

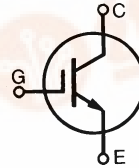


Preliminary data

# HiPerFAST™ IGBT

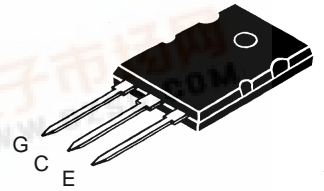
# IXGK80N60A

$V_{CES} = 600\text{ V}$   
 $I_{C25} = 80\text{ A}$   
 $V_{CE(sat)} = 2.7\text{ V}$   
 $t_{fi} = 275\text{ ns}$



| Symbol   | Test Conditions   | Maximum Ratings                   |                  |
|--|---|-----------------------------------|------------------|
| $V_{CES}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$   | 600                               | V                |
| $V_{CGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GE} = 1\text{ M}\Omega$   | 600                               | V                |
| $V_{GES}$  | Continuous  | $\pm 20$                          | V                |
| $V_{GEM}$  | Transient   | $\pm 30$                          | V                |
| $I_{C25}$  | $T_C = 25^\circ\text{C}$ , limited by leads   | 80                                | A                |
| $I_{C90}$  | $T_C = 90^\circ\text{C}$  | 80                                | A                |
| $I_{CM}$   | $T_C = 25^\circ\text{C}$ , 1 ms   | 200                               | A                |
| <b>SSOA (RBSOA)</b>  | $V_{GE} = 15\text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 10\ \Omega$<br>Clamped inductive load, $L = 30\ \mu\text{H}$ | $I_{CM} = 100$<br>@ $0.8 V_{CES}$ | A                |
| $P_c$  | $T_C = 25^\circ\text{C}$  | 500                               | W                |
| $T_J$  |   | -55 ... +150                      | $^\circ\text{C}$ |
| $T_{JM}$   |   | 150                               | $^\circ\text{C}$ |
| $T_{stg}$  |   | -55 ... +150                      | $^\circ\text{C}$ |
| $M_d$  | Mounting torque (M4)  | 0.9/6                             | Nm/lb.in.        |
| <b>Weight</b>  |   | 10                                | g                |
| Maximum lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10s |   | 300                               | $^\circ\text{C}$ |

TO-264 AA



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

### Features

- International standard package JEDEC TO-264 AA
- Two mached dice connected in parallel
- Low  $V_{CE(sat)}$ 
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity

### Applications

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

### Advantages

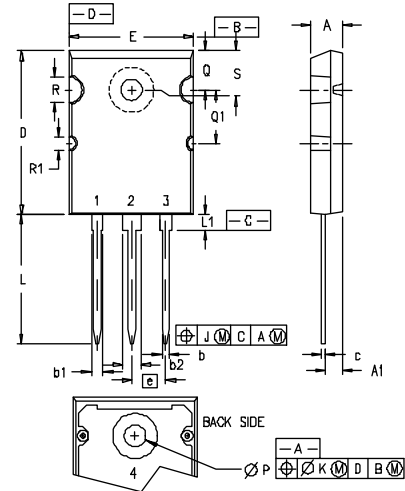
- Easy to mount with 1 screw (isolated mounting screw hole)
- Reduces assembly time and cost
- High power density

| Symbol        | Test Conditions                                       | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|---------------|---|---|------|---------------------------|
|               |   | min.  | typ. | max.                      |
| $BV_{CES}$    | $I_C = 500\ \mu\text{A}$ , $V_{GE} = 0\text{ V}$      | 600   |      | V                         |
| $V_{GE(th)}$  | $I_C = 500\ \mu\text{A}$ , $V_{CE} = V_{GE}$          | 2.5   |      | V                         |
| $I_{CES}$     | $V_{CE} = 0.8 \cdot V_{CES}$<br>$V_{GE} = 0\text{ V}$ |   |      | 400 $\mu\text{A}$<br>2 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                     |



| Symbol       | Test Conditions   | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |          |
|--------------|---|---|------|----------|
|              |   | min.  | typ. | max.     |
| $g_{fs}$     | $I_C = 40\text{A}; V_{CE} = 10\text{V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$          | 30  | 50   | S        |
| $Q_g$        | $I_C = I_{C90}, V_{GE} = 15\text{V}, V_{CE} = 0.5 V_{CES}$  |   | 400  | nC       |
| $Q_{ge}$     |   |   | 70   | nC       |
| $Q_{gc}$     |   |   | 160  | nC       |
| $C_{ies}$    | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$  |   | 8000 | pF       |
| $C_{oes}$    |   |   | 860  | pF       |
| $C_{res}$    |   |   | 200  | pF       |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b>  |   | 50   | ns       |
| $t_{ri}$     | $I_C = I_{C90}, V_{GE} = 15\text{V}, L = 100\ \mu\text{H}$ ,<br>$V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.7\ \Omega$ |   | 210  | ns       |
| $t_{d(off)}$ |   |   | 300  | ns       |
| $t_{fi}$     | Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$  |   | 350  | 500 ns   |
| $E_{off}$    |   |   | 10   | 12.5 mJ  |
| $t_{d(on)}$  | <b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b>   |   | 50   | ns       |
| $t_{ri}$     | $I_C = I_{C90}, V_{GE} = 15\text{V}, L = 100\ \mu\text{H}$  |   | 240  | ns       |
| $E_{on}$     |   |   | 3    | mJ       |
| $t_{d(off)}$ | $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.7\ \Omega$   |   | 400  | ns       |
| $t_{fi}$     | Remarks: Switching times may increase for $V_{CE}$ (Clamp) $> 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$  |   | 600  | ns       |
| $E_{off}$    |   |   | 15   | mJ       |
| $R_{thJC}$   |   |   |      | 0.25 K/W |
| $R_{thCK}$   |   |   | 0.15 | K/W      |

### TO-264 AA Outline



| 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  |

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