

IGBT Module

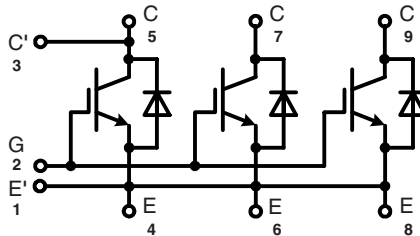
Single switch

Short Circuit SOA Capability
Square RBSOA

$$I_{C80} = 1200 \text{ A}$$

$$V_{CES} = 3300 \text{ V}$$

$$V_{CE(sat) \text{ typ.}} = 3.1 \text{ V}$$



IGBT

| Symbol | Conditions | Maximum Ratings | |
|-----------|---|-----------------|---------------|
| V_{CES} | $V_{GE} = 0 \text{ V}$ | 3300 | V |
| V_{GES} | | ± 20 | V |
| I_{C80} | $T_C = 80^\circ\text{C}$ | 1200 | A |
| I_{CM} | $t_p = 1 \text{ ms}; T_C = 80^\circ\text{C}$ | 2400 | A |
| t_{SC} | $V_{CC} = 2500 \text{ V}; V_{CEM \text{ CHIP}} \leq 3300 \text{ V};$ $V_{GE} \leq 15 \text{ V}; T_{VJ} \leq 125^\circ\text{C}$ | 10 | μs |

Features

- NPT³ IGBT
 - Low-loss
 - Smooth switching waveforms for good EMC
- Industry standard package
 - High power density
 - AISiC base-plate for high power cycling capacity
 - AlN substrate for low thermal resistance

Typical Applications

- AC power converters for
 - industrial drives
 - windmills
 - traction
- LASER pulse generator

| Symbol | Conditions | Characteristic Values ($T_{VJ} = 25^\circ\text{C}$, unless otherwise specified) | | |
|-------------------------|---|--|------------|------------|
| | | min. | typ. | max. |
| $V_{CE(sat)} \text{ ①}$ | $I_C = 1200 \text{ A}; V_{GE} = 15 \text{ V}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$ | | 3.1 3.8 | V V |
| $V_{GE(th)}$ | $I_C = 240 \text{ mA}; V_{CE} = V_{GE}$ | 6 | | 8 V |
| I_{CES} | $V_{CE} = 3300 \text{ V}; V_{GE} = 0 \text{ V}; T_{VJ} = 125^\circ\text{C}$ | | | 120 mA |
| I_{GES} | $V_{CE} = 0 \text{ V}; V_{GE} = \pm 20 \text{ V}; T_{VJ} = 125^\circ\text{C}$ | | | 500 nA |
| E_{on} | } Inductive load; $T_{VJ} = 125^\circ\text{C}; V_{GE} = \pm 15 \text{ V};$ $V_{CC} = 1800 \text{ V}; I_C = 1200 \text{ A}; R_G = 1 \Omega; L_e = 100 \text{ nH}$ | | 1750 | mJ |
| E_{off} | | | 2000 | mJ |
| R_{thJC} | | | | 0.0085 K/W |

① Collector emitter saturation voltage is given at chip level

Diode

| Symbol | Conditions | Maximum Ratings | |
|-----------|---|-----------------|---|
| I_{F80} | $T_C = 80^\circ\text{C}$ | 1200 | A |
| I_{FSM} | $V_R = 0\text{ V}; T_{VJ} = 125^\circ\text{C}; t_p = 10\text{ ms};$ half-sinewave | 12000 | A |

| Symbol | Conditions | Characteristic Values | | |
|---|---|-----------------------|------|---------------|
| | | min. | typ. | max. |
| V_F ② | $I_F = 1200\text{ A}; T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$ | 2.30 | | V |
| | | 2.35 | | V |
| I_{RM} t_{rr} Q_{RR} E_{rec} | $V_{CC} = 1800\text{ V}; I_C = 1200\text{ A};$ $V_{GE} = \pm 15\text{ V}; R_G = 1\ \Omega; T_{VJ} = 125^\circ\text{C}$ Inductive load; $L_\sigma = 100\text{ nH}$ | 1680 | | A |
| | | 800 | | ns |
| | | 1320 | | μC |
| | | 1740 | | mJ |
| R_{thJC} | | | | 0.017 K/W |

