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## NTE2375 MOSFET N-Ch, Enhancement Mode High Speed Switch

**Features:**

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Isolated Central Mounting Hole
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements

**Absolute Maximum Ratings:**

|  |                               |
|--|-------------------------------|
| Continuous Drain Current ( $V_{GS} = 10V$ ), $I_D$                                 |                               |
| $T_C = +25^\circ C$ .....  | 41A                           |
| $T_C = +100^\circ C$ .....   | 29A                           |
| Pulsed Drain Current (Note 1), $I_{DM}$ .....                                      | 120A                          |
| Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....                             | 230W                          |
| Derate Linearly Above $25^\circ C$ .....   | 1.5W/ $^\circ C$              |
| Gate-to-Source Voltage, $V_{GS}$ .....   | $\pm 20V$                     |
| Single Pulse Avalanche Energy (Note 2), $E_{AS}$ .....                             | 830mJ                         |
| Avalanche Current (Note 1), $I_{AR}$ .....   | 41A                           |
| Repetitive Avalanche Energy (Note 1), $E_{AR}$ .....                               | 19mJ                          |
| Peak Diode Recovery dv/dt (Note 3), dv/dt .....                                    | 5.5V/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, $R_{thJC}$ .....                             | 0.65 $^\circ C/W$             |
| Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....                          | 40 $^\circ C/W$               |
| Typical Thermal Resistance, Case-to-Sink (Flat, Greased Surface), $R_{thCS}$ ..... | 0.24 $^\circ C/W$             |

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

Note 2.  $V_{DD} = 25V$ , starting  $T_J = +25^\circ C$ ,  $L = 740\mu H$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 41A$

Note 3.  $I_{SD} \leq 41A$ , di/dt  $\leq 300A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq +175^\circ C$

