

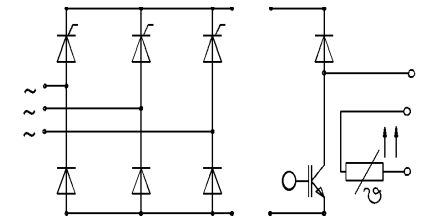
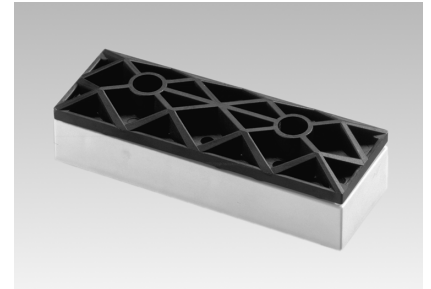
SKiiP 83 AHB 15

| Absolute Maximum Ratings | | Values | Units |
|----------------------------------|---|----------------|------------------|
| Symbol | Conditions ¹⁾ | | |
| Bridge Rectifier | | | |
| V_{RRM} | | 1500 | V |
| I_D | $T_{heatsink} = 80\text{ °C}$ | 125 | A |
| I_{FSM}/I_{TSM} | $t_p = 10\text{ ms}; \sin. 180\text{ °C}, T_j = 25\text{ °C}$ | 1000 | A |
| $I_{\Delta t}$ | $t_p = 10\text{ ms}; \sin. 180\text{ °C}, T_j = 25\text{ °C}$ | 5000 | A ² s |
| IGBT Chopper | | | |
| V_{CES} | | 1200 | V |
| V_{GES} | | ± 20 | V |
| I_C | $T_{heatsink} = 25 / 80\text{ °C}$ | 95 / 65 | A |
| I_{CM} | $t_p < 1\text{ ms}; T_{heatsink} = 25 / 80\text{ °C}$ | 190 / 130 | A |
| Freewheeling Diode ²⁾ | | | |
| V_{RRM} | | 1200 | V |
| I_F | $T_{heatsink} = 25 / 80\text{ °C}$ | 38 / 26 | A |
| I_{FM} | $t_p < 1\text{ ms}; T_{heatsink} = 25 / 80\text{ °C}$ | 76 / 52 | A |
| T_j | Diode & IGBT | - 40 ... + 150 | °C |
| T_j | Thyristor | - 40 ... + 125 | °C |
| T_{stg} | | - 40 ... + 125 | °C |
| V_{isol} | AC, 1 min. | 2500 | V |

| Characteristics | | min. | typ. | max. | Units |
|-----------------------|---|----------|----------|----------|-------|
| Symbol | Conditions ¹⁾ | | | | |
| Diode - Rectifier | | | | | |
| V_F | $I_F = 100\text{ A}, T_j = 125\text{ °C}$ | - | 1,15 | - | V |
| V_{TO} | $T_j = 125\text{ °C}$ | - | 0,8 | - | V |
| r_T | $T_j = 125\text{ °C}$ | - | 3,5 | - | mΩ |
| R_{thjh} | per diode | - | - | 0,7 | K/W |
| Thyristor - Rectifier | | | | | |
| V_T | $I_F = 120\text{ A}, T_j = 25\text{ °C}$ | - | - | 1,8 | V |
| $V_T (TO)$ | $T_j = 125\text{ °C}$ | - | - | 1,1 | V |
| r_T | $T_j = 125\text{ °C}$ | - | - | 5 | mΩ |
| R_{thjh} | per thyristor | - | - | 0,9 | K/W |
| I_{GD} | $T_j = 125\text{ °C}$ | 5 | - | - | mA |
| V_{GT} | $T_j = 25\text{ °C}$ | - | - | 3 | V |
| I_{GT} | | - | - | 150 | mA |
| I_H | $T_j = 25\text{ °C}$ | - | 250 | - | mA |
| I_L | | - | 600 | - | mA |
| dv/dt_{CR} | $T_j = 125\text{ °C}$ | 500 | - | - | V/μs |
| di/dt_{CR} | | - | - | 125 | A/μs |
| IGBT - Chopper | | | | | |
| V_{CEsat} | $I_C = 75\text{ A}, T_j = 25 (125)\text{ °C}$ | - | 2,5(3,1) | 3,0(3,7) | V |
| $t_{d(on)}$ | $V_{CC} = 600\text{ V}; V_{GE} = \pm 15\text{ V}$ $I_C = 75\text{ A}; T_j = 125\text{ °C}$ | - | 35 | 70 | ns |
| t_r | | - | 70 | 140 | ns |
| $t_{d(off)}$ | $R_{gon} = R_{goff} = 15\text{ Ω}$ inductive load | - | 450 | 600 | ns |
| t_f | | - | 70 | 100 | ns |
| $E_{on} + E_{off}$ | $V_{CE} = 25\text{ V}; V_{GE} = 0\text{ V}, 1\text{ MHz}$ | - | 18 | - | mJ |
| C_{ies} | | - | 5,0 | - | nF |
| R_{thjh} | | per IGBT | - | - | 0,35 |

