NTGS3433T1

Product Preview

MOSFET
–3.3 Amps, –12 Volts
P–Channel TSOP–6

Features

- Ultra Low $R_{DS(on)}$
- Higher Efficiency Extending Battery Life
- Miniature TSOP–6 Surface Mount Package

Applications

- Power Management in Portable and Battery–Powered Products, i.e.: Cellular and Cordless Telephones, and PCMCIA Cards

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Drain–to–Source Voltage	V_{DSS}	–12	Volts
Gate–to–Source Voltage – Continuous	V_{GS}	±8.0	Volts
Thermal Resistance Junction–to–Ambient (Note 1.) Total Power Dissipation @ T_A = 25°C Drain Current – Continuous @ T_A = 25°C – Pulsed Drain Current (T_p < 10 μS) Maximum Operating Power Dissipation Maximum Operating Drain Current	 $R_{\theta JA}$ P_d I_D I_{DM} P_d I_D	 62.5 2.0 –3.3 –20 1.0 –2.35	 °C/W Watts Amps Amps Watts Amps
Thermal Resistance Junction–to–Ambient (Note 2.) Total Power Dissipation @ T_A = 25°C Drain Current – Continuous @ T_A = 25°C – Pulsed Drain Current (T_p < 10 μS) Maximum Operating Power Dissipation Maximum Operating Drain Current	 $R_{\theta JA}$ P_d I_D I_{DM} P_d I_D	 128 1.0 –2.35 –14 0.5 –1.65	 °C/W Watts Amps Amps Watts Amps
Operating and Storage Temperature Range	T_J, T_{stg}	–55 to 150	°C
Maximum Lead Temperature for Soldering Purposes for 10 Seconds	T_L	260	°C

1. Mounted onto a 2″ square FR–4 board (1″ sq. 2 oz. cu. 0.06″ thick single sided), t < 5.0 seconds.
2. Mounted onto a 2″ square FR–4 board (1″ sq. 2 oz. cu. 0.06″ thick single sided), operating to steady state.

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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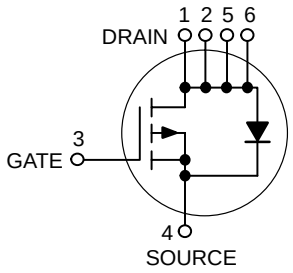
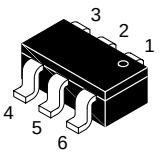
–3.3 AMPERES
–12 VOLTS
75 mΩ @ V_{GS} = –4.5 V

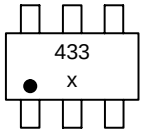
P–Channel



MARKING DIAGRAM

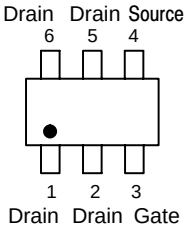


TSOP–6
CASE 318G
STYLE 1



x = Date Code

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping
NTGS3433T1	TSOP–6	3000 Tape & Reel

