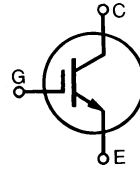


Low $V_{CE(sat)}$ IGBT
High speed IGBT

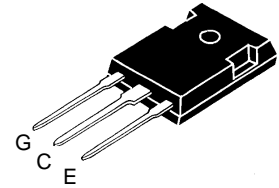
IXGH/IXGM 30 N60
IXGH/IXGM 30 N60A

| V_{CES} | I_{C25} | $V_{CE(sat)}$ |
|--------------|-------------|---------------|
| 600 V | 50 A | 2.5 V |
| 600 V | 50 A | 3.0 V |

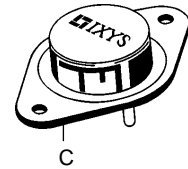


| Symbol | Test Conditions | Maximum Ratings | |
|---|--|----------------------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 600 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$ | 600 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 50 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 30 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 100 | A |
| SSOA (RBSOA) | $V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 33\ \Omega$ Clamped inductive load, $L = 100\ \mu\text{H}$ | $I_{CM} = 60$ @ $0.8 V_{CES}$ | A |
| P_C | $T_C = 25^\circ\text{C}$ | 200 | 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 (M3) | 1.13/10 Nm/lb.in. | |
| Weight | | TO-204 = 18 g, TO-247 = 6 g | |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | $^\circ\text{C}$ |

TO-247 AD (IXGH)



TO-204 AE (IXGM)



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

Features

- International standard packages
- 2nd generation HDMOS™ process
- Low $V_{CE(sat)}$
 - for low on-state conduction losses
- High current handling capability
- MOS Gate turn-on
 - drive simplicity
- Voltage rating guaranteed at high temperature (125°C)

Applications

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

Advantages

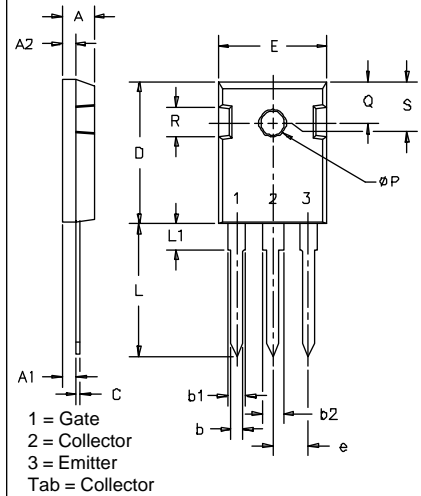
- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- High power density

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|--|---|------|--|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 250\ \mu\text{A}$, $V_{GE} = 0\text{ V}$ | 600 | | V |
| $V_{GE(th)}$ | $I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | | 5 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0\text{ V}$ | | | $T_J = 25^\circ\text{C}$: 200 μA $T_J = 125^\circ\text{C}$: 1 mA |
| I_{GES} | $V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$ | | | $\pm 100\text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ | | | 30N60: 2.5 V 30N60A: 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 $\leq 2\%$ | 8 | 16 | S |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 2800 | pF |
| C_{oes} | | | 230 | pF |
| C_{res} | | | 70 | pF |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 150 | 180 nC |
| Q_{ge} | | | 35 | 50 nC |
| Q_{gc} | | | 60 | 90 nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 33\ \Omega$ Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G 30N60 30N60A | | 100 | ns |
| t_{ri} | | | 200 | ns |
| $t_{d(off)}$ | | | 500 | ns |
| t_{fi} | | | 200 | ns |
| E_{off} | | | 2 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 33\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G 30N60 30N60A | | 100 | ns |
| t_{ri} | | | 200 | ns |
| E_{on} | | | 3 | mJ |
| $t_{d(off)}$ | | | 600 | 1000 ns |
| t_{fi} | | | 500 | 1500 ns |
| E_{off} | | | 250 | 800 ns |
| R_{thJC} | | | 0.62 | K/W |
| R_{thCK} | | 0.25 | | K/W |

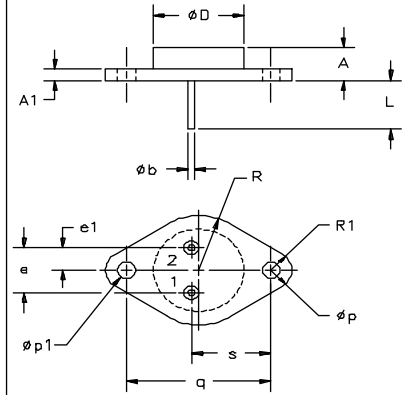
IXGH 30N60 and IXGH 30N60A characteristic curves are located on the IXGH 30N60U1 and IXGH 30N60AU1 data sheets.

TO-247 AD Outline



| SYM | INCHES | | MILLIMETERS | |
|----------|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .185 | .209 | 4.7 | 5.3 |
| A1 | .087 | .102 | 2.2 | 2.54 |
| A2 | .059 | .098 | 2.2 | 2.6 |
| b | .040 | .055 | 1.0 | 1.4 |
| b1 | .065 | .084 | 1.65 | 2.13 |
| b2 | .113 | .123 | 2.87 | 3.12 |
| C | .018 | .031 | .4 | .8 |
| D | .819 | .845 | 20.80 | 21.46 |
| E | .610 | .640 | 15.75 | 16.26 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | | .177 | | 4.50 |
| ϕP | .140 | .144 | 3.55 | 3.65 |
| Q | .212 | .244 | 5.4 | 6.2 |
| R | .170 | .216 | 4.32 | 5.49 |
| S | .242 BSC | | 6.15 BSC | |

TO-204AE Outline



| SYM | INCHES | | MILLIMETERS | |
|-----------|-----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .250 | .450 | 6.4 | 11.4 |
| A1 | .060 | .135 | 1.53 | 3.42 |
| ϕb | .057 | .063 | 1.45 | 1.60 |
| ϕD | .875 | | 22.22 | |
| e | .420 | .440 | 10.67 | 11.17 |
| e1 | .205 | .225 | 5.21 | 5.71 |
| L | .440 | .480 | 11.18 | 12.19 |
| ϕp | .151 | .165 | 3.84 | 4.19 |
| $\phi p1$ | .151 | .165 | 3.84 | 4.19 |
| q | 1.187 BSC | | 30.15 BSC | |
| R | .495 | .525 | 12.58 | 13.33 |
| R1 | .131 | .188 | 3.33 | 4.77 |
| s | .655 | .675 | 16.64 | 17.14 |

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