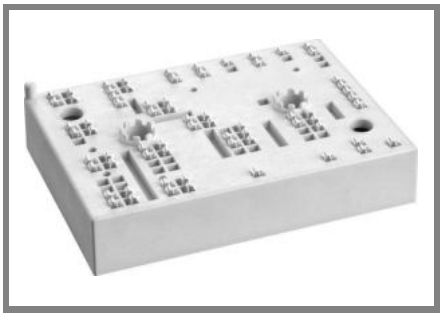


MiniSKiiP® 3

3-phase bridge rectifier + brake chopper

SKiiP 39AHB16V1

Features

- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

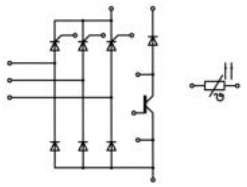
- Input bridge for inverter uo to 45 kVA

Remarks

- V_{CEsat} , V_F = chip level value

Absolute Maximum Ratings	T_s = 25 °C, unless otherwise specified		
Symbol	**Conditions**	**Values**	**Units**
IGBT - Chopper			
V_{CES}		1200	V
I_C	T_s = 25 (70) °C	157 (118)	A
I_{CRM}	$t_p \leq$ 1 ms	280	A
V_{GES}		± 20	V
T_j		- 40 ... + 150	°C
Diode - Chopper			
I_F	T_s = 25 (70) °C	167 (124)	A
I_{FRM}	$t_p \leq$ 1 ms	280	A
T_j		- 40 ... + 150	°C
Diode / Thyristor - Rectifier			
V_{RRM}		1600	V
I_F / I_T	T_s = 70	121	A
I_{FSM} / I_{TSM}	t_p = 10 ms, sin 180 °, T_j = 25 °C	1250	A
i^2t	t_p = 10 ms, sin 180 °, T_j = 25 °C	7800	A^2s
T_j	Diode	- 40 ... + 150	°C
T_j	Thyristor	- 40 ... + 125	°C
I_{tRMS}	per power terminal (20 A / spring)	160	A
T_{stg}	$T_{op} \leq T_{stg}$	- 40 ... + 125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics	T_s = 25 °C, unless otherwise specified				
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Chopper					
V_{CEsat}	I_{Cnom} = 140 A, T_j = 25 (125) °C		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6 mA	5	5,8	6,5	V
$V_{CE(TO)}$	T_j = 25 (125) °C		1 (0,9)	1,2 (1,1)	V
r_T	T_j = 25 (125) °C		5 (7,9)	6,4 (9,3)	mΩ
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		11,2		nF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1,9		nF
C_{res}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1,5		nF
$R_{th(j-s)}$	per IGBT		0,3		K/W
$t_{d(on)}$	under following conditions		80		ns
t_r	V_{CC} = 600 V, V_{GE} = ± 15 V		40		ns
$t_{d(off)}$	I_{Cnom} = 140 A, T_j = 125 °C		500		ns
t_f	R_{Gon} = R_{Goff} = 5 Ω		100		ns
E_{on}	inductive load		19,9		mJ
E_{off}			17,3		mJ
Diode - Chopper					
V_F = V_{EC}	I_{Fnom} = 140 A, T_j = 25 (125) °C		1,5 (1,5)	1,7 (1,7)	V
$V_{(TO)}$	T_j = 25 (125) °C		1 (0,8)	1,1 (0,9)	V
r_T	T_j = 25 (125) °C		3,6 (5)	4,3 (5,7)	mΩ
$R_{th(j-s)}$	per diode		0,4		K/W
I_{RRM}	under following conditions		210		A
Q_{rr}	I_{Fnom} = 140 A, V_R = 600 V		38		µC
E_{rr}	V_{GE} = 0 V, T_j = 125 °C		16,2		mJ
	di_F/dt = 4300 A/µs				



