NX3L4357

Low-ohmic single-pole triple-throw analog switch with enable input

Rev. 5 — 18 June 2012 | Product data sheet

1. General description

The NX3L4357 is a low-ohmic single-pole triple-throw analog switch suitable for use as an analog or digital 3:1 multiplexer/demultiplexer. It has two digital select inputs (S0 and S1), one digital enable input ($\overline{E}$), three independent inputs/outputs (Y0, Y1 and Y2) and a common input/output (Z). The device features a broadcast mode, when S0 and S1 are both high the signal applied to pin Z is passed to Y0, Y1 and Y2.

Schmitt trigger action at the digital inputs makes the circuit tolerant to slower input rise and fall times. Low threshold digital inputs allows this device to be driven by 1.8 V logic levels in 3.3 V applications without significant increase in supply current I_{CC}. This makes it possible for the NX3L4357 to switch 4.3 V signals with a 1.8 V digital controller, eliminating the need for logic level translation. The NX3L4357 allows signals with amplitude up to V_{CC} to be transmitted from Z to Yn or Yn to Z. Its low ON resistance (0.5 Ω) and flatness (0.13 Ω) ensures minimal attenuation and distortion of transmitted signals.

2. Features and benefits

- Wide supply voltage range from 1.4 V to 4.3 V
- Very low ON resistance (peak):
  - 1.65 Ω (typical) at V_{CC} = 1.4 V
  - 0.95 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
- Break-before-make switching
- High noise immunity
- ESD protection:
  - HBM JESD22-A114F Class 3A exceeds 7500 V
  - MM JESD22-A115-A exceeds 200 V
  - CDM AEC-Q100-011 revision B exceeds 1000 V
  - IEC61000-4-2 contact discharge exceeds 6000 V for switch ports
- CMOS low-power consumption
- Latch-up performance exceeds 100 mA per JESD 78B Class II Level A
- 1.8 V control logic at V_{CC} = 3.6 V
- Control input accepts voltages above supply voltage
- Very low supply current, even when input is below V_{CC}
- 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
NX3L4357GM	–40 °C to +125 °C	XQFN10	plastic extremely thin quad flatpackage; no leads; 10 terminals; body 2 × 1.55 × 0.5 mm	SOT1049-3

5. Marking

Table 2. Marking

Type number	Marking code
NX3L4357GM	D43

6. Functional diagram

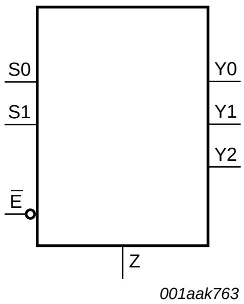


Fig 1. Logic symbol

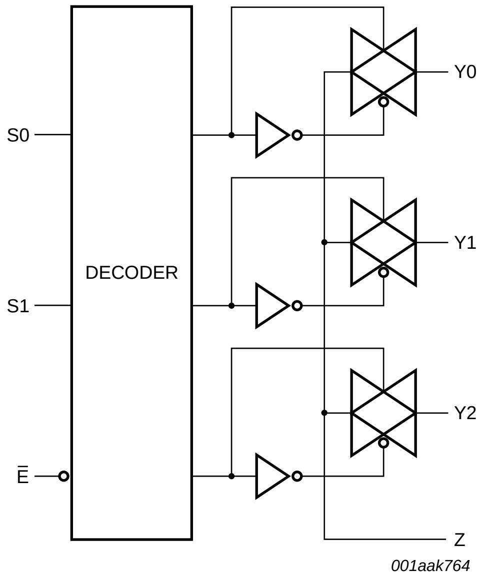


Fig 2. Logic diagram

7. Pinning information

7.1 Pinning

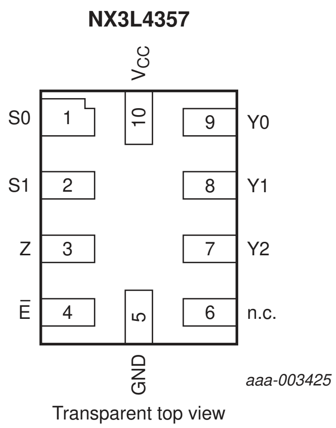


Fig 3. Pin configuration SOT1049-3 (XQFN10)

7.2 Pin description

Table 3. Pin description

Symbol	Pin	Description
S0	1	select input
S1	2	select input
Z	3	common output or input
$\overline{E}$	4	enable input (active LOW)
GND	5	ground (0 V)
n.c.	6	not connected
Y2	7	independent input or output
Y1	8	independent input or output
Y0	9	independent input or output
V_{CC}	10	supply voltage

8. Functional description

Table 4. Function table[1]

$\overline{E}$	S1	S0	Channel on
L	L	L	Y0 = Z
L	L	H	Y1 = Z
L	H	L	Y2 = Z
L	H	H	Y0, Y1, Y2 = Z (broadcast mode)
H	X	X	switches off

[1] H = HIGH voltage level; L = LOW voltage level; X = don't care.

