

SKM350MB120SCH17



SEMITRANS® 3

SiC MOSFET Module

Engineering Sample SKM350MB120SCH17

Target Data

Features

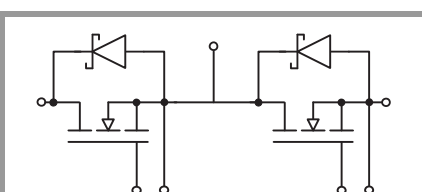
- Full Silicon Carbide (SiC) power module
- Latest generation SiC MOSFETs
- External SiC Schottky Barrier Diode embedded
- Optimized for fast switching and lowest power losses
- Insulated copper baseplate using DBC technology (Direct Bonded Copper)
- Improved thermal performances with Aluminium Nitride (AlN) substrate
- 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 $T_{op} = -40 \dots +150^{\circ}\text{C}$



MB

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
MOSFET				
V _{DSS}			1200	V
I _D	T _j = 175 °C	T _c = 25 °C	523	A
		T _c = 80 °C	416	A
I _{DM}			1280	A
V _{GS}			-6 ... 22	V
T _j			-40 ... 175	°C
Integrated body Diode				
I _{FM}				A

Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
Inverse diode				
V _{RRM}	T _j = 25 °C		1200	V
I _F	T _j = 175 °C	T _c = 25 °C	212	A
		T _c = 80 °C	163	A
I _{Fnom}			100	A
I _{FRM}	I _{FRM} = 3xI _{Fnom}		300	A
I _{FSM}	t _p = 8.3 ms, sin 180°, T _j = 25 °C		373	A
T _i			-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{t(RMS)}$		500	A
T_{stg}		-40 ... 125	$^{\circ}\text{C}$
V_{isol}	AC sinus 50 Hz, $t = 1 \text{ min}$	4000	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
MOSFET						
V _{(BR)DSS}	V _{GS} = 0 V, I _D = 8 mA		1200			V
V _{GS(th)}	V _{GS} = V _{GS} , I _D = 71.2 mA		1.6		4	V
I _{DSS}	V _{GS} = 0 V, V _{DS} = 1200 V, T _j = 25 °C				0.08	mA
I _{GSS}	V _{GS} = 22 V, V _{DS} = 0 V				600	nA
R _{DS(on)}	V _{GS} = 18 V	T _j = 25 °C	5.6		7.0	mΩ
	I _D = 176 A	T _j = 150 °C	9.5			mΩ
C _{iss}	V _{GS} = 0 V		34.48			nF
C _{oss}	V _{DS} = 800 V		1.096			nF
C _{rss}	f = 1 MHz		0.152			nF
R _{Gint}	25 °C		0.6			Ω
Q _G	V _{GS} = 18 V		1512			nC
t _{d(on)}	V _{DD} = 600 V	T _j = 150 °C				ns
t _r	I _D = 300 A	T _j = 150 °C				ns
t _{d(off)}	V _{GS} = -5 ... 20 V	T _j = 150 °C				ns
t _f	R _{Gon} = 0.5 Ω	T _j = 150 °C				ns
E _{on}	R _{Goff} = 1 Ω	T _j = 150 °C	4.73			mJ
E _{off}		T _j = 150 °C	2.3			mJ
R _{th(j-c)}	per MOSFET				0.045	K/W
R _{th(c-s)}	per MOSFET				0.03	K/W