AHB

Characteristics		T_s = 25 °C, unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
Diode - Rectifier					
V_F	I_{Fnom} = 90 A, T_j = 25 °C		1,2		V
$V_{(TO)}$	T_j = 150 °C		0,8		V
r_T	T_j = 150 °C		4		mΩ
$R_{th(j-s)}$	per diode		0,5		K/W
Thyristor - Rectifier					
V_T	I_{Fnom} = 200 A, T_j = 25 (125) °C			1,65 (1,6)	V
$V_{T(TO)}$	T_j = 125 °C			0,9	V
r_T	T_j = 125 °C			3,5	mΩ
V_{GT}	T_j = 25 °C			3	V
I_{GT}	T_j = 25 °C	150			mA
I_H	T_j = 25 °C		150		mA
I_L	T_j = 25 °C		300		mA
$dv/dt_{(cr)}$	T_j = 125 °C			1000	V/µs
$di/dt_{(cr)}$	T_j = 125 °C			100	A/µs
$R_{th(j-s)}$	per thyristor		0,5		K/W
Temperature Sensor					
R_{ts}	3 %, T_r = 25 (100) °C		1000(1670)		Ω
Mechanical Data					
w			95		g
M_s	Mounting torque	2		2,5	Nm

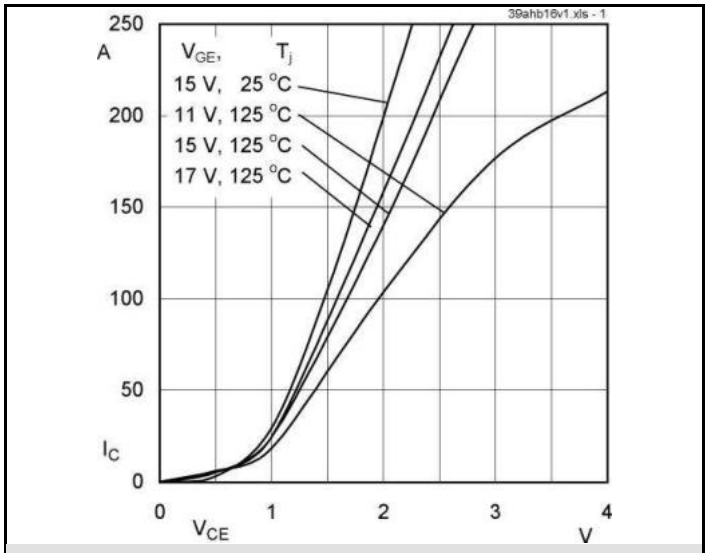


Fig. 1 Typ. output characteristic

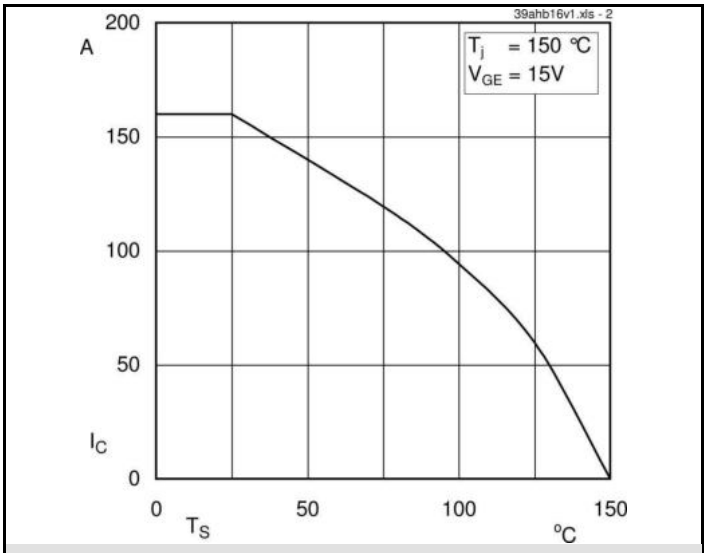


Fig. 2 Typ. rated current vs. temperature

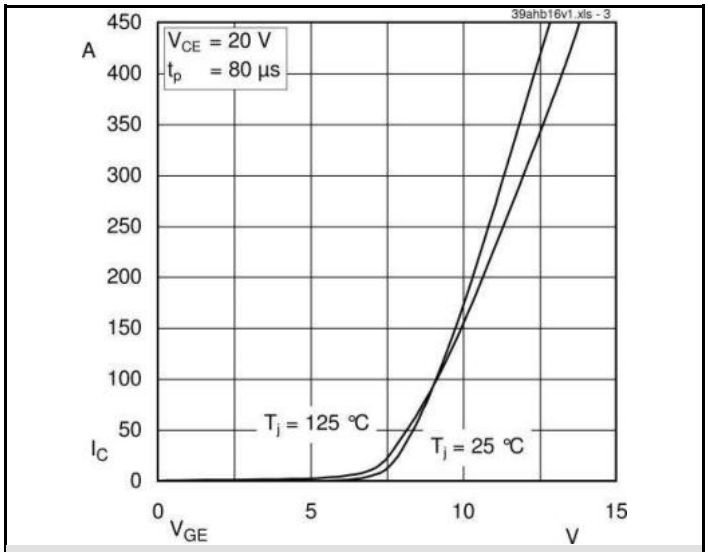


Fig. 3 Typ. transfer characteristic

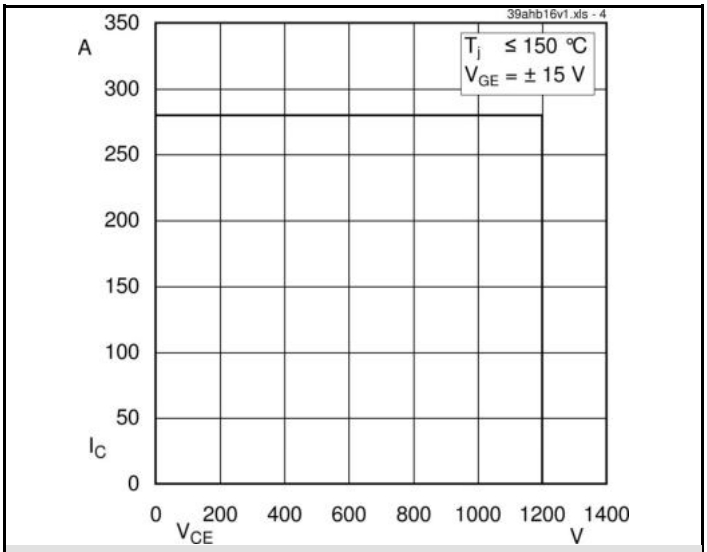


Fig. 4 Reverse bias safe operating area

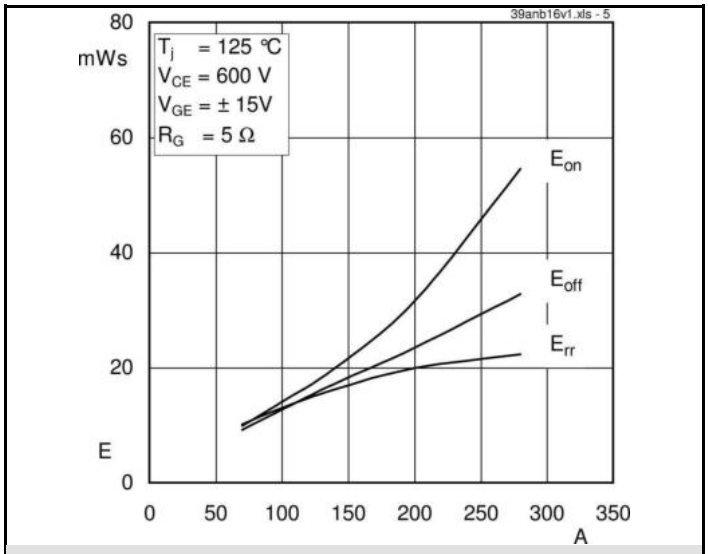


Fig. 5 Typ. Turn-on /-off energy = f (I_C)

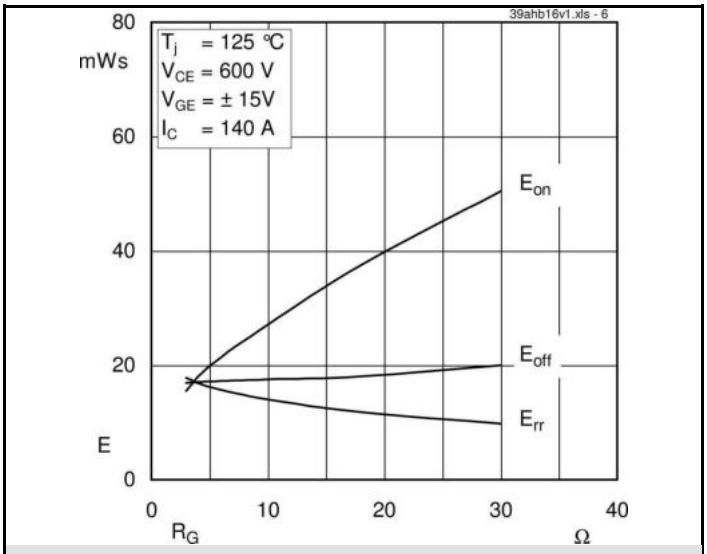


Fig. 6 Typ. Turn-on /-off energy = f (R_G)

