

NTJD2152P

Trench Small Signal MOSFET

8 V, Dual P-Channel, SC-88
ESD Protection

Features

- Leading -8 V Trench for Low $R_{DS(ON)}$ Performance
- ESD Protected Gate
- Small Footprint (2 x 2 mm)
- Same Package as SC-70-6
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

Applications

- Load Power switching
- DC-DC Conversion
- Li-Ion Battery Charging Circuits
- Cell Phones, Media Players, Digital Cameras, PDAs

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

Parameter		Symbol	Value	Unit	
Drain-to-Source Voltage		V_{DSS}	-8.0	V	
Gate-to-Source Voltage		V_{GS}	± 8.0	V	
Continuous Drain Current (Based on $R_{\theta JA}$)	Steady State	I_D	$T_A = 25^\circ\text{C}$	-0.775	A
			$T_A = 85^\circ\text{C}$	-0.558	
Power Dissipation (Based on $R_{\theta JA}$)	Steady State	P_D	$T_A = 25^\circ\text{C}$	0.27	W
			$T_A = 85^\circ\text{C}$	0.14	
Continuous Drain Current (Based on $R_{\theta JL}$)	Steady State	I_D	$T_A = 25^\circ\text{C}$	-1.1	A
			$T_A = 85^\circ\text{C}$	-0.8	
Power Dissipation (Based on $R_{\theta JL}$)	Steady State	P_D	$T_A = 25^\circ\text{C}$	0.55	W
			$T_A = 85^\circ\text{C}$	0.29	
Pulsed Drain Current		$t \leq 10 \mu\text{s}$	I_{DM}	± 1.2	A
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150		$^\circ\text{C}$
Continuous Source Current (Body Diode)		I_S	-0.775		A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T_L	260		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS (Note 1)

Parameter	Symbol	Typ	Max	Unit
Junction-to-Ambient - Steady State	$R_{\theta JA}$	400	460	$^\circ\text{C/W}$
Junction-to-Lead (Drain) - Steady State	$R_{\theta JL}$	194	226	

1. Surface mounted on FR4 board using 1 oz Cu area = 0.9523 in sq.

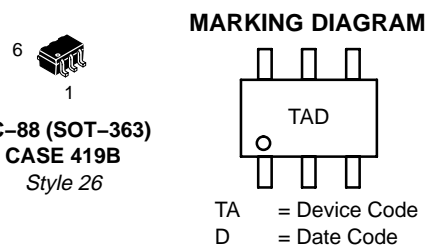
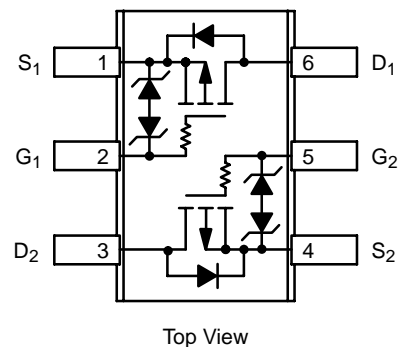


ON Semiconductor®

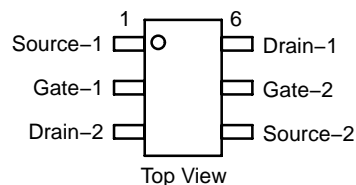
<http://onsemi.com>

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D Max
-8 V	0.22 Ω @ -4.5 V	-0.775 A
	0.32 Ω @ -2.5 V	
	0.51 Ω @ -1.8 V	

SOT-363 SC-88 (6 LEADS)



PIN ASSIGNMENT



ORDERING INFORMATION

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

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 μA	-8.0	-10.5		V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} /T _J			-6.0		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = -6.4 V			1.0	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8.0 V			10	μA

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250 μA	-0.45	-0.83	-1.0	V
Gate Threshold Temperature Coefficient	V _{GS(TH)} /T _J			2.2		mV/°C
Drain-to-Source On Resistance	R _{DS(on)}	V _{GS} = -4.5 V, I _D = -0.57 A		0.22	0.3	Ω
		V _{GS} = -2.5 V, I _D = -0.48 A		0.32	0.46	
		V _{GS} = -1.8 V, I _D = -0.20 A		0.51	0.9	
Forward Transconductance	g _{FS}	V _{GS} = -4.0 V, I _D = -0.57 A		2.0		S

