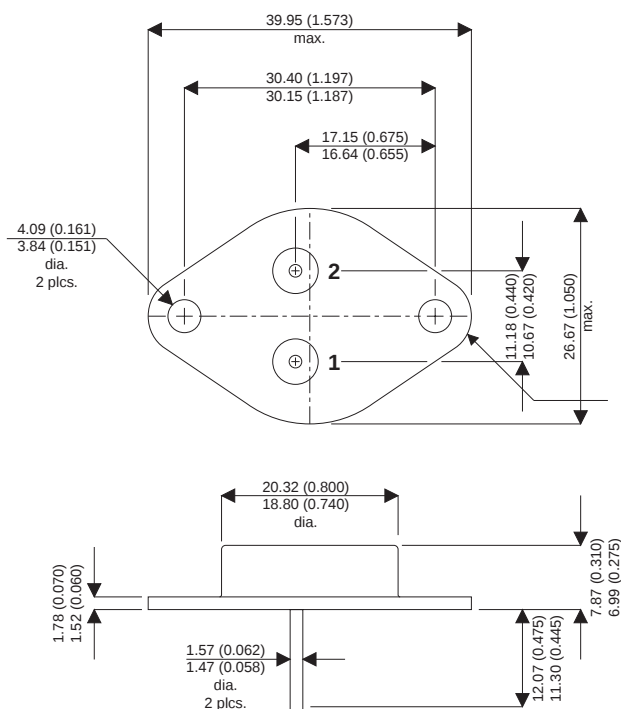


**MECHANICAL DATA**

Dimensions in mm (inches)


**TO-3 Metal Package**

Pin 1 – Gate

Pin 2 – Source

Case – Drain

**N-CHANNEL  
POWER MOSFET**
 $V_{DSS}$  **100V**
 $I_{D(cont)}$  **38A**
 $R_{DS(on)}$  **0.055 $\Omega$** 
**FEATURES**

- HERMETICALLY SEALED TO-3 METAL PACKAGE
- SIMPLE DRIVE REQUIREMENTS
- SCREENING OPTIONS AVAILABLE

**ABSOLUTE MAXIMUM RATINGS** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

|                |                                                                       |                         |
|----------------|-----------------------------------------------------------------------|-------------------------|
| $V_{GS}$       | Gate – Source Voltage                                                 | $\pm 20V$               |
| $I_D$          | Continuous Drain Current ( $V_{GS} = 0$ , $T_{case} = 25^{\circ}C$ )  | 38A                     |
| $I_D$          | Continuous Drain Current ( $V_{GS} = 0$ , $T_{case} = 100^{\circ}C$ ) | 24A                     |
| $I_{DM}$       | Pulsed Drain Current <sup>1</sup>                                     | 152A                    |
| $P_D$          | Power Dissipation @ $T_{case} = 25^{\circ}C$                          | 150W                    |
|                | Linear Derating Factor                                                | 1.2W/ $^{\circ}C$       |
| $E_{AS}$       | Single Pulse Avalanche Energy <sup>2</sup>                            | 150mJ                   |
| $I_{AR}$       | Avalanche Current <sup>2</sup>                                        | 38A                     |
| $E_{AR}$       | Repetitive Avalanche Energy <sup>2</sup>                              | 15mJ                    |
| $dv/dt$        | Peak Diode Recovery <sup>3</sup>                                      | 5.5V/ns                 |
| $T_J, T_{stg}$ | Operating and Storage Temperature Range                               | -55 to +150 $^{\circ}C$ |
| $T_L$          | Lead Temperature 1.6mm (0.63") from case for 10 sec.                  | 300 $^{\circ}C$         |

**Notes**

 1) Pulse Test: Pulse Width  $\leq 300\mu s$ ,  $\delta \leq 2\%$ 

 2) @  $V_{DD} = 50V$ ,  $L \geq 160\mu H$ ,  $R_G = 25\Omega$ , Peak  $I_L = 38A$ , Starting  $T_J = 25^{\circ}C$ 

 3) @  $I_{SD} \leq 38A$ ,  $di/dt \leq 300A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J \leq 150^{\circ}C$ , Suggested  $R_G = 2.35\Omega$

