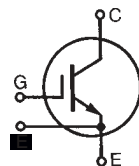


1200V XPT™ IGBT GenX3™

IXYN100N120C3

High-Speed IGBT
for 20-50 kHz Switching



$$V_{CES} = 1200V$$

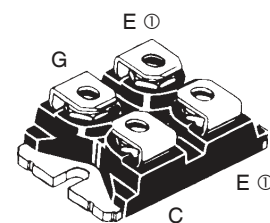
$$I_{C110} = 84A$$

$$V_{CE(sat)} \leq 3.50V$$

$$t_{fi(typ)} = 110ns$$

| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|---|---|--------------------------|
| V_{CES} | $T_J = 25^\circ C$ to $175^\circ C$ | 1200 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $175^\circ C$, $R_{GE} = 1M\Omega$ | 1200 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ (Chip Capability) | 160 | A |
| I_{C110} | $T_C = 110^\circ C$ | 84 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 460 | A |
| I_A | $T_C = 25^\circ C$ | 50 | A |
| E_{AS} | $T_C = 25^\circ C$ | 1.2 | J |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 150^\circ C$, $R_G = 1\Omega$ Clamped Inductive Load | $I_{CM} = 200$ @ $V_{CE} \leq V_{CES}$ | A |
| P_C | $T_C = 25^\circ C$ | 830 | W |
| T_J | | -55 ... +175 | $^\circ C$ |
| T_{JM} | | 175 | $^\circ C$ |
| T_{stg} | | -55 ... +175 | $^\circ C$ |
| V_{ISOL} | 50/60Hz $I_{ISOL} \leq 1mA$ | $t = 1min$ $t = 1s$ | 2500 3000 V~ V~ |
| M_d | Mounting Torque Terminal Connection Torque | 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

- Optimized for Low Switching Losses
- Square RBSOA
- Isolation Voltage 2500V~
- Positive Thermal Coefficient of $V_{ce(sat)}$
- Avalanche Rated
- High Current Handling Capability
- International Standard Package

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- High Frequency Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------|-----------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 1200 | | V |
| $V_{GE(th)}$ | $I_C = 250\mu A$, $V_{CE} = V_{GE}$ | 3.0 | | 5.0 V |
| I_{CES} | $V_{CE} = V_{CES}$, $V_{GE} = 0V$ $T_J = 150^\circ C$ | | | 10 μA 1.25 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = 100A$, $V_{GE} = 15V$, Note 1 $T_J = 150^\circ C$ | 2.96 3.78 | | 3.50 V V |

| Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | | Characteristic Values | | |
|--|---|-----------------------|-------|--------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = 60\text{A}, V_{CE} = 10\text{V}, \text{Note 1}$ | 30 | 50 | S |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 4950 | pF |
| C_{oes} | | | 356 | pF |
| C_{res} | | | 120 | pF |
| $Q_{g(on)}$ | $I_C = I_{C110}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$ | | 260 | nC |
| Q_{ge} | | | 47 | nC |
| Q_{gc} | | | 102 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C110}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 1\Omega$ Note 2 | | 27 | ns |
| t_{ri} | | | 110 | ns |
| E_{on} | | | 12.00 | mJ |
| $t_{d(off)}$ | | | 120 | ns |
| t_{fi} | | | 110 | ns |
| E_{off} | | | 4.90 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C110}, V_{GE} = 15\text{V}$ $V_{CE} = 0.5 \cdot V_{CES}, R_G = 1\Omega$ Note 2 | | 27 | ns |
| t_{ri} | | | 116 | ns |
| E_{on} | | | 15.00 | mJ |
| $t_{d(off)}$ | | | 146 | ns |
| t_{fi} | | | 125 | ns |
| E_{off} | | | 6.15 | mJ |
| R_{thJC} | | | 0.18 | $^\circ\text{C/W}$ |
| R_{thCS} | | 0.05 | | $^\circ\text{C/W}$ |

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 .

