

SKM100GB12V



SEMITRANS® 2

SKM100GB12V

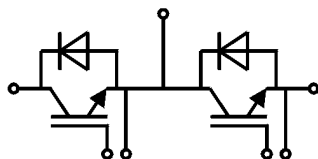
Target Data

Features

- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Fast & soft inverse CAL diodes
- Large clearance (10 mm) and creepage distances (20 mm)
- Isolated copper baseplate using DBC Technology (Direct Copper Bonding)
- UL recognized, file no. E63532

Typical Applications*

- AC inverter drives
- UPS
- Electronic welders at fsw up to 20 kHz



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Absolute Maximum Ratings

| Symbol | Conditions | Values | Unit | |
|----------------------|--|-----------------------|--------------------|---------------|
| IGBT | | | | |
| V_{CES} | | 1200 | V | |
| I_C | $T_j = 175\text{ °C}$ | $T_c = 25\text{ °C}$ | 155 | A |
| | | $T_c = 80\text{ °C}$ | 117 | A |
| I_{Cnom} | | 100 | A | |
| I_{CRM} | $I_{CRM} = 3 \times I_{Cnom}$ | 300 | A | |
| V_{GES} | | -20 ... 20 | V | |
| t_{psc} | $V_{CC} = 720\text{ V}$ $V_{GE} \leq 20\text{ V}$ $V_{CES} \leq 1200\text{ V}$ | $T_j = 125\text{ °C}$ | 10 | μs |
| | | | | |
| T_j | | -40 ... 175 | $^{\circ}\text{C}$ | |
| Inverse diode | | | | |
| I_F | $T_j = 175\text{ °C}$ | $T_c = 25\text{ °C}$ | 121 | A |
| | | $T_c = 80\text{ °C}$ | 91 | A |
| I_{Fnom} | | 100 | A | |
| I_{FRM} | $I_{FRM} = 3 \times I_{Fnom}$ | 300 | A | |
| I_{FSM} | $t_p = 10\text{ ms}$, $\sin 180^{\circ}$, $T_j = 25\text{ °C}$ | 550 | A | |
| T_j | | -40 ... 175 | $^{\circ}\text{C}$ | |
| Module | | | | |
| $I_{t(RMS)}$ | | 200 | A | |
| T_{stg} | | -40 ... 125 | $^{\circ}\text{C}$ | |
| V_{isol} | AC sinus 50Hz, $t = 1\text{ min}$ | 4000 | V | |

Characteristics

| Symbol | Conditions | min. | typ. | max. | Unit |
|---------------|--|-----------------------|-------|------|------------------|
| IGBT | | | | | |
| $V_{CE(sat)}$ | $I_C = 100\text{ A}$ $V_{GE} = 15\text{ V}$ chipllevel | $T_j = 25\text{ °C}$ | 1.75 | 2.2 | V |
| | | $T_j = 150\text{ °C}$ | 2.2 | 2.65 | V |
| V_{CE0} | | $T_j = 25\text{ °C}$ | 0.94 | 1.25 | V |
| | | $T_j = 150\text{ °C}$ | 0.88 | 1.22 | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25\text{ °C}$ | 8.1 | 9.5 | $\text{m}\Omega$ |
| | | $T_j = 150\text{ °C}$ | 13.2 | 14.3 | $\text{m}\Omega$ |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C = 4\text{ mA}$ | 6 | 6.5 | 7 | V |
| I_{CES} | $V_{GE} = 0\text{ V}$ $V_{CE} = 1200\text{ V}$ | $T_j = 25\text{ °C}$ | 0.1 | 0.3 | mA |
| | | $T_j = 150\text{ °C}$ | | | mA |
| C_{ies} | $V_{CE} = 25\text{ V}$ | | 6.01 | | nF |
| C_{oes} | $V_{GE} = 0\text{ V}$ | | 0.59 | | nF |
| C_{res} | | | 0.589 | | nF |
| Q_G | | | 1150 | | nC |
| R_{Gint} | | | 7.5 | | Ω |
| $t_{d(on)}$ | $V_{CC} = 600\text{ V}$ | | 294 | | ns |
| t_r | $I_C = 100\text{ A}$ $V_{GE} = \pm 15\text{ V}$ | $T_j = 150\text{ °C}$ | 38 | | ns |
| | | $T_j = 150\text{ °C}$ | 10 | | mJ |
| E_{on} | $R_{G on} = 1\text{ }\Omega$ | | 10 | | mJ |
| $t_{d(off)}$ | $R_{G off} = 1\text{ }\Omega$ | | 418 | | ns |
| t_f | $di/dt_{on} = 3230\text{ A}/\mu\text{s}$ | | 62 | | ns |
| E_{off} | $di/dt_{off} = 1330\text{ A}/\mu\text{s}$ | | 8 | | mJ |
| $R_{th(j-c)}$ | per IGBT | | | 0.27 | K/W |

