

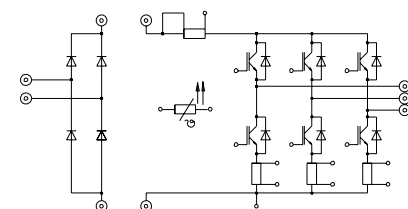
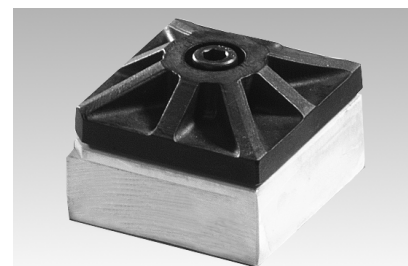
SKiiP 11 NEC 06 - SKiiP 11 NEC 06 I

Absolute Maximum Ratings			
Symbol	Conditions ¹⁾	Values	Units
Inverter			
V_{CES}		600	V
V_{GES}		± 20	V
I_C	$T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	17 / 12	A
I_{CM}	$t_p < 1 \text{ ms}; T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	34 / 24	A
$I_F = -I_C$	$T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	20 / 15	A
$I_{FM} = -I_{CM}$	$t_p < 1 \text{ ms}; T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	40 / 30	A
Bridge Rectifier			
V_{RRM}		800	V
I_D	$T_{heatsink} = 80 \text{ }^\circ\text{C}$	12	A
I_{FSM}	$t_p = 10 \text{ ms}; \sin. 180^\circ, T_j = 25 \text{ }^\circ\text{C}$	370	A
I^2t	$t_p = 10 \text{ ms}; \sin. 180^\circ, T_j = 25 \text{ }^\circ\text{C}$	680	A ² s
T_j		- 40 ... + 150	$^\circ\text{C}$
T_{stg}		- 40 ... + 125	$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		min.	typ.	max.	Units
Symbol	Conditions ¹⁾				
IGBT - Inverter					
V_{CESat}	$I_C = 10 \text{ A}, T_j = 25 (125) \text{ }^\circ\text{C}$	–	2,1(2,2)	2,7(2,8)	V
$t_{d(on)}$	$V_{CC} = 300 \text{ V}; V_{GE} = \pm 15 \text{ V}$	–	40	80	ns
t_r	$I_C = 10 \text{ A}; T_j = 125 \text{ }^\circ\text{C}$	–	60	120	ns
$t_{d(off)}$	$R_{gon} = R_{goff} = 100 \text{ }^\Omega$	–	250	400	ns
t_f	inductive load	–	500	750	ns
$E_{on} + E_{off}$		–	1,2	–	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}, 1 \text{ MHz}$	–	0,57	–	nF
R_{thjh}	per IGBT	–	–	2,3	K/W
Diode ²⁾ - Inverter					
$V_F = V_{EC}$	$I_F = 10 \text{ A}, T_j = 25 (125) \text{ }^\circ\text{C}$	–	1,45(1,4)	1,7(1,7)	V
V_{TO}	$T_j = 125 \text{ }^\circ\text{C}$	–	0,85	0,9	V
r_T	$T_j = 125 \text{ }^\circ\text{C}$	–	55	80	m Ω
I_{RRM}	$I_F = 10 \text{ A}, V_R = -300 \text{ V}$	–	13	–	A
Q_{rr}	$di_F/dt = -200 \text{ A}/\mu\text{s}$	–	1,5	–	μC
E_{off}	$V_{GE} = 0 \text{ V}, T_j = 125 \text{ }^\circ\text{C}$	–	0,45	–	mJ
R_{thjh}	per diode	–	–	2,7	K/W
Diode - Rectifier					
V_F	$I_F = 25 \text{ A}, T_j = 25 \text{ }^\circ\text{C}$	–	1,2	–	V
R_{thjh}	per diode	–	–	2,6	K/W
Temperature Sensor					
R_{TS}	$T = 25 / 100 \text{ }^\circ\text{C}$		1000 / 1670		Ω
Shunts (SKiiP 11 NEC 06 I)					
$R_{cs(dc)}$	5 % ⁴⁾		47		m Ω
$R_{cs(ac)}$	1 %		22		m Ω
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 11 NEC 06 SKiiP 11 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⁾ $T_{heatsink} = 25 \text{ }^\circ\text{C}$, 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.

