SEMIKRON

Absolute Maximum Ratings

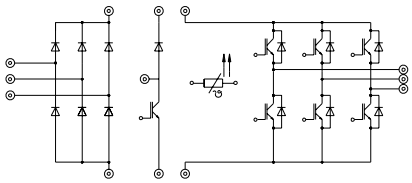
Symbol	Conditions [1]	Values	Units
Inverter	(Chopper see SKiiP 22 NAB 12 T18)		
V_{CES}		1200	V
V_{GES}		± 20	V
I_C	$T_{heatsink}$ = 25 / 80 °C	45 / 30	A
I_{CM}	t_p < 1 ms; $T_{heatsink}$ = 25 / 80 °C	90 / 60	A
$I_F = -I_C$	$T_{heatsink}$ = 25 / 80 °C	38 / 26	A
$I_{FM} = -I_{CM}$	t_p < 1 ms; $T_{heatsink}$ = 25 / 80 °C	76 / 52	A
Bridge Rectifier			
V_{RRM}		1500	V
I_D	$T_{heatsink}$ = 80 °C	35	A
I_{FSM}	t_p = 10 ms; sin. 180 °, T_j = 25 °C	700	A
I^2t	t_p = 10 ms; sin. 180 °, T_j = 25 °C	2400	A^2s
T_j		– 40 ... + 150	°C
T_{stg}		– 40 ... + 125	°C
V_{isol}	AC, 1 min.	2500	V

Characteristics

Symbol	Conditions [1]	min.	typ.	max.	Units
IGBT - Inverter					
V_{CEsat}	I_C = 30 A T_j = 25 (125) °C	–	2,5(3,1)	3,0(3,7)	V
$t_{d(on)}$	V_{CC} = 600 V; V_{GE} = ± 15 V	–	55	110	ns
t_r	I_C = 30 A; T_j = 125 °C	–	55	110	ns
$t_{d(off)}$	$R_{gon} = R_{goff}$ = 39 Ω	–	400	600	ns
t_f	inductive load	–	45	90	ns
$E_{on} + E_{off}$		–	7,8	–	mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V, 1 MHz	–	2,0	–	nF
R_{thjh}	per IGBT	–	–	0,7	K/W
IGBT - Chopper *					
V_{CEsat}	I_C = 15 A T_j = 25 (125) °C	–	2,5(3,1)	3,0(3,7)	V
$t_{d(on)}$	V_{CC} = 600 V; V_{GE} = ± 15 V	–	55	110	ns
t_r	I_C = 15 A; T_j = 125 °C	–	45	90	ns
$t_{d(off)}$	$R_{gon} = R_{goff}$ = 82 Ω	–	400	600	ns
t_f	inductive load	–	70	100	ns
$E_{on} + E_{off}$		–	4,0	–	mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V, 1 MHz	–	1,0	–	nF
R_{thjh}	per IGBT	–	–	1,4	K/W
Diode [2] - Inverter (Diode [2] - Chopper see SKiiP 22 NAB 12 T18)					
$V_F = V_{EC}$	I_F = 25 A T_j = 25 (125) °C	–	2,0(1,8)	2,5(2,3)	V
V_{TO}	T_j = 125 °C	–	1,0	1,2	V
r_T	T_j = 125 °C	–	32	44	mΩ
I_{RRM}	I_F = 25 A, V_R = – 600 V	–	25	–	A
Q_{rr}	di_F/dt = – 500 A/µs	–	4,5	–	µC
E_{off}	V_{GE} = 0 V, T_j = 125 °C	–	1,0	–	mJ
R_{thjh}	per diode	–	–	1,2	K/W
Diode - Rectifier					
V_F	I_F = 35 A T_j = 25 °C	–	1,2	–	V
R_{thjh}	per diode	–	–	1,6	K/W
Temperature Sensor					
R_{TS}	T = 25 / 100 °C		1000 / 1670		Ω
Mechanical Data					
M_1	Mounting torque	2	–	2,5	Nm
Case			M3		

MiniSKiiP 3
SEMIKRON integrated intelligent Power
SKiiP 31 NAB 12 T11
3-phase bridge rectifier + braking chopper
3-phase bridge inverter

Case M3



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Options
- also available with powerful chopper. For characteristics please refer to Inverter IGBT

[1] $T_{heatsink}$ = 25 °C, unless otherwise specified
[2] CAL = Controlled Axial Lifetime Technology (soft and fast recovery)

* For diagrams of the Chopper IGBT please refer to SKiiP 22 NAB 12 T18

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.

