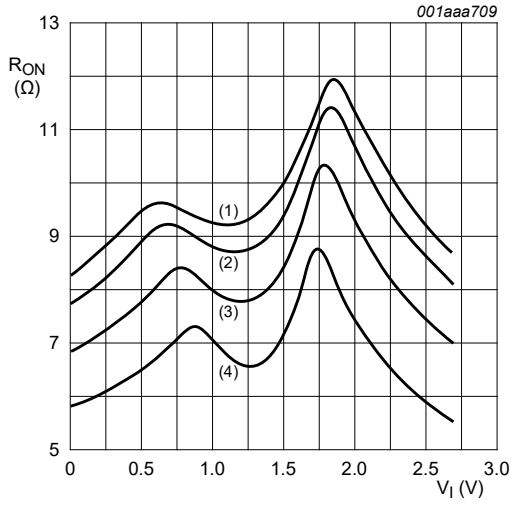
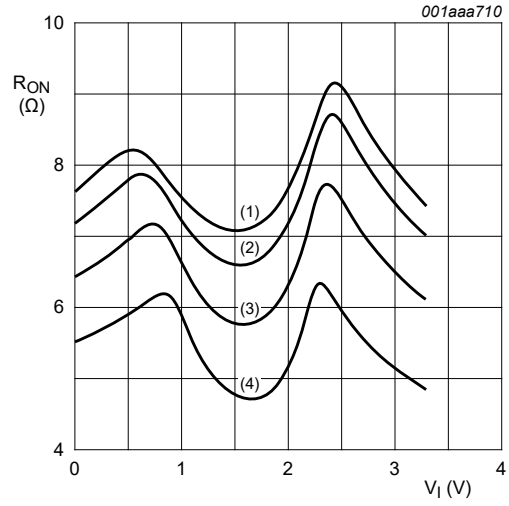


Fig. 12. ON resistance as a function of input voltage; $V_{CC} = 2.5 \text{ V}$



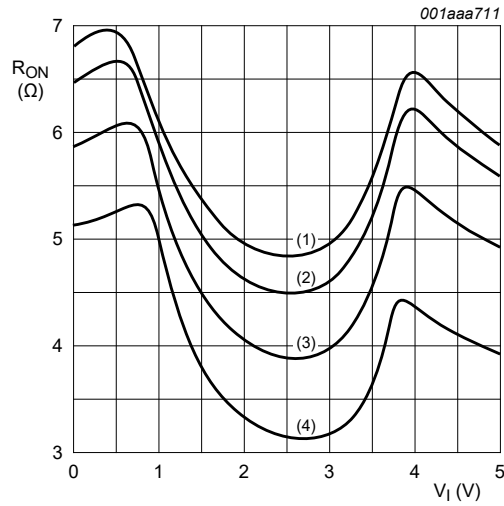
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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



- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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



- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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

11. Dynamic characteristics

Table 9. Dynamic characteristics

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

| Symbol | Parameter | Conditions | -40 °C to +85 °C | | | -40 °C to +125 °C | | Unit |
|-----------|------------------------|--|------------------|---------|------|-------------------|------|------|
| | | | Min | Typ [1] | Max | Min | Max | |
| t_{pd} | propagation delay | Z to Yn or Yn to Z; see Fig. 16 [2] [3] | | | | | | |
| | | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$ | - | - | 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 Fig. 17 [4] | | | | | | |
| | | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$ | 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 Fig. 17 [5] | | | | | | |
| | | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$ | 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 Fig. 18 [6] | | | | | | |
| | | $V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$ | 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} .

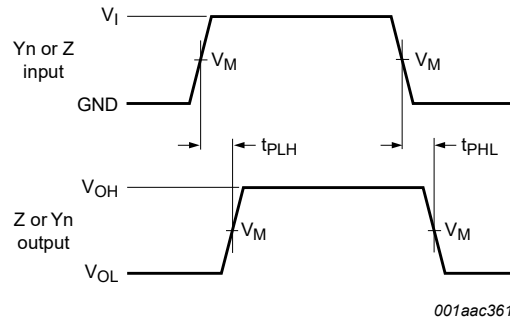
[3] Propagation delay is the calculated RC time constant of the typical ON resistance of the switch and the specified capacitance when driven by an ideal voltage source (zero output impedance).

[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.

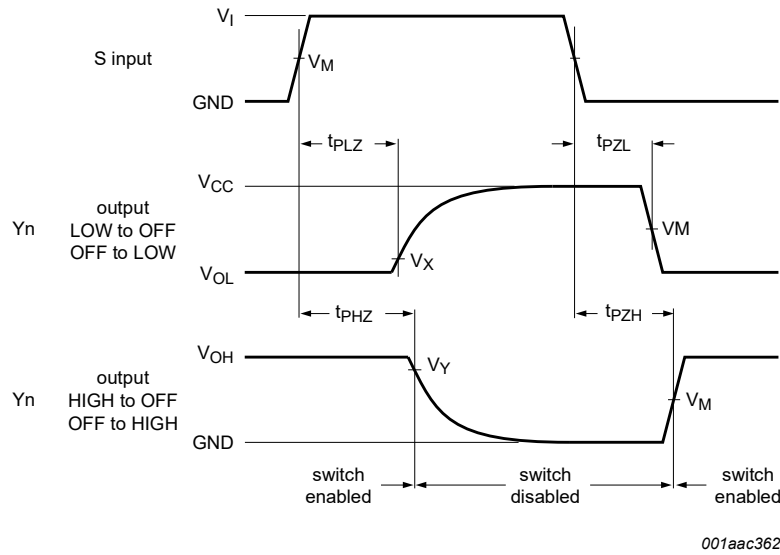
11.1. Waveforms and test circuits



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.

Fig. 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.