CHARGES AND CAPACITANCES

Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = -8.0 V		160	225	pF
Output Capacitance	C _{OSS}			38	55	
Reverse Transfer Capacitance	C _{RSS}			28	40	
Total Gate Charge	Q _{G(TOT)}	V _{GS} = -4.5 V, V _{DS} = -5.0 V, I _D = -0.6 A		2.2	4.0	nC
Threshold Gate Charge	Q _{G(TH)}			0.1		
Gate-to-Source Charge	Q _{GS}			0.5		
Gate-to-Drain Charge	Q _{GD}			0.5		

SWITCHING CHARACTERISTICS (Note 3)

Turn-On Delay Time	t _{d(ON)}	V _{GS} = -4.5 V, V _{DD} = -4.0 V, I _D = -0.5 A, R _G = 8.0 Ω		13		ns
Rise Time	t _r			23		
Turn-Off Delay Time	t _{d(OFF)}			50		
Fall Time	t _f			36		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V _{SD}	V _{GS} = 0 V, I _S = -0.23 A	T _J = 25°C		0.76	1.1	V
			T _J = 125°C		0.63		
Reverse Recovery Time	t _{RR}	V _{GS} = 0 V, dI _S /dt = 100 A/μs, I _S = -0.77 A			78		ns

2. Pulse Test: pulse width ≤ 300μs, duty cycle ≤ 2%.
3. Switching characteristics are independent of operating junction temperatures.

