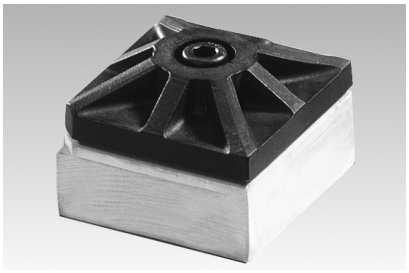
SKiiP 10 NEC 06 - SKiiP 10 NEC 06 I

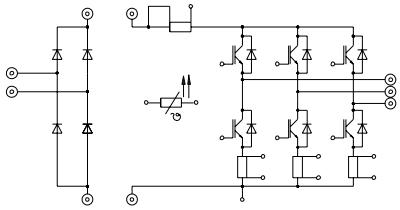
Absolute Maximum Ratings Symbol	Conditions [1]	Values	Units
Inverter			
V_{CES}		600	V
V_{GES}		± 20	V
I_C	$T_{heatsink}$ = 25 / 80 °C	11 / 8	A
I_{CM}	t_p < 1 ms; $T_{heatsink}$ = 25 / 80 °C	22 / 16	A
$I_F = -I_C$	$T_{heatsink}$ = 25 / 80 °C	20 / 15	A
$I_{FM} = -I_{CM}$	t_p < 1 ms; $T_{heatsink}$ = 25 / 80 °C	40 / 30	A
Bridge Rectifier			
V_{RRM}		800	V
I_D	$T_{heatsink}$ = 80 °C	12	A
I_{FSM}	t_p = 10 ms; sin. 180 °, T_j = 25 °C	370	A
I^2t	t_p = 10 ms; sin. 180 °, T_j = 25 °C	680	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 = 5 A T_j = 25 (125) °C	–	2,1(2,2)	2,7(2,8)	V
$t_{d(on)}$	V_{CC} = 300 V; V_{GE} = ± 15 V	–	45	90	ns
t_r	I_C = 5 A; T_j = 125 °C	–	55	110	ns
$t_{d(off)}$	$R_{gon} = R_{goff}$ = 200 Ω	–	270	400	ns
t_f	inductive load	–	500	750	ns
$E_{on} + E_{off}$		–	0,6	–	mJ
C_{ies}	V_{CE} = 25 V; V_{GE} = 0 V, 1 MHz	–	0,29	–	nF
R_{thjh}	per IGBT	–	–	3,0	K/W
Diode [2]	- Inverter				
$V_F = V_{EC}$	I_F = 10 A T_j = 25 (125) °C	–	1,45(1,4)	1,7(1,7)	V
V_{TO}	T_j = 125 °C	–	0,85	0,9	V
r_T	T_j = 125 °C	–	55	80	mΩ
I_{RRM}	I_F = 10 A, V_R = – 300 V	–	13	–	A
Q_{rr}	di_F/dt = – 200 A/µs	–	1,5	–	µC
E_{off}	V_{GE} = 0 V, T_j = 125 °C	–	0,45	–	mJ
R_{thjh}	per diode	–	–	2,7	K/W
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
Shunts (SKiiP 10 NEC 06 I)					
$R_{cs(dc)}$	5 % [4]		47		mΩ
$R_{cs(ac)}$	1 %		22		mΩ
Mechanical Data					
M_1	case to heatsink, SI Units	2	–	2,5	Nm
Case	mechanical outline see page B 16 – 5		M1		

MiniSKiiP 1
SEMIKRON integrated intelligent Power
SKiiP 10 NEC 06
SKiiP 10 NEC 06 I [3]
1-phase bridge rectifier + 3-phase bridge inverter

Case M1





UL recognized file no. E63532

- common characteristics see page B16–3
- specification of shunts and temperature sensor see part A

Options

- also available with faster IGBTs (type ... 063), data sheet on request

[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.

