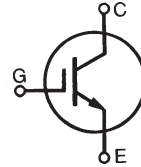


HiPerFAST™ IGBT

IXGP 30N60B2

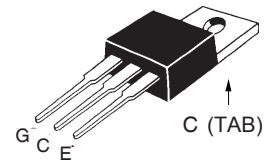
Optimized for 10-25 KHz hard switching and up to 150 KHz resonant switching

$$\begin{aligned} V_{CES} &= 600 \text{ V} \\ I_{C25} &= 70 \text{ A} \\ V_{CE(sat)} &< 1.8 \text{ V} \\ t_{fi typ} &= 82 \text{ ns} \end{aligned}$$



| Symbol | Test Conditions | Maximum Ratings | |
|---|---|------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 600 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$ | 600 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ (limited by leads) | 70 | A |
| I_{C110} | $T_C = 110^\circ\text{C}$ | 30 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 150 | A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10 \Omega$ Clamped inductive load @ $\leq 600 \text{ V}$ | $I_{CM} = 60$ | A |
| P_C | $T_C = 25^\circ\text{C}$ | 190 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | $^\circ\text{C}$ |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | $^\circ\text{C}$ |
| M_d | Mounting torque | 1.13/10Nm/lb.in. | |
| Weight | | 4 | g |

TO-220 (IXSP)



G = Gate, C = Collector,
E = Emitter, TAB = Collector

Features

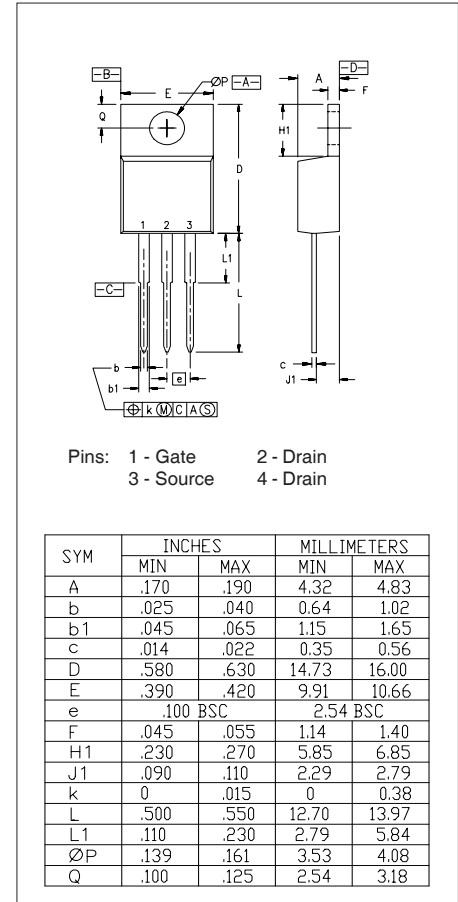
- Medium frequency IGBT
- Square RBSOA
- High current handling capability
- MOS Gate turn-on
- drive simplicity

Applications

- PFC circuits
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- AC motor speed control
- DC servo and robot drives
- DC choppers

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|--|---|------|--------------------------|
| | | min. | typ. | max. |
| $V_{GE(th)}$ | $I_C = 250 \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | | 5.0 V |
| I_{CES} | $V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$ | | | 50 μA 1 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = 24 \text{ A}$, $V_{GE} = 15 \text{ V}$ | | | 1.8 V |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|--------------|--|---|------|------|----|
| | | min. | typ. | max. | |
| g_{fs} | $I_C = 24\text{ A}; V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 18 | 26 | S | |
| C_{ies} | $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$ | | 1500 | pF | |
| C_{oes} | | | 115 | pF | |
| C_{res} | | | 40 | pF | |
| Q_g | $I_C = 24\text{ A}, V_{GE} = 15\text{ V}, V_{CE} = 300\text{ V}$ | | 66 | nC | |
| Q_{ge} | | | 9 | nC | |
| Q_{gc} | | | 22 | nC | |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 24\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 400\text{ V}, R_G = 5\ \Omega$ | | 13 | ns | |
| t_{ri} | | | 15 | ns | |
| $t_{d(off)}$ | | | 110 | 200 | ns |
| t_{fi} | | | 82 | 150 | ns |
| E_{off} | | | 0.32 | 0.6 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 24\text{ A}, V_{GE} = 15\text{ V}$ $V_{CE} = 400\text{ V}, R_G = 5\ \Omega$ | | 13 | ns | |
| t_{ri} | | | 17 | ns | |
| E_{on} | | | 0.22 | mJ | |
| $t_{d(off)}$ | | | 200 | ns | |
| t_{fi} | | | 150 | ns | |
| E_{off} | | 0.9 | mJ | | |
| R_{thJC} | | | | 0.65 | KW |
| R_{thCH} | | 0.25 | | | KW |



