NLX2G14

Dual Schmitt-Trigger Inverter

The NLX2G14 MiniGate™ is an advanced high−speed CMOS dual Schmitt−trigger inverter in ultra−small footprint.

The NLX2G14 input and output structures provide protection when voltages up to 7.0 V are applied, regardless of the supply voltage.

The NLX2G14 can be used to enhance noise immunity or to square up slowly changing waveforms.

Features

- Designed for 1.65 V to 5.5 V V_{CC} Operation
- Low Power Dissipation: I_{CC} = 1 μA (Max) at T_A = 25°C
- 24 Balanced Output Source and Sink Capability
- Balanced Propagation Delays
- Overvoltage Tolerant (OVT) Input and Output Pins
- Ultra−Small Packages
- These are Pb−Free Devices

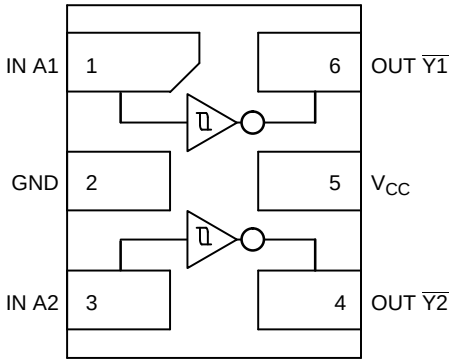


Figure 1. Pinout (Top View)

