MARKING

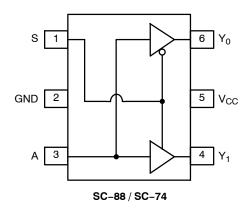
1-to-2 Demultiplexer with 3-State Deselected Output

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



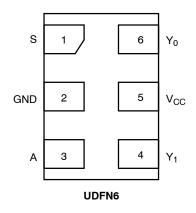
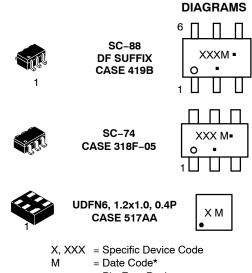


Figure 1. Pinout (Top View)



= 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 ₁ |
| 5 | V _{CC} |
| 6 | Y ₀ |

FUNCTION TABLE

| Input | | Output | |
|-------|---|----------------|----------------|
| S | Α | Y ₀ | Y ₁ |
| L | L | L | Z |
| L | Н | Н | Z |
| Н | L | Z | L |
| Н | Н | Z | Н |

MAXIMUM RATINGS

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

Lateriup Lateriup Laterius (1990) (

RECOMMENDED OPERATING CONDITIONS

| Symbol | Characteristics | Min | Мах | Unit |
|---------------------------------|-----------------------------|--|-------------------------------|------|
| V _{CC} | Positive DC Supply Voltage | 1.65 | 5.5 | V |
| V _{IN} | DC Input Voltage | 0 | 5.5 | V |
| V _{OUT} | Tri-S | High or Low State) 0 tate Mode (Note 1) 0 Mode (V _{CC} = 0 V) 0 | V _{CC} 5.5 5.5 | |
| T _A | Operating Temperature Range | -55 | +125 | °C |
| t _r , t _f | | = 1.65 V to 1.95 V 0 _{CC} = 2.3 V to 2.7 V 0 _{CC} = 3.0 V to 3.6 V 0 _{CC} = 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 _{cc} | T _A = 25°C | | | –55°C ≤ T _A ≤ 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 _{CC} | | | $0.70 \times V_{CC}$ | | |
| VIL | Low-Level Input | | 1.65 to 1.95 | | | 0.35 x V _{CC} | | $0.35 \times V_{CC}$ | V |
| | Voltage | | 2.3 to 5.5 | | | 0.30 x V _{CC} | | $0.30 \times V_{CC}$ | |
| V _{OH} | 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 _{CC} - 0.1 1.29 1.9 2.4 2.3 3.8 | V _{CC} 1.52 2.1 2.7 2.5 4 | | V _{CC} - 0.1 1.29 1.9 2.4 2.3 3.8 | | V |
| V _{OL} | 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 _{IN} | Input Leakage Current | $V_{IN} = 5.5 \text{ V or GND}$ | 1.65 to 5.5 | - | - | ±0.1 | _ | ±1.0 | μA |
| I _{OZ} | 3-State Output Leakage Current | V_{OUT} = 0 V to 5.5 V | 1.65 to 5.5 | - | - | ±0.5 | - | ±5.0 | μΑ |
| I _{OFF} | Power Off Leakage Current | V _{IN} = 5.5 V or 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 |

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.

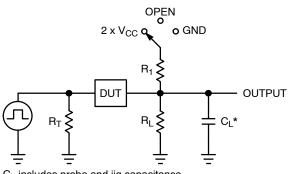
AC ELECTRICAL CHARACTERISTICS

| | | | V _{cc} | T | _A = 25° | C | –55°C ≤ T | _A ≤ 125°C | |
|-------------------|--------------------------------|-----------------------------------|-----------------|-----|--------------------|------|-----------|----------------------|-------|
| Symbol | Parameter | Condition | (V) | Min | Тур | Max | Min | Max | Units |
| t _{PLH,} | 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 _{PHL} | (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 _{PZH,} | Output Enable Time, | | 1.65 to 1.95 | - | 6.9 | 12 | - | 12.5 | ns |
| t _{PZL} | 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 _{PHZ,} | Output Disable Time, S to Y | | 1.65 to 1.95 | - | 6.0 | 10 | - | 10.5 | ns |
| t _{PLZ} | (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 _{IN} | Input Capacitance | V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC} | 2.5 | pF |
| C _{OUT} | Output Capacitance | V_{CC} = 5.5 V, V_{IN} = 0 V or V_{CC} | 2.5 | pF |
| C _{PD} | 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; $P_D = C_{PD} \bullet V_{CC}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$.