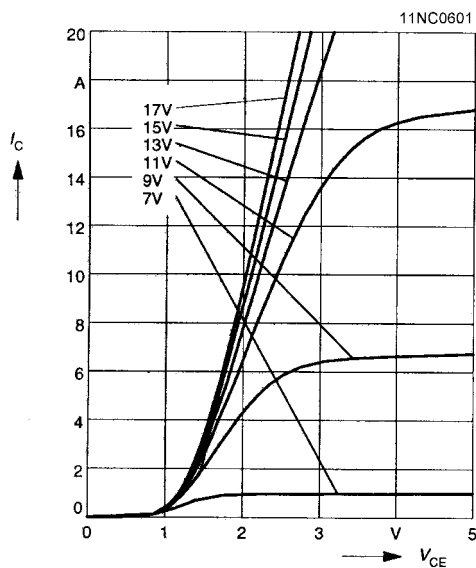


Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25^\circ C$

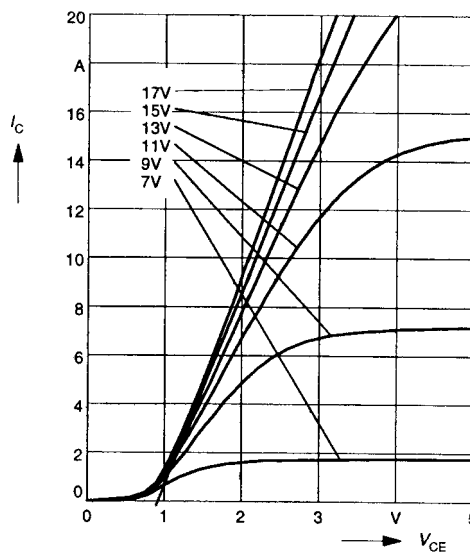


Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125^\circ C$

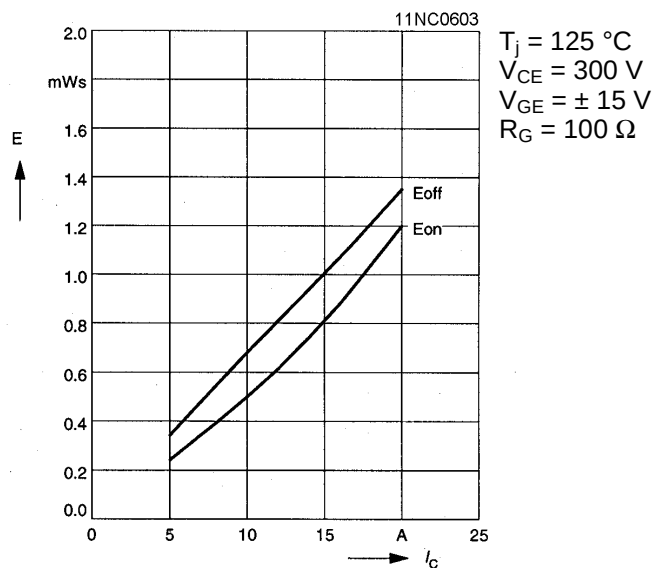


Fig. 3 Turn-on /off energy = $f(I_C)$

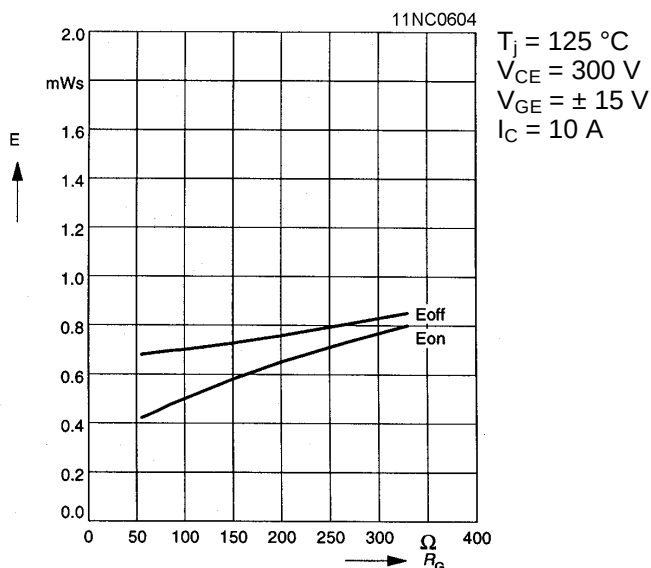


Fig. 4 Turn-on /off energy = $f(R_G)$

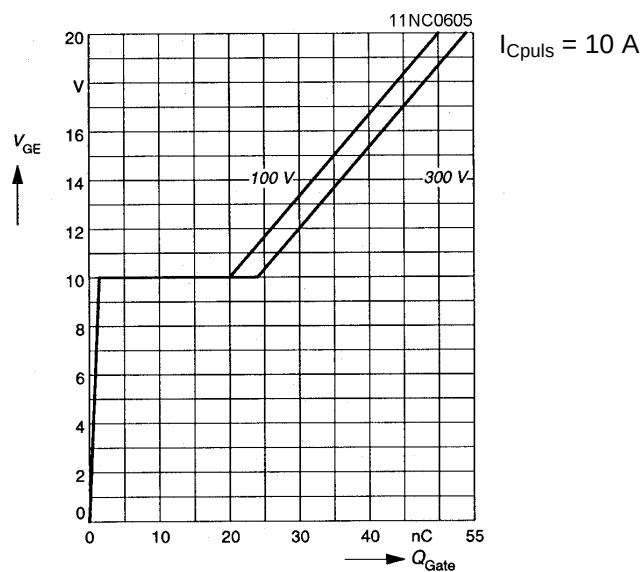


