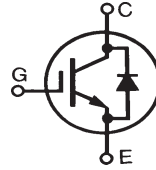


High Voltage IGBT with Diode

IXGR 32N170H1

Electrically Isolated Tab

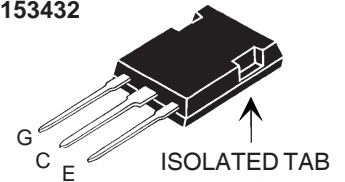
Preliminary Data Sheet



$$\begin{aligned} V_{CES} &= 1700 \text{ V} \\ I_{C25} &= 38 \text{ A} \\ V_{CE(sat)} &= 3.5 \text{ V} \\ t_{fi(typ)} &= 250 \text{ ns} \end{aligned}$$

| 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} | $T_C = 25^\circ\text{C}$ | 38 | A |
| I_{C90} | $T_C = 90^\circ\text{C}$ | 20 | A |
| I_{F90} | | 14 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1 ms | 200 | A |
| SSOA (RBSOA) | $V_{GE} = 15 \text{ V}$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 5\Omega$ Clamped inductive load | $I_{CM} = 70$ @ $0.8 V_{CES}$ | A |
| t_{SC} | $T_J = 125^\circ\text{C}$, $V_{CE} = 1200 \text{ V}$; $V_{GE} = 15 \text{ V}$, $R_G = 10\Omega$ | 10 | μs |
| P_C | $T_C = 25^\circ\text{C}$ | 200 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | $^\circ\text{C}$ |
| F_C | Mounting force with clamp | 22...130/5...30 | N/lb |
| V_{ISOL} | 50/60 Hz, 1 minute | 2500 | -V |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | $^\circ\text{C}$ |
| Weight | | 5 | g |

ISOPLUS247 (IXGR)
E153432



G = Gate,
E = Emitter

C = Collector,

Features

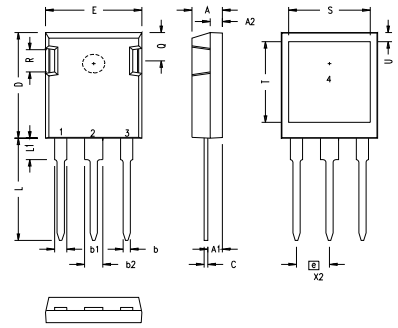
- Electrically Isolated tab
- High current handling capability
- MOS Gate turn-on
- drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

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

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified) | | |
|---------------|--|---|------|---------------------------|
| | | min. | typ. | max. |
| BV_{CES} | $I_C = 1 \text{ mA}$, $V_{GE} = 0 \text{ V}$ | 1700 | | V |
| $V_{GE(th)}$ | $I_C = 250 \mu\text{A}$, $V_{CE} = V_{GE}$ | 3.0 | | V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}$, Note 1 $T_J = 125^\circ\text{C}$ | | | 100 μA 3 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$ | | | $\pm 100 \text{ nA}$ |
| $V_{CE(sat)}$ | $I_C = I_T$, $V_{GE} = 15 \text{ V}$ Notes 2, 3 $T_J = 125^\circ\text{C}$ | 2.6 3.1 | 3.5 | V V |

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified) | | |
|--------------|---|---|------|----------|
| | | min. | typ. | max. |
| g_{fs} | $I_C = I_T, V_{CE} = 10\text{ V}$, Note 2 | 22 | 30 | S |
| C_{ies} | $V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$ | | 3670 | pF |
| C_{oes} | | | 210 | pF |
| C_{res} | | | 41 | pF |
| Q_g | $I_C = I_T, V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$ | | 155 | nC |
| Q_{ge} | | | 28 | nC |
| Q_{gc} | | | 52 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ | | 45 | ns |
| t_{ri} | $I_C = I_T, V_{GE} = 15\text{ V}$ | | 38 | ns |
| $t_{d(off)}$ | $R_G = 2.7\ \Omega$, $V_{CE} = 0.8 V_{CES}$ | | 270 | 500 ns |
| t_{fi} | Note 4 | | 250 | 500 ns |
| E_{off} | | | 10.6 | 20 mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ | | 48 | ns |
| t_{ri} | $I_C = I_T, V_{GE} = 15\text{ V}$ | | 42 | ns |
| E_{on} | $R_G = 2.7\ \Omega$, $V_{CE} = 0.8 V_{CES}$ | | 6.0 | mJ |
| $t_{d(off)}$ | Note 4 | | 360 | ns |
| t_{fi} | | | 560 | ns |
| E_{off} | | | 13.6 | mJ |
| R_{thJC} | | | | 0.65 K/W |
| R_{thCK} | | | 0.15 | K/W |

ISOPLUS247 Outline


| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .090 | .100 | 2.29 | 2.54 |
| A2 | .075 | .085 | 1.91 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b1 | .075 | .084 | 1.91 | 2.13 |
| b2 | .115 | .123 | 2.92 | 3.12 |
| C | .024 | .031 | 0.61 | 0.80 |
| D | .819 | .840 | 20.80 | 21.34 |
| E | .620 | .635 | 15.75 | 16.13 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .800 | 19.81 | 20.32 |
| L1 | .150 | .170 | 3.81 | 4.32 |
| Q | .220 | .244 | 5.59 | 6.20 |
| R | .170 | .190 | 4.32 | 4.83 |
| S | .520 | .540 | 13.21 | 13.72 |
| T | .620 | .640 | 15.75 | 16.26 |
| U | .065 | .080 | 1.65 | 2.03 |

- 1 - GATE
- 2 - DRAIN (COLLECTOR)
- 3 - SOURCE (EMITTER)
- 4 - NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

| Symbol | Test Conditions | Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified) | | |
|------------|--|---|------|---------------|
| | | min. | typ. | max. |
| V_F | $I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$, Note 2 | | | 2.85 V |
| | $T_J = 150^\circ\text{C}$ | | | 2.9 V |
| V_{TO} | For conduction power losses only | | | 2.1 V |
| r_{FO} | $T_J = 150^\circ\text{C}$ | | | 40 m Ω |
| I_{RM} | $I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$, $V_R = 1200\text{ V}$ $-di_F/dt = 450\text{ A}/\mu\text{s}$ | | 23 | A |
| | $T_J = 125^\circ\text{C}$ | | 27 | A |
| t_{rr} | $T_J = 125^\circ\text{C}$ | | 230 | ns |
| | | | 400 | ns |
| R_{thJC} | | | | 1.5 K/W |

- Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.
 2. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$
 3. Test current $I_T = 21\text{ A}$.
 4. Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$, higher T_J or increased R_G .
 5. See IXGH32N170 datasheets for additional IGBT characteristics.

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 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 |
| | 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 |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | |



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