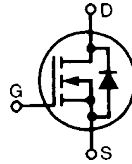


# TrenchT2™ HiPerFET™ Power MOSFET

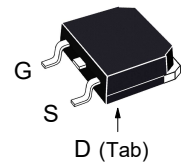
## IXFH340N075T2 IXFT340N075T2

$$\begin{aligned} V_{DSS} &= 75V \\ I_{D25} &= 340A \\ R_{DS(on)} &\leq 3.2m\Omega \end{aligned}$$

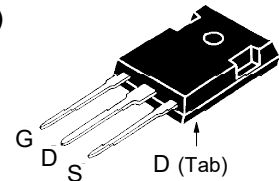
N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode



TO-268  
(IXFT)



TO-247  
(IXFH)



G = Gate      D = Drain  
S = Source    Tab = Drain

| 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 $175^\circ\text{C}$ , $R_{GS} = 1M\Omega$ | 75              | V                |
| $V_{GSM}$  | Transient                                                             | $\pm 20$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$ (Chip Capability)                            | 340             | A                |
| $I_{LRMS}$ | Lead Current Limit, RMS                                               | 160             | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , Pulse Width Limited by $T_{JM}$            | 850             | A                |
| $I_A$      | $T_C = 25^\circ\text{C}$                                              | 170             | A                |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$                                              | 960             | mJ               |
| $P_D$      | $T_C = 25^\circ\text{C}$                                              | 935             | W                |
| $T_J$      |                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$   |                                                                       | 175             | $^\circ\text{C}$ |
| $T_{stg}$  |                                                                       | -55 ... +175    | $^\circ\text{C}$ |
| $T_L$      | Maximum Lead Temperature for Soldering                                | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$ | Plastic Body for 10 seconds                                           | 260             | $^\circ\text{C}$ |
| $M_d$      | Mounting Torque (TO-247)                                              | 1.13/10         | Nm/lb.in.        |
| Weight     | TO-247                                                                | 6               | g                |
|            | TO-268                                                                | 4               | g                |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | Characteristic Values |      |                  |
|--------------|---------------------------------------------------------------------------|-----------------------|------|------------------|
|              |                                                                           | Min.                  | Typ. | Max.             |
| $BV_{DSS}$   | $V_{GS} = 0V$ , $I_D = 1mA$                                               | 75                    |      | V                |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 3mA$                                           | 2.0                   |      | 4.0 V            |
| $I_{GSS}$    | $V_{GS} = \pm 20V$ , $V_{DS} = 0V$                                        |                       |      | $\pm 200$ nA     |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $V_{GS} = 0V$<br>$T_J = 150^\circ\text{C}$           |                       |      | 25 $\mu\text{A}$ |
|              |                                                                           |                       |      | 1.5 mA           |
| $R_{DS(on)}$ | $V_{GS} = 10V$ , $I_D = 100A$ , Note 1                                    |                       |      | 3.2 m $\Omega$   |

### Features

- International Standard Packages
- $175^\circ\text{C}$  Operating Temperature
- High Current Handling Capability
- Avalanche Rated
- Fast Intrinsic Diode
- Low  $R_{DS(on)}$

### Advantages

- Easy to Mount
- Space Savings
- High Power Density

### Applications

- DC/DC Converters and Off-line UPS
- Primary- Side Switch
- High Current Switching Applications

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                                                                  | Characteristic Values |      |                         |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|-------------------------|
|              |                                                                                                                                              | Min.                  | Typ. | Max.                    |
| $g_{fs}$     | $V_{DS} = 10\text{V}$ , $I_D = 60\text{A}$ , Note 1                                                                                          | 65                    | 110  | S                       |
| $C_{iss}$    | $V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$                                                                             |                       | 19   | nF                      |
| $C_{oss}$    |                                                                                                                                              |                       | 2230 | pF                      |
| $C_{rss}$    |                                                                                                                                              |                       | 490  | pF                      |
| $R_{Gi}$     | Gate Input Resistance                                                                                                                        |                       | 1.7  | $\Omega$                |
| $t_{d(on)}$  | <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 100\text{A}$<br>$R_G = 1\Omega$ (External) |                       | 26   | ns                      |
| $t_r$        |                                                                                                                                              |                       | 50   | ns                      |
| $t_{d(off)}$ |                                                                                                                                              |                       | 60   | ns                      |
| $t_f$        |                                                                                                                                              |                       | 35   | ns                      |
| $Q_{g(on)}$  | $V_{GS} = 10\text{V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 \cdot I_{D25}$                                                             |                       | 300  | nC                      |
| $Q_{gs}$     |                                                                                                                                              |                       | 68   | nC                      |
| $Q_{gd}$     |                                                                                                                                              |                       | 70   | nC                      |
| $R_{thJC}$   | TO-247                                                                                                                                       |                       | 0.21 | 0.16 $^\circ\text{C/W}$ |
| $R_{thCH}$   |                                                                                                                                              |                       |      | $^\circ\text{C/W}$      |

