MARKING

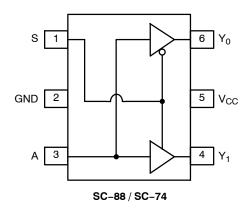
## **1-to-2 Demultiplexer with 3-State Deselected Output**

## **NL7SZ18**

The NL7SZ18 is a high-performance non-inverting 1-to-2 demultiplexer operating from a 1.65 to 5.5 V supply.

#### Features

- Designed for 1.65 V to 5.5 V  $V_{CC}$  Operation
- 2.5 ns  $t_{PD}$  at  $V_{CC} = 5 V (Typ)$
- Inputs/Outputs Overvoltage Tolerant up to 5.5 V
- IOFF Supports Partial Power Down Protection
- Sink 32 mA at 5.0 V
- Available in SC-88, SC-74 and UDFN6 Packages
- Chip Complexity < 100 FETs
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant



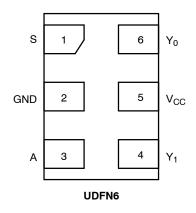
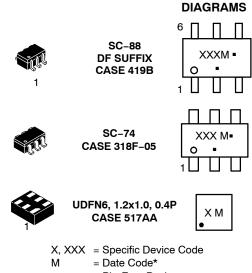


Figure 1. Pinout (Top View)



= Pb-Free Package

(Note: Microdot may be in either location) \*Date Code orientation and/or position may

vary depending upon manufacturing location.

#### **ORDERING INFORMATION**

See detailed ordering, marking and shipping information in the package dimensions section on page 6 of this data sheet.

#### **PIN ASSIGNMENT**

Pin	Function
1	S
2	GND
3	А
4	Y <sub>1</sub>
5	V <sub>CC</sub>
6	Y <sub>0</sub>

#### **FUNCTION TABLE**

Inp	out	Output		
S	Α	Y <sub>0</sub>	Y <sub>1</sub>	
L	L	L	Z	
L	Н	Н	Z	
Н	L	Z	L	
Н	Н	Z	Н	

#### **MAXIMUM RATINGS**

Symbol	Charac	teristics	Value	Unit
V <sub>CC</sub>	DC Supply Voltage		-0.5 to +6.5	V
V <sub>IN</sub>	DC Input Voltage		-0.5 to +6.5	V
V <sub>OUT</sub>	DC Output Voltage	Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V <sub>CC</sub> = 0 V)	-0.5 to V <sub>CC</sub> + 0.5 -0.5 to +6.5 -0.5 to +6.5	V
Ι <sub>ΙΚ</sub>	DC Input Diode Current	V <sub>IN</sub> < GND	-50	mA
I <sub>OK</sub>	DC Output Diode Current	V <sub>OUT</sub> < GND	-50	mA
I <sub>OUT</sub>	DC Output Source/Sink Current	±50	mA	
$I_{\rm CC}$ or $I_{\rm GND}$	DC Supply Current per Supply Pin or G	round Pin	±100	mA
T <sub>STG</sub>	Storage Temperature Range		-65 to +150	°C
ΤL	Lead Temperature, 1 mm from Case for	10 secs	260	°C
TJ	Junction Temperature Under Bias		+150	°C
$\theta_{JA}$	Thermal Resistance (Note 2)	SC-88 SC-74 UDFN6	377 320 154	°C/W
P <sub>D</sub>	Power Dissipation in Still Air	SC-88 SC-74 UDFN6	332 390 812	mW
MSL	Moisture Sensitivity		Level 1	-
F <sub>R</sub>	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	-
V <sub>ESD</sub>	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 1000	V
I <sub>Latchup</sub>	Latchup Performance (Note 4)		±100	mA

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#### **RECOMMENDED OPERATING CONDITIONS**