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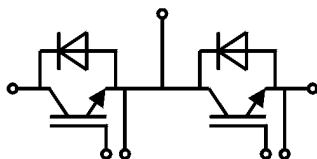
Features

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Typical Applications*

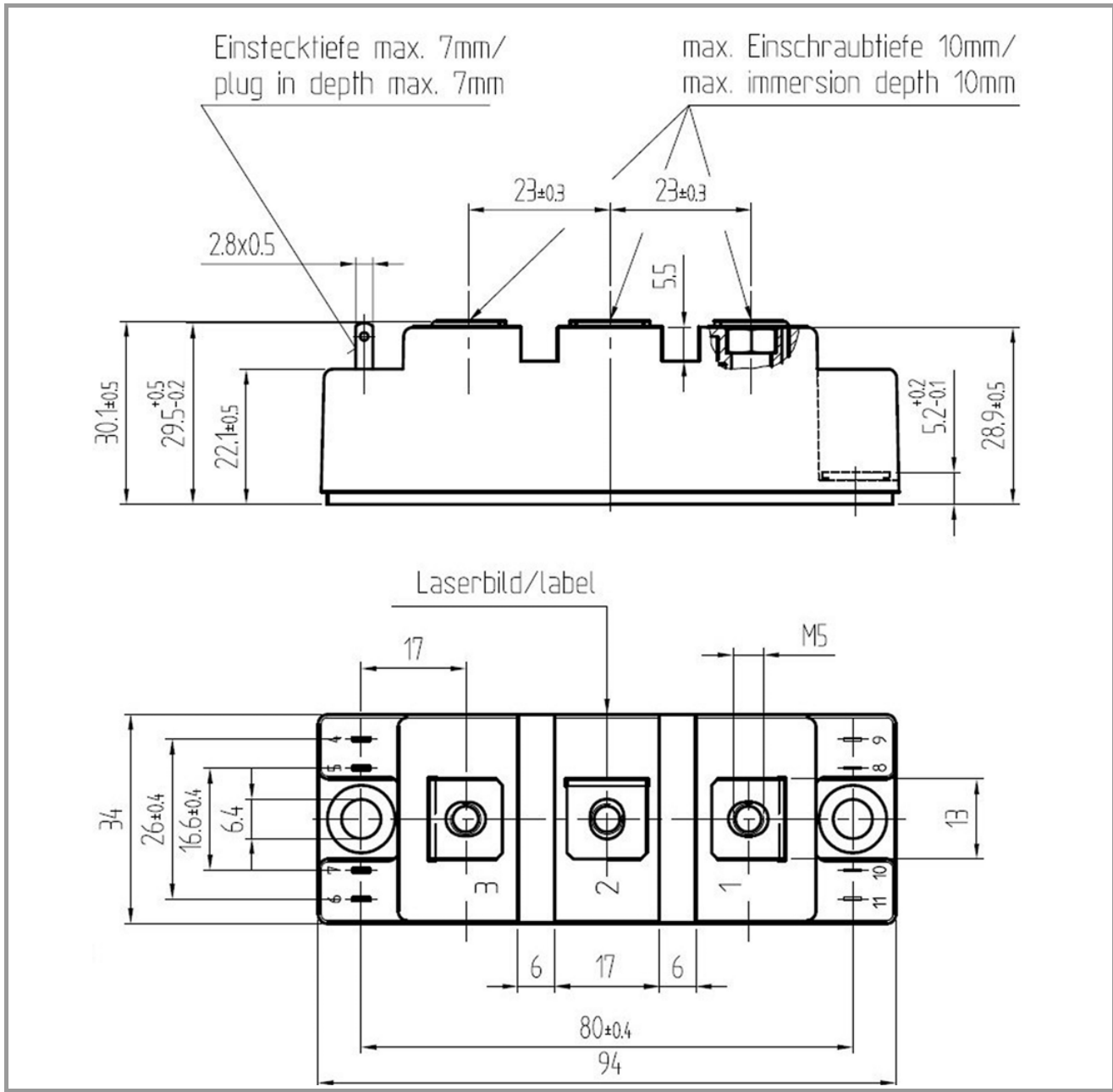
- AC inverter drives
- UPS
- Electronic welders at fsw up to 20 kHz

