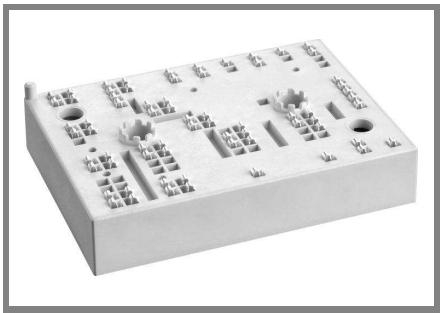


MiniSKiiP® 3

3-phase bridge inverter

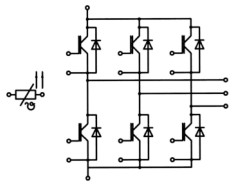
SKiiP 39AC066V4

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°C
- Product reliability results are valid for T_j = 150°C
- SC data: $t_p \leq 6$ µs; $V_{GE} \leq 15$ V; T_j = 150°C, V_{CC} = 360 V
- V_{CEsat}, V_F = chip level value



AC

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

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

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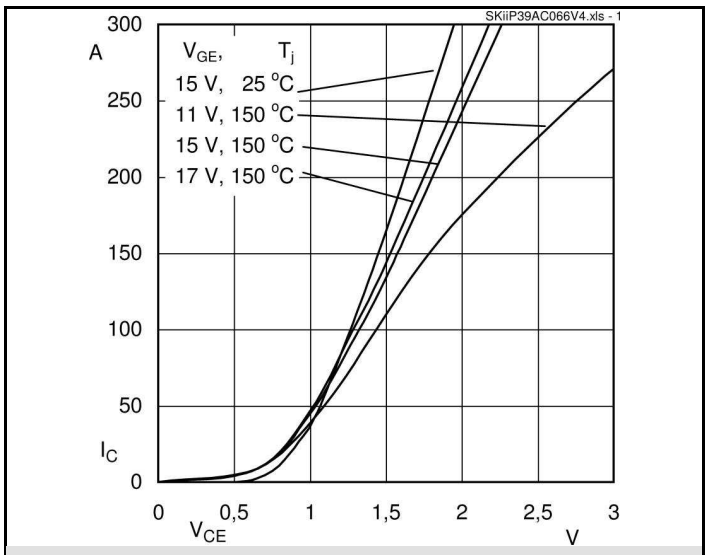