Fig. 5 Typ. gate charge characteristic

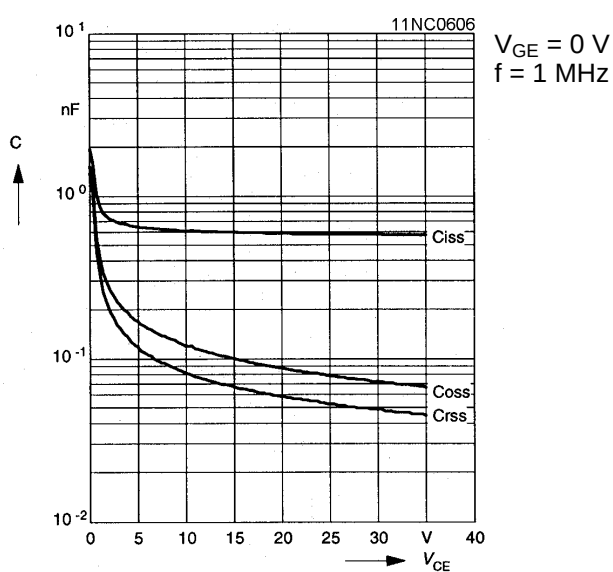


Fig. 6 Typ. capacitances vs. V_{CE}

2. Common characteristics of MiniSKiiP

MiniSKiiP 600 V

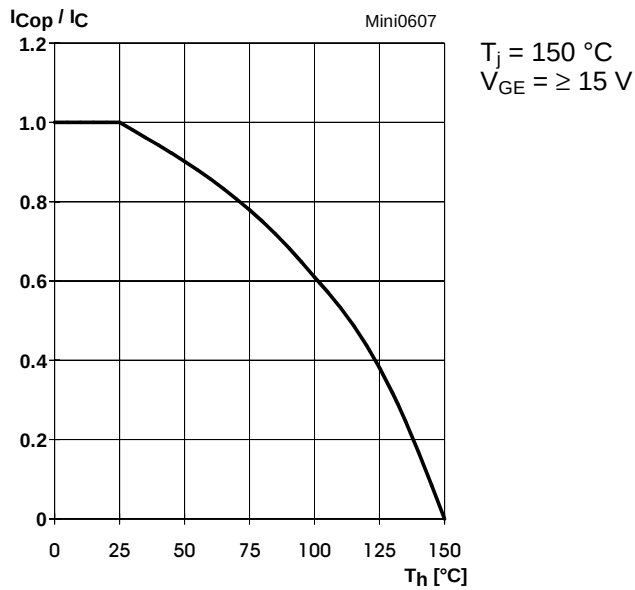


Fig. 7 Rated current of the IGBT $I_{Cop} / I_C = f(T_h)$

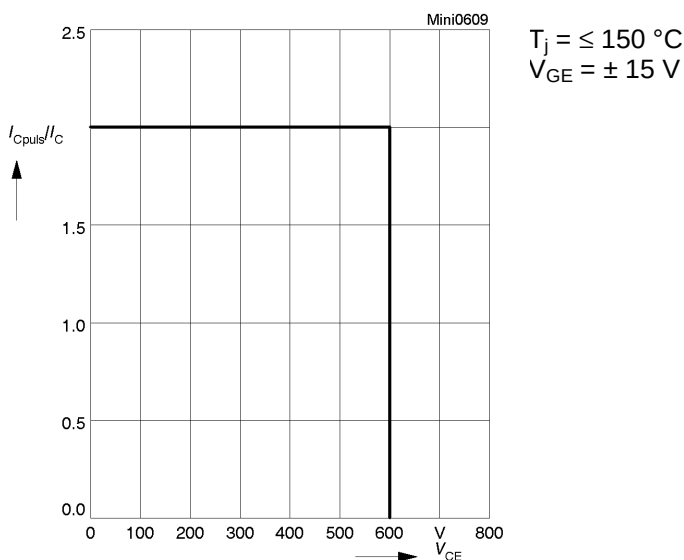


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

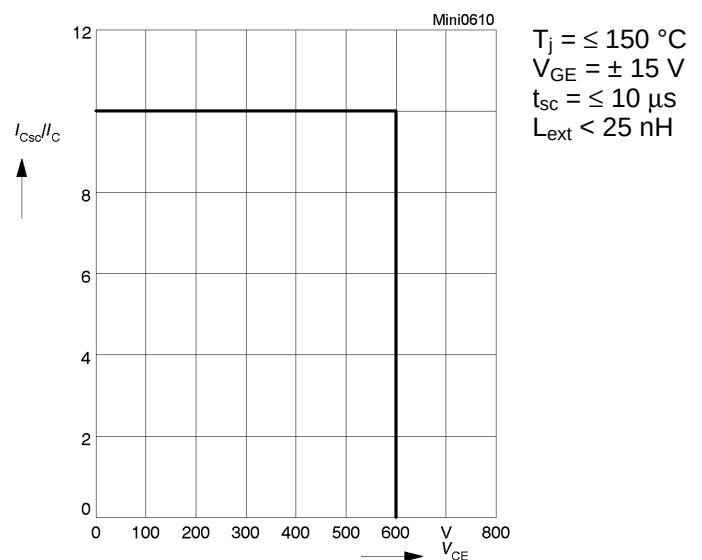


