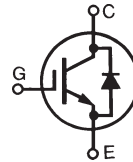


**GenX3™ 1200V
IGBT w/ Diode**
IXGN82N120C3H1

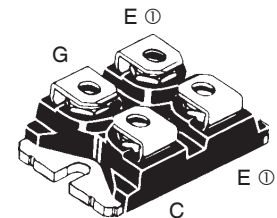
$$V_{CES} = 1200V$$

$$I_{C110} = 58A$$

$$V_{CE(sat)} \leq 3.9V$$

 High-Speed PT IGBT for
20-50 kHz Switching


| 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 , $R_{GE} = 1M\Omega$ | 1200 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ\text{C}$ | 130 | A |
| I_{C110} | $T_C = 110^\circ\text{C}$ | 58 | A |
| I_{F110} | $T_C = 110^\circ\text{C}$ | 42 | A |
| I_{CM} | $T_C = 25^\circ\text{C}$, 1ms | 500 | A |
| SSOA | $V_{GE} = 15V$, $T_{VJ} = 125^\circ\text{C}$, $R_G = 3\Omega$ | $I_{CM} = 164$ | A |
| (RBSOA) | Clamped Inductive Load | $V_{CE} \leq V_{CES}$ | |
| P_C | $T_C = 25^\circ\text{C}$ | 595 | W |
| T_J | | -55 ... +150 | $^\circ\text{C}$ |
| T_{JM} | | 150 | $^\circ\text{C}$ |
| T_{stg} | | -55 ... +150 | $^\circ\text{C}$ |
| V_{ISOL} | 50/60Hz | $t = 1\text{min}$ | 2500 V~ |
| | $I_{ISOL} \leq 1\text{mA}$ | $t = 1\text{s}$ | 3000 V~ |
| M_d | Mounting Torque | 1.5/13 | Nm/lb.in. |
| | Terminal Connection Torque | 1.3/11.5 | Nm/lb.in. |
| Weight | | 30 | g |

 SOT-227B, miniBLOC
 E153432

 G = Gate, C = Collector, E = Emitter
 ① either emitter terminal can be used as
Main or Kelvin Emitter

Features

- Optimized for Low Switching Losses
- Square RBSOA
- High Current Capability
- Isolation Voltage 2500 V~
- Anti-Parallel Ultra Fast Diode
- International Standard Package

Advantages

- High Power Density
- Low Gate Drive Requirement

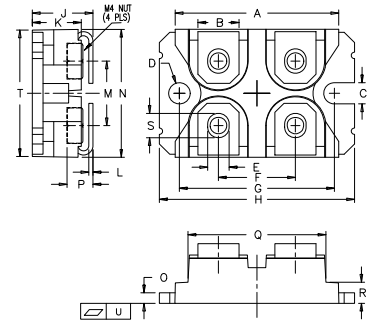
Applications

- Power Inverters
- UPS
- SMPS
- PFC Circuits
- Welding Machines
- Lamp Ballasts

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------|--------------------------|
| | | Min. | Typ. | Max. |
| $V_{GE(th)}$ | $I_C = 1\text{mA}$, $V_{CE} = V_{GE}$ | 3.0 | | 5.0 V |
| I_{CES} | $V_{CE} = V_{CES}$, $V_{GE} = 0V$, Note 1 $T_J = 125^\circ\text{C}$ | | | 50 μA 6 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 200 nA |
| $V_{CE(sat)}$ | $I_C = 82A$, $V_{GE} = 15V$, Note 2 | | 3.3 | 3.9 V |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = 60\text{A}$, $V_{CE} = 10\text{V}$, Note 2 | 38 | 62 | S |
| C_{ies} | $V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$ | | 7900 | pF |
| C_{oes} | | | 685 | pF |
| C_{res} | | | 197 | pF |
| $Q_{g(on)}$ | $I_C = 82\text{A}$, $V_{GE} = 15\text{V}$, $V_{CE} = 0.5 \cdot V_{CES}$ | | 340 | nC |
| Q_{ge} | | | 55 | nC |
| Q_{gc} | | | 145 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ | | 30 | ns |
| t_{ri} | | | 77 | ns |
| E_{on} | $I_C = 82\text{A}$, $V_{GE} = 15\text{V}$ | | 5.0 | mJ |
| $t_{d(off)}$ | $V_{CE} = 0.5 \cdot V_{CES}$, $R_G = 2\Omega$ | | 194 | ns |
| t_{fi} | Note 3 | | 100 | ns |
| E_{off} | | | 2.5 | 5.0 mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ | | 32 | ns |
| t_{ri} | | | 80 | ns |
| E_{on} | $I_C = 82\text{A}$, $V_{GE} = 15\text{V}$ | | 6.8 | mJ |
| $t_{d(off)}$ | $V_{CE} = 0.5 \cdot V_{CES}$, $R_G = 2\Omega$ | | 230 | ns |
| t_{fi} | Note 3 | | 270 | ns |
| E_{off} | | | 4.0 | mJ |
| R_{thJC} | | | | 0.21 $^\circ\text{C/W}$ |
| R_{thCK} | | 0.05 | | $^\circ\text{C/W}$ |

SOT-227B miniBLOC (IXGN)



| SYM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.240 | 1.255 | 31.50 | 31.88 |
| B | .307 | .323 | 7.80 | 8.20 |
| C | .161 | .169 | 4.09 | 4.29 |
| D | .161 | .169 | 4.09 | 4.29 |
| E | .161 | .169 | 4.09 | 4.29 |
| F | .587 | .595 | 14.91 | 15.11 |
| G | 1.186 | 1.193 | 30.12 | 30.30 |
| H | 1.496 | 1.505 | 38.00 | 38.23 |
| J | .460 | .481 | 11.68 | 12.22 |
| K | .351 | .378 | 8.92 | 9.60 |
| L | .030 | .033 | 0.76 | 0.84 |
| M | .496 | .506 | 12.60 | 12.85 |
| N | .990 | 1.001 | 25.15 | 25.42 |
| O | .078 | .084 | 1.98 | 2.13 |
| P | .195 | .235 | 4.95 | 5.97 |
| Q | 1.045 | 1.059 | 26.54 | 26.90 |
| R | .155 | .174 | 3.94 | 4.42 |
| S | .186 | .191 | 4.72 | 4.85 |
| T | .968 | .987 | 24.59 | 25.07 |
| U | -.002 | .004 | -0.05 | 0.1 |

Reverse Diode (FRED)

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|------------|---|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| V_F | $I_F = 60\text{A}$, $V_{GE} = 0\text{V}$, Note 1 | | | 2.5 V |
| | $T_J = 150^\circ\text{C}$ | | 1.4 | 1.8 V |
| I_{RM} | $I_F = 60\text{A}$, $V_{GE} = 0\text{V}$, $-di_F/dt = 200\text{A}/\mu\text{s}$, $V_R = 300\text{V}$ | | 8.3 | A |
| t_{rr} | | | 140 | ns |
| R_{thJC} | | | | 0.42 $^\circ\text{C/W}$ |

Notes:

1. Part must be heatsunk for high-temp I_{ces} measurement.
2. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
3. Switching times & energy losses may increase for higher $V_{CE}(\text{Clamp})$, T_J or R_G .

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.

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 | 7,005,734 B2 | 7,157,338B2 |
| | 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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