

SKiiP 83 AHB 15

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
Bridge Rectifier			
V _{RRM}	T _{heatsink} = 80 °C t _p = 10 ms; sin. 180 °C, T _j = 25 °C t _p = 10 ms; sin. 180 °C, T _j = 25 °C	1500	V
I _D		125	A
I _{FSM} /I _{TSM}		1000	A
I _{2t}		5000	A ² S
IGBT Chopper			
V _{CES}	T _{heatsink} = 25 / 80 °C t _p < 1 ms; T _{heatsink} = 25 / 80 °C	1200	V
V _{GES}		± 20	V
I _C		95 / 65	A
I _{CM}		190 / 130	A
Freewheeling Diode ²⁾			
V _{RRM}	T _{heatsink} = 25 / 80 °C t _p < 1 ms; T _{heatsink} = 25 / 80 °C	1200	V
I _F		38 / 26	A
I _{FM}		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					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
Diode - Rectifier					
V _F	I _F = 100 A T _j = 125 °C	–	1,15	–	V
V _{TO}	T _j = 125 °C	–	0,8	–	V
r _T	T _j = 125 °C	–	3,5	–	mΩ
R _{thjh}	per diode	–	–	0,7	K/W
Thyristor - Rectifier					
V _T	I _F = 120 A T _j = 25 °C	–	–	1,8	V
V _T (TO)	T _j = 125 °C	–	–	1,1	V
r _T	T _j = 125 °C	–	–	5	mΩ
R _{thjh}	per thyristor	–	–	0,9	K/W
I _{GD}	T _j = 125 °C	5	–	–	mA
V _{GT}	} T _j = 25 °C	–	–	3	V
I _{GT}		–	–	150	mA
I _H	} T _j = 25 °C	–	250	–	mA
I _L		–	600	–	mA
dv/dt _{CR}	} T _j = 125 °C	500	–	–	V/μs
di/dt _{CR}		–	–	125	A/μs
IGBT - Chopper					
V _{CEsat}	I _C = 75 A T _j = 25 (125) °C	–	2,5(3,1)	3,0(3,7)	V
t _{d(on)}	} V _{CC} = 600 V; V _{GE} = ± 15 V I _C = 75 A; T _j = 125 °C R _{gon} = R _{goff} = 15 Ω inductive load	–	35	70	ns
t _r		–	70	140	ns
t _{d(off)}		–	450	600	ns
t _f		–	70	100	ns
E _{on} + E _{off}		–	18	–	mJ
C _{ies}	V _{CE} = 25 V; V _{GE} = 0 V, 1 MHz	–	5,0	–	nF
R _{thjh}	per IGBT	–	–	0,35	K/W

MiniSKiiP 8

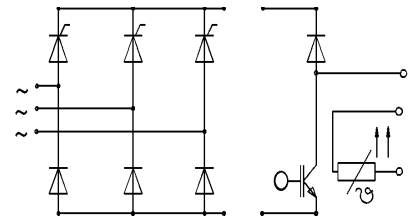
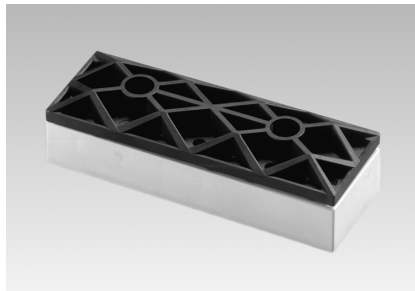
SEMIKRON integrated intelligent Power

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

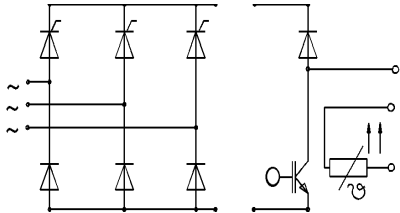
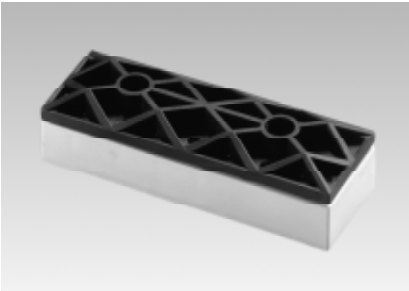
- also available with uncontrolled rectifier (called 83 ANB 15)
- also available with powerful chopper, for characteristics please refer to SKiiP 83 AC 12
- also available with full controlled rectifier (called 83 ATB 15)

