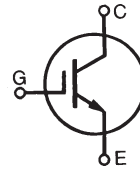


GenX3™ 1200V IGBTs

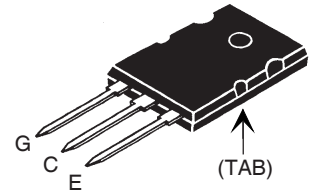
**IXGK120N120B3**  
**IXGX120N120B3**

**V<sub>CES</sub> = 1200V**  
**I<sub>C90</sub> = 120A**  
**V<sub>CE(sat)</sub> ≤ 3.0V**

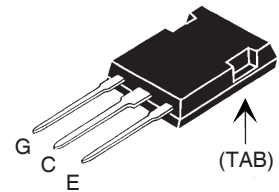
High Speed Low V<sub>sat</sub> PT IGBTs  
for 3-20 kHz Switching



TO-264 (IXGK)



PLUS 247™ (IXGX)



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

| Symbol                        | Test Conditions   | Maximum Ratings                                  |           |
|-------------------------------|---|--|-----------|
| V <sub>CES</sub>              | T <sub>J</sub> = 25°C to 150°C  | 1200   | V         |
| V <sub>CGR</sub>              | T <sub>J</sub> = 25°C to 150°C, R <sub>GE</sub> = 1MΩ   | 1200   | V         |
| V <sub>GES</sub>              | Continuous  | ±20  | V         |
| V <sub>GEM</sub>              | Transient   | ±30  | V         |
| I <sub>C25</sub>              | T <sub>C</sub> = 25°C ( Chip Capability )   | 200  | A         |
| I <sub>C90</sub>              | T <sub>C</sub> = 90°C   | 120  | A         |
| I <sub>LRMS</sub>             | Terminal Current Limit  | 120  | A         |
| I <sub>CM</sub>               | T <sub>C</sub> = 25°C, 1ms  | 370  | A         |
| <b>SSOA</b><br><b>(RBSOA)</b> | V <sub>GE</sub> = 15V, T <sub>VJ</sub> = 125°C, R <sub>G</sub> = 2Ω<br>Clamped Inductive Load | I <sub>CM</sub> = 240<br>V <sub>CES</sub> ≤ 1200 | A<br>V    |
| P <sub>C</sub>                | T <sub>C</sub> = 25°C   | 830  | W         |
| T <sub>J</sub>                |   | -55 ... +150                                     | °C        |
| T <sub>JM</sub>               |   | 150  | °C        |
| T <sub>stg</sub>              |   | -55 ... +150                                     | °C        |
| T <sub>L</sub>                | Maximum Lead Temperature for Soldering  | 300  | °C        |
| T <sub>SOLD</sub>             | 1.6 mm (0.062 in.) from Case for 10   | 260  | °C        |
| M <sub>d</sub>                | Mounting Torque ( IXGK )  | 1.13/10  | Nm/lb.in. |
| F <sub>C</sub>                | Mounting Force ( IXGX )   | 20..120/4.5..27                                  | N/lb.     |
| <b>Weight</b>                 | TO-264  | 10   | g         |
|                               | PLUS247   | 6  | g         |

| Symbol               | Test Conditions<br>(T <sub>J</sub> = 25°C, Unless Otherwise Specified)              | Characteristic Values |      |               |
|----------------------|---|-----------------------|------|---------------|
|                      |   | Min.                  | Typ. | Max.          |
| BV <sub>CES</sub>    | I <sub>C</sub> = 250μA, V <sub>CE</sub> = 0V  | 1200                  |      | V             |
| V <sub>GE(th)</sub>  | I <sub>C</sub> = 1mA, V <sub>CE</sub> = V <sub>GE</sub>                             | 3.0                   |      | 5.0 V         |
| I <sub>CES</sub>     | V <sub>CE</sub> = V <sub>CES</sub> , V <sub>GE</sub> = 0V<br>T <sub>J</sub> = 125°C |                       |      | 50 μA<br>5 mA |
| I <sub>GES</sub>     | V <sub>CE</sub> = 0V, V <sub>GE</sub> = ±20V  |                       |      | ±400 nA       |
| V <sub>CE(sat)</sub> | I <sub>C</sub> = 100A, V <sub>GE</sub> = 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<br>( $T_J = 25^\circ\text{C}$ , 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                 |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b><br>$I_C = 100\text{A}, V_{GE} = 15\text{V}$<br>$V_{CE} = 600\text{V}, R_G = 2\Omega$<br>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                 |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b><br>$I_C = 100\text{A}, V_{GE} = 15\text{V}$<br>$V_{CE} = 600\text{V}, R_G = 2\Omega$<br>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 | $^\circ\text{C/W}$ |

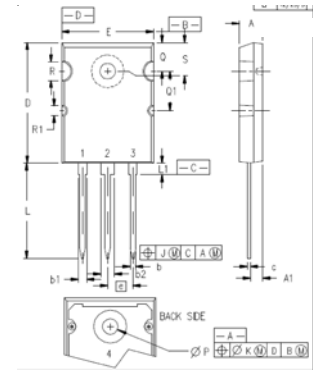
### Note

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.

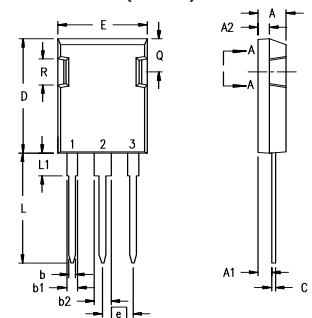
### TO-264 (IXGK) Outline



- 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 <sub>1</sub> | 2.29       | 2.54  | .090     | .100  |
| A <sub>2</sub> | 1.91       | 2.16  | .075     | .085  |
| b              | 1.14       | 1.40  | .045     | .055  |
| b <sub>1</sub> | 1.91       | 2.13  | .075     | .084  |
| b <sub>2</sub> | 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 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  
by one or more of the following U.S. patents: 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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