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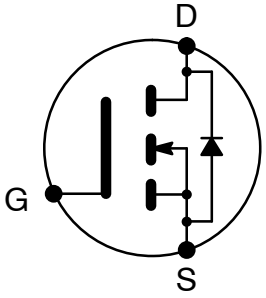
RoHS 2002/95/EC

NTE2913
MOSFET
N–Ch, Enhancement Mode
High Speed Switch
TO247 Type Package



Features:

- Advanced Process Technology
- Ultra Low On–Resistance
- Dynamic dv/dt Rating
- +175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated

Description:

The NTE2913 Power MOSFET utilizes advanced processing techniques to achieve extremely low on–resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO247 package is preferred for commercial–industrial applications where higher power levels preclude the use of TO220 devices. Th TO247 is similar, but superior, to the TO218 package because of its isolated mounting hole.

Absolute Maximum Ratings:

Continuous Drain Current (V_{GS} = 10V), I_D
- T_C = +25°C 110A
- T_C = +100°C 80A

Pulsed Drain Current (Note 1), I_{DM} 390A
Power Dissipation (T_C = +25°C), P_D 200W
- Derate Linearly Above 25°C . . . . . 1.3W/°C

Gate–to–Source Voltage, V_{GS} . . . . . ±20
Single Pulse Avalanche Energy (Note 2), E_{AS} 480mJ
Avalanche Current (Note 1), I_{AR} 59A
Repetitive Avalanche Energy (Note 1), E_{AR} 20mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt 5.0V/ns
Operating Junction Temperature Range, T_J . . . . . –55° to +175°C
Storage Temperature Range, T_{stg} . . . . . –55° to +175°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} . . . . . 0.75°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 40°C/W
Typical Thermal Resistance, Case–to–Sink (Flat, Greased Surface), R_{thCS} . . . . . 0.24°C/W

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.
Note 2. V_{DD} = 25V, starting T_J = +25°C, L = 190μH, R_G = 25Ω, I_{AS} = 59A
Note 3. I_{SD} ≤ 59A, di/dt ≤ 290A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ +175°C

