

3. Applications

- Cell phone
- PDA
- Portable media player

4. Ordering information

Table 1. Ordering information

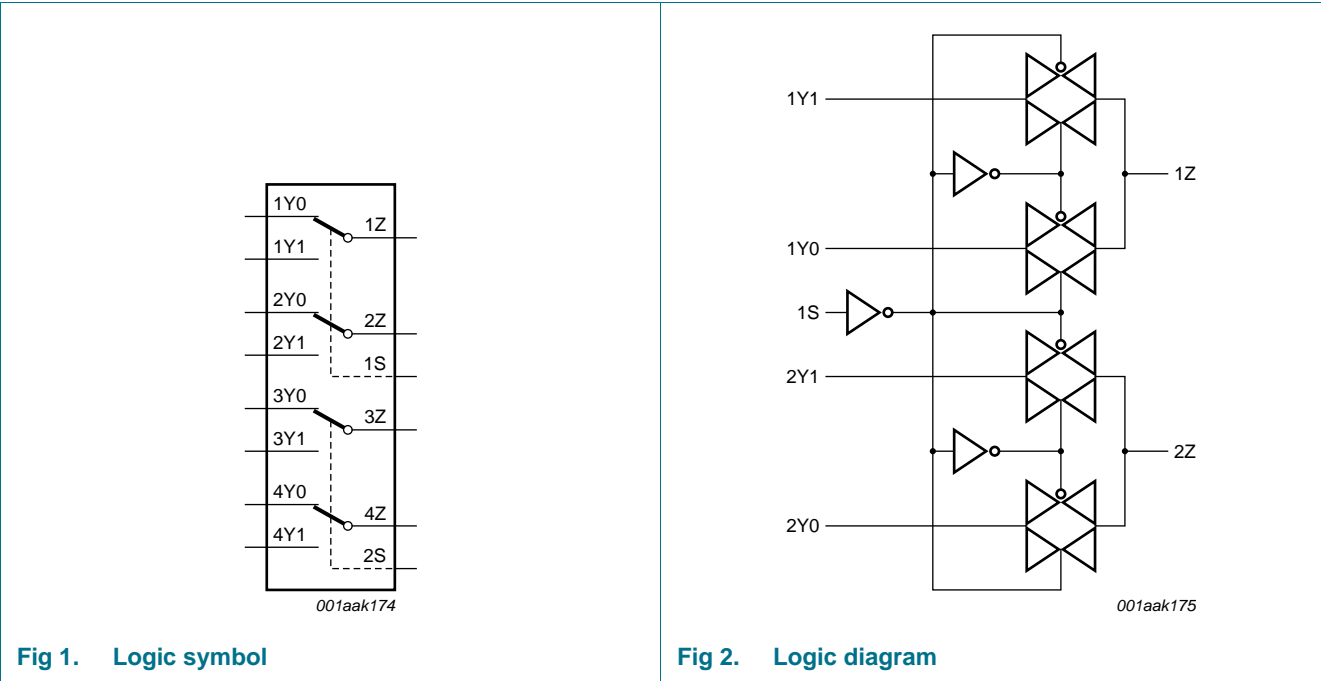
Type number	Package			
	Temperature range	Name	Description	Version
NX3L2467PW	–40 °C to +125 °C	TSSOP16	plastic thin shrink small outline package; 16 leads; body width 4.4 mm	SOT403-1
NX3L2467HR	–40 °C to +125 °C	HXQFN16	plastic thermal enhanced extremely thin quad flat package; no leads; 16 terminals; body 3 × 3 × 0.5 mm	SOT1039-2
NX3L2467GU	–40 °C to +125 °C	XQFN16	plastic, extremely thin quad flat package; no leads; 16 terminals; body 1.80 × 2.60 × 0.50 mm	SOT1161-1

5. Marking

Table 2. Marking codes

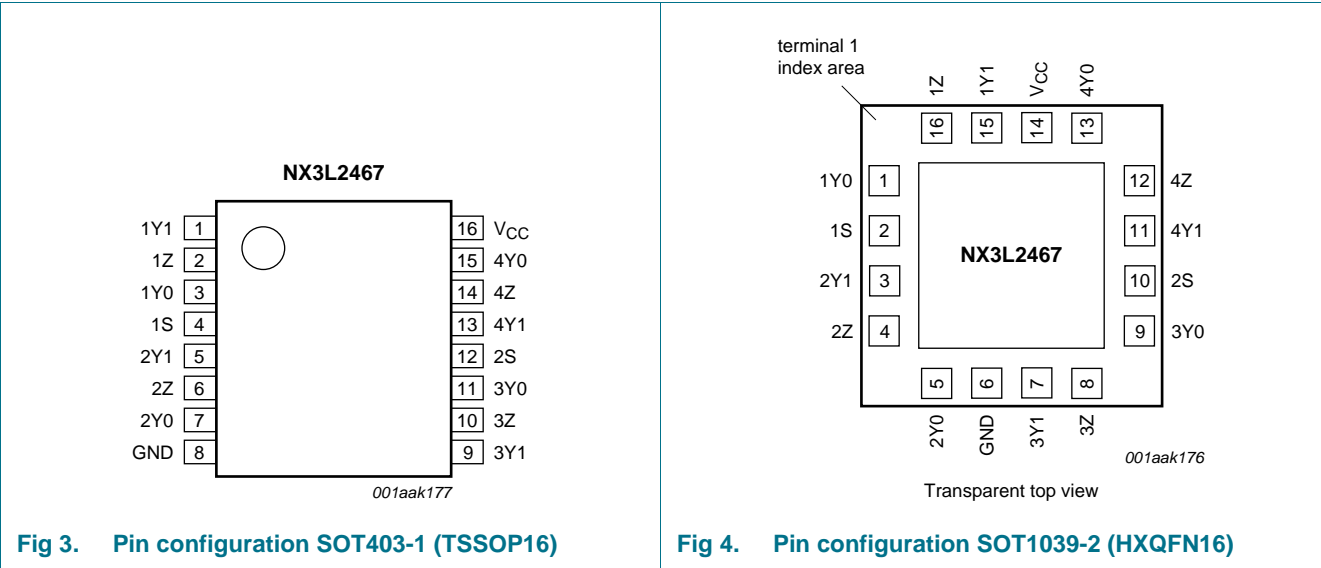
Type number	Marking code
NX3L2467PW	X3L2467
NX3L2467HR	D67
NX3L2467GU	D67

6. Functional diagram



7. Pinning information

7.1 Pinning



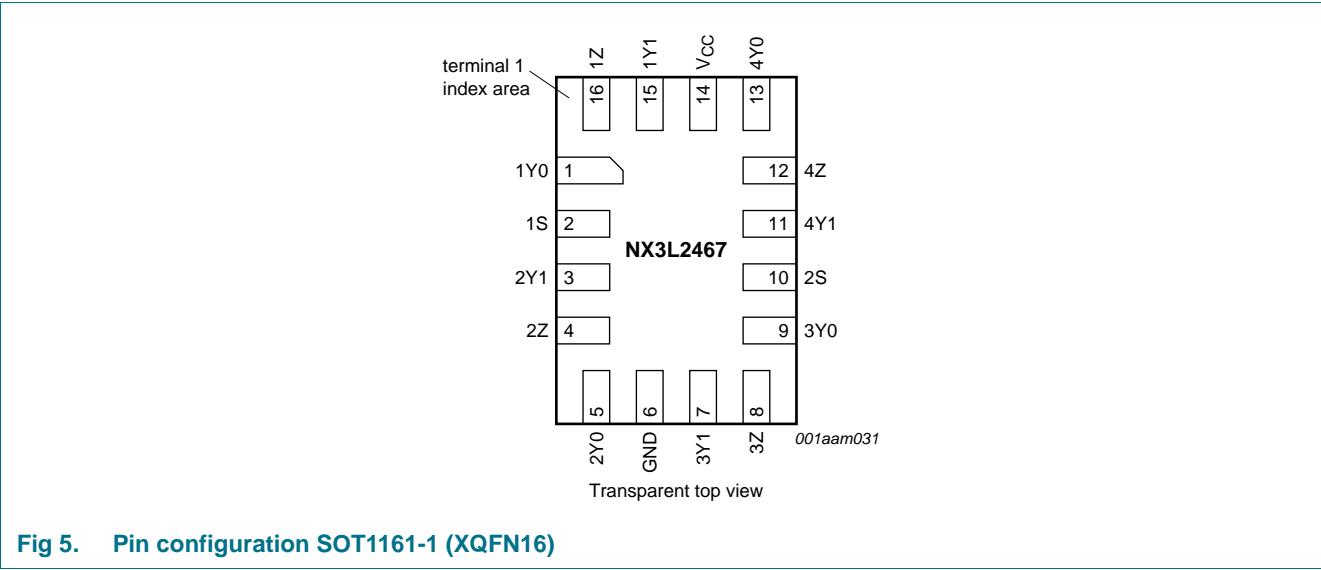


Fig 5. Pin configuration SOT1161-1 (XQFN16)