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

| | | | | | | | | | | |
|---|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| IXYS MOSFETs and IGBTs are covered | 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 |
| by one or more of the following U.S. patents: | 4,860,072 | 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 @ $T_J = 25^\circ\text{C}$

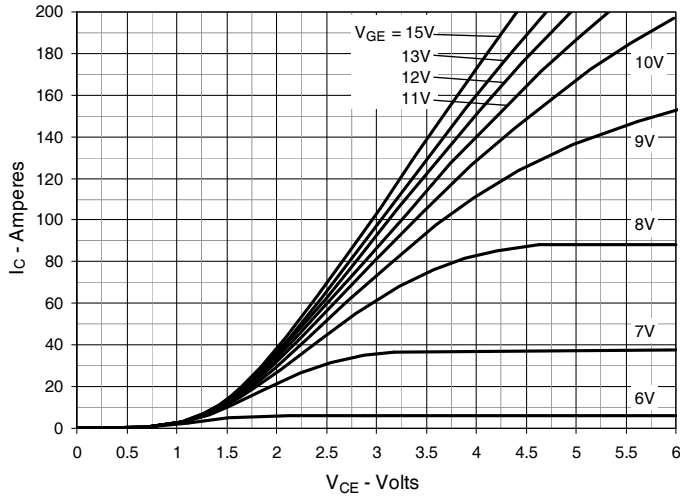


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

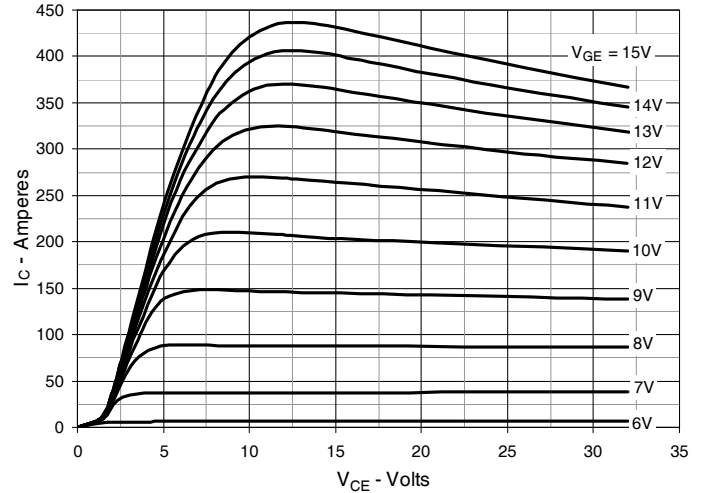


Fig. 3. Output Characteristics @ $T_J = 150^\circ\text{C}$

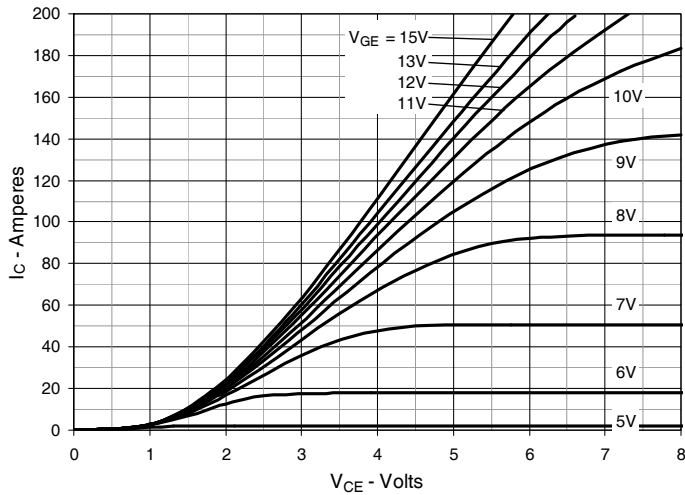


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

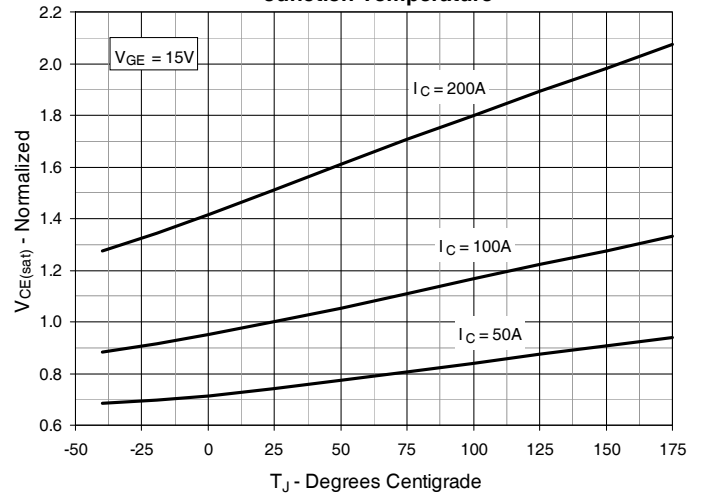


