

SKM500MB120SC



SEMITRANS® 3

SiC MOSFET Module

SKM500MB120SC

Target Data

Features

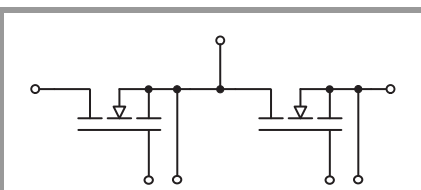
- Full Silicon Carbide (SiC) power module
- Latest generation SiC MOSFETs
- Optimized for fast switching and lowest power losses
- Insulated copper baseplate using DBC technology (Direct Bonded Copper)
- UL recognized, file no. E63532

Typical Applications*

- High frequency power supplies
- AC inverters

Remarks

- Case temperature limited to $T_c=125^\circ\text{C}$ max.
- Recommended $T_{op}= -40\dots+150^\circ\text{C}$



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Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
MOS-Chip				
V_{DS}		1200	V	
I_D	$T_j = 175^\circ\text{C}$	$T_c = 25^\circ\text{C}$	541	A
		$T_c = 80^\circ\text{C}$	431	A
I_{DM}		1920	A	
V_{GS}		-6 ... 22	V	
T_j		-40 ... 175	$^\circ\text{C}$	
Integrated MOS-diode				
$I_F = -I_S$			A	
$I_{FM} = -I_{SM}$			A	
Module				
$I_{t(RMS)}$		500	A	
T_{stg}		-40 ... 125	$^\circ\text{C}$	
V_{isol}	AC sinus 50 Hz, $t = 1$ min	4000	V	

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
MOS-Chip					
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	1200			V
$V_{GS(th)}$	$V_{GS} = V_{GS}, I_D = 106.8\text{ mA}$	1.6		4	V
I_{DSS}	$V_{GS} = 0\text{ V}$	$T_j = 25^\circ\text{C}$	1	10	μA
		$T_j = 125^\circ\text{C}$			μA
I_{GSS}	$V_{GS} = 22\text{ V}, V_{DS} = 0\text{ V}$			100	nA
$R_{DS(on)}$	$V_{GS} = 18\text{ V}$ $I_D = 264\text{ A}$	$T_j = 25^\circ\text{C}$	3.75	4.67	m Ω
		$T_j = 150^\circ\text{C}$	5.67		m Ω
C_{iss}	$V_{GS} = 0\text{ V}$		44.4		nF
C_{oss}	$V_{DS} = 800\text{ V}$		1.644		nF
C_{rss}	$f = 1\text{ MHz}$		0.336		nF
R_{Gint}	25°C		0.39		Ω
Q_G	$V_{GS} = 18\text{ V}$		2268		nC
$t_{d(on)}$	$V_{DD} = 600\text{ V}$	$T_j = 150^\circ\text{C}$	270		ns
t_r	$I_D = 250\text{ A}$	$T_j = 150^\circ\text{C}$	70		ns
$t_{d(off)}$	$V_{GS} = -6 \dots 20\text{ V}$	$T_j = 150^\circ\text{C}$	400		ns
t_f	$R_{Gon} = 2\ \Omega$ $R_{Goff} = 2\ \Omega$	$T_j = 150^\circ\text{C}$	65		ns
		$T_j = 150^\circ\text{C}$	10.3		mJ
E_{on}	$di/dt_{on} = 7000\text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	10.3		mJ
E_{off}	$di/dt_{off} = 6800\text{ A}/\mu\text{s}$	$T_j = 150^\circ\text{C}$	4.7		mJ
$R_{th(j-c)}$				0.07	K/W
$R_{th(c-s)}$				0.035	K/W
Integrated MOS-diode					
V_{SD}	$V_{GS} = 0\text{ V}$				V
t_{rr}					μs
Q_{rr}					μC
I_{rr}					A

