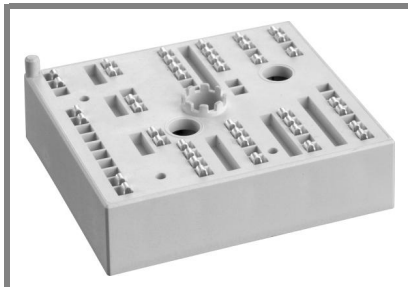


# SKiIP 28ANB16V1



MiniSKiIP<sup>®</sup> 2

3-phase bridge rectifier +  
brake chopper

SKiIP 28ANB16V1

## Features

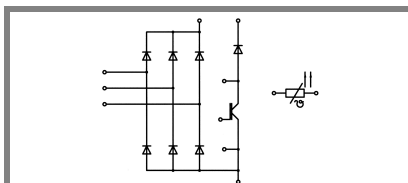
- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

## Typical Applications\*

- Input bridge for Inverter up to 39 kVA

## Remarks

- $V_{CEsat}$ ,  $V_F$  = chip level value



ANB

Absolute Maximum Ratings		$T_s = 25^\circ\text{C}$ , unless otherwise specified		
Symbol	Conditions	Values	Units	
<b>IGBT - Chopper</b>				
$V_{CES}$	$T_s = 25 (70)^\circ\text{C}$	1200	V	
$I_C$		118 (88)	A	
$I_{CRM}$		210	A	
$V_{GES}$		$\pm 20$	V	
$T_j$		- 40 ... + 150	$^\circ\text{C}$	
<b>Diode - Chopper</b>				
$I_F$	$T_s = 25 (70)^\circ\text{C}$	118 (88)	A	
$I_{FRM}$		210	A	
$T_j$		- 40 ... + 150	$^\circ\text{C}$	
<b>Diode - Rectifier</b>				
$V_{RRM}$	$T_s = 70^\circ\text{C}$	1600	V	
$I_F$		83	A	
$I_{FSM}$		$t_p = 10 \text{ ms, sin } 180^\circ, T_j = 25^\circ\text{C}$	1000	A
$i^2t$		$t_p = 10 \text{ ms, sin } 180^\circ, T_j = 25^\circ\text{C}$	6600	$\text{A}^2\text{s}$
$T_j$		- 40 ... + 150	$^\circ\text{C}$	
<b>Module</b>				
$I_{RMS}$	per power terminal (20 A / spring)	120	A	
$T_{stg}$		- 40 ... + 125	$^\circ\text{C}$	
$V_{isol}$	AC, 1 min.	2500	V	

Characteristics		$T_s = 25^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT - Chopper</b>					
$V_{CEsat}$	$I_{Cnom} = 105 \text{ A}, T_j = 25 (125)^\circ\text{C}$		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 3 \text{ mA}$	5	5,8	6,5	V
$V_{CE(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
$r_T$	$T_j = 25 (125)^\circ\text{C}$		6,7 (10)	8,6 (12)	$\text{m}\Omega$
$C_{ies}$	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$		8,4		nF
$C_{oes}$	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$		1,5		nF
$C_{res}$	$V_{CE} = 25 \text{ V}, V_{GE} = 0 \text{ V}, f = 1 \text{ MHz}$		1,1		nF
$R_{th(j-s)}$	per IGBT		0,4		K/W
$t_{d(on)}$	under following conditions		75		ns
$t_r$	$V_{CC} = 600 \text{ V}, V_{GE} = \pm 15 \text{ V}$		35		ns
$t_{d(off)}$	$I_{Cnom} = 105 \text{ A}, T_j = 125^\circ\text{C}$		465		ns
$t_f$	$R_{Gon} = R_{Goff} = 5 \Omega$		90		ns
$E_{on}$	inductive load		13,1		mJ
$E_{off}$			13		mJ
<b>Diode - Chopper</b>					
$V_F = V_{EC}$	$I_{Fnom} = 105 \text{ A}, T_j = 25 (125)^\circ\text{C}$		1,6 (1,6)	1,8 (1,8)	V
$V_{(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1 (0,8)	1,1 (0,9)	V
$r_T$	$T_j = 25 (125)^\circ\text{C}$		5,7 (7,6)	6,7 (8,6)	$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,55		K/W
$I_{RRM}$	under following conditions		175		A
$Q_{rr}$	$I_{Fnom} = 105 \text{ A}, V_R = 600 \text{ V}$		26		$\mu\text{C}$
$E_{rr}$	$V_{GE} = 0 \text{ V}, T_j = 125^\circ\text{C}$ $di_F/dt = 4000 \text{ A}/\mu\text{s}$		11,2		mJ
<b>Diode - Rectifier</b>					
$V_F$	$I_{Fnom} = 75 \text{ A}, T_j = 25^\circ\text{C}$		1,2		V
$V_{(TO)}$	$T_j = 150^\circ\text{C}$		0,8		V
$r_T$	$T_j = 150^\circ\text{C}$		7		$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,7		K/W
<b>Temperature Sensor</b>					
$R_{ts}$	3 %, $T_r = 25 (100)^\circ\text{C}$		1000(1670)		$\Omega$
<b>Mechanical Data</b>					
w			65		g
$M_s$	Mounting torque	2		2,5	Nm