MiniSKiiP 8 SEMIKRON integrated intelligent Power SKiiP 83 AHB 15 half controlled 3-phase bridge rectifier + IGBT braking chopper

Case M8a



UL recognized file no. E63532

- specification of temperature sensor see part A
- common characteristics see page B 16 – 4

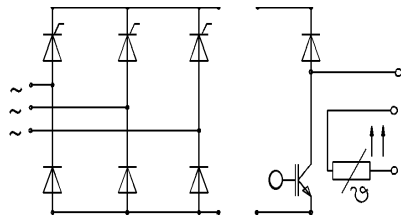
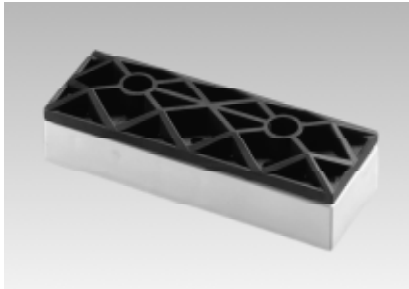
Options

- also available with uncontrolled rectifier (called 83 ANB 15)
- also available with powerful chopper, for characteristics please refer to SKiiP 83 AC 12
- also available with full controlled rectifier (called 83 ATB 15)

¹⁾ $T_{heatsink} = 25\text{ °C}$, unless otherwise specified
²⁾ CAL = Controlled Axial Lifetime Technology (soft and fast recovery)

MiniSKiiP 8
SEMIKRON integrated
intelligent Power
SKiiP 83 AHB 15
half controlled
3-phase bridge rectifier +
IGBT braking chopper

Case M8a



SKiiP 83 AHB 15

| Characteristics | | min. | typ. | max. | Units |
|------------------------------------|--|-----------|-------------|----------|---------------|
| Symbol | Conditions ¹⁾ | | | | |
| Diode ²⁾ - Freewheeling | | | | | |
| $V_F = V_{EC}$ | $I_F = 25 \text{ A}$ $T_j = 25 \text{ (125) } ^\circ\text{C}$ | – | 2,0(1,8) | 2,5(2,3) | V |
| V_{TO} | $T_j = 125 ^\circ\text{C}$ | – | 1,0 | 1,2 | V |
| r_T | $T_j = 125 ^\circ\text{C}$ | – | 32 | 44 | m Ω |
| I_{RRM} | $I_F = 25 \text{ A}; V_R = -600 \text{ V}$ $di_F/dt = -500 \text{ A}/\mu\text{s}$ $V_{GE} = 0 \text{ V}, T_j = 125 ^\circ\text{C}$ | – | 25 | – | A |
| Q_{rr} | | – | 4,5 | – | μC |
| E_{off} | | – | 1,0 | – | mJ |
| R_{thjh} | | per diode | – | – | 1,2 |
| Temperature Sensor | | | | | |
| R_{TS} | $T = 25 / 100 ^\circ\text{C}$ | | 1000 / 1670 | | Ω |
| Mechanical Data | | | | | |
| M_1 | case to heatsink, SI Units | 2,5 | – | 3,5 | Nm |
| Case | mechanical outline see pages B 16 –13 and B 16 – 14 | | M8a | | |

