

SK25MH120SCTp



SEMITOP® 2 Press-Fit

SiC MOSFET Module

Engineering Sample SK25MH120SCTp

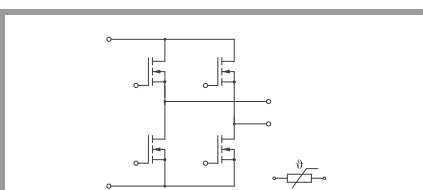
Target Data

Features

- 1200V SiC Planar MOSFET
- Single phase inverter topology
- One screw mounting module
- Fully compatible with other SEMITOP® Press-Fit types
- Improved thermal performance by aluminum oxide substrate
- Ultra Low inductance design
- Extremely fast switching
- UL recognized, file no. E63532

Typical Applications*

- Solar inverter
- UPS
- Power Supply



MH-T

Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
MOSFET 1				
V_{DSS}		1200	V	
I_D	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	26	A
		$T_s = 70\text{ °C}$	21	A
I_{DM}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	140	A	
I_{DRM}		42	A	
V_{GS}		-6 ... 22	V	
T_j		-40 ... 175	°C	
Integrated body diode				
I_{FM}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	140	A	
I_{FRM}		42	A	

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
Module			
$I_{T(RMS)}$	$T_{terminal} = 100\text{ °C}$, $T_s = 60\text{ °C}$, per pin	40	A
T_{stg}		-40 ... 125	°C
V_{isol}	AC, sinusoidal, $t = 1\text{ min}$	2500	V

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
MOSFET 1					
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 1\text{ mA}$, $T_j = 25\text{ °C}$	1200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4.4\text{ mA}$, $T_j = 25\text{ °C}$	1.6		4	V
I_{DSS}	$V_{GS} = 0\text{ V}$, $V_{DS} = 1200\text{ V}$, $T_j = 25\text{ °C}$			1	mA
I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = 22\text{ V}$, $T_j = 25\text{ °C}$			100	nA
$R_{DS(on)}$	$V_{GS} = 18\text{ V}$ $I_D = 10\text{ A}$ chiplevel	$T_j = 25\text{ °C}$	80	111	mΩ
		$T_j = 150\text{ °C}$	124		mΩ
C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 800\text{ V}$, $f = 1\text{ MHz}$		2070		pF
C_{oss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 800\text{ V}$, $f = 1\text{ MHz}$		80		pF
C_{rss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 800\text{ V}$, $f = 1\text{ MHz}$		20		pF
R_{Gint}	$T_j = 25\text{ °C}$		9.0		Ω
Q_G	$V_{DS} = 400\text{ V}$, $V_{GS} = 18\text{ V}$, $I_D = 10\text{ A}$		110		nC
$t_{d(on)}$	$V_{DD} = 600\text{ V}$				ns
$t_{d(off)}$	$V_{GS} = 20/-5\text{ V}$	$T_j = 150\text{ °C}$			ns
		$T_j = 150\text{ °C}$			ns
t_r	$I_D = 25\text{ A}$				ns
t_f	$R_G = 0.5\text{ Ω}$				ns
E_{on}	$di/dt_{off} = 2.2\text{ kA}/\mu s$ $di/dt_{on} = 3.9\text{ kA}/\mu s$	$T_j = 150\text{ °C}$	0.5		mJ
		$T_j = 150\text{ °C}$	0.2		mJ
$R_{th(j-s)}$	per MOSFET		1.4		K/W
Integrated body diode					
$V_F = V_{SD}$	$-I_D = 20\text{ A}$ $V_{GS} = 0\text{ V}$ chiplevel	$T_j = 25\text{ °C}$	5.75		V
		$T_j = 150\text{ °C}$	5.20		V
$V_{F0} = V_{SD0}$	chiplevel	$T_j = 25\text{ °C}$	1.35		V
		$T_j = 150\text{ °C}$	1.00		V
$r_F = r_{SD}$	chiplevel	$T_j = 25\text{ °C}$	220		mΩ
		$T_j = 150\text{ °C}$	210		mΩ
t_{rr}	$V_{DD} = 600\text{ V}$		-		ns
Q_{rr}	$-I_D = 25\text{ A}$		-		μC
I_{rr}			-		A
E_{rr}	$V_{GS} = -5\text{ V}$		0.17		mJ