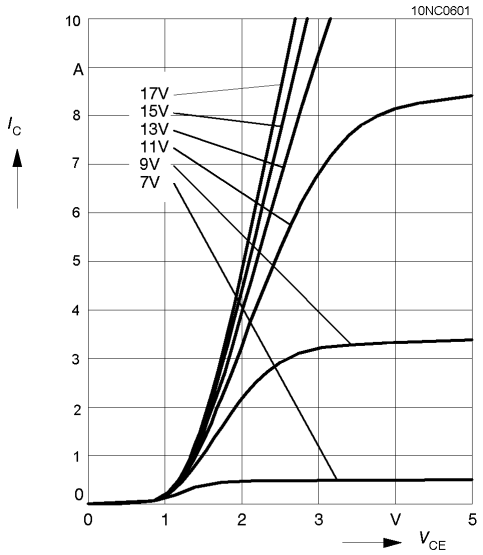


Fig. 1 Typ. output characteristic, t_p = 80 µs; 25 °C

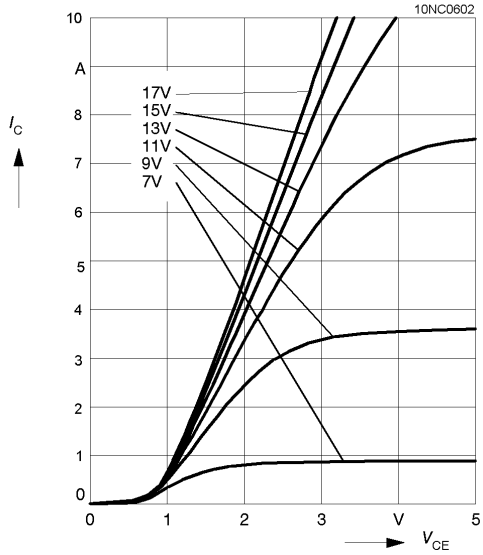
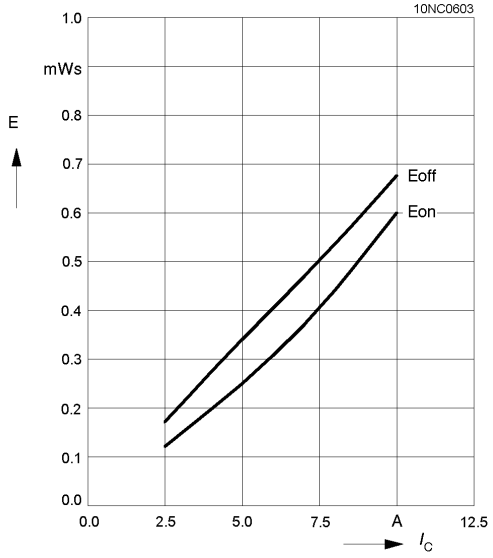
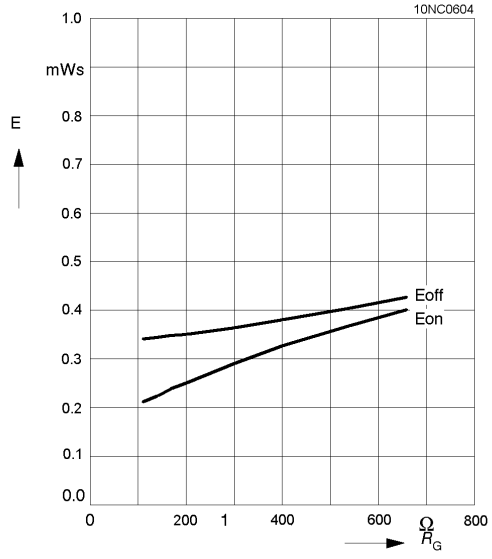


Fig. 2 Typ. output characteristic, t_p = 80 µs; 125 °C



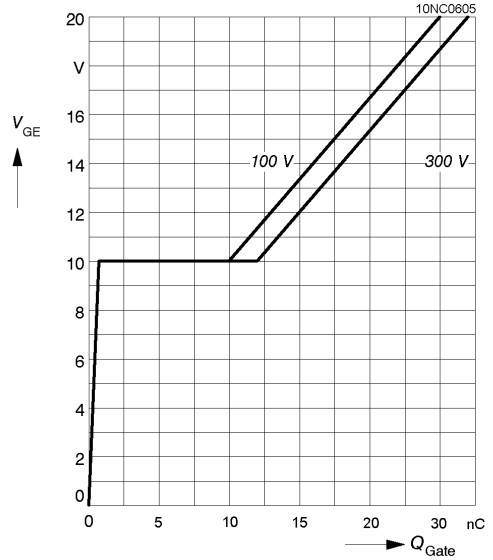
T_j = 125 °C
V_{CE} = 300 V
V_{GE} = ± 15 V
R_G = 200 Ω

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



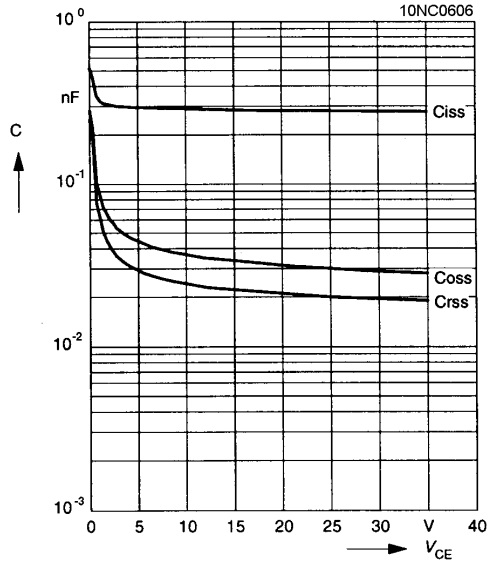
T_j = 125 °C
V_{CE} = 300 V
V_{GE} = ± 15 V
I_C = 5 A

