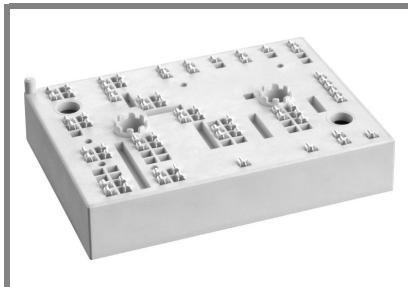


# SKiIP 39ANB16V1



MiniSKiIP<sup>®</sup> 3

3-phase bridge rectifier +  
brake chopper

SKiIP 39ANB16V1

## Features

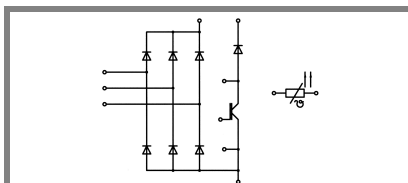
- Fast Trench IGBTs
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

## Typical Applications

- Input bridge for Inverter up to 45 kVA

## Remarks

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



ANB

Absolute Maximum Ratings		$T_s = 25\text{ }^\circ\text{C}$ , unless otherwise specified	
Symbol	Conditions	Values	Units
<b>IGBT - Inverter, Chopper</b>			
$V_{CES}$		1200	V
$I_C$	$T_s = 25\text{ (70) }^\circ\text{C}$	157 (118)	A
$I_{CRM}$	$t_p \leq 1\text{ ms}$	280	A
$V_{GES}$		$\pm 20$	V
$T_j$		- 40 ... + 150	$^\circ\text{C}$
<b>Diode - Inverter, Chopper</b>			
$I_F$	$T_s = 25\text{ (70) }^\circ\text{C}$	167 (124)	A
$I_{FRM}$	$t_p \leq 1\text{ ms}$	280	A
$T_j$		- 40 ... + 150	$^\circ\text{C}$
<b>Diode - Rectifier</b>			
$V_{RRM}$		1600	V
$I_F$	$T_s = 70\text{ }^\circ\text{C}$	124	A
$I_{FSM}$	$t_p = 10\text{ ms}$ , $\sin 180^\circ$ , $T_j = 25\text{ }^\circ\text{C}$	1600	A
$i^2t$	$t_p = 10\text{ ms}$ , $\sin 180^\circ$ , $T_j = 25\text{ }^\circ\text{C}$	14500	$\text{A}^2\text{s}$
$T_j$		- 40 ... + 150	$^\circ\text{C}$
$I_{RMS}$	per power terminal (20 A / spring)	160	A
$T_{stg}$	$T_{op} \leq T_{stg}$	- 40 ... + 125	$^\circ\text{C}$
$V_{isol}$	AC, 1 min.	2500	V

Characteristics		$T_s = 25\text{ }^\circ\text{C}$ , unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
<b>IGBT - Inverter, Chopper</b>					
$V_{CEsat}$	$I_{Cnom} = 140\text{ A}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		1,7 (2)	2,1 (2,4)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$ , $I_C = 6\text{ mA}$	5	5,8	6,5	V
$V_{CE(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1 (0,9)	1,2 (1,1)	V
$r_T$	$T_j = 25\text{ (125) }^\circ\text{C}$		5 (7,9)	6,4 (9,3)	$\text{m}\Omega$
$C_{ies}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		11,2		nF
$C_{oes}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		1,9		nF
$C_{res}$	$V_{CE} = 25\text{ V}$ , $V_{GE} = 0\text{ V}$ , $f = 1\text{ MHz}$		1,5		nF
$R_{th(j-s)}$	per IGBT		0,3		K/W
$t_{d(on)}$	under following conditions		80		ns
$t_r$	$V_{CC} = 600\text{ V}$ , $V_{GE} = \pm 15\text{ V}$		40		ns
$t_{d(off)}$	$I_{Cnom} = 140\text{ A}$ , $T_j = 125\text{ }^\circ\text{C}$		500		ns
$t_f$	$R_{Gon} = R_{Goff} = 5\text{ }\Omega$		100		ns
$E_{on}$	inductive load		19,9		mJ
$E_{off}$			17,2		mJ
<b>Diode - Inverter, Chopper</b>					
$V_F = V_{EC}$	$I_{Fnom} = 140\text{ A}$ , $T_j = 25\text{ (125) }^\circ\text{C}$		1,5 (1,5)	1,7 (1,7)	V
$V_{(TO)}$	$T_j = 25\text{ (125) }^\circ\text{C}$		1 (0,8)	1,1 (0,9)	V
$r_T$	$T_j = 25\text{ (125) }^\circ\text{C}$		3,6 (5)	4,3 (5,7)	$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,4		K/W
$I_{RRM}$	under following conditions		210		A
$Q_{rr}$	$I_{Fnom} = 140\text{ A}$ , $V_R = 600\text{ V}$		38		$\mu\text{C}$
$E_{rr}$	$V_{GE} = 0\text{ V}$ , $T_j = 125\text{ }^\circ\text{C}$		16,2		mJ
	$di_F/dt = 4300\text{ A}/\mu\text{s}$				
<b>Diode - Rectifier</b>					
$V_F$	$I_{Fnom} = 90\text{ A}$ , $T_j = 25\text{ }^\circ\text{C}$		1,2		V
$V_{(TO)}$	$T_j = 150\text{ }^\circ\text{C}$		0,8		V
$r_T$	$T_j = 150\text{ }^\circ\text{C}$		4		$\text{m}\Omega$
$R_{th(j-s)}$	per diode		0,5		K/W
<b>Temperature Sensor</b>					
$R_{ts}$	3 %, $T_r = 25\text{ (100) }^\circ\text{C}$		1000(1670)		$\Omega$
<b>Mechanical Data</b>					
w			95		g
$M_s$	Mounting torque	2		2,5	Nm

