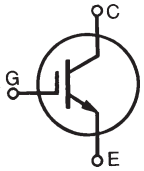
# IXYS

## High Voltage IGBT
## For Capacitor Discharge Applications

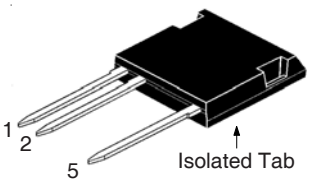
## IXGF36N300

$V_{CES}$ = 3000V
$I_{C25}$ = 36A
$V_{CE(sat)}$ ≤ 2.7V




**( Electrically Isolated Tab)**

**ISOPLUS i4-Pak™**




1 = Gate 5 = Collector
2 = Emitter

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{CES}$ | $T_J$ = 25°C to 150°C | 3000 | V |
| $V_{GES}$ | Continuous | ± 20 | V |
| $V_{GEM}$ | Transient | ± 30 | V |
| $I_{C25}$ | $T_C$ = 25°C | 36 | A |
| $I_{C110}$ | $T_C$ = 110°C | 18 | A |
| $I_{CM}$ | $T_C$ = 25°C, $V_{GE}$ = 20V, 1ms | 400 | A |
| **SSOA** | $V_{GE}$ = 20V, $T_{VJ}$ = 125°C, $R_G$ = 2Ω | $I_{CM}$ = 300 | A |
| **(RBSOA)** | Clamped Inductive Load | $V_{CE} \leq 0.8 \bullet V_{CES}$ | |
| $P_C$ | $T_C$ = 25°C | 160 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | 1.6 mm (0.062 in.) from Case for 10s | 300 | °C |
| $T_{SOLD}$ | Plastic Body for 10s | 260 | °C |
| $F_C$ | Mounting Force | 20..120/4.5..27 | Nm/lb-in. |
| $V_{ISOL}$ | 50/60Hz, 1 minute | 4000 | V~ |
| **Weight** | | 5 | g |

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{CES}$ | $I_C$ = 250μA, $V_{GE}$ = 0V | 3000 | | | V |
| $V_{GE(th)}$ | $I_C$ = 250μA, $V_{CE}$ = $V_{GE}$ | 3.0 | | 5.0 | V |
| $I_{CES}$ | $V_{CE}$ = 0.8 • $V_{CES}$, $V_{GE}$ = 0V | | | 50 | μA |
| | Note 2 ,$T_J$ = 125°C | | | 2 | mA |
| $I_{GES}$ | $V_{CE}$ = 0V, $V_{GE}$ = ±20V | | | ±200 | nA |
| $V_{CE(sat)}$ | $I_C$ = 36A, $V_{GE}$ = 15V, Note 1 | | | 2.7 | V |
| | $I_C$ = 100A | | | 5.2 | V |

### Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V Electrical Isolation
- High Peak Current Capability
- Low Saturation Voltage
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

### Applications

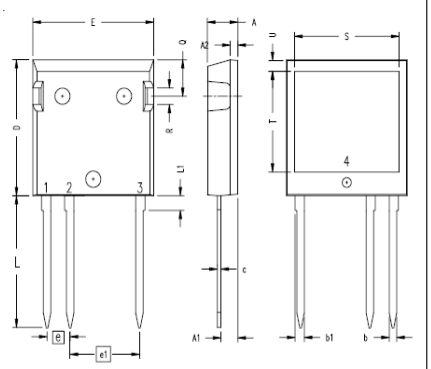
- Capacitor Discharge
- Pulser Circuits

### Advantages

- High Power Density
- Easy to Mount

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. |
|---|---|---|---|---|
| $g_{fs}$ | $I_C$ = 36A, $V_{CE}$ = 10V, Note 1 | 15 | 25 | S |
| $I_{C(ON)}$ | $V_{GE}$ = 15V, $V_{CE}$ = 20V, Note 1 | | 360 | A |
| $C_{ies}$ | $V_{CE}$ = 25V, $V_{GE}$ = 0V, f = 1MHz | | 2690 | pF |
| $C_{oes}$ | | | 123 | pF |
| $C_{res}$ | | | 34 | pF |
| $Q_g$ | $I_C$ = 30A, $V_{GE}$ = 15V, $V_{CE}$ = 600V | | 136 | nC |
| $Q_{ge}$ | | | 21 | nC |
| $Q_{gc}$ | | | 52 | nC |
| $t_{d(on)}$ | **Resistive Switching Times** | | 36 | ns |
| $t_r$ | $I_C$ = 36A, $V_{GE}$ = 15V | | 185 | ns |
| $t_{d(off)}$ | $V_{CE}$ = 1500V, $R_G$ = 2Ω | | 215 | ns |
| $t_f$ | | | 540 | ns |
| $R_{thJC}$ | | | | 0.78 °C/W |
| $R_{thCS}$ | | | 0.15 | °C/W |
| $R_{thJA}$ | | | 30 | °C/W |