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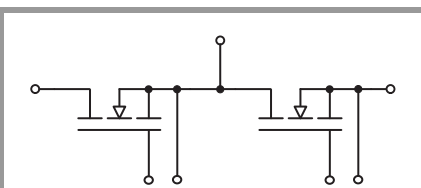
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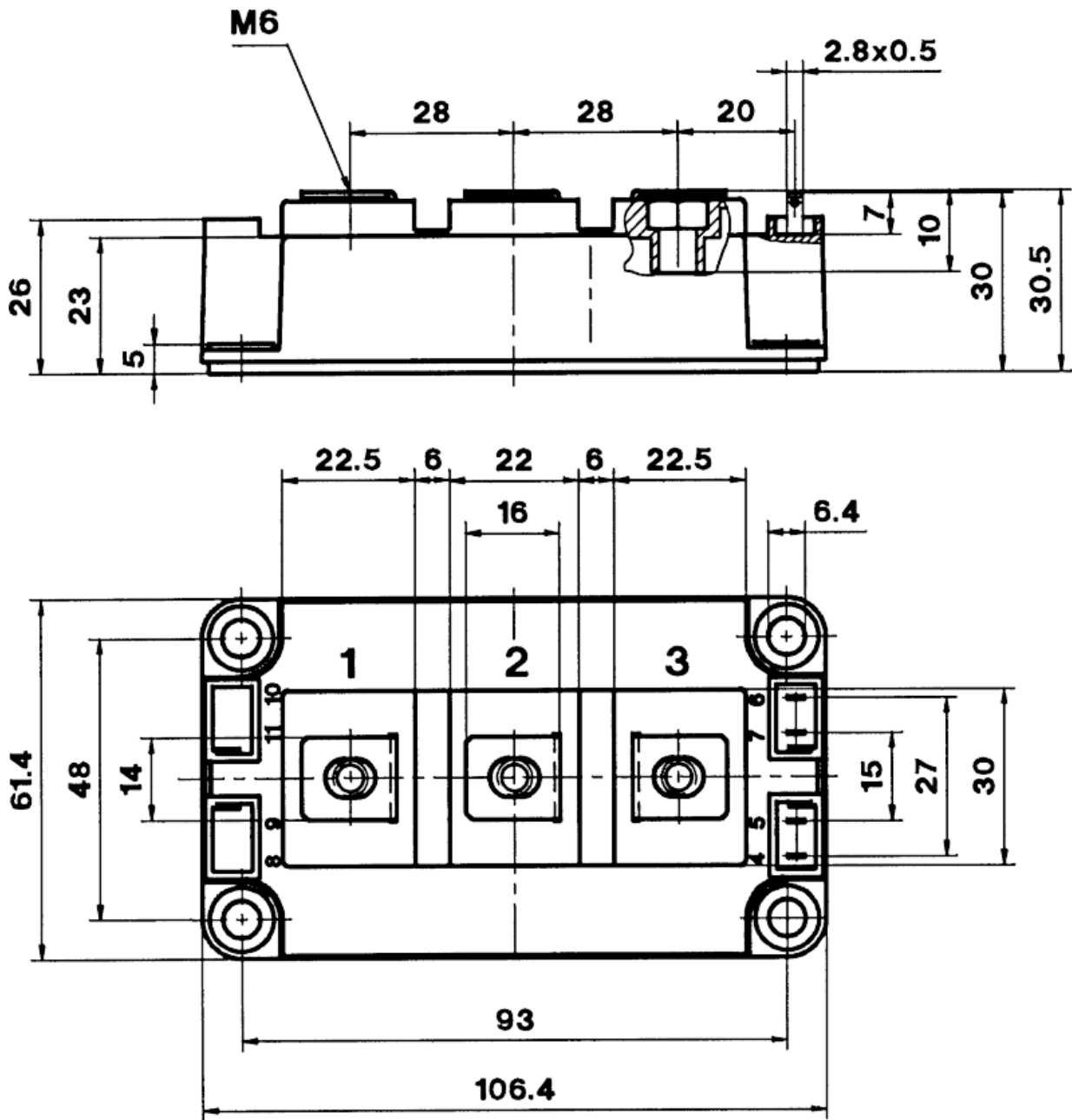
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
L_{DS}			15		nH
$R_{CC'+EE'}$	terminal-chip		0.55		m Ω
			0.85		m Ω
$R_{th(c-s)1}$	per module		t.b.d		K/W
$R_{th(c-s)2}$	including thermal coupling, T_s underneath module				K/W
M_s	to heat sink M6	3		5	Nm
M_t					Nm
					Nm
w				325	g



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SEMITRANS 3

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 staff.