## Source-Drain Diode

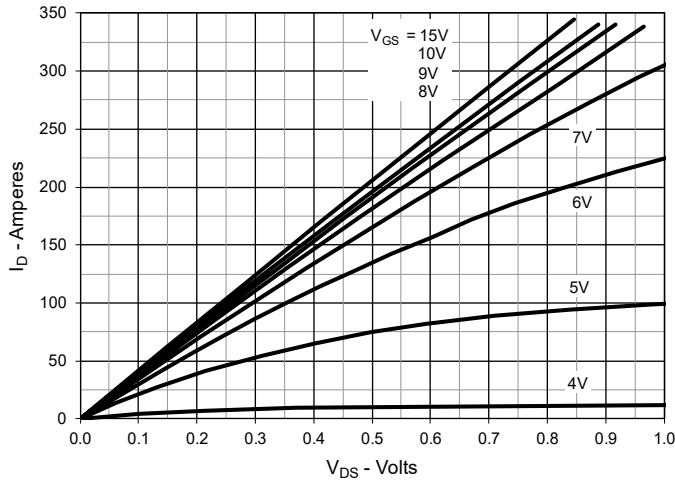
| Symbol   | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)                              | Characteristic Values |      |        |
|----------|----------------------------------------------------------------------------------------------------------|-----------------------|------|--------|
|          |                                                                                                          | Min.                  | Typ. | Max.   |
| $I_S$    | $V_{GS} = 0\text{V}$                                                                                     |                       |      | 340 A  |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$                                                              |                       |      | 1360 A |
| $V_{SD}$ | $I_F = 100\text{A}$ , $V_{GS} = 0\text{V}$ , Note 1                                                      |                       |      | 1.3 V  |
| $t_{rr}$ | $I_F = 170\text{A}$ , $V_{GS} = 0\text{V}$<br>$-di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 37.5\text{V}$ |                       | 75   | ns     |
| $I_{RM}$ |                                                                                                          |                       | 4.4  | A      |
| $Q_{RM}$ |                                                                                                          |                       | 165  | nC     |

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

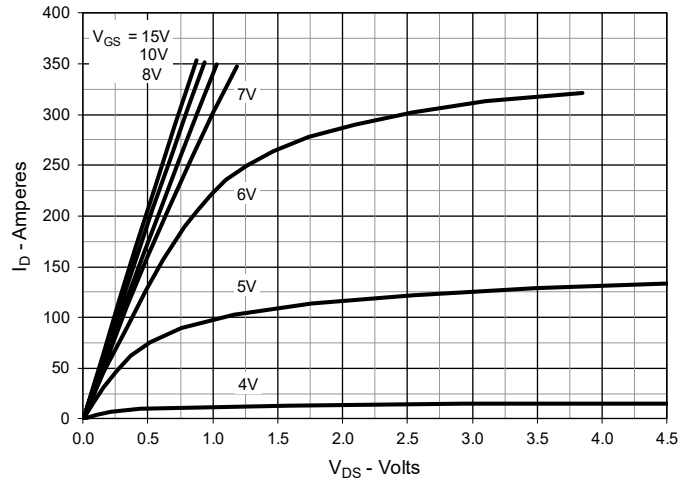
Littelfuse reserves the right to change limits, test conditions, and dimensions.

|                                                                                  |           |           |           |           |              |              |             |              |              |             |
|----------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|-------------|--------------|--------------|-------------|
| 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 | 7,157,338B2 |
|                                                                                  | 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123B1  | 6,534,343    | 6,710,405B2 | 6,759,692    | 7,063,975B2  |             |
|                                                                                  | 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    |             |