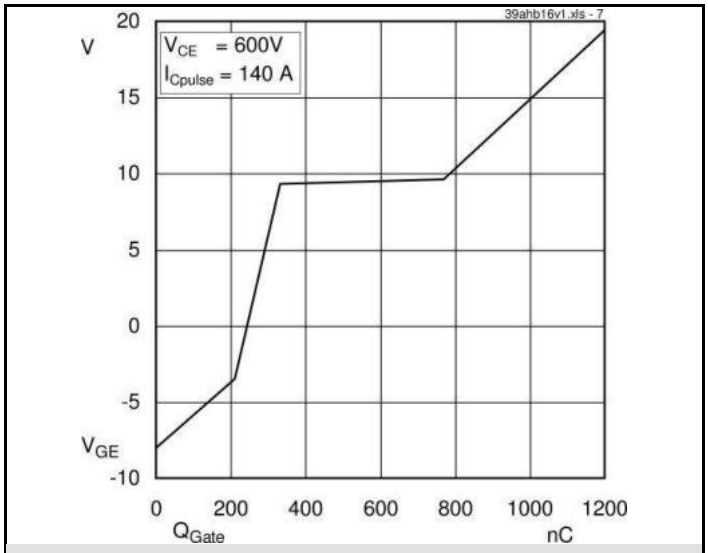


Fig. 7 Typ. gate charge characteristic

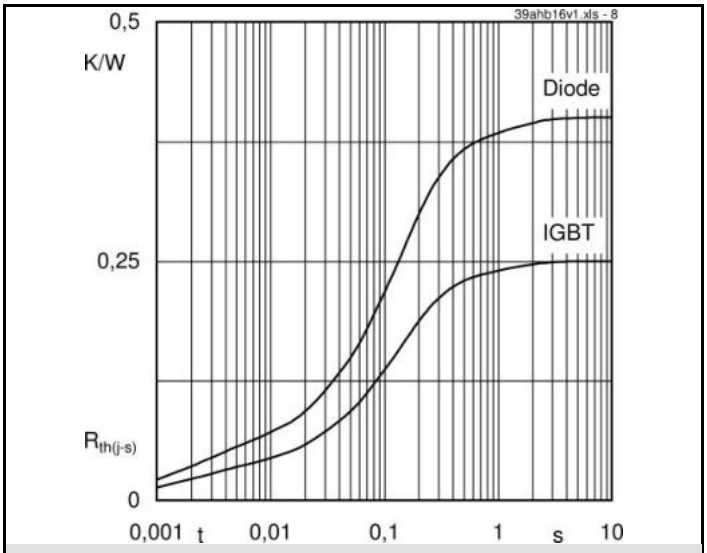


Fig. 8 Typ. thermal impedance

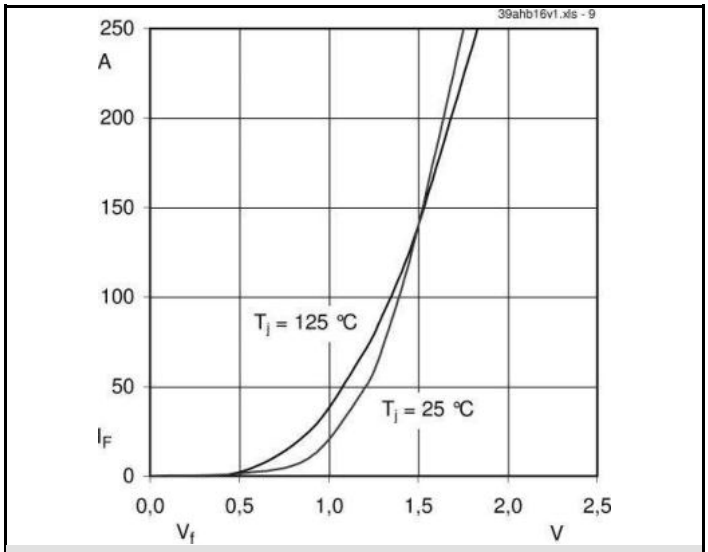


