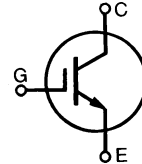


HiPerFAST™ IGBT Lightspeed™ Series

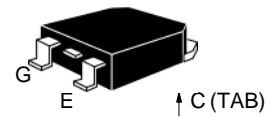
**IXGH 32N60C
IXGT 32N60C**

V_{CES} = 600 V
I_{C25} = 60 A
V_{CE(sat)typ} = 2.1 V
t_{fi typ} = 55 ns

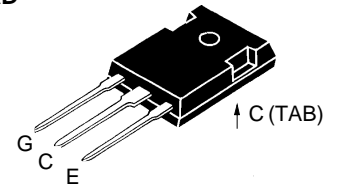


| Symbol | Test Conditions | Maximum Ratings | |
|---|--|--|-----|
| V _{CES} | T _J = 25°C to 150°C | 600 | V |
| V _{CGR} | T _J = 25°C to 150°C; R _{GE} = 1 MΩ | 600 | V |
| V _{GES} | Continuous | ±20 | V |
| V _{GEM} | Transient | ±30 | V |
| I _{C25} | T _C = 25°C | 60 | A |
| I _{C110} | T _C = 110°C | 32 | A |
| I _{CM} | T _C = 25°C, 1 ms | 120 | A |
| SSOA (RBSOA) | V _{GE} = 15 V, T _{VJ} = 125°C, R _G = 10 Ω Clamped inductive load, L = 100 μH | I _{CM} = 64 @ 0.8 V _{CES} | A |
| P _C | T _C = 25°C | 200 | 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 |
| M _d | Mounting torque (M3) | 1.13/10 Nm/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-247 and surface mountable TO-268
- High current handling capability
- Latest generation HDMOS™ process
- 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

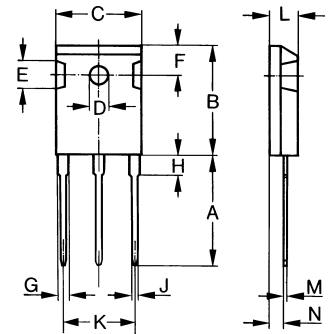
Advantages

- High power density
- Very fast switching speeds for high frequency applications

| 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 | 600 | | V |
| V_{GE(th)} | I _C = 250 μA, V _{CE} = V _{GE} | 2.5 | | 5 V |
| I_{CES} | V _{CE} = 0.8 • V _{CES} V _{GE} = 0 V | | | 200 μA 1 mA |
| I_{GES} | V _{CE} = 0 V, V _{GE} = ±20 V | | | ±100 nA |
| V_{CE(sat)} | I _C = I _{C110} , V _{GE} = 15 V | 2.1 | 2.5 | V |

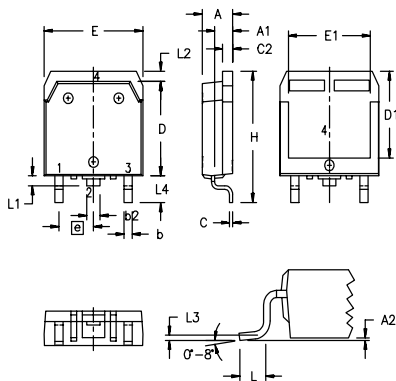
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|---------|
| | | min. | typ. | max. |
| g_{fs} | $I_C = I_{C110}$, $V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | | 25 | S |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 2700 | pF |
| C_{oes} | | | 190 | pF |
| C_{res} | | | 50 | pF |
| Q_g | $I_C = I_{C110}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 110 | nC |
| Q_{ge} | | | 22 | nC |
| Q_{gc} | | | 40 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C110}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 4.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 25 | ns |
| t_{ri} | | | 20 | ns |
| $t_{d(off)}$ | | | 85 | ns |
| t_{fi} | | | 55 | ns |
| E_{off} | | | 0.32 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 150^\circ\text{C}$ $I_C = I_{C110}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 4.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 25 | ns |
| t_{ri} | | | 25 | ns |
| E_{on} | | | 0.30 | mJ |
| $t_{d(off)}$ | | | 110 | 170 ns |
| t_{fi} | | | 105 | 160 ns |
| E_{off} | | | 0.85 | 1.25 mJ |
| R_{thJC} | | | 0.62 | K/W |
| R_{thCK} | (IXGH32N60C) | | 0.25 | K/W |

