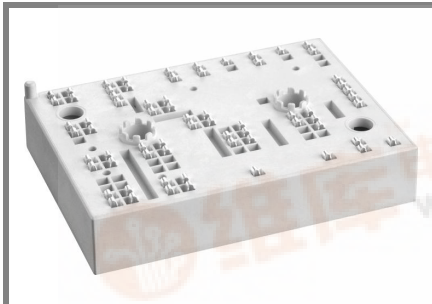


SKiIP 39AHB16V1



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

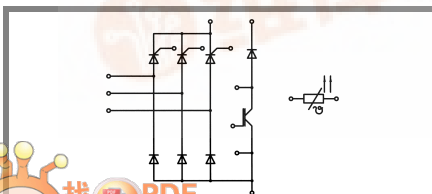
- Input bridge for inverter up to 45 kVA

Remarks

- V_{CEsat} , V_F = chip level value

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

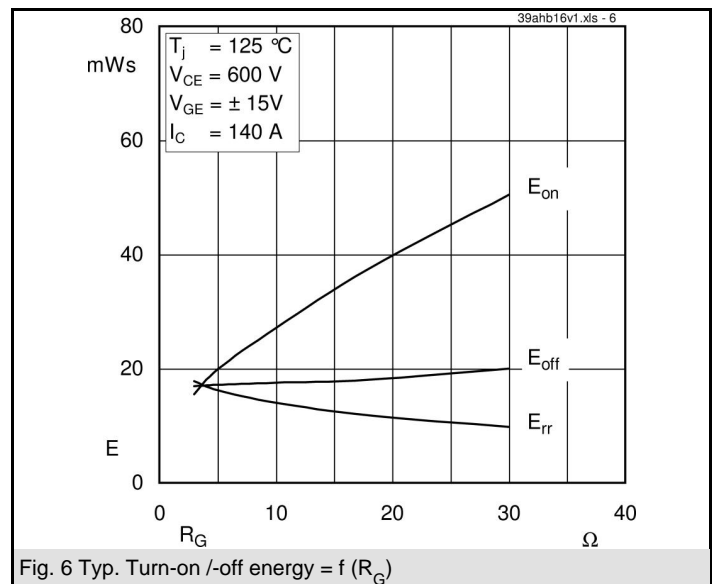
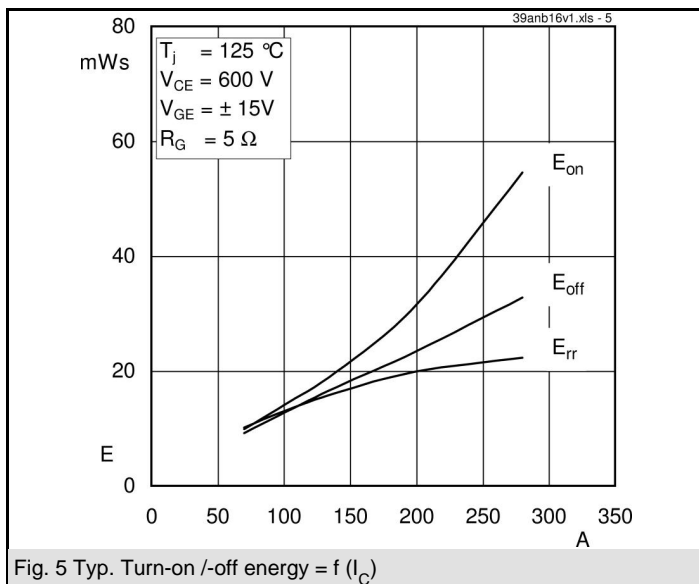
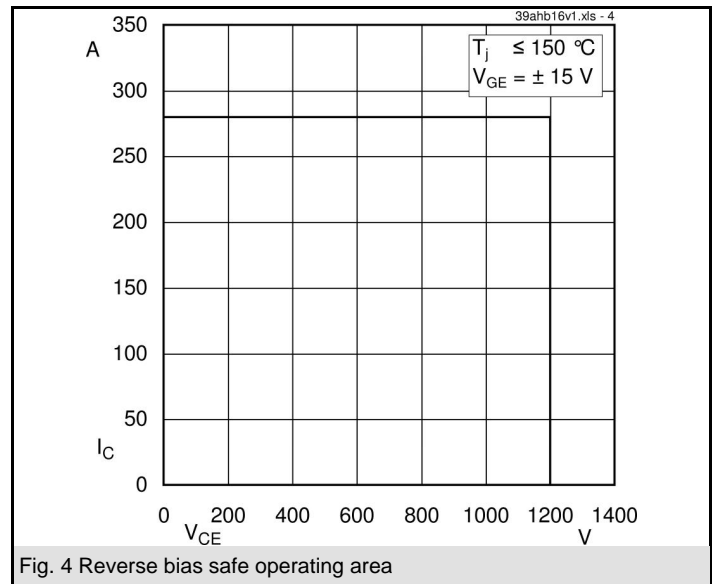
