

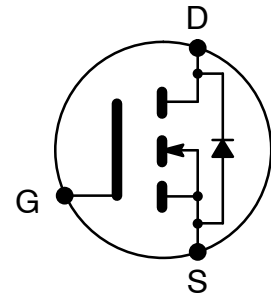


ELECTRONICS, INC.  
 44 FARRAND STREET  
 BLOOMFIELD, NJ 07003  
 (973) 748-5089  
<http://www.nteinc.com>

## NTE2924 MOSFET N-Ch, Enhancement Mode High Speed Switch TO247 Type Package

**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 ( $V_{GS} = 10V$ ), $I_D$                                 |                               |
| $T_C = +25^\circ C$ .....  | 6.8A                          |
| $T_C = +100^\circ C$ .....   | 4.3A                          |
| Pulsed Drain Current (Note 1), $I_{DM}$ .....                                      | 27A                           |
| Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....                             | 150W                          |
| Derate Linearly Above $25^\circ C$ .....   | 1.2W/ $^\circ C$              |
| Gate-to-Source Voltage, $V_{GS}$ .....   | $\pm 20$                      |
| Single Pulse Avalanche Energy (Note 2), $E_{AS}$ .....                             | 410mJ                         |
| Avalanche Current (Note 1), $I_{AR}$ .....   | 6.8A                          |
| Repetitive Avalanche Energy (Note 1), $E_{AR}$ .....                               | 15mJ                          |
| Peak Diode Recovery dv/dt (Note 3), dv/dt .....                                    | 3V/ns                         |
| Operating Junction Temperature Range, $T_J$ .....                                  | $-55^\circ$ to $+150^\circ C$ |
| Storage Temperature Range, $T_{stg}$ .....   | $-55^\circ$ to $+150^\circ C$ |
| 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, $R_{thJC}$ .....                             | 0.83 $^\circ C/W$             |
| 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.  $V_{DD} = 50V$ , starting  $T_J = +25^\circ C$ ,  $L = 16mH$ ,  $R_G = 25\pm$ ,  $I_{AS} = 6.8A$

Note 3.  $I_{SD} \leq 6.8A$ ,  $di/dt \leq 80A/\mu s$ ,  $V_{DD} \leq 600V$ ,  $T_J \leq +150^\circ C$

Note 4. Pules Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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