TO-247 AD (IXGH) Outline



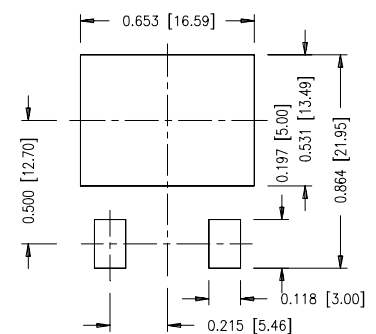
| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 1.65 | 2.13 | 0.065 | 0.084 |
| H | - | 4.5 | - | 0.177 |
| J | 1.0 | 1.4 | 0.040 | 0.055 |
| K | 10.8 | 11.0 | 0.426 | 0.433 |
| L | 4.7 | 5.3 | 0.185 | 0.209 |
| M | 0.4 | 0.8 | 0.016 | 0.031 |
| N | 1.5 | 2.49 | 0.087 | 0.102 |

TO-268AA (D³ PAK)



| 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 BSC | | .010 BSC | |
| L4 | 3.80 | 4.10 | .150 | .161 |

Min. Recommended Footprint



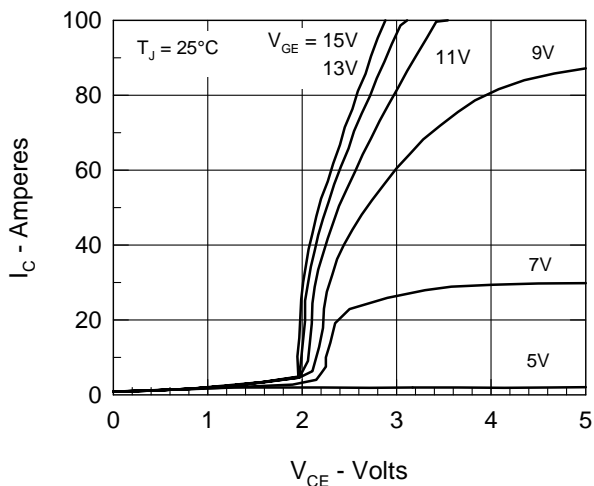


Fig. 1. Output Characteristics

