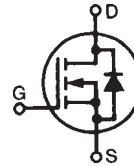


# TrenchMV™ Power MOSFET

**IXTA160N075T7**

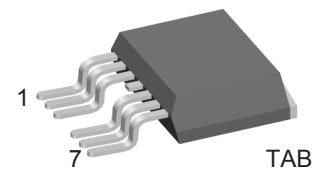
$$\begin{aligned} V_{DSS} &= 75 \text{ V} \\ I_{D25} &= 160 \text{ A} \\ R_{DS(on)} &\leq 6.0 \text{ m}\Omega \end{aligned}$$

N-Channel Enhancement Mode  
Avalanche Rated



| Symbol     | Test Conditions                                                                                                                       | Maximum Ratings |                  |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C to } 175^\circ\text{C}$                                                                                        | 75              | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C to } 175^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$                                                            | 75              | V                |
| $V_{GSM}$  | Transient                                                                                                                             | $\pm 20$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$                                                                                                              | 160             | A                |
| $I_{LRMS}$ | Lead Current Limit, RMS                                                                                                               | 120             | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                            | 430             | A                |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                                              | 25              | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                                                                                              | 750             | mJ               |
| $dv/dt$    | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$<br>$T_J \leq 175^\circ\text{C}$ , $R_G = 5 \Omega$ | 3               | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                                                                              | 360             | W                |
| $T_J$      |                                                                                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$   |                                                                                                                                       | 175             | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_L$      | 1.6 mm (0.062 in.) from case for 10 s                                                                                                 | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$ | Plastic body for 10 seconds                                                                                                           | 260             | $^\circ\text{C}$ |
| $M_d$      | Mounting torque (TO-3P, TO-220)                                                                                                       | 1.13 / 10       | Nm/lb.in.        |
| Weight     | TO-263 types                                                                                                                          | 3               | g                |

TO-263 (7-lead) (IXTA..7)



Pins: 1 - Gate  
2, 3 - Source  
4 - NC (cut)  
5,6,7 - Source  
TAB (8) - Drain

## Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance  
- easy to drive and to protect
- 175  $^\circ\text{C}$  Operating Temperature

## Advantages

- Easy to mount
- Space savings
- High power density

## Applications

- Automotive
  - Motor Drives
  - 42V Power Bus
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ unless otherwise specified) | Characteristic Values |      |                                       |
|--------------|---------------------------------------------------------------------------|-----------------------|------|---------------------------------------|
|              |                                                                           | Min.                  | Typ. | Max.                                  |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$                          | 75                    |      | V                                     |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$                               | 2.0                   |      | 4.0 V                                 |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$                      |                       |      | $\pm 200 \text{ nA}$                  |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$<br>$T_J = 150^\circ\text{C}$ |                       |      | 25 $\mu\text{A}$<br>250 $\mu\text{A}$ |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 25 \text{ A}$ , Note 1                   | 4.8                   | 6.0  | m $\Omega$                            |