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

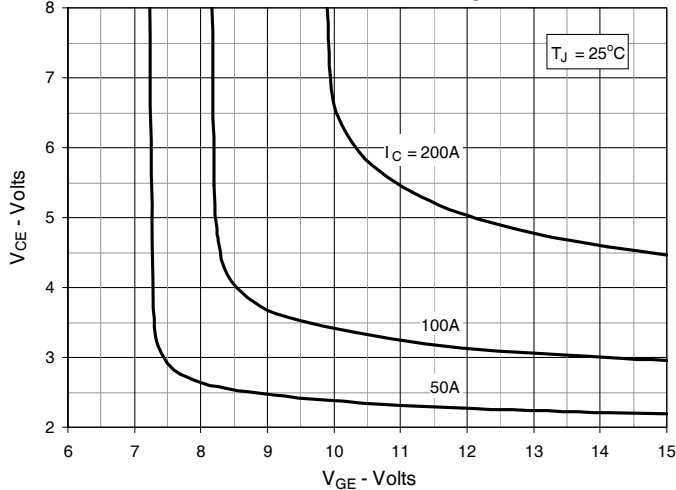


Fig. 6. Input Admittance

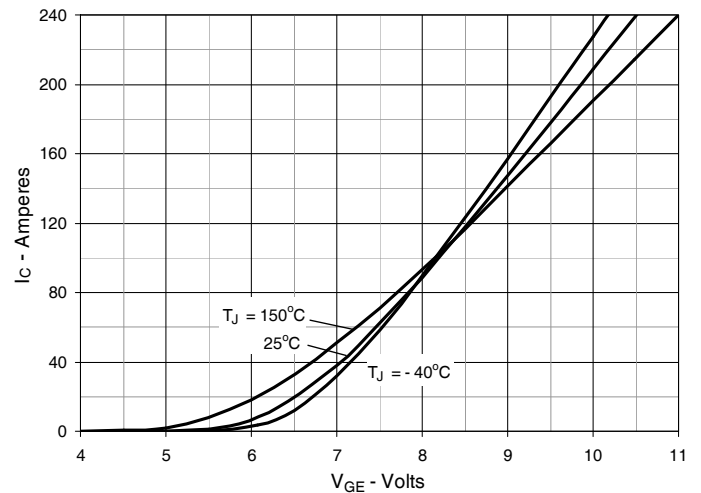


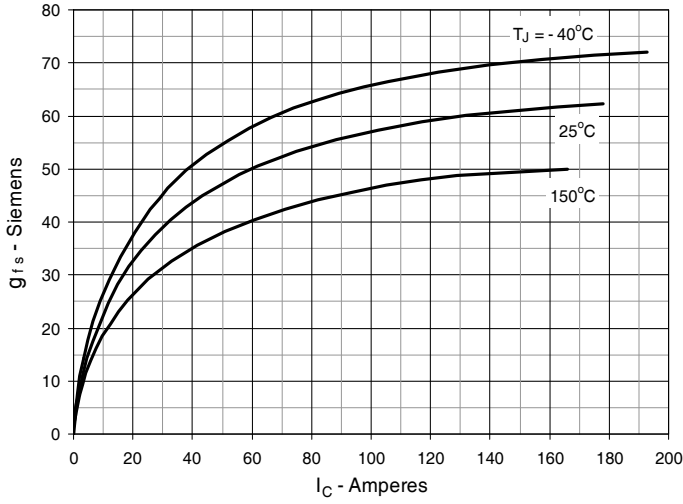
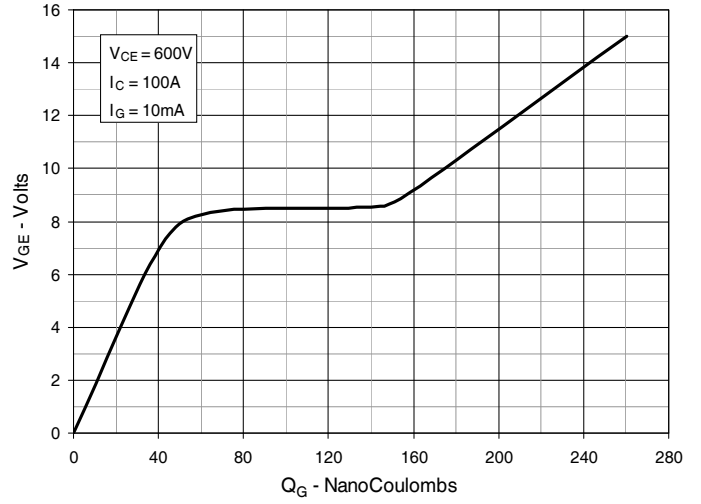
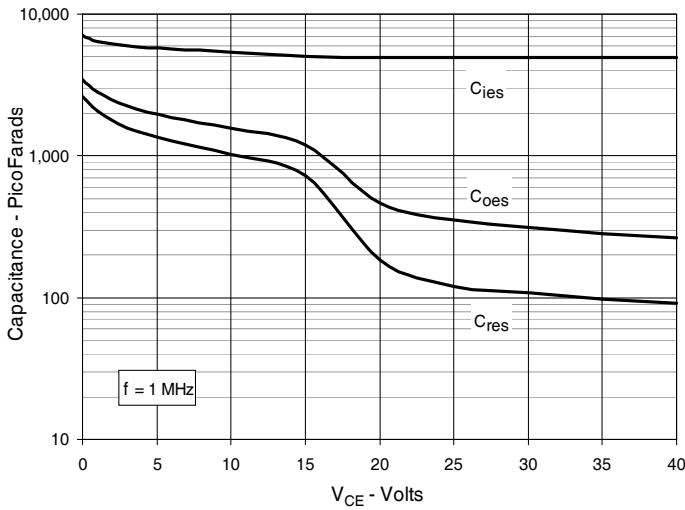
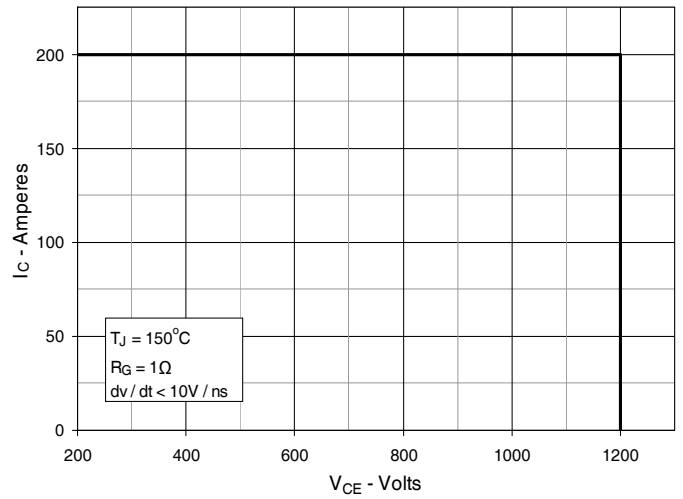
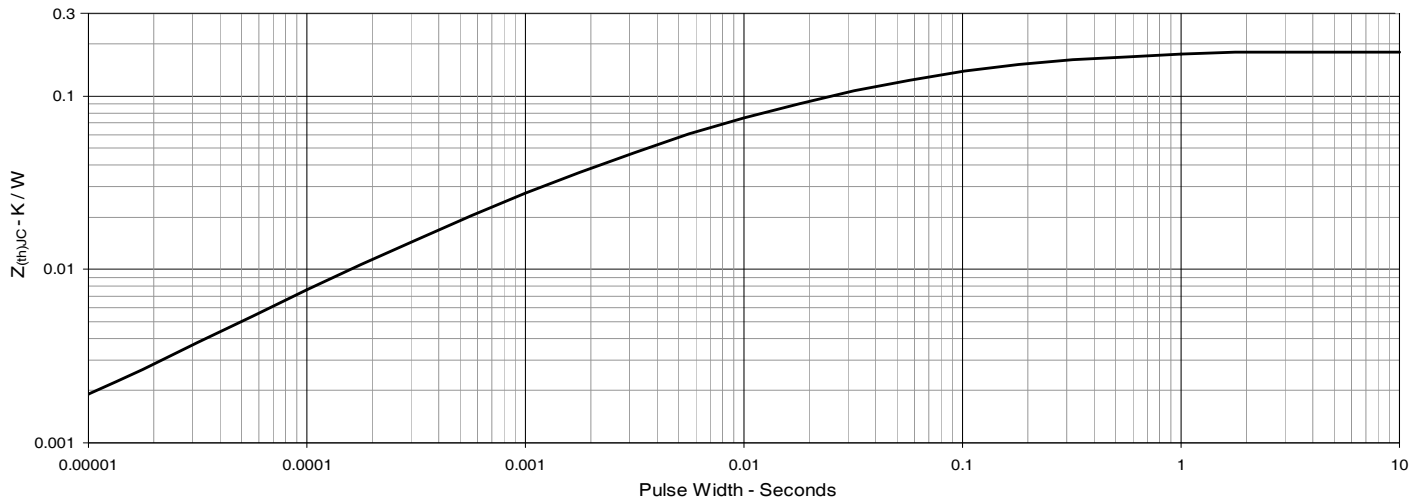
Fig. 7. Transconductance