Symbol	Characteristics	Min	Мах	Unit
V <sub>CC</sub>	Positive DC Supply Voltage	1.65	5.5	V
V <sub>IN</sub>	DC Input Voltage	0	5.5	V
V <sub>OUT</sub>	Tri-S	High or Low State)     0       tate Mode (Note 1)     0       Mode (V <sub>CC</sub> = 0 V)     0	V <sub>CC</sub> 5.5 5.5	
T <sub>A</sub>	Operating Temperature Range	-55	+125	°C
t <sub>r</sub> , t <sub>f</sub>		= 1.65 V to 1.95 V 0 <sub>CC</sub> = 2.3 V to 2.7 V 0 <sub>CC</sub> = 3.0 V to 3.6 V 0 <sub>CC</sub> = 4.5 V to 5.5 V 0	20 20 10 5	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

			v <sub>cc</sub>	T <sub>A</sub> = 25°C			–55°C ≤ T <sub>A</sub> ≤ 125°C		
Symbol	Parameter	Condition	(V)	Min	Тур	Max	Min	Max	Units
VIH	High-Level Input		1.65 to 1.95	$0.65 \times V_{CC}$			$0.65 \times V_{CC}$		V
	Voltage		2.3 to 5.5	0.70 x V <sub>CC</sub>			$0.70 \times V_{CC}$		
VIL	Low-Level Input		1.65 to 1.95			0.35 x V <sub>CC</sub>		$0.35 \times V_{CC}$	V
	Voltage		2.3 to 5.5			0.30 x V <sub>CC</sub>		$0.30 \times V_{CC}$	
V <sub>OH</sub>	High–Level Output Voltage	$ \begin{array}{l} V_{IN} = V_{IH} \mbox{ or } V_{IL} \\ I_{OH} = -100 \ \mu A \\ I_{OH} = -4 \ m A \\ I_{OH} = -8 \ m A \\ I_{OH} = -16 \ m A \\ I_{OH} = -24 \ m A \\ I_{OH} = -32 \ m A \end{array} $	1.65 to 5.5 1.65 2.3 3 3 4.5	V <sub>CC</sub> - 0.1 1.29 1.9 2.4 2.3 3.8	V <sub>CC</sub> 1.52 2.1 2.7 2.5 4		V <sub>CC</sub> - 0.1 1.29 1.9 2.4 2.3 3.8		V
V <sub>OL</sub>	Low-Level Output Voltage		1.65 to 5.5 1.65 2.3 3 3 4.5		- 0.08 0.12 0.24 0.26 0.31	0.1 0.24 0.3 0.4 0.55 0.55		0.1 0.24 0.3 0.4 0.55 0.55	V
I <sub>IN</sub>	Input Leakage Current	$V_{IN} = 5.5 \text{ V or GND}$	1.65 to 5.5	-	-	±0.1	_	±1.0	μA
I <sub>OZ</sub>	3-State Output Leakage Current	$V_{OUT}$ = 0 V to 5.5 V	1.65 to 5.5	-	-	±0.5	-	±5.0	μΑ
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>IN</sub> = 5.5 V or V <sub>OUT</sub> = 5.5 V	0	-	-	1.0	-	10	μA
I <sub>CC</sub>	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5	-	-	1.0	-	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.