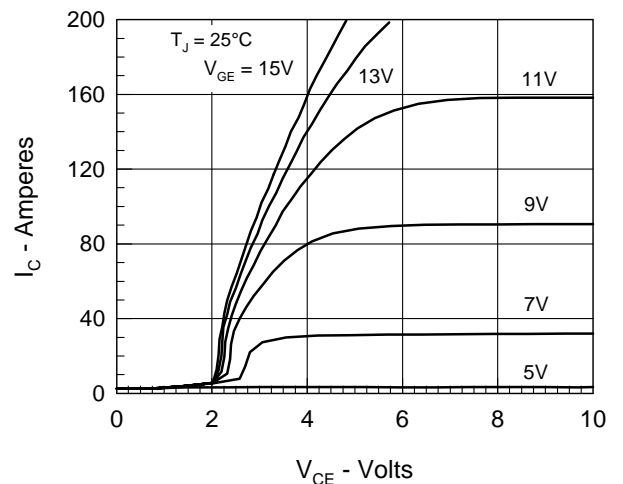


Fig. 2. Extended Output Characteristics

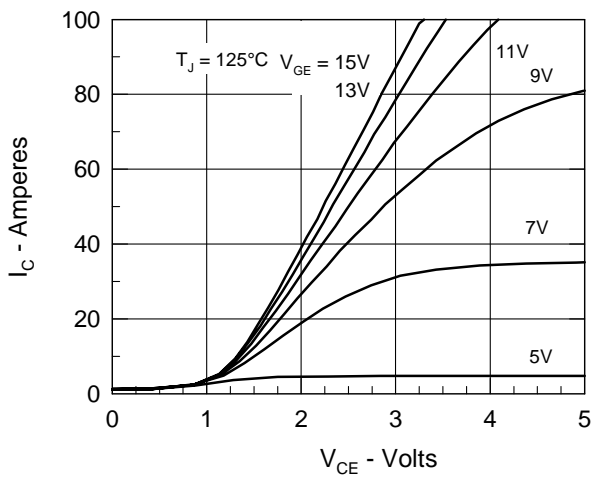


Fig. 3. High Temperature Output Characteristics

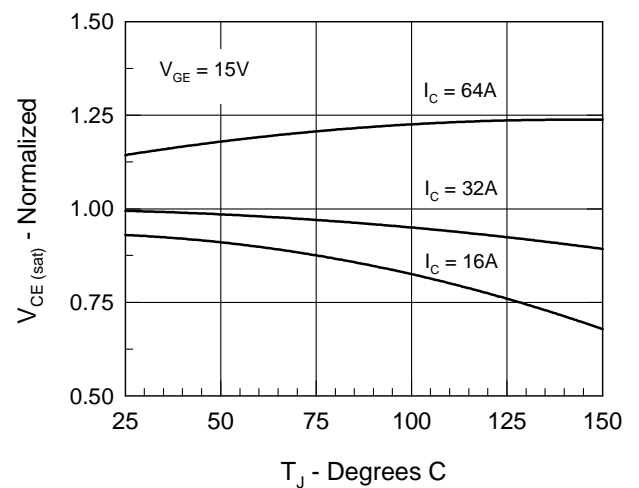
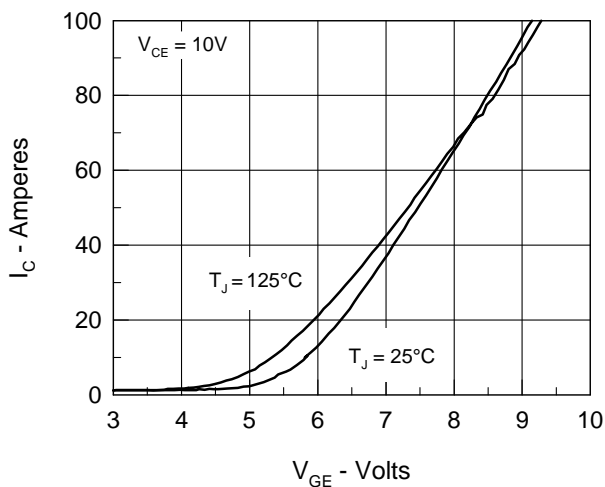

 Fig. 4. Temperature Dependence of $V_{CE(sat)}$


Fig. 5. Admittance Curves

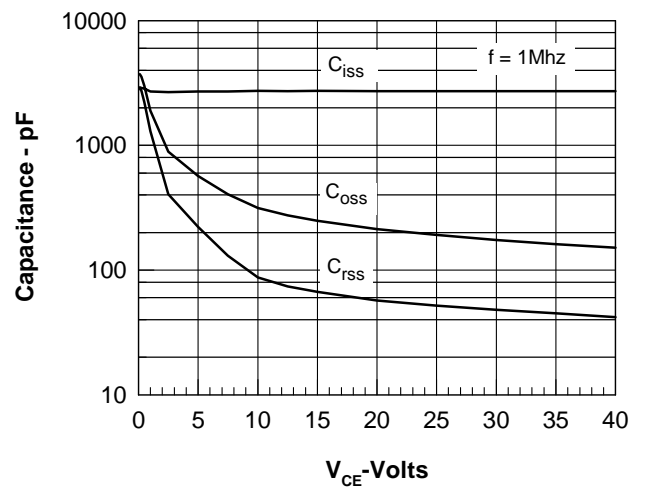


Fig. 6. Capacitance Curves

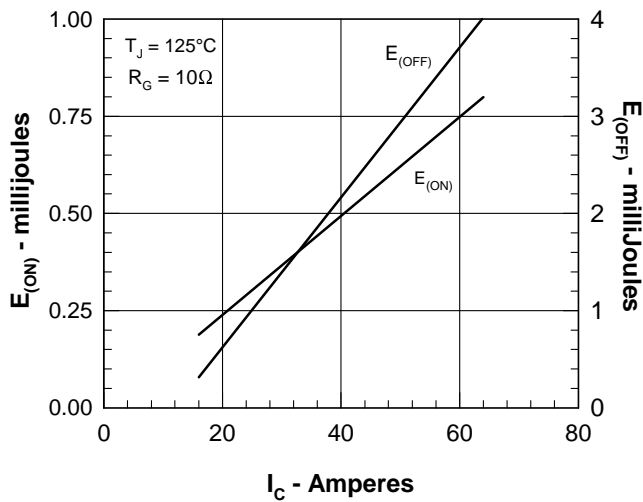


Fig. 7. Dependence of E_{ON} and E_{OFF} on I_C .

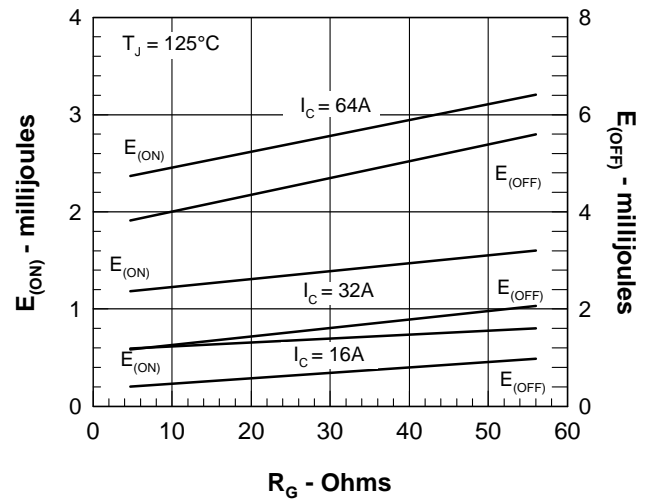


Fig. 8. Dependence of E_{ON} and E_{OFF} on R_G .