Fig. 1 Output characteristic

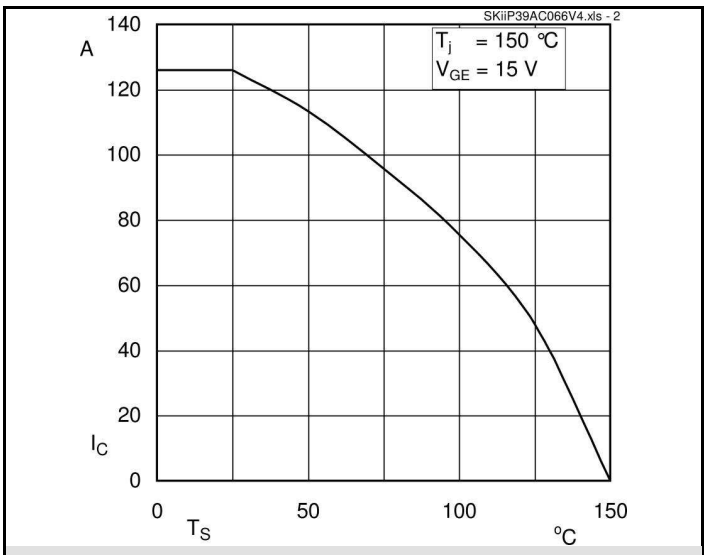

Fig. 2 Rated current vs. temperature

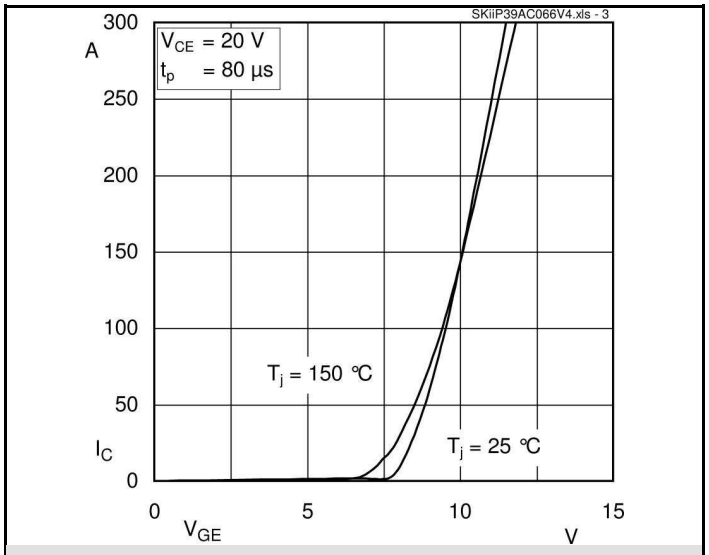

Fig. 3 Typ. transfer characteristic

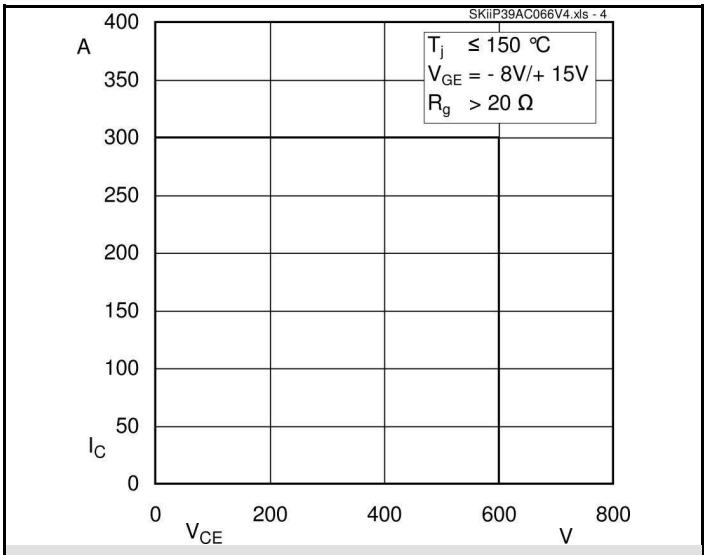

Fig. 4 Reverse bias safe operating area

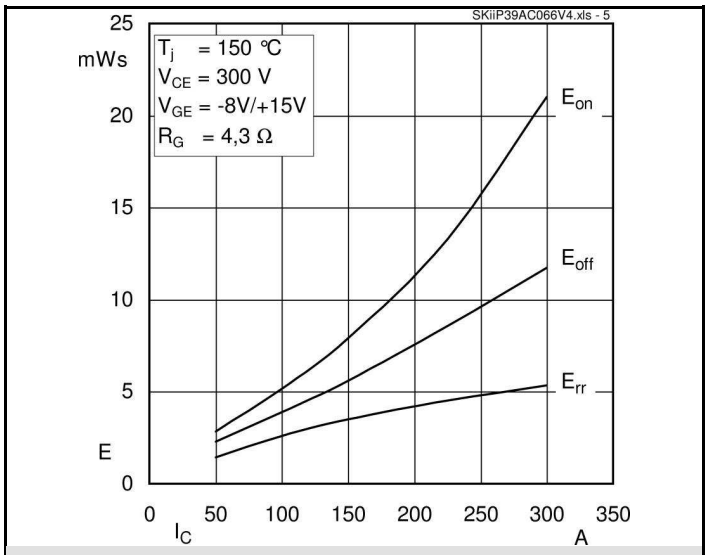

Fig. 5 Turn-on /-off energy = f (I_C)

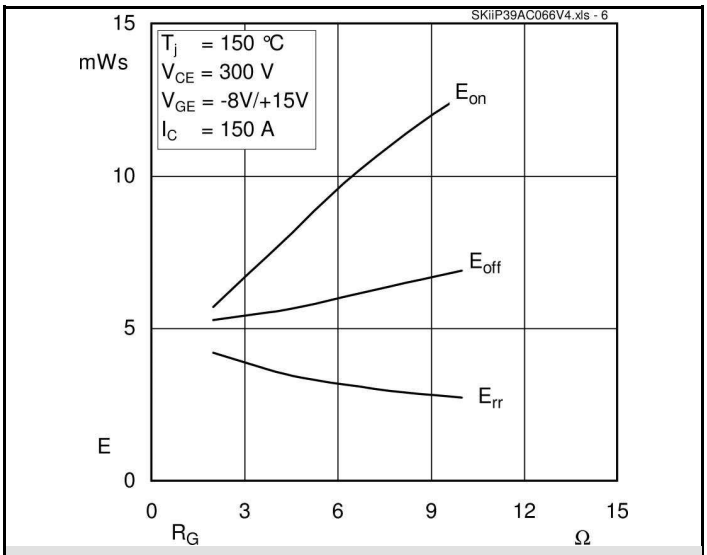

Fig. 6 Turn-on /-off energy = f (R_G)

