

SEMITRANS® 6

Superfast NPT-IGBT Module

SKM 100GD063DL

Features

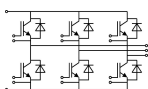
- Si structure (NPT IGBT)
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

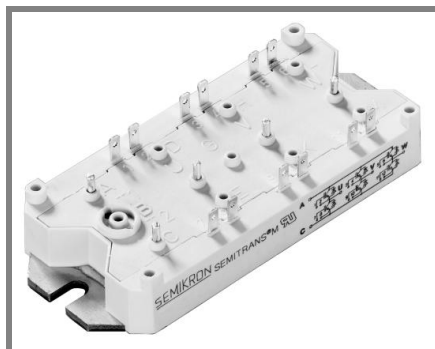
- Switched mode power supplies
- Three phase inverters for AC motor speed control
- For $f_{sw} > 10$ kHz

| Absolute Maximum Ratings | | $T_{case} = 25^\circ\text{C}$, unless otherwise specified | | |
|--------------------------|---|--|------------------|---|
| Symbol | Conditions | Values | Units | |
| IGBT | | | | |
| V_{CES} | $T_j = 25^\circ\text{C}$ | 600 | V | |
| I_C | $T_j = 150^\circ\text{C}$ | $T_c = 25^\circ\text{C}$ | 130 | A |
| | | $T_c = 80^\circ\text{C}$ | 95 | A |
| I_{CRM} | $I_{CRM} = 2 \times I_{Cnom}$ | 200 | A | |
| V_{GES} | | ± 20 | V | |
| t_{psc} | $V_{CC} = 300\text{ V}; V_{GE} \leq 20\text{ V}; T_j = 125^\circ\text{C}$ $V_{CES} < 600\text{ V}$ | 10 | μs | |
| Inverse Diode | | | | |
| I_F | $T_j = 150^\circ\text{C}$ | $T_c = 25^\circ\text{C}$ | 100 | A |
| | | $T_c = 80^\circ\text{C}$ | 75 | A |
| I_{FRM} | $I_{FRM} = 2 \times I_{Fnom}$ | 200 | A | |
| I_{FSM} | $t_p = 10\text{ ms}; \text{sin.}$ | $T_j = 150^\circ\text{C}$ | 720 | A |
| Module | | | | |
| $I_{t(RMS)}$ | | | A | |
| T_{vj} | | - 40 ... +150 | $^\circ\text{C}$ | |
| T_{stg} | | - 40 ... +125 | $^\circ\text{C}$ | |
| V_{isol} | AC, 1 min. | 2500 | V | |

| Characteristics | | $T_{case} = 25^\circ\text{C}$, unless otherwise specified | | | | |
|-----------------|---|--|--------------------------------------|-----------------------------------|------------------|---|
| Symbol | Conditions | min. | typ. | max. | Units | |
| IGBT | | | | | | |
| $V_{GE(th)}$ | $V_{GE} = V_{CE}, I_C = 3\text{ mA}$ | 4,5 | 5,5 | 6,5 | V | |
| I_{CES} | $V_{GE} = 0\text{ V}, V_{CE} = V_{CES}$ | | $T_j = 25^\circ\text{C}$ 0,15 | $T_j = 125^\circ\text{C}$ 0,45 | mA | |
| V_{CE0} | | | $T_j = 25^\circ\text{C}$ | 1,05 | V | |
| | | | $T_j = 125^\circ\text{C}$ | 1 | V | |
| r_{CE} | $V_{GE} = 15\text{ V}$ | | $T_j = 25^\circ\text{C}$ | 10,5 | $\text{m}\Omega$ | |
| | | | $T_j = 125^\circ\text{C}$ | 14 | $\text{m}\Omega$ | |
| $V_{CE(sat)}$ | $I_{Cnom} = 100\text{ A}, V_{GE} = 15\text{ V}$ | | $T_j = 25^\circ\text{C}_{chiplev.}$ | 2,1 | 2,5 | V |
| | | | $T_j = 125^\circ\text{C}_{chiplev.}$ | 2,4 | 2,8 | V |
| C_{ies} | $V_{CE} = 25, V_{GE} = 0\text{ V}$ | $f = 1\text{ MHz}$ | | 5,6 | nF | |
| C_{oes} | | | | 0,6 | nF | |
| C_{res} | | | | 0,4 | nF | |
| Q_G | $V_{GE} = 0\text{ V} \dots 15\text{ V}$ | | 240 | | nC | |
| $t_{d(on)}$ | $R_{Gon} = 10\ \Omega$ | $V_{CC} = 300\text{ V}$ $I_C = 100\text{ A}$ | | 50 | ns | |
| t_r | | | | 40 | ns | |
| E_{on} | | | | 4 | mJ | |
| $t_{d(off)}$ | $R_{Goff} = 10\ \Omega$ | $T_j = 125^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$ | | 300 | ns | |
| t_f | | | | 35 | ns | |
| E_{off} | | | | 3 | mJ | |
| $R_{th(j-c)}$ | per IGBT | | | 0,27 | K/W | |



