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# NX3L1T5157

# Low-ohmic single-pole double-throw analog switch

Rev. 6.1 — 30 November 2016

**Product data sheet** 

# 1. General description

The NX3L1T5157 is a low-ohmic single-pole double-throw analog switch suitable for use as an analog or digital 2:1 multiplexer/demultiplexer. It has a digital select input (S), two independent inputs/outputs (Y0 and Y1) and a common input/output (Z).

Schmitt trigger action at the digital input makes the circuit tolerant to slower input rise and fall times. Low threshold digital input 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 NX3L1T5157 to switch 4.3 V signals with a 1.8 V digital controller, eliminating the need for logic level translation. The NX3L1T5157 allows signals with amplitude up to  $V_{CC}$  to be transmitted from Z to Y0 or Y1, or from Y0 or Y1 to Z. Its low ON resistance  $(0.5 \ \Omega)$  and flatness  $(0.13 \ \Omega)$  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):
  - 1.6  $\Omega$  (typical) at  $V_{CC} = 1.4 \text{ V}$
  - 1.0  $\Omega$  (typical) at  $V_{CC} = 1.65 \text{ V}$
  - 0.55  $\Omega$  (typical) at  $V_{CC} = 2.3 \text{ V}$
  - 0.50 Ω (typical) at V<sub>CC</sub> = 2.7 V
  - 0.50 Ω (typical) at V<sub>CC</sub> = 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 8000 V for switch ports
- CMOS low-power consumption
- Latch-up performance exceeds 100 mA per JESD78 Class II Level A
- 1.8 V control logic at V<sub>CC</sub> = 3.6 V
- Control input accepts voltages above supply voltage
- Very low supply current, even when input is below V<sub>CC</sub>
- 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



# Low-ohmic single-pole double-throw analog switch

# 3. Applications

- Cell phone
- PDA
- Portable media player

# 4. Ordering information

#### Table 1. Ordering information

Type number	Package								
	Temperature range	Name	Description	Version					
NX3L1T5157GM	–40 °C to +125 °C		plastic extremely thin small outline package; no leads; 6 terminals; body $1 \times 1.45 \times 0.5$ mm	SOT886					

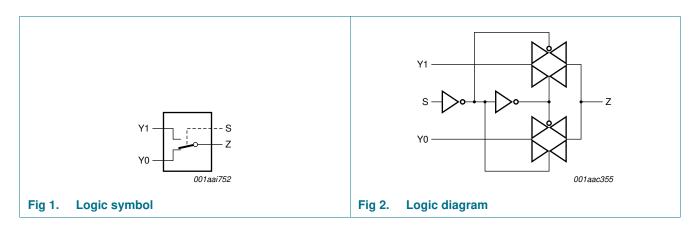
# 5. Marking

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

Type number	Marking code
NX3L1T5157GM	DI

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

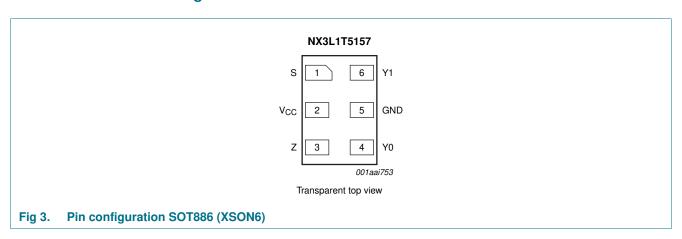
# 6. Functional diagram



# Low-ohmic single-pole double-throw analog switch

# 7. Pinning information

# 7.1 Pinning



# 7.2 Pin description

#### Table 3. Pin description

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

# 8. Functional description

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

Input S	Channel on
L	Y0
Н	Y1

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

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# 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 <sub>CC</sub>	supply voltage			-0.5	+4.6	V
VI	input voltage	select input S	[1]	-0.5	+4.6	V
$V_{SW}$	switch voltage		[2]	-0.5	$V_{CC} + 0.5$	V
I <sub>IK</sub>	input clamping current	$V_1 < -0.5 \text{ V}$		-50	-	mA
I <sub>SK</sub>	switch clamping current	$V_I < -0.5 \text{ V or } V_I > V_{CC} + 0.5 \text{ V}$		-	±50	mA
I <sub>SW</sub>	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 <sub>stg</sub>	storage temperature			-65	+150	°C
P <sub>tot</sub>	total power dissipation	$T_{amb} = -40  ^{\circ}\text{C} \text{ to } +125  ^{\circ}\text{C}$	[3]	-	250	mW

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

# 10. Recommended operating conditions

Table 6. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>CC</sub>	supply voltage		1.4	4.3	V
VI	input voltage	select input S	0	4.3	V
$V_{SW}$	switch voltage	[1]	0	V <sub>CC</sub>	V
T <sub>amb</sub>	ambient temperature		-40	+125	°C
Δt/ΔV	input transition rise and fall rate	$V_{CC} = 1.4 \text{ V to } 4.3 \text{ V}$ [2]	-	200	ns/V

<sup>[1]</sup> 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.

