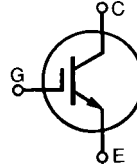


HiPerFAST™ IGBT

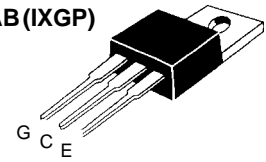
IXGA 7N60B
IXGP 7N60B

$V_{CES} = 600 \text{ V}$
 $I_{C25} = 14 \text{ A}$
 $V_{CE(sat)} = 2 \text{ V}$
 $t_{fi} = 150 \text{ ns}$

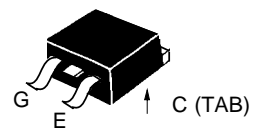


| Symbol | Test Conditions | Maximum Ratings | | |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------|-----------|
| V_{CES} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 600 | V | |
| V_{CGR} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$ | 600 | V | |
| V_{GES} | Continuous | ± 20 | V | |
| V_{GEM} | Transient | ± 30 | V | |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 14 | A | |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 7 | A | |
| I_{CM} | $T_C = 25^\circ\text{C}, 1 \text{ ms}$ | 30 | A | |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 22 \Omega$ Clamped inductive load, $L = 300 \mu\text{H}$ | $I_{CM} = 14$ @ $0.8 V_{CES}$ | A | |
| P_C | $T_C = 25^\circ\text{C}$ | 54 | 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 | $^\circ\text{C}$ | |
| M_d | Mounting torque, (TO-220) | M3 | 0.45/4 | Nm/lb.in. |
| | | M3.5 | 0.55/5 | |
| Weight | TO-220 | 4 | g | |
| | TO-263 | 2 | g | |

TO-220AB (IXGP)



TO-263 AA (IXGA)



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

Features

- International standard packages JEDEC TO-263 surface mountable and JEDEC TO-220 AB
- Medium frequency IGBT
- High current handling capability
- HiPerFAST™ HDMOS™ process
- MOS Gate turn-on - drive simplicity

Applications

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

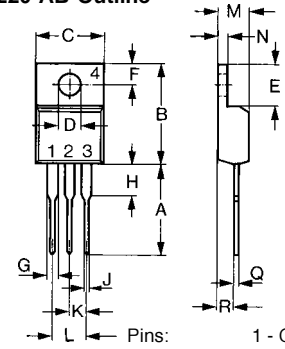
Advantages

- High power density
- Suitable for surface mounting
- Very low switching losses for high frequency applications

| 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 | | 5.5 V |
| I_{CES} | $V_{CE} = 0.8 V_{CES}, V_{GE} = 0 \text{ V}$ | $T_J = 25^\circ\text{C}$ | | 100 μA |
| | | $T_J = 125^\circ\text{C}$ | | 500 μA |
| I_{GES} | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}, V_{GE} = 15 \text{ V}$ | 1.8 | 2.0 | 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 $\leq 2\%$ | 3 | 7 | S |
| C_{ies} | $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$ | | 500 | pF |
| C_{oes} | | | 50 | pF |
| C_{res} | | | 17 | pF |
| Q_g | $I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$ | | 25 | nC |
| Q_{ge} | | | 5 | nC |
| Q_{gc} | | | 10 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}, L = 300\ \mu\text{H}$, $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 22\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 9 | ns |
| t_{ri} | | | 10 | ns |
| E_{on} | | | 0.07 | mJ |
| $t_{d(off)}$ | | | 100 | 200 ns |
| t_{fi} | | | 150 | 250 ns |
| E_{off} | | | 0.3 | 0.6 mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}, L = 300\ \mu\text{H}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 22\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 V_{CES}$, higher T_J or increased R_G | | 10 | ns |
| t_{ri} | | | 15 | ns |
| E_{on} | | | 0.15 | mJ |
| $t_{d(off)}$ | | | 200 | ns |
| t_{fi} | | | 250 | ns |
| E_{off} | | | 0.6 | mJ |
| R_{thJC} | | | | 2.3 K/W |
| R_{thCK} | (TO-220) | 0.25 | | K/W |

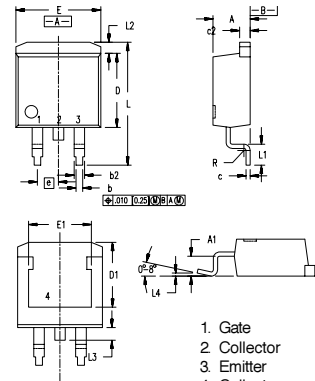
TO-220 AB Outline



Pins:
1 - Gate
2 - Collector
3 - Emitter
4 - Collector
Bottom Side

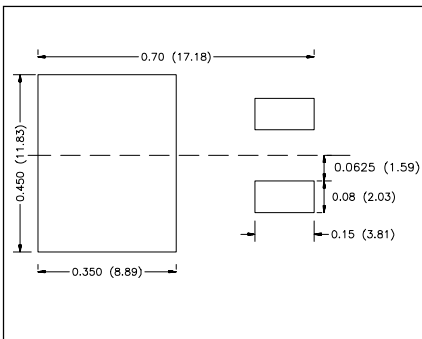
| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 12.70 | 13.97 | 0.500 | 0.550 |
| B | 14.73 | 16.00 | 0.580 | 0.630 |
| C | 9.91 | 10.66 | 0.390 | 0.420 |
| D | 3.54 | 4.08 | 0.139 | 0.161 |
| E | 5.85 | 6.85 | 0.230 | 0.270 |
| F | 2.54 | 3.18 | 0.100 | 0.125 |
| G | 1.15 | 1.65 | 0.045 | 0.065 |
| H | 2.79 | 5.84 | 0.110 | 0.230 |
| J | 0.64 | 1.01 | 0.025 | 0.040 |
| K | 2.54 | BSC | 0.100 | BSC |
| M | 4.32 | 4.82 | 0.170 | 0.190 |
| N | 1.14 | 1.39 | 0.045 | 0.055 |
| Q | 0.35 | 0.56 | 0.014 | 0.022 |
| R | 2.29 | 2.79 | 0.090 | 0.110 |

TO-263 AA Outline



1. Gate
2. Collector
3. Emitter
4. Collector
Bottom Side

| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|------|
| | Min. | Max. | Min. | Max. |
| A | 4.06 | 4.83 | .160 | .190 |
| A1 | 2.03 | 2.79 | .080 | .110 |
| b | 0.51 | 0.99 | .020 | .039 |
| b2 | 1.14 | 1.40 | .045 | .055 |
| c | 0.46 | 0.74 | .018 | .029 |
| c2 | 1.14 | 1.40 | .045 | .055 |
| D | 8.64 | 9.65 | .340 | .380 |
| D1 | 7.11 | 8.13 | .280 | .320 |
| E | 9.65 | 10.29 | .380 | .405 |
| E1 | 6.86 | 8.13 | .270 | .320 |
| e | 2.54 | BSC | .100 | BSC |
| L | 14.61 | 15.88 | .575 | .625 |
| L1 | 2.29 | 2.79 | .090 | .110 |
| L2 | 1.02 | 1.40 | .040 | .055 |
| L3 | 1.27 | 1.78 | .050 | .070 |
| L4 | 0 | 0.38 | 0 | .015 |
| R | 0.46 | 0.74 | .018 | .029 |



Min. Recommended Footprint (Dimensions in inches and mm)

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