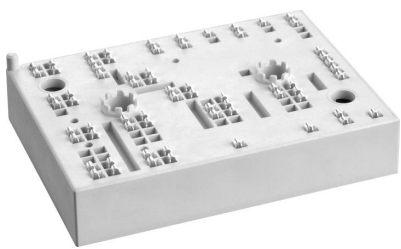# SKiiP 37NAB12T4V10

MiniSKiiP® 3

3-phase bridge rectifier + brake chopper + 3-phase bridge inverter
**SKiiP 37NAB12T4V10**

Features

- Trench 4 IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*
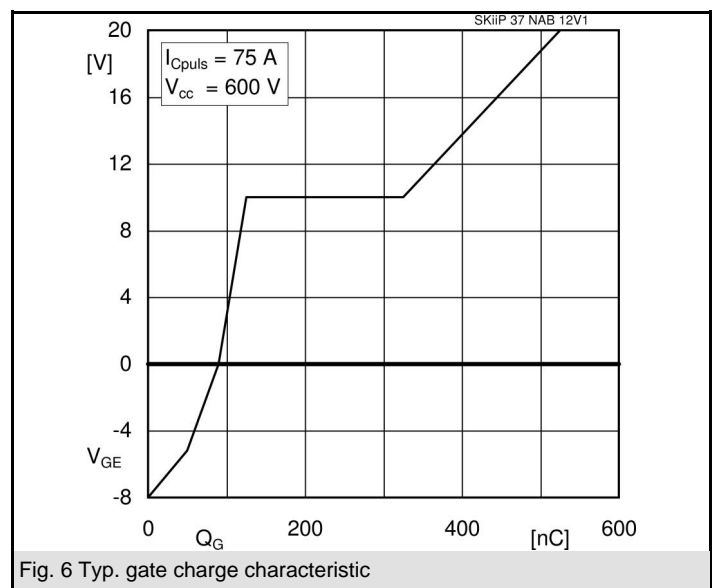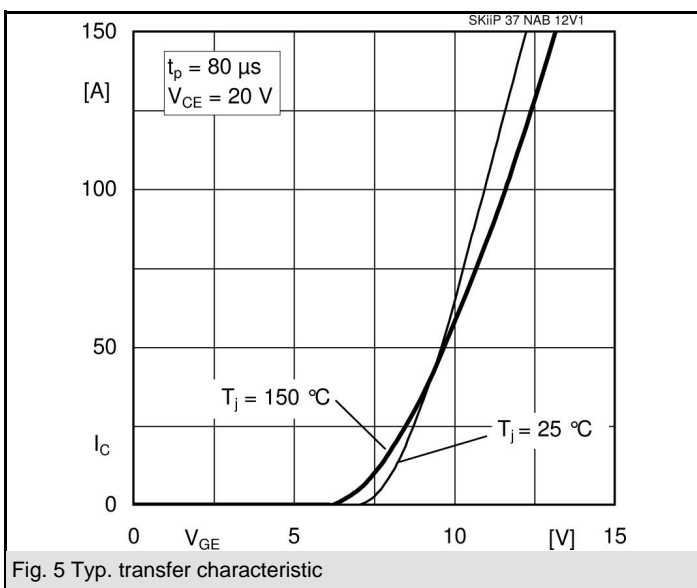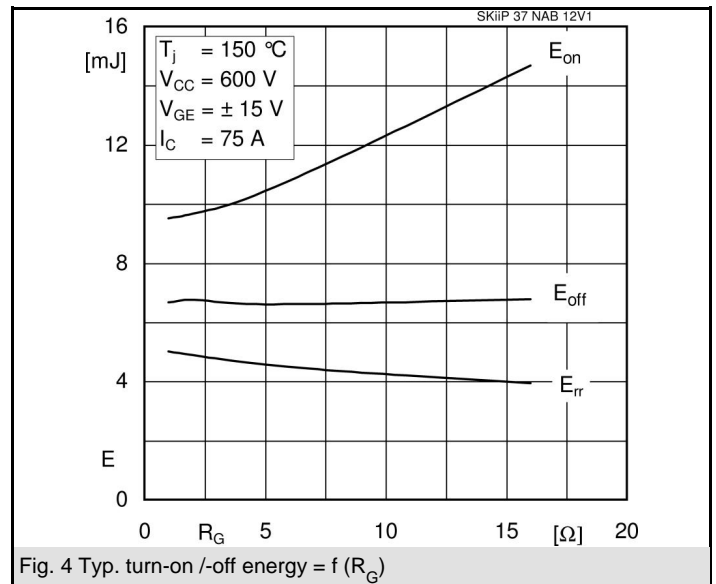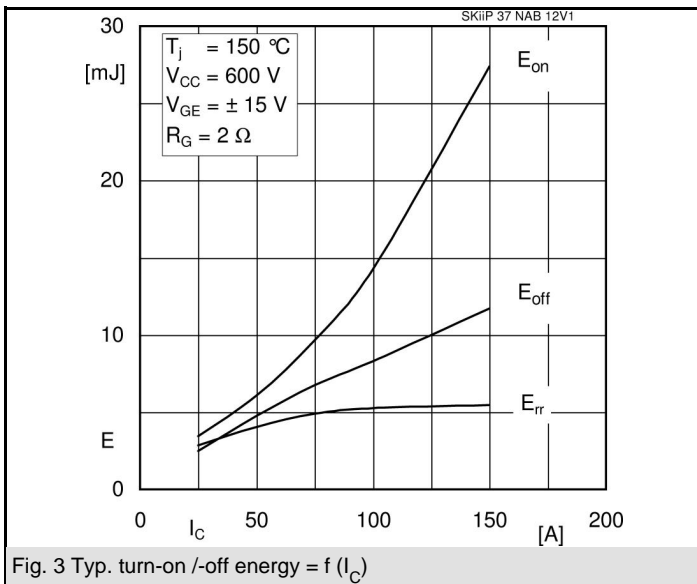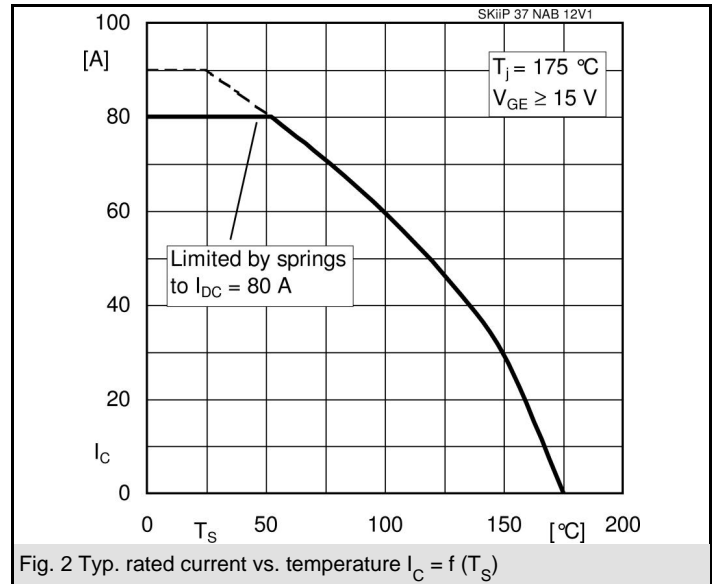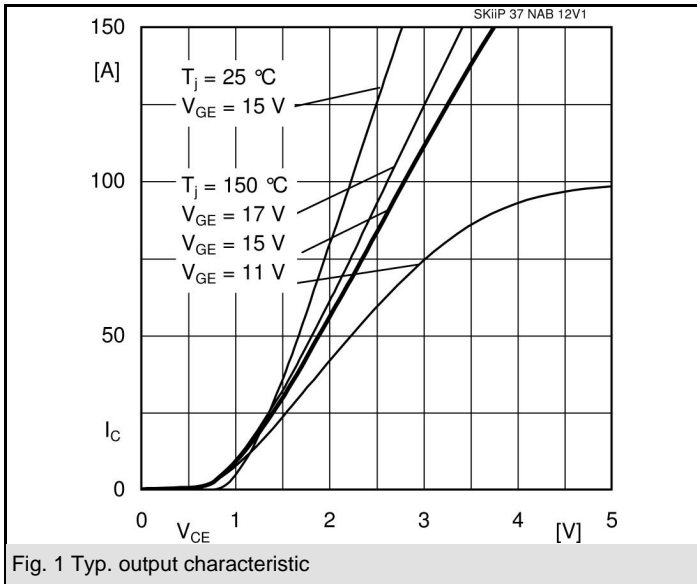
- Inverter up to 36 kVA
- Typical motor power 22 kW

