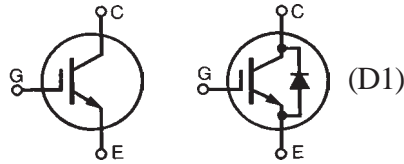


# HiPerFAST™ IGBT

**IXGK 35N120B**  
**IXGX 35N120B**  
**IXGK 35N120BD1**  
**IXGX 35N120BD1**

$$\begin{aligned}
 V_{CES} &= 1200 \text{ V} \\
 I_{C25} &= 70 \text{ A} \\
 V_{CE(sat)} &= 3.3 \text{ V} \\
 t_{fi(typ)} &= 160 \text{ ns}
 \end{aligned}$$

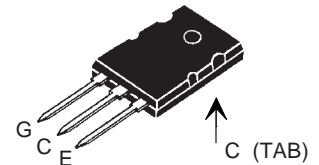


| Symbol  | Test Conditions   | Maximum Ratings                  |                  |
|---|---|----------------------------------|------------------|
| $V_{CES}$   | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$  | 1200                             | V                |
| $V_{CGR}$   | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$                    | 1200                             | V                |
| $V_{GES}$   | Continuous  | $\pm 20$                         | V                |
| $V_{GEM}$   | Transient   | $\pm 30$                         | V                |
| $I_{C25}$   | $T_C = 25^\circ\text{C}$  | 70                               | A                |
| $I_{C90}$   | $T_C = 90^\circ\text{C}$  | 35                               | A                |
| $I_{CM}$  | $T_C = 25^\circ\text{C}, 1 \text{ ms}$  | 140                              | A                |
| <b>SSOA (RBSOA)</b>   | $V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 5 \Omega$<br>Clamped inductive load | $I_{CM} = 90$<br>@ $0.8 V_{CES}$ | A                |
| $P_C$   | $T_C = 25^\circ\text{C}$  | 350                              | W                |
| $T_J$   |   | -55 ... +150                     | $^\circ\text{C}$ |
| $T_{JM}$  |   | 150                              | $^\circ\text{C}$ |
| $T_{stg}$   |   | -55 ... +150                     | $^\circ\text{C}$ |
| Maximum Lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10 s |   | 300                              | $^\circ\text{C}$ |

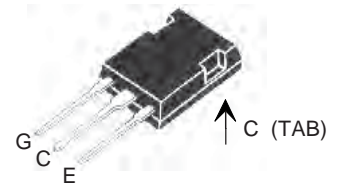
|               |                             |                  |
|---------------|-----------------------------|------------------|
| $M_d$         | Mounting torque (M3) (IXGK) | 1.13/10Nm/lb.in. |
| <b>Weight</b> | TO-264 AA                   | 10 g             |
|               | PLUS247™                    | 6 g              |

| Symbol        | Test Conditions                                   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|---------------|---|---|------|---------------------------|
|               |   | min.  | typ. | max.                      |
| $BV_{CES}$    | $I_C = 1 \text{ mA}, V_{GE} = 0 \text{ V}$        | 1200  |      | V                         |
| $V_{GE(th)}$  | $I_C = 750 \mu\text{A}, V_{CE} = V_{GE}$          | 2.5   |      | V                         |
| $I_{CES}$     | $V_{CE} = V_{CES}$<br>$V_{GE} = 0 \text{ V}$      | $T_J = 25^\circ\text{C}$  |      | 250 $\mu\text{A}$         |
|               |   | $T_J = 125^\circ\text{C}$   |      | 5 mA                      |
| $I_{GES}$     | $V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$ |   |      | $\pm 100 \text{ nA}$      |
| $V_{CE(sat)}$ | $I_C = I_{C90}, V_{GE} = 15 \text{ V}$            |   | 2.7  | 3.3 V                     |
|               |   |   |      | $T_J = 125^\circ\text{C}$ |

## TO-264 AA (IXGK)



## PLUS 247™ (IXGX)



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

## Features

- International standard packages JEDEC TO-264 and PLUS247™
- Low switching losses, low  $V_{(sat)}$
- MOS Gate turn-on - drive simplicity

## Applications

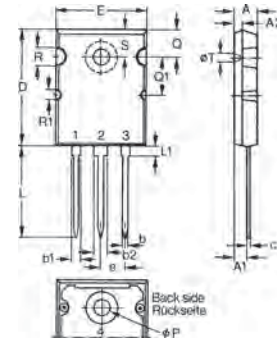
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

## Advantages

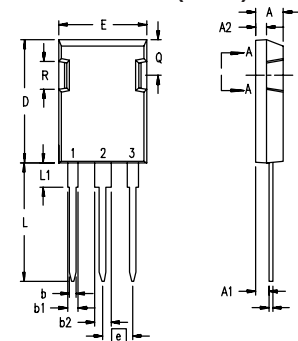
- High power density
- Easy to mount with 1 screw, (isolated mounting screw hole)
- Spring clip or clamp assembly possible.