Fig. 8. Gate Charge

Fig. 9. Capacitance

Fig. 10. Reverse-Bias Safe Operating Area

Fig. 11. Maximum Transient Thermal Impedance


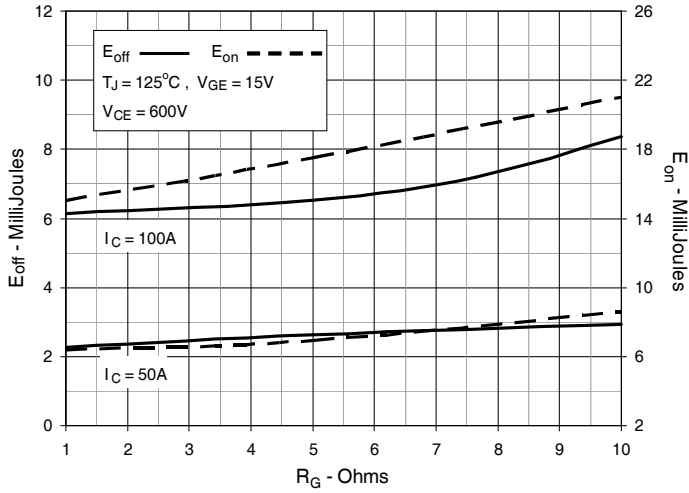
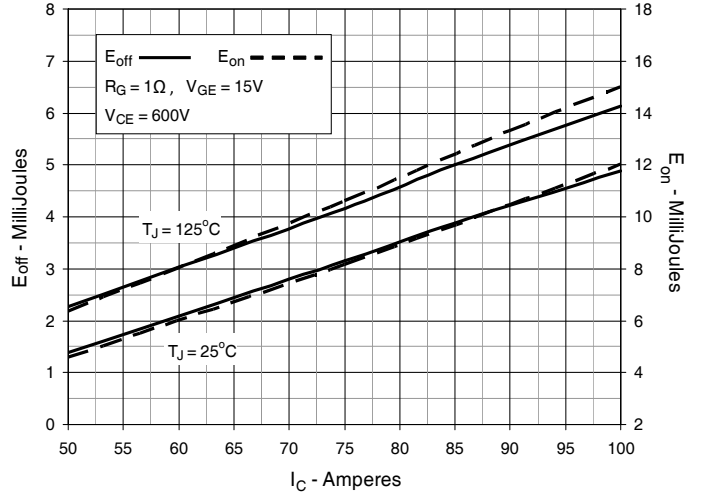
