

NTGS3446

Power MOSFET 5 Amps, 20 Volts N-Channel TSOP-6

Features

- Ultra Low $R_{DS(on)}$
- Higher Efficiency Extending Battery Life
- Logic Level Gate Drive
- Diode Exhibits High Speed, Soft Recovery
- Avalanche Energy Specified
- I_{DSS} and $V_{DS(on)}$ Specified at Elevated Temperature

Applications

- Power Management in portable and battery-powered products, i.e. computers, printers, PCMCIA cards, cellular and cordless
- Lithium Ion Battery Applications
- Note Book PC

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

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	Vdc
Gate-Source Voltage - Continuous	V_{GS}	± 20	Vdc
Drain - Continuous - Continuous @ 70°C - Single Pulse ($t_p \leq 10 \mu\text{s}$)	I_D I_D I_{DM}	5.8 TBD 20	Adc
Total Power Dissipation	P_D	1.6	Watts
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$
Single Drain-to-Source Avalanche Energy - Starting $T_J = 25^\circ\text{C}$ ($V_{DD} = 20 \text{ Vdc}$, $V_{GS} = 4.5 \text{ Vdc}$, $I_L = 5.8 \text{ A}$, $L = \text{TBD mH}$, $R_G = 25 \Omega$)	EAS	TBD	mJ
Thermal Resistance Junction-to-Ambient (Note 1.) Steady State	$R_{\theta JA}$	TBD	$^\circ\text{C/W}$
Junction-to-Ambient (Note 2.) Steady State	$R_{\theta JA}$	TBD	
Junction-to-Lead Steady State	$R_{\theta JL}$	TBD	

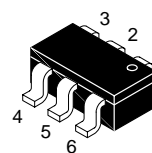
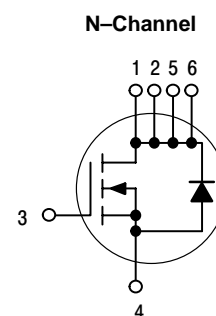
1. When surface mounted to Min Pad.
2. When surface mounted to 1" x 1" FR4 Board.



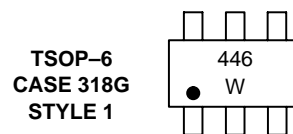
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5 AMPERES
20 VOLTS
 $R_{DS(on)} = 45 \text{ m}\Omega$



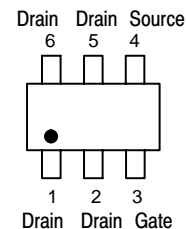
MARKING DIAGRAM



TSOP-6
CASE 318G
STYLE 1

W = Work Week

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping
NTGS3446T1	TSOP-6	3000 Tape & Reel

NTGS3446

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage ($V_{GS} = 0\text{ Vdc}$, $I_D = 0.25\text{ mAdc}$) Temperature Coefficient (Positive)	$V_{(BR)DSS}$	20 –	– TBD	– –	Vdc mV/°C
Zero Gate Voltage Collector Current ($V_{DS} = 20\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$) ($V_{DS} = 20\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$, $T_J = 85^\circ\text{C}$)	I_{DSS}	– –	– –	1.0 25	μAdc
Gate-Body Leakage Current ($V_{GS} = \pm 12\text{ Vdc}$, $V_{DS} = 0$)	$I_{GSS(f)}$ $I_{GSS(r)}$	– –	– –	100 100	nAdc

ON CHARACTERISTICS (Note 1.)

Gate Threshold Voltage $I_D = 0.25\text{ mA}$, $V_{DS} = V_{GS}$ Temperature Coefficient (Negative)	$V_{GS(th)}$	0.6 –	0.9 TBD	1.2 –	Vdc mV/°C
Static Drain-to-Source On-Resistance ($V_{GS} = 4.5\text{ Vdc}$, $I_D = 5.3\text{ Adc}$) ($V_{GS} = 2.5\text{ Vdc}$, $I_D = 4.4\text{ Adc}$)	$V_{DS(on)}$	– –	36 44	45 55	m Ω
Forward Transconductance ($V_{DS} = 10\text{ Vdc}$, $I_D = 5.3\text{ Adc}$)	gFS	10	17	–	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	$(V_{DS} = 10\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$, $f = 1.0\text{ MHz}$)	C_{iss}	–	930	TBD	pF
Output Capacitance		C_{oss}	–	370	TBD	
Transfer Capacitance		C_{rss}	–	105	TBD	

SWITCHING CHARACTERISTICS (Note 2.)

Turn-On Delay Time	$(V_{DD} = 10\text{ Vdc}$, $I_D = 1.0\text{ Adc}$, $V_{GS} = 4.5\text{ Vdc}$, $R_L = 10\ \Omega$, $R_G = 6.0\ \Omega$)	$t_{d(on)}$	–	8.6	TBD	ns
Rise Time		t_r	–	14	TBD	
Turn-Off Delay Time		$t_{d(off)}$	–	57	TBD	
Fall Time		t_f	–	54	TBD	
Gate Charge	$(V_{DS} = 10\text{ Vdc}$, $I_D = 5.8\text{ Adc}$, $V_{GS} = 4.5\text{ Vdc}$)	Q_T	–	11	15	nC
		Q_1	–	2.4	–	
		Q_2	–	2.4	–	

SOURCE-DRAIN DIODE CHARACTERISTICS

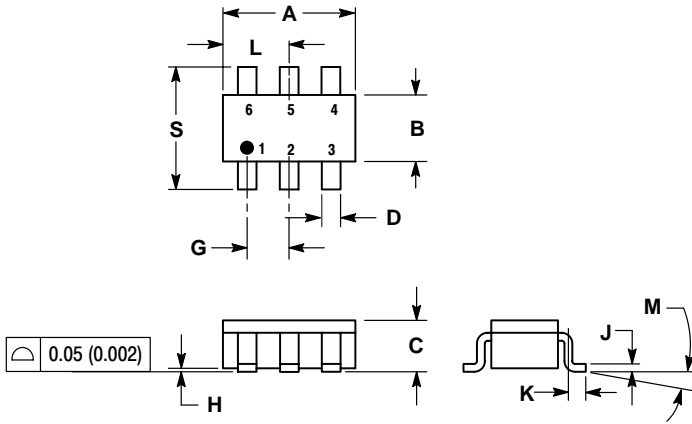
Forward On-Voltage (Note 1.)	$(I_S = 1.7\text{ Adc}$, $V_{GS} = 0\text{ Vdc}$) $(I_S = 1.7\text{ Adc}$, $V_{GS} = 0\text{ Vdc}$, $T_J = 85^\circ\text{C}$)	V_{SD}	– –	0.74 TBD	1.1 –	Vdc
Reverse Recovery Time		$(I_S = 1.7\text{ Adc}$, $V_{GS} = 0\text{ Vdc}$, $di_S/dt = 100\text{ A}/\mu\text{s}$)	t_{rr}	–	30	–
	t_a		–	14.5	–	
	t_b		–	15.5	–	
Reverse Recovery Stored Charge		Q_{RR}	–	0.01	–	μC

1. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.
2. Switching characteristics are independent of operating junction temperature.

NTGS3446

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

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Toll Free from Hong Kong & Singapore:
001-800-4422-3781
Email: ONlit-asia@hibbertco.com

JAPAN: ON Semiconductor, Japan Customer Focus Center
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-0031

Phone: 81-3-5740-2745
Email: r14525@onsemi.com

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