<sup>[2]</sup> 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.

<sup>[3]</sup> For XSON6 package: above 118 °C the value of Ptot derates linearly with 7.8 mW/K.

<sup>[2]</sup> Applies to control signal levels.

# Low-ohmic single-pole double-throw analog switch

# 11. Static characteristics

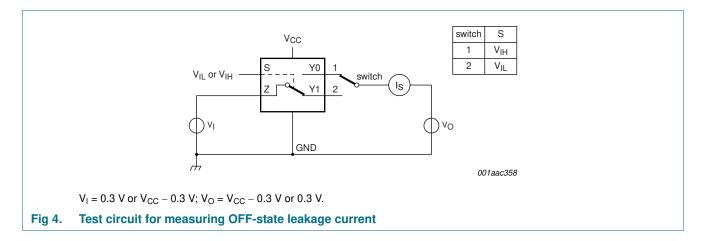
Table 7. Static characteristics

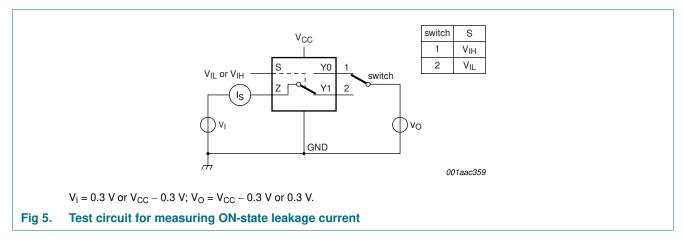
At recommended operating conditions; voltages are referenced to GND (ground 0 V).

Symbol	Parameter	Conditions	Ta	T <sub>amb</sub> = 25 °C			$T_{amb} = -40$ °C to +125 °C		
			Min	Тур	Max	Min	Max (85 °C)	Max (125 °C)	
$V_{IH}$	HIGH-level	V <sub>CC</sub> = 1.4 V to 1.6 V	0.9	-	-	0.9	-	-	٧
	input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	0.9	-	-	0.9	-	-	٧
		V <sub>CC</sub> = 2.3 V to 2.7 V	1.1	-	-	1.1	-	-	V
		V <sub>CC</sub> = 2.7 V to 3.6 V	1.3	-	-	1.3	-	-	٧
		V <sub>CC</sub> = 3.6 V to 4.3 V	1.4	-	-	1.4	-	-	٧
$V_{IL}$	LOW-level	V <sub>CC</sub> = 1.4 V to 1.6 V	-	-	0.3	-	0.3	0.3	٧
	input voltage	V <sub>CC</sub> = 1.65 V to 1.95 V	-	-	0.4	-	0.4	0.3	٧
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	-	0.4	-	0.4	0.4	٧
		V <sub>CC</sub> = 2.7 V to 3.6 V	-	-	0.5	-	0.5	0.5	V
		V <sub>CC</sub> = 3.6 V to 4.3 V	-	-	0.6	-	0.6	0.6	V
I <sub>I</sub>	input leakage current	select input S; V <sub>I</sub> = GND to 4.3 V; V <sub>CC</sub> = 1.4 V to 4.3 V	-	-	-	-	±0.5	±1	μΑ
I <sub>S(OFF)</sub>	OFF-state leakage	Y0 and Y1 port; see Figure 4							
	current	$V_{CC} = 1.4 \text{ V to } 3.6 \text{ V}$	-	-	±5	-	±50	±500	nA
		$V_{CC} = 3.6 \text{ V to } 4.3 \text{ V}$	-	-	±10	-	±50	±500	nA
I <sub>S(ON)</sub>	ON-state leakage	Z port; see Figure 5							
		V <sub>CC</sub> = 1.4 V to 3.6 V	-	-	±5	-	±50	±500	nA
	current	$V_{CC} = 3.6 \text{ V to } 4.3 \text{ V}$	-	-	±10	-	±50	±500	nA
I <sub>CC</sub>	supply current	$V_I = V_{CC}$ or GND; $V_{SW} = GND$ or $V_{CC}$							
		V <sub>CC</sub> = 3.6 V	-	-	100	-	690	6000	nA
		V <sub>CC</sub> = 4.3 V	-	-	150	-	800	7000	nA
$\Delta I_{CC}$	additional	$V_{SW} = GND \text{ or } V_{CC}$							
	supply current	$V_{I} = 2.6 \text{ V}; V_{CC} = 4.3 \text{ V}$	-	2.0	4.0	-	7	7	μА
		$V_{I} = 2.6 \text{ V}; V_{CC} = 3.6 \text{ V}$	-	0.35	0.7	-	1	1	μА
		V <sub>I</sub> = 1.8 V; V <sub>CC</sub> = 4.3 V	-	7.0	10.0	-	15	15	μА
		V <sub>I</sub> = 1.8 V; V <sub>CC</sub> = 3.6 V	-	2.5	4.0	-	5	5	μА
		V <sub>I</sub> = 1.8 V; V <sub>CC</sub> = 2.5 V	-	50	200	-	300	500	nA
Cı	input capacitance		-	1.0	-	-	-	-	pF
C <sub>S(OFF)</sub>	OFF-state capacitance		-	35	-	-	-	-	pF
C <sub>S(ON)</sub>	ON-state capacitance		-	130	-	-	-	-	pF