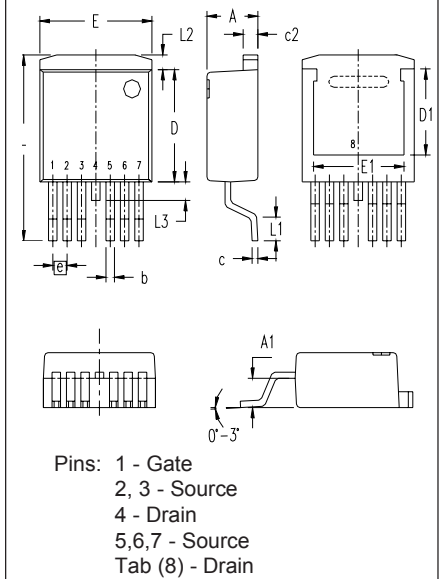
| Symbol                                              | Test Conditions                                                                        | Characteristic Values |      |           |
|-----------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------|------|-----------|
|                                                     |                                                                                        | Min.                  | Typ. | Max.      |
| (T <sub>J</sub> = 25° C unless otherwise specified) |                                                                                        |                       |      |           |
| <b>g<sub>fs</sub></b>                               | V <sub>DS</sub> = 10 V; I <sub>D</sub> = 60 A, Note 1                                  | 65                    | 100  | S         |
| <b>C<sub>iss</sub></b>                              | V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz                               |                       | 4950 | pF        |
| <b>C<sub>oss</sub></b>                              |                                                                                        |                       | 790  | pF        |
| <b>C<sub>rss</sub></b>                              |                                                                                        |                       | 145  | pF        |
| <b>Resistive Switching Times</b>                    |                                                                                        |                       |      |           |
| <b>t<sub>d(on)</sub></b>                            | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 25 A |                       | 29   | ns        |
| <b>t<sub>r</sub></b>                                |                                                                                        |                       | 64   | ns        |
| <b>t<sub>d(off)</sub></b>                           | R <sub>G</sub> = 5 Ω (External)                                                        |                       | 60   | ns        |
| <b>t<sub>f</sub></b>                                |                                                                                        |                       | 60   | ns        |
| <b>Q<sub>g(on)</sub></b>                            | V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 0.5 V <sub>DSS</sub> , I <sub>D</sub> = 25 A |                       | 112  | nC        |
| <b>Q<sub>gs</sub></b>                               |                                                                                        |                       | 30   | nC        |
| <b>Q<sub>gd</sub></b>                               |                                                                                        |                       | 30   | nC        |
| <b>R<sub>thJC</sub></b>                             |                                                                                        |                       |      | 0.42 °C/W |

## Source-Drain Diode

| Symbol          | Test Conditions                                      | Characteristic Values                              |      |       |
|-----------------|------------------------------------------------------|----------------------------------------------------|------|-------|
|                 |                                                      | T <sub>J</sub> = 25° C unless otherwise specified) |      |       |
|                 |                                                      | Min.                                               | Typ. | Max.  |
| I <sub>S</sub>  | V <sub>GS</sub> = 0 V                                |                                                    |      | 160 A |
| I <sub>SM</sub> | Pulse width limited by T <sub>JM</sub>               |                                                    |      | 430 A |
| V <sub>SD</sub> | I <sub>F</sub> = 25 A, V <sub>GS</sub> = 0 V, Note 1 |                                                    |      | 1.0 V |
| t <sub>rr</sub> | I <sub>F</sub> = 25 A, -di/dt = 100 A/μs             |                                                    | 80   | ns    |
|                 | V <sub>R</sub> = 40 V, V <sub>GS</sub> = 0 V         |                                                    |      |       |

Notes: 1. Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %.

## TO-263 (7-lead) (IXTA 7) Outline



| SYM | INCHES |      | MILLIMETER |       |
|-----|--------|------|------------|-------|
|     | MIN    | MAX  | MIN        | MAX   |
| A   | .170   | .185 | 4.30       | 4.70  |
| A1  | .085   | .104 | 2.15       | 2.65  |
| b   | .026   | .035 | 0.65       | 0.90  |
| c   | .016   | .024 | 0.40       | 0.60  |
| c2  | .049   | .055 | 1.25       | 1.40  |
| D   | .355   | .370 | 9.00       | 9.40  |
| D1  | .272   | .280 | 6.90       | 7.10  |
| E   | .386   | .402 | 9.80       | 10.20 |
| E1  | .311   | .319 | 7.90       | 8.10  |
| e   | .050   | BSC  | 1.27       | BSC   |
| L   | .591   | .614 | 15.00      | 15.60 |
| L1  | .091   | .110 | 2.30       | 2.80  |
| L2  | .039   | .059 | 1.00       | 1.50  |
| L3  | .000   | .059 | 0.00       | 1.50  |

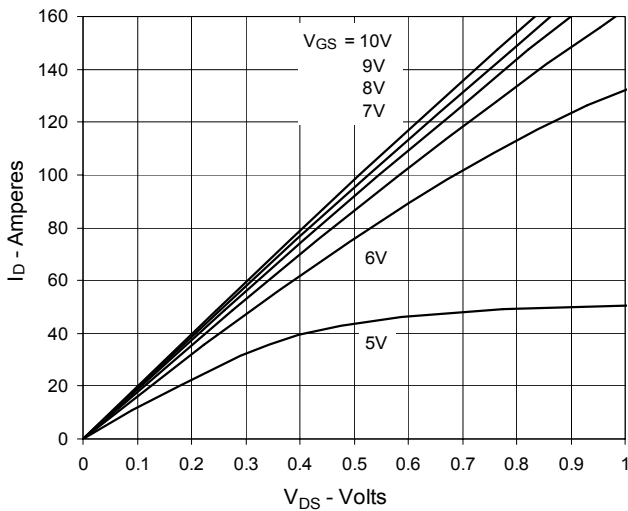
## PRELIMINARY TECHNICAL INFORMATION

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.

