# NX3L2G384

## Dual low-ohmic single-pole single-throw analog switch

Rev. 03 — 28 August 2009 Product data sheet

## 1. General description

The NX3L2G384 provides two low-ohmic single pole single throw analog switch functions. Each switch has two input/output terminals (nY and nZ) and an active LOW enable input ($n\overline{E}$). When pin $n\overline{E}$ is HIGH, the analog switch is turned off.

Schmitt-trigger action at the enable input ($n\overline{E}$) makes the circuit tolerant to slower input rise and fall times across the entire $V_{CC}$ range from 1.4 V to 4.3 V.

The NX3L2G384 allows signals with amplitude up to $V_{CC}$ to be transmitted from nY to nZ; or from nZ to nY. Its low ON resistance (0.5 Ω) and flatness (0.13 Ω) ensures minimal attenuation and distortion of transmitted signals.

## 2. Features

- Wide supply voltage range from 1.4 V to 4.3 V
- Very low ON resistance (peak):
  - 1.6 Ω (typical) at $V_{CC}$ = 1.4 V
  - 1.0 Ω (typical) at $V_{CC}$ = 1.65 V
  - 0.55 Ω (typical) at $V_{CC}$ = 2.3 V
  - 0.50 Ω (typical) at $V_{CC}$ = 2.7 V
  - 0.50 Ω (typical) at $V_{CC}$ = 4.3 V
- High noise immunity
- ESD protection:
  - HBM JESD22-A114E Class 3A exceeds 7500 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM AEC-Q100-011 revision B exceeds 1000 V
- CMOS low-power consumption
- Latch-up performance exceeds 100 mA per JESD 78 Class II Level A
- Direct interface with TTL levels at 3.0 V
- Control input accepts voltages above the supply voltage
- High current handling capability (350 mA continuous current under 3.3 V supply)
- Specified from –40 °C to +85 °C and from –40 °C to +125 °C

## 3. Applications

- Cell phone
- PDA
- Portable media player

## 4. Ordering information

**Table 1. Ordering information**

| Type number | Package | | | |
|---|---|---|---|---|
| | Temperature range | Name | Description | Version |
| NX3L2G384GT | –40 °C to +125 °C | XSON8 | plastic extremely thin small outline package; no leads; 8 terminals; body 1 × 1.95 × 0.5 mm | SOT833-1 |
| NX3L2G384GD | –40 °C to +125 °C | XSON8U | plastic extremely thin small outline package; no leads; 8 terminals; UTLP based; body 3 × 2 × 0.5 mm | SOT996-2 |
| NX3L2G384GM | –40 °C to +125 °C | XQFN8U | plastic extremely thin quad flat package; no leads; 8 terminals; body 1.6 × 1.6 × 0.5 mm | SOT902-1 |

## 5. Marking

**Table 2. Marking codes[1]**

| Type number | Marking code |
|---|---|
| NX3L2G384GT | ML2 |
| NX3L2G384GD | ML2 |
| NX3L2G384GM | ML2 |

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

## 6. Functional diagram

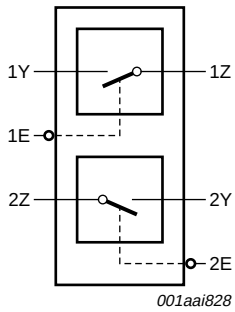



**Fig 1. Logic symbol**

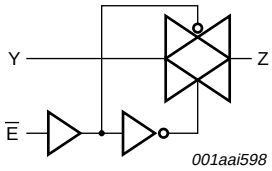
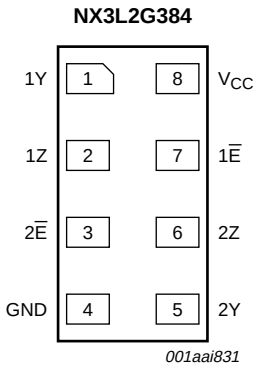



**Fig 2. Logic diagram (one switch)**

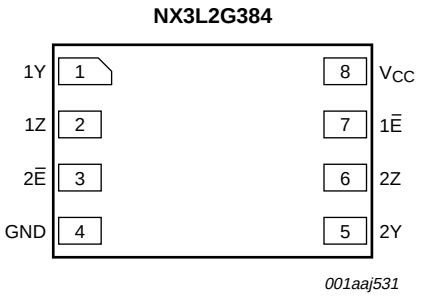
# 7. Pinning information

## 7.1 Pinning



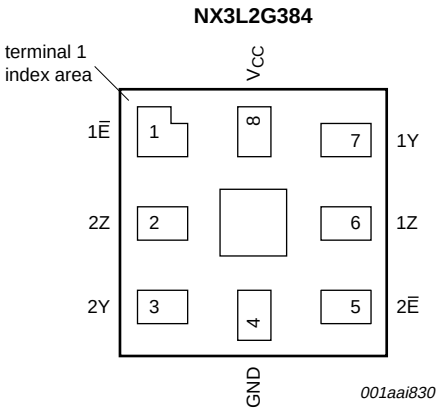

Transparent top view

**Fig 3. Pin configuration SOT833-1 (XSON8)**




Transparent top view

**Fig 4. Pin configuration SOT996-2 (XSON8U)**




Transparent top view

**Fig 5. Pin configuration SOT902-1 (XQFN8U)**

### 7.2 Pin description

**Table 3. Pin description**

| Symbol | Pin | | Description |
|---|---|---|---|
| | SOT833-1 and SOT996-2 | SOT902-1 | |
| 1Y, 2Y | 1, 5 | 7, 3 | independent input or output |
| 1Z, 2Z | 2, 6 | 6, 2 | independent input or output |
| GND | 4 | 4 | ground (0 V) |
| $1\overline{E}$, $2\overline{E}$ | 7, 3 | 1, 5 | enable input (active LOW) |
| $V_{CC}$ | 8 | 8 | supply voltage |

