

NTJD4402NT1

Product Preview

Power MOSFET

30 V, N-Channel, ESD Protected, SC-88 Dual

This new N-Channel device was designed using ON Semiconductor's leading edge planar technology to deliver fast switching and relatively low $R_{DS(on)}$ performance.

There are two devices conveniently packaged in industry standard SC-88 (6-leads) to increase board density and facilitate system integration.

This device is particularly suited for high speed switching or load switch applications in single or dual cell Li-Ion battery supplied devices such as cell phones, media players, video games, PDA's, etc.

Features & Benefits

- Low Gate Charge for Fast Switching
- SC-88 Package Provides Excellent Thermal Performance
- Minimum Breakdown Voltage Rating of 30 V
- Surface Mount SC-88 Package Saves Board Space
- ESD Protected Gate
- Small Footprint: 45% Smaller than TSOP-6
- Low Voltage Drive (2.5 V) to Facilitate Drive Circuit Design
- ESD HBM Level IB, MM Class A
- Lead Free Package to Facilitate "Green Manufacturing" Compliance

Applications

- Load Switch
- Power Management
- Battery Switch for 2 Cell Li-Ion Devices

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

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	30	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Drain Current			
- Continuous @ $T_A = 25^\circ\text{C}$ (Note 1)	I_D	100	mA
- Pulsed Drain Current ($t = 10 \mu\text{s}$) (Note 2)	I_{DM}	600	mW
Steady State Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 1)	P_D	200	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$
Continuous Source Current (Body Diode)	I_S	200	mA
Lead Temperature for Soldering Purposes (1/8" from case for 10 seconds)	T_L	260	$^\circ\text{C}$

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.

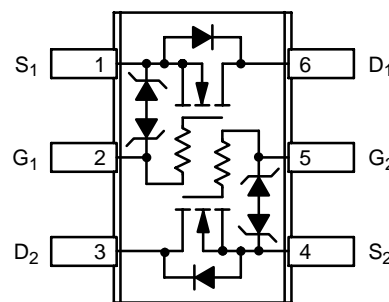


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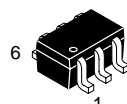
$V_{BR(DSS)} = 30 \text{ VOLTS}$
 $R_{DS(on)} (\text{max}) = 2.7 \Omega @$
 $V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ mA}$
 $R_{DS(on)} (\text{max}) = 4.0 \Omega @$
 $V_{GS} = 2.5 \text{ V}, I_D = 1.0 \text{ mA}$

SOT-363 (N-Channel) SC-88 (6-LEADS)

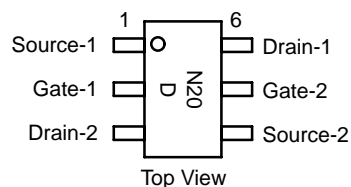


Top View

MARKING DIAGRAM & PIN ASSIGNMENT



SC-88
CASE 419B
STYLE 1



N20 = Specific Device Code
D = Date Code

ORDERING INFORMATION

Device	Package	Shipping
NTJD4402NT1	SC-88	3000/Tape & Reel

NTJD4402NT1

THERMAL RESISTANCE RATINGS

Thermal Resistance			°C/W
- Junction-to-Ambient - Steady State (Note 3)	R _{θJA}	TBD	
- Junction-to-Ambient - t = 10 s (Note 3)	R _{θJA}	TBD	
- Junction-to-Lead - Steady State (Note 4)	R _{θJL}	TBD	

- Surface-mounted on FR4 board using 1" sq pad size (Cu area = 1.127 in sq [1 oz] including traces)
- Surface-mounted on FR4 board using the minimum recommended pad size (Cu area = TBD in sq)

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage (Note 5) (V _{GS} = 0 V, I _D = 100 μA)	V _{(BR)DSS}	30	-	-	V
Zero Gate Voltage Drain Current (Note 5) (V _{GS} = 0 V, V _{DS} = 20 V)	I _{DSS}	-	-	1.0	μA
Gate-to-Source Leakage Current (V _{GS} = ±10 V, V _{DS} = 0 V)	I _{GSS}	-	-	±1.0	μA

ON CHARACTERISTICS

Gate Threshold Voltage (Note 5) (V _{DS} = 3.0 V, I _D = 100 μA)	V _{GS(th)}	0.8	-	1.5	V
Drain-to-Source On-Resistance (V _{GS} = 4.5 V, I _D = 10 mA) (V _{GS} = 2.5 V, I _D = 1.0 mA)	R _{DS(on)}	-	TBD	2.7 4.0	
Forward Transconductance (V _{DS} = 3.0 V, I _D = 10 mA)	g _{FS}	-	TBD	-	S

CHARGES, CAPACITANCES & GATE RESISTANCE

Input Capacitance	(V _{GS} = 0 V, f = 1 MHz, V _{DS} = 5.0 V)	C _{ISS}	-	TBD	-	pF
Output Capacitance		C _{OSS}	-	TBD	-	
Reverse Transfer Capacitance		C _{rSS}	-	TBD	-	

SWITCHING CHARACTERISTICS (Note 6)

Turn-On Delay Time	(V _{GS} = 4.5 V, V _{DS} = 5.0 V, I _D = 10 mA, R _G = 10 Ω)	t _{d(on)}	-	TBD	-	ns
Rise Time		t _r	-	TBD	-	
Turn-Off Delay Time		t _{d(off)}	-	TBD	-	
Fall Time		t _f	-	TBD	-	

DRAIN-SOURCE DIODE CHARACTERISTICS

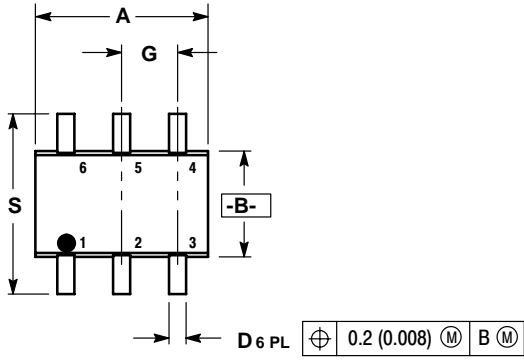
Forward Diode Voltage	(V _{GS} = 0 V, I _{SD} = 10 mA)	V _{SD}	-	TBD	1.2	V
Reverse Recovery Time	(dI _{SD} /dt = 100 A/μs, I _F = 10 mA)	t _{rr}	-	TBD	-	ns

- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- Switching characteristics are independent of operating junction temperature.

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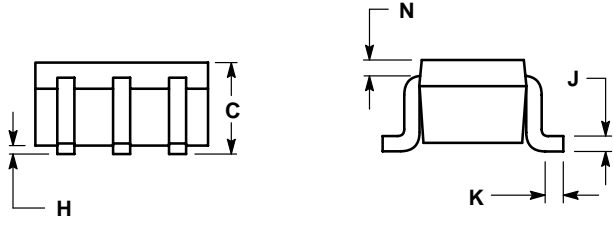
PACKAGE DIMENSIONS

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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