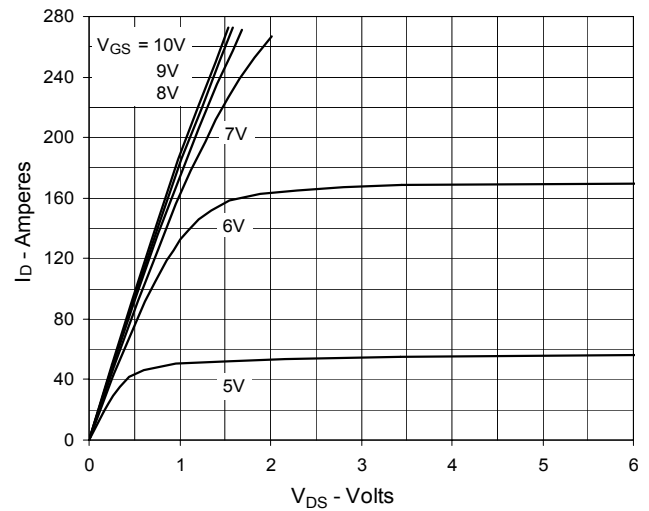
IXYS reserves the right to change limits, test conditions, and dimensions.

|                                                                                  |           |           |           |           |              |              |              |              |              |
|----------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|
| IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: | 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 |
|                                                                                  | 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    |

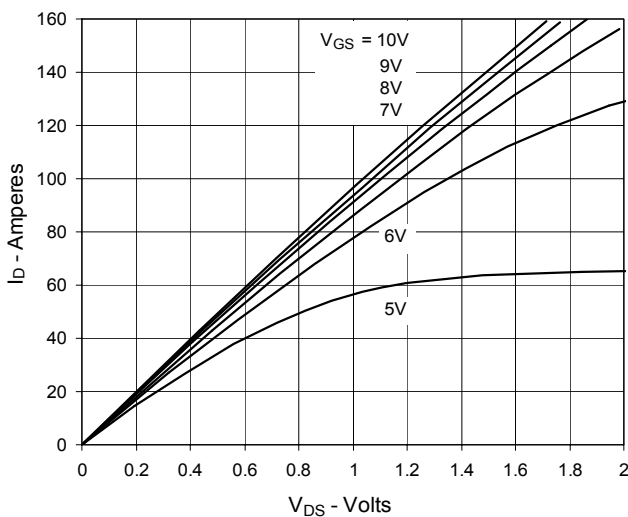
**Fig. 1. Output Characteristics  
@ 25°C**



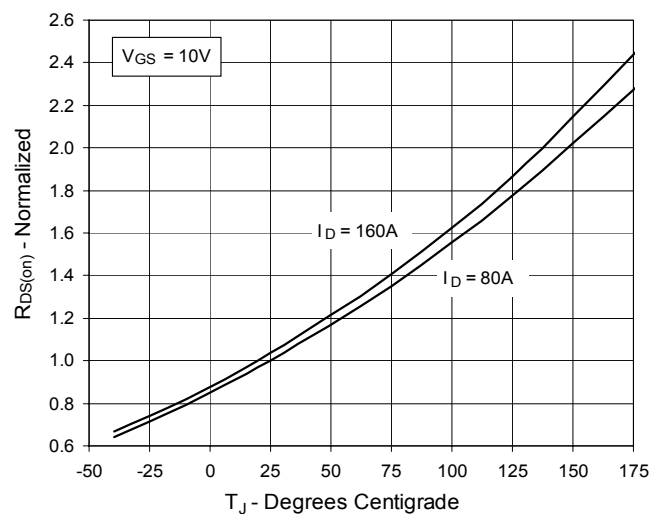
**Fig. 2. Extended Output Characteristics  
@ 25°C**