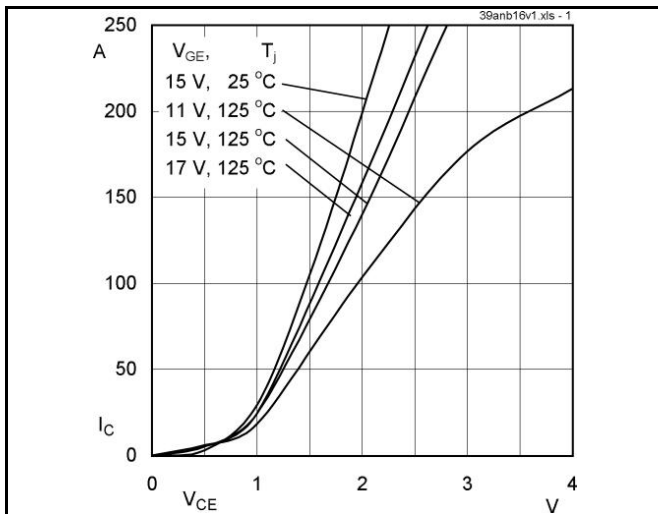


Fig. 1 Typ. output characteristic

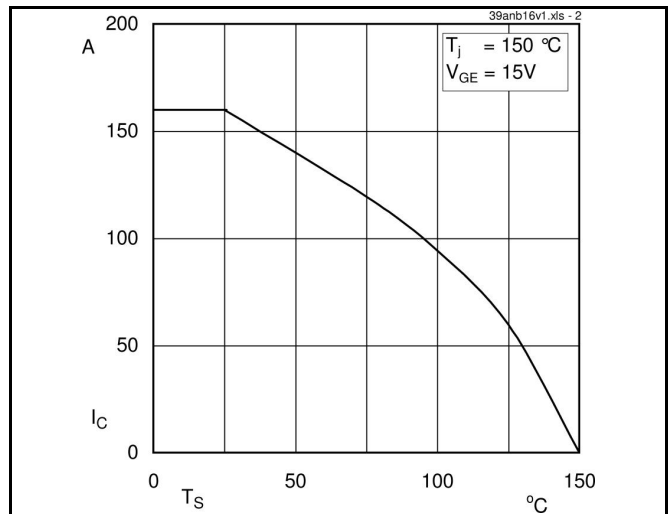


Fig. 2 Typ. rated current vs. temperature

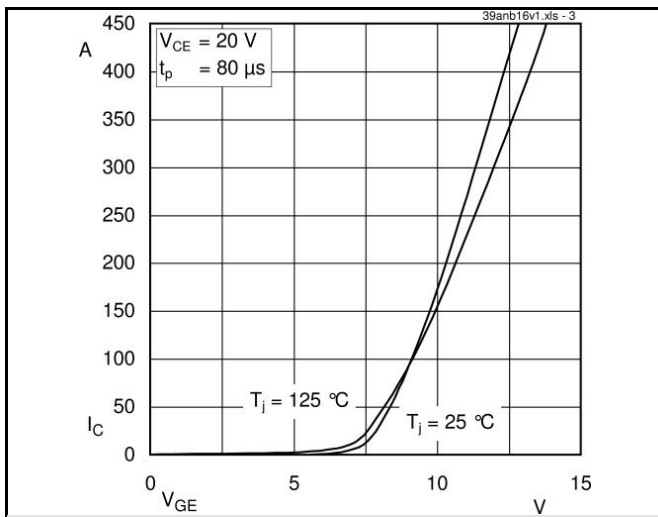


Fig. 3 Typ. transfer characteristic

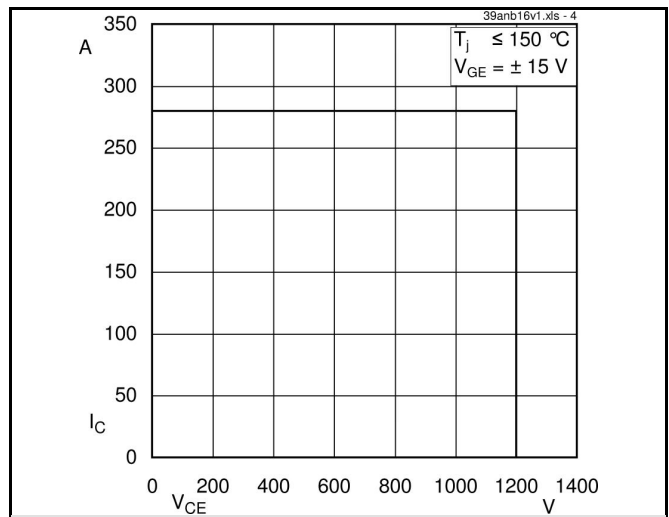


