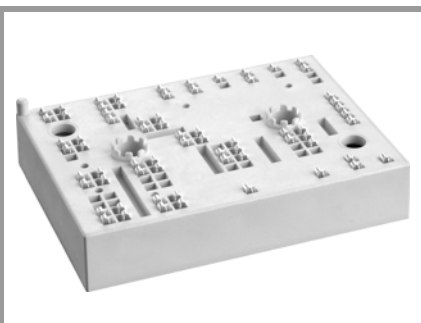


SKiiP39AC12F4V19



MiniSKiiP® 3

Evaluation Sample SKiiP39AC12F4V19

Target Data

Features

- Fast switching Trench 4 IGBT
- SiC Schottky Diode
- Highly reliable spring contacts for electrical connections

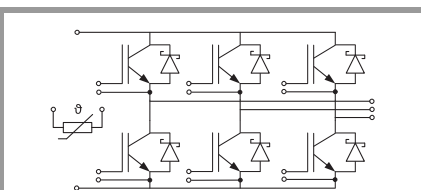
Typical Applications*

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

Remarks

Max. case temperature limited to $T_C = 125^\circ\text{C}$

Recommended $T_{j,op} = -40 \dots +150^\circ\text{C}$

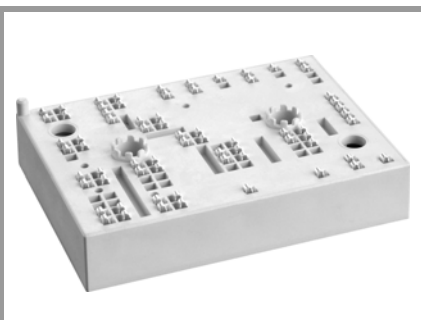


AC

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$		1200	V
I_C	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	148	A
		$T_j = 175^\circ\text{C}$	120	A
I_C	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	175	A
		$T_j = 175^\circ\text{C}$	143	A
I_{Cnom}			150	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$		450	A
V_{GES}			-20 ... 20	V
t_{psc}	$V_{CC} = 800 \text{ V}$	$T_j = 150^\circ\text{C}$	10	μs
	$V_{GE} \leq 15 \text{ V}$			
	$V_{CES} \leq 1200 \text{ V}$			
T_j			-40 ... 175	$^\circ\text{C}$
Inverse - Diode				
I_F	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	118	A
		$T_j = 175^\circ\text{C}$	96	A
I_F	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	140	A
		$T_j = 175^\circ\text{C}$	114	A
I_{Fnom}			80	A
I_{FRM}			168	A
I_{FSM}	$8.3 \text{ ms, sin } 180^\circ, T_j = 150^\circ\text{C}$		223.2	A
T_j			-40 ... 175	$^\circ\text{C}$
Module				
$I_t(\text{RMS})$	$T_{terminal} = 80^\circ\text{C}, 20 \text{ A per spring}$		t.b.d.	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
Inverter - IGBT						
$V_{CE(sat)}$	$I_C = 150 \text{ A}$ $V_{GE} = 15 \text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	2.05	2.40		V
		$T_j = 150^\circ\text{C}$	2.50	2.85		V
V_{CE0}	chipelevel	$T_j = 25^\circ\text{C}$	0.80	0.90		V
		$T_j = 150^\circ\text{C}$	0.70	0.80		V
r_{CE}	$V_{GE} = 15 \text{ V}$ chipelevel	$T_j = 25^\circ\text{C}$	8.3	10		$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	12	14		$\text{m}\Omega$
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 5.2 \text{ mA}$		5.2	5.8	6.4	V
I_{CES}	$V_{GE} = 0 \text{ V}, V_{CE} = 1200 \text{ V}, T_j = 25^\circ\text{C}$		0.1	0.3		mA
C_{ies}	$V_{CE} = 25 \text{ V}$ $V_{GE} = 0 \text{ V}$	$f = 1 \text{ MHz}$	8.80			nF
C_{oes}		$f = 1 \text{ MHz}$				nF
C_{res}		$f = 1 \text{ MHz}$	0.47			nF
Q_G	$-8 \text{ V} \dots +15 \text{ V}$		945			nC
R_{Gint}	$T_j = 25^\circ\text{C}$		5.0			Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$ $I_C = 150 \text{ A}$	$T_j = 150^\circ\text{C}$				ns
t_r		$T_j = 150^\circ\text{C}$				ns
E_{on}			9.6			mJ
$t_{d(off)}$						ns
t_f						ns
E_{off}	$V_{GE} = +15/-15 \text{ V}$		9.4			mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8 \text{ W/(mK)}$		0.35			K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5 \text{ W/(mK)}$		0.26			K/W

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Target Data

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Typical Applications*

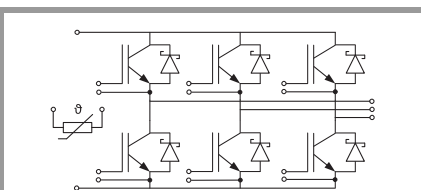
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Remarks