Fig. 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 | $0.5 \times V_{CC}$ | $0.5 \times V_{CC}$ | $V_{OL} + 0.3 \text{ V}$ | $V_{OH} - 0.3 \text{ V}$ |

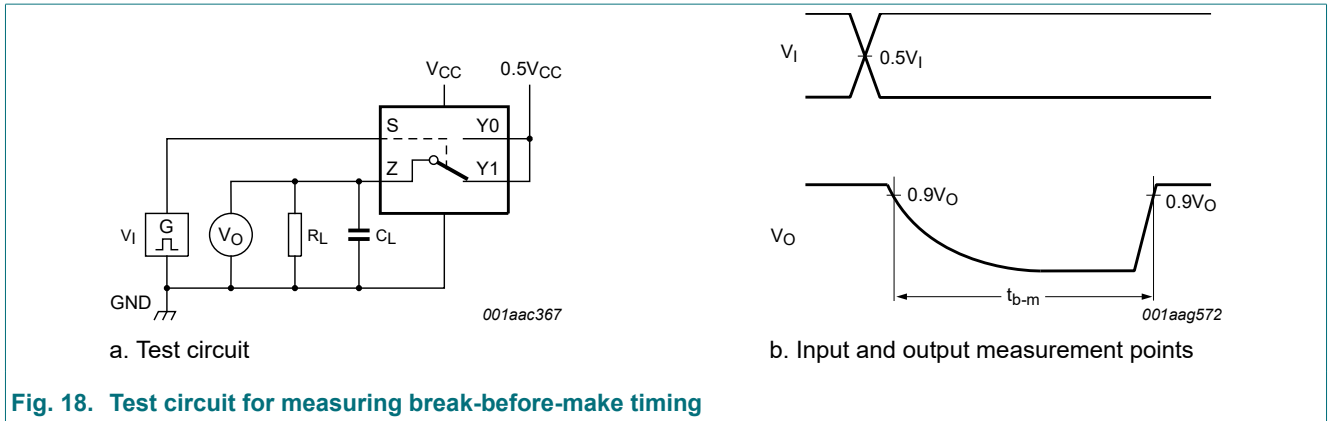


Fig. 18. Test circuit for measuring break-before-make timing

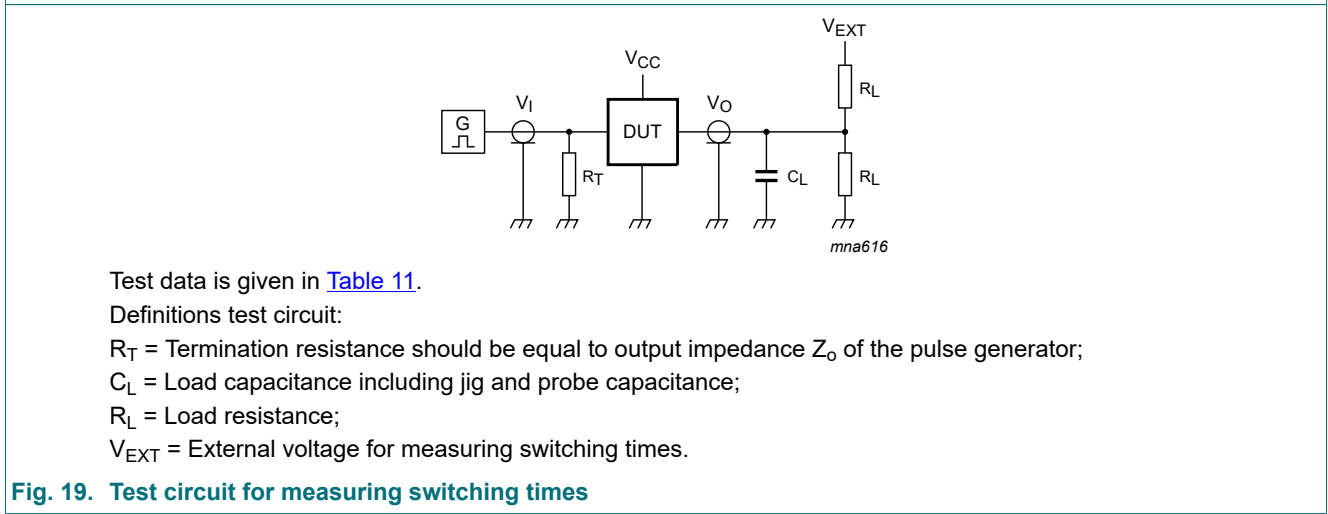


Fig. 19. Test circuit for measuring switching times

Table 11. Test data

| Supply voltage | Input | | Load | | V_{EXT} | | |
|------------------|----------|---------------|-------|--------------|--------------------|--------------------|--------------------|
| V_{CC} | V_I | t_r, t_f | C_L | R_L | t_{PLH}, t_{PHL} | t_{PZH}, t_{PHZ} | t_{PZL}, t_{PLZ} |
| 1.65 V to 1.95 V | V_{CC} | ≤ 2.0 ns | 50 pF | 500 Ω | open | GND | $2 \times V_{CC}$ |
| 2.3 V to 2.7 V | V_{CC} | ≤ 2.0 ns | 50 pF | 500 Ω | open | GND | $2 \times V_{CC}$ |
| 2.7 V | V_{CC} | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | $2 \times V_{CC}$ |
| 3 V to 3.6 V | V_{CC} | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | $2 \times V_{CC}$ |
| 4.5 V to 5.5 V | V_{CC} | ≤ 2.5 ns | 50 pF | 500 Ω | open | GND | $2 \times V_{CC}$ |

