

# NTJD2101PT1

## Product Preview

### Trench Power MOSFET

#### -8.0 V Dual, P-Channel, Gate Zener, SC-88

This P-Channel dual device was designed with a small footprint package (2 X 2 mm) and ON Semiconductor's leading trench process featuring low  $R_{DS(on)}$  for reduced footprint and increased circuit efficiency. The low  $R_{DS(on)}$  performance is particularly suited for single or dual cell Li-Ion battery supplied devices such as cell phones, media players, digital cameras, PDAs, etc.

#### Features & Benefits

- Leading -8.0 V Trench for Low  $R_{DS(on)}$
- Small Footprint Package for Less Board Space
- ESD Protected Gate
- Pb Free Package for Green Manufacturing

#### Applications

- Load/Power Management
- Charging Circuits
- Buck-Boost Synchronous Rectification

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

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DS}$	-8.0	V
Gate-to-Source Voltage	$V_{GS}$	$\pm 8.0$	V
Drain Current - Continuous @ $T_A = 25^\circ\text{C}$ (Note 1) - Pulsed Drain Current ( $t = 10 \mu\text{s}$ )	$I_D$ $I_{DM}$	-0.59 $\pm 1.0$	A
Steady State Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1)	$P_D$	0.27	W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$
Continuous Source Current (Body Diode)	$I_S$	-0.59	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 seconds)	$T_L$	260	$^\circ\text{C}$

#### THERMAL RESISTANCE RATINGS

Thermal Resistance - Junction-to-Ambient - Steady State (Note 1) - Junction-to-Ambient - $t = 10 \text{ s}$ (Note 1) - Junction-to-Lead - Steady State (Note 2)	$R_{\theta JA}$ $R_{\theta JA}$ $R_{\theta JL}$	TBD TBD TBD	$^\circ\text{C/W}$
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1. Surface-mounted on FR4 board using 1" sq pad size (Cu area = 1.127 in sq [1 oz] including traces)
2. Surface-mounted on FR4 board using the minimum recommended pad size (Cu area = TBD in sq)

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

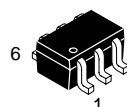
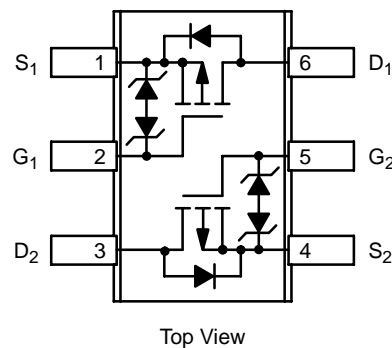


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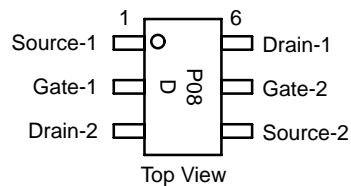
$V_{BR(DSS)} = -8.0 \text{ VOLTS}$
$R_{DS(on)} (\text{max}) @ V_{GS} = 600 \text{ m}\Omega @ -4.5 \text{ V}$
$I_{D(\text{max})} (\text{Note 1}) = -0.57 \text{ A}$
$R_{DS(on)} (\text{max}) @ V_{GS} = 850 \text{ m}\Omega @ -2.5 \text{ V}$
$I_{D(\text{max})} (\text{Note 1}) = -0.48 \text{ A}$
$R_{DS(on)} (\text{max}) @ V_{GS} = 1200 \text{ m}\Omega @ -1.8 \text{ V}$
$I_{D(\text{max})} (\text{Note 1}) = -0.20 \text{ A}$

#### SOT-363 (P-Channel) SC-88 (6-LEADS)



SC-88  
CASE 419B  
STYLE 1

#### MARKING DIAGRAM & PIN ASSIGNMENT



P08 = Specific Device Code  
D = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping
NTJD2101PT1	SC-88	3000/Tape & Reel

# NTJD2101PT1

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage (Note 3) ( $V_{GS} = 0\text{ V}$ , $I_D = -250\text{ }\mu\text{A}$ )	$V_{(BR)DSS}$	-8.0	-	-	V
Zero Gate Voltage Drain Current (Note 3) ( $V_{GS} = 0\text{ V}$ , $V_{DS} = -6.4\text{ V}$ )	$I_{DSS}$	-	-	1.0	$\mu\text{A}$
Gate-to-Source Leakage Current ( $V_{GS} = \pm 8.0\text{ V}$ , $V_{DS} = 0\text{ V}$ )	$I_{GSS}$	-	-	1.0	$\mu\text{A}$

