

SM Series 12.5 x 4.5 mm Crystal

Feature

- Hermetically sealed quartz crystal in resistance-welded SMD and through hole packages.
- High reliability & Low cost.
- Tight stability & extended temperature
- Pb-free and RoHS/Green compliant

Applications

- Consumer Electronics
- Home Devices
- Communication, Test equipment
- Portable Devices



Electrical Specifications

Item	Symb.	Min.	Typ.	Max.	Unit	Notes
Frequency Range	Freq.	3.200		48.000	MHz	
Oscillation Mode		Fundamental (AT-cut)				
Frequency Tolerance	$\Delta f/f$			± 10	ppm	at 25°C $\pm 2^\circ\text{C}$
Operating Temperature	T _{use}	-20		70	°C	
		-40		85	°C	
Storage Temperature Range	T _{sta}	-55		125	°C	
Shunt Capacitance	C ₀			7	pF	
Drive Level	DL		100	500	μW	
Load Capacitance	CL	8		20	pF	
Insulation Resistance	IR			500	MΩ	at DC 100V
Aging	f _{age}			3	ppm	1st. Year at 25°C

Frequency Stability & Operating Temperature Range

Temp. \ FT	$\pm 10\text{ppm}$	$\pm 15\text{ppm}$	$\pm 20\text{ppm}$	$\pm 30\text{ppm}$
-20°C to +70°C	$\triangle$	★	★	★
-40°C to +85°C		$\triangle$	★	★

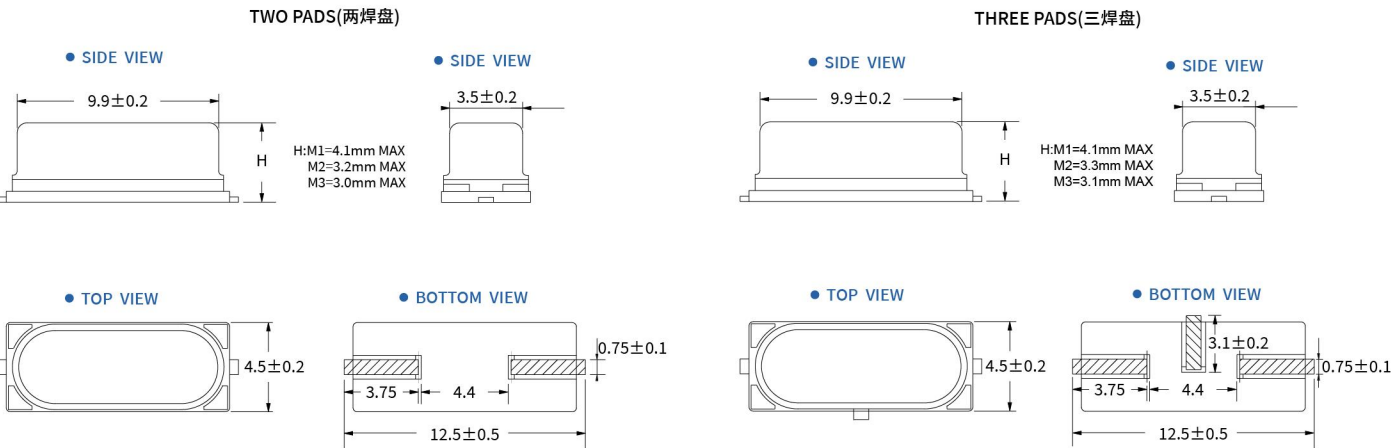
★: Available $\triangle$: Conditional

Equivalent Series Resistance

Frequency Range	ESR(Max.)
3.2MHz $\leq$ Freq. < 3.579MHz	150 Ω
3.579 MHz $\leq$ Freq. < 4MHz	120 Ω
4MHz $\leq$ Freq. < 5MHz	100 Ω
5MHz $\leq$ Freq. < 6MHz	80 Ω
6MHz $\leq$ Freq. < 10MHz	60 Ω
10MHz $\leq$ Freq. < 14MHz	35 Ω
14MHz $\leq$ Freq. < 20MHz	30 Ω
20MHz $\leq$ Freq. $\leq$ 48MHz	25 Ω