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 S0, S1 and $\overline{E}$	[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 XQFN10 packages: above 132 °C the value of P_{tot} derates linearly with 14.1 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 S0, S1 and $\overline{E}$		0	4.3	V
V_{SW}	switch voltage	switch input Y0, Y1 and Y2	[1]	0	V_{CC}	V
T_{amb}	ambient temperature			−40	+125	°C
Δt/ΔV	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 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 select input Sn signal levels.

11. Static characteristics

Table 7. Static characteristics

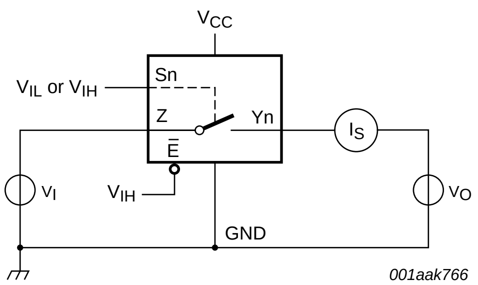
At recommended operating conditions; voltages are referenced to GND (ground 0 V).

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	-	-	0.5	-	0.5	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 S0, S1 and $\overline{E}$; 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	port Y0, Y1 and Y2; see Figure 4							
		V_{CC} = 1.4 V to 3.6 V	-	-	±5	-	±10	±100	nA
		V_{CC} = 3.6 V to 4.3 V	-	-	±10	-	±50	±200	nA
$I_{S(ON)}$	ON-state leakage current	Z port; see Figure 5							
		V_{CC} = 1.4 V to 3.6 V	-	-	±5	-	±20	±200	nA
		V_{CC} = 3.6 V to 4.3 V	-	-	±10	-	±50	±400	nA
I_{CC}	supply current	V_I = V_{CC} or GND; V_{SW} = GND or V_{CC}							
		V_{CC} = 3.6 V	-	-	100	-	300	3000	nA
		V_{CC} = 4.3 V	-	-	150	-	500	5000	nA

Table 7. Static characteristics *...continued*
At recommended operating conditions; voltages are referenced to GND (ground 0 V).

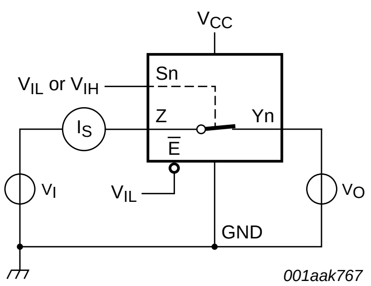
Symbol	Parameter	Conditions	T_{amb} = 25 °C			T_{amb} = −40 °C to +125 °C			Unit
			Min	Typ	Max	Min	Max (85 °C)	Max (125 °C)	
ΔI_{CC}	additional supply current	V_{SW} = GND or V_{CC}							
		V_I = 2.6 V; V_{CC} = 4.3 V	-	2.0	4.0	-	7	7	µA
		V_I = 2.6 V; V_{CC} = 3.6 V	-	0.35	0.7	-	1	1	µA
		V_I = 1.8 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	port Y0, Y1 and Y2	-	35	-	-	-	-	pF
$C_{S(ON)}$	ON-state capacitance	port Z; broadcast mode	-	330	-	-	-	-	pF
		port Y0, Y1 and Y2	-	170	-	-	-	-	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 4. Test circuit for measuring OFF-state leakage current



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

Fig 5. 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 7 to Figure 13.

