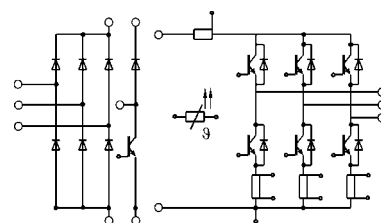


Absolute Maximum Ratings			
Symbol	Conditions <sup>1)</sup>	Values	Units
Inverter & Chopper			
V <sub>CES</sub>		1200	V
V <sub>GES</sub>		± 20	V
I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	23 / 15	A
I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	46 / 30	A
I <sub>F</sub> = -I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	24 / 17	A
I <sub>FM</sub> = -I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	48 / 34	A
Bridge Rectifier			
V <sub>RRM</sub>		1500	V
I <sub>D</sub>	T <sub>heatsink</sub> = 80 °C	25	A
I <sub>FSM</sub>	t <sub>p</sub> = 10 ms; sin. 180 °, T <sub>J</sub> = 25 °C	700	A
I <sup>2</sup> t	t <sub>p</sub> = 10 ms; sin. 180 °, T <sub>J</sub> = 25 °C	2400	A <sup>2</sup> s
T <sub>J</sub>		- 40 ... + 150	°C
T <sub>stg</sub>		- 40 ... + 125	°C
V <sub>isol</sub>	AC, 1 min.	2500	V

**MiniSKiIP 2**  
**SEMIKRON integrated intelligent Power**  
**SKiIP 22 NAB 12 T18**  
**SKiIP 22 NAB 12 I T1 <sup>3)</sup>**  
**3-phase bridge rectifier + braking chopper**  
**3-phase bridge inverter**  
**Case M2**



UL recognized file no. E63532

Characteristics					
Symbol	Conditions <sup>1)</sup>	min.	typ.	max.	Units
IGBT - Inverter & Chopper					
V <sub>CEsat</sub>	I <sub>C</sub> = 15 A T <sub>J</sub> = 25 (125) °C	-	2,5(3,1)	3,0(3,7)	V
t <sub>d(on)</sub>	V <sub>CC</sub> = 600 V; V <sub>GE</sub> = ± 15 V	-	55	110	ns
t <sub>r</sub>	I <sub>C</sub> = 15 A; T <sub>J</sub> = 125 °C	-	45	90	ns
t <sub>d(off)</sub>	R <sub>gon</sub> = R <sub>goff</sub> = 82 Ω	-	400	600	ns
t <sub>f</sub>	inductive load	-	70	100	ns
E <sub>on</sub> + E <sub>off</sub>		-	4,0	-	mJ
C <sub>ies</sub>	V <sub>CE</sub> = 25 V; V <sub>GE</sub> = 0 V, 1 MHz	-	1,0	-	nF
R <sub>thjh</sub>	per IGBT	-	-	1,4	K/W
Diode <sup>2)</sup> - Inverter & Chopper					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>F</sub> = 15 A T <sub>J</sub> = 25 (125) °C	-	2,0(1,8)	2,5(2,3)	V
V <sub>TO</sub>	T <sub>J</sub> = 125 °C	-	1,0	1,2	V
r <sub>T</sub>	T <sub>J</sub> = 125 °C	-	53	73	mΩ
I <sub>RRM</sub>	I <sub>F</sub> = 15 A, V <sub>R</sub> = - 600 V	-	16	-	A
Q <sub>rr</sub>	di <sub>F</sub> /dt = - 400 A/μs	-	2,7	-	μC
E <sub>off</sub>	V <sub>GE</sub> = 0 V, T <sub>J</sub> = 125 °C	-	0,6	-	mJ
R <sub>thjh</sub>	per diode	-	-	1,7	K/W
Diode - Rectifier					
V <sub>F</sub>	I <sub>F</sub> = 35 A T <sub>J</sub> = 25 °C	-	1,2	-	V
R <sub>thjh</sub>	per diode	-	-	1,6	K/W
Temperature Sensor					
R <sub>TS</sub>	T = 25 / 100 °C		1000 / 1670		Ω
Shunts (SKiIP 22 NAB 12 I T1)					
R <sub>cs(dc)</sub>	5 % <sup>4)</sup>		16,5		mΩ
R <sub>cs(ac)</sub>	1 %		10		mΩ
Mechanical Data					
M <sub>1</sub>	Mounting torque	2	-	2,5	Nm
Case			M2		