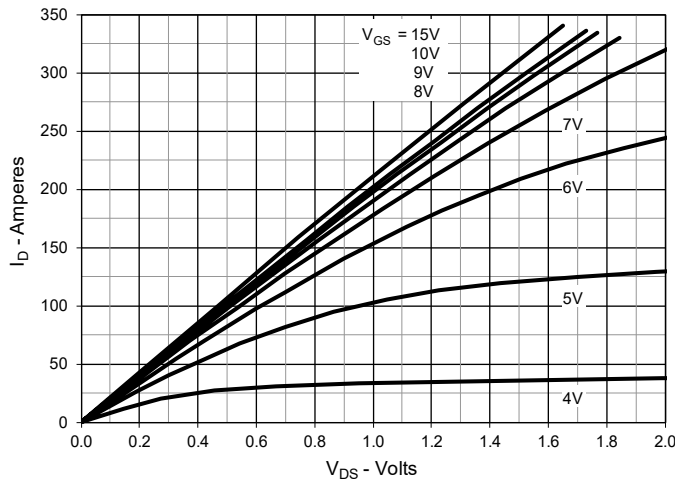
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



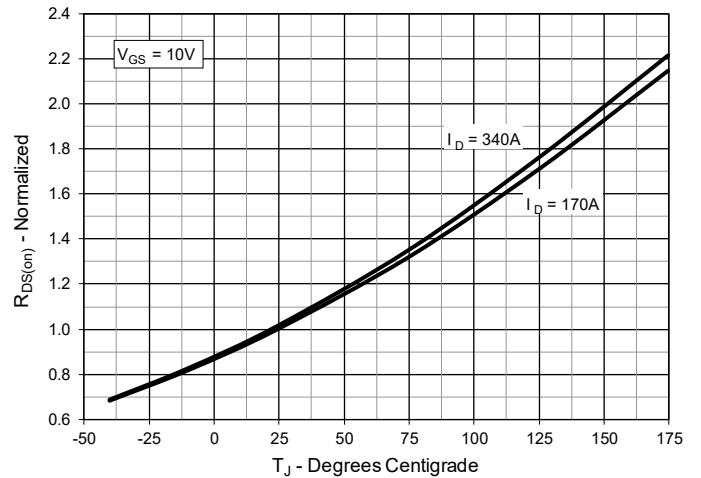
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



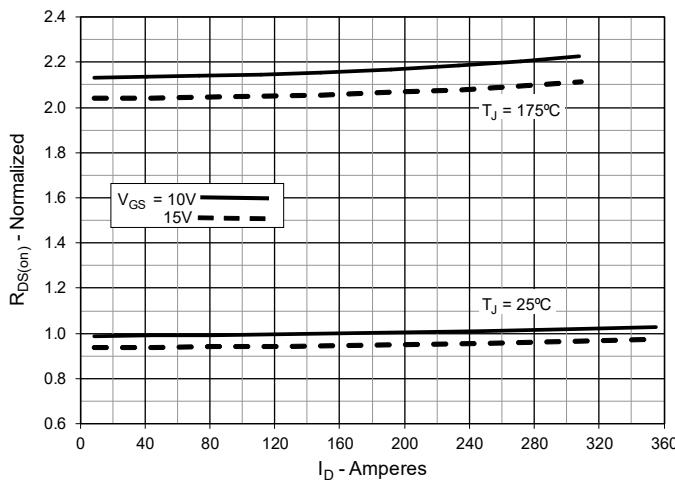
**Fig. 3. Output Characteristics @  $T_J = 150^\circ\text{C}$**



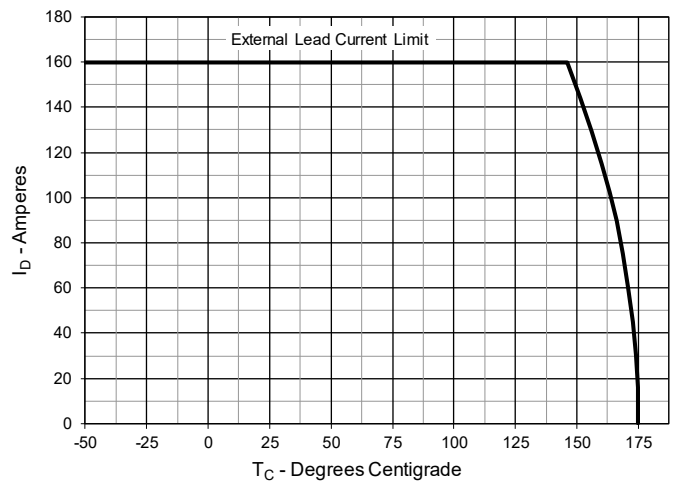
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 170\text{A}$  Value vs. Junction Temperature**