7.2 Pin description

Table 3. Pin description

Symbol	Pin		Description
	SOT1039-2 and SOT1161-1	SOT403-1	
1Y0, 2Y0, 3Y0, 4Y0	1, 5, 9, 13	3, 7, 11, 15	independent input or output
1S, 2S	2, 10	4, 12	select input
1Y1, 2Y1, 3Y1, 4Y1	15, 3, 7, 11	1, 5, 9, 13	independent input or output
1Z, 2Z, 3Z, 4Z	16, 4, 8, 12	2, 6, 10, 14	common output or input
GND	6	8	ground (0 V)
VCC	14	16	supply voltage

8. Functional description

Table 4. Function table^[1]

Input nS	Channel on
L	nY0
H	nY1

[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	select input nS	^[1] −0.5	+4.6	V
V _{SW}	switch voltage		^[2] −0.5	V _{CC} + 0.5	V

Table 5. Limiting values ...continued

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

Symbol	Parameter	Conditions	Min	Max	Unit
I_{IK}	input clamping current	$V_I < -0.5\text{ V}$	-50	-	mA
I_{SK}	switch clamping current	$V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$	-	± 50	mA
I_{SW}	switch current	$V_{SW} > -0.5\text{ V}$ or $V_{SW} < V_{CC} + 0.5\text{ V}$; source or sink current	-	± 350	mA
		$V_{SW} > -0.5\text{ V}$ or $V_{SW} < V_{CC} + 0.5\text{ V}$; pulsed at 1 ms duration, < 10 % duty cycle; peak current	-	± 500	mA
T_{stg}	storage temperature		-65	+150	°C
P_{tot}	total power dissipation	$T_{amb} = -40\text{ °C}$ to $+125\text{ °C}$			
		TSSOP16	[3] -	500	mW
		HXQFN16	[4] -	250	mW
		XQFN16	[5] -	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 TSSOP16 package: above 60 °C the value of P_{tot} derates linearly with 5.5 mW/K above.
- [4] For HXQFN16 package: above 135 °C the value of P_{tot} derates linearly with 16.9 mW/K.
- [5] For XQFN16 package: above 133 °C the value of P_{tot} derates linearly with 14.5 mW/K.

10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CC}	supply voltage		1.4	4.3	V
V_I	input voltage	select input nS	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	$V_{CC} = 1.4\text{ V}$ to 4.3 V	[2] -	200	ns/V

- [1] To avoid sinking GND current from terminal nZ when switch current flows in terminal nYn, 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 nYn. In this case, there is no limit for the voltage drop across the switch.
- [2] Applies to control signal levels.

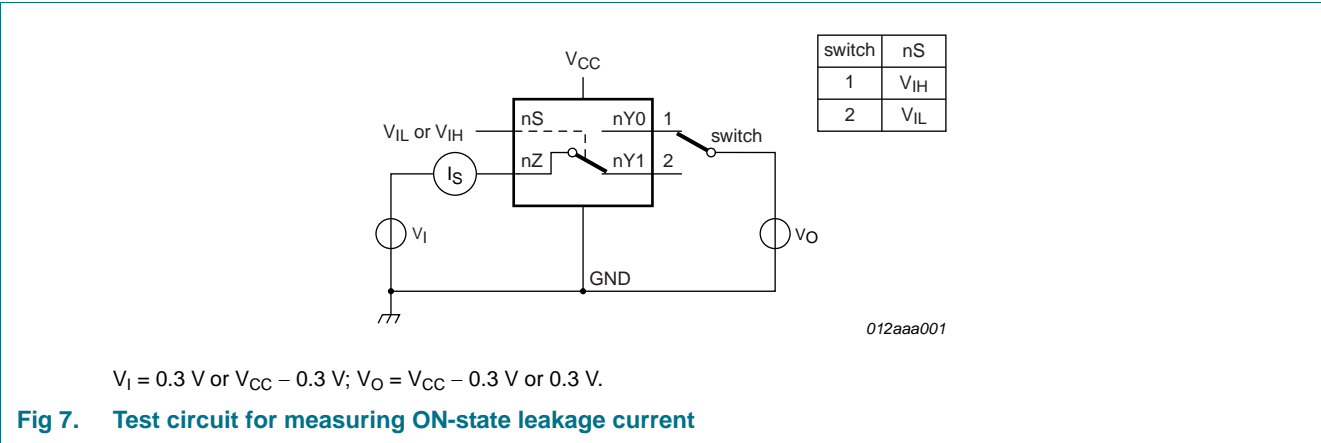
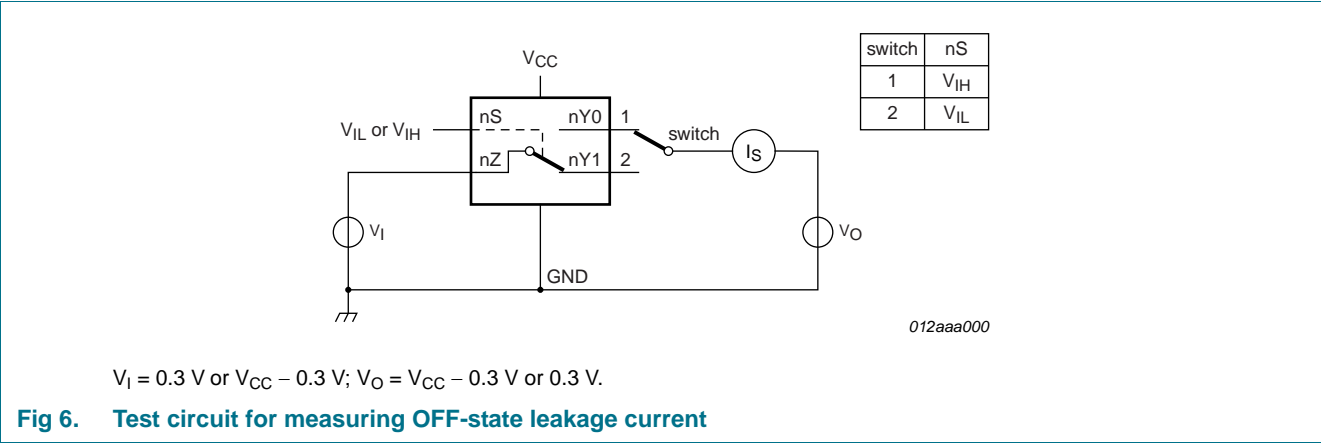
11. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	T _{amb} = 25 °C			T _{amb} = -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 1.6 V	0.9	-	-	0.9	-	-	V
		V _{CC} = 1.65 V to 1.95 V	0.9	-	-	0.9	-	-	V
		V _{CC} = 2.3 V to 2.7 V	1.1	-	-	1.1	-	-	V
		V _{CC} = 2.7 V to 3.6 V	1.3	-	-	1.3	-	-	V
		V _{CC} = 3.6 V to 4.3 V	1.4	-	-	1.4	-	-	V
V _{IL}	LOW-level input voltage	V _{CC} = 1.4 V to 1.6 V	-	-	0.3	-	0.3	0.3	V
		V _{CC} = 1.65 V to 1.95 V	-	-	0.4	-	0.4	0.3	V
		V _{CC} = 2.3 V to 2.7 V	-	-	0.4	-	0.4	0.4	V
		V _{CC} = 2.7 V to 3.6 V	-	-	0.5	-	0.5	0.5	V
		V _{CC} = 3.6 V to 4.3 V	-	-	0.6	-	0.6	0.6	V
I _I	input leakage current	select input nS; 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	nY0 and nY1 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; V _{CC} = 1.4 V to 3.6 V; 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	-	500	5000	nA
		V _{CC} = 4.3 V	-	-	150	-	800	6000	nA
ΔI _{CC}	additional supply current	V _{SW} = GND or V _{CC}							
		V _I = 2.6 V; V _{CC} = 4.3 V	-	2.0	4.0	-	7	7	μA
		V _I = 2.6 V; V _{CC} = 3.6 V	-	0.35	0.7	-	1	1	μA
		V _I = 1.8 V; V _{CC} = 4.3 V	-	7.0	10.0	-	15	15	μA
		V _I = 1.8 V; V _{CC} = 3.6 V	-	2.5	4.0	-	5	5	μA
		V _I = 1.8 V; V _{CC} = 2.5 V	-	50	200	-	300	500	nA
C _I	input capacitance		-	1.0	-	-	-	-	pF
C _{S(OFF)}	OFF-state capacitance		-	35	-	-	-	-	pF
C _{S(ON)}	ON-state capacitance		-	130	-	-	-	-	pF

11.1 Test circuits



11.2 ON resistance

Table 8. ON resistance^[1]
At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for graphs see [Figure 9](#) to [Figure 15](#).