- 1) T<sub>heatsink</sub> = 25 °C, unless otherwise specified
- 2) CAL = Controlled Axial Lifetime Technology (soft and fast recovery)
- 3) With integrated DC and AC shunts accuracy of pure shunt, please note that for DC shunt no separate sensing contact is used.
- 4) accuracy of pure shunt, please note that for DC shunt no separate sensing contact is used.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

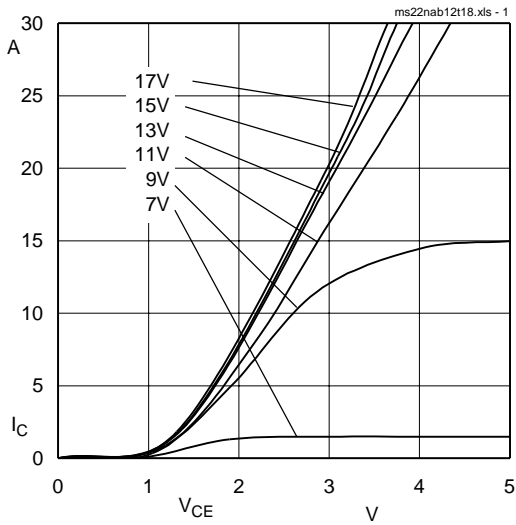


Fig. 1 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $25 \text{ }^\circ\text{C}$

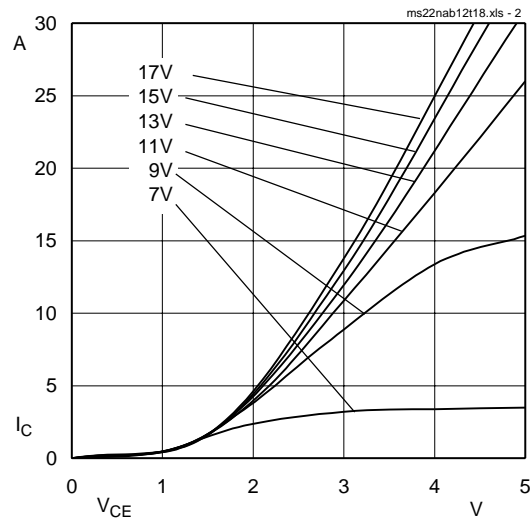


Fig. 2 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $125 \text{ }^\circ\text{C}$

