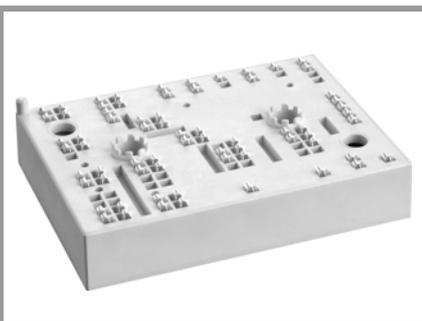


SKiiP38AC12F4V19



MiniSKiiP® 3

Evaluation Sample SKiiP38AC12F4V19

Target Data

Features

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

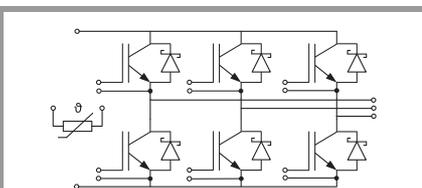
Typical Applications*

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

Remarks

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

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

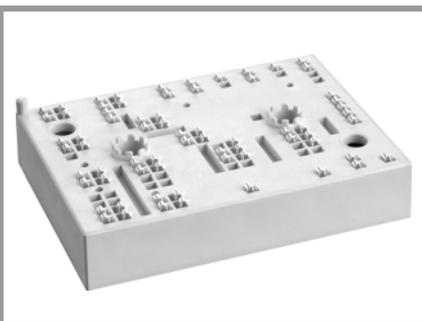


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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverter - IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$		1200	V
I_C	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	105	A
		$T_j = 175^\circ\text{C}$	85	A
I_C	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	128	A
		$T_j = 175^\circ\text{C}$	105	A
I_{Cnom}			100	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$		300	A
V_{GES}			-20 ... 20	V
t_{psc}	$V_{CC} = 800 \text{ V}$ $V_{GE} \leq 15 \text{ V}$ $V_{CES} \leq 1200 \text{ V}$	$T_j = 150^\circ\text{C}$	10	μs
T_j			-40 ... 175	$^\circ\text{C}$
Inverse - Diode				
I_F	$\lambda_{paste} = 0.8 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	62	A
		$T_j = 175^\circ\text{C}$	50	A
I_F	$\lambda_{paste} = 2.5 \text{ W/(mK)}$	$T_s = 25^\circ\text{C}$	71	A
		$T_j = 175^\circ\text{C}$	57	A
I_{Fnom}			50	A
I_{FRM}			169	A
I_{FSM}	8.3 ms, sin 180°, $T_j = 150^\circ\text{C}$		156	A
T_j			-40 ... 175	$^\circ\text{C}$
Module				
$I_t(\text{RMS})$	$T_{terminal} = 80^\circ\text{C}$, 20 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						
$V_{CE(sat)}$	$I_C = 100 \text{ A}$ $V_{GE} = 15 \text{ V}$ 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	$T_j = 25^\circ\text{C}$	13	15		m Ω
		$T_j = 150^\circ\text{C}$	18	21		m Ω
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 3.8 \text{ mA}$		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}	$V_{CE} = 25 \text{ V}$ $V_{GE} = 0 \text{ V}$	$f = 1 \text{ MHz}$	6.15			nF
C_{oes}		$f = 1 \text{ MHz}$				nF
C_{res}		$f = 1 \text{ MHz}$	0.35			nF
Q_G	- 8 V...+ 15 V		630			nC
R_{Gint}	$T_j = 25^\circ\text{C}$		7.5			Ω
$t_{d(on)}$	$V_{CC} = 600 \text{ V}$ $I_C = 100 \text{ A}$	$T_j = 150^\circ\text{C}$				ns
t_r		$T_j = 150^\circ\text{C}$				ns
E_{on}			6.4			mJ
$t_{d(off)}$						ns
t_f						ns
E_{off}	$V_{GE} = +15/-15 \text{ V}$		6.3			mJ
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 0.8 \text{ W/(mK)}$		0.47			K/W
$R_{th(j-s)}$	per IGBT, $\lambda_{paste} = 2.5 \text{ W/(mK)}$		0.33			K/W

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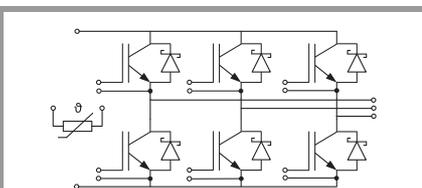
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Remarks

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						
$V_F = V_{EC}$	$I_F = 50\text{ A}$ $V_{GE} = 0\text{ V}$ chipllevel	$T_j = 25^\circ\text{C}$		1.40	1.60	V
		$T_j = 150^\circ\text{C}$		1.80	2.20	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	$T_j = 25^\circ\text{C}$		9.0	11	m Ω
		$T_j = 150^\circ\text{C}$		20	26	m Ω
C_j	$V_R = 800\text{ V}, f = 1\text{ MHz}, T_j = 25^\circ\text{C}$			0.0		nF
Q_c	$V_R = 800\text{ V}, di/dt_{off} = 500\text{ A}/\mu\text{s}, T_j = 25^\circ\text{C}$			0.167		μC
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=0.8\text{ W}/(\text{mK})$			0.9		K/W
$R_{th(j-s)}$	per Diode, $\lambda_{paste}=2.5\text{ W}/(\text{mK})$			0.72		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
$R(T)$	$R(T)=1000\Omega[1+A(T-25^\circ\text{C})+B(T-25^\circ\text{C})^2]$], $A = 7.635 \cdot 10^{-3} \text{ }^\circ\text{C}^{-1}$, $B = 1.731 \cdot 10^{-5} \text{ }^\circ\text{C}^{-2}$					



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