#### Low-ohmic single-pole double-throw analog switch

#### 11.1 Test circuits





#### 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			$T_{amb} = -40 \text{ °C to } +85 \text{ °C}$ $T_{amb} = -40 \text{ °C to } +125 \text{ °C}$				C to +125 °C	Unit
			Min	Typ[1]	Max	Min	Max				
R <sub>ON(peak)</sub>	ON resistance (peak)	$V_I = GND \text{ to } V_{CC};$ $I_{SW} = 100 \text{ mA}; \text{ see } \frac{\text{Figure 6}}{\text{MB}}$									
		V <sub>CC</sub> = 1.4 V	-	1.6	3.7	-	4.1	Ω			
		V <sub>CC</sub> = 1.65 V	-	1.0	1.6	-	1.7	Ω			
		$V_{CC} = 2.3 \text{ V}$	-	0.55	0.8	-	0.9	Ω			
		$V_{CC} = 2.7 \text{ V}$	-	0.5	0.75	-	0.9	Ω			
		V <sub>CC</sub> = 4.3 V	-	0.5	0.75	-	0.9	Ω			

#### Low-ohmic single-pole double-throw analog switch

Table 8. ON resistance ... continued

At recommended operating conditions; voltages are referenced to GND (ground = 0 V); for graphs see Figure 7 to Figure 13.

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

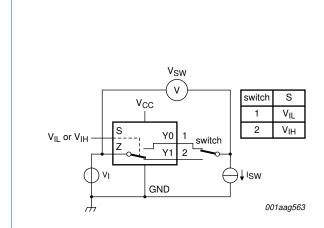
<sup>[1]</sup> Typical values are measured at  $T_{amb}$  = 25 °C.

<sup>[2]</sup> Measured at identical V<sub>CC</sub>, temperature and input voltage.

<sup>[3]</sup> Flatness is defined as the difference between the maximum and minimum value of ON resistance measured at identical V<sub>CC</sub> and temperature.

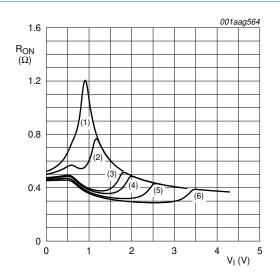
#### Low-ohmic single-pole double-throw analog switch

# 11.3 ON resistance test circuit and graphs



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

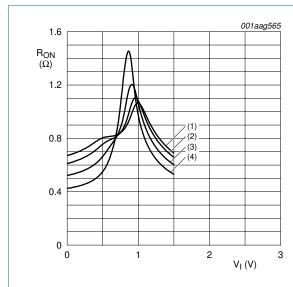
Fig 6. Test circuit for measuring ON resistance



- (1)  $V_{CC} = 1.5 \text{ V}.$
- (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 °C.

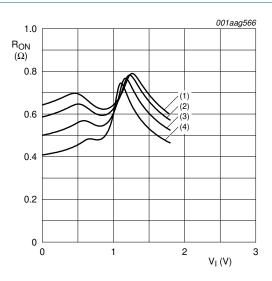
Fig 7. Typical ON resistance as a function of input voltage

#### Low-ohmic single-pole double-throw analog switch



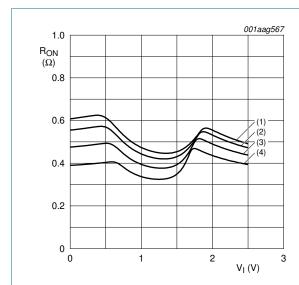
- (1)  $T_{amb} = 125 \, ^{\circ}C$ .
- (2)  $T_{amb} = 85 \, ^{\circ}C$ .
- (3)  $T_{amb} = 25 \, ^{\circ}C$ .
- (4)  $T_{amb} = -40 \, ^{\circ}C$ .

