

SKiiP 13ACM12V17



MiniSKiiP® 1

MOSFET Module

Evaluation Sample SKiiP 13ACM12V17

Target Data

Features

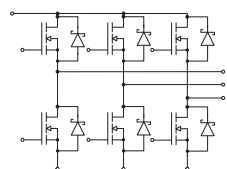
- SiC MOSFETs
- SiC Schottky Diodes
- Highly reliable spring contacts for electrical connections

Typical Applications*

- High frequency inverters
- Power supplies
- High efficiency inverters
- Solar inverters

Remarks

- Max. case temperature limited to $T_C = 125^\circ\text{C}$
- Recommended $T_{j,op} = -40 \dots +150^\circ\text{C}$



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Absolute Maximum Ratings

Symbol	Conditions	Values	Unit	
MOSFET				
V_{DSS}		1200	V	
I_D	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	25	A
	$\lambda_{paste}=0.8 \text{ W}/(\text{K}\cdot\text{m})$	$T_s = 70^\circ\text{C}$	21	A
I_D	$T_j = 175^\circ\text{C}$	$T_s = 25^\circ\text{C}$	27	A
	$\lambda_{paste}=2.5 \text{ W}/(\text{K}\cdot\text{m})$	$T_s = 70^\circ\text{C}$	22	A
I_{DM}		140	A	
I_{DRM}		t.b.d.	A	
V_{GS}		-6 ... 22	V	
T_j		-40 ... 175	$^\circ\text{C}$	
Integrated body diode				
I_{FM}		140	A	
I_{FRM}		t.b.d.	A	

Absolute Maximum Ratings

Symbol	Conditions	Values	Unit	
Diode 1				
V_{RRM}	$T_j = 25^\circ\text{C}$	1200	V	
I_F	$\lambda_{paste}=0.8 \text{ W}/(\text{mK})$	$T_s = 25^\circ\text{C}$	29	A
	$T_j = 175^\circ\text{C}$	$T_s = 70^\circ\text{C}$	24	A
I_F	$\lambda_{paste}=2.5 \text{ W}/(\text{mK})$	$T_s = 25^\circ\text{C}$	32	A
	$T_j = 175^\circ\text{C}$	$T_s = 70^\circ\text{C}$	26	A
I_{Fnom}		20	A	
I_{FRM}		42	A	
I_{FSM}	10 ms	$T_j = 25^\circ\text{C}$	t.b.d.	A
	sinusoidal	$T_j = 150^\circ\text{C}$	350	A
T_j		-40 ... 175	$^\circ\text{C}$	

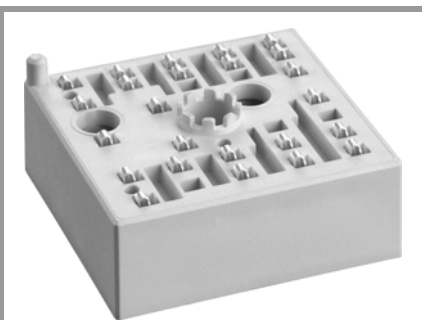
Absolute Maximum Ratings

Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$	20 A per spring	20	A
T_{stg}		-40 ... 125	$^\circ\text{C}$
V_{isol}	AC sinus 50 Hz, $t = 1 \text{ min}$	2500	V

Characteristics

Symbol	Conditions	min.	typ.	max.	Unit
Diode 1					
V_F	$I_F = 20 \text{ A}$ $V_{GE} = 0 \text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	1.40	1.60	V
		$T_j = 150^\circ\text{C}$	1.80	2.10	V
V_{F0}	chipelevel	$T_j = 25^\circ\text{C}$	0.95	1.05	V
		$T_j = 150^\circ\text{C}$	0.83	0.90	V
r_F	chipelevel	$T_j = 25^\circ\text{C}$	23	28	m Ω
		$T_j = 150^\circ\text{C}$	49	60	m Ω
C_j	$V_R = 800 \text{ V}$, $f = 1 \text{ MHz}$, $T_j = 25^\circ\text{C}$		0.1		nF
Q_c	$V_R = 800 \text{ V}$, $di/dt_{off} = 500 \text{ A}/\mu\text{s}$, $T_j = 25^\circ\text{C}$		0.066		μC
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8 \text{ W}/(\text{mK})$		1.8		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=2.5 \text{ W}/(\text{mK})$		1.55		K/W

