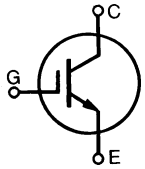
# IXYS

# HiPerFAST™ IGBT

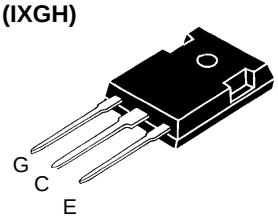
**IXGH 28N30B**
**IXGT 28N30B**

$V_{CES}$ = 300 V
$I_{C25}$ = 56 A
$V_{CE(sat)typ}$ = 2.1 V
$t_{fi(typ)}$ = 55 ns

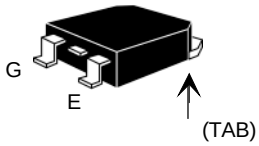



| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{CES}$ | $T_J$ = 25°C to 150°C | 300 | V |
| $V_{CGR}$ | $T_J$ = 25°C to 150°C; $R_{GE}$ = 1 MΩ | 300 | V |
| $V_{GES}$ | Continuous | ±20 | V |
| $V_{GEM}$ | Transient | ±30 | V |
| $I_{C25}$ | $T_C$ = 25°C | 56 | A |
| $I_{C90}$ | $T_C$ = 90°C | 28 | A |
| $I_{CM}$ | $T_C$ = 25°C, 1 ms | 112 | A |
| **SSOA (RBSOA)** | $V_{GE}$ = 15 V, $T_{VJ}$ = 125°C, $R_G$ = 10 Ω<br>Clamped inductive load, L = 100 μH | $I_{CM}$ = 56<br>@ 0.8 $V_{CES}$ | A |
| $P_C$ | $T_C$ = 25°C | 150 | 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) | 1.13/10 | Nm/lb.in. |
| **Weight** | TO-247 AD | 6 | g |
| | TO-268 | 4 | g |

**TO-247 AD (IXGH)**




**TO-268 (IXGT)**




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

| 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 | | 300 | | | V |
| $V_{GE(th)}$ | $I_C$ = 250 μA, $V_{CE}$ = $V_{GE}$ | | 2.5 | | 5 | V |
| $I_{CES}$ | $V_{CE}$ = 0.8 • $V_{CES}$ | $T_J$ = 25°C | | | 200 | μA |
| | $V_{GE}$ = 0 V | $T_J$ = 125°C | | | 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 | | | 2.1 | 2.4 | V |

### Features

- International standard packages JEDEC TO-268 surface and JEDEC TO-247 AD
- High current handling capability
- Newest generation HDMOS™ process
- MOS Gate turn-on
  - drive simplicity

### Applications

- 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
- Switching speed for high frequency applications
- Easy to mount with 1 screw, (isolated mounting screw hole)

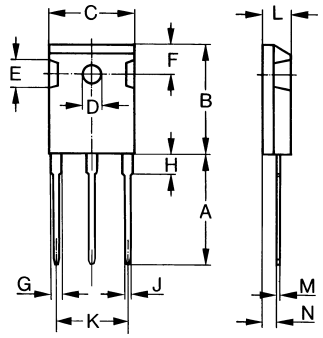
IXYS reserves the right to change limits, test conditions, and dimensions.

97530A (9/98)

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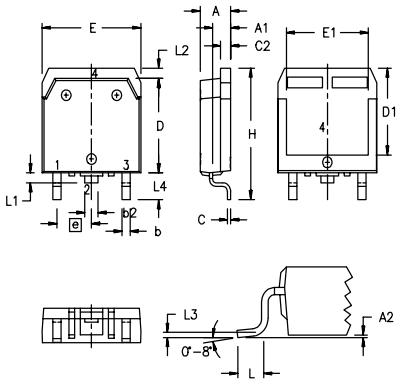
| Symbol | Test Conditions | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) min. | typ. | max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $I_C = I_{C90}$; $V_{CE}$ = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 % | 12 | 18 | | S |
| $C_{ies}$ | $V_{CE}$ = 25 V, $V_{GE}$ = 0 V, f = 1 MHz | | 1500 | | pF |
| $C_{oes}$ | | | 130 | | pF |
| $C_{res}$ | | | 40 | | pF |
| $Q_g$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V, $V_{CE}$ = 0.5 $V_{CES}$ | | 90 | | nC |
| $Q_{ge}$ | | | 15 | | nC |
| $Q_{gc}$ | | | 35 | | nC |
| $t_{d(on)}$ | **Inductive load, $T_J$ = 25°C** | | 15 | | ns |
| $t_{ri}$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V, L = 100 µH, | | 30 | | ns |
| $t_{d(off)}$ | $V_{CE}$ = 0.8 $V_{CES}$, $R_G = R_{off}$ = 4.7 Ω | | 50 | | ns |
| $t_{fi}$ | Remarks: Switching times may | | 55 | | ns |
| $E_{off}$ | increase for $V_{CE}$ (Clamp) > 0.8 • $V_{CES}$, higher $T_J$ or increased $R_G$ | | 0.3 | | mJ |
| $t_{d(on)}$ | **Inductive load, $T_J$ = 125°C** | | 15 | | ns |
| $t_{ri}$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V, L = 100 µH | | 30 | | ns |
| $E_{on}$ | $V_{CE}$ = 0.8 $V_{CES}$, $R_G = R_{off}$ = 4.7 Ω | | 0.3 | | mJ |
| $t_{d(off)}$ | Remarks: Switching times may | | 90 | 180 | ns |
| $t_{fi}$ | increase for $V_{CE}$ (Clamp) > 0.8 • $V_{CES}$, | | 110 | 230 | ns |
| $E_{off}$ | higher $T_J$ or increased $R_G$ | | 0.6 | 1.4 | mJ |
| $R_{thJC}$ | | | | 0.83 | K/W |
| $R_{thCK}$ | | | 0.25 | | K/W |

**TO-247 AD (IXGH) Outline**



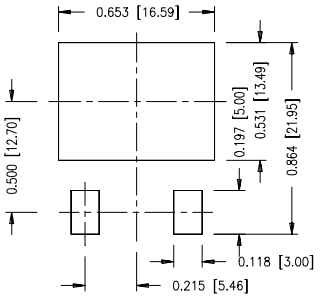

| Dim. | Millimeter Min. | Max. | Inches Min. | Max. |
|---|---|---|---|---|
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 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 ($D^3$ PAK)**




| Dim. | Millimeter Min. | Max. | Inches 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**




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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
4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025