¹⁾ T_{heatsink} = 25 °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					
Symbol	Conditions ¹⁾	min.	typ.	max.	Units
Diode ²⁾ - Freewheeling					
V _F = V _{EC}	I _F = 25 A T _j = 25 (125) °C	–	2,0(1,8)	2,5(2,3)	V
V _{TO}	T _j = 125 °C	–	1,0	1,2	V
r _T	T _j = 125 °C	–	32	44	mΩ
I _{R_{RRM}}	I _F = 25 A; V _R = – 600 V di _F /dt = – 500 A/μs V _{GE} = 0 V, T _j = 125 °C	–	25	–	A
Q _{rr}		–	4,5	–	μC
E _{off}		–	1,0	–	mJ
R _{thjh}		–	–	1,2	K/W
Temperature Sensor					
R _{TS}	T = 25 / 100 °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			

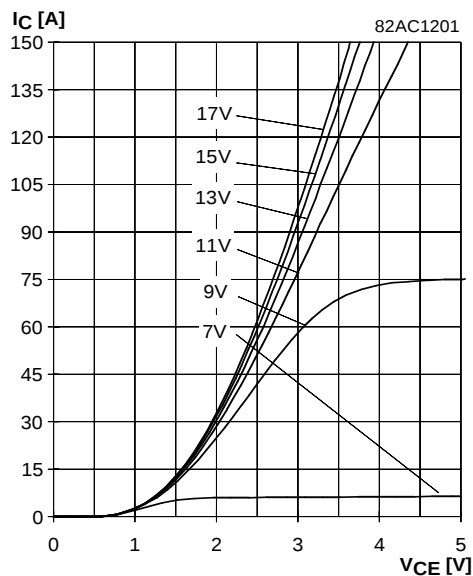


Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25^\circ C$

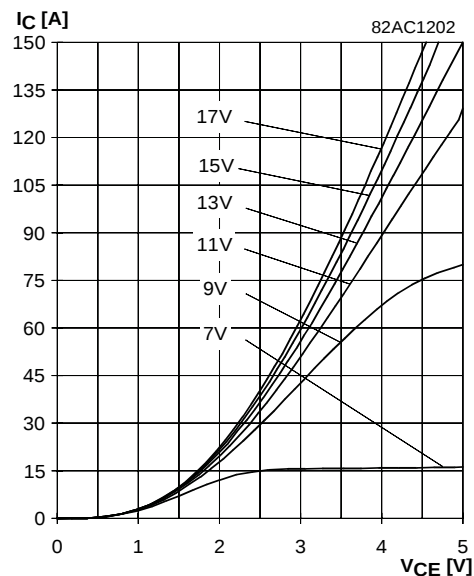


Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125^\circ C$

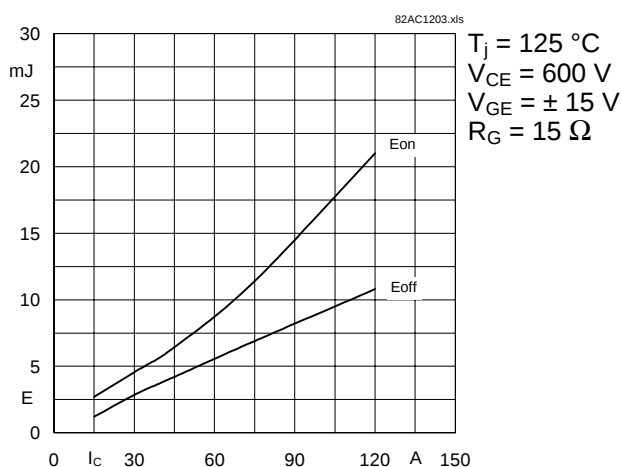


Fig. 3 Turn-on /-off energy = $f(I_C)$

