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## NTE2932 MOSFET N-Channel, Enhancement Mode High Speed Switch

**Features:**

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower  $R_{DS(on)}$ : 0.071Ω Typ
- Lower Leakage Current: 10μA (Max) @  $V_{DS} = 200V$

**Absolute Maximum Ratings:**

|  |                               |
|--|-------------------------------|
| Drain-to-Source Voltage, $V_{DSS}$ .....                                       | 200V                          |
| Drain Current, $I_D$   |                               |
| Continuous   |                               |
| $T_C = +25^\circ C$ .....  | 21.3A                         |
| $T_C = +100^\circ C$ .....   | 13.5A                         |
| Pulsed (Note 1) .....  | 130A                          |
| Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....                   | 90W                           |
| Derate Above $25^\circ C$ .....  | 0.72W/ $^\circ C$             |
| Gate-Source Voltage, $V_{GS}$ .....  | $\pm 30V$                     |
| Single Pulsed Avalanche Energy (Note 2), $E_{AS}$ .....                        | 605mJ                         |
| Avalanche Current (Note 1), $I_{AR}$ .....                                     | 21.3A                         |
| Repetitive Avalanche Energy (Note 1), $E_{AR}$ .....                           | 9mJ                           |
| Peak Diode Recovery $dv/dt$ (Note 3), $dv/dt$ .....                            | 5.0V/ns                       |
| Operating Junction Temperature Range, $T_J$ .....                              | $-55^\circ$ to $+150^\circ C$ |
| Storage Temperature Range, $T_{stg}$ .....                                     | $-55^\circ$ to $+150^\circ C$ |
| Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), $T_L$ ..... | $+300^\circ C$                |
| Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....                         | 1.38 $^\circ C/W$             |
| Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....                      | 40 $^\circ C/W$               |

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.  
 Note 2.  $L = 2mH$ ,  $I_{AS} = 21.3A$ ,  $V_{DD} = 50V$ ,  $R_G = 27\Omega$ , Starting  $T_J = +25^\circ C$ .  
 Note 3.  $I_{SD} \leq 32A$ ,  $di/dt \leq 320A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ , 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                        | $BV_{DSS}$                        | $V_{GS} = 0V, I_D = 250\mu A$   | 200 | –     | –     | V        |
| Breakdown Voltage Temperature Coefficient             | $\Delta V_{(BR)DSS} / \Delta T_J$ | $I_D = 250\mu A$  | –   | 0.24  | –     | V/°C     |
| Gate Threshold Voltage                                | $V_{GS(th)}$                      | $V_{DS} = 5V, I_D = 250\mu A$   | 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                       | $I_{DSS}$                         | $V_{DS} = 200V$   | –   | –     | 10    | $\mu A$  |
|   |                                   | $V_{DS} = 160V, T_C = +150^\circ\text{C}$                                 | –   | –     | 100   | $\mu A$  |
| Static Drain–Source ON Resistance                     | $R_{DS(on)}$                      | $V_{GS} = 10V, I_D = 10.65A, \text{Note 4}$                               | –   | –     | 0.085 | $\Omega$ |
| Forward Transconductance                              | $g_{fs}$                          | $V_{DS} = 40V, I_D = 10.65A, \text{Note 4}$                               | –   | 16.64 | –     | mhos     |
| Input Capacitance                                     | $C_{iss}$                         | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$                              | –   | 2300  | 3000  | pF       |
| Output Capacitance                                    | $C_{oss}$                         |   | –   | 410   | 475   | pF       |
| Reverse Transfer Capacitance                          | $C_{rss}$                         |   | –   | 200   | 230   | pF       |
| Turn–On Delay Time                                    | $t_{d(on)}$                       | $V_{DD} = 100V, I_D = 32A, R_G = 6.2\Omega, \text{Note 4, Note 5}$        | –   | 21    | 50    | ns       |
| Rise Time   | $t_r$                             |   | –   | 20    | 50    | ns       |
| Turn–Off Delay Time                                   | $t_{d(off)}$                      |   | –   | 77    | 160   | ns       |
| Fall Time   | $t_f$                             |   | –   | 38    | 90    | ns       |
| Total Gate Charge                                     | $Q_g$                             | $V_{GS} = 10V, I_D = 32A, V_{DS} = 160V, \text{Note 4, Note 5}$           | –   | 95    | 123   | nC       |
| Gate–Source Charge                                    | $Q_{gs}$                          |   | –   | 18    | –     | nC       |
| Gate–Drain (“Miller”) Charge                          | $Q_{gd}$                          |   | –   | 45.3  | –     | nC       |
| <b>Source–Drain Diode Ratings and Characteristics</b> |                                   |   |     |       |       |          |
| Continuous Source Current                             | $I_S$                             | (Body Diode)  | –   | –     | 21.3  | A        |
| Pulse Source Current                                  | $I_{SM}$                          | (Body Diode) Note 1   | –   | –     | 130   | A        |
| Diode Forward Voltage                                 | $V_{SD}$                          | $T_J = +25^\circ\text{C}, I_S = 21.3A, V_{GS} = 0V, \text{Note 4}$        | –   | –     | 1.5   | V        |
| Reverse Recovery Time                                 | $t_{rr}$                          | $T_J = +25^\circ\text{C}, I_F = 32A, di_F/dt = 100A/\mu s, \text{Note 4}$ | –   | 203   | –     | ns       |
| Reverse Recovery Charge                               | $Q_{rr}$                          |   | –   | 1.52  | –     | $\mu C$  |

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

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

Note 5. Essentially independent of operating temperature.

