
MiniSKiiP® 2

3-phase bridge rectifier + brake chopper

SKiiP 29AHB08V1

Preliminary Data

Features

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

Typical Applications

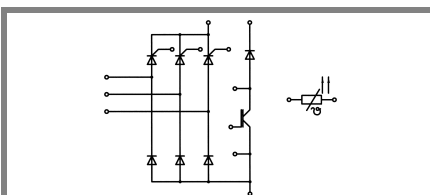
- Input bridge for Inverter up to 30 kVA

Remarks

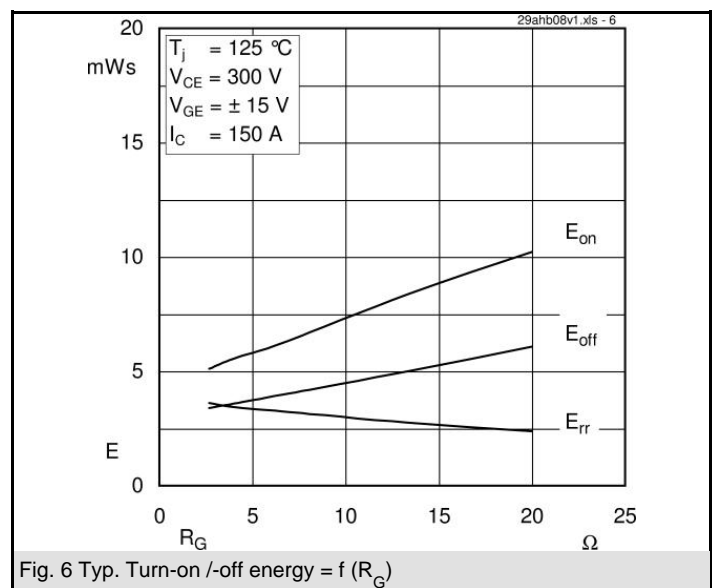
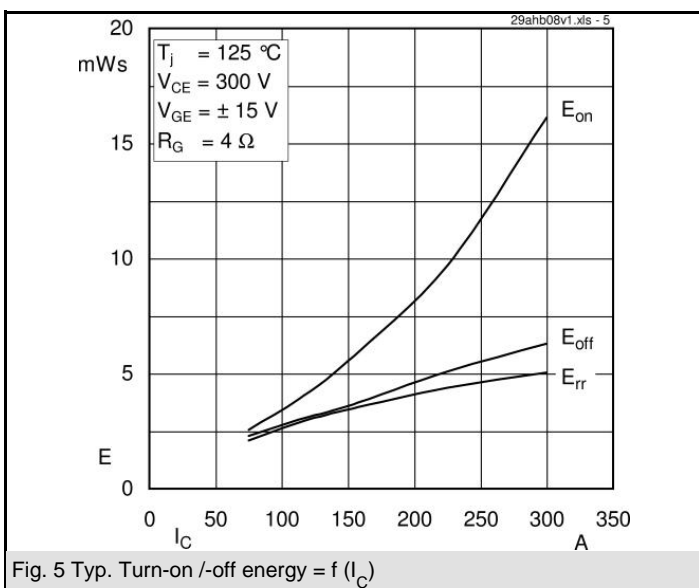
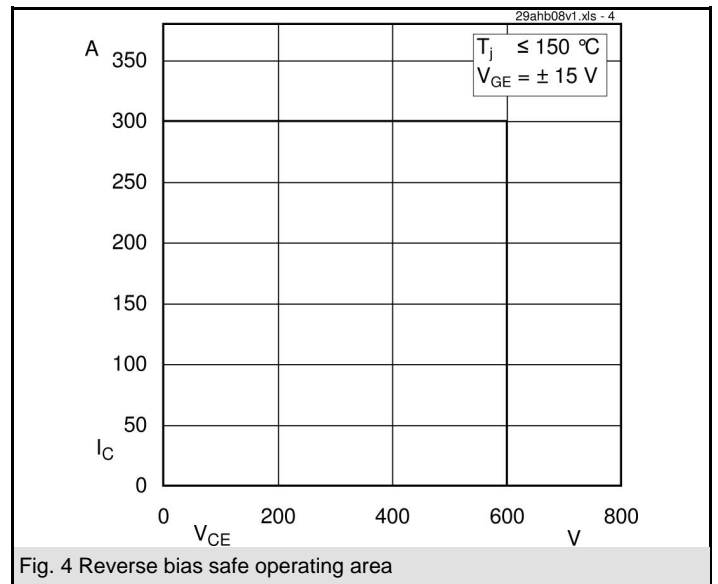
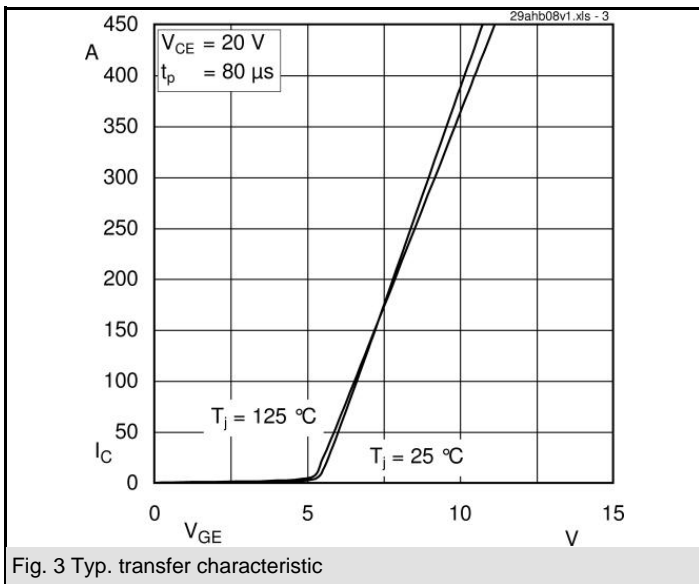
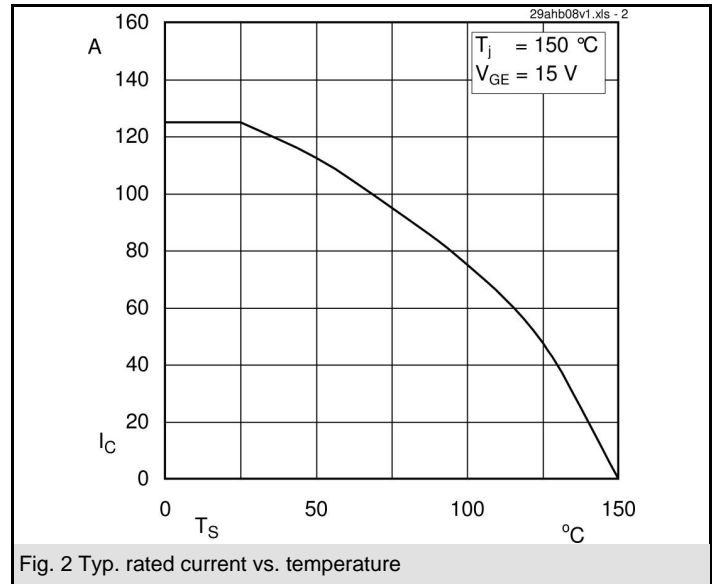
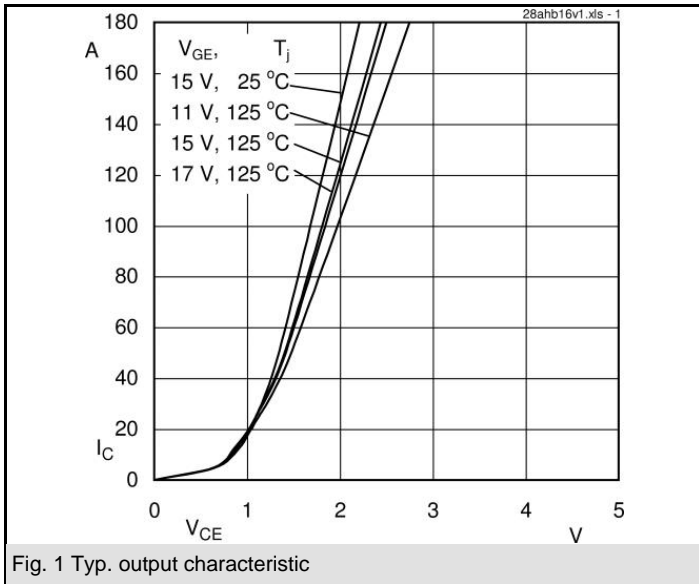
- V_{CEsat} , V_F = chip level value