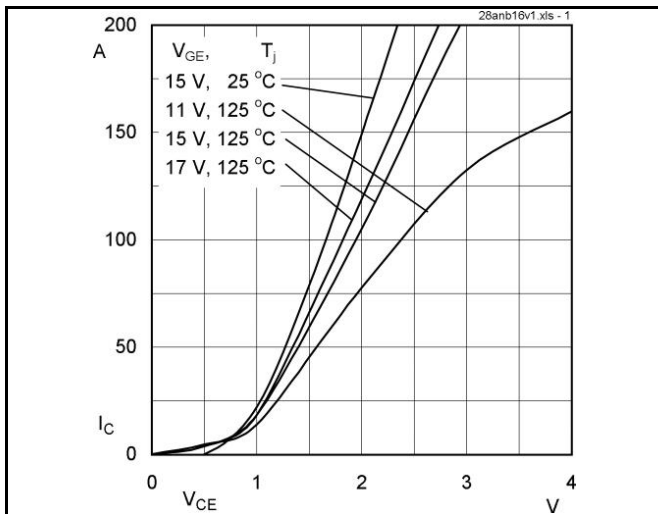


Fig. 1 Typ. output characteristic

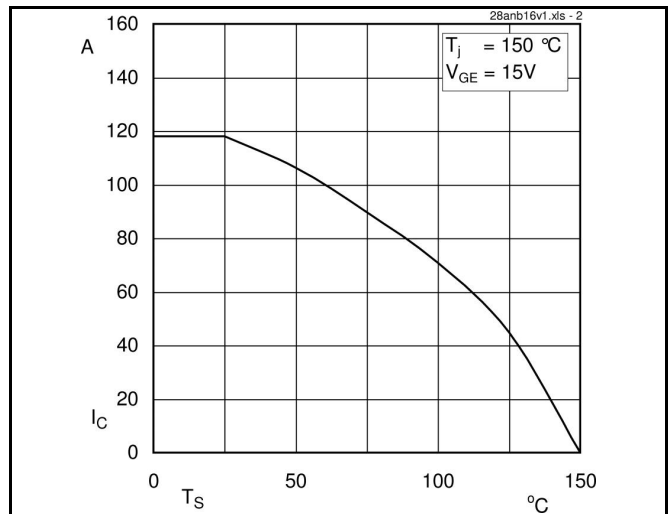


Fig. 2 Typ. rated current vs. temperature

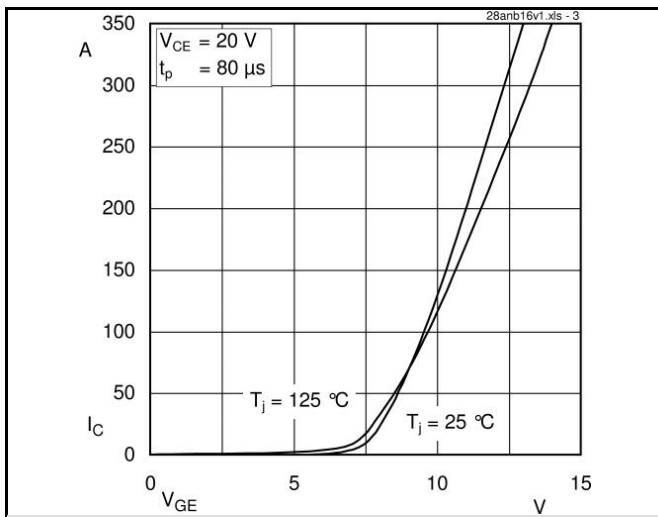


Fig. 3 Typ. transfer characteristic

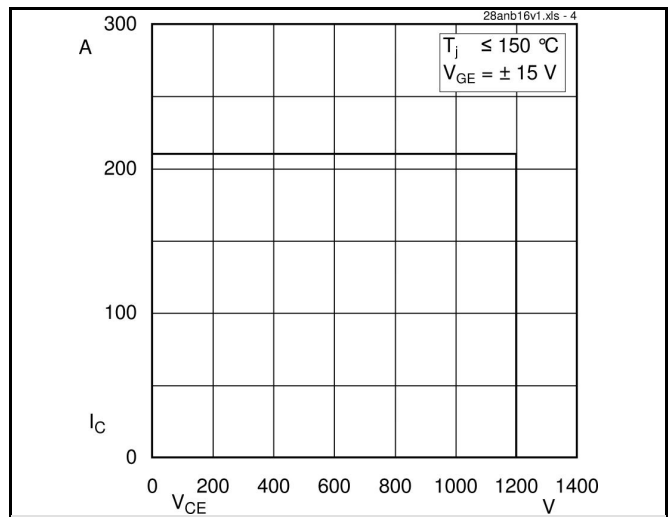


Fig. 4 Reverse bias safe operating area