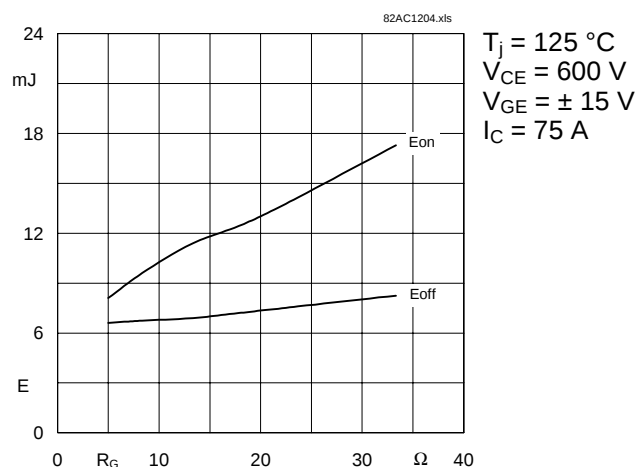


Fig. 4 Turn-on /-off energy = $f(R_G)$

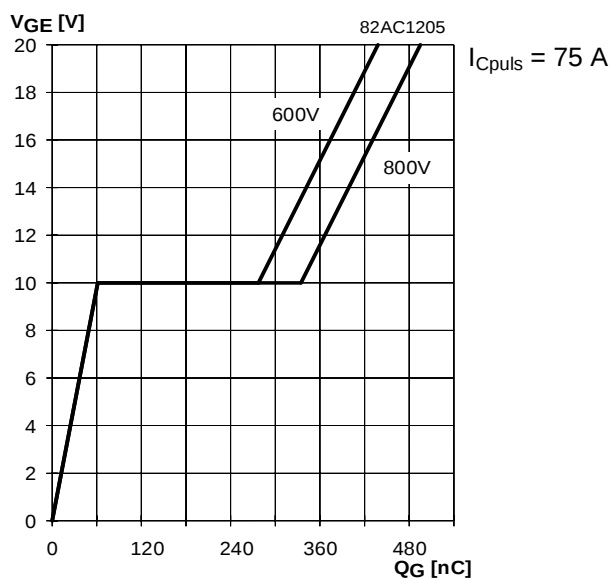


Fig. 5 Typ. gate charge characteristic

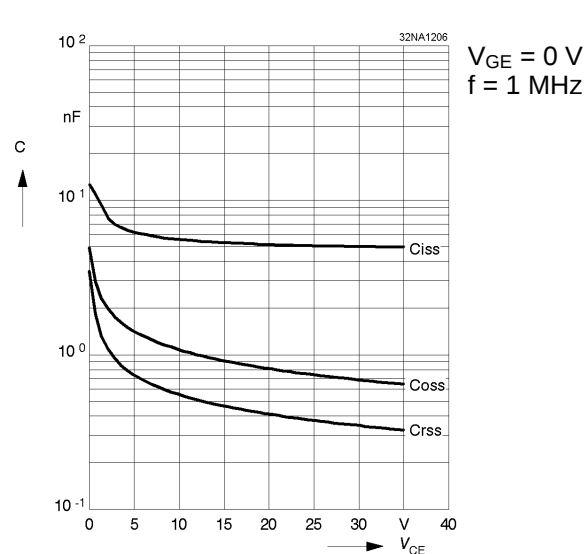


Fig. 6 Typ. capacitances vs. V_{CE}

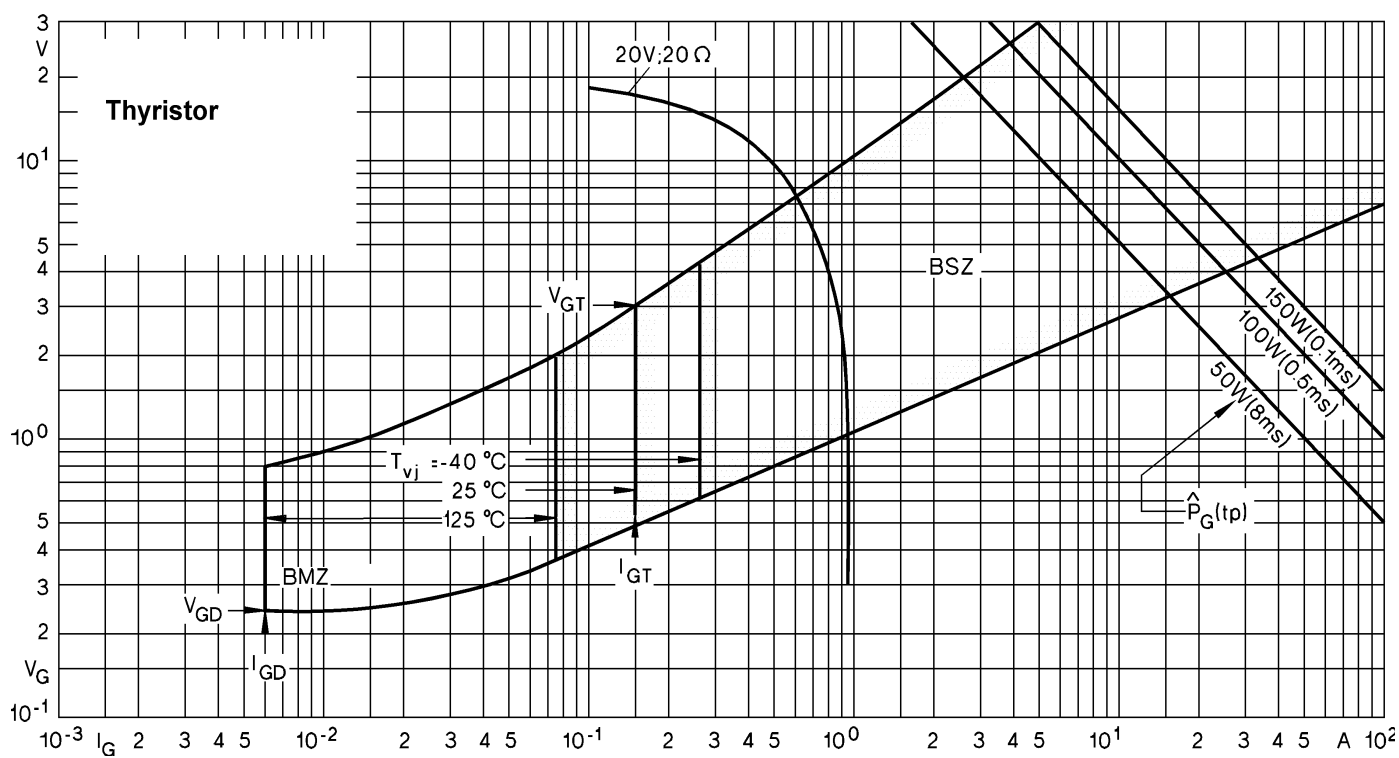


Fig. 7 Gate trigger characteristics

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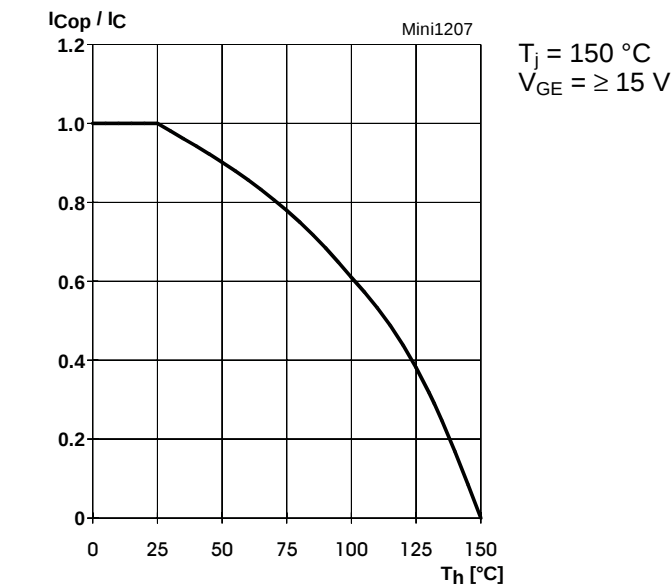


