Triple inverting Schmitt trigger with 5 V tolerant inputRev. 12 — 9 April 2013Product of

Product data sheet

General description 1.

The 74LVC3G14 provides three inverting buffers with Schmitt trigger input. It is capable of transforming slowly changing input signals into sharply defined, jitter-free output signals.

The inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of this device in a mixed 3.3 V and 5 V environment. Schmitt trigger action at the inputs makes the circuit tolerant of slower input rise and fall time. This device is fully specified for partial power-down applications using I_{OFF}. The I_{OFF} circuitry disables the output, preventing the damaging backflow current through the device when it is powered down.

Features and benefits 2.

- Wide supply voltage range from 1.65 V to 5.5 V
- 5 V tolerant input/output for interfacing with 5 V logic
- High noise immunity
- ESD protection:
 - HBM JESD22-A114F exceeds 2000 V
 - MM JESD22-A115-A exceeds 200 V
- ± 24 mA output drive (V_{CC} = 3.0 V)
- CMOS low power consumption
- Latch-up performance exceeds 250 mA
- Direct interface with TTL levels
- Unlimited rise and fall times
- Multiple package options
- Specified from -40 °C to +85 °C and -40 °C to +125 °C.

Applications 3.

- Wave and pulse shaper for highly noisy environment
- Astable multivibrator
- Monostable multivibrator.



Triple inverting Schmitt trigger with 5 V tolerant input

4. Ordering information

Table 1. Orde	ring information			
Type number	Package			
	Temperature range	Name	Description	Version
74LVC3G14DP	–40 °C to +125 °C	TSSOP8	plastic thin shrink small outline package; 8 leads; body width 3 mm; lead length 0.5 mm	SOT505-2
74LVC3G14DC	–40 °C to +125 °C	VSSOP8	plastic very thin shrink small outline package; 8 leads; body width 2.3 mm	SOT765-1
74LVC3G14GT	–40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body 1 \times 1.95 \times 0.5 mm	SOT833-1
74LVC3G14GF	–40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body $1.35 \times 1 \times 0.5$ mm	SOT1089
74LVC3G14GD	–40 °C to +125 °C	XSON8	plastic extremely thin small outline package; no leads; 8 terminals; body $3 \times 2 \times 0.5$ mm	SOT996-2
74LVC3G14GM	–40 °C to +125 °C	XQFN8	plastic, extremely thin quad flat package; no leads; 8 terminals; body $1.6 \times 1.6 \times 0.5$ mm	SOT902-2
74LVC3G14GN	–40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body $1.2 \times 1.0 \times 0.35$ mm	SOT1116
74LVC3G14GS	–40 °C to +125 °C	XSON8	extremely thin small outline package; no leads; 8 terminals; body $1.35 \times 1.0 \times 0.35$ mm	SOT1203

5. Marking

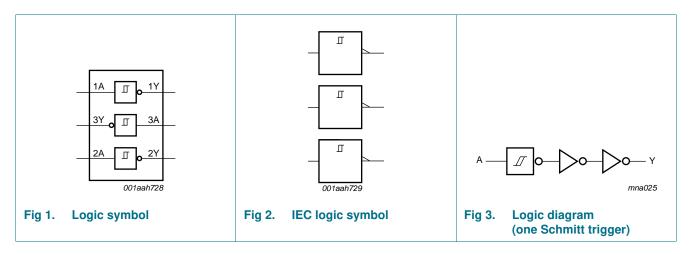
Table 2.Marking codes

Type number	Marking code ^[1]
74LVC3G14DP	V14
74LVC3G14DC	V14
74LVC3G14GT	V14
74LVC3G14GF	VK
74LVC3G14GD	V14
74LVC3G14GM	V14
74LVC3G14GN	VK
74LVC3G14GS	VK

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

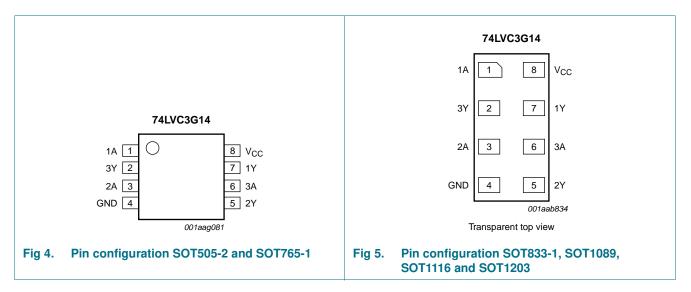
Triple inverting Schmitt trigger with 5 V tolerant input

6. Functional diagram

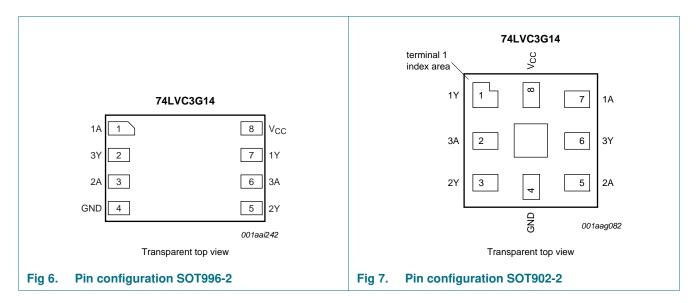


7. Pinning information

7.1 Pinning



Triple inverting Schmitt trigger with 5 V tolerant input



7.2 Pin description

Symbol	Pin	Pin		
	SOT505-2, SOT765-1, SOT833-1, SOT1089, SOT996-2, SOT1116 and SOT1203	SOT902-2		
1A, 2A, 3A	1, 3, 6	7, 5, 2	data input	
1Y, 2Y, 3Y	7, 5, 2	1, 3, 6	data output	
GND	4	4	ground (0 V)	
V _{CC}	8	8	supply voltage	

