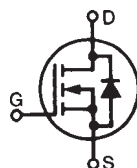


### TrenchMV™ Power MOSFET

### IXTN200N10T

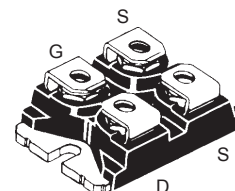
N-Channel Enhancement Mode  
Avalanche Rated



$$\begin{aligned} V_{DSS} &= 100V \\ I_{D25} &= 200A \\ R_{DS(on)} &\leq 5.5m\Omega \end{aligned}$$

| Symbol        | Test Conditions                                                       | Maximum Ratings |                  |
|---------------|-----------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$     | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$                       | 100             | V                |
| $V_{DGR}$     | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ , $R_{GS} = 1M\Omega$ | 100             | V                |
| $V_{GSS}$     | Continuous                                                            | $\pm 20$        | V                |
| $V_{GSM}$     | Transient                                                             | $\pm 30$        | V                |
| $I_{D25}$     | $T_C = 25^\circ\text{C}$                                              | 200             | A                |
| $I_{LRMS}$    | External lead current limit                                           | 100             | A                |
| $I_{DM}$      | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$            | 500             | A                |
| $I_A$         | $T_C = 25^\circ\text{C}$                                              | 40              | A                |
| $E_{AS}$      | $T_C = 25^\circ\text{C}$                                              | 1.5             | J                |
| $P_D$         | $T_C = 25^\circ\text{C}$                                              | 550             | W                |
| $T_J$         |                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$      |                                                                       | 175             | $^\circ\text{C}$ |
| $T_{stg}$     |                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_L$         | 1.6mm (0.062 in.) from case for 10s                                   | 300             | $^\circ\text{C}$ |
| $V_{ISOL}$    | 50/60 Hz, RMS                                                         | t = 1min        | 2500 V~          |
|               | $I_{ISOL} \leq 1\text{mA}$                                            | t = 1s          | 3000 V~          |
| $M_d$         | Mounting torque                                                       | 1.5/13          | Nm/lb.in.        |
|               | Terminal connection torque                                            | 1.3/11.5        | Nm/lb.in.        |
| <b>Weight</b> |                                                                       | 30              | g                |

miniBLOC, SOT-227 B  
E153432



G = Gate  
S = Source  
D = Drain

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

#### Features

- International standard package
- miniBLOC, with Aluminium nitride isolation
- Avalanche Rated
- Low  $R_{DS(on)}$  and  $Q_G$
- Low package inductance
- Fast intrinsic Rectifier

#### Advantages

- Low gate charge drive requirement
- High power density

#### Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC and DC motor drives
- Uninterrupted power supplies
- High speed power switching applications

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) | Characteristic Values |      |                |
|--------------|-----------------------------------------------------------------------------|-----------------------|------|----------------|
|              |                                                                             | Min.                  | Typ. | Max.           |
| $BV_{DSS}$   | $V_{GS} = 0V$ , $I_D = 250\mu A$                                            | 100                   |      | V              |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250\mu A$                                        | 2.5                   |      | 4.5 V          |
| $I_{GSS}$    | $V_{GS} = \pm 20V$ , $V_{DS} = 0V$                                          |                       |      | $\pm 200$ nA   |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$                                                          |                       |      | 5 $\mu A$      |
|              | $V_{GS} = 0V$ , $T_J = 150^\circ\text{C}$                                   |                       |      | 250 $\mu A$    |
| $R_{DS(on)}$ | $V_{GS} = 10V$ , $I_D = 50A$ , Note 1                                       |                       |      | 5.5 m $\Omega$ |