Fig. 4 Reverse bias safe operating area

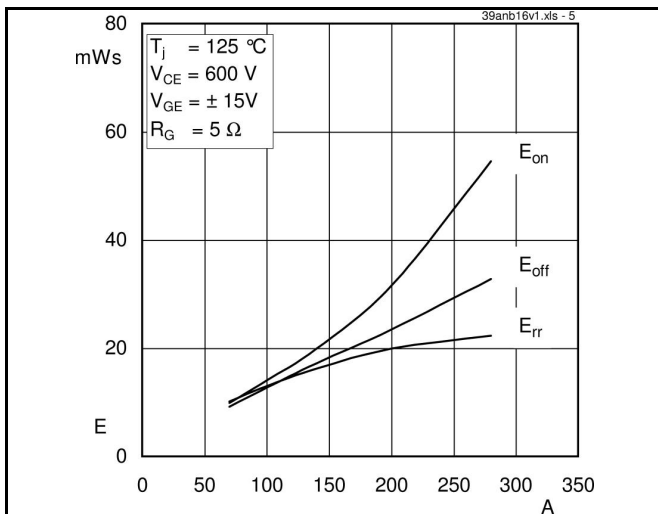


Fig. 5 Typ. Turn-on /-off energy =  $f(I_C)$

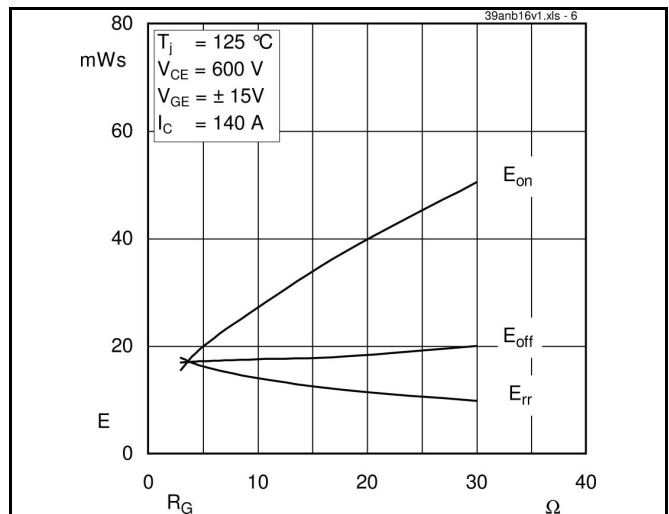


Fig. 6 Typ. Turn-on /-off energy =  $f(R_G)$

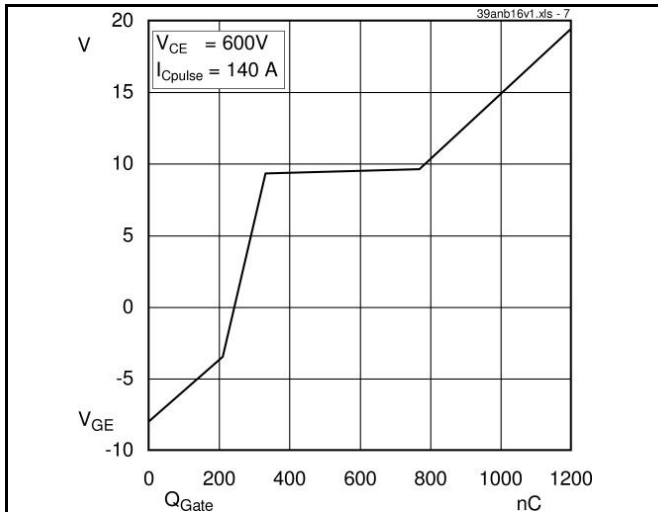


Fig. 7 Typ. gate charge characteristic

