

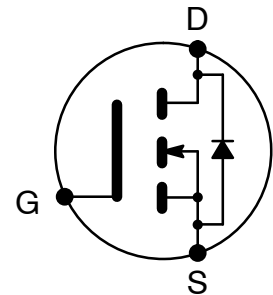


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NTE2984 Logic Level MOSFET N-Channel, Enhancement Mode High Speed Switch TO220 Type Package

Features:

- Dynamic dv/dt Rating
- Logic Level Gate Drive
- R_{DS(on)} Specified at V_{GS} = 4V & 5V
- +175°C Operating Temperature
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



Absolute Maximum Ratings:

| | |
|--|---------------------|
| Drain Current, I _D | |
| Continuous (V _{GS} = 5V) | |
| T _C = +25°C | 17A |
| T _C = +100°C | 12A |
| Pulsed (Note 1) | 68A |
| Total Power Dissipation (T _C = +25°C), P _D | 60W |
| Derate Above 25°C | 0.40W/°C |
| Gate-Source Voltage, V _{GS} | ±10V |
| Single Pulsed Avalanche Energy (Note 2), E _{AS} | 110mJ |
| Peak Diode Recovery dv/dt (Note 3), dv/dt | 4.5V/ns |
| Operating Junction Temperature Range, T _J | -55° to +175°C |
| Storage Temperature Range, T _{stg} | -55° to +175°C |
| Maximum Lead Temperature (During Soldering, 1.6mm from case, 10sec), T _L | +300°C |
| Mounting Torque, 6-32 or M3 Screw | 10 lbf•in (1.1 N•m) |
| Thermal Resistance: | |
| Maximum Junction-to-Case, R _{thJC} | 2.5K/W |
| Typical Case-to-Sink (Mounting surface flat, smooth, and greased), R _{thCS} | 0.5K/W |
| Maximum Junction-to-Ambient (Free Air Operation), R _{thJA} | 62K/W |

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

Note 2. L = 444≤H, V_{DD} = 25V, R_G = 25≥, Starting T_J = +175°C.

Note 3. $I_{SD} \leq 17A$, $di/dt \leq 140A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq +175^\circ C$.

Rev. 10-13

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} | $V_{GS} = 0V, I_D = 250\leq A$ | 60 | – | – | V |
| Breakdown Voltage Temperature Coefficient | $\pm V_{(BR)DSS} / \pm T_J$ | Reference to $+25^\circ\text{C}$, $I_D = 1\text{mA}$ | – | 0.06 | – | $V/^\circ\text{C}$ |
| Static Drain–Source ON Resistance | $R_{DS(on)}$ | $V_{GS} = 5V, I_D = 10A$, Note 4 | – | – | 0.10 | \geq |
| | | $V_{GS} = 5V, I_D = 8.5A$, Note 4 | – | – | 0.14 | \geq |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\leq A$ | 1.0 | – | 2.0 | V |
| Forward Transconductance | g_{fs} | $V_{DS} \geq 25V, I_D = 10A$, Note 4 | 7.3 | – | – | mhos |
| Drain–to–Source Leakage Current | I_{DSS} | $V_{DS} = 60V, V_{GS} = 0$ | – | – | 25 | $\leq A$ |
| | | $V_{DS} = 48V, V_{GS} = 0V, T_C = +150^\circ\text{C}$ | – | – | 250 | $\leq A$ |
| Gate–Source Leakage Forward | I_{GSS} | $V_{GS} = 10V$ | – | – | 100 | nA |
| Gate–Source Leakage Reverse | I_{GSS} | $V_{GS} = -10V$ | – | – | -100 | nA |
| Total Gate Charge | Q_g | $V_{GS} = 5V, I_D = 17A, V_{DS} = 48V$ | – | – | 18 | nC |
| Gate–Source Charge | Q_{gs} | | – | – | 4.5 | nC |
| Gate–Drain (“Miller”) Charge | Q_{gd} | | – | – | 12 | nC |
| Turn–On Delay Time | $t_{d(on)}$ | $V_{DD} = 30V, I_D = 17A, R_G = 9.0\geq, R_D = 1.7\geq$ | – | 11 | – | ns |
| Rise Time | t_r | | – | 110 | – | ns |
| Turn–Off Delay Time | $t_{d(off)}$ | | – | 23 | – | ns |
| Fall Time | t_f | | – | 41 | – | ns |
| Internal Drain Inductance | L_D | Between lead, 6mm (0.25”) from package and center of die contact | – | 4.5 | – | nH |
| Internal Source Inductance | L_S | | – | 7.5 | – | nH |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$ | – | 870 | – | pF |
| Output Capacitance | C_{oss} | | – | 360 | – | pF |
| Reverse Transfer Capacitance | C_{rss} | | – | 53 | – | pF |
| Source–Drain Diode Ratings and Characteristics | | | | | | |
| Continuous Source Current | I_S | (Body Diode) | – | – | 17 | A |
| Pulse Source Current | I_{SM} | (Body Diode) Note 1 | – | – | 68 | A |
| Diode Forward Voltage | V_{SD} | $T_J = +25^\circ\text{C}, I_S = 17A, V_{GS} = 0V$, Note 4 | – | – | 1.5 | V |
| Reverse Recovery Time | t_{rr} | $T_J = +25^\circ\text{C}, I_F = 17A, di/dt = 100A/\leq s$, Note 4 | – | 110 | 260 | ns |
| Reverse Recovery Charge | Q_{rr} | | – | 0.49 | 1.5 | $\leq C$ |
| Forward Turn–On Time | t_{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 Test: Pulse Width $\leq 300\leq s$, Duty Cycle $\leq 2\%$.