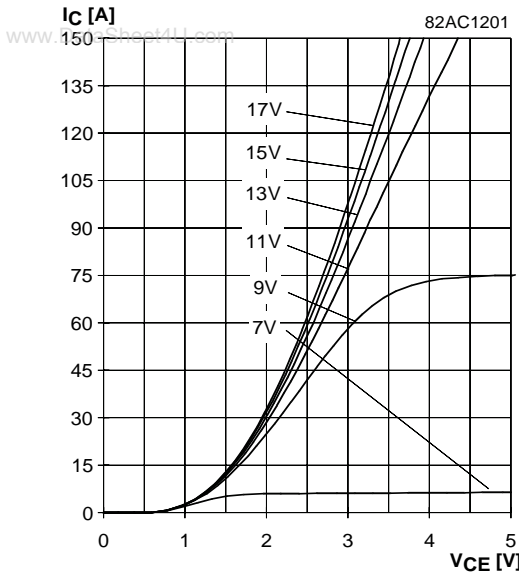


Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25 \text{ }^\circ\text{C}$

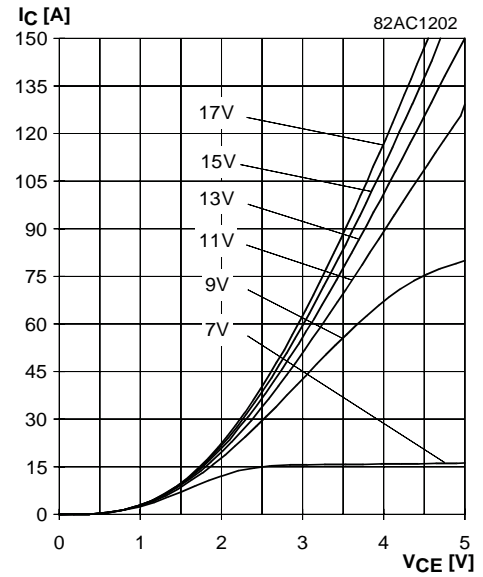


Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125 \text{ }^\circ\text{C}$

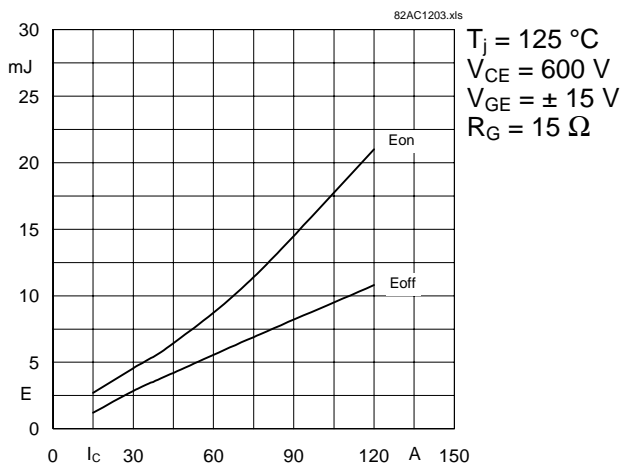


Fig. 3 Turn-on /-off energy = $f(I_c)$

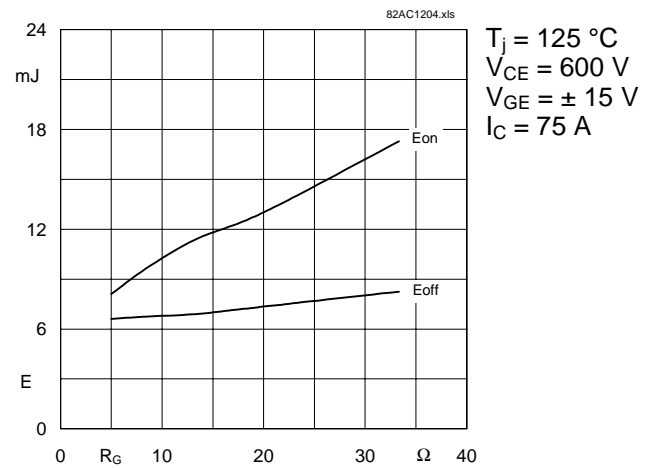


