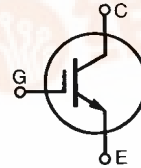




Advance Technical Data

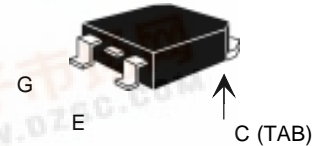
High Voltage IGBT

IXGH 24N170 $V_{CES} = 1700 \text{ V}$
 IXGT 24N170 $I_{C25} = 50 \text{ A}$
 $V_{CE(sat)} = 3.3 \text{ V}$
 $t_{fi(typ)} = 290 \text{ ns}$

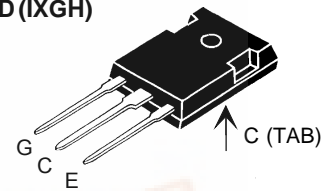


| Symbol | Test Conditions | Maximum Ratings |
|---------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------|
| V_{CES} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$ | 1700 V |
| V_{CGR} | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$ | 1700 V |
| V_{GES} | Continuous | $\pm 20 \text{ V}$ |
| V_{GEM} | Transient | $\pm 30 \text{ V}$ |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 50 A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 24 A |
| I_{CM} | $T_C = 25^\circ\text{C}, 1 \text{ ms}$ | 150 A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 5 \Omega$ Clamped inductive load | $I_{CM} = 50 \text{ A}$ @ $0.8 V_{CES}$ |
| P_c | $T_C = 25^\circ\text{C}$ | 250 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) | 1.13/10Nm/lb.in. |
| Weight | | TO-247 AD 6 g TO-268 4 g |

TO-268 (IXGT)



TO-247 AD (IXGH)



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

Features

- International standard packages JEDEC TO-268 and JEDEC TO-247 AD
- High current handling capability
- MOS Gate turn-on - drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

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

Advantages

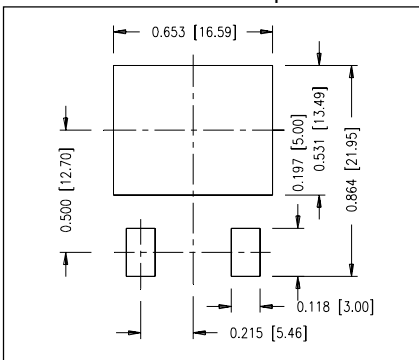
- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

| Symbol | Test Conditions | Characteristic Values | | |
|---------------|--------------------------------------------------------|----------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------|
| | | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ | | |
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 250 \mu\text{A}, V_{GE} = 0 \text{ V}$ | 1700 | | V |
| $V_{GE(th)}$ | $I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$ | 3.0 | | 5.0 V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$ | | | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ 50 μA 500 μA |
| I_{GES} | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}, V_{GE} = 15 \text{ V}$ | | 2.5 3.0 | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ 3.3 V V |

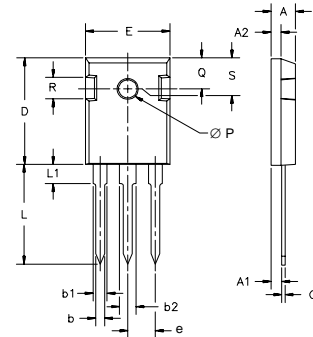


| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | | |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|------|-----|
| | | min. | typ. | max. | |
| g_{fs} | $I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 18 | 25 | S | |
| $I_{C(ON)}$ | $V_{GE} = 10\text{ V}, V_{CE} = 10\text{ V}$ | | 100 | A | |
| C_{ies} | $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$ | | 2400 | pF | |
| C_{oes} | | 120 | pF | | |
| C_{res} | | 33 | pF | | |
| Q_g | $I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$ | | 106 | nC | |
| Q_{ge} | | 18 | nC | | |
| Q_{gc} | | 32 | nC | | |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C25}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 42 | ns | |
| t_{ri} | | 39 | ns | | |
| $t_{d(off)}$ | | 200 | 400 | ns | |
| t_{fi} | | 250 | 500 | ns | |
| E_{off} | | 8 | 12 | mJ | |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C25}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 50 | ns | |
| t_{ri} | | 55 | ns | | |
| E_{on} | | 2.0 | mJ | | |
| $t_{d(off)}$ | | 200 | ns | | |
| t_{fi} | | 360 | ns | | |
| E_{off} | 12 | mJ | | | |
| R_{thJC} | | | | 0.5 | K/W |
| R_{thCK} | (TO-247) | | 0.25 | | K/W |

Min Recommended Footprint

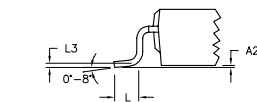
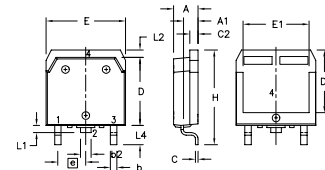


TO-247 AD Outline



| 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-268 Outline



| Dim. | Millimeter | | Inches | |
|----------------|------------|----------|--------|----------|
| | Min. | Max. | Min. | Max. |
| A | 4.9 | 5.1 | .193 | .201 |
| A ₁ | 2.7 | 2.9 | .106 | .114 |
| A ₂ | .02 | .25 | .001 | .010 |
| b | 1.15 | 1.45 | .045 | .057 |
| b ₂ | 1.9 | 2.1 | .75 | .83 |
| C | .4 | .65 | .016 | .026 |
| D | 13.80 | 14.00 | .543 | .551 |
| E | 15.85 | 16.05 | .624 | .632 |
| E ₁ | 13.3 | 13.6 | .524 | .535 |
| e | 5.45 | BSC | .215 | BSC |
| H | 18.70 | 19.10 | .736 | .752 |
| L | 2.40 | 2.70 | .094 | .106 |
| L1 | 1.20 | 1.40 | .047 | .055 |
| L2 | 1.00 | 1.15 | .039 | .045 |
| L3 | | 0.25 BSC | | .010 BSC |
| L4 | 3.80 | 4.10 | .150 | .161 |