

MOSFET – Power, P-Channel, High Side Load Switch with Level-Shift, SC-88

8 V, ±1.3 A

NTJD1155L

The NTJD1155L integrates a P and N-Channel MOSFET in a single package. This device is particularly suited for portable electronic equipment where low control signals, low battery voltages and high load currents are needed. The P-Channel device is specifically designed as a load switch using onsemi state-of-the-art trench technology. The N-Channel, with an external resistor (R1), functions as a level-shift to drive the P-Channel. The N-Channel MOSFET has internal ESD protection and can be driven by logic signals as low as 1.5 V. The NTJD1155L operates on supply lines from 1.8 to 8.0 V and can drive loads up to 1.3 A with 8.0 V applied to both V_{IN} and $V_{ON/OFF}$.

Features

- Extremely Low $R_{DS(on)}$ P-Channel Load Switch MOSFET
- Level Shift MOSFET is ESD Protected
- Low Profile, Small Footprint Package
- V_{IN} Range 1.8 to 8.0 V
- ON/OFF Range 1.5 to 8.0 V
- These Devices are Pb-Free and are RoHS Compliant

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating		Symbol	Value	Unit
Input Voltage (V_{DSS} , P-Ch)		V_{IN}	8.0	V
ON/OFF Voltage (V_{GS} , N-Ch)		$V_{ON/OFF}$	8.0	V
Continuous Load Current (Note 1)	Steady State	I_L	$T_A = 25^\circ\text{C}$	A
			$T_A = 85^\circ\text{C}$	
Power Dissipation (Note 1)	Steady State	P_D	$T_A = 25^\circ\text{C}$	W
			$T_A = 85^\circ\text{C}$	
Pulsed Load Current	$t_p = 10 \mu\text{s}$	I_{LM}	±3.9	A
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Source Current (Body Diode)		I_S	-0.4	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T_L	260	$^\circ\text{C}$

THERMAL CHARACTERISTICS

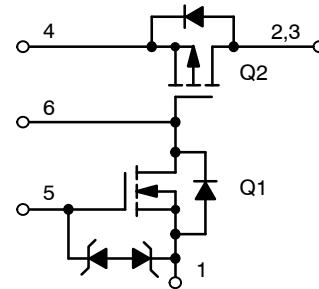
Characteristic	Symbol	Max	Unit
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	320	$^\circ\text{C/W}$
Junction-to-Foot – Steady State (Note 1)	$R_{\theta JF}$	220	

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.

- Surface-mounted on FR4 board using 1 inch sq pad size (Cu area = 1.127 in sq [1 oz] including traces).

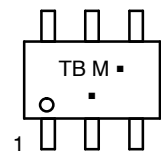
$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D MAX
8.0 V	130 mΩ @ -4.5 V	±1.3 A
	170 mΩ @ -2.5 V	
	260 mΩ @ -1.8 V	

SIMPLIFIED SCHEMATIC



SC-88
(SOT-363)
CASE 419B-02
STYLE 30

MARKING DIAGRAM



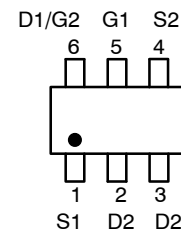
TB = Device Code

M = Date Code

■ = Pb-Free Package

(Note: Microdot may be in either location)

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping†
NTJD1155LT1G, NTJD1155LT2G	SC-88 (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 Specification Brochure, [BRD8011/D](#).

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ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Q2 Drain-to-Source Breakdown Voltage	V _{IN}	V _{GS2} = 0 V, I _{D2} = 250 μA	-8.0			V
Forward Leakage Current	I _{FL}	V _{GS1} = 0 V, V _{DS2} = -8.0 V	T _J = 25 °C		1.0	μA
			T _J = 125 °C		10	
Q1 Gate-to-Source Leakage Current	I _{GSS}	V _{DS1} = 0 V, V _{GS1} = ±8.0 V			±100	nA
Q1 Diode Forward On-Voltage	V _{SD}	I _S = -0.4 A, V _{GS1} = 0 V		-0.8	-1.1	V

