

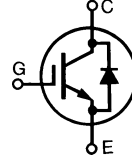
High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

IXBH 42N170
IXBT 42N170

$$V_{CES} = 1700 \text{ V}$$

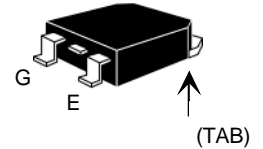
$$I_{C25} = 75 \text{ A}$$

$$V_{CE(sat)} = 3.3 \text{ V}$$

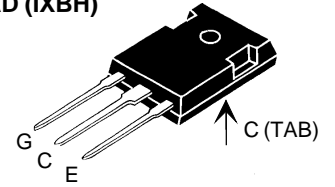


| Symbol | Test Conditions | Maximum Ratings | |
|---|--|-----------------------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 1700 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$ | 1700 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 75 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 42 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 180 | A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 10 \Omega$ Clamped inductive load | $I_{CM} = 90$ $V_{CES} = 1350$ | A V |
| T_{SC} (SCSOA) | $V_{GE} = 15 \text{ V}$, $V_{CES} = 1200 \text{ V}$, $T_J = 125^\circ\text{C}$ $R_G = 10 \Omega$ non repetitive | 10 | μs |
| P_C | $T_C = 25^\circ\text{C}$ | 300 | 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-268 | 4 | g |

TO-268
(IXBT)



TO-247 AD (IXBH)



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

Features

- High Blocking Voltage
- JEDEC TO-268 surface and JEDEC TO-247 AD
- Low conduction losses
- High current handling capability
- MOS Gate turn-on - drive simplicity
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- AC motor speed control
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- Capacitor discharge circuits

Advantages

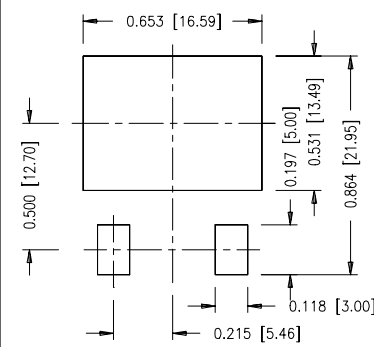
- Lower conduction losses than MOSFETs
- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|---------------|--|---|------|----------------------|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 250 \mu\text{A}$, $V_{GE} = 0 \text{ V}$ | 1700 | | V |
| $V_{GE(th)}$ | $I_C = 750 \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | | V |
| I_{CES} | $V_{CE} = 0.8 V_{CES}$ $V_{GE} = 0 \text{ V}$ | $T_J = 25^\circ\text{C}$ | | 50 μA |
| | | $T_J = 125^\circ\text{C}$ | | 1.5 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_{C90}$, $V_{GE} = 15 \text{ V}$ | | | 3.3 V |
| | | $T_J = 125^\circ\text{C}$ | 2.9 | V |

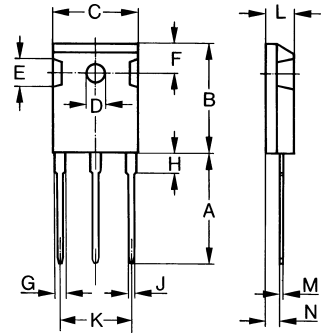
| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|--------------|--|---|------|------|
| | | min. | typ. | max. |
| g_{fs} | $I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$ | 25 | 40 | S |
| C_{ies} | $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$ | | 4700 | pF |
| C_{oes} | | | 213 | pF |
| C_{res} | | | 76 | pF |
| Q_g | $I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$ | | 169 | nC |
| Q_{ge} | | | 30 | nC |
| Q_{gc} | | | 52 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 45 | ns |
| t_{ri} | | | 35 | ns |
| $t_{d(off)}$ | | | 400 | ns |
| t_{fi} | | | 1500 | ns |
| E_{off} | | | 36 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10\ \Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | | 45 | ns |
| t_{ri} | | | 38 | ns |
| E_{on} | | | 50 | mJ |
| $t_{d(off)}$ | | | 560 | ns |
| t_{fi} | | | 1900 | ns |
| E_{off} | | 45 | mJ | |
| R_{thJC} | | | 0.42 | K/W |
| R_{thCK} | (TO-247) | 0.25 | | K/W |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified) | | |
|----------|---|---|------|-------|
| | | min. | typ. | max. |
| V_F | $I_F = I_{C90}, V_{GE} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$ | | | 4.0 V |
| I_{RM} | $I_F = 25\text{ A}, V_{GE} = 0\text{ V}, -di_F/dt = 50\text{ A}/\mu\text{s}$ $V_R = 100\text{ V}$ | | 24 | A |
| t_{rr} | | | 360 | ns |

Min. Recommended Footprint

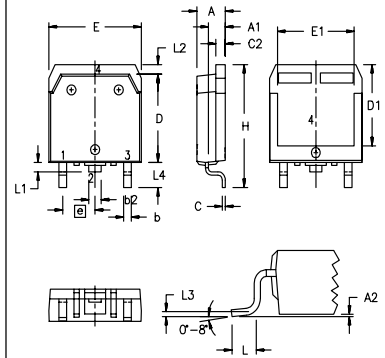


TO-247 AD Outline



| Dim. | Millimeter | | Inches | |
|------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 19.81 | 20.32 | 0.780 | 0.800 |
| B | 20.80 | 21.46 | 0.819 | 0.845 |
| C | 15.75 | 16.26 | 0.610 | 0.640 |
| D | 3.55 | 3.65 | 0.140 | 0.144 |
| E | 4.32 | 5.49 | 0.170 | 0.216 |
| F | 5.4 | 6.2 | 0.212 | 0.244 |
| G | 1.65 | 2.13 | 0.065 | 0.084 |
| H | - | 4.5 | - | 0.177 |
| J | 1.0 | 1.4 | 0.040 | 0.055 |
| K | 10.8 | 11.0 | 0.426 | 0.433 |
| L | 4.7 | 5.3 | 0.185 | 0.209 |
| M | 0.4 | 0.8 | 0.016 | 0.031 |
| N | 1.5 | 2.49 | 0.087 | 0.102 |

TO-268AA (D³ PAK)



| 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 |
| L ₁ | 1.20 | 1.40 | .047 | .055 |
| L ₂ | 1.00 | 1.15 | .039 | .045 |
| L ₃ | 0.25 BSC | | .010 BSC | |
| L ₄ | 3.80 | 4.10 | .150 | .161 |