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



I_{Cpuls} = 5 A

Fig. 5 Typ. gate charge characteristic

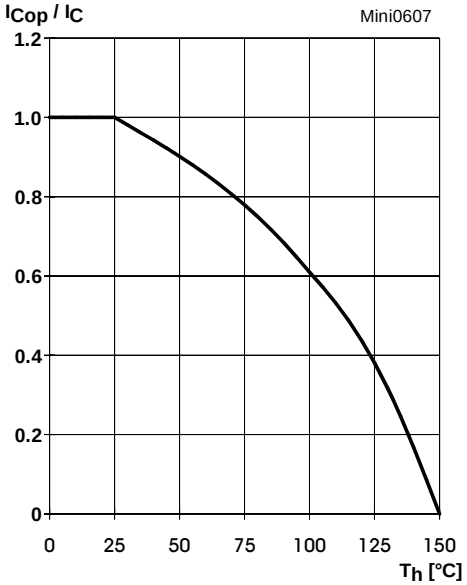


V_{GE} = 0 V
f = 1 MHz

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

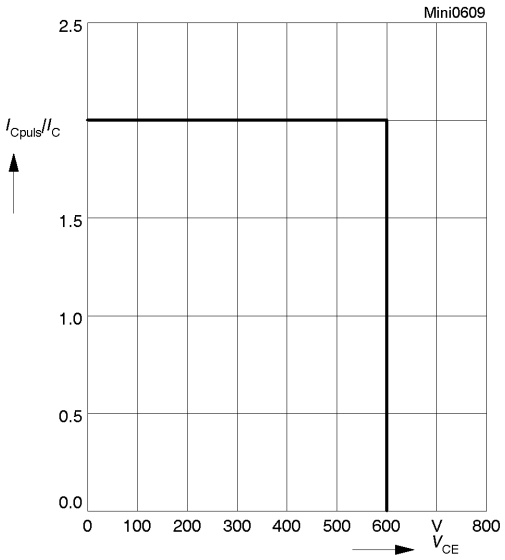
2. Common characteristics of MiniSKiiP

MiniSKiiP 600 V



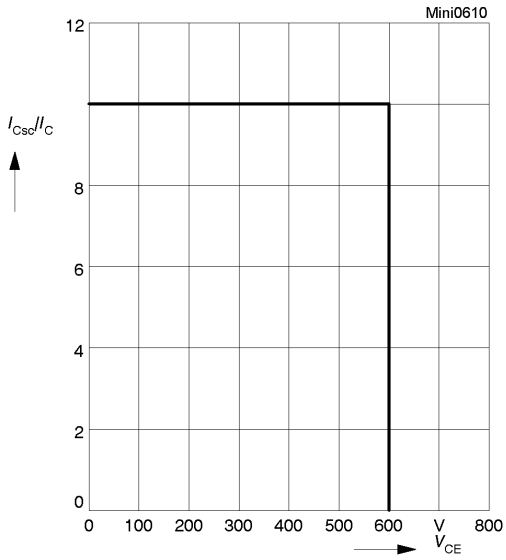
T_j = 150 °C
V_{GE} = ≥ 15 V

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



T_j = ≤ 150 °C
V_{GE} = ± 15 V

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



T_j = ≤ 150 °C
V_{GE} = ± 15 V
t_{sc} = ≤ 10 µs
L_{ext} < 25 nH

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

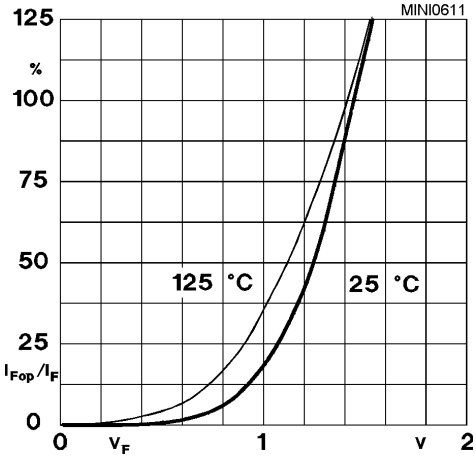


Fig. 11 Typ. freewheeling diode forward characteristic

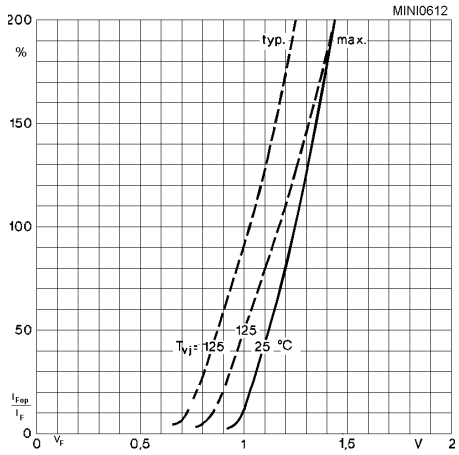


Fig. 12 Forward characteristic of the input bridge diode

MiniSKiiP 1

SKiiP 10 NEC 06 ... Circuit
SKiiP 11 NEC 06 ... Case M1
Layout and connections for the customer's printed circuit board

Note: The shunts are available only by option I