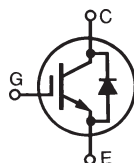


**BiMOSFET™ Monolithic
Bipolar MOS Transistor**
IXBN75N170A


$$V_{CES} = 1700V$$

$$I_{C90} = 42A$$

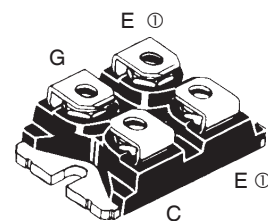
$$V_{CE(sat)} \leq 6.00V$$

$$t_{fi(typ)} = 60ns$$

| Symbol | Test Conditions | Maximum Ratings | |
|----------------|---|---------------------------------|------------|
| V_{CES} | $T_J = 25^\circ C$ to $150^\circ C$ | 1700 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 1700 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 75 | A |
| I_{C90} | $T_C = 90^\circ C$ | 42 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 350 | A |
| SSOA | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 1\Omega$ | $I_{CM} = 100$ | A |
| (RBSOA) | Clamped Inductive Load | $V_{CE} \leq 0.8 \cdot V_{CES}$ | |
| P_C | $T_C = 25^\circ C$ | 625 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062 in.) from Case for 10 | 260 | $^\circ C$ |
| V_{ISOL} | 50/60Hz $t = 1min$ | 2500 | V~ |
| | $I_{ISOL} \leq 1mA$ $t = 1s$ | 3000 | V~ |
| M_d | Mounting Torque | 1.5/13 | Nm/lb.in. |
| | Terminal Connection Torque (M4) | 1.3/11.5 | 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 Packages
- High Blocking Voltage
- Fast Switching
- 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

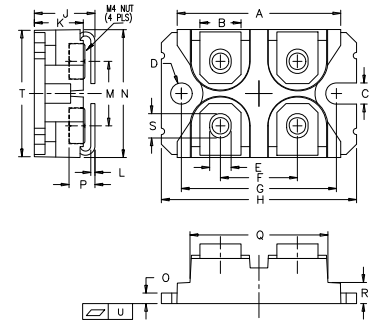
Applications

- Switched-Mode and Resonant-Mode Power Supplies
- UPS
- AC Motor Drives
- Substitutes for High Voltage MOSFETs

| Symbol | Test Conditions ($T_J = 25^\circ C$, 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} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 50 μA 3 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$ | 4.95 | 5.15 | 6.00 V V |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | Characteristic Values | | | |
|--------------|--|-----------------------|------|-----------|----|
| | | Min. | Typ. | Max. | |
| g_{fS} | $I_C = I_{C90}, V_{CE} = 10\text{V}$, Note 1 | 28 | 48 | S | |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 7200 | pF | |
| C_{oes} | | | 450 | pF | |
| C_{res} | | | 150 | pF | |
| Q_g | $I_C = I_{C90}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$ | | 358 | nC | |
| Q_{ge} | | | 46 | nC | |
| Q_{gc} | | | 148 | nC | |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ Note 2 | | 26 | ns | |
| t_{ri} | | | 40 | ns | |
| $t_{d(off)}$ | | | 418 | ns | |
| t_{fi} | | | 60 | 110 | ns |
| E_{off} | | | 3.80 | 7.00 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{V}$ $V_{CE} = 0.8 \cdot V_{CES}, R_G = 1\Omega$ Note 2 | | 27 | ns | |
| t_{ri} | | | 38 | ns | |
| $t_{d(off)}$ | | | 420 | ns | |
| t_{fi} | | | 175 | ns | |
| E_{off} | | | 6.35 | mJ | |
| R_{thJC} | | | | 0.20 °C/W | |
| R_{thCS} | | 0.05 | | °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 | $I_F = I_{C90}, V_{GE} = 0\text{V}$, Note 1 | | | 4.2 V |
| t_{rr} | $I_F = I_{C90}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$ | | 360 | ns |
| I_{RM} | | | 19 | A |
| Q_{RM} | | $V_R = 100\text{V}, V_{GE} = 0\text{V}$ | | 3.5 |

Notes:

1. Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.
2. Switching times & energy losses may increase for higher V_{CE} (Clamp), T_J or R_G .

