

NL7SZ18

1-of-2 Non-Inverting Demultiplexer with 3-State Deselected Output

The NL7SZ18 is a high-performance 1-to-2 Demultiplexer operating from a 1.65 V to 5.5 V supply. When the select pin [S] is enabled [high or low], the data in the address pin [A] is routed to one of the output pins [Y₀ or Y₁], maintaining a high-impedance on the deselected output pin (See Truth Table).

This device has been optimized for on-board buffering applications and offers mixed (1.65 V, 2.3 V, 3.0 V and 5.5 V) voltage capability by providing over voltage tolerance (OVT*) circuitry on I/O pins.

Features

- High-Speed Propagation Delay
t_{PD} 2.5 nS (Typ), Load 50 pF @ 5.0 V
- Power Down Impedance
Outputs in High-Z
- Output Drive Capability
32 mA @ 5.0 V
- Broad V_{CC} Operating Range
1.65 V to 5.5 V
- Surface Mount Technology
SC-70, 6-Lead Packaging
- OVT* on Inputs / Outputs

Typical Applications

- Cell Phones
- PDAs
- Digital Cameras
- Video Cameras

Important Information

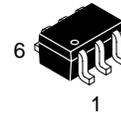
- ESD Protection: MM >200 V, HBM >2000 V
- Latch-Up Max Rating: 300 mA
- Pin to Pin Compatible with NC7SZ18

*Over Voltage Tolerance (OVT) enables input and output pins to function outside (higher) of their operating voltages, with no damage to the devices or to signal integrity.



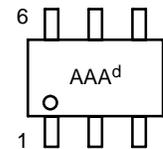
ON Semiconductor®

<http://onsemi.com>

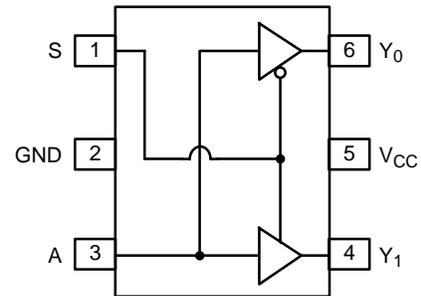


SOT-363/SC70-6/SC-88
DF SUFFIX
CASE 419B

MARKING DIAGRAM



AAA = Device Marking
d = Date Code



(TOP VIEW)

PIN/FUNCTION TABLE

Pin	Function
A	Data Input
S	Demultiplexer Select
Y ₀	Output 1
Y ₁	Output 2

TRUTH TABLE

Input		Output	
S	A	Y ₀	Y ₁
L	L	L	Z
L	H	H	Z
H	L	Z	L
H	H	Z	H

ORDERING INFORMATION

Device	Package	Shipping†
NL7SZ18DFT2	SC70-6	3000 / Tape & Reel

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

NL7SZ18

MAXIMUM RATINGS

Symbol	Rating	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 ₁ < -0.5 V	-50	mA
I _{OK}	DC Output Diode Current @ V ₁ < -0.5 V	-50	mA
I _{OUT}	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
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
T _J	Junction Temperature Under Bias	+150	°C
θ _{JA}	Thermal Resistance (Note 1)	250	°C/W
P _D	Power Dissipation in Still Air at 85°C	180	mW
MSL	Moisture Sensitivity	Level 1	-
FR	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0125 in	-
V _{ESD}	ESD Withstand Voltage Human Body Model (Note 2) Machine Model (Note 3) Charged Device Model (Note 4)	> 2000 > 200 n/a	V

Maximum Ratings are those values beyond which damage to the device may occur. Exposure to these conditions or conditions beyond those indicated may adversely affect device reliability. Functional operation under absolute maximum-rated conditions is not implied. Functional operation should be restricted to the Recommended Operating Conditions.

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/JESD22-A115-A.
4. Tested to JESD22-C101-A.

