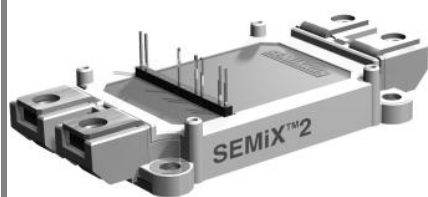


SEMiX 452GB126HD

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SEMiX[®] 2

Trench IGBT Modules

SEMiX 452GB126HD

Preliminary Data

Features

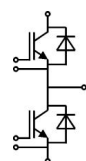
- Homogeneous Si
- Trench = Trenchgate technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

- AC inverter drives
- UPS
- Electronic Welding

Remarks

- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design



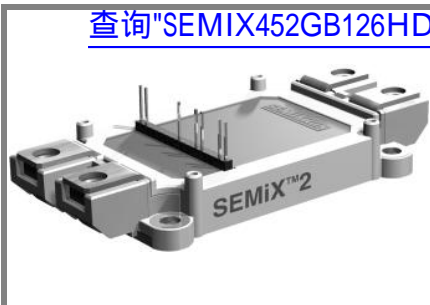
GB

| Absolute Maximum Ratings | | $T_{case} = 25^\circ\text{C}$, unless otherwise specified | | |
|--------------------------|--|--|------|------------------|
| Symbol | Conditions | Values | | Units |
| IGBT | | | | |
| V_{CES} | $T_j = 25^\circ\text{C}$ | 1200 | | V |
| I_C | $T_j = 150^\circ\text{C}$ | $T_{case} = 25^\circ\text{C}$ | 455 | A |
| | | $T_{case} = 80^\circ\text{C}$ | 320 | A |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$ | 600 | | A |
| V_{GES} | | ± 20 | | V |
| t_{psc} | $V_{CC} = 600\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 1200\text{ V}$ | 10 | | μs |
| Inverse Diode | | | | |
| I_F | $T_j = 150^\circ\text{C}$ | $T_{case} = 25^\circ\text{C}$ | 395 | A |
| | | $T_{case} = 80^\circ\text{C}$ | 270 | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$ | 600 | | A |
| I_{FSM} | $t_p = 10\text{ ms}; \text{sin.}$ | $T_j = 25^\circ\text{C}$ | 1900 | A |
| Module | | | | |
| $I_{t(RMS)}$ | | 600 | | A |
| T_{vj} | | - 40 ... + 150 | | $^\circ\text{C}$ |
| T_{stg} | | - 40 ... + 125 | | $^\circ\text{C}$ |
| V_{isol} | AC, 1 min. | 4000 | | V |

| Characteristics | | $T_{case} = 25^\circ\text{C}$, unless otherwise specified | | | |
|-----------------|---|--|------|------|------------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 12\text{ mA}$ | 5 | 5,8 | 6,5 | V |
| I_{CES} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | | | 0,3 | mA |
| V_{CE0} | | $T_j = 25^\circ\text{C}$ | 1 | 1,2 | V |
| | | $T_j = 125^\circ\text{C}$ | 0,9 | 1,1 | V |
| r_{CE} | $V_{GE} = 15\text{ V}$ | $T_j = 25^\circ\text{C}$ | 2,3 | 3,2 | $\text{m}\Omega$ |
| | | $T_j = 125^\circ\text{C}$ | 3,7 | 4,5 | $\text{m}\Omega$ |
| $V_{CE(sat)}$ | $I_{Cnom} = 300\text{ A}, V_{GE} = 15\text{ V}$ | $T_j = 25^\circ\text{C}_{chiplev.}$ | 1,7 | 2,15 | V |
| | | $T_j = 125^\circ\text{C}_{chiplev.}$ | 2 | 2,45 | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | 21,5 | | nF |
| C_{oes} | | | 1,13 | | nF |
| C_{res} | | | 0,98 | | nF |
| Q_G | $V_{GE} = -8 \dots +15\text{V}$ | 2400 | | nC | |
| $t_{d(on)}$ | $R_{Gon} = 2\ \Omega$ | $V_{CC} = 600\text{V}$ $I_{Cnom} = 300\text{A}$ | 280 | | ns |
| t_r | | | 65 | | ns |
| E_{on} | $R_{Goff} = 2\ \Omega$ | $T_j = 125^\circ\text{C}$ | 35 | | mJ |
| $t_{d(off)}$ | | | 630 | | ns |
| t_f | | | 130 | | ns |
| E_{off} | | | 45 | | mJ |
| $R_{th(j-c)}$ | per IGBT | 0,083 | | K/W | |