8. Functional description

Table 4. Function table [1]	
Input nA	Output nY
L	Н
Н	L

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

Triple inverting Schmitt trigger with 5 V tolerant input

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	+6.5	V
l _{IK}	input clamping current	V _I < 0 V	-50	-	mA
VI	input voltage		<u>[1]</u> –0.5	+6.5	V
I _{OK}	output clamping current	$V_{\rm O}$ > $V_{\rm CC}$ or $V_{\rm O}$ < 0 V	-	±50	mA
Vo	output voltage	Active mode	[1][2] -0.5	$V_{CC} + 0.5$	V
		Power-down mode	[1][2] -0.5	+6.5	V
lo	output current	$V_{O} = 0 V$ to V_{CC}	-	±50	mA
I _{CC}	supply current		-	100	mA
I _{GND}	ground current		-100	-	mA
P _{tot}	total power dissipation	$T_{amb} = -40 \ ^{\circ}C \ to \ +125 \ ^{\circ}C$	<u>[3]</u>	250	mW
T _{stg}	storage temperature		-65	+150	°C
-					

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

[2] When V_{CC} = 0 V (Power-down mode), the output voltage can be 5.5 V in normal operation.

[3] For TSSOP8 package: above 55 °C the value of P_{tot} derates linearly with 2.5 mW/K.
 For VSSOP8 package: above 110 °C the value of P_{tot} derates linearly with 8 mW/K.
 For XSON8 and XQFN8 packages: above 118 °C the value of P_{tot} derates linearly with 7.8 mW/K.

10. Recommended operating conditions

Operating conditions				
Parameter	Conditions	Min	Max	Unit
supply voltage		1.65	5.5	V
input voltage		0	5.5	V
output voltage	Active mode	0	V _{CC}	V
	Power-down mode; $V_{CC} = 0 V$	0	5.5	V
ambient temperature		-40	+125	°C
	Parameter supply voltage input voltage output voltage	Parameter Conditions supply voltage input voltage output voltage Active mode Power-down mode; V _{CC} = 0 V	Parameter Conditions Min supply voltage 1.65 input voltage 0 output voltage Active mode 0 Power-down mode; V _{CC} = 0 V 0	ParameterConditionsMinMaxsupply voltage1.655.5input voltage05.5output voltageActive mode0V _{CC} Power-down mode; V _{CC} = 0 V05.5

Triple inverting Schmitt trigger with 5 V tolerant input

11. Static characteristics

Table 7. Static characteristics

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

Symbol	Parameter	Conditions	Min	Typ 🛄	Max	Uni
T _{amb} = ⊸	40 °C to +85 °C					
V _{OH}	HIGH-level output voltage	$V_I = V_{T+} \text{ or } V_{T-}$				
		I_O = $-100~\mu\text{A};V_{CC}$ = 1.65 V to 5.5 V	$V_{CC}-0.1$	-	-	V
		$I_{O} = -4 \text{ mA}; V_{CC} = 1.65 \text{ V}$	1.2	-	-	V
		$I_{O} = -8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.9	-	-	V
		$I_{O} = -12 \text{ mA}; V_{CC} = 2.7 \text{ V}$	2.2	-	-	V
		$I_{O} = -24 \text{ mA}; V_{CC} = 3.0 \text{ V}$	2.3	-	-	V
		$I_{O} = -32 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.8	-	-	V
V _{OL}	LOW-level output voltage	$V_I = V_{T+}$ or V_{T-}				
		I_{O} = 100 μ A; V_{CC} = 1.65 V to 5.5 V	-	-	0.1	V
		I _O = 4 mA; V _{CC} = 1.65 V	-	-	0.45	V
		$I_{O} = 8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.3	V
		I _O = 12 mA; V _{CC} = 2.7 V	-	-	0.4	V
		I _O = 24 mA; V _{CC} = 3.0 V	-	-	0.55	V
		I _O = 32 mA; V _{CC} = 4.5 V	-	-	0.55	V
I	input leakage current	$V_{I} = 5.5$ V or GND; $V_{CC} = 0$ V to 5.5 V	-	±0.1	±5	μA
OFF	power-off leakage current	$V_1 \text{ or } V_0 = 5.5 \text{ V}; V_{CC} = 0 \text{ V}$	-	±0.1	±10	μA
СС	supply current	$V_{I} = 5.5 V \text{ or GND}; I_{O} = 0 A;$ $V_{CC} = 1.65 V \text{ to } 5.5 V$	-	0.1	10	μA
VI _{CC}	additional supply current	$V_{I} = V_{CC} - 0.6 \text{ V}; I_{O} = 0 \text{ A};$ $V_{CC} = 2.3 \text{ V} \text{ to } 5.5 \text{ V}$	-	5	500	μA
Ci	input capacitance	V_{CC} = 3.3 V; V_{I} = GND to V_{CC}	-	3.5	-	pF
Γ _{amb} = →	40 °C to +125 °C					
/ _{ОН}	HIGH-level output voltage	$V_{I} = V_{T+}$ or V_{T-}				
		$I_{O} = -100 \ \mu A$; $V_{CC} = 1.65 \ V$ to 5.5 V	$V_{CC} - 0.1$	-	-	V
		$I_{O} = -4 \text{ mA}; V_{CC} = 1.65 \text{ V}$	0.95	-	-	V
		$I_{O} = -8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	1.7	-	-	V
		$I_{O} = -12 \text{ mA}; V_{CC} = 2.7 \text{ V}$	1.9	-	-	V
		$I_{\rm O} = -24$ mA; $V_{\rm CC} = 3.0$ V	2.0	-	-	V
		$I_{O} = -32 \text{ mA}; V_{CC} = 4.5 \text{ V}$	3.4	-	-	V
/ _{OL}	LOW-level output voltage	$V_{I} = V_{T+} \text{ or } V_{T-}$				
0L		$I_{O} = 100 \ \mu\text{A}; V_{CC} = 1.65 \ \text{V} \text{ to } 5.5 \ \text{V}$	-	-	0.1	V
		$I_0 = 4 \text{ mA}; V_{CC} = 1.65 \text{ V}$	-	-	0.7	V
		$I_{O} = 8 \text{ mA}; V_{CC} = 2.3 \text{ V}$	-	-	0.45	V
		$I_{O} = 12 \text{ mA}; V_{CC} = 2.7 \text{ V}$	-	-	0.6	V
		$I_0 = 24 \text{ mA}; V_{CC} = 3.0 \text{ V}$	_	_	0.8	V
		$I_0 = 32 \text{ mA}; V_{CC} = 4.5 \text{ V}$	_	_	0.8	V
		$V_1 = 5.5 \text{ V or GND}; V_{CC} = 0 \text{ V to } 5.5 \text{ V}$			0.0	v

