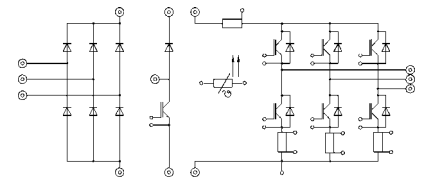


## SKiiP 21 NAB 063 T1, SKiiP 21 NAB 063 I T1

Absolute Maximum Ratings			
Symbol	Conditions <sup>1)</sup>	Values	Units
Inverter			
V <sub>CES</sub>		600	V
V <sub>GES</sub>		± 20	V
I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	24 / 17	A
I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	48 / 34	A
I <sub>F</sub> = -I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	36 / 24	A
I <sub>FM</sub> = -I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	72 / 48	A
Bridge Rectifier			
V <sub>R<sub>RM</sub></sub>		800	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	370	A
I <sup>2</sup> t	t <sub>p</sub> = 10 ms; sin. 180 °, T <sub>j</sub> = 25 °C	680	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 21 NAB 063 T1**  
**SKiiP 21 NAB 063 I T1** <sup>3)</sup>  
**3-phase bridge rectifier +**  
**braking chopper +**  
**3-phase bridge inverter**

Case M2



UL recognized file no. E63532

- fast NPT IGBTs

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

Characteristics					
Symbol	Conditions <sup>1)</sup>	min.	typ.	max.	Units
IGBT - Inverter & Chopper					
V <sub>CEsat</sub>	I <sub>C</sub> = 20 A T <sub>j</sub> = 25 (125) °C	-	2,1(2,4)	2,6(2,9)	V
t <sub>d(on)</sub>	V <sub>CC</sub> = 300 V; V <sub>GE</sub> = ± 15 V	-	30	-	ns
t <sub>r</sub>	I <sub>C</sub> = 20 A; T <sub>j</sub> = 125 °C	-	35	-	ns
t <sub>d(off)</sub>	R <sub>gon</sub> = R <sub>goff</sub> = 47 Ω	-	200	-	ns
t <sub>f</sub>	inductive load	-	25	-	ns
E <sub>on</sub> + E <sub>off</sub>		-	1,7	-	mJ
C <sub>ies</sub>	V <sub>CE</sub> = 25 V; V <sub>GE</sub> = 0 V, 1 MHz	-	1,1	-	nF
R <sub>thjh</sub>	per IGBT	-	-	1,7	K/W
Diode <sup>2)</sup> - Inverter & Chopper					
V <sub>F</sub> = V <sub>EC</sub>	I <sub>F</sub> = 25 A T <sub>j</sub> = 25 (125) °C	-	1,45(1,4)	1,7(1,75)	V
V <sub>TO</sub>	T <sub>j</sub> = 125 °C	-	0,85	0,9	V
r <sub>T</sub>	T <sub>j</sub> = 125 °C	-	22	32	mΩ
I <sub>R<sub>RM</sub></sub>	I <sub>F</sub> = 25 A, V <sub>R</sub> = - 300 V	-	16	-	A
Q <sub>rr</sub>	di <sub>F</sub> /dt = - 500 A/μs	-	2	-	μC
E <sub>off</sub>	V <sub>GE</sub> = 0 V, T <sub>j</sub> = 125 °C	-	0,25	-	mJ
R <sub>thjh</sub>	per diode	-	-	1,7	K/W
Diode - Rectifier					
V <sub>F</sub>	I <sub>F</sub> = 25 A T <sub>j</sub> = 25 °C	-	1,2	-	V
R <sub>thjh</sub>	per diode	-	-	1,7	K/W
Temperature Sensor					
R <sub>TS</sub>	T = 25 / 100 °C		1000 / 1670		Ω
Shunts (SKiiP 21 NAB 063 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		