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Remarks

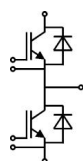
- Case temperatur limited to $T_C=125^\circ\text{C}$ max.
- Not for new design

Characteristics

| Symbol | Conditions | min. | typ. | max. | Units |
|---------------------------|--|--------------------------------|----------|------|-------|
| Inverse Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 300\text{ A}; V_{GE} = 0\text{ V}$ | | 1,6 | 1,8 | V |
| | | | 1,6 | 1,8 | V |
| V_{F0} | | | 1 | 1,1 | V |
| | | | 0,8 | 0,9 | V |
| r_F | | | 2 | 2,3 | mΩ |
| | | | 2,7 | 3 | mΩ |
| I_{RRM} | $I_{Fnom} = 300\text{ A}$ | | 375 | | A |
| Q_{rr} | $di/dt = 6200\text{ A}/\mu\text{s}$ | | 75 | | μC |
| E_{rr} | $V_{GE} = -15\text{ V}; V_{CC} = 600\text{ V}$ | | 33 | | mJ |
| $R_{th(j-c)D}$ | per diode | | | 0,15 | K/W |
| Module | | | | | |
| L_{CE} | | | 18 | | nH |
| $R_{CC'+EE'}$ | res., terminal-chip | $T_{case} = 25^\circ\text{C}$ | 0,7 | | mΩ |
| | | $T_{case} = 125^\circ\text{C}$ | 1 | | mΩ |
| $R_{th(c-s)}$ | per module | | 0,045 | | K/W |
| M_s | to heat sink (M5) | | 3 | 5 | Nm |
| M_t | to terminals (M6) | | 2,5 | 5 | Nm |
| w | | | | 250 | g |
| Temperature sensor | | | | | |
| R_{100} | $T_c = 100^\circ\text{C}$ ($R_{25} = 5\text{ k}\Omega$) | | 0,493±5% | | kΩ |
| $B_{100/125}$ | $R(T) = R_{100} \exp[B_{100/125} (1/T - 1/T_{100})]$; $T[\text{K}]; B$ | | 3550±2% | | K |