ON CHARACTERISTICS

ON/OFF Voltage	V _{ON/OFF}		1.5		8.0	V
Q1 Gate Threshold Voltage	V _{GS1(th)}	V _{GS1} = V _{DS1} , I _D = 250 μA	0.4		1.0	V
Input Voltage	V _{IN}	V _{GS1} = V _{DS1} , I _D = 250 μA	1.8		8.0	V
Q2 Drain-to-Source On Resistance	R _{DS(on)}	V _{ON/OFF} = 1.5 V	V _{IN} = 4.5 V I _L = 1.2 A	130	175	mΩ
			V _{IN} = 2.5 V I _L = 1.0 A	170	220	
			V _{IN} = 1.8 V I _L = 0.7 A	260	320	
Load Current	I _L	V _{DROP} ≤ 0.2 V, V _{IN} = 5.0 V, V _{ON/OFF} = 1.5 V	1.0			A
		V _{DROP} ≤ 0.3 V, V _{IN} = 2.5 V, V _{ON/OFF} = 1.5 V	1.0			

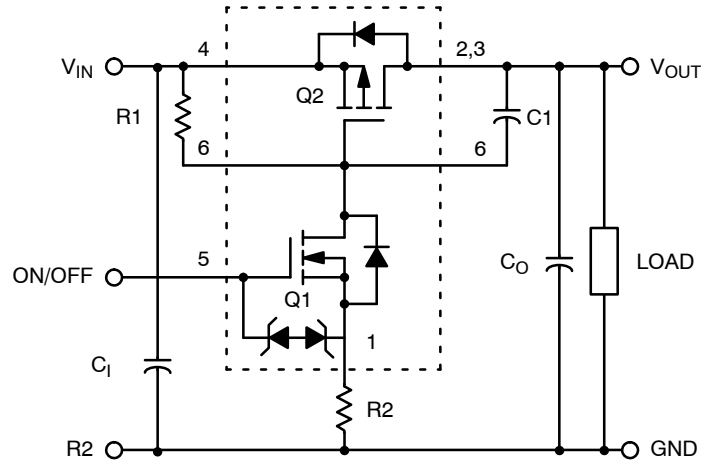


Figure 1. Load Switch Application

Components	Description	Values
R1	Pullup Resistor	Typical 10 kΩ to 1.0 MΩ*
R2	Optional Slew-Rate Control	Typical 0 to 100 kΩ*
C _O , C _I	Output Capacitance	Usually < 1.0 μF
C1	Optional In-Rush Current Control	Typical ≤ 1000 pF

* Minimum R1 value should be at least 10 x R2 to ensure Q1 turn-on.

TYPICAL PERFORMANCE CURVES ($T_J = 25^\circ\text{C}$ unless otherwise noted)