## 8. Functional description

**Table 4. Function table[1]**

| Input $n\overline{E}$ | Switch |
|---|---|
| L | ON-state |
| H | OFF-state |

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

## 9. 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 |
| $V_I$ | input voltage | enable input $n\overline{E}$ | [1] | –0.5 | +4.6 | V |
| $V_{SW}$ | switch voltage | | [2] | –0.5 | $V_{CC}$ + 0.5 | V |
| $I_{IK}$ | input clamping current | $V_I$ < –0.5 V | | –50 | - | mA |
| $I_{SK}$ | switch clamping current | $V_I$ < –0.5 V or $V_I$ > $V_{CC}$ + 0.5 V | | - | ±50 | mA |
| $I_{SW}$ | switch current | $V_{SW}$ > –0.5 V or $V_{SW}$ < $V_{CC}$ + 0.5 V; source or sink current | | - | ±350 | mA |
| | | $V_{SW}$ > –0.5 V or $V_{SW}$ < $V_{CC}$ + 0.5 V; pulsed at 1 ms duration, < 10 % duty cycle; peak current | | - | ±500 | mA |
| $T_{stg}$ | storage temperature | | | –65 | +150 | °C |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = –40 °C to +125 °C | [3] | - | 250 | mW |

[1] The minimum input 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 but may not exceed 4.6 V.

[3] For XSON8, XSON8U and XQFN8U packages: above 118 °C the value of $P_{tot}$ derates linearly with 7.8 mW/K.

## 10. Recommended operating conditions

**Table 6. Recommended operating conditions**

| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_{CC}$ | supply voltage | | | 1.4 | - | 4.3 | V |
| $V_I$ | input voltage | enable input $n\overline{E}$ | | 0 | - | 4.3 | V |
| $V_{SW}$ | switch voltage | | [1] | 0 | - | $V_{CC}$ | V |
| $T_{amb}$ | ambient temperature | | | –40 | - | +125 | °C |
| $\Delta t/\Delta V$ | input transition rise and fall rate | $V_{CC}$ = 1.4 V to 4.3 V | [2] | - | - | 200 | ns/V |

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

[2] Applies to control signal levels.

## 11. Static characteristics

**Table 7. Static characteristics**

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

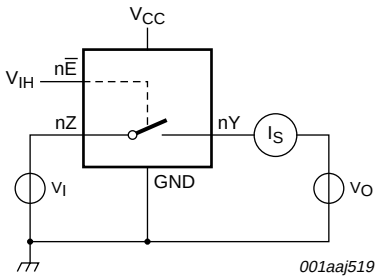
| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| $V_{IH}$ | HIGH-level input voltage | $V_{CC}$ = 1.4 V to 1.95 V | 0.65$V_{CC}$ | - | - | 0.65$V_{CC}$ | - | - | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | 1.7 | - | - | 1.7 | - | - | V |
| | | $V_{CC}$ = 2.7 V to 3.6 V | 2.0 | - | - | 2.0 | - | - | V |
| | | $V_{CC}$ = 3.6 V to 4.3 V | 0.7$V_{CC}$ | - | - | 0.7$V_{CC}$ | - | - | V |
| $V_{IL}$ | LOW-level input voltage | $V_{CC}$ = 1.4 V to 1.95 V | - | - | 0.35$V_{CC}$ | - | 0.35$V_{CC}$ | 0.35$V_{CC}$ | V |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | - | 0.7 | - | 0.7 | 0.7 | V |
| | | $V_{CC}$ = 2.7 V to 3.6 V | - | - | 0.8 | - | 0.8 | 0.8 | V |
| | | $V_{CC}$ = 3.6 V to 4.3 V | - | - | 0.3$V_{CC}$ | - | 0.3$V_{CC}$ | 0.3$V_{CC}$ | V |
| $I_I$ | input leakage current | enable input $n\overline{E}$; $V_I$ = GND to 4.3 V; $V_{CC}$ = 1.4 V to 4.3 V | - | - | - | - | ±0.5 | ±1 | µA |
| $I_{S(OFF)}$ | OFF-state leakage current | nY port; see Figure 6 | | | | | | | |
| | | $V_{CC}$ = 1.4 V to 3.6 V | - | - | ±5 | - | ±50 | ±500 | nA |
| | | $V_{CC}$ = 3.6 V to 4.3 V | - | - | ±10 | - | ±50 | ±500 | nA |
| $I_{S(ON)}$ | ON-state leakage current | nZ port; see Figure 7 | | | | | | | |
| | | $V_{CC}$ = 1.4 V to 3.6 V | - | - | ±5 | - | ±50 | ±500 | nA |
| | | $V_{CC}$ = 3.6 V to 4.3 V | - | - | ±10 | - | ±50 | ±500 | nA |
| $I_{CC}$ | supply current | $V_I$ = $V_{CC}$ or GND; $V_{SW}$ = GND or $V_{CC}$ | | | | | | | |
| | | $V_{CC}$ = 3.6 V | - | - | 100 | - | 690 | 6000 | nA |
| | | $V_{CC}$ = 4.3 V | - | - | 150 | - | 800 | 7000 | nA |

**Table 7. Static characteristics** *…continued*

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

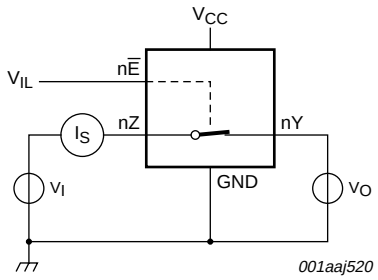
| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | Min | Max (85 °C) | Max (125 °C) | |
| $C_I$ | input capacitance | | - | 1.0 | - | - | - | - | pF |
| $C_{S(OFF)}$ | OFF-state capacitance | | - | 35 | - | - | - | - | pF |
| $C_{S(ON)}$ | ON-state capacitance | | - | 110 | - | - | - | - | pF |

## 11.1 Test circuits




$V_I$ = 0.3 V or $V_{CC}$ – 0.3 V; $V_O$ = $V_{CC}$ – 0.3 V or 0.3 V.

**Fig 6. Test circuit for measuring OFF-state leakage current**




$V_I$ = 0.3 V or $V_{CC}$ – 0.3 V; $V_O$ = open circuit.

