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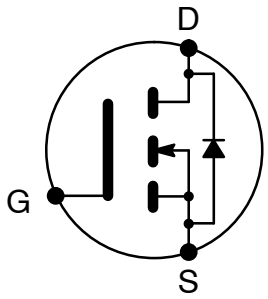
NTE2993
MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO3 Type Package



Features:
- Repetitive Avalanche Ratings
- Dynamic dv/dt Rating
- Simple Drive Requirements
- Ease of Paralleling

Absolute Maximum Ratings:

Drain–Source Voltage (V_{GS} = 0V, I_D = 1mA), V_{DSS} 400V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Continuous Drain Current (V_{GS} = 10V), I_D
T_C = +25°C 14A
T_C = +100°C 9A
Pulsed Drain Current (Note 1), I_{DM} 56A
Maximum Power Dissipation (T_C = +25°C), P_D 150W
Linear Derating Factor . . . . . 1.2W/°C
Single Pulse Avalanche Energy (Note 2), E_{AS} 11.3mJ
Avalanche Current (Note 1), I_{AR} 14A
Repetitive Avalanche Energy (Note 1), E_{AR} 15mJ
Peak Diode Recovery (Note 3), dv/dt 4.0V/ns
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead temperature (During Soldering, .063” (1.6mm) from case, 10sec max), T_L . . . . . +300°C
Thermal Resistance, Junction–to–Ambient (Typical Socket Mount), R_{thJA} 30K/W
Thermal Resistance, Junction–to–Case, R_{thJC} 0.83K/W

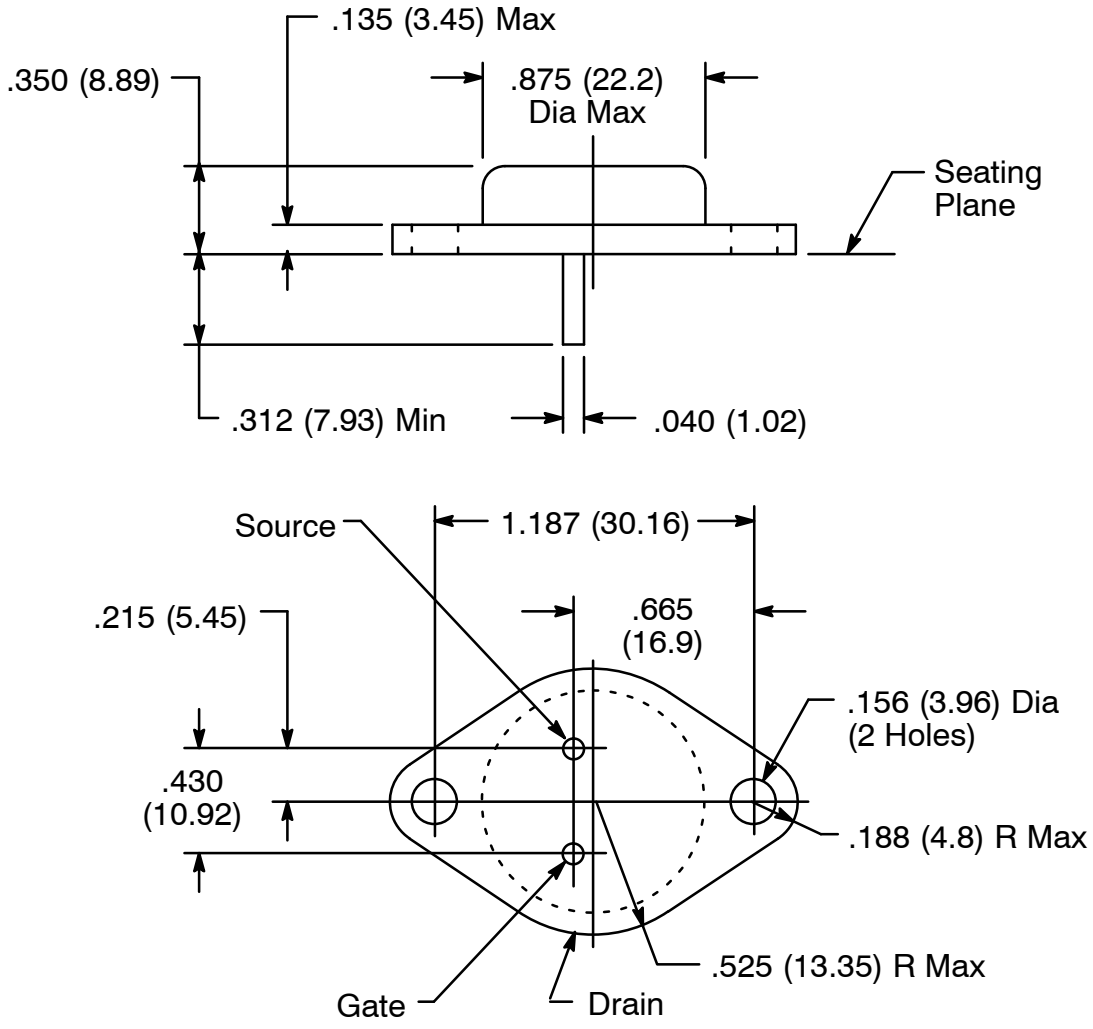
Note 1. Repetitive Rating; Pulse width limited by maximum junction temperature.
Note 2. V_{DD} = 50V, Starting T_J = +150°C, Peak I_L = 14A.
Note 3. $I_{SD} \le 14A$, $di/dt \le 145A/\mu s$, $V_{DD} \le 400V$, $T_J \le +150°C$.

