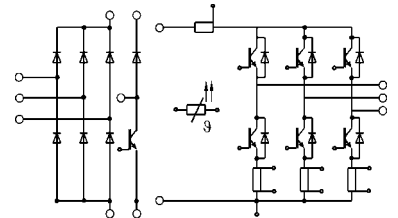


Absolute Maximum Ratings			
Symbol	Conditions <sup>1)</sup>	Values	Units
Inverter & Chopper			
V <sub>CES</sub>		1200	V
V <sub>GES</sub>		± 20	V
I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	23 / 15	A
I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	46 / 30	A
I <sub>F</sub> = -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>R<sub>RM</sub></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>R<sub>RM</sub></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
- 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.

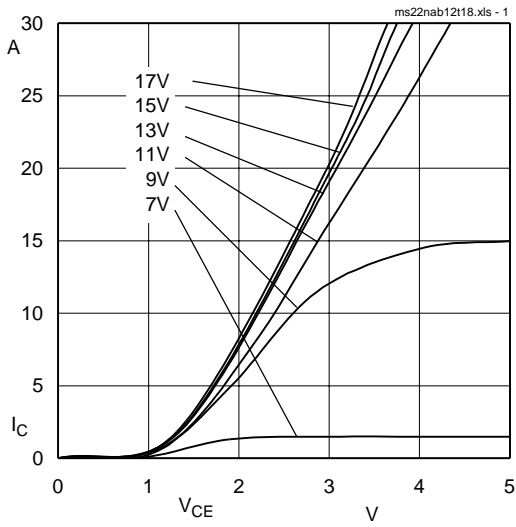


Fig. 1 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $25 \text{ }^\circ\text{C}$

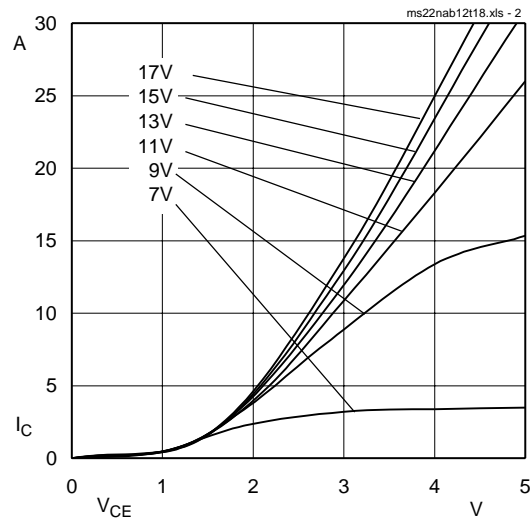


Fig. 2 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $125 \text{ }^\circ\text{C}$

