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[IXGA4N100](#)

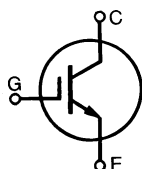
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# IGBT

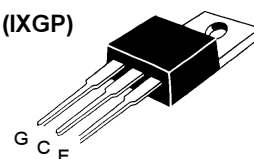
**IXGA 4N100**  
**IXGP 4N100**

$V_{CES} = 1000 \text{ V}$   
 $I_{C25} = 8 \text{ A}$   
 $V_{CE(sat)} = 2.7 \text{ V}$

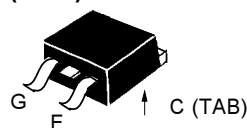


| Symbol                                                                          | Test Conditions                                                                                 | Maximum Ratings                 |                  |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------|------------------|
| $V_{CES}$                                                                       | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$                                                  | 1000                            | V                |
| $V_{CGR}$                                                                       | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$                      | 1000                            | V                |
| $V_{GES}$                                                                       | Continuous                                                                                      | $\pm 20$                        | V                |
| $V_{GEM}$                                                                       | Transient                                                                                       | $\pm 30$                        | V                |
| $I_{C25}$                                                                       | $T_C = 25^\circ\text{C}$                                                                        | 8                               | A                |
| $I_{C90}$                                                                       | $T_C = 90^\circ\text{C}$                                                                        | 4                               | A                |
| $I_{CM}$                                                                        | $T_C = 25^\circ\text{C}, 1 \text{ ms}$                                                          | 16                              | A                |
| <b>SSOA</b><br><b>(RBSOA)</b>                                                   | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 120 \Omega$<br>Clamped inductive load | $I_{CM} = 8$<br>@ $0.8 V_{CES}$ | A                |
| $P_C$                                                                           | $T_C = 25^\circ\text{C}$                                                                        | 40                              | W                |
| $T_J$                                                                           |                                                                                                 | -55 ... +150                    | $^\circ\text{C}$ |
| $T_{JM}$                                                                        |                                                                                                 | 150                             | $^\circ\text{C}$ |
| $T_{sg}$                                                                        |                                                                                                 | -55 ... +150                    | $^\circ\text{C}$ |
| Maximum lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10 s |                                                                                                 | 300                             | $^\circ\text{C}$ |
| $M_d$                                                                           | Mounting torque with screw M3<br>Mounting torque with screw M3.5                                | 0.45/4<br>0.55/5                | Nm/lb.in.        |
| <b>Weight</b>                                                                   | TO-220                                                                                          | 4                               | g                |
|                                                                                 | TO-263                                                                                          | 2                               | g                |

TO-220AB (IXGP)



TO-263 AA (IXGA)



## Features

- International standard packages  
JEDEC TO-220AB and TO-263AA
- 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
- Capacitor discharge

## Advantages

- Easy to mount with one screw
- Reduces assembly time and cost
- High power density

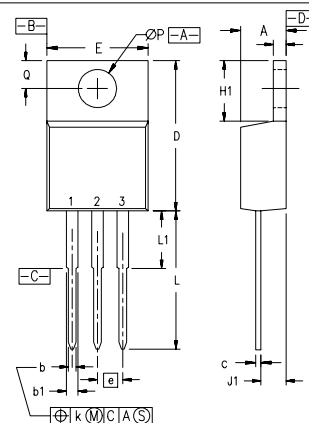
| Symbol        | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) | Characteristic Values     |      |                      |
|---------------|-----------------------------------------------------------------------------|---------------------------|------|----------------------|
|               |                                                                             | Min.                      | Typ. | Max.                 |
| $BV_{CES}$    | $I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$                               | 1000                      |      | V                    |
| $V_{GE(th)}$  | $I_C = 100 \mu\text{A}, V_{CE} = V_{GE}$                                    | 2.5                       |      | 5.0 V                |
| $I_{CES}$     | $V_{CE} = 0.8 \cdot V_{CES}$                                                | $T_J = 25^\circ\text{C}$  |      | 25 $\mu\text{A}$     |
|               | $V_{GE} = 0 \text{ V}$                                                      | $T_J = 125^\circ\text{C}$ |      | 250 $\mu\text{A}$    |
| $I_{GES}$     | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$                           |                           |      | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}, V_{GE} = 15 \text{ V}$                                      | 2.2                       | 2.7  | V                    |

