

NTGS3455T1

Product Preview

MOSFET

-3.5 Amps, -30 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 ($T_J = 25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	-30	Volts
Gate-to-Source Voltage – Continuous	V_{GS}	± 20.0	Volts
Thermal Resistance			
Junction-to-Ambient (Note 1.)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_d	2.0	Watts
Drain Current		-3.5	Amps
– Continuous @ $T_A = 25^\circ\text{C}$	I_D		
– Pulsed Drain Current ($T_p < 10 \mu\text{s}$)	I_{DM}	-20	Amps
Maximum Operating Power Dissipation	P_d	1.0	Watts
Maximum Operating Drain Current	I_D	-2.5	Amps
Thermal Resistance			
Junction-to-Ambient (Note 2.)	$R_{\theta JA}$	128	$^\circ\text{C/W}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_d	1.0	Watts
Drain Current			
– Continuous @ $T_A = 25^\circ\text{C}$	I_D	-2.5	Amps
– Pulsed Drain Current ($T_p < 10 \mu\text{s}$)	I_{DM}	-14	Amps
Maximum Operating Power Dissipation	P_d	0.5	Watts
Maximum Operating Drain Current	I_D	-1.75	Amps
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes for 10 Seconds	T_L	260	$^\circ\text{C}$

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.



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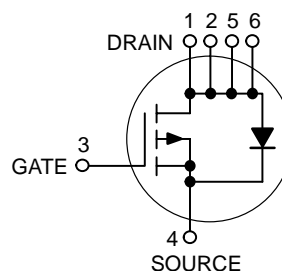
<http://onsemi.com>

-3.5 AMPERES

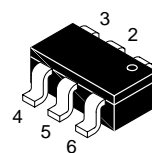
-30 VOLTS

100 mΩ @ $V_{GS} = -10 \text{ V}$

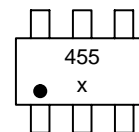
P-Channel



MARKING DIAGRAM

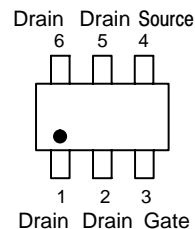


**TSOP-6
CASE 318G
STYLE 1**



x = Date Code

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping
NTGS3455T1	TSOP-6	3000 Tape & Reel

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

NTGS3455T1

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain–Source Breakdown Voltage (V _{GS} = 0 Vdc, I _D = –10 µA)	V _{(BR)DSS}	–30	–	–	Vdc
Zero Gate Voltage Drain Current (V _{GS} = 0 Vdc, V _{DS} = –30 Vdc, T _J = 25°C) (V _{GS} = 0 Vdc, V _{DS} = –30 Vdc, T _J = 70°C)	I _{DSS}	– –	– –	–1.0 –5.0	µAdc
Gate–Body Leakage Current (V _{GS} = –20.0 Vdc, V _{DS} = 0 Vdc)	I _{GSS}	–	–	–100	nAdc
Gate–Body Leakage Current (V _{GS} = +20.0 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)}	–1.0	–1.87	–3.0	Vdc
Static Drain–Source On–State Resistance (V _{GS} = –10 Vdc, I _D = –3.5 Adc) (V _{GS} = –4.5 Vdc, I _D = –2.7 Adc)	R _{DS(on)}	– –	0.094 0.144	0.100 0.170	Ω
Forward Transconductance (V _{DS} = –15 Vdc, I _D = –3.5 Adc)	g _{FS}	–	6.0	–	mhos

DYNAMIC CHARACTERISTICS

Total Gate Charge	(V _{DS} = –15 Vdc, V _{GS} = –10 Vdc, I _D = –3.5 Adc)	Q _{tot}	–	9.0	13	nC
Gate–Source Charge		Q _{gs}	–	2.5	–	
Gate–Drain Charge		Q _{gd}	–	2.0	–	
Input Capacitance	(V _{DS} = –5.0 Vdc, V _{GS} = 0 Vdc, f = 1.0 MHz)	C _{iss}	–	480	–	pF
Output Capacitance		C _{oss}	–	220	–	
Reverse Transfer Capacitance		C _{rss}	–	60	–	

SWITCHING CHARACTERISTICS

Turn–On Delay Time	(V _{DD} = –20 Vdc, I _D = –1.0 Adc, V _{GS} = –10 Vdc, R _g = 6.0 Ω)	t _{d(on)}	–	10	20	ns
Rise Time		t _r	–	15	30	
Turn–Off Delay Time		t _{d(off)}	–	20	35	
Fall Time		t _f	–	10	20	
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}	–	–0.90	–1.2	Vdc
Diode Forward On–Voltage	(I _S = –3.5 Adc, V _{GS} = 0 Vdc)	V _{SD}	–	–1.0	–	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.