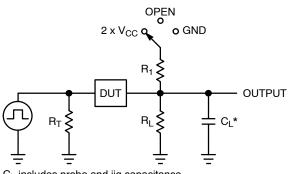
#### AC ELECTRICAL CHARACTERISTICS

			V <sub>cc</sub>	T	<sub>A</sub> = 25°	C	–55°C ≤ T	<sub>A</sub> ≤ 125°C	
Symbol	Parameter	Condition	(V)	Min	Тур	Max	Min	Max	Units
t <sub>PLH,</sub>	Propagation Delay, A to Y	$R_L$ = 1 MΩ, $C_L$ = 15 pF	1.65 to 1.95	-	6.3	10.1	-	10.5	ns
t <sub>PHL</sub>	(Figures 2 and 3)	$R_L$ = 1 MΩ, $C_L$ = 15 pF	2.3 to 2.7	-	3.6	5.7	-	6.0	
		$R_L = 1 M\Omega$ , $C_L = 15 pF$	3.0 to 3.6	-	2.7	4.0	-	4.3	
		$R_L$ = 500 Ω, $C_L$ = 50 pF		-	3.4	4.9	-	5.4	
		$R_L$ = 1 MΩ, $C_L$ = 15 pF	4.5 to 5.5	-	2.0	3.1	-	3.3	
		$R_L$ = 500 Ω, $C_L$ = 50 pF		-	2.5	3.9	-	4.2	
t <sub>PZH,</sub>	Output Enable Time,		1.65 to 1.95	-	6.9	12	-	12.5	ns
t <sub>PZL</sub>	S to Y (Figures 2 and 3)		2.3 to 2.7	-	4.2	6.8	-	7.3	
			3.0 to 3.6	-	3.2	5.0	-	5.5	
			4.5 to 5.5	-	2.5	4.0	-	4.3	
t <sub>PHZ,</sub>	Output Disable Time, S to Y		1.65 to 1.95	-	6.0	10	-	10.5	ns
t <sub>PLZ</sub>	(Figures 2 and 3)		2.3 to 2.7	-	4.0	6.8	-	7.1	
			3.0 to 3.6	-	2.9	4.9	-	5.3	
			4.5 to 5.5		1.8	3.5	-	3.7	

#### **CAPACITIVE CHARACTERISTICS**

Symbol	Parameter	Condition	Typical	Units
C <sub>IN</sub>	Input Capacitance	$V_{CC}$ = 5.5 V, $V_{IN}$ = 0 V or $V_{CC}$	2.5	pF
C <sub>OUT</sub>	Output Capacitance	$V_{CC}$ = 5.5 V, $V_{IN}$ = 0 V or $V_{CC}$	2.5	pF
C <sub>PD</sub>	Power Dissipation Capacitance (Note 5)	10 MHz, $V_{CC}$ = 3.3 V, $V_{IN}$ = 0 V or $V_{CC}$ 10 MHz, $V_{CC}$ = 5.5 V, $V_{IN}$ = 0 V or $V_{CC}$	9 11	pF

5.  $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the 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;  $P_D = C_{PD} \bullet V_{CC}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$ .

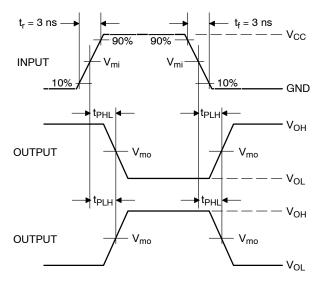


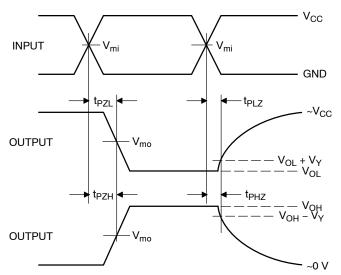
Switch Position	C <sub>L</sub> , pF	$R_{L}, \Omega$	R <sub>1</sub> , Ω	
Open	See AC Characteristics Table			
$2 \times V_{CC}$	50	500	500	
GND	50	500	500	
	Position Open 2 x V <sub>CC</sub>	Position     See AC Character       Open     See AC Character       2 x V <sub>CC</sub> 50	Position     See AC Characteristics Tat       2 x V <sub>CC</sub> 50	

X = Don't Care

 $C_L$  includes probe and jig capacitance  $R_T$  is  $Z_{OUT}$  of pulse generator (typically 50  $\Omega)$  f = 1 MHz

