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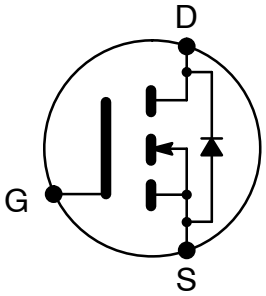
NTE2981
Logic Level MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO251 Type Package

Features:
- Dynamic dv/dt Rating
- Repetitive Avalanche rated
- Logic Level Gate Drive
- R_{DS}(on) Specified at V_{GS} = 4V & 5V
- TO251 Type Package



Absolute Maximum Ratings:

Drain Current, I_D
- Continuous (V_{GS} = 5V)
  - T_C = +25°C 7.7A
  - T_C = +100°C 4.9A
- Pulsed (Note 1) 31A

Total Power Dissipation (T_C = +25°C), P_D 42W
- Derate Above 25°C . . . . . 0.33W/°C

Total Power Dissipation (PC Board Mount, T_C = +25°C, Note 2), P_D 2.5W
- Derate Above 25°C . . . . . 0.02W/°C

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

Single Pulsed Avalanche Energy (Note 3), E_{AS} 210mJ

Avalanche Current (Note 1), I_{AR} 7.7A

Repetitive Avalanche Energy (Note 1), E_{AR} 4.2mJ

Peak Diode Recovery dv/dt (Note 4), dv/dt 5.5V/ns

Operating Junction Temperature Range, T_J . . . . . –55° to +150°C

Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T_L . . . . . +260°C

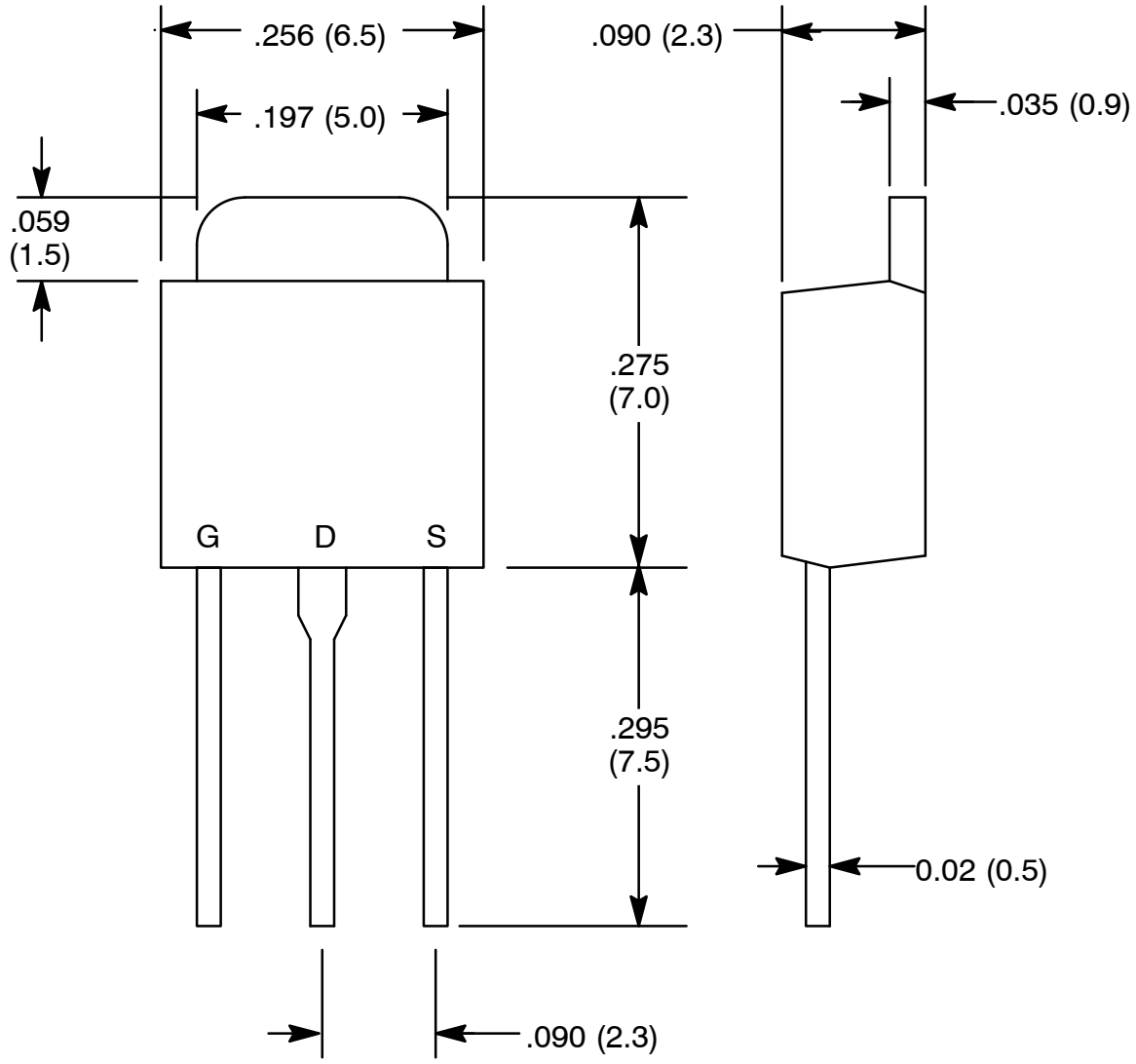
Maximum Thermal Resistance:
- Junction–to–Case, R_{thJC} . . . . . 3.0°C/W
- Junction–to–Ambient (PCB Mount, Note 2), R_{thJA} . . . . . 50°C/W
- Junction–to–Ambient, R_{thJA} . . . . . 110°C/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. When mounted on a 1” square PCB (FR–4 or G–10 material).
Note 3. L = 5.3mH, V_{DD} = 25V, R_G = 25≤ , Starting T_J = +25°C, I_{AS} = 7.7A.
Note 4. I_{SD} ≤ 9.2A, di/dt ≤ 110A/° s, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ +150°C.

Electrical Characteristics: (T_J = +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	100	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS}/\pm T_J$	Reference to +25°C, I_D = 1mA	–	0.13	–	V/°C
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 5V, I_D = 4.6A, Note 5	–	–	0.27	≤
		V_{GS} = 4V, I_D = 3.9A, Note 4	–	–	0.38	≤
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} = 50V, I_D = 4.6A, Note 5	4.4	–	–	mhos
Drain–to–Source Leakage Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0	–	–	25	° A
		V_{DS} = 80V, V_{GS} = 0V, T_C = +125°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 = 9.2A, V_{DS} = 80V, Note 5	–	–	12	nC
Gate–Source Charge	Q_{gs}		–	–	3.0	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	–	7.1	nC
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 9.2A, R_G = 9.0≤, R_D = 5.2≤, Note 5	–	9.8	–	ns
Rise Time	t_r		–	64	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	21	–	ns
Fall Time	t_f		–	27	–	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	–	490	–	pF
Output Capacitance	C_{oss}		–	150	–	pF
Reverse Transfer Capacitance	C_{rss}		–	30	–	pF
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	7.7	A
Pulse Source Current	I_{SM}	(Body Diode) Note 1	–	–	31	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 7.7A, V_{GS} = 0V, Note 5	–	–	2.5	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 9.2A, di/dt = 100A/° s, Note 5	–	110	140	ns
Reverse Recovery Charge	Q_{rr}		–	0.8	1.0	° 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 5. Pulse Test: Pulse Width ≤ 300° s, Duty Cycle ≤ 2%.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(1.5)
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G
D
S
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.090 (2.3)
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