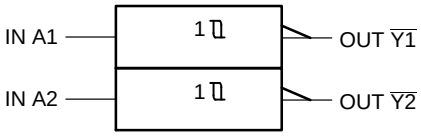


Figure 2. Logic Symbol

FUNCTION TABLE

A	$\overline{Y}$
L	H
H	L

PIN ASSIGNMENT

1	IN A1
2	GND
3	IN A2
4	OUT $\overline{Y2}$
5	V_{CC}
6	OUT $\overline{Y1}$

ON Semiconductor®

www.onsemi.com

MARKING DIAGRAMS


1

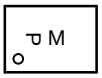
UDFN6
1.0 x 1.0
CASE 517BX


1

UDFN6
1.2 x 1.0
CASE 517AA


1

UDFN6
1.45 x 1.0
CASE 517AQ



T = Device Marking*
M = Date Code
* Rotated 90° clockwise

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to +7.0	V
V_{IN}	DC Input Voltage		−0.5 to +7.0	V
V_{OUT}	DC Output Voltage		−0.5 to +7.0	V
I_{IK}	DC Input Diode Current	V_{IN} < GND	−50	mA
I_{OK}	DC Output Diode Current	V_{OUT} < GND	−50	mA
I_O	DC Output Source/Sink Current		±50	mA
I_{CC}	DC Supply Current Per Supply Pin		±100	mA
I_{GND}	DC Ground Current per Ground Pin		±100	mA
T_{STG}	Storage Temperature Range		−65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T_J	Junction Temperature Under Bias		150	°C
MSL	Moisture Sensitivity		Level 1	
F_R	Flammability Rating Oxygen	Index: 28 to 34	UL 94 V−0 @ 0.125 in	
$I_{LATCHUP}$	Latchup Performance Above V_{CC} and Below GND at 125°C (Note 5)		±500	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Measured with minimum pad spacing on an FR4 board, using 10 mm−by−1 inch, 2 ounce copper trace no air flow.
2. Tested to EIA/JESD22−A114−A.
3. Tested to EIA/UESD22−A115−A.
4. Tested to JESD22−C101−A.
5. Tested to EIA / JESD78.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Max	Unit
V_{CC}	Positive DC Supply Voltage		1.65	5.5	V
V_{IN}	Digital Input Voltage		0	5.5	V
V_{OUT}	Output Voltage		0	5.5	V
T_A	Operating Free−Air Temperature		−55	+125	°C
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate	V_{CC} = 3.3 V ± 0.3 V V_{CC} = 5.0 V ± 0.5 V	0 0	No Limit No Limit	ns/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25°C			T_A = +85°C		T_A = −55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{T+}	Positive Threshold Voltage		1.65 2.3 2.7 3.0 4.5 5.5	0.6 1.0 1.2 1.3 1.9 2.2	1.0 1.5 1.7 1.9 2.7 3.3	1.4 1.8 2.0 2.2 3.1 3.6	0.6 1.0 1.2 1.3 1.9 2.2	1.4 1.8 2.0 2.2 3.1 3.6	0.6 1.0 1.2 1.3 1.9 2.2	1.4 1.8 2.0 2.2 3.1 3.6	V
V_{T-}	Negative Threshold Voltage		1.65 2.3 2.7 3.0 4.5 5.5	0.2 0.4 0.5 0.6 1.0 1.2	0.5 0.75 0.87 1.0 1.5 1.9	0.8 1.15 1.4 1.5 2.0 2.3	0.2 0.4 0.5 0.6 1.0 1.2	0.8 1.15 1.4 1.5 2.0 2.3	0.2 0.4 0.5 0.6 1.0 1.2	0.8 1.15 1.4 1.5 2.0 2.3	V
V_H	Hysteresis Voltage		1.65 2.3 2.7 3.0 4.5 5.5	0.1 0.25 0.3 0.4 0.6 0.7	0.48 0.75 0.83 0.93 1.2 1.4	0.9 1.1 1.15 1.2 1.5 1.7	0.1 0.25 0.3 0.4 0.6 0.7	0.9 1.1 1.15 1.2 1.5 1.7	0.1 0.25 0.3 0.4 0.6 0.7	0.9 1.1 1.15 1.2 1.5 1.7	V
V_{OH}	Minimum High−Level Output Voltage	$V_{IN} \le V_{T-MIN}$ I_{OH} = −100 μA	1.65−5.5	V_{CC} − 0.1	V_{CC}		V_{CC} − 0.1		V_{CC} − 0.1		V
		$V_{IN} \le V_{T-MIN}$ I_{OH} = −4 mA I_{OH} = −8 mA I_{OH} = −12 mA I_{OH} = −16 mA I_{OH} = −24 mA I_{OH} = −32 mA	1.65 2.3 2.7 3.0 3.0 4.5	1.29 1.9 2.2 2.4 2.3 3.8	1.52 2.1 2.4 2.7 2.5 4.0		1.29 1.9 2.2 2.4 2.3 3.8		1.29 1.8 2.1 2.3 2.2 3.7		
V_{OL}	Maximum Low−Level Output Voltage	$V_{IN} \ge V_{T+MAX}$ I_{OL} = 100 μA	1.65−5.5		0	0.1		0.1		0.1	V
		$V_{IN} \ge V_{T+MAX}$ I_{OH} = −4 mA I_{OH} = −8 mA I_{OH} = −12 mA I_{OH} = −16 mA I_{OH} = −24 mA I_{OH} = −32 mA	1.65 2.3 2.7 3.0 3.0 4.5		0.08 0.2 0.22 0.28 0.38 0.42	0.24 0.3 0.4 0.4 0.55 0.55		0.24 0.3 0.4 0.4 0.55 0.55		0.24 0.4 0.5 0.5 0.55 0.65	
I_{IN}	Input Leakage Current	0 ≤ V_{IN} ≤ 5.5 V	0 to 5.5			±0.1		±1.0		±1.0	μA
I_{OFF}	Power−Off Output Leakage Current	V_{OUT} = 5.5 V	0			1.0		10		10	μA
I_{CC}	Quiescent Supply Current	0 ≤ V_{IN} ≤ V_{CC}	5.5			1.0		10		10	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	V_{CC} (V)	Test Condition	T_A = 25°C			T_A = +85°C		T_A = −55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}, t_{PHL}	Propagation Delay, Input A to Output $\overline{Y}$	2.3−2.7	R_L = 1 MΩ, C_L = 15 pF	1.8	4.3	7.4	1.8	8.1	1.8	9.1	ns
		3.0−3.6	R_L = 1 MΩ, C_L = 15 pF	1.5	3.3	5.0	1.5	5.5	1.5	6.5	
			R_L = 500 Ω, C_L = 50 pF	1.8	4.0	6.0	1.8	6.6	1.8	7.6	
		4.5−5.5	R_L = 1 MΩ, C_L = 15 pF	1.0	2.7	4.1	1.0	4.5	1.0	5.5	
			R_L = 500 Ω, C_L = 50 pF	1.2	3.2	4.9	1.2	5.4	1.2	6.4	
C_{IN}	Input Capacitance	5.5	V_{IN} = 0 V or V_{CC}		2.5						pF
C_{PD}	Power Dissipation Capacitance (Note 6)	3.3 5.5	10 MHz V_{IN} = 0 V or V_{CC}		11 12.5						pF

6. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the dynamic operating current consumption without load. Average operating current can be obtained by the equation $I_{CC(OPR)} = C_{PD} \bullet V_{CC} \bullet f_{in} + I_{CC}$. C_{PD} is used to determine the no−load dynamic power consumption: $P_D = C_{PD} \bullet V_{CC}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$.

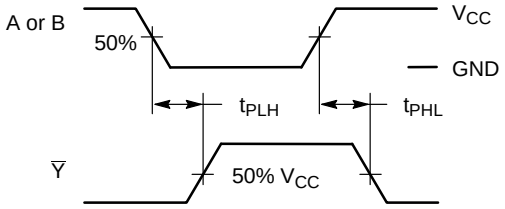
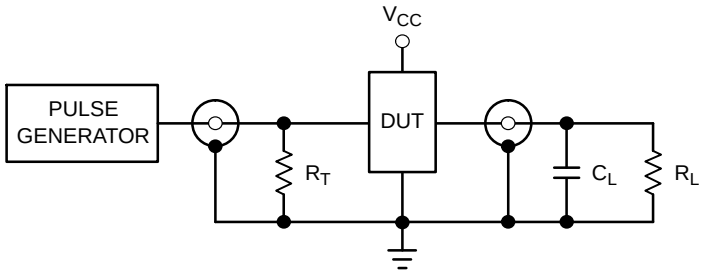


Figure 3. Switching Waveforms



R_T = Z_{OUT} of pulse generator (typically 50 Ω)

