

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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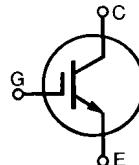
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

IGBT

High Voltage, Low $V_{CE(sat)}$

IXGH 45N120
IXGT 45N120

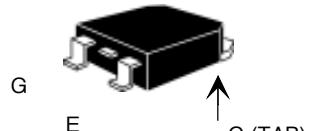
V_{CES} = 1200 V
 I_{C25} = 75 A
 $V_{CE(sat)}$ = 2.5 V
 $t_{fi(typ)}$ = 390 ns



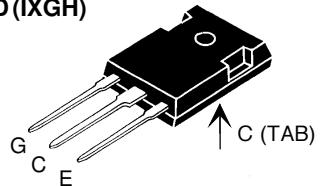
Preliminary data sheet

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|----------------------------------|------------------|
| V_{CES} | $T_J = 25^\circ\text{C}$ to 150°C | 1200 | V |
| V_{CGR} | $T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$ | 1200 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_c = 25^\circ\text{C}$, limited by leads | 75 | A |
| I_{C90} | $T_c = 90^\circ\text{C}$ | 45 | A |
| I_{CM} | $T_c = 25^\circ\text{C}$, 1 ms | 180 | A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 5 \Omega$ Clamped inductive load | $I_{CM} = 90$ @ $0.8 V_{CES}$ | A |
| 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) | 1.13/10Nm/lb.in. | |
| Weight | | TO-247 AD | 6 g |
| | | TO-268 | 4 g |

TO-268 (IXGT)



TO-247 AD (IXGH)



G = Gate,
E = Emitter,

C = Collector,
TAB = Collector

Features

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

Applications

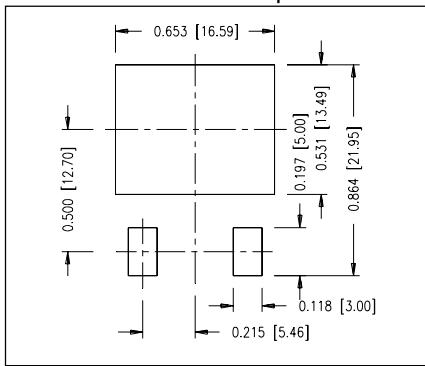
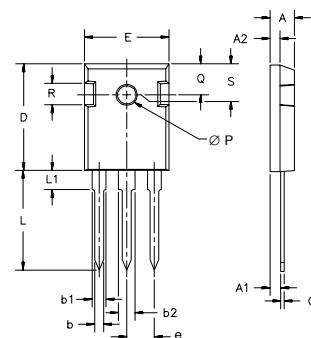
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- Capacitor discharge

Advantages

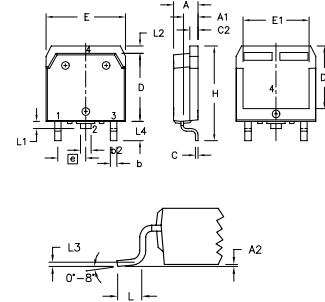
- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw,
(isolated mounting screw hole)

| Symbol | Test Conditions | Characteristic Values | | |
|---------------|--|--|------|---------------------------|
| | | ($T_J = 25^\circ\text{C}$, unless otherwise specified) | min. | typ. |
| BV_{CES} | $I_c = 1 \text{ mA}$, $V_{GE} = 0 \text{ V}$ | 1200 | | V |
| $V_{GE(th)}$ | $I_c = 750 \mu\text{A}$, $V_{CE} = V_{GE}$ | 2.5 | 5 | V |
| I_{CES} | $V_{CE} = V_{CES}$ $V_{GE} = 0 \text{ V}$ | $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ | | $250 \mu\text{A}$ 2 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_c = I_{C90}$, $V_{GE} = 15 \text{ V}$ | | 2.5 | V |

| Symbol | Test Conditions | Characteristic Values | | |
|--------------|--|--|------|------|
| | | ($T_J = 25^\circ\text{C}$, unless otherwise specified) | min. | typ. |
| g_{fs} | $I_C = I_{C90}$; $V_{GE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ | 33 | 44 | S |
| $I_{C(ON)}$ | $V_{GE} = 10\text{ V}$, $V_{CE} = 10\text{ V}$ | 220 | | A |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | 4700 | | pF |
| C_{oes} | | 255 | | pF |
| C_{res} | | 89 | | pF |
| Q_g | $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5\text{ V}_{CES}$ | 170 | | nC |
| Q_{ge} | | 28 | | nC |
| Q_{gc} | | 57 | | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.8\text{ }V_{CES}$, $R_G = R_{off} = 5\text{ }\Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | 55 | | ns |
| t_{ri} | | 28 | | ns |
| $t_{d(off)}$ | | 370 | 800 | ns |
| t_{fi} | | 390 | 700 | ns |
| E_{off} | | 14 | 25 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ $V_{CE} = 0.8\text{ }V_{CES}$, $R_G = R_{off} = 5\text{ }\Omega$ Remarks: Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G | 64 | | ns |
| t_{ri} | | 32 | | ns |
| E_{on} | | 3.0 | | mJ |
| $t_{d(off)}$ | | 660 | | ns |
| t_{fi} | | 740 | | ns |
| E_{off} | | 25 | | mJ |
| R_{thJC} | | | 0.42 | K/W |
| R_{thCK} | (TO-247) | 0.25 | | K/W |

Min Recommended Footprint

TO-247 AD Outline


| Dim. | Millimeter Min. | Millimeter Max. | Inches Min. | Inches 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 |
| ØP | 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 Min. | Millimeter Max. | Inches Min. | Inches 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 |

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 4,850,072 4,931,844 5,017,508 5,049,961 5,187,117 5,486,715 5,034,796 5,063,307 5,237,481 5,381,025