NTGS3455T1

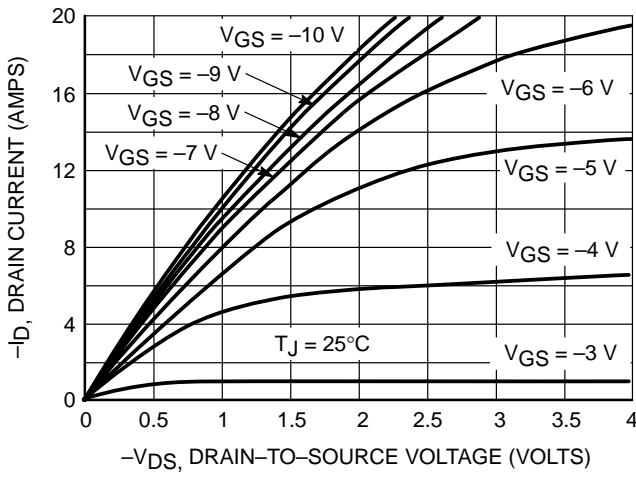


Figure 1. On-Region Characteristics

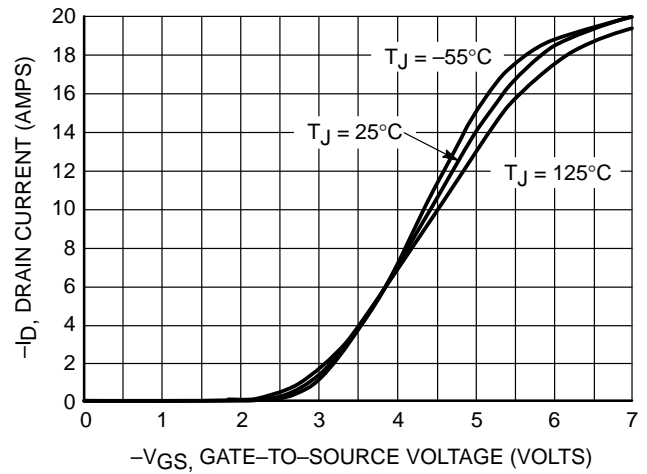


Figure 2. Transfer Characteristics

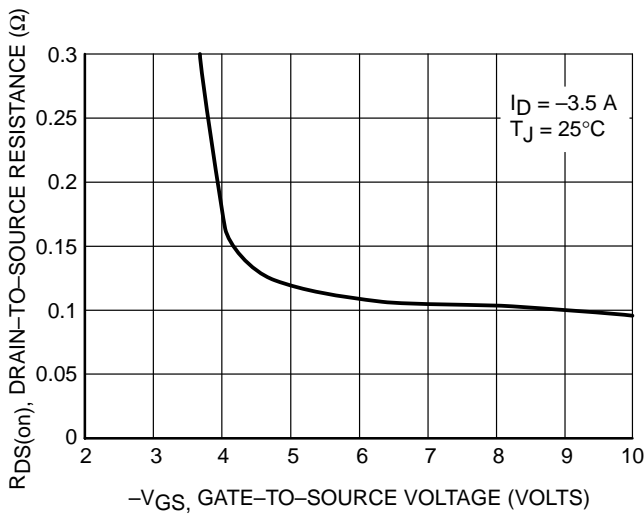


Figure 3. On-Resistance vs. Gate-to-Source Voltage

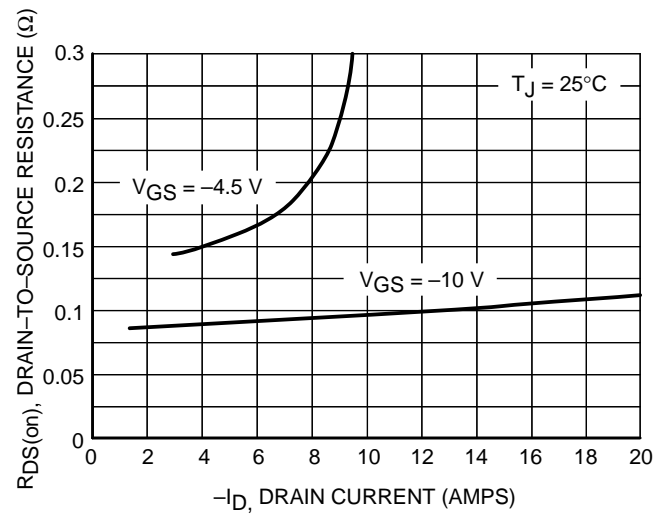