Fig. 4 Turn-on /-off energy = $f(R_G)$

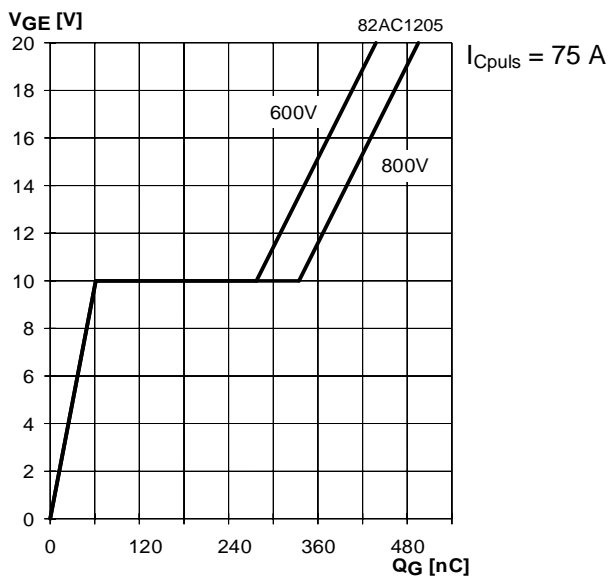


Fig. 5 Typ. gate charge characteristic

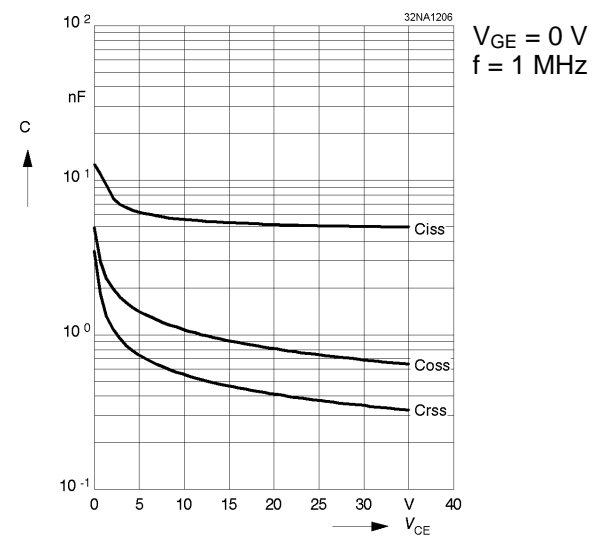


Fig. 6 Typ. capacitances vs. V_{CE}

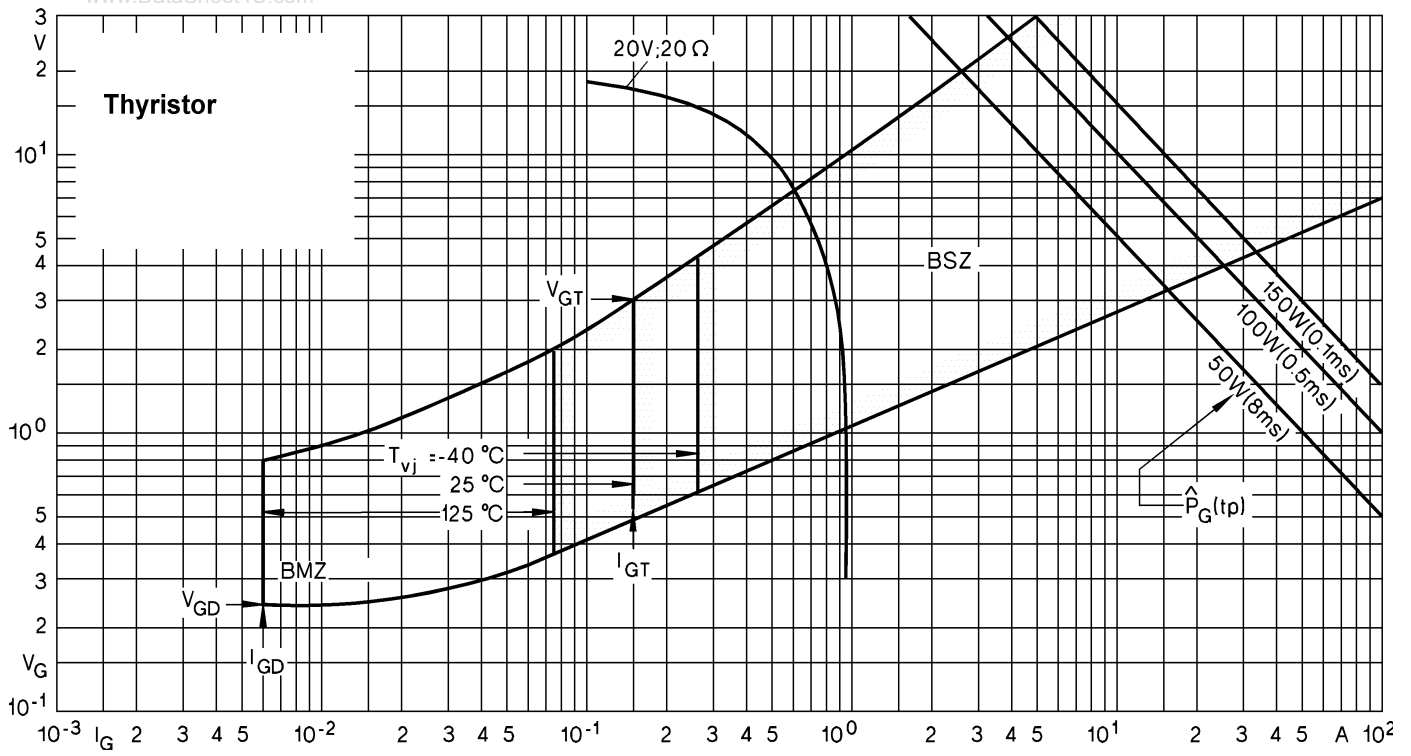


Fig. 7 Gate trigger characteristics

MiniSKiiP 1200 V

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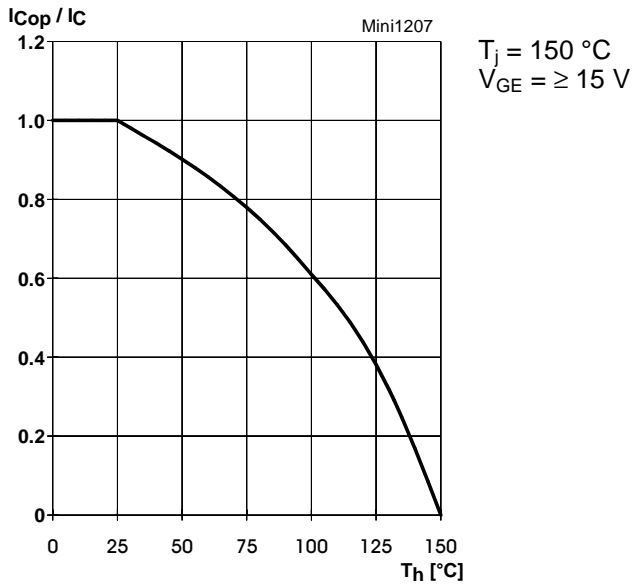


