

SKiiP 30 NAB 06

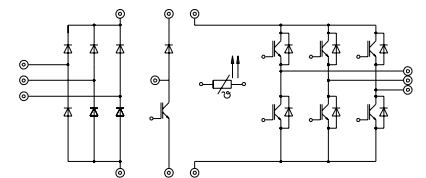
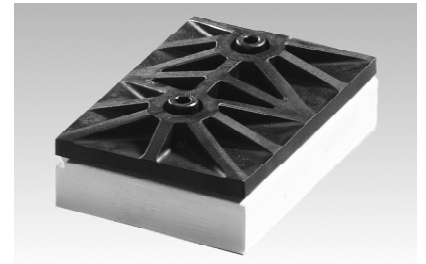
Absolute Maximum Ratings		Values	Units
Symbol	Conditions ¹⁾		
Inverter			
V_{CES}		600	V
V_{GES}		± 20	V
I_C	$T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	36 / 25	A
I_{CM}	$t_p < 1 \text{ ms}; T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	72 / 50	A
$I_F = -I_C$	$T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	57 / 38	A
$I_{FM} = -I_{CM}$	$t_p < 1 \text{ ms}; T_{heatsink} = 25 / 80 \text{ }^\circ\text{C}$	114 / 76	A
Bridge Rectifier			
V_{RRM}		800	V
I_D	$T_{heatsink} = 80 \text{ }^\circ\text{C}$	25	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}	$I_C = 30 \text{ A}, T_j = 25 (125) \text{ }^\circ\text{C}$	-	2,1(2,2)	2,7(2,8)	V
$t_{d(on)}$	$V_{CC} = 300 \text{ V}; V_{GE} = \pm 15 \text{ V}$ $I_C = 30 \text{ A}; T_j = 125 \text{ }^\circ\text{C}$ $R_{gon} = R_{goff} = 33 \text{ }^\Omega$ inductive load	-	50	100	ns
t_r		-	80	160	ns
$t_{d(off)}$		-	250	370	ns
t_f		-	500	750	ns
$E_{on} + E_{off}$		-	4,0	-	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}, 1 \text{ MHz}$	-	1,6	-	nF
R_{thjh}	per IGBT	-	-	1,7	K/W
IGBT - Chopper *					
V_{CEsat}	$I_C = 20 \text{ A}, T_j = 25 (125) \text{ }^\circ\text{C}$	-	2,1(2,2)	2,7(2,8)	V
$t_{d(on)}$	$V_{CC} = 300 \text{ V}; V_{GE} = \pm 15 \text{ V}$ $I_C = 20 \text{ A}; T_j = 125 \text{ }^\circ\text{C}$ $R_{gon} = R_{goff} = 47 \text{ }^\Omega$ inductive load	-	40	80	ns
t_r		-	70	140	ns
$t_{d(off)}$		-	250	370	ns
t_f		-	500	750	ns
$E_{on} + E_{off}$		-	2,5	-	mJ
C_{ies}	$V_{CE} = 25 \text{ V}; V_{GE} = 0 \text{ V}, 1 \text{ MHz}$	-	1,1	-	nF
R_{thjh}	per IGBT	-	-	2,0	K/W
Diode ²⁾ - Inverter (Diode ²⁾ - Chopper see SKiiP 21NAB 06)					
$V_F = V_{EC}$	$I_F = 50 \text{ A}, T_j = 25 (125) \text{ }^\circ\text{C}$	-	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	$T_j = 125 \text{ }^\circ\text{C}$	-	11	16	m Ω
I_{RRM}	$I_F = 50 \text{ A}, V_R = -300 \text{ V}$ $di_F/dt = -800 \text{ A}/\mu\text{s}$ $V_{GE} = 0 \text{ V}, T_j = 125 \text{ }^\circ\text{C}$	-	50	-	A
Q_{rr}		-	5,0	-	μC
E_{off}		-	1,5	-	mJ
R_{thjh}		per diode	-	-	1,2
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
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 Chopper please refer to SKiiP 21 NAB 06

MiniSKiiP 3 SEMIKRON integrated intelligent Power SKiiP 30 NAB 06 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 see page B16-3

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)

