

# NTJS4405N

## Small Signal MOSFET

25 V, 1.2 A, Single, N-Channel, SC-88

### Features

- Advance Planar Technology for Fast Switching, Low  $R_{DS(on)}$
- Higher Efficiency Extending Battery Life
- Pb-Free Packages are Available

### Applications

- Boost and Buck Converter
- Load Switch
- Battery Protection

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

Rating			Symbol	Value	Unit
Drain-to-Source Voltage			$V_{DSS}$	25	V
Gate-to-Source Voltage			$V_{GS}$	$\pm 8.0$	V
Drain Current	$t < 5 \text{ s}$	$T_A = 25^\circ\text{C}$	$I_D$	1.2	A
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	1.0	A
		$T_A = 75^\circ\text{C}$		0.80	
Power Dissipation (Note 1)	Steady State		$P_D$	0.63	W
Power Dissipation (Note 1)	$t \leq 5 \text{ s}$		$P_D$	0.89	W
Pulsed Drain Current	$t_p = 10 \mu\text{s}$		$I_{DM}$	3.7	A
Operating Junction and Storage Temperature			$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$
Source Current (Body Diode) (Note 1)			$I_S$	0.8	A
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			$T_L$	260	$^\circ\text{C}$
ESD Rating – Machine Model				250	V

### THERMAL RESISTANCE RATINGS

Rating	Symbol	Max	Unit
Junction-to-Lead – Steady State (Note 1)	$R_{\theta JL}$	102	$^\circ\text{C/W}$
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	200	
Junction-to-Ambient – $t \leq 5 \text{ s}$ (Note 1)	$R_{\theta JA}$	140	

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

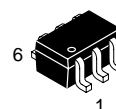
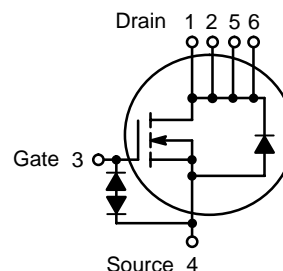


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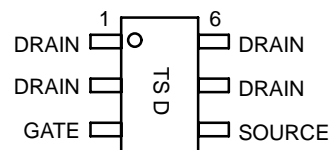
$V_{(BR)DSS}$	$R_{DS(on)}$ Typ	$I_D$ Max
25 V	249 m $\Omega$ @ 4.5 V	1.2 A
	299 m $\Omega$ @ 2.7 V	

### N-Channel



SC-88  
(SOT-363)  
CASE 419B

### PIN CONNECTIONS AND MARKING DIAGRAM



TS = Specific Device Code  
D = Date Code

### ORDERING INFORMATION

Device	Package	Shipping†
NTJS4405NT1	SC-88	3000 Tape & Reel
NTJS4405NT1G	SC-88 (Pb-Free)	3000 Tape & Reel
NTJS4405NT4	SC-88	10000 Tape & Reel
NTJS4405NT4G	SC-88 (Pb-Free)	10000 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.

# NTJS4405N

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	25			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	V <sub>(BR)DSS</sub> /T <sub>J</sub>			30		mV/°C
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 20 V	T <sub>J</sub> = 25°C		1.0	μA
			T <sub>J</sub> = 125°C		10	
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = 8.0 V			100	nA

### ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 μA	0.65		1.5	V
Negative Threshold Temperature Coefficient	V <sub>GS(TH)</sub> /T <sub>J</sub>			-2.0		mV/°C
Drain-to-Source On Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 0.6 A		249	350	mΩ
		V <sub>GS</sub> = 2.7 V, I <sub>D</sub> = 0.2 A		299	400	
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1.2 A		260		
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 0.5 A		0.5		S

### CHARGES AND CAPACITANCES

Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0 V, f = 1.0 MHz, V <sub>DS</sub> = 10 V		49	60	pF
Output Capacitance	C <sub>OSS</sub>			22.4	30	
Reverse Transfer Capacitance	C <sub>RSS</sub>			8.0	12	
Total Gate Charge	Q <sub>G(TOT)</sub>	V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 0.95 A		0.75	1.5	nC
Threshold Gate Charge	Q <sub>G(TH)</sub>			0.10		
Gate-to-Source Charge	Q <sub>GS</sub>			0.30	0.50	
Gate-to-Drain Charge	Q <sub>GD</sub>			0.20	0.40	

### SWITCHING CHARACTERISTICS (Note 3)

Turn-On Delay Time	t <sub>d(ON)</sub>	V <sub>GS</sub> = 4.5 V, V <sub>DS</sub> = 6.0 V, I <sub>D</sub> = 0.5 A, R <sub>G</sub> = 50 Ω		6.0	12	ns
Rise Time	t <sub>r</sub>			4.7	8.0	
Turn-Off Delay Time	t <sub>d(OFF)</sub>			25	35	
Fall Time	t <sub>f</sub>			41	60	

### DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 0.6 A	T <sub>J</sub> = 25°C		0.82	1.20	V
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- Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Switching characteristics are independent of operating junction temperatures.