Remarks

- V_{CEsat} , V_F= chip level value
- Case temp. limited to T_C = 125°C max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_j \leq 150$ (recomm. T_{op} = -40 ... +150°C)
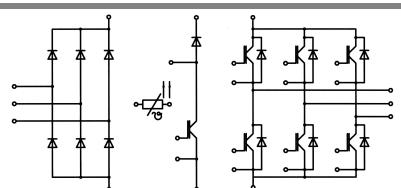
NAB

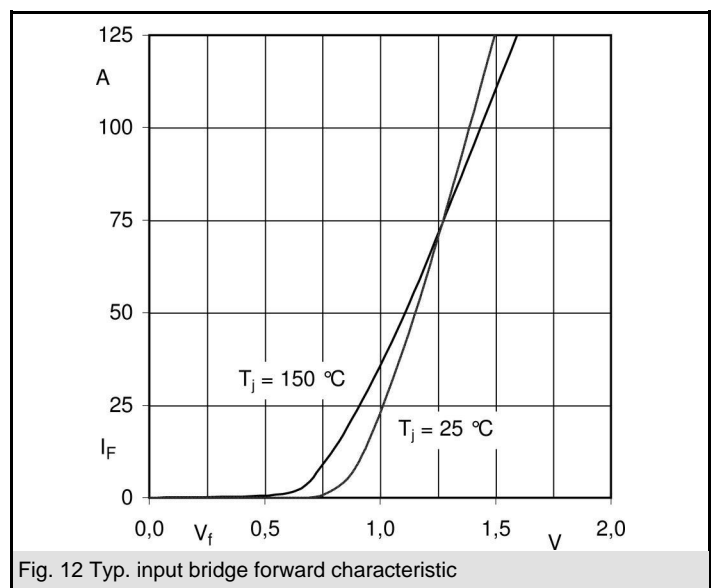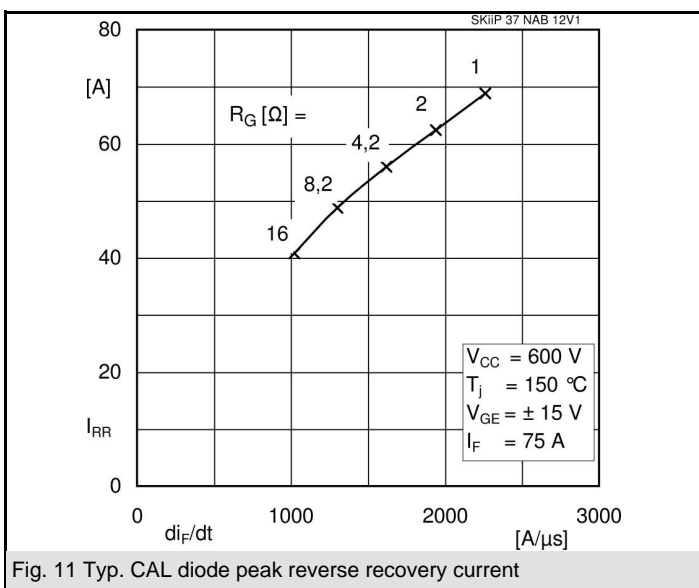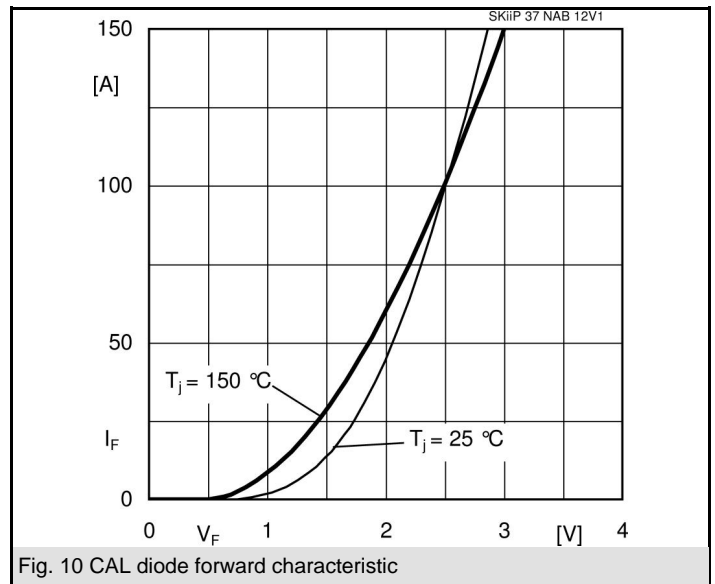| Absolute Maximum Ratings		T_s = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Inverter, Chopper			
V_{CES}		1200	V
I_C	T_s = 25 (70) °C	90 (73)	A
I_{CRM}		225	A
V_{GES}		± 20	V
T_j		- 40 ... + 175	°C
Diode - Inverter, Chopper			
I_F	T_s = 25 (70) °C	82 (61)	A
I_{FRM}		225	A
T_j		- 40 ... + 175	°C
Diode - Rectifier			
V_{RRM}		1600	V
I_F	T_s = 70 °C	67	A
I_{FSM}	t_p = 10 ms, sin 180 °, T_j = 25 °C	850	A
i^2t	t_p = 10 ms, sin 180 °, T_j = 25 °C	3600	A²s
T_j		- 40 ... + 150	°C
Module			