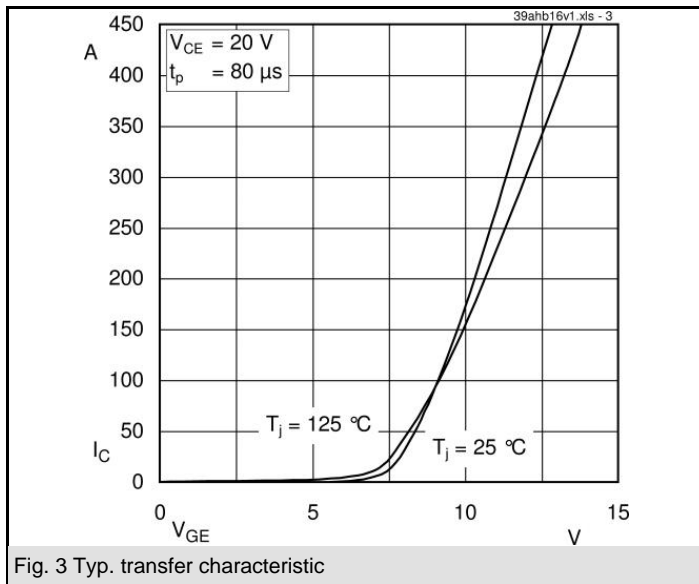
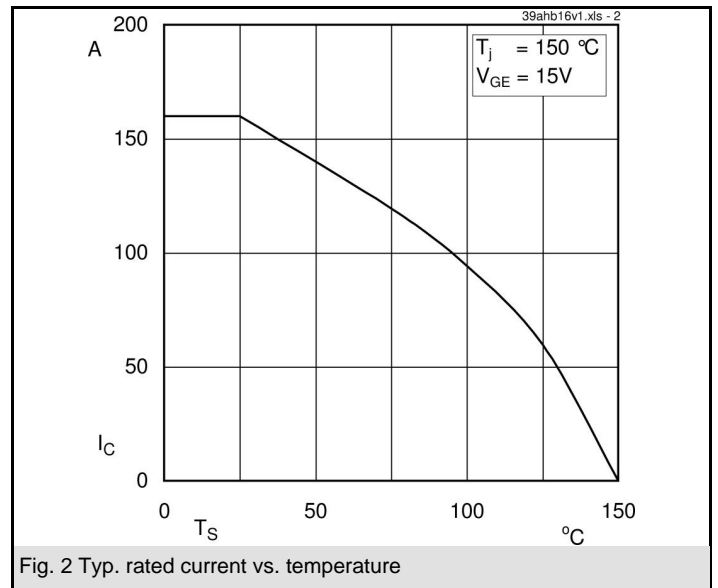
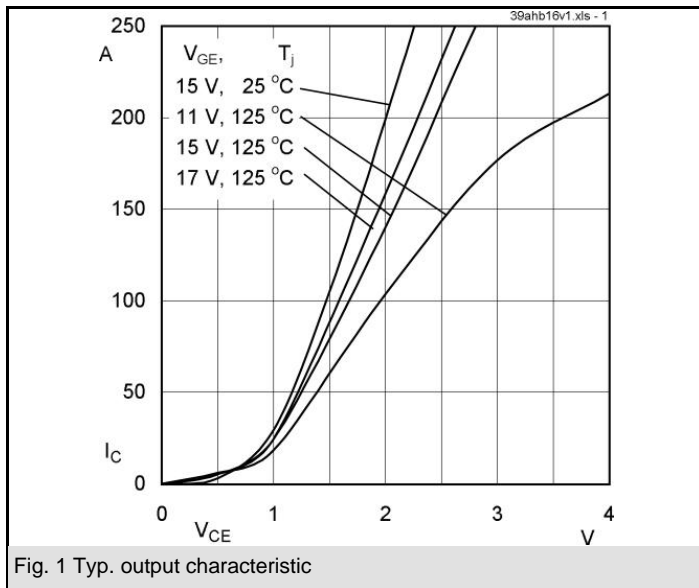
Characteristics		$T_s = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Chopper					
V_{CEsat}	$I_{Cnom} = 140\text{ A}$, $T_j = 25\text{ (125) }^\circ\text{C}$		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 6\text{ mA}$	5	5,8	6,5	V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



