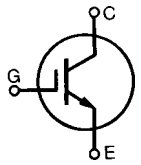
# IXYS

# HiPerFAST™ IGBT
# ISOPLUS247™

| | $V_{CES}$ | $I_{C25}$ | $V_{CE(sat)}$ | $t_{fi(typ)}$ |
|---|---|---|---|---|
| IXGR 35N120B | 1200 V | 70 A | 3.3 V | 160 ns |
| IXGR 35N120C | 1200 V | 70 A | 4.0 V | 115 ns |

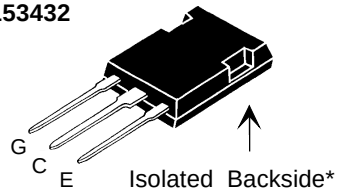
## (Electrically Isolated Backside)




| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{CES}$ | $T_J$ = 25°C to 150°C | 1200 | V |
| $V_{CGR}$ | $T_J$ = 25°C to 150°C; $R_{GE}$ = 1 MΩ | 1200 | V |
| $V_{GES}$ | Continuous | ±20 | V |
| $V_{GEM}$ | Transient | ±30 | V |
| $I_{C25}$ | $T_C$ = 25°C | 70 | A |
| $I_{C90}$ | $T_C$ = 90°C | 35 | A |
| $I_{CM}$ | $T_C$ = 25°C, 1 ms | 140 | A |
| **SSOA (RBSOA)** | $V_{GE}$ = 15 V, $T_{VJ}$ = 125°C, $R_G$ = 10 Ω<br>Clamped inductive load | $I_{CM}$ = 90<br>@ 0.8 $V_{CES}$ | A |
| $P_C$ | $T_C$ = 25°C | 200 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s | | 300 | °C |
| **Weight** | | 5 | g |

**ISOPLUS 247**

E153432




G = Gate, C = Collector
E = Emitter

* Patent pending

### Features

- DCB Isolated mounting tab
- Meets TO-247AD package Outline
- High current handling capability
- MOS Gate turn-on
  - drive simplicity

### Applications

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

### Advantages

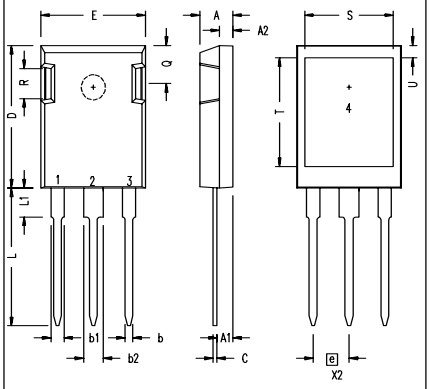
- Easy assembly
- High power density

| Symbol | Test Conditions | | Characteristic Values ($T_J$ = 25°C, unless otherwise specified) Min. | Typ. | Max. | |
|---|---|---|---|---|---|---|
| $BV_{CES}$ | $I_C$ = 1 mA, $V_{GE}$ = 0 V | | 1200 | | | V |
| $V_{GE(th)}$ | $I_C$ = 750 µA, $V_{CE}$ = $V_{GE}$ | | 2.5 | | 5.0 | V |
| $I_{CES}$ | $V_{CE}$ = $V_{CES}$ | | | | 250 | µA |
| | $V_{GE}$ = 0 V; note 1 | $T_J$ = 125°C | | | 5 | mA |
| $I_{GES}$ | $V_{CE}$ = 0 V, $V_{GE}$ = ±20 V | | | | ±100 | nA |
| $V_{CE(sat)}$ | $I_C$ = $I_{C90}$, $V_{GE}$ = 15 V | 35N120B | | | 3.3 | V |
| | | $T_J$ = 125°C | | 2.7 | | V |
| | | 35N120C | | | 4.0 | V |
| | | $T_J$ = 125°C | | 3.4 | | V |

| Symbol | Test Conditions ($T_J$ = 25°C, unless otherwise specified) | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| $g_{fs}$ | $I_C = I_{C90}$, $V_{CE}$ = 10 V, Note1 | | 30 | 40 | | S |
| $C_{ies}$ | $V_{CE}$ = 25 V, $V_{GE}$ = 0 V, f = 1 MHz | | | 4620 | | pF |
| $C_{oes}$ | | | | 260 | | pF |
| $C_{res}$ | | | | 90 | | pF |
| $Q_g$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V, $V_{CE}$ = 0.5 $V_{CES}$ | | | 170 | | nC |
| $Q_{ge}$ | | | | 28 | | nC |
| $Q_{gc}$ | | | | 57 | | nC |
| $t_{d(on)}$ | **Inductive load, $T_J$ = 25°C** | | | 50 | | ns |
| $t_{ri}$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V | | | 27 | | ns |
| $t_{d(off)}$ | $V_{CE}$ = 0.8 $V_{CES}$, $R_G = R_{off}$ = 4.7 Ω | 35N120B | | 180 | 280 | ns |
| | Remarks: Switching times may | 35N120C | | 150 | 220 | ns |
| $t_{fi}$ | increase for $V_{CE}$ (Clamp) > 0.8 $V_{CES}$, higher $T_J$ or increased $R_G$ | 35N120B | | 160 | 320 | ns |
| | | 35N120C | | 115 | 190 | ns |
| $E_{off}$ | | 35N120B | | 3.8 | 7.3 | mJ |
| | | 35N120C | | 3.0 | 4.2 | mJ |
| $t_{d(on)}$ | **Inductive load, $T_J$ = 125°C** | | | 55 | | ns |
| $t_{ri}$ | $I_C = I_{C90}$, $V_{GE}$ = 15 V | | | 31 | | ns |
| $E_{on}$ | $V_{CE}$ = 0.8 $V_{CES}$, $R_G = R_{off}$ = 4.7 Ω | | | 2.6 | | mJ |
| $t_{d(off)}$ | Remarks: Switching times may | 35N120B | | 300 | | ns |
| | increase for $V_{CE}$ (Clamp) > 0.8 $V_{CES}$, higher $T_J$ or increased $R_G$ | 35N120C | | 220 | | ns |
| $t_{fi}$ | | 35N120B | | 360 | | ns |
| | | 35N120C | | 260 | | ns |
| $E_{off}$ | | 35N120B | | 8.0 | | mJ |
| | | 35N120C | | 6.2 | | mJ |
| $R_{thJC}$ | | | | | 0.5 | K/W |
| $R_{thCK}$ | | | | 0.15 | | K/W |

Note: 1. Pulse test, $t_p \leq 300$ ms, duty cycle:d ≤ 2 %

**ISOPLUS 247 OUTLINE**




1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

| Dim. | Millimeter Min. | Max. | Inches 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 | .244 |
| R | 4.32 | 4.83 | .170 | .190 |