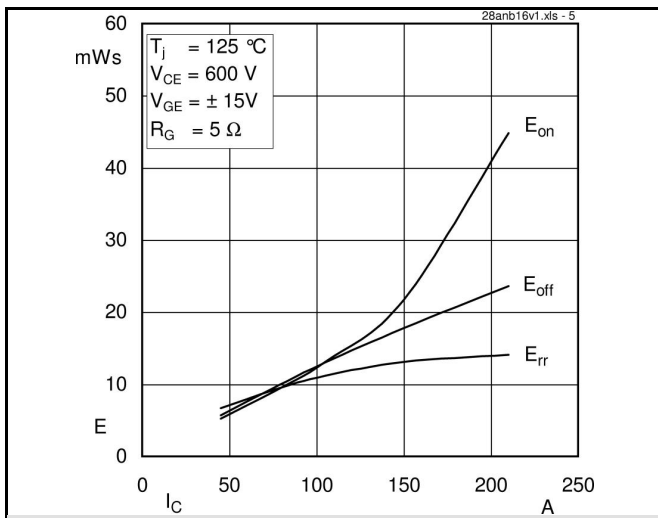


Fig. 5 Typ. Turn-on /-off energy =  $f(I_C)$

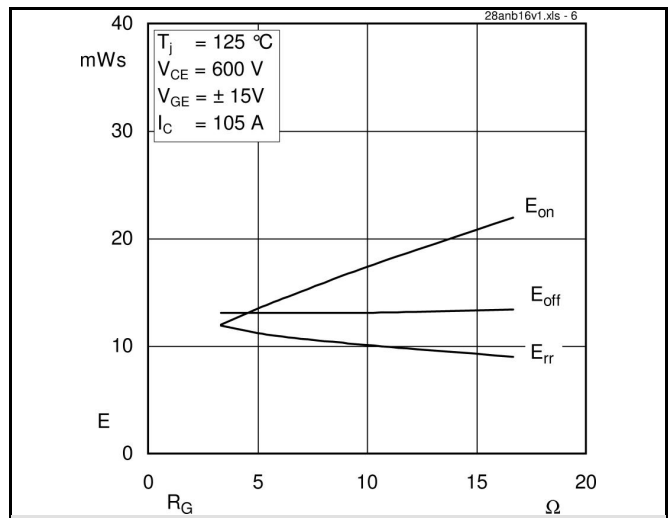


Fig. 6 Typ. Turn-on /-off energy =  $f(R_G)$

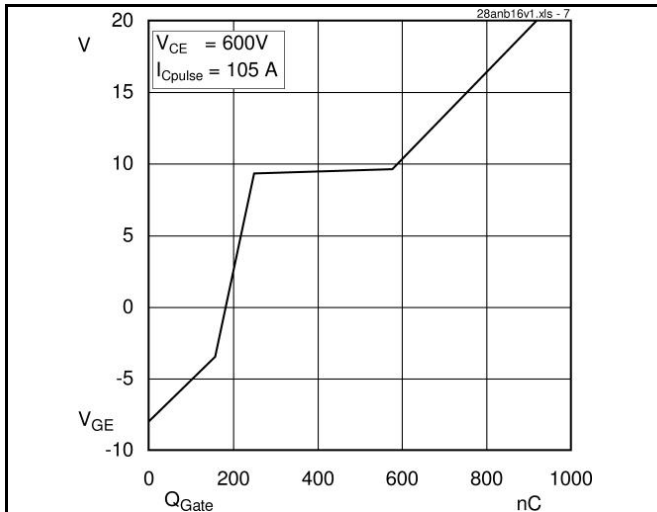


Fig. 7 Typ. gate charge characteristic

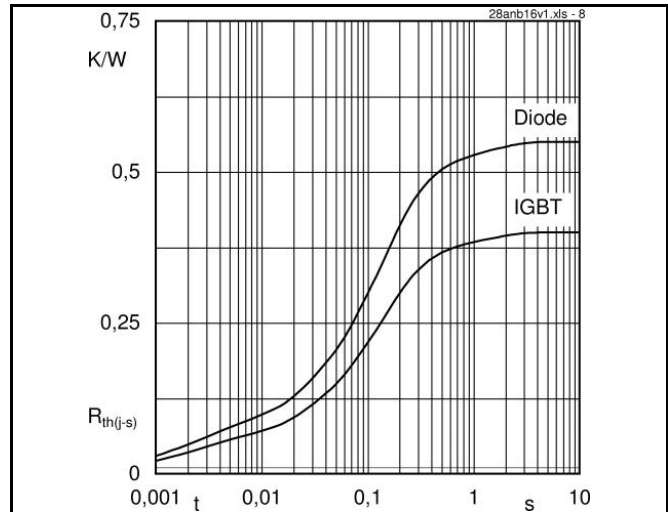