11.2. Additional dynamic characteristics

Table 12. Additional dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); $T_{amb} = 25\text{ }^{\circ}\text{C}$.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|---------------------------|--|-----|-------|-----|------|
| THD | total harmonic distortion | $f_i = 600\text{ Hz to }20\text{ kHz}; R_L = 600\text{ }\Omega; C_L = 50\text{ pF}; V_i = 0.5\text{ V (p-p)}$; see Fig. 20 | | | | |
| | | $V_{CC} = 1.65\text{ V}$ | - | 0.260 | - | % |
| | | $V_{CC} = 2.3\text{ V}$ | - | 0.078 | - | % |
| | | $V_{CC} = 3.0\text{ V}$ | - | 0.078 | - | % |
| | | $V_{CC} = 4.5\text{ V}$ | - | 0.078 | - | % |
| $f_{(-3dB)}$ | -3 dB frequency response | $R_L = 50\text{ }\Omega$; see Fig. 21 | | | | |
| | | $V_{CC} = 1.65\text{ V}$ | - | 200 | - | MHz |
| | | $V_{CC} = 2.3\text{ V}$ | - | 300 | - | MHz |
| | | $V_{CC} = 3.0\text{ V}$ | - | 300 | - | MHz |
| | | $V_{CC} = 4.5\text{ V}$ | - | 300 | - | MHz |
| α_{iso} | isolation (OFF-state) | $R_L = 50\text{ }\Omega; C_L = 5\text{ pF}; f_i = 10\text{ MHz}$; see Fig. 22 | | | | |
| | | $V_{CC} = 1.65\text{ V}$ | - | -42 | - | dB |
| | | $V_{CC} = 2.3\text{ V}$ | - | -42 | - | dB |
| | | $V_{CC} = 3.0\text{ V}$ | - | -40 | - | dB |
| | | $V_{CC} = 4.5\text{ V}$ | - | -40 | - | dB |
| Q_{inj} | charge injection | $C_L = 0.1\text{ nF}; V_{gen} = 0\text{ V}; R_{gen} = 0\text{ }\Omega; f_i = 1\text{ MHz}; R_L = 1\text{ M}\Omega$; see Fig. 23 | | | | |
| | | $V_{CC} = 1.8\text{ V}$ | - | 3.3 | - | pC |
| | | $V_{CC} = 2.5\text{ V}$ | - | 4.1 | - | pC |
| | | $V_{CC} = 3.3\text{ V}$ | - | 5.0 | - | pC |
| | | $V_{CC} = 4.5\text{ V}$ | - | 6.4 | - | pC |
| | | $V_{CC} = 5.5\text{ V}$ | - | 7.5 | - | pC |

11.3. Test circuits

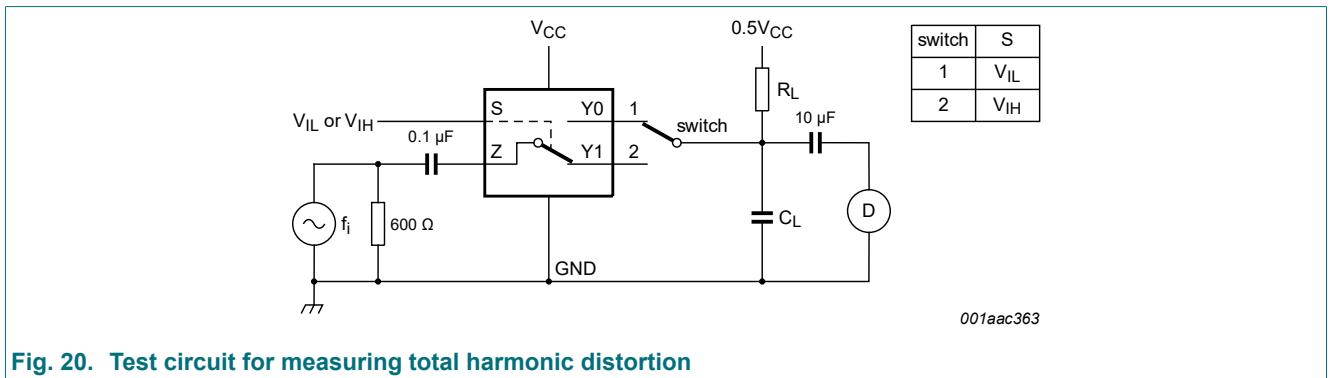
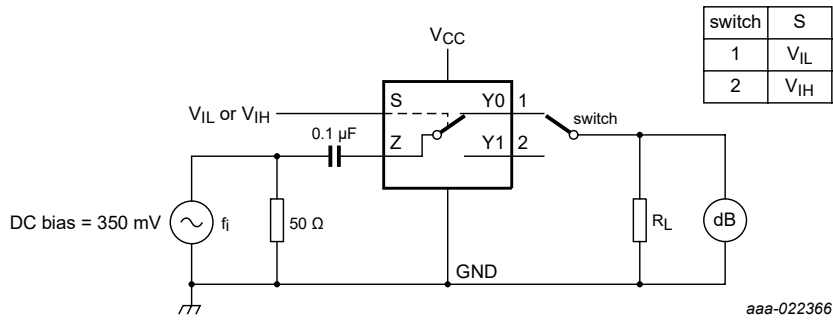
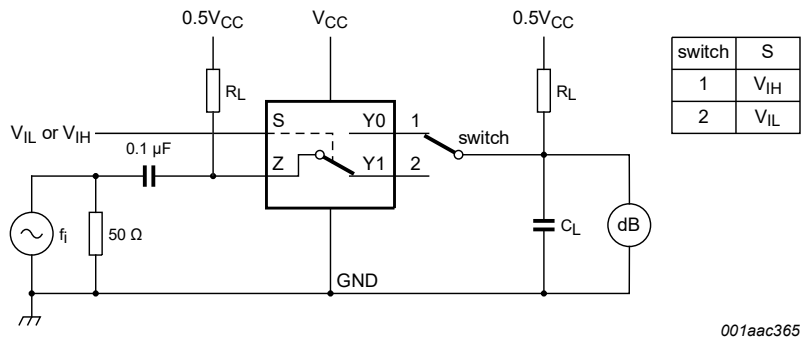


Fig. 20. Test circuit for measuring total harmonic distortion



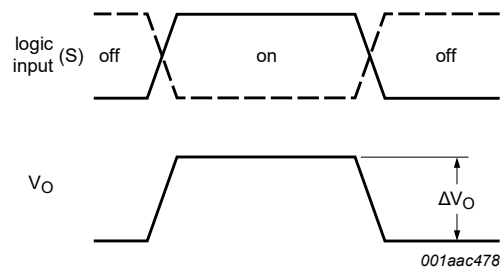
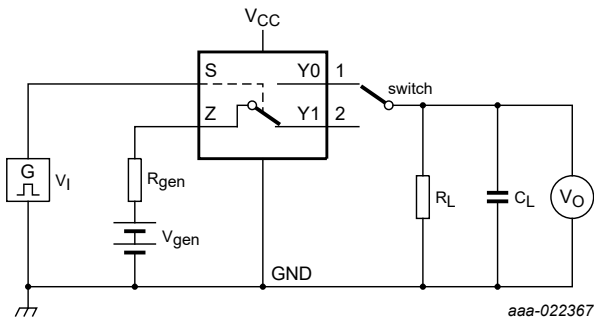
Adjust f_i voltage to obtain 0 dBm level at output. Increase f_i frequency until dB meter reads -3 dB.