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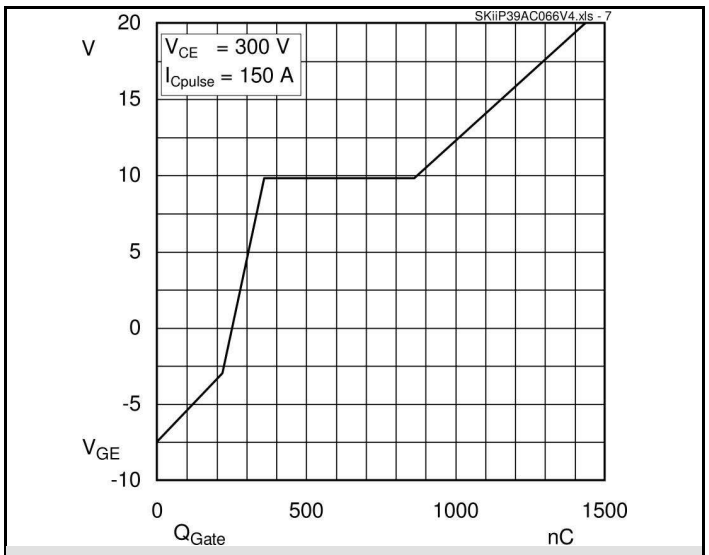