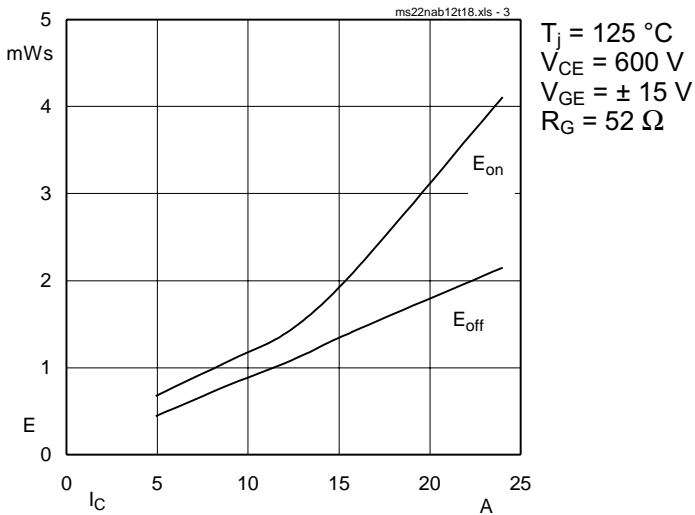


Fig. 3 Turn-on /-off energy =  $f(I_c)$

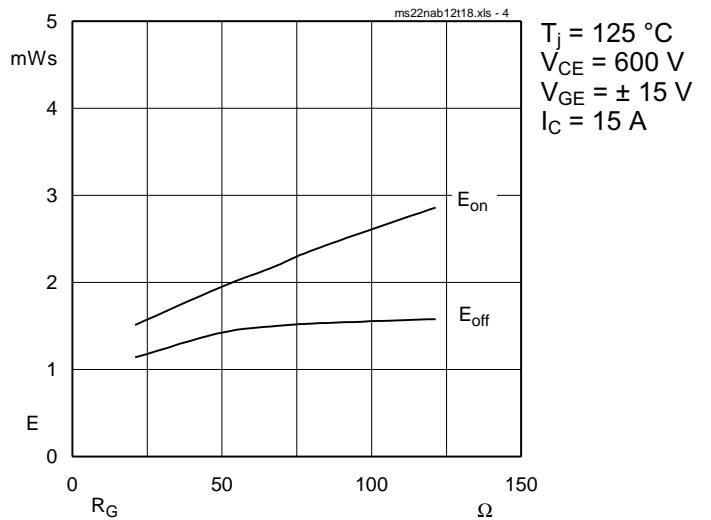


Fig. 4 Turn-on /-off energy =  $f(R_G)$

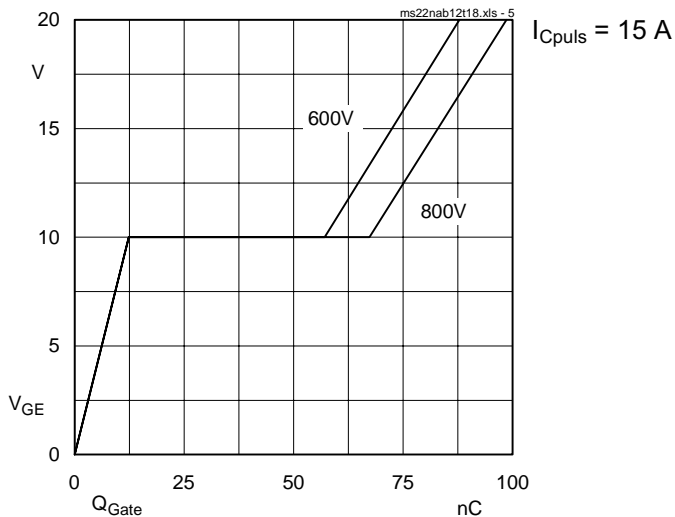


Fig. 5 Typ. gate charge characteristic

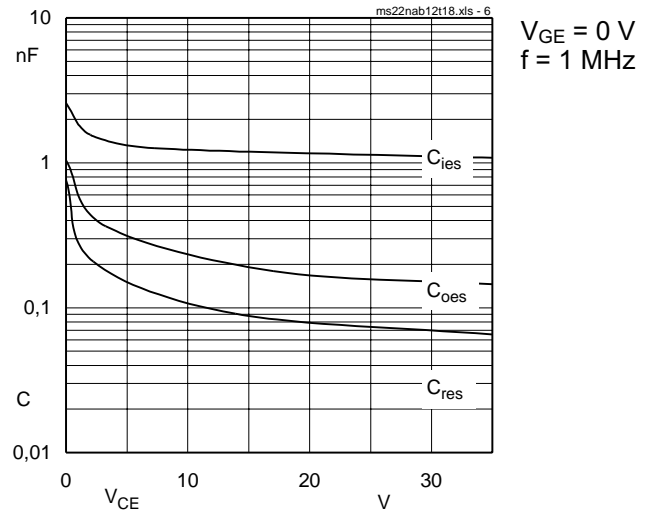