#### Figure 2. Test Circuit





#### Figure 3. Switching Waveforms

		Vm		
V <sub>CC</sub> , V	V <sub>mi</sub> , V	t <sub>PLH</sub> , t <sub>PHL</sub>	t <sub>PZL</sub> , t <sub>PLZ</sub> , t <sub>PZH</sub> , t <sub>PHZ</sub>	V <sub>Y</sub> , V
1.65 to 1.95	V <sub>CC</sub> /2	V <sub>CC</sub> /2	V <sub>CC</sub> /2	0.15
2.3 to 2.7	V <sub>CC</sub> /2	V <sub>CC</sub> /2	V <sub>CC</sub> /2	0.15
3.0 to 3.6	V <sub>CC</sub> /2	V <sub>CC</sub> /2	V <sub>CC</sub> /2	0.3
4.5 to 5.5	V <sub>CC</sub> /2	V <sub>CC</sub> /2	V <sub>CC</sub> /2	0.3

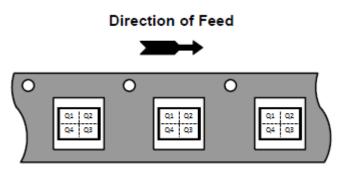
### **NL7SZ18**

#### **DEVICE ORDERING INFORMATION**

Device	Packages	Specific Device Code	Pin 1 Orientation (See below)	Shipping <sup>†</sup>
NL7SZ18DFT2G	SC-88	LD	Q4	3000 / Tape & Reel
NL7SZ18DBVT1G	SC-74	AJ	Q4	3000 / Tape & Reel
NL7SZ18MU2TCG (Contact <b>onsemi</b> )	UDFN6, 1.2 x 1.0, 0.4P	Т	Q4	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.
\*\* Please refer to NLV specifications for this device.

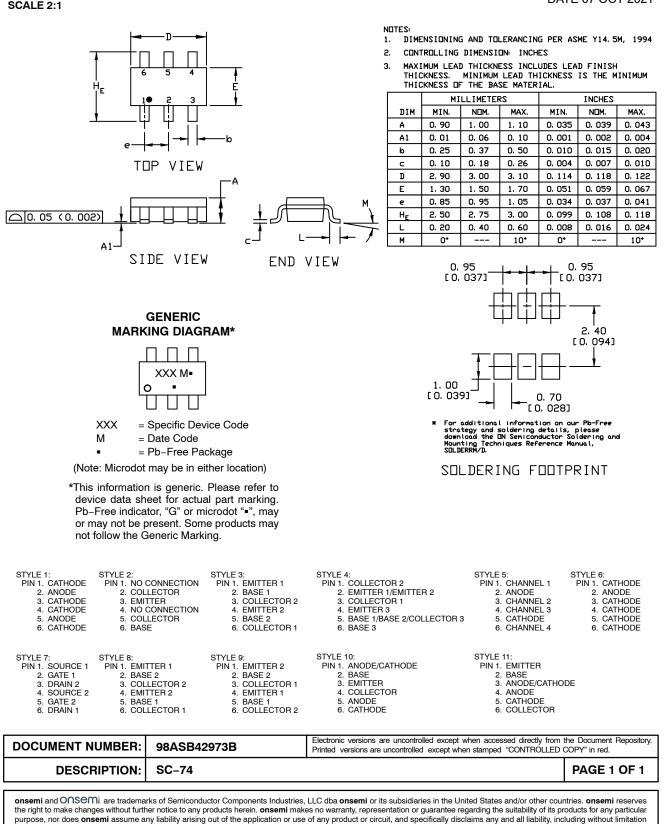
#### Pin 1 Orientation in Tape and Reel



# onsemi

SC-74 CASE 318F ISSUE P

DATE 07 OCT 2021



special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

0.043

0.004





- XXX = Specific Device Code

(Note: Microdot may be in either location)

\*Date Code orientation and/or position may vary depending upon manufacturing location.

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.



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.

