

NTJD4401N

Small Signal MOSFET

20 V, Dual N-Channel, SC-88
ESD Protection

Features

- Small Footprint (2 x 2 mm)
- Low Gate Charge N-Channel Device
- ESD Protected Gate
- Pb-Free Package for Green Manufacturing (G Suffix)
- Same Package as SC-70 (6 Leads)

Applications

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

MAXIMUM RATINGS (T_J = 25°C unless otherwise stated)

Parameter		Symbol	Value	Units	
Drain-to-Source Voltage		V _{DSS}	20	V	
Gate-to-Source Voltage		V _{GS}	±12	V	
Continuous Drain Current (Based on R _{θJA})	Steady State	I _D	T _A = 25 °C	0.63	A
			T _A = 85 °C	0.46	
Power Dissipation (Based on R _{θJA})	Steady State	P _D	T _A = 25 °C	0.27	W
			T _A = 85 °C	0.14	
Continuous Drain Current (Based on R _{θJL})	Steady State	I _D	T _A = 25 °C	0.91	A
			T _A = 85 °C	0.65	
Power Dissipation (Based on R _{θJL})	Steady State	P _D	T _A = 25 °C	0.55	W
			T _A = 85 °C	0.29	
Pulsed Drain Current		t ≤ 10 μs	I _{DM}	±1.2	A
Operating Junction and Storage Temperature		T _J , T _{STG}	-55 to 150		°C
Continuous Source Current (Body Diode)		I _S	0.63		A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T _L	260		°C

THERMAL RESISTANCE RATINGS (Note 1)

Parameter	Symbol	Typ	Max	Units
Junction-to-Ambient – Steady State	R _{θJA}	400	460	°C/W
Junction-to-Lead (Drain) – Steady State	R _{θJL}	194	226	

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

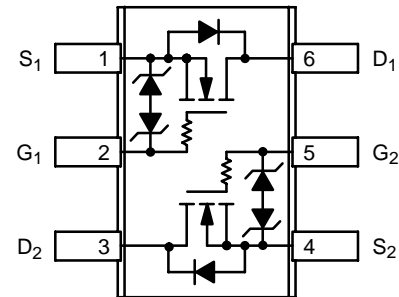


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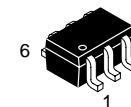
<http://onsemi.com>

V _{(BR)DSS}	R _{DS(on)} TYP	I _D Max
20 V	0.29 Ω @ 4.5 V	0.63 A
	0.36 Ω @ 2.5 V	

SOT-363 SC-88 (6 LEADS)

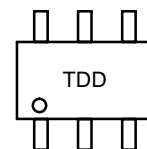


Top View



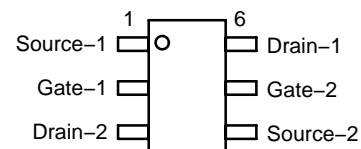
SOT 363
SC-70 (6 Leads)
SC-88
CASE 419B
STYLE 26

MARKING DIAGRAM



TD = Device Code
D = Date Code

PIN ASSIGNMENT



Top View

ORDERING INFORMATION

Device	Package	Shipping
NTJD4401NT1	SOT-363	3000 Units/Reel
NTJD4401NT1G	SOT-363 (Pb-Free)	3000 Units/Reel

NTJD4401N

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	20	27		V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V _{(BR)DSS} /T _J			22		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V, V _{DS} = 16 V			1.0	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±12 V			10	μA

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250 μA	0.6	0.92	1.5	V
Gate Threshold Temperature Coefficient	V _{GS(TH)} /T _J			-2.1		mV/°C
Drain-to-Source On Resistance	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.63 A		0.29	0.375	Ω
		V _{GS} = 2.5 V, I _D = 0.40 A		0.36	0.445	
Forward Transconductance	g _{FS}	V _{DS} = 4.0 V, I _D = 0.63 A		2.0		S

CHARGES AND CAPACITANCES

Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = 20 V		33	46	pF
Output Capacitance	C _{OSS}			13	22	
Reverse Transfer Capacitance	C _{RSS}			2.8	5.0	
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D = 0.63 A		1.3	3.0	nC
Threshold Gate Charge	Q _{G(TH)}			0.1		
Gate-to-Source Charge	Q _{GS}			0.2		
Gate-to-Drain Charge	Q _{GD}			0.4		

SWITCHING CHARACTERISTICS (Note 3)

Turn-On Delay Time	t _{d(ON)}	V _{GS} = 4.5 V, V _{DD} = 10 V, I _D = 0.5 A, R _G = 20 Ω		0.083		μs
Rise Time	t _r			0.227		
Turn-Off Delay Time	t _{d(OFF)}			0.786		
Fall Time	t _f			0.506		