**Fig 7. Test circuit for measuring ON-state leakage current**

## 11.2 ON resistance

**Table 8. ON resistance**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for graphs see Figure 9 to Figure 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) | $V_I$ = GND to $V_{CC}$; $I_{SW}$ = 100 mA; see Figure 8 | | | | | | |
| | | $V_{CC}$ = 1.4 V | - | 1.6 | 3.7 | - | 4.1 | Ω |
| | | $V_{CC}$ = 1.65 V | - | 1.0 | 1.6 | - | 1.7 | Ω |
| | | $V_{CC}$ = 2.3 V | - | 0.55 | 0.8 | - | 0.9 | Ω |
| | | $V_{CC}$ = 2.7 V | - | 0.5 | 0.75 | - | 0.9 | Ω |
| | | $V_{CC}$ = 4.3 V | - | 0.5 | 0.75 | - | 0.9 | Ω |

**Table 8. ON resistance** *…continued*

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for graphs see Figure 9 to Figure 15.*

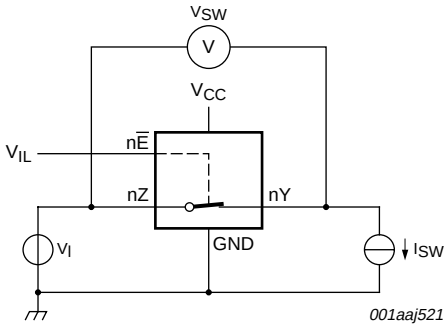
| Symbol | Parameter | Conditions | –40 °C to +85 °C | | | –40 °C to +125 °C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max | |
| $\Delta R_{ON}$ | ON resistance mismatch between channels | $V_I$ = GND to $V_{CC}$; $I_{SW}$ = 100 mA [2] | | | | | | |
| | | $V_{CC}$ = 1.4 V | - | 0.04 | 0.3 | - | 0.3 | Ω |
| | | $V_{CC}$ = 1.65 V | - | 0.04 | 0.2 | - | 0.3 | Ω |
| | | $V_{CC}$ = 2.3 V | - | 0.02 | 0.08 | - | 0.1 | Ω |
| | | $V_{CC}$ = 2.7 V | - | 0.02 | 0.075 | - | 0.1 | Ω |
| | | $V_{CC}$ = 4.3 V | - | 0.02 | 0.075 | - | 0.1 | Ω |
| $R_{ON(flat)}$ | ON resistance (flatness) | $V_I$ = GND to $V_{CC}$; $I_{SW}$ = 100 mA [3] | | | | | | |
| | | $V_{CC}$ = 1.4 V | - | 1.0 | 3.3 | - | 3.6 | Ω |
| | | $V_{CC}$ = 1.65 V | - | 0.5 | 1.2 | - | 1.3 | Ω |
| | | $V_{CC}$ = 2.3 V | - | 0.15 | 0.3 | - | 0.35 | Ω |
| | | $V_{CC}$ = 2.7 V | - | 0.13 | 0.3 | - | 0.35 | Ω |
| | | $V_{CC}$ = 4.3 V | - | 0.2 | 0.4 | - | 0.45 | Ω |

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

[2] Measured at identical $V_{CC}$, temperature and input voltage.

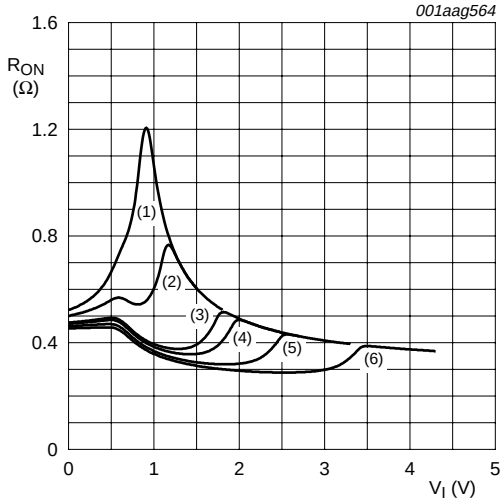
[3] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical $V_{CC}$ and temperature.

## 11.3 ON resistance test circuit and graphs




$R_{ON} = V_{SW} / I_{SW}$.

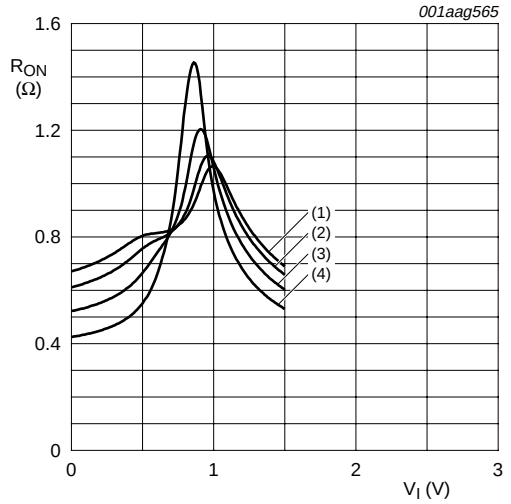
**Fig 8. Test circuit for measuring ON resistance**




(1) $V_{CC}$ = 1.5 V.
(2) $V_{CC}$ = 1.8 V.
(3) $V_{CC}$ = 2.5 V.
(4) $V_{CC}$ = 2.7 V.
(5) $V_{CC}$ = 3.3 V.
(6) $V_{CC}$ = 4.3 V.

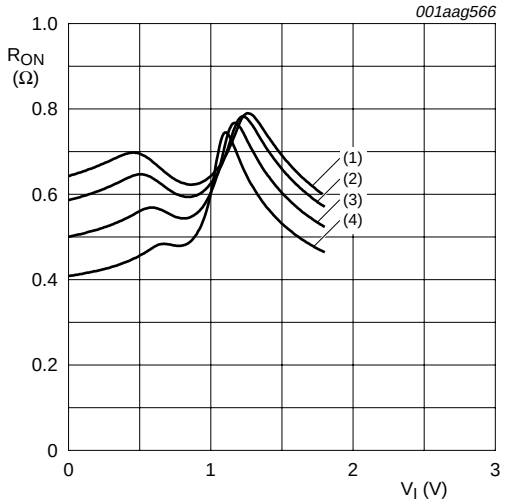
Measured at $T_{amb}$ = 25 °C.