Triple inverting Schmitt trigger with 5 V tolerant input

At recom	At recommended operating conditions; voltages are referenced to GND (ground = 0 V).								
Symbol	Parameter	Conditions	Min	Typ 🛄	Max	Unit			
I _{OFF}	power-off leakage current	$V_{I} \text{ or } V_{O} = 5.5 \text{ V}; V_{CC} = 0 \text{ V}$	-	-	±20	μA			
I _{CC}	supply current	$V_{I} = 5.5 \text{ V or GND}; I_{O} = 0 \text{ A};$ $V_{CC} = 1.65 \text{ V to } 5.5 \text{ V}$	-	-	40	μA			
ΔI_{CC}	additional supply current		-	-	5000	μA			

Table 7. Static characteristics ... continued

[1] All typical values are measured at maximum V_{CC} and T_{amb} = 25 °C.

Transfer characteristics Table 8.

Voltages are referenced to GND (ground = 0 V; for test circuit see Figure 9

Symbol	Parameter	Conditions	-40	–40 °C to +85 °C			–40 °C to +125 °C	
			Min	Typ <mark>[1]</mark>	Max	Min	Max	
V_{T+}	positive-going threshold voltage	see <u>Figure 10</u> and <u>Figure 11</u>						
		V _{CC} = 1.8 V	0.70	1.10	1.50	0.70	1.70	V
		$V_{CC} = 2.3 V$	1.00	1.40	1.80	1.00	2.00	V
		$V_{CC} = 3.0 V$	1.30	1.76	2.20	1.30	2.40	V
		$V_{CC} = 4.5 V$	1.90	2.47	3.10	1.90	3.30	V
		$V_{CC} = 5.5 V$	2.20	2.91	3.60	2.20	3.80	V
V _T - negative-going threshold voltage		see <u>Figure 10</u> and <u>Figure 11</u>						
		V _{CC} = 1.8 V	0.25	0.61	0.90	0.25	1.10	V
		$V_{CC} = 2.3 V$	0.40	0.80	1.15	0.40	1.35	V
		$V_{CC} = 3.0 V$	0.60	1.04	1.50	0.60	1.70	V
		$V_{CC} = 4.5 V$	1.00	1.55	2.00	1.00	2.20	V
		$V_{CC} = 5.5 V$	1.20	1.86	2.30	1.20	2.50	V
V _H [2]	hysteresis voltage	see Figure 10, Figure 11 and Figure 12						
		V _{CC} = 1.8 V	0.15	0.49	1.00	0.15	1.20	V
		$V_{CC} = 2.3 V$	0.25	0.60	1.10	0.25	1.30	V
		$V_{CC} = 3.0 V$	0.40	0.73	1.20	0.40	1.40	V
		$V_{CC} = 4.5 V$	0.60	0.92	1.50	0.60	1.70	V
		V _{CC} = 5.5 V	0.70	1.02	1.70	0.70	1.90	V

[1] All typical values are measured at $T_{amb} = 25 \degree C$

[2] $V_H = V_{T+} - V_{T-}$

Triple inverting Schmitt trigger with 5 V tolerant input

12. Dynamic characteristics

Table 9. Dynamic characteristics

Voltages are referenced to GND (ground = 0 V). For test circuit see Figure 9.

