SKM350MB120SCH17

SEMITRANS® 3

SiC MOSFET Module

Engineering Sample

SKM350MB120SCH17

Target Data

Features

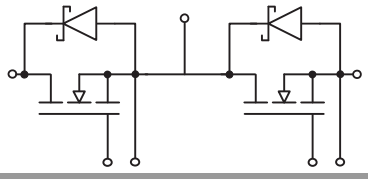
- Full Silicon Carbide (SiC) power module
- Latest generation SiC MOSFETs
- External SiC Schottky Barrier Diode embedded
- Optimized for fast switching and lowest power losses
- Insulated copper baseplate using DBC technology (Direct Bonded Copper)
- Improved thermal performances with Aluminium Nitride (AIN) substrate
- UL recognized, file no. E63532

Typical Applications*

- High frequency power supplies
- AC inverters

Remarks

- Case temperature limited to Tc=125°C max.
- Recommended Top= -40…+150°C



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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_j			-40 ... 175	°C

Absolute Maximum Ratings			
Symbol	**Conditions**	**Values**	**Unit**
Module			
$I_{t(RMS)}$		500	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC sinus 50 Hz, t = 1 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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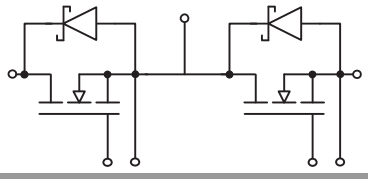

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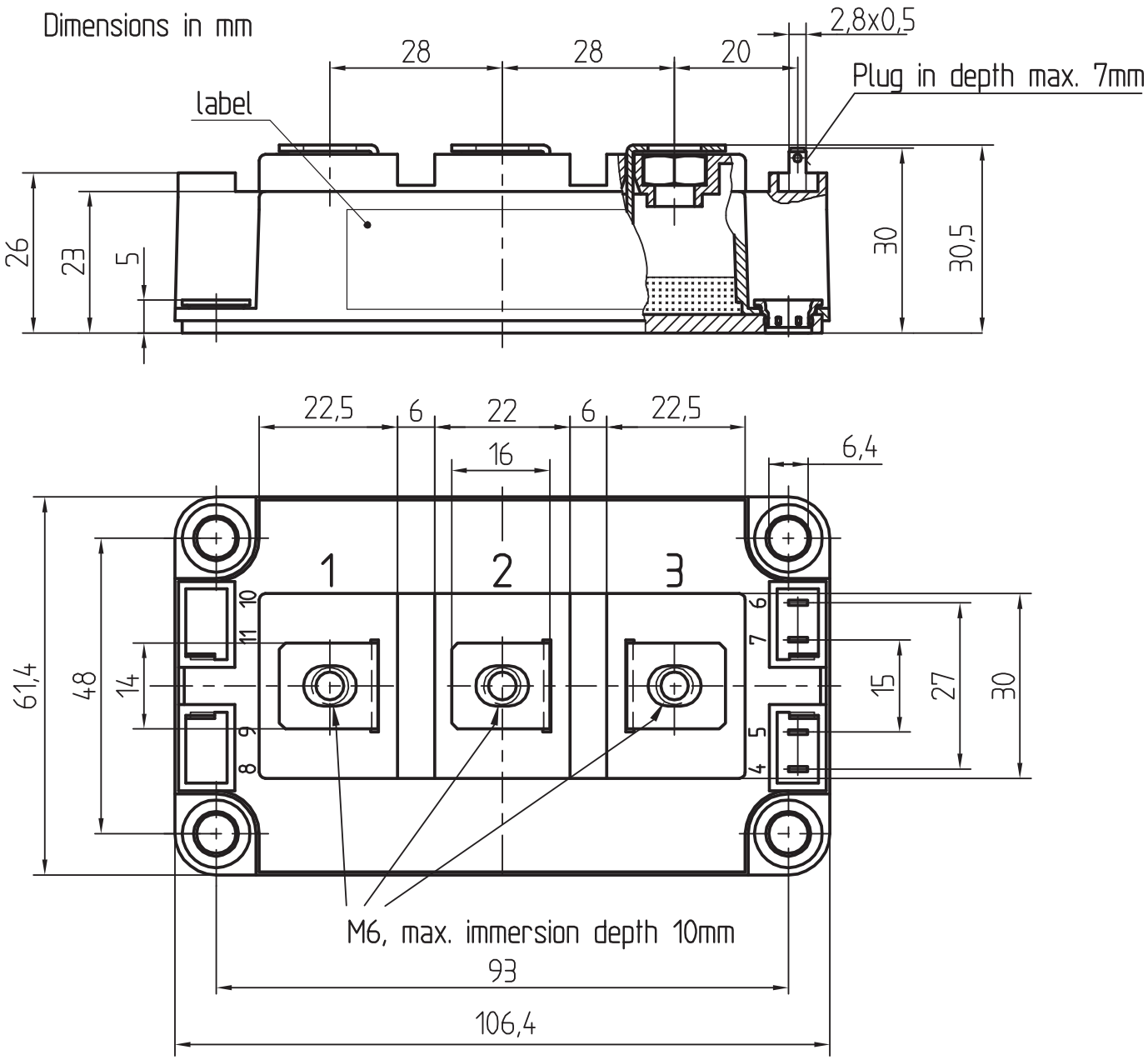
Characteristics

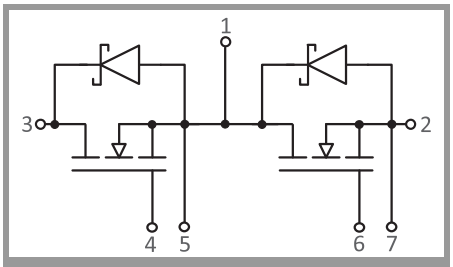
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
$V_F = V_{EC}$	I_F = 100 A	T_j = 25 °C		1.40	1.60	V
	chiplevel	T_j = 150 °C		1.80	2.20	V
V_{F0}	chiplevel	T_j = 25 °C		0.95	1.05	V
		T_j = 150 °C		0.80	0.90	V
r_F	chiplevel	T_j = 25 °C		4.5	5.5	mΩ
		T_j = 150 °C		10.0	13	mΩ
C_j	parallel to C_{oss}, 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
$Rth_{(c-s)1}$	per module			0.012		K/W
$Rth_{(c-s)2}$	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 +/- 0,5 mm



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

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