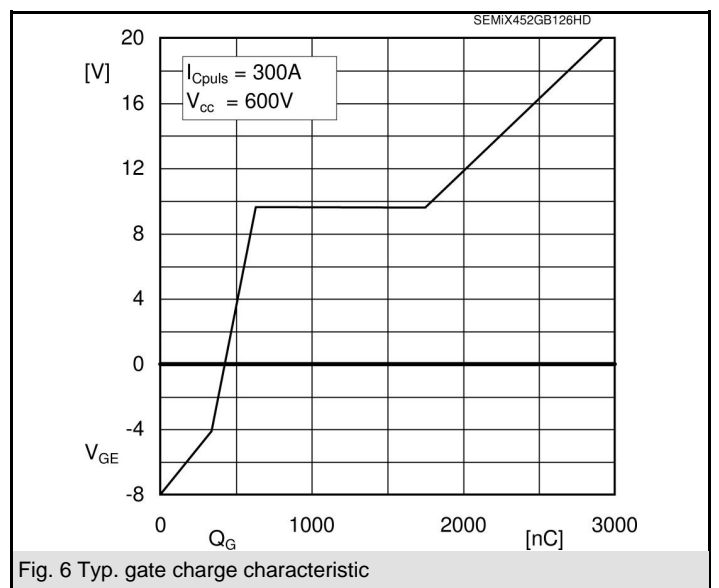
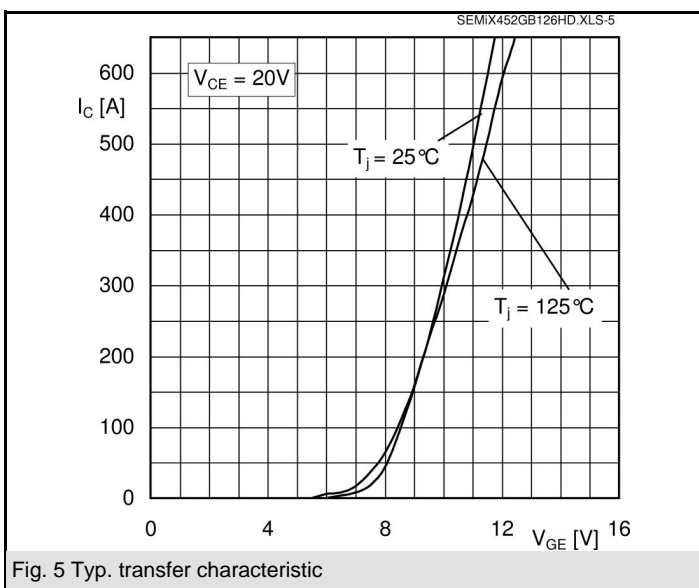
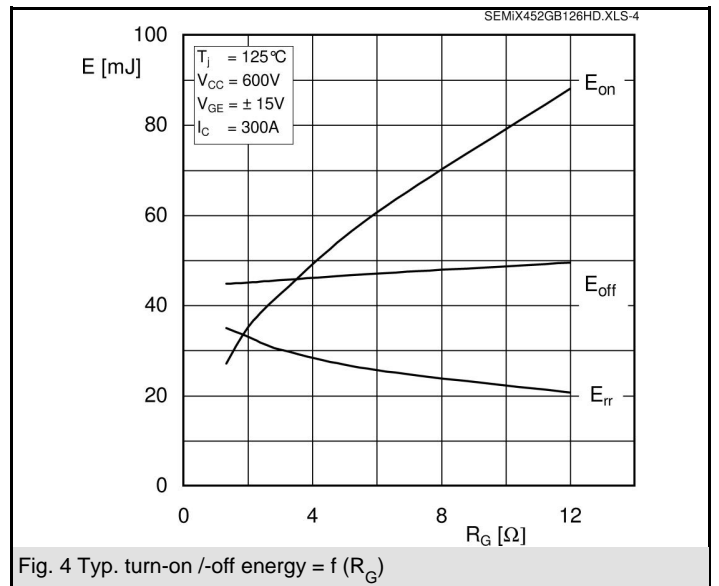
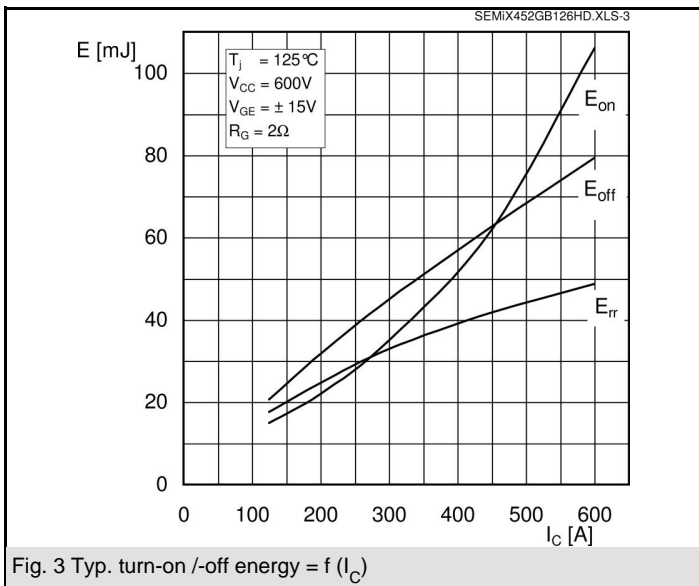
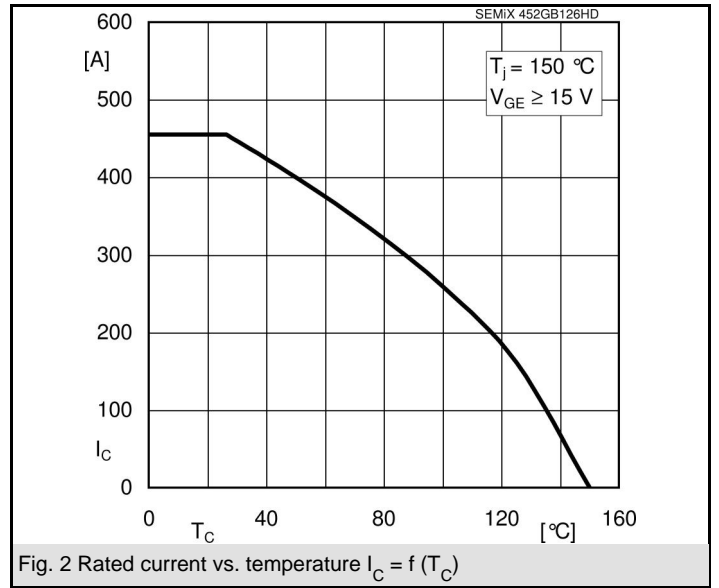
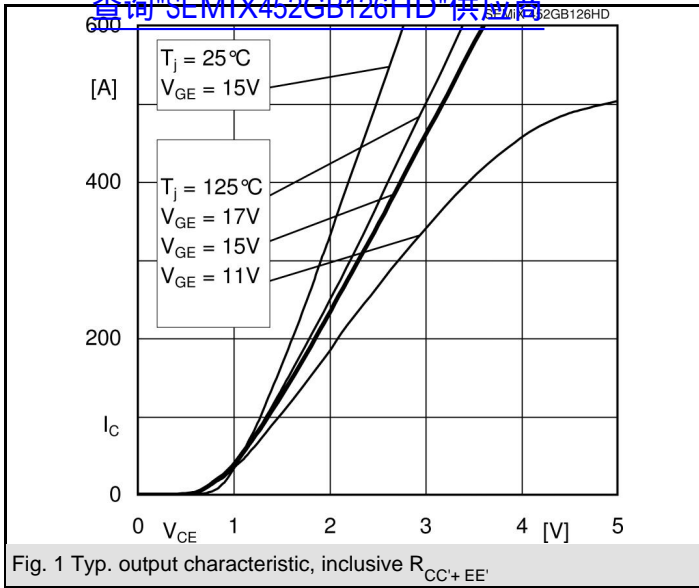
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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