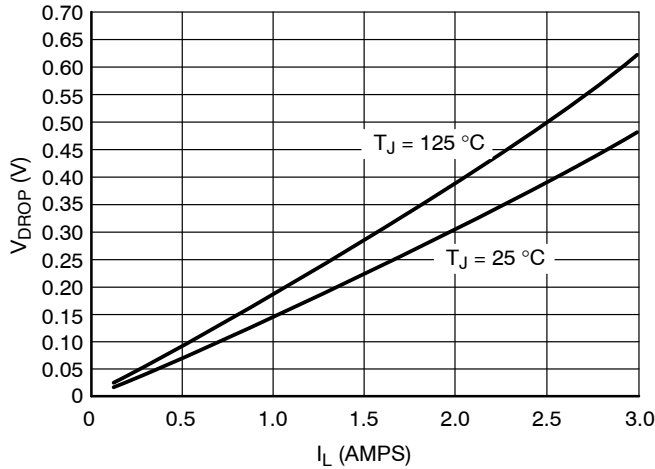


Figure 2. V_{drop} vs. I_L @ $V_{\text{in}} = 2.5\text{ V}$

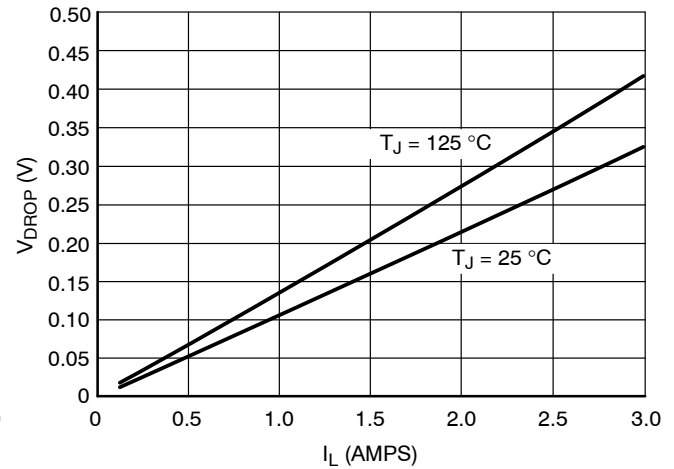


Figure 3. V_{drop} vs. I_L @ $V_{\text{in}} = 4.5\text{ V}$

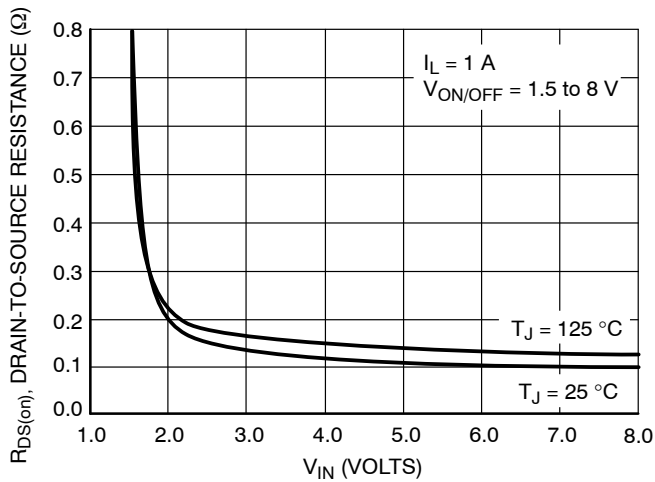


Figure 4. On-Resistance vs. Input Voltage

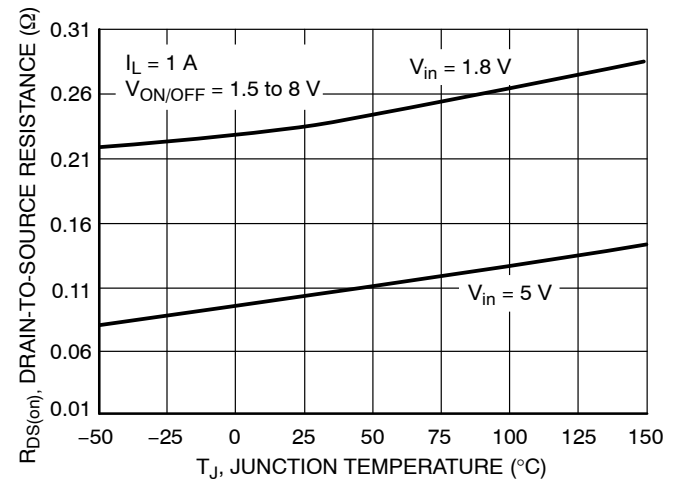


Figure 5. On-Resistance Variation with Temperature

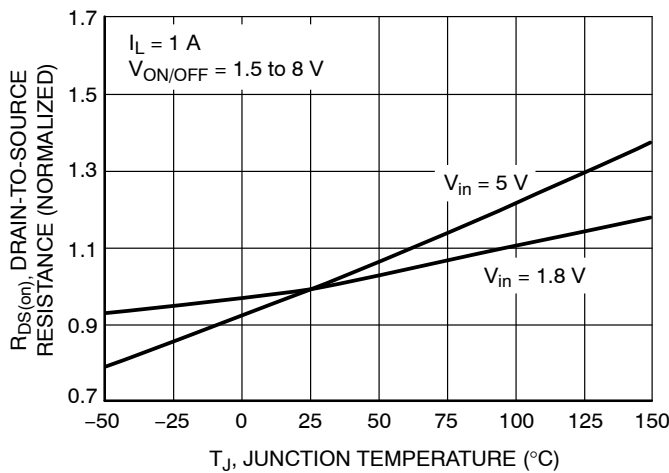


Figure 6. Normalized On-Resistance Variation with Temperature

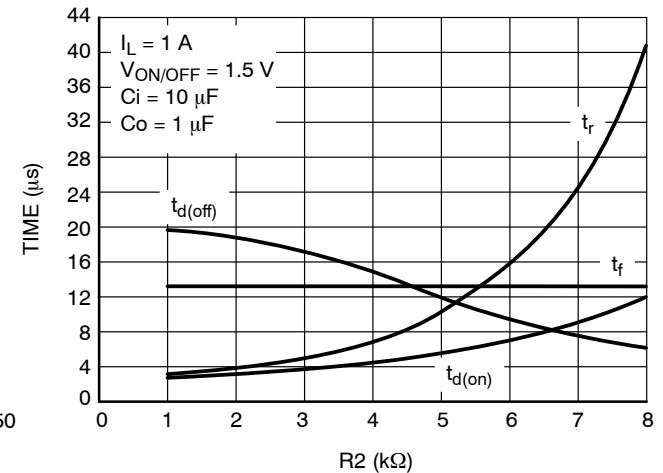


Figure 7. Switching Variation R_2 @ $V_{\text{in}} = 4.5\text{ V}$, $R_1 = 20\text{ k}\Omega$