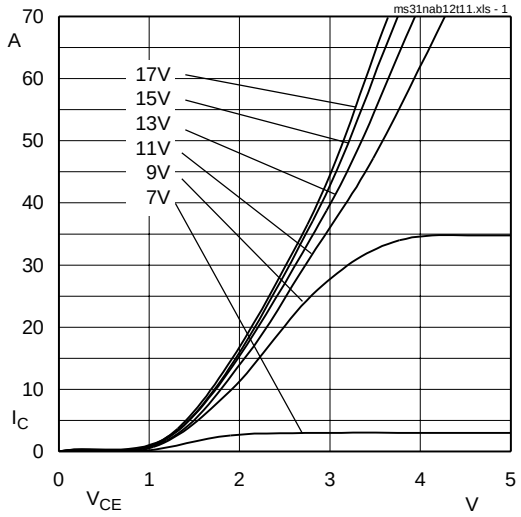

Fig. 1 Typ. output characteristic, t_p = 80 µs; 25 °C

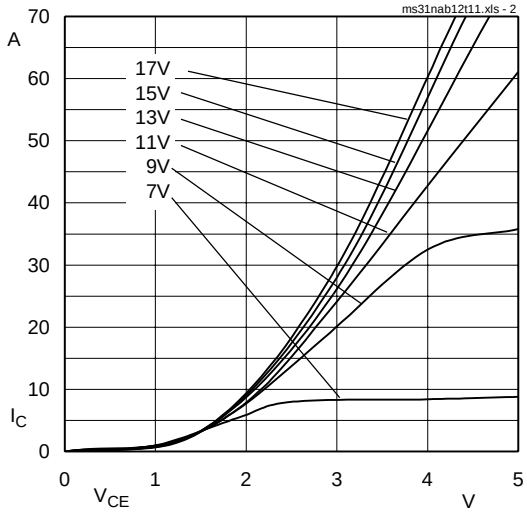

Fig. 2 Typ. output characteristic, t_p = 80 µs; 125 °C

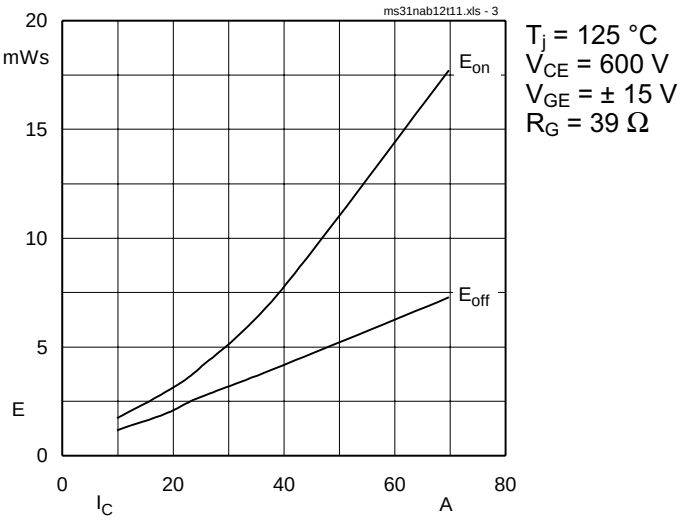

Fig. 3 Turn-on /-off energy = f (I_C)

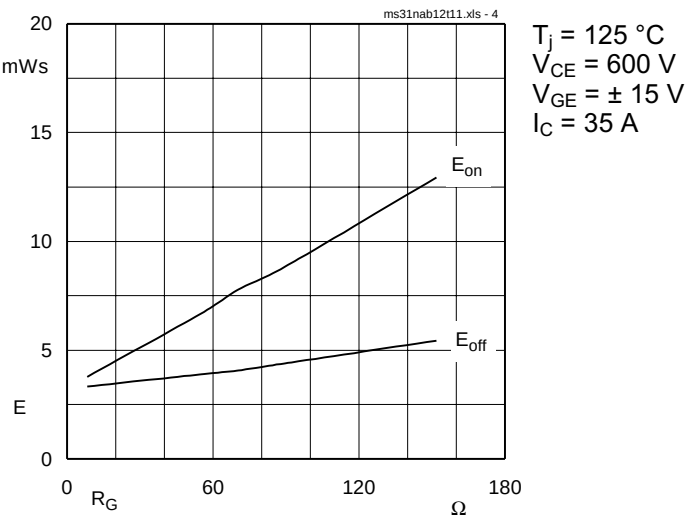

Fig. 4 Turn-on /-off energy = f (R_G)