Fig. 7 Rated current of the IGBT $I_{COP} / I_C = f(T_h)$

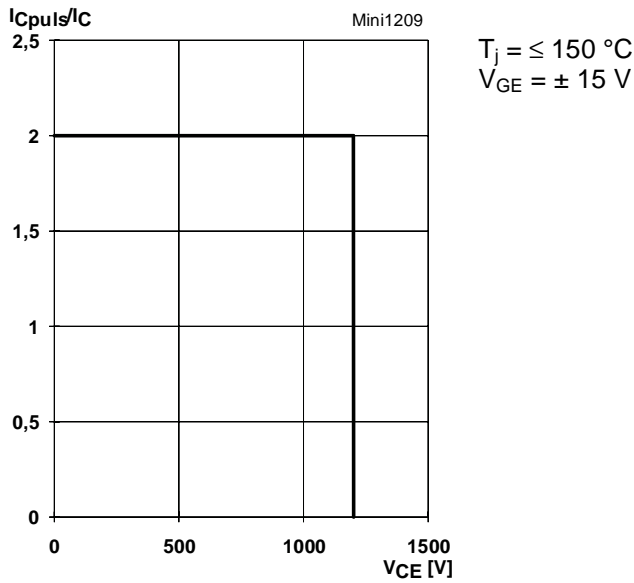


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

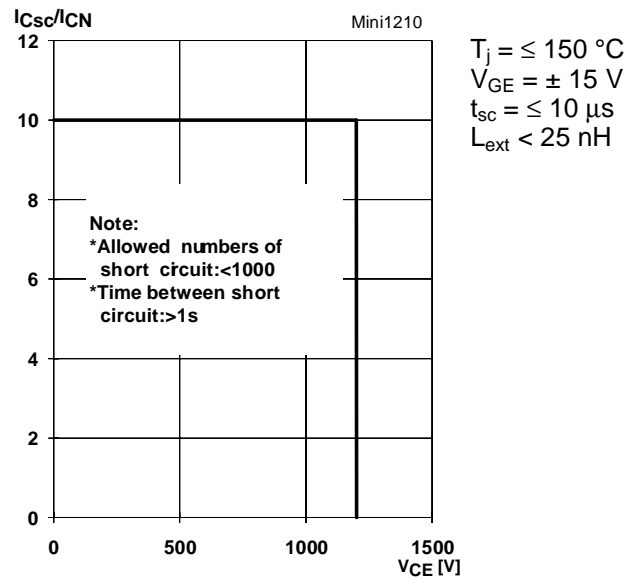


Fig. 10 Safe operating area at short circuit of the IGBT

