

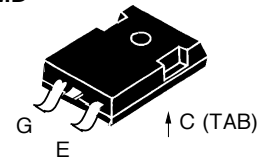
HiPerFAST™ IGBT

IXGH 40N30/S
IXGH 40N30A/S
IXGH 40N30B/S

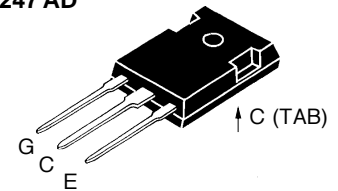
| V_{CES} | I_{C25} | $V_{CE(sat)}$ | t_{fi} |
|-----------|-----------|---------------|----------|
| 300 V | 60 A | 1.8 V | 220ns |
| 300 V | 60 A | 2.1 V | 120ns |
| 300 V | 60 A | 2.4 V | 75 ns |

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|-----------------------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 300 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$ | 300 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 60 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 40 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 160 | A |
| SSOA (RBSOA) | $V_{GE} = 15\text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10\ \Omega$ Clamped inductive load, $L = 30\ \mu\text{H}$ | $I_{CM} = 80$ @ $0.8\ V_{CES}$ | 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 | $^\circ\text{C}$ |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | $^\circ\text{C}$ |
| Maximum Tab temperature for soldering SMD devices for 10 s | | 260 | $^\circ\text{C}$ |
| M_d | Mounting torque (M3) | 1.13/10 | Nm/lb.in. |
| Weight | TO-247 AD | 6 | g |
| | TO-247 SMD | 4 | g |

TO-247 SMD*



TO-247 AD



G = Gate, C = Collector,
 E = Emitter, TAB = Collector
 * Add suffix letter "S" for surface mountable package

Features

- International standard packages
JEDEC TO-247 AD and surface mountable TO-247 SMD
- 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

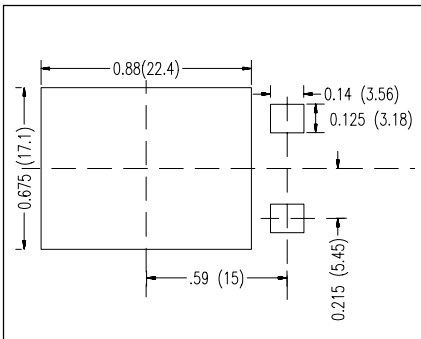
Advantages

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

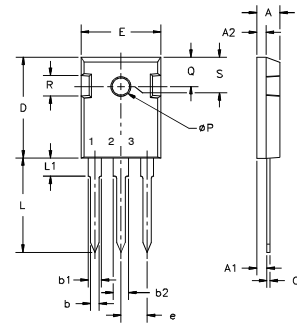
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|---|---|------|--|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 250\ \mu\text{A}$, $V_{GE} = 0\text{ V}$ | 300 | | V |
| $V_{GE(th)}$ | $I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | | V |
| I_{CES} | $V_{CE} = 0.8\ V_{CES}$, $T_J = 25^\circ\text{C}$ $V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$ | | | 200 μA 1 mA |
| I_{GES} | $V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$ | | | $\pm 100\text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ | | | 40N30 40N30A 40N30B 1.8 V 2.1 V 2.4 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 $\leq 2\%$ | 20 | 28 | S |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 2500 | pF |
| C_{oes} | | | 210 | pF |
| C_{res} | | | 60 | pF |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 145 | 170 nC |
| Q_{ge} | | | 23 | 35 nC |
| Q_{gc} | | | 50 | 75 nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 1.0\ \Omega$ Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 25 | ns |
| t_{ri} | | | 40 | ns |
| $t_{d(off)}$ | | 40N30 | 170 | ns |
| | | 40N30A | 100 | ns |
| | | 40N30B | 75 | ns |
| t_{ri} | | 40N30 | 230 | ns |
| | | 40N30A | 120 | ns |
| | 40N30B | 75 | ns | |
| E_{off} | | 40N30 | 1.6 | mJ |
| | | 40N30A | 0.75 | mJ |
| | | 40N30B | 0.3 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 100\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}$, $R_G = R_{off} = 1.0\ \Omega$ Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 25 | ns |
| t_{ri} | | | 40 | ns |
| E_{on} | | | 0.3 | mJ |
| $t_{d(off)}$ | | 40N30 | 250 | 500 ns |
| | | 40N30A | 150 | 300 ns |
| | | 40N30B | 90 | 180 ns |
| t_{ri} | | 40N30 | 350 | 600 ns |
| | 40N30A | 220 | 330 ns | |
| | 40N30B | 130 | 230 ns | |
| E_{off} | | 40N30 | 3.3 | 4.8 mJ |
| | | 40N30A | 1.6 | 2.4 mJ |
| | | 40N30B | 0.6 | 1.4 mJ |
| R_{thJC} | | | | 0.62 K/W |
| R_{thCK} | | 0.25 | | K/W |

Min. Recommended Footprint
(Dimensions in inches and mm)

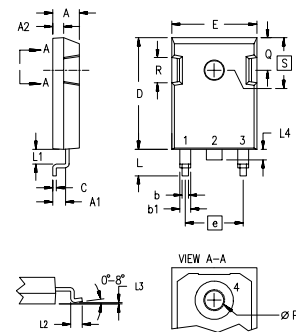


TO-247 AD Outline



| 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 |
| ∅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 |

TO-247 SMD Outline



- 1 - Gate
- 2 - Drain (collector)
- 3 - Source (Emitter)
- 4 - Drain (collector)

| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|------|
| | Min. | Max. | Min. | Max. |
| A | 4.83 | 5.21 | .190 | .205 |
| A1 | 2.29 | 2.54 | .090 | .100 |
| A2 | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| b1 | 1.19 | 2.13 | .075 | .084 |
| C | 0.61 | 0.80 | .024 | .031 |
| D | 20.80 | 21.34 | .819 | .840 |
| E | 15.75 | 16.13 | .620 | .635 |
| e | 5.45 | BSC | .215 | BSC |
| L | 4.90 | 5.10 | .193 | .201 |
| L1 | 2.70 | 2.90 | .106 | .114 |
| L2 | 2.10 | 2.30 | .083 | .091 |
| L3 | 0.00 | 0.10 | .000 | .004 |
| L4 | 1.90 | 2.10 | .075 | .083 |
| ∅P | 3.55 | 3.65 | .140 | .144 |
| Q | 5.59 | 6.20 | .220 | .244 |
| R | 4.32 | 4.83 | .170 | .190 |
| 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