Fig. 7 Typ. Gate charge characteristic

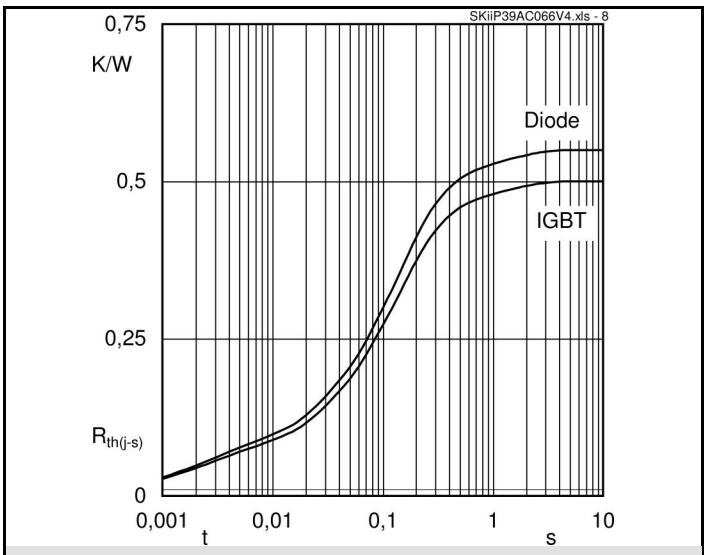

Fig. 8 Thermal impedance

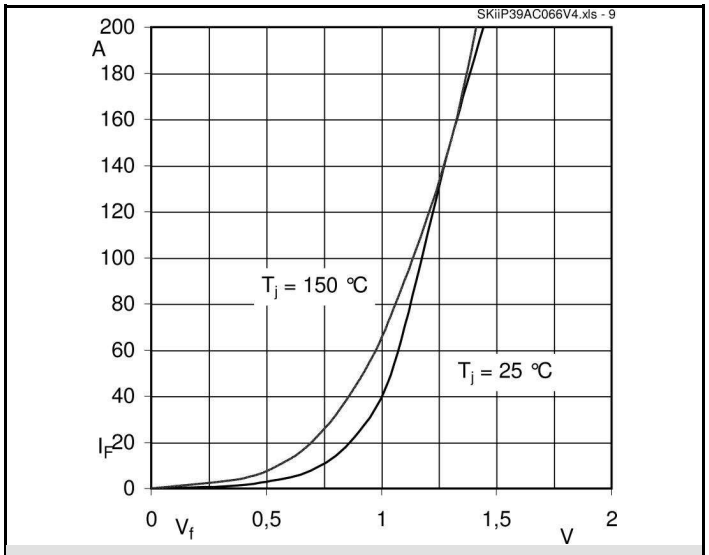

Fig. 9 Freewheeling diode forward characteristic

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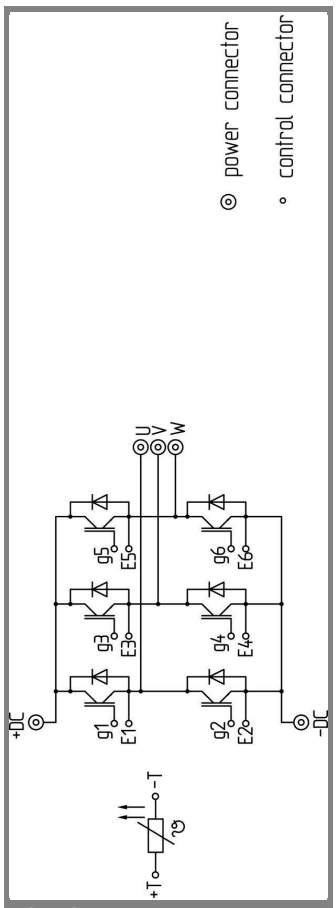
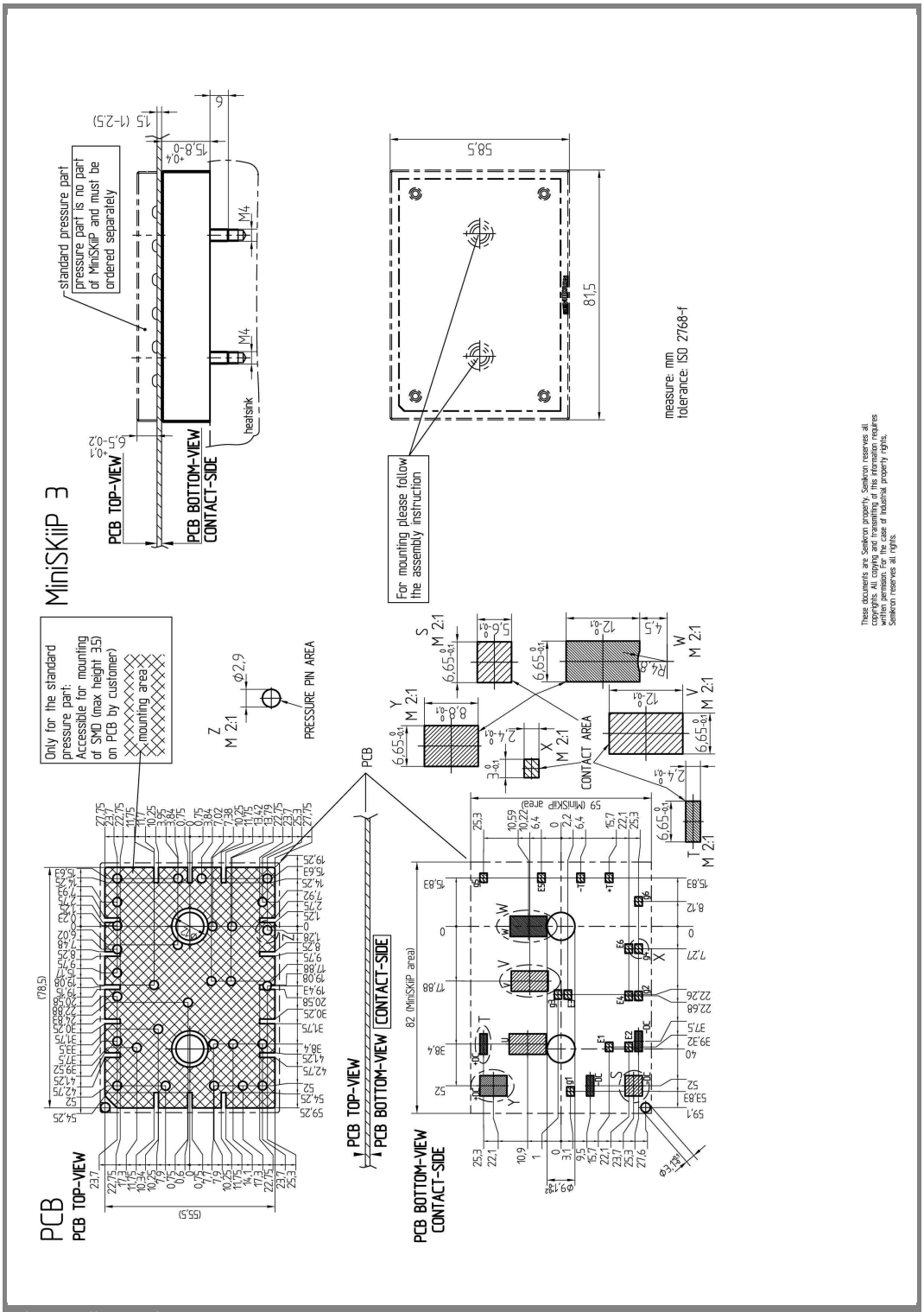


circuit



pinout,dimensions

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

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