Symbol	Parameter	Conditions		–40 °C to +85 °C		-40 °C to +85 °C -40 °C to +125 °C		o +125 °C	C Unit
				Min	Typ <mark>[1]</mark>	Мах	Min	Max	
t _{pd}	propagation delay	nA to nY; see Figure 8	[2]						
		V _{CC} = 1.65 V to 1.95 V		1.0	4.2	11.0	1.0	12.0	ns
		$V_{CC} = 2.3 \text{ V}$ to 2.7 V		0.5	3.0	6.5	0.5	7.2	ns
		V _{CC} = 2.7 V		0.5	3.8	7.0	0.5	7.7	ns
		$V_{CC} = 3.0 \text{ V} \text{ to } 3.6 \text{ V}$		0.5	3.2	6.0	0.5	6.7	ns
		$V_{CC} = 4.5 V \text{ to } 5.5 V$		0.5	2.4	4.3	0.5	4.7	ns
C _{PD}	power dissipation capacitance	V_{I} = GND to $V_{CC};V_{CC}$ = 3.3 V	[3]	-	18.1	-	-	-	pF

[1] Typical values are measured at T_{amb} = 25 °C and V_{CC} = 1.8 V, 2.5 V, 2.7 V, 3.3 V and 5.0 V respectively.

[2] t_{pd} is the same as t_{PLH} and t_{PHL} .

[3] C_{PD} is used to determine the dynamic power dissipation (P_D in μ W).

 $P_{D} = C_{PD} \times V_{CC}{}^2 \times f_i \times N + \sum (C_L \times V_{CC}{}^2 \times f_o)$ where:

f_i = input frequency in MHz;

 $f_o = output frequency in MHz;$

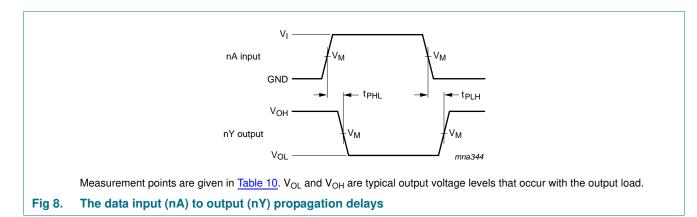
 C_L = output load capacitance in pF;

 V_{CC} = supply voltage in V;

N = number of inputs switching;

 $\Sigma(C_L \times V_{CC}{}^2 \times f_o)$ = sum of outputs.

13. Waveforms

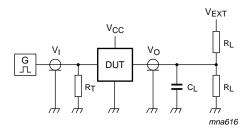


74LVC3G14

Triple inverting Schmitt trigger with 5 V tolerant input

Table 10. Measurement points		
V _{cc}	Input V _M	Output V _M
1.65 V to 1.95 V	$0.5 imes V_{CC}$	$0.5 imes V_{CC}$
2.3 V to 2.7 V	$0.5 imes V_{CC}$	$0.5 imes V_{CC}$
2.7 V	1.5 V	1.5 V
3.0 V to 3.6 V	1.5 V	1.5 V
4.5 V to 5.5 V	$0.5 imes V_{CC}$	$0.5 imes V_{CC}$





Test data is given in Table 11. Definitions for test circuit:

R_L = Load resistance.

C_L = Load capacitance including jig and probe capacitance.

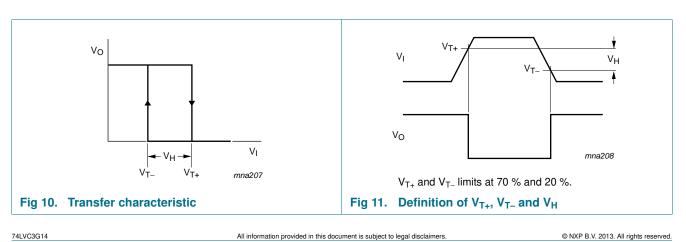
 R_T = Termination resistance should be equal to the output impedance Z_0 of the pulse generator.

- V_{EXT} = External voltage for measuring switching times.
- Test circuit for measuring switching times Fig 9.

Table 11. Test data

Supply voltage	Input		Load		V _{EXT}
V _{CC}	VI	$t_r = t_f$	CL	RL	t _{PLH} , t _{PHL}
1.65 V to 1.95 V	V _{CC}	\leq 2.0 ns	30 pF	1 kΩ	open
2.3 V to 2.7 V	V _{CC}	\leq 2.0 ns	30 pF	500 Ω	open
2.7 V	2.7 V	\leq 2.5 ns	50 pF	500 Ω	open
3.0 V to 3.6 V	2.7 V	\leq 2.5 ns	50 pF	500 Ω	open
4.5 V to 5.5 V	V _{CC}	\leq 2.5 ns	50 pF	500 Ω	open

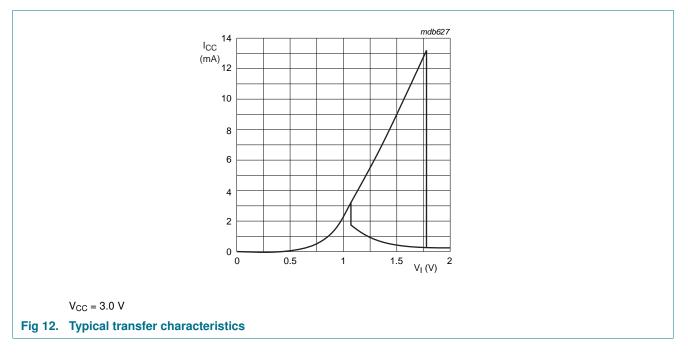
14. Waveforms transfer characteristics



74LVC3G14 **Product data sheet**

74LVC3G14

Triple inverting Schmitt trigger with 5 V tolerant input



15. Application information

The slow input rise and fall times cause additional power dissipation, this can be calculated using the following formula:

 $P_{add} = f_i \times (t_r \times \Delta I_{CC(AV)} + t_f \times \Delta I_{CC(AV)}) \times V_{CC} \text{ where:}$

 P_{add} = additional power dissipation (μ W);

 $f_i = input frequency (MHz);$

 t_r = input rise time (ns); 10 % to 90 %;

 t_f = input fall time (ns); 90 % to 10 %;

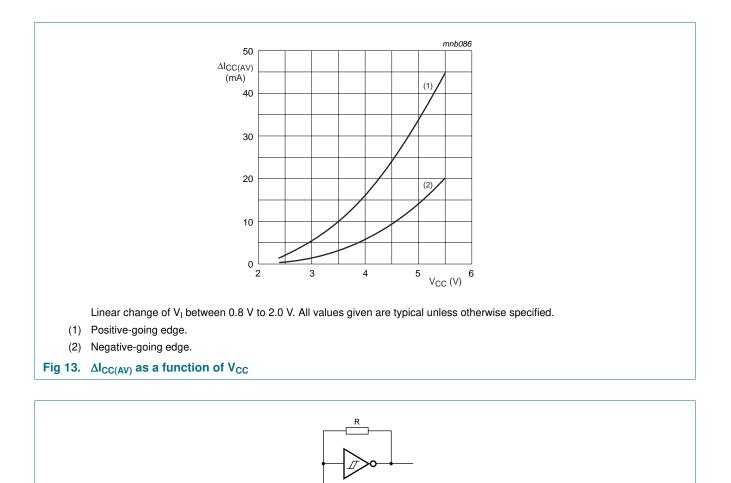
 $\Delta I_{CC(AV)}$ = average additional supply current (µA).

 $\Delta I_{CC(AV)}$ differs with positive or negative input transitions, as shown in Figure 13.

An example of a relaxation circuit using the 74LVC3G14 is shown in Figure 14.

74LVC3G14

Triple inverting Schmitt trigger with 5 V tolerant input



mna035

 $f = \frac{l}{T} \approx \frac{l}{0.8 \times RC}$



74LVC3G14

Triple inverting Schmitt trigger with 5 V tolerant input

16. Package outline

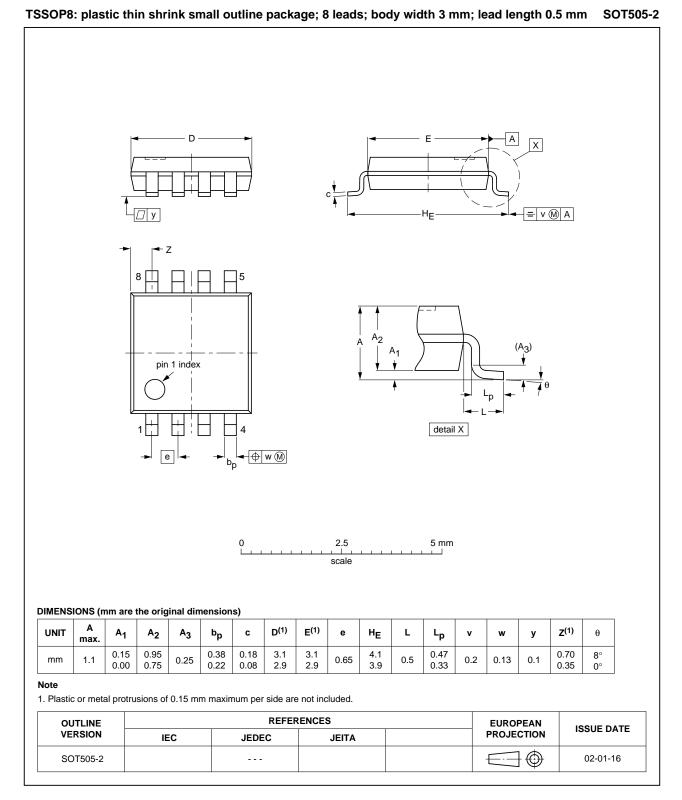


Fig 15. Package outline SOT505-2 (TSSOP8)

All information provided in this document is subject to legal disclaimers.