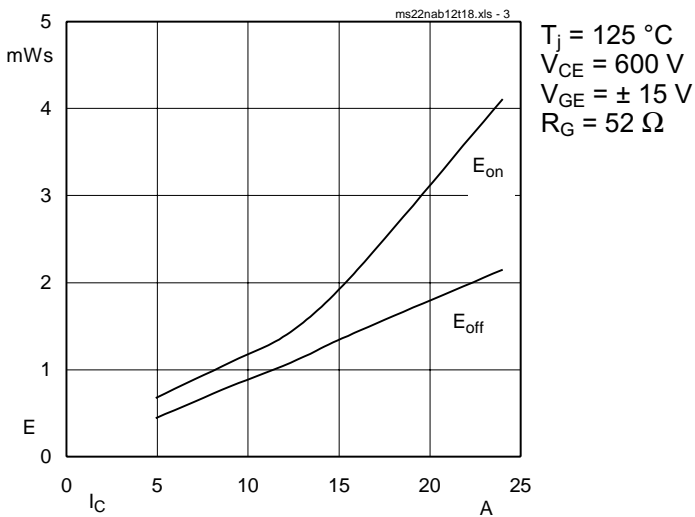


Fig. 3 Turn-on /-off energy =  $f(I_c)$

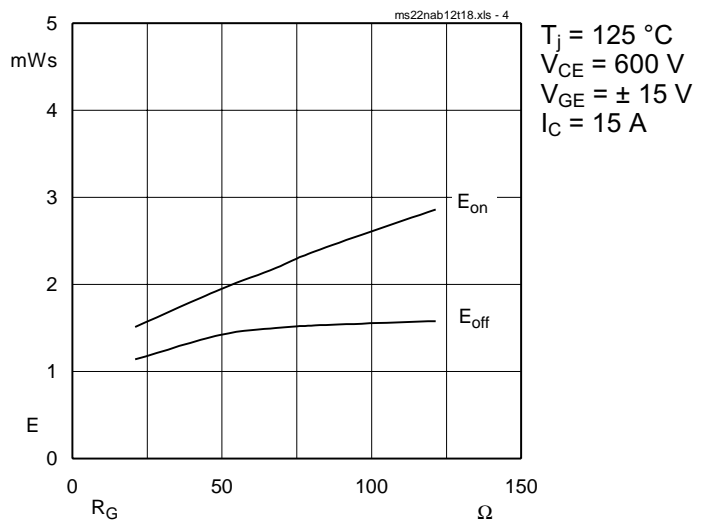


Fig. 4 Turn-on /-off energy =  $f(R_G)$

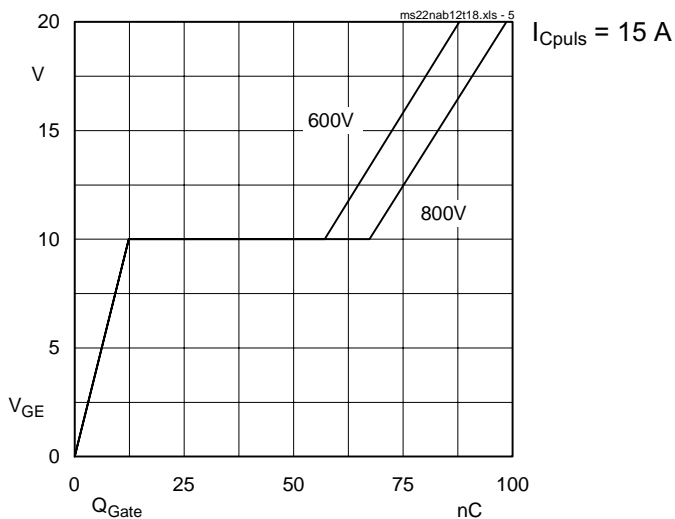


