

SKM 800GA176D



SEMITRANS™ 4

Trench IGBT Modules

SKM 800GA176D

Preliminary Data

Features

- Homogeneous Si
- Trench = Trenchgate technology
- V_{CEsat} with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

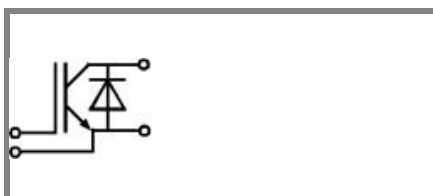
- AC inverter drives mains 575 - 750 V AC
- Public transport (auxiliary syst.)
- Wind power

Remarks

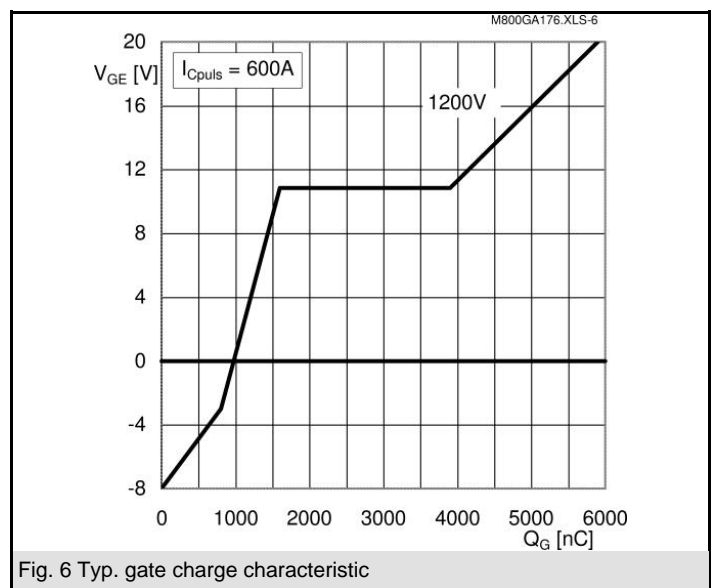
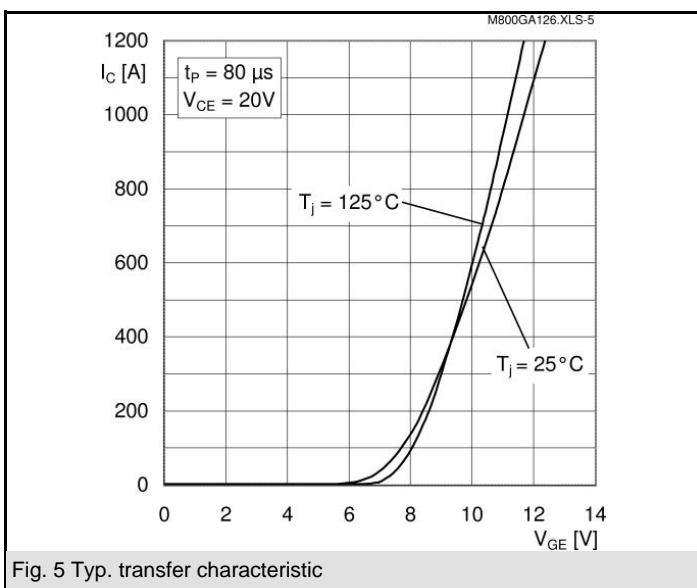
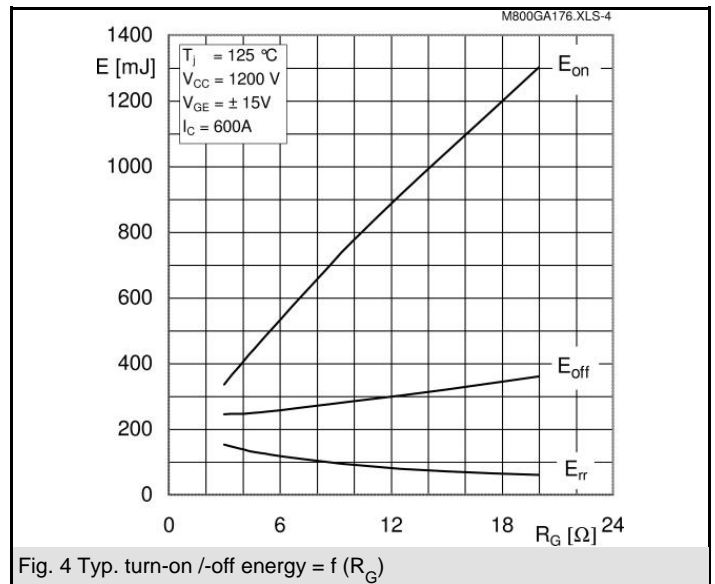
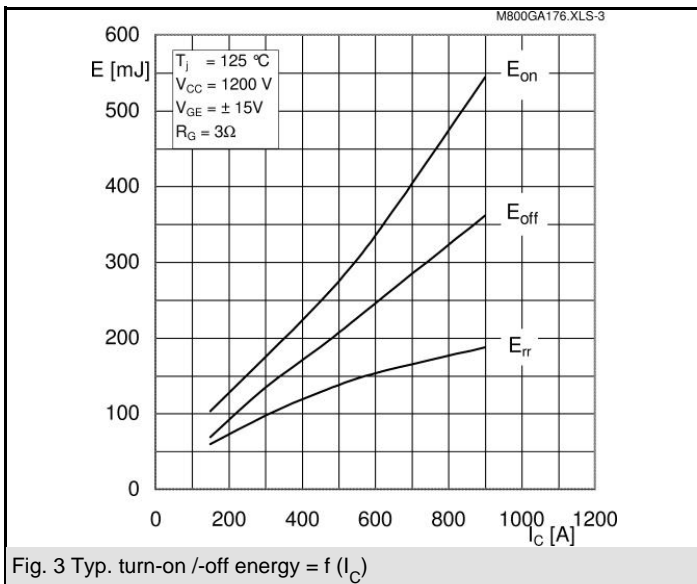
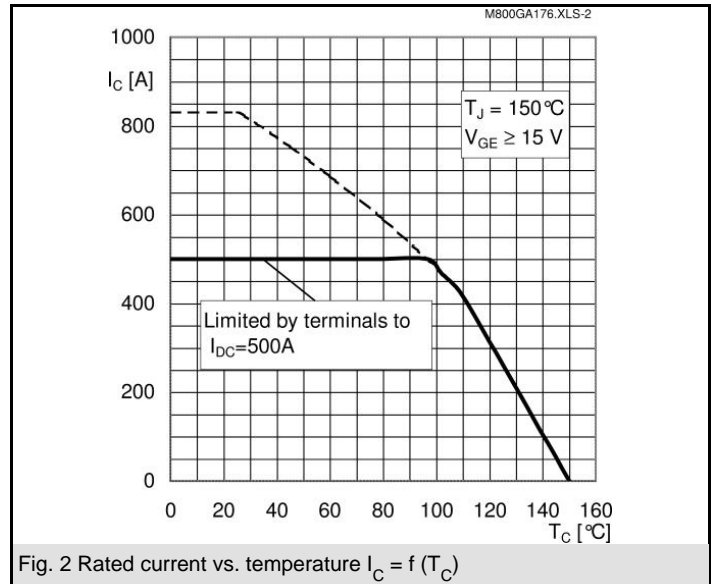
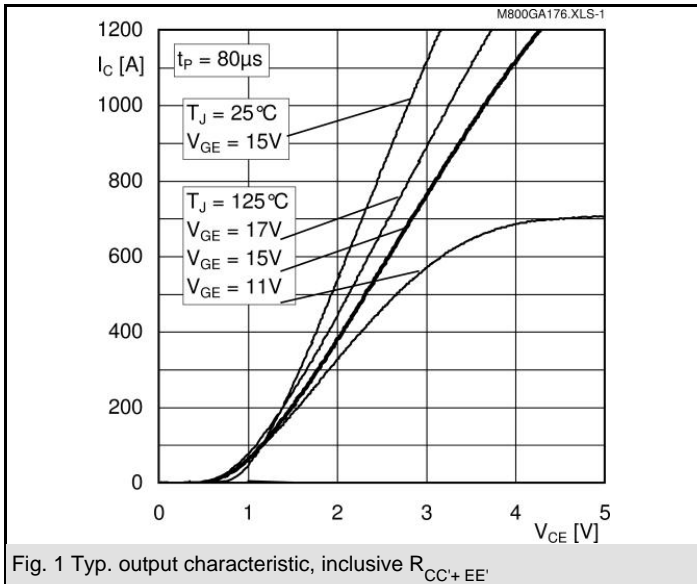
- $I_{DC} \leq 500$ A limited for $T_{Terminal} = 100$ °C

