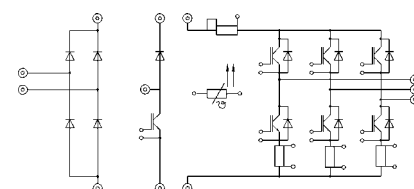
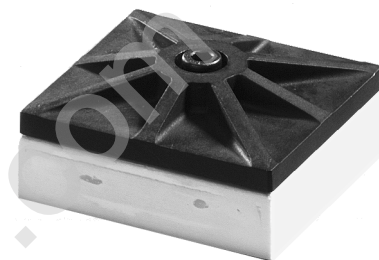


Absolute Maximum Ratings			
Symbol	Conditions <sup>1)</sup>	Values	Units
Inverter & Chopper			
V <sub>CES</sub>		600	V
V <sub>GES</sub>		± 20	V
I <sub>C</sub>	T <sub>heatsink</sub> = 25 / 80 °C	24 / 17	A
I <sub>CM</sub>	t <sub>p</sub> < 1 ms; T <sub>heatsink</sub> = 25 / 80 °C	48 / 34	A
I <sub>F</sub> = -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 NEB 063 T1**  
**SKiiP 21 NEB 063 I T1** <sup>3)</sup>  
**1-phase bridge rectifier + braking chopper +**  
**3-phase bridge inverter**

Case M2



UL recognized file no. E63532

- fast NPT IGBTs

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 NEB 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		

- <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.

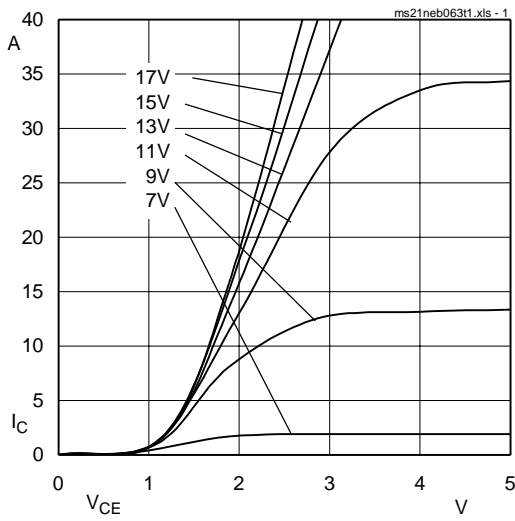


Fig. 1 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $25 \text{ }^\circ\text{C}$

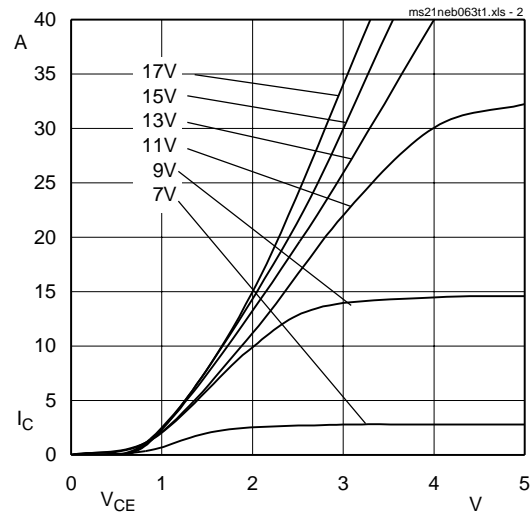


Fig. 2 Typ. output characteristic,  $t_p = 80 \mu s$ ;  $125 \text{ }^\circ\text{C}$