RECOMMENDED OPERATING CONDITIONS

Symbol	Rating	Value	Unit
V _{CC}	DC Supply Voltage	1.65 to 5.5	V
V _{CC}	DC Supply Voltage, Data Retention	1.5 to 5.5	V
V _{IN}	Input Voltage	0 to 5.5	V
V _{OUT}	Output Voltage	0 to 5.5	V
T _A	Operating Temperature	-40 to 85	°C
t _r , t _f	Input Rise and Fall Times V _{CC} @ 1.8 ± 0.15 V V _{CC} @ 2.5 ± 0.2 V V _{CC} @ 3.3 ± 0.3 V V _{CC} @ 5.0 ± 0.5 V	0 to 20 0 to 20 0 to 10 0 to 5	nS/V
θ _{JA}	Thermal Resistance	350	°C/W

NL7SZ18

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25°C			T _A = -40°C to 85°C		Unit								
				Min	Typ	Max	Min	Max									
V _{IH}	High-Level Input Voltage		1.65–1.95 2.3–5.5	0.75 V _{CC} 0.70 V _{CC}			0.75 V _{CC} 0.70 V _{CC}		V								
V _{IL}	Low-Level Output Voltage		1.65–1.95 2.3–5.5			0.25 V _{CC} 0.30 V _{CC}		0.25 V _{CC} 0.30 V _{CC}	V								
V _{OH}	High-Level Output Voltage	V _{IN} = V _{IH}	I _{OH} = -100 µA	1.65	1.55	1.65		1.55		V							
				2.3	2.20	2.30		2.20									
				3.0	2.90	3.00		2.90									
				4.5	4.40	4.50		4.40									
			I _{OH} = -4.0 mA I _{OH} = -8.0 mA I _{OH} = -16 mA I _{OH} = -24 mA I _{OH} = -32 mA	1.65	1.29	1.52		1.29									
				2.3	1.90	2.15		1.90									
V _{OL}	Low-Level Output Voltage	V _{IN} = V _{IL}	I _{OL} = 100 µA	1.65		0.0	0.10		0.10	V							
				2.3		0.0	0.10		0.10								
				3.0		0.0	0.10		0.10								
				4.5		0.0	0.10		0.10								
			I _{OL} = 4.0 mA I _{OL} = 8.0 mA I _{OL} = 16 mA I _{OL} = 24 mA I _{OL} = 32 mA	1.65		0.08	0.24		0.24								
				2.3		0.10	0.30		0.30								
I _{IN}	Input Leakage Current	V _{IN} = 5.5 V, GND	0.0 to 5.5				±0.1		±1.0	µA							
				I _{OZ}	Output High-Z Current	V _{IN} = V _{IH} or V _{IL} 0 < V _{out} ≤ 5.5 V	1.65 to 5.5			±0.5		±5.0	µA				
								I _{OFF}	Power-Off Leakage Current	V _{IN} or V _{CC} = 5.5 V	0.0			1.0		10	µA
												I _{CC}	Quiescent Supply Current	V _{IN} = 5.5 V, GND	1.8 to 5.5		