**Fig 9. Typical ON resistance as a function of input voltage**



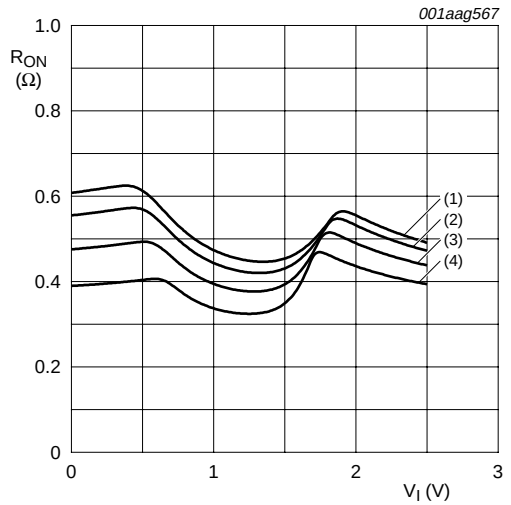

(1) $T_{amb}$ = 125 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 25 °C.
(4) $T_{amb}$ = –40 °C.

**Fig 10. ON resistance as a function of input voltage; $V_{CC}$ = 1.5 V**



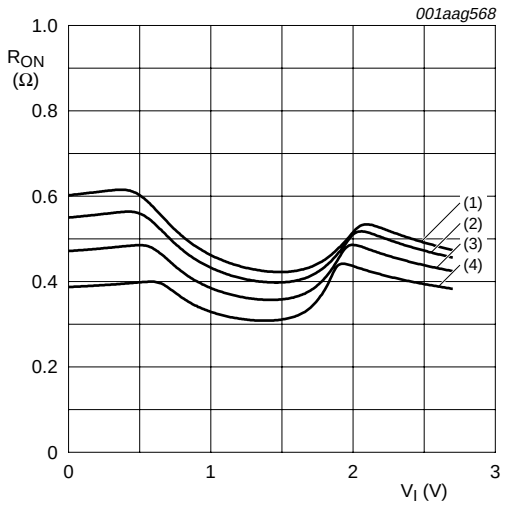

(1) $T_{amb}$ = 125 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 25 °C.
(4) $T_{amb}$ = –40 °C.

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



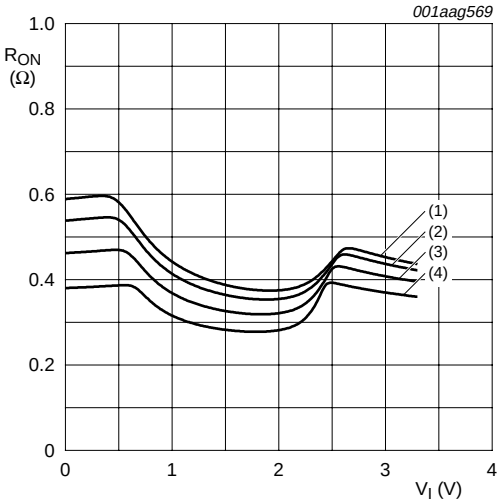

(1) $T_{amb}$ = 125 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 25 °C.
(4) $T_{amb}$ = –40 °C.

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



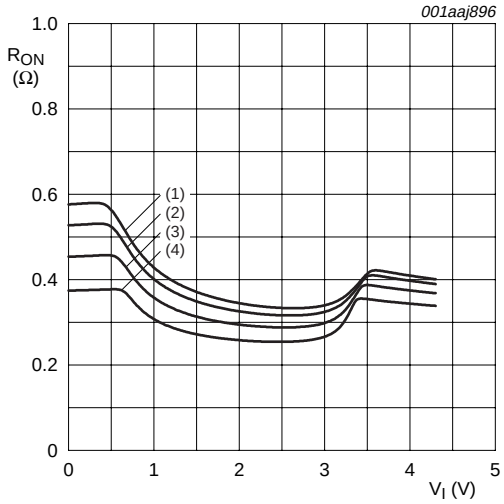

(1) $T_{amb}$ = 125 °C.
(2) $T_{amb}$ = 85 °C.
(3) $T_{amb}$ = 25 °C.
(4) $T_{amb}$ = –40 °C.

**Fig 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.

**Fig 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.

**Fig 15. ON resistance as a function of input voltage; $V_{CC}$ = 4.3 V**

## 12. Dynamic characteristics

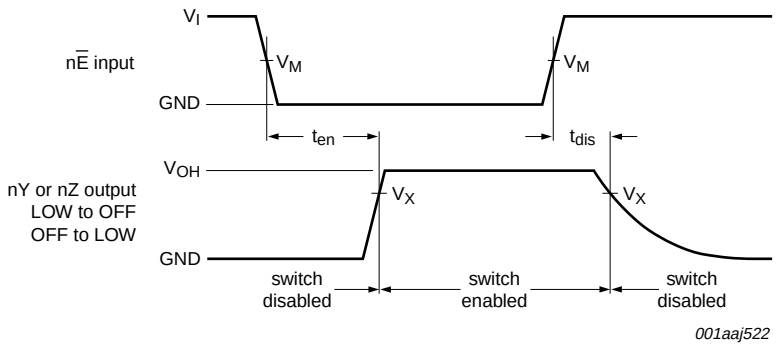
**Table 9. Dynamic characteristics**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for load circuit see Figure 17.*