Symbol	Parameter	Conditions	T _{amb} = −40 °C to +85 °C			T _{amb} = −40 °C to +125 °C		Unit
			Min	Typ ^[2]	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	-	1.7	3.7	-	4.1	Ω
		V _{CC} = 1.65 V	-	1.0	1.6	-	1.7	Ω
		V _{CC} = 2.3 V	-	0.6	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^[1]At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for graphs see [Figure 9](#) to [Figure 15](#).

Symbol	Parameter	Conditions	T _{amb} = −40 °C to +85 °C			T _{amb} = −40 °C to +125 °C		Unit
			Min	Typ ^[2]	Max	Min	Max	
ΔR _{ON}	ON resistance mismatch between channels	V _I = GND to V _{CC} ; I _{SW} = 100 mA ^[3]						
		V _{CC} = 1.4 V; V _{SW} = 0.4 V	-	0.18	0.3	-	0.3	Ω
		V _{CC} = 1.65 V; V _{SW} = 0.5 V	-	0.18	0.2	-	0.3	Ω
		V _{CC} = 2.3 V; V _{SW} = 0.7 V	-	0.07	0.1	-	0.13	Ω
		V _{CC} = 2.7 V; V _{SW} = 0.8 V	-	0.07	0.1	-	0.13	Ω
		V _{CC} = 4.3 V; V _{SW} = 0.8 V	-	0.07	0.1	-	0.13	Ω
R _{ON(flat)}	ON resistance (flatness)	V _I = GND to V _{CC} ; I _{SW} = 100 mA ^[4]						
		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] For NX3L2467PW (TSSOP16 package), all ON resistance values are up to 0.05 Ω higher.[2] Typical values are measured at T_{amb} = 25 °C.[3] Measured at identical V_{CC}, temperature and input voltage.[4] 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

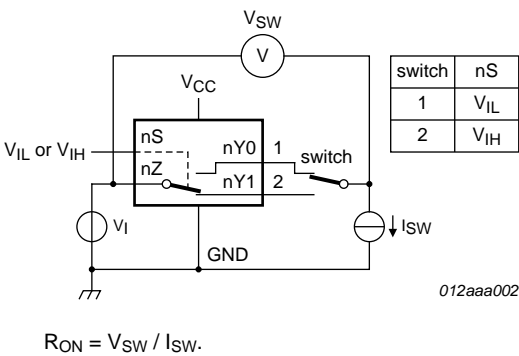
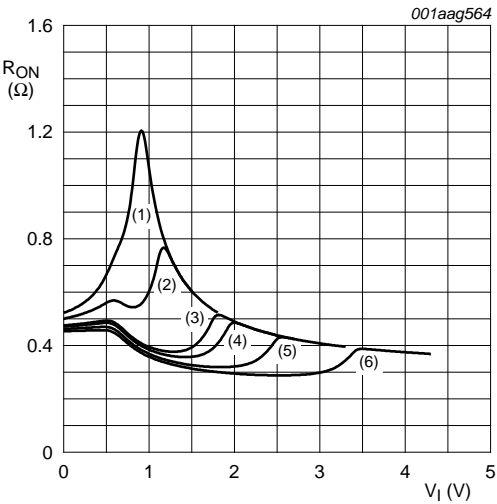
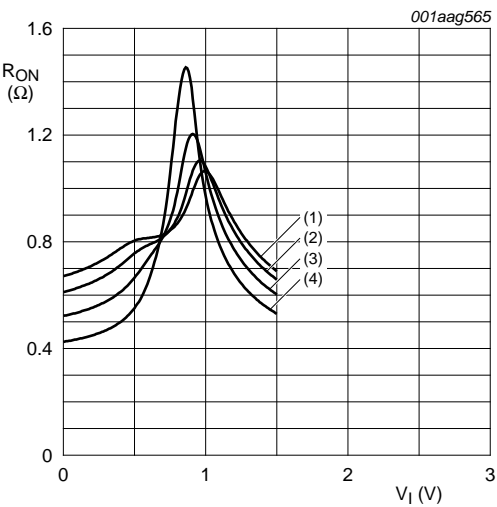


Fig 8. Test circuit for measuring ON resistance



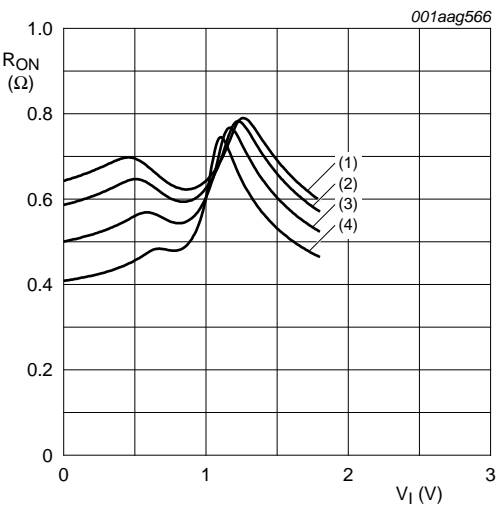
- (1) $V_{CC} = 1.5 \text{ V}$.
 - (2) $V_{CC} = 1.8 \text{ V}$.
 - (3) $V_{CC} = 2.5 \text{ V}$.
 - (4) $V_{CC} = 2.7 \text{ V}$.
 - (5) $V_{CC} = 3.3 \text{ V}$.
 - (6) $V_{CC} = 4.3 \text{ V}$.
- Measured at $T_{amb} = 25 \text{ }^{\circ}\text{C}$.

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



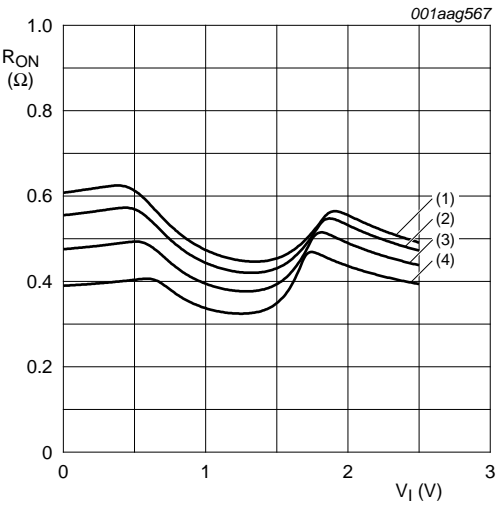
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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



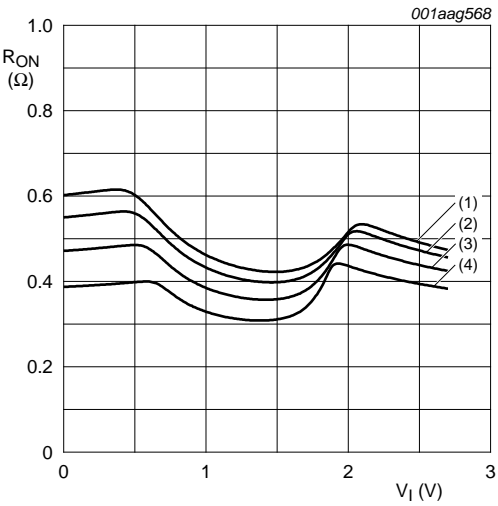
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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



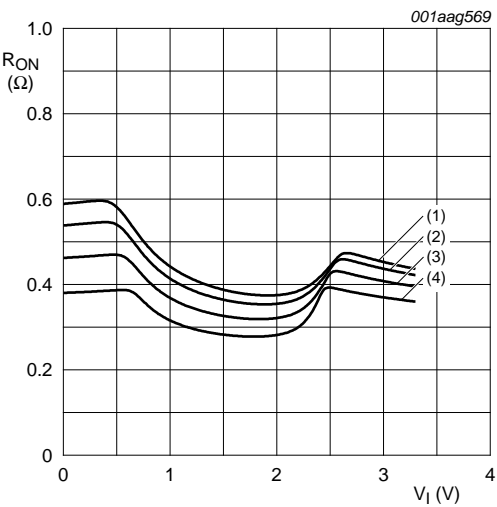
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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