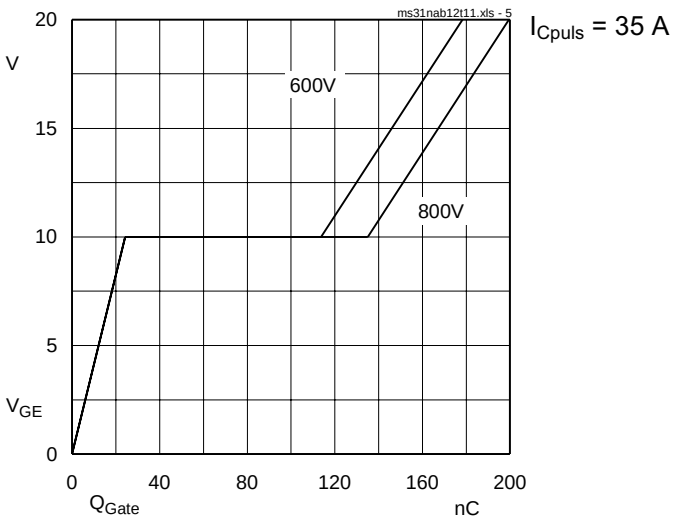

Fig. 5 Typ. gate charge characteristic

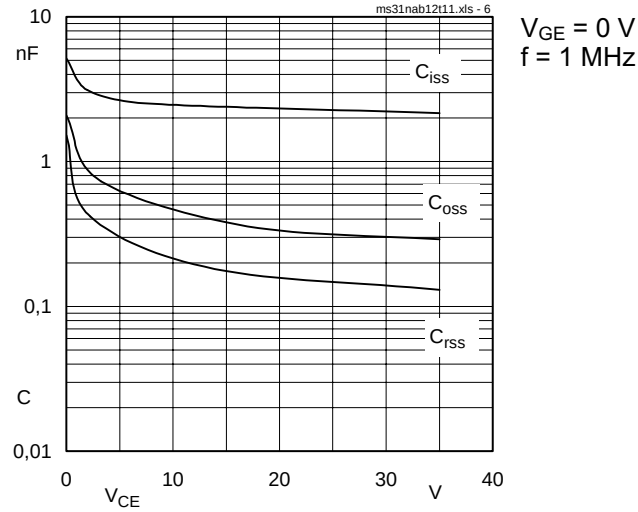

Fig. 6 Typ. capacitances vs. V_{CE}

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MiniSKiiP 1200 V

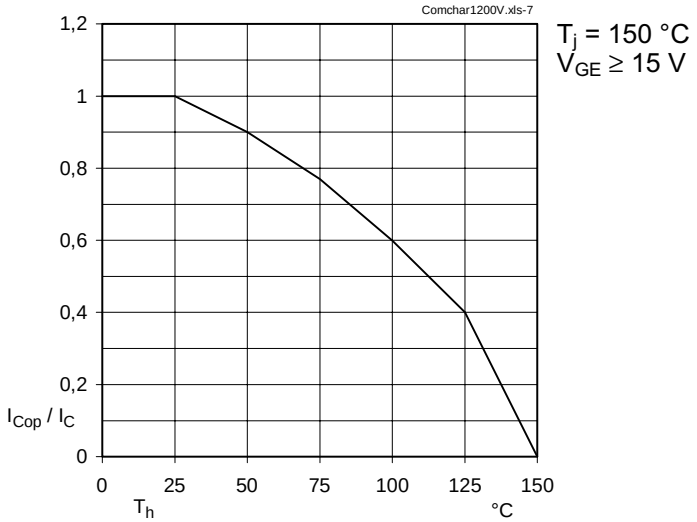


Fig. 7 Rated current of the IGBT I_{Cop} / I_C = f (T_h)