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

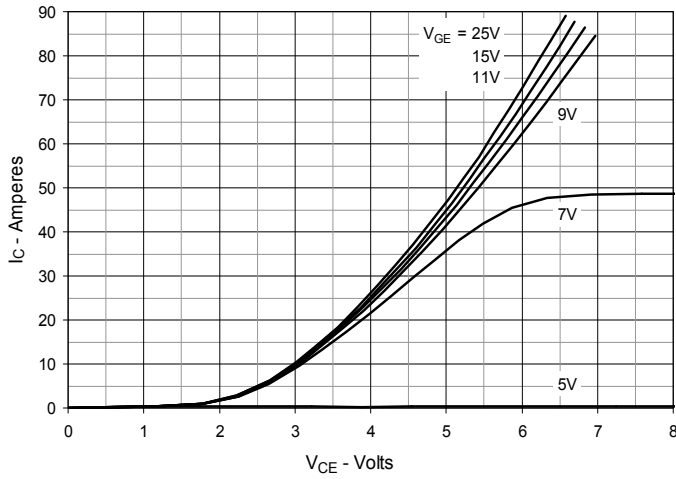


Fig. 2. Extended Output Characteristics @ 25°C

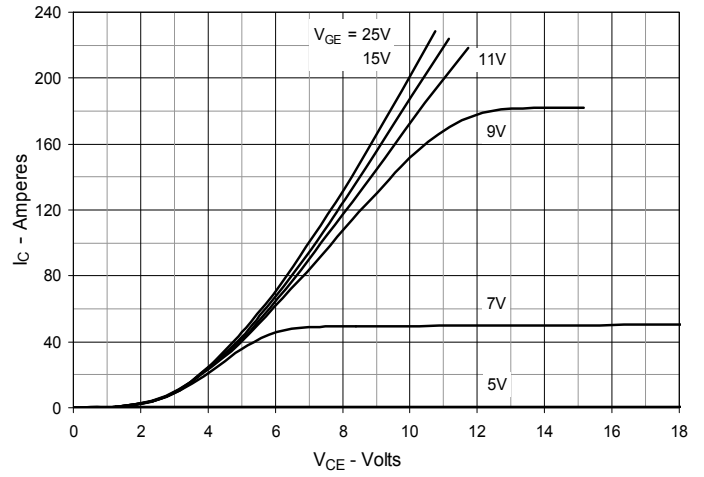


Fig. 3. Output Characteristics @ 125°C

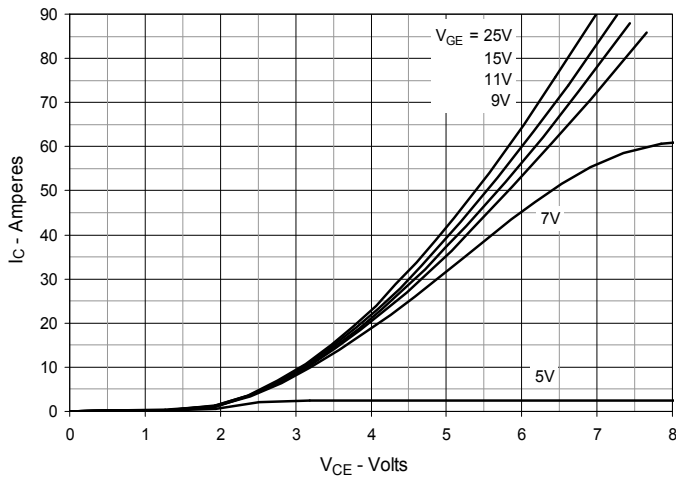


