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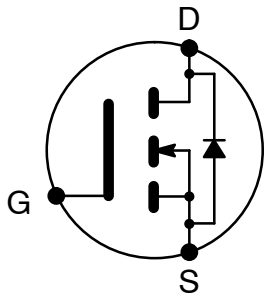
NTE2398
MOSFET
N–Ch, Enhancement Mode
High Speed Switch
TO220 Type Package

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



Absolute Maximum Ratings:

Continuous Drain Current (V_{GS} = 10V), I_D
- T_C = +25°C 4.5A
- T_C = +100°C 2.9A

Pulsed Drain Current (Note 1), I_{DM} 18A

Power Dissipation (T_C = +25°C), P_D 74W
- Derate Linearly Above 25°C . . . . . 0.59W/°C

Gate–to–Source Voltage, V_{GS} . . . . . ±20V

Single Pulse Avalanche Energy (Note 2), E_{AS} 280mJ

Avalanche Current (Note 1), I_{AR} 4.5A

Repetitive Avalanche Energy (Note 1), E_{AR} 7.4mJ

Peak Diode Recovery dv/dt (Note 3), dv/dt 3.5V/ns

Operating Junction Temperature Range, T_J . . . . . –55° to +150°C

Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

Lead Temperature (During Soldering, 1.6mm from case for 10sec), T_L . . . . . +300°C

Mounting Torque (6–32 or M3 Screw) . . . . . 10 lbf•in (1.1N•m)

Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.7°C/W

Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 62°C/W

Typical Thermal Resistance, Case–to–Sink (Flat, Greased Surface), R_{thCS} . . . . . 0.5°C/W

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 2. V_{DD} = 50V, starting T_J = +25°C, L = 24mH, R_G = 25±, I_{AS} = 4.5A

Note 3. I_{SD} ≤ 4.5A, di/dt ≤ 75A/≤s, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ +150°C