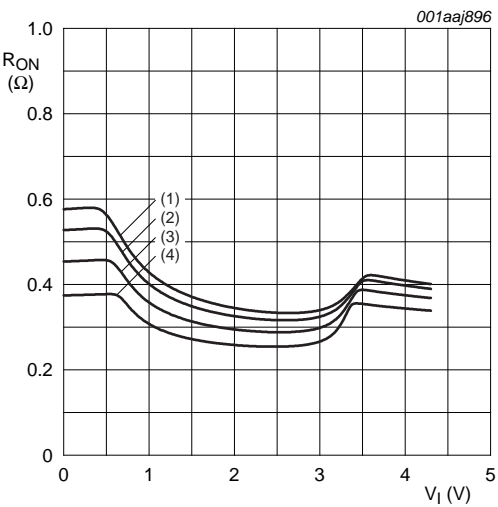
- (1) $T_{amb} = 125\text{ }^{\circ}\text{C}.$
- (2) $T_{amb} = 85\text{ }^{\circ}\text{C}.$
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}.$
- (4) $T_{amb} = -40\text{ }^{\circ}\text{C}.$

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;
 $V_{CC} = 4.3\text{ V}$

12. Dynamic characteristics

Table 9. Dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for load circuit see [Figure 18](#).

Symbol	Parameter	Conditions	$T_{amb} = 25\text{ }^{\circ}\text{C}$			$T_{amb} = -40\text{ }^{\circ}\text{C to } +125\text{ }^{\circ}\text{C}$			Unit
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t_{en}	enable time	nS to nZ or nYn; see Figure 16							
		$V_{CC} = 1.4\text{ V to } 1.6\text{ V}$	-	41	90	-	120	120	ns
		$V_{CC} = 1.65\text{ V to } 1.95\text{ V}$	-	30	70	-	80	90	ns
		$V_{CC} = 2.3\text{ V to } 2.7\text{ V}$	-	20	45	-	50	55	ns
		$V_{CC} = 2.7\text{ V to } 3.6\text{ V}$	-	19	40	-	45	50	ns
		$V_{CC} = 3.6\text{ V to } 4.3\text{ V}$	-	19	40	-	45	50	ns
t_{dis}	disable time	nS to nZ or nYn; see Figure 16							
		$V_{CC} = 1.4\text{ V to } 1.6\text{ V}$	-	24	70	-	80	90	ns
		$V_{CC} = 1.65\text{ V to } 1.95\text{ V}$	-	15	55	-	60	65	ns
		$V_{CC} = 2.3\text{ V to } 2.7\text{ V}$	-	9	25	-	30	35	ns
		$V_{CC} = 2.7\text{ V to } 3.6\text{ V}$	-	8	20	-	25	30	ns
		$V_{CC} = 3.6\text{ V to } 4.3\text{ V}$	-	8	20	-	25	30	ns

Table 9. Dynamic characteristics ...continued

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for load circuit see Figure 18.

Symbol	Parameter	Conditions	T _{amb} = 25 °C			T _{amb} = -40 °C to +125 °C			Unit
			Min	Typ ^[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t _{b-m}	break-before-make time	see Figure 17							
				[2]					
		V _{CC} = 1.4 V to 1.6 V	-	20	-	9	-	-	ns
		V _{CC} = 1.65 V to 1.95 V	-	17	-	7	-	-	ns
		V _{CC} = 2.3 V to 2.7 V	-	13	-	4	-	-	ns
		V _{CC} = 2.7 V to 3.6 V	-	11	-	3	-	-	ns
		V _{CC} = 3.6 V to 4.3 V	-	11	-	2	-	-	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.

[2] Break-before-make guaranteed by design.

12.1 Waveform and test circuits

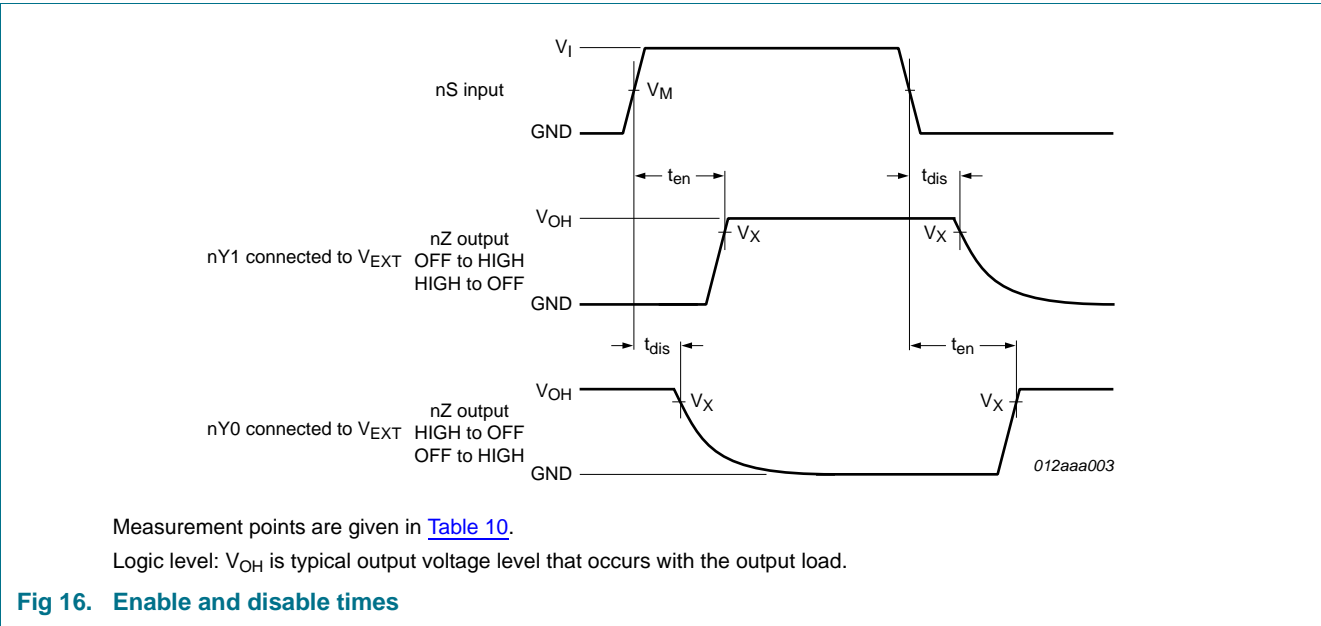


Table 10. Measurement points

Supply voltage	Input	Output
V _{CC}	V _M	V _X
1.4 V to 4.3 V	0.5V _{CC}	0.9V _{OH}

