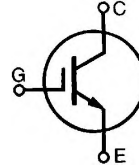


Preliminary data

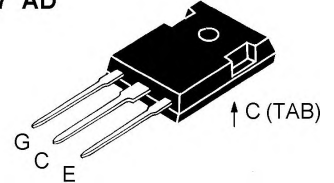
HiPerFAST™ IGBT

IXGH 50N50B
IXGH 50N60B

| V_{CES} | I_{C25} | $V_{CE(sat)}$ | t_{fi} |
|-----------|-----------|---------------|----------|
| 500 V | 75 A | 2.3 V | 100 ns |
| 600 V | 75 A | 2.5 V | 120 ns |



TO-247 AD



G = Gate C = Collector
E = Emitter Tab = Collector

| Symbol | Test Conditions | Maximum Ratings | | |
|---|---|-----------------|-----------------------------------|------------------|
| | | 50N50 | 50N60 | |
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 500 | 600 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$ | 500 | 600 | V |
| V_{GES} | Continuous | | ± 20 | V |
| V_{GEM} | Transient | | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | | 75 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | | 50 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | | 200 | A |
| SSOA (RBSOA) | $V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$ | | $I_{CM} = 100$ @ $0.8 V_{CES}$ | A |
| P_c | $T_C = 25^\circ\text{C}$ | | 250 | W |
| T_J | | -55 ... +150 | | $^\circ\text{C}$ |
| T_{JM} | | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | | $^\circ\text{C}$ |
| M_d | Mounting torque, TO-247 AD | | 1.13/10 Nm/lb.in. | |
| Weight | | | 6 | g |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | | 300 | $^\circ\text{C}$ |

Features

- International standard package JEDEC TO-247 AD
- High frequency IGBT
- 3rd generation HDMOS™ process
- High current handling capability
- MOS Gate turn-on - drive simplicity

Applications

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

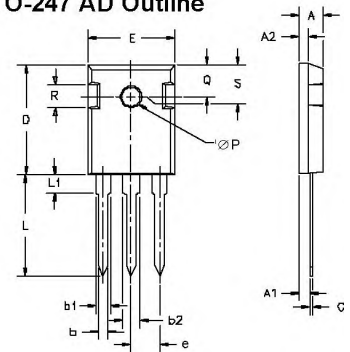
Advantages

- Easy to mount with 1 screw (insulated mounting screw hole)
- Switching speed for high frequency applications
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|---|---|------------|---------------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\ \mu\text{A}$, $V_{GE} = 0\text{ V}$ | 50N50 50N60 | 500 600 | V V |
| $V_{GE(th)}$ | $I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$ | | 2.5 | 5.0 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0\text{ V}$ | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ | | 200 μA 1 mA |
| I_{GES} | $V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$ | | | $\pm 100\text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ | 50N50B 50N60B | | 2.3 V 2.5 V |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|----------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = I_{C90}$; $V_{CE} = 10\text{ V}$. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 25 | 35 | S |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 3800 | pF |
| C_{oes} | | | 300 | pF |
| C_{res} | | | 85 | pF |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 200 | 250 nC |
| Q_{ge} | | | 35 | 50 nC |
| Q_{gc} | | | 70 | 100 nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 2.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$ V_{CES} , higher T_J or increased R_G | | 50 | ns |
| t_{ri} | | | 50 | ns |
| $t_{d(off)}$ | | | 110 | ns |
| t_{fl} | | 50N50 | 100 | ns |
| E_{off} | | 50N60 | 120 | ns |
| | | 50N50 | 1.5 | mJ |
| | | 50N60 | 1.8 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 2.7\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 50 | ns |
| t_{ri} | | | 60 | ns |
| E_{on} | | | 3 | mJ |
| $t_{d(off)}$ | | 50N50 | 200 | 300 ns |
| t_{fl} | | 50N60 | 150 | 275 ns |
| | | 50N50 | 2.6 | 3.5 mJ |
| | | 50N60 | 3 | 4.2 mJ |
| R_{thJC} | | | 0.25 | 0.50 K/W |
| R_{thCK} | | | | K/W |

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 |
| L ₁ | | 4.50 | | .177 |
| ∅P | 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 |

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