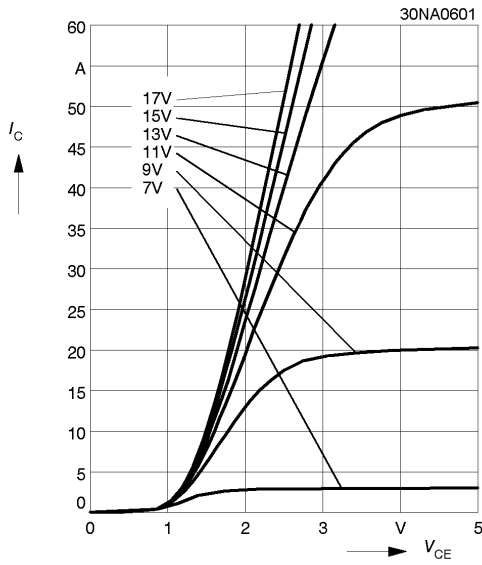


Fig. 1 Typ. output characteristic, $t_p = 80 \mu s$; $25 \text{ }^\circ\text{C}$

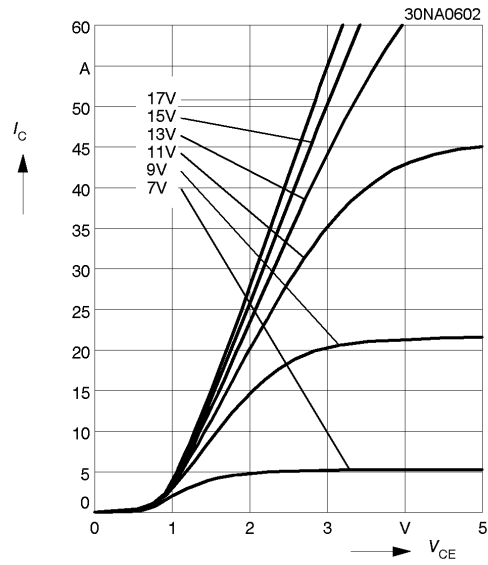


Fig. 2 Typ. output characteristic, $t_p = 80 \mu s$; $125 \text{ }^\circ\text{C}$