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 = 0.63 A		0.410		μs

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

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

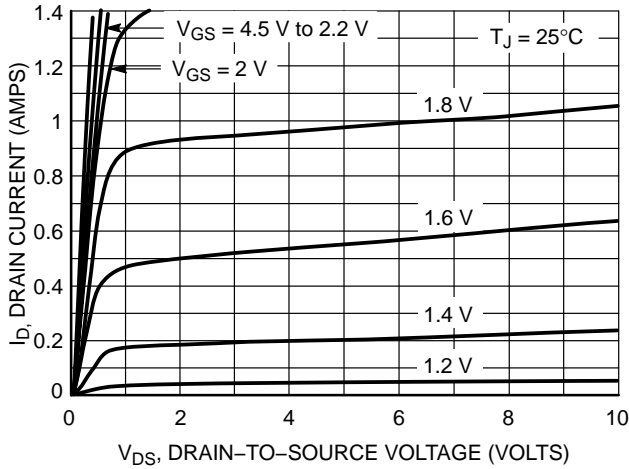


Figure 1. On-Region Characteristics

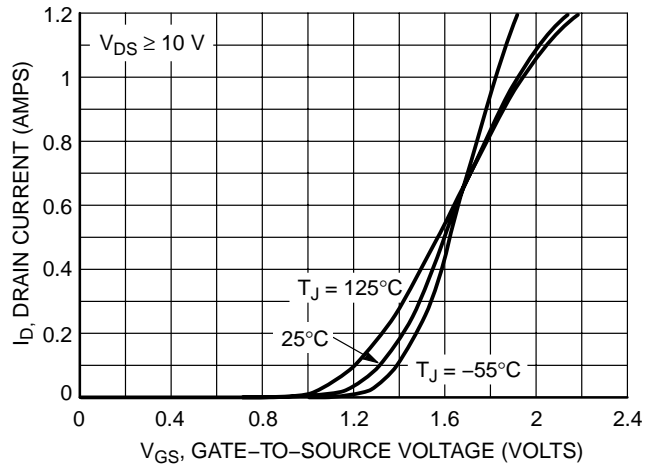


Figure 2. Transfer Characteristics

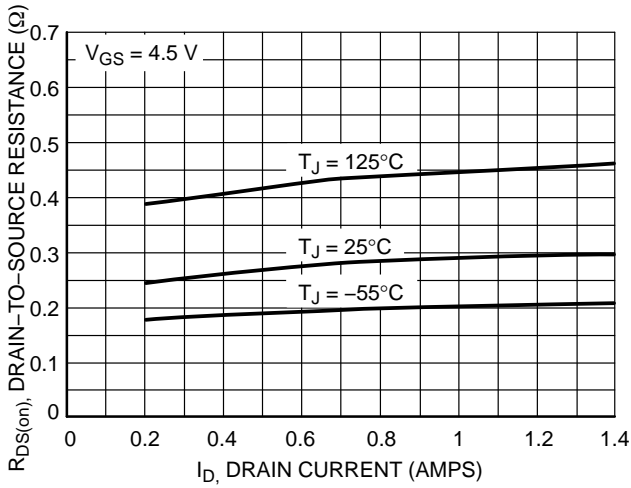


Figure 3. On-Resistance vs. Drain Current and Temperature

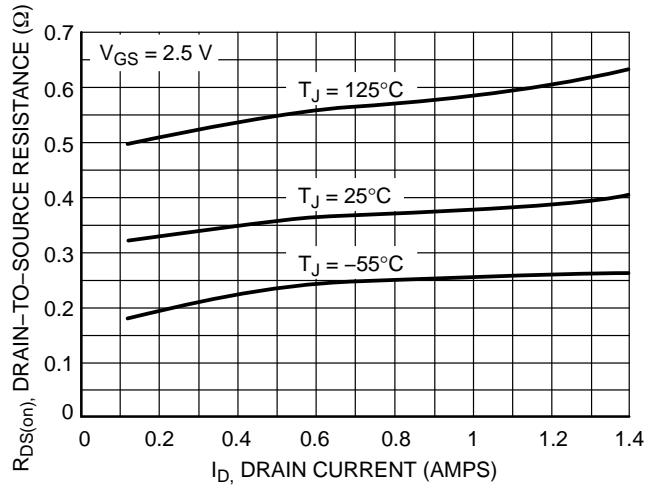


Figure 4. On-Resistance vs. Drain Current and Temperature

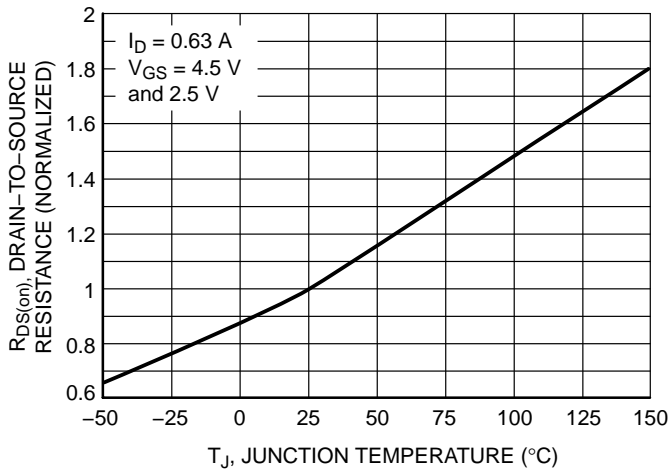


Figure 5. On-Resistance Variation with Temperature

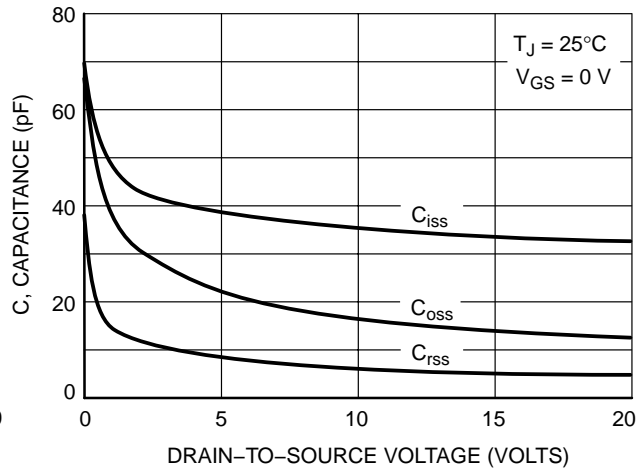