Fig 8. ON resistance as a function of input voltage;  $V_{CC} = 1.5 \text{ V}$ 



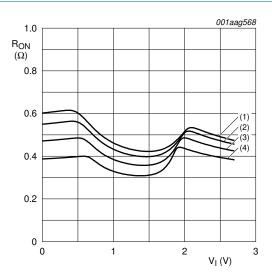
- (1)  $T_{amb} = 125 \, ^{\circ}C$ .
- (2)  $T_{amb} = 85 \, ^{\circ}C$ .
- (3)  $T_{amb} = 25 \, ^{\circ}C$ .
- (4)  $T_{amb} = -40 \, ^{\circ}C$ .

Fig 9. ON resistance as a function of input voltage;  $V_{CC} = 1.8 \text{ V}$ 



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

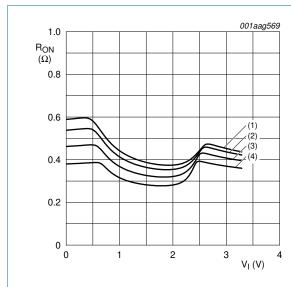
Fig 10. ON resistance as a function of input voltage;  $V_{CC} = 2.5 \text{ V}$ 



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

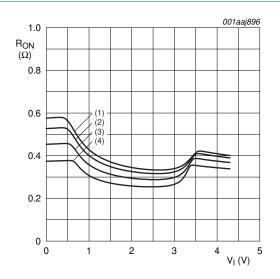
Fig 11. ON resistance as a function of input voltage;  $V_{CC}$  = 2.7 V

#### Low-ohmic single-pole double-throw analog switch



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

Fig 12. ON resistance as a function of input voltage;  $V_{CC} = 3.3 \text{ V}$ 



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

Fig 13. 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 <u>Figure 16</u>.

Symbol	ymbol Parameter Conditions			25 °C			-40 °C to +125 °C		
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t <sub>en</sub>	enable time	S to Z or Yn; see Figure 14							
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	50	90	-	120	120	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	36	70	-	80	90	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	24	45	-	50	55	ns
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$	-	22	40	-	45	50	ns
		$V_{CC} = 3.6 \text{ V to } 4.3 \text{ V}$	-	22	40	-	45	50	ns
t <sub>dis</sub>	disable time	S to Z or Yn; see Figure 14							
		V <sub>CC</sub> = 1.4 V to 1.6 V	-	32	70	-	80	90	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	20	55	-	60	65	ns
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	-	12	25	-	30	35	ns
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$	-	10	20	-	25	30	ns
		$V_{CC} = 3.6 \text{ V to } 4.3 \text{ V}$	-	10	20	-	25	30	ns

#### Low-ohmic single-pole double-throw analog switch

 Table 9.
 Dynamic characteristics ...continued

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

Symbol	Parameter	Conditions	25 °C		5 °C	Unit			
			Min	Typ[1]	Max	Min	Max (85 °C)	Max (125 °C)	
t <sub>b-m</sub>	break-before-make	see Figure 15 [2]							
	time	V <sub>CC</sub> = 1.4 V to 1.6 V	-	19	-	9	-	-	ns
		V <sub>CC</sub> = 1.65 V to 1.95 V	-	17	-	7	-	-	ns
		V <sub>CC</sub> = 2.3 V to 2.7 V	-	13	-	4	-	-	ns
		V <sub>CC</sub> = 2.7 V to 3.6 V	-	10	-	3	-	-	ns
		V <sub>CC</sub> = 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 Waveform and test circuits

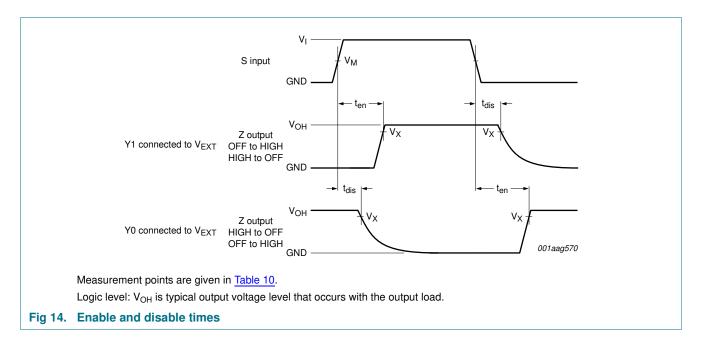
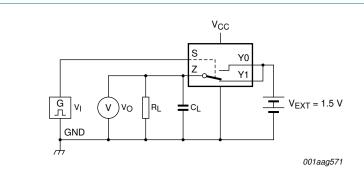


