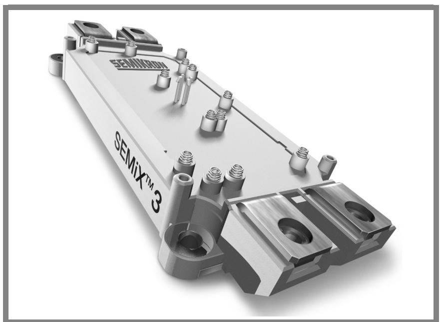
# SEMiX 503GB126HDs



SEMiX™ 3s

## Trench IGBT Modules

**SEMiX 503GB126HDs**

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

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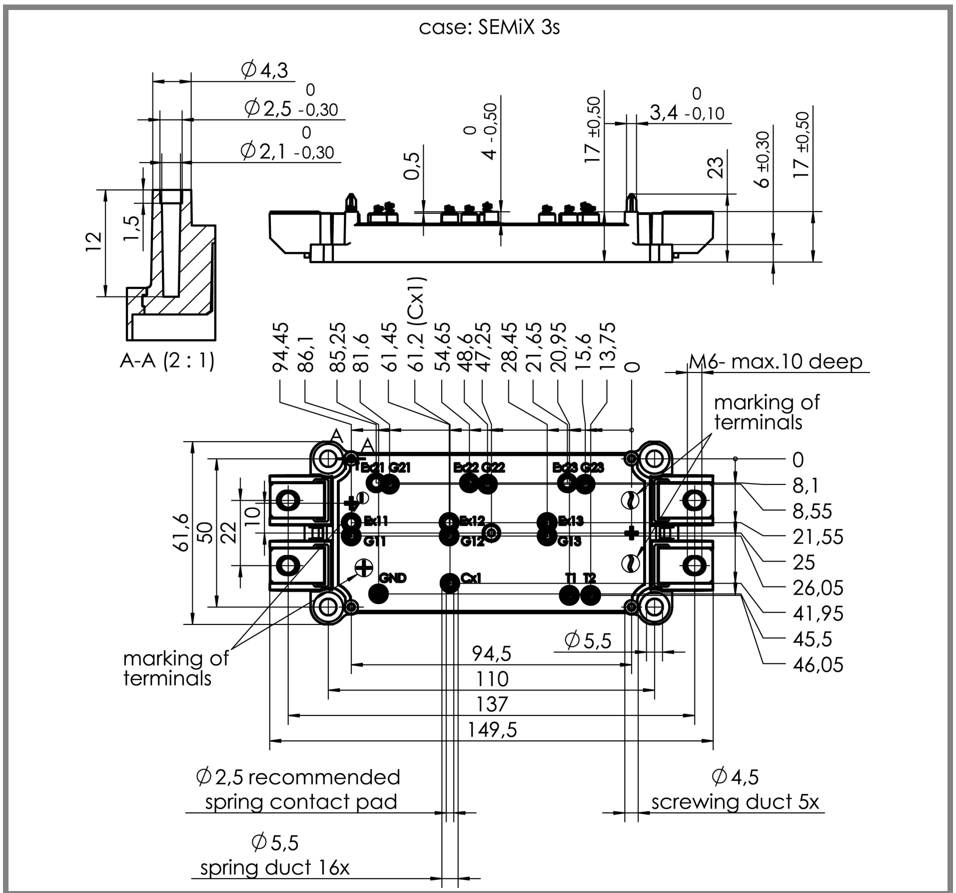
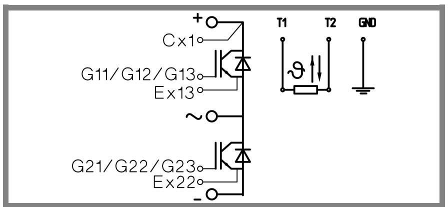
| **Absolute Maximum Ratings** | | $T_c$ = 25 °C, unless otherwise specified | |
|---|---|---|---|
| **Symbol** | **Conditions** | **Values** | **Units** |
| **IGBT** | | | |
| $V_{CES}$ | | 1200 | V |
| $I_C$ | $T_c$ = 25 (80) °C | 490 (370) | A |
| $I_{CRM}$ | $T_c$ = 25 (80) °C, $t_p$ = 1 ms | 980 (740) | 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** | | | |
| $I_F$ = - $I_C$ | $T_c$ = 25 (80) °C | 350 (250) | A |
| $I_{FRM}$ | $T_c$ = 25 (125) °C, $t_p$ = 1 ms | 980 (740) | A |
| $I_{FSM}$ | $t_p$ = 10 ms; sin.; $T_j$ = 25 °C | | A |

