

Power MOSFET 1 Amp, 20 Volts

P-Channel TSOP-6

Features

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

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)

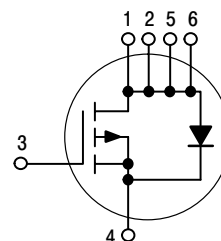
Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	-20	V
Gate-to-Source Voltage - Continuous	V_{GS}	± 8.0	V
Thermal Resistance Junction-to-Ambient (Note 1)	$R_{\theta JA}$	244	$^\circ\text{C/W}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_d	0.5	W
Drain Current - Continuous @ $T_A = 25^\circ\text{C}$	I_D	-1.65	A
- Pulsed Drain Current ($T_p < 10 \mu\text{s}$)	I_{DM}	-10	A
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	W
Drain Current - Continuous @ $T_A = 25^\circ\text{C}$	I_D	-2.35	A
- Pulsed Drain Current ($T_p < 10 \mu\text{s}$)	I_{DM}	-14	A
Thermal Resistance Junction-to-Ambient (Note 3)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_d	2.0	W
Drain Current - Continuous @ $T_A = 25^\circ\text{C}$	I_D	-3.3	A
- Pulsed Drain Current ($T_p < 10 \mu\text{s}$)	I_{DM}	-20	A
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. Minimum FR-4 or G-10PCB, operating to steady state.
2. Mounted onto a 2" square FR-4 board (1" sq. 2 oz. cu. 0.06" thick single sided), operating to steady state.
3. Mounted onto a 2" square FR-4 board (1" sq. 2 oz. cu. 0.06" thick single sided), $t < 5.0$ seconds.

NTGS3441T1

**1 AMPERE
20 VOLTS**
 $R_{DS(on)} = 90 \text{ m}\Omega$

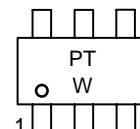
P-Channel



MARKING DIAGRAM

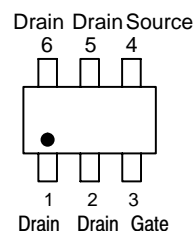


**TSOP-6
CASE 318G
STYLE 1**



PT = Device Code
W = Work Week

PIN ASSIGNMENT



ORDERING INFORMATION

Device	Package	Shipping†
NTGS3441T1	TSOP-6	3000 / Tape & Reel
NTGS3441T1G	TSOP-6 (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

NTGS3441T1

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Notes 4 & 5)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain–Source Breakdown Voltage ($V_{GS} = 0\text{ Vdc}$, $I_D = -10\ \mu\text{A}$)	$V_{(BR)DSS}$	-20	-	-	Vdc
Zero Gate Voltage Drain Current ($V_{GS} = 0\text{ Vdc}$, $V_{DS} = -20\text{ Vdc}$, $T_J = 25^\circ\text{C}$) ($V_{GS} = 0\text{ Vdc}$, $V_{DS} = -20\text{ Vdc}$, $T_J = 70^\circ\text{C}$)	I_{DSS}	-	-	-1.0 -5.0	μAdc
Gate–Body Leakage Current ($V_{GS} = -8.0\text{ Vdc}$, $V_{DS} = 0\text{ Vdc}$)	I_{GSS}	-	-	-100	nAdc
Gate–Body Leakage Current ($V_{GS} = +8.0\text{ Vdc}$, $V_{DS} = 0\text{ Vdc}$)	I_{GSS}	-	-	100	nAdc

ON CHARACTERISTICS

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = -250\ \mu\text{Adc}$)	$V_{GS(th)}$	-0.45	-1.05	-1.50	Vdc
Static Drain–Source On–State Resistance ($V_{GS} = -4.5\text{ Vdc}$, $I_D = -3.3\text{ Adc}$) ($V_{GS} = -2.5\text{ Vdc}$, $I_D = -2.9\text{ Adc}$)	$R_{DS(on)}$	-	0.069 0.117	0.090 0.135	Ω
Forward Transconductance ($V_{DS} = -10\text{ Vdc}$, $I_D = -3.3\text{ Adc}$)	g_{FS}	-	6.8	-	mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	$(V_{DS} = -5.0\text{ Vdc}$, $V_{GS} = 0\text{ Vdc}$, $f = 1.0\text{ MHz}$)	C_{iss}	-	480	-	pF
Output Capacitance		C_{oss}	-	265	-	pF
Reverse Transfer Capacitance		C_{rss}	-	100	-	pF

SWITCHING CHARACTERISTICS

Turn–On Delay Time	$(V_{DD} = -20\text{ Vdc}$, $I_D = -1.6\text{ Adc}$, $V_{GS} = -4.5\text{ Vdc}$, $R_g = 6.0\ \Omega$)	$t_{d(on)}$	-	13	25	ns
Rise Time		t_r	-	23.5	45	ns
Turn–Off Delay Time		$t_{d(off)}$	-	27	50	ns
Fall Time		t_f	-	24	45	ns
Total Gate Charge	$(V_{DS} = -10\text{ Vdc}$, $V_{GS} = -4.5\text{ Vdc}$, $I_D = -3.3\text{ Adc}$)	Q_{tot}	-	6.2	14	nC
Gate–Source Charge		Q_{gs}	-	1.3	-	nC
Gate–Drain Charge		Q_{gd}	-	2.5	-	nC

BODY–DRAIN DIODE RATINGS

Diode Forward On–Voltage	$(I_S = -1.6\text{ Adc}$, $V_{GS} = 0\text{ Vdc}$)	V_{SD}	-	-0.88	-1.2	Vdc
Diode Forward On–Voltage	$(I_S = -3.3\text{ Adc}$, $V_{GS} = 0\text{ Vdc}$)	V_{SD}	-	-0.98	-	Vdc
Reverse Recovery Time	$(I_S = -1.6\text{ Adc}$, $dI_S/dt = 100\text{ A}/\mu\text{s}$)	t_{rr}	-	30	60	ns

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

5. Handling precautions to protect against electrostatic discharge is mandatory.