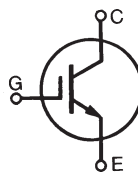


High Voltage IGBT

IXGH 32N170
IXGT 32N170

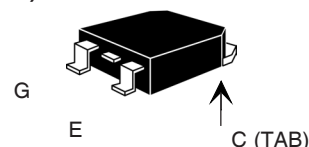
V_{CES} = 1700 V
I_{C25} = 75 A
V_{CE(sat)} = 3.3 V
t_{fi(typ)} = 250 ns

Preliminary Data Sheet

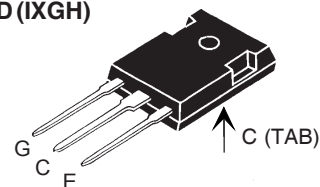


| Symbol | Test Conditions | Maximum Ratings | |
|---|---|--|-----|
| V _{CES} | T _J = 25°C to 150°C | 1700 | V |
| V _{CGR} | T _J = 25°C to 150°C; R _{GE} = 1 MΩ | 1700 | V |
| V _{GES} | Continuous | ±20 | V |
| V _{GEM} | Transient | ±30 | V |
| I _{C25} | T _C = 25°C | 75 | A |
| I _{C90} | T _C = 90°C | 32 | A |
| I _{CM} | T _C = 25°C, 1 ms | 200 | A |
| SSOA (RBSOA) | V _{GE} = 15 V, T _{VJ} = 125°C, R _G = 5 Ω Clamped inductive load | I _{CM} = 90 @ 0.8 V _{CES} | A |
| P _C | T _C = 25°C | 350 | W |
| T _J | | -55 ... +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 ... +150 | °C |
| Maximum Lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | °C |
| Maximum Tab temperature for soldering SMD devices for 10 s | | 260 | °C |
| M _d | Mounting torque (M3) | 1.13/10Nm/lb.in. | |
| Weight | | TO-247 AD | 6 g |
| | | TO-268 | 4 g |

TO-268 (IXGT)



TO-247 AD (IXGH)



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

Features

- International standard packages
JEDEC TO-268 and
JEDEC TO-247 AD
- High current handling capability
- MOS Gate turn-on
- drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0
flammability classification

Applications

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

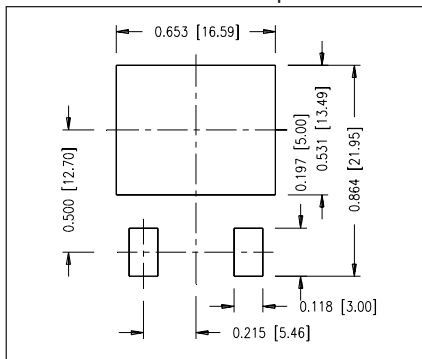
Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw,
(isolated mounting screw hole)

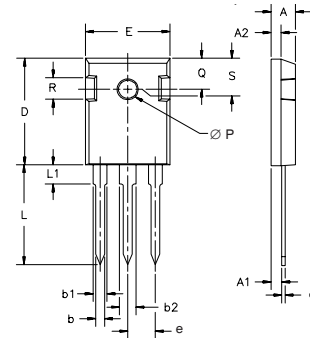
| Symbol | Test Conditions | Characteristic Values (T _J = 25°C, unless otherwise specified) | | |
|----------------------------|--|--|------|---------|
| | | min. | typ. | max. |
| BV_{CES} | I _C = 250 μA, V _{GE} = 0 V | 1700 | | V |
| V_{GE(th)} | I _C = 250 μA, V _{CE} = V _{GE} | 3.0 | | V |
| I_{CES} | V _{CE} = 0.8 • V _{CES} | | | 50 μA |
| | V _{GE} = 0 V | | | 1 mA |
| I_{GES} | V _{CE} = 0 V, V _{GE} = ±20 V | | | ±100 nA |
| V_{CE(sat)} | I _C = I _{C90} , V _{GE} = 15 V | T _J = 25°C | 2.5 | 3.3 V |
| | | T _J = 125°C | 3.0 | V |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|---|---|------|----------|
| | | min. | typ. | max. |
| g_{fs} | $I_C = I_{C90}$; $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 22 | 30 | S |
| $I_{C(ON)}$ | $V_{GE} = 10\text{ V}$, $V_{CE} = 10\text{ V}$ | | 120 | A |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 3500 | pF |
| C_{oes} | | | 165 | pF |
| C_{res} | | | 40 | pF |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 155 | nC |
| Q_{ge} | | | 30 | nC |
| Q_{gc} | | | 51 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.6 V_{CES}$, $R_G = R_{off} = 2.7\ \Omega$ | | 45 | ns |
| t_{ri} | | | 38 | ns |
| $t_{d(off)}$ | | | 270 | 500 ns |
| t_{fi} | | | 250 | 500 ns |
| E_{off} | | | 11 | 20 mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.6 V_{CES}$, $R_G = R_{off} = 2.7\ \Omega$ | | 48 | ns |
| t_{ri} | | | 42 | ns |
| E_{on} | | | 6.0 | mJ |
| $t_{d(off)}$ | | | 360 | ns |
| t_{fi} | | | 560 | ns |
| E_{off} | | 14 | mJ | |
| R_{thJC} | | | | 0.35 K/W |
| R_{thCK} | (TO-247) | | 0.25 | K/W |

