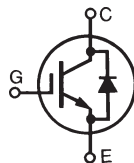


**BiMOSFET™ Monolithic
Bipolar MOS Transistor**
IXBN75N170

$$V_{CES} = 1700V$$

$$I_{C90} = 75A$$

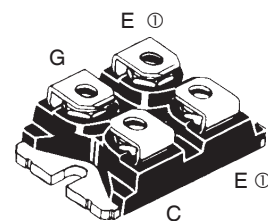
$$V_{CE(sat)} \leq 3.1V$$



| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|---|---|--------------------------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 1700 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C , $R_{GE} = 1M\Omega$ | 1700 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 145 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 75 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1ms | 680 | A |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 1\Omega$ Clamped Inductive Load | $I_{CM} = 150$ $V_{CE} \leq 0.8 \cdot V_{CES}$ | A |
| P_C | $T_C = 25^\circ\text{C}$ | 625 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | $^\circ\text{C}$ |
| T_L T_{SOLD} | Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10 | 300 260 | $^\circ\text{C}$ $^\circ\text{C}$ |
| V_{ISOL} | 50/60Hz $I_{ISOL} \leq 1mA$ | $t = 1min$ $t = 1s$ | 2500 3000 V~ V~ |
| M_d | Mounting Torque Terminal Connection Torque (M4) | 1.5/13 1.3/11.5 | Nm/lb.in. Nm/lb.in. |
| Weight | | 30 | g |

SOT-227B, miniBLOC

E153432



G = Gate, C = Collector, E = Emitter
 ① either emitter terminal can be used as
 Main or Kelvin Emitter

Features

- International Standard Package
- High Blocking Voltage
- Isolation Voltage 3000 V~
- High Current Handling Capability
- Anti-Parallel Diode

Advantages

- High Power Density
- Low Gate Drive Requirement
- Easy to Mount with 2 Screws
- Integrated Diode Can Be Used for Protection

Applications

- Capacitor Discharge
- AC Switches
- Switch-Mode and Resonant-Mode Power Supplies
- UPS
- AC Motor Drives

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------------|--------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 1700 | | V |
| $V_{GE(th)}$ | $I_C = 1.5mA$, $V_{CE} = V_{GE}$ | 2.5 | | 5.5 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ\text{C}$ | | | 25 μA 2 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ\text{C}$ | | 2.6 3.1 | 3.1 V V |

Symbol Test Conditions

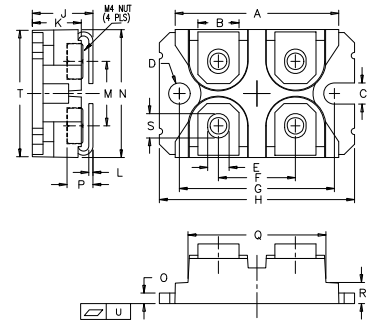
($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

Min. Typ. Max.

| | | | | |
|--------------|---|------|------|-------------------------|
| g_{fs} | $I_C = I_{C90}, V_{CE} = 10V, \text{Note 1}$ | 34 | 56 | S |
| C_{ies} | $V_{CE} = 25V, V_{GE} = 0V, f = 1\text{MHz}$ | | 6930 | pF |
| C_{oes} | | | 400 | pF |
| C_{res} | | | 150 | pF |
| Q_g | $I_C = I_{C90}, V_{GE} = 15V, V_{CE} = 0.5 \cdot V_{CES}$ | | 350 | nC |
| Q_{ge} | | | 50 | nC |
| Q_{gc} | | | 160 | nC |
| $t_{d(on)}$ | Resistive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15V$ $R_G = 1\Omega, V_{CE} = 0.5 \cdot V_{CES}$ | | 46 | ns |
| t_r | | | 160 | ns |
| $t_{d(off)}$ | | | 260 | ns |
| t_f | | | 440 | ns |
| $t_{d(on)}$ | Resistive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15V$ $R_G = 1\Omega, V_{CE} = 0.5 \cdot V_{CES}$ | | 47 | ns |
| t_r | | | 230 | ns |
| $t_{d(off)}$ | | | 260 | ns |
| t_f | | | 580 | ns |
| R_{thJC} | | | | 0.20 $^\circ\text{C/W}$ |
| R_{thCS} | | 0.05 | | $^\circ\text{C/W}$ |

