

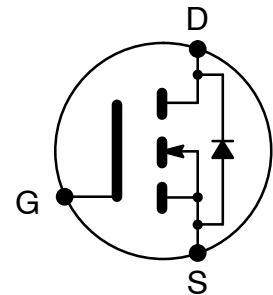


ELECTRONICS, INC.  
 44 FARRAND STREET  
 BLOOMFIELD, NJ 07003  
 (973) 748-5089  
<http://www.nteinc.com>

## NTE2984 Logic Level MOSFET N-Channel, Enhancement Mode High Speed Switch TO220 Type Package

**Features:**

- Dynamic dv/dt Rating
- Logic Level Gate Drive
- R<sub>DS(on)</sub> Specified at V<sub>GS</sub> = 4V & 5V
- +175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



**Absolute Maximum Ratings:**

Drain Current, I <sub>D</sub>	
Continuous (V <sub>GS</sub> = 5V)	
T <sub>C</sub> = +25°C	17A
T <sub>C</sub> = +100°C	12A
Pulsed (Note 1)	68A
Total Power Dissipation (T <sub>C</sub> = +25°C), P <sub>D</sub>	60W
Derate Above 25°C	0.40W/°C
Gate-Source Voltage, V <sub>GS</sub>	±10V
Single Pulsed Avalanche Energy (Note 2), E <sub>AS</sub>	110mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt	4.5V/ns
Operating Junction Temperature Range, T <sub>J</sub>	-55° to +175°C
Storage Temperature Range, T <sub>stg</sub>	-55° to +175°C
Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T <sub>L</sub>	+300°C
Mounting Torque, 6-32 or M3 Screw	10 lbf•in (1.1 N•m)
Thermal Resistance:	
Maximum Junction-to-Case, R <sub>thJC</sub>	2.5K/W
Typical Case-to-Sink (Mounting surface flat, smooth, and greased), R <sub>thCS</sub>	0.5K/W
Maximum Junction-to-Ambient (Free Air Operation), R <sub>thJA</sub>	62K/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. L = 444≤H, V<sub>DD</sub> = 25V, R<sub>G</sub> = 25≥, Starting T<sub>J</sub> = +175°C.

Note 3.  $I_{SD} \leq 17A$ ,  $di/dt \leq 140A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq +175^\circ C$ .