SM Series 12.5 x 4.5 mm Crystal

Dimensions (UNIT:mm)

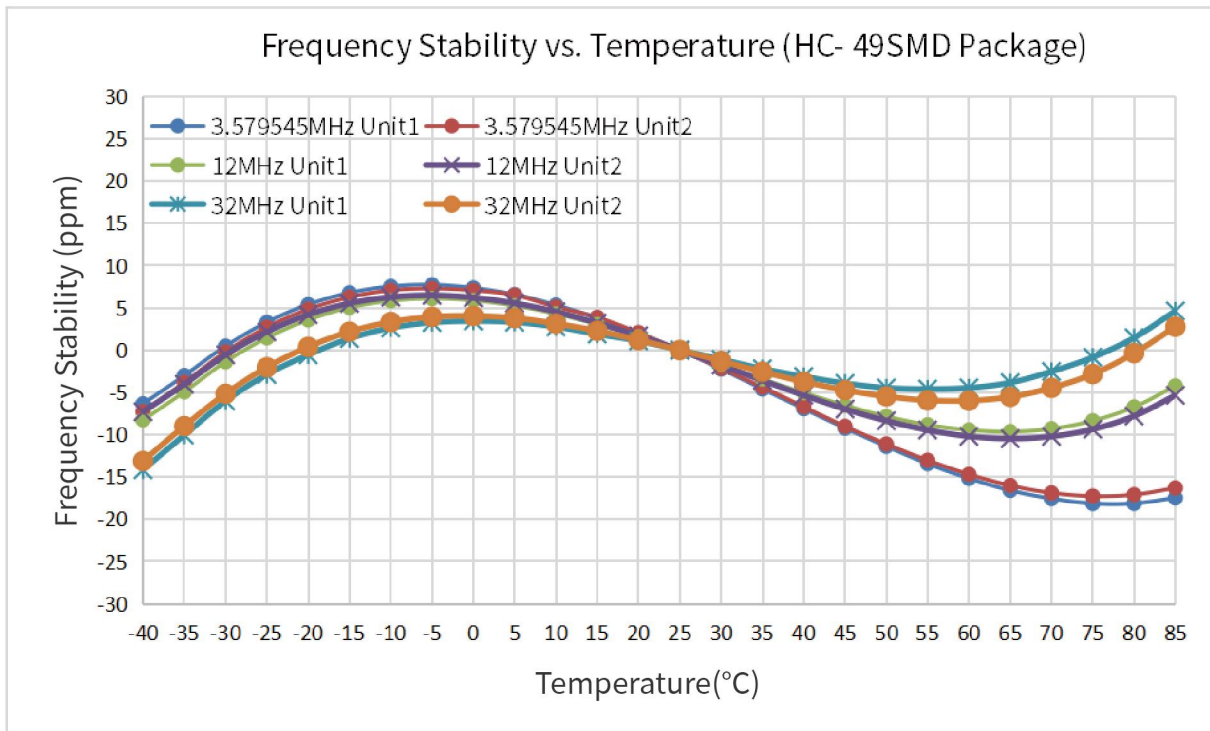


Options and Part Identification : Example SXMH3.579545F2020F30

Company	Ceramic Package	Frequency Code [MHz]	Vibration Mode	Load Capacitance	Frequency Tolerance	Operating Temperature	Frequency Drift
SX	MH	X.XXX	F	20	20	F	30
Code Company		Frequency	Code Vibration Mode		Code Frequency Tolerance		Code Frequency Drift
SX SCTF		3.579545	F AT - Fundamental		10 ±10ppm 20 ±20ppm		15 ±15ppm 20 ±20ppm 30 ±30ppm
	Code Ceramic Package			Code Load Capacitance		Code Operating Temperature	
	SA 10.8 x 4.5 x 3.38mm[HC-49S]			S Please specify CL in pF or S for series		E -20°C ~ +70°C	
	MH 12.5 x 4.5 x 4.1mm[HC-49SMD]			08 8pF		F -40°C ~ +85°C	
				10 10pF			
				12 12pF			
				20 20pF			