Fig. 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.

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



a. Test circuit

b. Input and output pulse definitions

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

ΔV_O = output voltage variation;
 R_{gen} = generator resistance;
 V_{gen} = generator voltage.

Fig. 23. Test circuit for measuring charge injection

12. Package outline

TSSOP6: plastic thin shrink small outline package; 6 leads; body width 1.25 mm

SOT363-2

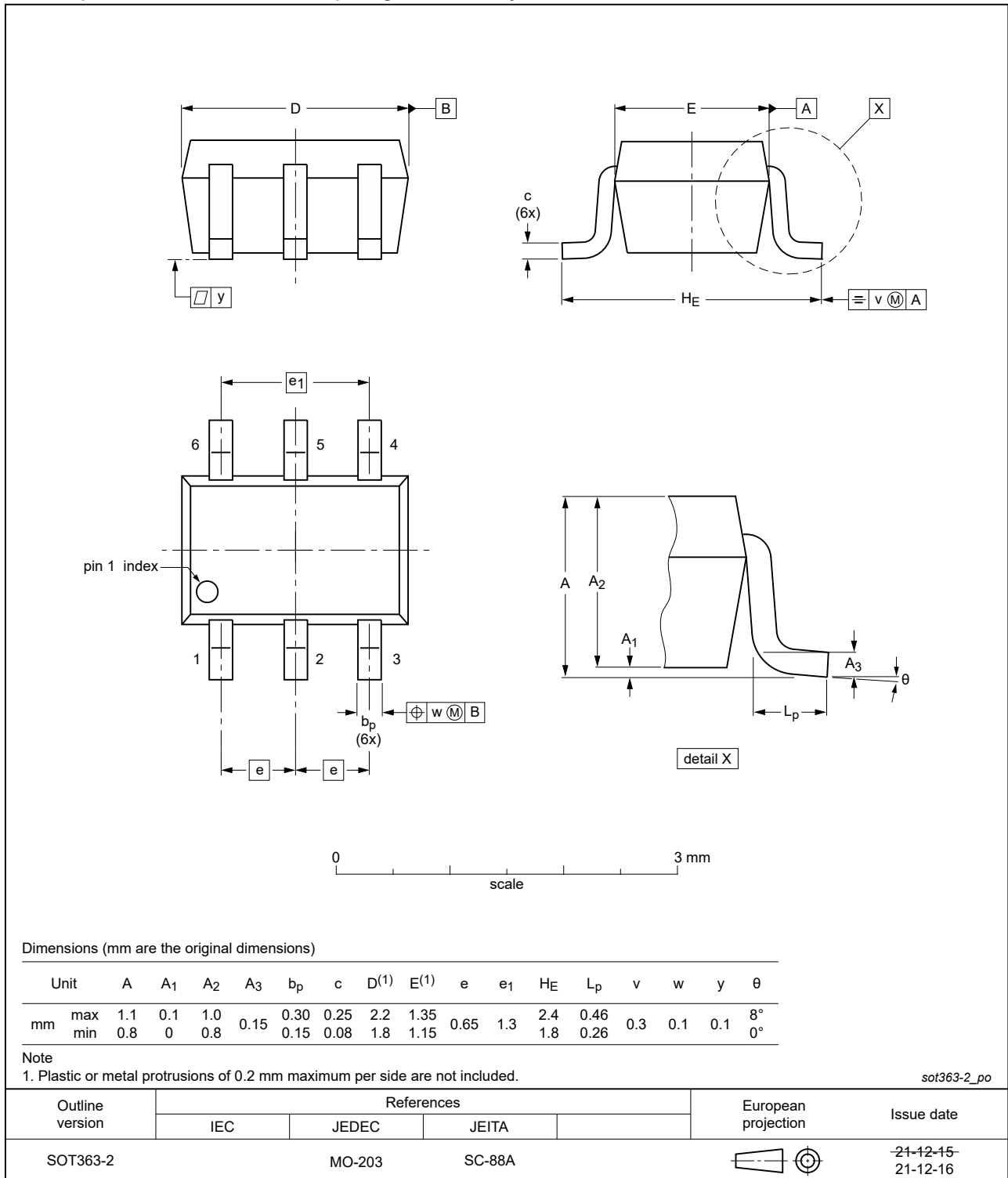


Fig. 24. Package outline SOT363-2 (TSSOP6)

