

SKiiP 20 NAB 12 - SKiiP 20 NAB 12 I

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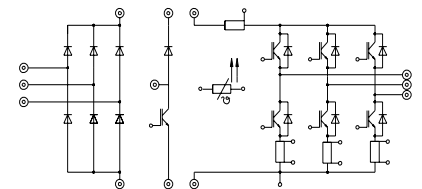
Absolute Maximum Ratings		
Symbol	Conditions ¹⁾	Units
Inverter	(Chopper see SKiiP 22 NAB 12)	
V _{CES}		1200 V
V _{GES}		± 20 V
I _C	T _{heatsink} = 25 / 80 °C	16 / 11 A
I _{CM}	t _p < 1 ms; T _{heatsink} = 25 / 80 °C	32 / 22 A
I _F = -I _C	T _{heatsink} = 25 / 80 °C	16 / 11 A
I _{FM} = -I _{CM}	t _p < 1 ms; T _{heatsink} = 25 / 80 °C	32 / 22 A
Bridge Rectifier		
V _{RRM}		1500 V
I _D	T _{heatsink} = 80 °C	25 A
I _{FSM}	t _p = 10 ms; sin. 180 °, T _j = 25 °C	370 A
I ² t	t _p = 10 ms; sin. 180 °, T _j = 25 °C	680 A ² s
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 = 10 A T _j = 25 (125) °C	- 2,7(3,3) 3,2(3,9) V
t _{d(on)}	V _{CC} = 600 V; V _{GE} = ± 15 V I _C = 10 A; T _j = 125 °C R _{gon} = R _{goff} = 150 Ω inductive load	- 55 110 ns
t _r		- 50 100 ns
t _{d(off)}		- 380 570 ns
t _f		- 80 120 ns
E _{on} + E _{off}		- 2,7 - mJ
C _{ies}	V _{CE} = 25 V; V _{GE} = 0 V, 1 MHz	- 0,53 - nF
R _{thjh}	per IGBT	- - 1,8 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 I _C = 15 A; T _j = 125 °C R _{gon} = R _{goff} = 82 Ω inductive load	- 55 110 ns
t _r		- 45 90 ns
t _{d(off)}		- 400 600 ns
t _f		- 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)		
V _F = V _{EC}	I _F = 10 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	- 80 110 mΩ
I _{RRM}	I _F = 10 A, V _R = - 600 V di _F /dt = - 300 A/μs V _{GE} = 0 V, T _j = 125 °C	- 12 - A
Q _{rr}		- 1,8 - μC
E _{off}		- 0,4 - mJ
R _{thjh}		per diode
Diode - Rectifier		
V _F	I _F = 25 A, T _j = 25 °C	- 1,2 - V
R _{thjh}	per diode	- - 2,6 K/W
Temperature Sensor		
R _{TS}	T = 25 / 100 °C	1000 / 1670 Ω
Mechanical Data		
M ₁	case to heatsink, SI Units	2 - 2,5 Nm
Case	mechanical outline see page B 16 - 8	M2

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

MiniSKiiP 2 SEMIKRON integrated intelligent Power SKiiP 20 NAB 12 SKiiP 20 NAB 12 I ³⁾ 3-phase bridge rectifier + braking chopper + 3-phase bridge inverter

Case M2



UL recognized file no. E63532

- specification of shunts and temperature sensor see part A
- common characteristics see page B 16 - 4

- ¹⁾ T_{heatsink} = 25 °C, unless otherwise specified
- ²⁾ CAL = Controlled Axial Lifetime Technology (soft and fast recovery)
- ³⁾ With integrated DC and/or AC shunts
- ⁴⁾ accuracy of pure shunt, please note that for DC shunt no separate sensing contact is used.