Fig. 6 Typ. capacitances vs.  $V_{CE}$

## MiniSKiiP 1200 V

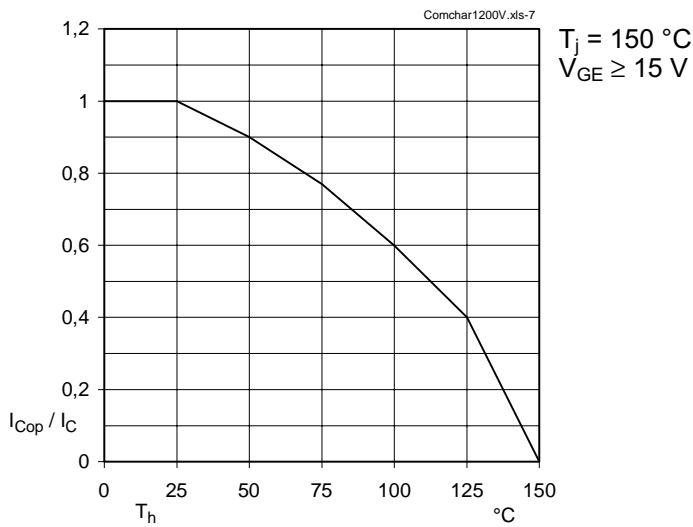


Fig. 7 Rated current of the IGBT  $I_{COp} / I_C = f(T_h)$

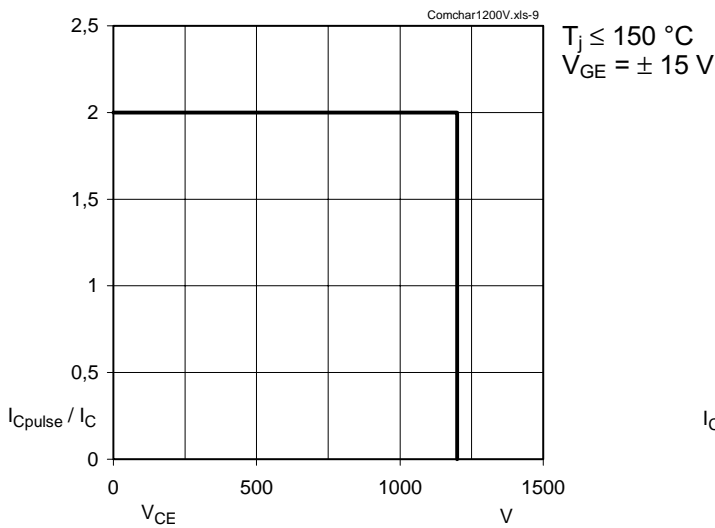


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

