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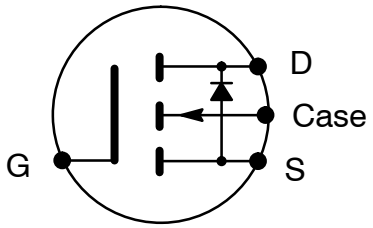
NTE2392
MOSFET
N–Channel Enhancement Mode, High Speed Switch
TO3 Type Package

Description:

The NTE2392 is an N–Channel Enhancement Mode Power MOS Field Effect Transistor. Easy drive and very fast switching times make this device ideal for high speed switching applications. Typical applications include switching mode power supplies, uninterruptible power supplies, and motor speed control.

Features:

- Fast Switching
- Low Drive Current
- Ease of Paralleling
- No Second Breakdown
- Excellent Temperature Stability



Absolute Maximum Ratings:

Drain–Source Voltage (Note 1), V_{DS} 100V
Drain–Gate Voltage (R_{GS} = 20kΩ, Note 1), V_{DGR} 100V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Pulsed Drain Current (Note 3), I_{DM} 160A
Clamped Inductive Current (L = 100μH), I_{LM} 160A
Continuous Drain Current, I_D
T_C = +25°C 40A
T_C = +100°C 25A
Total Dissipation (T_C = +25°C), P_{tot} 150W
Derate Above 25°C . . . . . 1.2W/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 0.063 in. (1.6mm) from case, 10sec), T_L . . . . . +300°C
Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 0.83°C/W
Typical Thermal Resistance, Case–to–Sink (Note 4), R_{thCS} . . . . . 0.1°C/W
Maximum Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 30°C/W