SOT-227B miniBLOC (IXBN)



| 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 |

Reverse Diode

Symbol Test Conditions

($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)

Characteristic Values

Min. Typ. Max.

| | | | | |
|----------|--|--|------|---------------|
| V_F | $I_F = I_{C90}, V_{GE} = 0V, \text{Note 1}$ | | 3.0 | V |
| t_{rr} | $I_F = 37V, V_{GE} = 0V, -di_F/dt = 100A/\mu\text{s}$ $V_R = 100V, V_{GE} = 0V$ | | 1.5 | μs |
| I_{RM} | | | 50 | A |
| Q_{RM} | | | 38.2 | μC |

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

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 | 7,157,338B2 |
| 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

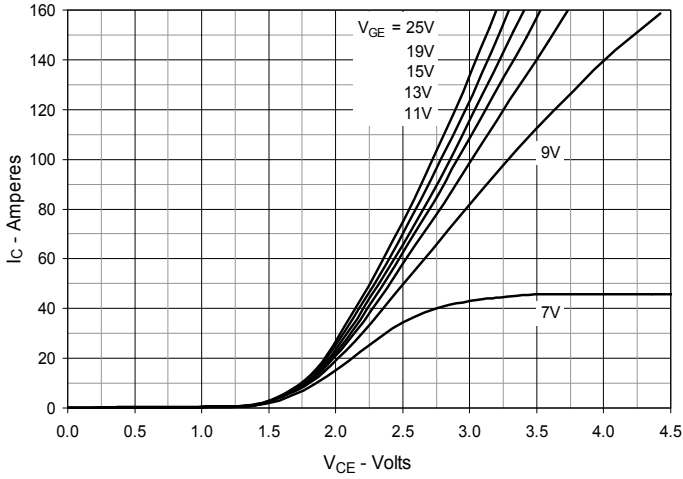


Fig. 2. Extended Output Characteristics @ 25°C

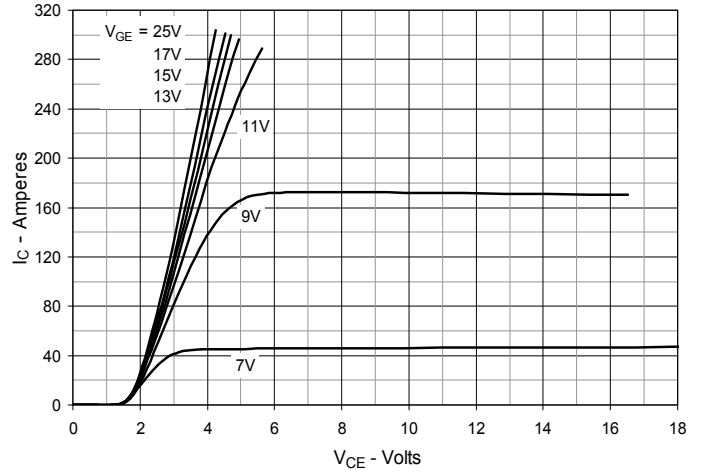


Fig. 3. Output Characteristics @ 125°C