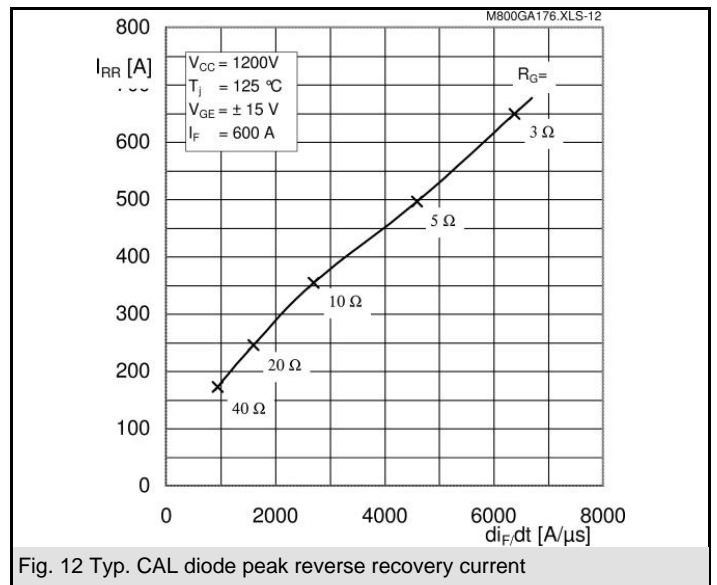
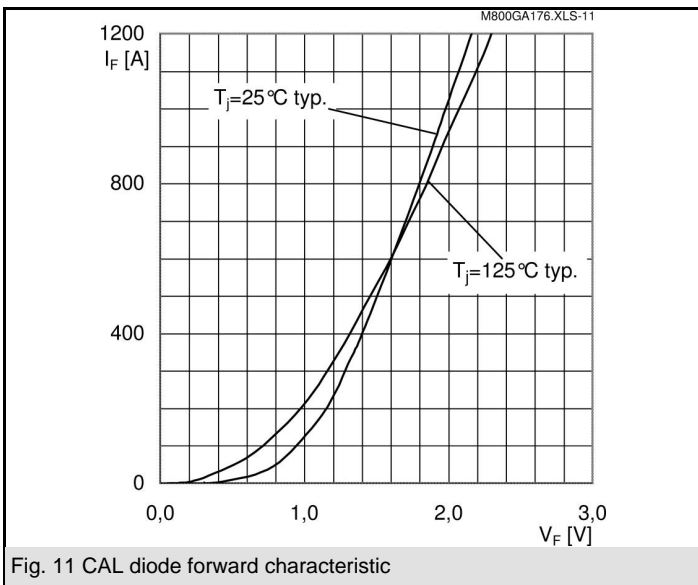
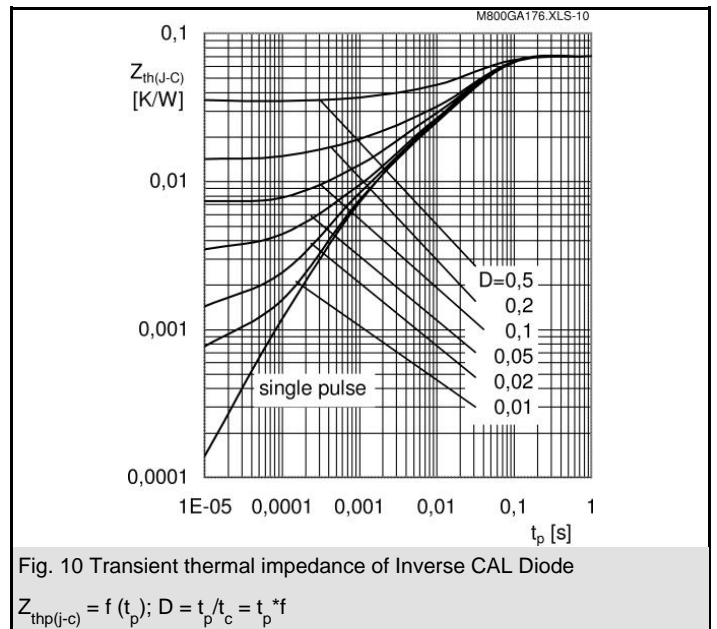
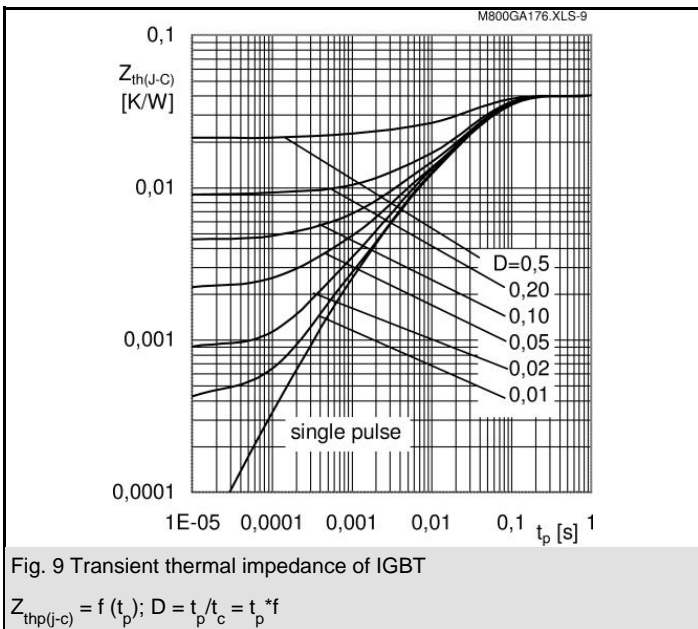
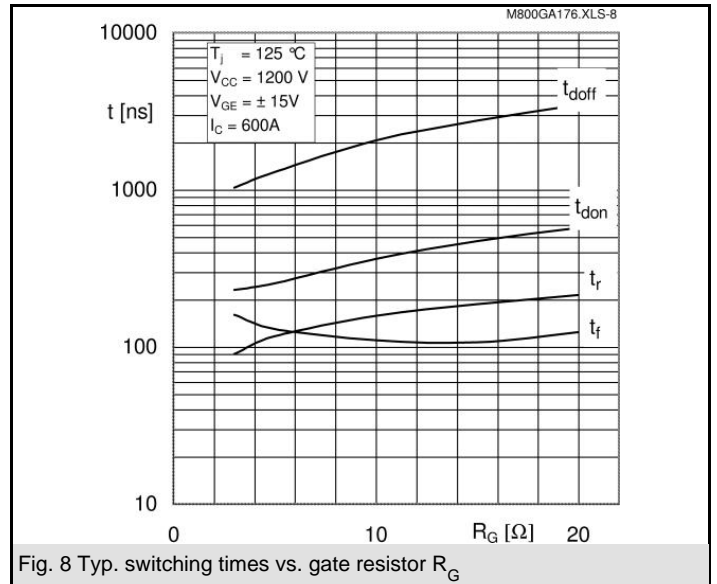
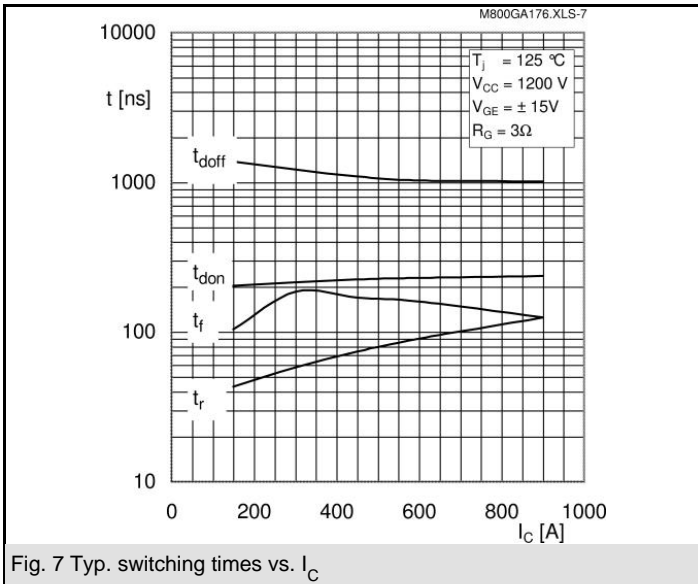
| Absolute Maximum Ratings | | $T_c = 25$ °C, unless otherwise specified | |
|--------------------------|-------------------------------------|---|-------|
| Symbol | Conditions | Values | Units |
| IGBT | | | |
| V_{CES} | | 1700 | V |
| I_C | $T_c = 25$ (80) °C | 830 (590) | A |
| I_{CRM} | $t_p = 1$ 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 | $T_c = 25$ (80) °C | 630 (440) | A |
| I_{FRM} | $t_p = 1$ ms | 1200 | A |
| I_{FSM} | $t_p = 10$ ms; sin.; $T_j = 150$ °C | 3600 | A |

