

SKiiP 32 NAB 12

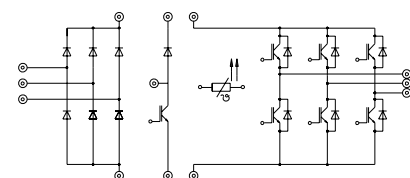
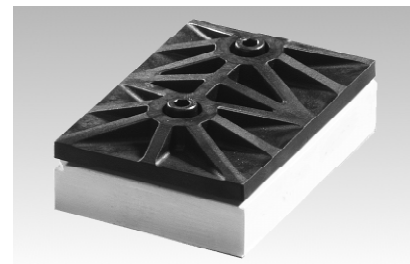
Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
Inverter			
V_{CES}		1200	V
V_{GES}		± 20	V
I_C	$T_{\text{heatsink}} = 25 / 80 \text{ }^{\circ}\text{C}$	65 / 45	A
I_{CM}	$t_p < 1 \text{ ms}; T_{\text{heatsink}} = 25 / 80 \text{ }^{\circ}\text{C}$	130 / 90	A
$I_F = -I_C$	$T_{\text{heatsink}} = 25 / 80 \text{ }^{\circ}\text{C}$	60 / 40	A
$I_{FM} = -I_{CM}$	$t_p < 1 \text{ ms}; T_{\text{heatsink}} = 25 / 80 \text{ }^{\circ}\text{C}$	120 / 80	A
Bridge Rectifier			
V_{RRM}		1500	V
I_D	$T_{\text{heatsink}} = 80 \text{ }^{\circ}\text{C}$	35	A
I_{FSM}	$t_p = 10 \text{ ms}; \sin. 180^{\circ}, T_j = 25 \text{ }^{\circ}\text{C}$	700	A
I^2t	$t_p = 10 \text{ ms}; \sin. 180^{\circ}, T_j = 25 \text{ }^{\circ}\text{C}$	2400	A ² s
T_j		$-40 \dots +150$	$^{\circ}\text{C}$
T_{stg}		$-40 \dots +125$	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
IGBT - Inverter					
V_{CESat}	$I_C = 50 \text{ A}, T_j = 25 (125) \text{ }^{\circ}\text{C}$	–	2,5(3,1)	3,0(3,7)	V
$t_{d(on)}$	$V_{CC} = 600 \text{ V}; V_{GE} = \pm 15 \text{ V}$	–	44	100	ns
t_r	$I_C = 50 \text{ A}; T_j = 125 \text{ }^{\circ}\text{C}$	–	56	100	ns
$t_{d(off)}$	$R_{gon} = R_{goff} = 22 \text{ } \Omega$	–	380	500	ns
t_f	inductive load	–	70	100	ns
$E_{on} + E_{off}$		–	13	–	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}, 1 \text{ MHz}$	–	3,3	–	nF
R_{thjh}	per IGBT	–	–	0,5	K/W
IGBT - Chopper					
V_{CESat}	$I_C = 25 \text{ A}, T_j = 25 (125) \text{ }^{\circ}\text{C}$	–	2,5(3,1)	3,0(3,7)	V
$t_{d(on)}$	$V_{CC} = 600 \text{ V}; V_{GE} = \pm 15 \text{ V}$	–	75	150	ns
t_r	$I_C = 25 \text{ A}; T_j = 125 \text{ }^{\circ}\text{C}$	–	65	130	ns
$t_{d(off)}$	$R_{gon} = R_{goff} = 47 \text{ } \Omega$	–	400	600	ns
t_f	inductive load	–	50	100	ns
$E_{on} + E_{off}$		–	6,2	–	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}, 1 \text{ MHz}$	–	1,65	–	nF
R_{thjh}	per IGBT	–	–	1,0	K/W
Diode ²⁾ - Inverter & Chopper					
$V_F = V_{EC}$	$I_F = 50 \text{ A}, T_j = 25 (125) \text{ }^{\circ}\text{C}$	–	2,0(1,8)	2,5(2,3)	V
V_{TO}	$T_j = 125 \text{ }^{\circ}\text{C}$	–	1,0	1,2	V
r_T	$T_j = 125 \text{ }^{\circ}\text{C}$	–	16	22	m Ω
I_{RRM}	$I_F = 50 \text{ A}, V_R = -600 \text{ V}$	–	40	–	A
Q_{rr}	$di_F/dt = -800 \text{ A}/\mu\text{s}$	–	8,0	–	μC
E_{off}	$V_{GE} = 0 \text{ V}, T_j = 125 \text{ }^{\circ}\text{C}$	–	2,0	–	mJ
R_{thjh}	per diode	–	–	1,0	K/W
Diode - Rectifier					
V_F	$I_F = 35 \text{ A}, T_j = 25 \text{ }^{\circ}\text{C}$	–	1,2	–	V
R_{thjh}	per diode	–	–	1,6	K/W
Temperature Sensor					
R_{TS}	$T = 25 / 100 \text{ }^{\circ}\text{C}$		1000 / 1670		Ω
Mechanical Data					
M_1	case to heatsink, SI Units	2	–	2,5	Nm
Case	mechanical outline see page B 16 – 9		M3		