I_{tRMS}	per power terminal (20 A / spring)	80	A
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 - Inverter, Chopper					
V_{CEsat}	I_{Cnom} = 75 A, T_j = 25 (150) °C		1,85 (2,25)	2,05 (2,45)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 3 mA	5	5,8	6,5	V
$V_{CE(TO)}$	T_j = 25 (150) °C		0,8 (0,7)	0,9 (0,8)	V
r_T	T_j = 25 (150) °C		14 (21)	15 (22)	mΩ
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		4,4		nF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,29		nF
C_{res}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		0,24		nF
$R_{th(j-s)}$	per IGBT		0,58		K/W
$t_{d(on)}$	under following conditions		150		ns
t_r	V_{CC} = 600 V, V_{GE} = ± 15 V		35		ns
$t_{d(off)}$	I_{Cnom} = 75 A, T_j = 150°C		355		ns
t_f	R_{Gon} = R_{Goff} = 2 Ω		60		ns
E_{on}	inductive load		9,7		mJ
E_{off}			6,8		mJ
Diode - Inverter, Chopper					
$V_F = V_{EC}$	I_{Fnom} = 75 A, T_j = 25 (150) °C		2,2 (2,1)	2,5 (2,45)	V
$V_{(TO)}$	T_j = 25 (150) °C		1,3 (0,9)	1,5 (1,1)	V
r_T	T_j = 25 (150) °C		12 (16)	13 (18)	mΩ
$R_{th(j-s)}$	per diode		0,75		K/W
I_{RRM}	under following conditions		62		A
Q_{rr}	I_{Fnom} = 75 A, V_R = 600 V		12,6		µC
E_{rr}	V_{GE} = 0 V, T_j = 150 °C		4,9		mJ
	di_F/dt = 1940 A/µs				
Diode - Rectifier					
V_F	I_{Fnom} = 40 A, T_j = 25 °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,8		V
r_T	T_j = 150 °C		9		mΩ
$R_{th(j-s)}$	per diode		0,85		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
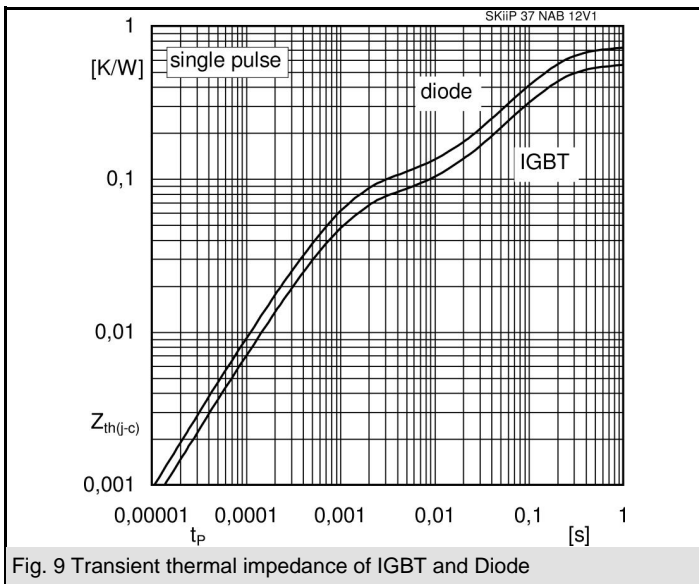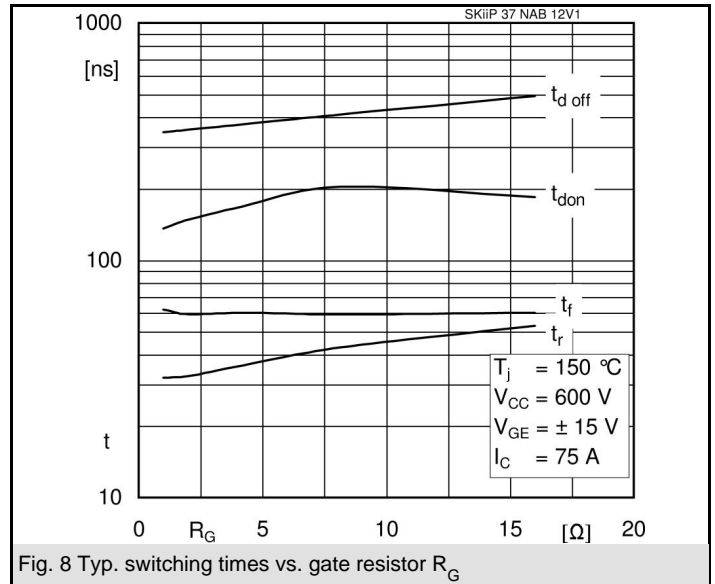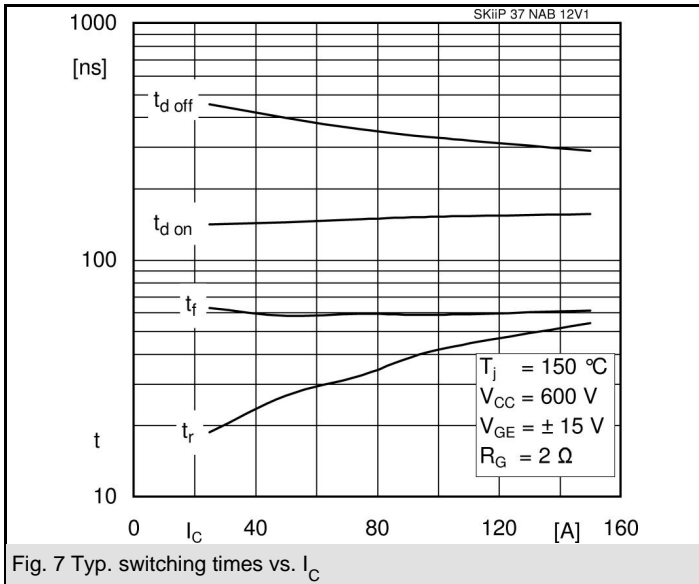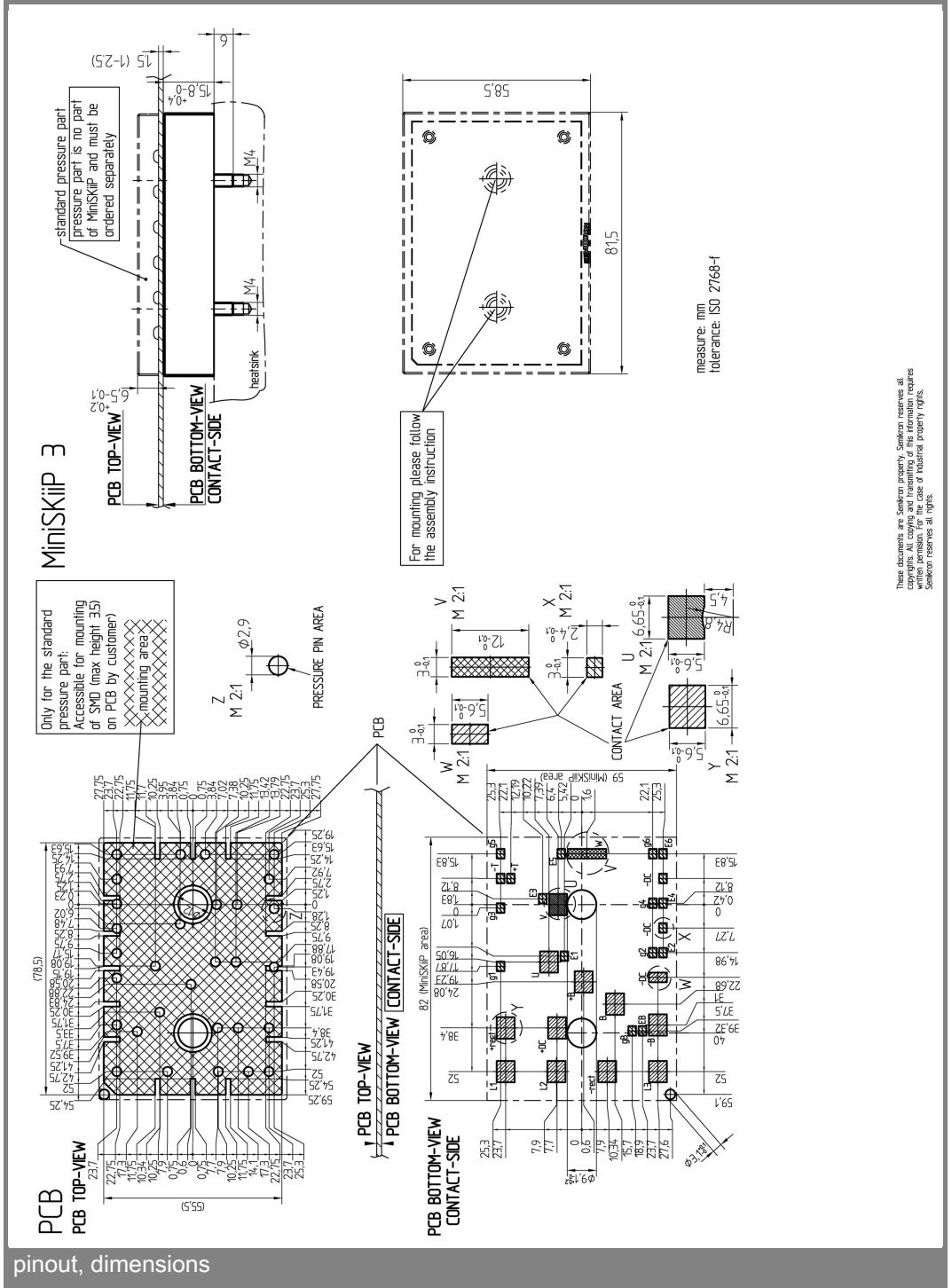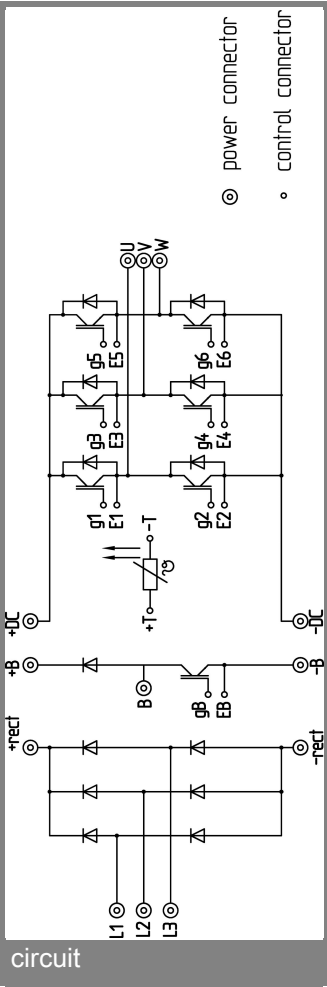
Fig. 1 Typ. output characteristic

Fig. 2 Typ. rated current vs. temperature $I_C = f(T_S)$

Fig. 3 Typ. turn-on /-off energy = $f(I_C)$

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

Fig. 5 Typ. transfer characteristic

Fig. 6 Typ. gate charge characteristic

Fig. 7 Typ. switching times vs. I_C

Fig. 8 Typ. switching times vs. gate resistor R_G

Fig. 9 Transient thermal impedance of IGBT and Diode

Fig. 10 CAL diode forward characteristic

Fig. 11 Typ. CAL diode peak reverse recovery current

Fig. 12 Typ. input bridge forward characteristic

circuit

pinout, dimensions

MiniSKiiP 3

standard pressure part
pressure part is no part
of MiniSKiiP and must be
ordered separately

For mounting please follow
the assembly instruction

measure: mm
tolerance: ISO 2768-f

Only for the standard
pressure part:
Accessible for mounting
of SMD (max height 3,5)
on PCB by customer:
mounting area

PRESSURE PIN AREA

CONTACT AREA

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.

22-04-2010 LAN