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V _{CC}	T _A = 25°C			T _A = -40°C to 85°C		Unit	Figure
				Min	Typ	Max	Min	Max		
t _{PLH} t _{PHL}	Propagation Delay A to Y ₀ or Y ₁	C _L = 15 pF R _D = 1.0 MΩ S = OPEN	1.8 ± 0.15 2.5 ± 0.2 3.3 ± 0.3 5.0 ± 0.5	2.0 1.0 0.8 0.5	6.3 3.6 2.7 2.0	10.1 5.7 4.0 3.1	2.0 1.0 0.8 0.5	10.5 6.0 4.3 3.3	nS	Figures 1 & 3
		C _L = 50 pF R _D = 500 Ω S = OPEN	3.3 ± 0.3 5.0 ± 0.5	1.2 0.8	3.4 2.5	4.9 3.9	1.2 0.8	5.4 4.2	nS	Figures 1 & 3
t _{PZH} t _{PZL}	Output Enable Time	C _L = 50 pF R _D , R _U = 500 Ω S = GND for t _{PZH} S = V _{IN} for t _{PZL} V _I = 2 x V _{CC}	1.8 ± 0.15 2.5 ± 0.2 3.3 ± 0.3 5.0 ± 0.5	3.0 1.8 1.2 0.8	6.9 4.2 3.2 2.5	12 6.8 5.0 4.0	3.0 1.8 1.2 0.8	12.5 7.3 5.5 4.3	nS	Figures 1 & 3
		C _L = 50 pF R _D , R _D = 500 Ω S = GND for t _{PHZ} S = V _{IN} for t _{PLZ} V _I = 2 x V _{CC}	1.8 ± 0.15 2.5 ± 0.2 3.3 ± 0.3 5.0 ± 0.5	2.5 1.5 0.8 0.3	6.0 4.0 2.9 1.8	10 6.8 4.9 3.5	2.5 1.5 0.8 0.3	10.5 7.1 5.3 3.7	nS	Figures 1 & 3
C _{IN} C _{OUT}	Input Capacitance Output Capacitance		OPEN 3.3		2.5 4.0				pF	
C _{PD}	Power Dissipation Capacitance	Note 5	3.3 5.0		16 19.5				pF	Figure 2

5. C_{PD} is defined as the value of the internal equivalent capacitance which is derived from dynamic operating current consumption (I_{CCD}) at no output loading and operating at 50% duty cycle (see Figure 2). C_{PD} is related to I_{CCD} dynamic operating current by the expression: I_{CCD} = (C_{PD}) (V_{CC}) (f_{IN}) + (I_{CCD}static).

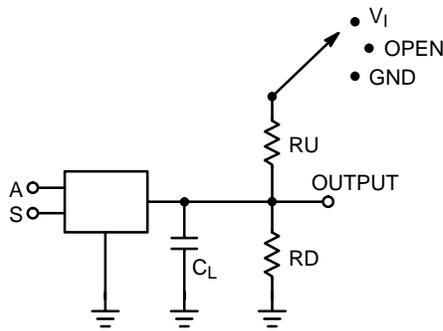


Figure 1. AC Test Circuit
C_L Includes Load and Stray Capacitance
Input PRR = 1.0 MHz; t_w = 500 nS

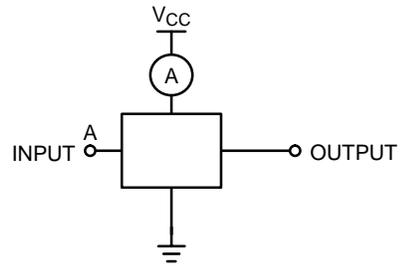


Figure 2. I_{CCD} Test Circuit
Input = AC Waveform; t_r = t_f = 1.8 nS
PRR = 10 MHz; Duty Cycle = 50%
S Input = GND or x