* For diagrams of the Chopper IGBT please refer to SKiiP 30 NAB 12

MiniSKIIP 3 SEMİKRON integrated intelligent Power SKiiP 32 NAB 12 3-phase bridge rectifier + braking chopper + 3-phase bridge inverter

Case M3



UL recognized file no. E63532

- specification of temperature sensor see part A
- common characteristics B 16 – 4

Options

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

- 1) $T_{\text{heatsink}} = 25 \text{ }^{\circ}\text{C}$, unless otherwise specified
 2) CAL = Controlled Axial Lifetime Technology (soft and fast recovery)

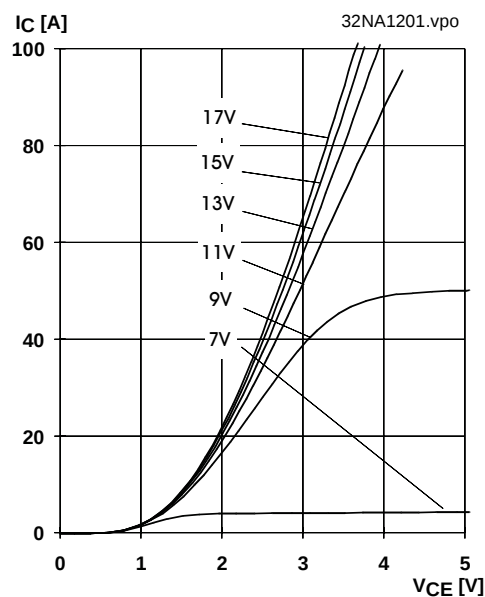
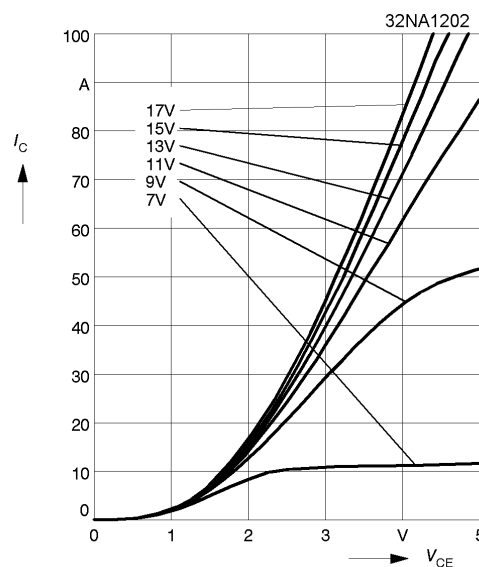
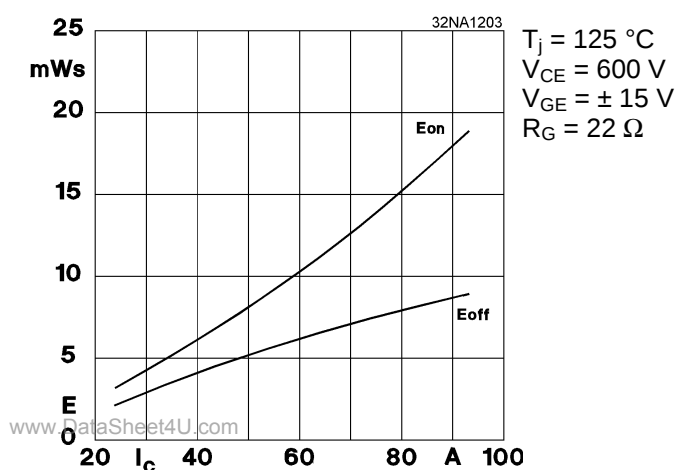
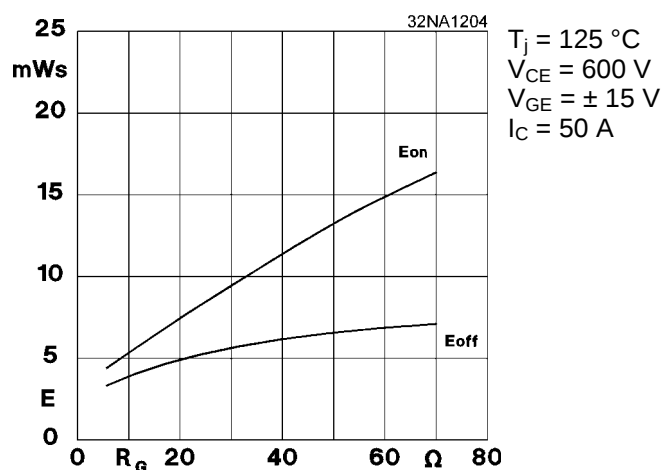
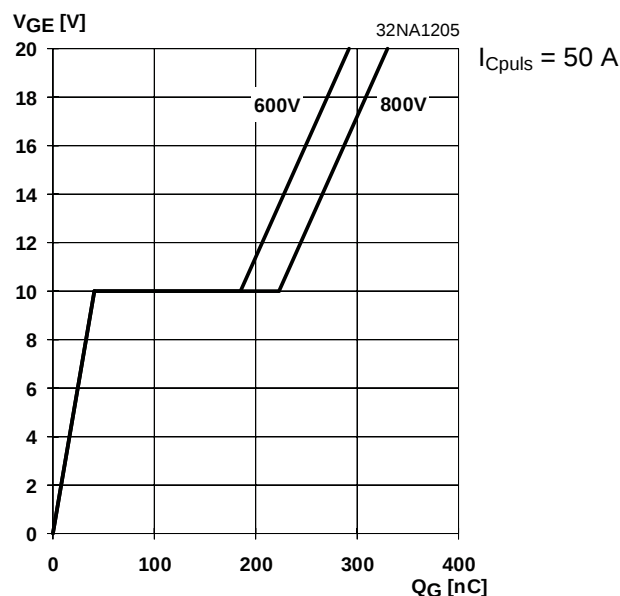
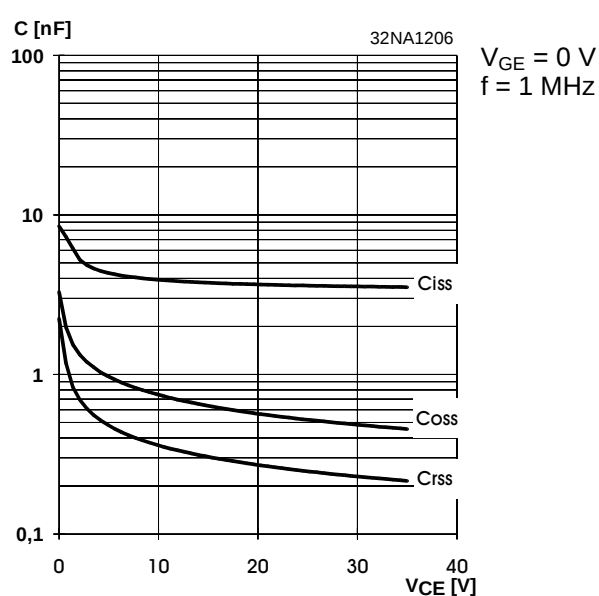
Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25^\circ C$ Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125^\circ C$ Fig. 3 Turn-on /off energy = $f(I_C)$ Fig. 4 Turn-on /off energy = $f(R_G)$ 