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain–Source Breakdown Voltage (V_{GS} = 0 Vdc, I_D = –10 μA)		$V_{(BR)DSS}$	–12	–	–	Vdc
Zero Gate Voltage Drain Current (V_{GS} = 0 Vdc, V_{DS} = –8 Vdc, T_J = 25°C) (V_{GS} = 0 Vdc, V_{DS} = –8 Vdc, T_J = 70°C)		I_{DSS}	– –	– –	–1.0 –5.0	μAdc
Gate–Body Leakage Current (V_{GS} = –8.0 Vdc, V_{DS} = 0 Vdc)		I_{GSS}	–	–	–100	nAdc
Gate–Body Leakage Current (V_{GS} = +8.0 Vdc, V_{DS} = 0 Vdc)		I_{GSS}	–	–	100	nAdc
ON CHARACTERISTICS						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = –250 μAdc)		$V_{GS(th)}$	–0.50	–0.70	–1.50	Vdc
Static Drain–Source On–State Resistance (V_{GS} = –4.5 Vdc, I_D = –3.3 Adc) (V_{GS} = –2.5 Vdc, I_D = –2.9 Adc)		$R_{DS(on)}$	– –	0.055 0.075	0.075 0.095	Ω
Forward Transconductance (V_{DS} = –10 Vdc, I_D = –3.3 Adc)		g_{FS}	–	7.0	–	mhos
DYNAMIC CHARACTERISTICS						
Total Gate Charge	(V_{DS} = –10 Vdc, V_{GS} = –4.5 Vdc, I_D = –3.3 Adc)	Q_{tot}	–	7.0	15	nC
Gate–Source Charge		Q_{gs}	–	2.0	–	
Gate–Drain Charge		Q_{gd}	–	3.5	–	
Input Capacitance	(V_{DS} = –5.0 Vdc, V_{GS} = 0 Vdc, f = 1.0 MHz)	C_{iss}	–	550	–	pF
Output Capacitance		C_{oss}	–	450	–	
Reverse Transfer Capacitance		C_{rss}	–	200	–	
SWITCHING CHARACTERISTICS						
Turn–On Delay Time	(V_{DD} = –10 Vdc, I_D = –1.0 Adc, V_{GS} = –4.5 Vdc, R_g = 6.0 Ω)	$t_{d(on)}$	–	20	30	ns
Rise Time		t_r	–	20	30	
Turn–Off Delay Time		$t_{d(off)}$	–	110	120	
Fall Time		t_f	–	100	115	
Reverse Recovery Time	(I_S = –1.7 Adc, dI_S/dt = 100 A/μs)	t_{rr}	–	30	–	ns
BODY–DRAIN DIODE RATINGS						
Diode Forward On–Voltage	(I_S = –1.7 Adc, V_{GS} = 0 Vdc)	V_{SD}	–	–0.80	–1.5	Vdc
Diode Forward On–Voltage	(I_S = –3.3 Adc, V_{GS} = 0 Vdc)	V_{SD}	–	–0.90	–	Vdc

*Indicates Pulse Test: P.W. = 300 μsec max, Duty Cycle = 2%.

*Class 1 ESD rated – Handling precautions to protect against electrostatic discharge is mandatory.