Triple inverting Schmitt trigger with 5 V tolerant input

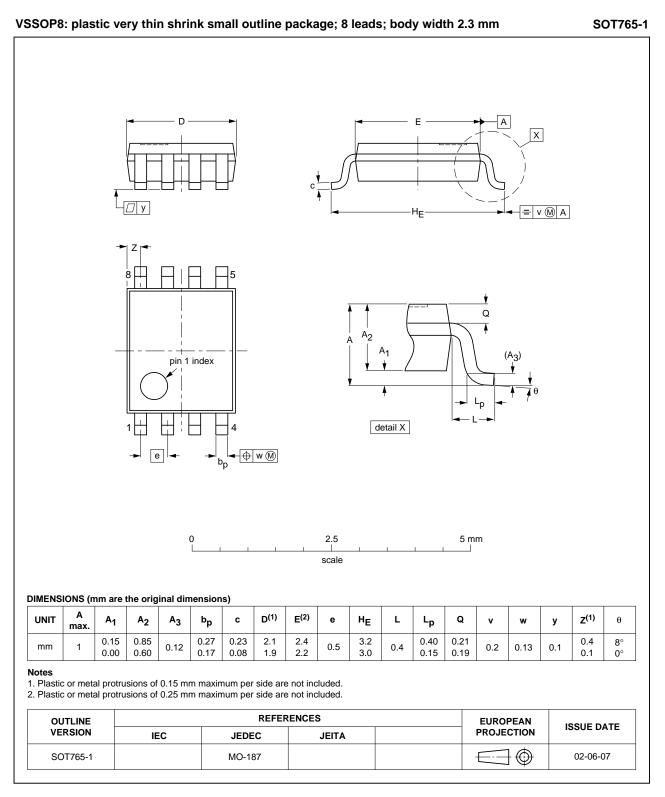


Fig 16. Package outline SOT765-1 (VSSOP8)

74LVC3G14 Product data sheet

Triple inverting Schmitt trigger with 5 V tolerant input

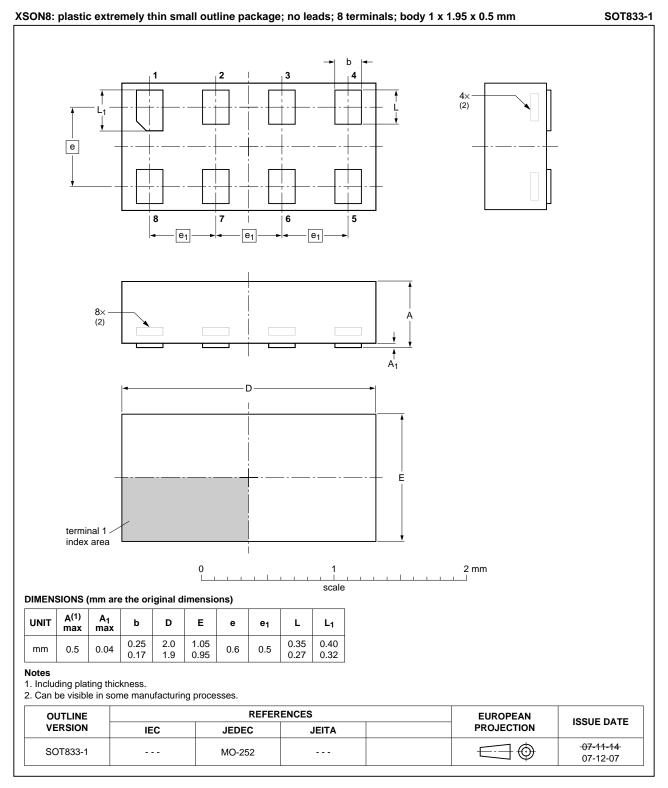
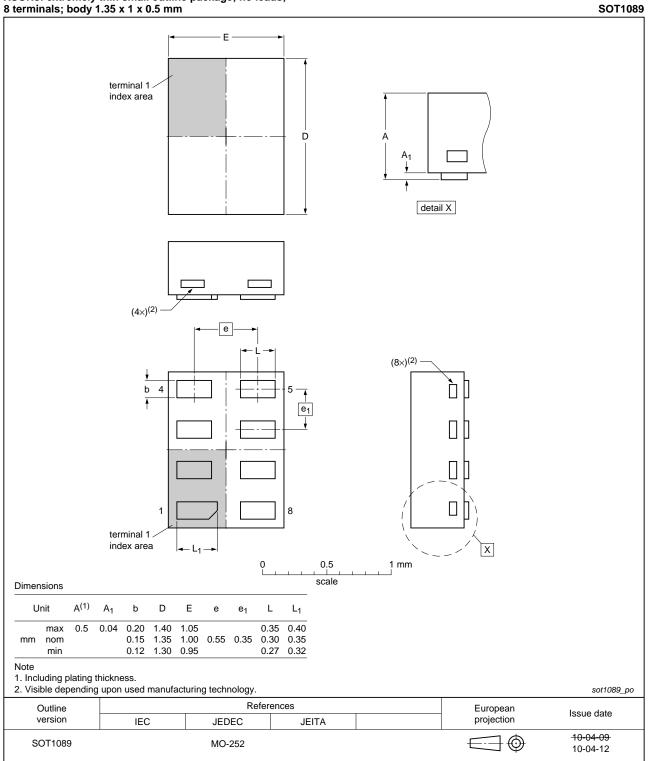


Fig 17. Package outline SOT833-1 (XSON8)