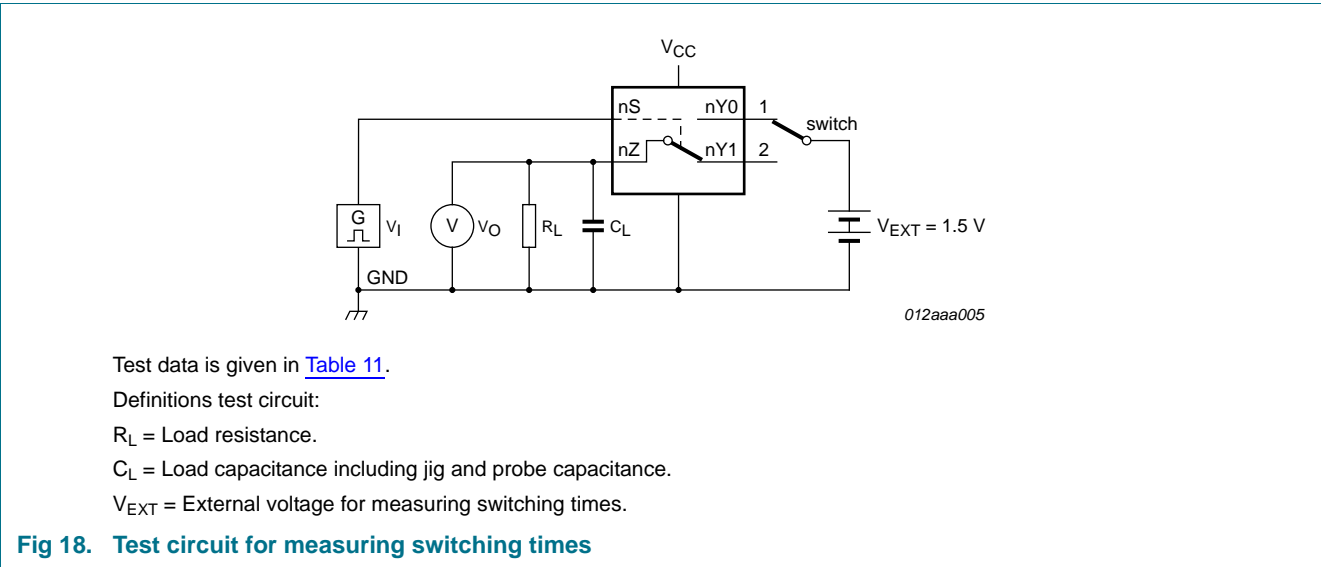
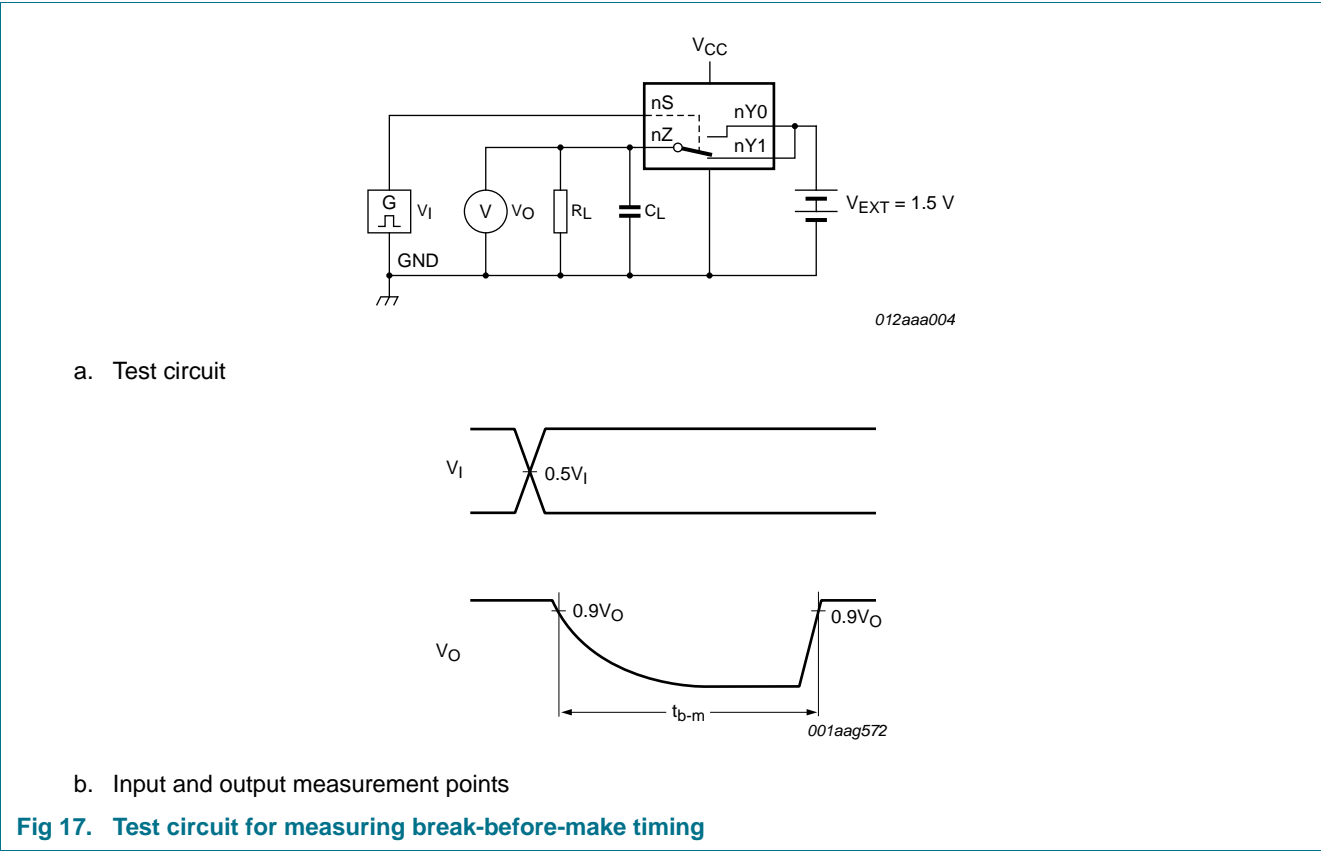


Table 11. Test data

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); $V_I = \text{GND}$ or V_{CC} (unless otherwise specified); $t_r = t_f \leq 2.5 \text{ ns}$; $T_{amb} = 25 \text{ }^\circ\text{C}$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
THD	total harmonic distortion	$f_i = 20 \text{ Hz to } 20 \text{ kHz}$; $R_L = 32 \text{ }\Omega$; see Figure 19	[1]			
		$V_{CC} = 1.4 \text{ V}$; $V_I = 1 \text{ V (p-p)}$	-	0.15	-	%
		$V_{CC} = 1.65 \text{ V}$; $V_I = 1.2 \text{ V (p-p)}$	-	0.10	-	%
		$V_{CC} = 2.3 \text{ V}$; $V_I = 1.5 \text{ V (p-p)}$	-	0.02	-	%
		$V_{CC} = 2.7 \text{ V}$; $V_I = 2 \text{ V (p-p)}$	-	0.02	-	%
		$V_{CC} = 4.3 \text{ V}$; $V_I = 2 \text{ V (p-p)}$	-	0.02	-	%
$f_{(-3\text{dB})}$	–3 dB frequency response	$R_L = 50 \text{ }\Omega$; see Figure 20	[1]			
		$V_{CC} = 1.4 \text{ V to } 4.3 \text{ V}$	-	60	-	MHz
α_{iso}	isolation (OFF-state)	$f_i = 100 \text{ kHz}$; $R_L = 50 \text{ }\Omega$; see Figure 21	[1]			
		$V_{CC} = 1.4 \text{ V to } 4.3 \text{ V}$	-	–90	-	dB
V_{ct}	crosstalk voltage	between digital inputs and switch; $f_i = 1 \text{ MHz}$; $C_L = 50 \text{ pF}$; $R_L = 50 \text{ }\Omega$; see Figure 22				
		$V_{CC} = 1.4 \text{ V to } 3.6 \text{ V}$	-	0.2	-	V
		$V_{CC} = 3.6 \text{ V to } 4.3 \text{ V}$	-	0.3	-	V
Xtalk	crosstalk	between switches; $f_i = 100 \text{ kHz}$; $R_L = 50 \text{ }\Omega$; see Figure 23	[1]			
		$V_{CC} = 1.4 \text{ V to } 4.3 \text{ V}$	-	–90	-	dB
Q_{inj}	charge injection	$f_i = 1 \text{ MHz}$; $C_L = 0.1 \text{ nF}$; $R_L = 1 \text{ M}\Omega$; $V_{gen} = 0 \text{ V}$; $R_{gen} = 0 \text{ }\Omega$; see Figure 24				
		$V_{CC} = 1.5 \text{ V}$	-	3	-	pC
		$V_{CC} = 1.8 \text{ V}$	-	4	-	pC
		$V_{CC} = 2.5 \text{ V}$	-	6	-	pC
		$V_{CC} = 3.3 \text{ V}$	-	9	-	pC
		$V_{CC} = 4.3 \text{ V}$	-	15	-	pC