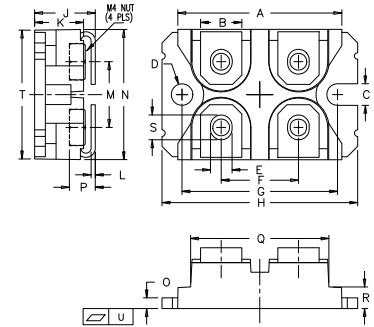
| Symbol       | Test Conditions                                                                                                           | Characteristic Values |      |           |
|--------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------|------|-----------|
|              |                                                                                                                           | Min.                  | Typ. | Max.      |
| $g_{fs}$     | $V_{DS} = 10V, I_D = 60A$ , Note 1                                                                                        | 60                    | 96   | S         |
| $C_{iss}$    | $V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$                                                                                     |                       | 9400 | pF        |
| $C_{oss}$    |                                                                                                                           |                       | 1087 | pF        |
| $C_{rss}$    |                                                                                                                           |                       | 140  | pF        |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 50A$<br>$R_G = 3.3\Omega$ (External) |                       | 35   | ns        |
| $t_r$        |                                                                                                                           |                       | 31   | ns        |
| $t_{d(off)}$ |                                                                                                                           |                       | 45   | ns        |
| $t_f$        |                                                                                                                           |                       | 34   | ns        |
| $Q_{g(on)}$  | $V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 25A$                                                                     |                       | 152  | nC        |
| $Q_{gs}$     |                                                                                                                           |                       | 47   | nC        |
| $Q_{gd}$     |                                                                                                                           |                       | 47   | nC        |
| $R_{thJC}$   |                                                                                                                           | 0.05                  |      | 0.27 °C/W |
| $R_{thCS}$   |                                                                                                                           |                       |      | °C/W      |

## Source-Drain Diode

| Symbol   | Test Conditions                                               | Characteristic Values |      |       |
|----------|---------------------------------------------------------------|-----------------------|------|-------|
|          |                                                               | Min.                  | Typ. | Max.  |
| $I_S$    | $V_{GS} = 0V$                                                 |                       |      | 200 A |
| $I_{SM}$ | Repetitive, pulse width limited by $T_{JM}$                   |                       |      | 500 A |
| $V_{SD}$ | $I_F = 50A, V_{GS} = 0V$ , Note 1                             |                       |      | 1.0 V |
| $t_{rr}$ | $I_F = 100A, -di/dt = 100A/\mu s, V_R = 50V$<br>$V_{GS} = 0V$ |                       | 76   | ns    |
| $I_{RM}$ |                                                               |                       | 5.4  | A     |
| $Q_{RM}$ |                                                               |                       | 205  | nC    |

Note 1: Pulse test,  $t \leq 300\mu s$ ; duty cycle,  $d \leq 2\%$ .

## SOT-227B Outline



| SYM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 1.240  | 1.255 | 31.50       | 31.88 |
| B   | .307   | .323  | 7.80        | 8.20  |
| C   | .161   | .169  | 4.09        | 4.29  |
| D   | .161   | .169  | 4.09        | 4.29  |
| E   | .161   | .169  | 4.09        | 4.29  |
| F   | .587   | .595  | 14.91       | 15.11 |
| G   | 1.186  | 1.193 | 30.12       | 30.30 |
| H   | 1.496  | 1.505 | 38.00       | 38.23 |
| J   | .460   | .481  | 11.68       | 12.22 |
| K   | .351   | .378  | 8.92        | 9.60  |
| L   | .030   | .033  | 0.76        | 0.84  |
| M   | .496   | .506  | 12.60       | 12.85 |
| N   | .990   | 1.001 | 25.15       | 25.42 |
| O   | .078   | .084  | 1.98        | 2.13  |
| P   | .195   | .235  | 4.95        | 5.97  |
| Q   | 1.045  | 1.059 | 26.54       | 26.90 |
| R   | .155   | .174  | 3.94        | 4.42  |
| S   | .186   | .191  | 4.72        | 4.85  |
| T   | .968   | .987  | 24.59       | 25.07 |
| U   | -.002  | .004  | -0.05       | 0.1   |