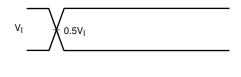
Table 10. Measurement points

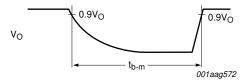
Supply voltage	Input	Output
V <sub>CC</sub>	V <sub>M</sub>	$V_X$
1.4 V to 4.3 V	0.5V <sub>CC</sub>	0.9V <sub>OH</sub>

#### Low-ohmic single-pole double-throw analog switch



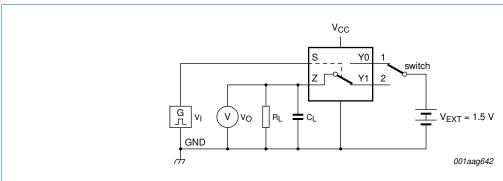
a. Test circuit





b. Input and output measurement points

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



Test data is given in Table 11.

Definitions test circuit:

R<sub>L</sub> = Load resistance.

C<sub>L</sub> = Load capacitance including jig and probe capacitance.

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

Fig 16. Load circuit for switching times

Table 11. Test data

Supply voltage	Input		pply voltage Input Load		
V <sub>CC</sub>	VI	t <sub>r</sub> , t <sub>f</sub>	CL	$R_L$	
1.4 V to 4.3 V	V <sub>CC</sub>	≤ 2.5 ns	35 pF	50 Ω	

NX3L1T5157

#### Low-ohmic single-pole double-throw analog switch

# 12.2 Additional dynamic characteristics

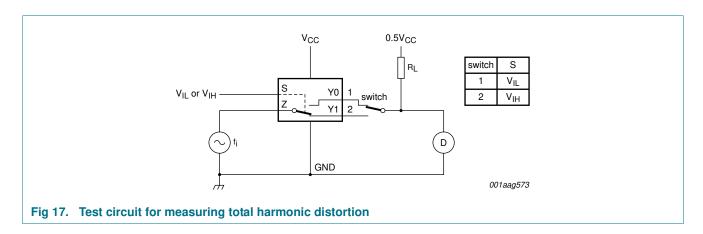
#### Table 12. Additional dynamic characteristics

At recommended operating conditions; voltages are referenced to GND (ground = 0 V);  $V_l$  = GND or  $V_{CC}$  (unless otherwise specified);  $t_r = t_f \le 2.5$  ns;  $T_{amb} = 25$  °C.

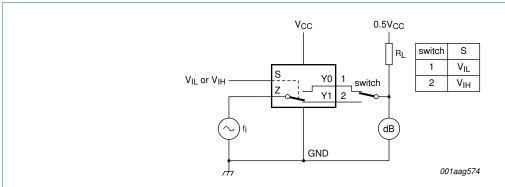
Symbol	Parameter	Conditions		Min	Тур	Max	Unit
THD total harmonic		$f_i$ = 20 Hz to 20 kHz; $R_L$ = 32 $\Omega$ ; see Figure 17	[1]		'		
	distortion	$V_{CC} = 1.4 \text{ V}; V_I = 1 \text{ V (p-p)}$		-	0.15	-	%
		V <sub>CC</sub> = 1.65 V; V <sub>I</sub> = 1.2 V (p-p)		-	0.10	-	%
		$V_{CC} = 2.3 \text{ V}; V_I = 1.5 \text{ V (p-p)}$		-	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 <sub>(-3dB)</sub>	-3 dB frequency	$R_L = 50 \Omega$ ; see Figure 18	[1]				
	response	V <sub>CC</sub> = 1.4 V to 4.3 V		-	60	-	MHz
$\alpha_{\text{iso}}$ isolation (OFF-state)		$f_i$ = 100 kHz; $R_L$ = 50 $\Omega$ ; see Figure 19	[1]				
		V <sub>CC</sub> = 1.4 V to 4.3 V		-	-90	-	dB
V <sub>ct</sub> crosstalk voltage	between digital inputs and switch; $f_i = 1 \text{ MHz}$ ; $C_L = 50 \text{ pF}$ ; $R_L = 50 \Omega$ ; see Figure 20						
	V <sub>CC</sub> = 1.4 V to 3.6 V		-	0.2	-	V	
		V <sub>CC</sub> = 3.6 V to 4.3 V		-	0.3	-	V
Q <sub>inj</sub>	charge injection	$f_i$ = 1 MHz; $C_L$ = 0.1 nF; $R_L$ = 1 M $\Omega$ ; $V_{gen}$ = 0 V; $R_{gen}$ = 0 $\Omega$ ; see Figure 21					
		V <sub>CC</sub> = 1.5 V		-	3	-	рС
		V <sub>CC</sub> = 1.8 V		-	4	-	рC
		V <sub>CC</sub> = 2.5 V		-	6	-	рС
		V <sub>CC</sub> = 3.3 V		-	9	-	рС
		V <sub>CC</sub> = 4.3 V		-	15	-	рС

<sup>[1]</sup>  $f_i$  is biased at 0.5 $V_{CC}$ .

