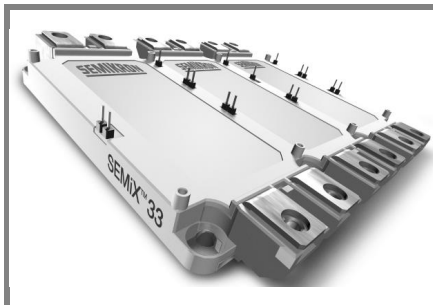


SEMiX 553GD128Dc



SEMiX® 33c

SPT IGBT Modules

SEMiX 553GD128Dc

Preliminary Data

Features

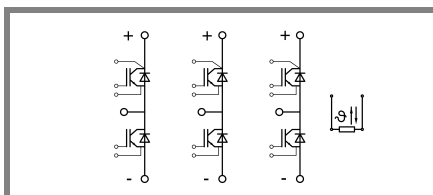
- Homogeneous Si
- SPT = Soft-Punch-Through technology
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability

Typical Applications

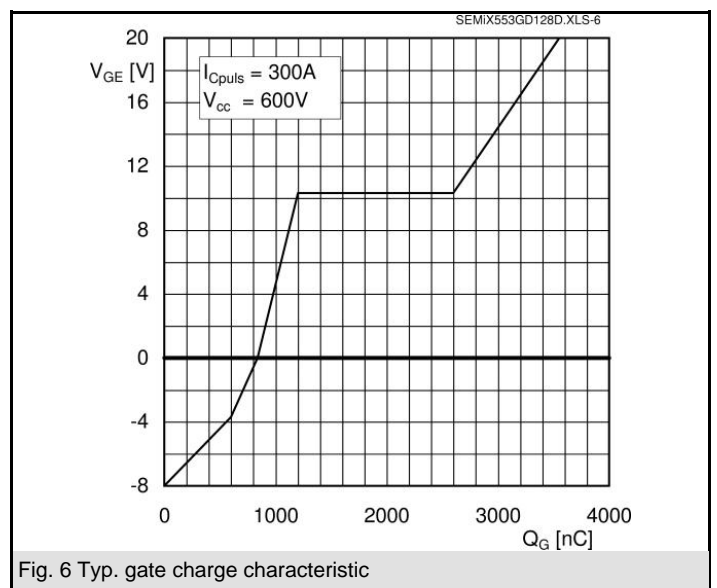
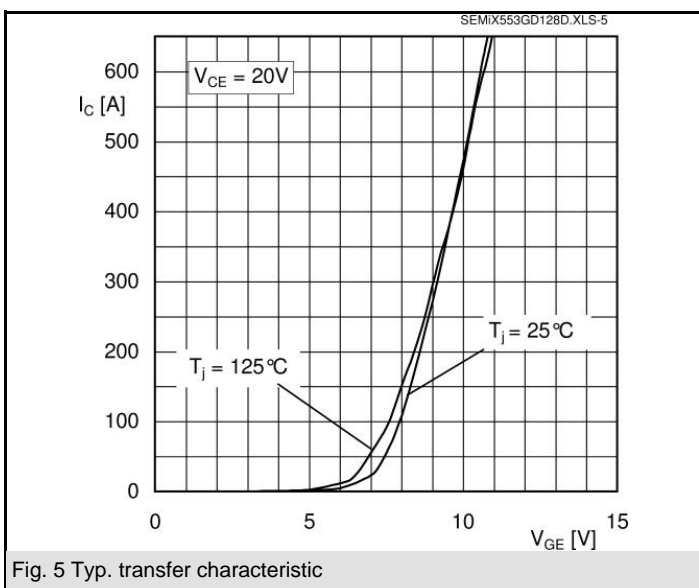
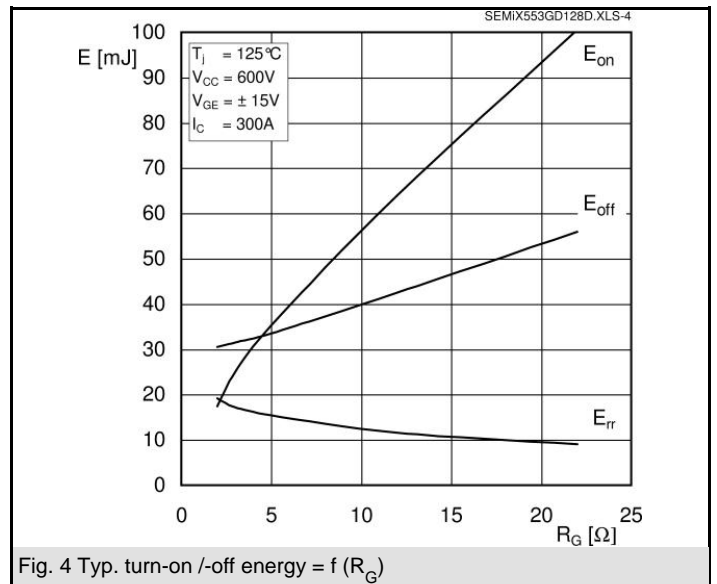
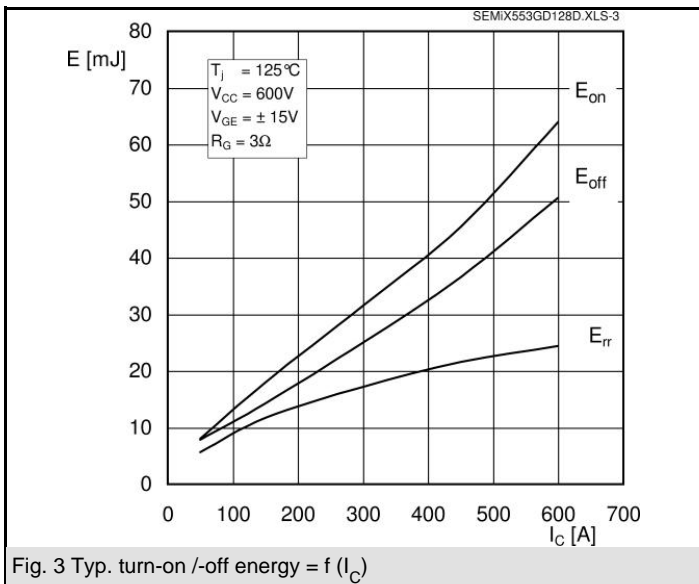
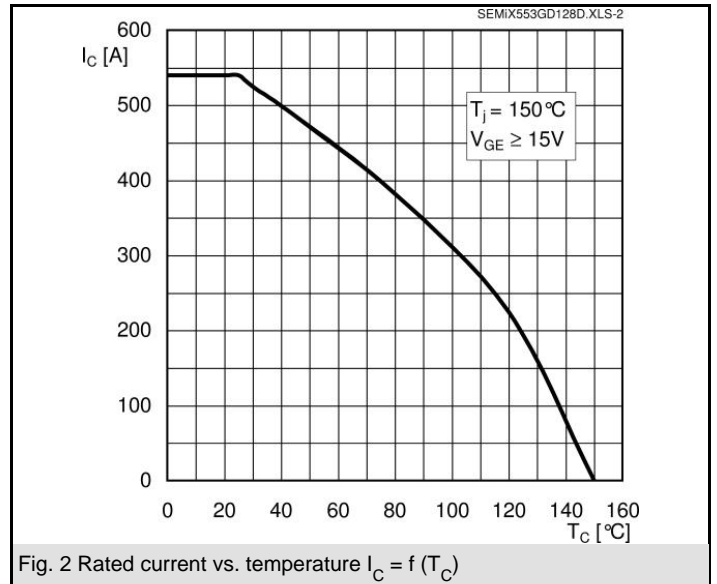
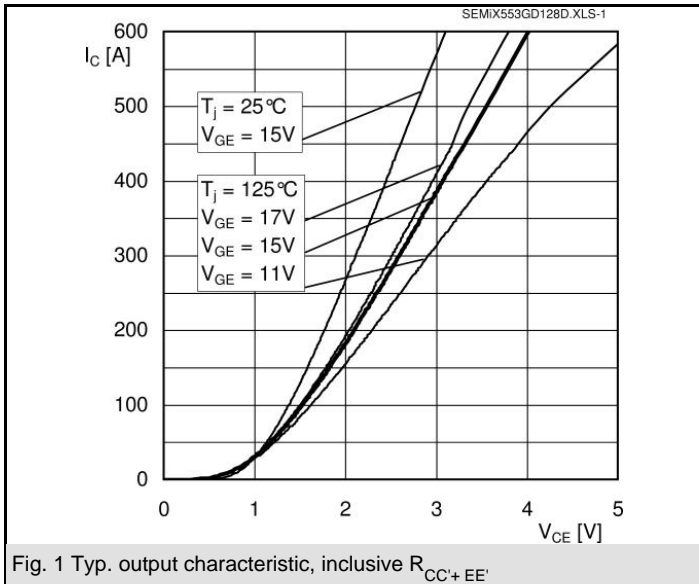
- AC inverter drives
- UPS
- Electronic welders up to 20 kHz