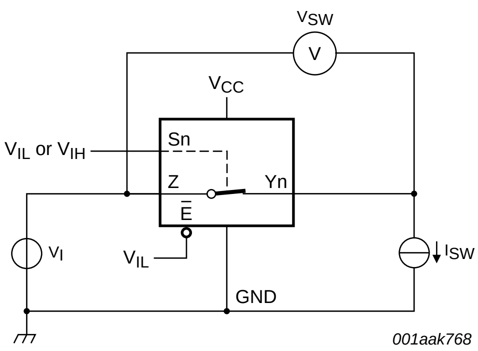
Symbol	Parameter	Conditions		T_{amb} = −40 °C to +85 °C			T_{amb} = −40 °C to +125 °C		Unit
				Min	Typ[1]	Max	Min	Max	
$R_{ON(peak)}$	ON resistance (peak)	port Y0, Y1 and Y2; V_I = GND to V_{CC}; I_{SW} = 100 mA; see Figure 6							
		V_{CC} = 1.4 V		-	1.6	3.7	-	4.1	Ω
		V_{CC} = 1.65 V		-	1.0	1.6	-	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
ΔR_{ON}	ON resistance mismatch between channels	V_I = GND to V_{CC}; I_{SW} = 100 mA	[2]						
		V_{CC} = 1.4 V		-	0.20	0.35	-	0.35	Ω
		V_{CC} = 1.65 V		-	0.20	0.25	-	0.30	Ω
		V_{CC} = 2.3 V		-	0.09	0.13	-	0.15	Ω
		V_{CC} = 2.7 V		-	0.09	0.13	-	0.15	Ω
		V_{CC} = 4.3 V		-	0.09	0.13	-	0.15	Ω
$R_{ON(flat)}$	ON resistance (flatness)	port Y0, Y1 and Y2; V_I = GND to V_{CC}; I_{SW} = 100 mA	[3]						
		V_{CC} = 1.4 V		-	1.05	3.35	-	3.65	Ω
		V_{CC} = 1.65 V		-	0.55	1.25	-	1.35	Ω
		V_{CC} = 2.3 V		-	0.20	0.35	-	0.40	Ω
		V_{CC} = 2.7 V		-	0.18	0.35	-	0.40	Ω
		V_{CC} = 4.3 V		-	0.23	0.40	-	0.45	Ω

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

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

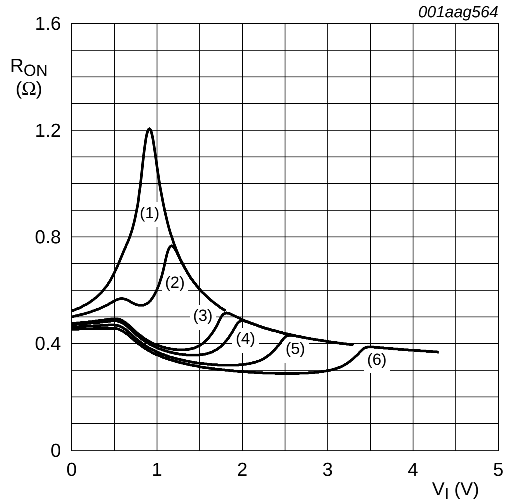
[3] Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V_{CC} and temperature.

11.3 ON resistance test circuit and graphs



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

Fig 6. Test circuit for measuring ON resistance



(1) V_{CC} = 1.5 V.

(2) V_{CC} = 1.8 V.

(3) V_{CC} = 2.5 V.

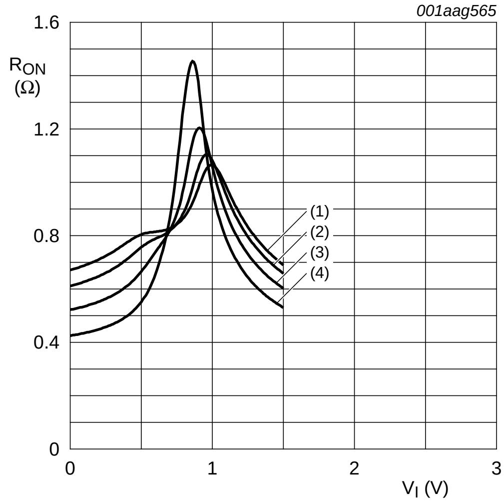
(4) V_{CC} = 2.7 V.

(5) V_{CC} = 3.3 V.

(6) V_{CC} = 4.3 V.

Measured at T_{amb} = 25 °C.