Fig. 9 Typ. freewheeling diode forward characteristic

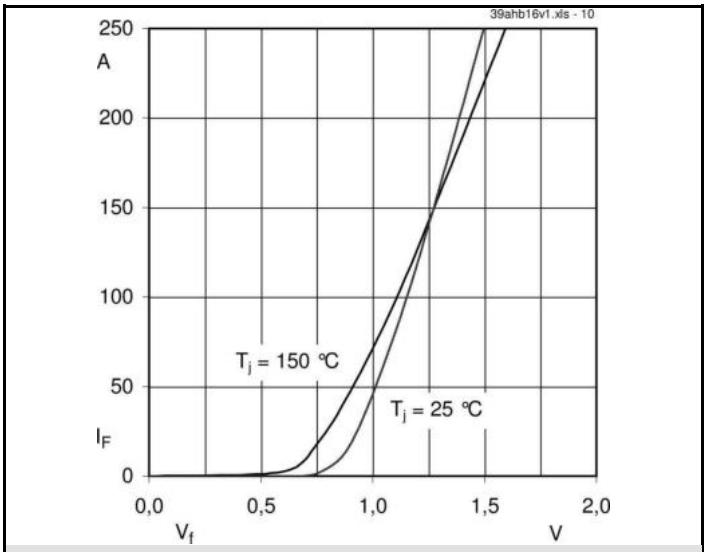


Fig. 10 Typ. input bridge forward characteristic

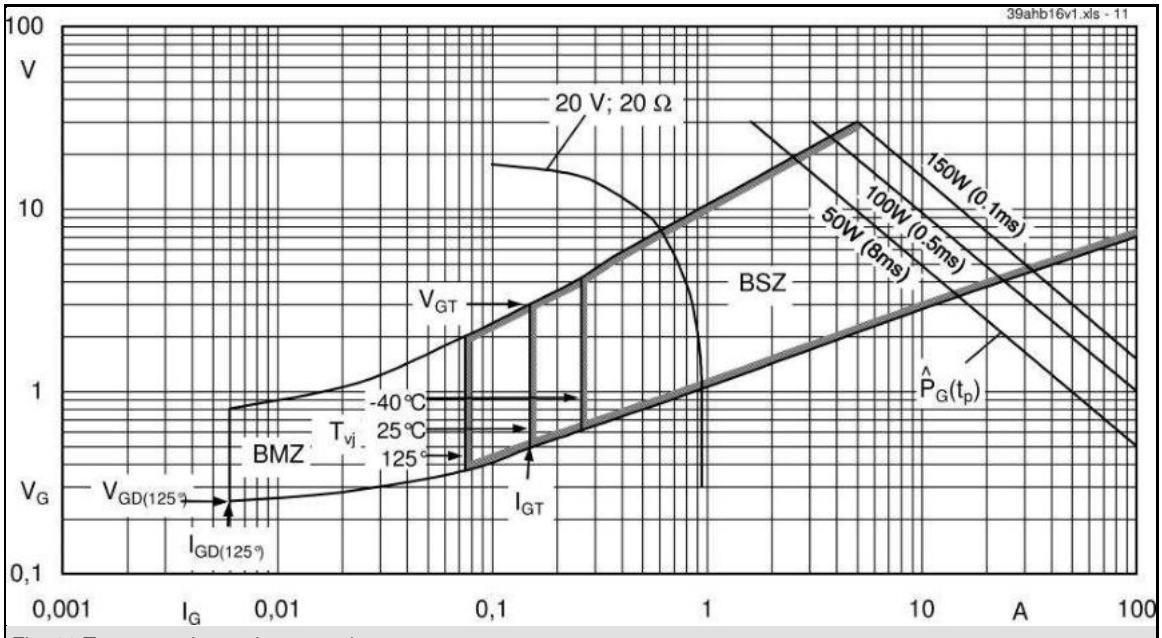