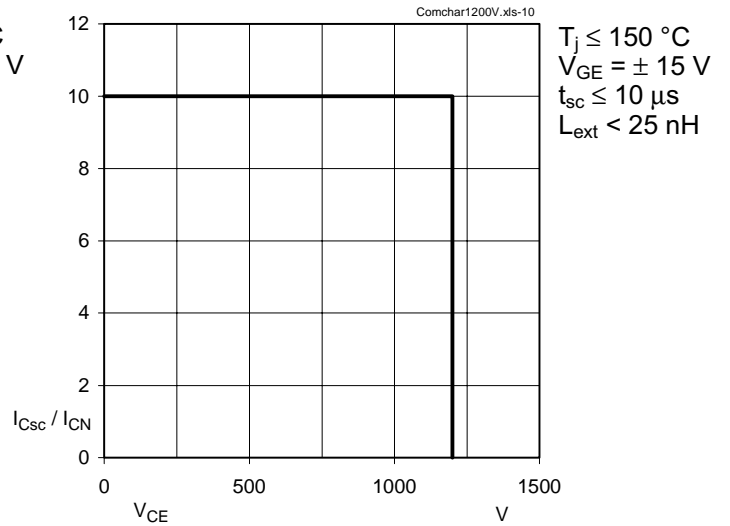


Fig. 10 Safe operating area at short circuit of the IGBT

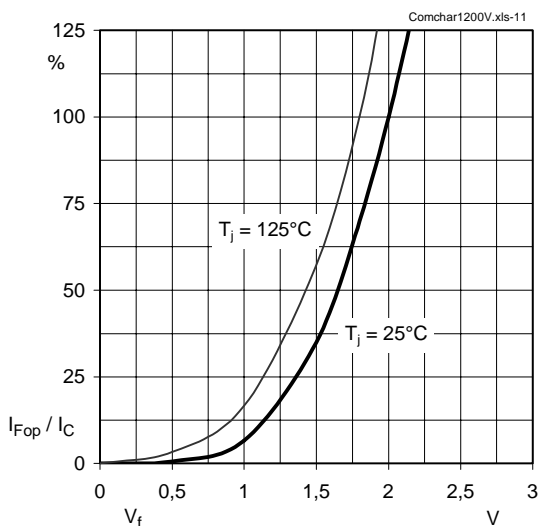


Fig. 11 Typ. freewheeling diode forward characteristic

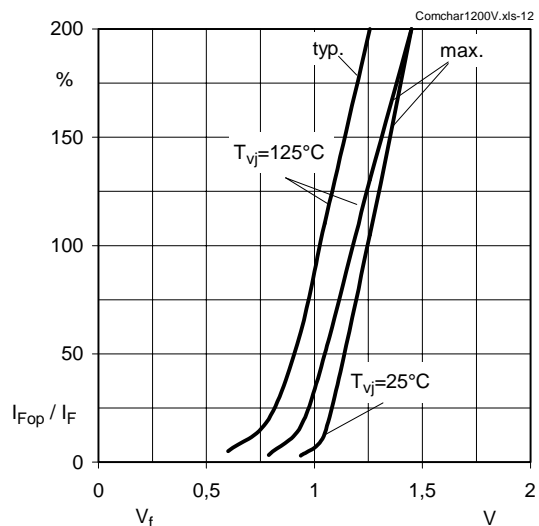
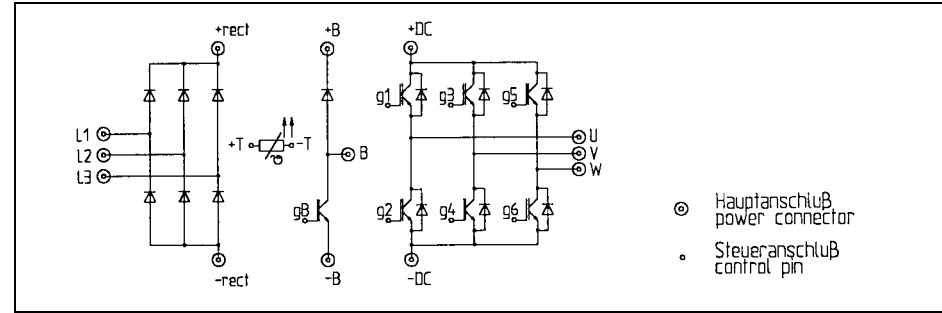


