| | Value | Unit |
|---|---|---|
| | 80 | V |
| | 3.0 | V |
| | 148 | A |
| | 3.8 | mΩ |

**Marking**

**Electrical Characteristics** ($T_J$ = 25°C unless otherwise specified)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $I_D$ = 250μA, $V_{GS}$ = 0V | 80 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 64V, $V_{GS}$ = 0V | - | - | 1.0 | μ |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{DS}$ = 0V, $V_{GS}$ = ±20V | - | - | ±100 | |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$ = $V_{GS}$, $I_D$ = 250μA | 2.1 | 3.0 | 4.0 | V |
| $R_{DS(ON)}$ | Static Drain-Source ON-Resistance(4) | $V_{GS}$ = 10V, $I_D$ = 20A | - | 3.8 | 4.2 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| $R_g$ | Gate Resistance | f = 1MHz | - | 0.7 | - | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$ = 0V, $V_{DS}$ = 40V, f = 1MHz | - | 4769 | 6439 | pF |
| $C_{oss}$ | Output Capacitance | | - | 809 | 1092 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 12 | 16 | pF |
| $Q_g$ | Total Gate Charge | $V_{GS}$ = 0 to 10V $V_{DS}$ = 40V, $I_D$ = 20A | - | 67 | - | nC |
| $Q_{gs}$ | Gate Source Charge | | - | 26 | - | nC |
| $Q_{gd}$ | Gate Drain("Miller") Charge | | - | 12 | - | nC |
| | | | | | | |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On DelayTime | $V_{GS}$ = 10V, $V_{DD}$ = 40V $I_D$= 20A, $R_{GEN}$ = 3Ω | - | 23 | - | ns |
| $t_r$ | Turn-On Rise Time | | - | 30 | - | ns |
| $t_{d(off)}$ | Turn-Off DelayTime | | - | 36 | - | ns |
| $t_f$ | Turn-Off Fall Time | | - | 10 | - | ns |
| **Body Diode Characteristics** | | | | | | |
| $I_S$ | Maximum Continuous Body Diode Forward Current | | - | - | 148 | A |
| $I_{SM}$ | Maximum Pulsed Body Diode Forward Current | | - | - | 593 | A |
| $V_{SD}$ | Body Diode Forward Voltage | $V_{GS}$ = 0V, $I_S$ = 20A | - | | 1.2 | V |
| trr | Body Diode Reverse Recovery Time | $I_F$ = 20A, di/dt = 100A/us | 46 | 64 | 86 | ns |
| Qrr | Body Diode Reverse Recovery Charge | | - | 139 | - | nC |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. $E_{AS}$ condition: Starting $T_J$=25C, $V_{DD}$=40V, $V_{GS}$=10V, $R_G$=25ohm, L=3mH, $I_{AS}$=18.2A, $V_{DD}$=0V during time in avalanche.

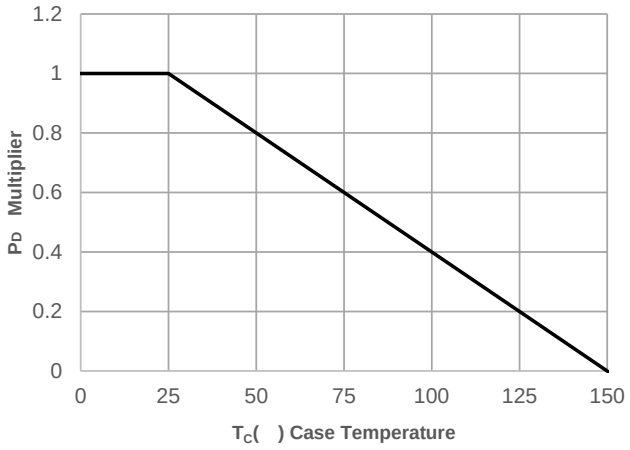
3. R is measured with the device mounted on a 1inch$^2$ pad of 2oz copper FR4 PCB.