Absolute Maximum Ratings		$T_s = 25\text{ °C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Chopper			
V_{CES}	$T_s = 25\text{ (70) °C}$ $t_p \leq 1\text{ ms}$	600	V
I_C		125 (93)	A
I_{CRM}		300	A
V_{GES}		± 15	V
T_j		- 40 ... + 150	°C
Diode - Chopper			
I_F	$T_s = 25\text{ (70) °C}$ $t_p \leq 1\text{ ms}$	120 (89)	A
I_{FRM}		300	A
T_j		- 40 ... + 150	°C
Diode / Thyristor - Rectifier			
V_{RRM}	$T_s = 70$ $t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$ $t_p = 10\text{ ms, sin } 180\text{ °, } T_j = 25\text{ °C}$	800	V
I_F / I_T		82	A
I_{FSM} / I_{TSM}		1000	A
i^2t		5500	A ² s
T_j		Diode	- 40 ... + 150
T_j	Thyristor	- 40 ... + 125	°C
I_{RMS}	per power terminal (20 A / spring)	120	A
T_{stg}	$T_{op} \leq T_{stg}$	- 40 ... + 125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_s = 25\text{ °C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Chopper					
V_{CEsat}	$I_C = 150\text{ A, } T_j = 25\text{ (125) °C}$		2 (2,2)	2,5 (2,7)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3\text{ mA}$	3	4	5	V
$V_{CE(TO)}$	$T_j = 25\text{ (125) °C}$		1,2 (1,1)	1,3 (1,2)	V
r_T	$T_j = 25\text{ (125) °C}$		5,3 (7,3)	8 (10)	mΩ
C_{ies}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		9		nF
C_{oes}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		1,7		nF
C_{res}	$V_{CE} = 25\text{ V, } V_{GE} = 0\text{ V, } f = 1\text{ MHz}$		2,1		nF
$R_{th(j-s)}$	per IGBT		0,4		K/W
$t_{d(on)}$	under following conditions		20		ns
t_r	$V_{CC} = 300\text{ V, } V_{GE} = \pm 15\text{ V}$		25		ns
$t_{d(off)}$	$I_C = 150\text{ A, } T_j = 125\text{ °C}$		185		ns
t_f	$R_{Gon} = R_{Goff} = 4\text{ } \Omega$		15		ns
E_{on}	inductive load		5,7		mJ
E_{off}			3,7		mJ
Diode - Chopper					
$V_F = V_{EC}$	$I_F = 150\text{ A, } T_j = 25\text{ (125) °C}$		1,7 (1,7)	2,1 (2,1)	V
$V_{(TO)}$	$T_j = 25\text{ (125) °C}$		1 (0,9)	1,1 (1)	V
r_T	$T_j = 25\text{ (125) °C}$		4,7 (5,3)	6,7 (7,3)	mΩ
$R_{th(j-s)}$	per diode		0,55		K/W
I_{RRM}	under following conditions		270		A
Q_{rr}	$I_F = 150\text{ A, } V_R = 300\text{ V}$		18		μC
E_{rr}	$V_{GE} = 0\text{ V, } T_j = 125\text{ °C}$ $di_F/dt = 13700\text{ A/}\mu\text{s}$		3,5		mJ


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Characteristics		$T_s = 25\text{ }^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
Diode - Rectifier					
V_F	$I_F = 75\text{ A}$, $T_j = 25\text{ }^\circ\text{C}$		1,2		V
$V_{T(TO)}$	$T_j = 150\text{ }^\circ\text{C}$		0,8		V
r_T	$T_j = 150\text{ }^\circ\text{C}$		7		m Ω
$R_{th(j-s)}$	per diode		0,7		K/W
Thyristor - Rectifier					
V_T	$I_F = 120\text{ A}$, $T_j = 25\text{ (125)}\text{ }^\circ\text{C}$			1,8 (1,7)	V
$V_{T(TO)}$	$T_j = 125\text{ }^\circ\text{C}$			1,1	V
r_T	$T_j = 125\text{ }^\circ\text{C}$			5	m Ω
V_{GT}	$T_j = 25\text{ }^\circ\text{C}$			3	V
I_{GT}	$T_j = 25\text{ }^\circ\text{C}$	150			mA
I_H	$T_j = 25\text{ }^\circ\text{C}$		200		mA
I_L	$T_j = 25\text{ }^\circ\text{C}$		400		mA
$dv/dt_{(cr)}$	$T_j = 125\text{ }^\circ\text{C}$			1000	V/ μs
$di/dt_{(cr)}$	$T_j = 125\text{ }^\circ\text{C}$			50	A/ μs
$R_{th(j-s)}$	per thyristor		0,65		K/W
Temperature Sensor					
R_{ts}	3 %, $T_r = 25\text{ (100)}\text{ }^\circ\text{C}$		1000(1670)		Ω
Mechanical Data					
w			65		g
M_s	Mounting torque	2		2,5	Nm