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

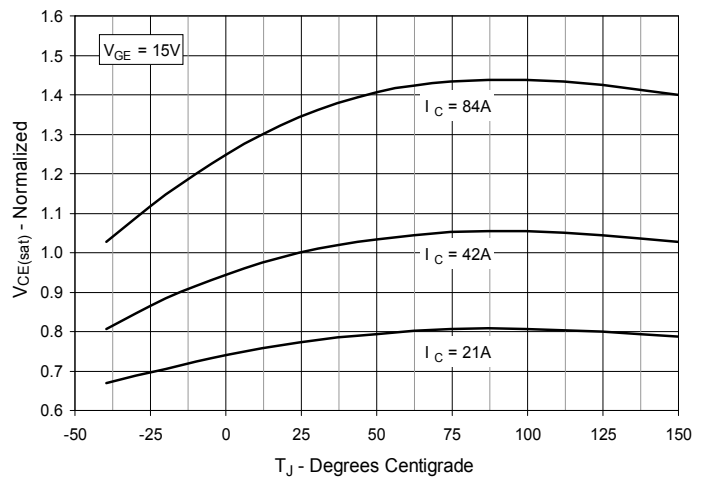


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

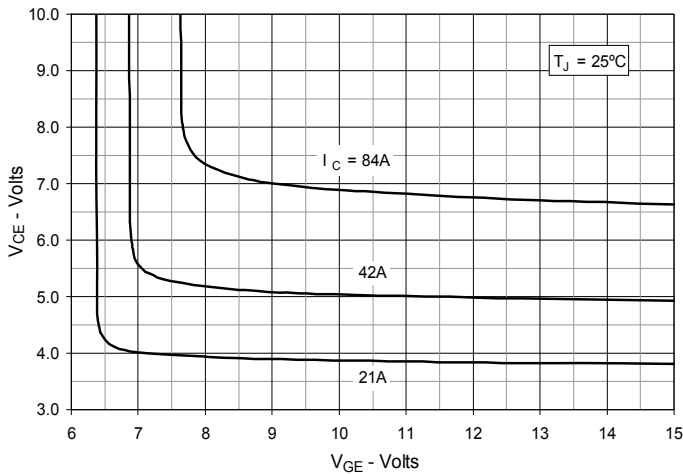


Fig. 6. Input Admittance

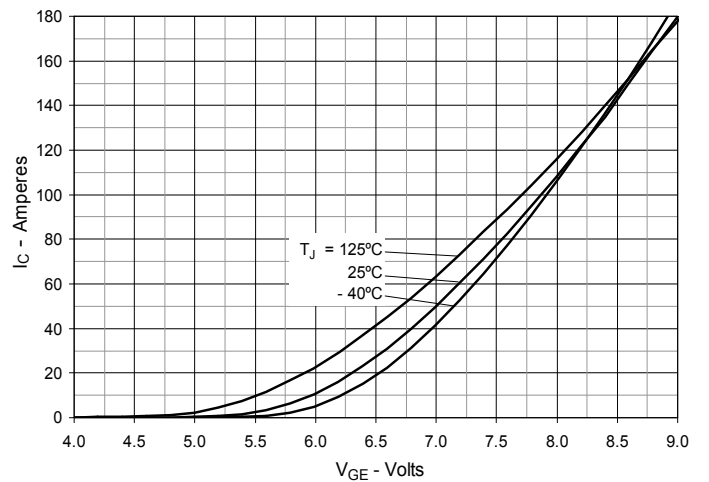


