

NL27WZ17

Dual Non-Inverting Schmitt Trigger Buffer

The NL27WZ17 is a high performance dual buffer operating from a 1.65 to 5.5 V supply. At $V_{CC} = 3.0$ V, high impedance TTL compatible inputs significantly reduce current loading to input drivers while the TTL compatible outputs offer improved switching noise performance.

Features

- Extremely High Speed: t_{PD} 2.0 ns (typical) at $V_{CC} = 5.0$ V
- Designed for 1.65 V to 5.5 V V_{CC} Operation
- Overvoltage Tolerant Inputs
- LVTTL Compatible – Interface Capability with 5.0 V TTL Logic with $V_{CC} = 3.0$ V (2.7–3.3)
- LVC MOS Compatible
- 24 mA Balanced Output Sink and Source Capability at $V_{CC} = 3.0$ V
- Near Zero Static Supply Current Substantially Reduces System Power Requirements
- Chip Complexity: FET = 72; Equivalent Gate = 18
- Pb-Free Package is Available

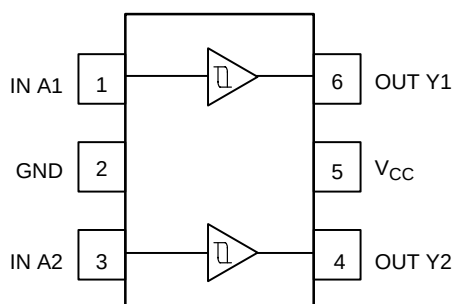


Figure 1. Pinout (Top View)

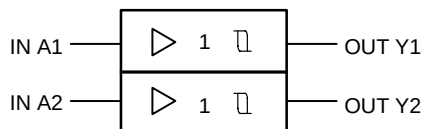


Figure 2. Logic Symbol

PIN ASSIGNMENT

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

FUNCTION TABLE

A Input	$\bar{Y}$ Output
L	L
H	H



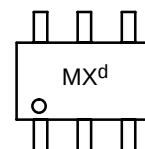
ON Semiconductor®

<http://onsemi.com>



SC-88/SOT-363/SC-70
DF SUFFIX
CASE 419B

MARKING DIAGRAM



Pin 1
d = Date Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

MAXIMUM RATINGS

Symbol	Characteristics	Value	Unit
V _{CC}	DC Supply Voltage	− 0.5 to + 7.0	V
V _I	DC Input Voltage	− 0.5 ≤ V _I ≤ + 7.0	V
V _O	DC Output Voltage Output in Z or LOW State (Note 1)	− 0.5 ≤ V _O ≤ 7.0	V
I _{IK}	DC Input Diode Current V _I < GND	− 50	mA
I _{OK}	DC Output Diode Current V _O < GND	− 50	mA
I _O	DC Output 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
P _D	Power Dissipation in Still Air	200	mW
θ _{JA}	Thermal Resistance	333	°C/W
T _L	Lead Temperature, 1 mm from case for 10 s	260	°C
T _J	Junction Temperature under Bias	+ 150	°C
V _{ESD}	ESD Withstand Voltage Human Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note 4)	> 2000 150 N/A	V
I _{Latch-Up}	Latch-Up Performance Above V _{CC} and Below GND at 85°C (Note 5)	± 500	mA

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. I_O absolute maximum rating must be observed.
2. Tested to EIA/JESD22-A114-A
3. Tested to EIA/JESD22-A115-A
4. Tested to JESD22-C101-A
5. Tested to EIA/JESD78

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	Supply Voltage Operating Data Retention Only	1.65 1.5	5.5 5.5	V
V _I	Input Voltage	0	5.5	V
V _O	Output Voltage (High or LOW State)	0	5.5	V
T _A	Operating Free-Air Temperature	− 40	+ 85	°C
Δt/ΔV	Input Transition Rise or Fall Rate V _{CC} = 2.5 V ± 0.2 V V _{CC} = 3.0 V ± 0.3 V V _{CC} = 5.0 V ± 0.5 V	0 0 0	No Limit No Limit No Limit	ns/V