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

12.3 Test circuits

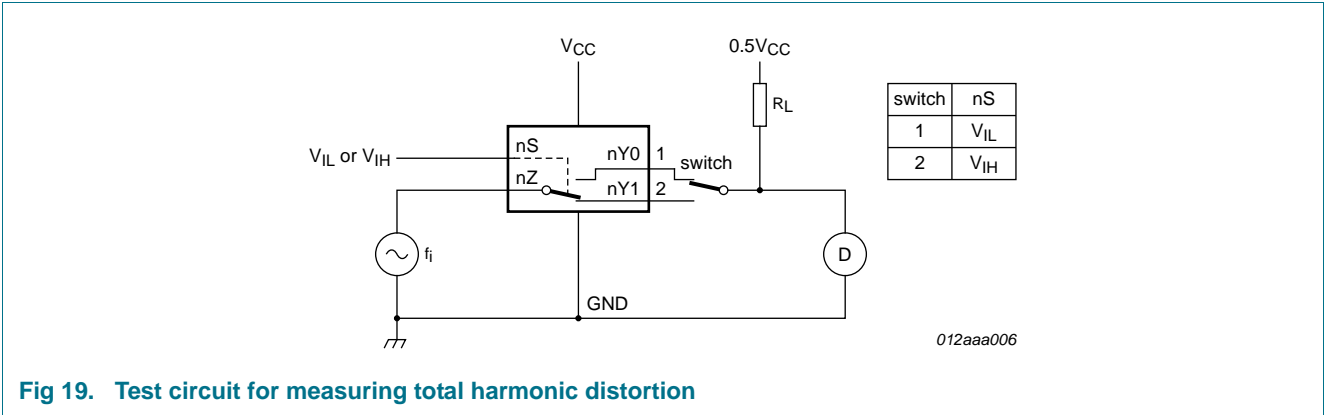
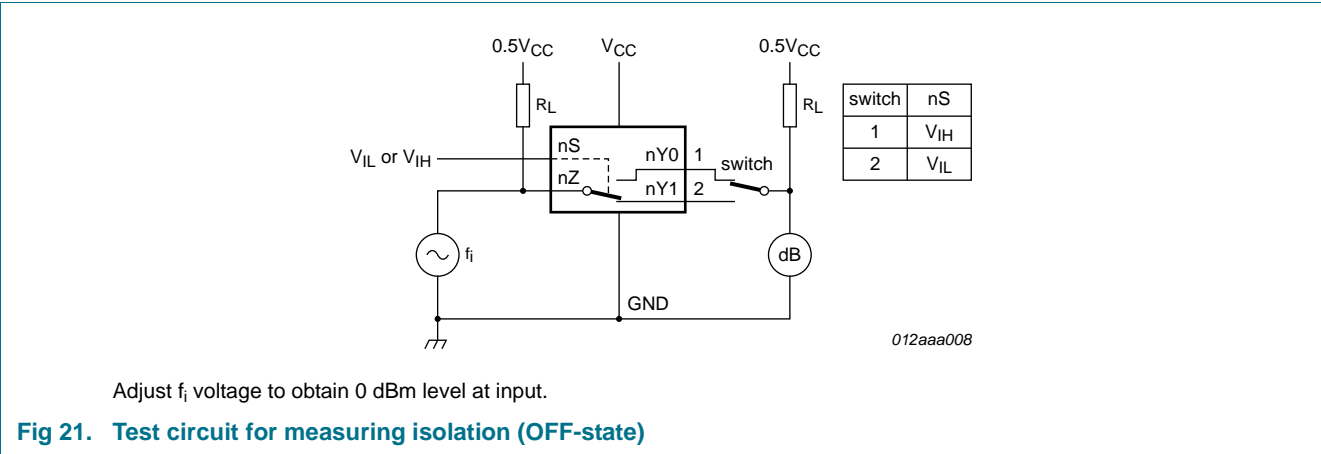
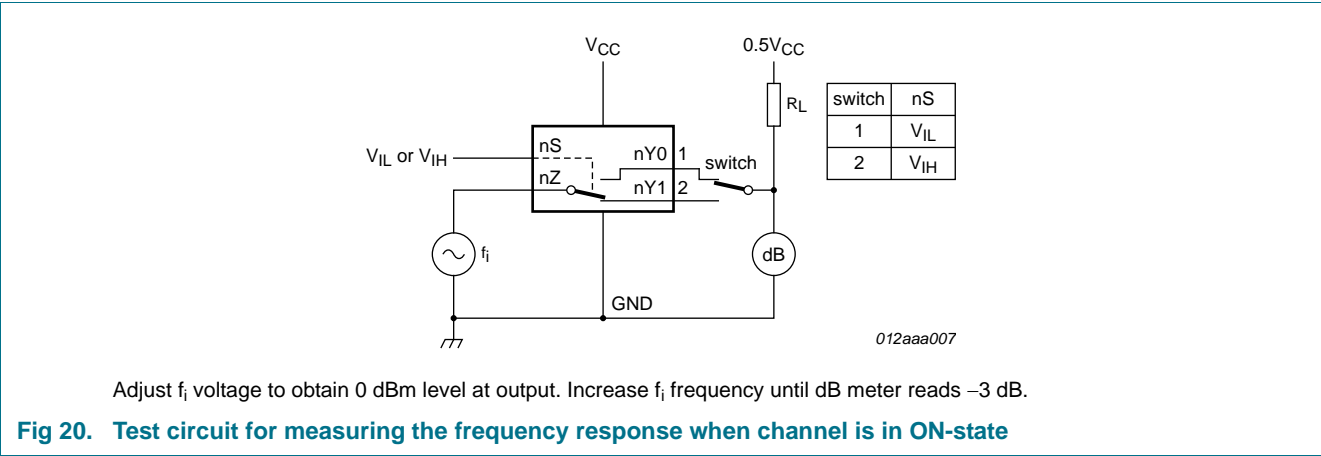
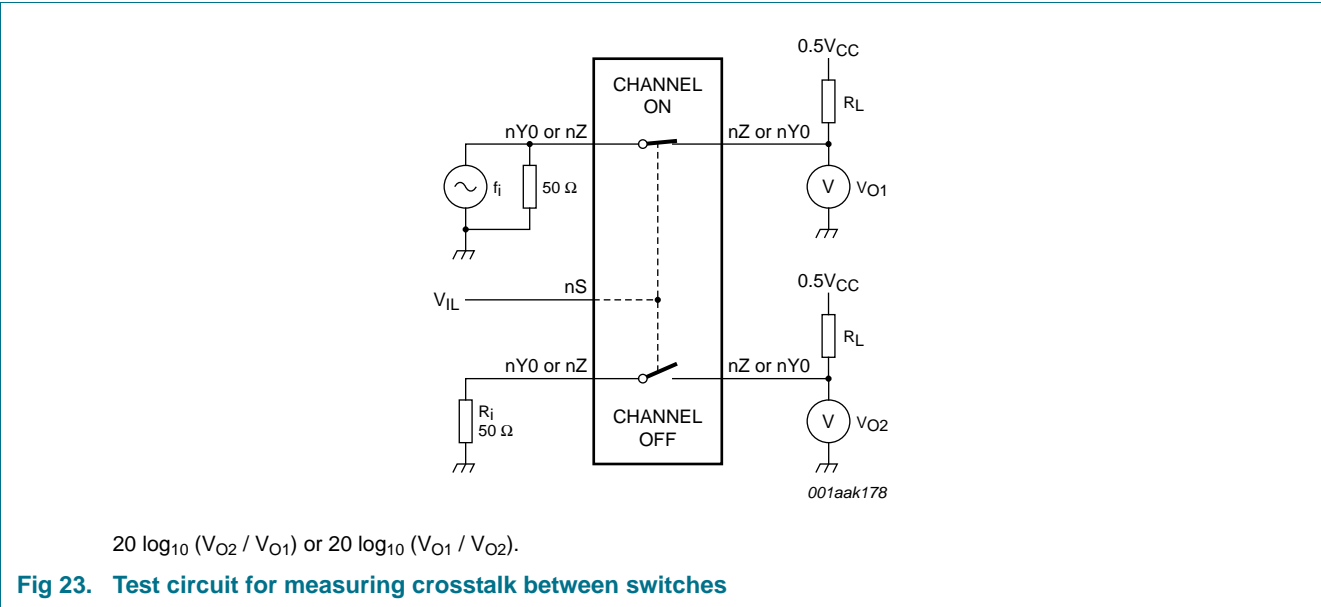
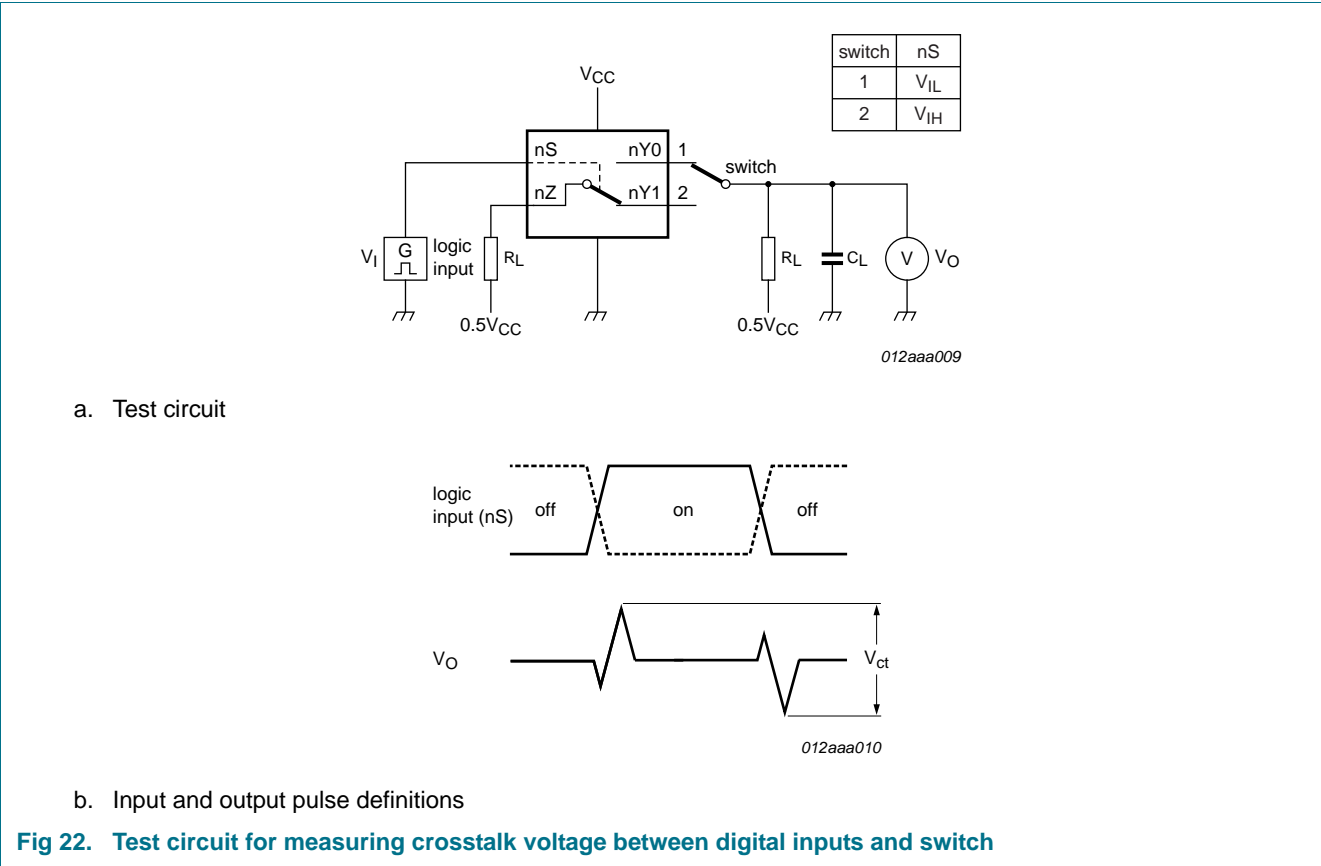
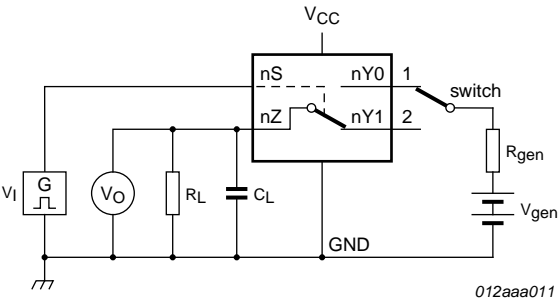