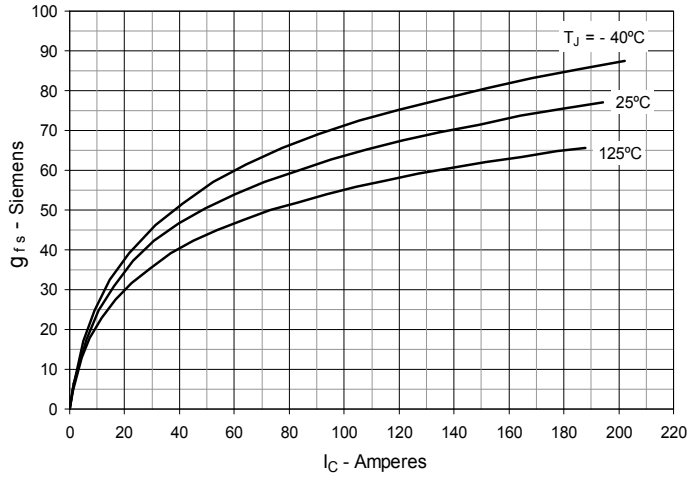
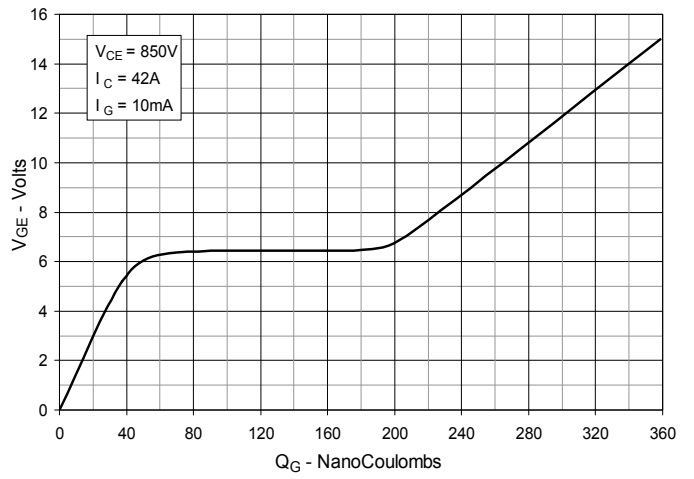
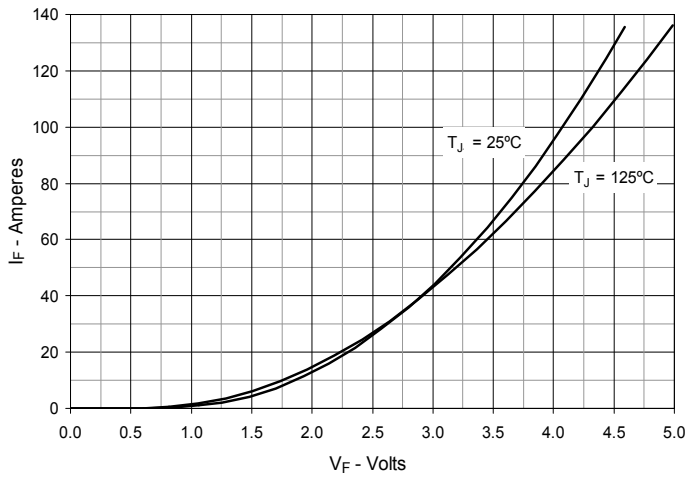
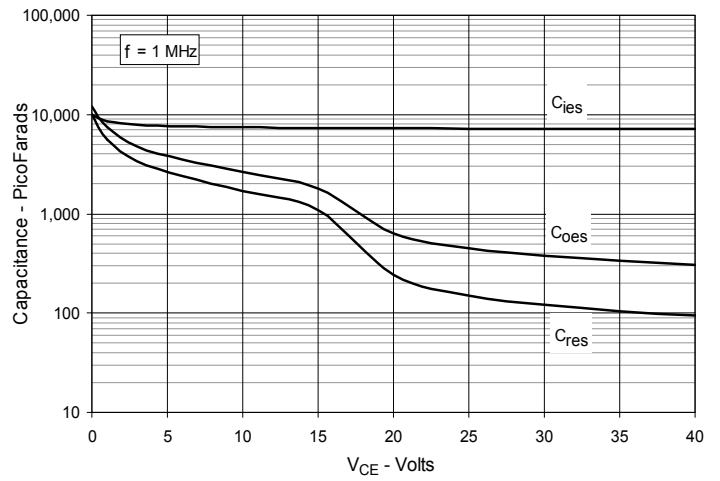
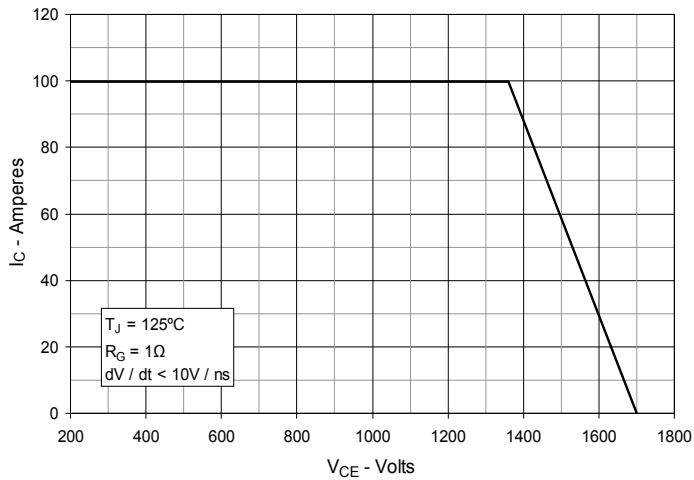
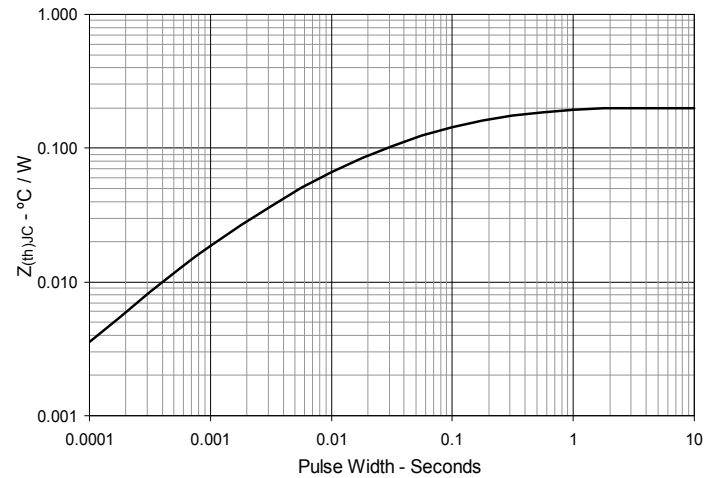
Fig. 7. Transconductance

