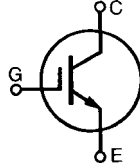


# IGBT

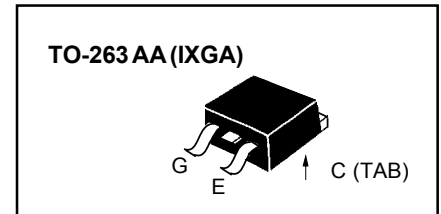
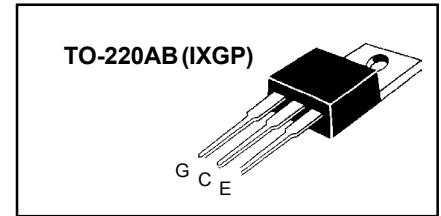
**IXGA 20N100**  
**IXGP 20N100**

$V_{CES} = 1000 \text{ V}$   
 $I_{C25} = 40 \text{ A}$   
 $V_{CE(sat)} = 3.0 \text{ V}$

Preliminary Data Sheet



| 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                |
| $I_{C25}$   | $T_C = 25^\circ\text{C}$  | 40                                   | A                |
| $I_{C90}$   | $T_C = 90^\circ\text{C}$  | 20                                   | A                |
| $I_{CM}$  | $T_C = 25^\circ\text{C}, 1 \text{ ms}$  | 80                                   | A                |
| <b>SSOA</b><br><b>(RBSOA)</b>   | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 47 \Omega$<br>Clamped inductive load, $L = 300 \mu\text{H}$ | $I_{CM} = 40$<br>@ $0.8 V_{CES}$     | A                |
| $P_C$   | $T_C = 25^\circ\text{C}$  | 150                                  | 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<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 Nm/lb.in.<br>0.55/5 Nm/lb.in. |                  |
| <b>Weight</b>   | TO-220<br>TO-263  | 4<br>2                               | g<br>g           |



| Symbol        | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) | Characteristic Values |   |                           |
|---------------|---|-----------------------|---|---------------------------|
|               |   | Min.                  | Typ.  | Max.                      |
| $BV_{CES}$    | $I_C = 1 \text{ mA}, V_{GE} = 0 \text{ V}$                                  | 1000                  |   | V                         |
| $V_{GE(th)}$  | $I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$                                    | 2.5                   |   | V                         |
| $I_{CES}$     | $V_{CE} = V_{CES}$<br>$V_{GE} = 0 \text{ V}$                                |                       | $T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ | 250 $\mu\text{A}$<br>1 mA |
| $I_{GES}$     | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$                           |                       |   | $\pm 100 \text{ nA}$      |
| $V_{CE(sat)}$ | $I_C = I_{CE90}, V_{GE} = 15$   |                       | 2.2   | 3.0 V                     |

### Features

- International standard packages JEDEC TO-220AB and TO-263AA
- High current handling capability
- MOS Gate turn-on - drive simplicity

### Applications

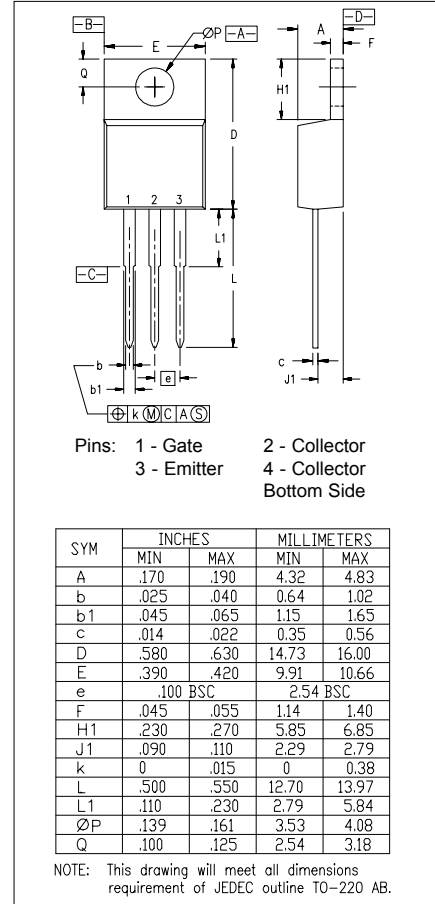
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies
- Capacitor discharge