Plastic, surface-mounted package (SC-74; TSOP6); 6 leads

SOT457

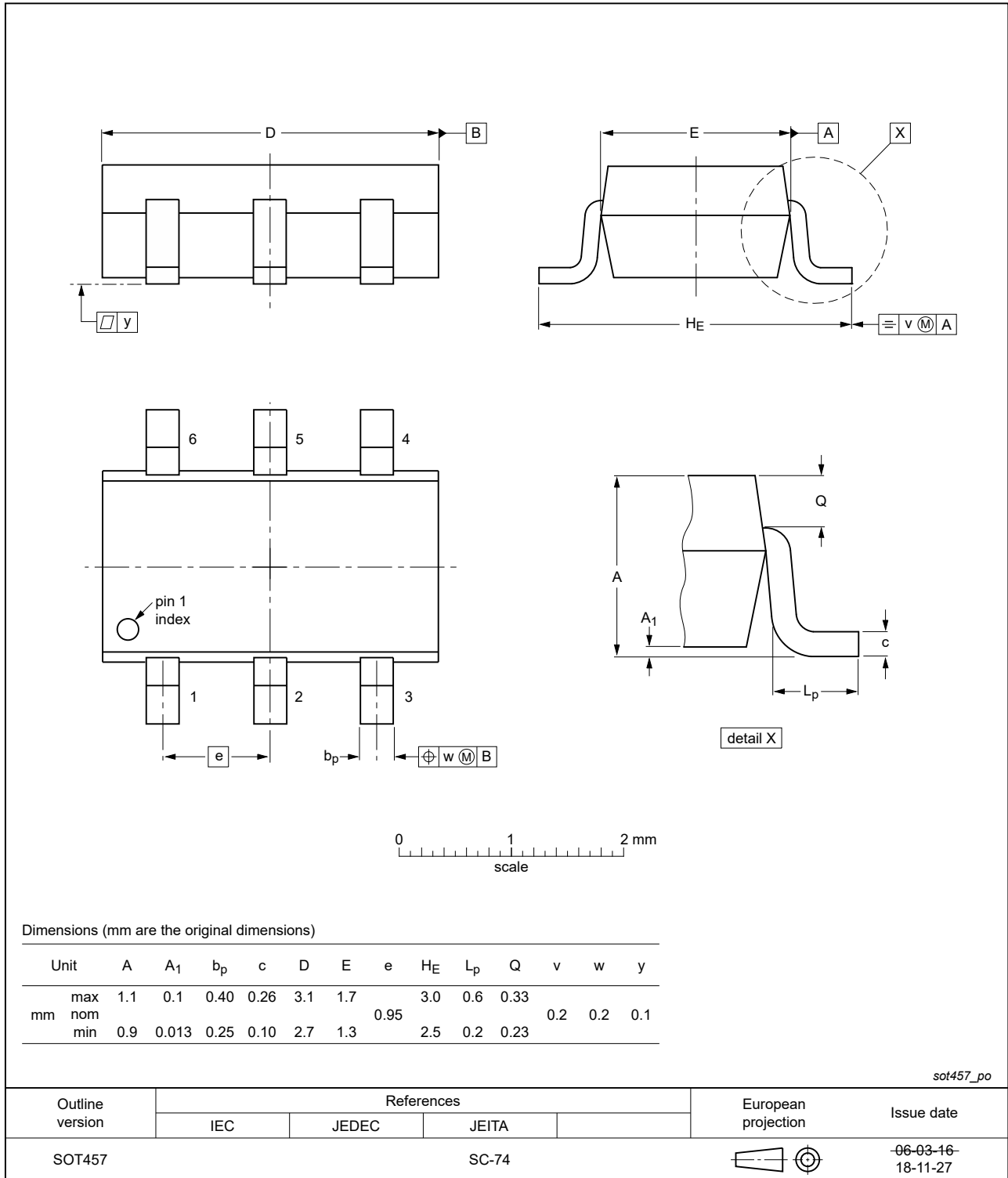


Fig. 25. Package outline SOT457 (SC-74; TSOP6)

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

SOT886

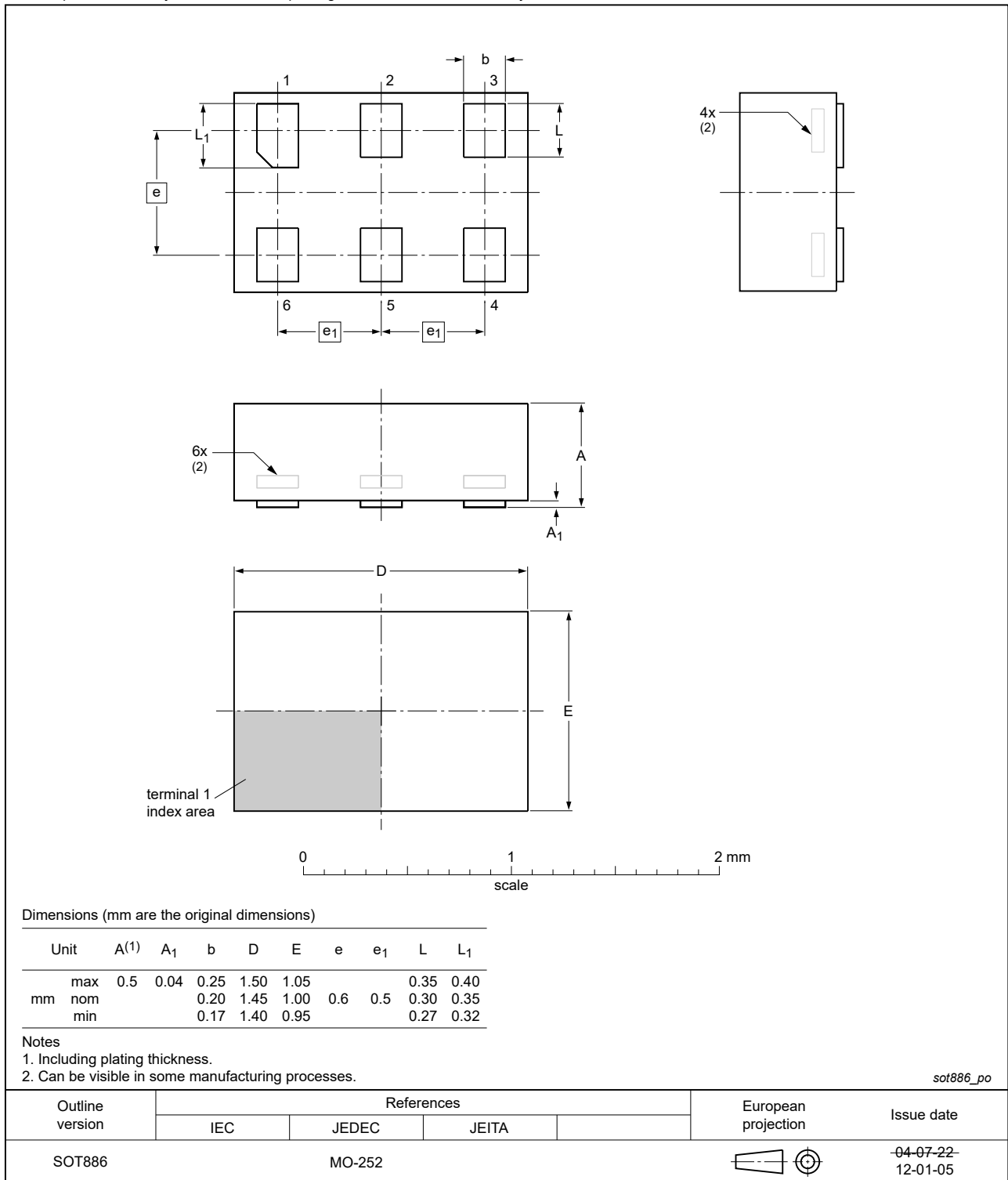


Fig. 26. Package outline SOT886 (XSON6)