Fig. 10 Safe operating area at short circuit of the IGBT

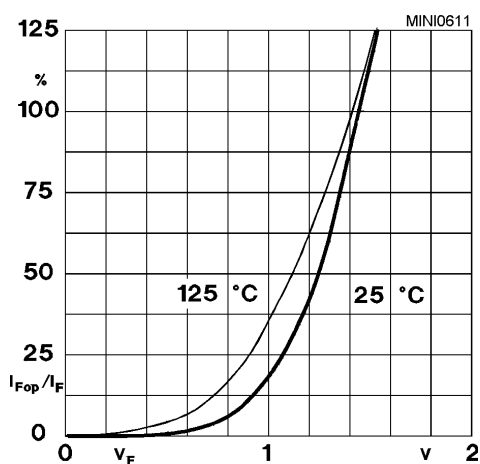


Fig. 11 Typ. freewheeling diode forward characteristic

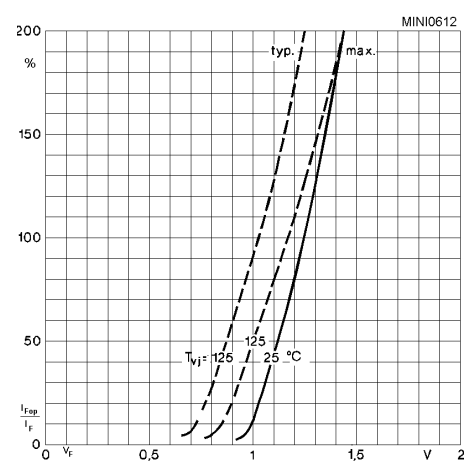


Fig. 12 Forward characteristic of the input bridge diode

MiniSKiiP 1

SKiiP 10 NEC 06 ...

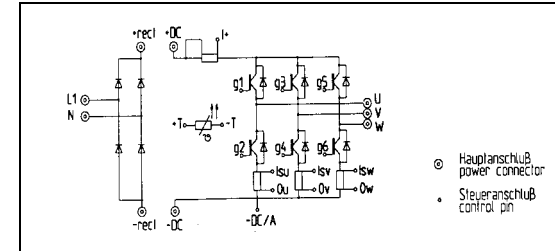
Circuit

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



3. Circuits, Cases, Layout for the Printed Circuit Board