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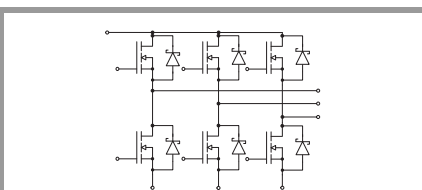
Remarks

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Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
MOSFET					
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	1200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$	1.6		4	$T_j = 25^\circ\text{C}$
	$I_D = 4.4\text{ mA}$				V
I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 1200\text{ V}, T_j = 25^\circ\text{C}$			1	mA
I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = 22\text{ V}$			100	nA
$R_{DS(on)}$	$V_{GS} = 18\text{ V}$ $I_D = 10\text{ A}$	$T_j = 25^\circ\text{C}$	80	111	m Ω
		$T_j = 150^\circ\text{C}$	124		m Ω
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 800\text{ V}, f = 1\text{ MHz}$		2070		pF
C_{oss}	$V_{GS} = 0\text{ V}, V_{DS} = 800\text{ V}, f = 1\text{ MHz}$		80		pF
C_{rssi}	$V_{GS} = 0\text{ V}, V_{DS} = 800\text{ V}, f = 1\text{ MHz}$		20		pF
R_{Gint}	$T_j = 25^\circ\text{C}$		9.0		Ω
Q_G	$V_{DS}=400\text{V}, V_{GS}=18\text{V}, I_D = 10\text{ A}$		110		nC
$t_{d(on)}$	$V_{DD} = 600\text{ V}$ $V_{GS} = 20\text{ V}$ $I_D = 20\text{ A}$	$T_j = 150^\circ\text{C}$			ns
$t_{d(off)}$		$T_j = 150^\circ\text{C}$			ns
t_r		$T_j = 150^\circ\text{C}$			ns
t_f		$T_j = 150^\circ\text{C}$			ns
E_{on}		$T_j = 150^\circ\text{C}$	0.5		mJ
E_{off}		$T_j = 150^\circ\text{C}$	0.2		mJ
$R_{th(j-s)}$	per MOSFET, $\lambda_{paste}=0.8\text{ W/(K}\cdot\text{m)}$		1.5		K/W
$R_{th(j-s)}$	per MOSFET, $\lambda_{paste}=2.5\text{ W/(K}\cdot\text{m)}$		1.28		K/W

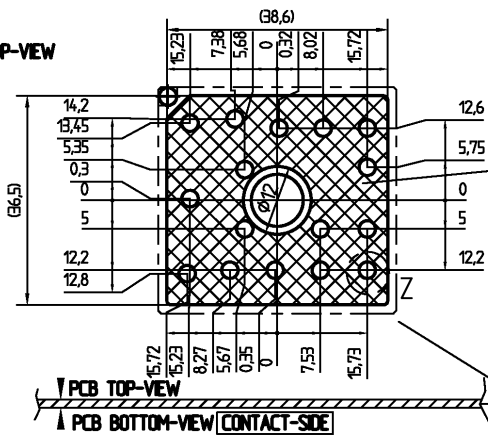
Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
M_s	to heat sink	2		2.5	Nm
w	weight		30		g

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R_{100}	$T_r=100^\circ\text{C} (R_{25}=1000\Omega)$		$1670 \pm 3\%$		Ω
$R(T)$	$R(T)=1000\Omega[1+A(T-25^\circ\text{C})+B(T-25^\circ\text{C})^2]$], $A = 7.635 \cdot 10^{-3} \text{ }^\circ\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^\circ\text{C}^{-2}$				