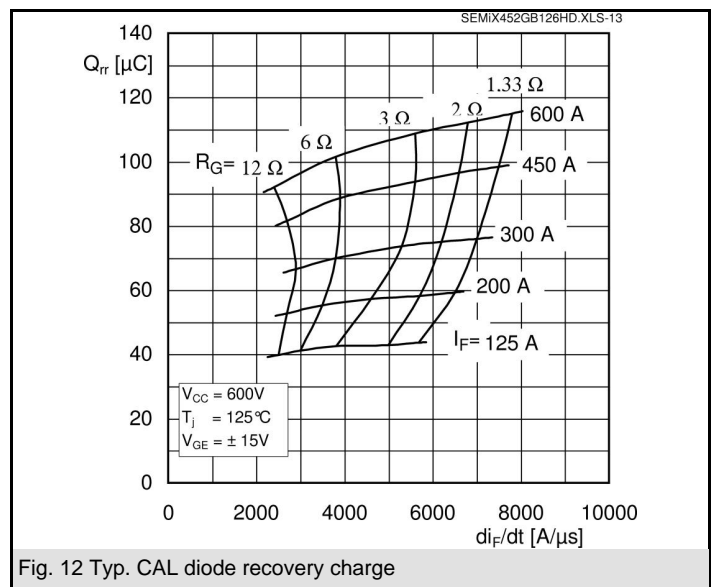
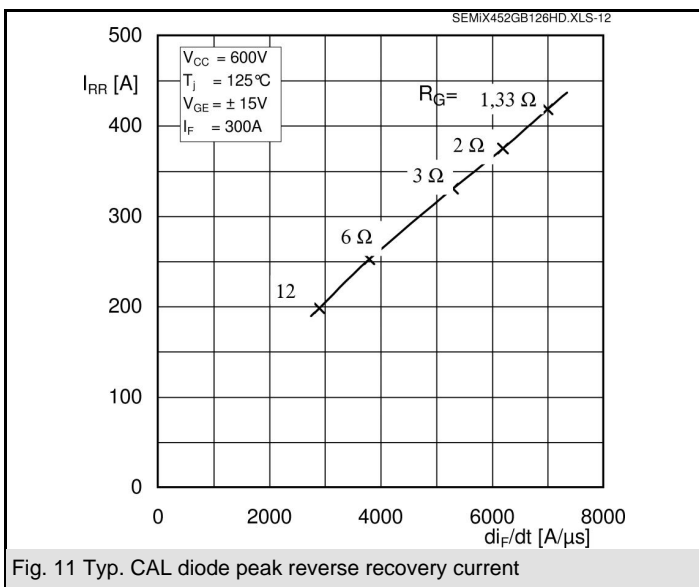
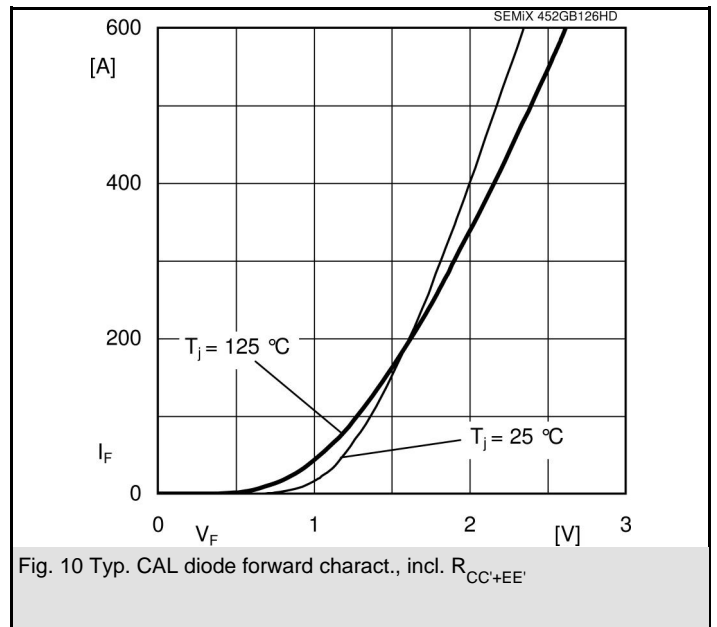