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

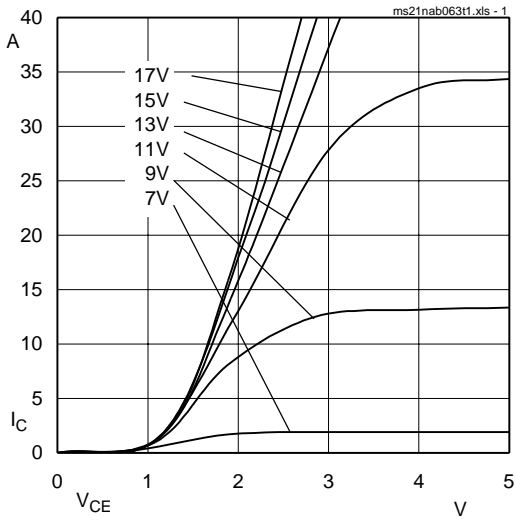


Fig. 1 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $25 \text{ }^\circ\text{C}$

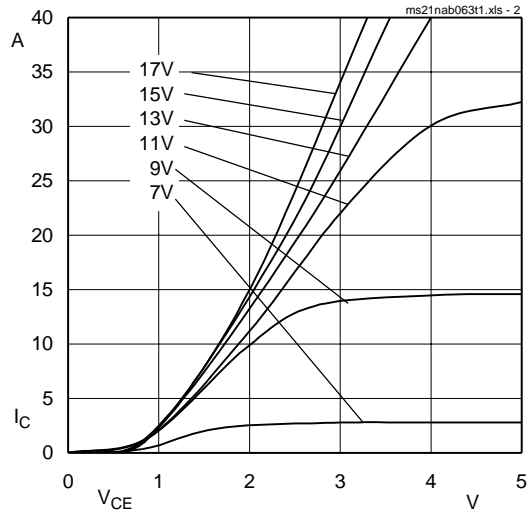


Fig. 2 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $125 \text{ }^\circ\text{C}$