Fig. 5 Typ. gate charge characteristic

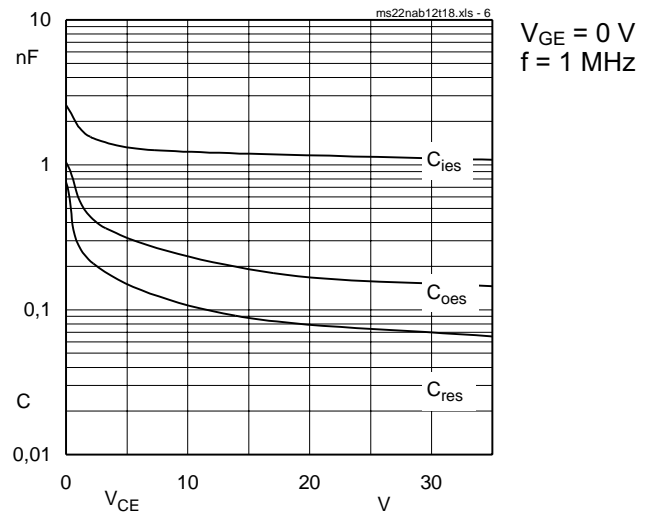


Fig. 6 Typ. capacitances vs.  $V_{CE}$

## MiniSKiiP 1200 V

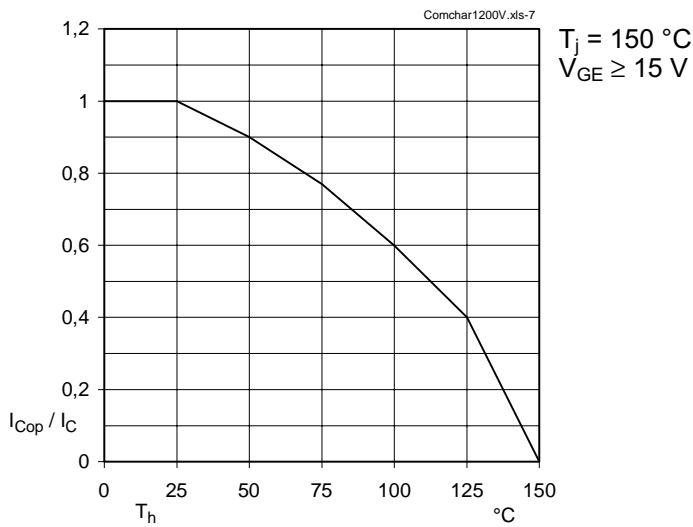


Fig. 7 Rated current of the IGBT  $I_{COp} / I_C = f(T_h)$