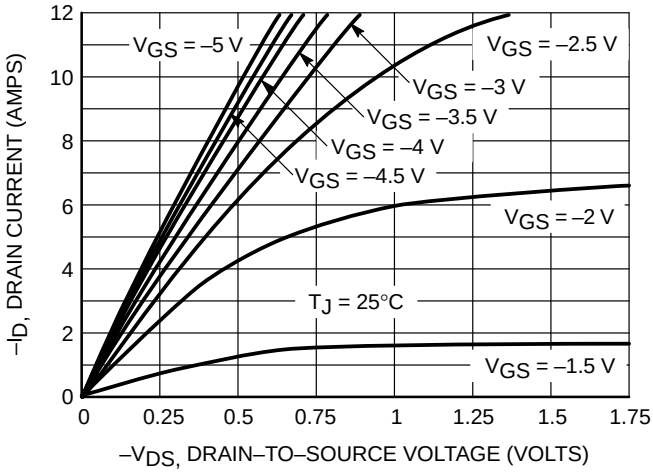


Figure 1. On–Region Characteristics

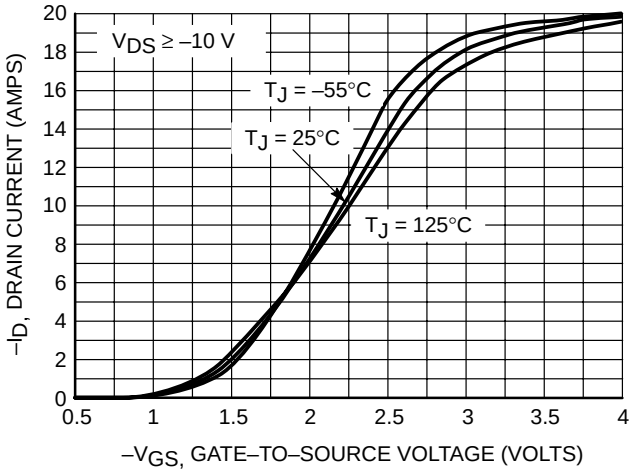


Figure 2. Transfer Characteristics

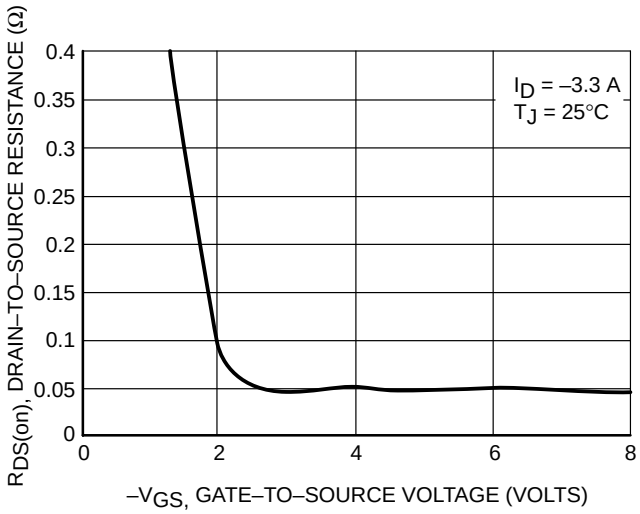


Figure 3. On–Resistance vs. Gate–to–Source Voltage

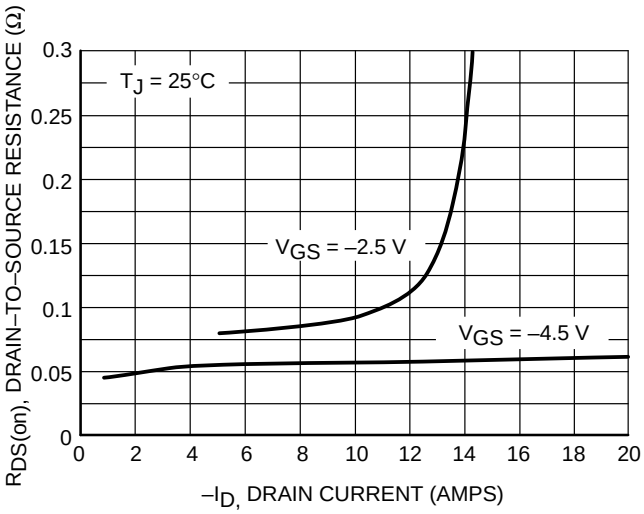


Figure 4. On–Resistance vs. Drain Current and Gate Voltage

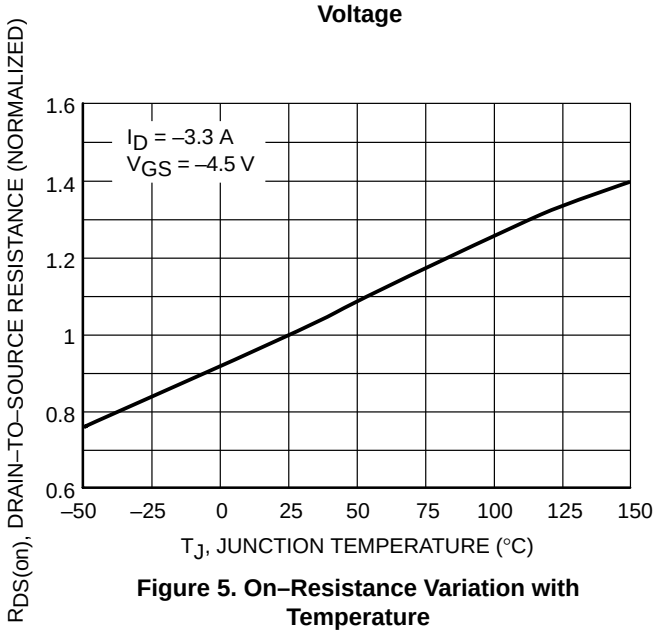


Figure 5. On–Resistance Variation with Temperature

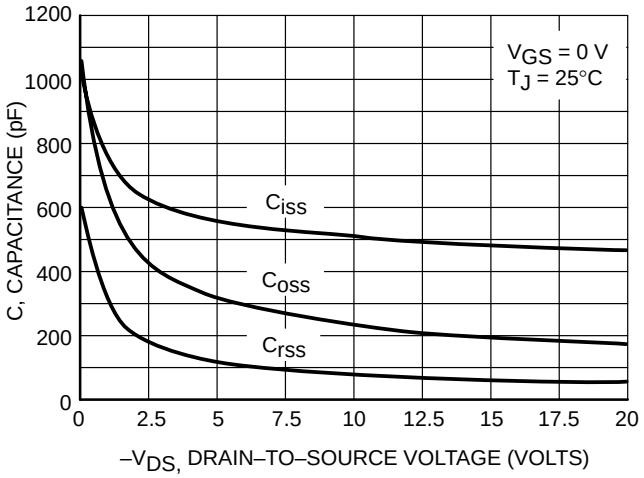