R _{CS(dc)}	5 % ⁴⁾	16,5 mΩ
R _{CS(ac)}	1 %	10 mΩ

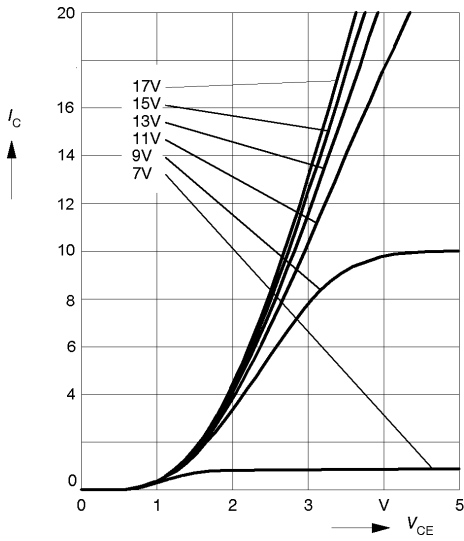


Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25 \text{ }^\circ\text{C}$

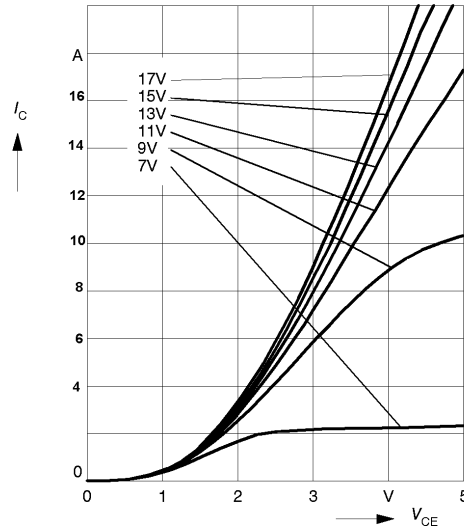


Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125 \text{ }^\circ\text{C}$

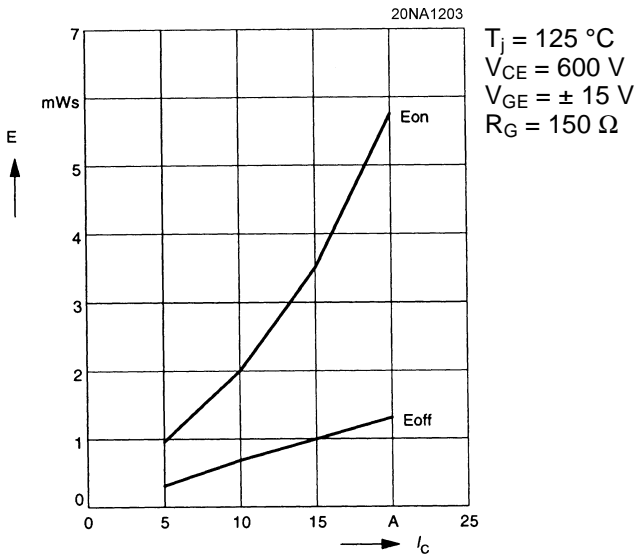