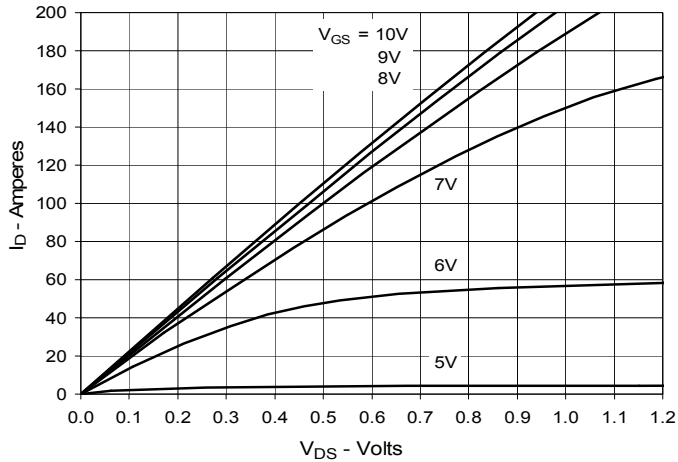
## PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

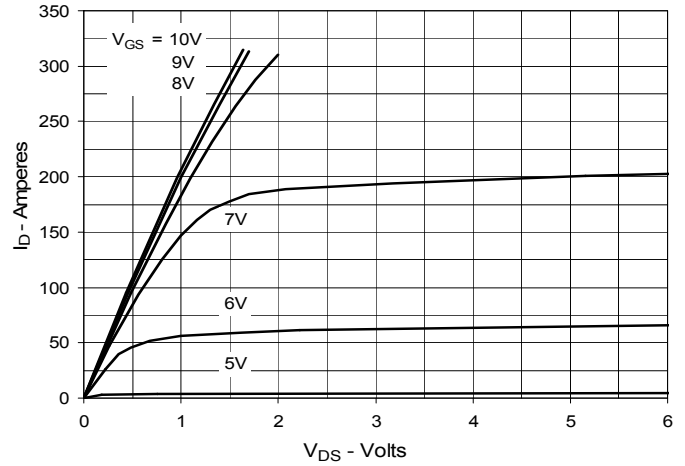
IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2  
by one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2  
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

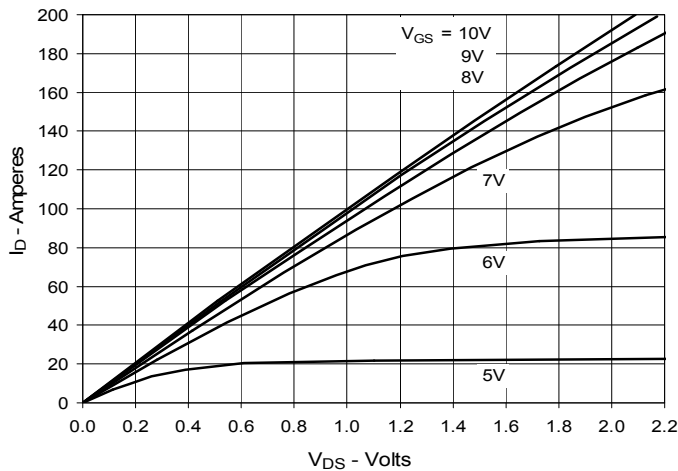
**Fig. 1. Output Characteristics  
@ 25°C**



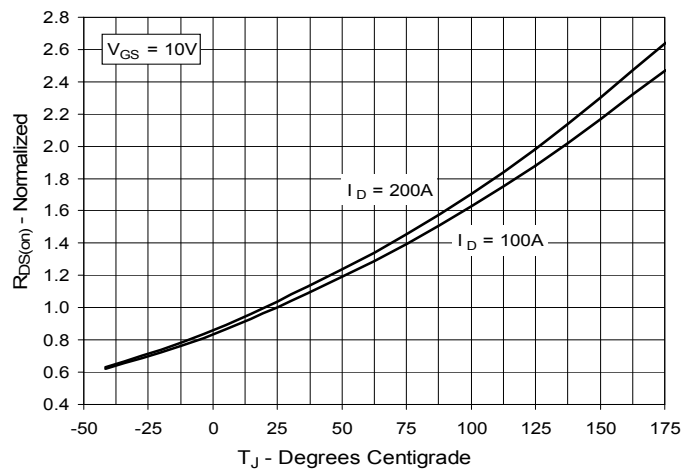
**Fig. 2. Extended Output Characteristics  
@ 25°C**