Fig 7. Typical ON resistance as a function of input voltage (Yn port)



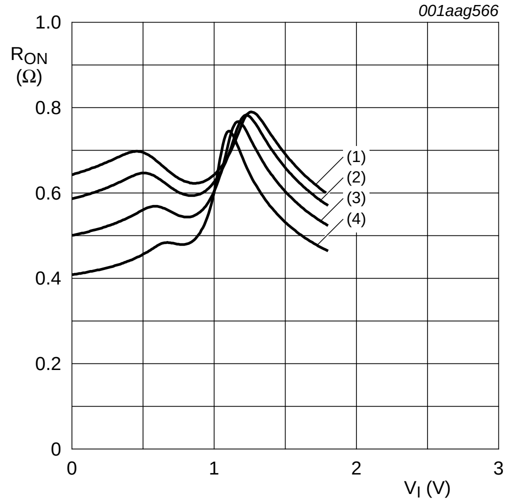
(1) T_{amb} = 125 °C.

(2) T_{amb} = 85 °C.

(3) T_{amb} = 25 °C.

(4) T_{amb} = −40 °C.

Fig 8. ON resistance as a function of input voltage; V_{CC} = 1.5 V (Yn port)



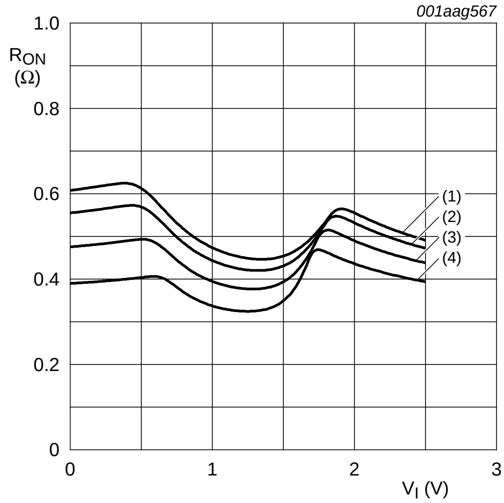
(1) T_{amb} = 125 °C.

(2) T_{amb} = 85 °C.

(3) T_{amb} = 25 °C.

(4) T_{amb} = −40 °C.

Fig 9. ON resistance as a function of input voltage; V_{CC} = 1.8 V (Yn port)



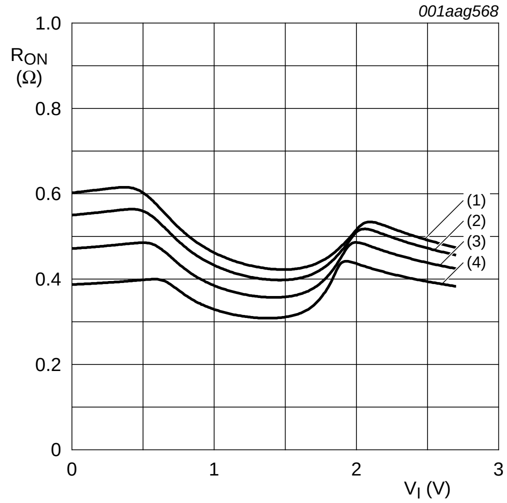
(1) T_{amb} = 125 °C.

(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} = 2.5 V (Yn port)



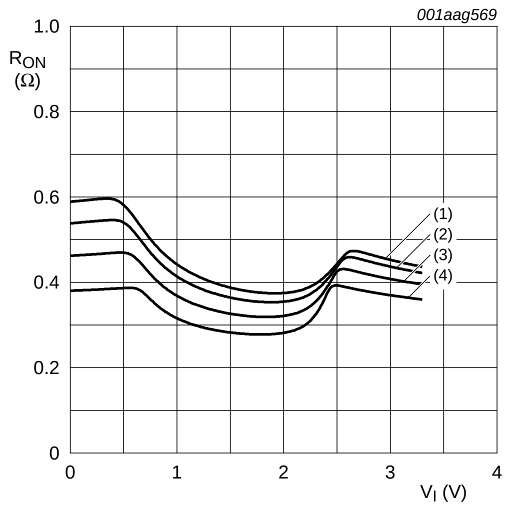
(1) T_{amb} = 125 °C.