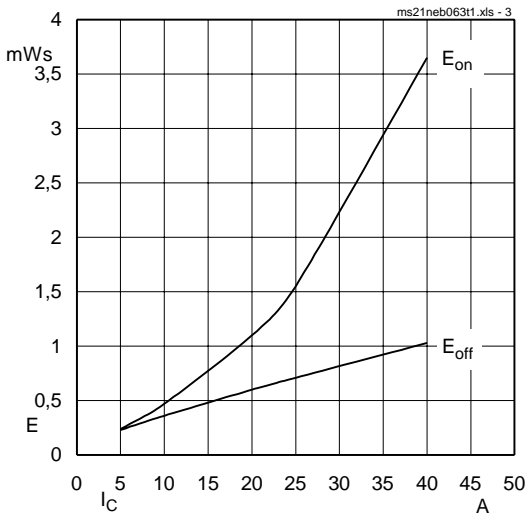


Fig. 3 Turn-on /-off energy =  $f(I_c)$

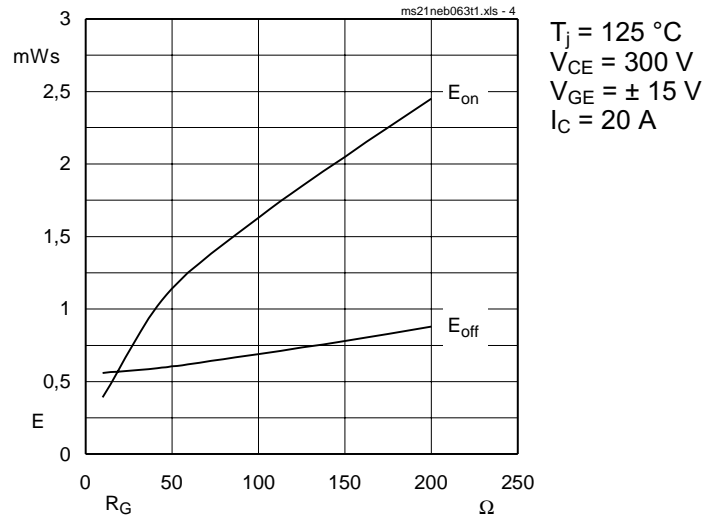


Fig. 4 Turn-on /-off energy =  $f(R_G)$

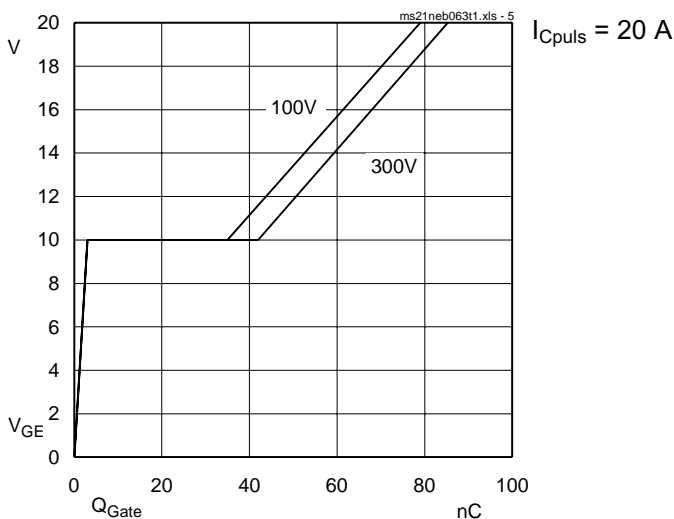


Fig. 5 Typ. gate charge characteristic

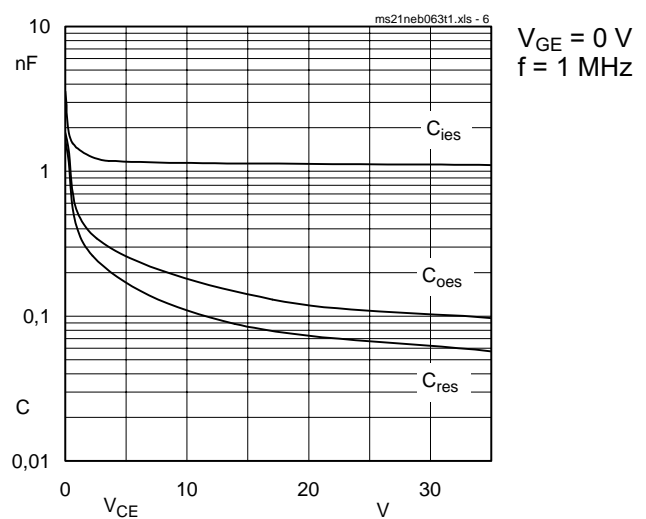


Fig. 6 Typ. capacitances vs.  $V_{CE}$