### ON CHARACTERISTICS

Gate Threshold Voltage (Note 3) ( $V_{GS} = V_{DS}$ , $I_D = -250\text{ }\mu\text{A}$ )	$V_{GS(th)}$	-0.45	-	-	V
Drain-to-Source On-Resistance ( $V_{GS} = -4.5\text{ V}$ , $I_D = -0.57\text{ A}$ ) ( $V_{GS} = -2.5\text{ V}$ , $I_D = -0.48\text{ A}$ ) ( $V_{GS} = -1.8\text{ V}$ , $I_D = -0.20\text{ A}$ )	$R_{DS(on)}$	- - -	TBD TBD TBD	600 850 1200	$\text{m}\Omega$
Forward Transconductance ( $V_{DS} = -10\text{ V}$ , $I_D = -0.57\text{ A}$ )	$g_{FS}$	-	TBD	-	S

### CHARGES, CAPACITANCES & GATE RESISTANCE

Input Capacitance	$(V_{GS} = 0\text{ V}, f = 1\text{ MHz}, V_{DS} = -8.0\text{ V})$	$C_{iss}$	-	TBD	-	$\text{pF}$
Output Capacitance		$C_{oss}$	-	TBD	-	
Reverse Transfer Capacitance		$C_{rss}$	-	TBD	-	
Total Gate Charge	$(V_{GS} = -4.5\text{ V}, V_{DS} = -4.0\text{ V}, I_D = -0.57\text{ A})$	$Q_{G(tot)}$	-	TBD	-	$\text{nC}$
Gate-to-Source Gate Charge		$Q_{GS}$	-	TBD	-	
Gate-to-Drain "Miller" Charge		$Q_{GD}$	-	TBD	-	

### SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	$(V_{GS} = -4.5\text{ V}, V_{DS} = -4.0\text{ V}, I_D = -0.57\text{ A}, R_G = 3.0\text{ }\Omega)$	$t_{d(on)}$	-	TBD	-	$\text{ns}$
Rise Time		$t_r$	-	TBD	-	
Turn-Off Delay Time		$t_{d(off)}$	-	TBD	-	
Fall Time		$t_f$	-	TBD	-	

### DRAIN-SOURCE DIODE CHARACTERISTICS

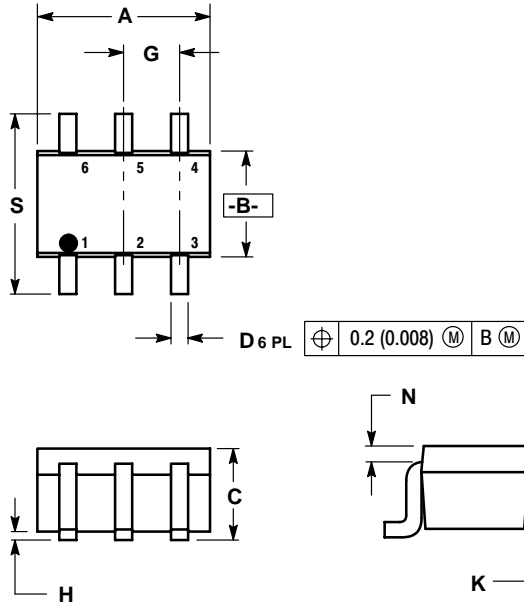
Forward Diode Voltage	$(V_{GS} = 0\text{ V}, I_{SD} = -0.23\text{ A})$	$V_{SD}$	-	TBD	-	V
Reverse Recovery Time	$(dI_{SD}/dt = 100\text{ A}/\mu\text{s}, I_{SD} = -0.23\text{ A})$	$t_{rr}$	-	TBD	TBD	ns

- Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- Switching characteristics are independent of operating junction temperature.

# NTJD2101PT1

## PACKAGE DIMENSIONS

**SC-88 (SOT-363)**  
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

### STYLE 1:

- PIN 1: EMITTER 2  
2. BASE 2  
3. COLLECTOR 1  
4. EMITTER 1  
5. BASE 1  
6. COLLECTOR 2

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