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: | 4,850,072 | 4,931,844 | 5,034,796 | 5,063,307 | 5,237,481 | 5,381,025 | 6,404,065B1 | 6,162,665 | 6,534,343 | 6,583,505 |
| | 4,835,592 | 4,881,106 | 5,017,508 | 5,049,961 | 5,187,117 | 5,486,715 | 6,306,728B1 | 6,259,123B1 | 6,306,728B1 | 6,683,344 |

Fig. 1. Output Characteristics @ 25 Deg. C

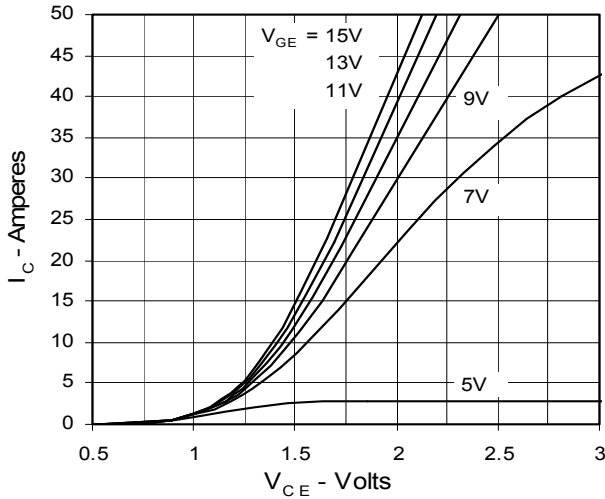


Fig. 2. Extended Output Characteristics @ 25 deg. C