| Symbol | Parameter | Conditions | 25 °C | | | –40 °C to +125 °C | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Typ[1] | Max | Min | Max (85 °C) | Max (125 °C) | |
| $t_{en}$ | enable time | $n\overline{E}$ to nZ or nY; see Figure 16 | | | | | | | |
| | | $V_{CC}$ = 1.4 V to 1.6 V | - | 27 | 41 | - | 44 | 48 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | 23 | 35 | - | 37 | 40 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | 17 | 26 | - | 28 | 31 | ns |
| | | $V_{CC}$ = 2.7 V to 3.6 V | - | 14 | 24 | - | 25 | 27 | ns |
| | | $V_{CC}$ = 3.6 V to 4.3 V | - | 14 | 24 | - | 25 | 27 | ns |
| $t_{dis}$ | disable time | $n\overline{E}$ to nZ or nY; see Figure 16 | | | | | | | |
| | | $V_{CC}$ = 1.4 V to 1.6 V | - | 9 | 17 | - | 19 | 21 | ns |
| | | $V_{CC}$ = 1.65 V to 1.95 V | - | 7 | 13 | - | 14 | 15 | ns |
| | | $V_{CC}$ = 2.3 V to 2.7 V | - | 4 | 8 | - | 9 | 10 | ns |
| | | $V_{CC}$ = 2.7 V to 3.6 V | - | 3 | 7 | - | 8 | 9 | ns |
| | | $V_{CC}$ = 3.6 V to 4.3 V | - | 3 | 7 | - | 8 | 9 | ns |

[1] Typical values are measured at $T_{amb}$ = 25 °C and $V_{CC}$ = 1.5 V, 1.8 V, 2.5 V, 3.3 V and 4.3 V respectively.

## 12.1 Waveform and test circuits



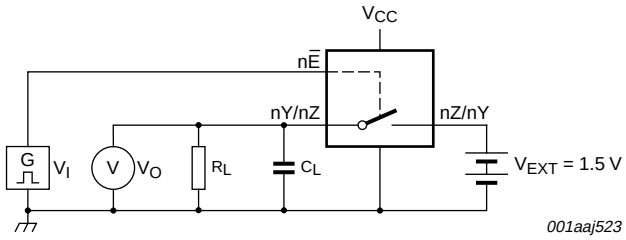

Measurement points are given in Table 10.

Logic level: $V_{OH}$ is the typical output voltage that occurs with the output load.

**Fig 16. Enable and disable times**

**Table 10. Measurement points**

| Supply voltage | Input | Output |
|---|---|---|
| $V_{CC}$ | $V_M$ | $V_X$ |
| 1.4 V to 4.3 V | $0.5V_{CC}$ | $0.9V_{OH}$ |




Test data is given in Table 11.

Definitions test circuit:

$R_L$ = Load resistance.

$C_L$ = Load capacitance including jig and probe capacitance.

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

**Fig 17. Load circuit for switching times**

**Table 11. Test data**

| Supply voltage | Input | | Load | |
|---|---|---|---|---|
| $V_{CC}$ | $V_I$ | $t_r$, $t_f$ | $C_L$ | $R_L$ |
| 1.4 V to 4.3 V | $V_{CC}$ | ≤ 2.5 ns | 35 pF | 50 Ω |

### 12.2 Additional dynamic characteristics

**Table 12. Additional dynamic characteristics**

*At recommended operating conditions; voltages are referenced to GND (ground = 0 V); $V_I$ = GND or $V_{CC}$ (unless otherwise specified); $t_r = t_f \leq 2.5$ ns.*

| Symbol | Parameter | Conditions | | 25 °C | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | |
| THD | total harmonic distortion | $f_i$ = 20 Hz to 20 kHz; $R_L$ = 32 Ω; see Figure 18 | [1] | | | | |
| | | $V_{CC}$ = 1.4 V; $V_I$ = 1 V (p-p) | | - | 0.15 | - | % |
| | | $V_{CC}$ = 1.65 V; $V_I$ = 1.2 V (p-p) | | - | 0.10 | - | % |
| | | $V_{CC}$ = 2.3 V; $V_I$ = 1.5 V (p-p) | | - | 0.02 | - | % |
| | | $V_{CC}$ = 2.7 V; $V_I$ = 2 V (p-p) | | - | 0.02 | - | % |
| | | $V_{CC}$ = 4.3 V; $V_I$ = 2 V (p-p) | | - | 0.02 | - | % |
| $f_{(-3dB)}$ | –3 dB frequency response | $R_L$ = 50 Ω; see Figure 19 | [1] | | | | |
| | | $V_{CC}$ = 1.4 V to 4.3 V | | - | 60 | - | MHz |
| $\alpha_{iso}$ | isolation (OFF-state) | $f_i$ = 100 kHz; $R_L$ = 50 Ω; see Figure 20 | [1] | | | | |
| | | $V_{CC}$ = 1.4 V to 4.3 V | | - | –90 | - | dB |
| $V_{ct}$ | crosstalk voltage | between digital inputs and switch; $f_i$ = 1 MHz; $C_L$ = 50 pF; $R_L$ = 50 Ω; see Figure 21 | | | | | |
| | | $V_{CC}$ = 1.4 V to 3.6 V | | - | 0.2 | - | V |
| | | $V_{CC}$ = 3.6 V to 4.3 V | | - | 0.2 | - | V |
| Xtalk | crosstalk | between switches; $f_i$ = 100 kHz; $R_L$ = 50 Ω; see Figure 22 | [1] | | | | |
| | | $V_{CC}$ = 1.4 V to 4.3 V | | - | –90 | - | dB |
| $Q_{inj}$ | charge injection | $f_i$ = 1 MHz; $C_L$ = 0.1 nF; $R_L$ = 1 MΩ; $V_{gen}$ = 0 V; $R_{gen}$ = 0 Ω; see Figure 23 | | | | | |
| | | $V_{CC}$ = 1.5 V | | - | 3 | - | pC |
| | | $V_{CC}$ = 1.8 V | | - | 3 | - | pC |
| | | $V_{CC}$ = 2.5 V | | - | 3 | - | pC |
| | | $V_{CC}$ = 3.3 V | | - | 3 | - | pC |
| | | | | - | 6 | - | pC |

[1] $f_i$ is biased at $0.5V_{CC}$.