NL7SZ18

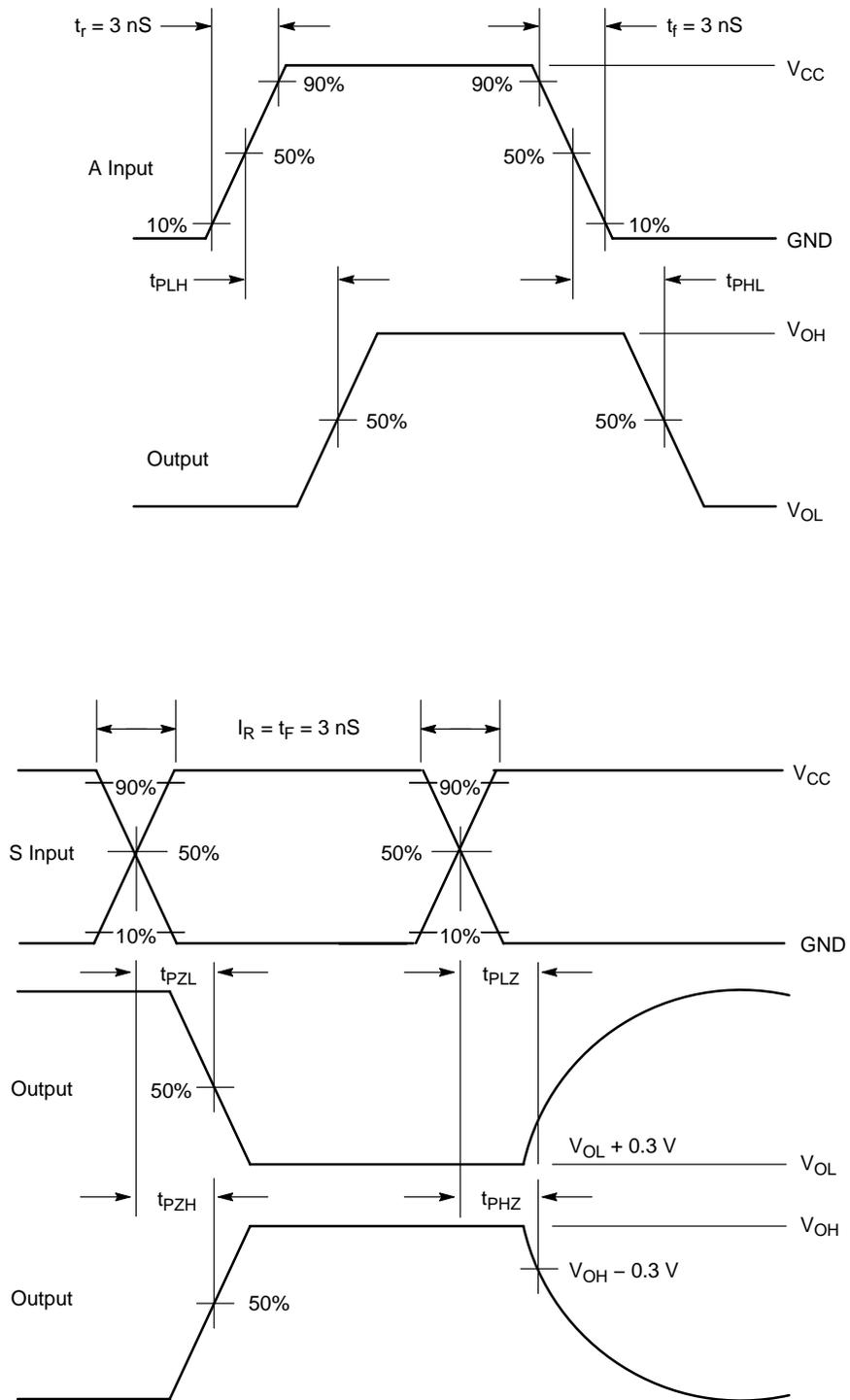
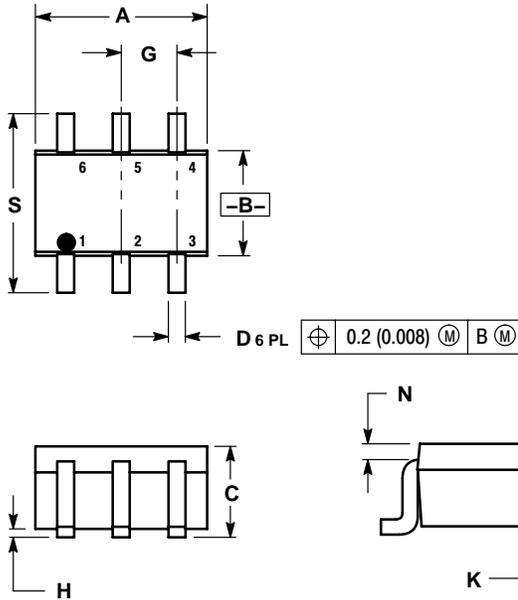


Figure 3. AC Waveforms

NL7SZ18

PACKAGE DIMENSIONS

SOT-363/SC70-6/SC-88
 DF SUFFIX
 6-LEAD PACKAGE
 CASE 419B-02
 ISSUE N



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

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.