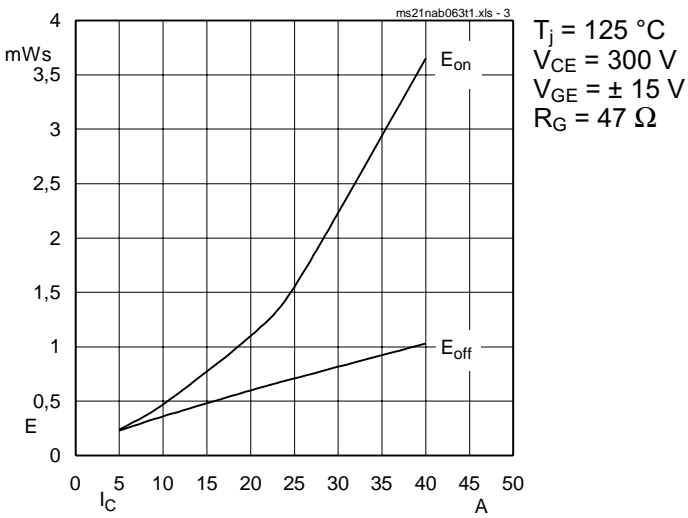


Fig. 3 Turn-on /-off energy =  $f(I_c)$

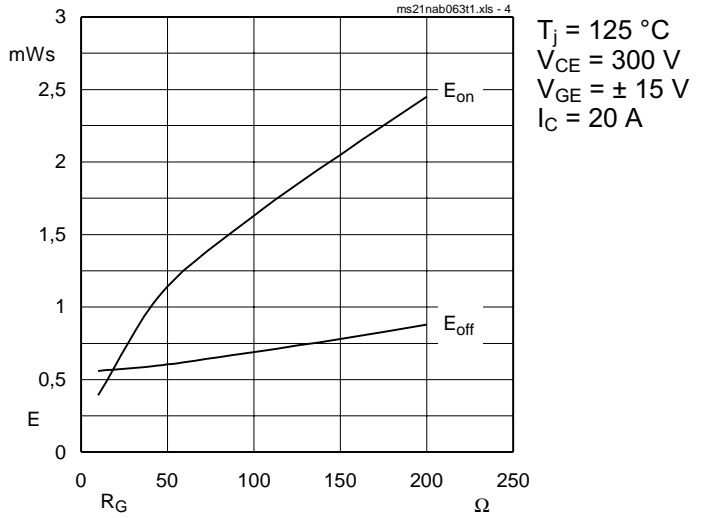


Fig. 4 Turn-on /-off energy =  $f(R_G)$

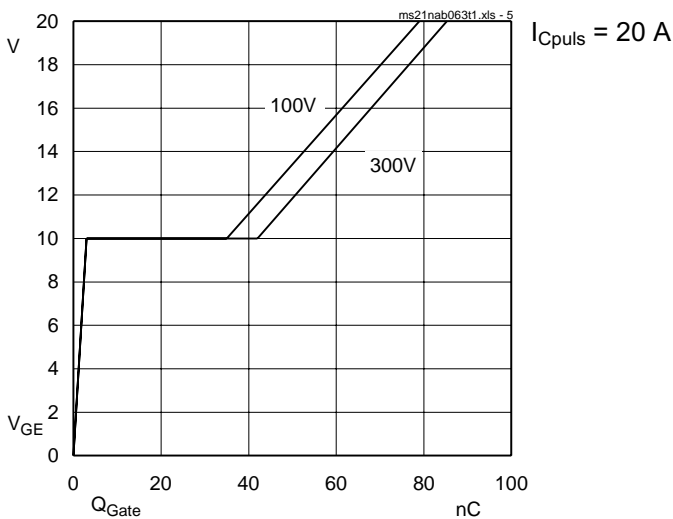


Fig. 5 Typ. gate charge characteristic

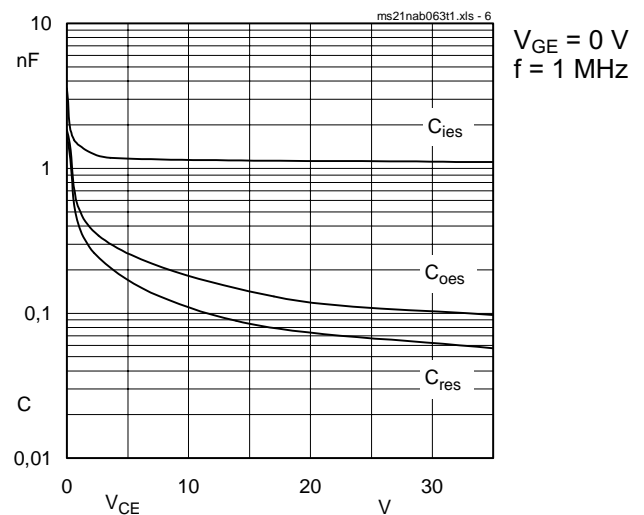


Fig. 6 Typ. capacitances vs.  $V_{CE}$

## 2. Common characteristics of MiniSKiiP

### MiniSKiiP 600 V

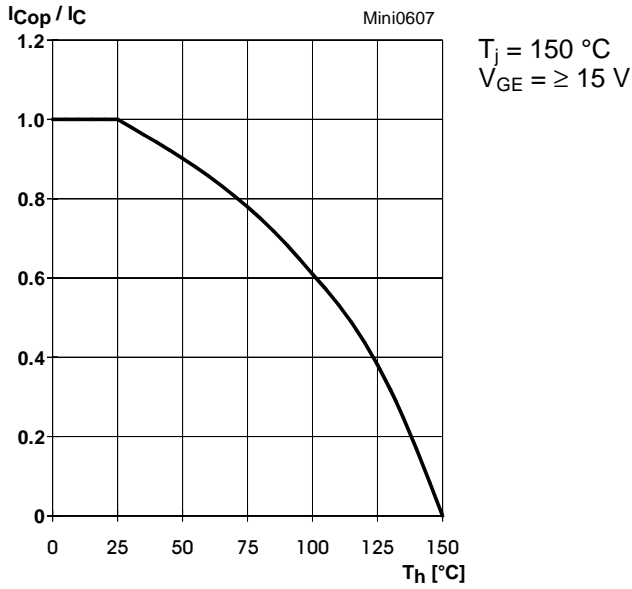


Fig. 7 Rated current of the IGBT  $I_{COP} / I_C = f(T_h)$