(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} = 2.7 V (Yn port)



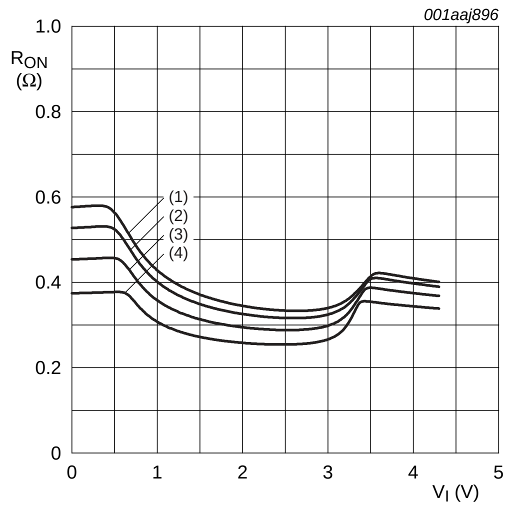
(1) T_{amb} = 125 °C.

(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} = 3.3 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} = 4.3 V

12. Dynamic characteristics

Table 9. Dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Figure 16.

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_{en}	enable time	$\overline{E}$, Sn to Z or Yn; see Figure 14							
		V_{CC} = 1.4 V to 1.6 V	-	50	100	-	120	125	ns
		V_{CC} = 1.65 V to 1.95 V	-	36	75	-	85	95	ns
		V_{CC} = 2.3 V to 2.7 V	-	24	50	-	55	60	ns
		V_{CC} = 2.7 V to 3.6 V	-	22	45	-	45	50	ns
		V_{CC} = 3.6 V to 4.3 V	-	22	45	-	45	50	ns
t_{dis}	disable time	$\overline{E}$, Sn to Z or Yn; see Figure 14							
		V_{CC} = 1.4 V to 1.6 V	-	32	80	-	90	105	ns
		V_{CC} = 1.65 V to 1.95 V	-	20	65	-	70	75	ns
		V_{CC} = 2.3 V to 2.7 V	-	12	30	-	35	40	ns
		V_{CC} = 2.7 V to 3.6 V	-	10	25	-	30	35	ns
		V_{CC} = 3.6 V to 4.3 V	-	10	25	-	30	35	ns

Table 9. Dynamic characteristics *...continued*

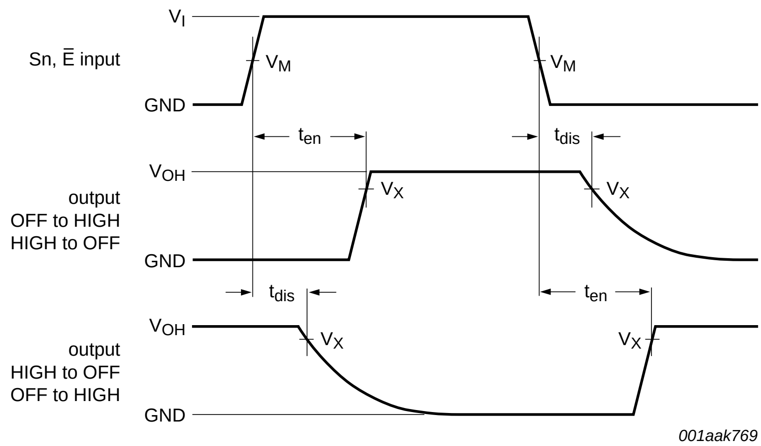
At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for test circuit see Figure 16.

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 15 [2]							
		V_{CC} = 1.4 V to 1.6 V	-	19	-	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	-	10	-	3	-	-	ns
		V_{CC} = 3.6 V to 4.3 V	-	10	-	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 Waveforms and test circuits



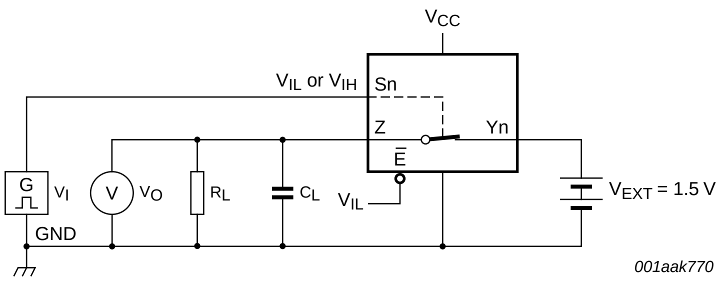
Measurement points are given in Table 10.