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

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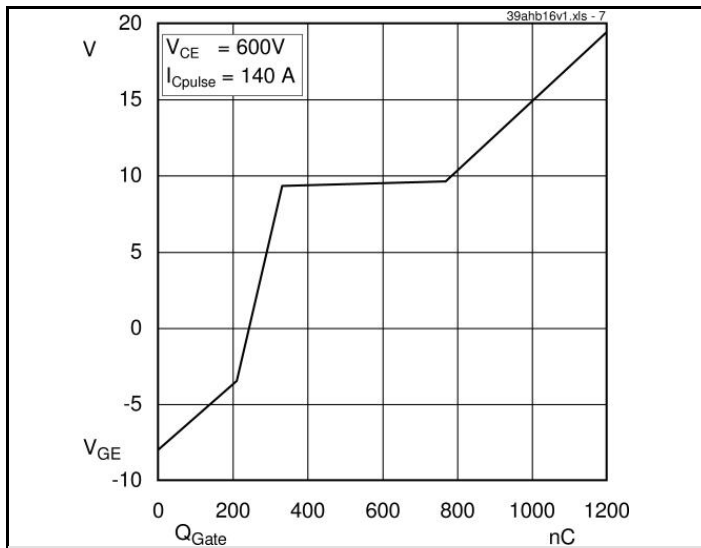