Figure 4. Test Circuit

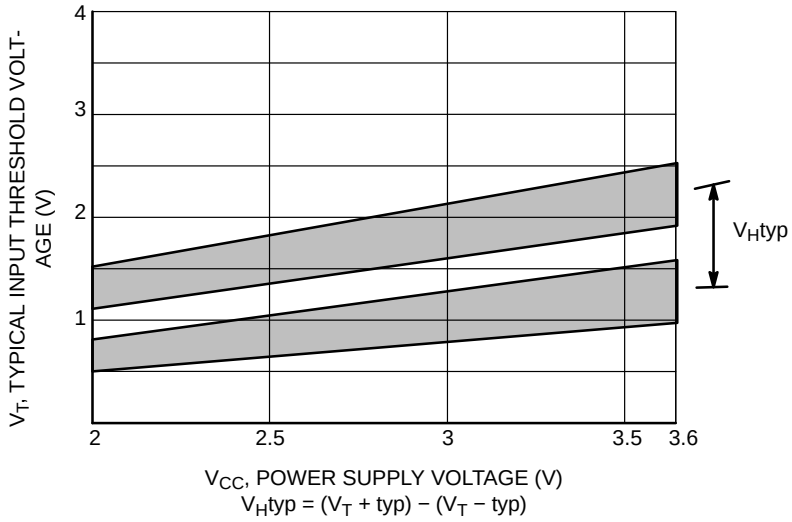
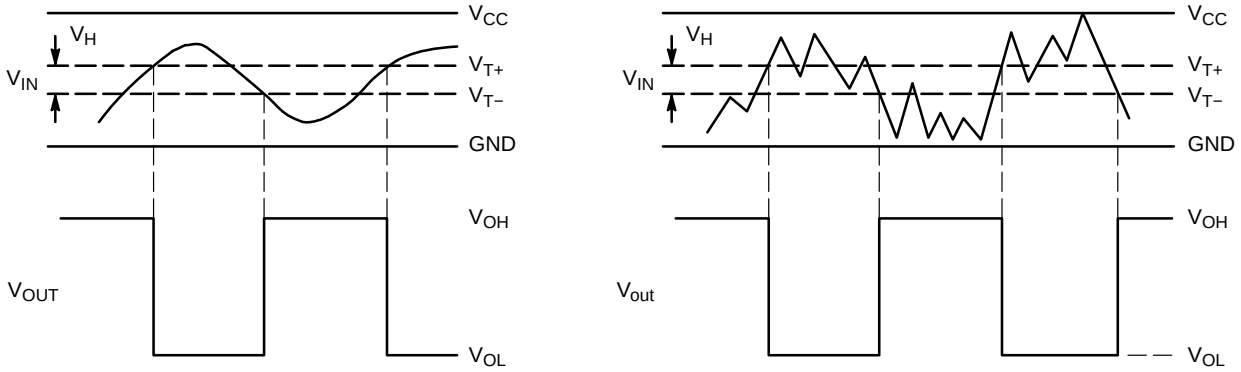