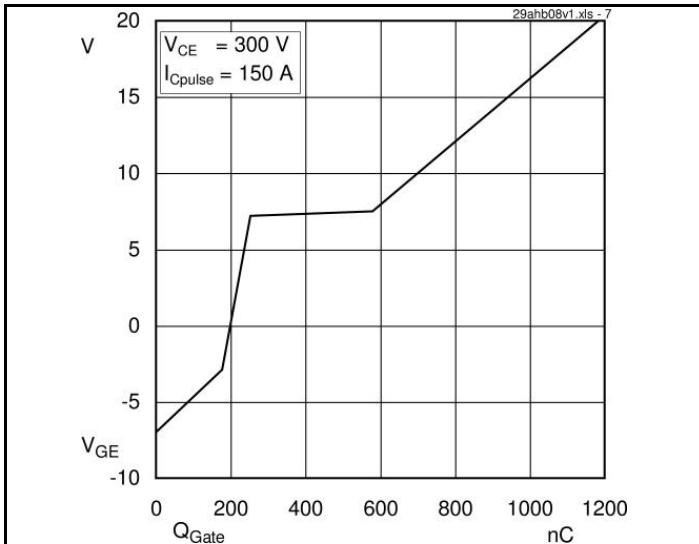


Fig. 7 Typ. gate charge characteristic

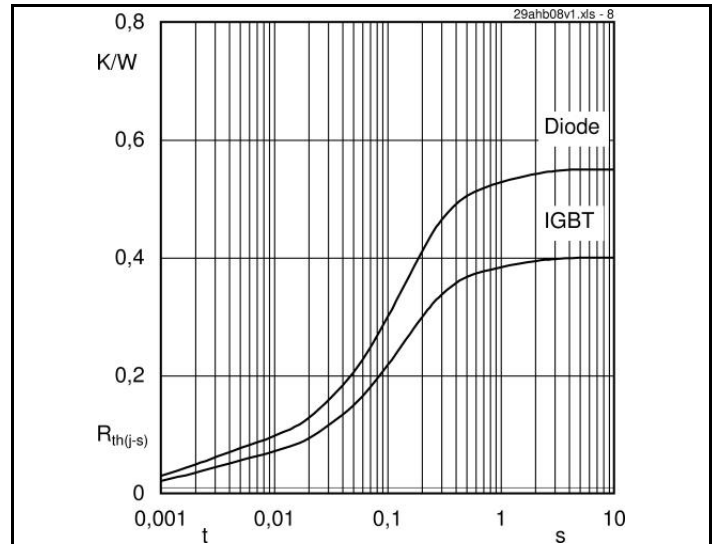


Fig. 8 Typ. thermal impedance

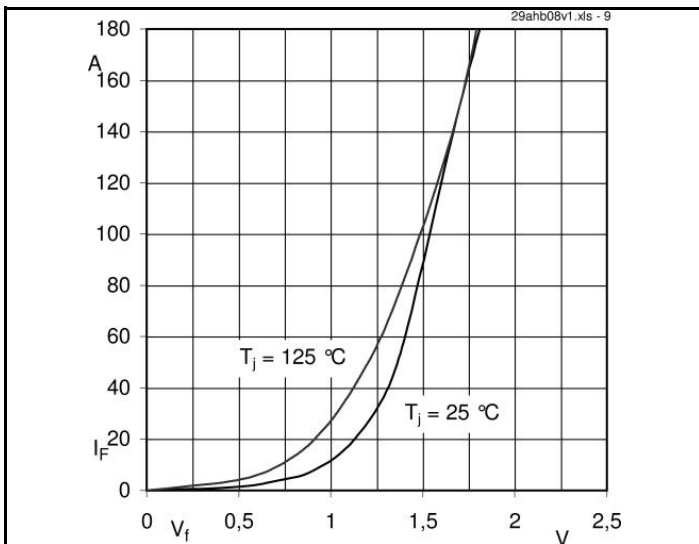