## 13. Test circuits

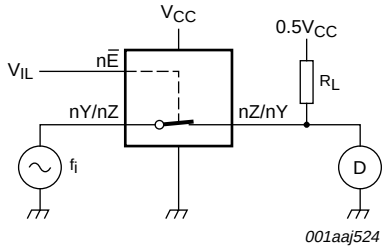
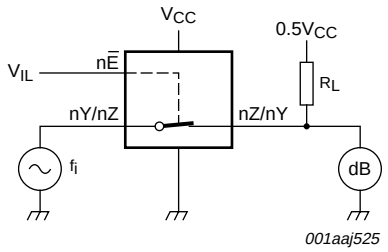
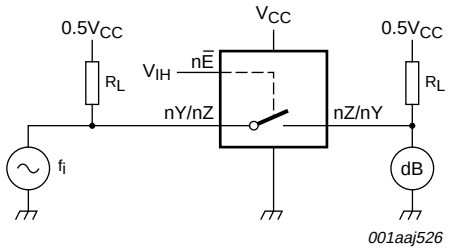



**Fig 18. Test circuit for measuring total harmonic distortion**



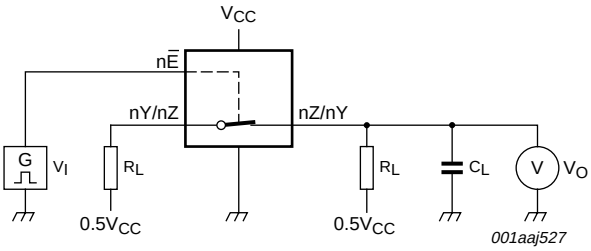

Adjust $f_i$ voltage to obtain 0 dBm level at output. Increase $f_i$ frequency until dB meter reads −3 dB.

**Fig 19. Test circuit for measuring the frequency response when channel is in ON-state**

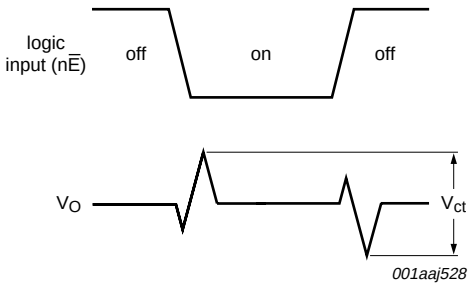



Adjust $f_i$ voltage to obtain 0 dBm level at input.

**Fig 20. Test circuit for measuring isolation (OFF-state)**

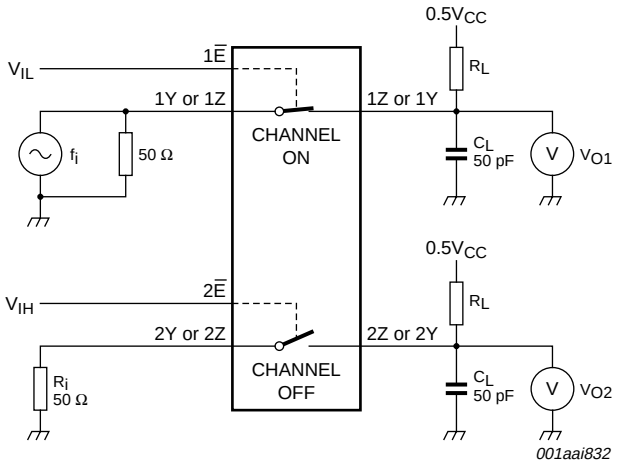



a. Test circuit



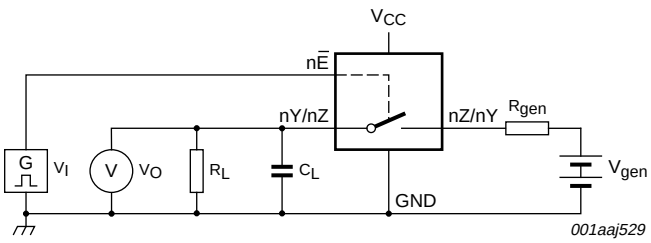

b. input and output pulse definitions

**Fig 21. Test circuit for measuring crosstalk voltage between digital inputs and switch**

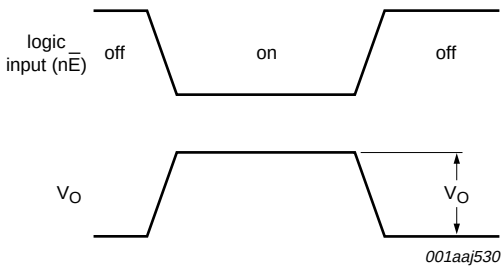



20 $\log_{10}$ ($V_{O2}$ / $V_{O1}$) or 20 $\log_{10}$ ($V_{O1}$ / $V_{O2}$).

**Fig 22. Test circuit for measuring crosstalk between switches**




a. Test circuit




b. Input and output pulse definitions

Definition: $Q_{inj} = \Delta V_O \times C_L$.

$\Delta V_O$ = output voltage variation.