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

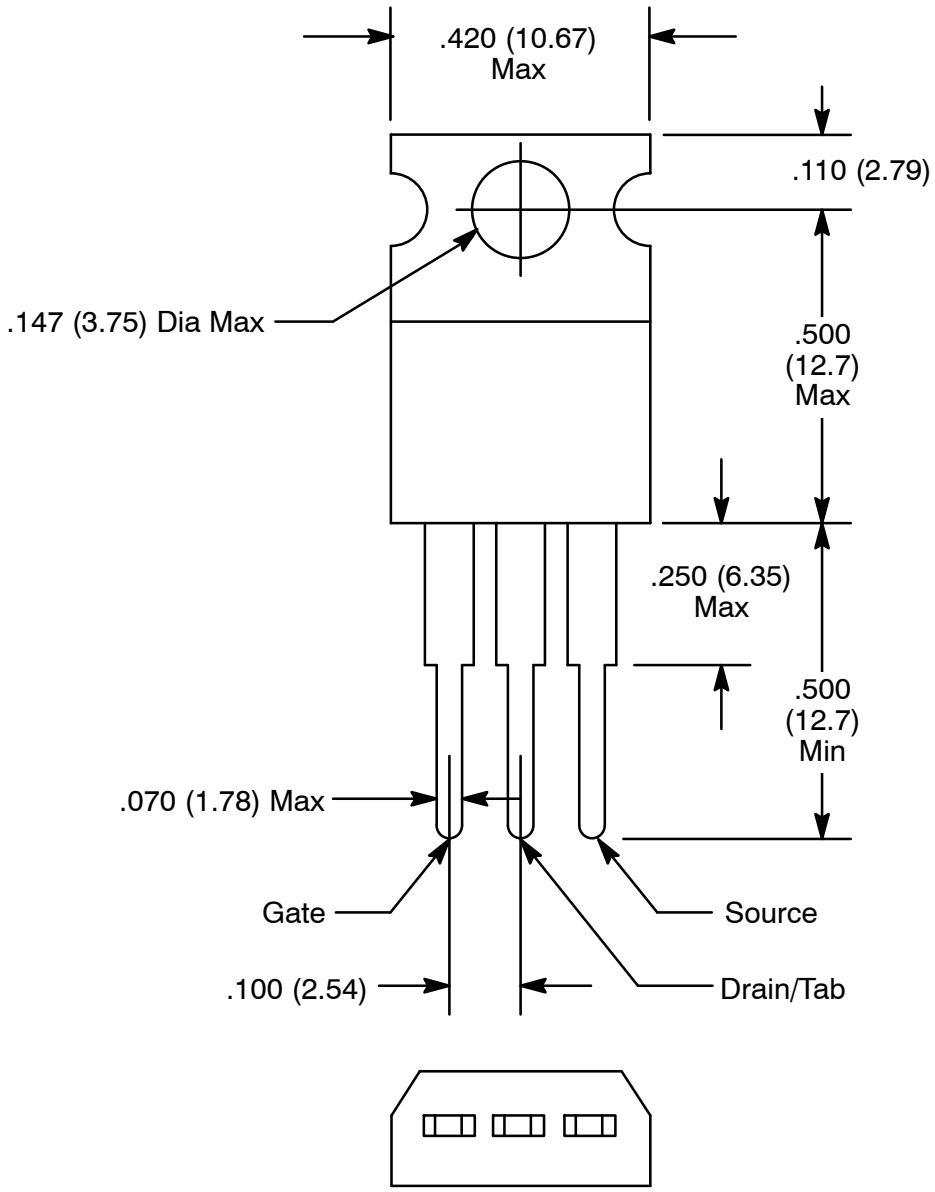
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250≤A	500	–	–	V
Breakdown Voltage Temp. Coefficient	$\frac{V_{(BR)DSS}}{T_J}$	Reference to +25°C, I_D = 1mA	–	0.61	–	V/°C
Static Drain−to−Source On−Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.7A, Note 4	–	–	1.5	±
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250≤A	2.0	–	4.0	V
Forward Transconductance	g_{fs}	V_{DS} = 50V, I_D = 2.7A, Note 4	2.5	–	–	mhos
Drain−to−Source Leakage Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V	–	–	25	≤A
		V_{DS} = 400V, V_{GS} = 0V, T_J = +125°C	–	–	250	≤A
Gate−to−Source Forward Leakage	I_{GSS}	V_{GS} = 20V	–	–	100	nA
Gate−to−Source Reverse Leakage	I_{GSS}	V_{GS} = −20V	–	–	−100	nA
Total Gate Charge	Q_g	I_D = 3.1A, V_{DS} = 400V, V_{GS} = 10V, Note 4	–	–	38	nC
Gate−to−Source Charge	Q_{gs}		–	–	5.0	nC
Gate−to−Drain (“Miller”) Charge	Q_{gd}		–	–	22	nC
Turn−On Delay Time	$t_{d(on)}$	V_{DD} = 250V, I_D = 3.1A, R_G = 12±, R_D = 79±, Note 4	–	8.2	–	ns
Rise Time	t_r		–	16	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	42	–	ns
Fall Time	t_f		–	16	–	ns
Internal Drain Inductance	L_D	Between lead, .250in. (6.0) mm 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 = 1MHz	–	610	–	pF
Output Capacitance	C_{oss}		–	160	–	pF
Reverse Transfer Capacitance	C_{rss}		–	68	–	pF

Source−Drain Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S		–	–	4.5	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	–	–	18	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 4.5A, V_{GS} = 0V, Note 4	–	–	1.6	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 3.1A, di/dt = 100A/≤s, Note 4	–	320	640	ns
Reverse Recovery Charge	Q_{rr}		–	1.0	2.0	≤C
Forward Turn−On Time	t_{on}	Intrinsic turn−on time is neglegible (turn−on is dominated by L_S+L_D)				

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 4. Pulse width ≤ 300≤s; duty cycle ≤ 2%.


.420 (10.67)
Max
.110 (2.79)
.147 (3.75) Dia Max
.500
(12.7)
Max
.250 (6.35)
Max
.500
(12.7)
Min
.070 (1.78) Max
Gate
Source
.100 (2.54)
Drain/Tab

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