Fig. 7 Rated current of the IGBT $I_{COP} / I_C = f(T_h)$

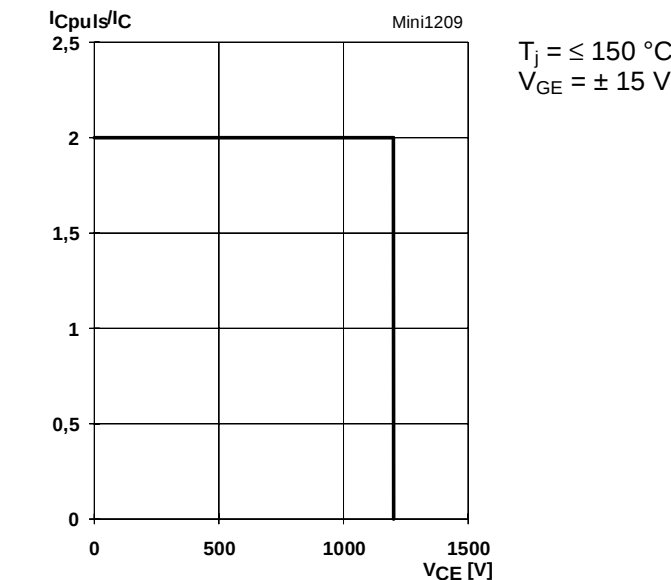


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

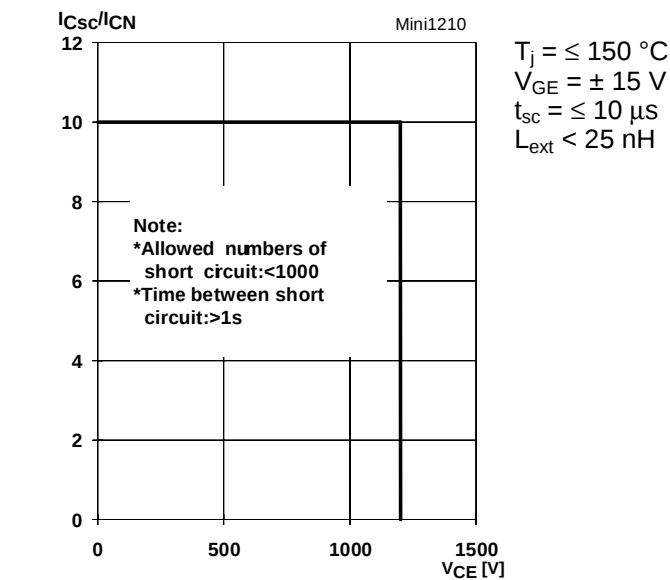


Fig. 10 Safe operating area at short circuit of the IGBT

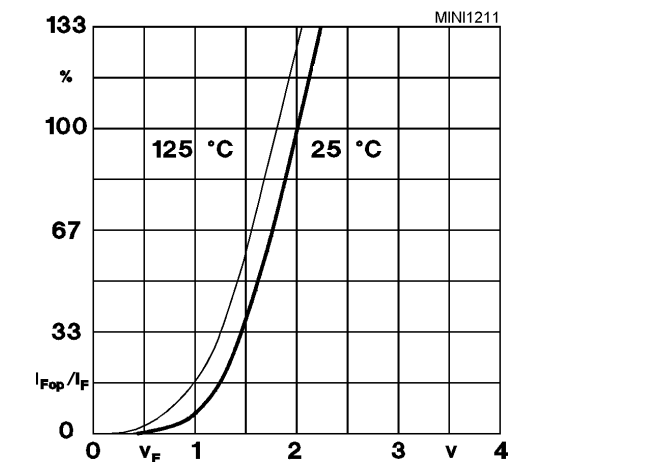


Fig. 11 Typ. freewheeling diode forward characteristic

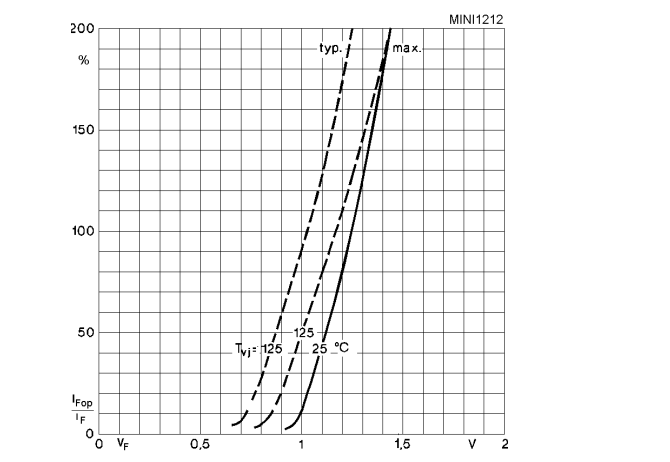


Fig. 12 Forward characteristic of the input bridge diode

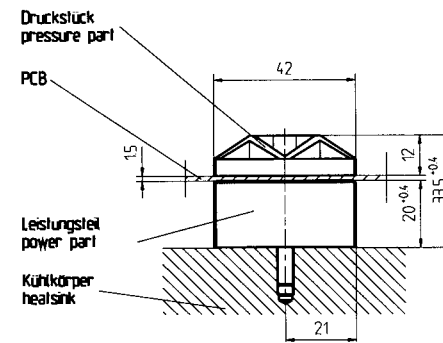
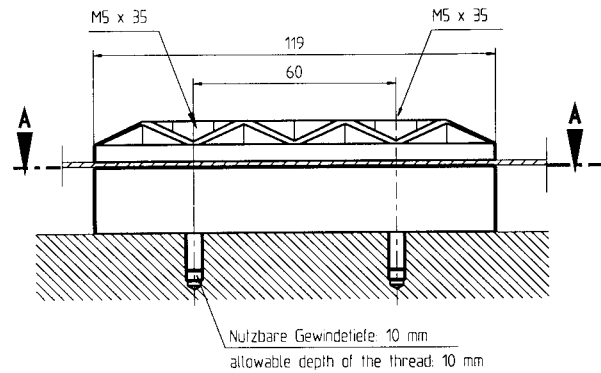
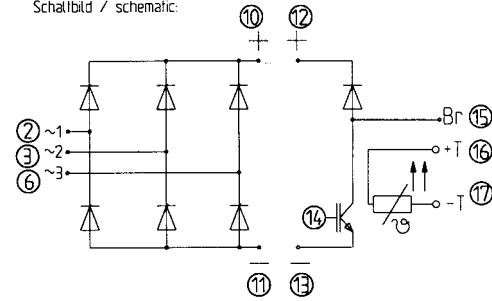