NTJD1155L

TYPICAL PERFORMANCE CURVES ($T_J = 25^\circ\text{C}$ unless otherwise noted)

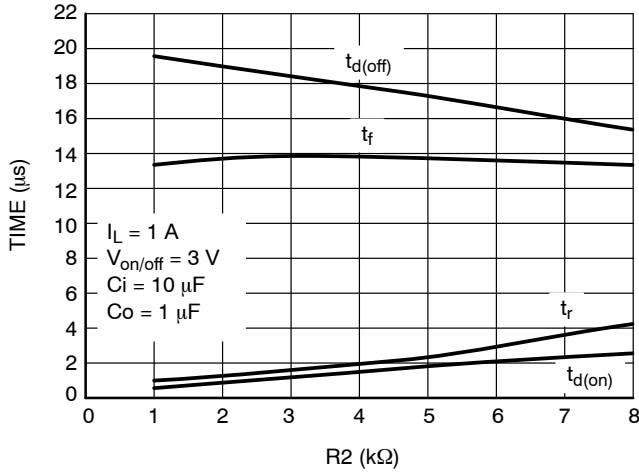


Figure 8. Switching Variation
R2 @ $V_{in} = 4.5\text{ V}$, $R_1 = 20\text{ k}\Omega$

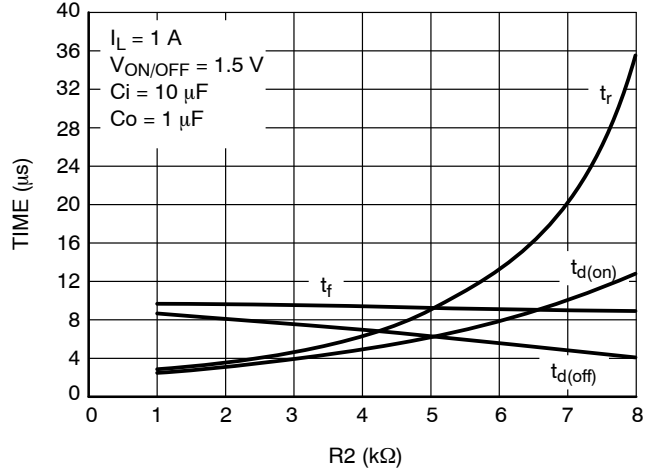


Figure 9. Switching Variation
R2 @ $V_{in} = 2.5\text{ V}$, $R_1 = 20\text{ k}\Omega$

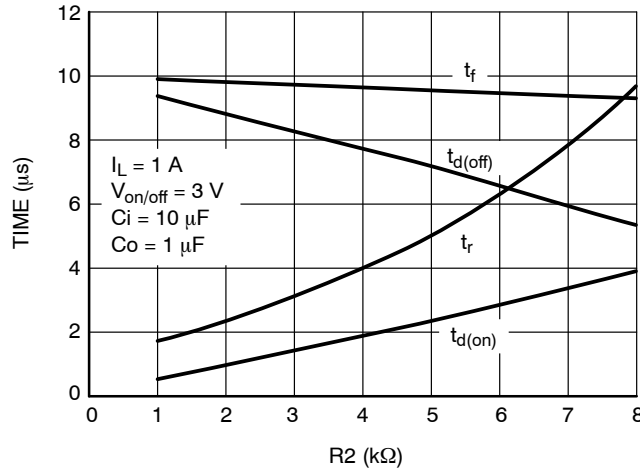


Figure 10. Switching Variation
R2 @ $V_{in} = 2.5\text{ V}$, $R_1 = 20\text{ k}\Omega$