Min Recommended Footprint

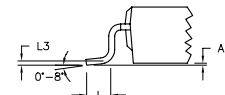
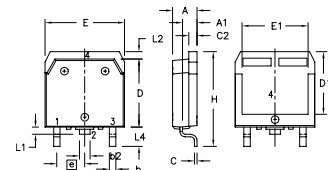


TO-247 AD Outline



| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 2.87 | 3.12 | .113 | .123 |
| C | .4 | .8 | .016 | .031 |
| D | 20.80 | 21.46 | .819 | .845 |
| E | 15.75 | 16.26 | .610 | .640 |
| e | 5.20 | 5.72 | 0.205 | 0.225 |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | | 4.50 | | .177 |
| ØP | 3.55 | 3.65 | .140 | .144 |
| Q | 5.89 | 6.40 | 0.232 | 0.252 |
| R | 4.32 | 5.49 | .170 | .216 |
| S | 6.15 | BSC | .242 | BSC |

TO-268 Outline



| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|------|
| | Min. | Max. | Min. | Max. |
| A | 4.9 | 5.1 | .193 | .201 |
| A ₁ | 2.7 | 2.9 | .106 | .114 |
| A ₂ | .02 | .25 | .001 | .010 |
| b | 1.15 | 1.45 | .045 | .057 |
| b ₂ | 1.9 | 2.1 | .75 | .83 |
| C | .4 | .65 | .016 | .026 |
| D | 13.80 | 14.00 | .543 | .551 |
| E | 15.85 | 16.05 | .624 | .632 |
| E ₁ | 13.3 | 13.6 | .524 | .535 |
| e | 5.45 | BSC | .215 | BSC |
| H | 18.70 | 19.10 | .736 | .752 |
| L | 2.40 | 2.70 | .094 | .106 |
| L1 | 1.20 | 1.40 | .047 | .055 |
| L2 | 1.00 | 1.15 | .039 | .045 |
| L3 | | 0.25 | | .010 |
| L4 | 3.80 | 4.10 | .150 | .161 |

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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1
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