Figure 6. Capacitance Variation

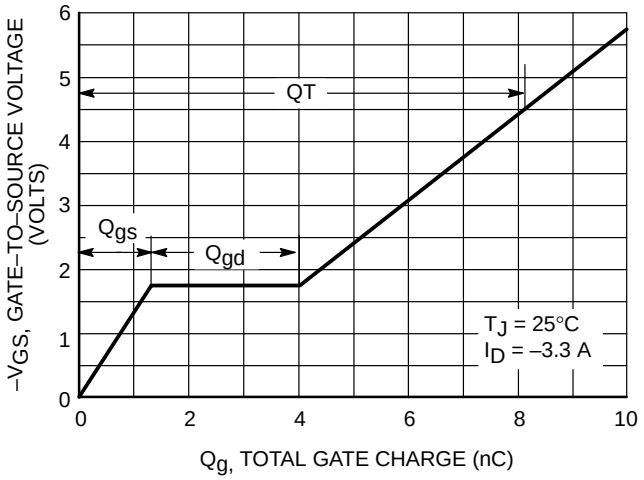


Figure 7. Gate–to–Source and Drain–to–Source Voltage vs. Total Charge

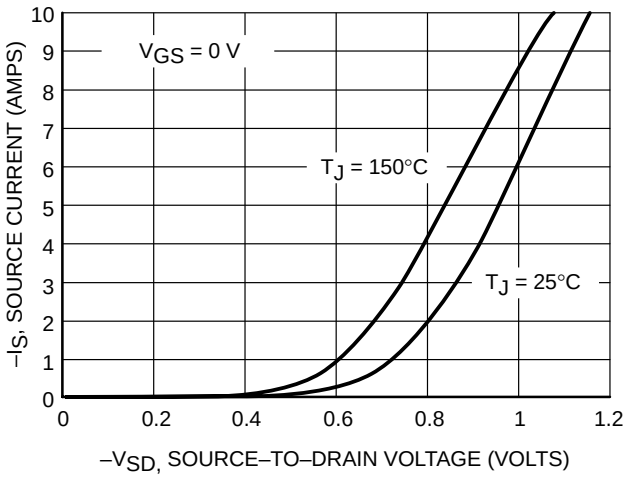


Figure 8. Diode Forward Voltage vs. Current

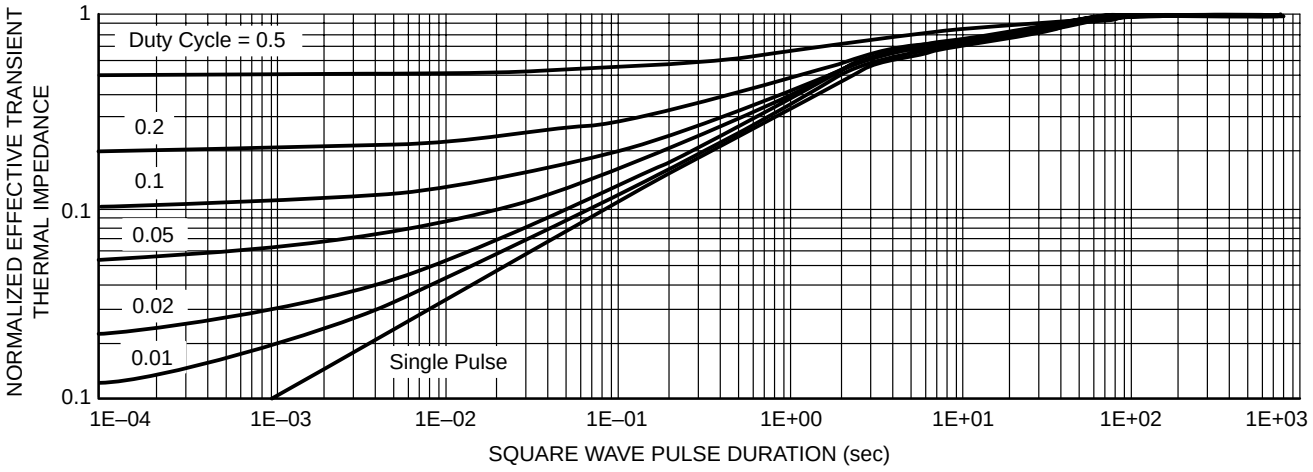


Figure 9. Normalized Thermal Transient Impedance, Junction–to–Ambient

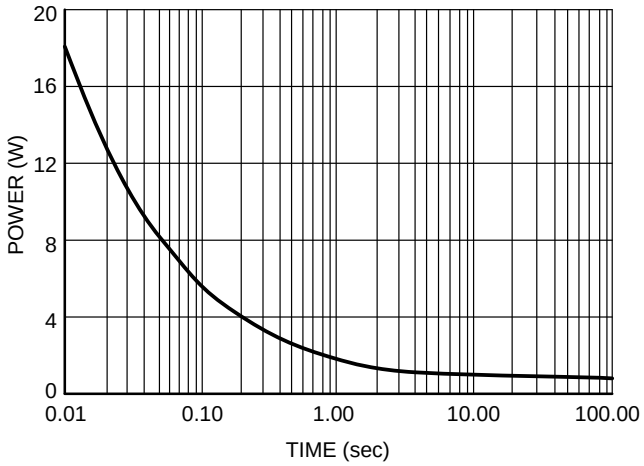
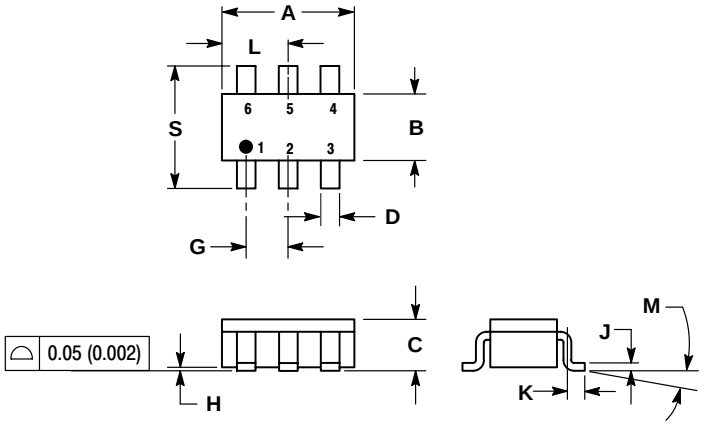


Figure 10. Single Pulse Power

PACKAGE DIMENSIONS

TSOP–6
CASE 318G–02
ISSUE G



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	2.90	3.10	0.1142	0.1220
B	1.30	1.70	0.0512	0.0669
C	0.90	1.10	0.0354	0.0433
D	0.25	0.50	0.0098	0.0197
G	0.85	1.05	0.0335	0.0413
H	0.013	0.100	0.0005	0.0040
J	0.10	0.26	0.0040	0.0102
K	0.20	0.60	0.0079	0.0236
L	1.25	1.55	0.0493	0.0610
M	0°	10°	0°	10°
S	2.50	3.00	0.0985	0.1181

STYLE 1:
PIN 1. DRAIN
2. DRAIN
3. GATE
4. SOURCE
5. DRAIN
6. DRAIN

Notes

Notes

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