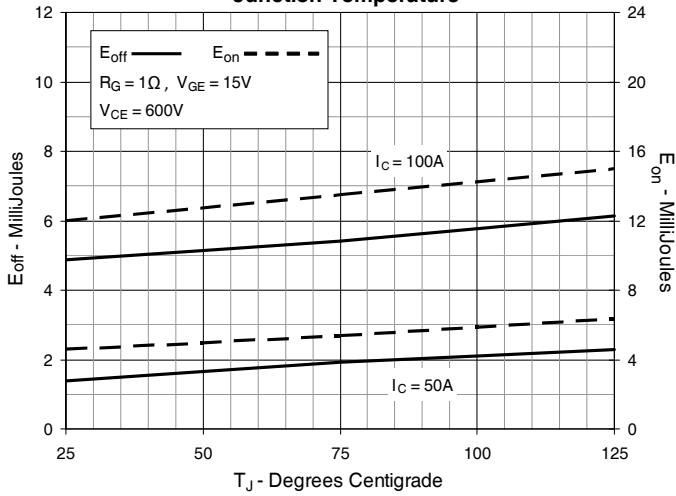
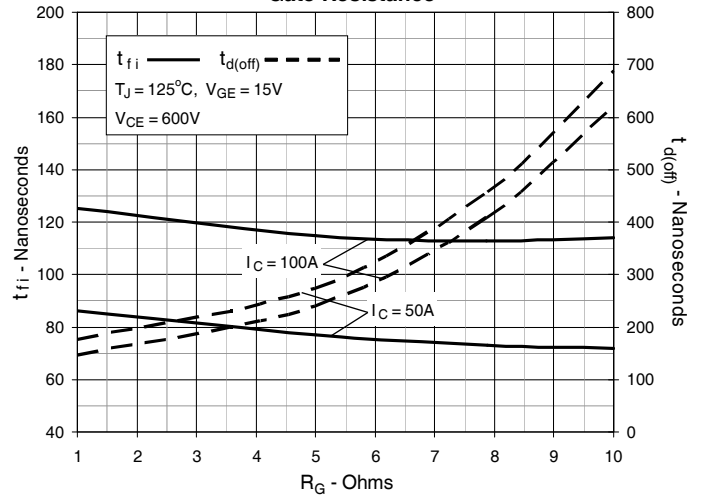
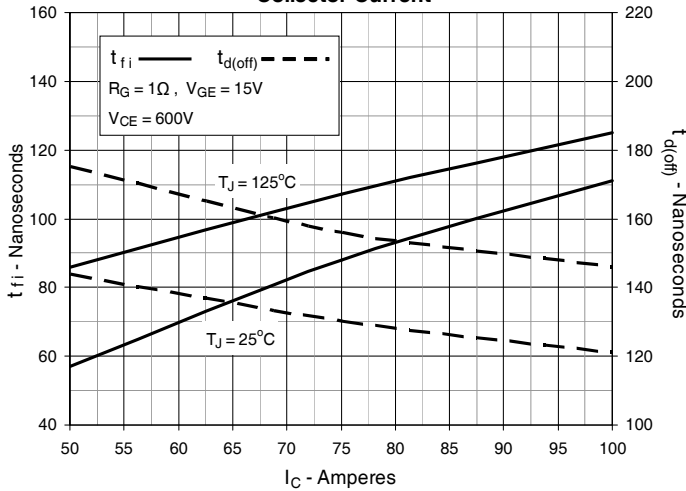
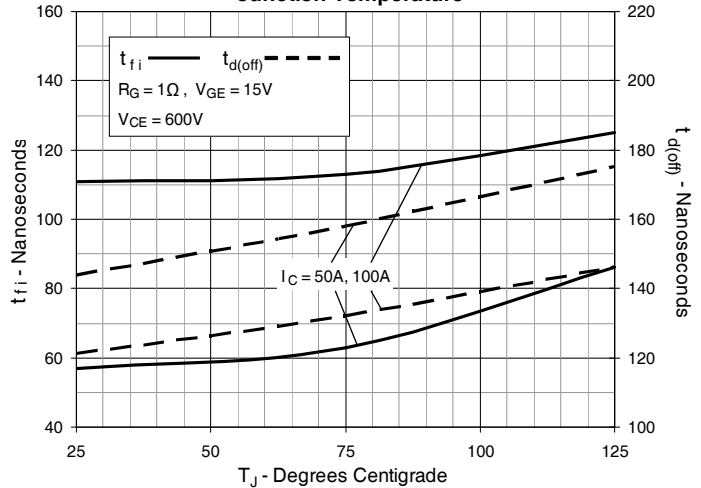
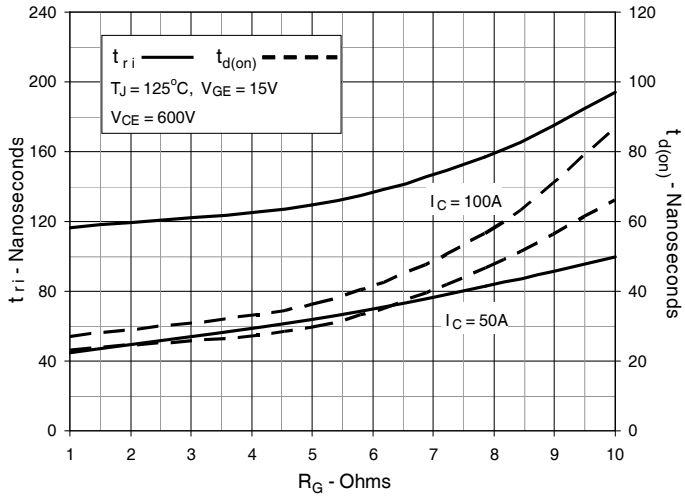