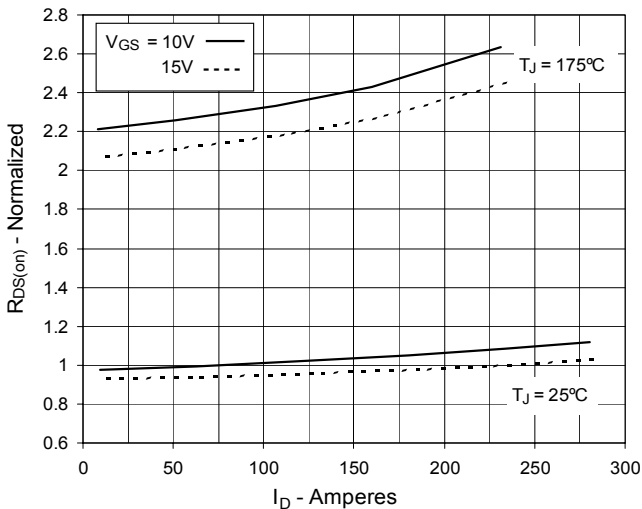
**Fig. 3. Output Characteristics  
@ 150°C**



**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 80A$  Value  
vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 80A$  Value  
vs. Drain Current**



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

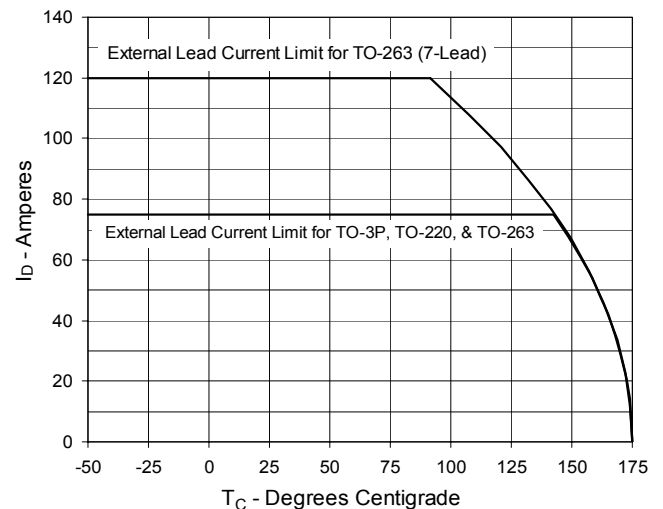