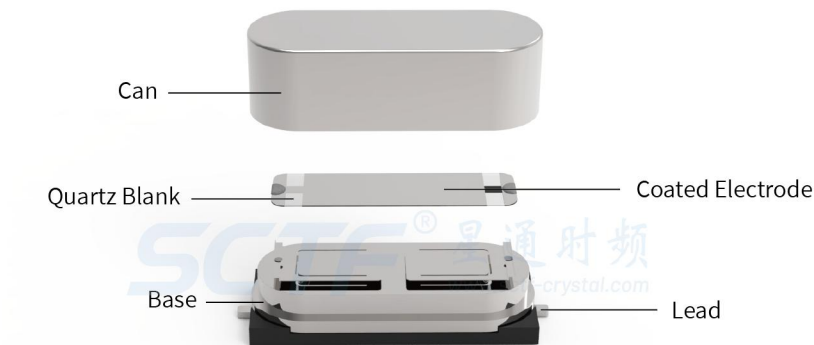
If you have other parameter requirements, you can contact **SCTF** at any time.

Frequency Temperature Characteristics



Product Structure&Marking Information

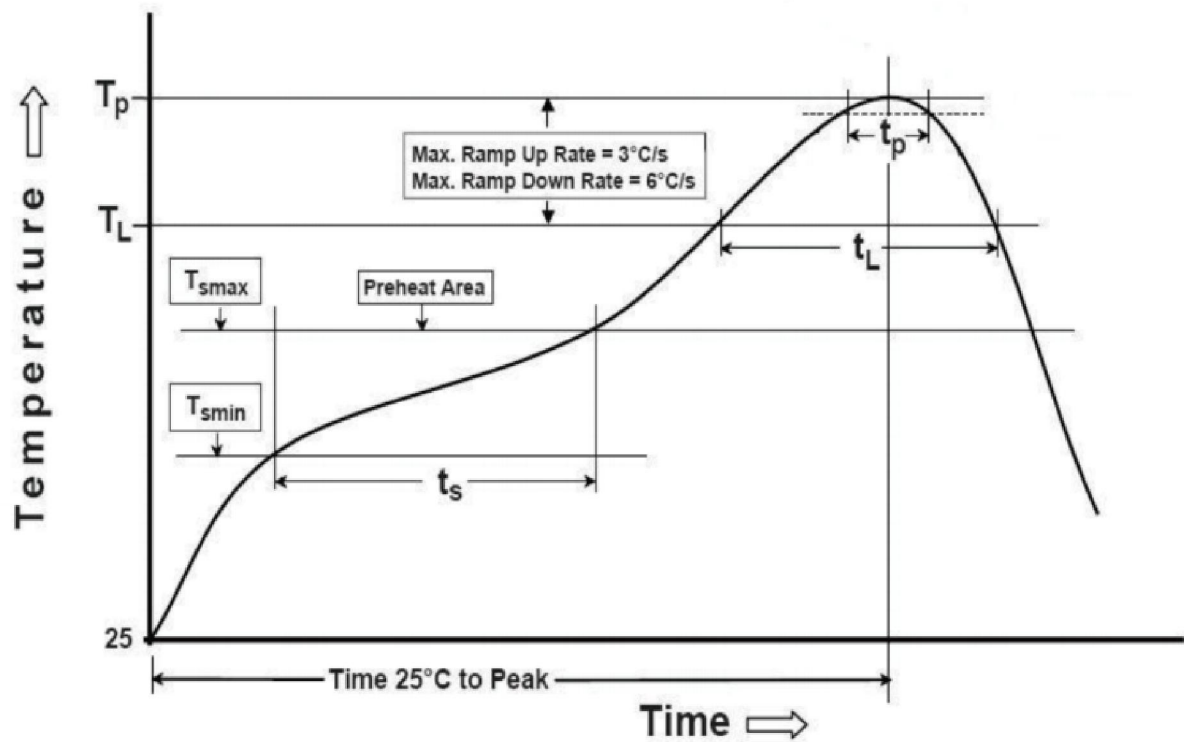
Product Structure



Marking Information



Suggested Reflow Profile

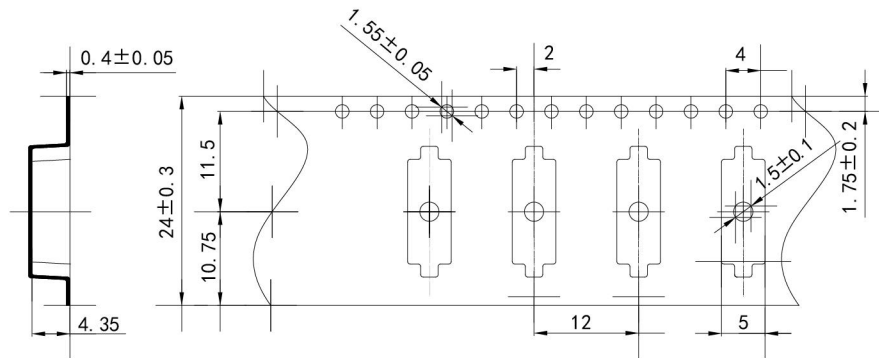
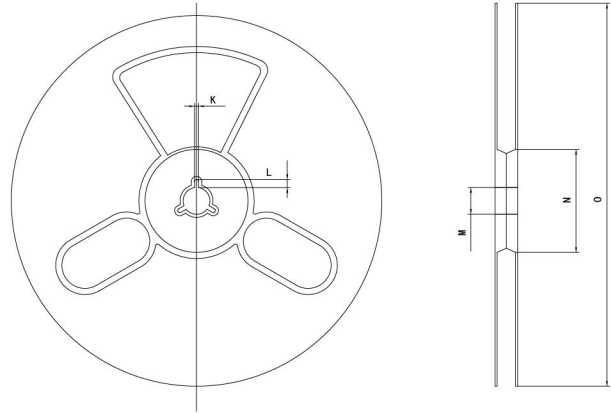


Profile Feature	Sn - Pb Eutectic Assembly	Preheat / Soak
Preheat / Soak ● Temperature Min (T_s min) ● Temperature Max (T_s max) ● Time (T_s min to T_s max)	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Ramp - up rate (T _L to T _p)	3°C/ second max.	3°C/ second max.
Time maintained above ● Liquidous temperature (T_L) ● Time (t_L) maintained above T_L	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body temperature (T _p)	235°C	260°C
Time within 5° C of the specified classification temperature (T _p)	20 seconds	30 seconds