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

SOT891

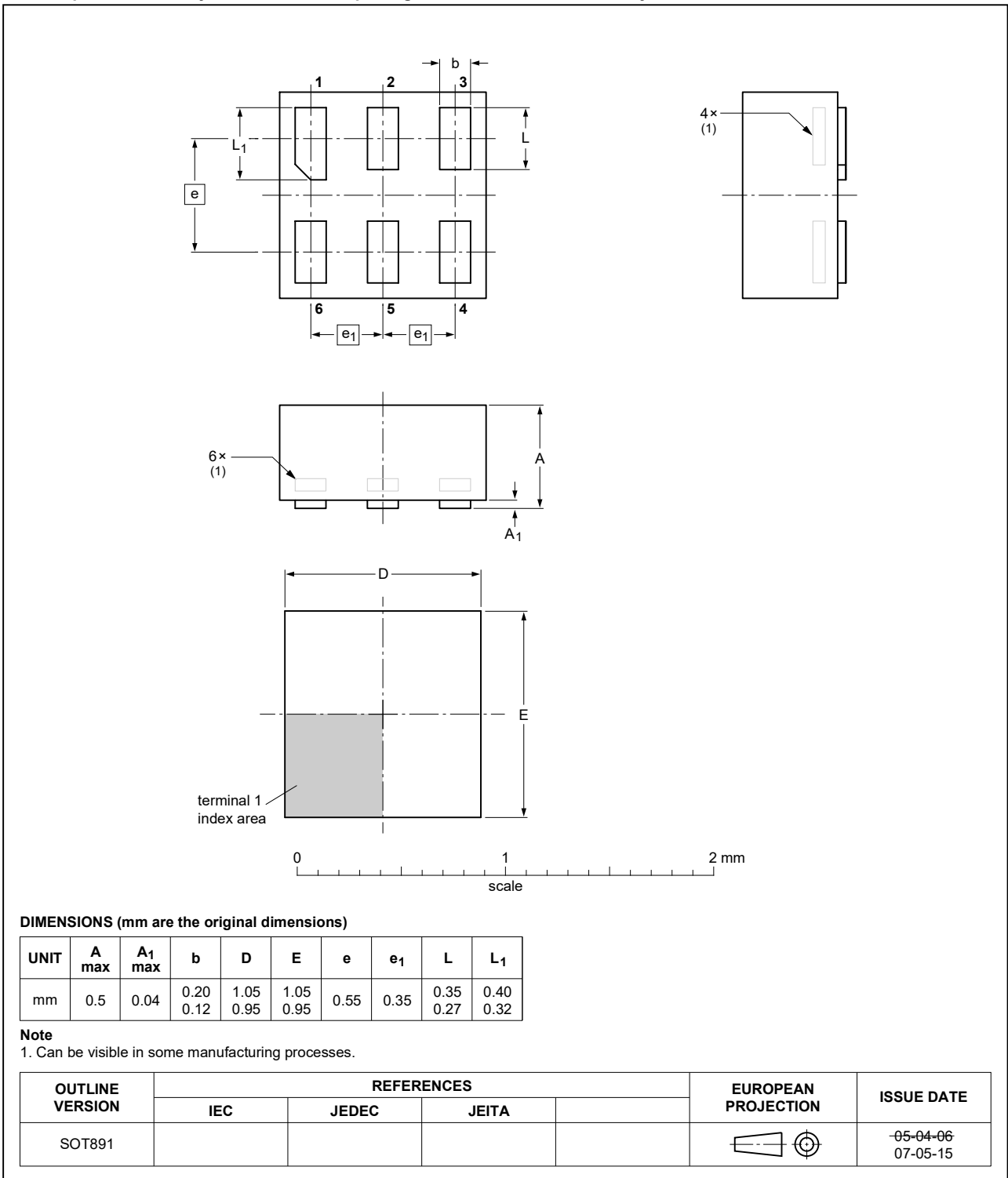


Fig. 27. Package outline SOT891 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 0.9 x 1.0 x 0.35 mm