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#### SC-88/SC70-6/SOT-363 CASE 419B-02 ISSUE Y

#### DATE 11 DEC 2012

STYLE 1: PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2	STYLE 2: CANCELLED	STYLE 3: CANCELLED	STYLE 4: PIN 1. CATHODE 2. CATHODE 3. COLLECTOR 4. EMITTER 5. BASE 6. ANODE	STYLE 5: PIN 1. ANODE 2. ANODE 3. COLLECTOR 4. EMITTER 5. BASE 6. CATHODE	STYLE 6: PIN 1. ANODE 2 2. N/C 3. CATHODE 1 4. ANODE 1 5. N/C 6. CATHODE 2
STYLE 7: PIN 1. SOURCE 2 2. DRAIN 2 3. GATE 1 4. SOURCE 1 5. DRAIN 1 6. GATE 2	STYLE 8: CANCELLED	STYLE 9: PIN 1. EMITTER 2 2. EMITTER 1 3. COLLECTOR 1 4. BASE 1 5. BASE 2 6. COLLECTOR 2	STYLE 10: PIN 1. SOURCE 2 2. SOURCE 1 3. GATE 1 4. DRAIN 1 5. DRAIN 2 6. GATE 2	STYLE 11: PIN 1. CATHODE 2 2. CATHODE 2 3. ANODE 1 4. CATHODE 1 5. CATHODE 1 6. ANODE 2	STYLE 12: PIN 1. ANODE 2 2. ANODE 2 3. CATHODE 1 4. ANODE 1 5. ANODE 1 6. CATHODE 2
STYLE 13:	STYLE 14:	STYLE 15:	STYLE 16:	STYLE 17:	STYLE 18:
PIN 1. ANODE	PIN 1. VREF	PIN 1. ANODE 1	PIN 1. BASE 1	PIN 1. BASE 1	PIN 1. VIN1
2. N/C	2. GND	2. ANODE 2	2. EMITTER 2	2. EMITTER 1	2. VCC
3. COLLECTOR	3. GND	3. ANODE 3	3. COLLECTOR 2	3. COLLECTOR 2	3. VOUT2
4. EMITTER	4. IOUT	4. CATHODE 3	4. BASE 2	4. BASE 2	4. VIN2
5. BASE	5. VEN	5. CATHODE 2	5. EMITTER 1	5. EMITTER 2	5. GND
6. CATHODE	6. VCC	6. CATHODE 1	6. COLLECTOR 1	6. COLLECTOR 1	6. VOUT1
STYLE 19:	STYLE 20:	STYLE 21:	STYLE 22:	STYLE 23:	STYLE 24:
PIN 1. I OUT	PIN 1. COLLECTOR	PIN 1. ANODE 1	PIN 1. D1 (i)	PIN 1. Vn	PIN 1. CATHODE
2. GND	2. COLLECTOR	2. N/C	2. GND	2. CH1	2. ANODE
3. GND	3. BASE	3. ANODE 2	3. D2 (i)	3. Vp	3. CATHODE
4. V CC	4. EMITTER	4. CATHODE 2	4. D2 (c)	4. N/C	4. CATHODE
5. V EN	5. COLLECTOR	5. N/C	5. VBUS	5. CH2	5. CATHODE
6. V REF	6. COLLECTOR	6. CATHODE 1	6. D1 (c)	6. N/C	6. CATHODE
STYLE 25:	STYLE 26:	STYLE 27:	STYLE 28:	STYLE 29:	STYLE 30:
PIN 1. BASE 1	PIN 1. SOURCE 1	PIN 1. BASE 2	PIN 1. DRAIN	PIN 1. ANODE	PIN 1. SOURCE 1
2. CATHODE	2. GATE 1	2. BASE 1	2. DRAIN	2. ANODE	2. DRAIN 2
3. COLLECTOR 2	3. DRAIN 2	3. COLLECTOR 1	3. GATE	3. COLLECTOR	3. DRAIN 2
4. BASE 2	4. SOURCE 2	4. EMITTER 1	4. SOURCE	4. EMITTER	4. SOURCE 2
5. EMITTER	5. GATE 2	5. EMITTER 2	5. DRAIN	5. BASE/ANODE	5. GATE 1
6. COLLECTOR 1	6. DRAIN 1	6. COLLECTOR 2	6. DRAIN	6. CATHODE	6. DRAIN 1

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

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