

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_{DSS}	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 Junction-to-Ambient (Note 2.) Junction-to-Lead Steady State	$R_{\theta JA}$ $R_{\theta JA}$ $R_{\theta JL}$	TBD TBD TBD	$^\circ\text{C/W}$

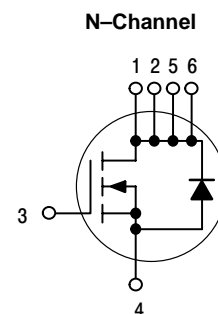
1. When surface mounted to Min Pad.
2. When surface mounted to $1'' \times 1''$ FR4 Board.



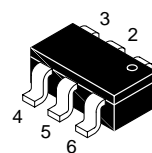
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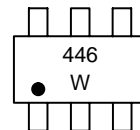
**5 AMPERES
20 VOLTS
 $R_{DS(on)} = 45 \text{ m}\Omega$**



MARKING DIAGRAM

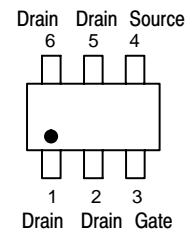


**TSOP-6
CASE 318G
STYLE 1**



W = Work Week

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping
NTGS3446T1	TSOP-6	3000 Tape & Reel

NTGS3446

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage (V _{GS} = 0 Vdc, I _D = 0.25 mAdc) Temperature Coefficient (Positive)	V _{(BR)DSS}	20 –	– TBD	– –	Vdc mV/°C
Zero Gate Voltage Collector Current (V _{DS} = 20 Vdc, V _{GS} = 0 Vdc) (V _{DS} = 20 Vdc, V _{GS} = 0 Vdc, T _J = 85°C)	I _{DSS}	– –	– –	1.0 25	μAdc
Gate-Body Leakage Current (V _{GS} = ±12 Vdc, V _{DS} = 0)	I _{GSS(f)} I _{GSS(r)}	– –	– –	100 100	nAdc

ON CHARACTERISTICS (Note 1.)

Gate Threshold Voltage I _D = 0.25 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 Vdc, I _D = 5.3 Adc) (V _{GS} = 2.5 Vdc, I _D = 4.4 Adc)	V _{DS(on)}	– –	36 44	45 55	mΩ
Forward Transconductance (V _{DS} = 10 Vdc, I _D = 5.3 Adc)	g _{FS}	10	17	–	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	(V _{DS} = 10 Vdc, V _{GS} = 0 Vdc, f = 1.0 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 Vdc, I _D = 1.0 Adc, V _{GS} = 4.5 Vdc, R _L = 10 Ω R _G = 6.0 Ω)	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 Vdc, I _D = 5.8 Adc, V _{GS} = 4.5 Vdc)	Q _T	–	11	15	nC
		Q ₁	–	2.4	–	
		Q ₂	–	2.4	–	

SOURCE-DRAIN DIODE CHARACTERISTICS

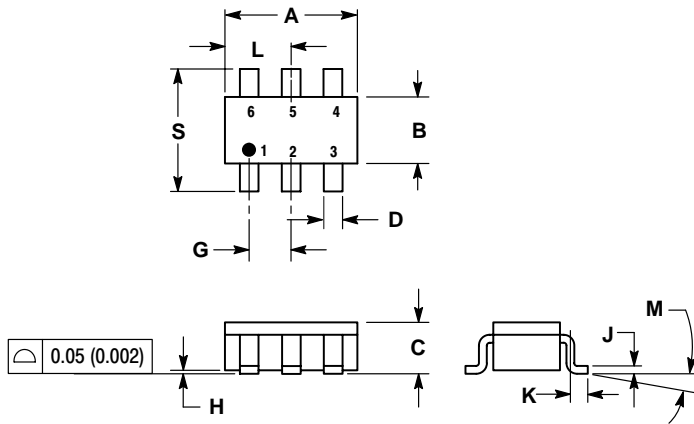
Forward On-Voltage (Note 1.)	(I _S = 1.7 Adc, V _{GS} = 0 Vdc) (I _S = 1.7 Adc, V _{GS} = 0 Vdc, T _J = 85°C)	V _{SD}	– –	0.74 TBD	1.1 –	Vdc
Reverse Recovery Time	(I _S = 1.7 Adc, V _{GS} = 0 Vdc, di _S /dt = 100 A/μs)	t _{rr}	–	30	–	ns
		t _a	–	14.5	–	
		t _b	–	15.5	–	
Reverse Recovery Stored Charge		Q _{RR}	–	0.01	–	μC

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 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
- DRAIN
- GATE
- SOURCE
- DRAIN
- DRAIN

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