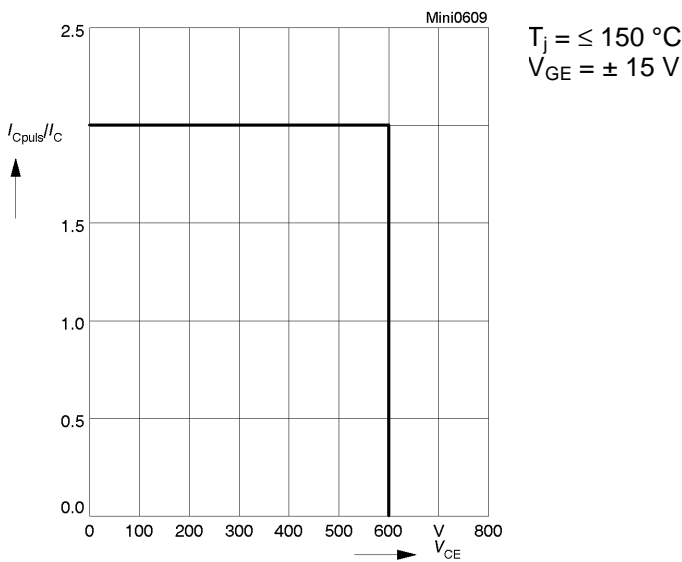


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

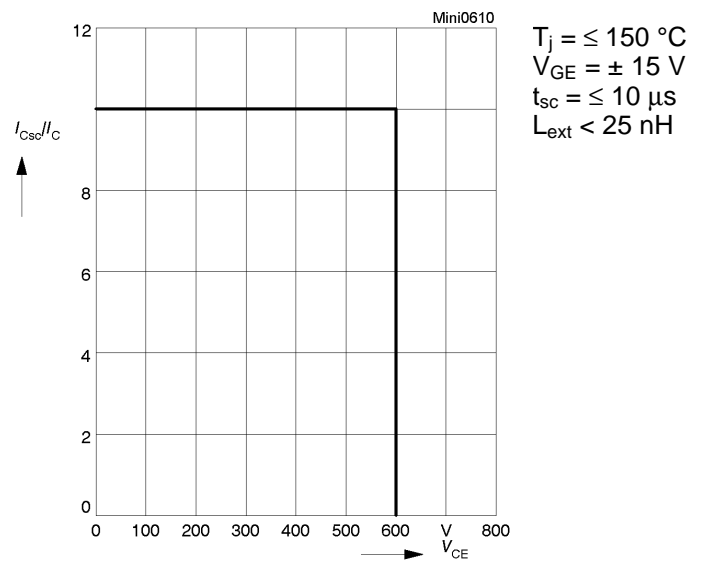


Fig. 10 Safe operating area at short circuit of the IGBT

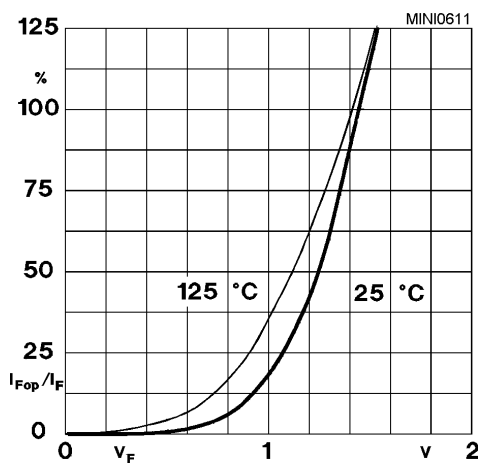


Fig. 11 Typ. freewheeling diode forward characteristic

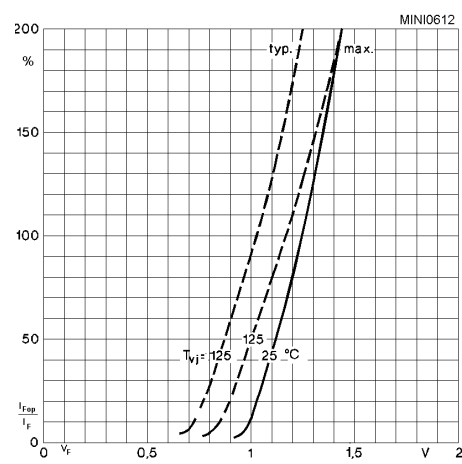
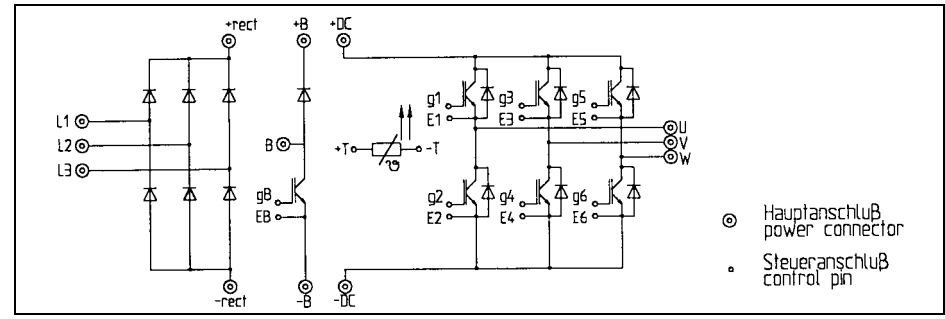


Fig. 12 Forward characteristic of the input bridge diode

# MiniSKiiP 2

SKiiP 21 NAB 063 T1  
SKiiP 22 NAB 063 T1



PCB