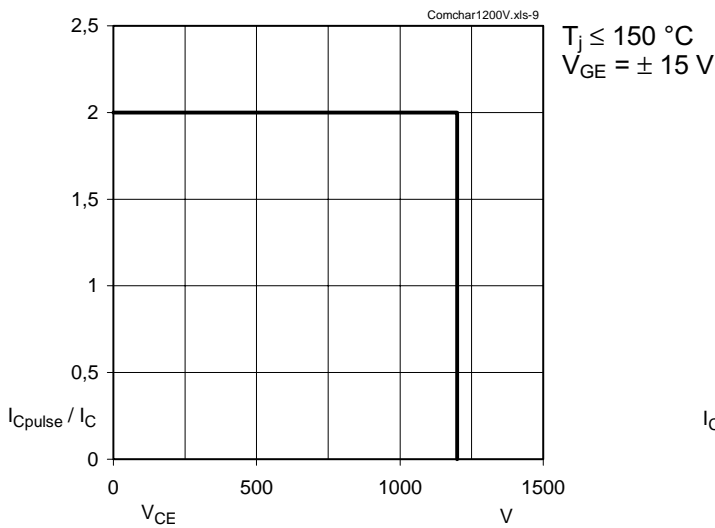


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

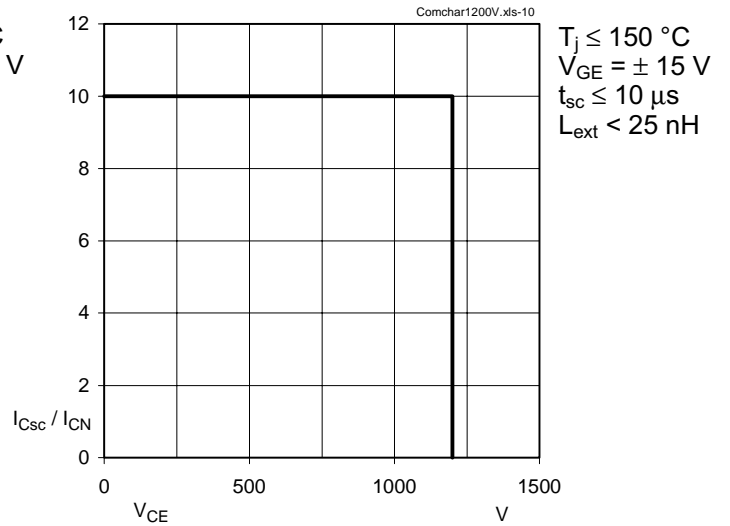


Fig. 10 Safe operating area at short circuit of the IGBT