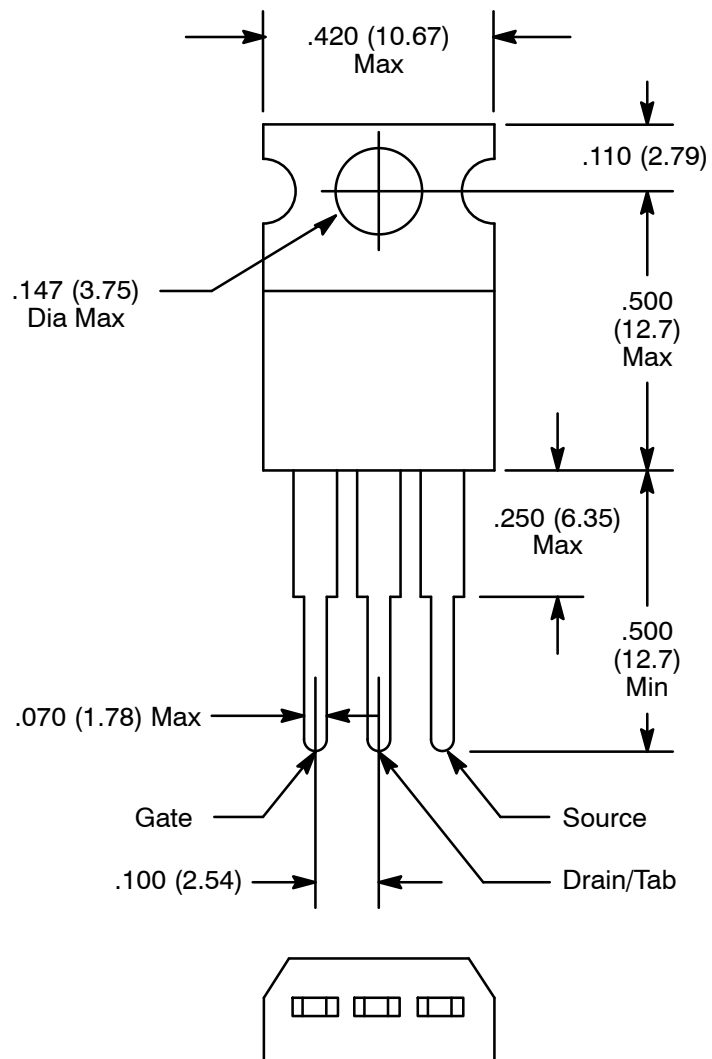
Rev. 10-13

**Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = 250\leq A$	60	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS} / \pm T_J$	Reference to $+25^\circ\text{C}, I_D = 1\text{mA}$	–	0.06	–	$V/^\circ\text{C}$
Static Drain–Source ON Resistance	$R_{DS(on)}$	$V_{GS} = 5V, I_D = 10A, \text{Note 4}$	–	–	0.10	$\geq$
		$V_{GS} = 5V, I_D = 8.5A, \text{Note 4}$	–	–	0.14	$\geq$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\leq A$	1.0	–	2.0	V
Forward Transconductance	$g_{fs}$	$V_{DS} \geq 25V, I_D = 10A, \text{Note 4}$	7.3	–	–	mhos
Drain–to–Source Leakage Current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0$	–	–	25	$\leq A$
		$V_{DS} = 48V, V_{GS} = 0V, T_C = +150^\circ\text{C}$	–	–	250	$\leq A$
Gate–Source Leakage Forward	$I_{GSS}$	$V_{GS} = 10V$	–	–	100	nA
Gate–Source Leakage Reverse	$I_{GSS}$	$V_{GS} = -10V$	–	–	-100	nA
Total Gate Charge	$Q_g$	$V_{GS} = 5V, I_D = 17A, V_{DS} = 48V$	–	–	18	nC
Gate–Source Charge	$Q_{gs}$		–	–	4.5	nC
Gate–Drain (“Miller”) Charge	$Q_{gd}$		–	–	12	nC
Turn–On Delay Time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 17A, R_G = 9.0\geq, R_D = 1.7\geq$	–	11	–	ns
Rise Time	$t_r$		–	110	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	23	–	ns
Fall Time	$t_f$		–	41	–	ns
Internal Drain Inductance	$L_D$	Between lead, 6mm (0.25”) from package and center of die contact	–	4.5	–	nH
Internal Source Inductance	$L_S$		–	7.5	–	nH
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$	–	870	–	pF
Output Capacitance	$C_{oss}$		–	360	–	pF
Reverse Transfer Capacitance	$C_{rss}$		–	53	–	pF
<b>Source–Drain Diode Ratings and Characteristics</b>						
Continuous Source Current	$I_S$	(Body Diode)	–	–	17	A
Pulse Source Current	$I_{SM}$	(Body Diode) Note 1	–	–	68	A
Diode Forward Voltage	$V_{SD}$	$T_J = +25^\circ\text{C}, I_S = 17A, V_{GS} = 0V, \text{Note 4}$	–	–	1.5	V
Reverse Recovery Time	$t_{rr}$	$T_J = +25^\circ\text{C}, I_F = 17A, di/dt = 100A/\leq s, \text{Note 4}$	–	110	260	ns
Reverse Recovery Charge	$Q_{rr}$		–	0.49	1.5	$\leq C$
Forward Turn–On Time	$t_{on}$	Intrinsic turn–on time is negligible (turn–on is dominated by $L_S + L_D$ )				

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulse Test: Pulse Width  $\leq 300\leq s$ , Duty Cycle  $\leq 2\%$ .



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