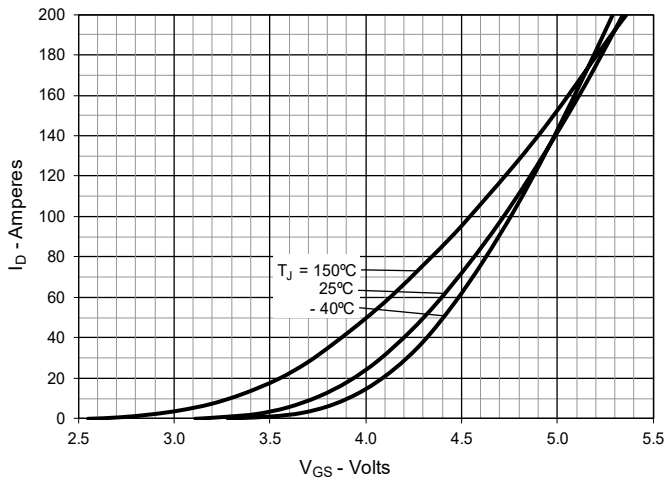
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 170\text{A}$  Value vs. Drain Current**



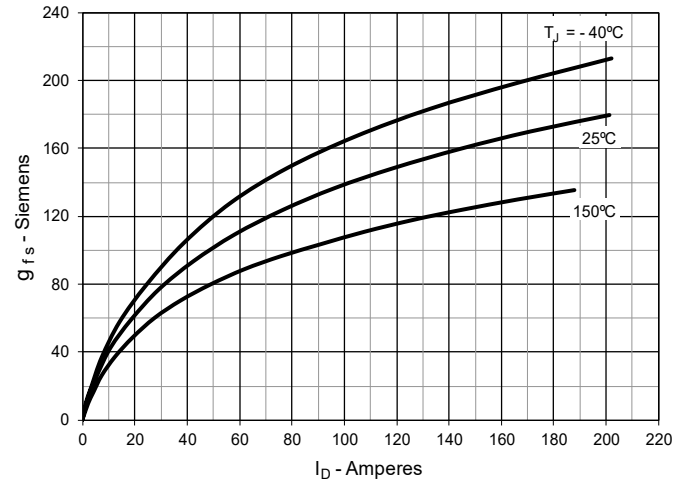
**Fig. 6. Drain Current vs. Case Temperature**