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

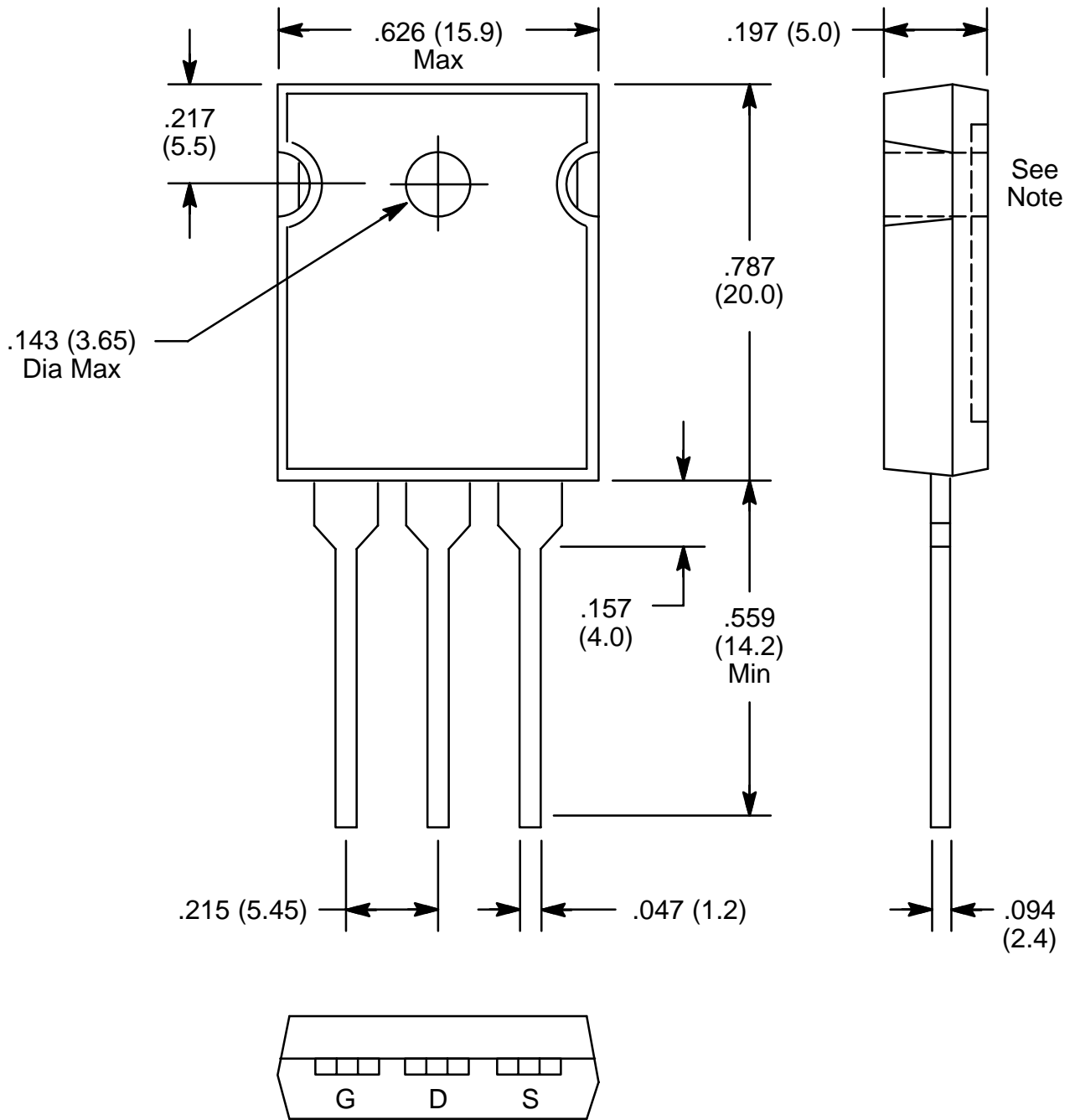
| Parameter                            | Symbol                                  | Test Conditions  | Min | Typ  | Max   | Unit                |
|--------------------------------------|---|--|-----|------|-------|---------------------|
| Drain-to-Source Breakdown Voltage    | $V_{(BR)DSS}$                           | $V_{GS} = 0V, I_D = 250\mu A$  | 100 | –    | –     | V                   |
| Breakdown Voltage Temp. Coefficient  | $\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$ | Reference to $+25^\circ\text{C}$ , $I_D = 1\text{mA}$                      | –   | 0.14 | –     | V/ $^\circ\text{C}$ |
| Static Drain-to-Source On-Resistance | $R_{DS(on)}$                            | $V_{GS} = 10V, I_D = 25A$ , Note 4   | –   | –    | 0.055 | $\Omega$            |
| Gate Threshold Voltage               | $V_{GS(th)}$                            | $V_{DS} = V_{GS}, I_D = 250\mu A$  | 2.0 | –    | 4.0   | V                   |
| Forward Transconductance             | $g_{fs}$                                | $V_{DS} = 25V, I_D = 25A$ , Note 4   | 13  | –    | –     | mhos                |
| Drain-to-Source Leakage Current      | $I_{DSS}$                               | $V_{DS} = 100V, V_{GS} = 0V$   | –   | –    | 25    | $\mu A$             |
|                                      |   | $V_{DS} = 80V, V_{GS} = 0V, T_J = +150^\circ\text{C}$                      | –   | –    | 250   | $\mu A$             |
| Gate-to-Source Forward Leakage       | $I_{GSS}$                               | $V_{GS} = 20V$   | –   | –    | 100   | nA                  |
| Gate-to-Source Reverse Leakage       | $I_{GSS}$                               | $V_{GS} = -20V$  | –   | –    | -100  | nA                  |
| Total Gate Charge                    | $Q_g$                                   | $I_D = 41A, V_{DS} = 80V, V_{GS} = 10V$ ,<br>Note 4                        | –   | –    | 140   | nC                  |
| Gate-to-Source Charge                | $Q_{gs}$                                |  | –   | –    | 29    | nC                  |
| Gate-to-Drain ("Miller") Charge      | $Q_{gd}$                                |  | –   | –    | 68    | nC                  |
| Turn-On Delay Time                   | $t_{d(on)}$                             | $V_{DD} = 50V, I_D = 41A, R_G = 6.2\Omega$ ,<br>$R_D = 1.2\Omega$ , Note 4 | –   | 16   | –     | ns                  |
| Rise Time                            | $t_r$                                   |  | –   | 120  | –     | ns                  |
| Turn-Off Delay Time                  | $t_{d(off)}$                            |  | –   | 60   | –     | ns                  |
| Fall Time                            | $t_f$                                   |  | –   | 81   | –     | ns                  |
| Internal Drain Inductance            | $L_D$                                   | Between lead, .250in. (6.0) mm from<br>package and center of die contact   | –   | 5.0  | –     | nH                  |
| Internal Source Inductance           | $L_S$                                   |  | –   | 13.0 | –     | nH                  |
| Input Capacitance                    | $C_{iss}$                               | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$                               | –   | 2800 | –     | pF                  |
| Output Capacitance                   | $C_{oss}$                               |  | –   | 1100 | –     | pF                  |
| Reverse Transfer Capacitance         | $C_{rss}$                               |  | –   | 280  | –     | pF                  |

**Source-Drain Ratings and Characteristics:**

| Parameter                              | Symbol   | Test Conditions   | Min | Typ | Max | Unit    |
|--|----------|---|-----|-----|-----|---------|
| Continuous Source Current (Body Diode) | $I_S$    |   | –   | –   | 41  | A       |
| Pulsed Source Current (Body Diode)     | $I_{SM}$ | Note 1  | –   | –   | 160 | A       |
| Diode Forward Voltage                  | $V_{SD}$ | $T_J = +25^\circ\text{C}, I_S = 41A, V_{GS} = 0V$ ,<br>Note 4             | –   | –   | 2.5 | V       |
| Reverse Recovery Time                  | $t_{rr}$ | $T_J = +25^\circ\text{C}, I_F = 41A$ ,<br>$di/dt = 100A/\mu s$ , Note 4   | –   | 220 | 330 | ns      |
| Reverse Recovery Charge                | $Q_{rr}$ |   | –   | 1.9 | 2.9 | $\mu C$ |
| 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 width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .



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**Note:** Drain connected to metal part of mounting surface.