Fig. 9 Typ. freewheeling diode forward characteristic

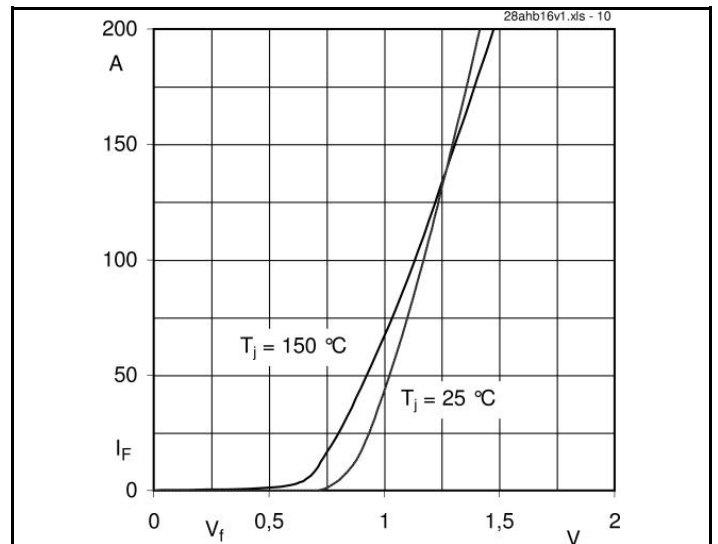


Fig. 10 Typ. input bridge forward characteristic

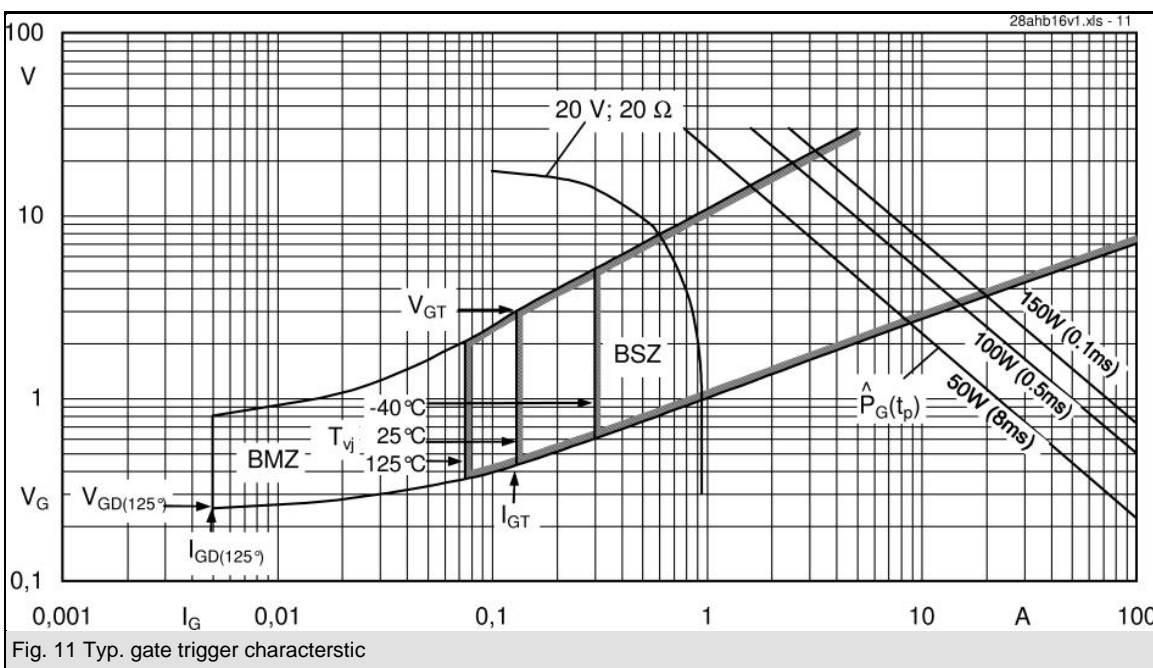
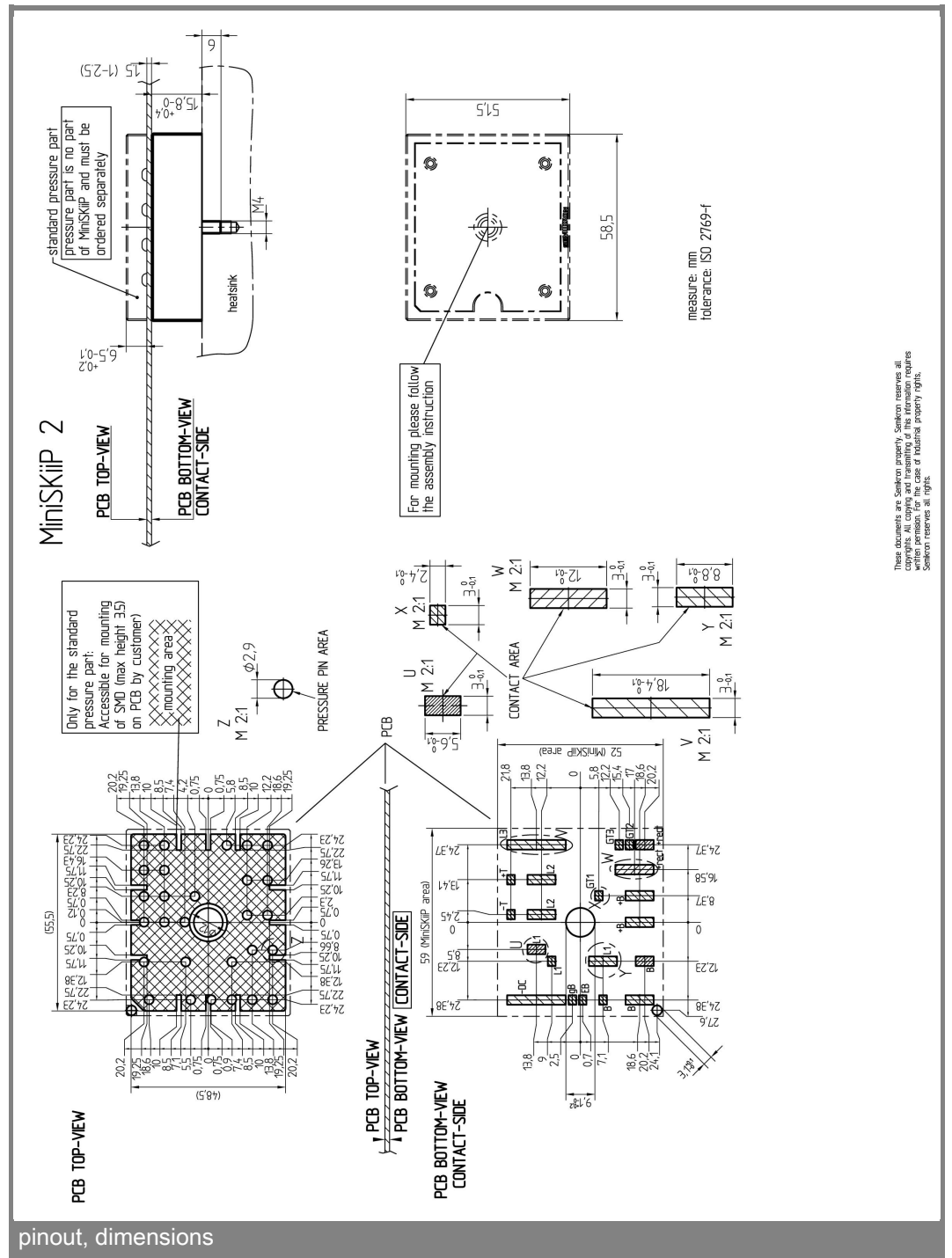
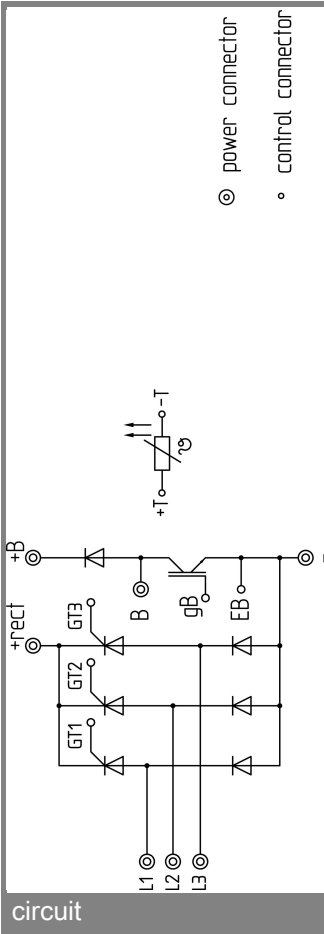


Fig. 11 Typ. gate trigger characteristic



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

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