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

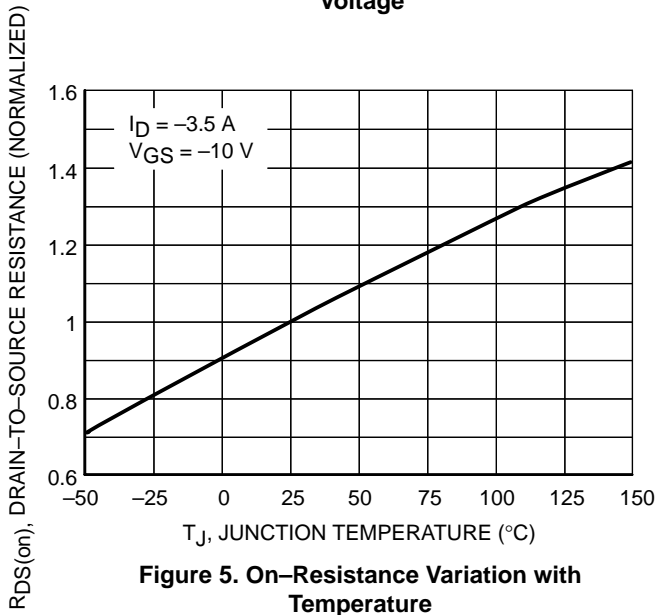


Figure 5. On-Resistance Variation with Temperature

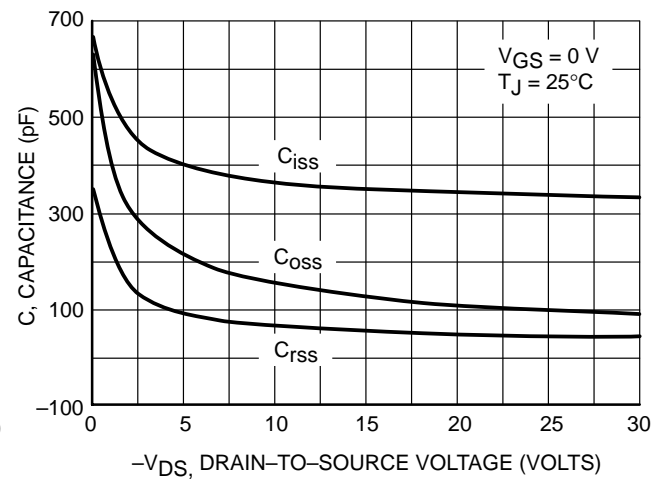


Figure 6. Capacitance Variation

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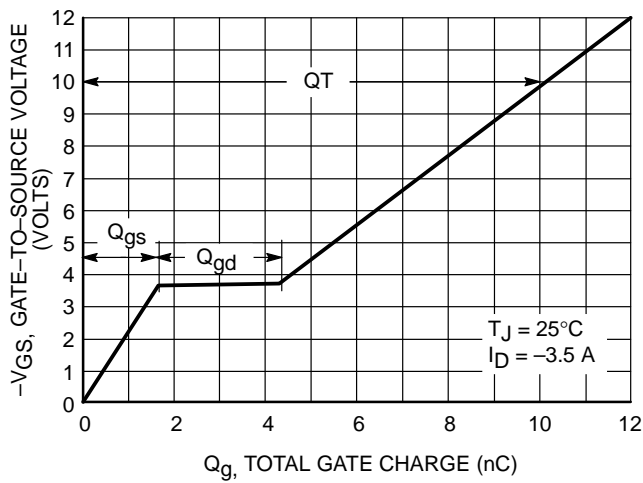