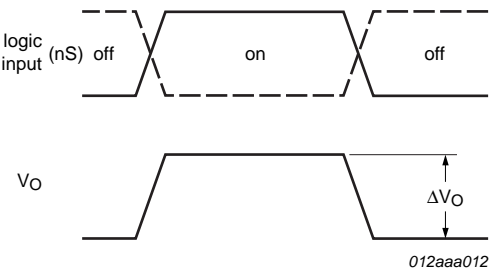
Fig 19. Test circuit for measuring total harmonic distortion







a. Test circuit



b. Input and output pulse definitions

Definition: $Q_{inj} = \Delta V_O \times C_L$.
 ΔV_O = output voltage variation.
 R_{gen} = generator resistance.
 V_{gen} = generator voltage.

Fig 24. Test circuit for measuring charge injection

13. Package outline

HXQFN16: plastic thermal enhanced extremely thin quad flat package; no leads;
 16 terminals; body 3 x 3 x 0.5 mm

SOT1039-2

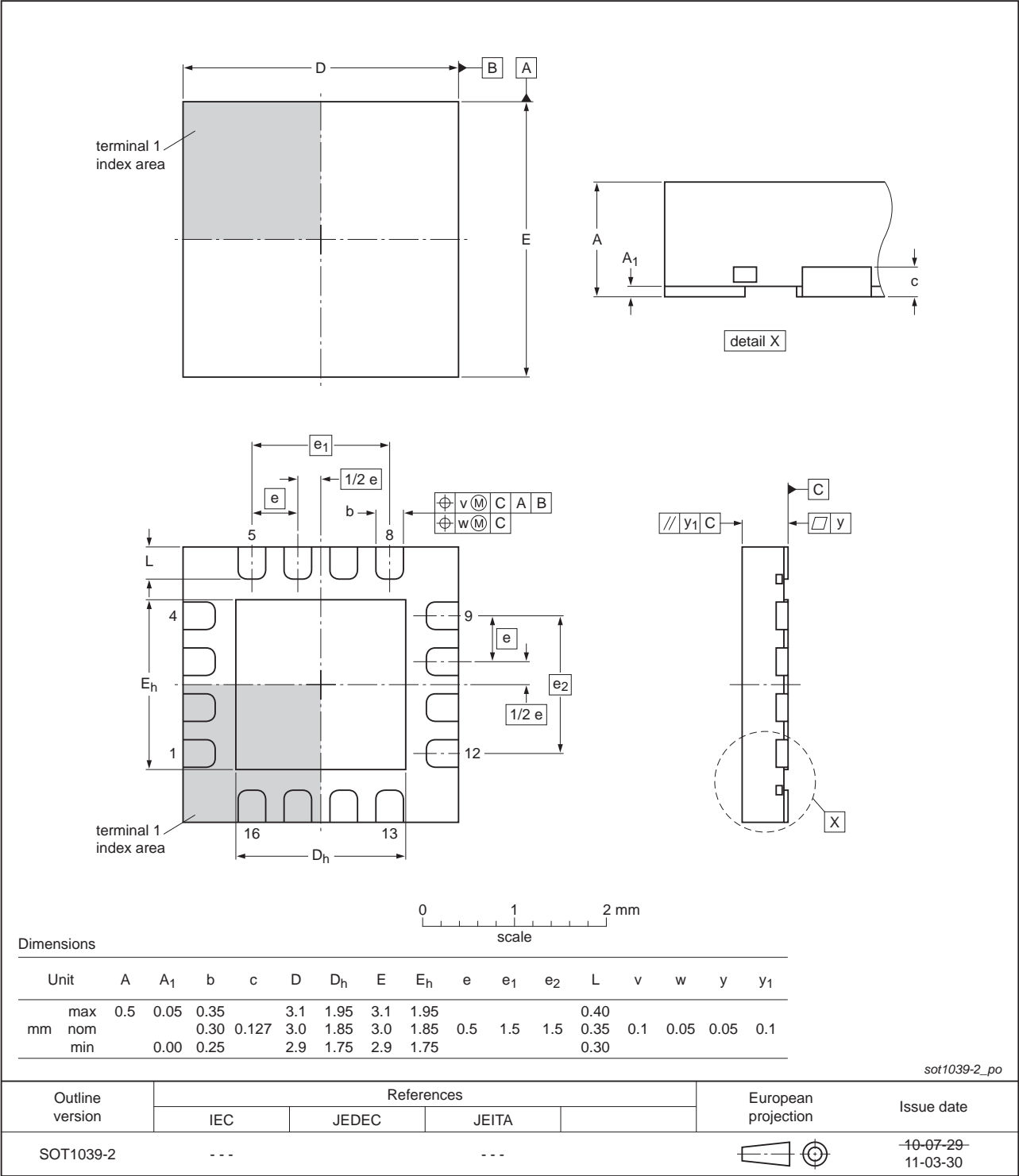


Fig 25. Package outline SOT1039-2 (HXQFN16)