Fig. 7. Input Admittance

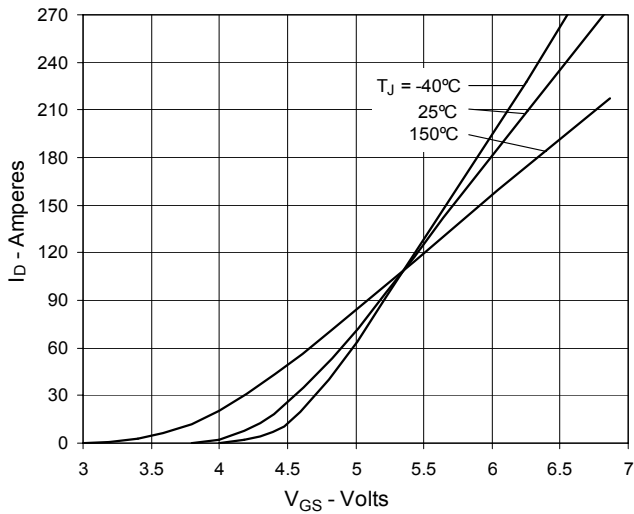


Fig. 8. Transconductance

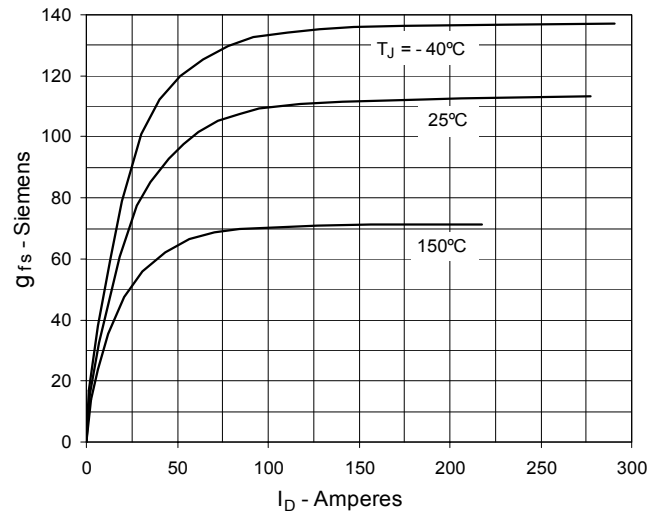


Fig. 9. Forward Voltage Drop of Intrinsic Diode

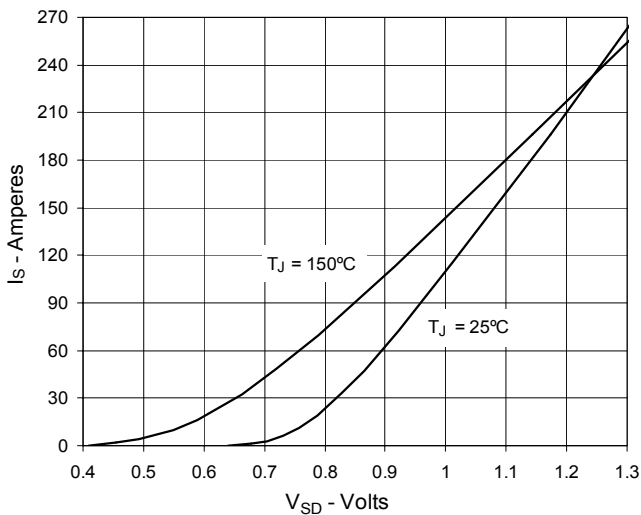


Fig. 10. Gate Charge

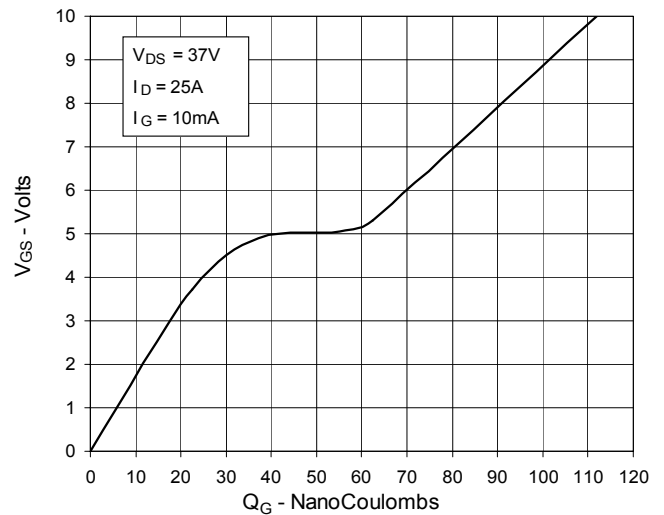


Fig. 11. Capacitance