Figure 5. Typical Input Threshold, V_T+, V_T− versus Power Supply Voltage



(a) A Schmitt−Trigger Squares Up Inputs With Slow Rise and Fall Times

(b) A Schmitt−Trigger Offers Maximum Noise Immunity

Figure 6. Typical Schmitt−Trigger Applications

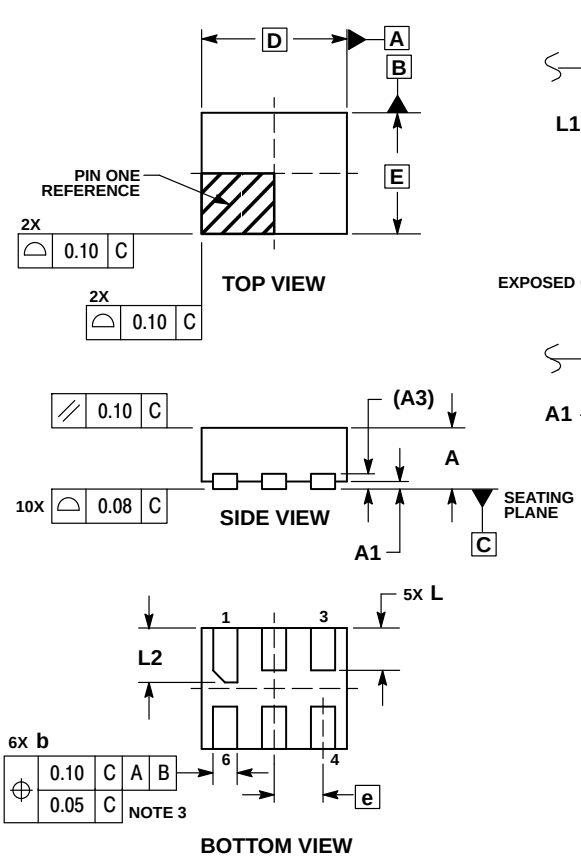
ORDERING INFORMATION

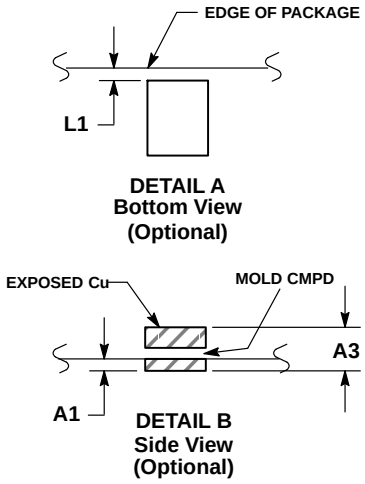
Device	Package	Shipping†
NLX2G14MUTCG	UDFN6, 1.2 x 1.0, 0.4P (Pb−Free)	3000 / Tape & Reel
NLX2G14AMUTCG	UDFN6, 1.45 x 1.0, 0.5P (Pb−Free)	3000 / Tape & Reel
NLX2G14CMUTCG	UDFN6, 1.0 x 1.0, 0.35P (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

UDFN6, 1.2x1.0, 0.4P
CASE 517AA
ISSUE D

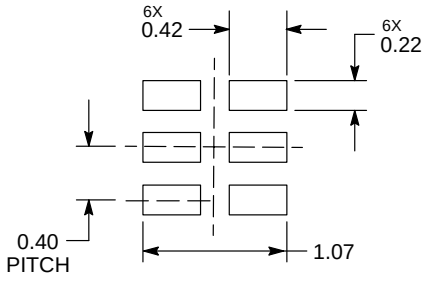




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 mm FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.127 REF	
b	0.15	0.25
D	1.20 BSC	
E	1.00 BSC	
e	0.40 BSC	
L	0.30	0.40
L1	0.00	0.15
L2	0.40	0.50

MOUNTING FOOTPRINT*

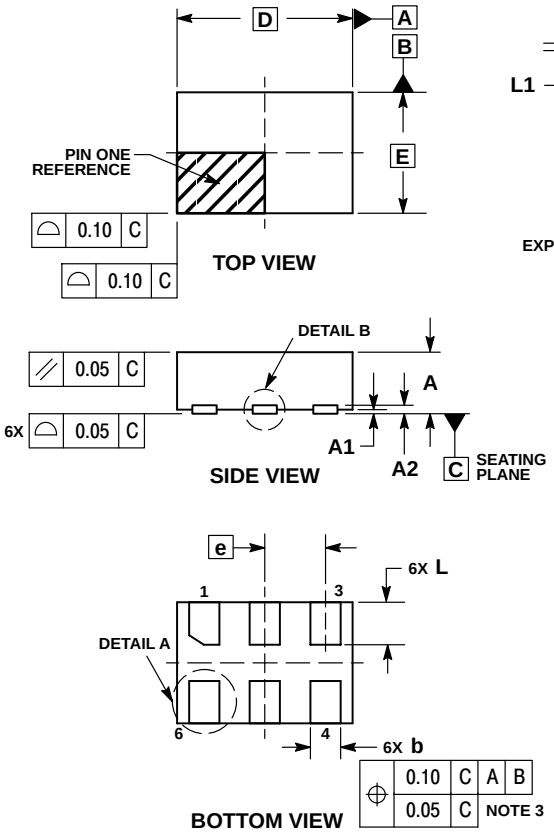


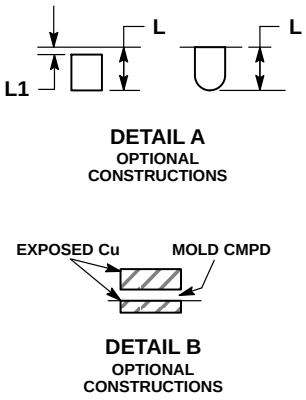
DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

UDFN6 1.45x1.0, 0.5P
CASE 517AQ
ISSUE O

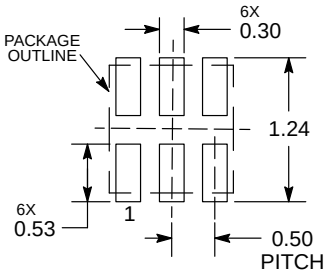




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.