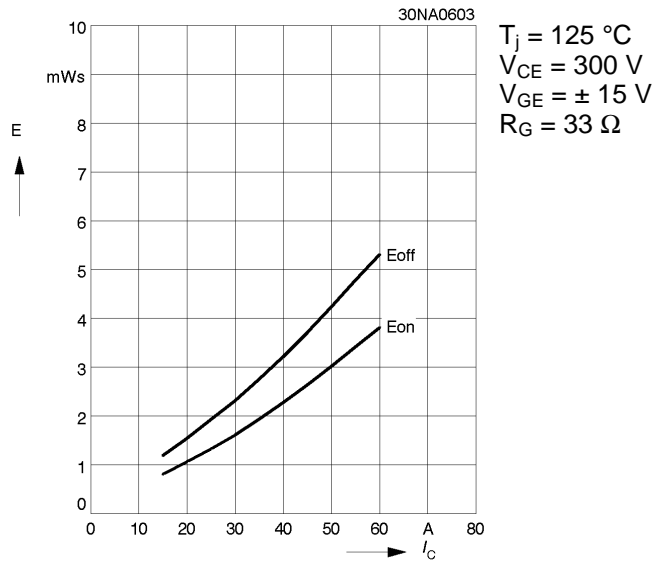


Fig. 3 Turn-on /-off energy = $f(I_c)$

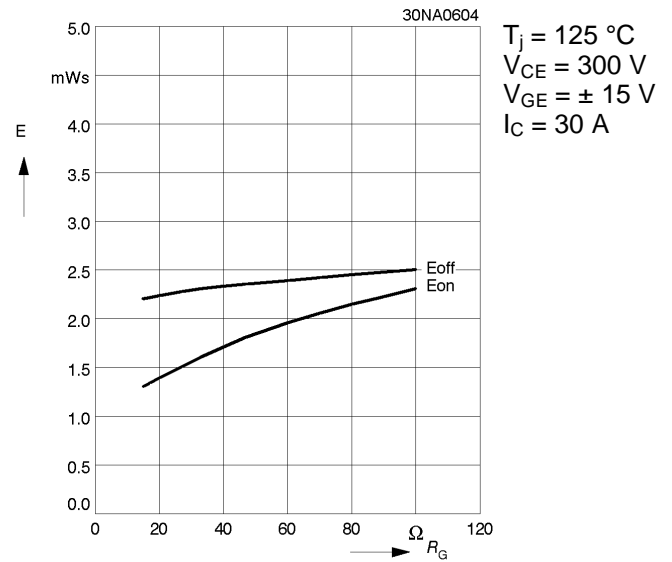


Fig. 4 Turn-on /-off energy = $f(R_G)$

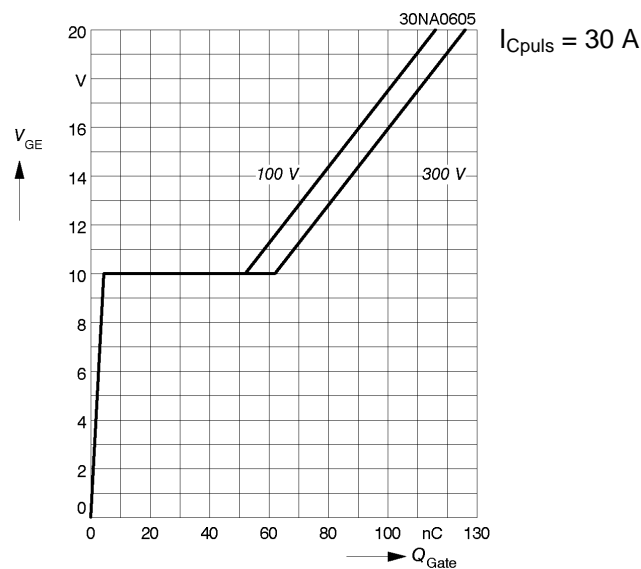


Fig. 5 Typ. gate charge characteristic

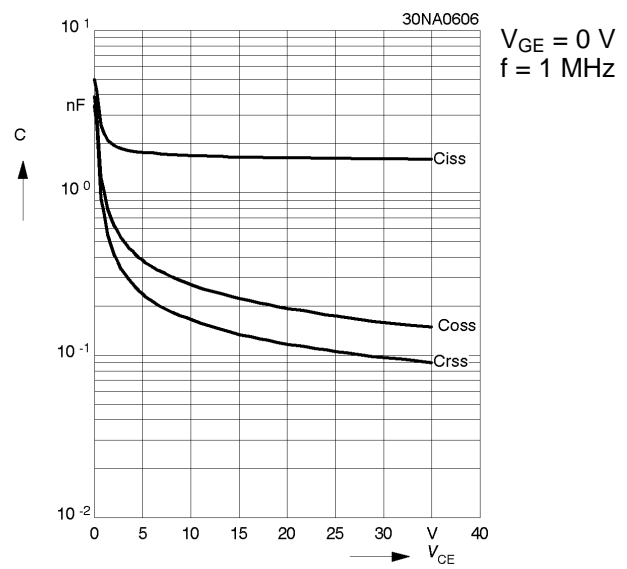


Fig. 6 Typ. capacitances vs. V_{CE}

2. Common characteristics of MiniSKiiP

MiniSKiiP 600 V

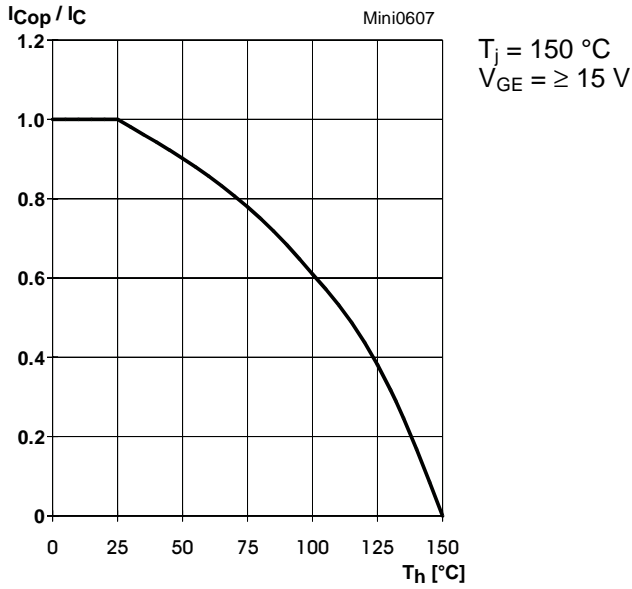


Fig. 7 Rated current of the IGBT $I_{COP} / I_C = f(T_h)$

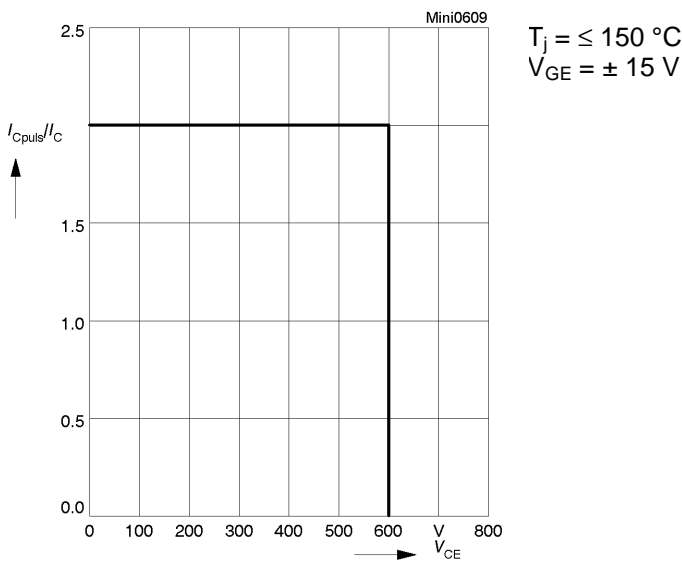