**ISOPLUS i4-Pak™ (HV) Outline**




Pin 1 = Gate
Pin 2 = Emitter
Pin 3 = Collector
Tab 4 = Isolated

| SYM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .102 | .118 | 2.59 | 3.00 |
| A2 | .046 | .085 | 1.17 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .058 | .068 | 1.47 | 1.73 |
| C | .020 | .029 | 0.51 | 0.74 |
| D | .819 | .840 | 20.80 | 21.34 |
| E | .770 | .799 | 19.56 | 20.29 |
| e | .150 BSC | | 3.81 BSC | |
| e1 | .450 BSC | | 11.43 BSC | |
| L | .780 | .840 | 19.81 | 21.34 |
| L1 | .083 | .102 | 2.11 | 2.59 |
| Q | .210 | .244 | 5.33 | 6.20 |
| R | .100 | .180 | 2.54 | 4.57 |
| S | .660 | .690 | 16.76 | 17.53 |
| T | .590 | .620 | 14.99 | 15.75 |
| U | .065 | .080 | 1.65 | 2.03 |

Notes:

1. Pulse test, t < 300μs, duty cycle, d < 2%.
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

**Fig. 1. Output Characteristics @ $T_J$ = 25ºC**

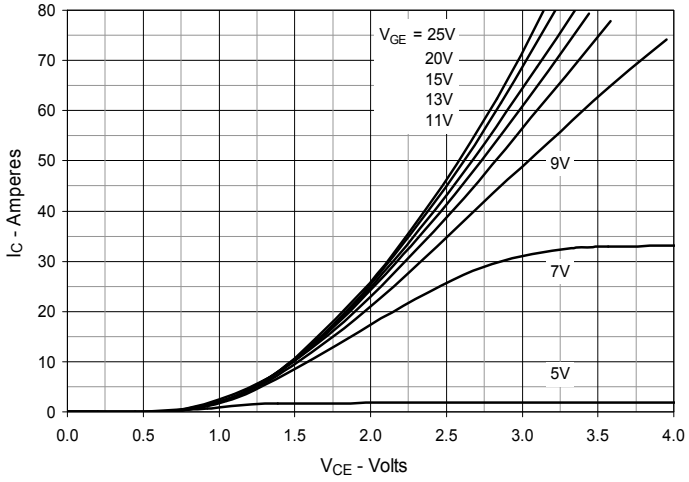



**Fig. 2. Extended Output Characteristics @ $T_J$ = 25ºC**

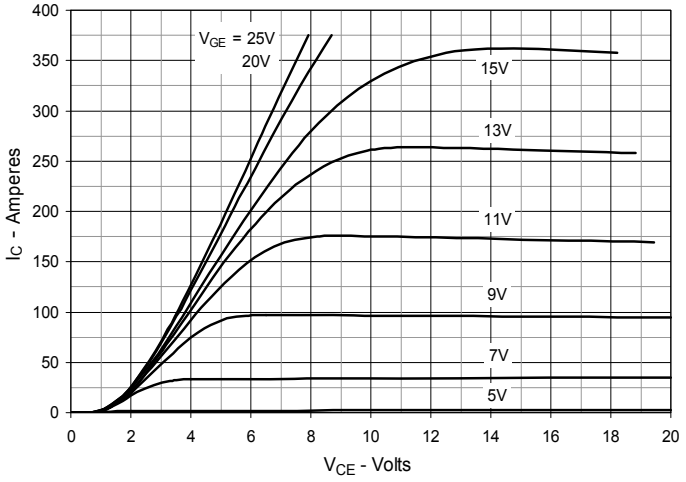