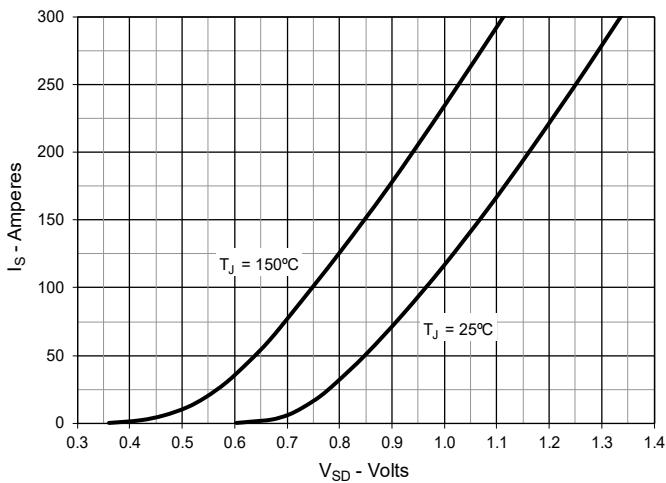
**Fig. 7. Input Admittance**



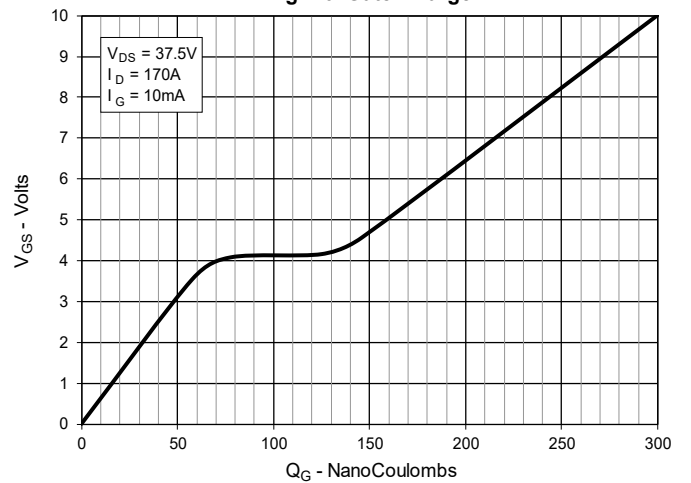
**Fig. 8. Transconductance**



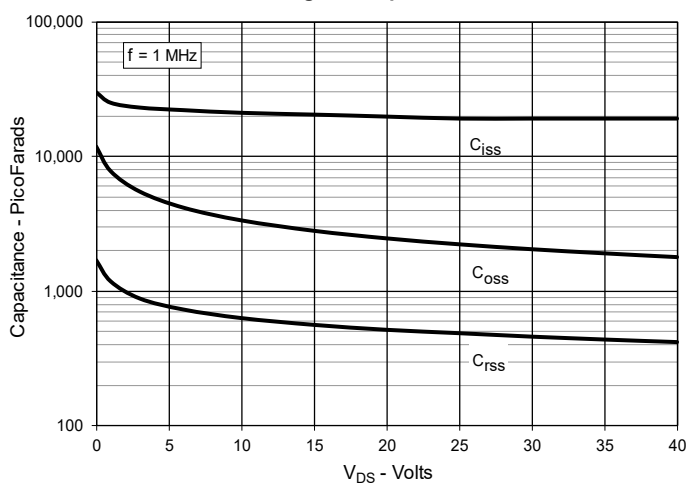
**Fig. 9. Forward Voltage Drop of Intrinsic Diode**



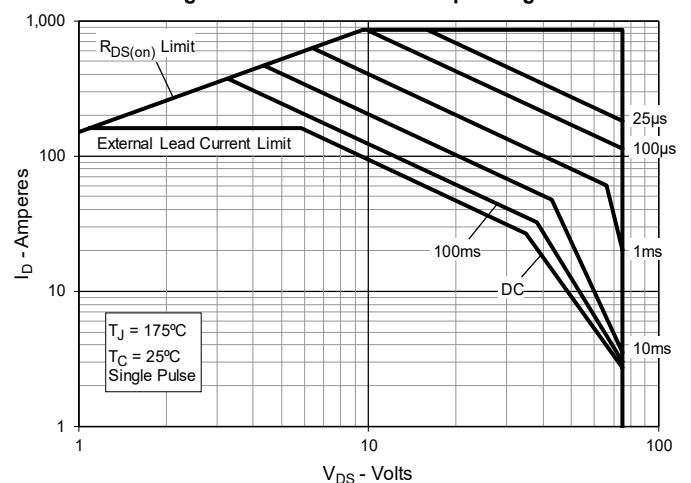
**Fig. 10. Gate Charge**



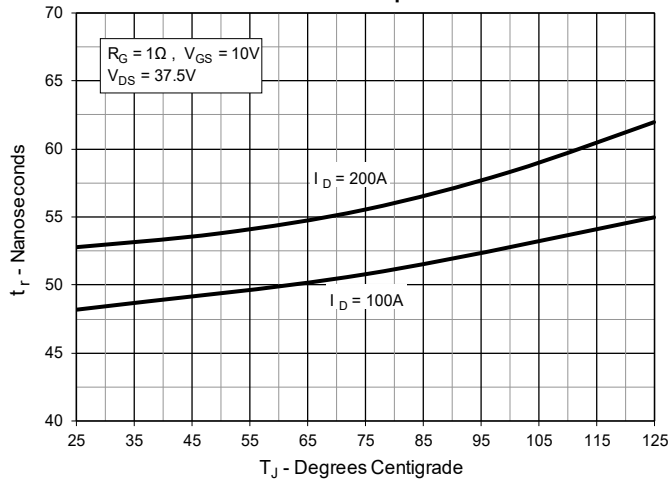
**Fig. 11. Capacitance**



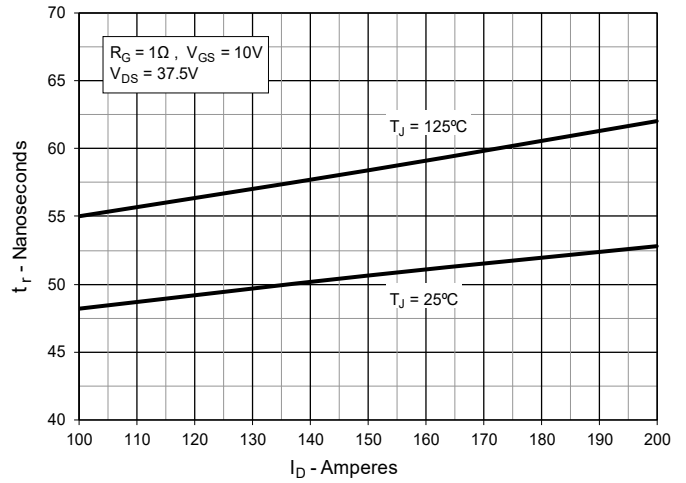
**Fig. 12. Forward-Bias Safe Operating Area**