**IXYS**

**IXGA 4N100**  
**IXGP 4N100**

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                                                                                                                                                                                                      | Characteristic Values |      |        |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------|--------|
|              |                                                                                                                                                                                                                                                                                                  | Min.                  | Typ. | Max.   |
| $g_{fs}$     | $I_C = I_{C90}, V_{CE} = 10\text{ V}$ ,<br>Pulse test, $t \leq 300\text{ }\mu\text{s}$ , duty cycle $\leq 2\%$                                                                                                                                                                                   | 2.5                   | 4    | S      |
| $C_{ies}$    | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$                                                                                                                                                                                                                              |                       | 343  | pF     |
| $C_{oes}$    |                                                                                                                                                                                                                                                                                                  |                       | 21   | pF     |
| $C_{res}$    |                                                                                                                                                                                                                                                                                                  |                       | 5    | pF     |
| $I_{C(ON)}$  | $V_{GE} = 10\text{ V}$ , $V_{CE} = 10\text{ V}$                                                                                                                                                                                                                                                  |                       | 21   | A      |
| $Q_g$        | $I_C = I_{C90}, V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5\text{ V}_{CES}$                                                                                                                                                                                                                            |                       | 13.6 | nC     |
| $Q_{ge}$     |                                                                                                                                                                                                                                                                                                  |                       | 2.5  | nC     |
| $Q_{gc}$     |                                                                                                                                                                                                                                                                                                  |                       | 6.5  | nC     |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b><br>$I_C = I_{C90}, V_{GE} = 15\text{ V}$<br>$V_{CE} = 800\text{ V}$ , $R_G = R_{off} = 120\text{ }\Omega$<br>Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8\text{ V}_{CES}$ , higher $T_J$ or increased $R_G$  |                       | 20   | ns     |
| $t_{ri}$     |                                                                                                                                                                                                                                                                                                  |                       | 25   | ns     |
| $t_{d(off)}$ |                                                                                                                                                                                                                                                                                                  |                       | 390  | ns     |
| $t_{fi}$     |                                                                                                                                                                                                                                                                                                  |                       | 340  | ns     |
| $E_{off}$    |                                                                                                                                                                                                                                                                                                  |                       | 0.9  | mJ     |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b><br>$I_C = I_{C90}, V_{GE} = 15\text{ V}$<br>$V_{CE} = 800\text{ V}$ , $R_G = R_{off} = 120\text{ }\Omega$<br>Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8\text{ V}_{CES}$ , higher $T_J$ or increased $R_G$ |                       | 20   | ns     |
| $t_{ri}$     |                                                                                                                                                                                                                                                                                                  |                       | 25   | ns     |
| $E_{on}$     |                                                                                                                                                                                                                                                                                                  |                       | 0.16 | mJ     |
| $t_{d(off)}$ |                                                                                                                                                                                                                                                                                                  |                       | 700  | ns     |
| $t_{fi}$     |                                                                                                                                                                                                                                                                                                  |                       | 520  | ns     |
| $E_{off}$    |                                                                                                                                                                                                                                                                                                  |                       | 2.0  | mJ     |
| $R_{thJC}$   | TO-220                                                                                                                                                                                                                                                                                           |                       | 0.5  | 3.1 KW |
| $R_{thCK}$   |                                                                                                                                                                                                                                                                                                  |                       |      | KW     |

#### TO-220 AB Dimensions

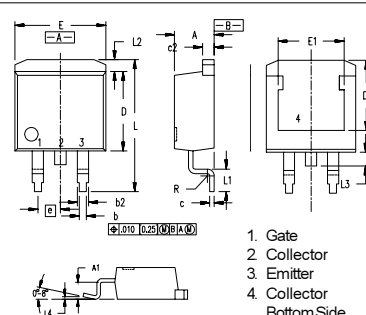


Pins: 1 - Gate  
2 - Collector  
3 - Emitter  
4 - Collector  
Bottom Side

| SYM | INCHES   |      | MILLIMETERS |       |
|-----|----------|------|-------------|-------|
|     | MIN      | MAX  | MIN         | MAX   |
| A   | .170     | .190 | 4.32        | 4.83  |
| b   | .025     | .040 | 0.64        | 1.02  |
| b1  | .045     | .065 | 1.15        | 1.65  |
| c   | .014     | .022 | 0.35        | 0.56  |
| D   | .580     | .630 | 14.73       | 16.00 |
| E   | .390     | .420 | 9.91        | 10.66 |
| e   | .100 BSC |      | 2.54 BSC    |       |
| F   | .045     | .055 | 1.14        | 1.40  |
| H1  | .230     | .270 | 5.85        | 6.85  |
| J1  | .090     | .110 | 2.29        | 2.79  |
| k   | 0        | .015 | 0           | 0.38  |
| L   | .500     | .550 | 12.70       | 13.97 |
| L1  | .110     | .230 | 2.79        | 5.84  |
| ØP  | .139     | .161 | 3.53        | 4.08  |
| Q   | .100     | .125 | 2.54        | 3.18  |

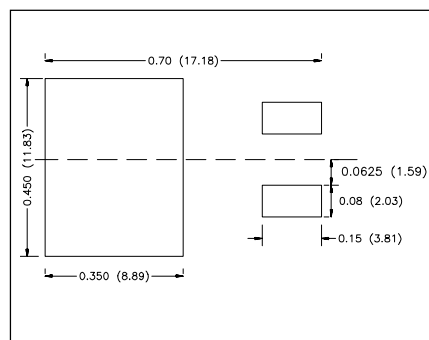
NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-220 AB.

#### 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.

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 |