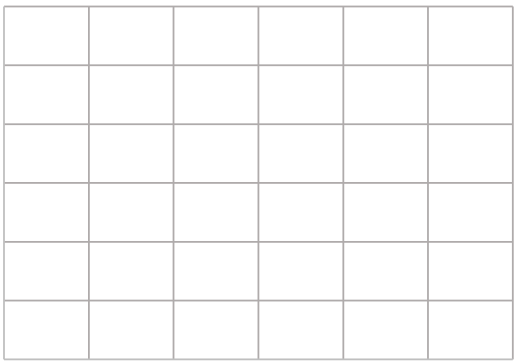
4. Pulse Test: Pulse Width ≤ ≤ 0.5%.


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# Typical Performance Characteristics

**Figure 1: Power De-rating**



## Typical Performance Characteristics

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

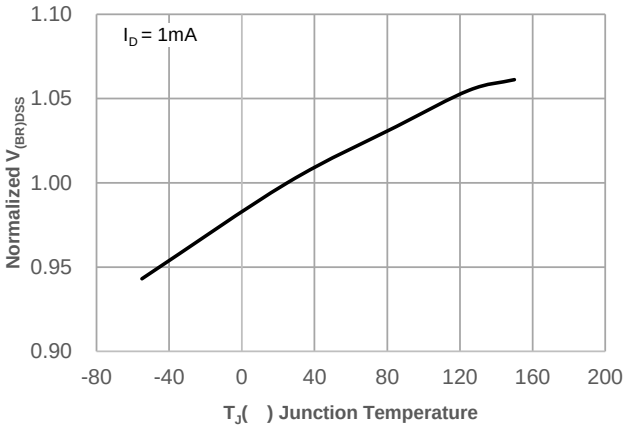



Figure 12: Normalized on Resistance vs. Junction Temperature

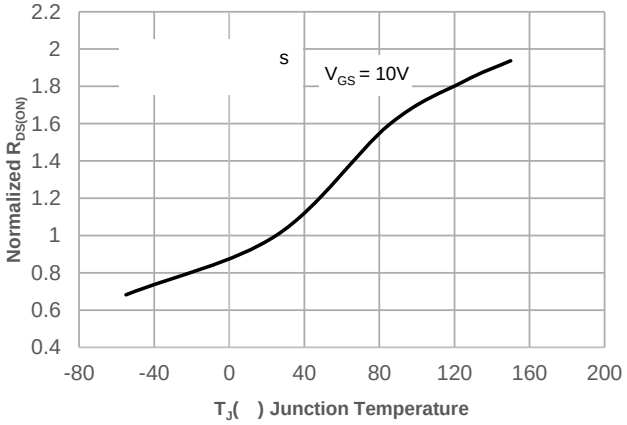



Figure 14: $R_{DS(ON)}$ vs. $V_{GS}$

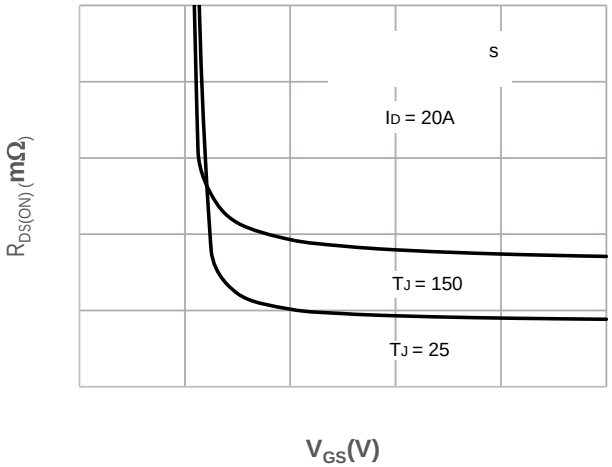
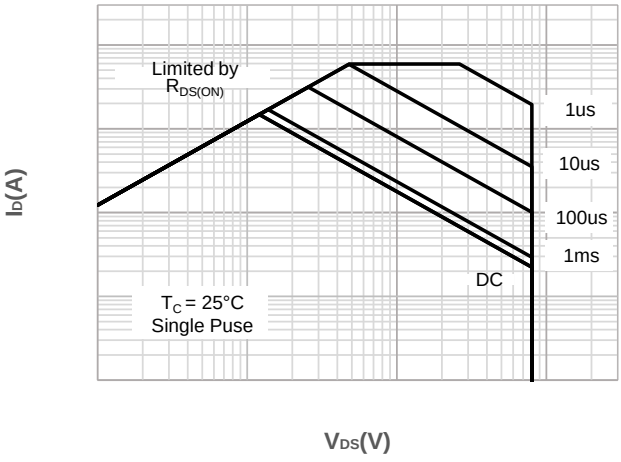