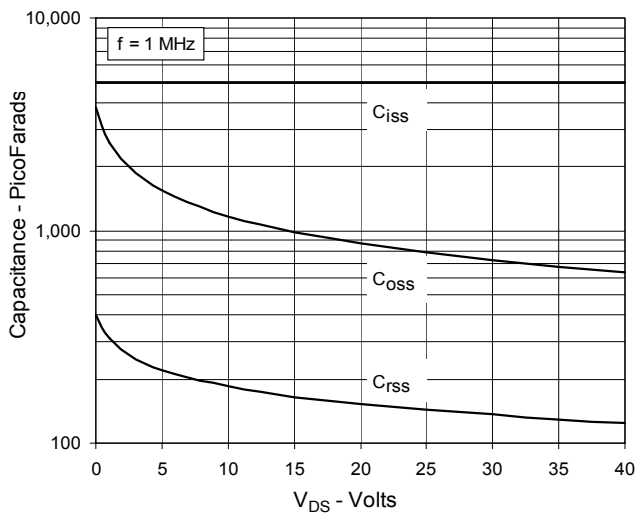
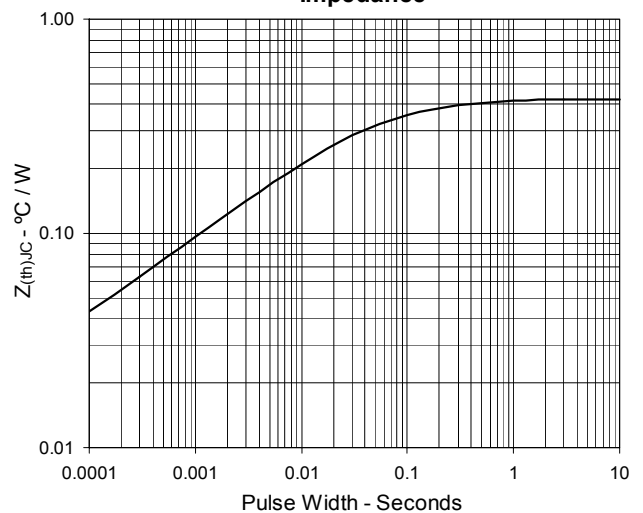
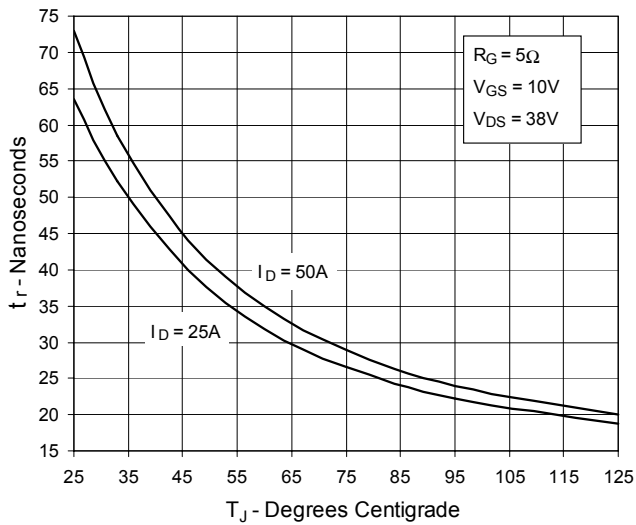


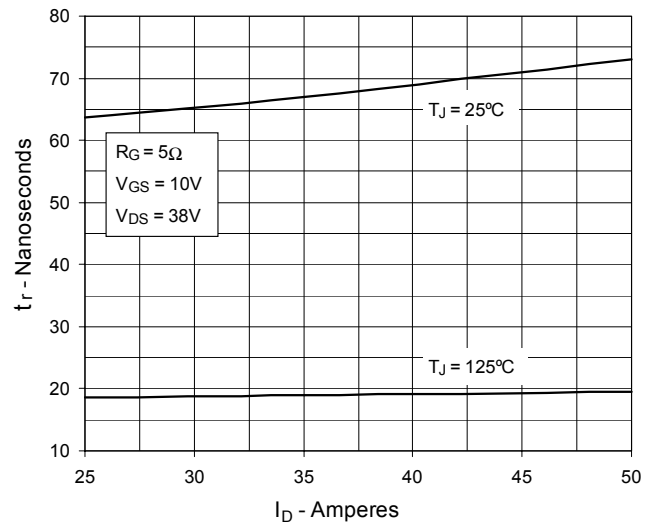
Fig. 12. Maximum Transient Thermal Impedance



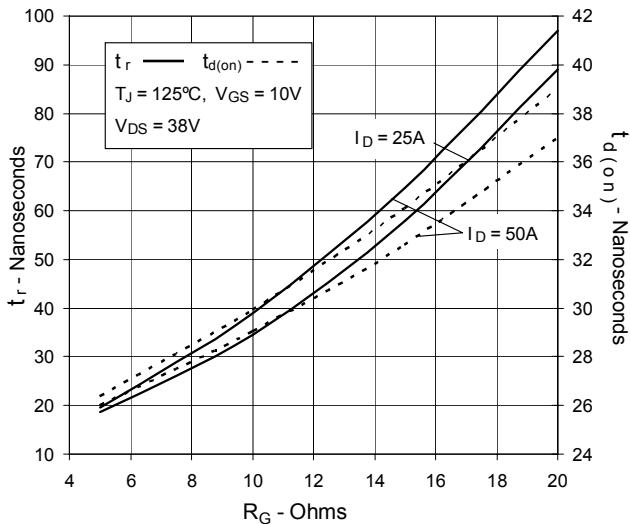
**Fig. 13. Resistive Turn-on**  
**Rise Time vs. Junction Temperature**