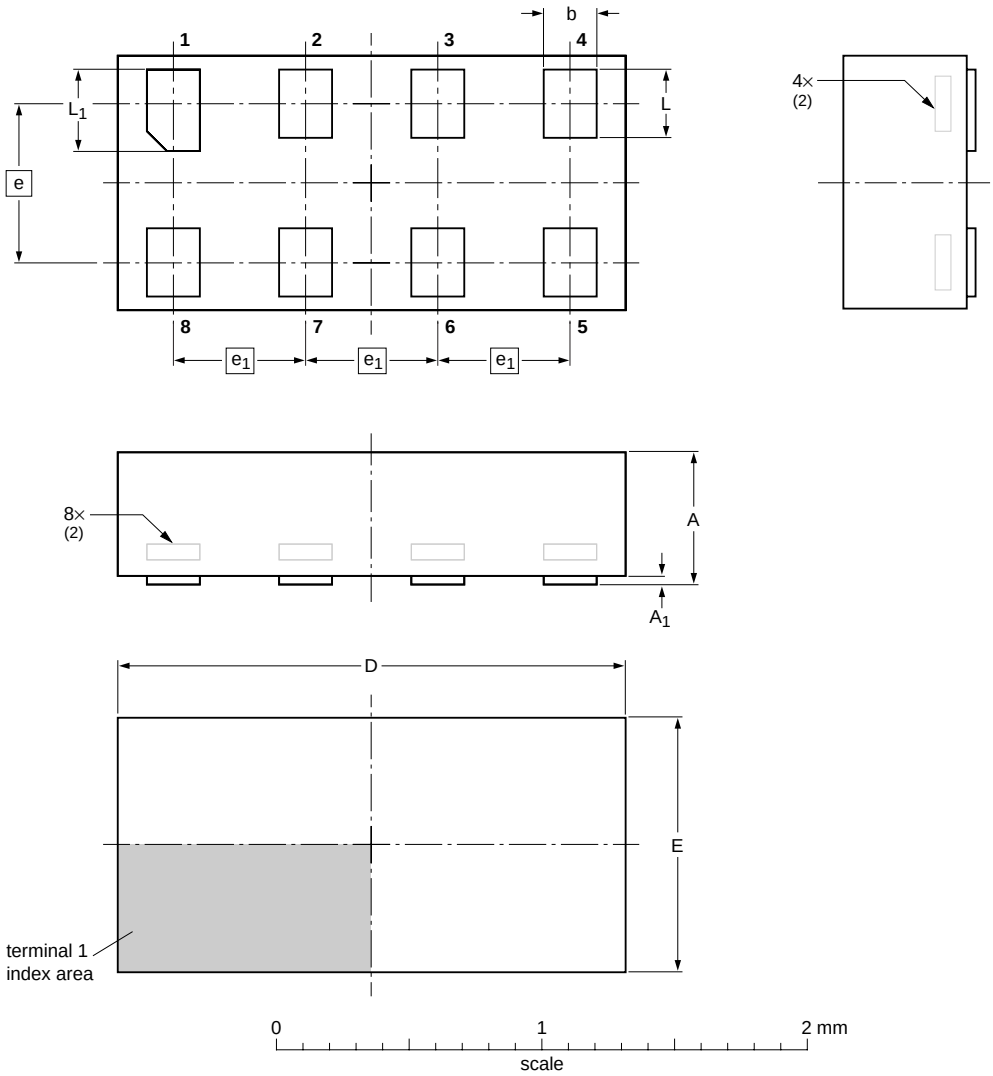
$R_{gen}$ = generator resistance.

$V_{gen}$ = generator voltage.

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

## 14. Package outline

**XSON8: plastic extremely thin small outline package; no leads; 8 terminals; body 1 x 1.95 x 0.5 mm** **SOT833-1**




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

| UNIT | A(1) max | A1 max | b | D | E | e | e1 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|
| mm | 0.5 | 0.04 | 0.25<br>0.17 | 2.0<br>1.9 | 1.05<br>0.95 | 0.6 | 0.5 | 0.35<br>0.27 | 0.40<br>0.32 |

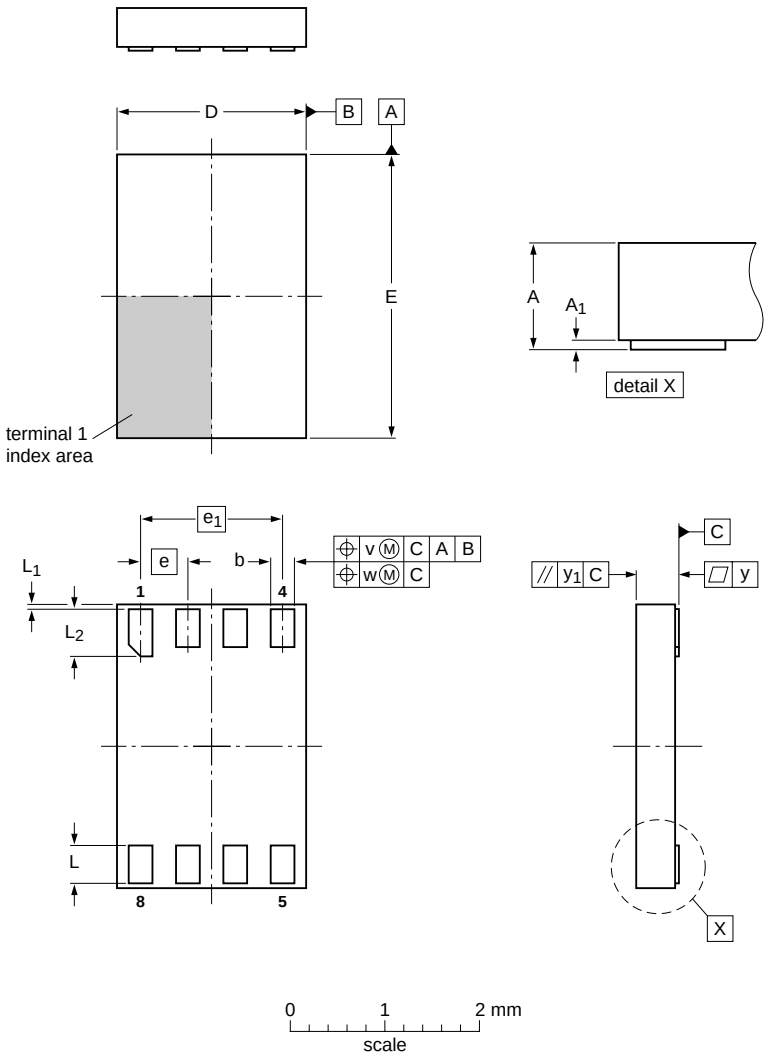
**Notes**

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

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT833-1 | - - - | MO-252 | - - - | | | ~~07-11-14~~<br>07-12-07 |

**Fig 24. Package outline SOT833-1 (XSON8)**

**XSON8U: plastic extremely thin small outline package; no leads; 8 terminals; UTLP based; body 3 x 2 x 0.5 mm** **SOT996-2**



