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°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 ($t_p \leq 10$ μs)	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	°C
Single Drain–to–Source Avalanche Energy – Starting T_J = 25°C (V_{DD} = 20 Vdc, V_{GS} = 4.5 Vdc, I_L = 5.8 A, L = TBD mH, R_G = 25 Ω)	E_{AS}	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	°C/W

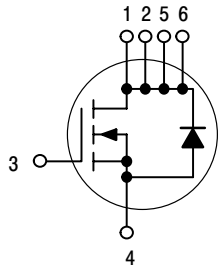
1. When surface mounted to Min Pad.
2. When surface mounted to 1″ x 1″ FR4 Board.

ON Semiconductor™

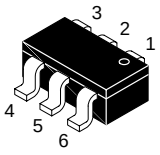
http://onsemi.com

5 AMPERES
20 VOLTS
$R_{DS(on)}$ = 45 mΩ

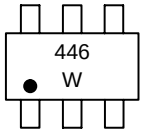
N–Channel



MARKING DIAGRAM

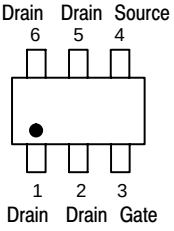


TSOP–6
CASE 318G
STYLE 1



W = Work Week

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping
NTGS3446T1	TSOP–6	3000 Tape & Reel

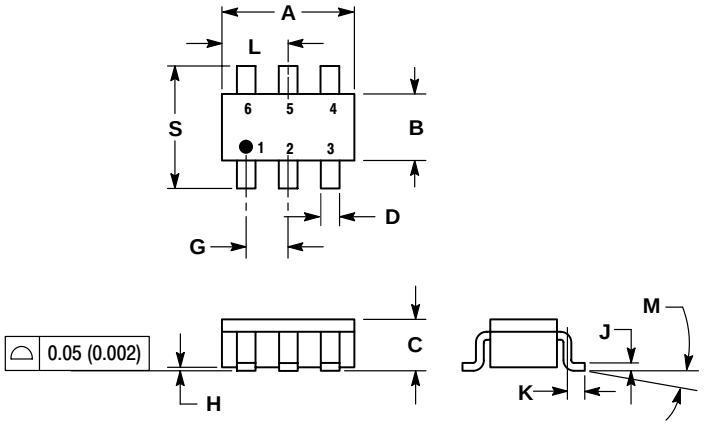
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
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.

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

PUBLICATION ORDERING INFORMATION

NORTH AMERICA Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com
Fax Response Line: 303–675–2167 or 800–344–3810 Toll Free USA/Canada

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

EUROPE: LDC for ON Semiconductor – European Support
German Phone: (+1) 303–308–7140 (Mon–Fri 2:30pm to 7:00pm CET)
Email: ONlit–german@hibbertco.com
French Phone: (+1) 303–308–7141 (Mon–Fri 2:00pm to 7:00pm CET)
Email: ONlit–french@hibbertco.com
English Phone: (+1) 303–308–7142 (Mon–Fri 12:00pm to 5:00pm GMT)
Email: ONlit@hibbertco.com

EUROPEAN TOLL–FREE ACCESS*: 00–800–4422–3781
*Available from Germany, France, Italy, UK, Ireland

CENTRAL/SOUTH AMERICA:
Spanish Phone: 303–308–7143 (Mon–Fri 8:00am to 5:00pm MST)
Email: ONlit–spanish@hibbertco.com

ASIA/PACIFIC: LDC for ON Semiconductor – Asia Support
Phone: 303–675–2121 (Tue–Fri 9:00am to 1:00pm, Hong Kong Time)
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

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local Sales Representative.