**Fig. 3. Output Characteristics @ $T_J$ = 125ºC**

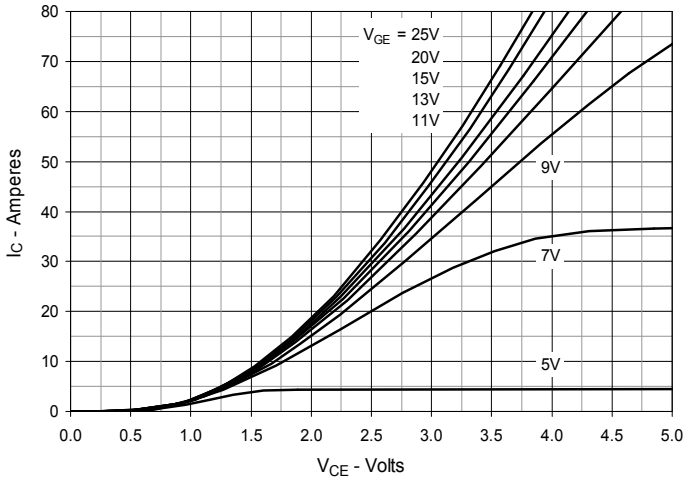



**Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature**

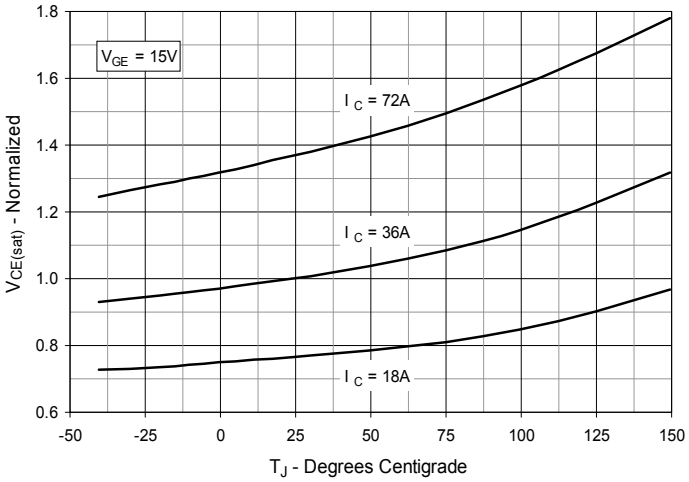



**Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage**

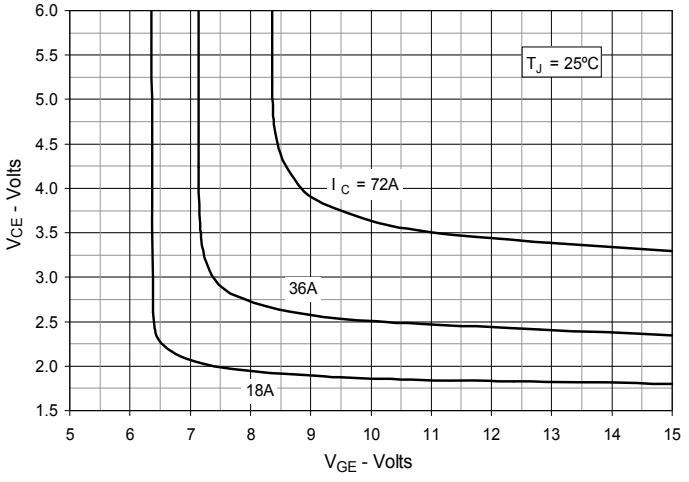



**Fig. 6. Input Admittance**

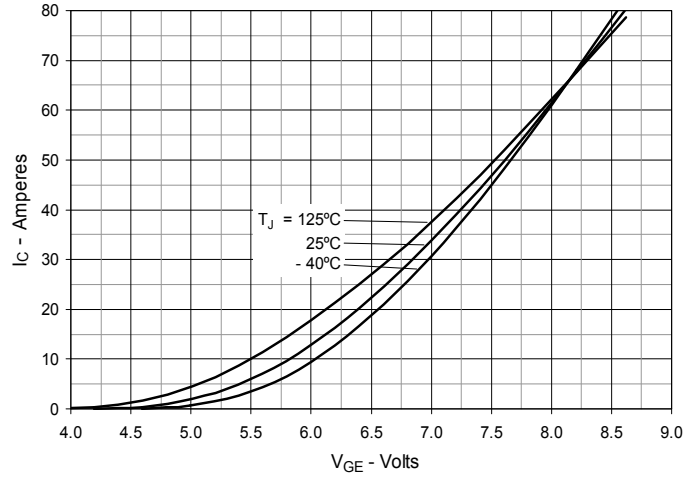


**Fig. 7. Transconductance**

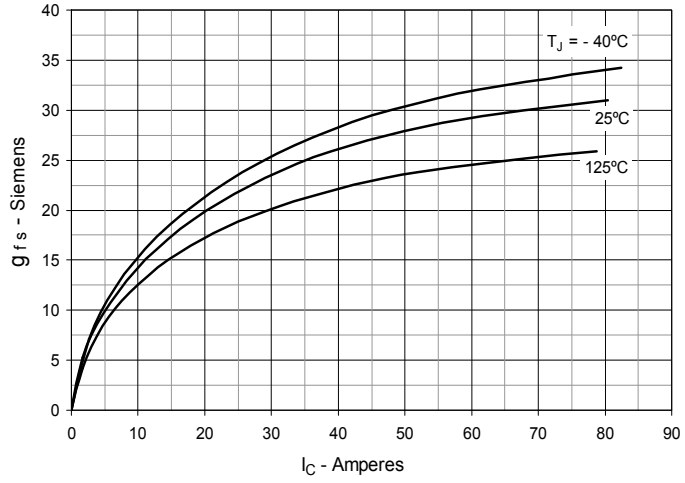