#### 12.3 Test circuits

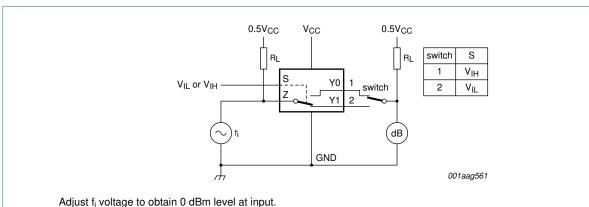


# Low-ohmic single-pole double-throw analog switch



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

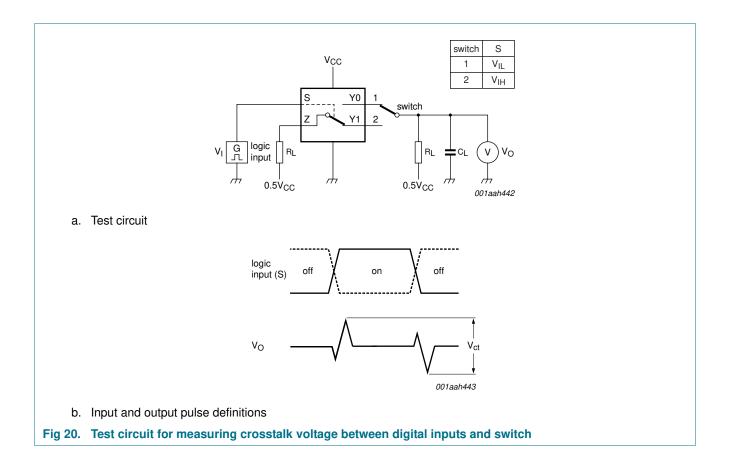
Fig 18. Test circuit for measuring the frequency response when channel is in ON-state



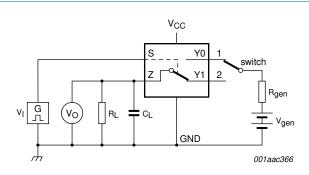
Adjust if voltage to obtain o dom level at input.

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

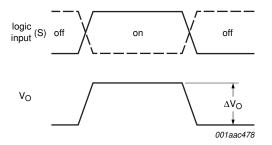
# Low-ohmic single-pole double-throw analog switch



# Low-ohmic single-pole double-throw analog switch



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 21. Test circuit for measuring charge injection

#### Low-ohmic single-pole double-throw analog switch

# 13. Package outline

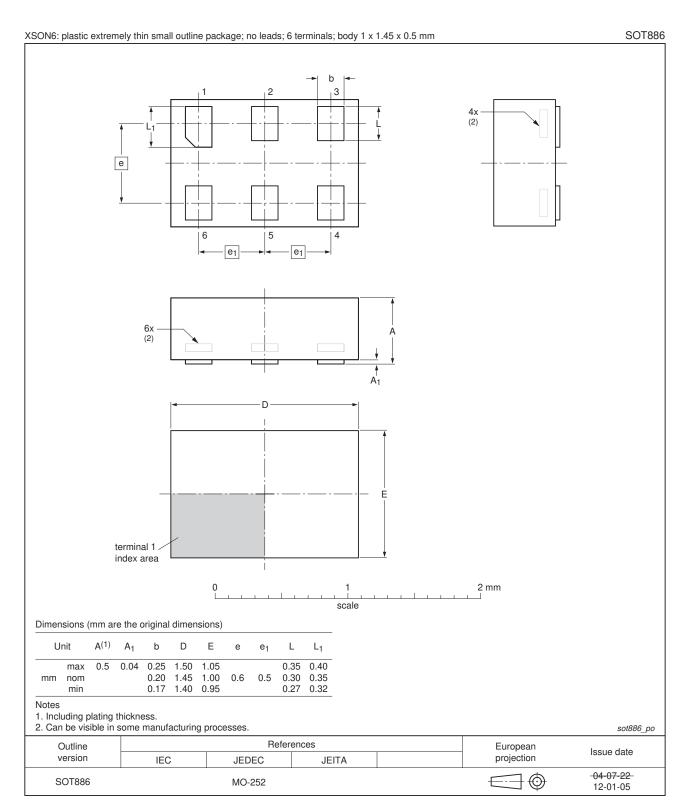


Fig 22. Package outline SOT886 (XSON6)