Fig. 12 Forward characteristic of the input bridge diode

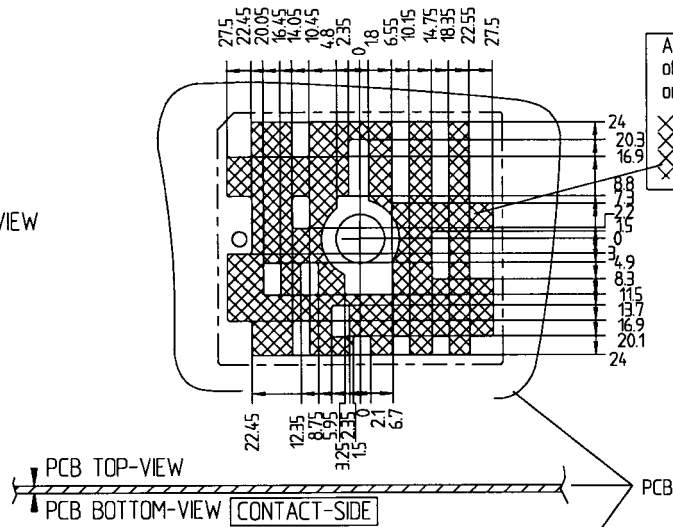
# MiniSKiiP 2

SKiiP 20 NAB 12 T17  
SKiiP 22 NAB 12 T18



PCB

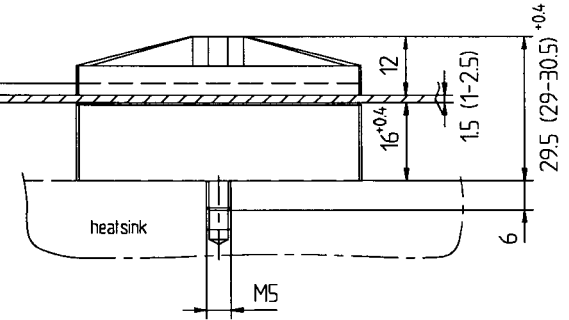
PCB TOP-VIEW



Mini-SKiiP 2

PCB TOP-VIEW

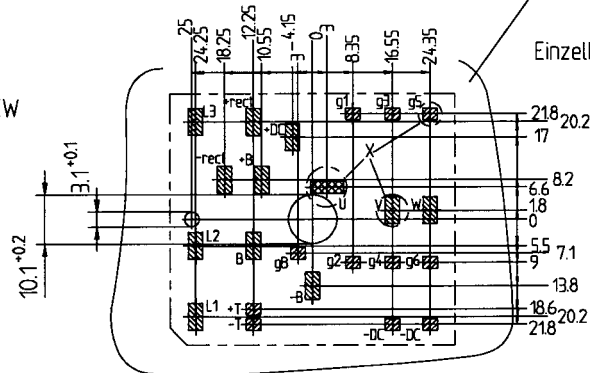
PCB BOTTOM-VIEW  
CONTACT-SIDE



PCB TOP-VIEW  
PCB BOTTOM-VIEW CONTACT-SIDE

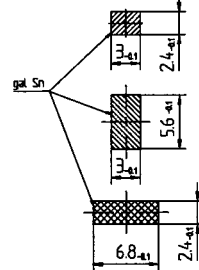
PCB

PCB BOTTOM-VIEW  
CONTACT-SIDE

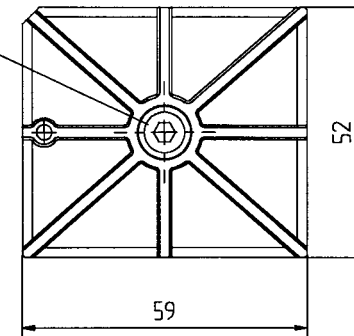


Einzelheit "X" Maßstab 2 : 1

CONTACT-AREA



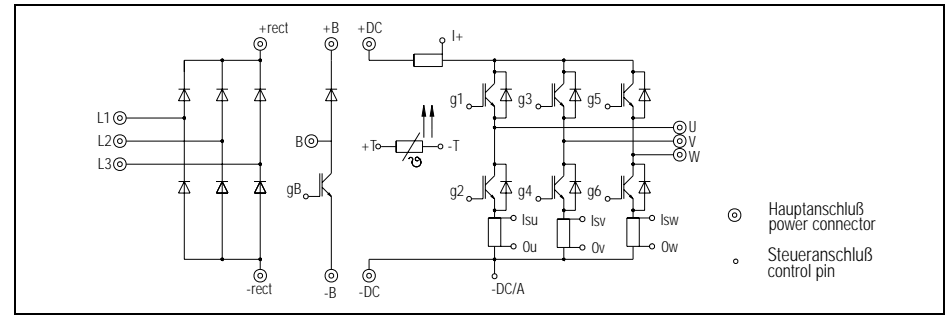
Bitte beachten Sie die Montagevorschrift  
For mounting please follow the assembly instruction