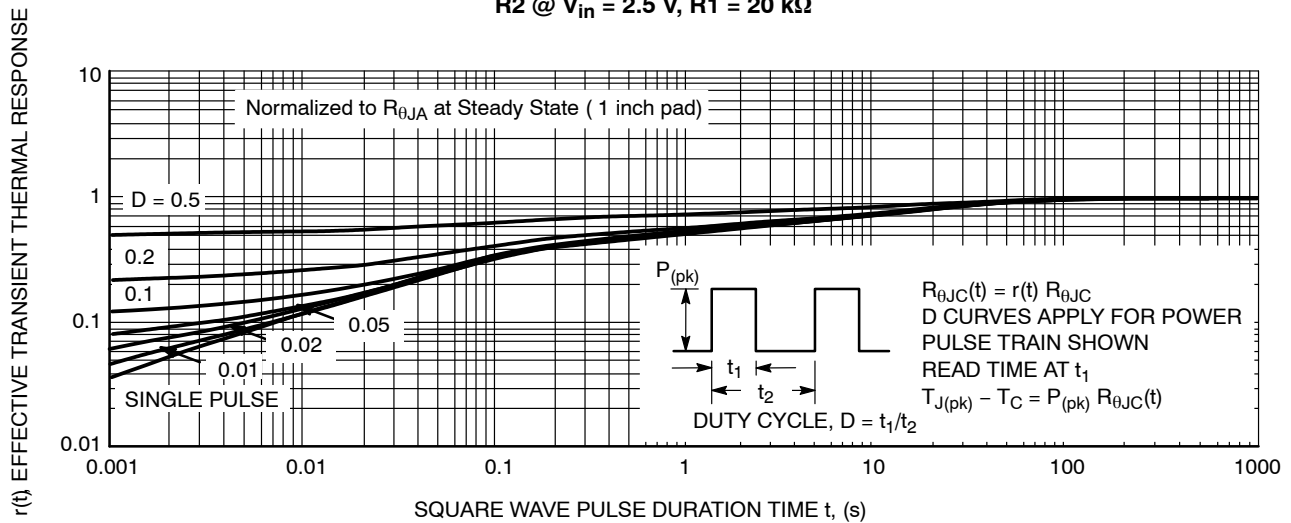


Figure 11. FET Thermal Response

REVISION HISTORY

Revision	Description of Changes	Date
7	Document rebranded to onsemi format.	10/16/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



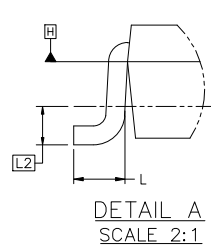
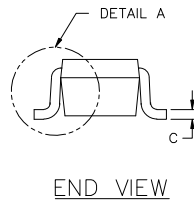
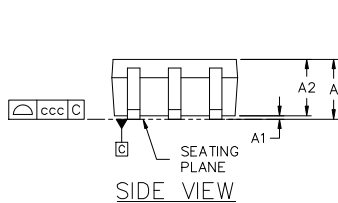
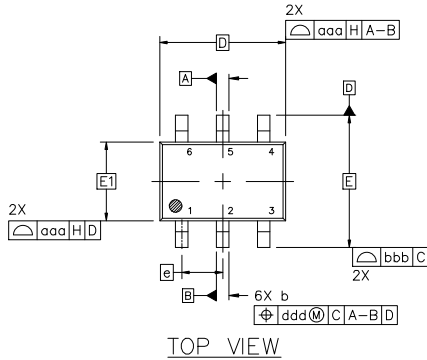


SC-88 2.00x1.25x0.90, 0.65P
CASE 419B-02
ISSUE Z

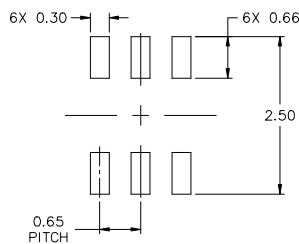
DATE 18 APR 2024

NOTES:

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



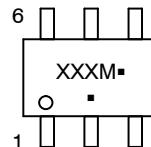
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	---	---	1.10
A1	0.00	---	0.10
A2	0.70	0.90	1.00
b	0.15	0.20	0.25
c	0.08	0.15	0.22
D	2.00 BSC		
E	2.10 BSC		
E1	1.25 BSC		
e	0.65 BSC		
L	0.26	0.36	0.46
L2	0.15 BSC		
aaa	0.15		
bbb	0.30		
ccc	0.10		
ddd	0.10		



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.

GENERIC
MARKING DIAGRAM*



XXX = Specific Device Code
M = Date Code*
▪ = 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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CASE 419B-02
ISSUE Z

DATE 18 APR 2024

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