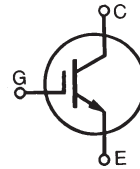


GenX3™ 1200V IGBTs

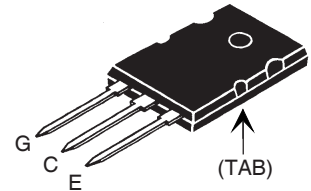
IXGK120N120B3
IXGX120N120B3

$V_{CES} = 1200V$
 $I_{C90} = 120A$
 $V_{CE(sat)} \leq 3.0V$

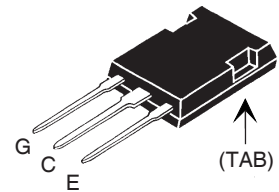
High Speed Low Vsat PT IGBTs
for 3-20 kHz Switching



TO-264 (IXGK)



PLUS 247™ (IXGX)



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

| Symbol | Test Conditions | Maximum Ratings | |
|-------------------------------|---|---------------------------------------|------------|
| V_{CES} | $T_J = 25^\circ C$ to $150^\circ C$ | 1200 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 1200 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ (Chip Capability) | 200 | A |
| I_{C90} | $T_C = 90^\circ C$ | 120 | A |
| I_{LRMS} | Terminal Current Limit | 120 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 370 | A |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 2\Omega$ Clamped Inductive Load | $I_{CM} = 240$ $V_{CES} \leq 1200$ | A V |
| P_C | $T_C = 25^\circ C$ | 830 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062 in.) from Case for 10 | 260 | $^\circ C$ |
| M_d | Mounting Torque (IXGK) | 1.13/10 | Nm/lb.in. |
| F_C | Mounting Force (IXGX) | 20..120/4.5..27 | N/lb. |
| Weight | TO-264 | 10 | g |
| | PLUS247 | 6 | g |

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------|--------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{CE} = 0V$ | 1200 | | V |
| $V_{GE(th)}$ | $I_C = 1mA$, $V_{CE} = V_{GE}$ | 3.0 | | 5.0 V |
| I_{CES} | $V_{CE} = V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 50 μA 5 mA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 400 nA |
| $V_{CE(sat)}$ | $I_C = 100A$, $V_{GE} = 15V$, Note 1 | | 2.4 | 3.0 V |

Features

- Optimized for Low Conduction and Switching Losses
- Square RBSOA
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

| 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 1 | 40 | 70 | S |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{ MHz}$ | | 9700 | pF |
| C_{oes} | | | 670 | pF |
| C_{res} | | | 255 | pF |
| $Q_{g(on)}$ | $I_C = I_{C90}, V_{GE} = 15\text{V}, V_{CE} = 0.5 \cdot V_{CES}$ | | 470 | nC |
| Q_{ge} | | | 67 | nC |
| Q_{gc} | | | 190 | nC |
| $t_{d(on)}$ | Inductive load, $T_J = 25^\circ\text{C}$ $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 600\text{V}, R_G = 2\Omega$ Note 2 | | 36 | ns |
| t_{ri} | | | 88 | ns |
| E_{on} | | | 5.5 | mJ |
| $t_{d(off)}$ | Note 2 | | 275 | ns |
| t_{fi} | | | 145 | ns |
| E_{off} | | | 5.8 | mJ |
| $t_{d(on)}$ | Inductive load, $T_J = 125^\circ\text{C}$ $I_C = 100\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 600\text{V}, R_G = 2\Omega$ Note 2 | | 34 | ns |
| t_{ri} | | | 88 | ns |
| E_{on} | | | 6.1 | mJ |
| $t_{d(off)}$ | Note 2 | | 315 | ns |
| t_{fi} | | | 570 | ns |
| E_{off} | | | 10.3 | mJ |
| R_{thJC} | | | 0.15 | $^\circ\text{C/W}$ |
| R_{thCK} | | | 0.15 | $^\circ\text{C/W}$ |

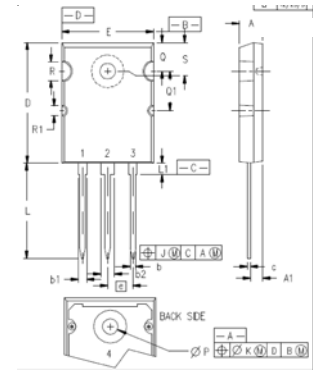
Note

1. Pulse Test, $t \leq 300\mu\text{s}$, Duty Cycle, $d \leq 2\%$.
2. Switching Times may Increase for $V_{CE}(\text{Clamp}) > 0.8 V_{CES}$, Higher T_J or Increased 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.

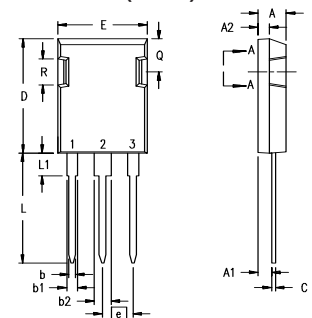
TO-264 (IXGK) Outline



- 1 - GATE
2, 4 - DRAIN (COLLECTOR)
3 - SOURCE (EMITTER)

| SYM | INCHES | | MILLIMETERS | |
|------------------|----------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .185 | .209 | 4.70 | 5.31 |
| A1 | .102 | .118 | 2.59 | 3.00 |
| b | .037 | .055 | 0.94 | 1.40 |
| b1 | .087 | .102 | 2.21 | 2.59 |
| b2 | .110 | .126 | 2.79 | 3.20 |
| c | .017 | .029 | 0.43 | 0.74 |
| D | 1.007 | 1.047 | 25.58 | 26.59 |
| E | .760 | .799 | 19.30 | 20.29 |
| e | .215 BSC | | 5.46 BSC | |
| J | .000 | .010 | 0.00 | 0.25 |
| K | .000 | .010 | 0.00 | 0.25 |
| L | .779 | .842 | 19.79 | 21.39 |
| L1 | .087 | .102 | 2.21 | 2.59 |
| $\varnothing P$ | .122 | .138 | 3.10 | 3.51 |
| Q | .240 | .256 | 6.10 | 6.50 |
| Q1 | .330 | .346 | 8.38 | 8.79 |
| $\varnothing R$ | .155 | .187 | 3.94 | 4.75 |
| $\varnothing R1$ | .085 | .093 | 2.16 | 2.36 |
| S | .243 | .253 | 6.17 | 6.43 |

PLUS 247™ (IXGX) Outline



- Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.83 | 5.21 | .190 | .205 |
| A ₁ | 2.29 | 2.54 | .090 | .100 |
| A ₂ | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| b ₁ | 1.91 | 2.13 | .075 | .084 |
| b ₂ | 2.92 | 3.12 | .115 | .123 |
| C | 0.61 | 0.80 | .024 | .031 |
| D | 20.80 | 21.34 | .819 | .840 |
| E | 15.75 | 16.13 | .620 | .635 |
| e | 5.45 BSC | | .215 BSC | |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | 3.81 | 4.32 | .150 | .170 |
| Q | 5.59 | 6.20 | .220 | 0.244 |
| R | 4.32 | 4.83 | .170 | .190 |

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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