## 2. Common characteristics of MiniSKiiP

### MiniSKiiP 600 V

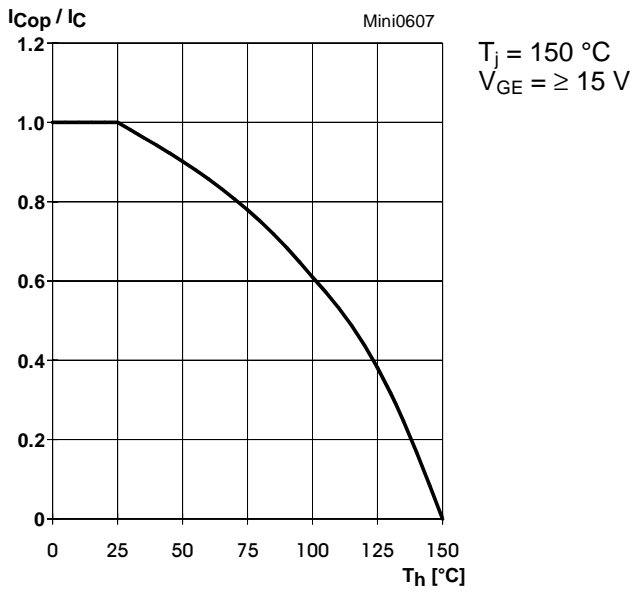


Fig. 7 Rated current of the IGBT  $I_{COP} / I_C = f(T_h)$

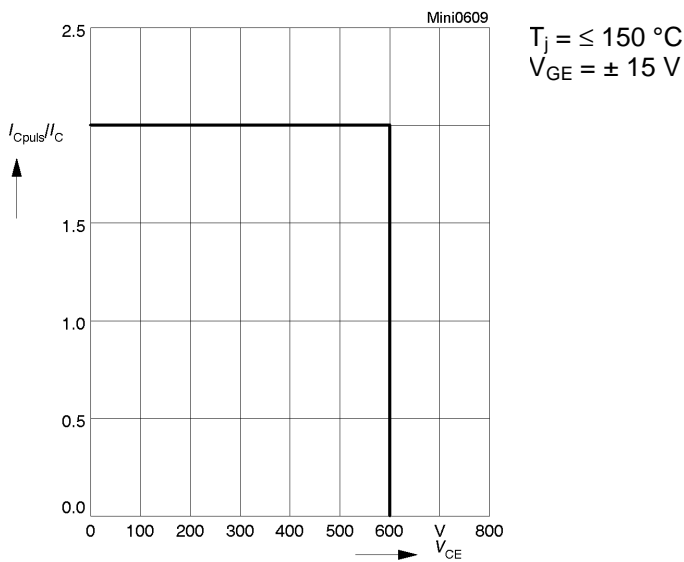


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

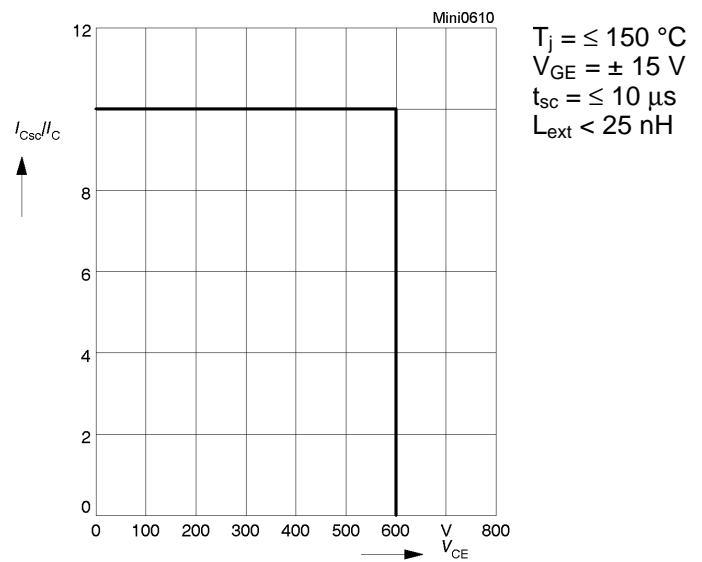


Fig. 10 Safe operating area at short circuit of the IGBT

