NTE2945
MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO220 Full Pack Type Package

Features:

- Low Static Drain–Source ON Resistance
- Improved Inductive Ruggedness
- Fast Switching Times
- Low Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability
- TO220 Type Isolated Package
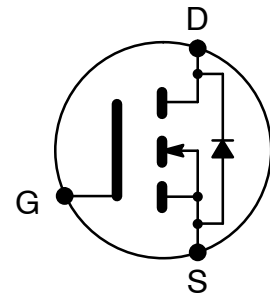
Absolute Maximum Ratings:

Drain–Source Voltage (Note 1), V_{DSS} 400V

Drain–Gate Voltage (R_{GS} = 1M±, Note 1), V_{DGR} 400V

Gate–Source Voltage, V_{GS} . . . . ±20V

Drain Current, I_D
    Continuous
        T_C = +25°C 5.5A
        T_C = +100°C 3.9A
    Pulsed (Note 2) 40A

Gate Current (Pulsed), I_{GM} . . . . ±1.5A

Single Pulsed Avalanche Energy (Note 3), E_{AS} 157mJ

Avalanche Current, I_{AS} 5.5A

Total Power Dissipation (T_C = +25°C), P_D 40W
    Derate Above 25°C . . . . 0.32W/°C

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

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

Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L . . . . +300°C

Thermal Resistance:
    Maximum Junction–to–Case, R_{thJC} 3.12K/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} 62.5K/W

Note 1. T_J = +25° to +150°C.
Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.
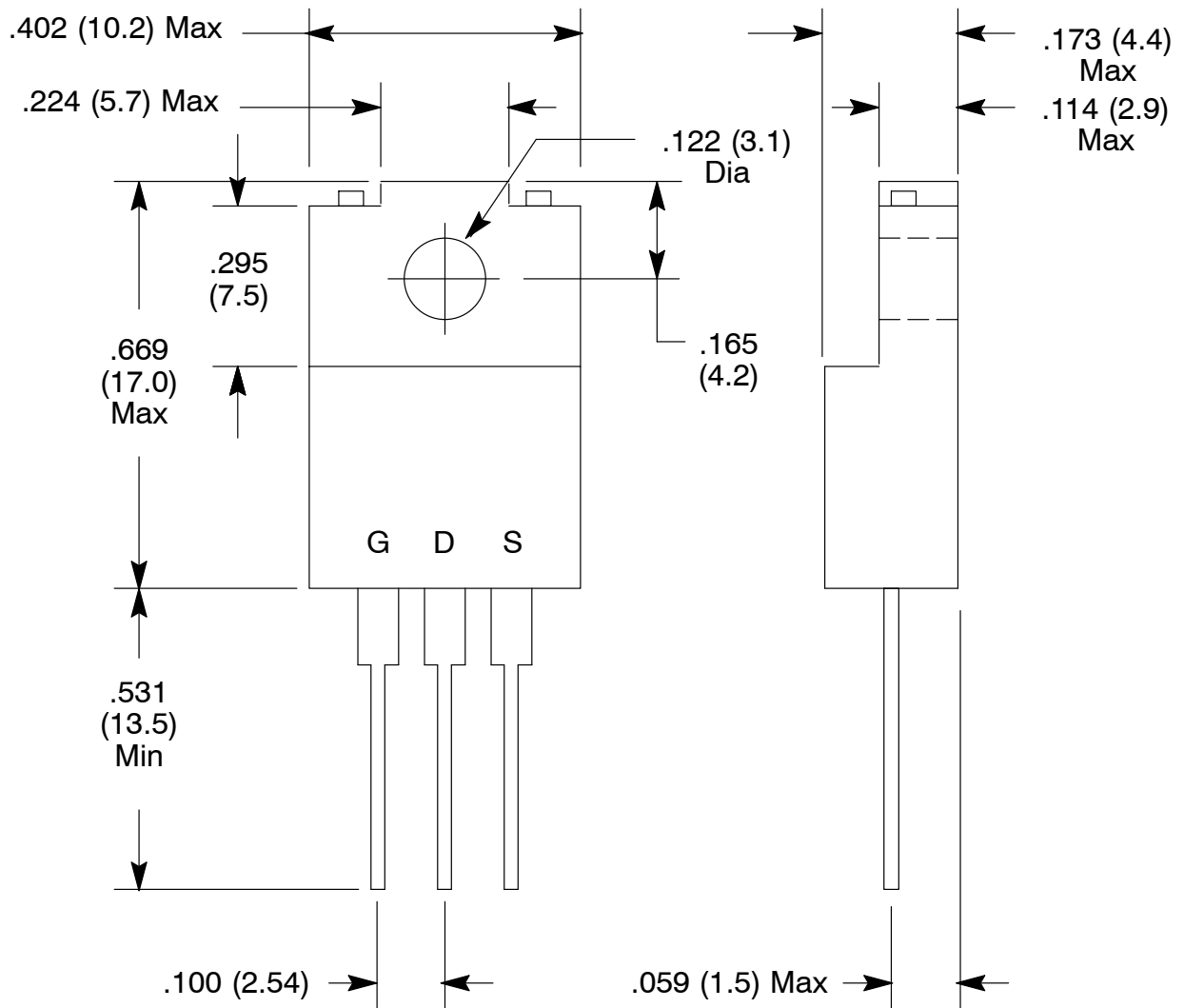Note 3. L = 9.1mH, V_{DD} = 50V, R_G = 25±, Starting T_J = +25°C.

Rev. 10–13

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	450	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250≥A	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} = 0	–	–	250	≥A
		V_{DS} = 0.8 Max. Rating, T_C = +125°C	–	–	1000	≥A
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 5A, Note 4	–	–	0.55	±
Forward Transconductance	g_{fs}	V_{DS} ≥ 50V, I_D = 5A, Note 4	5.8	8.7	–	mhos
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	1500	–	pF
Output Capacitance	C_{oss}		–	170	–	pF
Reverse Transfer Capacitance	C_{rss}		–	75	–	pF
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 0.5 BV_{DSS}, I_D = 10A, Z_O = 9.1±, (MOSFET switching times are essentially independent of operating temperature)	–	14	21	ns
Rise Time	t_r		–	27	41	ns
Turn–Off Delay Time	$t_{d(off)}$		–	50	75	ns
Fall Time	t_f		–	24	36	ns
Total Gate Charge (Gate–Source Plus Gate–Drain)	Q_g	V_{GS} = 10V, I_D = 10A, V_{DS} = 0.8 Max. Rating, (Gate charge is essentially independent of operating temperature)	–	–	79	nC
Gate–Source Charge	Q_{gs}		–	1013	–	nC
Gate–Drain ("Miller") Charge	Q_{gd}		–	32.3	–	nC
Source–Drain Diode Ratings and Characteristics						
Continuous Source Current	I_S	(Body Diode)	–	–	10	A
Pulse Source Current	I_{SM}	(Body Diode) Note 2	–	–	40	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 10A, V_{GS} = 0V, Note 4	–	–	2	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 10A, dI_F/dt = 100A/≥s	–	370	–	ns

Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 4. Pulse Test: Pulse Width ≤ 300≥s, Duty Cycle ≤ 2%.

.402 (10.2) Max

.224 (5.7) Max

.122 (3.1)
Dia

.295
(7.5)

.669
(17.0)
Max

.165
(4.2)

.173 (4.4)
Max

.114 (2.9)
Max

G D S

.531
(13.5)
Min

.100 (2.54)

.059 (1.5) Max

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