74LVC3G14 Product data sheet

Triple inverting Schmitt trigger with 5 V tolerant input

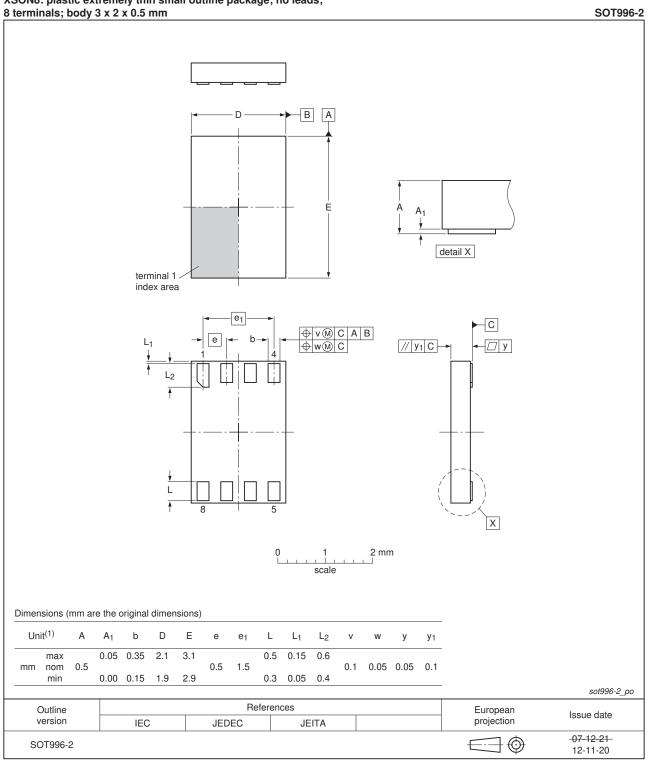


XSON8: extremely thin small outline package; no leads; 8 terminals; body 1.35 x 1 x 0.5 mm

Fig 18. Package outline SOT1089 (XSON8)

All information provided in this document is subject to legal disclaimers.

Triple inverting Schmitt trigger with 5 V tolerant input

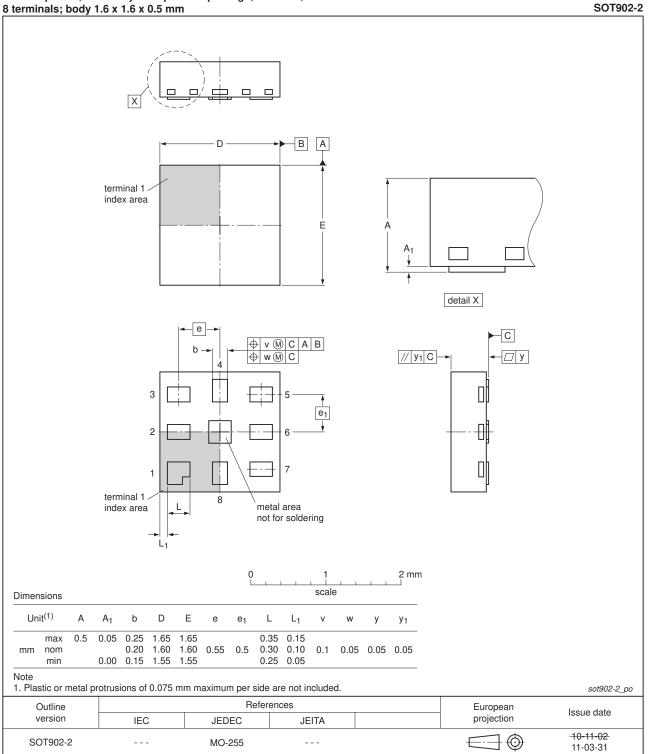


XSON8: plastic extremely thin small outline package; no leads;

Fig 19. Package outline SOT996-2 (XSON8)

All information provided in this document is subject to legal disclaimers.

Triple inverting Schmitt trigger with 5 V tolerant input

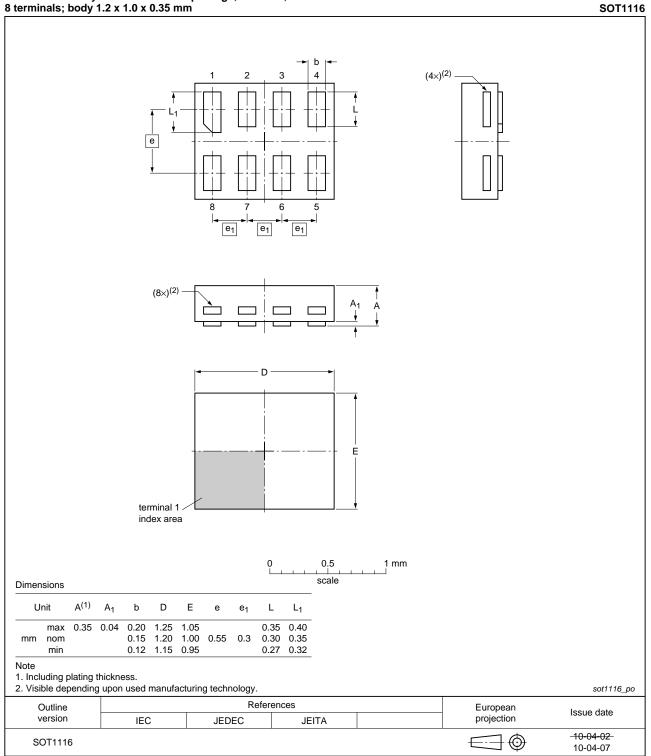


XQFN8: plastic, extremely thin quad flat package; no leads; 8 terminals: body 1.6 x 1.6 x 0.5 mm

Fig 20. Package outline SOT902-2 (XQFN8)