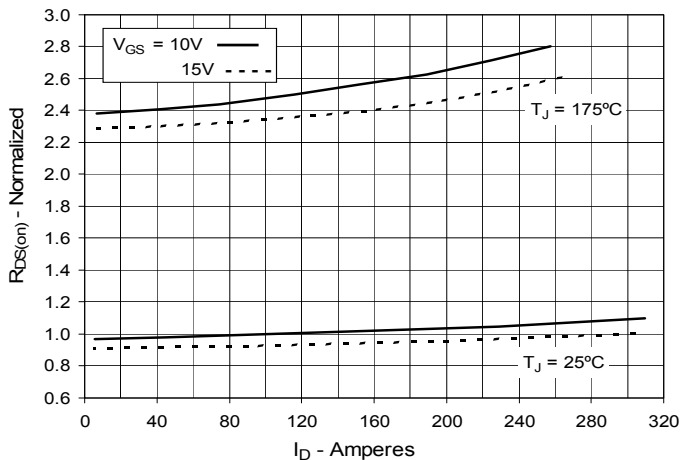
**Fig. 3. Output Characteristics  
@ 150°C**



**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 100A$  Value  
vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 100A$  Value  
vs. Drain Current**



**Fig. 6. Drain Current vs. Case Temperature**

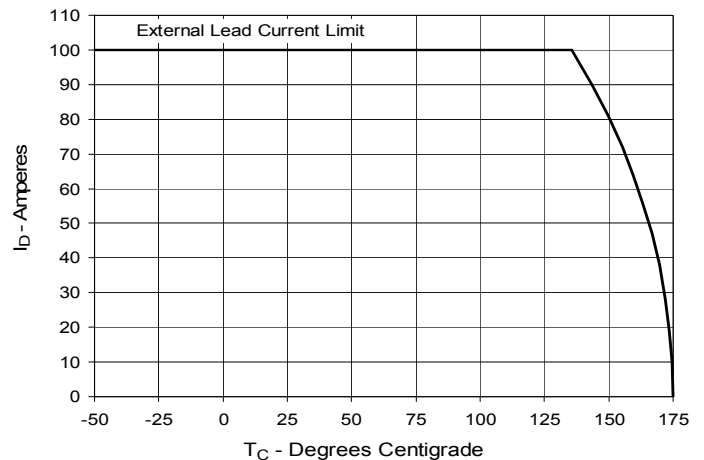


