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NTE66
MOSFET
N–Ch, Enhancement Mode
High Speed Switch

Description:

The NTE66 is a TMOS Power 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
- Lower Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability

Absolute Maximum Ratings:

Drain–Source Voltage (T_J = +25°C to +150°C), V_{DSS} 100V
Drain–Gate Voltage (R_{GS} = 1MΩ, T_J = +25°C to +125°C), V_{DGR} 100V
Gate–Source Voltage, V_{GS} . . . . . ±20V
Continuous Drain Current, I_D
T_C = +25°C 14A
T_C = +100°C 10A
Pulsed Drain Current (Note 2), I_{DM} 56A
Pulsed Gate Current, I_{GM} . . . . . ±1.5A
Single Pulsed Avalanche Energy (Note 3), E_{AS} 69mJ
Avalanche Current, I_{AS} 14A
Total Power Dissipation (T_C = +25°C), P_D 77W
Derate Above 25°C . . . . . 0.62W/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Lead Temperature (During Soldering, 1/8” from case, 5sec max.), T_L . . . . . +300°C
Thermal Resistance, Junction–to–Case, $R_{\Theta JC}$ 1.62K/W
Thermal Resistance, Junction–to–Ambient, $R_{\Theta JA}$ 80K/W
Thermal Resistance, Case–to–Sink (Mounting surface flat, smooth, and greased), $R_{\Theta CS}$. 0.5K/W

Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 2. Repetitive rating: Pulse width limited by max, junction temperature.
Note 3. L = 0.53mH, V_{dd} = 25V, R_G = 25Ω, Starting T_J = +25°C.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain–Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	100	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	–	4.0	V
Gate–Source Leakage, Forward	I_{GSS}	V_{GS} = 20V	–	–	100	nA
Gate–Source Leakage, Reverse	I_{GSS}	V_{GS} = –20V	–	–	–100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = Max. Rating, V_{GS} = 0V	–	–	250	μA
		V_{DS} = Max. Rating x 0.8, V_{GS} = 0V, T_C = +125°C	–	–	1000	μA
On–State Drain–Source Current	$I_{D(on)}$	V_{DS} > $I_{D(on)}$ x $R_{DS(on)}$max, V_{GS} = 10V, Note 1	14	–	–	A
Static Drain–Source On–State Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 8.3A, Note 1	–	0.10	0.16	Ω
Forward Transconductance	g_{fs}	V_{DS} ≥ 50V, I_D = 8.3A, Note 1	5.1	7.6	–	mhos
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	640	–	pF
Output Capacitance	C_{oss}		–	240	–	pF
Reverse Transfer Capacitance	C_{rss}		–	72	–	pF
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 0.5BV_{DSS}, I_D = 8.3A, Z_O = 12Ω (MOSFET switching times are essentially independent of operating temperature)	–	10	15	ns
Rise Time	t_r		–	34	51	ns
Turn–Off Delay Time	$t_{d(off)}$		–	23	35	ns
Fall Time	t_f		–	24	36	ns
Total Gate Charge (Gate–Source Plus Gate–Drain)	Q_g	V_{GS} = 10V, I_D = 14A, V_{DS} = 0.8 Max. Rating (Gate charge is essentially independent of operating temperature)	–	17	26	nC
Gate–Source Charge	Q_{gs}		–	3.7	5.5	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	7	11	nC

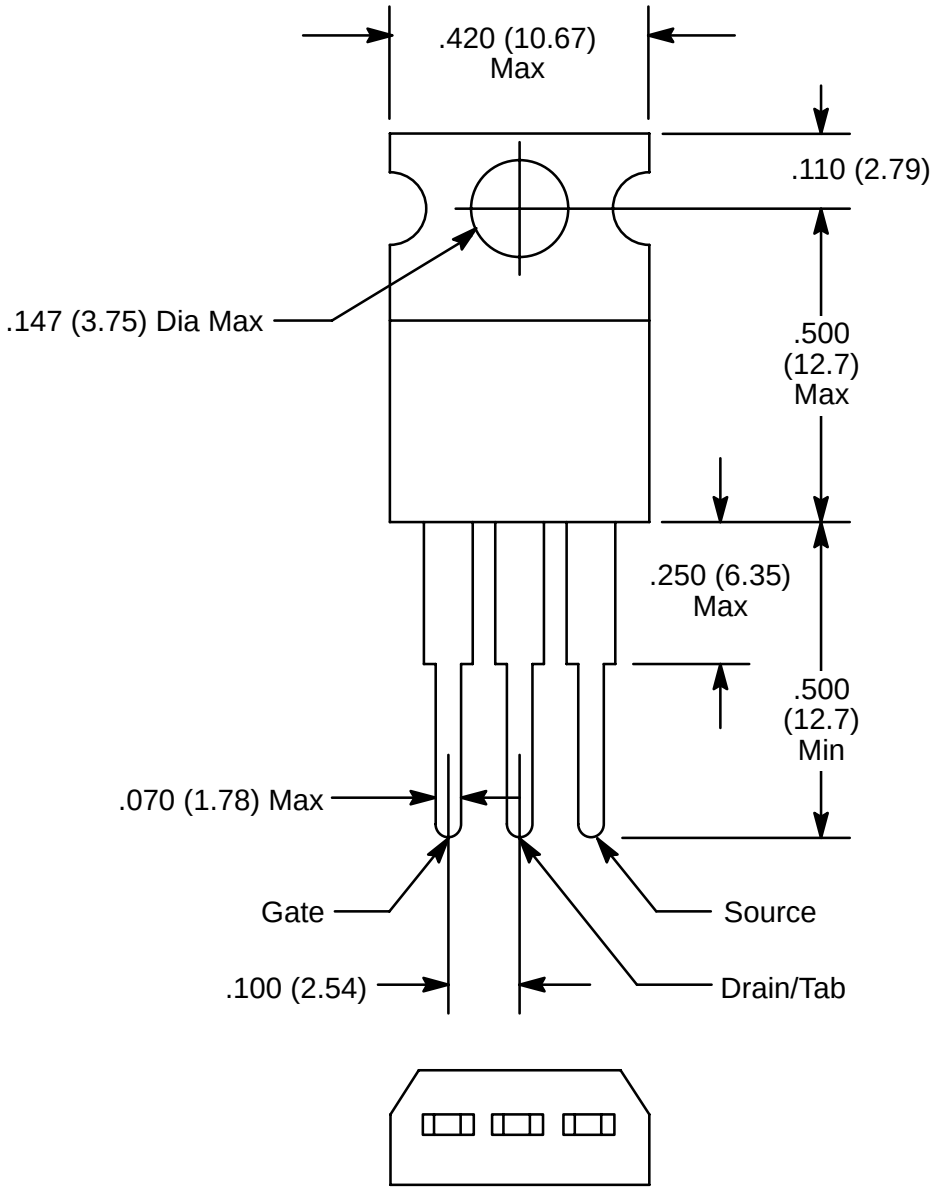
Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Source–Drain Diode Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S		–	–	14	A
Pulse Source Current (Body Diode)	I_{SM}	Note 2	–	–	56	A
Diode Forward Voltage	V_{SD}	T_C = +25°C, I_S = 14A, V_{GS} = 0V	–	–	2.5	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 14A, dI_F/dt = 100A/μs	–	120	250	ns

Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Note 2. 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