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

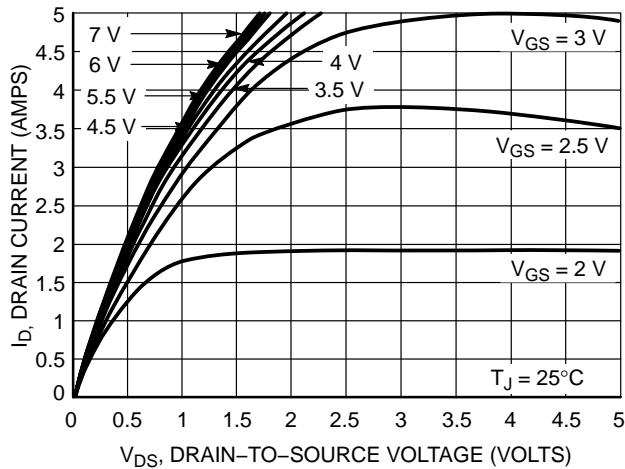


Figure 1. On-Region Characteristics

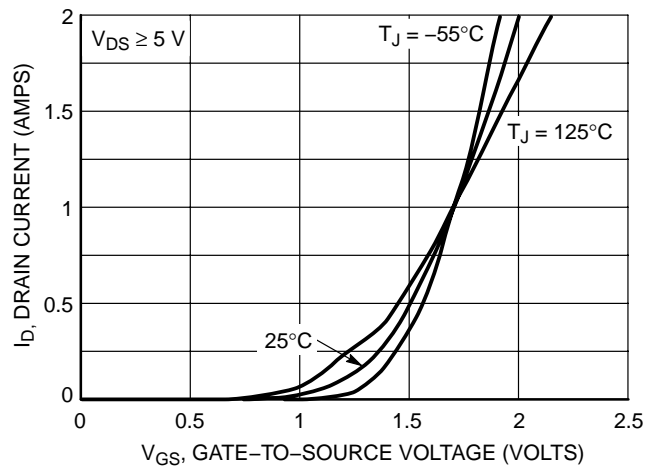


Figure 2. Transfer Characteristics

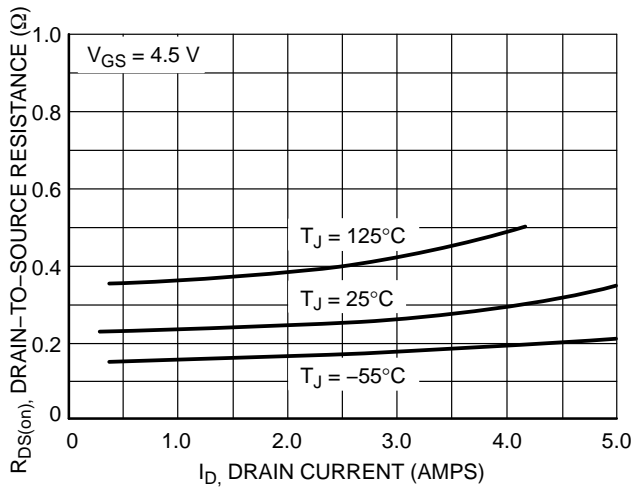


Figure 3. On-Resistance vs. Drain Current and Temperature

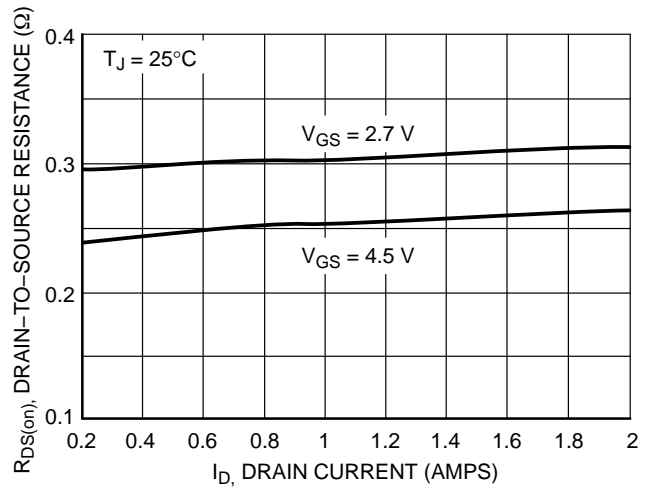


