

MiniSKiiP® 3

3-phase bridge inverter

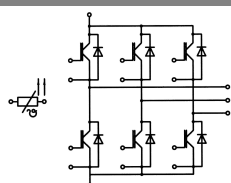
SKiiP 39AC066V4

Features

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

Remarks

- Case temperature limited to $T_C = 125^\circ\text{C}$
- Product reliability results are valid for $T_j = 150^\circ\text{C}$
- SC data: $t_p \leq 6 \mu\text{s}$; $V_{GE} \leq 15 \text{ V}$; $T_j = 150^\circ\text{C}$, $V_{CC} = 360 \text{ V}$
- V_{CESat} , V_F = chip level value



AC

Absolute Maximum Ratings		$T_S = 25^\circ\text{C}$, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Inverter			
V_{CES}		600	V
I_C	$T_S = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	131 (87)	A
I_C	$T_S = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	146 (107)	A
I_{CRM}	$t_p = 1 \text{ ms}$	300	A
V_{GES}		± 20	V
T_j		$-40 \dots +175$	$^\circ\text{C}$
Diode - Inverter			
I_F	$T_S = 25 (70)^\circ\text{C}$, $T_j = 150^\circ\text{C}$	151 (98)	A
I_F	$T_S = 25 (70)^\circ\text{C}$, $T_j = 175^\circ\text{C}$	164 (119)	A
I_{FRM}	$t_p = 1 \text{ ms}$	300	A
T_j		$-40 \dots +175$	$^\circ\text{C}$
I_{RMS}	per power terminal (20 A / spring)	160	A
T_{stg}	$T_{op} \leq T_{stg}$	$-40 \dots +125$	$^\circ\text{C}$
V_{isol}	AC, 1 min.	2500	V

Characteristics		$T_S = 25^\circ\text{C}$, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Inverter					
V_{CESat}	$I_{Cnom} = 150 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$	1,05	1,45 (1,65)	1,85 (2,05)	V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3 \text{ mA}$		5,8		V
$V_{CE(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,85 (0,7)	1,1 (1)	V
r_T	$T_j = 25 (150)^\circ\text{C}$		4 (6,3)	5 (7)	m Ω
C_{ies}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		9		nF
C_{oes}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		1,7		nF
C_{res}	$V_{CE} = 25 \text{ V}$, $V_{GE} = 0 \text{ V}$, $f = 1 \text{ MHz}$		1,4		nF
$R_{CC'+EE'}$	spring contact-chip $T_S = 25 (150)^\circ\text{C}$				m Ω
$R_{th(j-s)}$	per IGBT		0,5		K/W
$t_{d(on)}$	under following conditions		135		ns
t_r	$V_{CC} = 300 \text{ V}$, $V_{GE} = -8\text{V}/+15\text{V}$		55		ns
$t_{d(off)}$	$I_{Cnom} = 150 \text{ A}$, $T_j = 150^\circ\text{C}$		450		ns
t_f	$R_{Gon} = R_{Goff} = 4,3 \Omega$		50		ns
$E_{on}(E_{off})$	inductive load		7,9 (5,6)		mJ
Diode - Inverter					
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}$, $T_j = 25 (150)^\circ\text{C}$		1,3 (1,3)	1,5 (1,5)	V
$V_{(TO)}$	$T_j = 25 (150)^\circ\text{C}$		0,9 (0,8)	1 (0,9)	V
r_T	$T_j = 25 (150)^\circ\text{C}$		2,7 (3,3)	3,3 (4)	m Ω
$R_{th(j-s)}$	per diode		0,55		K/W
I_{RRM}	under following conditions		150		A
Q_{rr}	$I_{Fnom} = 150 \text{ A}$, $V_R = 300 \text{ V}$		17		μC
E_{rr}	$V_{GE} = 0 \text{ V}$, $T_j = 150^\circ\text{C}$		3,5		mJ
	$di_F/dt = 3000 \text{ A}/\mu\text{s}$				
Temperature Sensor					
R_{ts}	3 %, $T_f = 25 (100)^\circ\text{C}$		1000(1670)		Ω
Mechanical Data					
m			97		g
M_s	Mounting torque	2		2,5	Nm

