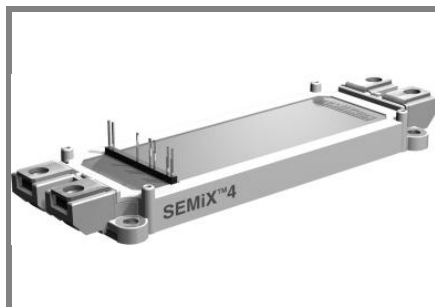


SEMiX 854GB176HD



SEMiX® 4

Trench IGBT Modules

SEMiX 854GB176HD

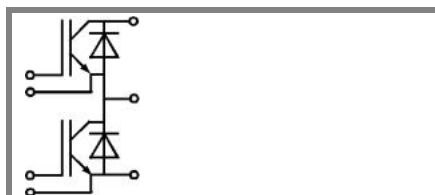
Target Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

- AC inverter drives
- UPS
- Electronic welders

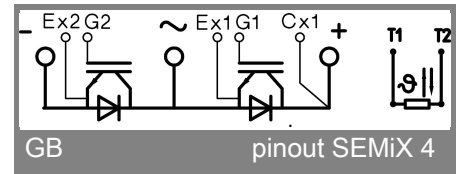
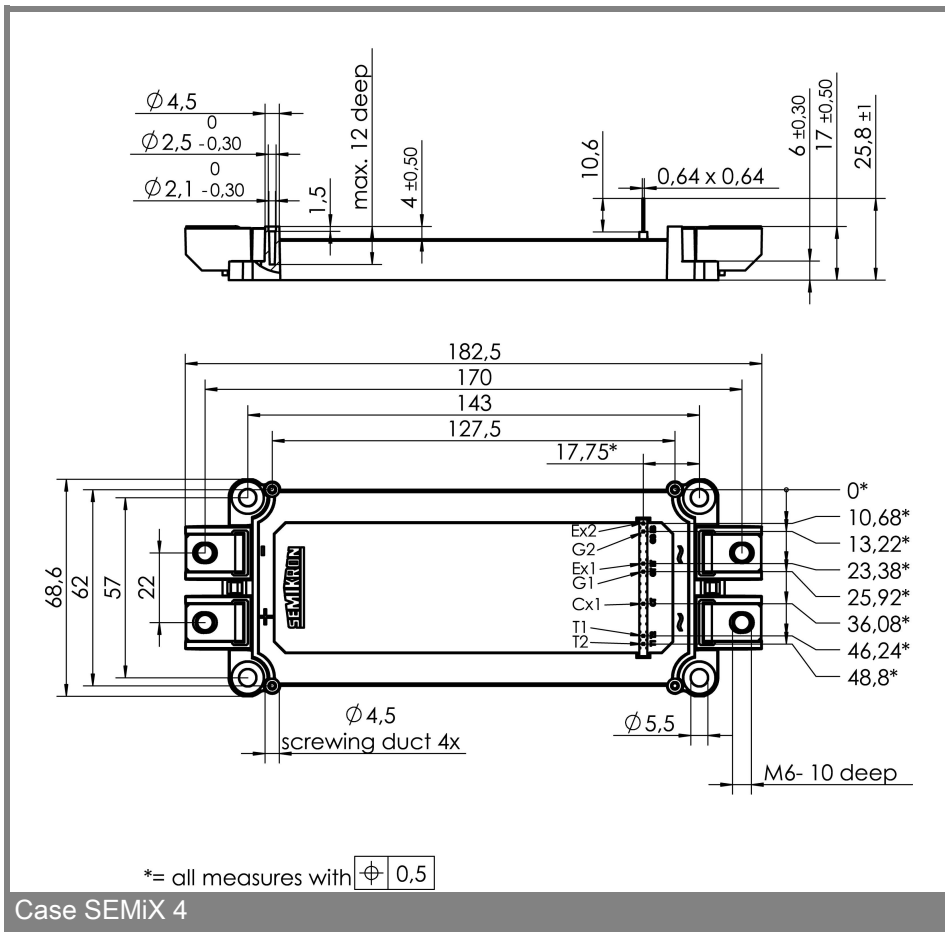