Fig. 7. Input Admittance

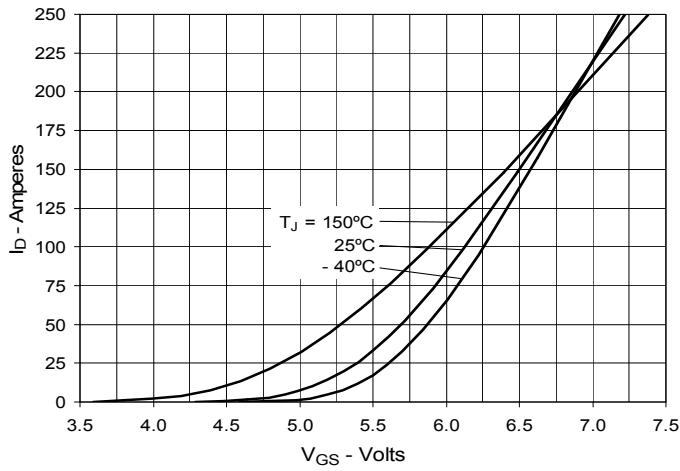


Fig. 8. Transconductance

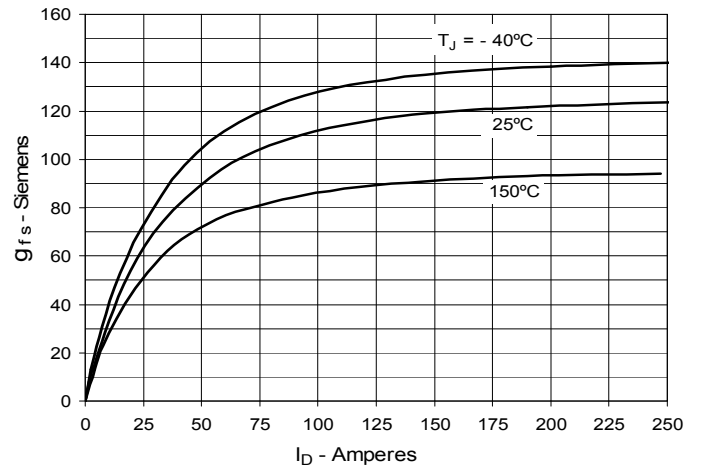


Fig. 9. Forward Voltage Drop of Intrinsic Diode

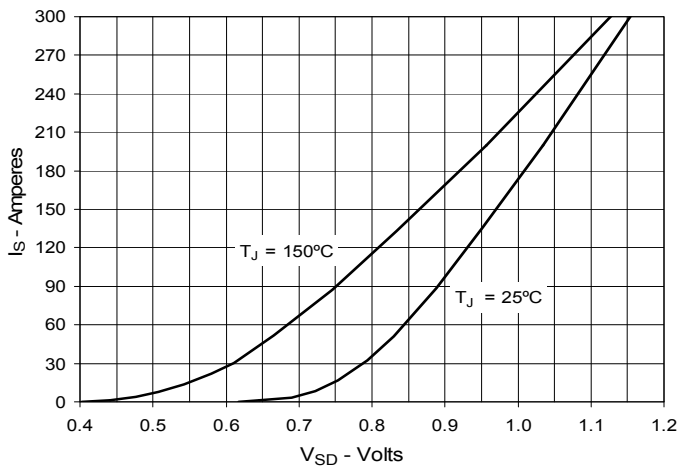


Fig. 10. Gate Charge

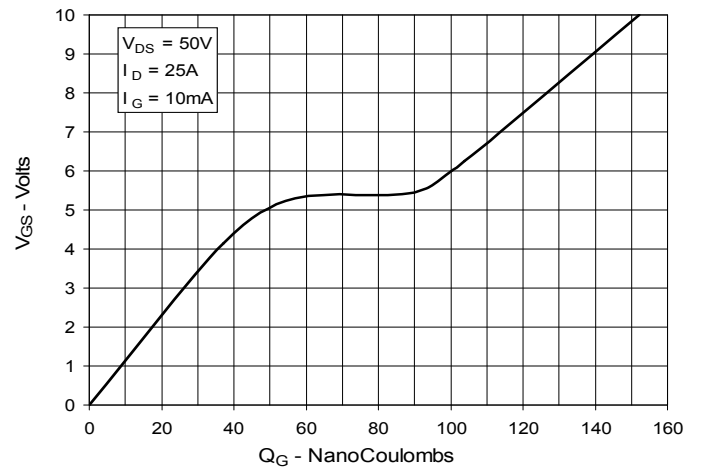


Fig. 11. Capacitance