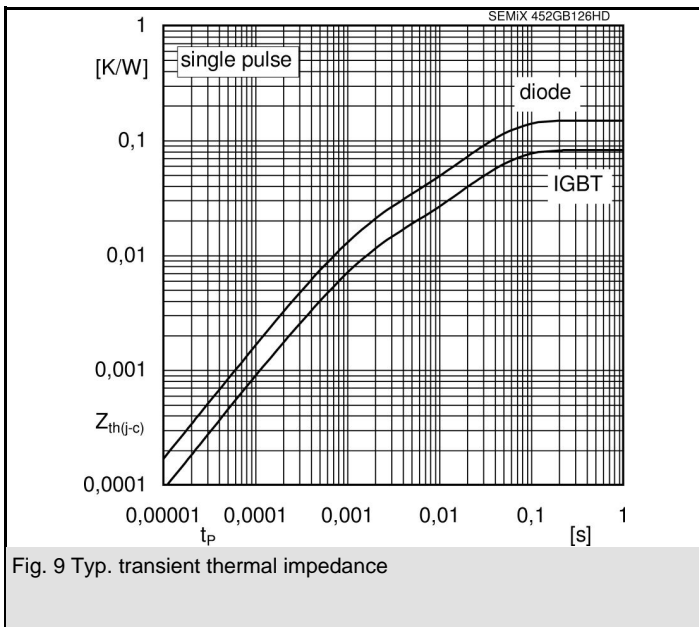
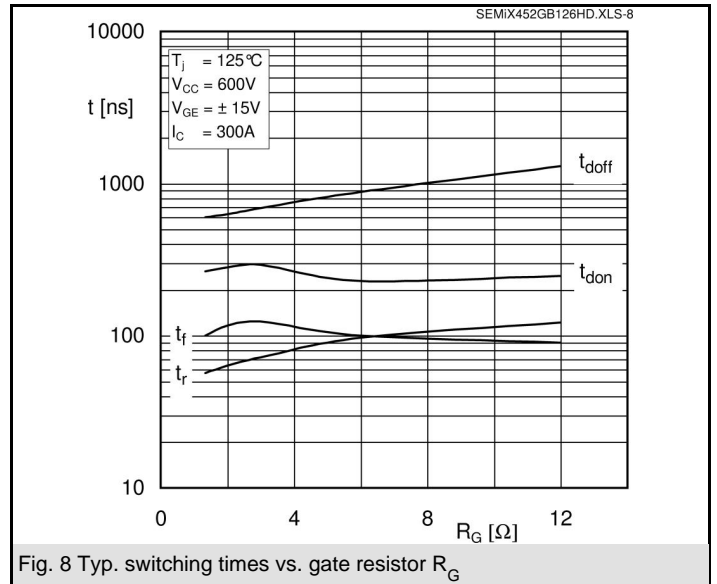
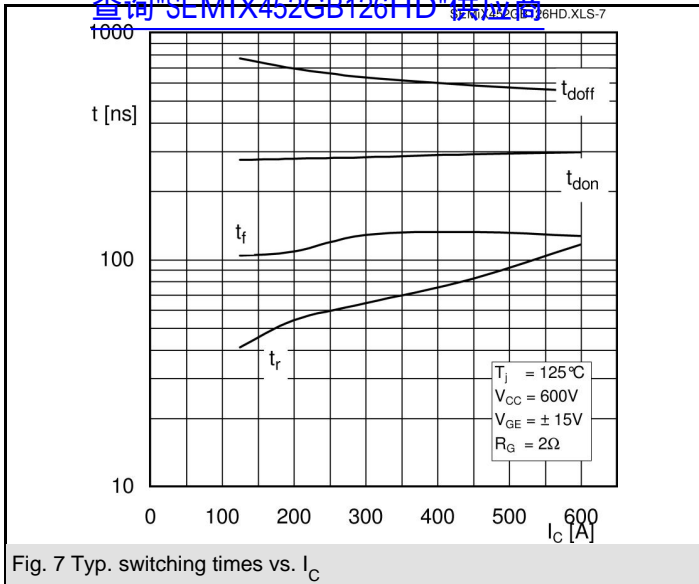