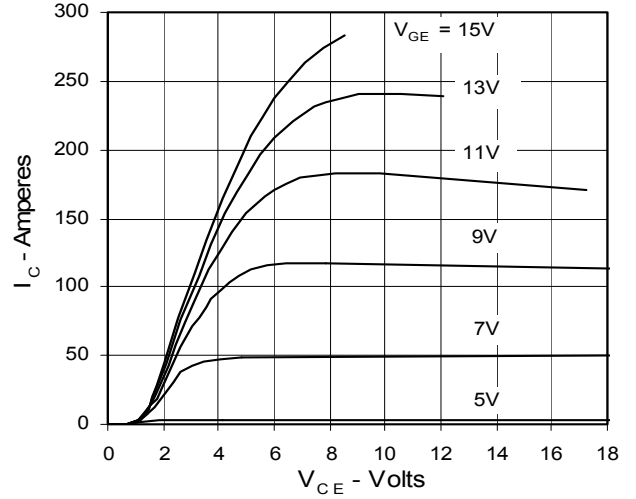


Fig. 3. Output Characteristics @ 125 Deg. C

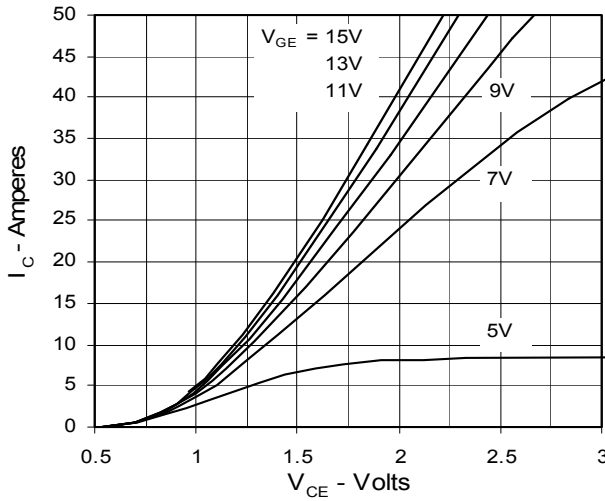


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

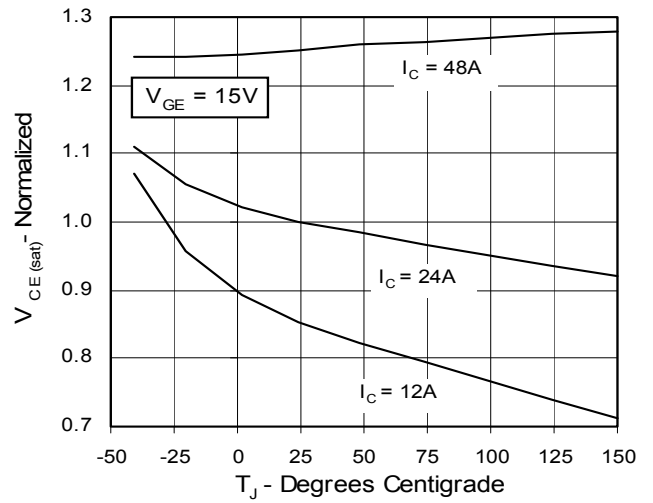


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

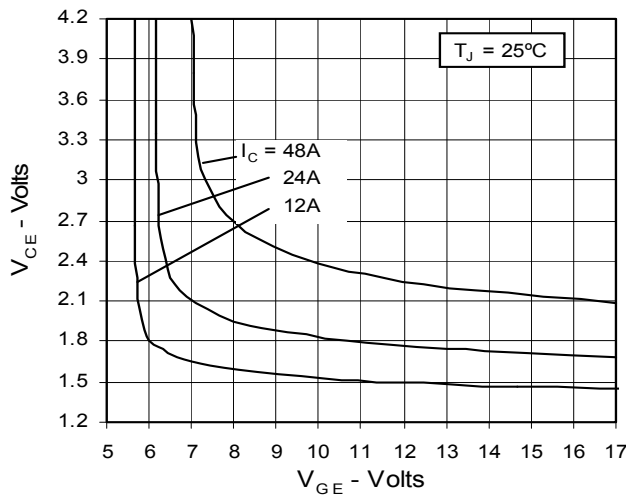


Fig. 6. Input Admittance

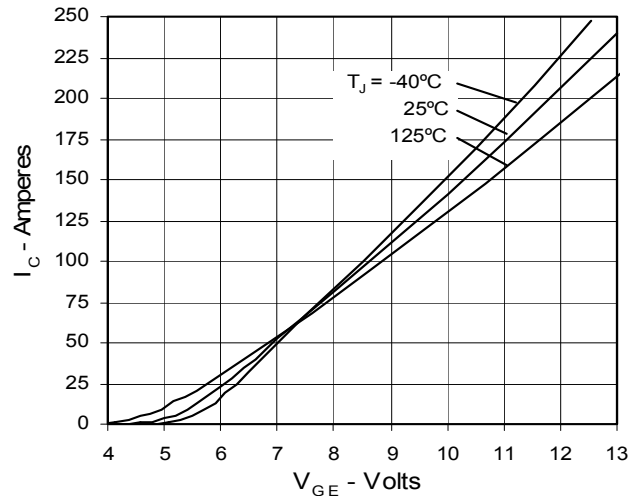


Fig. 7. Transconductance

