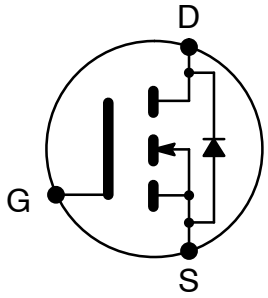
ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

NTE2396
MOSFET
N–Ch, Enhancement Mode
High Speed Switch
TO–220 Type Package

Features:
- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Current Sense
- +175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



Absolute Maximum Ratings:

Continuous Drain Current (V_{GS} = 10V), I_D
- T_C = +25°C 28A
- T_C = +100°C 20A

Pulsed Drain Current (Note 1), I_{DM} 110A

Power Dissipation (T_C = +25°C), P_D 150W
- Derate Linearly Above 25°C . . . . . 1.0W/°C

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

Single Pulse Avalanche Energy (Note 2), E_{AS} 100mJ

Avalanche Current (Note 1), I_{AR} 28A

Repetitive Avalanche Energy (Note 1), E_{AR} 15mJ

Peak Diode Recovery dv/dt (Note 3), dv/dt 5.5V/ns

Operating Junction Temperature Range, T_J . . . . . –55° to +175°C

Storage Temperature Range, T_{stg} . . . . . –55° to +175°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} . . . . . 1.0°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} = 25V, starting T_J = +25°C, L = 191μH, R_G = 25Ω, I_{AS} = 28A

Note 3. I_{SD} ≤ 28A, di/dt ≤ 170A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ +175°C

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

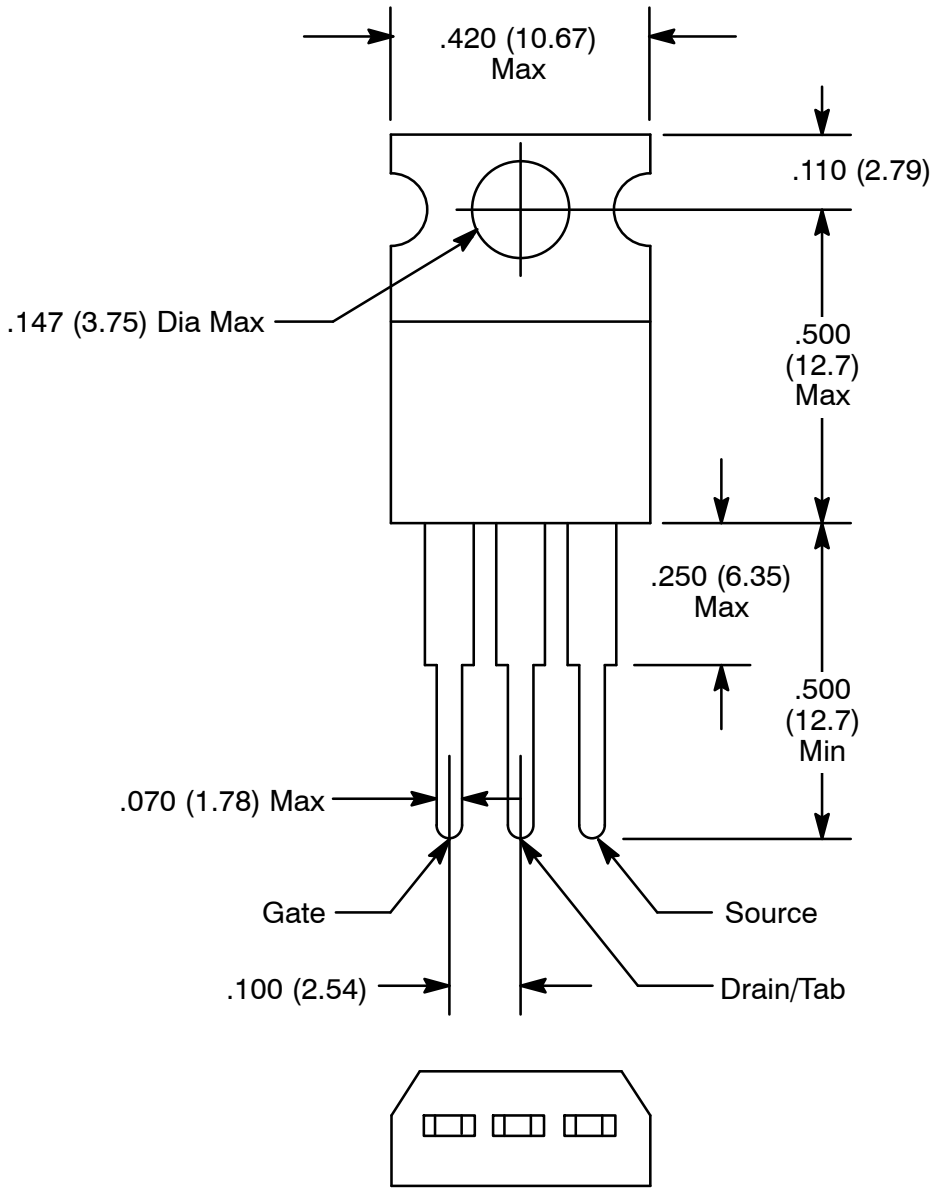
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–to–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	–	–	100	V
Breakdown Voltage Temp. Coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	Reference to +25°C, I_D = 1mA	–	0.13	–	V/°C
Static Drain–to–Source On–Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 17A, Note 4	–	–	0.077	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	–	4.0	V
Forward Transconductance	g_{fs}	V_{DS} = 50V, I_D = 17A, Note 4	5.8	–	–	mhos
Drain–to–Source Leakage Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	–	–	25	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = +150°C	–	–	250	μA
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 = 29A, V_{DS} = 80V, V_{GS} = 10V, Note 4	–	–	69	nC
Gate–to–Source Charge	Q_{gs}		–	–	13	nC
Gate–to–Drain (“Miller”) Charge	Q_{gd}		–	–	37	nC
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 29A, R_G = 9.1Ω, R_D = 1.7Ω, Note 4	–	13	–	ns
Rise Time	t_r		–	77	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	40	–	ns
Fall Time	t_f		–	48	–	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	–	1300	–	pF
Output Capacitance	C_{oss}		–	630	–	pF
Reverse Transfer Capacitance	C_{rss}		–	130	–	pF

Source–Drain Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S		–	–	28	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	–	–	110	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 28A, V_{GS} = 0V, Note 4	–	–	2.5	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 29A, di/dt = 100A/μs, Note 4	–	120	260	ns
Reverse Recovery Charge	Q_{rr}		–	0.52	1.2	μC
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 ≤ 300μs; 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