| Characteristics | | $T_c = 25$ °C, unless otherwise specified | | | |
|--------------------------------|---|---|-------------|------------|-------|
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}$; $I_C = 24$ mA | 5,2 | 5,8 | 6,4 | V |
| I_{CES} | $V_{GE} = 0$; $V_{CE} = V_{CES}$; $T_j = 25$ (125) °C | | 0,2 | 0,6 | 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 | | 1,7 (2,5) | 2,1 | mΩ |
| $V_{CE(sat)}$ | $I_{Cnom} = 600$ A; $V_{GE} = 15$ V; chip level | | 2 (2,45) | 2,45 (2,9) | V |
| C_{ies} | under following conditions | | 53 | | nF |
| C_{oes} | $V_{GE} = 0$; $V_{CE} = 25$ V; $f = 1$ MHz | | 3,5 | | nF |
| C_{res} | | | 2,5 | | nF |
| L_{CE} | | | | 20 | nH |
| $R_{CC'+EE'}$ | res., terminal-chip $T_c = 25$ (125) °C | | 0,18 (0,22) | | mΩ |
| $t_{d(on)}$ | $V_{CC} = 1200$ V; $I_{Cnom} = 600$ A | | 230 | | ns |
| t_r | $R_{Gon} = R_{Goff} = 3$ Ω; $T_j = 125$ °C | | 90 | | ns |
| $t_{d(off)}$ | $V_{GE} = \pm 15$ V | | 1030 | | ns |
| t_f | | | 160 | | ns |
| $E_{on} (E_{off})$ | | | 335 (245) | | mJ |
| Inverse diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 600$ A; $V_{GE} = 0$ V; $T_j = 25$ (125) | | 1,6 (1,6) | 1,9 | V |
| $V_{(TO)}$ | $T_j = 25$ (125) °C | | 1,1 | 1,3 | V |
| r_T | $T_j = 25$ (125) °C | | 0,83 | 1 | mΩ |
| I_{RRM} | $I_{Fnom} = 600$ A; $T_j = 25$ (125) °C | | (650) | | A |
| Q_{rr} | $di/dt = 6400$ A/μs | | (230) | | μC |
| E_{rr} | $V_{GE} = 0$ V | | (155) | | mJ |
| Thermal characteristics | | | | | |
| $R_{th(j-c)}$ | per IGBT | | | 0,04 | K/W |
| $R_{th(j-c)D}$ | per Inverse Diode | | | 0,07 | K/W |
| $R_{th(c-s)}$ | per module | | | 0,038 | K/W |
| Mechanical data | | | | | |
| M_s | to heatsink M6 | 3 | | 5 | Nm |
| M_t | to terminals M6, M4 | 2,5 | | 5 | Nm |
| w | | | | 330 | g |