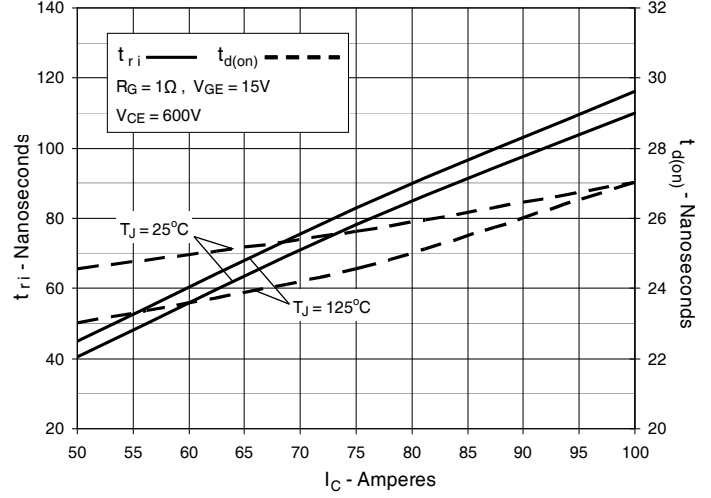
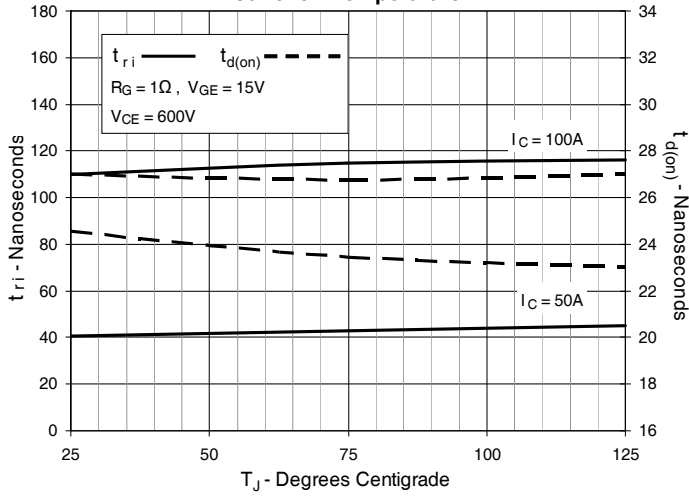
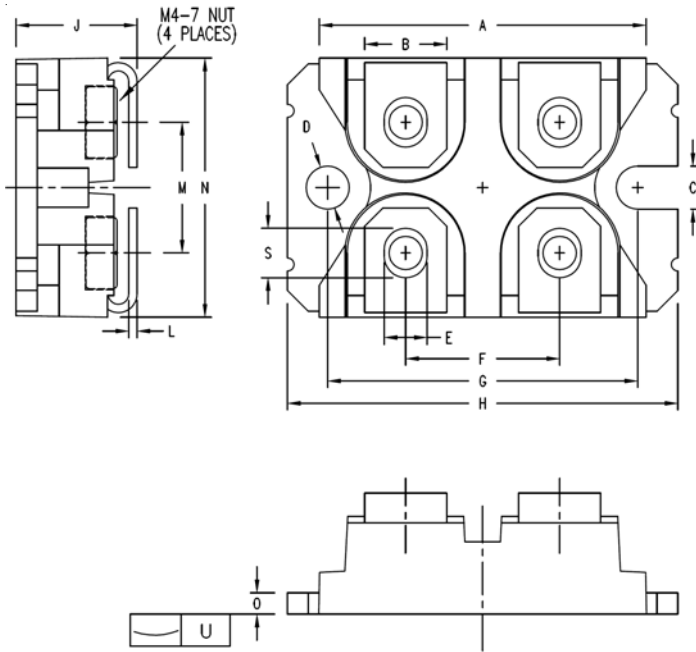
Fig. 12. Inductive Switching Energy Loss vs. Gate Resistance