SOT1115

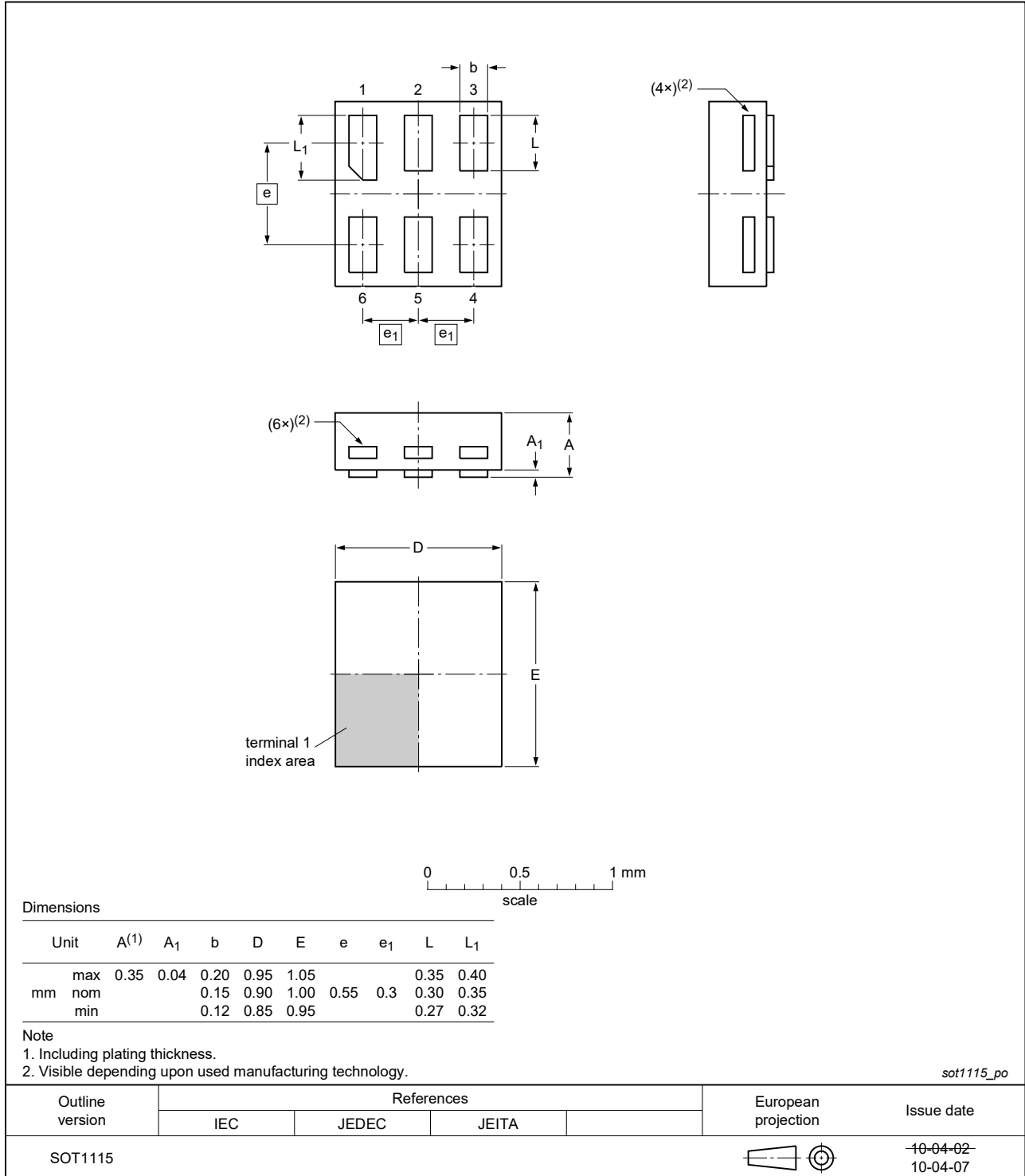


Fig. 28. Package outline SOT1115 (XSON6)

XSON6: extremely thin small outline package; no leads;
6 terminals; body 1.0 x 1.0 x 0.35 mm

SOT1202

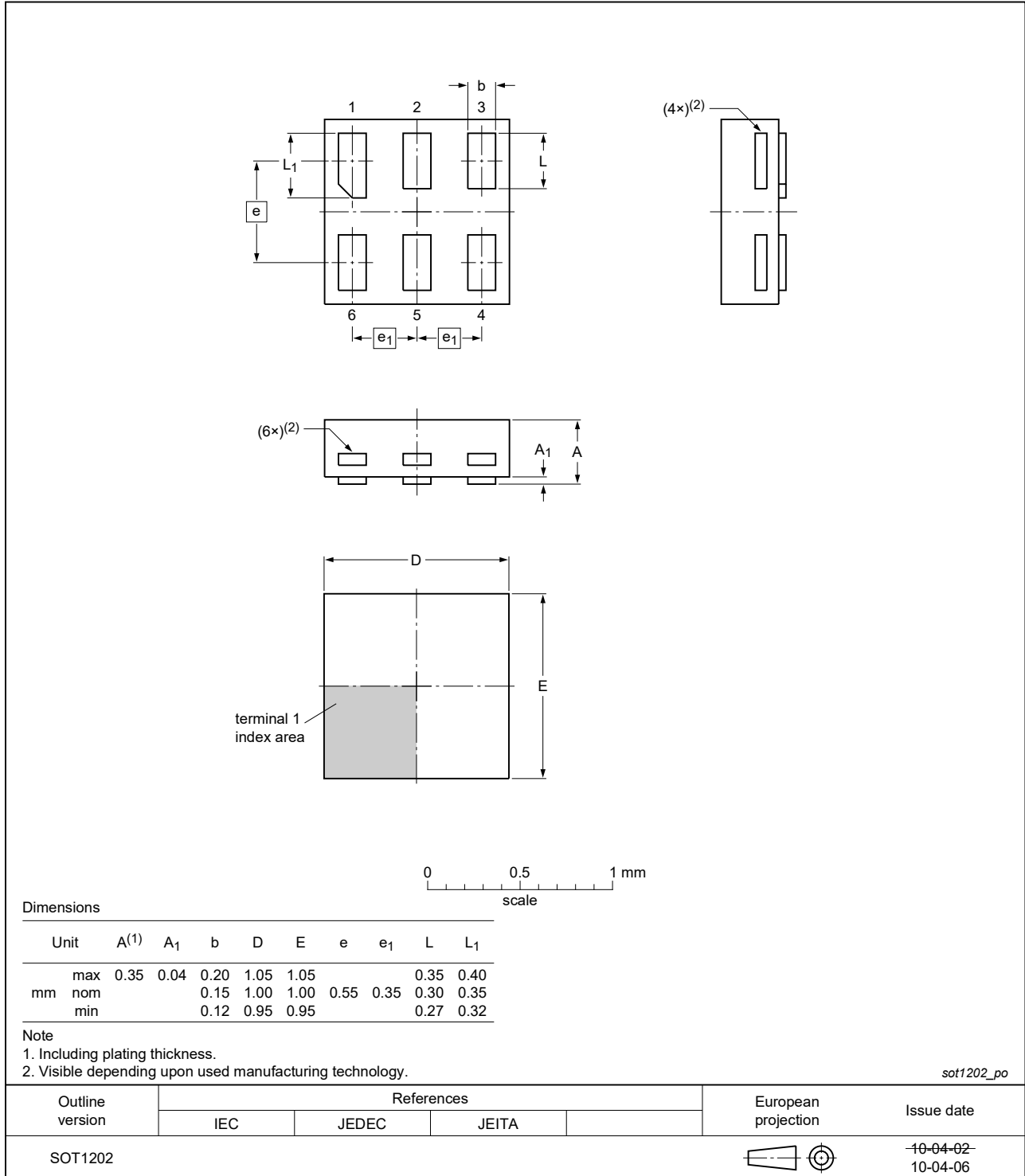


Fig. 29. Package outline SOT1202 (XSON6)