② Forward voltage is given at chip level

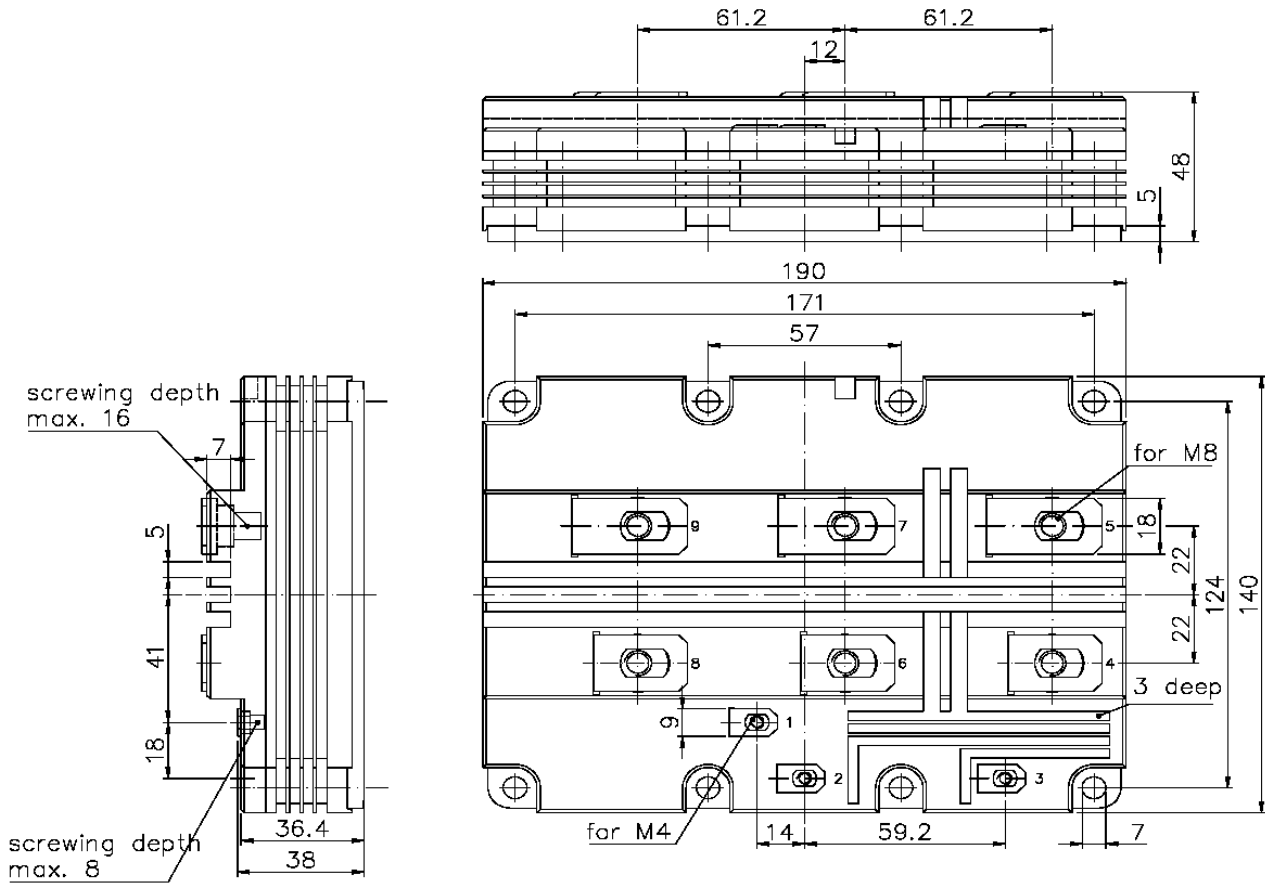
Module

| Symbol | Conditions | Maximum Ratings | |
|-----------|--------------------------|---------------------------|------------------|
| T_{JM} | max junction temperature | +125 | $^\circ\text{C}$ |
| T_{VJ} | Operating temperature | -40...+125 | $^\circ\text{C}$ |
| T_{stg} | Storage temperature | -40...+125 | $^\circ\text{C}$ |
| M_d | Mounting torque | Base-heatsink, M6 screws | 4 - 6 Nm |
| | | Main terminals, M8 screws | 8 - 10 Nm |

| Symbol | Conditions | Characteristic Values | | |
|-------------------|--|-----------------------|-------|------------|
| | | min. | typ. | max. |
| d_A | Clearance distance | terminal to base | 26 | mm |
| | | terminal to terminal | 26 | mm |
| d_s | Surface creepage distance | terminal to base | 56 | mm |
| | | terminal to terminal | 56 | mm |
| V_{ISOL} | 1 min, $f = 50\text{ Hz}$ | 10500 | | V~ |
| V_E | Partial discharge extinction voltage $f = 50\text{ Hz}, Q_{PD} \leq 10\text{ pC}$ | 5100 | | V |
| CTI | Comperative tracking index | 600 | | |
| L_σ | Module stray inductance, C to E terminal | | 18 | nH |
| $R_{term-chip}^*$ | Resistance terminal to chip | | 0.12 | m Ω |
| R_{thCH} | per module; λ grease = 1 W/m \cdot K | | 0.006 | K/W |
| Weight | | | 1500 | g |

 *) $V = V_{CE(sat)} + R_{term-chip} \cdot I_C$ resp. $V = V_F + R_{term-chip} \cdot I_F$

Outline drawing



Note: all dimensions are shown in mm