Fig. 8. Gate Charge

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Capacitance

Fig. 11. Reverse-Bias Safe Operating Area

Fig. 12. Maximum Transient Thermal Impedance


Fig. 13. Inductive Turn-off
Switching Energy Loss vs. Gate Resistance

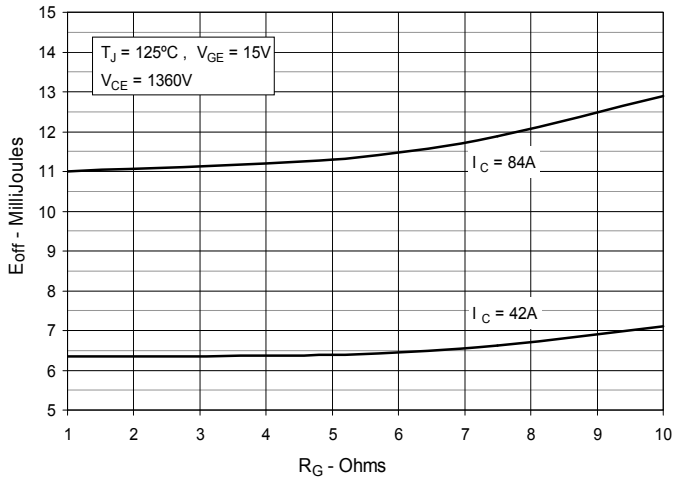


Fig. 14. Inductive Turn-off
Switching Energy Loss vs. Collector Current