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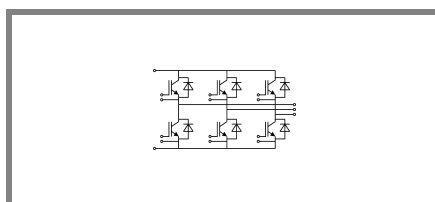
Typical Applications

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- Three phase inverters for AC motor speed control
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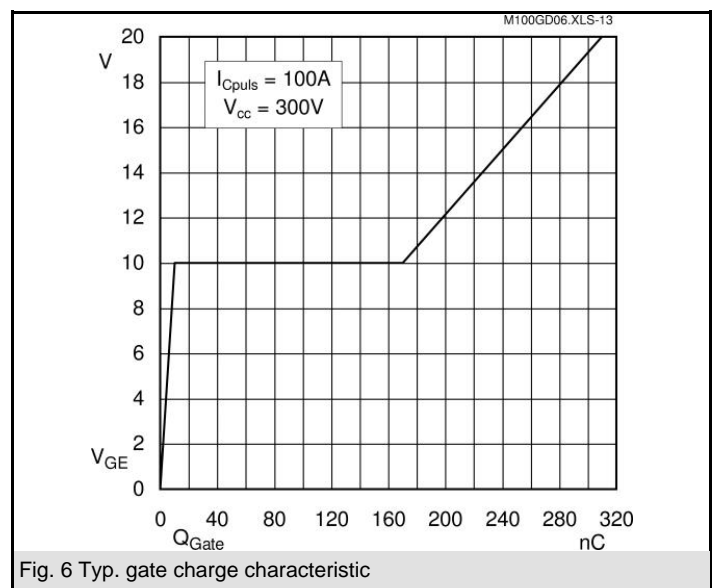
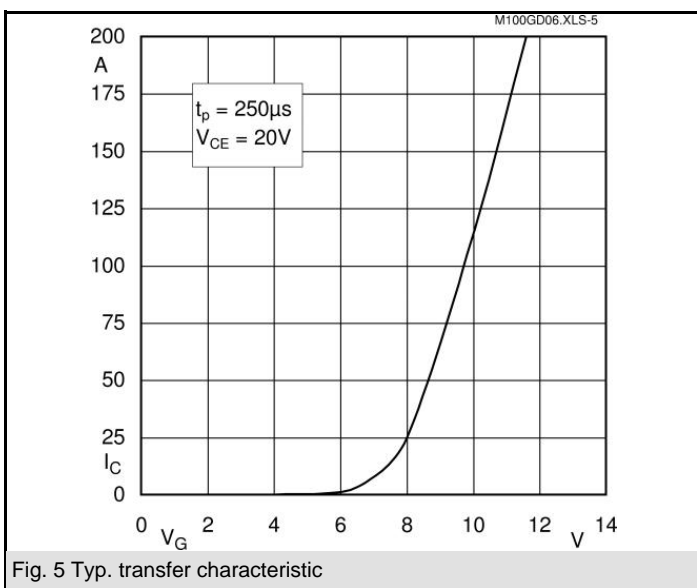
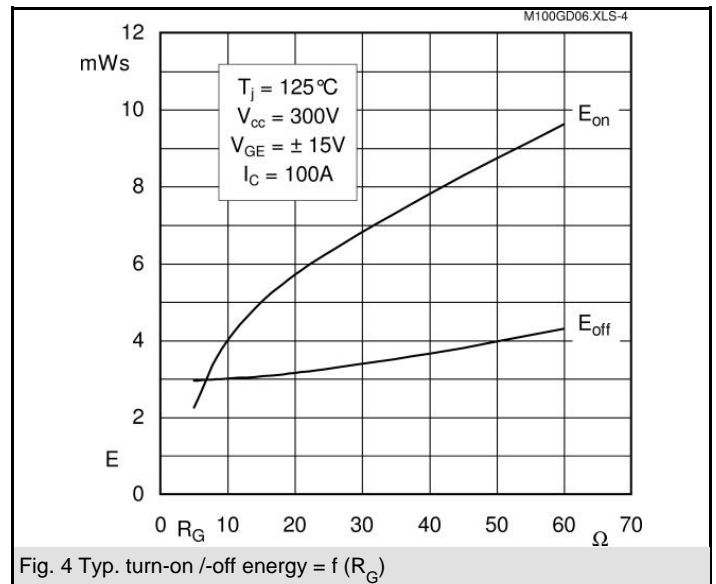
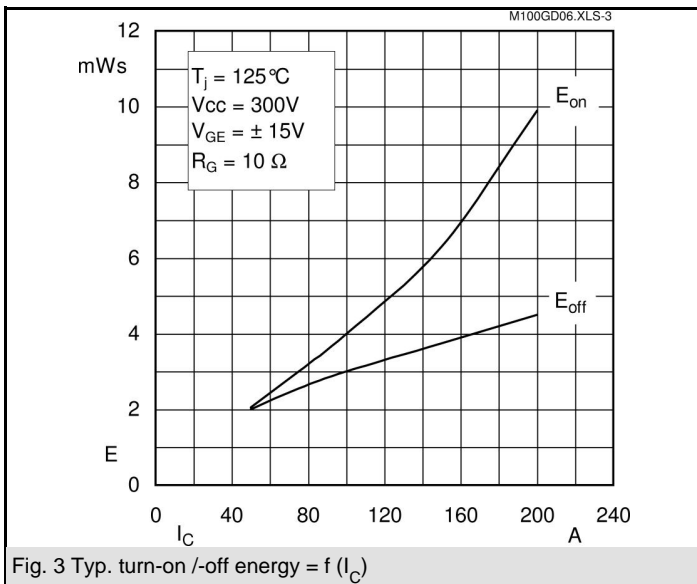
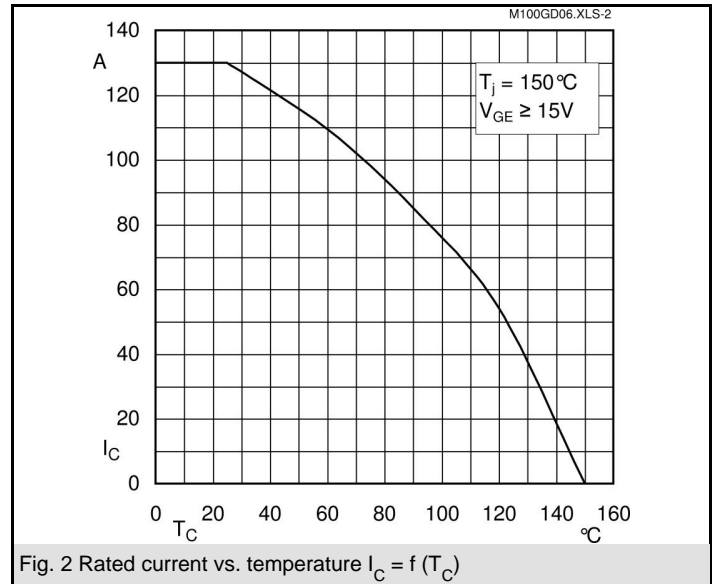
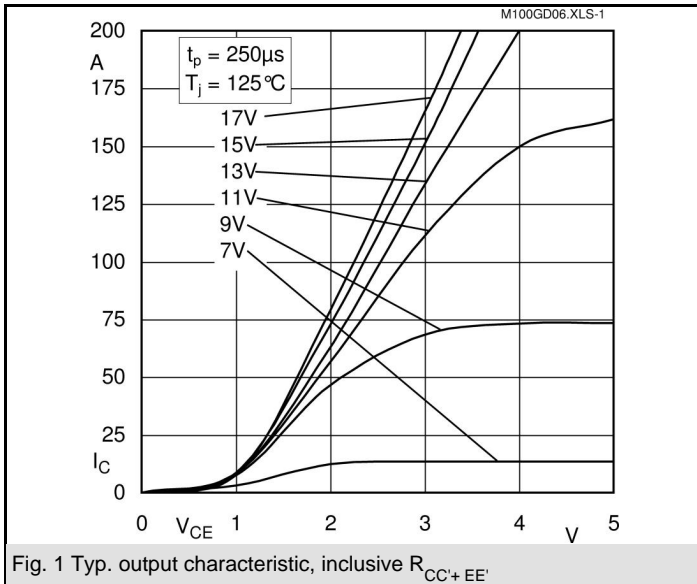
| Characteristics | | min. | typ. | max. | Units |
|----------------------|------------------------------------|------|------|------|-------|
| Inverse Diode | | | | | |
| $V_F = V_{EC}$ | $I_{Fnom} = 100$ A; $V_{GE} = 0$ V | | 1,55 | 1,9 | V |
| | $T_j = 25$ °C _{chiplev.} | | | | V |
| | $T_j = 125$ °C _{chiplev.} | | 1,55 | | V |
| V_{F0} | | | | 0,9 | V |
| | $T_j = 25$ °C | | | | V |
| r_F | | | | 10 | mΩ |
| | $T_j = 25$ °C | | | | mΩ |
| I_{RRM} | $I_F = 100$ A | | 8 | | A |
| Q_{rr} | $di/dt = 1000$ A/μs | | 44 | | μC |
| E_{rr} | $V_{GE} = -15$ V; $V_{CC} = 600$ V | | 1,5 | | mJ |
| $R_{th(j-c)D}$ | per diode | | | 0,6 | K/W |
| Module | | | | | |
| L_{CE} | | | | 60 | nH |
| $R_{th(c-s)}$ | per module | | | 0,05 | K/W |
| M_s | to heat sink M5 | 4 | | 5 | Nm |
| w | | | | 175 | g |