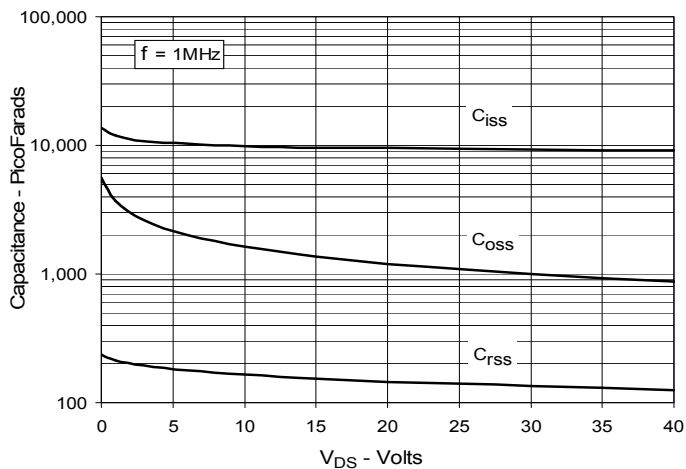
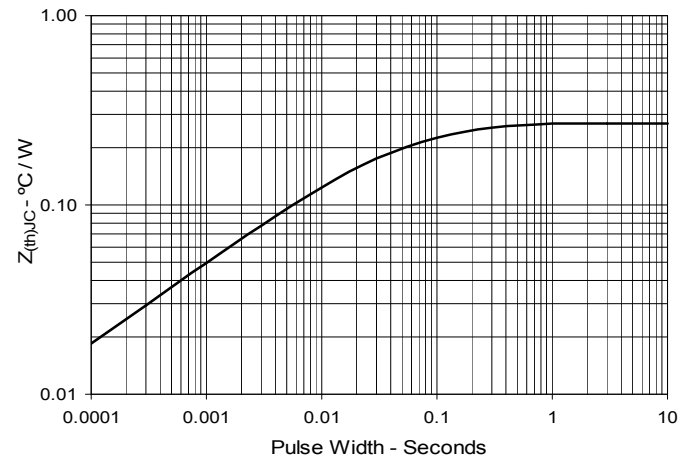
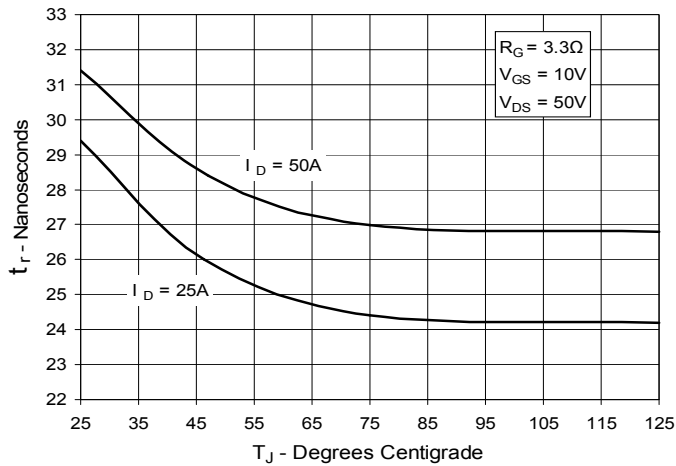


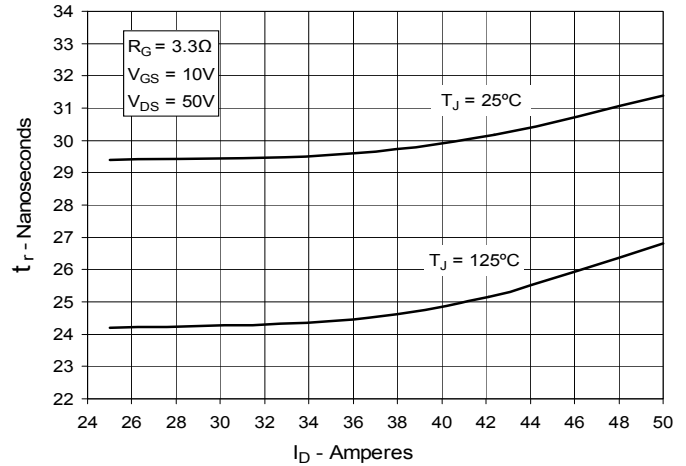
Fig. 12. Maximum Transient Thermal Impedance



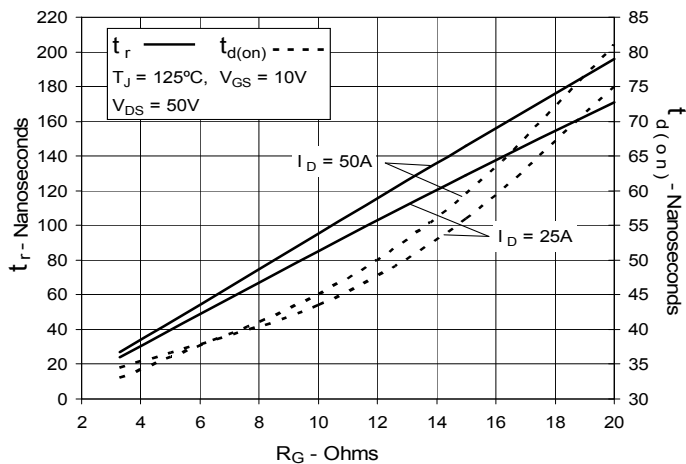
**Fig. 13. Resistive Turn-on  
Rise Time vs. Junction Temperature**