Figure 7. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

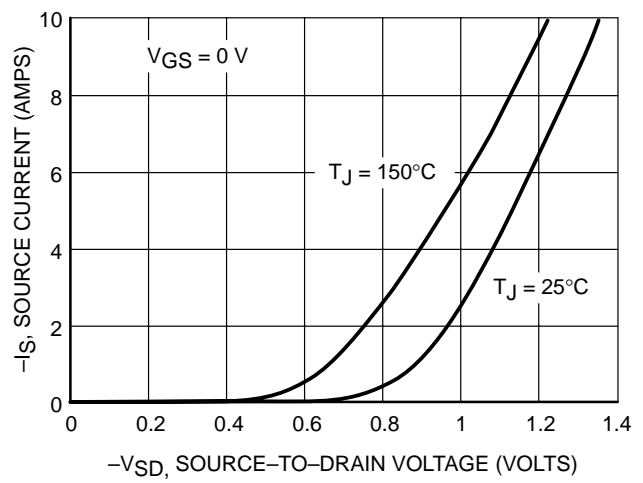


Figure 8. Diode Forward Voltage vs. Current

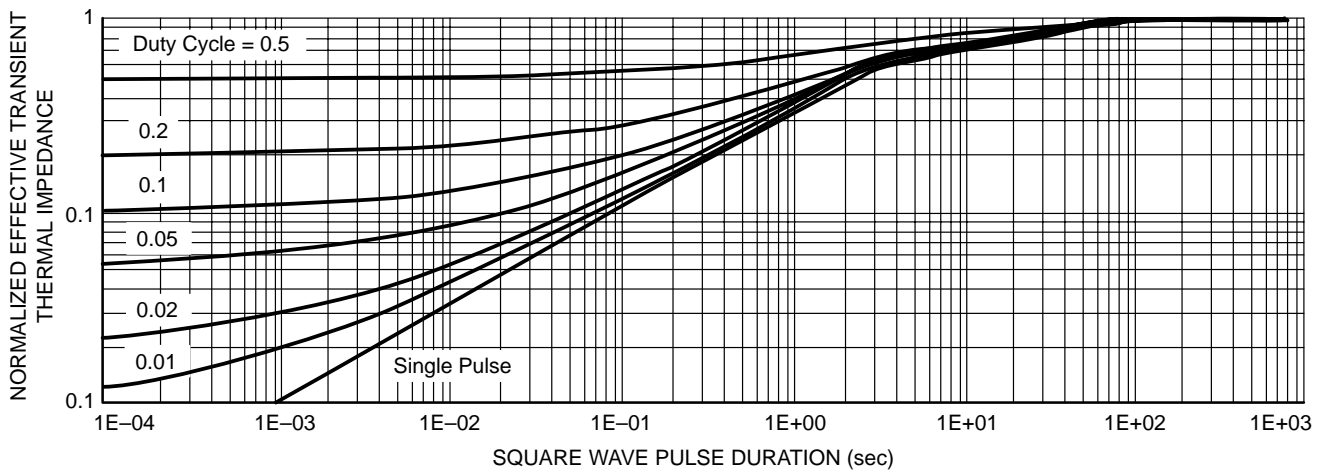


Figure 9. Normalized Thermal Transient Impedance, Junction-to-Ambient

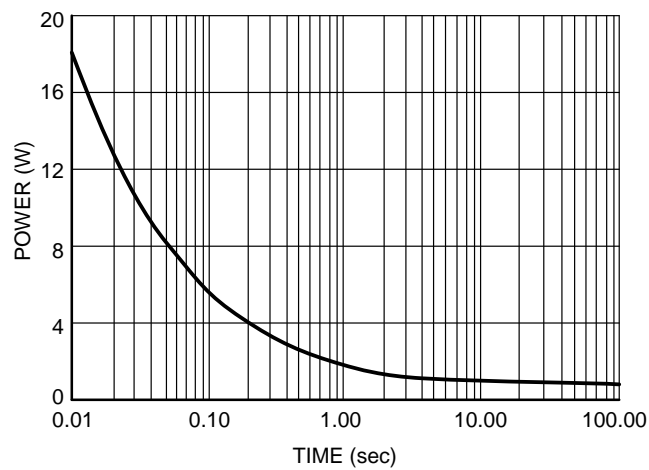
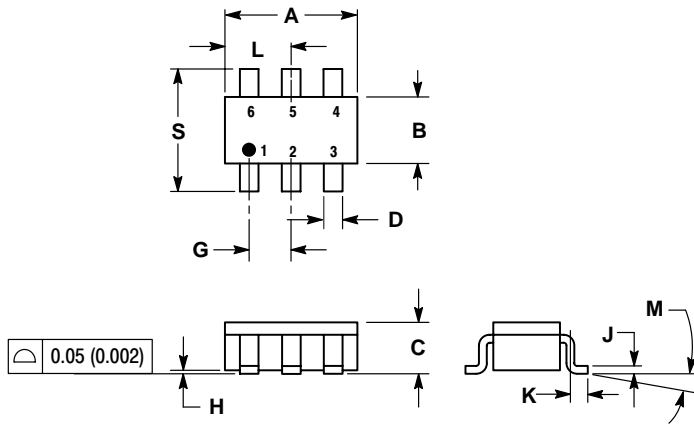


Figure 10. Single Pulse Power

NTGS3455T1

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.

DIM	MILLIMETERS		INCHES	
	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
- DRAIN
- GATE
- SOURCE
- DRAIN
- DRAIN

Notes

Notes

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