Tolerance: ISO 2768-f

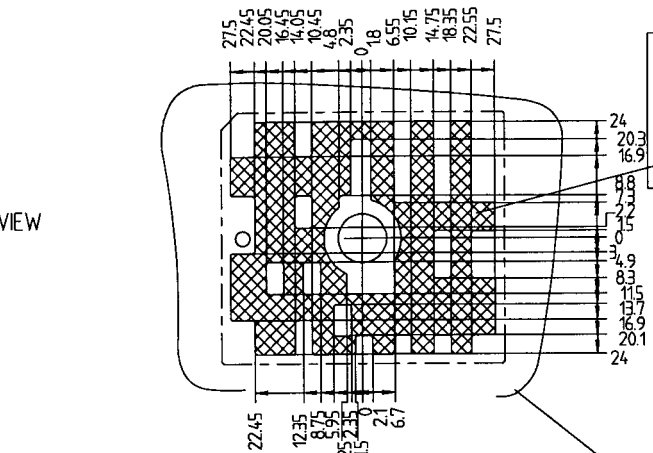
# MiniSKiiP 2

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



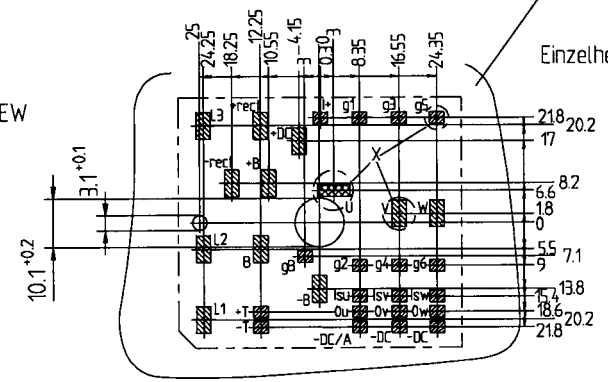
## PCB

PCB TOP-VIEW

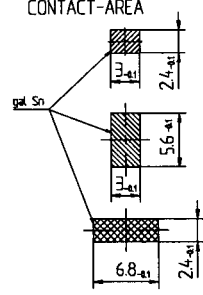


PCB TOP-VIEW  
PCB BOTTOM-VIEW CONTACT-SIDE

PCB BOTTOM-VIEW CONTACT-SIDE



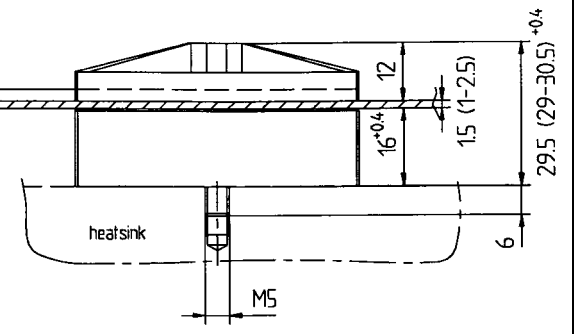
Einzelheit "X" Maßstab 2 : 1  
CONTACT-AREA



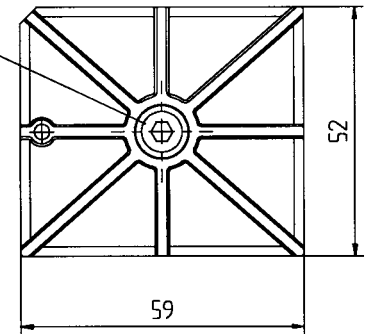
## Mini-SKiiP 2

PCB TOP-VIEW

PCB BOTTOM-VIEW CONTACT-SIDE



Bitte beachten Sie die Montagevorschrift  
For mounting please follow the assembly instruction



Tolerance: ISO 2768-f