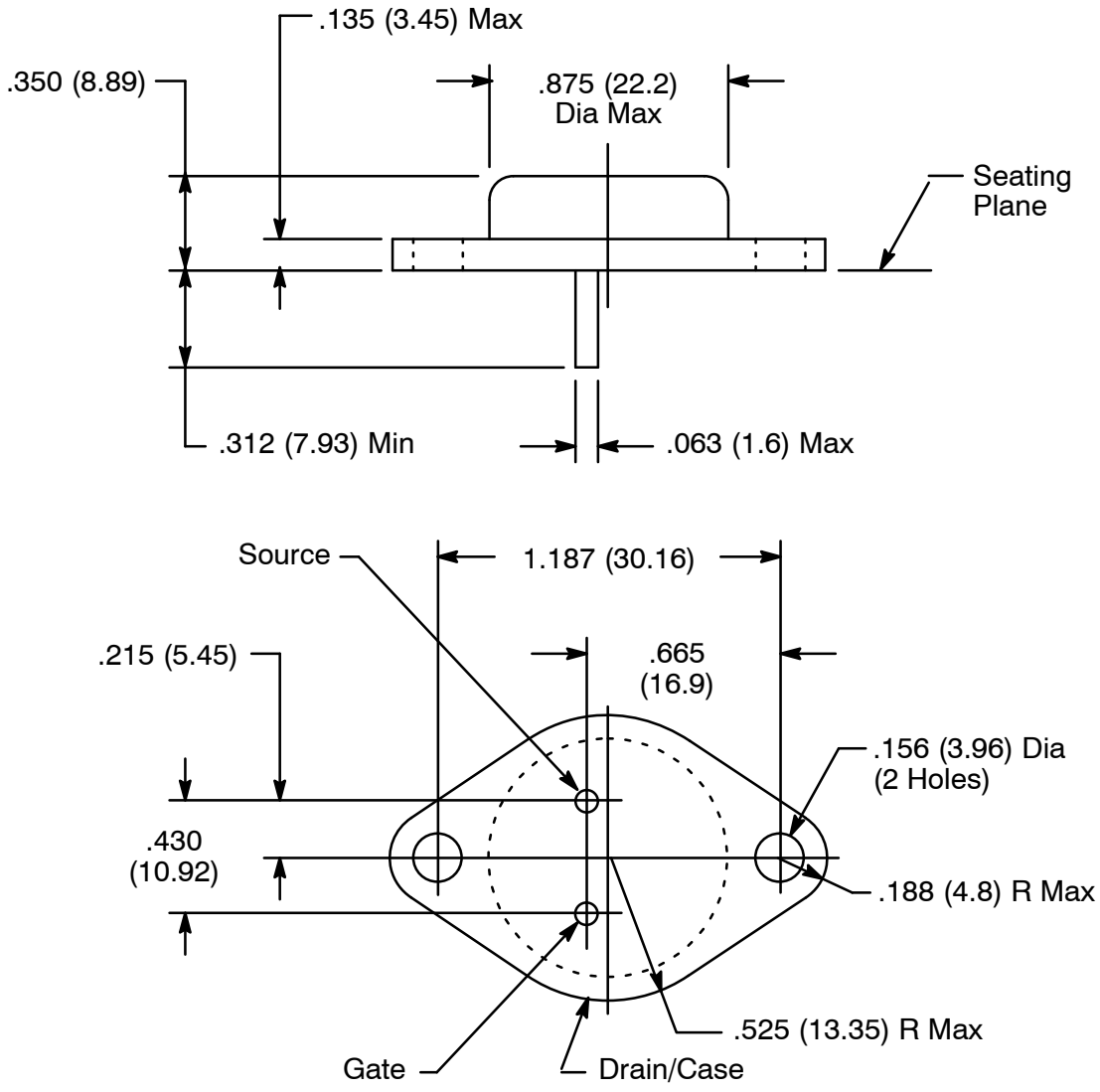
Note 1. T_J = +25° to +150°C
Note 2. Pulse test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 3. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 4. Mounting surface flat, smooth, and greased.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0	100	–	–	V
Zero−Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0, V_{DS} = 100V	–	–	250	μA
		V_{GS} = 0, V_{DS} = 80V, T_C = +125°C	–	–	1000	μA
Gate−Body Leakage Current	I_{GSS}	V_{DS} = 0, V_{GS} = ±20V	–	–	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	–	4	V
On−State Drain Current	$I_{D(on)}$	V_{DS} > $I_{D(on)}$ x $R_{DS(on)\ max}$, V_{GS} = 10V, Note 2	40	–	–	A
Static Drain−Source On Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A, Note 2	–	0.045	0.055	W
Forward Transconductance	g_{fs}	V_{DS} > $I_{D(on)}$ x $R_{DS(on)\ max}$, I_D = 20A, Note 2	9	11	–	mho
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	–	2000	3000	pf
Output Capacitance	C_{oss}		–	1000	1500	pf
Reverse Transfer Capacitance	C_{rss}		–	350	500	pf
Turn−On Time	$t_{d(on)}$	V_{DD} = 24V, I_D = 20A, R_I = 4.7Ω	–	–	35	ns
Rise Time	t_r		–	–	100	ns
Turn−Off Delay Time	$t_{d(off)}$		–	–	125	ns
Fall Time	t_f		–	–	100	ns
Total Gate Charge	Q_g	V_{GS} = 10V, I_D = 50A, V_{DS} = 80V	–	63	120	nC
Gate−Source Charge	Q_{gs}		–	27	–	nC
Gate−Drain (“Miller”) Charge	Q_{gd}		–	36	–	nC
Internal Drain Inductance	L_D	Measured between the contact screw on header that is closer to source and gate pins and center of die	–	5.0	–	nH
Internal Source Inductance	L_S	Measured from the source pin, 6mm (.25 in.) from header	–	12.5	–	nH
Source−Drain Diode Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S		–	–	40	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 3	–	–	160	A
Forward ON Voltage	V_{SD}	I_S = 40A, V_{GS} = 0, T_J = +25°C, Note 3	–	–	2.5	V
Reverse Recovery Time	t_{rr}	I_F = 40A, di_F/dt = 100A/μs, T_J = +150°C	–	600	–	ns
Reverse Recovered Charge	Q_{rr}		–	3.3	–	μC

Note 2. Pulse test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Note 3. Repetitive Rating: Pulse width limited by maximum junction temperature.


.135 (3.45) Max
.350 (8.89)
.875 (22.2)
Dia Max
Seating
Plane
.312 (7.93) Min
.063 (1.6) Max
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/Case