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NTE2383
MOSFET
P–Channel Enhancement Mode, High Speed Switch (Compl to NTE2382)

Description:

The NTE2383 is a MOS power P–Channel FET in a TO220 type package designed for high voltage, high speed power switching applications such as switching regulators, converters, solenoid, and relay drivers.

Features:

- Lower $R_{DS(ON)}$
- Improved Inductive Ruggedness
- Fast Switching Times
- Rugged Polysilicon Gate Cell Structure
- Lower Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability

Absolute Maximim Ratings:

Drain–Source Voltage (Note 1), V_{DSS} 100V
Drain–Gate Voltage (R_{GS} = 1MΩ, Note 1), V_{DGR} 100V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Continuous Drain Current, I_D
T_C = +25°C 10.5A
T_C = +100°C 7.5A
Drain Current, Pulsed (Note 3), I_{DM} 42A
Gate Current, Pulsed, I_{GM} . . . . . ±1.5A
Single Pulsed Avalanvhe Energy (Note 4), E_{AS} 510mJ
Avalanche Current, I_{AS} 10.5A
Total Power Dissipation (T_C = +25°C), P_D 75W
Derate Above 25°C . . . . . 0.6W/°C
Operating Junction Temperature Range, T_{opr} . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 62.5°C/W
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.67°C/W
Thermal Resistance, Case–to–Sink (Note 5), R_{thCS} . . . . . 0.5°C/W
Maximum Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +300°C

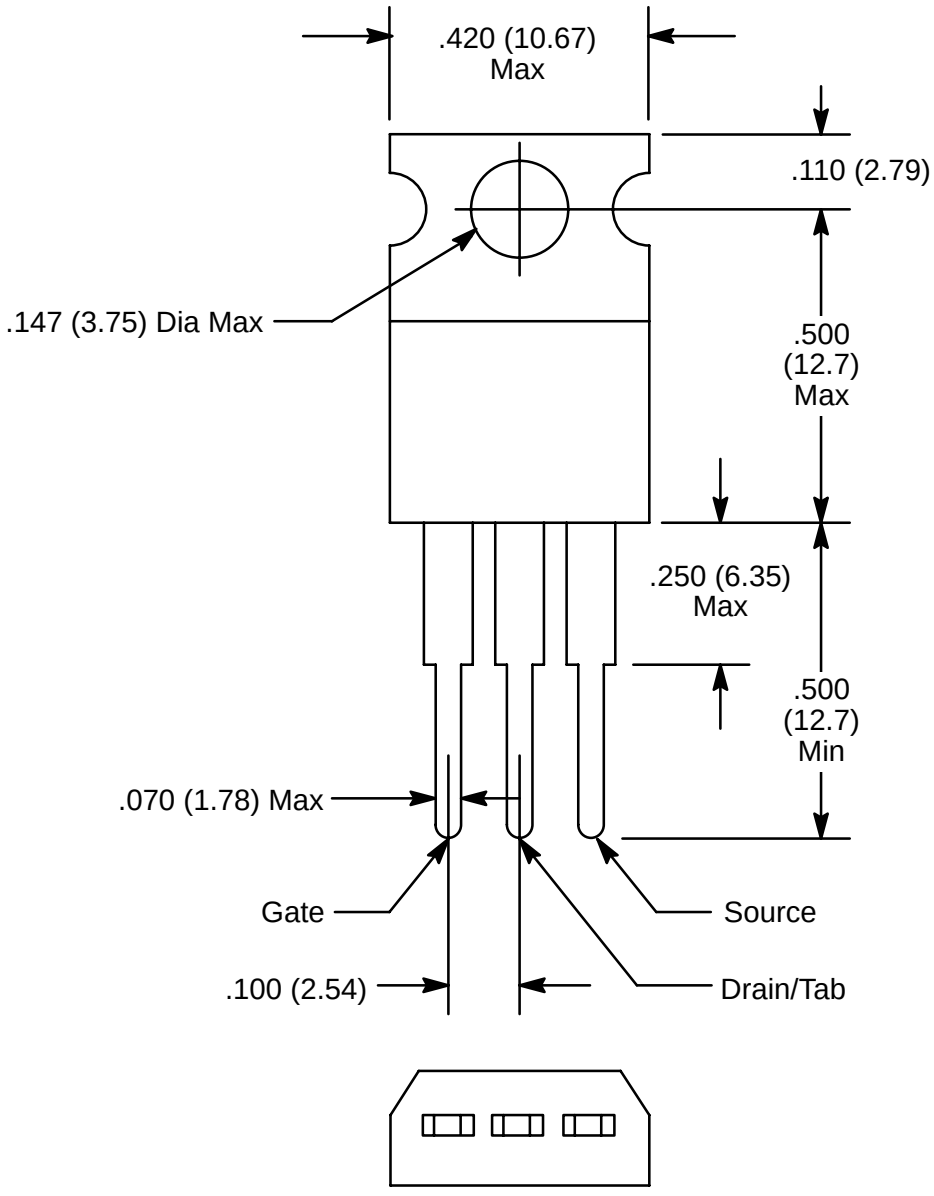
Note 1. T_J = +25° to +150°C
Note 2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 3. Repetitive rating: Pulse width limited by max. junction temperature.
Note 4. L = 8.5mH, V_{DD} = 25V, R_G = 25Ω, Starting T_J = +25°C.
Note 5. Mounting surface flat, smooth, and greased.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0, I_D = 0.25mA	100	–	–	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0	–	–	0.25	mA
		V_{DS} = 80V, V_{GS} = 0, T_J = +125°C	–	–	1.0	mA
Gate–Body Leakage Current, Forward	I_{GSS}	V_{GS} = 20V	–	–	100	nA
Gate–Body Leakage Current, Reverse	I_{GSS}	V_{GS} = 20V	–	–	–100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 0.25mA	2.0	–	4.0	V
Static Drain–Source On–Resistance	$r_{DS(on)}$	V_{GS} = 10V, I_D = 5.3A, Note 2	–	–	0.3	Ω
Forward Transconductance	g_{FS}	$V_{DS} \leq$ 50V, I_D = 5.3A, Note 2	2.0	–	–	mhos
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	–	835	–	pF
Output Capacitance	C_{oss}		–	357	–	pF
Reverse Transfer Capacitance	C_{rss}		–	94	–	pF
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 10.5A, Z_O = 24Ω, MOSFET switching times are essentially independent of operating temperature	–	–	60	ns
Rise Time	t_r		–	–	140	ns
Turn–Off Delay Time	$t_{d(off)}$		–	–	140	ns
Fall Time	t_f		–	–	140	ns
Total Gate Charge	Q_g	V_{GS} = 10V, V_{DS} = 80V, I_D = 10.5A, Gate charge is essentially independent of operating temperature	–	–	58	nC
Gate–Source Charge	Q_{gs}		–	12.6	–	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	16.6	–	ns
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S		–	–	10.5	A
Pulse Source Current (Body Diode)	I_{SM}	Note 3	–	–	42	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 10.5A, V_{GS} = 0V, Note 2	–	–	6.3	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 10.5A, dI_F/dt = 100A/μs	–	–	300	ns

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

Note 3. Repetitive rating: Pulse width limited by max. junction temperature.


.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