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
V _{T+}	Positive Input 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	V
V _{T-}	Negative Input 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	V
V _H	Input 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 1.25 0.3 0.4 0.6 0.7	0.9 1.1 1.15 1.2 1.5 1.7	V
V _{OH}	High-Level Output Voltage V _{IN} = V _{IH} or V _{IL}	I _{OH} = -100 μA I _{OH} = -3.0 mA I _{OH} = -8.0 mA I _{OH} = -12 mA I _{OH} = -16 mA I _{OH} = -24 mA I _{OH} = -32 mA	1.65-5.5 1.65 2.3 2.7 3.0 3.0 4.5	V _{CC} -0.1 1.29 1.9 2.2 2.4 2.3	V _{CC} 1.52 2.1 2.4 2.7 2.5 4.0		V _{CC} -0.1 1.29 1.9 2.2 2.4 2.3		V
V _{OL}	Low-Level Output Voltage V _{IN} = V _{IH} or V _{IL}	I _{OL} = 100 μA I _{OL} = 4.0 mA I _{OL} = 8.0 mA I _{OL} = 12 mA I _{OL} = 16 mA I _{OL} = 24 mA I _{OL} = 32 mA	1.65-5.5 1.65 2.3 2.7 3.0 3.0 4.5		0.08 0.2 0.22 0.28 0.38 0.42	0.1 0.24 0.3 0.4 0.4 0.55 0.55		0.1 0.24 0.3 0.4 0.4 0.55 0.55	V
I _{IN}	Input Leakage Current	V _{IN} = V _{CC} or GND	0 to 5.5			±0.1		±1.0	μA
I _{OFF}	Power Off-Output Leakage Current	V _{OUT} = 5.5 V	0			1.0		10	μA
I _{CC}	Quiescent Supply Current	V _{IN} = V _{CC} or GND	5.5			1.0		10	μA

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

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			-40°C ≤ T _A ≤ 85°C		Unit
				Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation Delay Input A to Y	R _L = 1.0 MΩ, C _L = 15 pF	1.65 1.8 2.5 ± 0.2 3.3 ± 0.3 5.0 ± 0.5	2.0 2.0 1.0 1.0 0.5	9.1 7.6 5.0 3.7 3.1	15 12.5 9.0 6.3 5.2	2.0 2.0 1.0 1.0 0.5	15.6 13 9.5 6.5 5.5	ns
		R _L = 500 Ω, C _L = 50 pF	3.3 ± 0.3 5.0 ± 0.5	1.5 0.8	4.4 3.7	7.2 5.9	1.5 0.8	7.5 6.2	

CAPACITIVE CHARACTERISTICS

Symbol	Parameter	Condition	Typical	Unit
C _{IN}	Input Capacitance	V _{CC} = 5.5 V, V _I = 0 V or V _{CC}	7.0	pF
C _{PD}	Power Dissipation Capacitance	10 MHz, V _{CC} = 3.3 V, V _I = 0 V or V _{CC} 10 MHz, V _{CC} = 5.5 V, V _I = 0 V or V _{CC}	9.0 11	pF

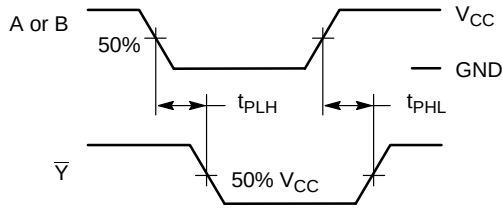
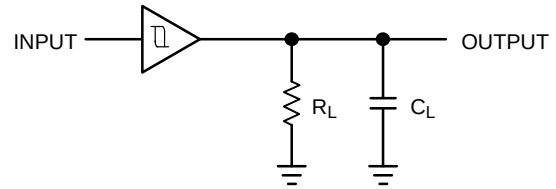


Figure 3. Switching Waveforms



A 1-MHz square input wave is recommended for propagation delay tests.