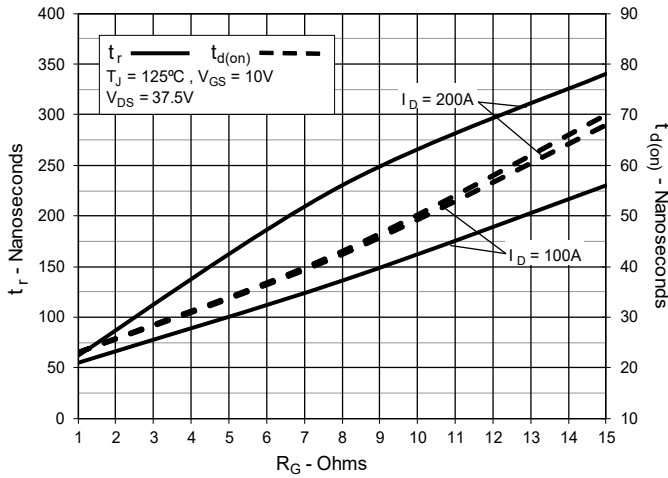
**Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature**



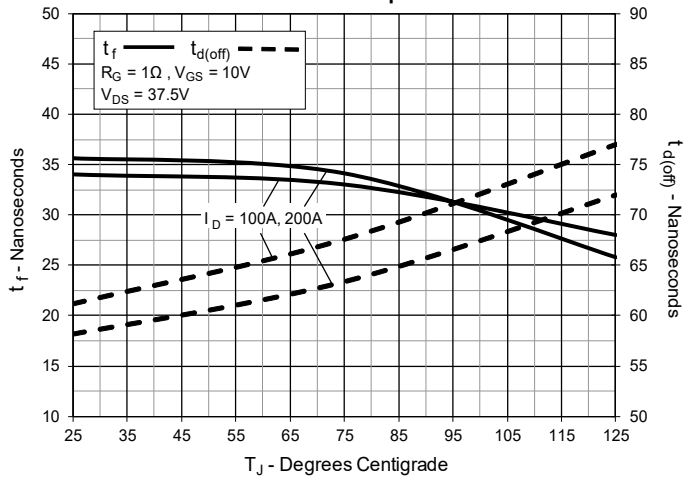
**Fig. 14. Resistive Turn-on Rise Time vs. Drain Current**



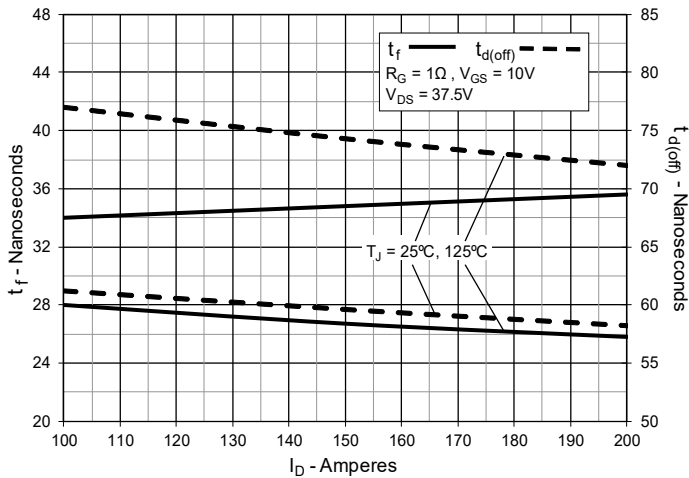
**Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance**



