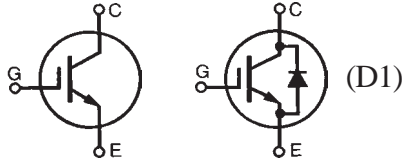


# HiPerFAST™ IGBT IXGK 35N120B IXGX 35N120B IXGK 35N120BD1 IXGX 35N120BD1

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

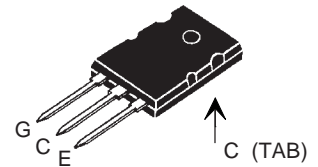


| Symbol  | Test Conditions   | Maximum Ratings                  |                  |
|---|---|----------------------------------|------------------|
| $V_{CES}$   | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$  | 1200                             | V                |
| $V_{CGR}$   | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$                    | 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                              | $^\circ\text{C}$ |

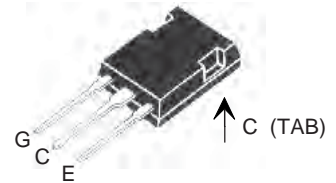
|               |                             |                  |
|---------------|-----------------------------|------------------|
| $M_d$         | Mounting torque (M3) (IXGK) | 1.13/10Nm/lb.in. |
| <b>Weight</b> | TO-264 AA                   | 10 g             |
|               | PLUS247™      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

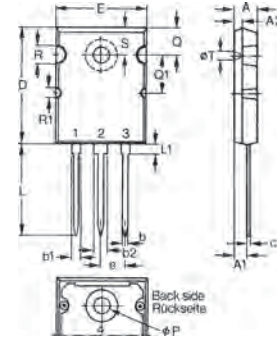
| Symbol       | Test Conditions   | Characteristic Values  |      |          |    |
|--------------|---|--|------|----------|----|
|              |   | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |          |    |
|              |   | min.   | typ. | max.     |    |
| $g_{fs}$     | $I_C = I_{C90}; V_{CE} = 10\text{ V},$<br>Pulse test, $t \leq 300\ \mu\text{s}, \text{ duty cycle } \leq 2\%$   | 30   | 40   | S        |    |
| $C_{ies}$    | $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$   |  | 4620 | pF       |    |
| $C_{oes}$    |   |  | 260  | pF       |    |
| $C_{res}$    |   |  | 90   | pF       |    |
| $Q_g$        | $I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$   |  | 170  | nC       |    |
| $Q_{ge}$     |   |  | 28   | nC       |    |
| $Q_{gc}$     |   |  | 57   | nC       |    |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b><br>$I_C = I_{C90}, V_{GE} = 15\text{ V}$<br>$V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5\ \Omega$<br>Remarks: Switching times may increase for $V_{CE} \text{ (Clamp)} > 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$  |  | 50   | ns       |    |
| $t_{ri}$     |   |  | 27   | ns       |    |
| $t_{d(off)}$ |   |  | 180  | 280      | ns |
| $t_{fi}$     |   |  | 160  | 320      | ns |
| $E_{off}$    |   |  | 3.8  | 7.3      | mJ |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b><br>$I_C = I_{C90}, V_{GE} = 15\text{ V}$<br>$V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 5\ \Omega$<br>Remarks: Switching times may increase for $V_{CE} \text{ (Clamp)} > 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$ |  | 55   | ns       |    |
| $t_{ri}$     |   |  | 31   | ns       |    |
| $E_{on}$     |   |  | 2.6  | mJ       |    |
| $t_{d(off)}$ |   |  | 300  | ns       |    |
| $t_{fi}$     |   |  | 360  | ns       |    |
| $E_{off}$    |   | 8.0  | mJ   |          |    |
| $R_{thJC}$   |   |  |      | 0.35 K/W |    |
| $R_{thCK}$   |   | 0.15   |      | K/W      |    |

| Symbol     | Test Conditions   | Characteristic Values  |      |          |
|------------|---|--|------|----------|
|            |   | $(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$ |      |          |
|            |   | min.   | typ. | max.     |
| $V_F$      | $I_F = I_{C90}, V_{GE} = 0\text{ V}, \text{ Pulse test,}$<br>$t \leq 300\ \mu\text{s}, \text{ duty cycle } d \leq 2\%, T_J = 125^\circ\text{C}$                               |  |      | 2.35 V   |
| $I_{RM}$   | $I_F = I_{C90}, V_{GE} = 0\text{ V}, -di_F/dt = 480\text{ A}/\mu\text{s}$<br>$V_R = 540\text{ V}$<br>$I_F = 1\text{ A}; -di/dt = 200\text{ A}/\mu\text{s}; V_R = 30\text{ V}$ |  | 32   | 36 A     |
| $t_{rr}$   |   |  | 225  | ns       |
|            |   |  | 40   | 60       |
| $R_{thJC}$ |   |  |      | 0.65 K/W |

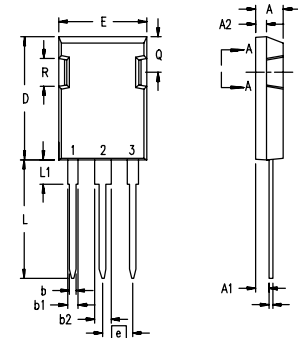
IXYS reserves the right to change limits, test conditions, and dimensions.

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

**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  |
| A1   | 2.29       | 2.54  | .090     | .100  |
| A2   | 1.91       | 2.16  | .075     | .085  |
| b    | 1.14       | 1.40  | .045     | .055  |
| b1   | 1.91       | 2.13  | .075     | .084  |
| b2   | 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  |

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



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