### Advantages

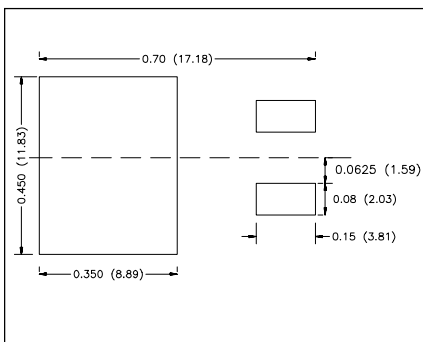
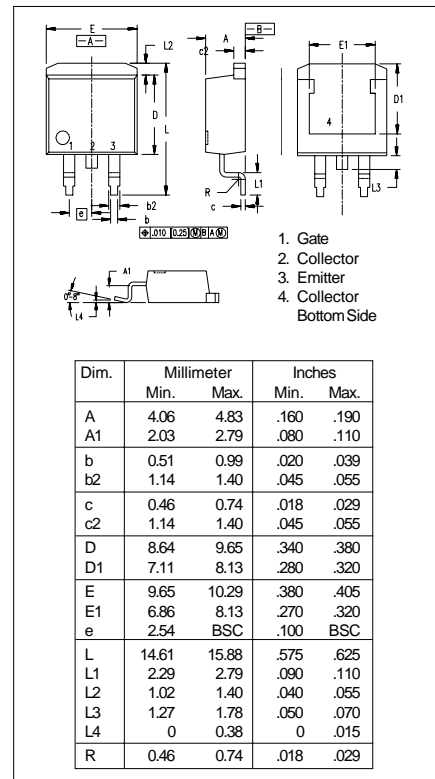
- Easy to mount with one screw
- Reduces assembly time and cost
- High power density

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                 | Characteristic Values |      |      |
|--------------|---|-----------------------|------|------|
|              |   | Min.                  | Typ. | Max. |
| $g_{fs}$     | $I_C = I_{C90}$ ; $V_{CE} = 10\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$ | 12                    | 16   | S    |
| $C_{ies}$    | $V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$   |                       | 1750 | pF   |
| $C_{oes}$    |   |                       | 100  | pF   |
| $C_{res}$    |   |                       | 38   | pF   |
| $I_{C(ON)}$  | $V_{GE} = 10\text{ V}$ , $V_{CE} = 10\text{ V}$   |                       | 90   | A    |
| $Q_g$        | $I_C = I_{C90}$ ; $V_{GE} = 15\text{ V}$ , $V_{CE} = 0.5 V_{CES}$   |                       | 73   | nC   |
| $Q_{ge}$     |   |                       | 13   | nC   |
| $Q_{gc}$     |   |                       | 26   | nC   |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>  |                       | 30   | ns   |
| $t_{ri}$     | $I_C = I_{C90}$ ; $V_{GE} = 15\text{ V}$  |                       | 30   | ns   |
| $t_{d(off)}$ | $V_{CE} = 800\text{ V}$ , $R_G = R_{off} = 47\ \Omega$  | 350                   | 700  | ns   |
| $t_{fi}$     | Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 V_{CES}$ ,                                | 280                   | 700  | ns   |
| $E_{off}$    | higher $T_J$ or increased $R_G$   | 3.5                   | 8.0  | mJ   |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>   |                       | 30   | ns   |
| $t_{ri}$     | $I_C = I_{C90}$ ; $V_{GE} = 15\text{ V}$  |                       | 30   | ns   |
| $E_{on}$     | $V_{CE} = 800\text{ V}$ , $R_G = R_{off} = 47\ \Omega$  | 0.65                  |      | mJ   |
| $t_{d(off)}$ | Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 V_{CES}$ ,                                | 700                   |      | ns   |
| $t_{fi}$     | higher $T_J$ or increased $R_G$   | 520                   |      | ns   |
| $E_{off}$    |   | 6.5                   |      | mJ   |
| $R_{thJC}$   |   |                       | 0.83 | K/W  |
| $R_{thCK}$   | TO-220  | 0.5                   |      | K/W  |

### TO-220 AB Dimensions



### TO-263 AA Outline



### Min. Recommended Footprint (Dimensions in inches and mm)

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



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