Low-ohmic single-pole double-throw analog switch

# 14. Packing information

# 14.1 XSON6; Reel pack; SMD, 7" Q1/T1 Standard product orientation; Orderable part number ending ,115 or Ordering code (12NC) ending 115

#### 14.1.1 Packing method

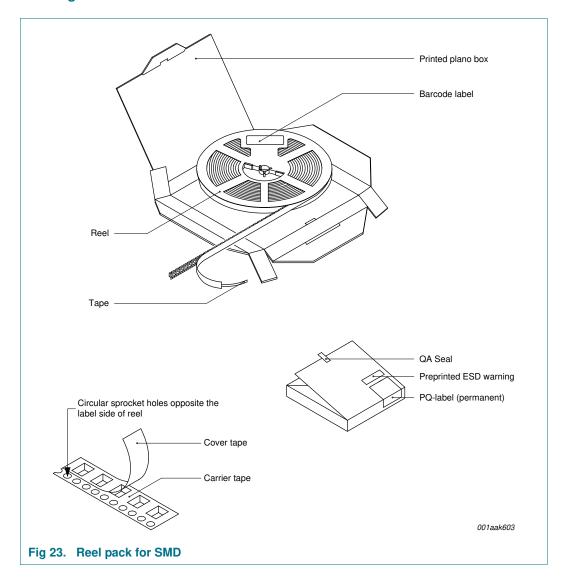
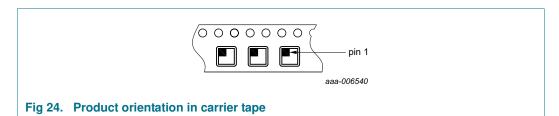


Table 13. Dimensions and quantities

Reel dimensions d x w (mm)	SPQ/PQ (pcs)		Outer box dimensions I x w x h (mm)
180 x 8	5000	1	186 x 186 x 17

# Low-ohmic single-pole double-throw analog switch

#### 14.1.2 Product orientation



# 14.1.3 Carrier tape dimensions

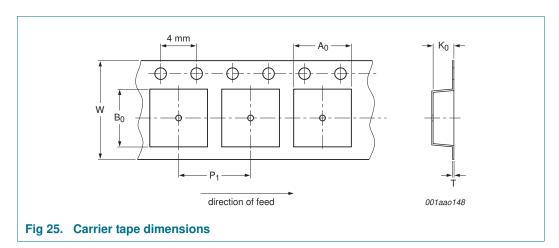


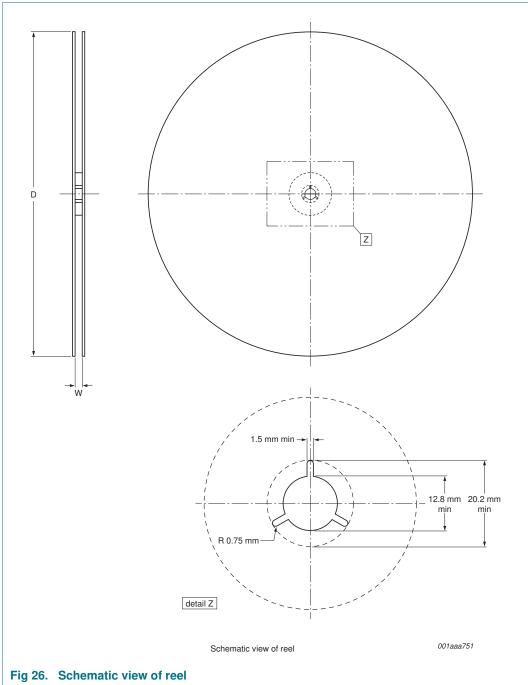
Table 14. Carrier tape dimensions

In accordance with IEC 60286-3.

A <sub>0</sub> (mm)	B <sub>0</sub> (mm)	K <sub>0</sub> (mm)	T (mm)	P <sub>1</sub> (mm)	W (mm)
1.2	1.6	0.63	-	4	8

# Low-ohmic single-pole double-throw analog switch

#### 14.1.4 Reel dimensions



\_\_\_\_\_

Table 15. Reel dimensions
In accordance with IEC 60286-3.