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

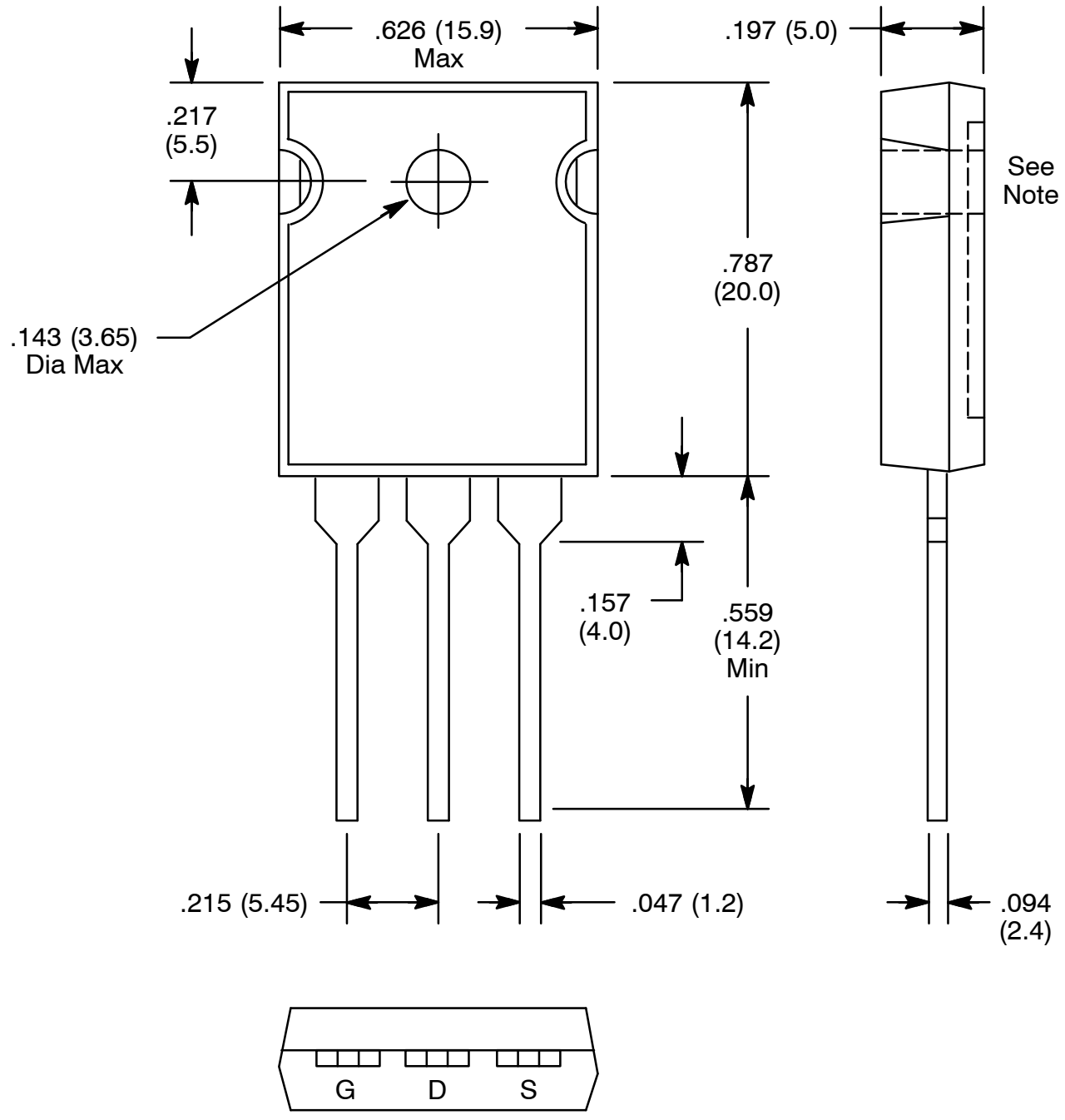
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	55	–	–	V
Breakdown Voltage Temp. Coefficient	$\frac{V_{(BR)DSS}}{T_J}$	Reference to +25°C, I_D = 1mA	–	0.057	–	V/°C
Static Drain−to−Source On−Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 59A, Note 4	–	–	0.008	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	–	4.0	V
Forward Transconductance	g_{fs}	V_{DS} = 25V, I_D = 59A	42	–	–	mhos
Drain−to−Source Leakage Current	I_{DSS}	V_{DS} = 55V, V_{GS} = 0V	–	–	25	μA
		V_{DS} = 44V, V_{GS} = 0V, T_J = +150°C	–	–	250	μA
Gate−to−Source Forward Leakage	I_{GSS}	V_{GS} = 20V	–	–	100	nA
Gate−to−Source Reverse Leakage	I_{GSS}	V_{GS} = −20V	–	–	−100	nA
Total Gate Charge	Q_g	I_D = 59A, V_{DS} = 44V, V_{GS} = 10V, Note 4	–	–	170	nC
Gate−to−Source Charge	Q_{gs}		–	–	32	nC
Gate−to−Drain (“Miller”) Charge	Q_{gd}		–	–	74	nC
Turn−On Delay Time	$t_{d(on)}$	V_{DD} = 28V, I_D = 59A, R_G = 2.5Ω, R_D = 0.39Ω, Note 4	–	14	–	ns
Rise Time	t_r		–	100	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	43	–	ns
Fall Time	t_f		–	70	–	ns
Internal Drain Inductance	L_D	Between lead, .250in. (6.0) mm from package and center of die contact	–	5.0	–	nH
Internal Source Inductance	L_S		–	13	–	nH
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	4000	–	pF
Output Capacitance	C_{oss}		–	1300	–	pF
Reverse Transfer Capacitance	C_{rss}		–	480	–	pF

Note 4. Pulse width ≤ 300μs; duty cycle ≤ 2%.

Source−Drain Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S	Note 5	–	–	110	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	–	–	390	A
Diode Forward Voltage	V_{SD}	T_J = +25°C, I_S = 59A, V_{GS} = 0V, Note 4	–	–	1.3	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 59A, di/dt = 100A/μs, Note 4	–	110	170	ns
Reverse Recovery Charge	Q_{rr}		–	450	680	μC

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.
Note 4. Pulse width ≤ 300μs; duty cycle ≤ 2%.
Note 5. Calculated continuous current based on maximum allowable junction temperature.



Note: Drain connected to metal part of mounting surface.