	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A2	0.07 REF	
b	0.20	0.30
D	1.45 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	–––	0.15

MOUNTING FOOTPRINT

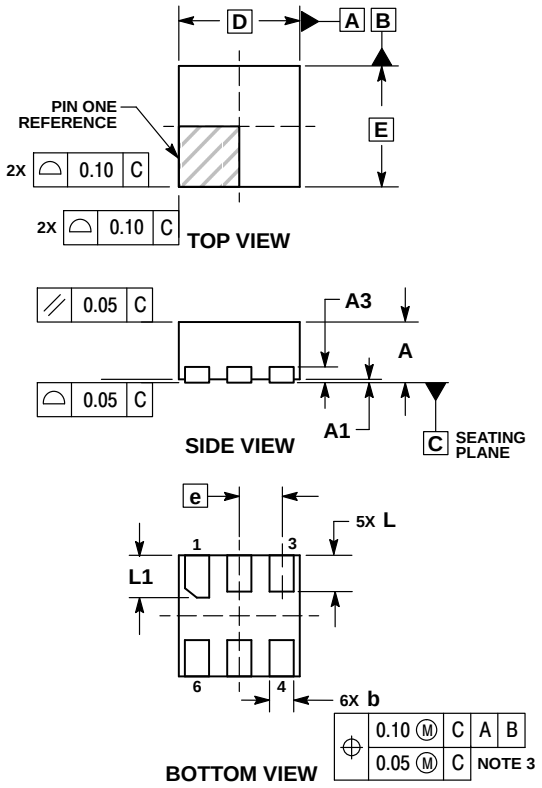


DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

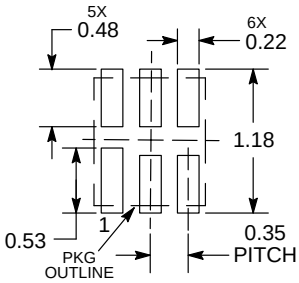
UDFN6 1.0x1.0, 0.35P
CASE 517BX
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.20 MM FROM TERMINAL TIP.
4. PACKAGE DIMENSIONS EXCLUSIVE OF BURRS AND MOLD FLASH.

	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.13 REF	
b	0.12	0.22
D	1.00 BSC	
E	1.00 BSC	
e	0.35 BSC	
L	0.25	0.35
L1	0.30	0.40

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Inverters ***category:***

Click to view products by ON Semiconductor ***manufacturer:***

Other Similar products are found below :

E5-652Z NL17SGU04P5T5G NLX2G04BMX1TCG CD4009UBE TC4584BFN 022413E NL17SG14AMUTCG NLU2G04AMUTCG NLU2GU04BMX1TCG NLU2G04CMX1TCG NLV17SZ06DFT2G NCV1729SN35T1G TC74VHC04FK(EL,K) NLV74HC04ADTR2G NLU1G04AMUTCG NLX2G04CMUTCG NLX2G04AMUTCG NLU1GU04CMUTCG NLU1GT14AMUTCG NLU1G04CMUTCG NL17SZU04P5T5G 74LVC06ADTR2G 74LVC04ADR2G NLV37WZ04USG NLX3G14FMUTCG NL17SZ04P5T5G NLV17SG14DFT2G 74ACT14SC BU4069UBF-E2 EMPP008Z NC7WZ14P6X NLV14106BDTR2G NLV74AC14DTR2G SN74HCT04DE4 ODE-3-120023-1F12 74VHCT04AM SV004IE5-1C TC74HC04APF TC7SH04F,LJ(CT TC7W14FK,LF 74VHC14MTCX 74LCX14MTC SN74LVC1GU04DBVR NL27WZ14DFT2G NLU1G14BMX1TCG NLU2G04AMX1TCG NLU2G14AMX1TCG NLU3G14AMX1TCG NLVVHC1G04DFT2G NLX2G04CMX1TCG