**ELECTRICAL CHARACTERISTICS** ( $T_{\text{case}} = 25^{\circ}\text{C}$  unless otherwise stated)

| Parameter                            |                                                                                | Test Conditions                                                 |                                        | Min.       | Typ. | Max.  | Unit  |
|--------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------|------------|------|-------|-------|
| STATIC ELECTRICAL RATINGS            |                                                                                |                                                                 |                                        |            |      |       |       |
| BV <sub>DSS</sub>                    | Drain – Source Breakdown Voltage                                               | V <sub>GS</sub> = 0                                             | I <sub>D</sub> = 1mA                   | 100        |      |       | V     |
| ΔBV <sub>DSS</sub>                   | Temperature Coefficient of Breakdown Voltage                                   | Reference to 25°C<br>I <sub>D</sub> = 1mA                       |                                        |            | 0.13 |       | V/°C  |
| R <sub>DS(on)</sub>                  | Static Drain – Source On–State Resistance <sup>1</sup>                         | V <sub>GS</sub> = 10V                                           | I <sub>D</sub> = 24A                   |            |      | 0.055 | Ω     |
|                                      |                                                                                | V <sub>GS</sub> = 10V                                           | I <sub>D</sub> = 38A                   |            |      | 0.065 |       |
| V <sub>GS(th)</sub>                  | Gate Threshold Voltage                                                         | V <sub>DS</sub> = V <sub>GS</sub>                               | I <sub>D</sub> = 250mA                 | 2          |      | 4     | V     |
| g <sub>fs</sub>                      | Forward Transconductance <sup>1</sup>                                          | V <sub>DS</sub> ≥ 15V                                           | I <sub>DS</sub> = 24A                  | 9          |      |       | S (V) |
| I <sub>DSS</sub>                     | Zero Gate Voltage Drain Current                                                | V <sub>GS</sub> = 0                                             | V <sub>DS</sub> = 0.8BV <sub>DSS</sub> |            |      | 25    | μA    |
|                                      |                                                                                |                                                                 | T <sub>J</sub> = 125°C                 |            |      | 250   |       |
| I <sub>GSS</sub>                     | Forward Gate – Source Leakage                                                  | V <sub>GS</sub> = 20V                                           |                                        |            |      | 100   | nA    |
| I <sub>GSS</sub>                     | Reverse Gate – Source Leakage                                                  | V <sub>GS</sub> = –20V                                          |                                        |            |      | –100  |       |
| DYNAMIC CHARACTERISTICS              |                                                                                |                                                                 |                                        |            |      |       |       |
| C <sub>iss</sub>                     | Input Capacitance                                                              | V <sub>GS</sub> = 0                                             |                                        |            | 3700 |       | pF    |
| C <sub>oss</sub>                     | Output Capacitance                                                             | V <sub>DS</sub> = 25V                                           |                                        |            | 1100 |       |       |
| C <sub>rss</sub>                     | Reverse Transfer Capacitance                                                   | f = 1MHz                                                        |                                        |            | 200  |       |       |
| Q <sub>g</sub>                       | Total Gate Charge                                                              | V <sub>GS</sub> = 10V                                           |                                        | 50         |      | 125   | nC    |
| Q <sub>gs</sub>                      | Gate – Source Charge                                                           | I <sub>D</sub> = 38A                                            |                                        | 8          |      | 22    |       |
| Q <sub>gd</sub>                      | Gate – Drain (“Miller”) Charge                                                 | V <sub>DS</sub> = 0.5BV <sub>DSS</sub>                          |                                        | 25         |      | 65    |       |
| t <sub>d(on)</sub>                   | Turn–On Delay Time                                                             | V <sub>DD</sub> = 50V                                           |                                        |            |      | 35    | ns    |
| t <sub>r</sub>                       | Rise Time                                                                      | I <sub>D</sub> = 38A                                            |                                        |            |      | 190   |       |
| t <sub>d(off)</sub>                  | Turn–Off Delay Time                                                            | R <sub>G</sub> = 2.35Ω                                          |                                        |            |      | 170   |       |
| t <sub>f</sub>                       | Fall Time                                                                      |                                                                 |                                        |            |      | 130   |       |
| SOURCE – DRAIN DIODE CHARACTERISTICS |                                                                                |                                                                 |                                        |            |      |       |       |
| I <sub>S</sub>                       | Continuous Source Current                                                      |                                                                 |                                        |            |      | 38    | A     |
| I <sub>SM</sub>                      | Pulse Source Current <sup>2</sup>                                              |                                                                 |                                        |            |      | 152   |       |
| V <sub>SD</sub>                      | Diode Forward Voltage <sup>1</sup>                                             | I <sub>S</sub> = 38A                                            | T <sub>J</sub> = 25°C                  |            |      | 1.8   | V     |
|                                      |                                                                                | V <sub>GS</sub> = 0                                             |                                        |            |      |       |       |
| t <sub>rr</sub>                      | Reverse Recovery Time                                                          | I <sub>F</sub> = 38A                                            | T <sub>J</sub> = 25°C                  |            |      | 500   | ns    |
| Q <sub>rr</sub>                      | Reverse Recovery Charge <sup>1</sup>                                           | d <sub>i</sub> / d <sub>t</sub> ≤ 100A/μs V <sub>DD</sub> ≤ 50V |                                        |            |      | 2.9   | μC    |
| t <sub>on</sub>                      | Forward Turn–On Time                                                           |                                                                 |                                        | Negligible |      |       |       |
| PACKAGE CHARACTERISTICS              |                                                                                |                                                                 |                                        |            |      |       |       |
| L <sub>D</sub>                       | Internal Drain Inductance (measured from 6mm down drain lead to centre of die) |                                                                 |                                        |            | 5.0  |       | nH    |
| L <sub>S</sub>                       | Internal Source Inductance (from 6mm down source lead to source bond pad)      |                                                                 |                                        |            | 13   |       |       |
| THERMAL CHARACTERISTICS              |                                                                                |                                                                 |                                        |            |      |       |       |
| R <sub>θJC</sub>                     | Thermal Resistance Junction – Case                                             |                                                                 |                                        |            |      | 0.83  | °C/W  |
| R <sub>θCS</sub>                     | Thermal Resistance Case – Sink                                                 |                                                                 |                                        |            | 0.12 |       |       |
| R <sub>θJA</sub>                     | Thermal Resistance Junction – Ambient                                          |                                                                 |                                        |            |      | 30    |       |

**Notes**

1) Pulse Test: Pulse Width  $\leq 300\text{ms}$ ,  $\delta \leq 2\%$ 

2) Repetitive Rating – Pulse width limited by maximum junction temperature.