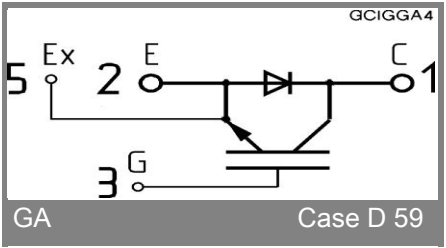
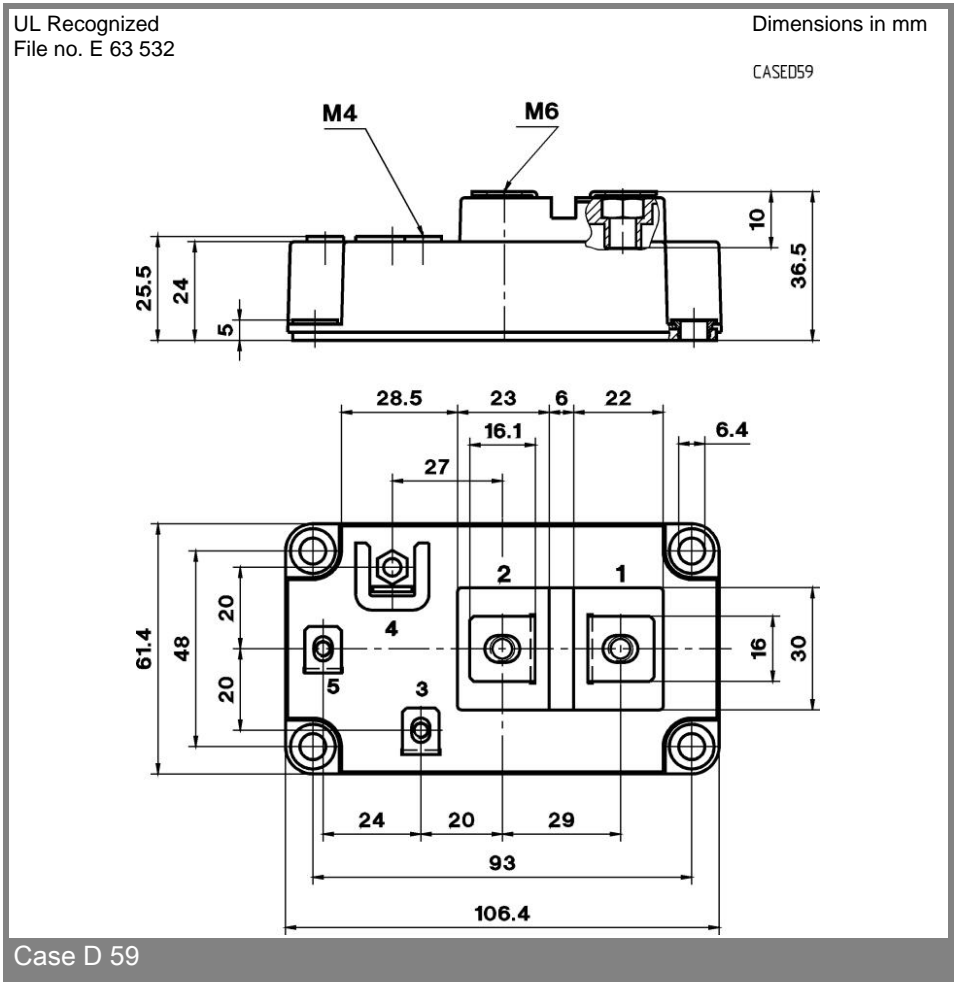
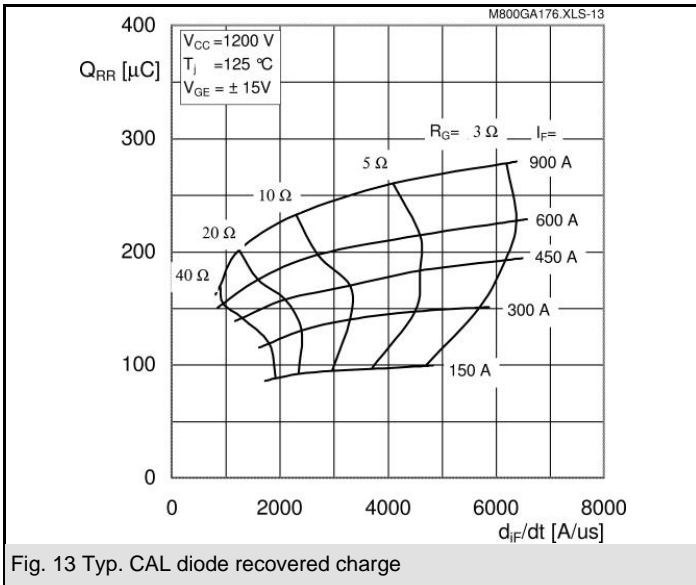


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This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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