Fig. 5 Typ. gate charge characteristic

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

MiniSKiiP 1200 V

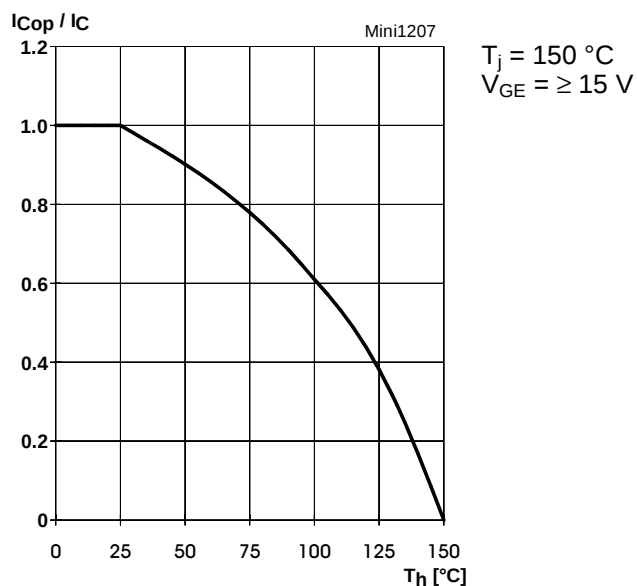
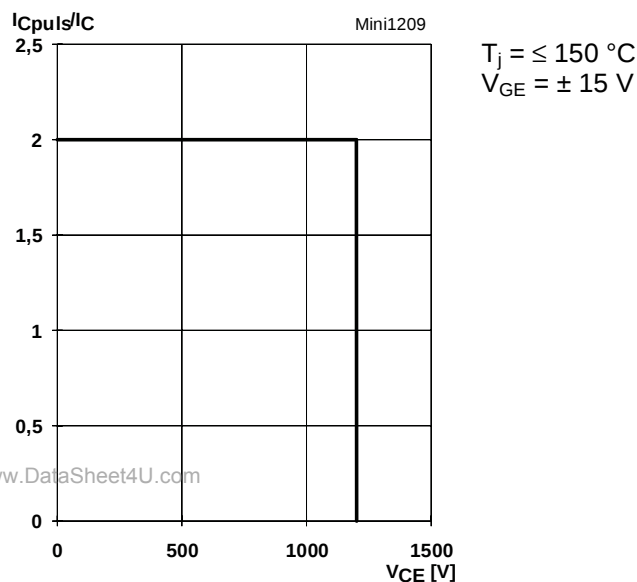
Fig. 7 Rated current of the IGBT $I_{C_{op}} / I_C = f(T_h)$ 

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

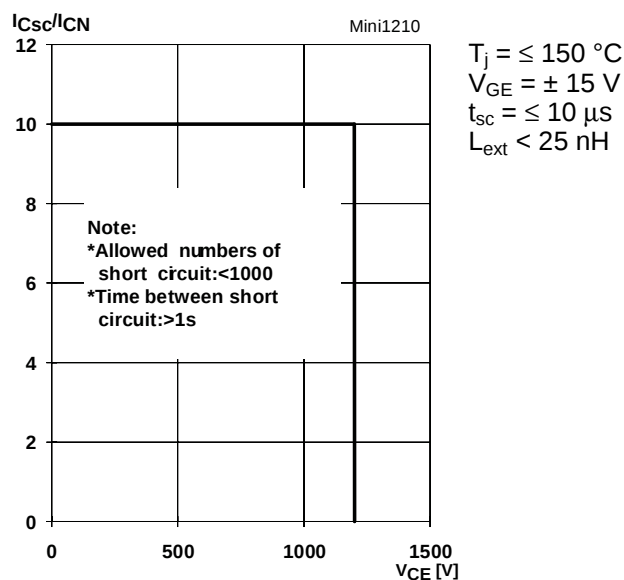


Fig. 10 Safe operating area at short circuit of the IGBT

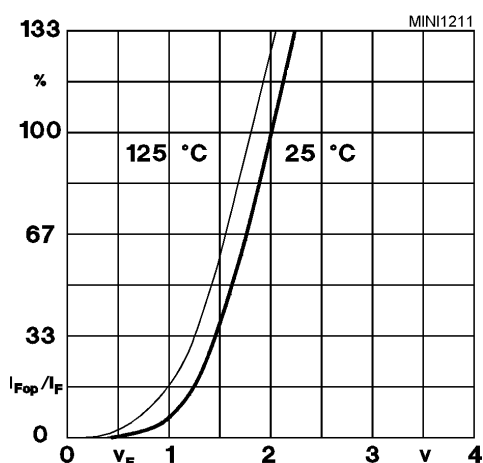


Fig. 11 Typ. freewheeling diode forward characteristic

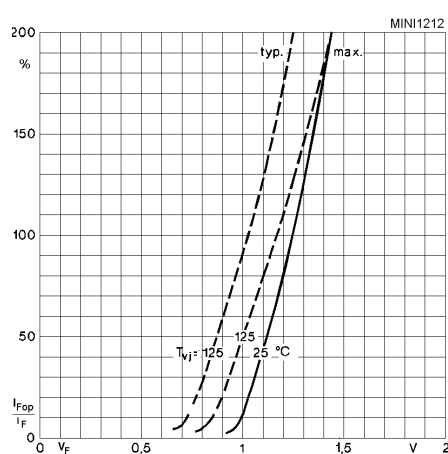


Fig. 12 Forward characteristic of the input bridge diode