Fig. 1. Output Characteristics @ 25 Deg. C

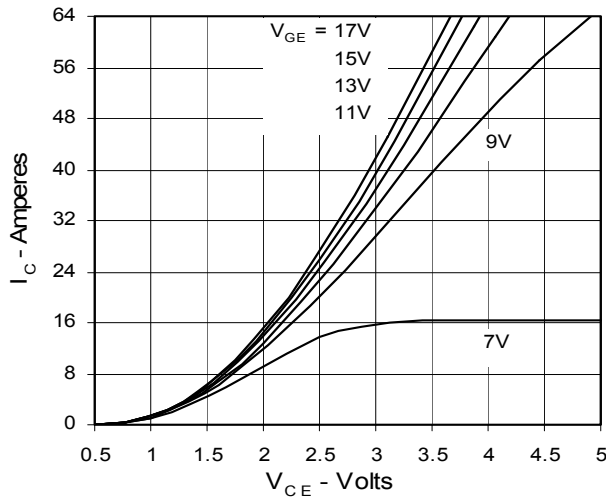


Fig. 2. Extended Output Characteristics @ 25 deg. C

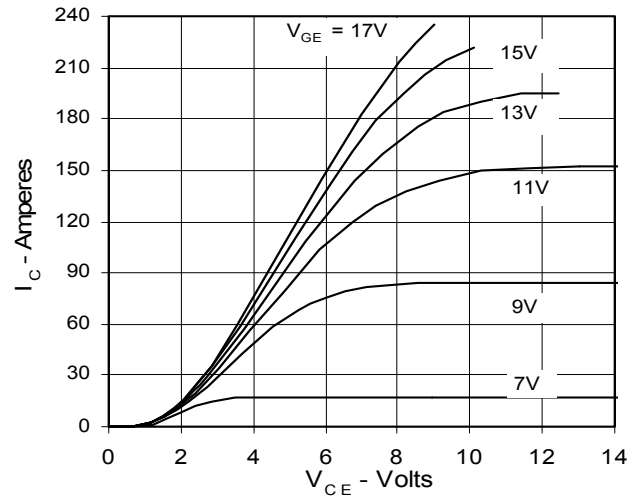


Fig. 3. Output Characteristics @ 125 Deg. C

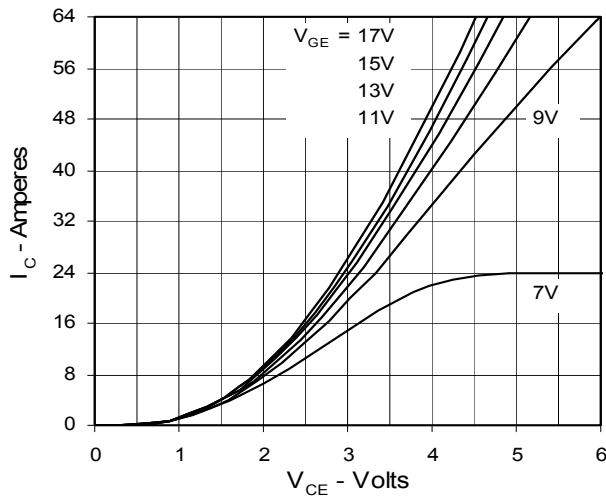


Fig. 4. Dependence of $V_{CE(sat)}$ on Temperature

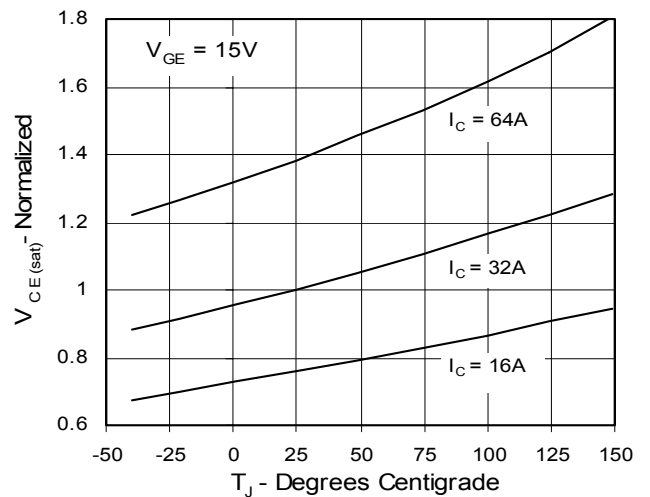