PCB TOP-VIEW

PCB TOP-VIEW  
PCB BOTTOM-VIEW CONTACT-SIDE

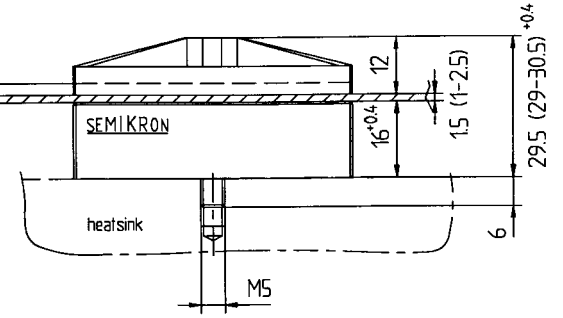
PCB BOTTOM-VIEW CONTACT-SIDE

Mini-SKiiP 2

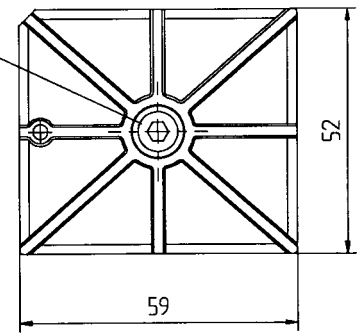
PCB TOP-VIEW

PCB BOTTOM-VIEW CONTACT-SIDE

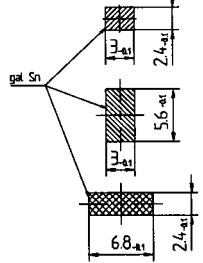
Accessible for mounting of SMD (max height 2.5) on PCB (by customer).  
mounting area



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



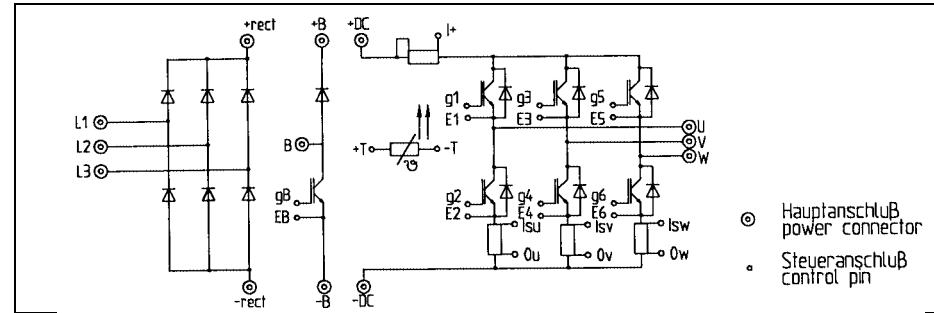
Einzelheit "X" Maßstab 2 : 1  
CONTACT-AREA