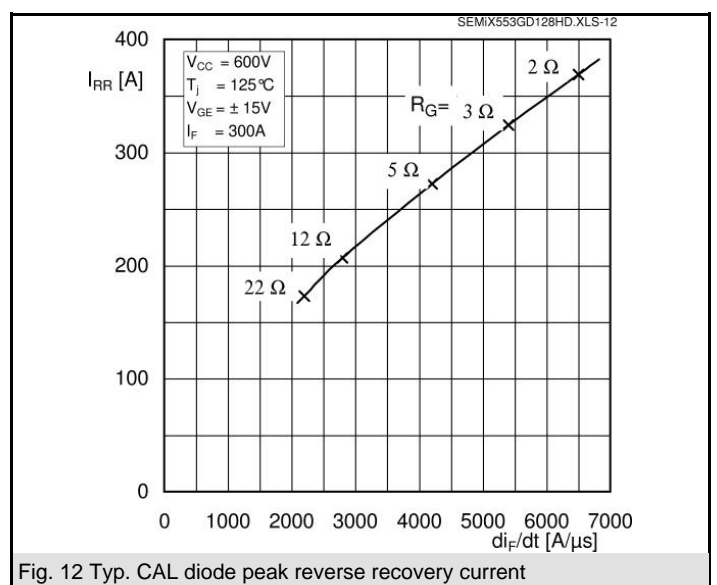
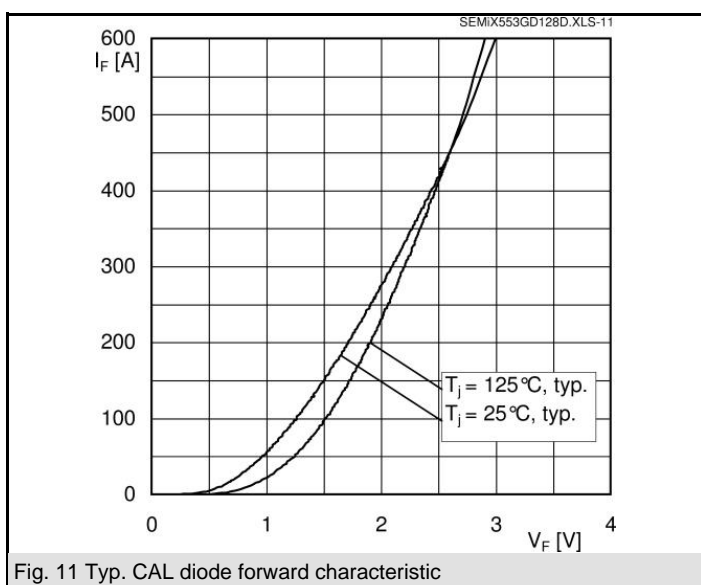
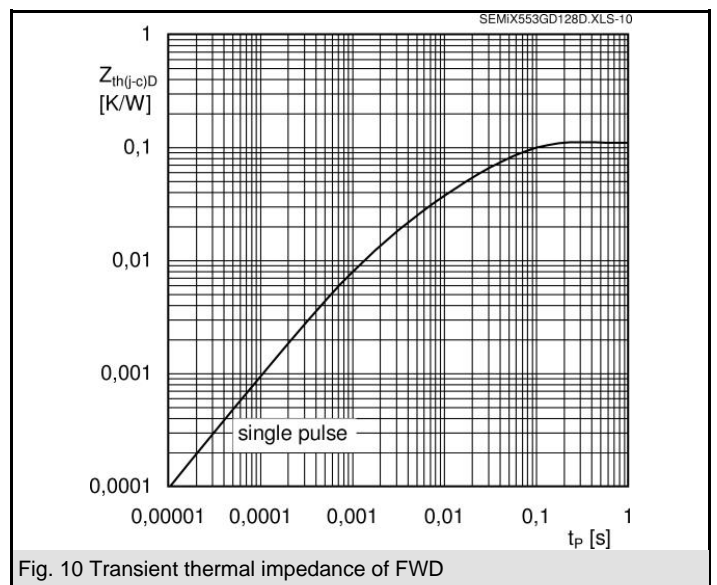
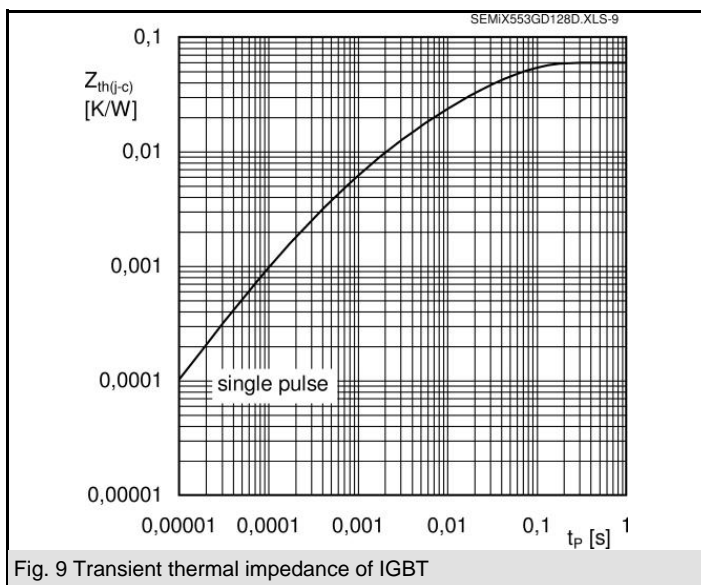
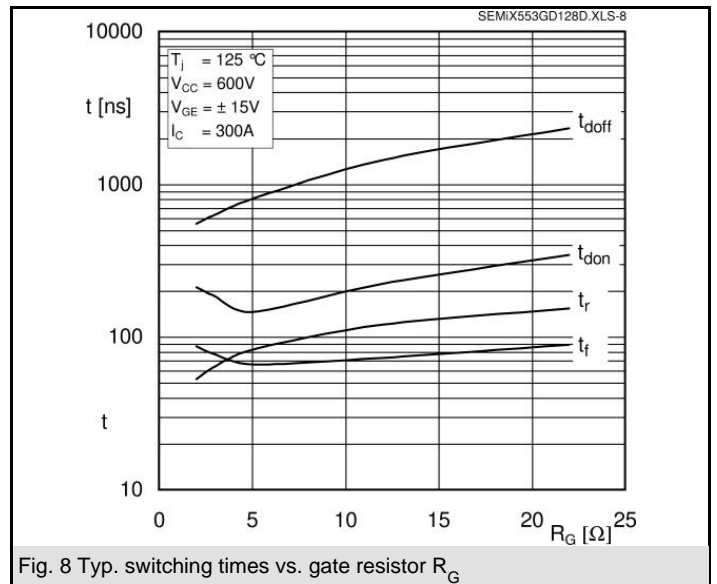
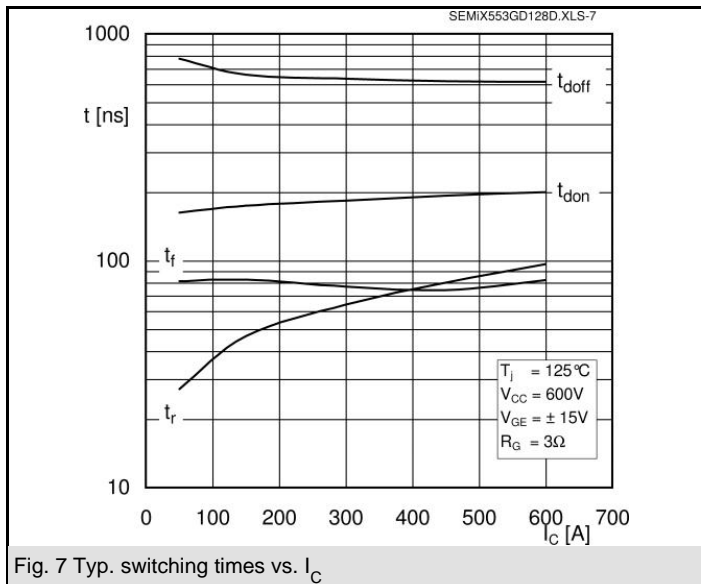
| Absolute Maximum Ratings | | $T_{case} = 25^{\circ}C$, unless otherwise specified | |
|--------------------------|--|---|-------------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1200 | V |
| I_C | $T_c = 25 (80) ^{\circ}C$ | 540 (380) | A |
| I_{CRM} | $t_p = 1 \text{ ms}$ | 600 | A |
| V_{GES} | | ± 20 | V |
| T_{vj} (T_{stg}) | $T_{OPERATION} \leq T_{stg}$ | - 40 ... + 150 (125) | $^{\circ}C$ |
| V_{isol} | AC, 1 min. | 4000 | V |
| Inverse diode | | | |
| I_F | $T_c = 25 (80) ^{\circ}C$ | 420 (280) | A |
| I_{FRM} | $t_p = 1 \text{ ms}$ | 600 | A |
| I_{FSM} | $t_p = 10 \text{ ms}; \text{sin.}; T_j = 25 ^{\circ}C$ | 2300 | A |