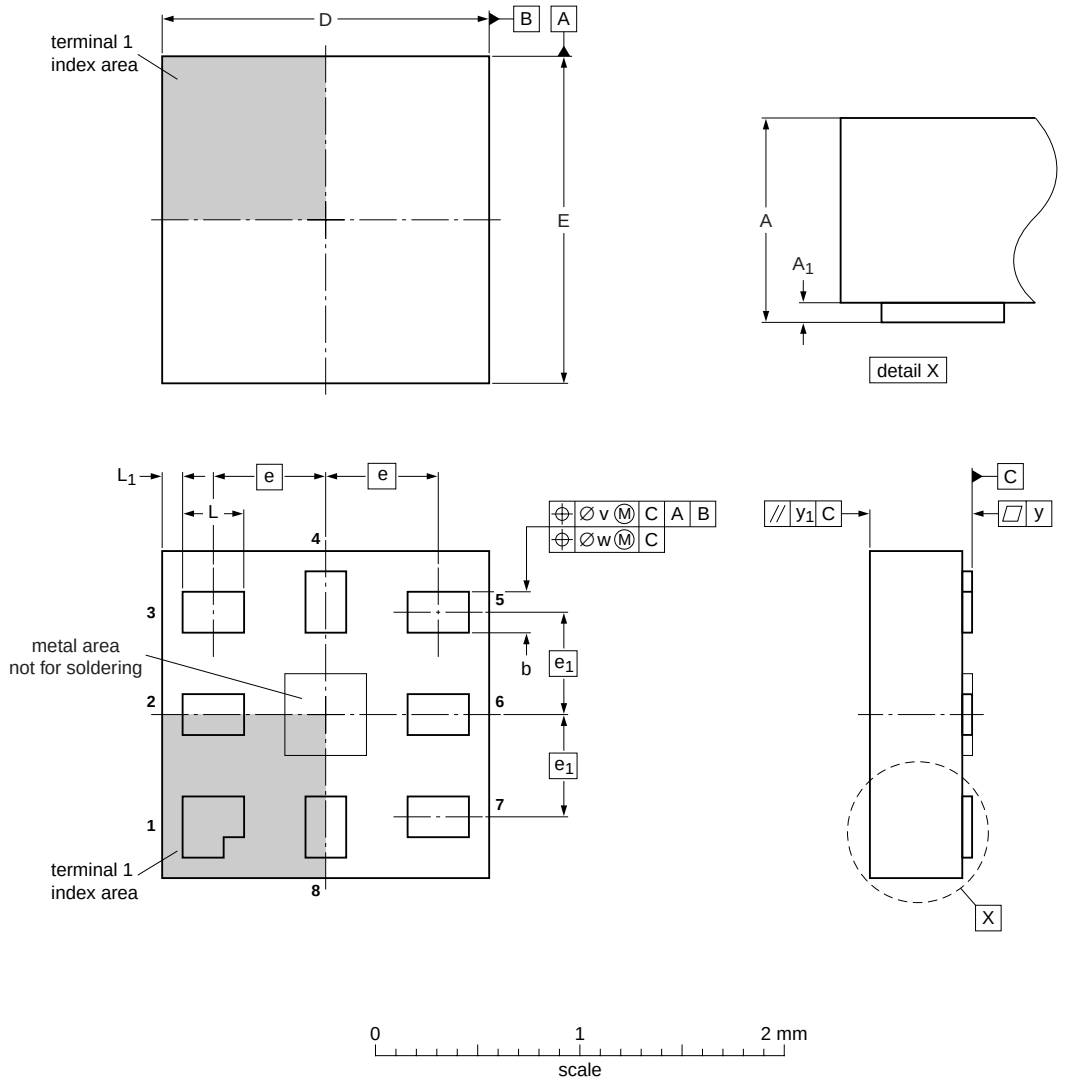

**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max | $A_1$ | b | D | E | e | $e_1$ | L | $L_1$ | $L_2$ | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 0.5 | 0.05<br>0.00 | 0.35<br>0.15 | 2.1<br>1.9 | 3.1<br>2.9 | 0.5 | 1.5 | 0.5<br>0.3 | 0.15<br>0.05 | 0.6<br>0.4 | 0.1 | 0.05 | 0.05 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT996-2 | - - - | | - - - | | | ~~07-12-18~~<br>07-12-21 |

**Fig 25. Package outline SOT996-2 (XSON8U)**

**XQFN8U: plastic extremely thin quad flat package; no leads; 8 terminals; UTLP based; body 1.6 x 1.6 x 0.5 mm** **SOT902-1**




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

| UNIT | A max | $A_1$ | b | D | E | e | $e_1$ | L | $L_1$ | v | w | y | $y_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 0.5 | 0.05<br>0.00 | 0.25<br>0.15 | 1.65<br>1.55 | 1.65<br>1.55 | 0.55 | 0.5 | 0.35<br>0.25 | 0.15<br>0.05 | 0.1 | 0.05 | 0.05 | 0.05 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOT902-1 | - - - | MO-255 | - - - | | | ~~05-11-25~~<br>07-11-14 |

**Fig 26. Package outline SOT902-1 (XQFN8U)**

## 15. Abbreviations

**Table 13. Abbreviations**

| Acronym | Description |
|---|---|
| CDM | Charged Device Model |
| CMOS | Complementary Metal Oxide Semiconductor |
| ESD | ElectroStatic Discharge |
| HBM | Human Body Model |
| MM | Machine Model |
| TTL | Transistor-Transistor Logic |

## 16. Revision history

**Table 14. Revision history**

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| NX3L2G384_3 | 20090828 | Product data sheet | - | NX3L2G384_2 |
| Modifications: | • Figure 6 “Test circuit for measuring OFF-state leakage current” updated.<br>• Table 8 “ON resistance”: $R_{ON(flat)}$ values for $V_{CC}$ = 4.3 V updated. | | | |
| NX3L2G384_2 | 20090415 | Product data sheet | - | NX3L2G384_1 |
| NX3L2G384_1 | 20080918 | Product data sheet | - | - |

# 17. Legal information

## 17.1 Data sheet status

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

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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