GB

| Absolute Maximum Ratings | | $T_c = 25\text{ °C}$, unless otherwise specified | |
|--------------------------|---|---|-------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1700 | V |
| I_C | $T_c = 25\text{ (80) °C}$ | 830 (590) | A |
| I_{CRM} | $t_p = 1\text{ ms}$ | 1200 | A |
| V_{GES} | | ± 20 | V |
| T_{vj} (T_{stg}) | $T_{OPERATION} \leq T_{stg}$ | - 40 ... + 150 (125) | °C |
| V_{isol} | AC, 1 min. | 4000 | V |
| Inverse diode | | | |
| I_F | $T_c = 25\text{ (80) °C}$ | 590 (370) | A |
| I_{FRM} | $t_p = 1\text{ ms}$ | 1200 | A |
| I_{FSM} | $t_p = 10\text{ ms}$; sin.; $T_j = 25\text{ °C}$ | 3800 | A |

| Characteristics | | $T_c = 25\text{ °C}$, unless otherwise specified | | | Units |
|--------------------------------|---|---|-----------|------------|-------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C = 24\text{ mA}$ | 5,2 | 5,8 | 6,4 | V |
| I_{CES} | $V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25\text{ (125) °C}$ | | | 3,6 | mA |
| $V_{CE(TO)}$ | $T_j = 25\text{ (125) °C}$ | | 1 (0,9) | 1,2 (1,1) | V |
| r_{CE} | $V_{GE} = 0\text{ V}$, $T_j = 25\text{ (125) °C}$ | | 1,7 (2,6) | 2,1 (3) | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom} = 600\text{ A}$, $V_{GE} = 15\text{ V}$, $T_j = 25\text{ (125) °C}$, chip level | | 2 (2,45) | 2,45 (2,9) | V |
| C_{ies} | under following conditions | | 39,6 | | nF |
| C_{oes} | $V_{GE} = 0$, $V_{CE} = 25\text{ V}$, $f = 1\text{ MHz}$ | | 2,2 | | nF |
| C_{res} | | | 1,8 | | nF |
| L_{CE} | | | 22 | | nH |
| $R_{CC'+EE'}$ | terminal-chip, $T_c = 25\text{ (125) °C}$ | | | | mΩ |
| $t_{d(on)}/t_r$ | $V_{CC} = 1200\text{ V}$, $I_{Cnom} = 600\text{ A}$ | | 410 / 70 | | ns |
| $t_{d(off)}/t_f$ | $V_{GE} = \pm 15\text{ V}$ | | 775 / 145 | | ns |
| $E_{on} (E_{off})$ | $R_{Gon} = R_{Goff} = 1\text{ Ω}$, $T_j = 125\text{ °C}$ | | 298 (202) | | mJ |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 600\text{ A}$; $V_{GE} = 0\text{ V}$; $T_j = 25\text{ (125) °C}$, chip level | | 2 (2,1) | 2,2 (2,3) | V |
| $V_{(TO)}$ | $T_j = 25\text{ (125) °C}$ | | 1,1 (0,9) | 1,3 (1,1) | V |
| r_T | $T_j = 25\text{ (125) °C}$ | | 1,5 (2) | 1,5 (2) | mΩ |
| I_{RRM} | $I_{Fnom} = 600\text{ A}$; $T_j = 25\text{ (125) °C}$ | | (830) | | A |
| Q_{rr} | $di/dt = 10000\text{ A/μs}$ | | (230) | | μC |
| E_{rr} | $V_{GE} = -15\text{ V}$ | | (172) | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0,039 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0,09 | K/W |
| $R_{th(j-c)FD}$ | per FWD | | | | K/W |
| $R_{th(c-s)}$ | per module | | 0,03 | | K/W |
| Temperature sensor | | | | | |
| R_{25} | $T_c = 25\text{ °C}$ | | 5 ±5% | | kΩ |
| $B_{25/85}$ | $R_2 = R_1 \exp[B(1/T_2 - 1/T_1)]$; $T[K]; B$ | | 3420 | | K |
| Mechanical data | | | | | |
| M_s/M_t | to heatsink (M5) / for terminals (M6) | 3/2,5 | | 5 / 5 | Nm |
| w | | | 390 | | g |

SEMiX 854GB176HD



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

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.