| Characteristics | | $T_{case} = 25^{\circ}C$, unless otherwise specified | | | |
|--------------------------------|--|---|------------|-------------|---------------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 12 \text{ mA}$ | 4,5 | 5 | 6,5 | V |
| I_{CES} | $V_{GE} = 0, V_{CE} = V_{CES}, T_j = 25 (125) ^{\circ}C$ | | | 0,3 | mA |
| $V_{CE(TO)}$ | $T_j = 25 (125) ^{\circ}C$ | | 1 (0,9) | 1,15 (1,05) | V |
| r_{CE} | $V_{GE} = 15 \text{ V}, T_j = 25 (125) ^{\circ}C$ | | 3 (4,7) | 4 (5) | m Ω |
| $V_{CE(sat)}$ | $I_{Cnom} = 300 \text{ A}, V_{GE} = 15 \text{ V}, T_j = 25 (125) ^{\circ}C$, chip level | | 1,9 (2,3) | 2,35 (2,55) | V |
| C_{ies} | under following conditions | | 27 | | nF |
| C_{oes} | $V_{GE} = 0, V_{CE} = 25 \text{ V}, f = 1 \text{ MHz}$ | | 2 | | nF |
| C_{res} | | | 1,3 | | nF |
| L_{CE} | | | 20 | | nH |
| $R_{CC'+EE'}$ | terminal-chip, $T_c = 25 (125) ^{\circ}C$ | | 0,7 (1) | | m Ω |
| $t_{d(on)}/t_r$ | $V_{CC} = 600 \text{ V}, I_{Cnom} = 300 \text{ A}$ | | 185 / 65 | | ns |
| $t_{d(off)}/t_f$ | $V_{GE} = \pm 15 \text{ V}$ | | 635 / 80 | | ns |
| $E_{on} (E_{off})$ | $R_{Gon} = R_{Goff} = 3 \Omega, T_j = 125 ^{\circ}C$ | | 25 (32) | | mJ |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 300 \text{ A}; V_{GE} = 0 \text{ V}; T_j = 25 (125) ^{\circ}C$, chip level | | 2 (1,8) | 2,5 (2,3) | V |
| $V_{(TO)}$ | $T_j = 25 (125) ^{\circ}C$ | | 1,1 | 1,45 (1,25) | V |
| r_T | $T_j = 25 (125) ^{\circ}C$ | | 3 | 3,5 (3,5) | m Ω |
| I_{RRM} | $I_{Fnom} = 300 \text{ A}; T_j = 25 (125) ^{\circ}C$ | | (324) | | A |
| Q_{rr} | $di/dt = 5400 \text{ A}/\mu\text{s}$ | | (46) | | μC |
| E_{rr} | $V_{GE} = -15 \text{ V}$ | | (17) | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0,06 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0,11 | K/W |
| $R_{th(j-c)FD}$ | per FWD | | | | K/W |
| $R_{th(c-s)}$ | per module | | 0,014 | | K/W |
| Temperature sensor | | | | | |
| R_{25} | $T_c = 25 ^{\circ}C$ | | 5 \pm 5% | | k Ω |
| $B_{25/85}$ | $R_2 = R_1 \exp[B(1/T_2 - 1/T_1)]; T[K]; B$ | | 3420 | | K |
| Mechanical data | | | | | |
| M_s/M_t | to heatsink (M5) / for terminals (M6) | 3/2,5 | | 5 / 5 | Nm |
| w | | | 866 | | g |