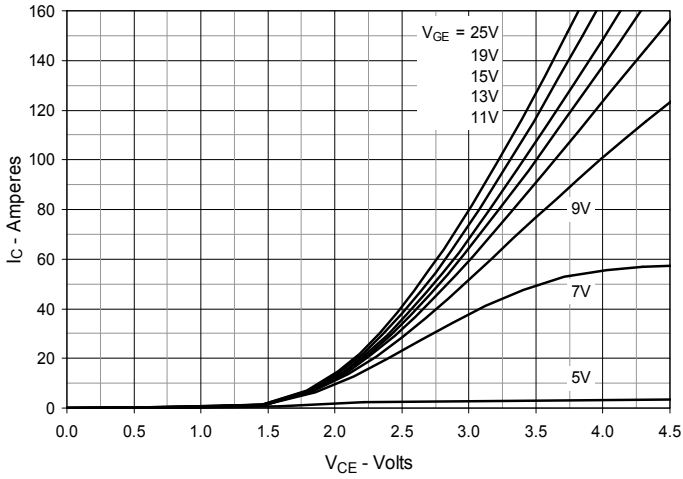


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

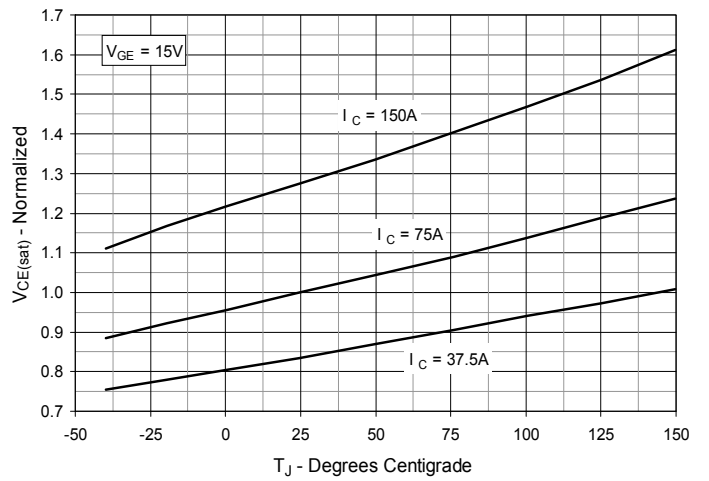


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

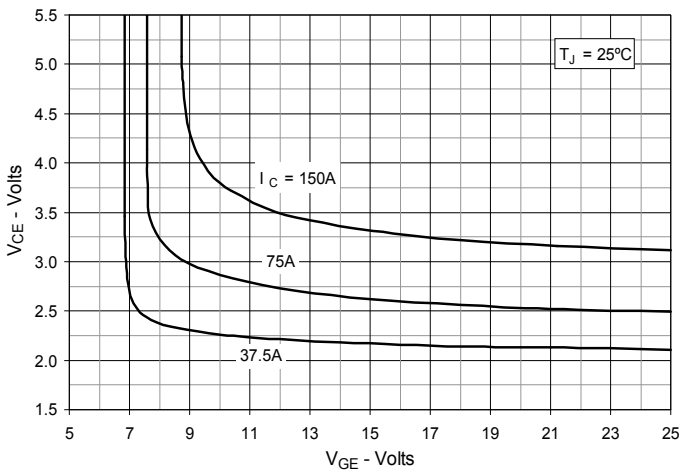


Fig. 6. Input Admittance

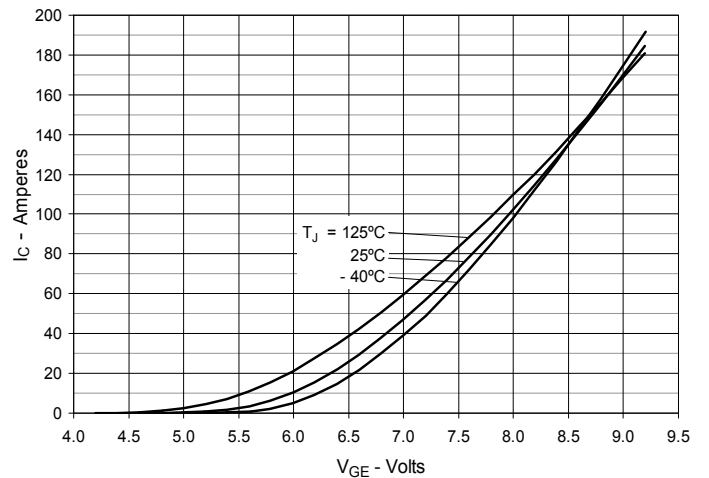


Fig. 7. Transconductance

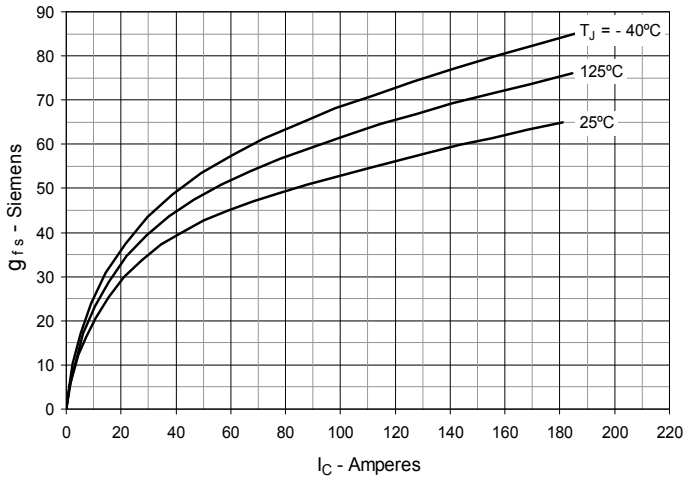


Fig. 8. Forward Voltage Drop of Intrinsic Diode

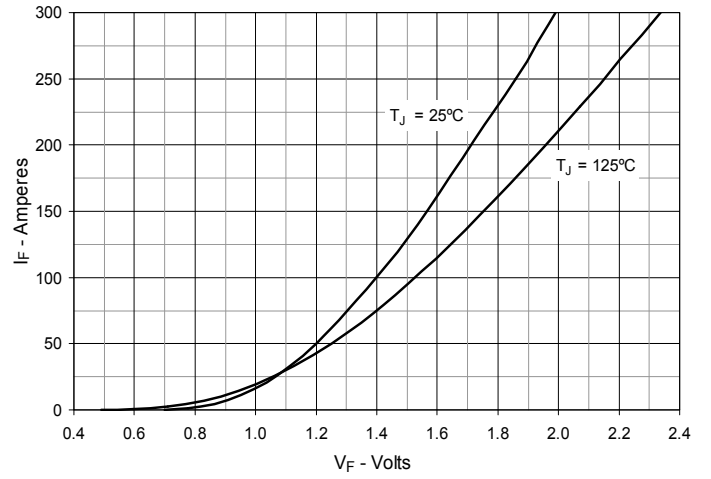