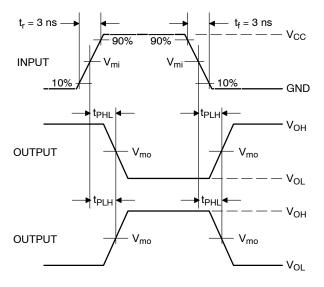


| Switch Position | C _L , pF | R_{L}, Ω | R ₁ , Ω | |
|--------------------|---|--|--|--|
| Open | See AC Characteristics Table | | | |
| $2 \times V_{CC}$ | 50 | 500 | 500 | |
| GND | 50 | 500 | 500 | |
| | Position Open 2 x V _{CC} | Position See AC Character Open See AC Character 2 x V _{CC} 50 | Position See AC Characteristics Tat 2 x V _{CC} 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



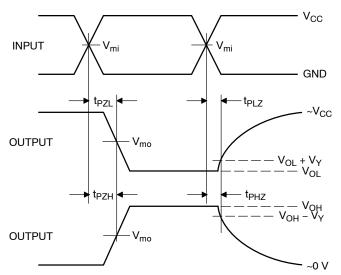


Figure 3. Switching Waveforms

| | | Vm | | |
|---------------------|---------------------|-------------------------------------|---|--------------------|
| V _{CC} , V | V _{mi} , V | t _{PLH} , t _{PHL} | t _{PZL} , t _{PLZ} , t _{PZH} , t _{PHZ} | V _Y , V |
| 1.65 to 1.95 | V _{CC} /2 | V _{CC} /2 | V _{CC} /2 | 0.15 |
| 2.3 to 2.7 | V _{CC} /2 | V _{CC} /2 | V _{CC} /2 | 0.15 |
| 3.0 to 3.6 | V _{CC} /2 | V _{CC} /2 | V _{CC} /2 | 0.3 |
| 4.5 to 5.5 | V _{CC} /2 | V _{CC} /2 | V _{CC} /2 | 0.3 |

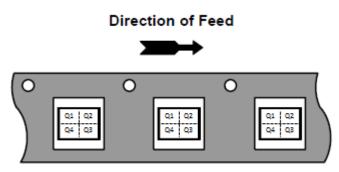
NL7SZ18

DEVICE ORDERING INFORMATION

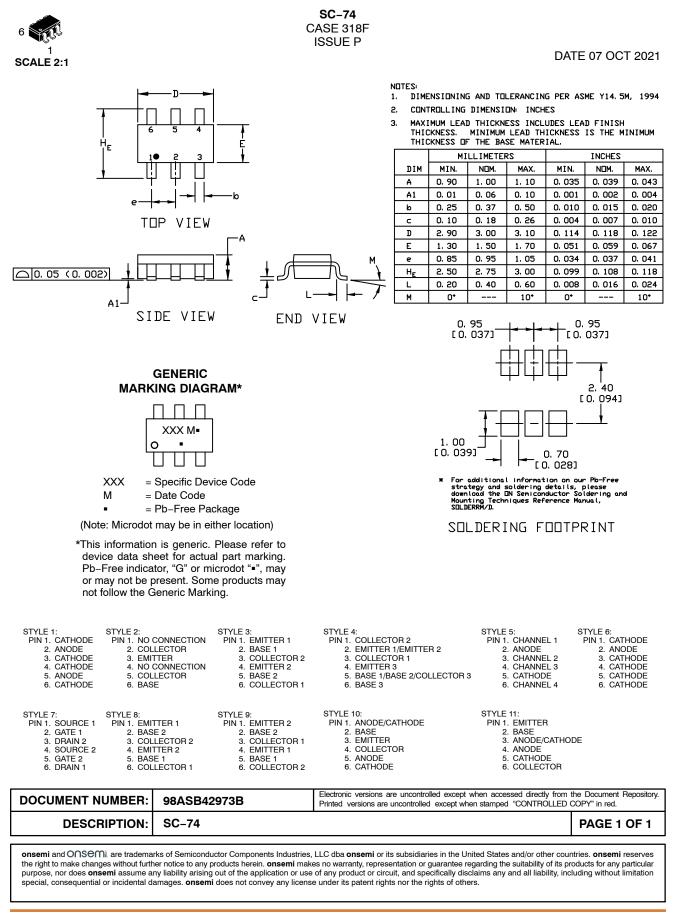
| Device | Packages | Specific Device Code | Pin 1 Orientation (See below) | Shipping [†] |
|---|------------------------|----------------------|----------------------------------|-----------------------|
| NL7SZ18DFT2G | SC-88 | LD | Q4 | 3000 / Tape & Reel |
| NL7SZ18DBVT1G | SC-74 | AJ | Q4 | 3000 / Tape & Reel |
| NL7SZ18MU2TCG (Contact onsemi) | 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