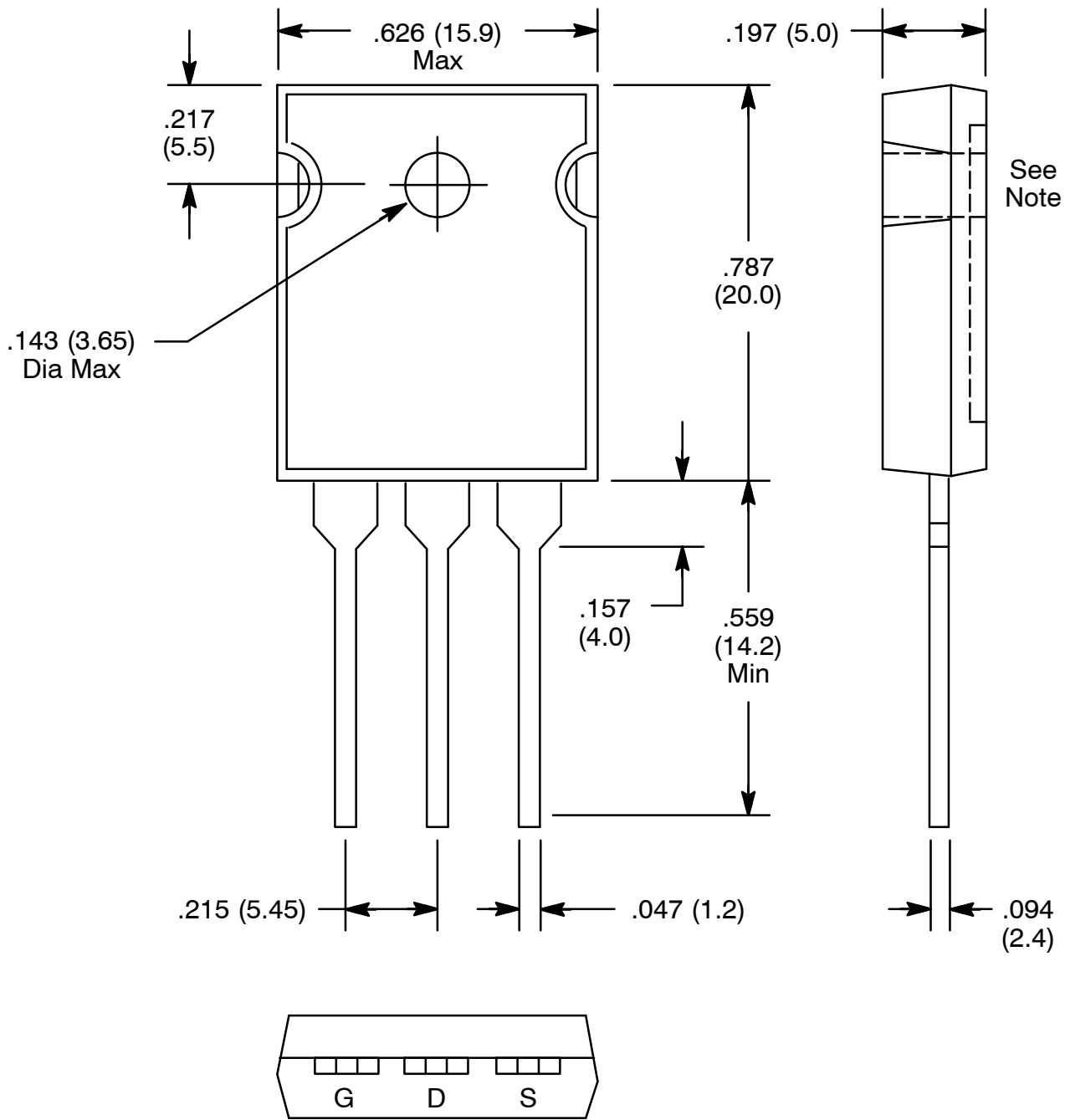
| Parameter                            | Symbol                    | Test Conditions  | Min | Typ  | Max  | Unit               |
|--------------------------------------|---------------------------|--|-----|------|------|--------------------|
| Drain-to-Source Breakdown Voltage    | $V_{(BR)DSS}$             | $V_{GS} = 0V, I_D = 250\leq A$   | 600 | -    | -    | V                  |
| Breakdown Voltage Temp. Coefficient  | $\frac{V_{(BR)DSS}}{T_J}$ | Reference to $+25^\circ\text{C}$ , $I_D = 1\text{mA}$                    | -   | 0.70 | -    | $V/^\circ\text{C}$ |
| Static Drain-to-Source On-Resistance | $R_{DS(on)}$              | $V_{GS} = 10V, I_D = 4.1A$ , Note 4                                      | -   | -    | 1.2  | $\pm$              |
| Gate Threshold Voltage               | $V_{GS(th)}$              | $V_{DS} = V_{GS}, I_D = 250\leq A$                                       | 2.0 | -    | 4.0  | V                  |
| Forward Transconductance             | $g_{fs}$                  | $V_{DS} = 100V, I_D = 4.1A$ , Note 4                                     | 4.9 | -    | -    | mhos               |
| Drain-to-Source Leakage Current      | $I_{DSS}$                 | $V_{DS} = 600V, V_{GS} = 0V$   | -   | -    | 100  | $\leq A$           |
|                                      |                           | $V_{DS} = 480V, V_{GS} = 0V, T_J = +125^\circ\text{C}$                   | -   | -    | 500  | $\leq A$           |
| 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                    | $Q_g$                     | $I_D = 6.2A, V_{DS} = 360V, V_{GS} = 10V$ ,<br>Note 4                    | -   | -    | 60   | nC                 |
| Gate-to-Source Charge                | $Q_{gs}$                  |  | -   | -    | 8.3  | nC                 |
| Gate-to-Drain ("Miller") Charge      | $Q_{gd}$                  |  | -   | -    | 30   | nC                 |
| Turn-On Delay Time                   | $t_{d(on)}$               | $V_{DD} = 300V, I_D = 6.2A, R_G = 9.1\pm$ ,<br>$R_D = 47\pm$ , Note 4    | -   | 13   | -    | ns                 |
| Rise Time                            | $t_r$                     |  | -   | 18   | -    | ns                 |
| Turn-Off Delay Time                  | $t_{d(off)}$              |  | -   | 55   | -    | ns                 |
| Fall Time                            | $t_f$                     |  | -   | 20   | -    | 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   | -    | nH                 |
| Input Capacitance                    | $C_{iss}$                 | $V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$                             | -   | 1300 | -    | pF                 |
| Output Capacitance                   | $C_{oss}$                 |  | -   | 160  | -    | pF                 |
| Reverse Transfer Capacitance         | $C_{riss}$                |  | -   | 30   | -    | pF                 |

**Source-Drain Ratings and Characteristics:**

| Parameter                              | Symbol   | Test Conditions   | Min | Typ | Max | Unit     |
|--|----------|---|-----|-----|-----|----------|
| Continuous Source Current (Body Diode) | $I_S$    |   | -   | -   | 6.8 | A        |
| Pulsed Source Current (Body Diode)     | $I_{SM}$ | Note 1  | -   | -   | 27  | A        |
| Diode Forward Voltage                  | $V_{SD}$ | $T_J = +25^\circ\text{C}, I_S = 6.8A, V_{GS} = 0V$ ,<br>Note 4            | -   | -   | 1.5 | V        |
| Reverse Recovery Time                  | $t_{rr}$ | $T_J = +25^\circ\text{C}, I_F = 6.2A$ ,<br>$di/dt = 100A/\leq s$ , Note 4 | -   | 450 | 940 | ns       |
| Reverse Recovery Charge                | $Q_{rr}$ |   | -   | 3.8 | 7.9 | $\leq C$ |
| 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 width  $\leq 300\leq s$ ; duty cycle  $\leq 2\%$ .



TO247

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

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