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

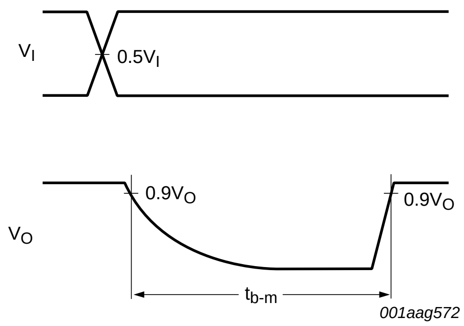
Fig 14. Enable and disable times

Table 10. Measurement points

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



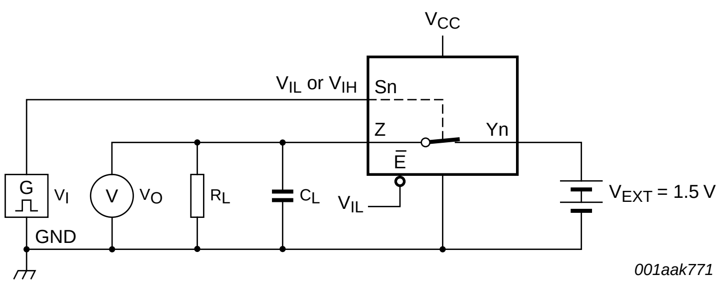
a. Test circuit



b. Input and output measurement points

V_I may be connected to S0 or S1.

Fig 15. Test circuit for measuring break-before-make timing



Test data is given in Table 11.

V_I may be connected to Sn or $\overline{E}$.

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 16. 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		Tamb = 25 °C			Unit
				Min	Typ	Max	
THD	total harmonic distortion	f_i = 20 Hz to 20 kHz; R_L = 32 Ω; see Figure 17	[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	-	%
		V_{CC} = 3.0 V; V_I = 1 V (p-p); R_L = 600 Ω		-	0.01	-	%
$f_{(-3dB)}$	−3 dB frequency response	R_L = 50 Ω; see Figure 18	[1]				
		port Y0, Y1 or Y2; V_{CC} = 1.4 V to 4.3 V		-	30	-	MHz
		port Y0, Y1 and Y2; V_{CC} = 1.4 V to 4.3 V		-	20	-	MHz
α_{iso}	isolation (OFF-state)	f_i = 100 kHz; R_L = 50 Ω; see Figure 19	[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 20					
		V_{CC} = 1.4 V to 3.6 V		-	0.21	-	V
		V_{CC} = 3.6 V to 4.3 V		-	0.30	-	V
Xtalk	crosstalk	between switches; f_i = 100 kHz; R_L = 50 Ω; see Figure 21	[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 22					
		V_{CC} = 1.5 V		-	10	-	pC
		V_{CC} = 1.8 V		-	15	-	pC
		V_{CC} = 2.5 V		-	26	-	pC
		V_{CC} = 3.3 V		-	36	-	pC
		V_{CC} = 4.3 V		-	50	-	pC

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

12.3 Test circuits

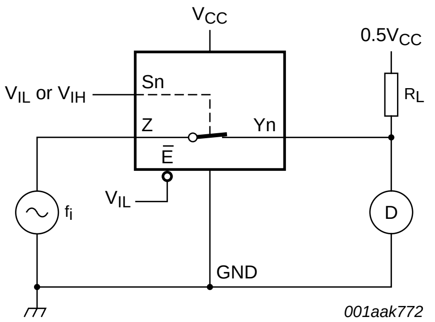
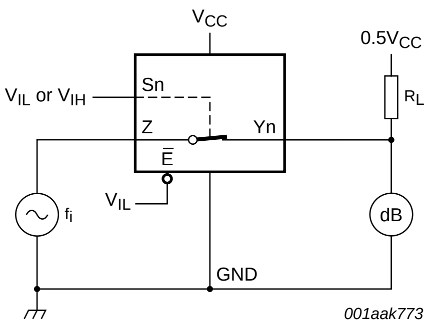
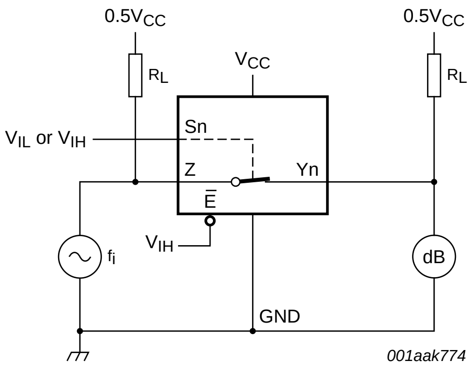