Fig. 7 Typ. gate charge characteristic

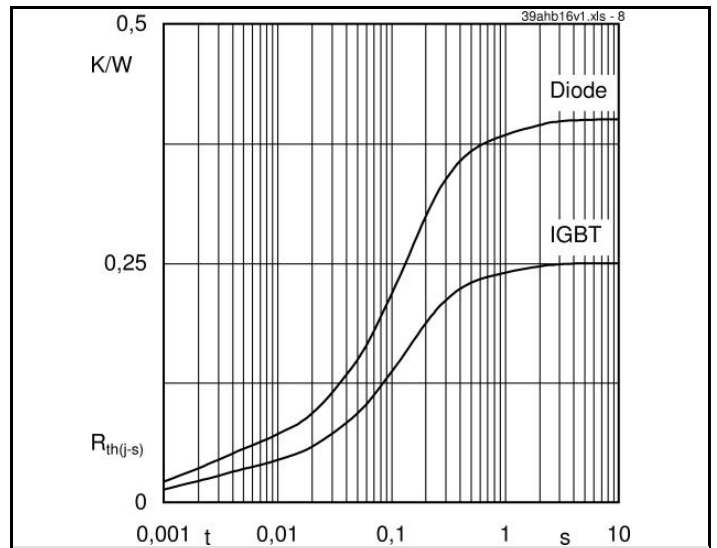


Fig. 8 Typ. thermal impedance

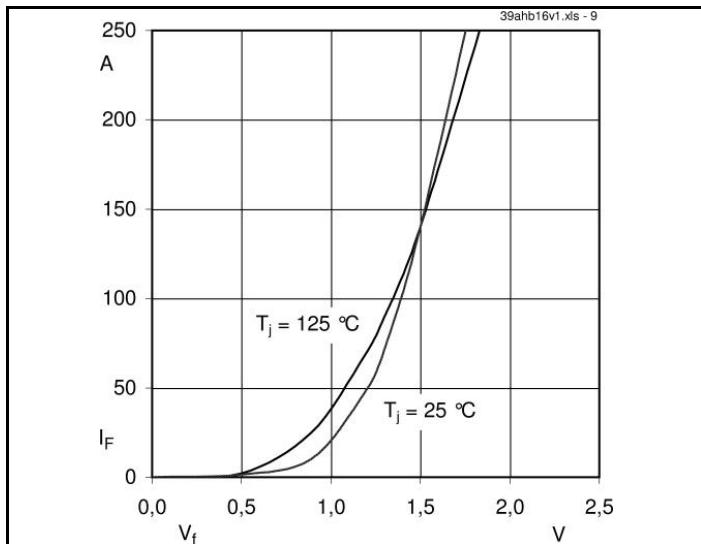


Fig. 9 Typ. freewheeling diode forward characteristic

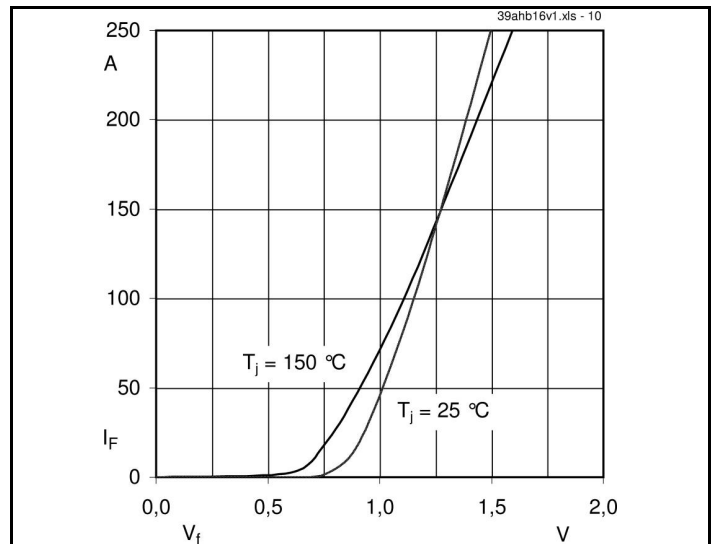