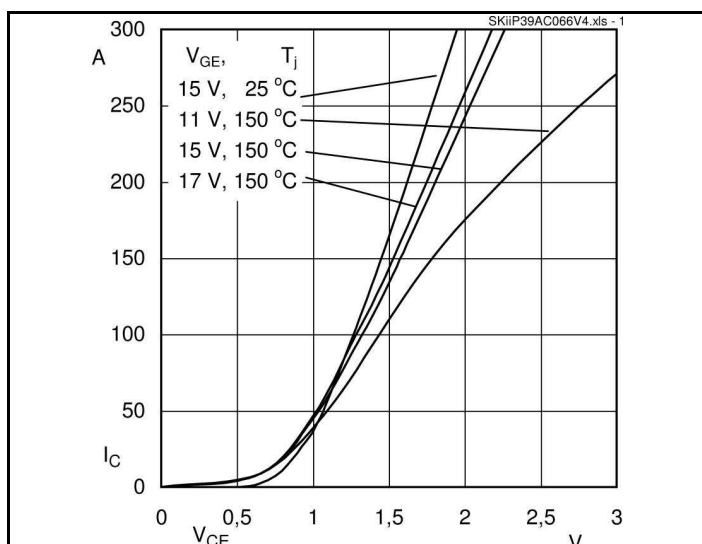


Fig. 1 Output characteristic

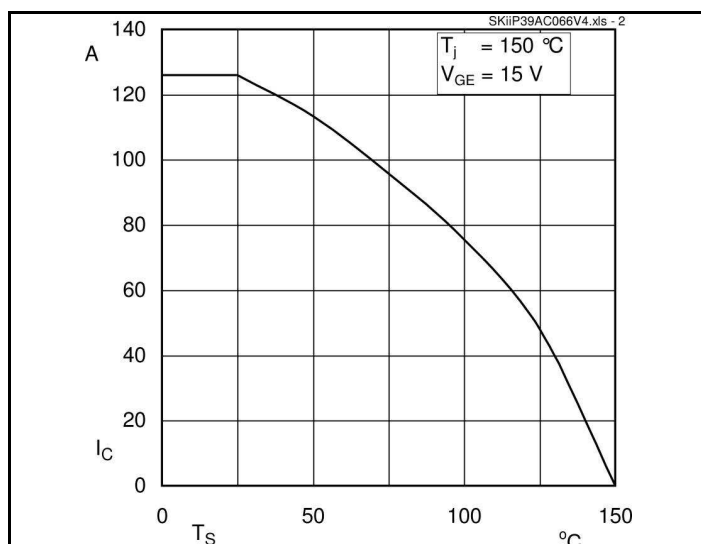


Fig. 2 Rated current vs. temperature

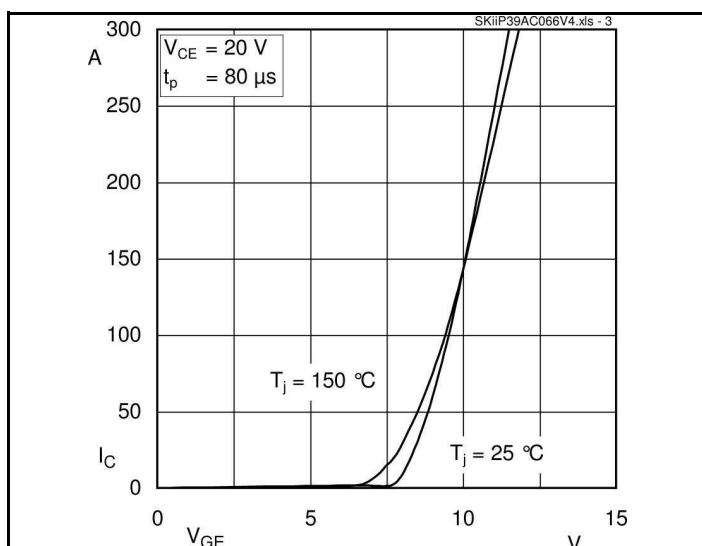


Fig. 3 Typ. transfer characteristic

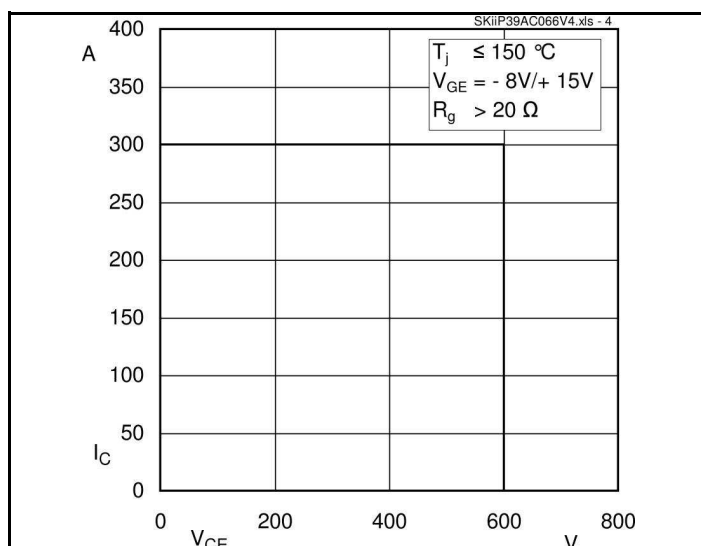