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter voltage

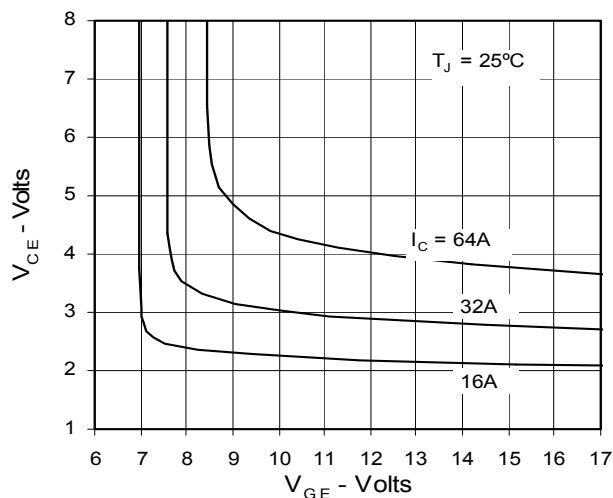


Fig. 6. Input Admittance

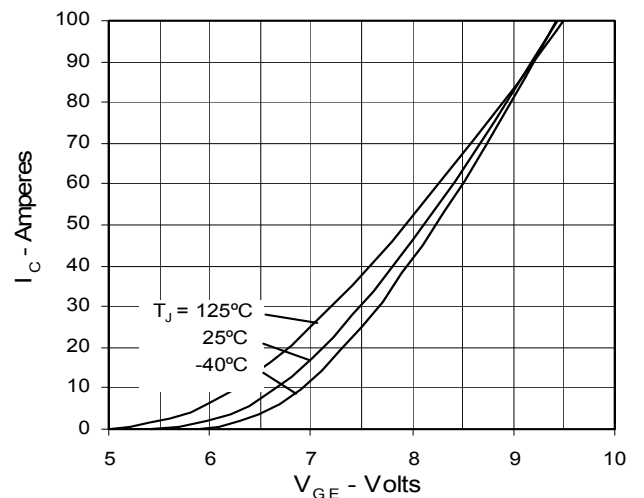


Fig. 7. Transconductance

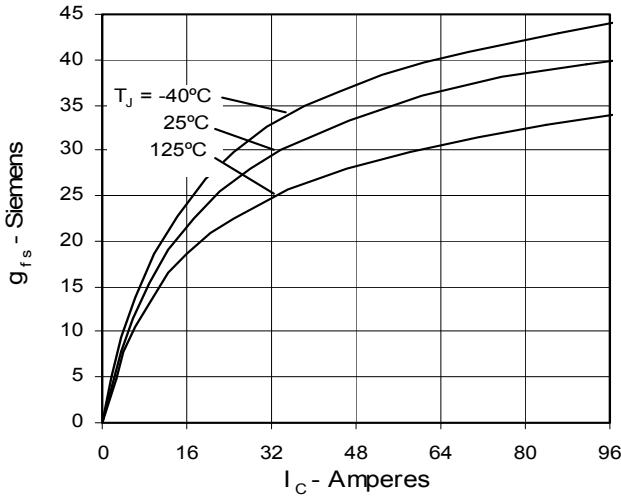


Fig. 8. Dependence of E_{off} on R_G

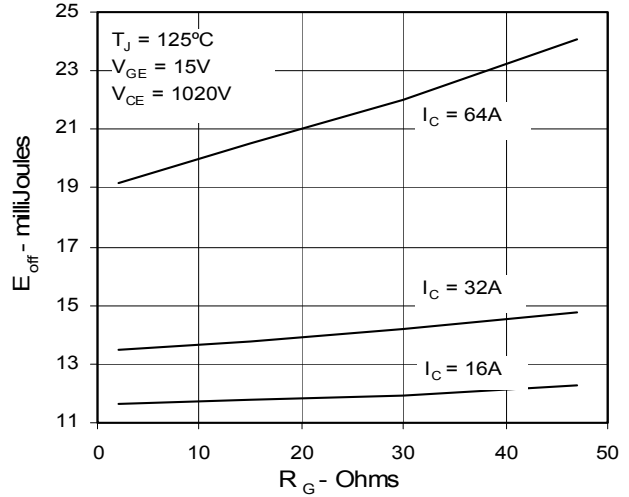


Fig. 9. Dependence of E_{off} on I_C

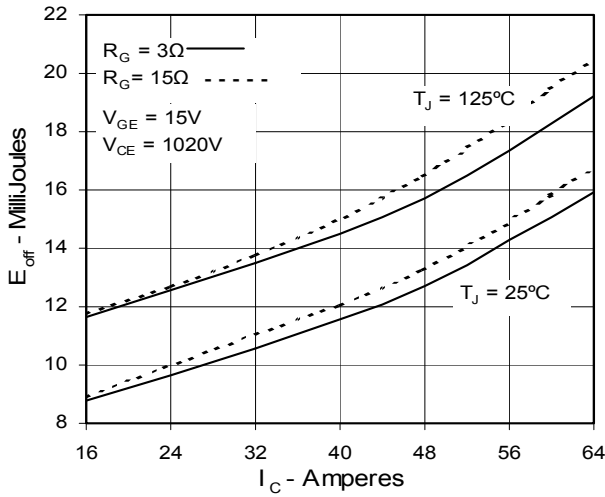