**Fig. 8. Gate Charge**

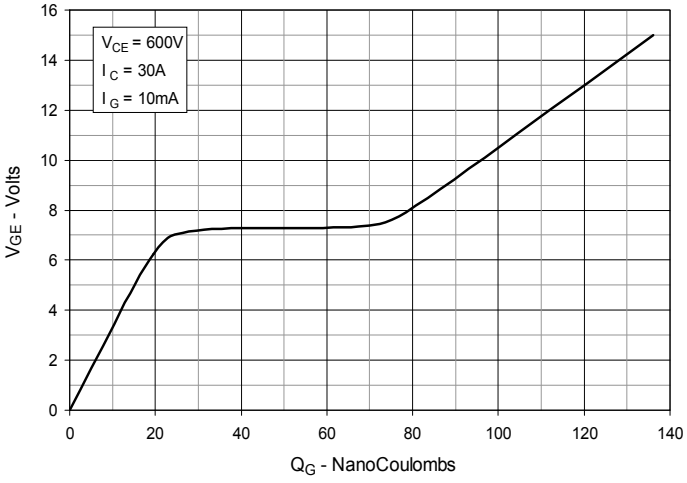



**Fig. 9. Reverse-Bias Safe Operating Area**

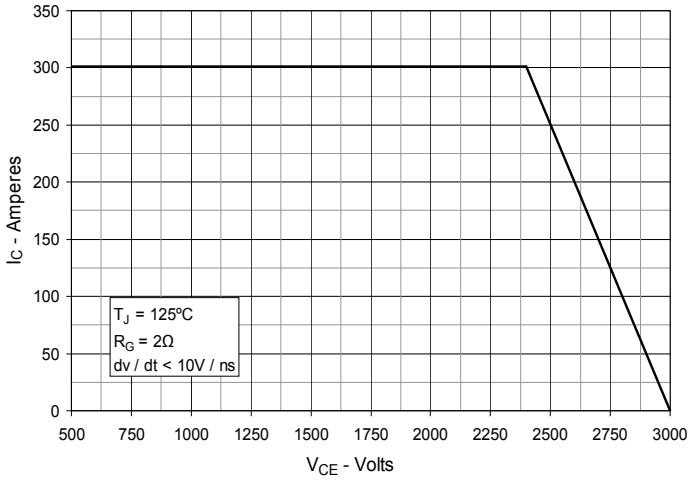



**Fig. 10. Capacitance**

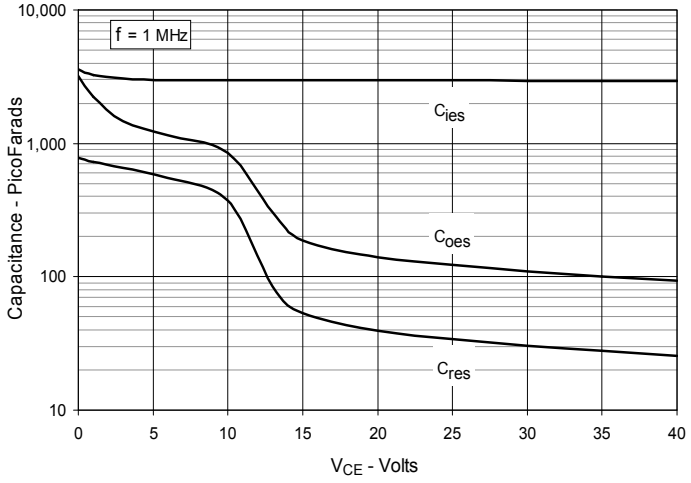



**Fig. 11. Maximum Transient Thermal Impedance**

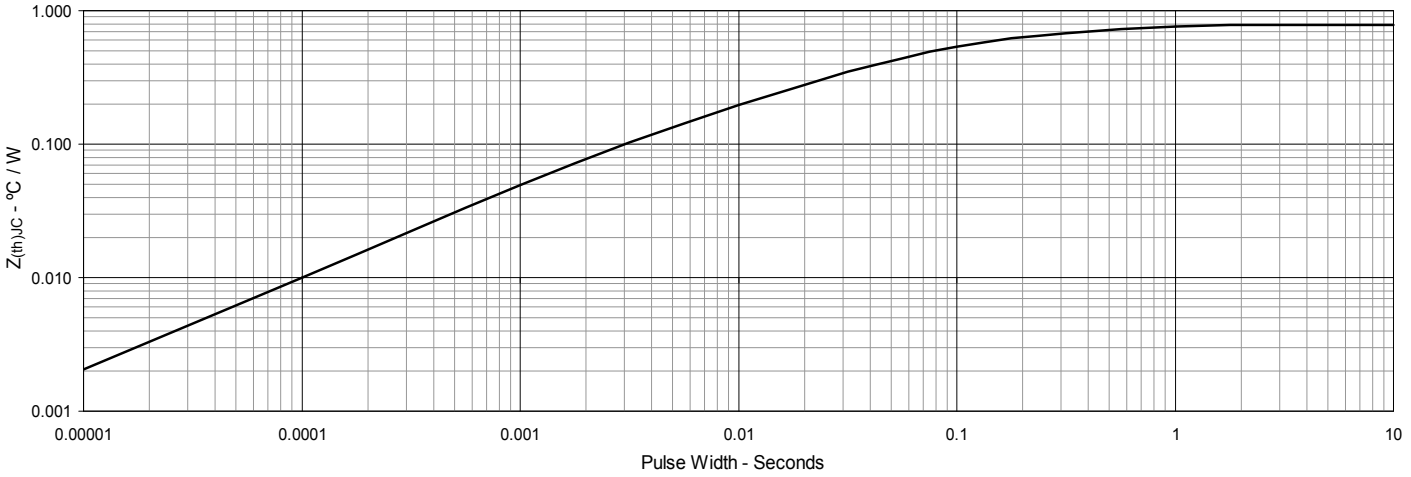


**Fig. 12. Resistive Turn-on Rise Time vs. Junction Temperature**

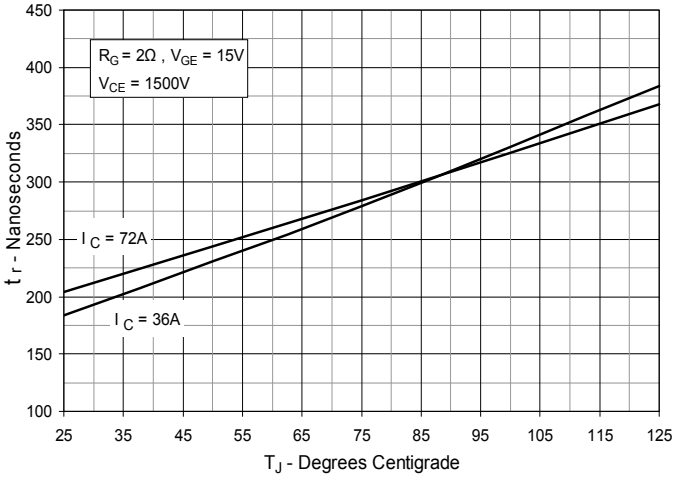



