



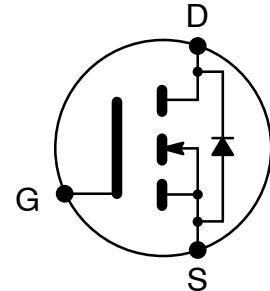
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NTE2913 MOSFET N-Ch, Enhancement Mode High Speed Switch TO247 Type Package

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. The 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 | |
| $T_C = +25^\circ C$ | 110A |
| $T_C = +100^\circ C$ | 80A |
| Pulsed Drain Current (Note 1), I_{DM} | 390A |
| Power Dissipation ($T_C = +25^\circ C$), P_D | 200W |
| Derate Linearly Above $25^\circ C$ | 1.3W/ $^\circ C$ |
| 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 $+175^\circ C$ |
| Storage Temperature Range, T_{stg} | -55° to $+175^\circ C$ |
| Lead Temperature (During Soldering, 1.6mm from case for 10sec), T_L | $+300^\circ C$ |
| Mounting Torque (6-32 or M3 Screw) | 10 lbf•in (1.1N•m) |
| Thermal Resistance, Junction-to-Case, R_{thJC} | $0.75^\circ C/W$ |
| Thermal Resistance, Junction-to-Ambient, R_{thJA} | $40^\circ C/W$ |
| Typical Thermal Resistance, Case-to-Sink (Flat, Greased Surface), R_{thCS} | $0.24^\circ C/W$ |

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 2. $V_{DD} = 25V$, starting $T_J = +25^\circ C$, $L = 190\mu H$, $R_G = 25\Omega$, $I_{AS} = 59A$

Note 3. $I_{SD} \leq 59A$, $di/dt \leq 290A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq +175^\circ C$

Electrical Characteristics: ($T_J = +25^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------------------|---|-----|-------|-------|---------------------|
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 55 | - | - | V |
| Breakdown Voltage Temp. Coefficient | $\frac{V_{(BR)DSS}}{T_J}$ | Reference to $+25^\circ\text{C}$, $I_D = 1\text{mA}$ | - | 0.057 | - | V/ $^\circ\text{C}$ |
| Static Drain-to-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 59A$, Note 4 | - | - | 0.008 | Ω |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 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 |
| | | $V_{DS} = 44V, V_{GS} = 0V, T_J = +150^\circ\text{C}$ | - | - | 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 | $t_{d(on)}$ | $V_{DD} = 28V, I_D = 59A, R_G = 2.5\Omega$, $R_D = 0.39\Omega$, 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} | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$ | - | 4000 | - | pF |
| Output Capacitance | C_{oss} | | - | 1300 | - | pF |
| Reverse Transfer Capacitance | C_{riss} | | - | 480 | - | pF |

Note 4. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

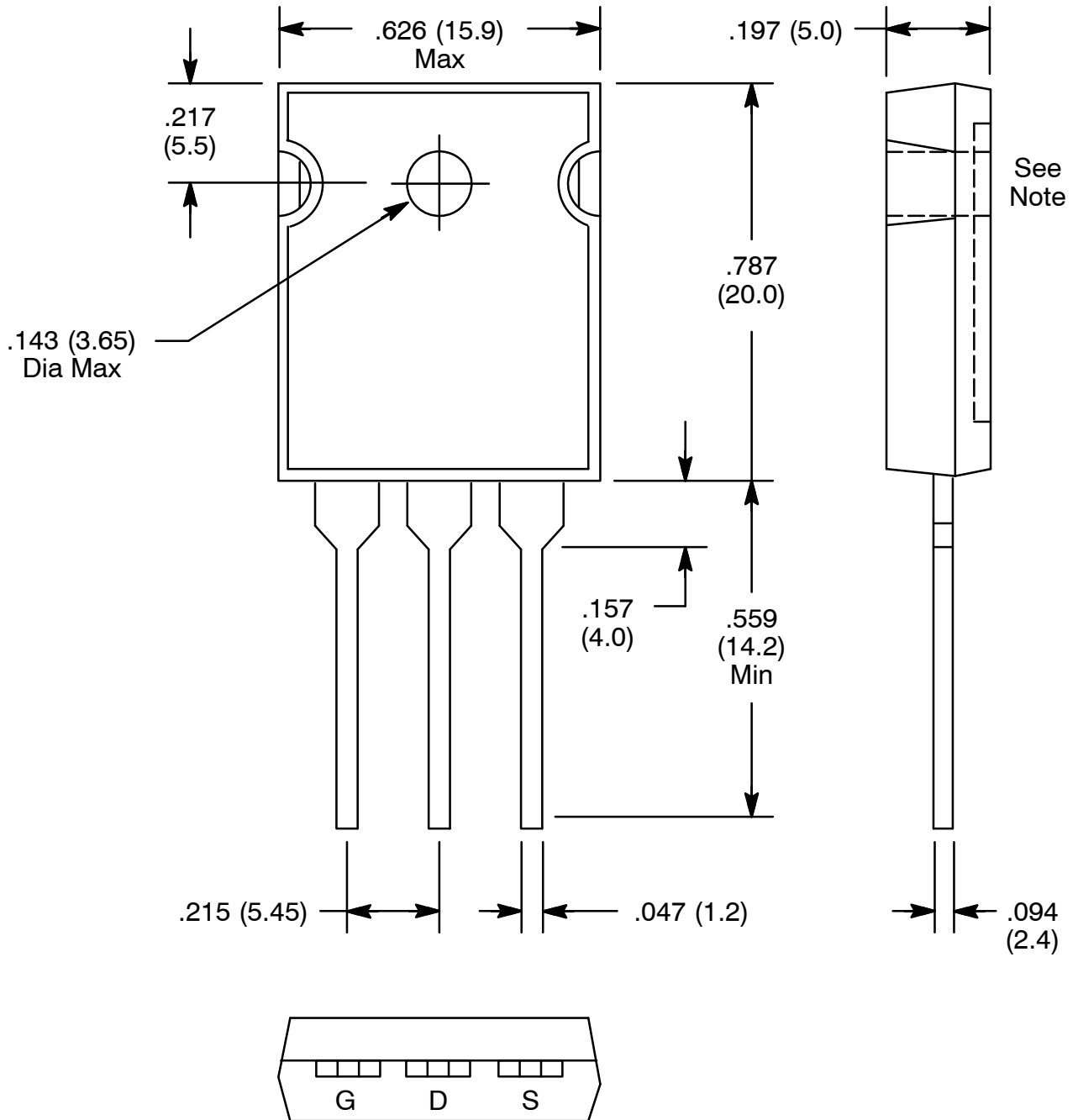
Source-Drain Ratings and Characteristics:

| 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} | $T_J = +25^\circ\text{C}, I_S = 59A, V_{GS} = 0V$, Note 4 | - | - | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $T_J = +25^\circ\text{C}, I_F = 59A$, $di/dt = 100A/\mu\text{s}$, 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 $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

Note 5. Calculated continuous current based on maximum allowable junction temperature.



Note: Drain connected to metal part of mounting surface.