Tolerance: ISO 2768-f

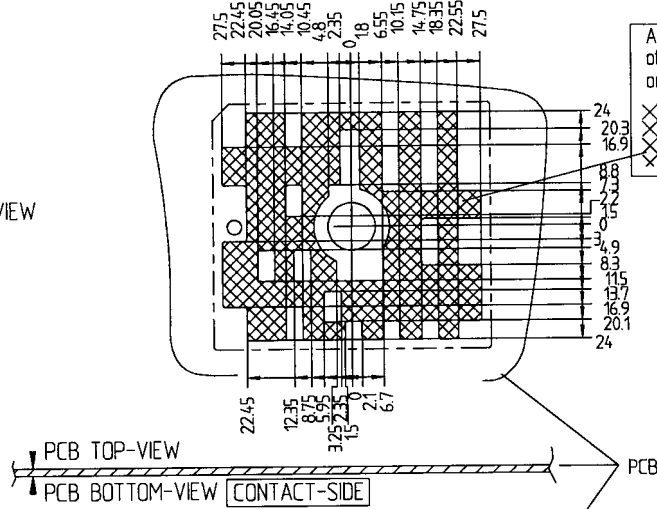
# MiniSKiiP 2

SKiiP 21 NAB 063 I T1



## PCB

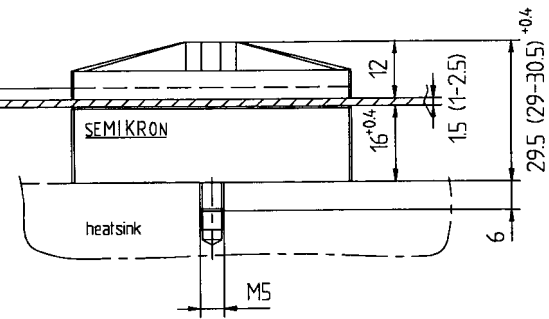
PCB TOP-VIEW



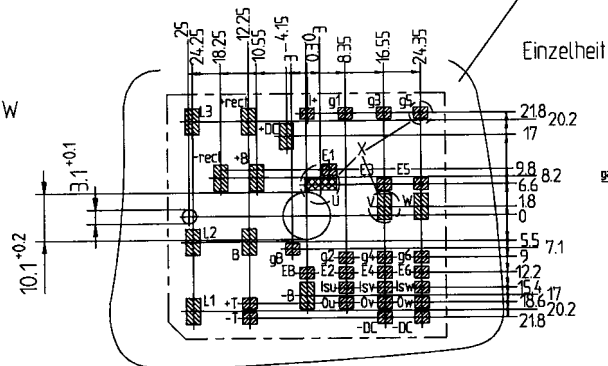
## Mini-SKiiP 2

PCB TOP-VIEW

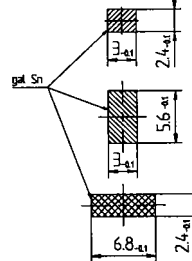
PCB BOTTOM-VIEW CONTACT-SIDE



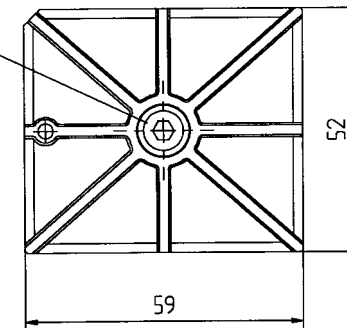
PCB BOTTOM-VIEW CONTACT-SIDE



Einzelheit "X" Maßstab 2 : 1  
CONTACT-AREA



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



Tolerance: ISO 2768-f