TSSOP16: plastic thin shrink small outline package; 16 leads; body width 4.4 mm

SOT403-1

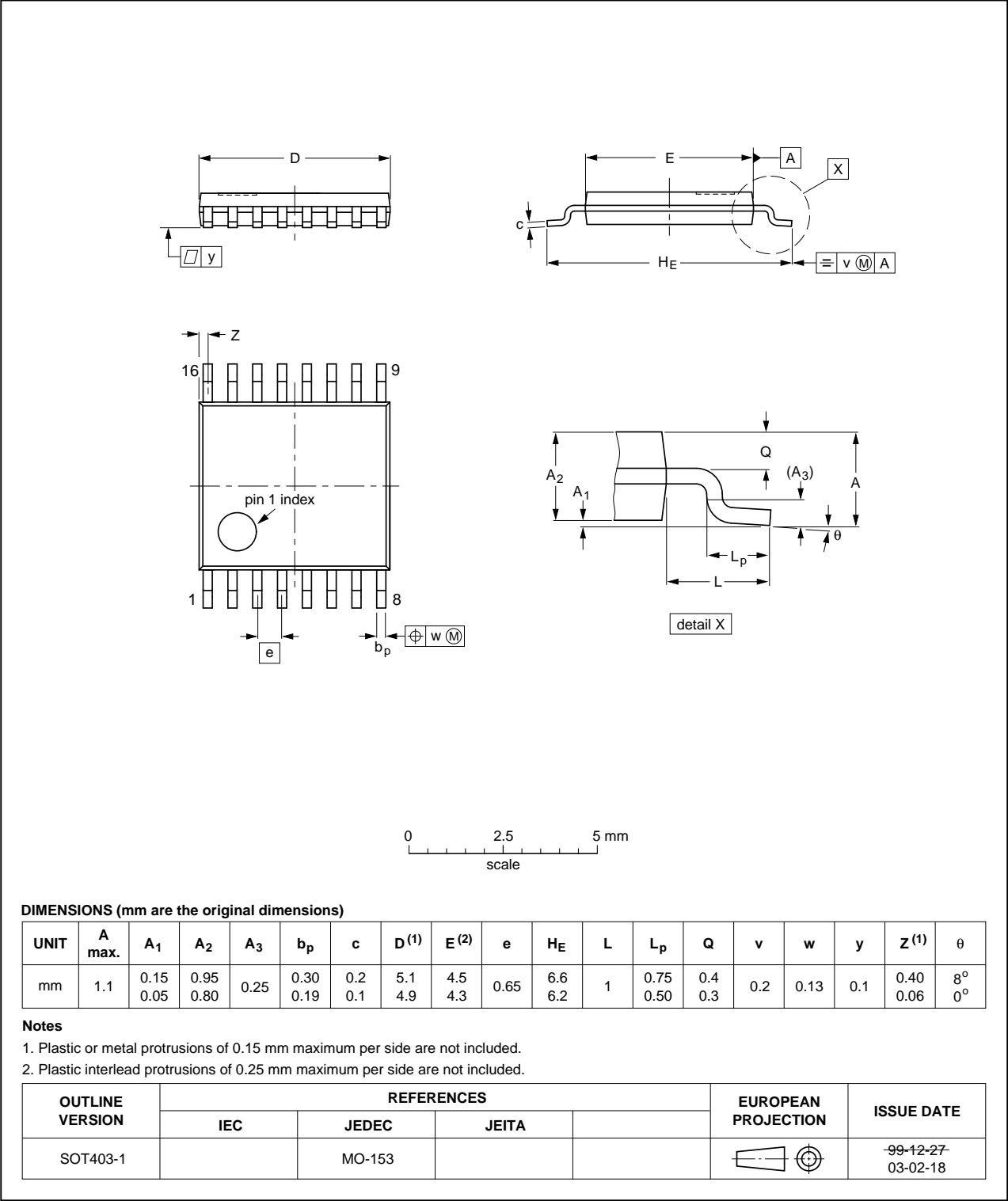


Fig 26. Package outline SOT403-1 (TSSOP16)

XQFN16: plastic, extremely thin quad flat package; no leads;
16 terminals; body 1.80 x 2.60 x 0.50 mm

SOT1161-1

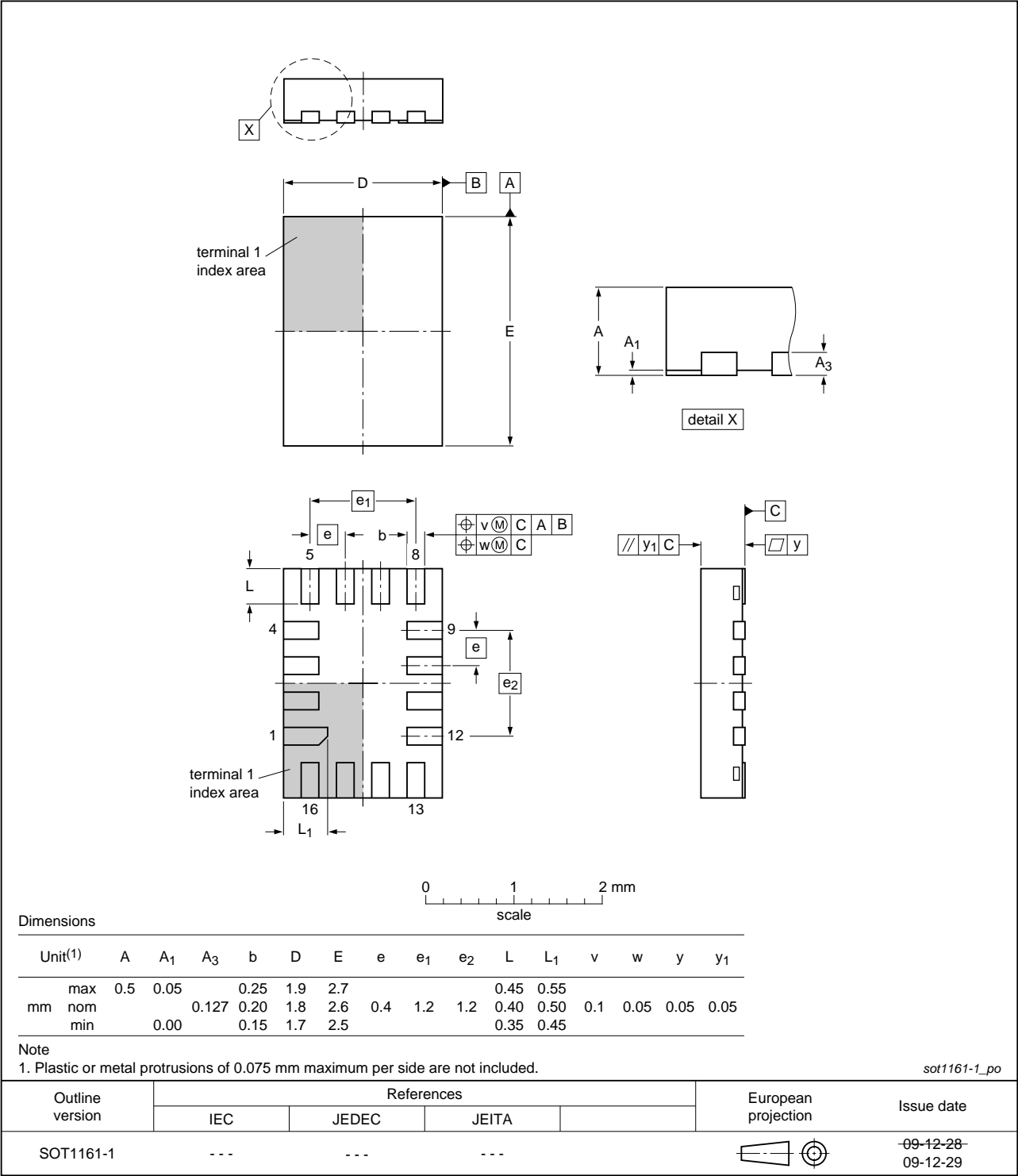


Fig 27. Package outline SOT1161-1 (XQFN16)

14. 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
PDA	Personal Digital Assistant

15. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NX3L2467 v.5	20120702	Product data sheet	-	NX3L2467 v.4
Modifications:	• For type number NX3L2467HR the sot code has changed to SOT1039-2.			
NX3L2467 v.4	20111108	Product data sheet	-	NX3L2467 v.3
Modifications:	• Legal pages updated.			
NX3L2467 v.3	20101229	Product data sheet	-	NX3L2467 v.2
NX3L2467 v.2	20100519	Product data sheet	-	NX3L2467 v.1
NX3L2467 v.1	20090623	Product data sheet	-	-

16. Legal information

16.1 Data sheet status

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

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

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

[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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