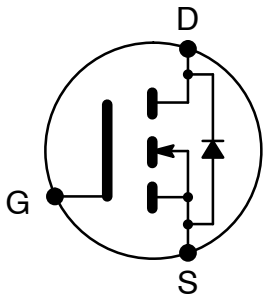
ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

NTE2387
MOSFET
N–Channel Enhancement Mode, High Speed Switch TO–220 Type Package

Description:

The NTE2387 is an N–Channel Enhancement Mode Power MOSFET in a TO–220 type package designed with the best combination of fast switching, ruggedized device design, low on–resistance, and cost–effectiveness.



Features:

- Dynamic dV/dt rating
- Repetitive Avalanche Rated
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

Absolute Maximum Ratings: (T_C = +25°C unless otherwise specified)

Drain–Source Voltage, V_{DS} 800V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Pulsed Drain Current (Note 1), I_{DM} 16A
Continuous Drain Current (V_{GS} = 10V), I_D
  T_C = +25°C 4.1A
  T_C = +100°C 2.6A
Maximum Power Dissipation (T_C = +25°C), P_D 125W
  Derate Linearly Above 25°C . . . . . 1.0W/°C
Single Pulse Avalanche Energy (Note 2), E_{AS} 260mJ
Avalanche Current (Note 1), I_{AR} 4.1A
Repetitive Avalanche Energy (Note 1), E_{AR} 13mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt 2.0V/ns
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 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} = 50V, starting T_J = +25°C, L = 29mH, R_G = 25Ω, I_{AS} = 4.1A
Note 3. I_{SD} ≤ 4.1A, di/dt ≤ 100A/μs, V_{DD} ≤ 600V, T_J ≤ +150°C

Rev. 9–19

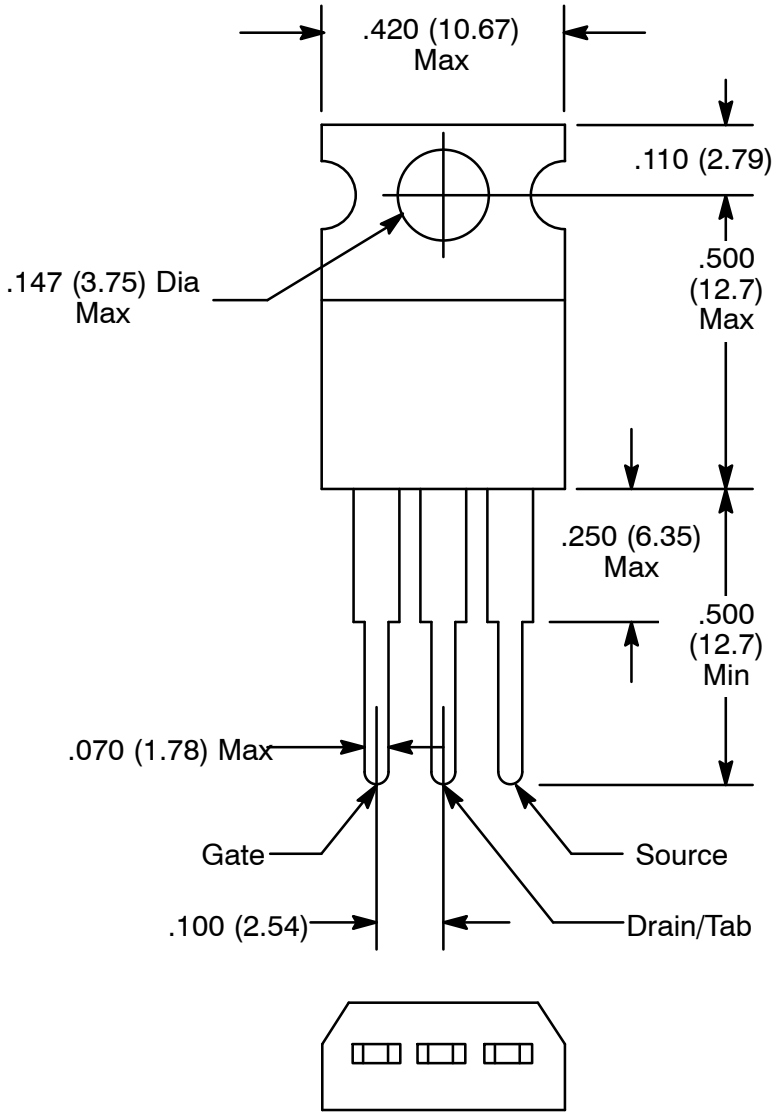
RoHS

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain−Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0	800	–	–	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to +25°C, I_D = 1mA	–	0.9	–	V/°C
Zero−Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0, V_{DS} = 800V	–	–	100	μA
		V_{GS} = 0, V_{DS} = 640V, T_J = +125°C	–	–	500	μA
Gate−Sourcwe Leakage Current	I_{GSS}	V_{GS} = ±20V	–	–	±100	nA
Gate−Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	–	4.0	V
Drain−Source On−State Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.5A, Note 4	–	–	3.0	Ω
Forward Transconductance	g_{fs}	V_{DS} = 100V, I_D = 2.5A, Note 4	2.5	–	–	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0, f = 1MHz	–	1300	–	pf
Output Capacitance	C_{oss}		–	310	–	pf
Reverse Transfer Capacitance	C_{rss}		–	190	–	pf
Total Gate Charge	Q_g	V_{DS} = 400V, V_{GS} = 10V, I_D = 4.1A, Note 4	–	–	78	nC
Gate−Source Charge	Q_{gs}		–	–	9.6	nC
Gate−Drain Charge	Q_{gd}		–	–	45	nC
Turn−On Delay Time	$t_{d(on)}$	V_{DD} = 400V, I_D = 4.1A, R_D = 95Ω, R_g = 12Ω, Note 4	–	12	–	ns
Rise Time	t_r		–	33	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	82	–	ns
Fall Time	t_f		–	30	–	ns
Internal Drain Inductance	L_D	Measured from drain lead 6mm from package to center of die	–	4.5	–	nH
Internal Source Inductance	L_S	Measured from drain lead 6mm from package to center of die	–	7.5	–	nH
Drain−Source Body Diode Characteristics						
Continuous Source−Drain Diode Current	I_S		–	–	4.1	A
Pulsed Diode Forward Current	I_{SM}	Note 1	–	–	16	A
Body Diode Voltage	V_{SD}	T_J = +25°C, I_S = 4.1A, V_{GS} = 0, Note 1	–	–	1.8	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 4.1A, dI/dt = 100A/μs, Note 4	–	480	720	ns
Reverse Recovered Charge	Q_{rr}		–	1.8	2.7	μC
Forward Turn−On Time	t_{on}	Intrinsic turn−on time is negligible (turn−on is dominated by L_S and 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