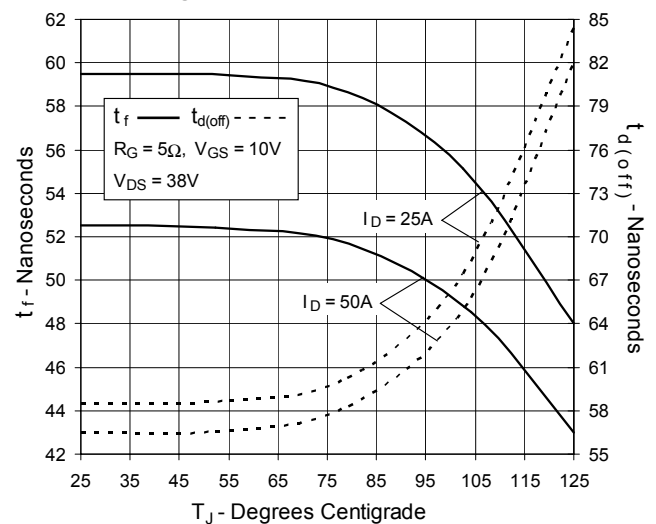
**Fig. 14. Resistive Turn-on**  
**Rise Time vs. Drain Current**



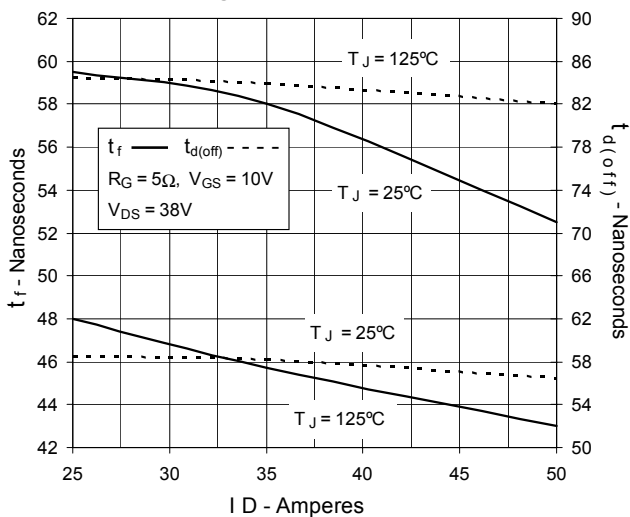
**Fig. 15. Resistive Turn-on**  
**Switching Times vs. Gate Resistance**



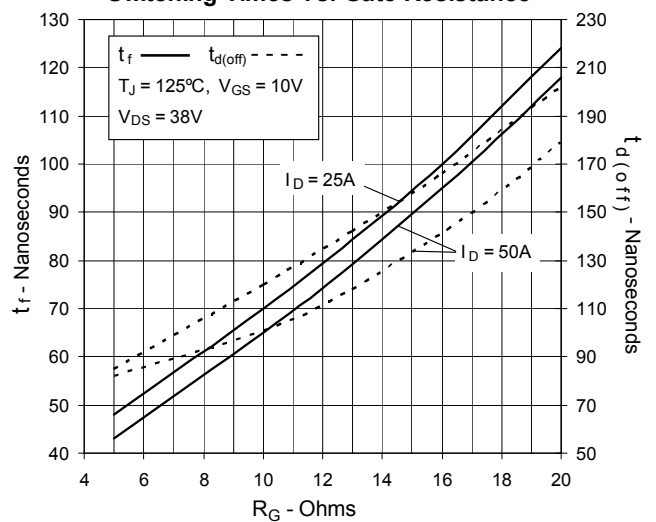
**Fig. 16. Resistive Turn-off**  
**Switching Times vs. Junction Temperature**



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



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





---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).