Figure 6. Capacitance Variation

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

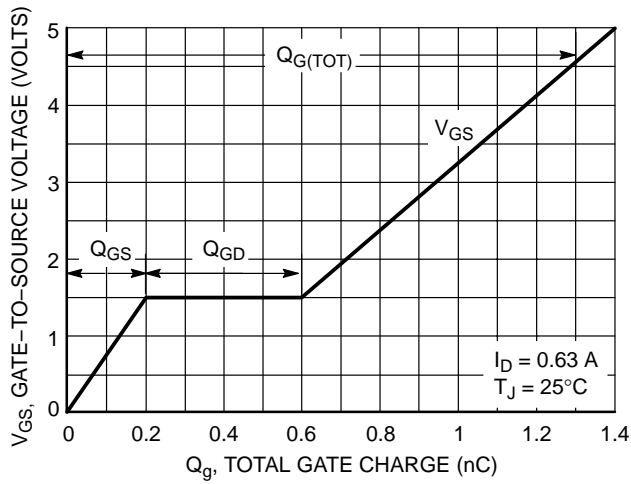


Figure 7. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

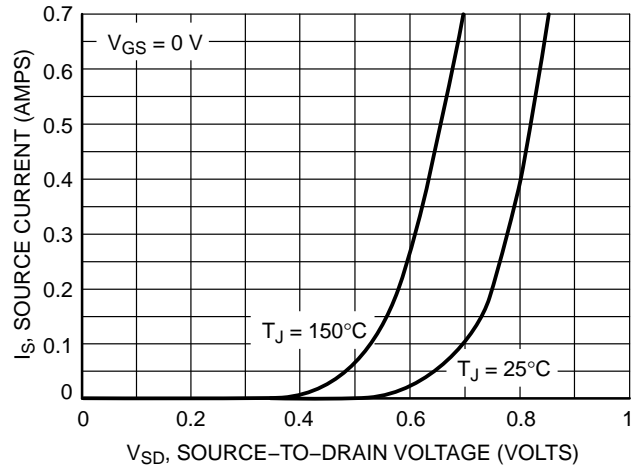
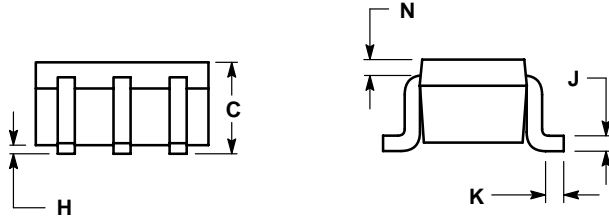
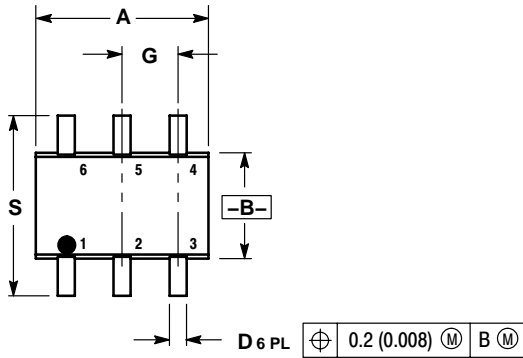


Figure 8. Diode Forward Voltage vs. Current

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PACKAGE DIMENSIONS

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




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 26:

- PIN 1. SOURCE 1
2. GATE 1
3. DRAIN 2
4. SOURCE 2
5. GATE 2
6. DRAIN 1

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