Fig. 3 Turn-on /-off energy = $f(I_C)$

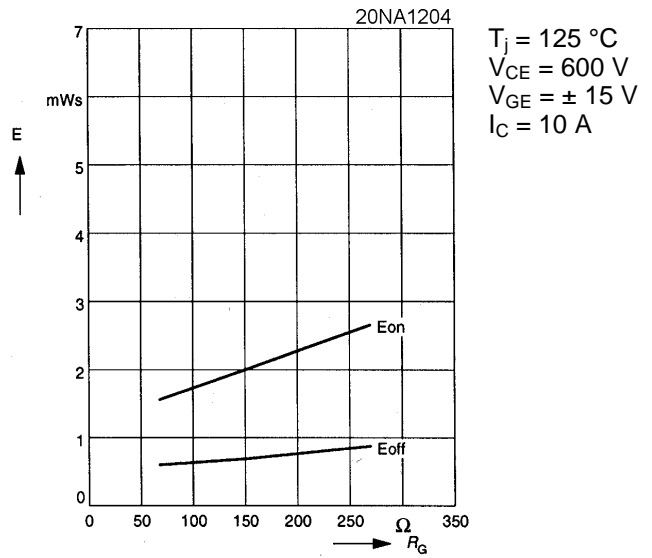


Fig. 4 Turn-on /-off energy = $f(R_G)$

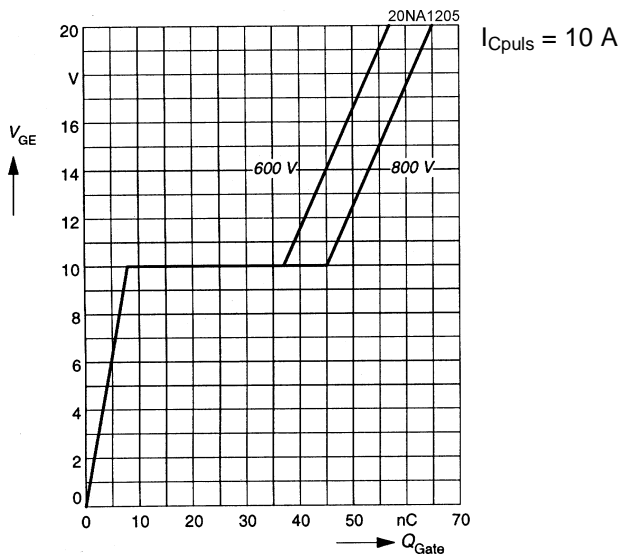


Fig. 5 Typ. gate charge characteristic

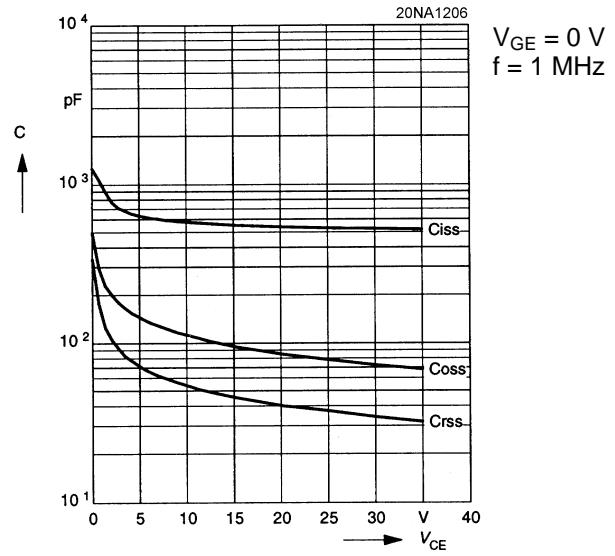


Fig. 6 Typ. capacitances vs. V_{CE}

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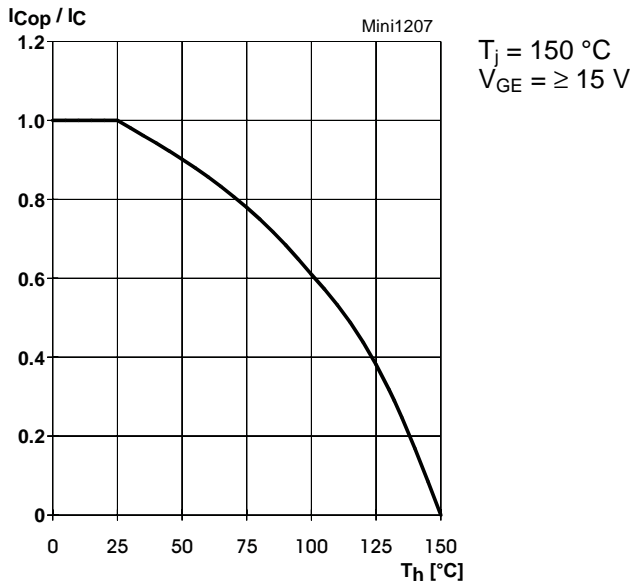