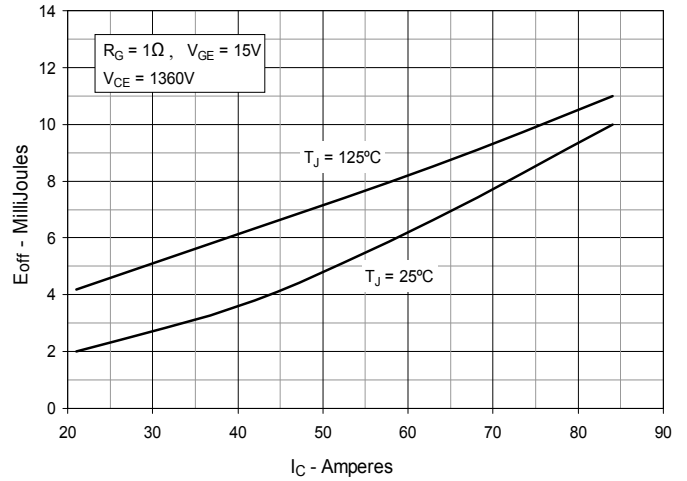


Fig. 15. Inductive Turn-off
Switching Energy Loss vs. Junction Temperature

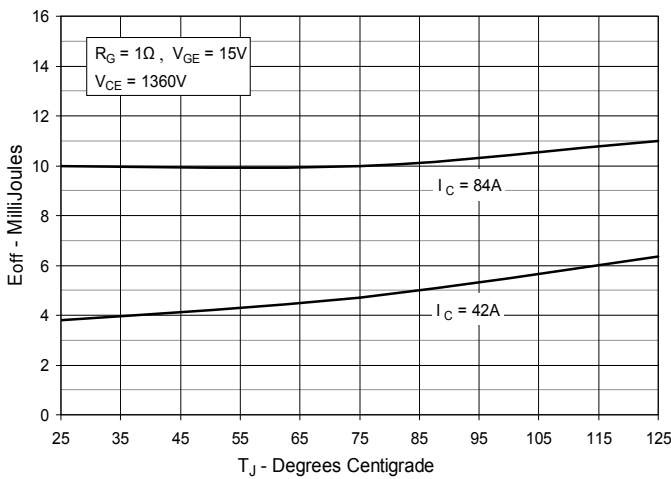


Fig. 16. Inductive Turn-off
Switching Times vs. Gate Resistance

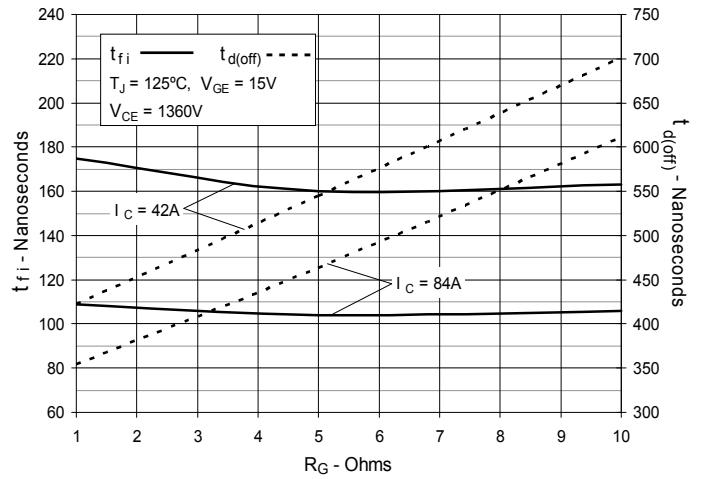


Fig. 17. Inductive Turn-off
Switching Times vs. Collector Current

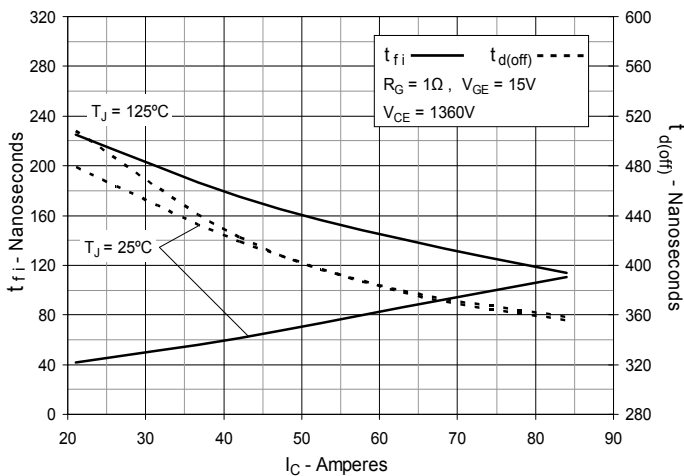
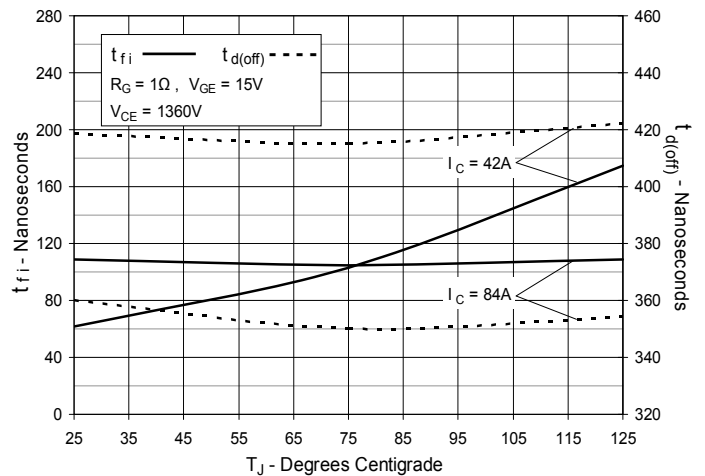