Figure 15: Maximum Safe Operating Area



## Test Circuit



**Figure 1: Gate Charge Test Circuit & Waveform**

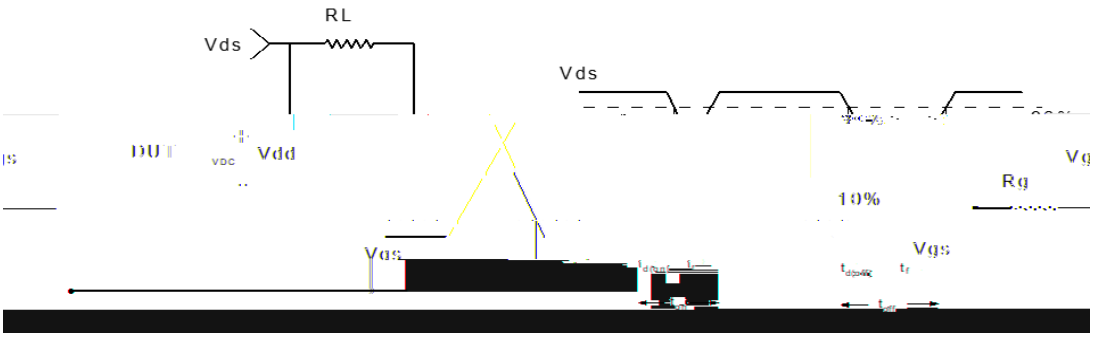



**Figure 2: Resistive Switching Test Circuit & Waveform**

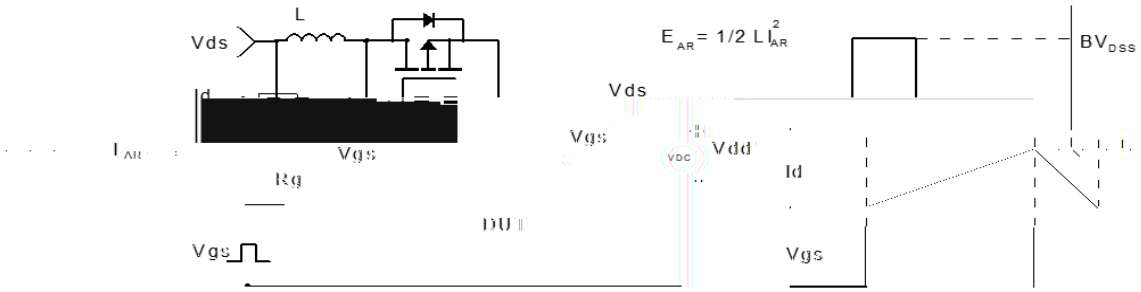



**Figure 3: Unclamped Inductive Switching Test Circuit& Waveform**

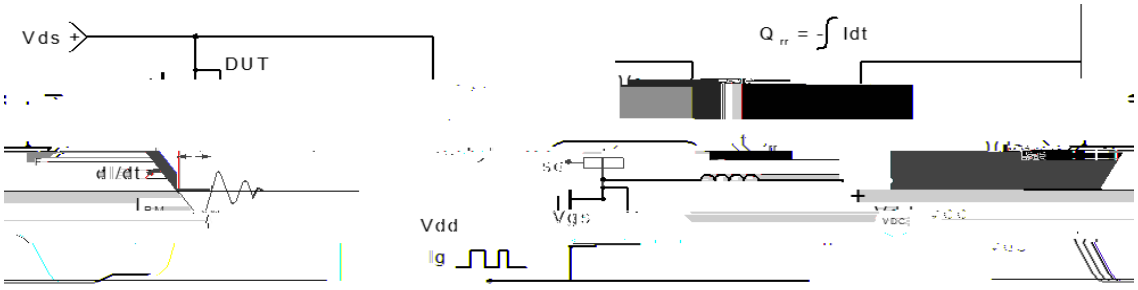



**Figure 4: Diode Recovery Test Circuit & Waveform**


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## Package Mechanical Data(TO-220-3L)