| Characteristics | | | | | | |
|----------------------|--|------------------------------------|------|------|------|---------------|
| Symbol | Conditions | | min. | typ. | max. | Unit |
| Inverse diode | | | | | | |
| $V_F = V_{EC}$ | $I_F = 100 \text{ A}$ $V_{GE} = 0 \text{ V}$ chip | $T_j = 25 \text{ }^\circ\text{C}$ | | 2.2 | 2.5 | V |
| | | $T_j = 150 \text{ }^\circ\text{C}$ | | 2.1 | 2.5 | V |
| V_{F0} | | $T_j = 25 \text{ }^\circ\text{C}$ | | 1.3 | 1.5 | V |
| | | $T_j = 150 \text{ }^\circ\text{C}$ | | 0.9 | 1.1 | V |
| r_F | | $T_j = 25 \text{ }^\circ\text{C}$ | | 9.0 | 10.2 | m Ω |
| | | $T_j = 150 \text{ }^\circ\text{C}$ | | 12.5 | 13.7 | m Ω |
| I_{RRM} | $I_F = 100 \text{ A}$ $di/dt_{off} = 1600 \text{ A}/\mu\text{s}$ $V_{GE} = \pm 15 \text{ V}$ $V_{CC} = 600 \text{ V}$ | $T_j = 150 \text{ }^\circ\text{C}$ | | 54 | | A |
| Q_{rr} | | $T_j = 150 \text{ }^\circ\text{C}$ | | 15.7 | | μC |
| E_{rr} | | $T_j = 150 \text{ }^\circ\text{C}$ | | 5.9 | | mJ |
| $R_{th(j-c)}$ | per diode | | | | 0.48 | K/W |
| Module | | | | | | |
| L_{CE} | | | | | 30 | nH |
| $R_{CC+EE'}$ | terminal-chip | $T_C = 25 \text{ }^\circ\text{C}$ | | 0.65 | | m Ω |
| | | $T_C = 125 \text{ }^\circ\text{C}$ | | 1 | | m Ω |
| $R_{th(c-s)}$ | per module | | | 0.04 | 0.05 | K/W |
| M_s | to heat sink M6 | | 3 | | 5 | Nm |
| M_t | | to terminals M5 | 2.5 | | 5 | Nm |
| | | | | | | Nm |
| w | | | | | 160 | g |

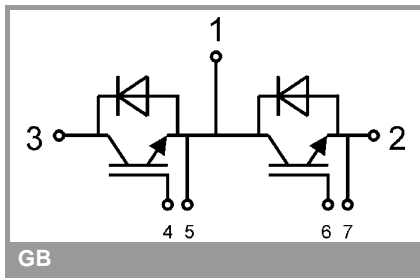


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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.