Fig. 4 Reverse bias safe operating area

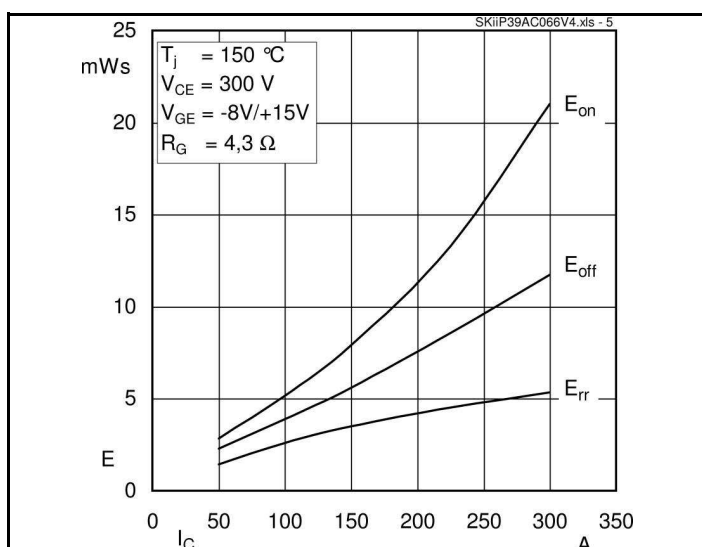


Fig. 5 Turn-on /-off energy = $f(I_C)$

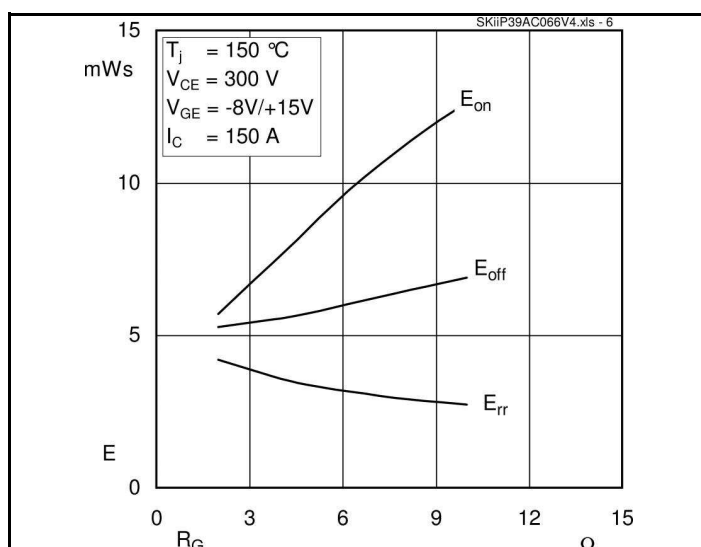


Fig. 6 Turn-on /-off energy = $f(R_G)$

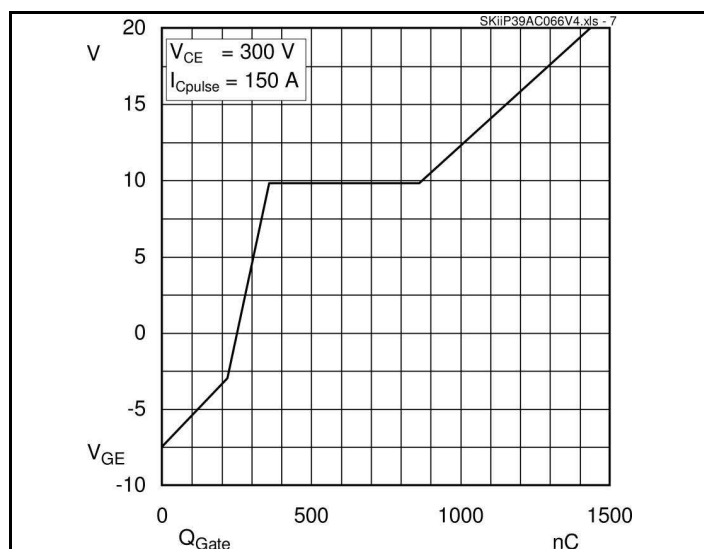