Fig. 9. Gate Charge

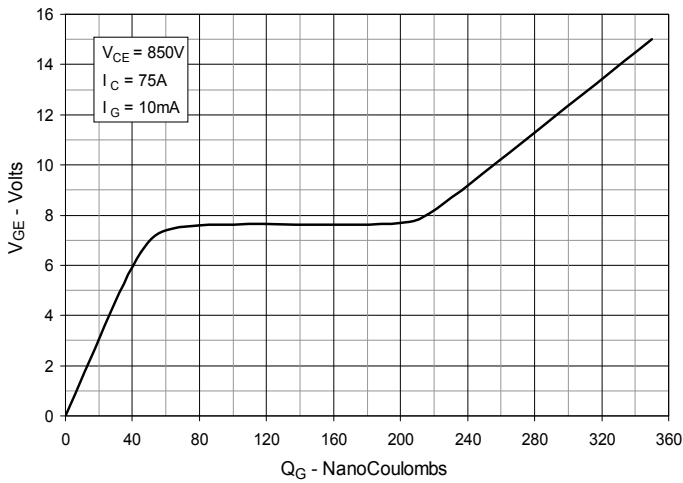


Fig. 10. Capacitance

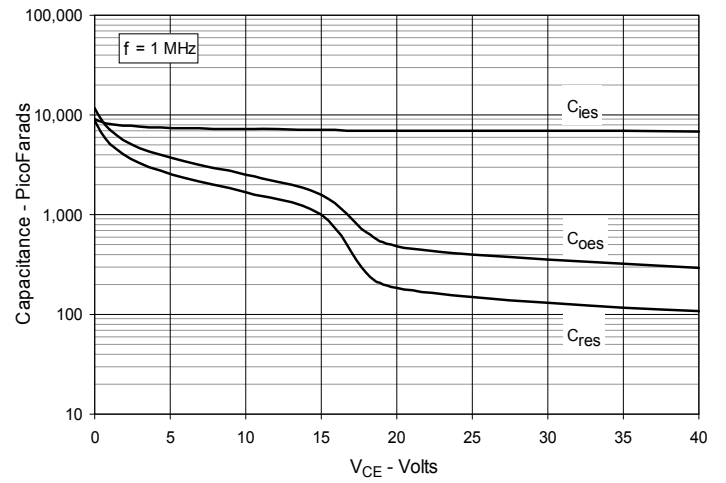


Fig. 11. Reverse-Bias Safe Operating Area

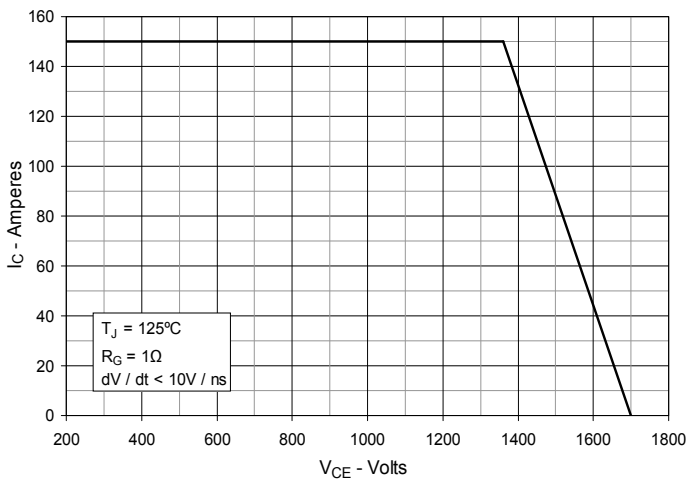


Fig. 12. Maximum Transient Thermal Impedance

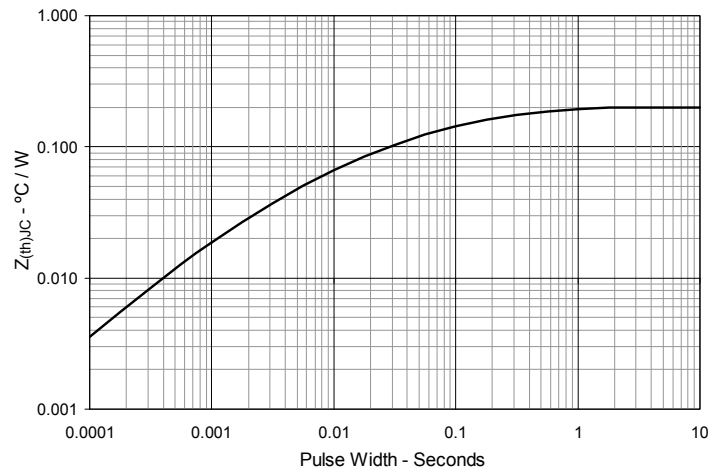


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

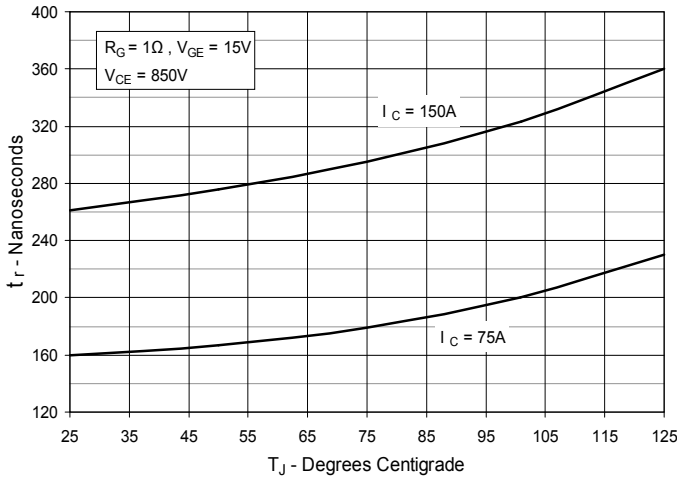