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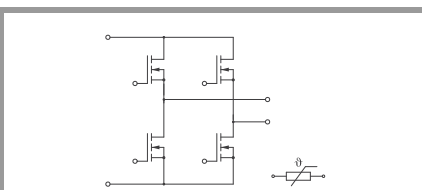
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Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Module					
L_{CE}			t.b.d.		nH
M_s	to heatsink	1.8		2	Nm
w	weight		19		g

Characteristics					
Symbol	Conditions	min.	typ.	max.	Unit
Temperature Sensor					
R_{100}	$T_r = 100\text{ °C}$		$493 \pm 5\%$		Ω
$B_{100/125}$	$R(T) = R_{100} \exp[B_{100/125}(1/T - 1/T_{100})]$; T[K];		$3550 \pm 2\%$		K

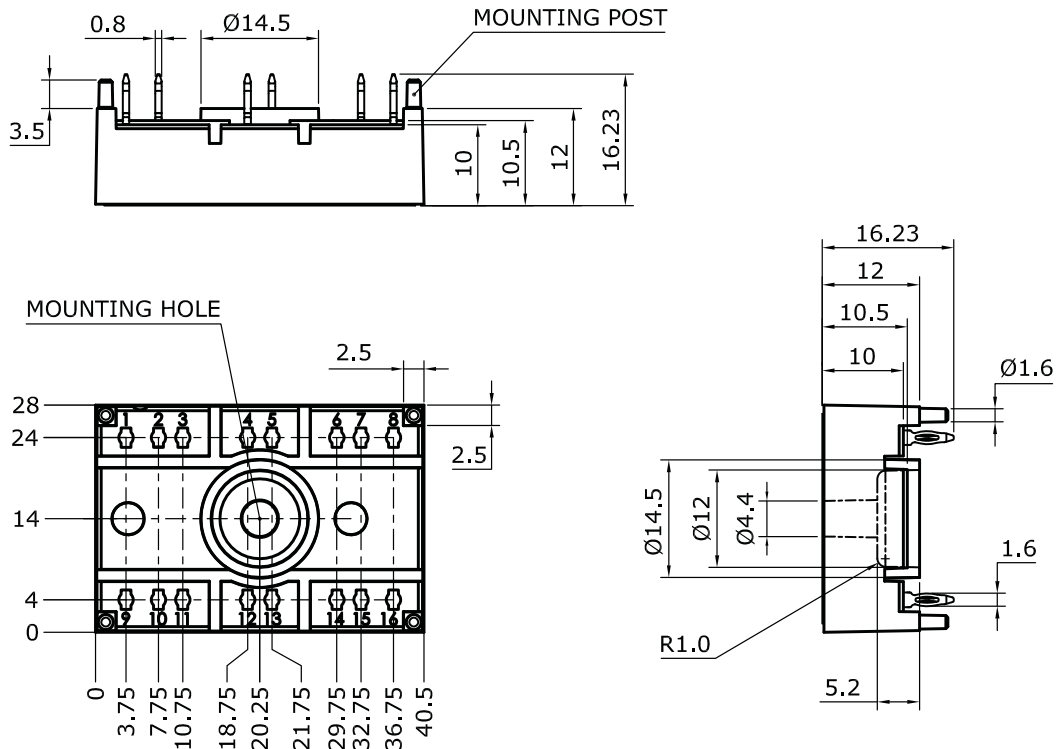


MH-T

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Dimensions: mm

Tolerance system: ISO 2768-m



Suggested drilled hole diameter for terminal pins in the circuit board:

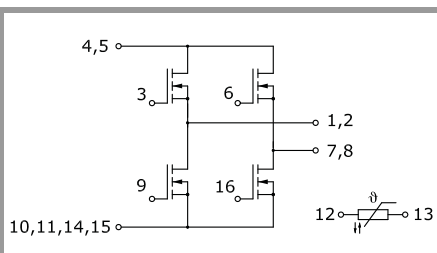
- minimum: 1.575 mm
- typical: 1.6 mm
- maximum: 1.625 mm

Suggested hole diameter for the mounting post in the circuit board:

- 2 mm

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SEMITOP 2 Press-Fit



MH-T

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

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