MiniSKiiP 8

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

Schalbild / schematic:



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Input bridge part

- SKiiP 82 ANB 08

SKiiP 83 ANB 08

SKiiP 81 ANB 15

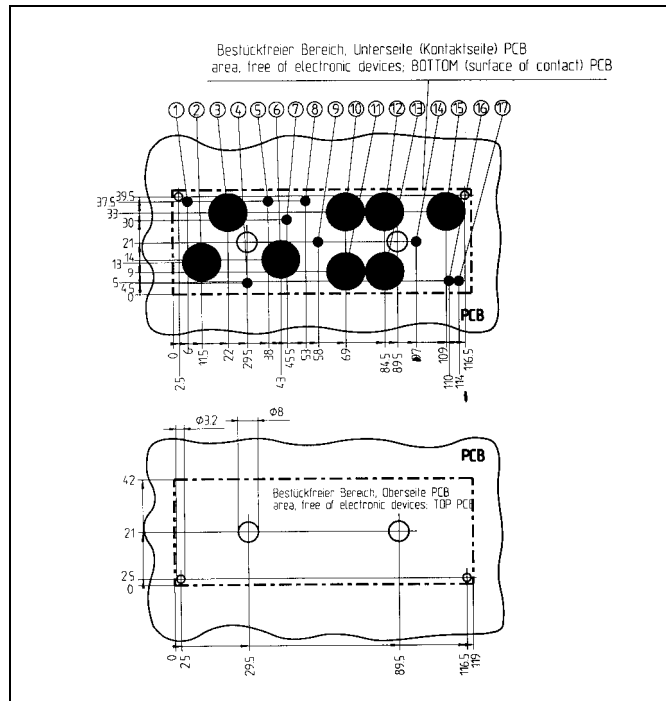
SKiiP 82 ANB 15

SKiiP 83 ANB 15

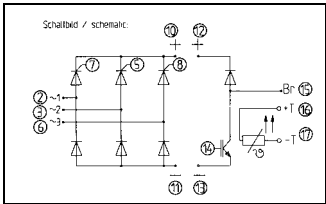
SKiiP 83 AHB 15

SKiiP 83 ATB 15
- Case M8a

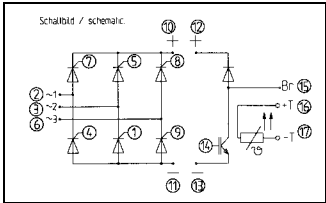
Layout and connections for the customer's printed circuit board



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 -