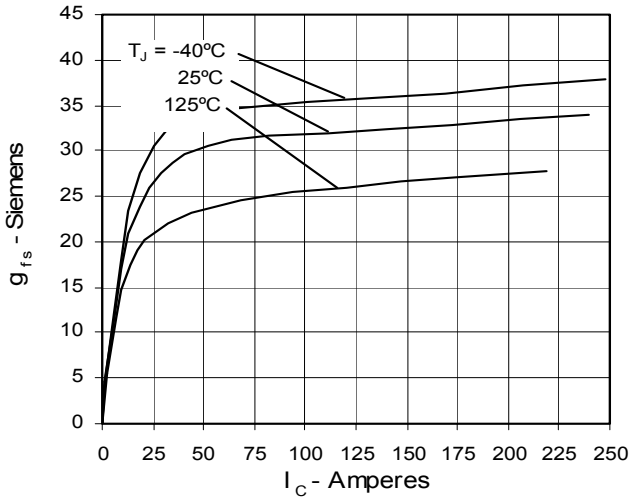


Fig. 8. Dependence of Turn-Off Energy on R_G

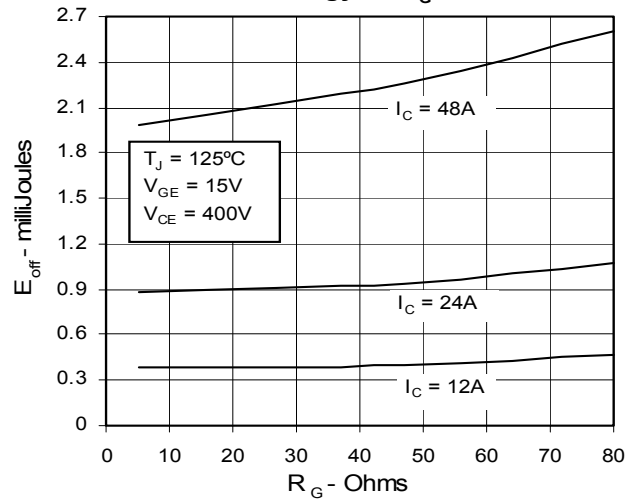


Fig. 9. Dependence of Turn-Off Energy on I_C

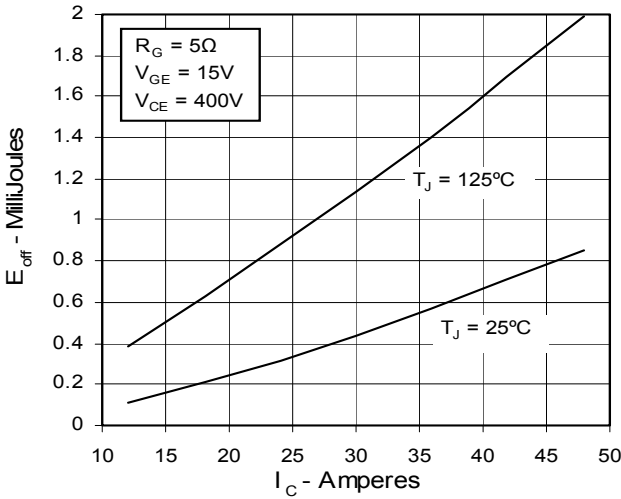


Fig. 10. Dependence of Turn-Off Energy on Temperature

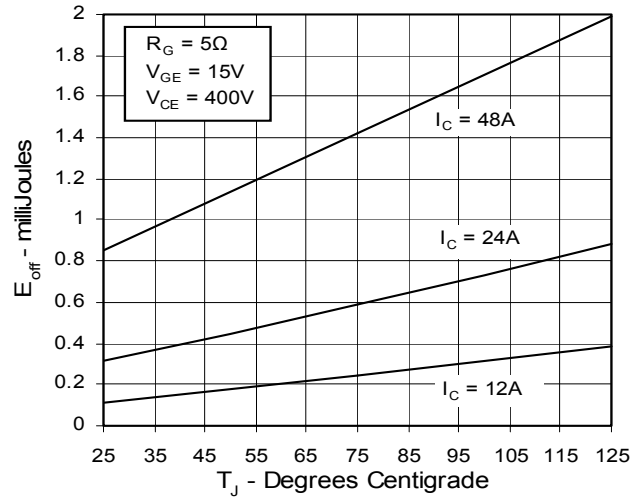


Fig. 11. Dependence of Turn-Off Switching Time on R_G

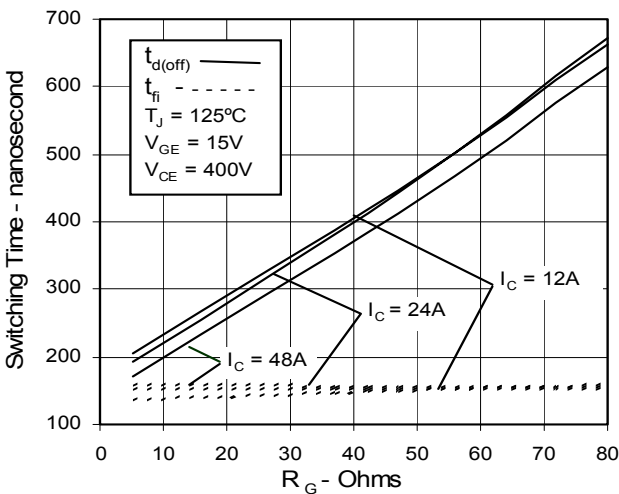
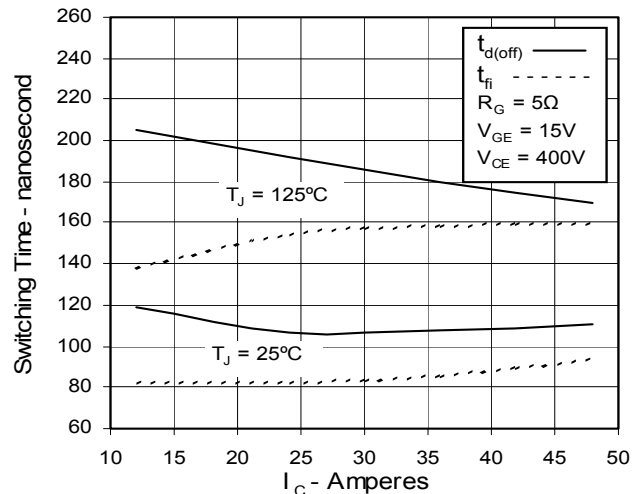