semi

SC-88 2.00x1.25x0.90, 0.65P CASE 419B-02 **ISSUE Z**

DATE 18 APR 2024





- DIMENSIONING AND TOLERANCING CONFORM TO ASME 1. Y14.5-2018.
- 2.
- ALL DIMENSION ARE IN MILLIMETERS. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 3. PER END.
- 4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF
- DATUMS A AND B ARE DETERMINED AT DATUM H. 5.
- DIMENSIONS & AND C APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP. 6.
- DIMENSION & DOES NOT INCLUDE DAMBAR PROTRUSION. 7 ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION & AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.





DETAIL A



| | MILLIMETERS | | | | |
|-----|-------------|----------|------|--|--|
| DIM | MIN. | NOM. | MAX. | | |
| A | | | 1.10 | | |
| A1 | 0.00 | | 0.10 | | |
| A2 | 0.70 | 0.90 | 1.00 | | |
| b | 0.15 | 0.20 | 0.25 | | |
| С | 0.08 | 0.15 | 0.22 | | |
| D | 2.00 BSC | | | | |
| E | 2.10 BSC | | | | |
| E1 | 1.25 BSC | | | | |
| е | | 0.65 BSC |) | | |
| L | 0.26 | 0.36 | 0.46 | | |
| L2 | | 0.15 BSC | | | |
| aaa | 0.15 | | | | |
| bbb | 0.30 | | | | |
| ссс | 0.10 | | | | |
| ddd | | 0.10 | | | |

6X 0.66 6X 0.30-2.50 0.65 PITCH

RECOMMENDED MOUNTING FOOTPRINT*

FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

XXX = Specific Device Code = Date Code* Μ

GENERIC **MARKING DIAGRAM***

XXXM-

. 0

6

= Pb-Free Package

(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.

STYLES ON PAGE 2

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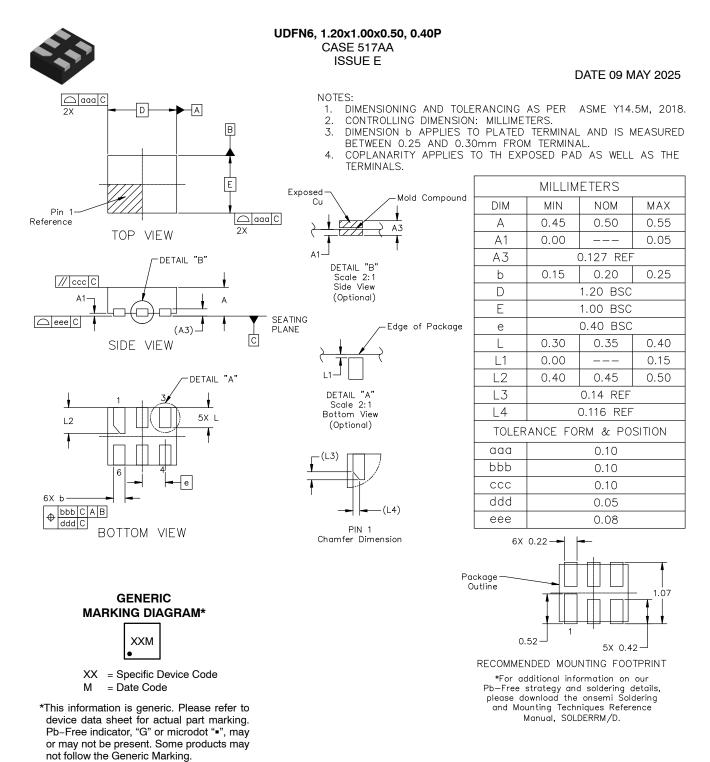
| STYLE 1: PIN 1. EMITTER 2 2. BASE 2 3. COLLECTOR 1 4. EMITTER 1 5. BASE 1 6. COLLECTOR 2 | STYLE 2: CANCELLED | STYLE 3: CANCELLED | STYLE 4: PIN 1. CATHODE 2. CATHODE 3. COLLECTOR 4. EMITTER 5. BASE 6. ANODE | STYLE 5: PIN 1. ANODE 2. ANODE 3. COLLECTOR 4. EMITTER 5. BASE 6. CATHODE | STYLE 6: PIN 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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