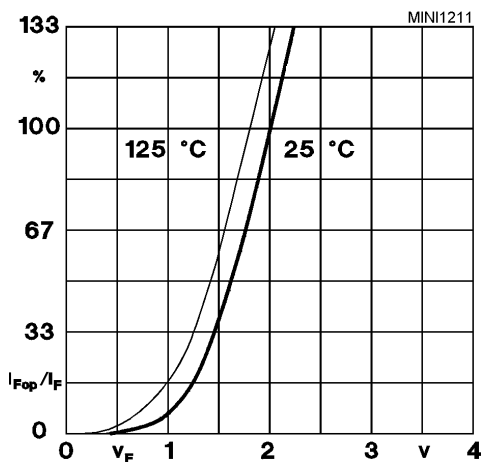


Fig. 11 Typ. freewheeling diode forward characteristic

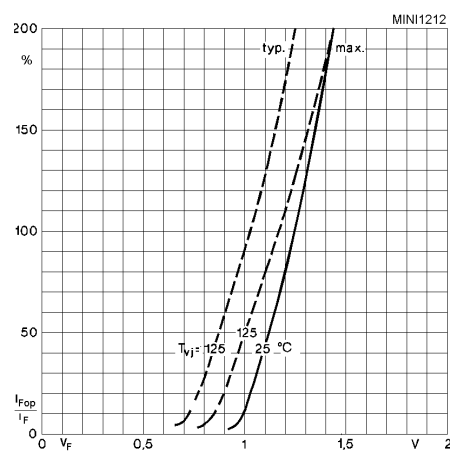


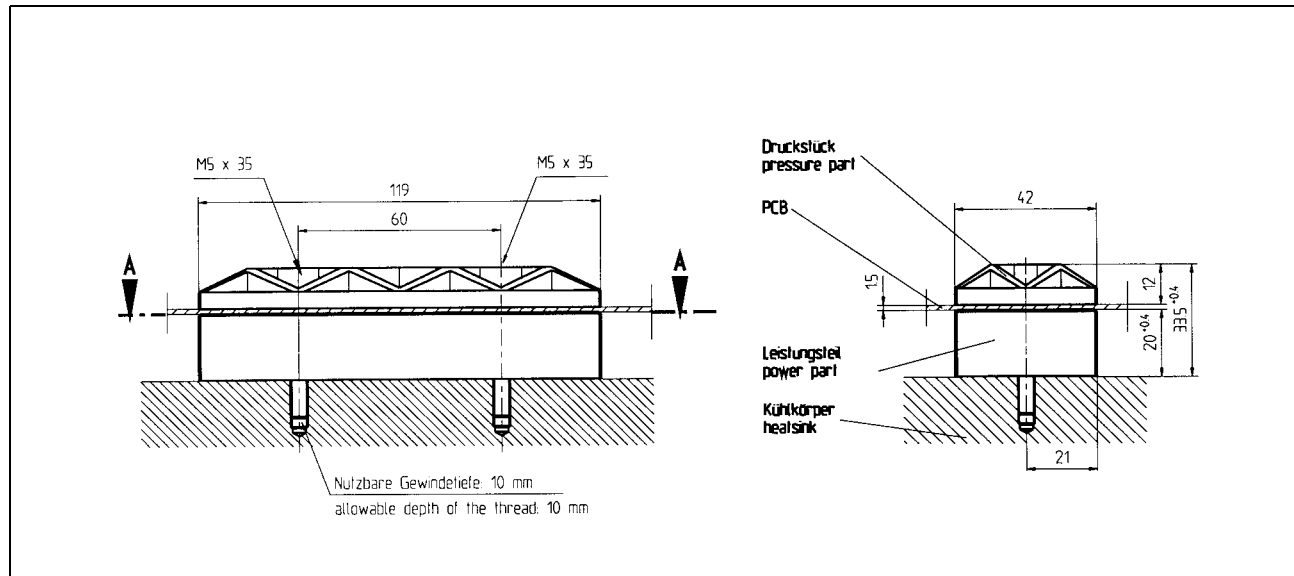
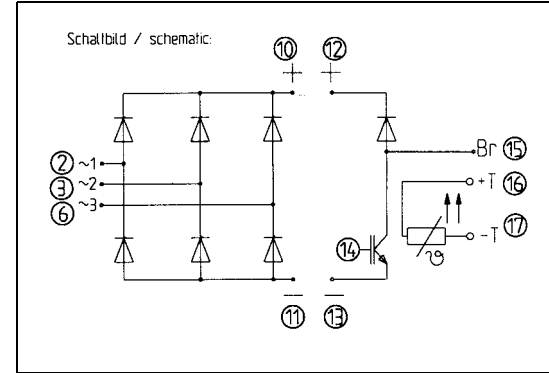
Fig. 12 Forward characteristic of the input bridge diode