| Symbol              | Test Conditions  | Characteristic Values                               |      |          |    |
|---------------------|--|---|------|----------|----|
|                     |  | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |          |    |
|                     |  | min.  | typ. | max.     |    |
| g <sub>fs</sub>     | I <sub>C</sub> = I <sub>C90</sub> ; V <sub>CE</sub> = 10 V,<br>Pulse test, t ≤ 300 μs, duty cycle ≤ 2 %  | 30  | 40   | S        |    |
| C <sub>ies</sub>    | V <sub>CE</sub> = 25 V, V <sub>GE</sub> = 0 V, f = 1 MHz   |   | 4620 | pF       |    |
| C <sub>oes</sub>    |  |   | 260  | pF       |    |
| C <sub>res</sub>    |  |   | 90   | pF       |    |
| Q <sub>g</sub>      | I <sub>C</sub> = I <sub>C90</sub> , V <sub>GE</sub> = 15 V, V <sub>CE</sub> = 0.5 V <sub>CES</sub>   |   | 170  | nC       |    |
| Q <sub>ge</sub>     |  |   | 28   | nC       |    |
| Q <sub>gc</sub>     |  |   | 57   | nC       |    |
| t <sub>d(on)</sub>  | <b>Inductive load, T<sub>J</sub> = 25°C</b><br>I <sub>C</sub> = I <sub>C90</sub> , V <sub>GE</sub> = 15 V<br>V <sub>CE</sub> = 0.8 V <sub>CES</sub> , R <sub>G</sub> = R <sub>off</sub> = 5 Ω<br>Remarks: Switching times may increase for V <sub>CE</sub> (Clamp) > 0.8 • V <sub>CES</sub> , higher T <sub>J</sub> or increased R <sub>G</sub>  |   | 50   | ns       |    |
| t <sub>ri</sub>     |  |   | 27   | ns       |    |
| t <sub>d(off)</sub> |  |   | 180  | 280      | ns |
| t <sub>fi</sub>     |  |   | 160  | 320      | ns |
| E <sub>off</sub>    |  |   | 3.8  | 7.3      | mJ |
| t <sub>d(on)</sub>  | <b>Inductive load, T<sub>J</sub> = 125°C</b><br>I <sub>C</sub> = I <sub>C90</sub> , V <sub>GE</sub> = 15 V<br>V <sub>CE</sub> = 0.8 V <sub>CES</sub> , R <sub>G</sub> = R <sub>off</sub> = 5 Ω<br>Remarks: Switching times may increase for V <sub>CE</sub> (Clamp) > 0.8 • V <sub>CES</sub> , higher T <sub>J</sub> or increased R <sub>G</sub> |   | 55   | ns       |    |
| t <sub>ri</sub>     |  |   | 31   | ns       |    |
| E <sub>on</sub>     |  |   | 2.6  | mJ       |    |
| t <sub>d(off)</sub> |  |   | 300  | ns       |    |
| t <sub>fi</sub>     |  |   | 360  | ns       |    |
| E <sub>off</sub>    |  | 8.0   | mJ   |          |    |
| R <sub>thJC</sub>   |  |   |      | 0.35 K/W |    |
| R <sub>thCK</sub>   |  | 0.15  |      | K/W      |    |

| Symbol            | Test Conditions   | Characteristic Values                               |      |          |
|-------------------|---|---|------|----------|
|                   |   | (T <sub>J</sub> = 25°C, unless otherwise specified) |      |          |
|                   |   | min.  | typ. | max.     |
| V <sub>F</sub>    | I <sub>F</sub> = I <sub>C90</sub> , V <sub>GE</sub> = 0 V, Pulse test,<br>t ≤ 300 μs, duty cycle d ≤ 2 %, T <sub>J</sub> = 125°C  |   |      | 2.35 V   |
| I <sub>RM</sub>   | I <sub>F</sub> = I <sub>C90</sub> , V <sub>GE</sub> = 0 V, -di <sub>F</sub> /dt = 480 A/μs<br>V <sub>R</sub> = 540 V T <sub>J</sub> = 100°C<br>I <sub>F</sub> = 1 A; -di <sub>F</sub> /dt = 200 A/μs; V <sub>R</sub> = 30 V T <sub>J</sub> = 25°C |   | 32   | 36 A     |
| t <sub>rr</sub>   |   |   | 225  | ns       |
|                   |   |   | 40   | 60       |
| R <sub>thJC</sub> |   |   |      | 0.65 K/W |

**TO-264 AA Outline (IXGK)**


| Dim. | Millimeter |       | Inches   |       |
|------|------------|-------|----------|-------|
|      | Min.       | Max.  | Min.     | Max.  |
| A    | 4.82       | 5.13  | .190     | .202  |
| A1   | 2.54       | 2.89  | .100     | .114  |
| A2   | 2.00       | 2.10  | .079     | .083  |
| b    | 1.12       | 1.42  | .044     | .056  |
| b1   | 2.39       | 2.69  | .094     | .106  |
| b2   | 2.90       | 3.09  | .114     | .122  |
| c    | 0.53       | 0.83  | .021     | .033  |
| D    | 25.91      | 26.16 | 1.020    | 1.030 |
| E    | 19.81      | 19.96 | .780     | .786  |
| e    | 5.46 BSC   |       | .215 BSC |       |
| J    | 0.00       | 0.25  | .000     | .010  |
| K    | 0.00       | 0.25  | .000     | .010  |
| L    | 20.32      | 20.83 | .800     | .820  |
| L1   | 2.29       | 2.59  | .090     | .102  |
| P    | 3.17       | 3.66  | .125     | .144  |
| Q    | 6.07       | 6.27  | .239     | .247  |
| Q1   | 8.38       | 8.69  | .330     | .342  |
| R    | 3.81       | 4.32  | .150     | .170  |
| R1   | 1.78       | 2.29  | .070     | .090  |
| S    | 6.04       | 6.30  | .238     | .248  |
| T    | 1.57       | 1.83  | .062     | .072  |

**PLUS247™ Outline (IXGX)**


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

| 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 by one or more of the following U.S. patents:

4,835,592    4,881,106    5,017,508  
4,850,072    4,931,844    5,034,796

5,049,961    5,187,117    5,486,715    6,306,728B1  
5,063,307    5,237,481    5,381,025



---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).