D (mm)	W (mm)
180	8

#### Low-ohmic single-pole double-throw analog switch

#### 14.1.5 Barcode label

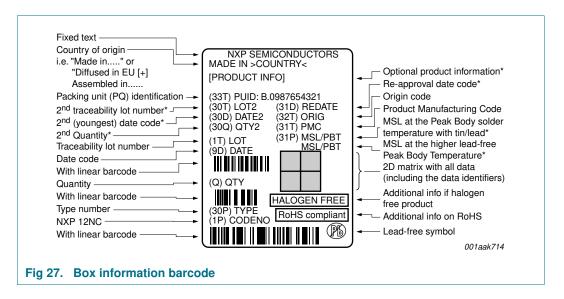




Table 16. Barcode dimensions

	Reel barcode label I x w (mm)
100 x 75	35 x 75

#### Low-ohmic single-pole double-throw analog switch

# 14.2 XSON6; reel pack; standard product orientation; 12NC ending 132

# 14.2.1 Packing method

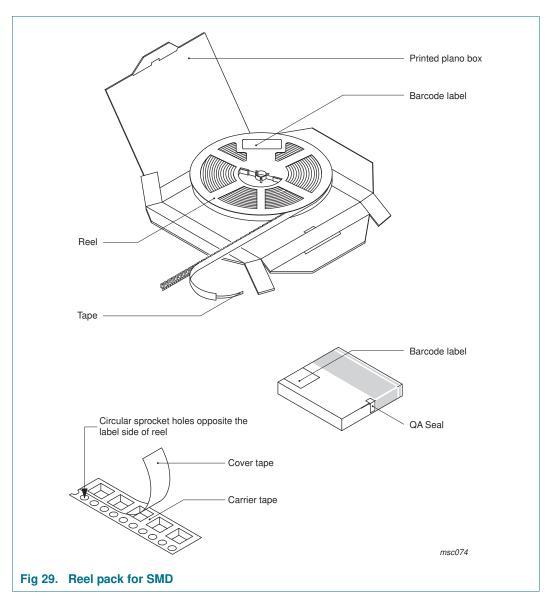


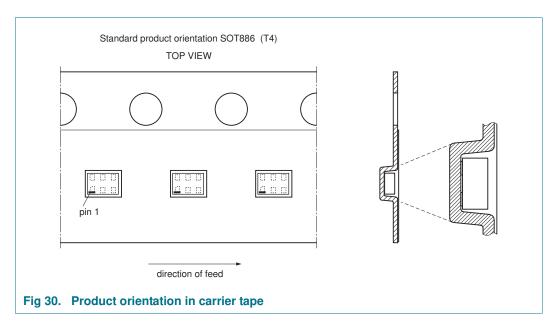
Table 17. Packing information

Package version	12NC ending	Reel dimensions d x w (mm) [1]	SPQ/PQ (pcs)	_	Outer box dimensions I x w x h (mm)
NX3L1T5157	132	180 x 8	5000	1	186 x 186 x 17

[1] d = reel diameter; w = tape width.

# Low-ohmic single-pole double-throw analog switch

#### 14.2.2 Product orientation



# 14.2.3 Carrier tape dimensions

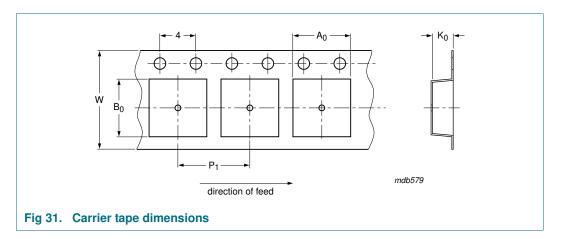


Table 18. Carrier tape dimensions

In accordance with IEC 60286-3.

$A_0$ (mm)	B <sub>0</sub> (mm)	K <sub>0</sub> (mm)	T (mm)	P <sub>1</sub> (mm)	W (mm)
1.67	1.17	0.63	-	4.0	8

# Low-ohmic single-pole double-throw analog switch

# 15. Abbreviations

#### Table 19. Abbreviations

Acronym	Description			
CDM	Charged Device Model			
CMOS	mplementary Metal-Oxide Semiconductor			
ESD	lectroStatic Discharge			
HBM	Human Body Model			
MM	Machine Model			
PDA	Personal Digital Assistant			

# 16. Revision history

#### Table 20. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes		
NX3L1T5157 v.6.1	20161130	Product data sheet	-	NX3L1T5157 v.6		
Modifications:	Added <u>Section</u>	Added <u>Section 14 "Packing information"</u>				
NX3L1T5157 v.6	20111108	Product data sheet	-	NX3L1T5157 v.5		
Modifications:	Legal pages u	pdated.				
NX3L1T5157 v.5	20110728	Product data sheet	-	NX3L1T5157 v.4		
NX3L1T5157 v.4	20100324	Product data sheet	-	NX3L1T5157 v.3		
NX3L1T5157 v.3	20100208	Product data sheet	-	NX3L1T5157 v.2		
NX3L1T5157 v.2	20090417	Product data sheet	-	NX3L1T5157 v.1		
NX3L1T5157 v.1	20080916	Product data sheet	-	-		

#### Low-ohmic single-pole double-throw analog switch

# 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 <a href="http://www.nxp.com">http://www.nxp.com</a>.

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