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

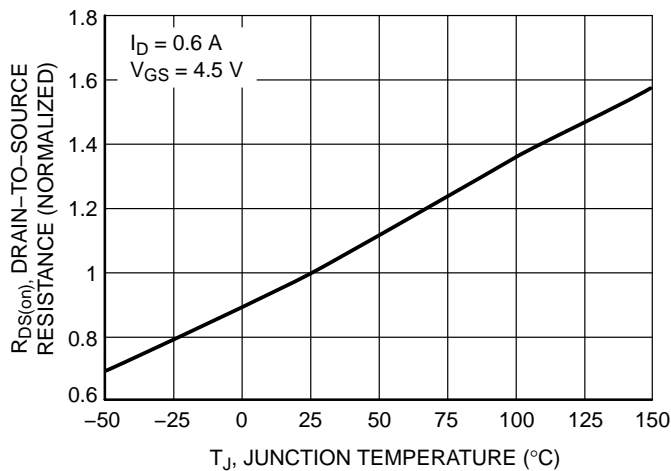


Figure 5. On-Resistance Variation with Temperature

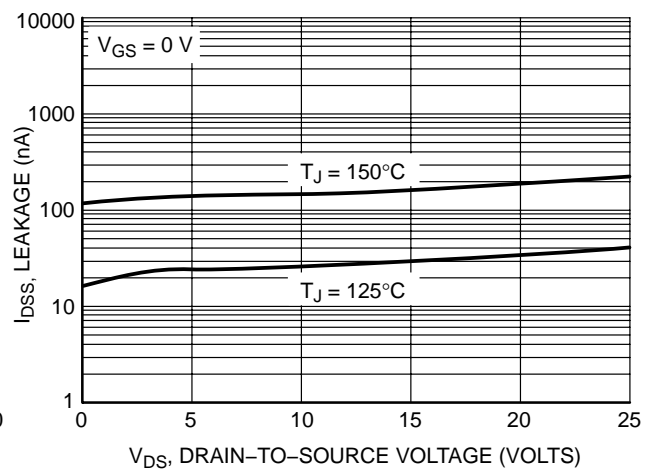
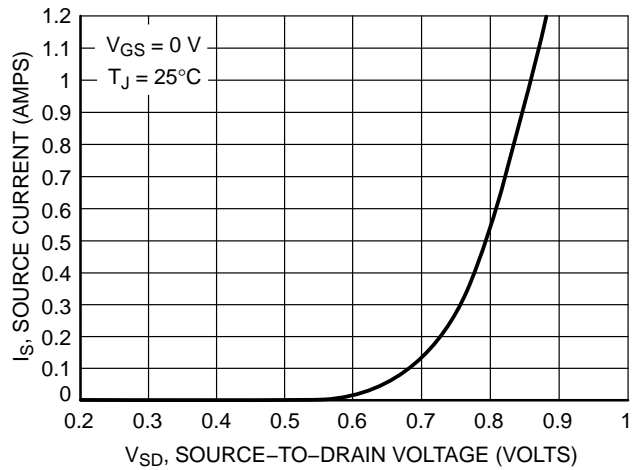
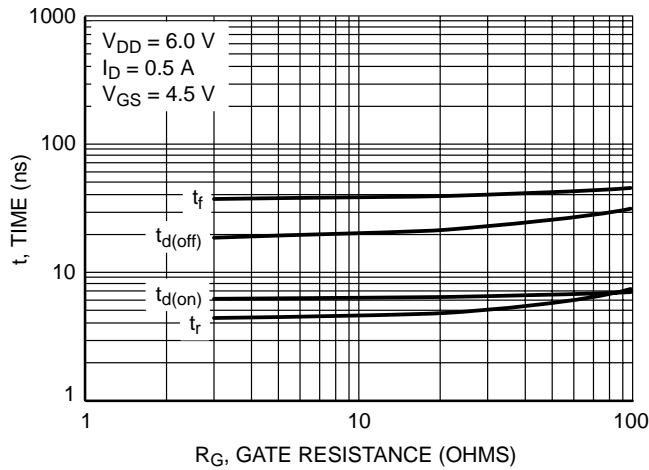
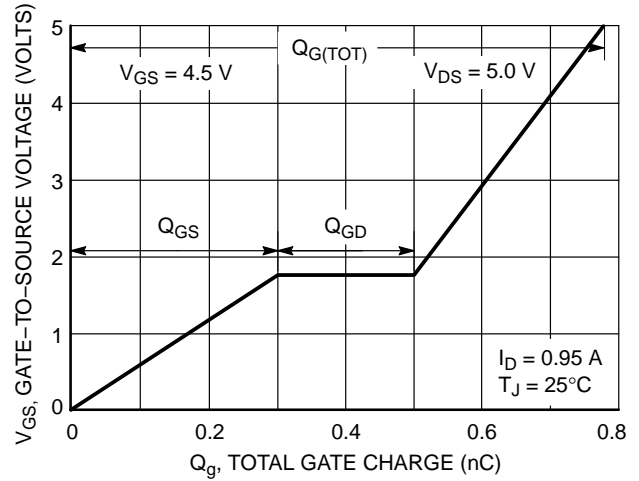
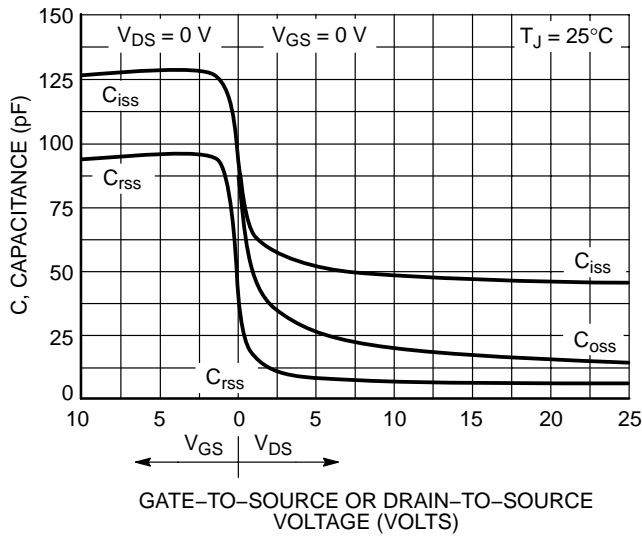