Fig 17. Test circuit for measuring total harmonic distortion



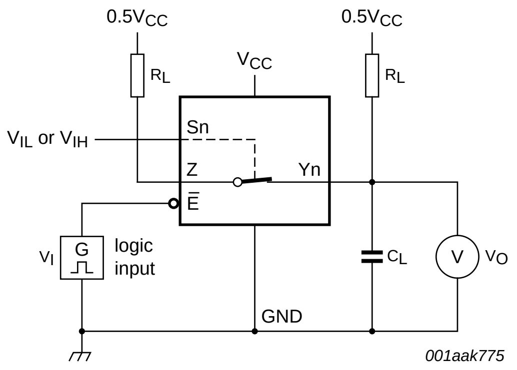
Adjust f_i voltage to obtain 0 dBm level at output. Increase f_i frequency until dB meter reads −3 dB.

Fig 18. Test circuit for measuring the frequency response when channel is in ON-state

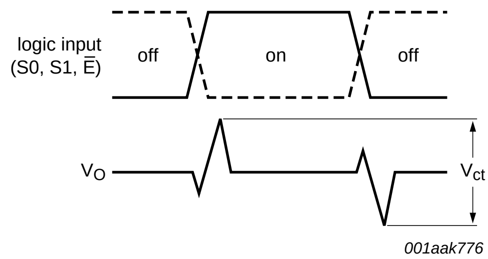


Adjust f_i voltage to obtain 0 dBm level at input.

Fig 19. Test circuit for measuring isolation (OFF-state)



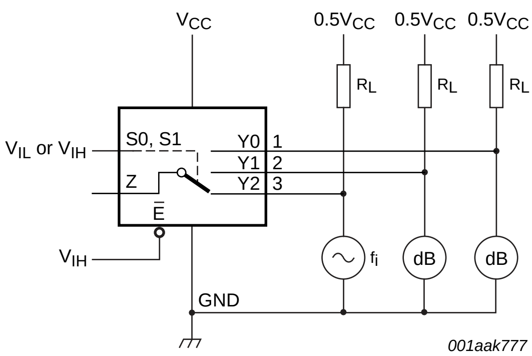
a. Test circuit



b. Input and output pulse definitions

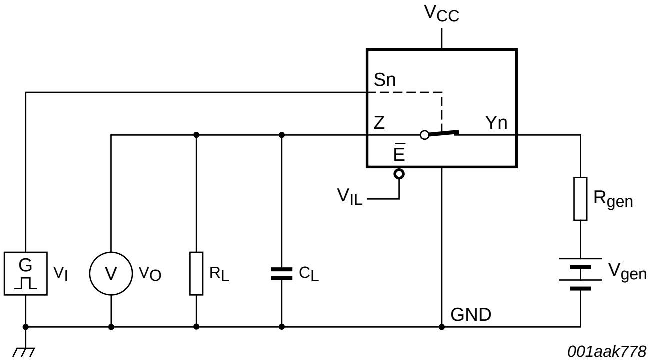
V_I may be connected to Sn or $\overline{E}$.

Fig 20. Test circuit for measuring crosstalk voltage between digital inputs and switch

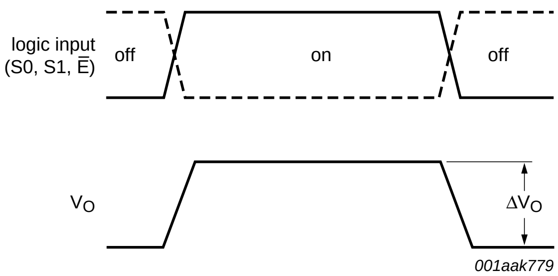


f_i may be connected to Y0, Y1 or Y2.

Fig 21. Test circuit for measuring crosstalk between switches



a. Test circuit



b. Input and output pulse definitions

V_I may be connected to Sn or $\overline{E}$.

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

ΔV_O = output voltage variation.