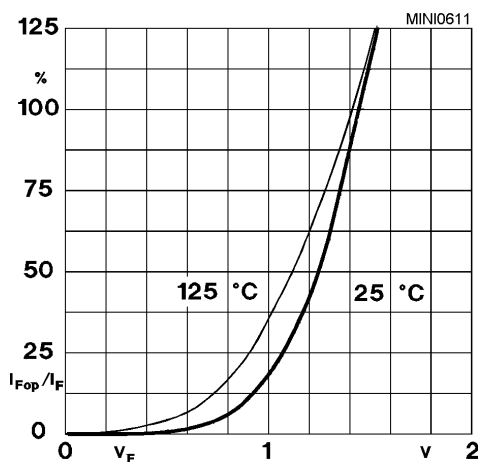


Fig. 11 Typ. freewheeling diode forward characteristic

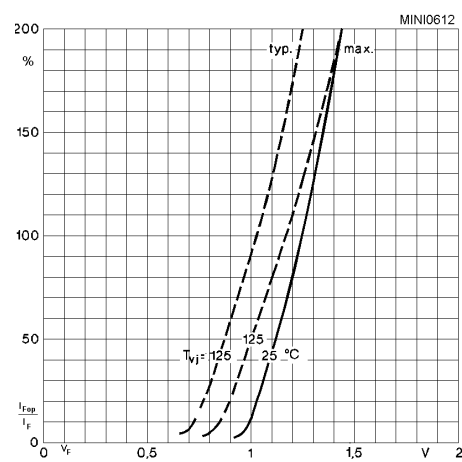
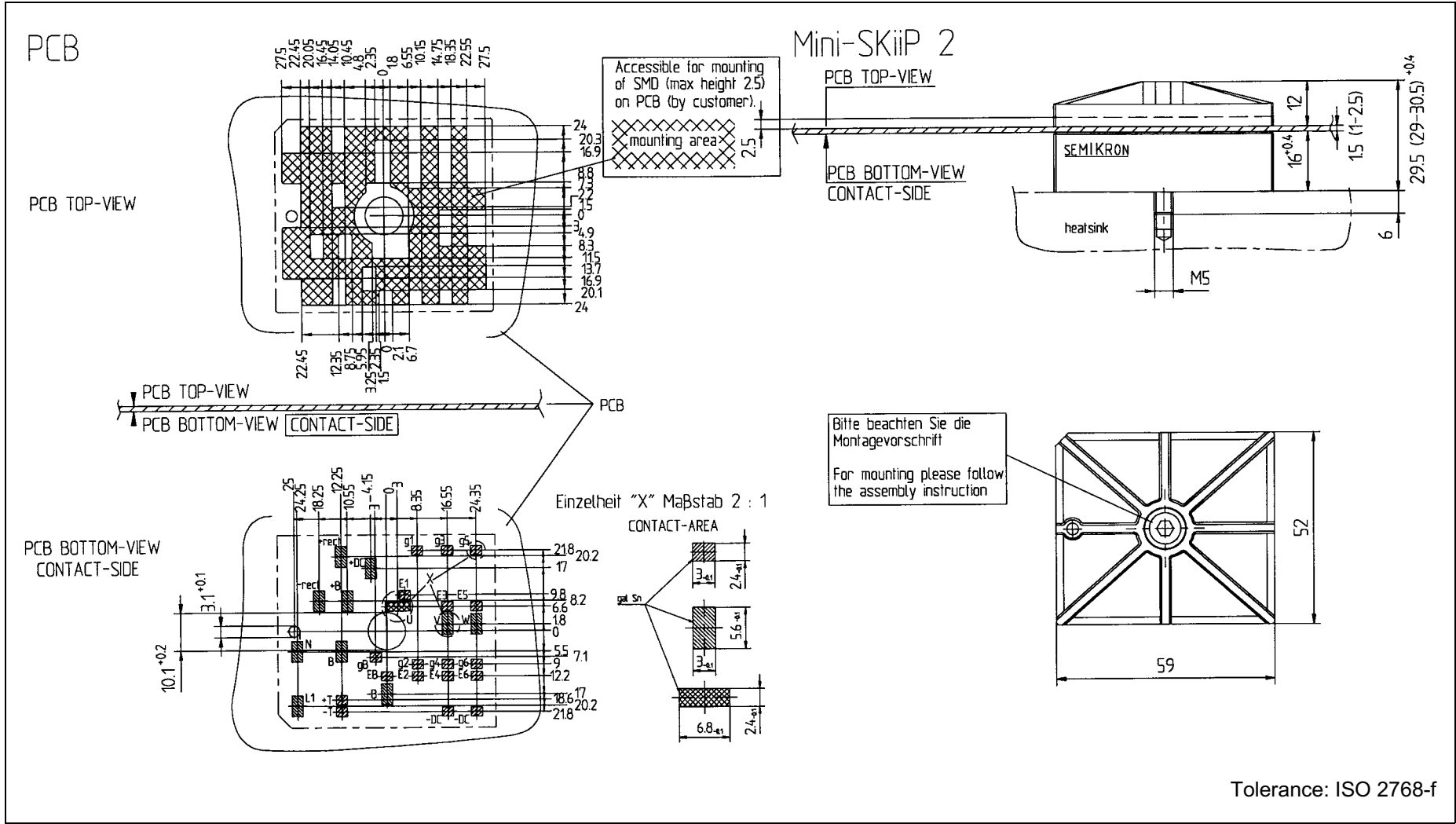
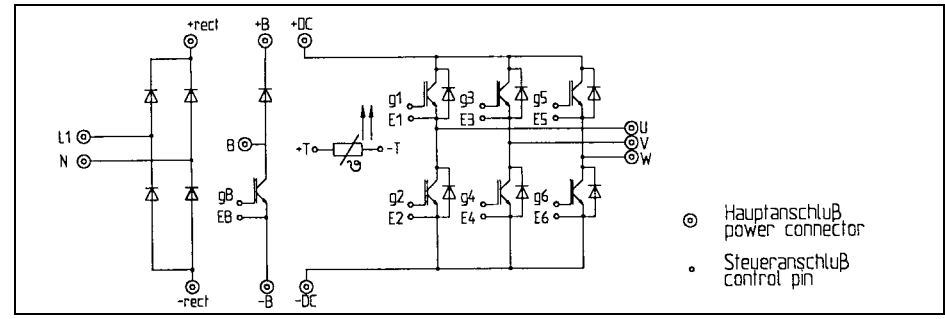


Fig. 12 Forward characteristic of the input bridge diode

# MiniSKiiP 2

SKiiP 21 NEB 063 T1



# MiniSKiiP 2

SKiiP 21 NEB 063 I T1