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

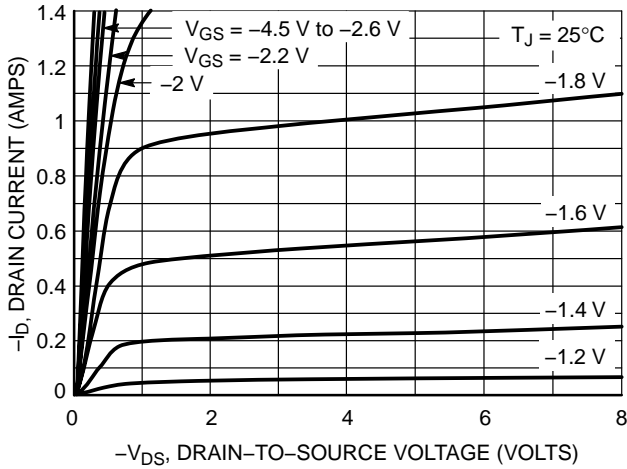


Figure 1. On-Region Characteristics

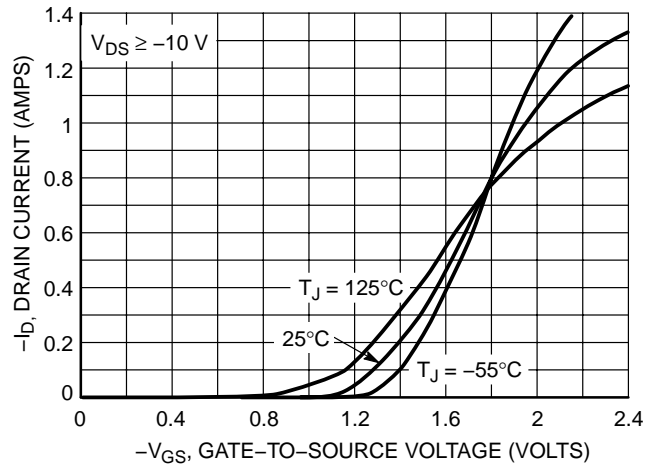


Figure 2. Transfer Characteristics

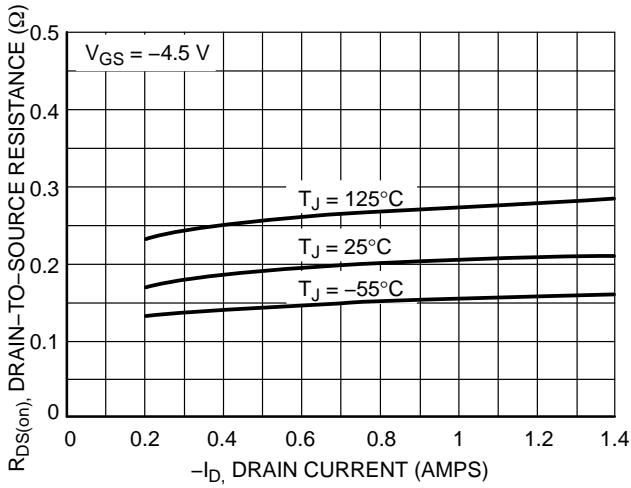


Figure 3. On-Resistance vs. Drain Current and Temperature

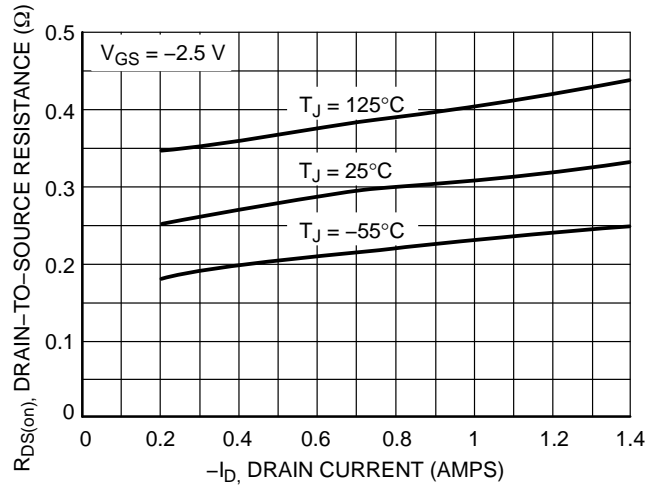


Figure 4. On-Resistance vs. Drain Current and Temperature

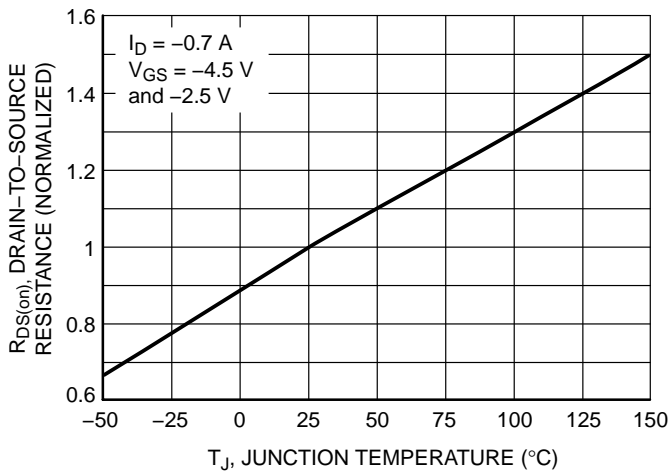


Figure 5. On-Resistance Variation with Temperature

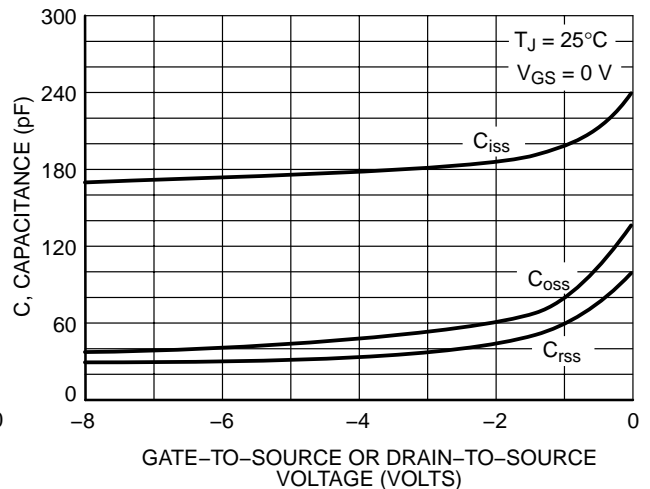


Figure 6. Capacitance Variation

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

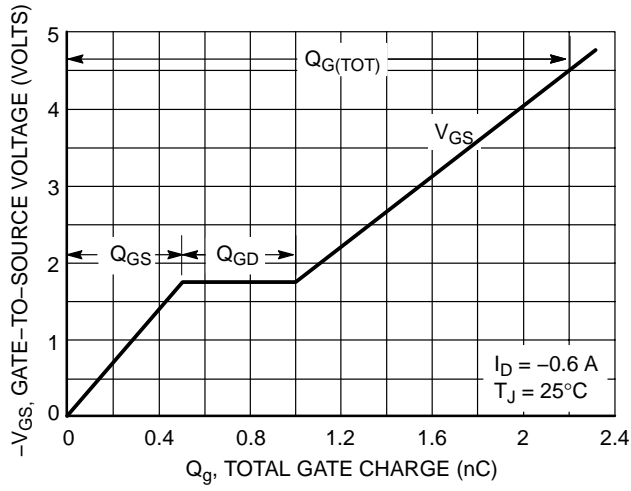


Figure 7. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

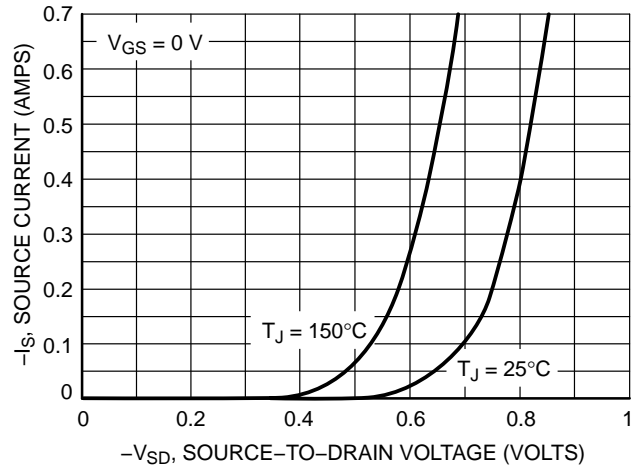


Figure 8. Diode Forward Voltage vs. Current