Fig. 12. Dependence of Turn-Off Switching Time on I_C



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

Fig. 13. Dependence of Turn-Off Switching Time on Temperature

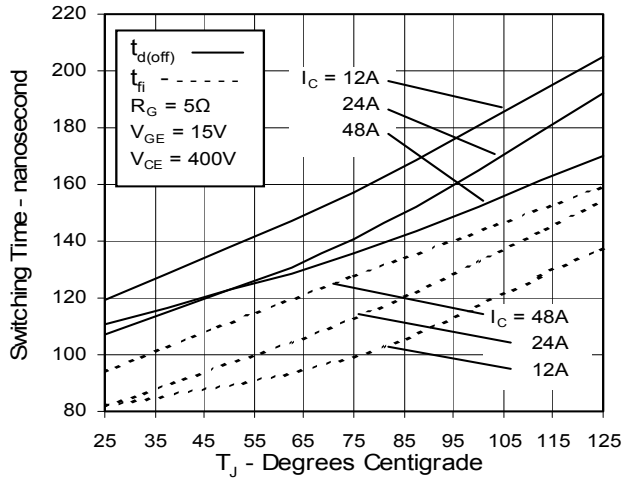


Fig. 14. Gate Charge

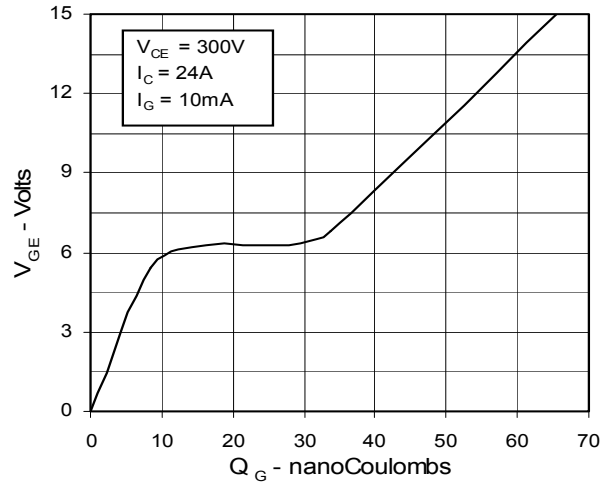


Fig. 15. Capacitance

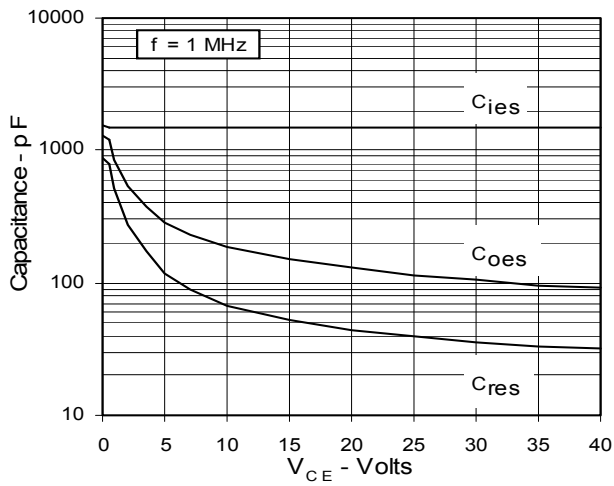


Fig. 16. Maximum Transient Thermal Resistance