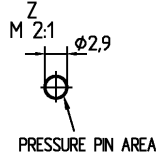


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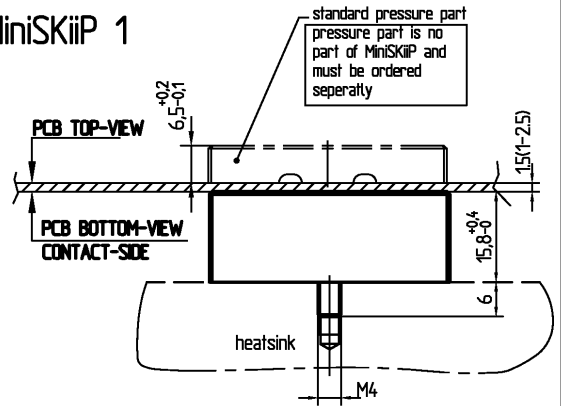
PCB PCB TOP-VIEW



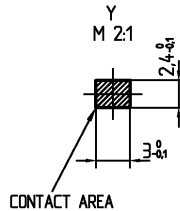
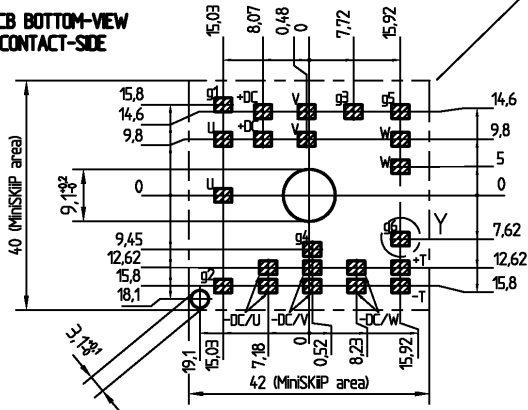
Only for the standard pressure part:
Accessible for mounting of SMD (max height 3.5) on PCB by customer



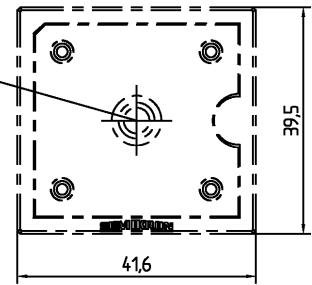
MiniSKiIP 1



PCB BOTTOM-VIEW CONTACT-SIDE

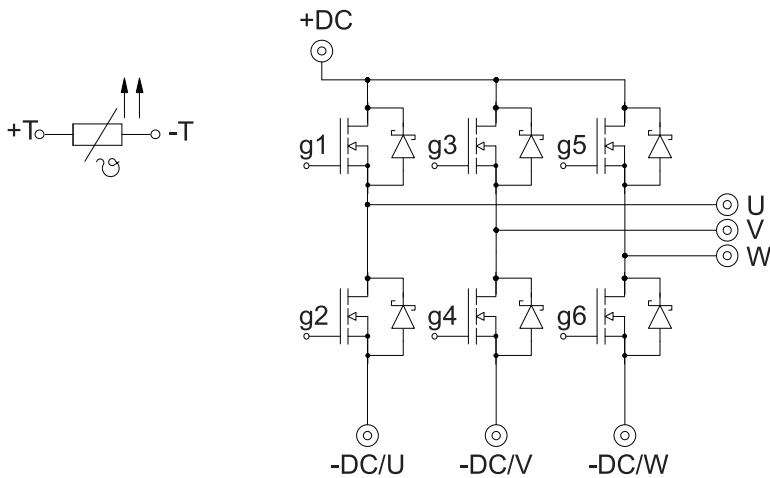


For mounting please follow the assembly instruction



measure: mm
tolerance: ISO 2768-f

pinout, dimensions



pinout

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

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