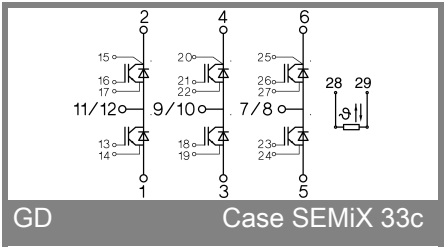
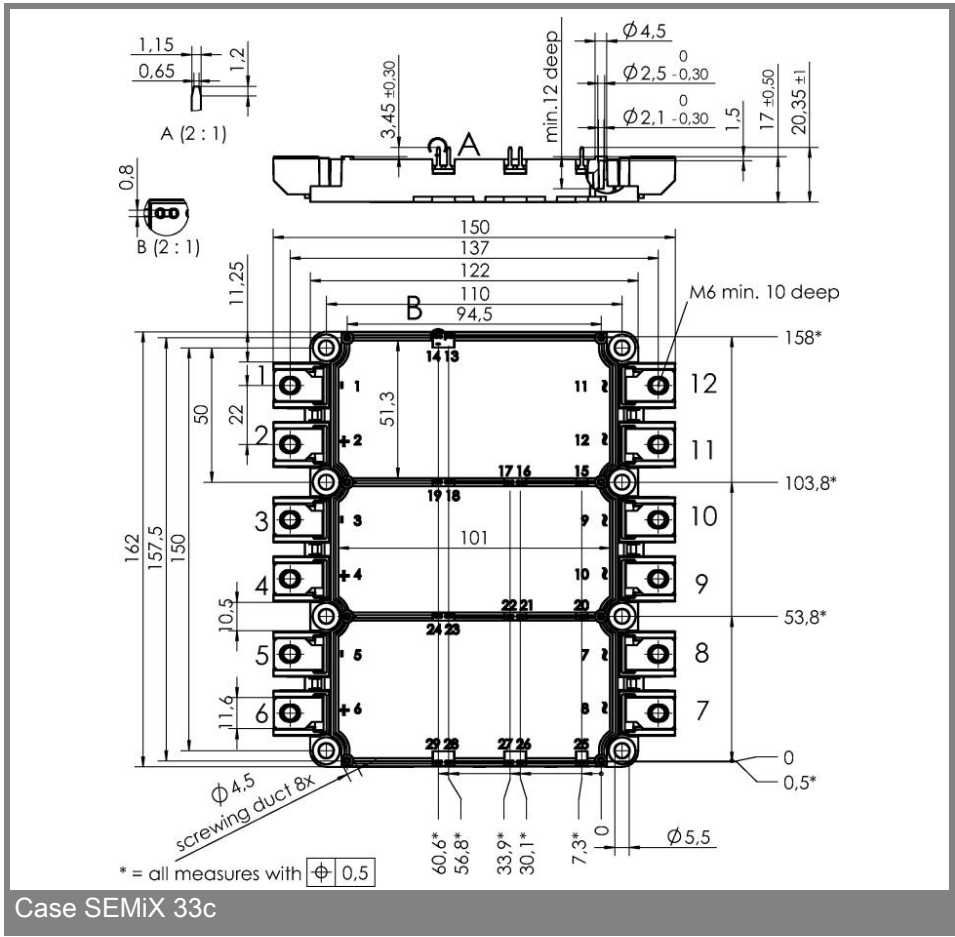
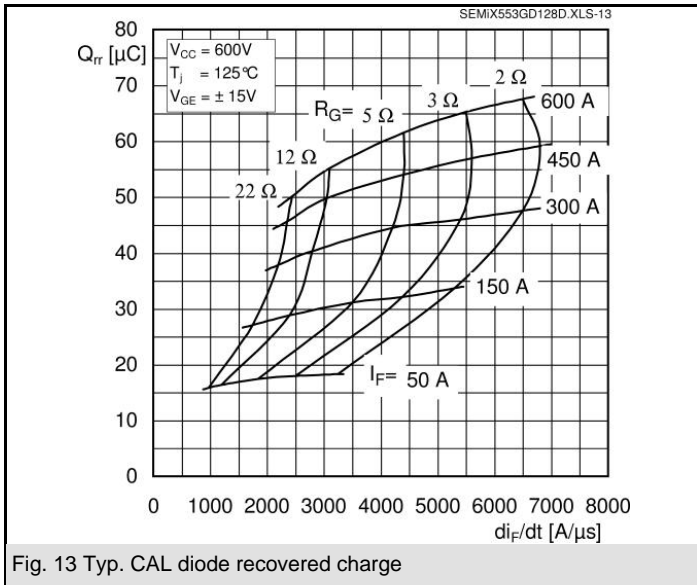


GD





SEMiX 553GD128Dc



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

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