MiniSKiiP 8

Input bridge part

- SKiiP 82 ANB 08
- SKiiP 83 ANB 08
- SKiiP 81 ANB 15
- SKiiP 82 ANB 15
- SKiiP 83 ANB 15
- SKiiP 83 AHB 15
- SKiiP 83 ATB 15

Circuit ANB
Case M8a

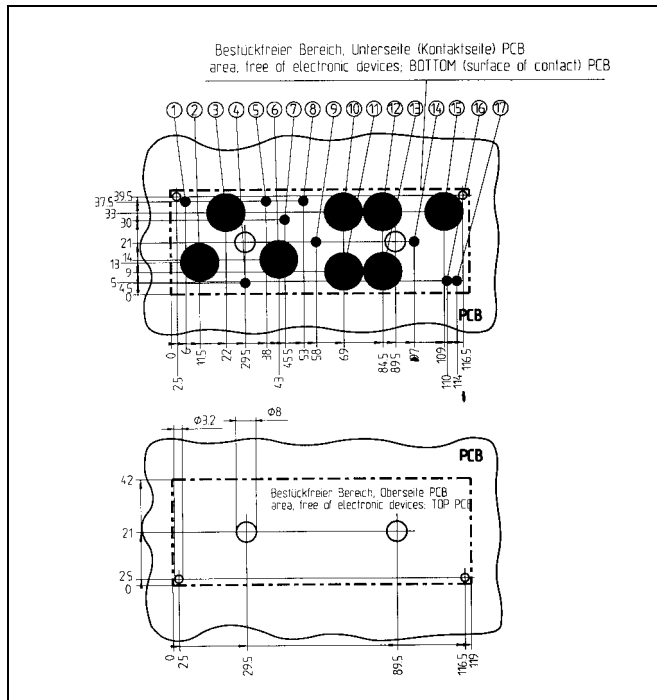


MiniSKiiP 8

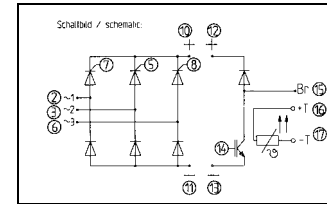
Input bridge part

- SKiiP 82 ANB 08
- SKiiP 83 ANB 08
- SKiiP 81 ANB 15
- SKiiP 82 ANB 15
- SKiiP 83 ANB 15
- SKiiP 83 AHB 15
- SKiiP 83 ATB 15

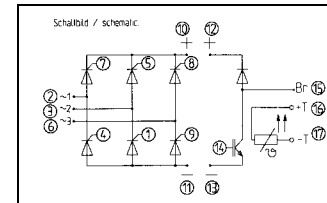
Case M8a
Layout and connections for the customer's printed circuit board



Circuit AHB



Circuit ATB



| Pin | Connection | | |
|-----|------------------|--------------------|----------------------|
| | Diode bridge ANB | Halfcontrolled AHB | Thyristor bridge ATB |
| 1 | reserved | reserved | G2 Bot |
| 2 | ~ 1 | ~ 1 | ~ 1 |
| 3 | ~ 2 | ~ 2 | ~ 2 |
| 4 | reserved | reserved | G1 Bot |
| 5 | reserved | G2 Top | G2 Top |
| 6 | ~ 3 | ~ 3 | ~ 3 |
| 7 | reserved | G1 Top | G1 Top |
| 8 | reserved | G3 Top | G3 Top |
| 9 | reserved | reserved | G3 Bot |
| 10 | + | + | + |
| 11 | - | - | - |
| 12 | + | + | + |
| 13 | - | - | - |
| 14 | Gate Br | Gate Br | Gate Br |
| 15 | Br | Br | Br |
| 16 | T + | T + | T + |
| 17 | T - | T - | T - |