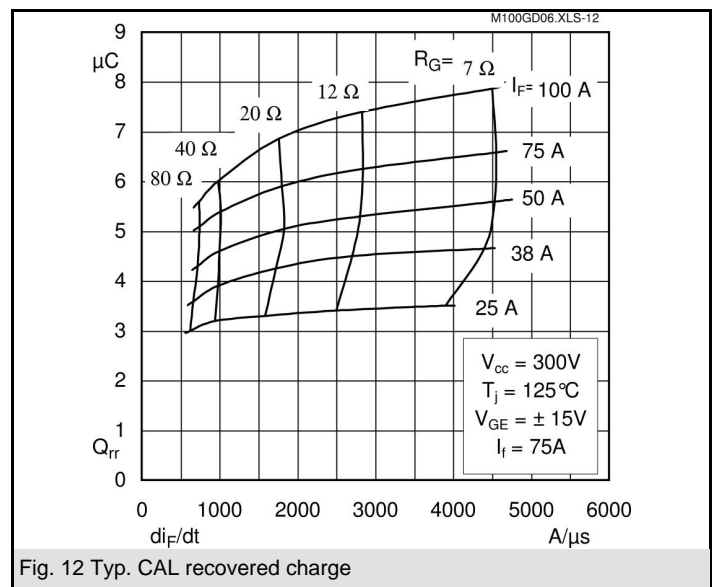
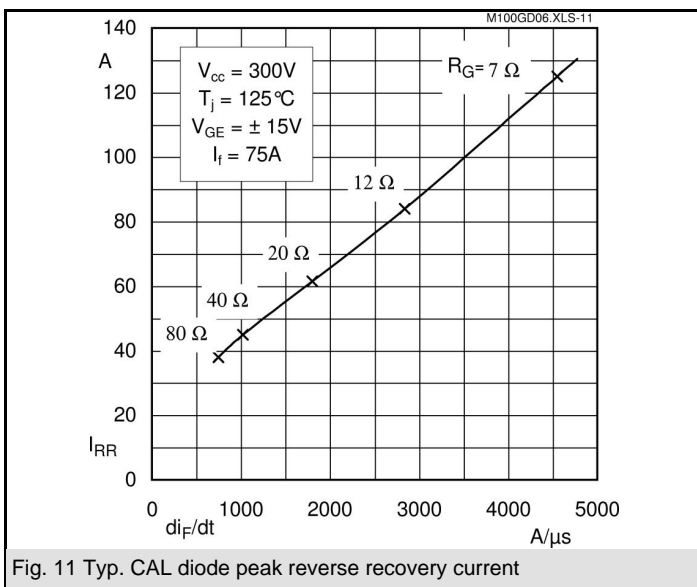
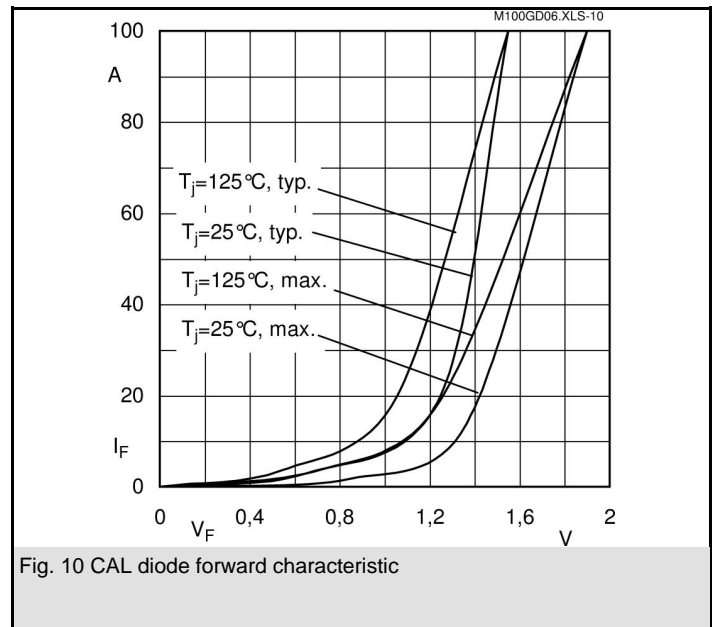
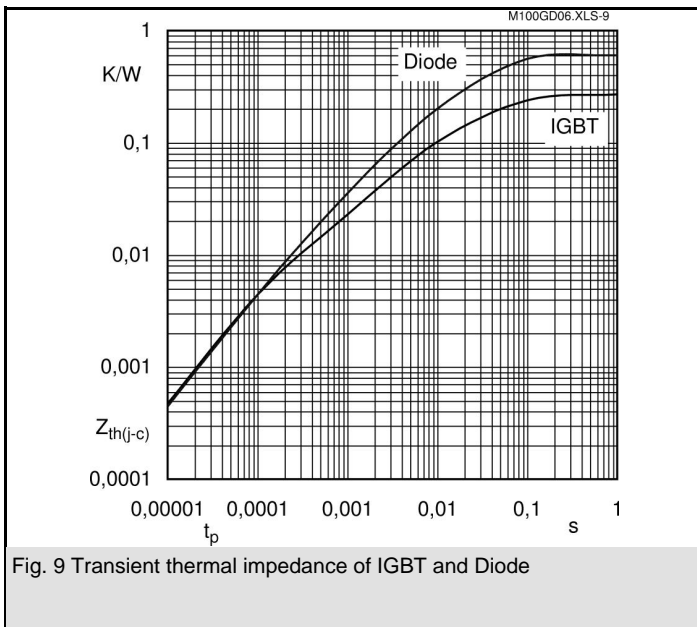
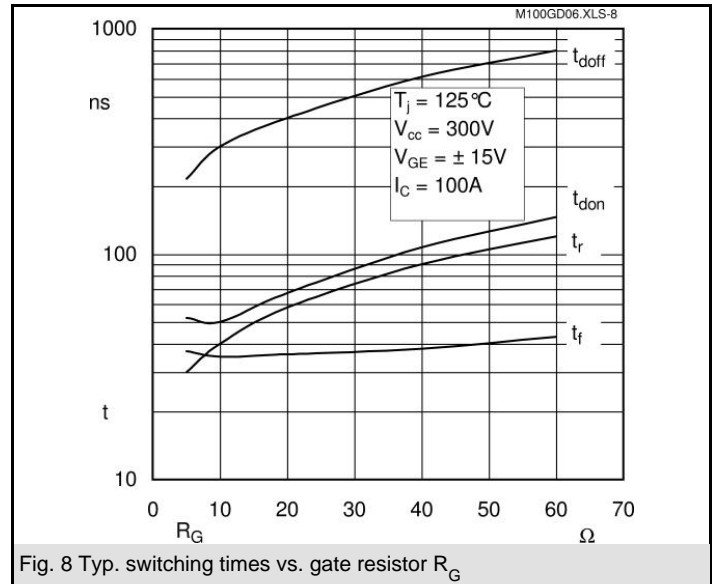
