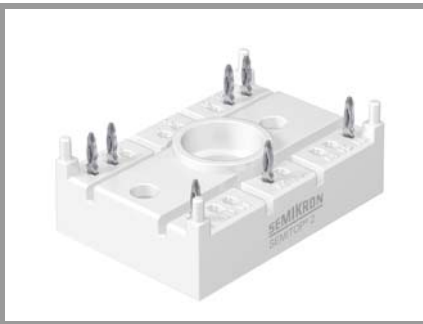


# SK45MH120TSCp



SEMISTOP® 2 Press-Fit

## SiC MOSFET Module

### Engineering Sample

### SK45MH120TSCp

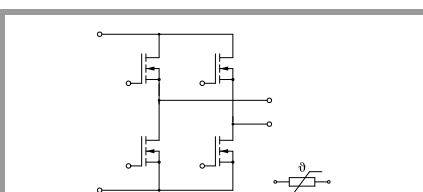
#### Target Data

#### Features

- 1200V SiC Planar MOSFET
- Single phase inverter topology
- One screw mounting module
- Fully compatible with other SEMISTOP® 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



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Absolute Maximum Ratings				
Symbol	Conditions	Values	Unit	
<b>MOSFET 1</b>				
$V_{DSS}$		1200	V	
$I_D$	$T_j = 175\text{ °C}$	$T_s = 25\text{ °C}$	40	A
		$T_s = 70\text{ °C}$	33	A
$I_{DM}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	160	A	
$I_{DRM}$		113	A	
$V_{GS}$		-6 ... 22	V	
$T_j$		-40 ... 175	°C	
<b>Integrated body diode</b>				
$I_{FM}$	$PW \leq 10\mu s$ , duty cycle $\leq 1\%$	160	A	
$I_{FRM}$		113	A	

Absolute Maximum Ratings			
Symbol	Conditions	Values	Unit
<b>Module</b>			
$I_{t(RMS)}$	$T_{terminal} = 100\text{ °C}$ , $T_s = 60\text{ °C}$ , 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
<b>MOSFET 1</b>					
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 1\text{ mA}$ , $T_j = 25\text{ °C}$	1200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8.9\text{ mA}$ , $T_j = 25\text{ °C}$	1.6	2.8	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
$R_{DS(on)}$	$V_{GS} = 18\text{ V}$ $I_D = 22\text{ A}$	$T_j = 25\text{ °C}$	45	56	mΩ
		$T_j = 150\text{ °C}$	76	89	mΩ
$C_{iss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 800\text{ V}$ , $f = 1\text{ MHz}$		4310		pF
$C_{oss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 800\text{ V}$ , $f = 1\text{ MHz}$		137		pF
$C_{rss}$	$V_{GS} = 0\text{ V}$ , $V_{DS} = 800\text{ V}$ , $f = 1\text{ MHz}$		19		pF
$R_{Gint}$	$T_j = 25\text{ °C}$		4.7		Ω
$Q_G$	$V_{DS} = 600\text{ V}$ , $V_{GS} = -5\text{ V} \dots +20\text{ V}$ , $I_D = 45\text{ A}$		215		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
$t_r$	$I_D = 45\text{ A}$				ns
$t_f$	$R_G = 0.5\text{ Ω}$				ns
$E_{on}$	$di/dt_{off} = 2.2\text{ kA}/\mu s$ $di/dt_{on} = 3.9\text{ kA}/\mu s$	$T_j = 150\text{ °C}$	0.8		mJ
		$T_j = 150\text{ °C}$	0.4		mJ
$R_{th(j-s)}$			1		K/W
<b>Integrated body diode</b>					
$V_F = V_{SD}$	$-I_D = 50\text{ A}$ $V_{GS} = 0\text{ V}$ chipelevel	$T_j = 25\text{ °C}$	6.40		V
		$T_j = 150\text{ °C}$	5.20		V
$V_{F0} = V_{SD0}$	chipelevel	$T_j = 25\text{ °C}$	3.90		V
		$T_j = 150\text{ °C}$	3.40		V
$r_F = r_{SD}$	chipelevel	$T_j = 25\text{ °C}$	50		mΩ
		$T_j = 150\text{ °C}$	36		mΩ
$t_{rr}$	$V_{DD} = 600\text{ V}$		-		ns
$Q_{rr}$	$-I_D = 45\text{ A}$		-		μC
$I_{rr}$			-		A
$E_{rr}$	$V_{GS} = -5\text{ V}$		0.28		mJ