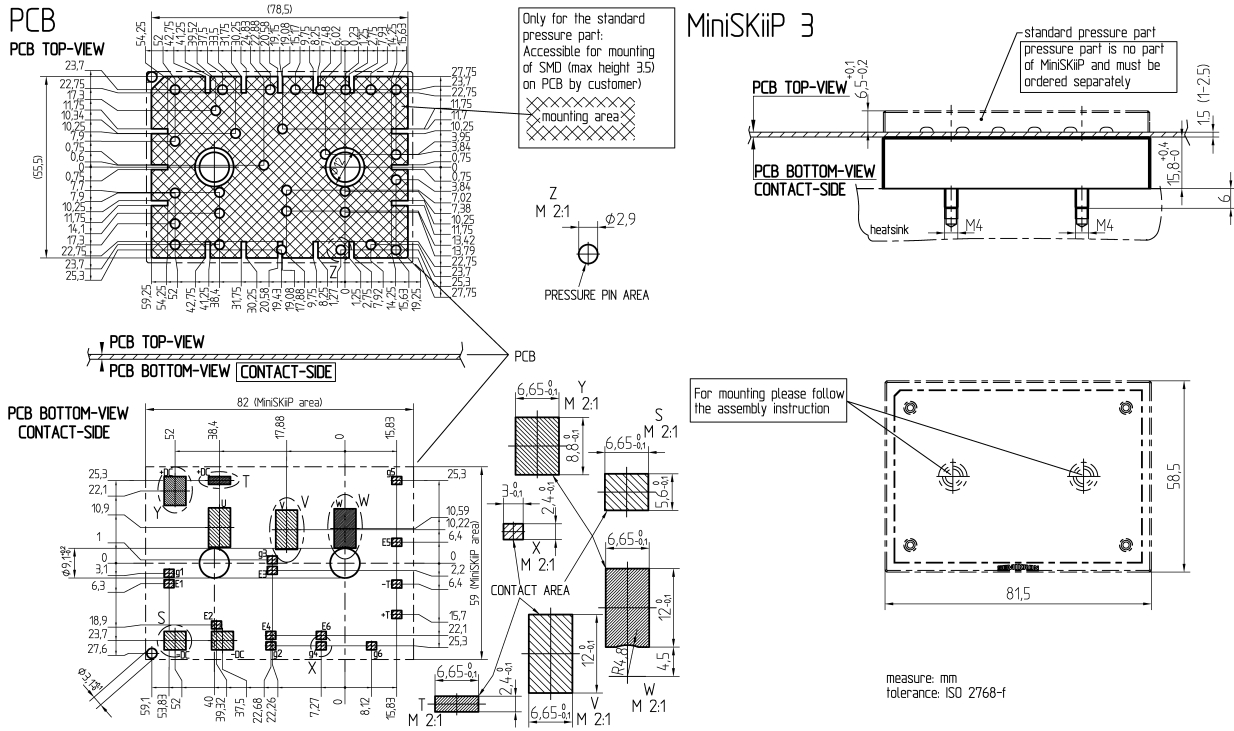
Max. case temperature limited to $T_C=125^\circ\text{C}$

Recommended $T_{j,op}=-40\dots+150^\circ\text{C}$

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse - Diode						
$V_F = V_{EC}$	$I_F = 80\text{ A}$ $V_{GE} = 0\text{ V}$ chipllevel	$T_j = 25^\circ\text{C}$		1.40	1.60	V
		$T_j = 150^\circ\text{C}$		1.80	2.10	V
V_{F0}	chipllevel	$T_j = 25^\circ\text{C}$		0.95	1.05	V
		$T_j = 150^\circ\text{C}$		0.80	0.90	V
r_F	chipllevel	$T_j = 25^\circ\text{C}$		5.6	6.9	m Ω
		$T_j = 150^\circ\text{C}$		13	15	m Ω
C_j	$V_R = 800\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$			0.3		nF
Q_c	$V_R = 800\text{ V}, di/dt_{off} = 500\text{ A}/\mu\text{s}, T_j = 25^\circ\text{C}$			0.264		μC
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8\text{ W}/(\text{mK})$			0.44		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=2.5\text{ W}/(\text{mK})$			0.33		K/W
Module						
L_{CE}				-		nH
M_s	to heat sink		2		2.5	Nm
w				82		g
Temperature Sensor						
R_{100}	$T_r=100^\circ\text{C}$ ($R_{25}=1000\Omega$)			$1670 \pm 3\%$		Ω
$R(T)$	$R(T)=1000\Omega[1+A(T-25^\circ\text{C})+B(T-25^\circ\text{C})^2]$], $A = 7.635 \cdot 10^{-3} \text{ }^\circ\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^\circ\text{C}^{-2}$					



AC



pinout, dimensions

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

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