Fig. 9 Turn-off safe operating area (RBSOA) of the IGBT

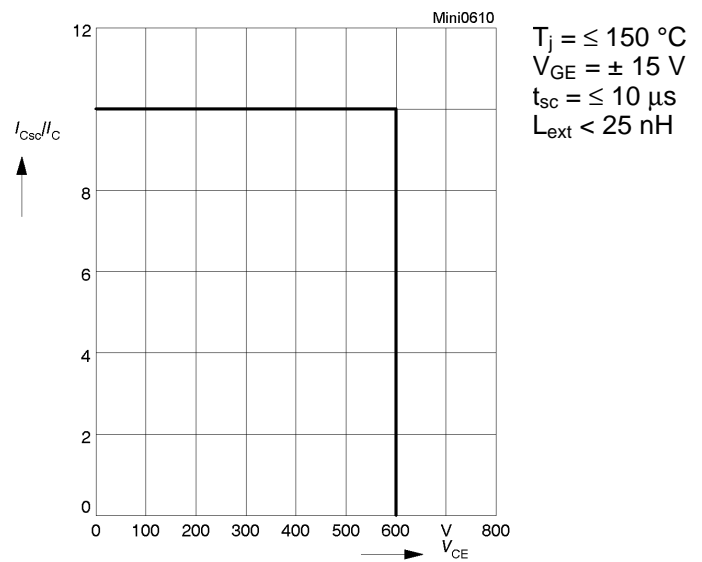


Fig. 10 Safe operating area at short circuit of the IGBT

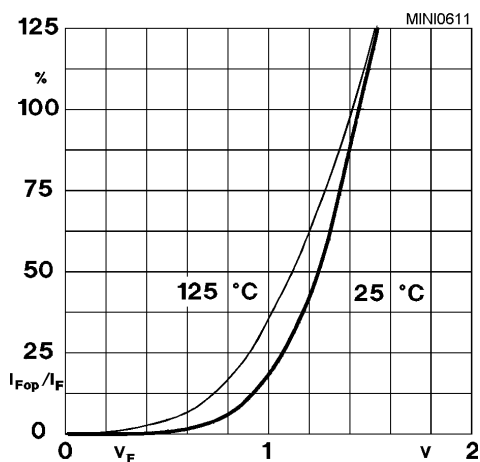


Fig. 11 Typ. freewheeling diode forward characteristic

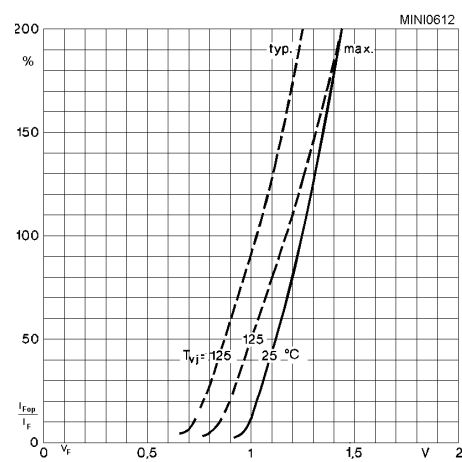


Fig. 12 Forward characteristic of the input bridge diode

MiniSKiiP 3

SKiiP 30 NAB 06
 SKiiP 31 NAB 06
 SKiiP 32 NAB 06
 SKiiP 30 NAB 12
 SKiiP 31 NAB 12
 SKiiP 32 NAB 12

Circuit
 Case M3
 Layout and connections for the
 customer's printed circuit board