Figure 4. Test Circuit

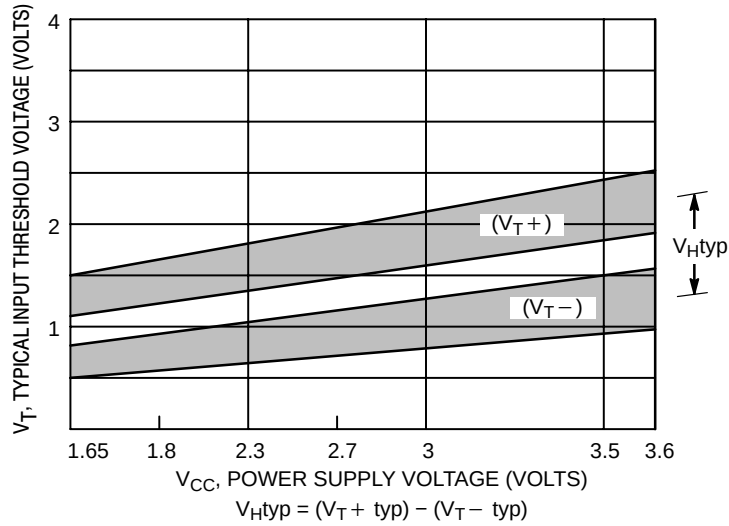
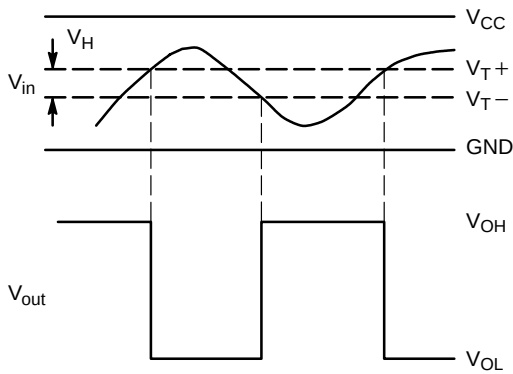
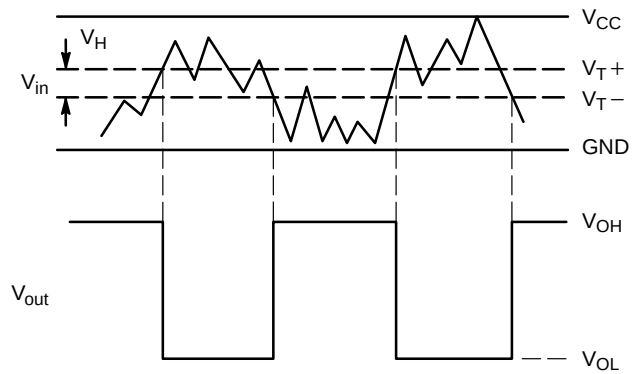


Figure 5. Typical Input Threshold, V_{T+} , V_{T-} versus Power Supply Voltage



(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

NL27WZ17

ORDERING INFORMATION

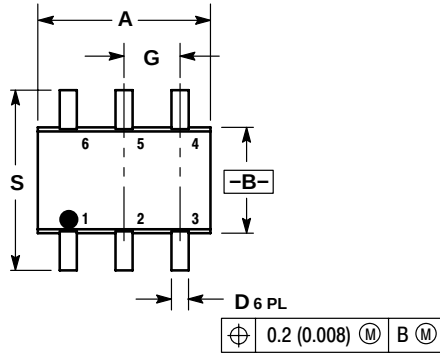
Device	Device Nomenclature						Package	Shipping [†]
	Logic Circuit Indicator	No. of Gates per Package	Temp Range Identifier	Technology	Device Function	Package Suffix		
NL27WZ17DFT2	NL	2	7	WZ	17	DFT2	SC-88	3000 / Tape & Reel
NL27WZ17DFT2G	NL	2	7	WZ	17	DFT2	SC-88	3000 / Tape & Reel

[†]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.

NL27WZ17

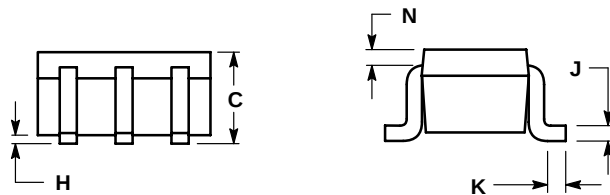
PACKAGE DIMENSIONS

SC-88/SOT-363/SC-70
DF SUFFIX
CASE 419B-02
ISSUE 02U

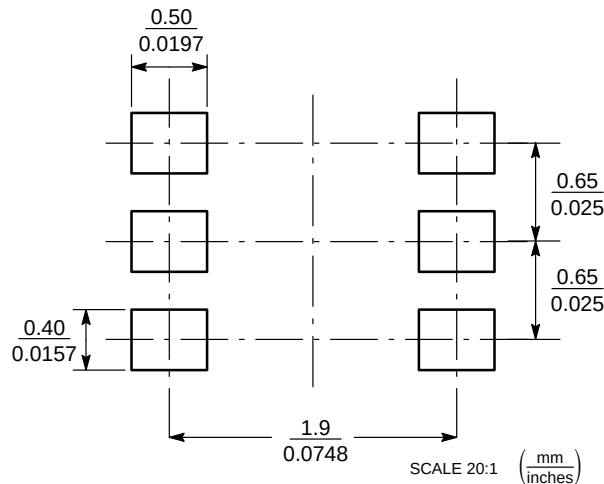


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20



SOLDERING FOOTPRINT*



SC-88/SC70-6/SOT363

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

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 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
Japan: ON Semiconductor, Japan Customer Focus Center
2-9-1 Kamimeguro, Meguro-ku, Tokyo, Japan 153-0051
Phone: 81-3-5773-3850

ON Semiconductor Website: <http://onsemi.com>

Order Literature: <http://www.onsemi.com/litorder>

For additional information, please contact your local Sales Representative.