Fig. 7 Typ. Gate charge characteristic

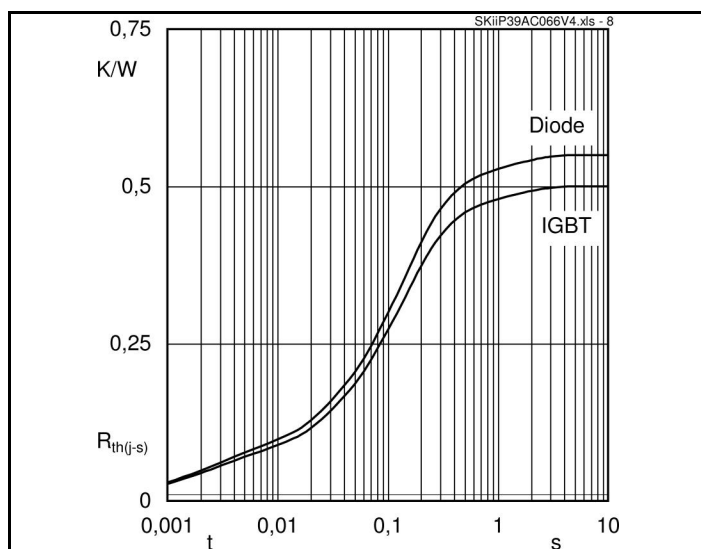


Fig. 8 Thermal impedance

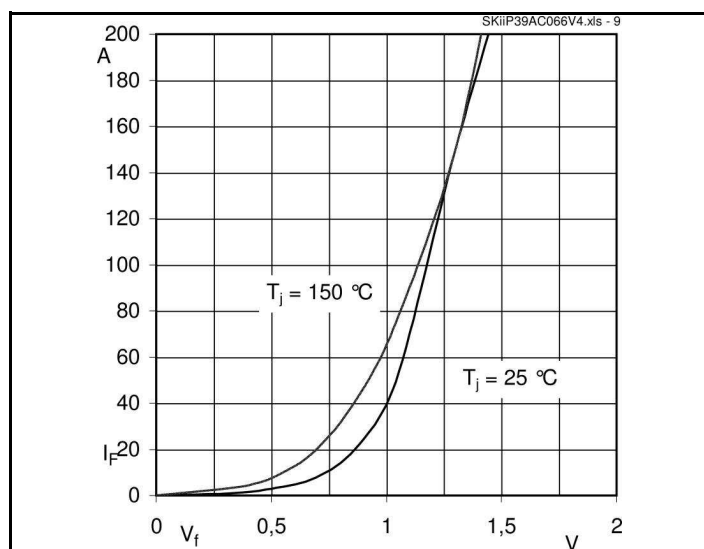
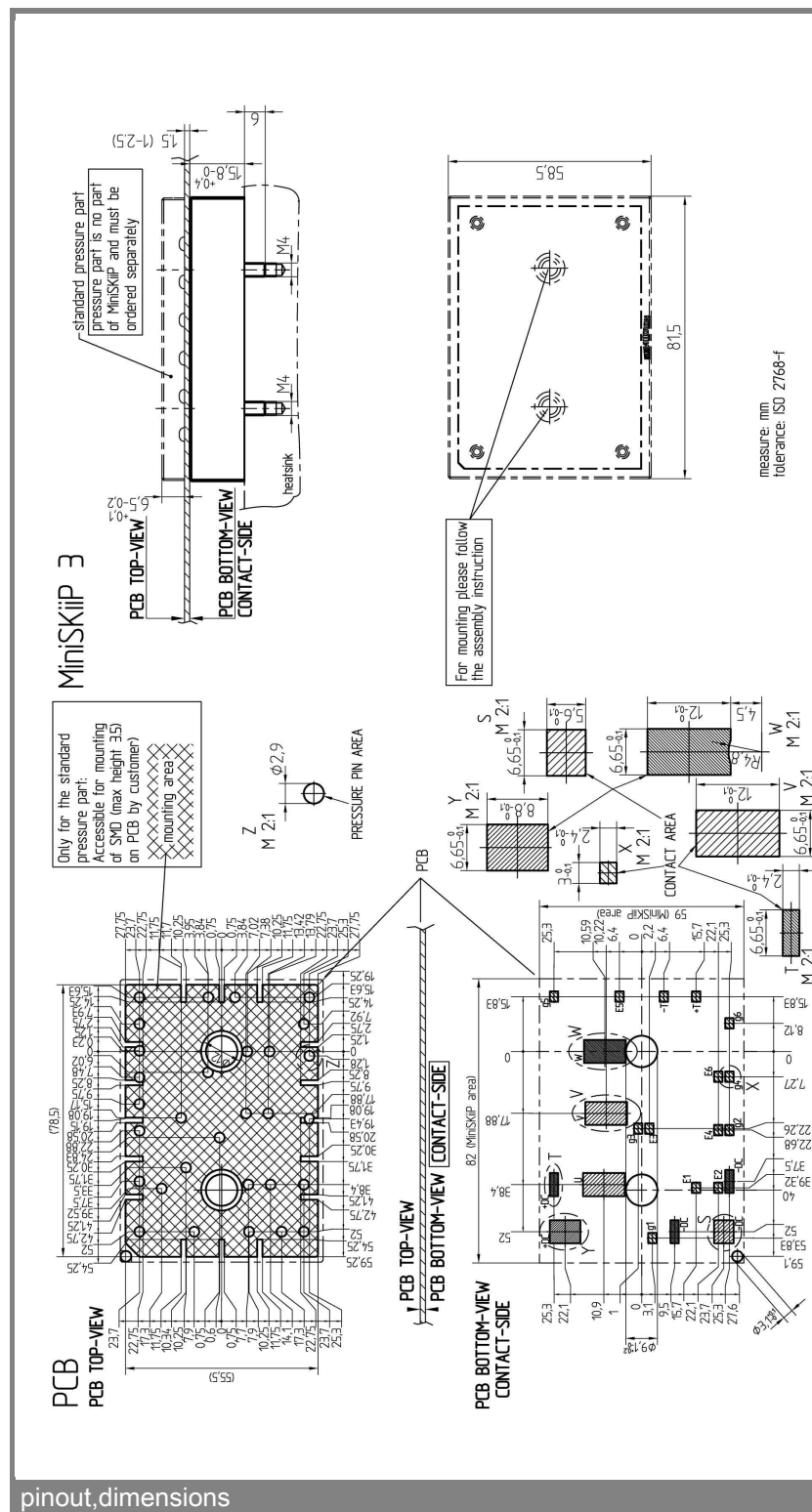
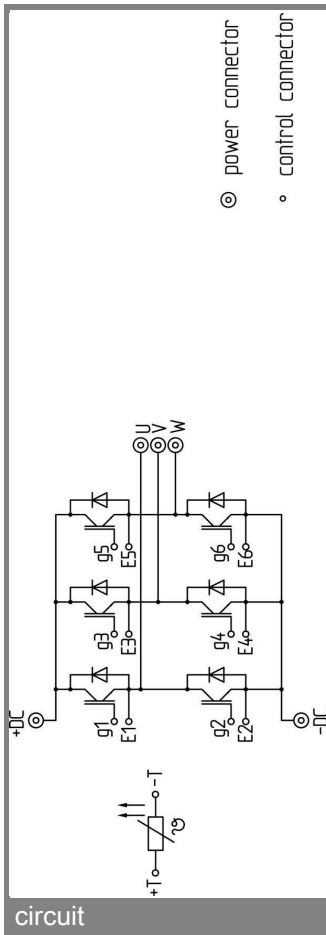


Fig. 9 Freewheeling diode forward characteristic



These documents are Sentikron property. Sentikron reserves all copyrights. All copying and transmitting of this information requires written permission. For the case of industrial property rights, Sentikron 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.