**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**

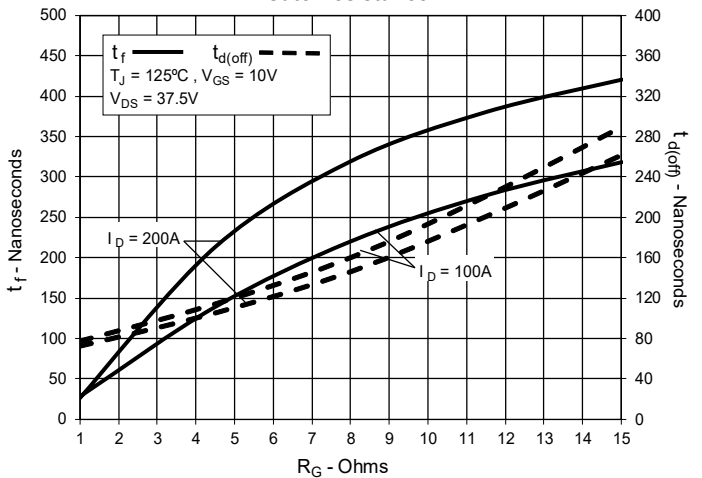
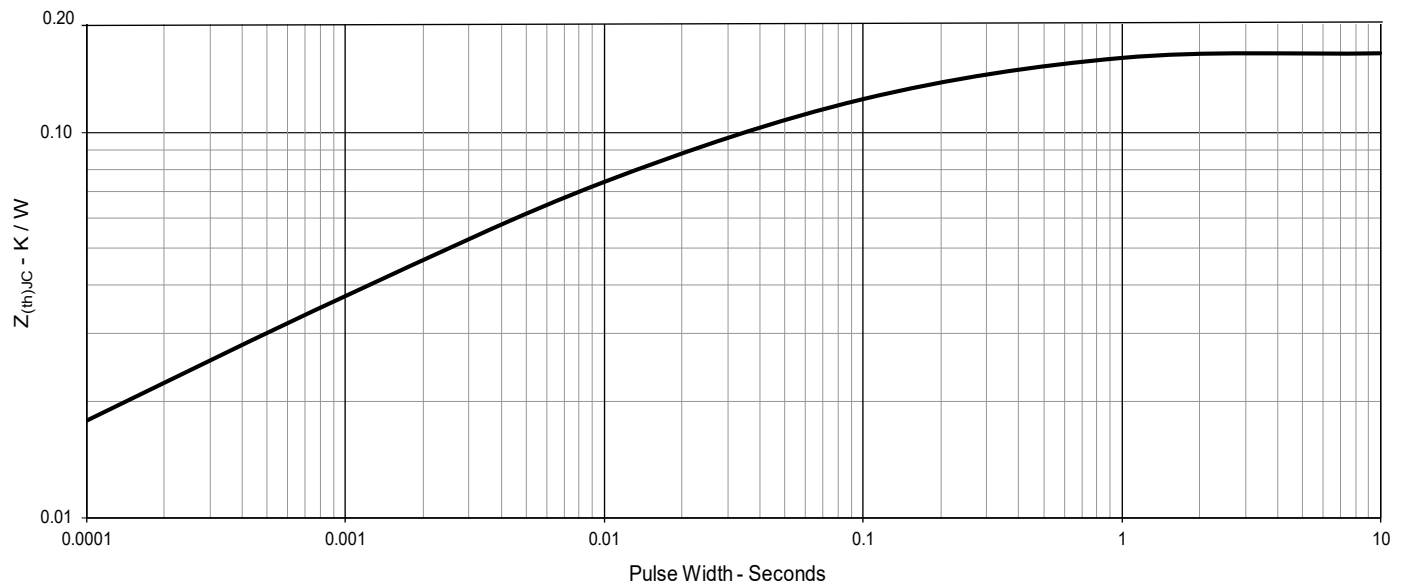
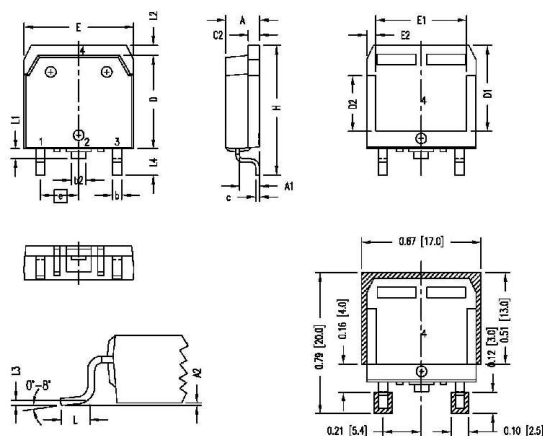