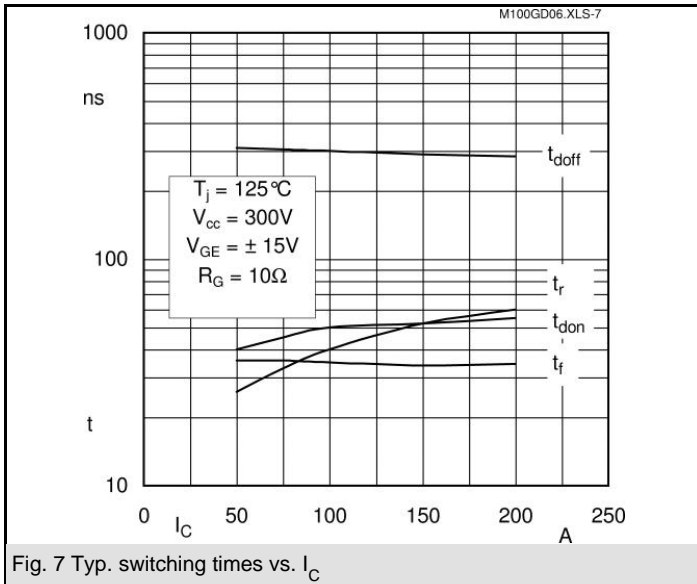
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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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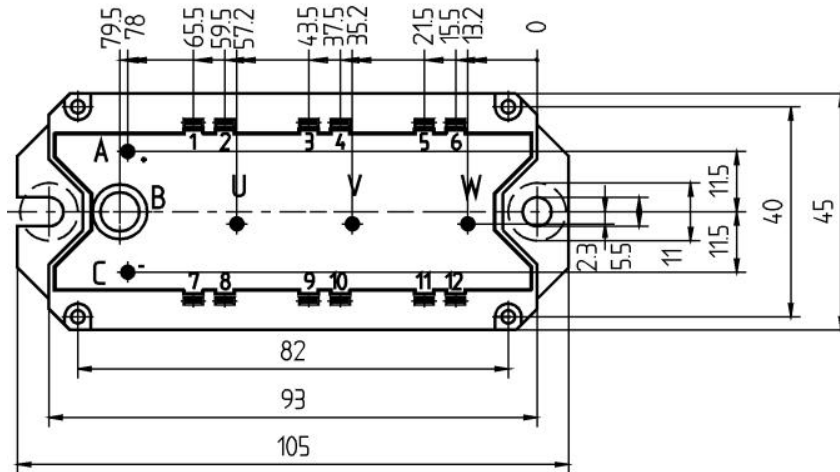