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

SOT1255

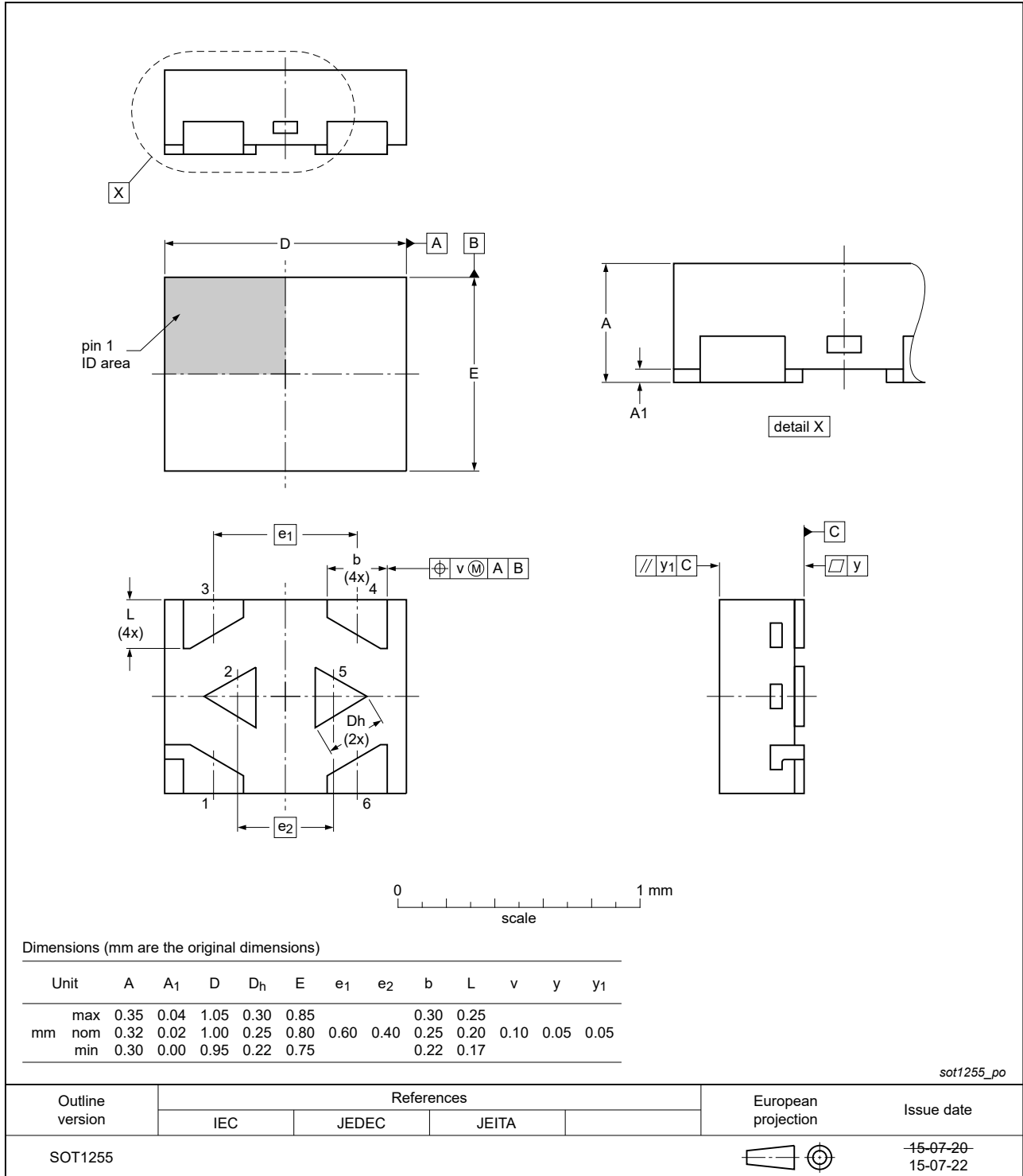


Fig. 30. Package outline SOT1255 (X2SON6)

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.8 | 20220204 | Product data sheet | - | 74LVC1G3157 v.7 |
| Modifications: | <ul style="list-style-type: none"> Package SOT363 (SC-88) changed to SOT363-2 (TSSOP6). Section 1 updated. Table 5: Derating values for P_{tot} total power dissipation updated. Package outline drawing SOT457 updated. | | | |
| 74LVC1G3157 v.7 | 20170214 | Product data sheet | - | 74LVC1G3157 v.6 |
| Modifications: | <ul style="list-style-type: none"> Table 7: The maximum limits for leakage current and supply current have changed. The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. Legal texts have been adapted to the new company name where appropriate. | | | |
| 74LVC1G3157 v.6 | 20160512 | Product data sheet | - | 74LVC1G3157 v.5 |
| Modifications: | <ul style="list-style-type: none"> Added type number 74LVC1G3157GX (SOT1255 package) Table 9: Minimum and maximum values enable and disable times revised. Table 12 and Fig. 21: Condition and test circuit for $f_{(-3dB)}$ revised. Fig. 23: Test circuit for charge injection revised. | | | |
| 74LVC1G3157 v.5 | 20121206 | Product data sheet | - | 74LVC1G3157 v.4 |
| Modifications: | <ul style="list-style-type: none"> Package outline drawing of SOT886 (Fig. 26) modified. | | | |
| 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

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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