Fig. 10 Typ. input bridge forward characteristic

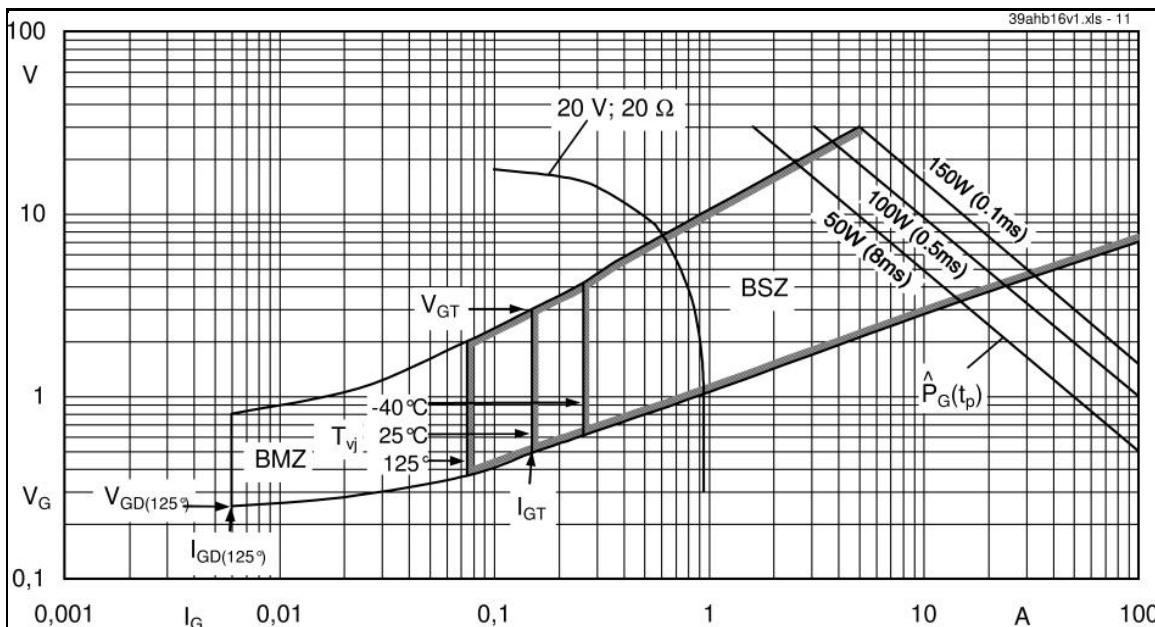
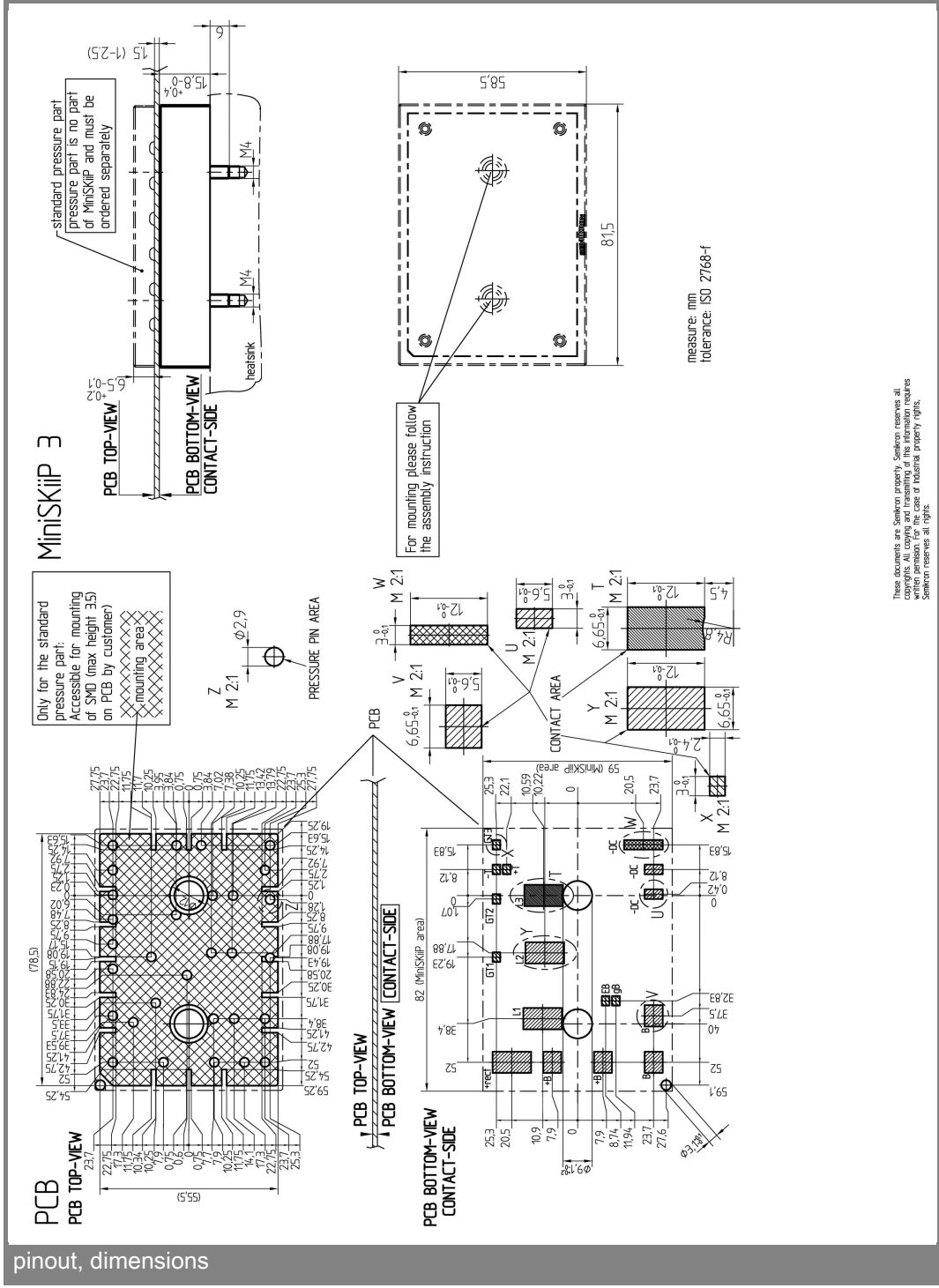
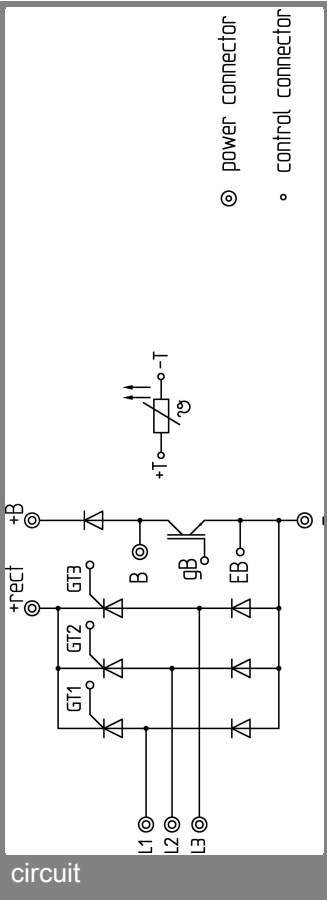


Fig. 11 Typ. gate trigger characteristic

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