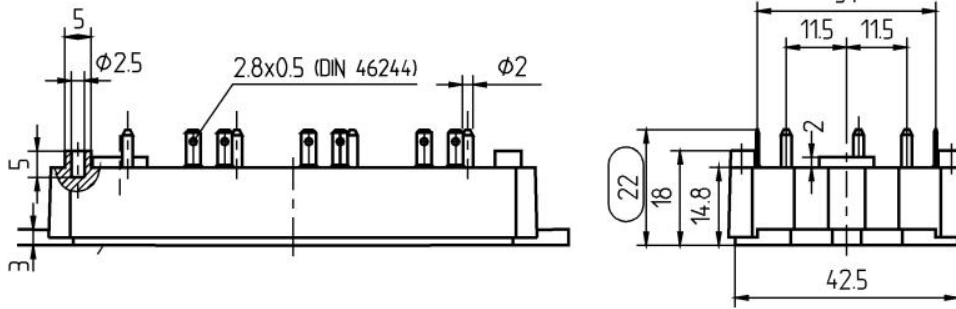


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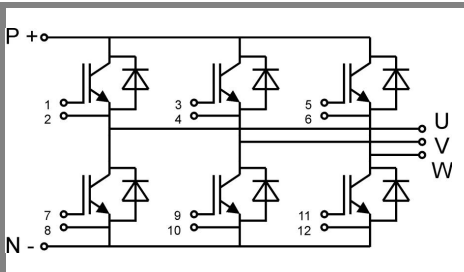
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Case 68