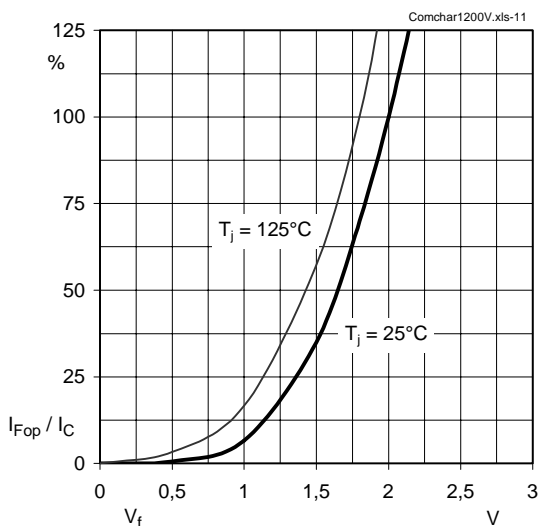


Fig. 11 Typ. freewheeling diode forward characteristic

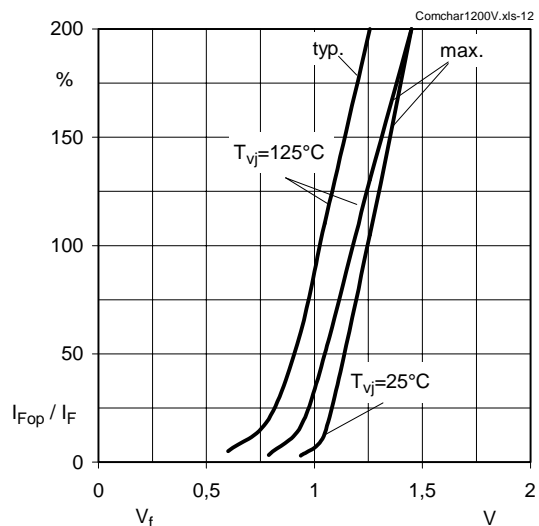
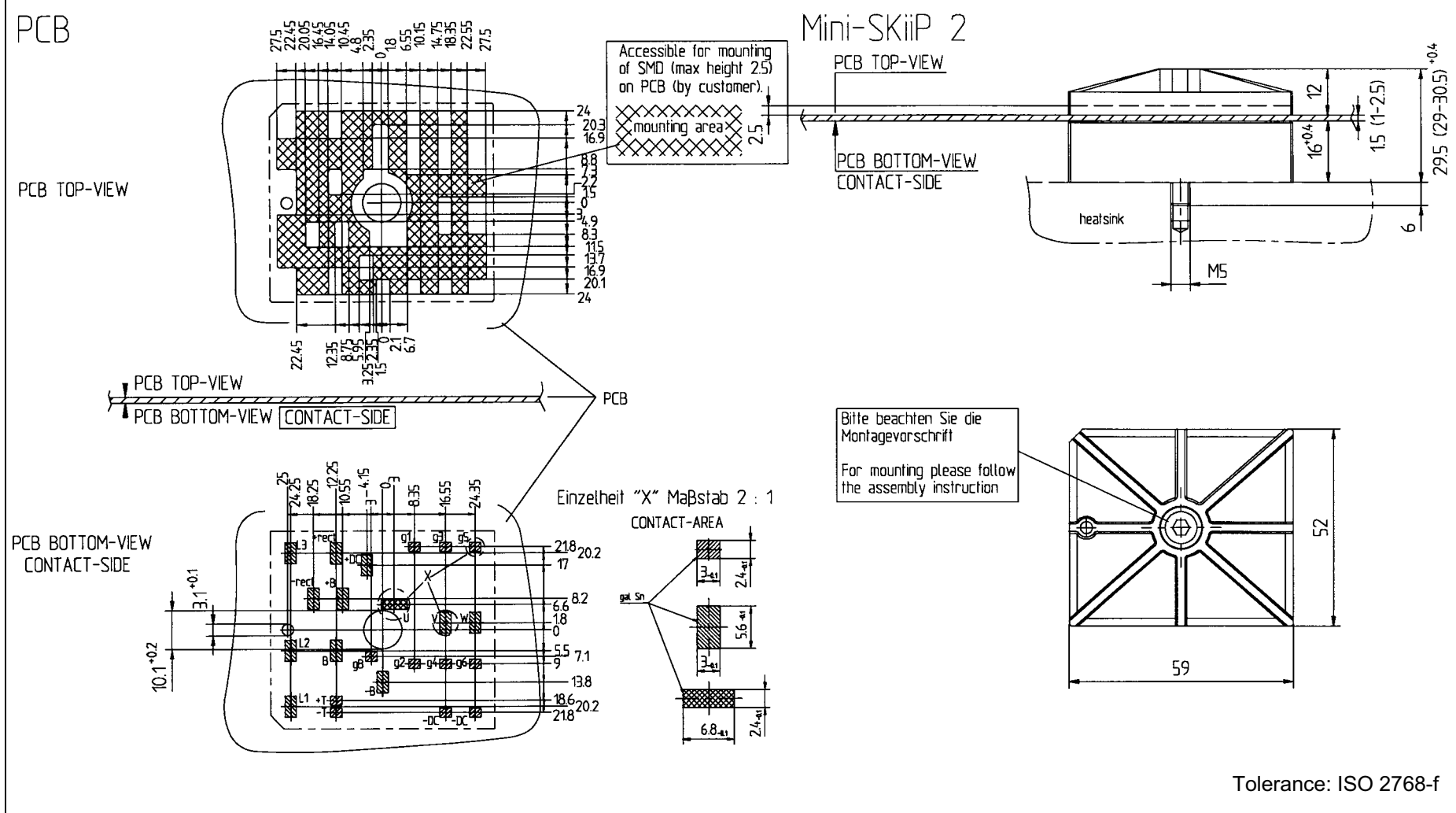
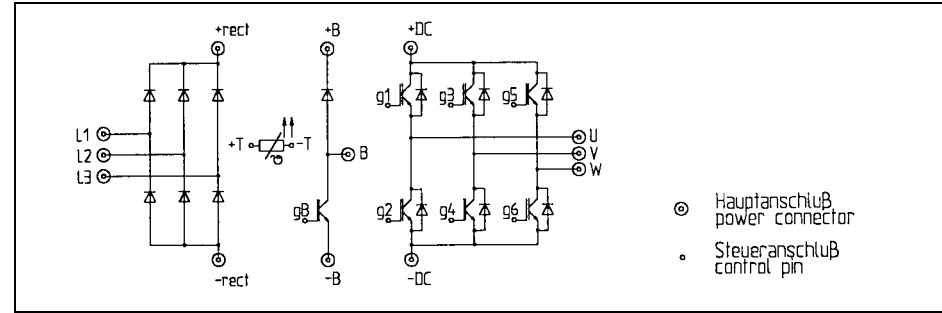