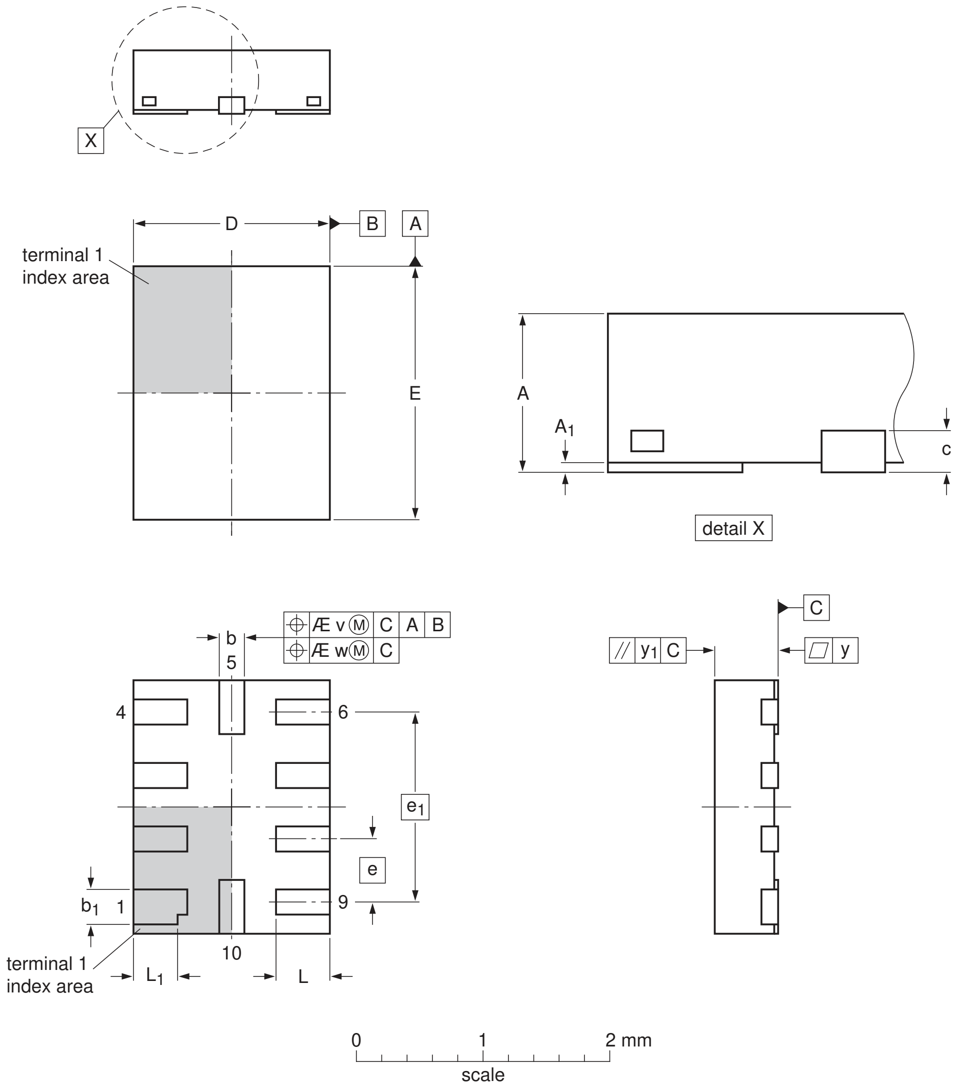
R_{gen} = generator resistance.

V_{gen} = generator voltage.

Fig 22. Test circuit for measuring charge injection

13. Package outline

XQFN10: plastic, extremely thin quad flat package; no leads; 10 terminals; body 1.55 x 2.00 x 0.50 mm **SOT1049-3**



Dimensions

Unit(1)		A	A_1	b	b_1	c	D	E	e	e_1	L	L_1	v	w	y	y_1
	max	0.5	0.05	0.25	0.33		1.65	2.1			0.48	0.40				
mm	nom			0.20	0.28	0.127	1.55	2.0	0.5	1.5	0.43	0.35	0.1	0.05	0.05	0.05
	min		0.00	0.15	0.23		1.45	1.9			0.38	0.30				

Note

1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot1049-3_po

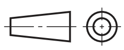
Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1049-3	- - -	MO255	- - -			~~10-12-06~~ 11-03-30

Fig 23. Package outline SOT1049-3 (XQFN10)

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

15. Revision history

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NX3L4357 v.5	20120618	Product data sheet	-	NX3L4357 v.4
Modifications:	• Package outline drawing SOT1049-2 changed to SOT1049-3 (Figure 23).			
NX3L4357 v.4	20111107	Product data sheet	-	NX3L4357 v.3
Modifications:	• Legal pages updated.			
NX3L4357 v.3	20101228	Product data sheet	-	NX3L4357 v.2
NX3L4357 v.2	20100428	Product data sheet	-	NX3L4357 v.1
NX3L4357 v.1	20091019	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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18. Contents

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