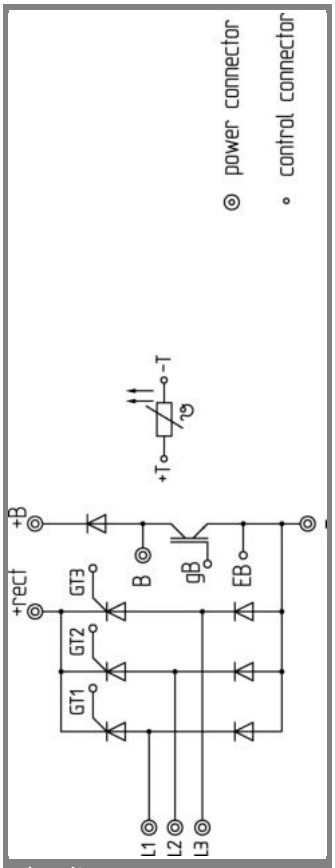
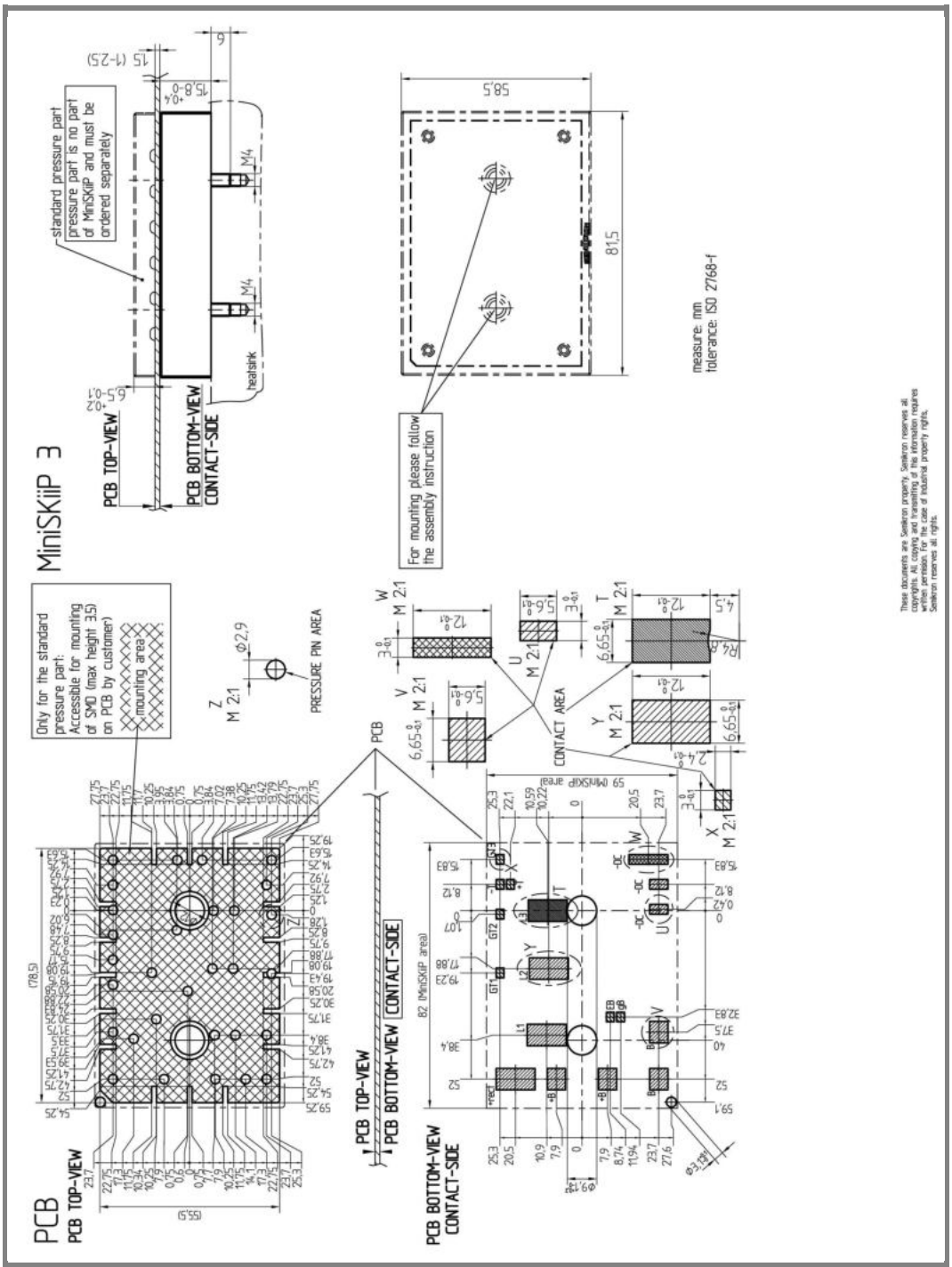


Fig. 11 Typ. gate trigger characterstic



circuit



pinout, dimensions

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.