Fig. 12 Forward characteristic of the input bridge diode

# MiniSKiiP 2

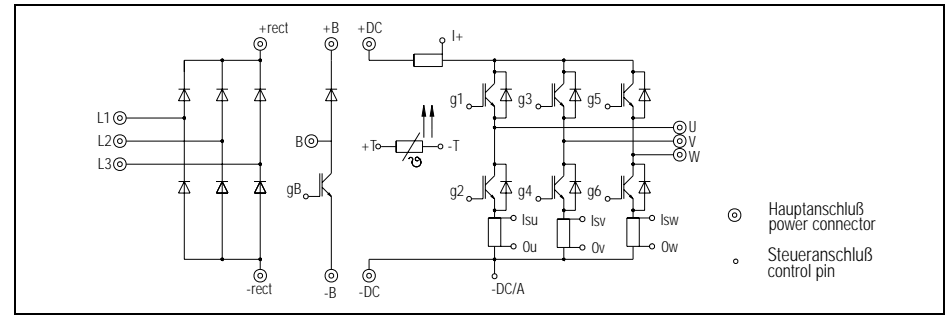
SKiiP 20 NAB 12 T17  
SKiiP 22 NAB 12 T18



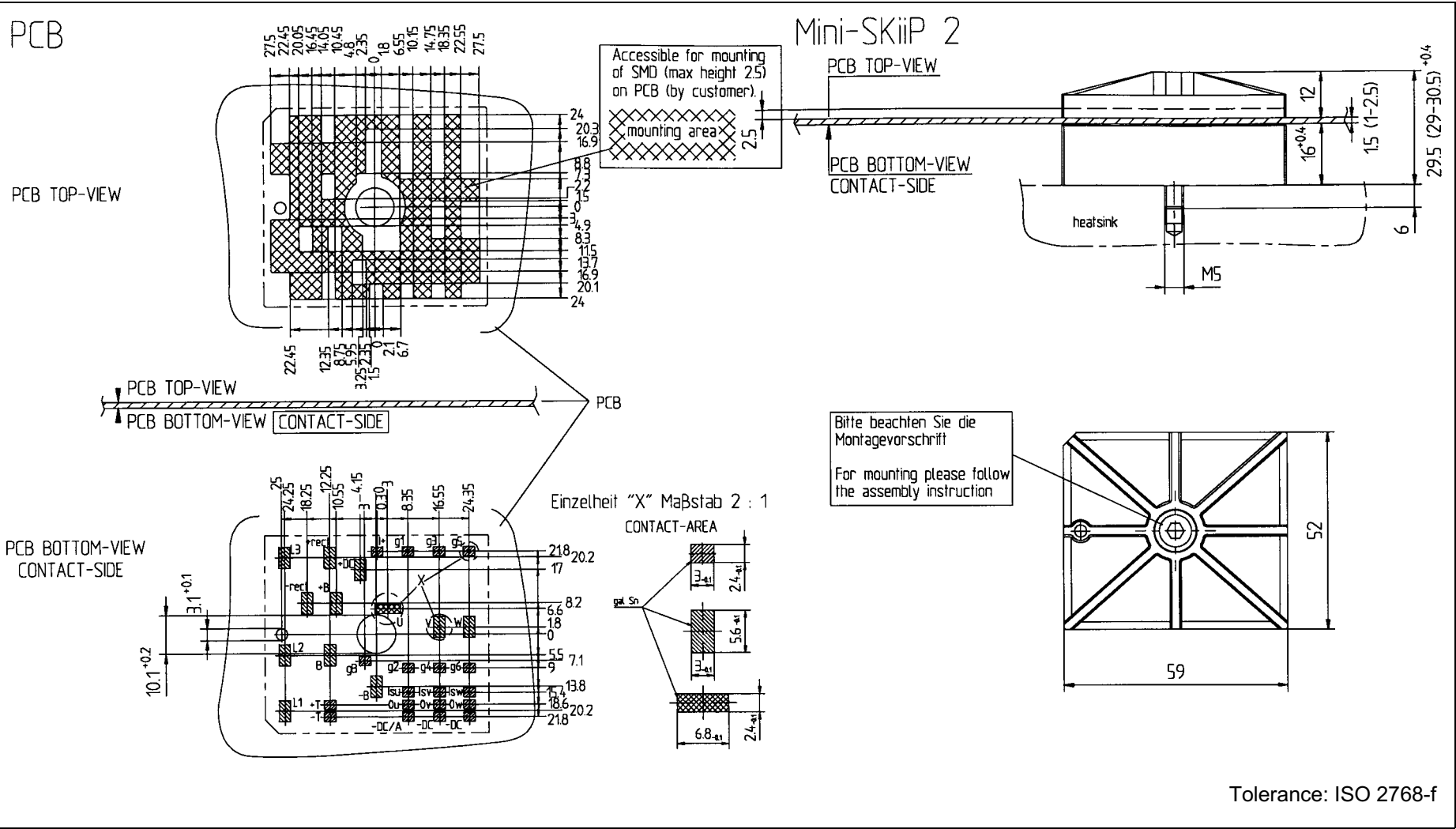
Tolerance: ISO 2768-f

# MiniSKiiP 2

SKiiP 20 NAB 12 | T12  
SKiiP 22 NAB 12 | T1



⊕ Hauptanschluß power connector  
⊙ Steueranschluß control pin



001218

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