**Fig. 13. Resistive Turn-on Rise Time vs. Drain Current**

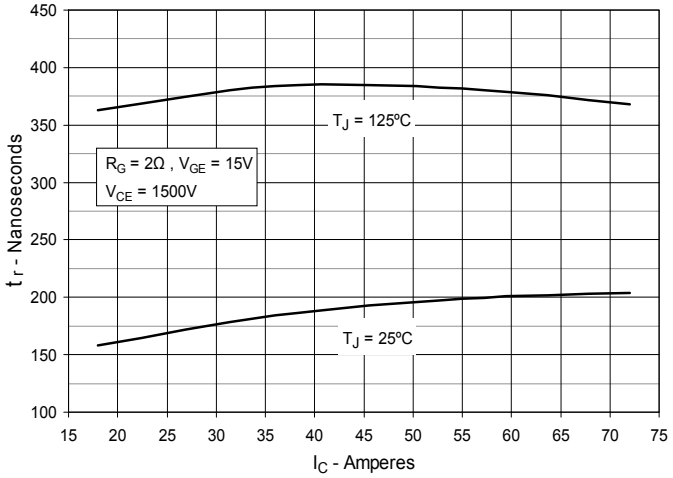



**Fig. 14. Resistive Turn-on Switching Times vs. Gate Resistance**

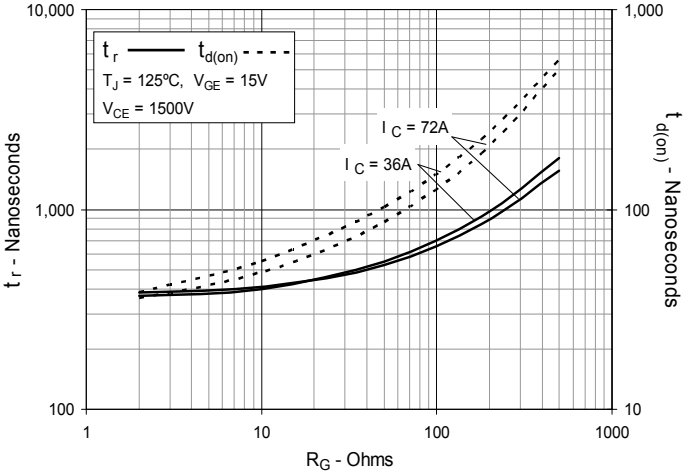



**Fig. 15. Resistive Turn-off Switching Times vs. Junction Temperature**

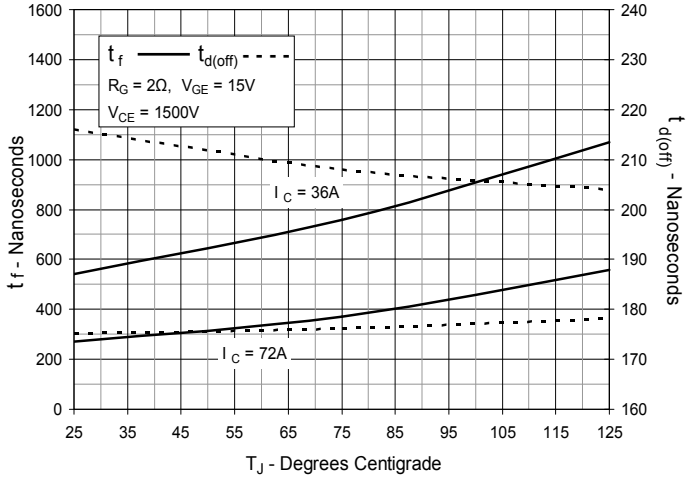



**Fig. 16. Resistive Turn-off Switching Times vs. Drain Current**

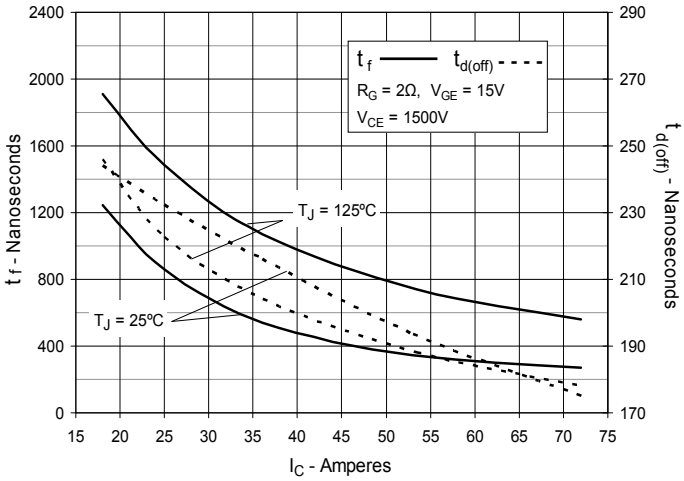



**Fig. 17. Resistive Turn-off Switching Times vs. Gate Resistance**