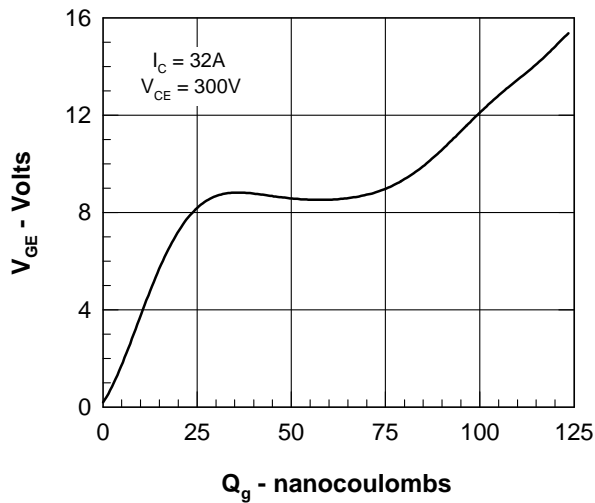


Fig. 9. Gate Charge

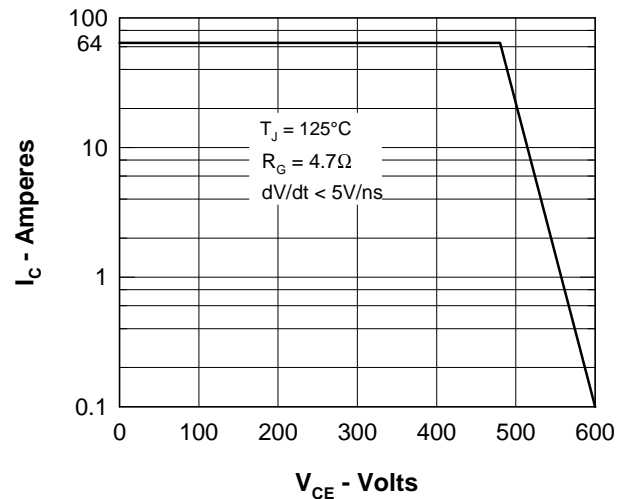


Fig. 10. Turn-off Safe Operating Area

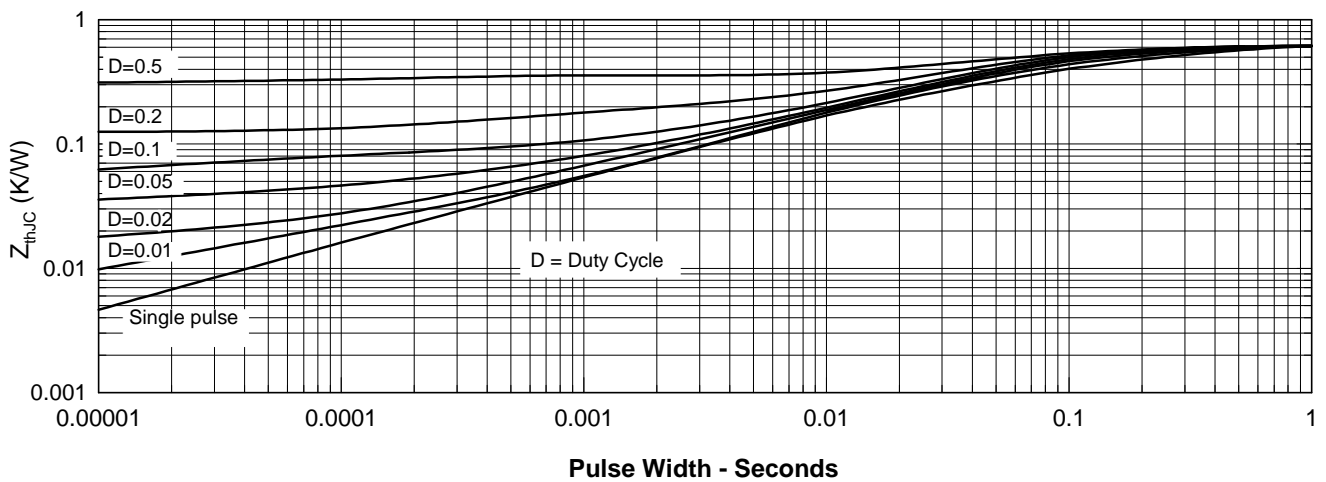


Fig. 11. Transient Thermal Resistance