74LVC3G14 Product data sheet

Triple inverting Schmitt trigger with 5 V tolerant input

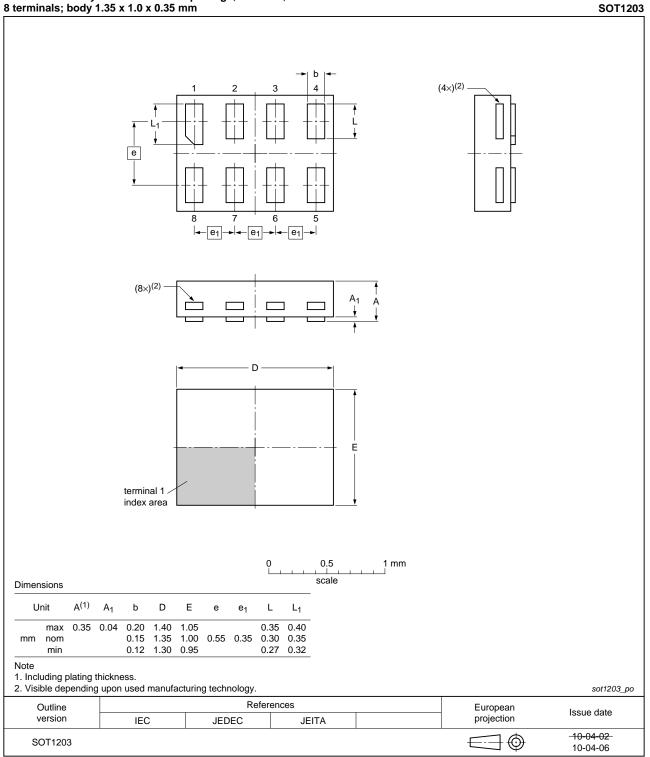


XSON8: extremely thin small outline package; no leads; 8 terminals; body 1.2 x 1.0 x 0.35 mm

Fig 21. Package outline SOT1116 (XSON8)

All information provided in this document is subject to legal disclaimers.

Triple inverting Schmitt trigger with 5 V tolerant input



XSON8: extremely thin small outline package; no leads; 8 terminals; body 1.35 x 1.0 x 0.35 mm

Fig 22. Package outline SOT1203 (XSON8)

19 of 23

Triple inverting Schmitt trigger with 5 V tolerant input

17. Abbreviations

Table 12.	Abbreviations		
Acronym	Description		
CMOS	Complementary Metal-Oxide Semiconductor		
DUT	Device Under Test		
ESD	ElectroStatic Discharge		
HBM	Human Body Model		
MM	Machine Model		
TTL	Transistor-Transistor Logic		
UTLP	Ultra-Thin Leadless Package		

18. Revision history

Table 13. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74LVC3G14 v.12	20130409	Product data sheet	-	74LVC3G14 v.11
Modifications:	 For type nu 	mber 74LVC3G14GD XSO	N8U has changed to XS	SON8.
74LVC3G14 v.11	20120706	Product data sheet	-	74LVC3G14 v.10
Modifications:	 For type nu 	mber 74LVC3G14GM the S	SOT code has changed	to SOT902-2.
74LVC3G14 v.10	20111123	Product data sheet	-	74LVC3G14 v.9
Modifications:	 Legal pages 	s updated.		
74LVC3G14 v.9	20110922	Product data sheet	-	74LVC3G14 v.8
74LVC3G14 v.8	20100819	Product data sheet	-	74LVC3G14 v.7
74LVC3G14 v.7	20080612	Product data sheet	-	74LVC3G14 v.6
74LVC3G14 v.6	20080207	Product data sheet	-	74LVC3G14 v.5
74LVC3G14 v.5	20071005	Product data sheet	-	74LVC3G14 v.4
74LVC3G14 v.4	20070314	Product data sheet	-	74LVC3G14 v.3
74LVC3G14 v.3	20050131	Product data sheet	-	74LVC3G14 v.2
74LVC3G14 v.2	20041027	Product data sheet	-	74LVC3G14 v.1
74LVC3G14 v.1	20040510	Product data sheet	-	-
-				

Triple inverting Schmitt trigger with 5 V tolerant input

19. Legal information

19.1 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.

19.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

19.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors products product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

© NXP B.V. 2013. All rights reserved.

Triple inverting Schmitt trigger with 5 V tolerant input

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the

20. Contact information

product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

19.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com

Triple inverting Schmitt trigger with 5 V tolerant input

21. Contents

1	General description 1
2	Features and benefits 1
3	Applications 1
4	Ordering information 2
5	Marking 2
6	Functional diagram 3
7	Pinning information 3
7.1	Pinning 3
7.2	Pin description 4
8	Functional description 4
9	Limiting values 5
10	Recommended operating conditions 5
11	Static characteristics 6
12	Dynamic characteristics 8
13	Waveforms 8
14	Waveforms transfer characteristics
15	Application information 10
16	Package outline 12
17	Abbreviations
18	Revision history
19	Legal information 21
19.1	Data sheet status 21
19.2	Definitions 21
19.3	Disclaimers 21
19.4	Trademarks 22
20	Contact information 22
21	Contents 23

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

© NXP B.V. 2013.

All rights reserved.

For more information, please visit: http://www.nxp.com For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 9 April 2013 Document identifier: 74LVC3G14