Ramp - down rate (T _p to T _L)	6°C/ second max.	6°C/ second max.
Time 25° C to peak temperature	6 minutes max.	8 minutes max.
Suggest reflow times	2 Times max.	

SM Series 12.5 x 4.5 mm Crystal

Packaging Information

T=Tape and reel (1,000pcs/reel)



Pocket Tape Dimensions(mm)

HC-49SMD	0.4±0.05	14.9±0.1	4.35±0.1	24±0.3	11.5±0.1	5.0±0.1	12±0.1	4.0±0.1	2.0±0.1	φ1.5±0.1	2.0±0.2	4.0±1.0	φ13±0.5	φ100±1	φ330±1
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Common Frequencies – MHz

SM Series				
3.579545	3.6864	4.000	4.096	4.194304
4.897	4.9152	5.000	5.5296	6.000
6.144	6.7458	7.3728	7.680	8.000
8.192	9.81563	9.8304	9.84375	10.000
11.0592	11.2896	12.000	12.288	13.000
13.1072	13.225625	13.52127	13.52313	13.560
13.598	13.824	14.31818	14.7456	15.000
16.000	16.384	16.9344	17.734475	18.432
19.200	19.6608	20.000	22.1184	22.5792
24.000	24.576	25.000	26.000	27.000
27.120	27.1412	28.63636	29.4912	30.000
32.000	36.000	40.000		