

# Fast IGBT Chopper

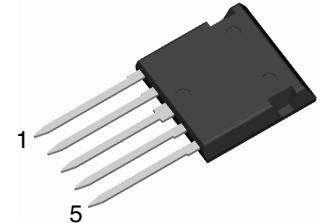
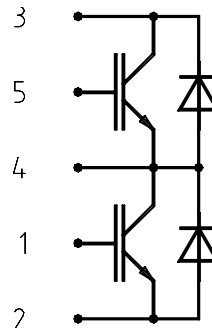
in ISOPLUS i4-PAC™

## FII 30-12D

$$I_{C25} = 30 \text{ A}$$

$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 2.3 \text{ V}$$



### IGBT

| Symbol                | Conditions   | Maximum Ratings |               |
|-----------------------|--|-----------------|---------------|
| $V_{CES}$             | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$  | 1200            | V             |
| $V_{GES}$             |  | $\pm 20$        | V             |
| $I_{C25}$             | $T_C = 25^{\circ}\text{C}$   | 30              | A             |
| $I_{C90}$             | $T_C = 90^{\circ}\text{C}$   | 18              | A             |
| $I_{CM}$<br>$V_{CEK}$ | $V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$<br>RBSOA, Clamped inductive load; $L = 100 \mu\text{H}$ | 35              | A             |
|                       |  | $V_{CES}$       |               |
| $t_{SC}$<br>(SCSOA)   | $V_{CE} = V_{CES}; V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega; T_{VJ} = 125^{\circ}\text{C}$<br>non-repetitive                     | 10              | $\mu\text{s}$ |
| $P_{tot}$             | $T_C = 25^{\circ}\text{C}$   | 125             | W             |

### Features

- NPT IGBT
  - low saturation voltage
  - no latch up
  - positive temperature coefficient for easy paralleling
- HiPerFRED™ diode
  - fast reverse recovery
  - low operating forward voltage
  - low leakage current
- ISOPLUS i4-PAC™ package
  - isolated back surface
  - enlarged creepage towards heatsink
  - application friendly pinout
  - low inductive current path
  - high reliability
  - industry standard outline

| Symbol | Conditions | Characteristic Values<br>( $T_{VJ} = 25^{\circ}\text{C}$ , unless otherwise specified) |      |      |
|--------|------------|--|------|------|
|        |            | min.   | typ. | max. |

|   |  |            |  |              |
|---|--|------------|--|--------------|
| $V_{CE(sat)}$                                 | $I_C = 20 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 125^{\circ}\text{C}$                                     | 2.3<br>2.6 |  | V<br>V       |
| $V_{GE(th)}$                                  | $I_C = 0.6 \text{ mA}; V_{GE} = V_{CE}$  | 4.5        |  | 6.5 V        |
| $I_{CES}$                                     | $V_{CE} = V_{CES}; V_{GE} = 0 \text{ V}; T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 125^{\circ}\text{C}$  | 0.9        |  | 0.9 mA<br>mA |
| $I_{GES}$                                     | $V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}$  |            |  | 200 nA       |
| $t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | Inductive load, $T_{VJ} = 125^{\circ}\text{C}$<br>$V_{CE} = 600 \text{ V}; I_C = 20 \text{ A}$<br>$V_{GE} = \pm 15 \text{ V}; R_G = 82 \Omega$ | 100        |  | ns           |
|   |  | 75         |  | ns           |
|   |  | 500        |  | ns           |
|   |  | 70         |  | ns           |
| $E_{on}$<br>$E_{off}$                         |  | 3.0<br>2.4 |  | mJ<br>mJ     |
| $C_{ies}$                                     | $V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}; f = 1 \text{ MHz}$   | 1000       |  | pF           |
| $Q_{Gon}$                                     | $V_{CE} = 600 \text{ V}; V_{GE} = 15 \text{ V}; I_C = 18 \text{ A}$  | 70         |  | nC           |
| $R_{thJC}$                                    |  |            |  | 1.0 K/W      |

### Applications

- single phaseleg
  - buck-boost chopper
- H bridge
  - power supplies
  - induction heating
  - four quadrant DC drives
  - controlled rectifier
- three phase bridge
  - AC drives
  - controlled rectifier

**Diodes**

| Symbol    | Conditions  | Maximum Ratings |   |
|-----------|---|-----------------|---|
| $V_{RRM}$ | $T_{VJ} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$ | 1200            | V |
| $I_{F25}$ | $T_C = 25^{\circ}\text{C}$                            | 25              | A |
| $I_{F90}$ | $T_C = 90^{\circ}\text{C}$                            | 15              | A |

| Symbol     | Conditions  | Characteristic Values |      |         |
|------------|---|-----------------------|------|---------|
|            |   | min.                  | typ. | max.    |
| $V_F$      | $I_F = 20\text{ A}; T_{VJ} = 25^{\circ}\text{C}$<br>$T_{VJ} = 125^{\circ}\text{C}$  | 2.5                   | 2.9  | V       |
| $I_{RM}$   | $I_F = 15\text{ A}; di_F/dt = -400\text{ A}/\mu\text{s}; T_{VJ} = 125^{\circ}\text{C}$<br>$V_R = 600\text{ V}; V_{GE} = 0\text{ V}$ | 16                    |      | A       |
| $t_{rr}$   |   | 130                   |      | ns      |
| $R_{thJC}$ | (per diode)   |                       |      | 2.3 K/W |

**Component**

| Symbol     | Conditions                                   | Maximum Ratings |                    |
|------------|--|-----------------|--------------------|
| $T_{VJ}$   |  | -55...+150      | $^{\circ}\text{C}$ |
| $T_{stg}$  |  | -55...+125      | $^{\circ}\text{C}$ |
| $V_{ISOL}$ | $I_{ISOL} \leq 1\text{ mA}; 50/60\text{ Hz}$ | 2500            | V~                 |
| $F_c$      | mounting force with clip                     | 20...120        | N                  |

| Symbol        | Conditions             | Characteristic Values |      |      |
|---------------|------------------------|-----------------------|------|------|
|               |                        | min.                  | typ. | max. |
| $d_S, d_A$    | pin - pin              | 1.7                   |      | mm   |
| $d_S, d_A$    | pin - backside metal   | 5.5                   |      | mm   |
| $R_{thCH}$    | with heatsink compound |                       | 0.15 | K/W  |
| <b>Weight</b> |                        |                       | 9    | g    |

**Dimensions in mm (1 mm = 0.0394")**