Fig. 8 Typ. thermal impedance

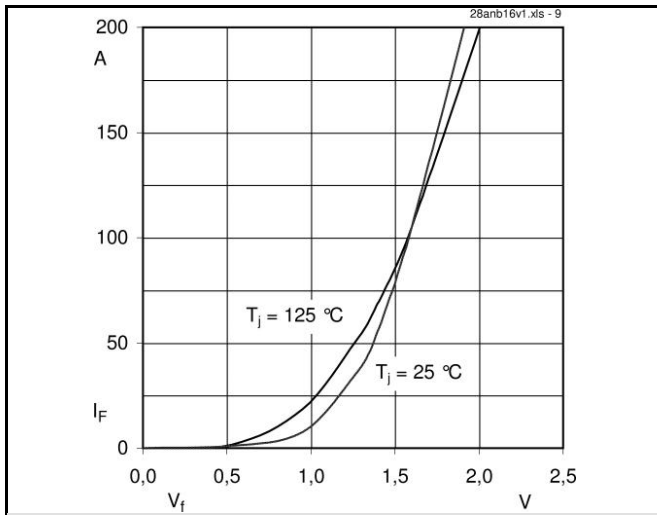


Fig. 9 Typ. freewheeling diode forward characteristic

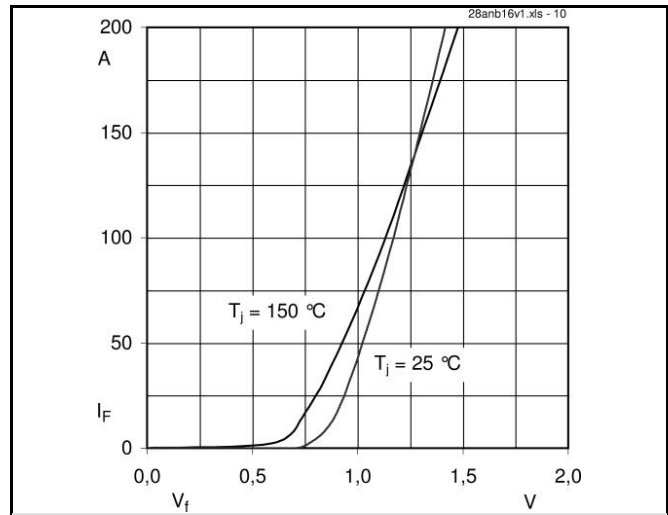
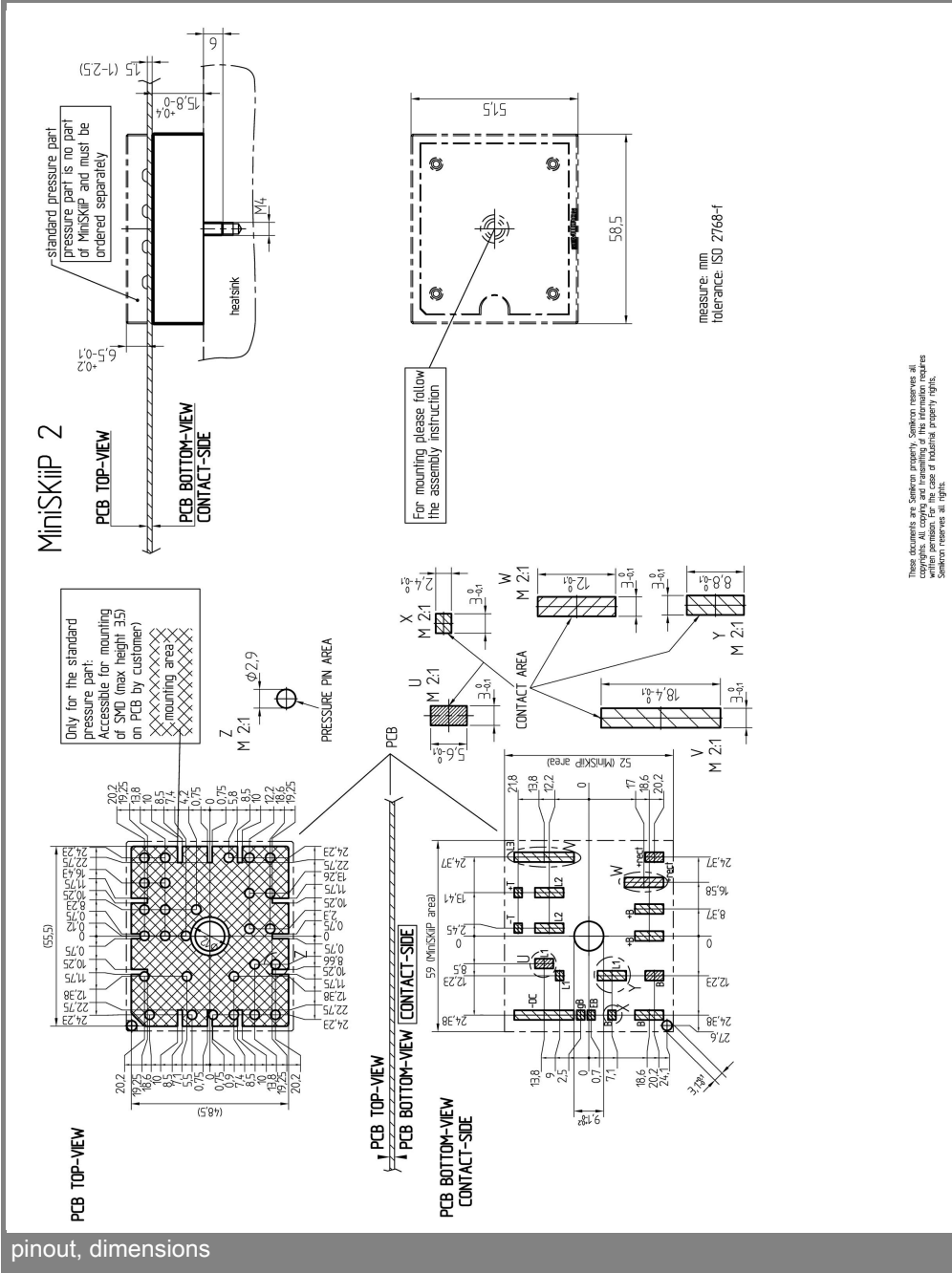
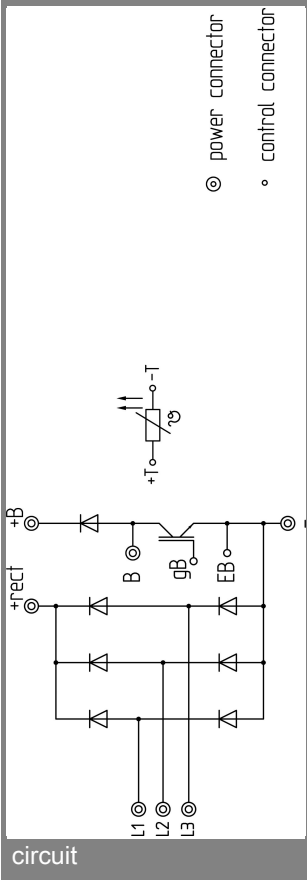


Fig. 10 Typ. input bridge forward characteristic



These documents are SEMIKRON property. SEMIKRON reserves all rights. No part of these documents may be reproduced without written permission. In the case of industrial property rights, SEMIKRON reserves all rights.

This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

\* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.