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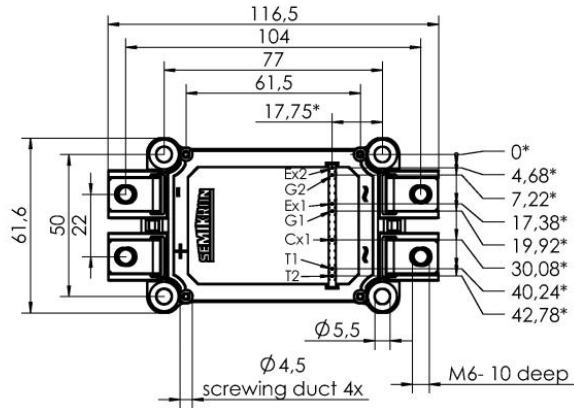
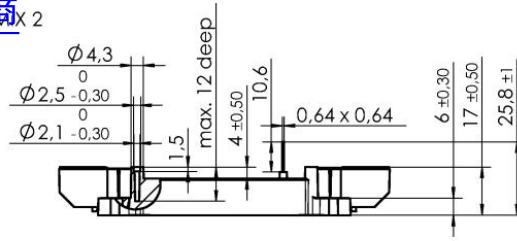


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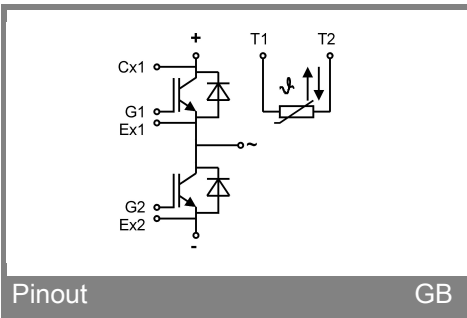
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*= all measures with ± 0.5

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Pinout

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