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ORDERING INFORMATION

Device Order Number	Package Type	Tape and Reel Size†
NTJD2152PT1	SOT-363	3000 / Tape & Reel
NTJD2152PT1G	SOT-363 (Pb-Free)	3000 / Tape & Reel
NTJD2152PT2	SOT-363	3000 / Tape & Reel
NTJD2152PT2G	SOT-363 (Pb-Free)	3000 / Tape & Reel
NTJD2152PT4	SOT-363	10,000 / Tape & Reel
NTJD2152PT4G	SOT-363 (Pb-Free)	10,000 / Tape & Reel

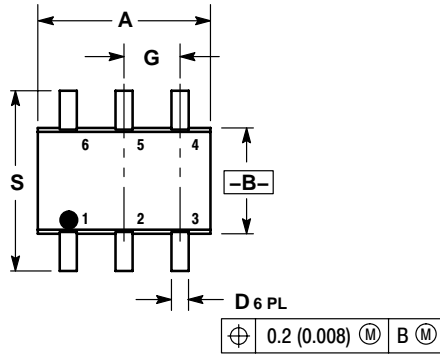
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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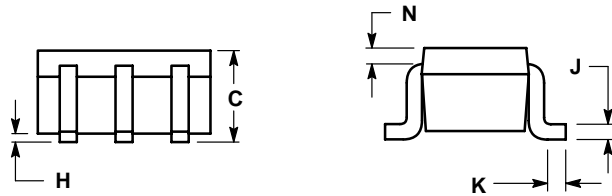
PACKAGE DIMENSIONS

SC-88 (SOT-363)
CASE 419B-02
ISSUE T

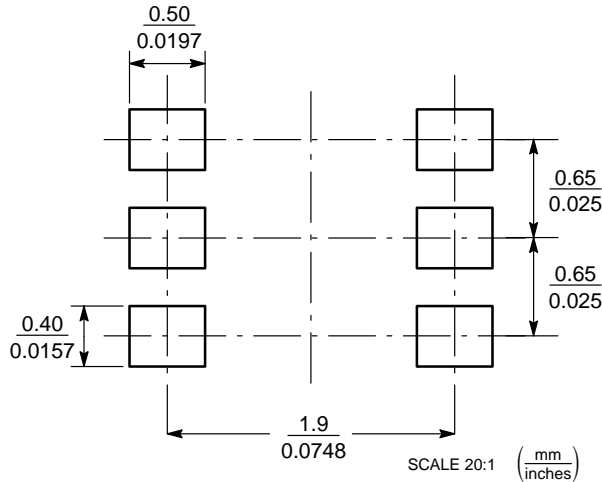
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.



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

*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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