Fig. 7 Rated current of the IGBT $I_{COp} / I_C = f(T_h)$

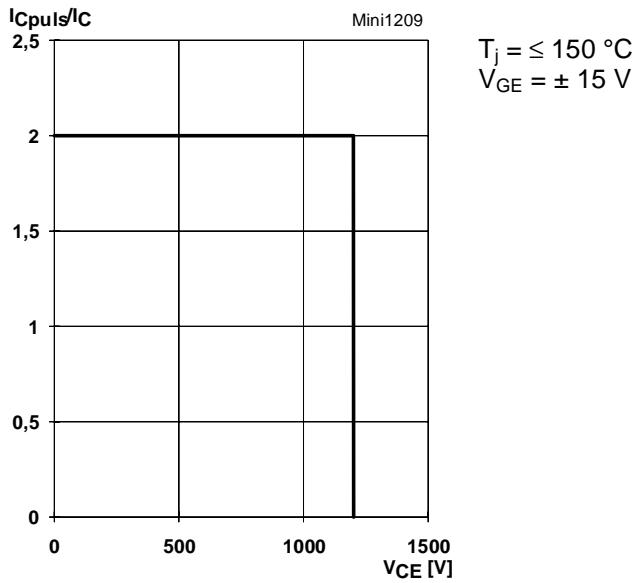


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

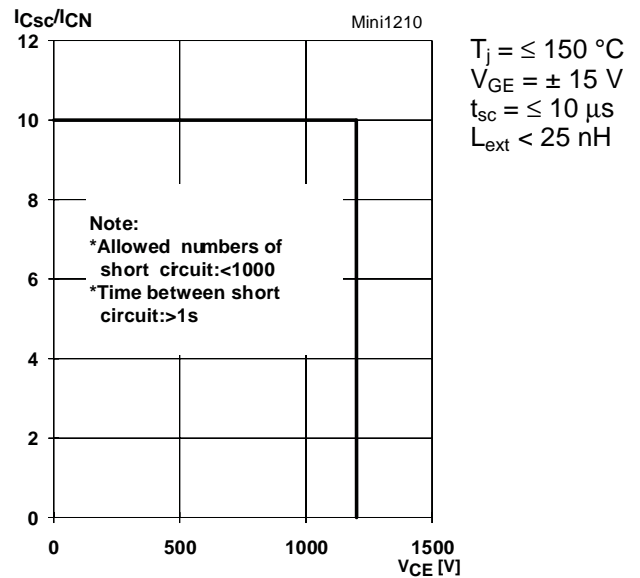


Fig. 10 Safe operating area at short circuit of the IGBT

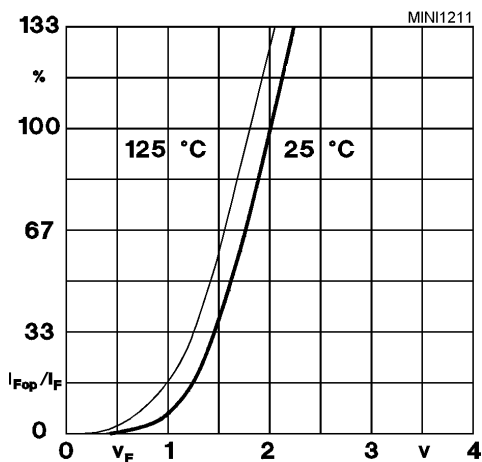


Fig. 11 Typ. freewheeling diode forward characteristic

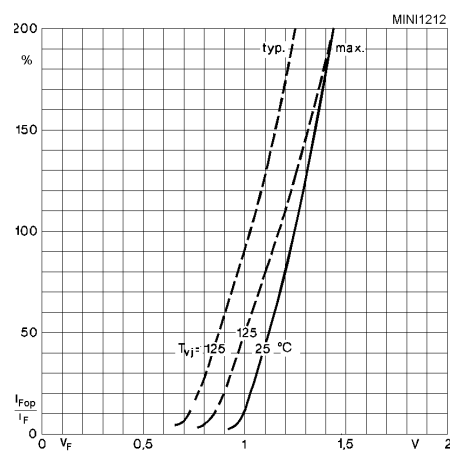


Fig. 12 Forward characteristic of the input bridge diode

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- SKiiP 20 NAB 06 ... Circuit
- SKiiP 21 NAB 06 ... Case M2
- SKiiP 20 NAB 12 ... Layout and connections for the customer's printed circuit board
- SKiiP 22 NAB 12 ...

Note: The shunts are available only by option I

