



**NTE2900**  
**MOSFET**  
**N-Ch, Enhancement Mode**  
**High Speed Switch**

**Features:**

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Fast Switching
- Ease of Parallelizing
- Simple Drive Requirements

**Absolute Maximum Ratings:**

Continuous Drain Current ( $V_{GS} = 10V$ ),  $I_D$

|                            |      |
|----------------------------|------|
| $T_C = +25^\circ C$ .....  | 14A  |
| $T_C = +100^\circ C$ ..... | 8.5A |

Pulsed Drain Current (Note 1),  $I_{DM}$  .....

56A

Power Dissipation ( $T_C = +25^\circ C$ ),  $P_D$  .....

125W

Derate Linearly Above  $25^\circ C$  .....

1.0W/ $^\circ C$

Gate-to-Source Voltage,  $V_{GS}$  .....

$\pm 20$

Single Pulse Avalanche Energy (Note 2),  $E_{AS}$  .....

550mJ

Avalanche Current (Note 1),  $I_{AR}$  .....

14A

Repetitive Avalanche Energy (Note 1),  $E_{AR}$  .....

13mJ

Peak Diode Recovery dv/dt (Note 3), dv/dt .....

4.8V/ns

Operating Junction Temperature Range,  $T_J$  .....

$-55^\circ$  to  $+175^\circ C$

Storage Temperature Range,  $T_{stg}$  .....

$-55^\circ$  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,  $R_{thJC}$  .....

1.0°C/W

Thermal Resistance, Junction-to-Ambient,  $R_{thJA}$  .....

62°C/W

Typical Thermal Resistance, Case-to-Sink (Flat, Greased Surface),  $R_{thCS}$  .....

0.5°C/W

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

Note 2.  $V_{DD} = 25V$ , starting  $T_J = +25^\circ C$ ,  $L = 4.5mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 14A$

Note 3.  $I_{SD} \leq 14A$ ,  $di/dt \leq 150A/\mu s$ ,  $V_{DD} \leq 250V$ ,  $T_J \leq +175^\circ C$

Note 4. Pulses Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

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

| Parameter                            | Symbol  | Test Conditions   | Min | Typ  | Max  | Unit                      |
|--------------------------------------|---|---|-----|------|------|---------------------------|
| Drain-to-Source Breakdown Voltage    | $V_{(\text{BR})\text{DSS}}$                           | $V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$   | 250 | —    | —    | V                         |
| Breakdown Voltage Temp. Coefficient  | $\frac{\Delta V_{(\text{BR})\text{DSS}}}{\Delta T_J}$ | Reference to $+25^\circ\text{C}$ , $I_D = 1\text{mA}$                                       | —   | 0.34 | —    | $\text{V}/^\circ\text{C}$ |
| Static Drain-to-Source On-Resistance | $R_{\text{DS}(\text{on})}$                            | $V_{\text{GS}} = 10\text{V}, I_D = 8.4\text{A}$ , Note 4                                    | —   | —    | 0.28 | $\Omega$                  |
| Gate Threshold Voltage               | $V_{\text{GS}(\text{th})}$                            | $V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$                                       | 2.0 | —    | 4.0  | V                         |
| Forward Transconductance             | $g_{\text{fs}}$                                       | $V_{\text{DS}} = 50\text{V}, I_D = 8.4\text{A}$ , Note 4                                    | 6.7 | —    | —    | mhos                      |
| Drain-to-Source Leakage Current      | $I_{\text{DSS}}$                                      | $V_{\text{DS}} = 250\text{V}, V_{\text{GS}} = 0\text{V}$                                    | —   | —    | 25   | $\mu\text{A}$             |
|                                      |   | $V_{\text{DS}} = 200\text{V}, V_{\text{GS}} = 0\text{V}, T_J = +125^\circ\text{C}$          | —   | —    | 250  | $\mu\text{A}$             |
| Gate-to-Source Forward Leakage       | $I_{\text{GSS}}$                                      | $V_{\text{GS}} = 20\text{V}$  | —   | —    | 100  | nA                        |
| Gate-to-Source Reverse Leakage       | $I_{\text{GSS}}$                                      | $V_{\text{GS}} = -20\text{V}$   | —   | —    | -100 | nA                        |
| Total Gate Charge                    | $Q_g$   | $I_D = 7.9\text{A}, V_{\text{DS}} = 200\text{V}, V_{\text{GS}} = 10\text{V}$ , Note 4       | —   | —    | 68   | nC                        |
| Gate-to-Source Charge                | $Q_{\text{gs}}$                                       |   | —   | —    | 11   | nC                        |
| Gate-to-Drain ("Miller") Charge      | $Q_{\text{gd}}$                                       |   | —   | —    | 35   | nC                        |
| Turn-On Delay Time                   | $t_{\text{d}(\text{on})}$                             | $V_{\text{DD}} = 125\text{V}, I_D = 7.9\text{A}, R_G = 9.1\Omega, R_D = 8.7\Omega$ , Note 4 | —   | 11   | —    | ns                        |
| Rise Time                            | $t_r$   |   | —   | 24   | —    | ns                        |
| Turn-Off Delay Time                  | $t_{\text{d}(\text{off})}$                            |   | —   | 53   | —    | ns                        |
| Fall Time                            | $t_f$   |   | —   | 49   | —    | ns                        |
| Internal Drain Inductance            | $L_D$   | Between lead, .250in. (6.0) mm from package and center of die contact                       | —   | 4.5  | —    | nH                        |
| Internal Source Inductance           | $L_S$   |   | —   | 7.5  | —    | nH                        |
| Input Capacitance                    | $C_{\text{iss}}$                                      | $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 25\text{V}, f = 1\text{MHz}$                    | —   | 1300 | —    | pF                        |
| Output Capacitance                   | $C_{\text{oss}}$                                      |   | —   | 330  | —    | pF                        |
| Reverse Transfer Capacitance         | $C_{\text{rss}}$                                      |   | —   | 85   | —    | pF                        |

**Source-Drain Ratings and Characteristics:**

| Parameter                              | Symbol          | Test Conditions   | Min | Typ | Max | Unit          |
|--|-----------------|---|-----|-----|-----|---------------|
| Continuous Source Current (Body Diode) | $I_S$           |   | —   | —   | 14  | A             |
| Pulsed Source Current (Body Diode)     | $I_{\text{SM}}$ | Note 1  | —   | —   | 56  | A             |
| Diode Forward Voltage                  | $V_{\text{SD}}$ | $T_J = +25^\circ\text{C}, I_S = 14\text{A}, V_{\text{GS}} = 0\text{V}$ , Note 4           | —   | —   | 1.8 | V             |
| Reverse Recovery Time                  | $t_{\text{rr}}$ | $T_J = +25^\circ\text{C}, I_F = 7.9\text{A}$ , $dI/dt = 100\text{A}/\mu\text{s}$ , Note 4 | —   | 250 | 500 | ns            |
| Reverse Recovery Charge                | $Q_{\text{rr}}$ |   | —   | 2.3 | 4.6 | $\mu\text{C}$ |
| Forward Turn-On Time                   | $t_{\text{on}}$ | Intrinsic turn-on time is negligible (turn-on is dominated by $L_S+L_D$ )                 |     |     |     |               |

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

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