Fig. 10. Dependence of E_{off} on Temperature

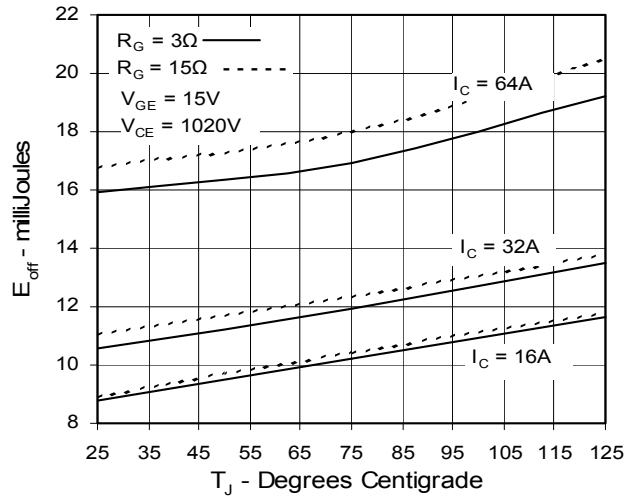


Fig. 11. Gate Charge

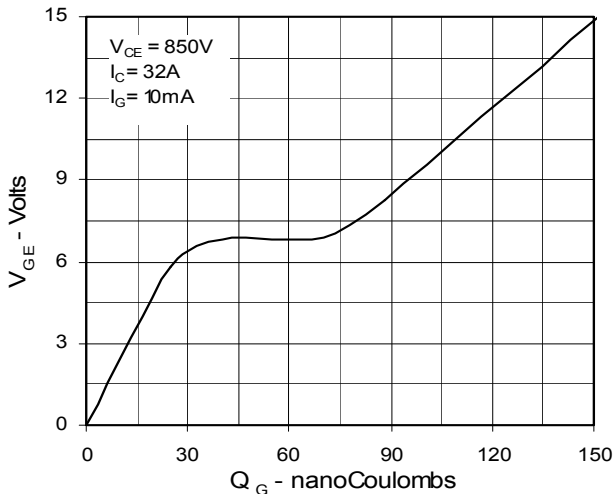
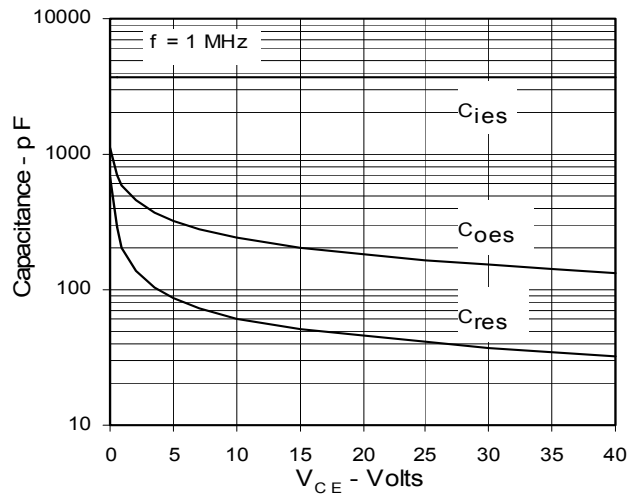


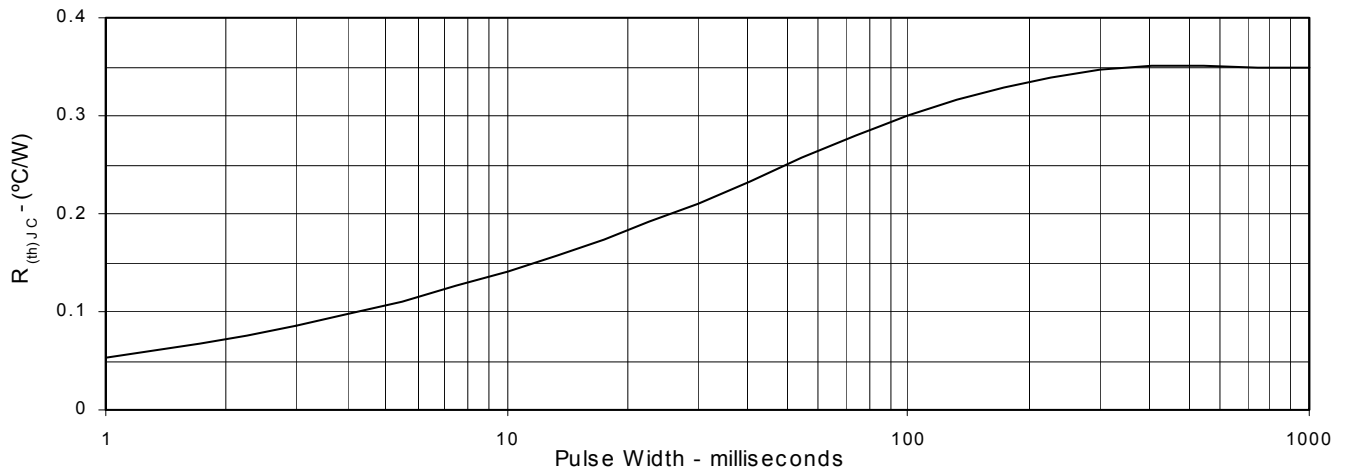
Fig. 12. Capacitance



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Fig. 13. Maximum Transient Thermal Resistance





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