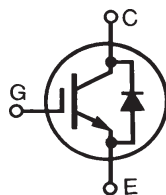


PolarHV™ IGBT
IXGH28N60B3D1

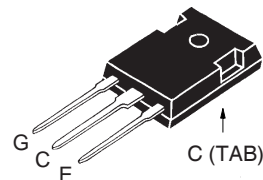
$$V_{CES} = 600V$$

$$I_{C110} = 28A$$

$$V_{CE(sat)} \leq 1.8V$$



| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|--|-----------------|------------|
| V_{CES} | $T_J = 25^\circ C$ to $150^\circ C$ | 600 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 600 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 66 | A |
| I_{C110} | $T_C = 110^\circ C$ | 28 | A |
| I_{F110} | $T_C = 110^\circ C$ | 10 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 150 | A |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 10\Omega$ Clamped inductive load @ $\leq 600V$ | $I_{CM} = 60$ | A |
| P_C | $T_C = 25^\circ C$ | 190 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | 1.6mm (0.062 in.) from case for 10 seconds | 300 | $^\circ C$ |
| T_{SOLD} | Plastic body for 10 seconds | 260 | $^\circ C$ |
| M_d | Mounting torque (M3) | 1.13/10 | Nm/lb.in. |
| Weight | | 6 | g |

TO-247 (IXGH)


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

Features

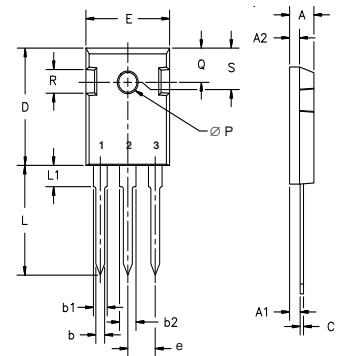
- Square RBSOA
- High current handling capability
- MOS Gate turn-on
- drive simplicity

Applications

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

| Symbol | Test Conditions ($T_J = 25^\circ C$ unless otherwise specified) | Characteristic Values | | |
|---------------|---|-----------------------|------|----------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 600 | | V |
| $V_{GE(th)}$ | $I_C = 250\mu A$, $V_{CE} = V_{GE}$ | 3.0 | | V |
| I_{CES} | $V_{CE} = V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 50 μA 1.0 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = 24A$, $V_{GE} = 15V$, Note 1 | 1.5 | 1.8 | V |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|--------------|--|-----------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = I_{C110}, V_{CE} = 10\text{V}$, Note 1 | 18 | 30 | S |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 2320 | pF |
| C_{oes} | | | 176 | pF |
| C_{res} | | | 24 | pF |
| Q_g | $I_C = I_{C110}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$ | | 62 | nC |
| Q_{ge} | | | 11 | nC |
| Q_{gc} | | | 23 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 24\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 400\text{V}, R_G = 10\Omega$ | | 19 | ns |
| t_{ri} | | | 24 | ns |
| E_{on} | | | 0.34 | mJ |
| $t_{d(off)}$ | | | 125 | 200 ns |
| t_{fi} | | | 100 | 160 ns |
| E_{off} | | | 0.65 | 1.2 mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 24\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 400\text{V}, R_G = 10\Omega$ | | 19 | ns |
| t_{ri} | | | 26 | ns |
| E_{on} | | | 0.6 | mJ |
| $t_{d(off)}$ | | | 180 | ns |
| t_{fi} | | | 170 | ns |
| E_{off} | | | 1.0 | mJ |
| R_{thJC} | | | 0.66 | $^\circ\text{C/W}$ |
| R_{thCS} | | 0.21 | | $^\circ\text{C/W}$ |

TO-247 (IXGH) Outline


Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

| 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 |

Reverse Diode (FRED)

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | |
|------------|---|--|------|----------------|
| | | Min. | Typ. | Max. |
| V_F | $I_F = 24\text{A}, V_{GE} = 0\text{V}$, Note 1 $T_J = 150^\circ\text{C}$ | | | 2.5 V 1.7 V |
| I_{RM} | $I_F = 24\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$ | | 5 | A |
| t_{rr} | | $I_F = 1\text{A}, -di_F/dt = 100\text{A}/\mu\text{s}, V_R = 30\text{V}$ $T_J = 100^\circ\text{C}$ | | 25 100 |
| R_{thJC} | | | | 1.0 K/W |

Note 1: Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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| | | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|
| IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338 B2 |
| | 4,850,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 | |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 | 7,071,537 | |



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