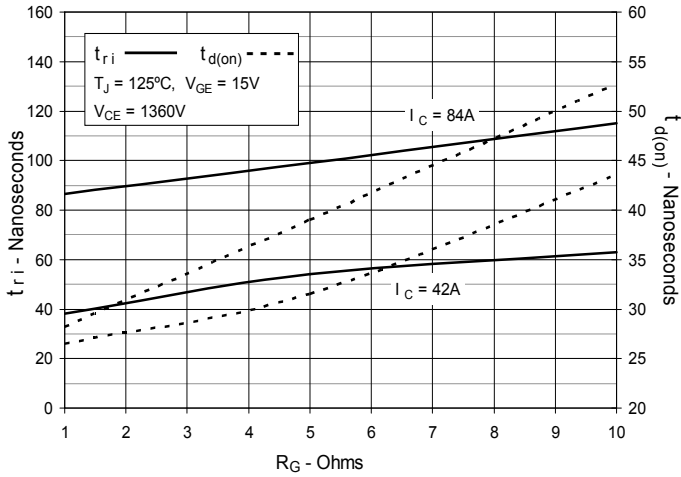


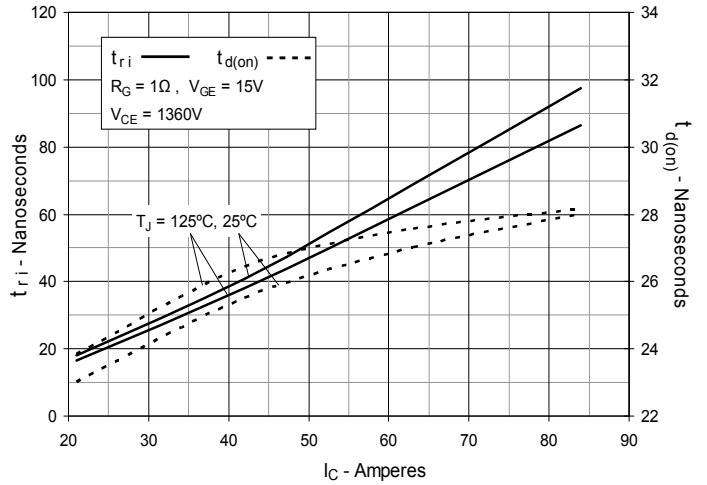
Fig. 18. Inductive Turn-off
Switching Times vs. Junction Temperature



**Fig. 19. Inductive Turn-on
Switching Times vs. Gate Resistance**



**Fig. 20. Inductive Turn-on
Switching Times vs. Collector Current**



**Fig. 21. Inductive Turn-on
Switching Times vs. Junction Temperature**