Fig. 13. Inductive Switching Energy Loss vs. Collector Current

Fig. 14. Inductive Switching Energy Loss vs. Junction Temperature

Fig. 15. Inductive Turn-off Switching Times vs. Gate Resistance

Fig. 16. Inductive Turn-off Switching Times vs. Collector Current

Fig. 17. Inductive Turn-off Switching Times vs. Junction Temperature


Fig. 18. Inductive Turn-on Switching Times vs. Gate Resistance

Fig. 19. Inductive Turn-on Switching Times vs. Collector Current

Fig. 20. Inductive Turn-on Switching Times vs. Junction Temperature


SOT-227 miniBLOC (IXYN)


| SYM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.224 | 1.260 | 31.10 | 32.00 |
| B | .303 | .327 | 7.70 | 8.30 |
| C | .161 | .173 | 4.10 | 4.40 |
| D | .161 | .173 | 4.10 | 4.40 |
| E | .161 | .173 | 4.10 | 4.40 |
| F | .587 | .598 | 14.90 | 15.20 |
| G | 1.181 | 1.201 | 30.00 | 30.50 |
| H | 1.488 | 1.508 | 37.80 | 38.30 |
| J | .461 | .484 | 11.70 | 12.30 |
| L | .030 | .033 | 0.75 | 0.85 |
| M | .492 | .512 | 12.50 | 13.00 |
| N | .984 | 1.004 | 25.00 | 25.50 |
| O | .075 | .087 | 1.90 | 2.20 |
| S | .181 | .193 | 4.60 | 4.90 |
| U | .000 | .005 | 0.00 | 0.13 |

- NUT MATERIAL:**
 STANDARD - Low carbon steel with Ni plating.
 OPTIONAL: - Brass Nut is available.
 PART NUMBER-BN
- ALL METAL SURFACE ARE PRE NI PLATED EXCEPT TRIM AREA.**