

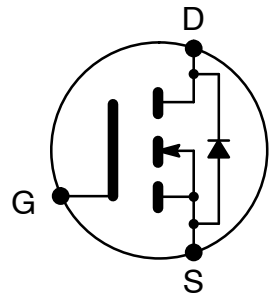


ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089
<http://www.nteinc.com>

NTE2933 MOSFET N-Channel, Enhancement Mode High Speed Switch TO3PML Type Package

Features:

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower $R_{DS(on)}$: $0.437 \leq$ Typ
- Lower Leakage Current: 10° A (Max) @ $V_{DS} = 400V$



Absolute Maximum Ratings:

| | |
|--|----------------------------------|
| Drain-to-Source Voltage, V_{DSS} | 400V |
| Drain Current, I_D | |
| Continuous | |
| $T_C = +25^{\circ}C$ | 8A |
| $T_C = +100^{\circ}C$ | 5.1A |
| Pulsed (Note 1) | 44A |
| Total Power Dissipation ($T_C = +25^{\circ}C$), P_D | 85W |
| Derate Above $25^{\circ}C$ | 0.68W/ $^{\circ}C$ |
| Gate-Source Voltage, V_{GS} | $\pm 30V$ |
| Single Pulsed Avalanche Energy (Note 2), E_{AS} | 549mJ |
| Avalanche Current (Note 1), I_{AR} | 8A |
| Repetitive Avalanche Energy (Note 1), E_{AR} | 8.5mJ |
| Peak Diode Recovery dv/dt (Note 3), dv/dt | 4.0V/ns |
| Operating Junction Temperature Range, T_J | -55° to $+150^{\circ}C$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^{\circ}C$ |
| Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L | $+300^{\circ}C$ |
| Thermal Resistance, Junction-to-Case, R_{thJC} | 1.46 $^{\circ}C/W$ |
| Thermal Resistance, Junction-to-Ambient, R_{thJA} | 40 $^{\circ}C/W$ |

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. $L = 15mH$, $I_{AS} = 8A$, $V_{DD} = 50V$, $R_G = 27 \leq$, Starting $T_J = +25^{\circ}C$.

Note 3. $I_{SD} \leq 10A$, $di/dt \leq 170A/^\circ s$, $V_{DD} \leq V_{(BR)DSS}$, Starting $T_J = +25^\circ C$.

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|-----------------------------|--|-----|------|------|---------------------|
| Drain–Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0V, I_D = 250^\circ A$ | 400 | – | – | V |
| Breakdown Voltage Temperature Coefficient | $\pm V_{(BR)DSS} / \pm T_J$ | $I_D = 250^\circ A$ | – | 0.50 | – | V/ $^\circ\text{C}$ |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = 5V, I_D = 250^\circ A$ | 2.0 | – | 4.0 | V |
| Gate–Source Leakage Forward | I_{GSS} | $V_{GS} = 30V$ | – | – | 100 | nA |
| Gate–Source Leakage Reverse | I_{GSS} | $V_{GS} = -30V$ | – | – | -100 | nA |
| Drain–to–Source Leakage Current | I_{DSS} | $V_{DS} = 400V$ | – | – | 10 | $^\circ A$ |
| | | $V_{DS} = 320V, T_C = +150^\circ\text{C}$ | – | – | 100 | $^\circ A$ |
| Static Drain–Source ON Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 4A, \text{Note 4}$ | – | – | 0.55 | \leq |
| Forward Transconductance | g_{fs} | $V_{DS} = 50V, I_D = 4A, \text{Note 4}$ | – | 7.05 | – | mhos |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$ | – | 1180 | 1530 | pF |
| Output Capacitance | C_{oss} | | – | 175 | 205 | pF |
| Reverse Transfer Capacitance | C_{rss} | | – | 80 | 95 | pF |
| Turn–On Delay Time | $t_{d(on)}$ | $V_{DD} = 200V, I_D = 10A, R_G = 9.1\leq, \text{Note 4, Note 5}$ | – | 18 | 50 | ns |
| Rise Time | t_r | | – | 21 | 55 | ns |
| Turn–Off Delay Time | $t_{d(off)}$ | | – | 78 | 170 | ns |
| Fall Time | t_f | | – | 28 | 65 | ns |
| Total Gate Charge | Q_g | $V_{GS} = 10V, I_D = 10A, V_{DS} = 320V, \text{Note 4, Note 5}$ | – | 58 | 75 | nC |
| Gate–Source Charge | Q_{gs} | | – | 8.1 | – | nC |
| Gate–Drain (“Miller”) Charge | Q_{gd} | | – | 31.3 | – | nC |
| Source–Drain Diode Ratings and Characteristics | | | | | | |
| Continuous Source Current | I_S | (Body Diode) | – | – | 8 | A |
| Pulse Source Current | I_{SM} | (Body Diode) Note 1 | – | – | 44 | A |
| Diode Forward Voltage | V_{SD} | $T_J = +25^\circ\text{C}, I_S = 8A, V_{GS} = 0V, \text{Note 4}$ | – | – | 1.5 | V |
| Reverse Recovery Time | t_{rr} | $T_J = +25^\circ\text{C}, I_F = 10A, di_F/dt = 100A/^\circ s, \text{Note 4}$ | – | 315 | – | ns |
| Reverse Recovery Charge | Q_{rr} | | – | 2.84 | – | $^\circ\text{C}$ |

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 4. Pulse Test: Pulse Width = 250 $^\circ$ s, Duty Cycle \leq 2%.

Note 5. Essentially independent of operating temperature.