Figure 6. Drain-to-Source Leakage Current vs. Voltage

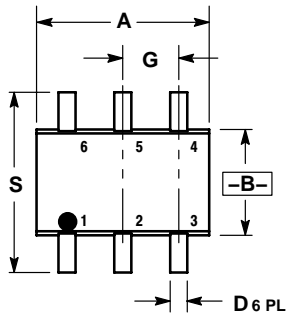
TYPICAL PERFORMANCE CURVES ( $T_J = 25^\circ\text{C}$  unless otherwise noted)



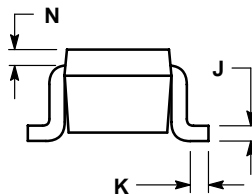
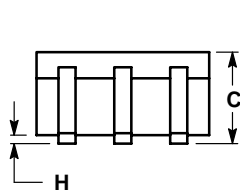
# NTJS4405N

## PACKAGE DIMENSIONS

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



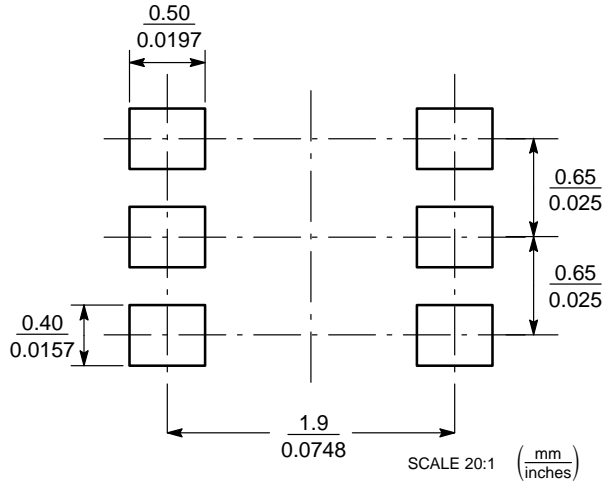
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- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

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/SOT-363

\*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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