Fig. 14. Resistive Turn-on Rise Time vs. Collector Current

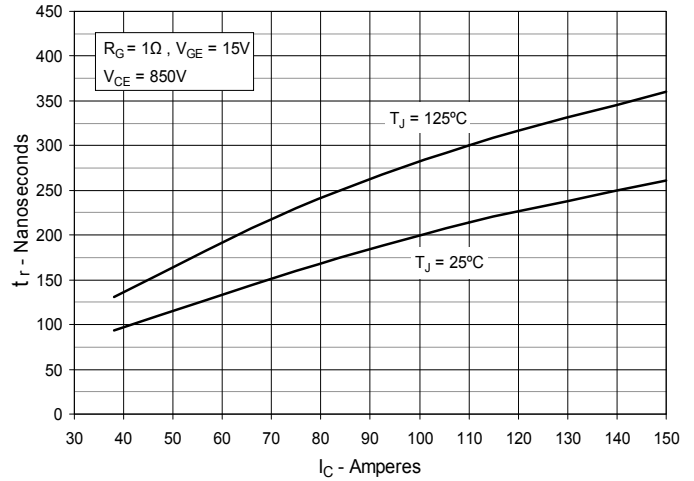


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

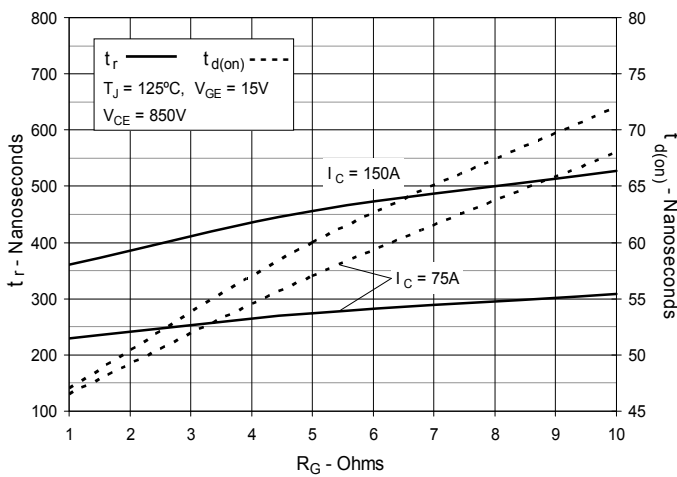


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

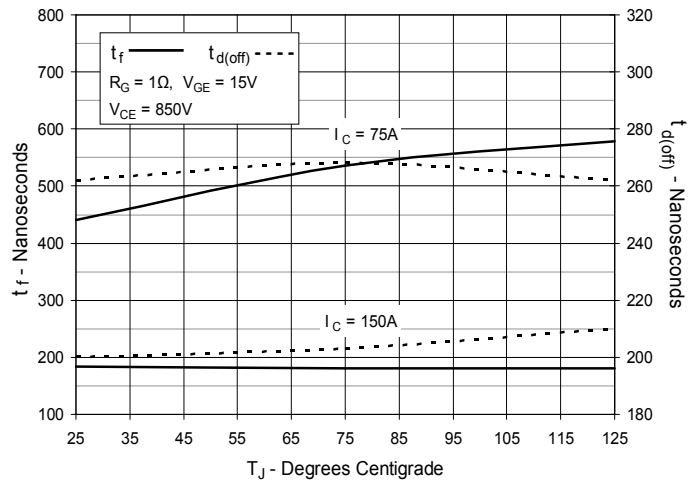


Fig. 17. Resistive Turn-off Switching Times vs. Collector Current

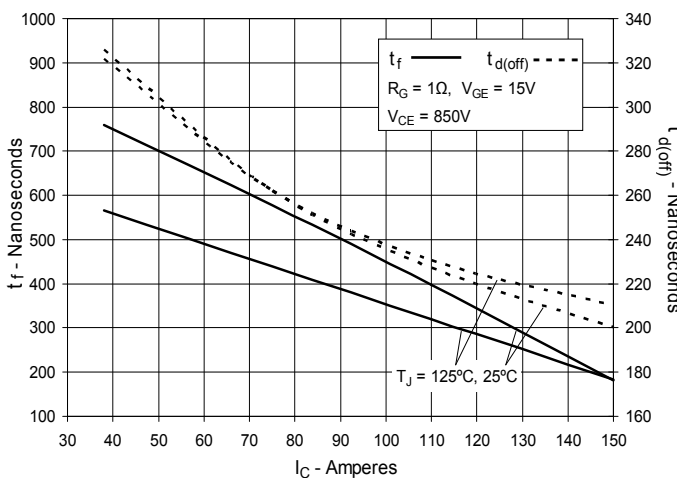


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