Electrical Characteristics: (T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 1mA, V_{GS} = 0V	400	–	–	V
Temperature Coefficient of Breakdown Voltage	$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	Reference to +25°C, I_D = 1mA	–	0.46	–	V/°C
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	–	4.0	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 320	–	–	25	μA
		V_{GS} = 0V, T_J = 125°C	–	–	250	μA
On−State Drain Current	$I_{D(on)}$	V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$ max, V_{GS} = 10V	15	–	–	A
Gate−Source Leakage Forward	I_{GSS}	V_{GS} = 20V	–	–	100	nA
Gate−Source Leakage Reverse	I_{GSS}	V_{GS} = −20V			−100	nA
Drain−Source On−State Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 9A , Note 4	–	–	0.3	Ω
		V_{GS} = 10V, I_D = 14A, Note 4	–	–	0.4	Ω
Forward Transconductance	g_{fs}	I_D = 3A, V_{DS} = 10V, Note 4	6.0	–	–	S
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0 MHz	–	2600	–	pF
Output Capacitance	C_{oss}		–	680	–	pF
Reverse Transfer Capacitance	C_{rss}		–	250	–	pF
Turn−On Time	$t_{d(on)}$	V_{DD} = 200V, I_D = 14A, R_G = 2.35Ω	–	–	35	ns
Rise Time	t_r		–	–	190	ns
Turn−Off Time	$t_{d(off)}$		–	–	170	ns
Fall Time	t_f		–	–	130	ns
Total Gate Charge	Q_g	V_{GS} = 10V, I_D = 14A, V_{DS} = 200V	52	–	110	nC
Gate−Source Charge	Q_{gs}		5.0	–	18	nC
Gate−Drain (“Miller”) Charge	Q_{gd}		25	–	65	nC
Internal Drain Inductance	L_S + L_D	Measured between the contact screw on header that is closer to source and gate pins and center of die.	–	6.1	–	nH
Source−Drain Diode Ratings and Characteristics:						
Continuous Source Current	I_S		–	–	14	A
Pulse Source Current	I_{SM}	Note 1	–	–	56	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 14A, V_{GS} = 0V, Note 4	–	–	1.7	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 14A, dI/dt ≤100A/μs, V_{DD} ≤ 50V, Note 4	–	–	1200	ns
Reverse Recovered Charge	Q_{RR}		–	–	250	μc
Forward Turn−on Time	t_{on}	Intrinsic turn−on time is negligible. Turn−on speed is substantially controlled by L_S + L_D.				

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

Note 4. Pulse width ≤ 300μs, Duty Cycle 2%.


.135 (3.45) Max
.350 (8.89)
.875 (22.2)
Dia Max
Seating
Plane
.312 (7.93) Min
.040 (1.02)
Source
1.187 (30.16)
.215 (5.45)
.665
(16.9)
.156 (3.96) Dia
(2 Holes)
.430
(10.92)
.188 (4.8) R Max
.525 (13.35) R Max
Gate
Drain