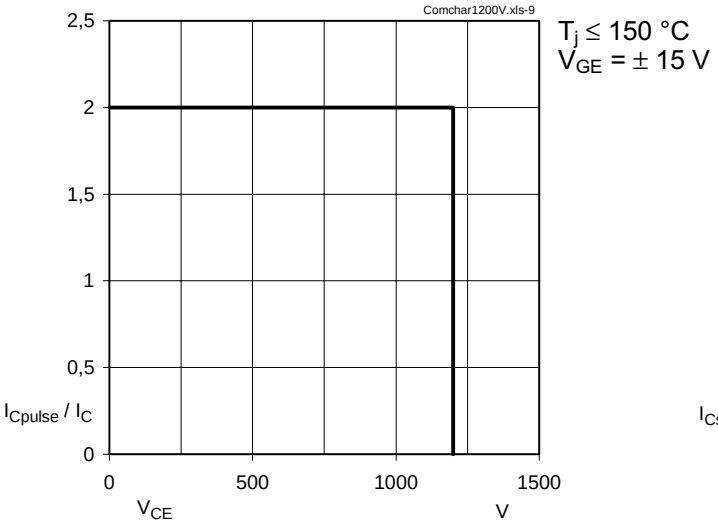


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

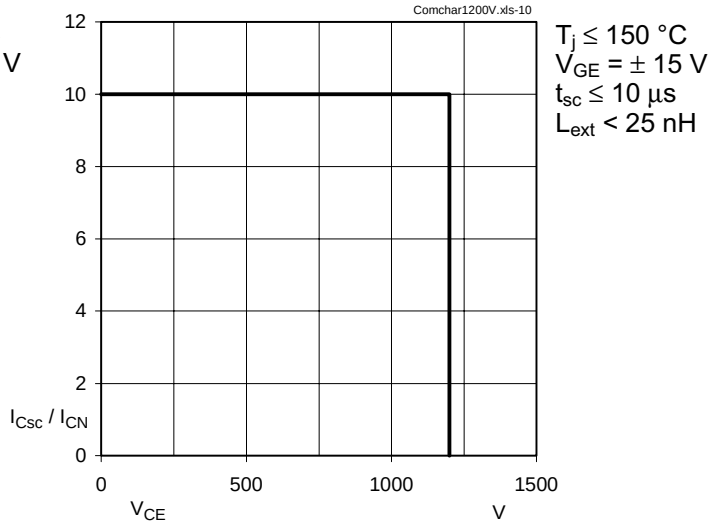


Fig. 10 Safe operating area at short circuit of the IGBT

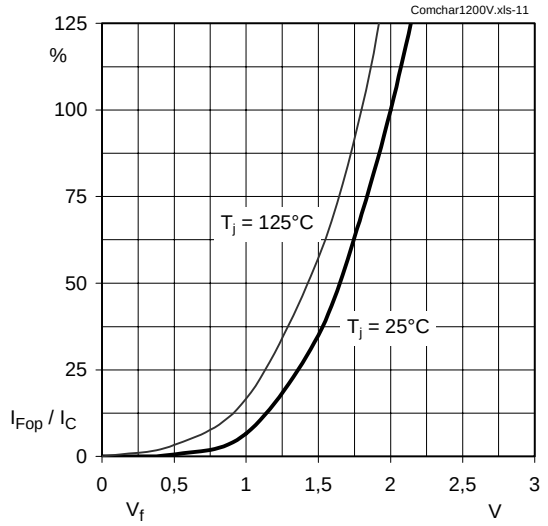


Fig. 11 Typ. freewheeling diode forward characteristic