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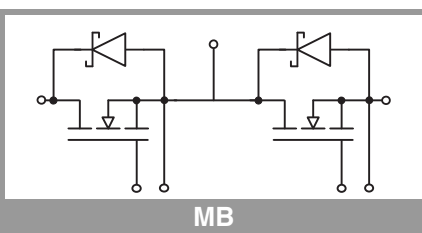
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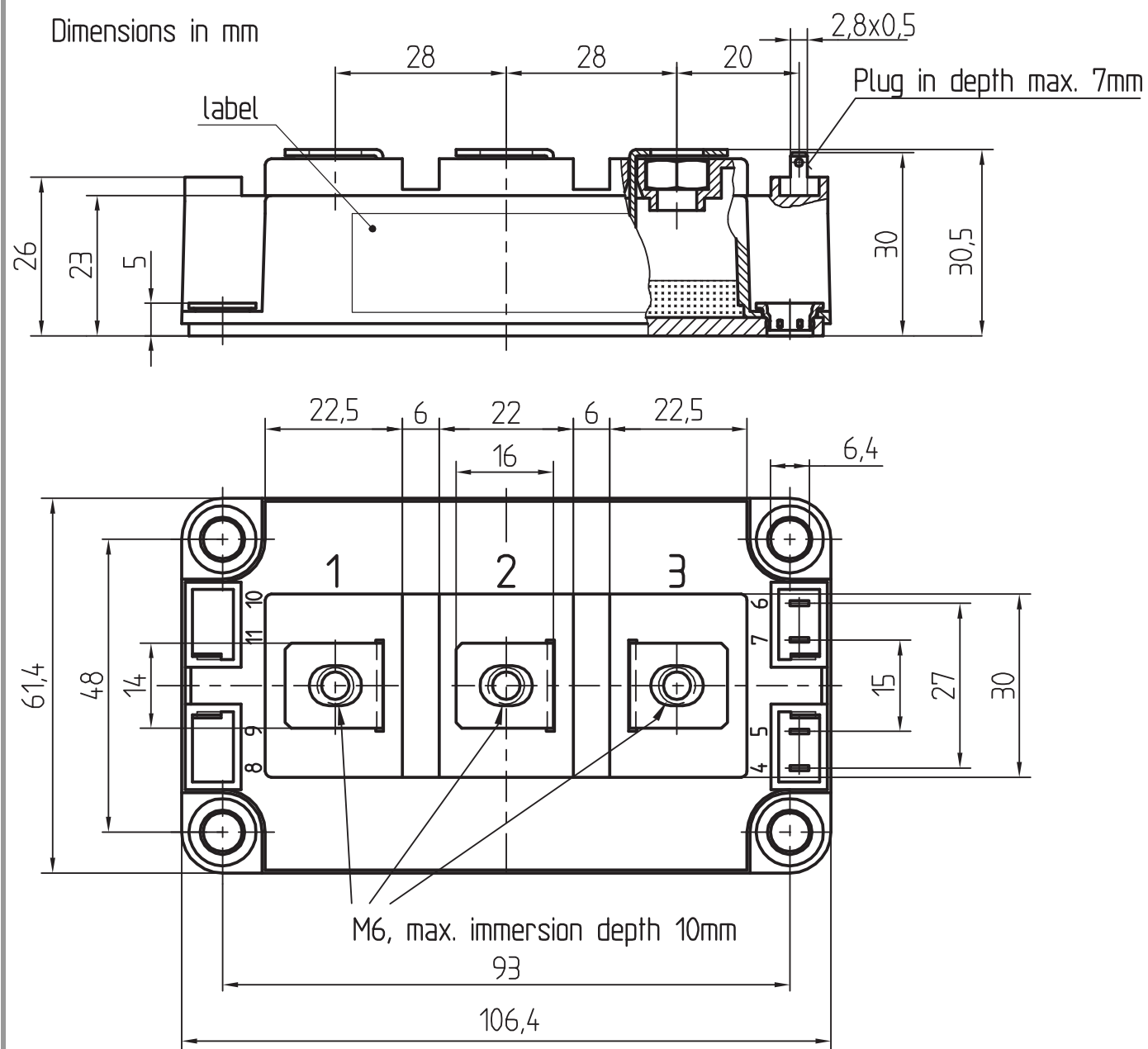
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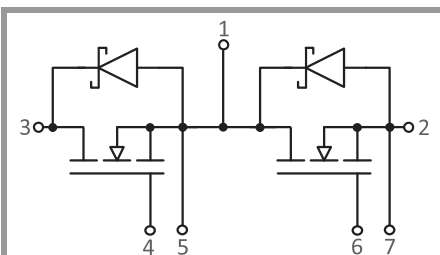
Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _F = 100 A	T _j = 25 °C		1.40	1.60	V
		T _j = 150 °C		1.80	2.20	V
V _{F0}	chipelevel	T _j = 25 °C		0.95	1.05	V
		T _j = 150 °C		0.80	0.90	V
r _F	chipelevel	T _j = 25 °C		4.5	5.5	mΩ
		T _j = 150 °C		10.0	13	mΩ
C _j	parallel to C _{oss} , 1 MHz, 800 V, 25 °C			0.42		nF
Q _c	800 V, 500 A/μs, 25 °C			0.334		μC
R _{th(j-c)}	per diode				0.18	K/W
R _{th(c-s)}	per diode			-	0.12	K/W

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Module						
L _{CE}			15			nH
R _{CC'+EE'}	measured per switch,		0.55			mΩ
R _{th(c-s)1}	per module		0.012			K/W
R _{th(c-s)2}	including thermal coupling, Ts underneath module		0.0189			K/W
M _s	to heat sink M6		3		5	Nm
M _t		to terminals M6	2.5		5	Nm
						Nm
w			325			g





General tolerance $\pm 0,5$ mm



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

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