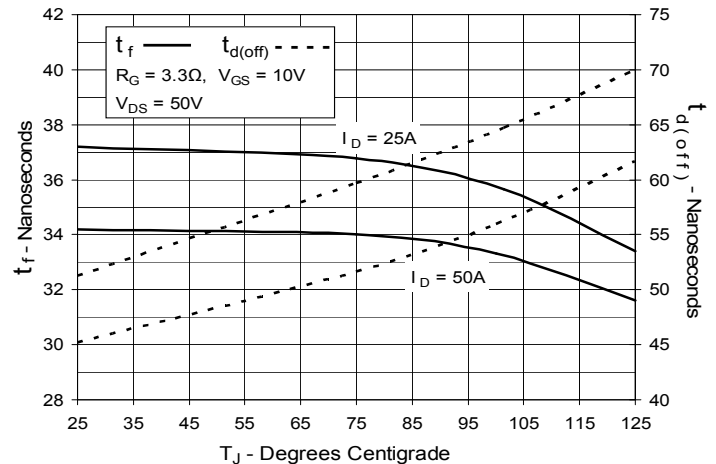
**Fig. 14. Resistive Turn-on  
Rise Time vs. Drain Current**



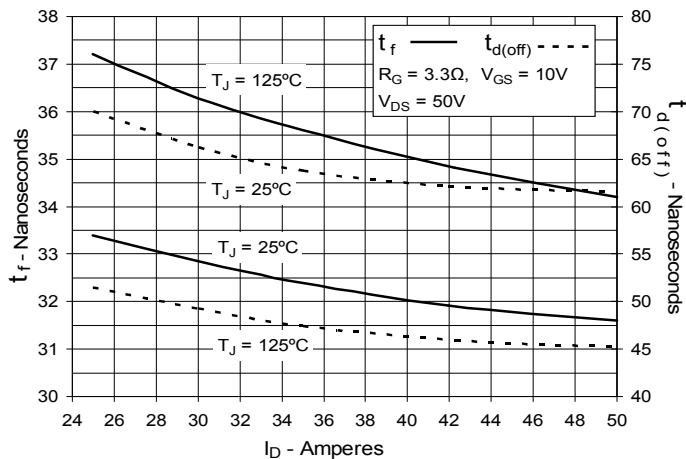
**Fig. 15. Resistive Turn-on  
Switching Times vs. Gate Resistance**



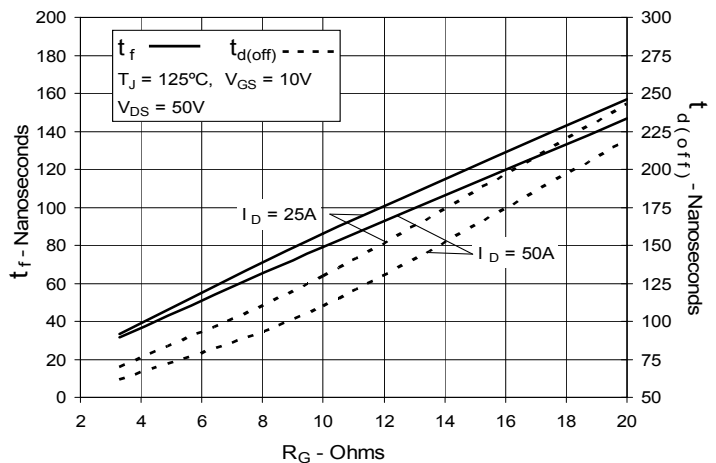
**Fig. 16. Resistive Turn-off  
Switching Times vs. Junction Temperature**



**Fig. 17. Resistive Turn-off  
Switching Times vs. Drain Current**



**Fig. 18. Resistive Turn-off  
Switching Times vs. Gate Resistance**





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