# SK45MH120TSCp



SEMITOP® 2 Press-Fit

## SiC MOSFET Module

### Engineering Sample

### SK45MH120TSCp

#### Target Data

#### Features

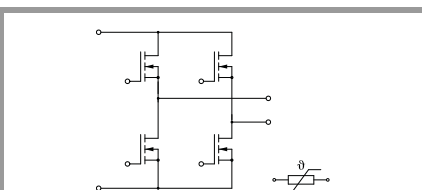
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- Extremely fast switching
- UL recognized, file no. E63532

#### Typical Applications\*

- Solar inverter
- UPS
- Power Supply

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

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

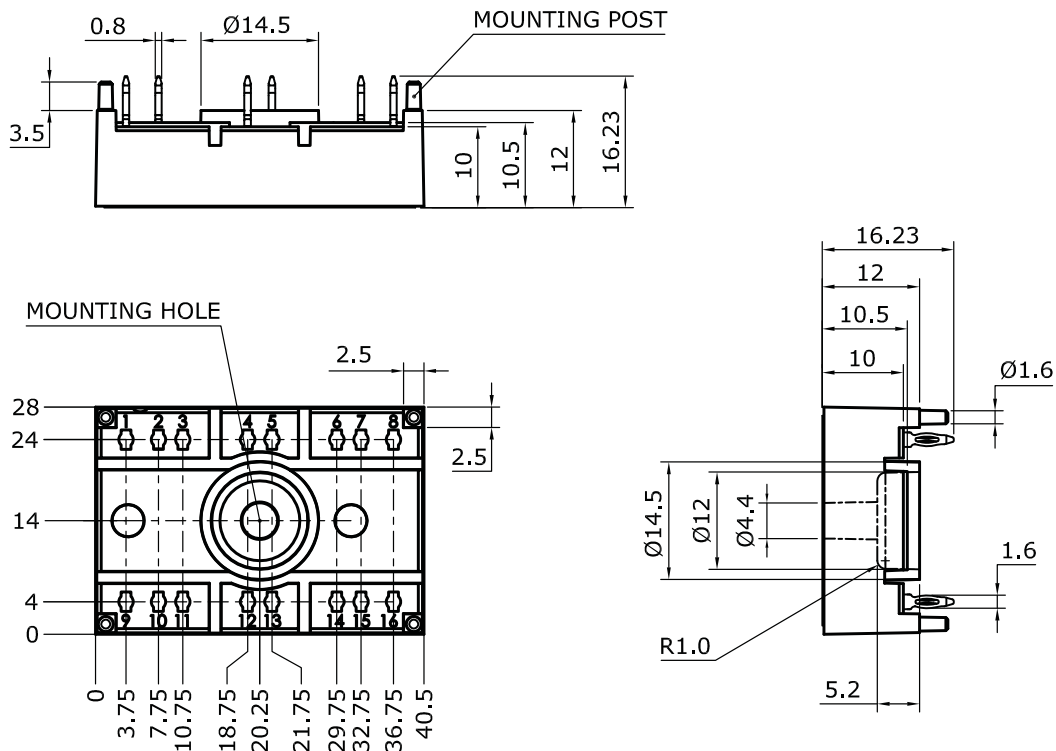


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# SK45MH120TSCp

Dimensions: mm

Tolerance system: ISO 2768-m



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

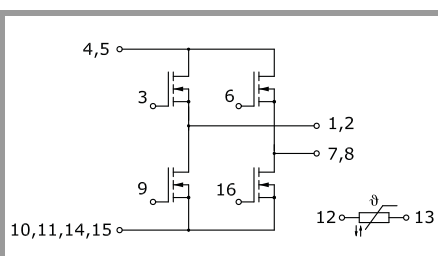
- minimum: 1.575 mm
- typical: 1.6 mm
- maximum: 1.625 mm

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

- 2 mm

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SEMITOP 2 Press-Fit



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

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