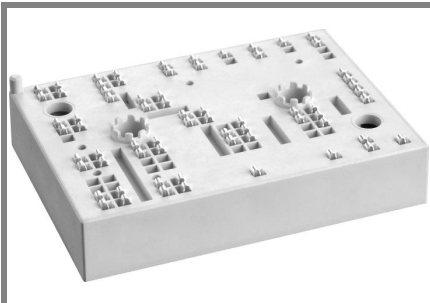


SKiiP 39AC12T4V1



MiniSKiiP[®]3

3-phase bridge inverter

SKiiP 39AC12T4V1

Features

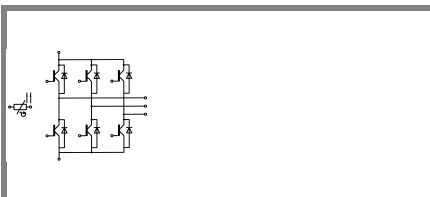
- Trench 4 IGBT's
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 50 kVA
- Typical motor power 30 kW

Remarks

- V_{CEsat} , V_F = chip level value
- Case temp. limited to $T_C = 125^\circ\text{C}$ max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_j \leq 150$ (recomm. $T_{op} = -40 \dots +150^\circ\text{C}$)
- For short circuit: Soft R_{Goff} recommended

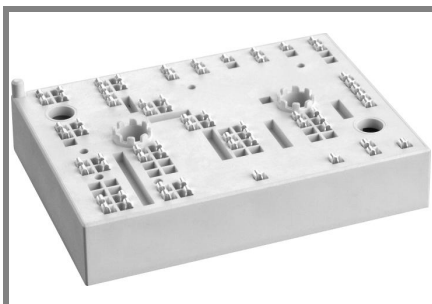


AC

Absolute Maximum Ratings		$T_S = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values	Units	
IGBT				
V_{CES}	$T_j = 25^\circ\text{C}$	1200	V	
I_C	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	167	A
		$T_c = 70^\circ\text{C}$	135	A
I_{CRM}	$I_{CRM} = 3 \times I_{Cnom}$	450	A	
V_{GES}		± 20	V	
t_{psc}	$V_{CC} = 800\text{ V}; V_{GE} \leq 15\text{ V}; T_j = 150^\circ\text{C}$ $V_{CES} < 1200\text{ V}$	10	μs	
Inverse Diode				
I_F	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	136	A
		$T_c = 70^\circ\text{C}$	107	A
I_{FRM}	$I_{FRM} = 3 \times I_{Fnom}$	450	A	
I_{FSM}	$t_p = 10\text{ ms}; \sin$	$T_j = 150^\circ\text{C}$	900	A
Module				
$I_t(\text{RMS})$		160	A	
T_{vj}		$-40 \dots +175$	$^\circ\text{C}$	
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					
$V_{GE(th)}$	$V_{GE} = V_{CE}, I_C = 6\text{ mA}$	5	5,8	6,5	V
I_{CES}	$V_{GE} = V, V_{CE} = V_{CES}$	$T_j = 25^\circ\text{C}$			mA
		$T_j = 150^\circ\text{C}$			
V_{CE0}		$T_j = 25^\circ\text{C}$	0,8	0,9	V
		$T_j = 150^\circ\text{C}$	0,7	0,8	V
r_{CE}	$V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$	6,7	7,3	$\text{m}\Omega$
		$T_j = 150^\circ\text{C}$	10	10,7	$\text{m}\Omega$
$V_{CE(sat)}$	$I_{Cnom} = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}_{chiplev.}$	1,85	2,05	V
		$T_j = 150^\circ\text{C}_{chiplev.}$	2,25	2,45	V
C_{ies}	$V_{CE} = 25, V_{GE} = 0\text{ V}$	$f = 1\text{ MHz}$	8,8		nF
C_{oes}			0,58		nF
C_{res}			0,47		nF
Q_G	$V_{GE} = -8 \dots +15\text{ V}$		850		nC
R_{Gint}	$T_j = 25^\circ\text{C}$		5		Ω
$t_{d(on)}$	$R_{Gon} = 1\ \Omega$ $di/dt = 2840\text{ A}/\mu\text{s}$	$V_{CC} = 600\text{ V}$ $I_C = 150\text{ A}$	165		ns
t_r			50		ns
E_{on}			22,5		mJ
$t_{d(off)}$	$R_{Goff} = 1\ \Omega$ $di/dt = 1880\text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$ $V_{GE} = \pm 15\text{ V}$	390		ns
t_f			80		ns
E_{off}			14		mJ
$R_{th(j-s)}$	per IGBT		0,33		K/W

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Features

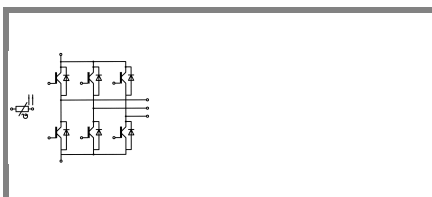
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AC

Characteristics

Symbol	Conditions	min.	typ.	max.	Units	
Inverse Diode						
$V_F = V_{EC}$	$I_{Fnom} = 150 \text{ A}; V_{GE} = 15 \text{ V}$		$T_j = 25^\circ\text{C}_{chiplev.}$	2,15	2,45	V
			$T_j = 150^\circ\text{C}_{chiplev.}$	2,05	2,4	V
V_{F0}			$T_j = 25^\circ\text{C}$	1,3	1,5	V
			$T_j = 150^\circ\text{C}$	0,9	1,1	V
r_F			$T_j = 25^\circ\text{C}$	5,7	6,3	m Ω
			$T_j = 150^\circ\text{C}$	7,7	8,7	m Ω
I_{RRM}	$I_F = 150 \text{ A}$		$T_j = 150^\circ\text{C}$	188		A
Q_{rr}	$di/dt = 4020 \text{ A}/\mu\text{s}$			27		μC
E_{rr}	$V_{GE} = \pm 15 \text{ V}$			11,4		mJ
$R_{th(j-s)}$	per diode			0,52		K/W
M_s	to heat sink	2		2,5		Nm
w				97		g
Temperature sensor						
R_{ts}	3%, $T_r = 25^\circ\text{C}$			1000		Ω
R_{ts}	3%, $T_r = 100^\circ\text{C}$			1670		Ω

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.