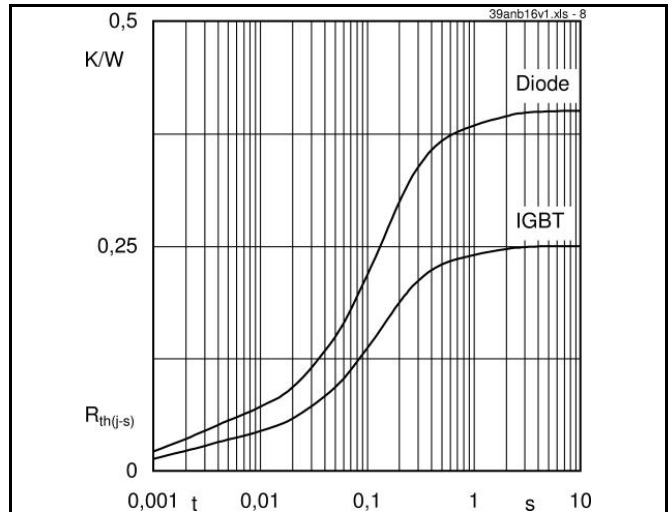


Fig. 8 Typ. thermal impedance

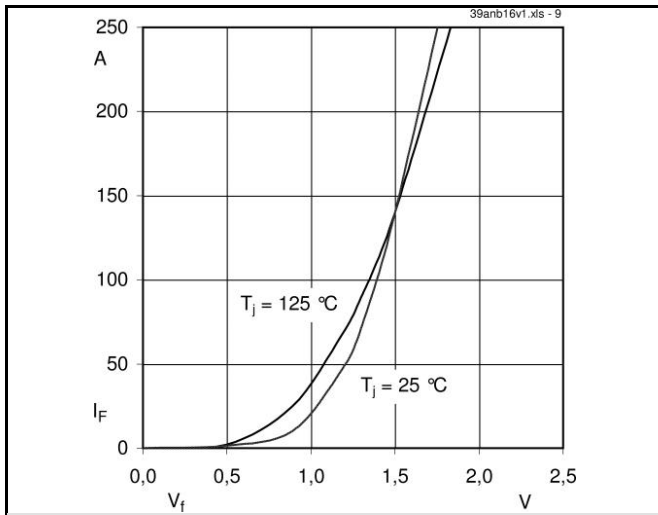


Fig. 9 Typ. freewheeling diode forward characteristic

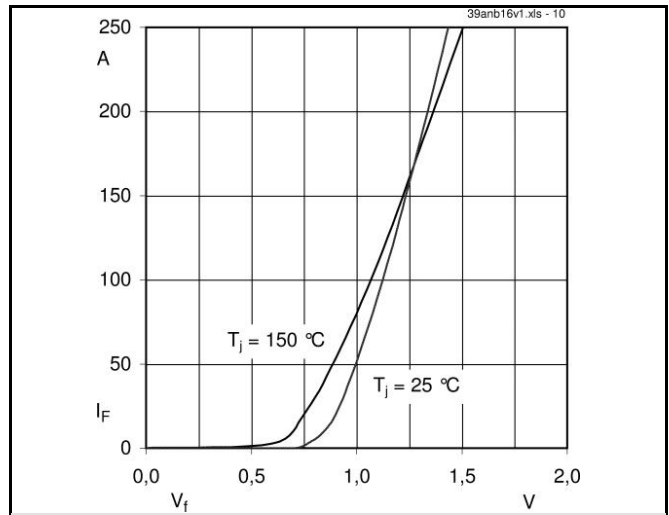


Fig. 10 Typ. input bridge forward characteristic

