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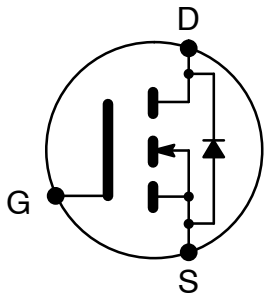
NTE2986
Logic Level MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO220 Type Package

Features:

- Dynamic dv/dt Rating
- Logic Level Gate Drive
- R_{DS}(on) Specified at V_{GS} = 4V & 5V
- +175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



Absolute Maximum Ratings:

Drain Current, I_D
- Continuous (V_{GS} = 5V)
  - T_C = +25°C 50A
  - T_C = +100°C 36A
- Pulsed (Note 1) 200A

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

Gate–Source Voltage, V_{GS} . . . . . ±10V

Single Pulsed Avalanche Energy (Note 2), E_{AS} 110mJ

Peak Diode Recovery dv/dt (Note 3), dv/dt 4.5V/ns

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

Storage Temperature Range, T_{stg} . . . . . –55° to +175°C

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

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

Thermal Resistance:
- Maximum Junction–to–Case, R_{thJC} 1.0K/W
- Typical Case–to–Sink (Mounting surface flat, smooth, and greased), R_{thCS} 0.5K/W
- Maximum Junction–to–Ambient (Free Air Operation), R_{thJA} 62K/W

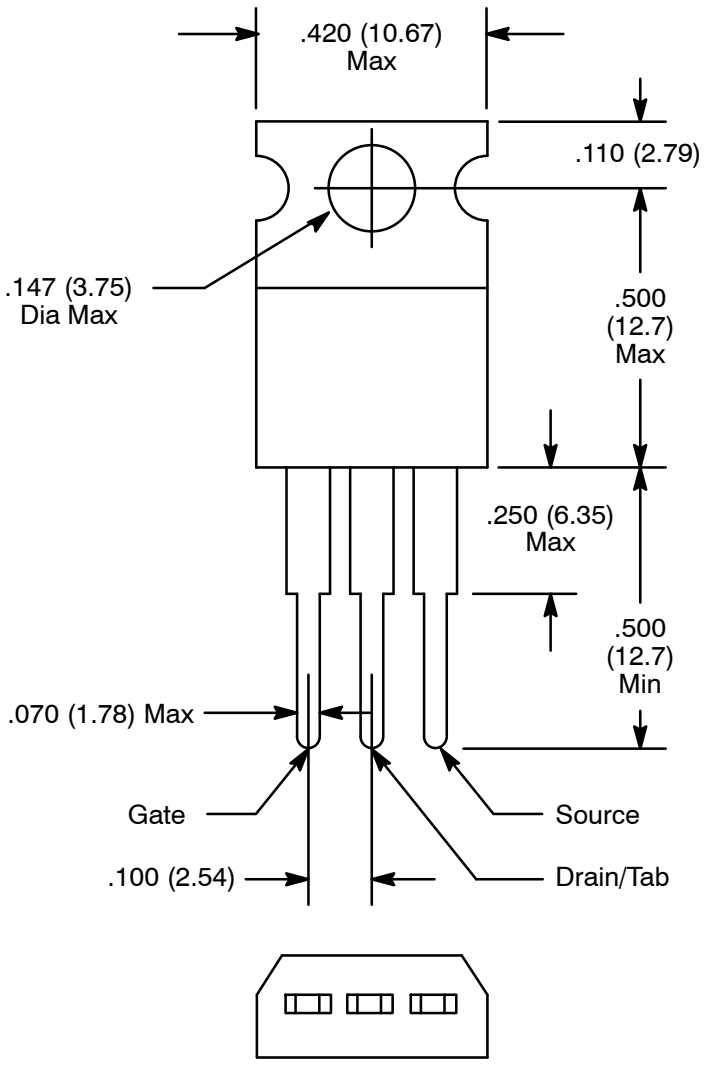
Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. L = 179≤H, V_{DD} = 25V, R_G = 25≥ , I_{AS} = 51A, Starting T_J = +175°C.

Note 3. $I_{SD} \leq 51A$, $di/dt \leq 250A/\leq s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq +175°C$.

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 = 250≤A	60	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS}/\pm T_J$	Reference to +25°C, I_D = 1mA	–	0.07	–	V/°C
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 5V, I_D = 31A, Note 4	–	–	0.028	≥
		V_{GS} = 4V, I_D = 25A, Note 4	–	–	0.039	≥
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250≤A	1.0	–	2.0	V
Forward Transconductance	g_{fs}	V_{DS} ≥ 25V, I_D = 31A, Note 4	23	–	–	mhos
Drain–to–Source Leakage Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0	–	–	25	≤A
		V_{DS} = 48V, V_{GS} = 0V, , T_C = +150°C	–	–	250	≤A
Gate–Source Leakage Forward	I_{GSS}	V_{GS} = 10V	–	–	100	nA
Gate–Source Leakage Reverse	I_{GSS}	V_{GS} = –10V	–	–	–100	nA
Total Gate Charge	Q_g	V_{GS} = 5V, I_D = 51A, V_{DS} = 48V	–	–	66	nC
Gate–Source Charge	Q_{gs}		–	–	12	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	–	43	nC
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 51A, R_G = 4.6≥ , R_D = 0.56≥	–	17	–	ns
Rise Time	t_r		–	230	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	42	–	ns
Fall Time	t_f		–	110	–	ns
Internal Drain Inductance	L_D	Between lead, 6mm (0.25”) 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	–	3300	–	pF
Output Capacitance	C_{oss}		–	1200	–	pF
Reverse Transfer Capacitance	C_{rss}		–	200	–	pF
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	50	A
Pulse Source Current	I_{SM}	(Body Diode) Note 1	–	–	200	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 51A, V_{GS} = 0V, Note 4	–	–	2.5	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 51A, di/dt = 100A/≤s, Note 4	–	130	180	ns
Reverse Recovery Charge	Q_{rr}		–	0.84	1.3	≤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 Test: 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
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Min
.070 (1.78) Max
Gate
Source
.100 (2.54)
Drain/Tab

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