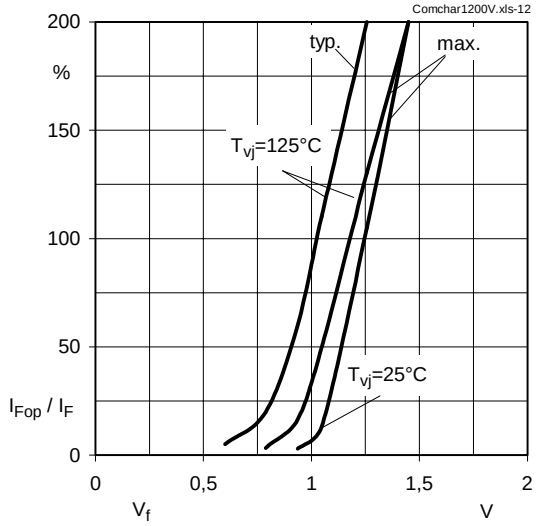
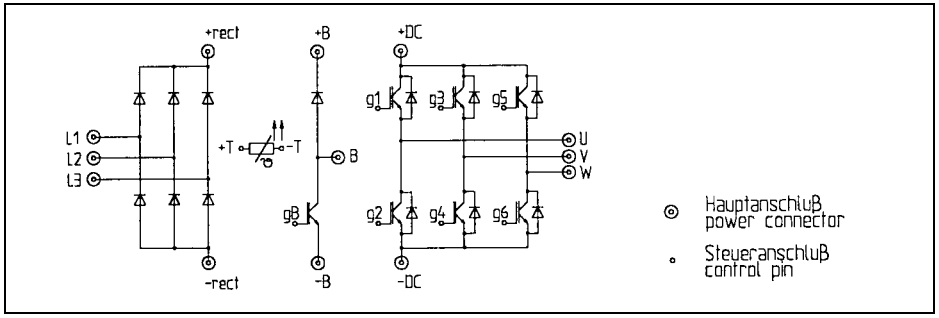
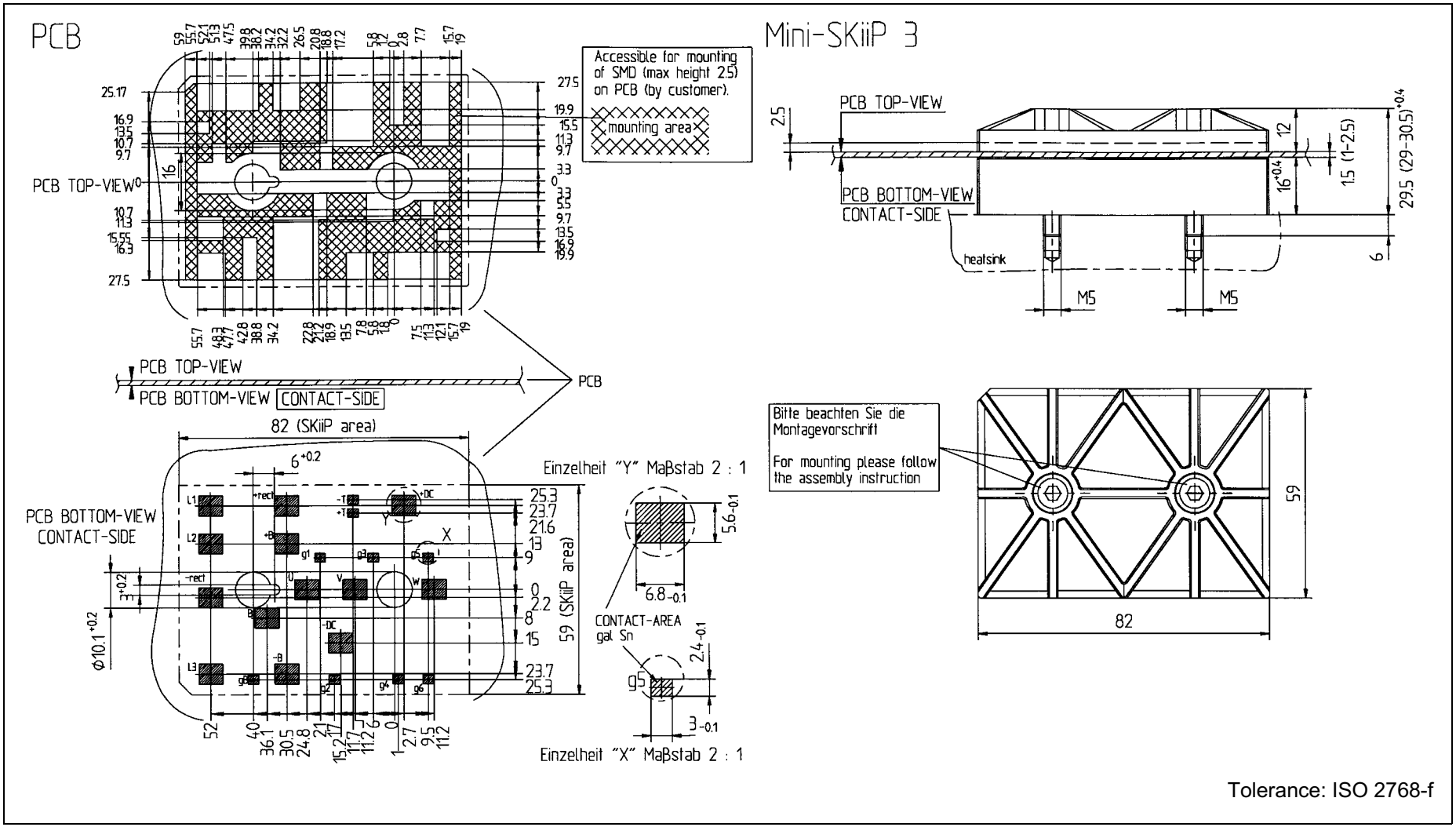


Fig. 12 Forward characteristic of the input bridge diode

MiniSKiiP 3

SKiiP 30 NAB 12 T10
SKiiP 31 NAB 12 T11
SKiiP 32 NAB 12 T1





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