Fig. 19. Maximum Transient Thermal Impedance



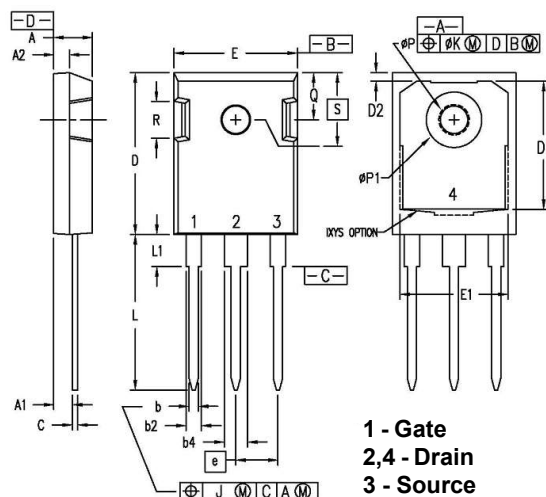
**TO-268 Outline**


**1 - Gate**  
**2,4 - Drain**  
**3 - Source**

RECOMMENDED MINIMUM FOOT PRINT FOR SMD

| SYMBOL | INCHES |      | MILLIMETERS |       |
|--------|--------|------|-------------|-------|
|        | MIN    | MAX  | MIN         | MAX   |
| A      | .193   | .201 | 4.90        | 5.10  |
| A1     | .106   | .114 | 2.70        | 2.90  |
| A2     | .001   | .010 | 0.02        | 0.25  |
| b      | .045   | .057 | 1.15        | 1.45  |
| b2     | .075   | .083 | 1.90        | 2.10  |
| C      | .016   | .026 | 0.40        | 0.65  |
| C2     | .057   | .063 | 1.45        | 1.60  |
| D      | .543   | .551 | 13.80       | 14.00 |
| D1     | .488   | .500 | 12.40       | 12.70 |
| D2     | .320   | .335 | 8.13        | 8.50  |
| E      | .624   | .632 | 15.85       | 16.05 |
| E1     | .524   | .535 | 13.30       | 13.60 |
| E2     | .045   | .055 | 1.14        | 1.39  |
| e      | .215   | BSC  | 5.45        | BSC   |
| H      | .736   | .752 | 18.70       | 19.10 |
| L      | .094   | .106 | 2.40        | 2.70  |
| L1     | .047   | .055 | 1.20        | 1.40  |
| L2     | .039   | .045 | 1.00        | 1.15  |
| L3     | .010   | BSC  | 0.25        | BSC   |
| L4     | .150   | .161 | 3.80        | 4.10  |

NOTE: ALL METAL SURFACE ARE MATTE PURE TIN PLATED EXCEPT TRIM AREA.  
 Pb PLATING THICKNESS (4 ~ 20 um)

**TO-247 Outline**


**1 - Gate**  
**2,4 - Drain**  
**3 - Source**

| SYM | INCHES |      | MILLIMETERS |       |
|-----|--------|------|-------------|-------|
|     | MIN    | MAX  | MIN         | MAX   |
| A   | .190   | .205 | 4.83        | 5.21  |
| A1  | .090   | .100 | 2.29        | 2.54  |
| A2  | .075   | .085 | 1.91        | 2.16  |
| b   | .045   | .055 | 1.14        | 1.40  |
| b2  | .075   | .087 | 1.91        | 2.20  |
| b4  | .115   | .126 | 2.92        | 3.20  |
| C   | .024   | .031 | 0.61        | 0.80  |
| D   | .819   | .840 | 20.80       | 21.34 |
| D1  | .650   | .690 | 16.51       | 17.53 |
| D2  | .035   | .050 | 0.89        | 1.27  |
| E   | .620   | .635 | 15.75       | 16.13 |
| E1  | .545   | .565 | 13.84       | 14.35 |
| e   | .215   | BSC  | 5.45        | BSC   |
| J   | --     | .010 | --          | 0.25  |
| K   | --     | .025 | --          | 0.64  |
| L   | .780   | .810 | 19.81       | 20.57 |
| L1  | .150   | .170 | 3.81        | 4.32  |
| øP  | .140   | .144 | 3.55        | 3.65  |
| øP1 | .275   | .290 | 6.99        | 7.37  |
| Q   | .220   | .244 | 5.59        | 6.20  |
| R   | .170   | .190 | 4.32        | 4.83  |
| S   | .242   | BSC  | 6.15        | BSC   |

NOTE: This drawing will meet all dimensions  
 requirement of JEDEC outlines TO-247 AD (R-PSIP-F3)