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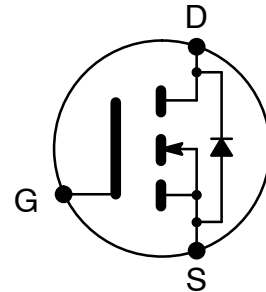
NTE2382 MOSFET N-Channel Enhancement Mode, High Speed Switch (Compl to NTE2383)

Description:

The NTE2382 is a MOS power N-Channel FET in a TO220 type package designed for high voltage, high speed power switching applications such as switching regulators, converters, solenoid, and relay drivers.

Features:

- Lower $R_{DS(ON)}$
- Improved Inductive Ruggedness
- Fast Switching Times
- Rugged Polysilicon Gate Cell Structure
- Lower Input Capacitance
- Extended Safe Operating Area
- Improved High Temperature Reliability



Absolute Maximim Ratings:

| | |
|--|-------------------------------|
| Drain-Source Voltage (Note 1), V_{DSS} | 100V |
| Drain-Gate Voltage ($R_{GS} = 1M\pm$, Note 1), V_{DGR} | 100V |
| Gate-Source Voltage, V_{GS} | $\pm 20V$ |
| Continuous Drain Current, I_D | |
| $T_C = +25^\circ C$ | 9.2A |
| $T_C = +100^\circ C$ | 6.5A |
| Drain Current, Pulsed (Note 3), I_{DM} | 37A |
| Gate Current, Pulsed, I_{GM} | $\pm 1.5A$ |
| Single Pulsed Avalanche Energy (Note 4), E_{AS} | 36mJ |
| Avalanche Current, I_{AS} | 9.2A |
| Total Power Dissipation ($T_C = +25^\circ C$), P_D | 50W |
| Derate Above $25^\circ C$ | 0.4W/ $^\circ C$ |
| Operating Junction Temperature Range, T_{opr} | -55° to $+150^\circ C$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^\circ C$ |
| Thermal Resistance, Junction-to-Ambient, R_{thJA} | 62.5 $^\circ C/W$ |
| Thermal Resistance, Junction-to-Case, R_{thJC} | 2.5 $^\circ C/W$ |
| Thermal Resistance, Case-to-Sink (Note 5), R_{thCS} | 0.5 $^\circ C/W$ |
| Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L | $+300^\circ C$ |

Note 1. $T_J = +25^\circ$ to $+150^\circ C$

Note 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 3. Repetitive rating: Pulse width limited by max. junction temperature.

Note 4. $L = 64\text{mH}$, $V_{DD} = 25\text{V}$, $R_G = 25\pm$, Starting $T_J = +25^\circ\text{C}$.

Note 5. Mounting surface flat, smooth, and greased.

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---------------|--|-----|-----|------|-------|
| Drain–Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0$, $I_D = 0.25\text{mA}$ | 100 | – | – | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 100\text{V}$, $V_{GS} = 0$ | – | – | 0.25 | mA |
| | | $V_{DS} = 80\text{V}$, $V_{GS} = 0$, $T_J = +125^\circ\text{C}$ | – | – | 1.0 | mA |
| Gate–Body Leakage Current, Forward | I_{GSS} | $V_{GS} = 20\text{V}$ | – | – | 100 | nA |
| Gate–Body Leakage Current, Reverse | I_{GSS} | $V_{GS} = 20\text{V}$ | – | – | –100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 0.25\text{mA}$ | 2.0 | – | 4.0 | V |
| Static Drain–Source On–Resistance | $r_{DS(on)}$ | $V_{GS} = 10\text{V}$, $I_D = 4.6\text{A}$, Note 2 | – | – | 0.27 | \pm |
| Forward Transconductance | g_{FS} | $V_{DS} \geq 50\text{V}$, $I_D = 4.6\text{A}$, Note 2 | 2.7 | 4.1 | – | mhos |
| Input Capacitance | C_{iss} | $V_{DS} = 25\text{V}$, $V_{GS} = 0$, $f = 1\text{MHz}$ | – | 400 | – | pF |
| Output Capacitance | C_{oss} | | – | 130 | – | pF |
| Reverse Transfer Capacitance | C_{rss} | | – | 40 | – | pF |
| Turn–On Delay Time | $t_{d(on)}$ | $V_{DD} = 50\text{V}$, $I_D = 9.2\text{A}$, $Z_O = 18\pm$, MOSFET switching times are essentially independent of operating temperature | – | 8.8 | 13.0 | ns |
| Rise Time | t_r | | – | 30 | 45 | ns |
| Turn–Off Delay Time | $t_{d(off)}$ | | – | 19 | 27 | ns |
| Fall Time | t_f | | – | 20 | 30 | ns |
| Total Gate Charge | Q_g | $V_{GS} = 10\text{V}$, $V_{DS} = 80\text{V}$, $I_D = 9.2\text{A}$, Gate charge is essentially independent of operating temperature | – | – | 23 | nC |
| Gate–Source Charge | Q_{gs} | | – | 4.6 | – | nC |
| Gate–Drain (“Miller”) Charge | Q_{gd} | | – | 9.1 | – | ns |
| Source–Drain Diode Ratings and Characteristics | | | | | | |
| Continuous Source Current (Body Diode) | I_S | | – | – | 9.2 | A |
| Pulse Source Current (Body Diode) | I_{SM} | Note 3 | – | – | 37 | A |
| Diode Forward Voltage | V_{SD} | $T_J = +25^\circ\text{C}$, $I_S = 9.2\text{A}$, $V_{GS} = 0\text{V}$, Note 2 | – | – | 2.5 | V |
| Reverse Recovery Time | t_{rr} | $T_J = +25^\circ\text{C}$, $I_F = 9.2\text{A}$, $dI_F/dt = 100\text{A}/\mu\text{s}$ | – | 110 | 240 | ns |

Note 2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 3. Repetitive rating: Pulse width limited by max. junction temperature.