| **Characteristics** | | | | $T_c$ = 25 °C, unless otherwise specified | |
|---|---|---|---|---|---|
| **Symbol** | **Conditions** | **min.** | **typ.** | **max.** | **Units** |
| **IGBT** | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$, $I_C$ = 12 mA | 5 | 5,8 | 6,5 | V |
| $I_{CES}$ | $V_{GE}$ = 0, $V_{CE} = V_{CES}$, $T_j$ = 25 (125) °C | | | 2 | mA |
| $V_{CE(TO)}$ | $T_j$ = 25 (125) °C | | 1 (0,9) | 1,2 (1,1) | V |
| $r_{CE}$ | $V_{GE}$ = 15 V, $T_j$ = 25 (125) °C | | 2,2 (3,7) | 3,2 (4,5) | mΩ |
| $V_{CE(sat)}$ | $I_C$ = 300 A, $V_{GE}$ = 15 V, $T_j$ = 25 (125) °C, chip level | | 1,7 (2) | 2,15 (2,45) | V |
| $C_{ies}$ | under following conditions | | 21,6 | | nF |
| $C_{oes}$ | $V_{GE}$ = 0, $V_{CE}$ = 25 V, f = 1 MHz | | 1,1 | | nF |
| $C_{res}$ | | | 1 | | nF |
| $L_{CE}$ | | | 20 | | nH |
| $R_{CC'+EE'}$ | resistance, terminal-chip, $T_c$= 25 (125) °C | | 0,8 (1,2) | | mΩ |
| $t_{d(on)}/t_r$ | $V_{CC}$ = 600 V, $I_C$ = 300 A | | | | ns |
| $t_{d(off)}/t_f$ | $V_{GE}$ = ± 15 V | | | | ns |
| $E_{on}$ ($E_{off}$) | $R_{Gon} = R_{Goff}$ = 3 Ω, $T_j$ = 125 °C | | 29 (45) | | mJ |
| **Inverse diode** | | | | | |
| $V_F = V_{EC}$ | $I_F$ = 300 A; $V_{GE}$ = 0 V; $T_j$ = 25 (125) °C, chip level | | 1,6 (1,6) | 1,8 (1,8) | V |
| $V_{(TO)}$ | $T_j$ = 25 (125) °C | | 1 (0,8) | 1,1 (0,9) | V |
| $r_T$ | $T_j$ = 25 (125) °C | | 2 (2,7) | 2,3 (3) | mΩ |
| $I_{RRM}$ | $I_F$ = 300 A; $T_j$ = 25 (125) °C | | | | A |
| $Q_{rr}$ | di/dt = A/µs | | | | µC |
| $E_{rr}$ | $V_{GE}$ = 0 V | | | | mJ |
| **Thermal characteristics** | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0,075 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0,165 | K/W |
| $R_{th(j-c)FD}$ | per FWD | | | | K/W |
| $R_{th(c-s)}$ | per module | | 0,04 | | K/W |
| **Temperature sensor** | | | | | |
| $R_{25}$ | $T_c$ = 25 °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 | | | 289 | | g |




Case SEMiX 3s

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

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