



规格样品书

客户名称 Customer Name: _____

产品名称 Product Name: M- 49SS-SMD Crystal

产品规格 : 24.000MHz/12PF



1、石英晶体一般规格及特性 Crystal Specification & Characteristic

No	Item Symb	Symb	Electrical Specification				Remark
			Min.	Typ.	Max	Units	
1	标称频率 Nominal Frequency	F0	24.000000				MHz
2	振动模式 Mode of Oscillation		Fundamental				
3	盒型 Hold Style		M-49SS-SMD				
4	调整频差 Frequency Tolerance	$\Delta F/F0$	-10	-	10	ppm	at 25°C 3°C
5	工作温度 Work Temperature	TOPR	-20	-	85	°C	
6	温度频差 Temperature Tolerance	TC	-30	-	30	ppm	
7	工作湿度 Work Humidity		10%	-	85%	RH	
8	保存环境温度 Conserve Tem	TSTG	-40	-	85	°C	
9	负载电容 Load Capacitance	CL	-	12	-	pF	
10	保存环境湿度 Conserve Humidity		10%	-	90%	RH	
11	等效电阻 Equivalency Resistance	ESR	-	-	40	Ω	
12	激励功率 Drive Level	DL	-	10	-	μW	
13	绝缘阻抗 Insulation Resistance	IR	500	-	-	M Ω	DC 100V $\pm$ 15V
14	激励电平依赖性 Drive Level Dependency: 0.01~300 μW 10points	DLD2	-	-	12	Ω	
		RLD2	-	-	40	Ω	
15	静态电容 Shunt Capacitance	C0	-	-	7	pF	
16	老化 Aging	Fa	-3	-	3	ppm	First Year

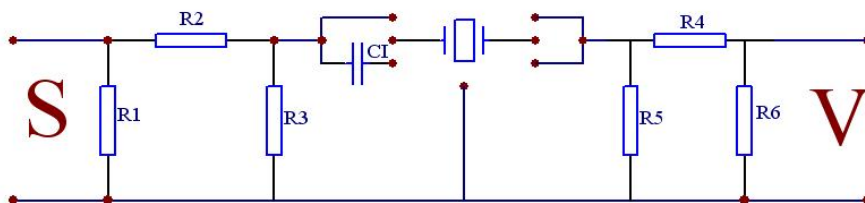
2； 频率测试方法 Frequency Test Measure

1. 测试仪器 Test Instrument

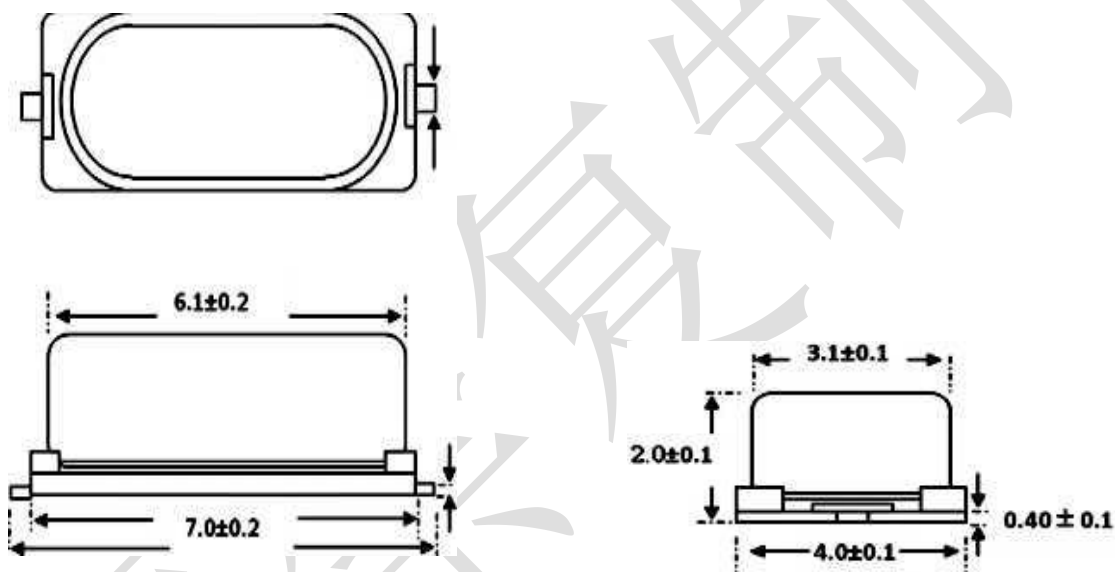
S & A 250B Pi-Network

2. 测试电路 Test Circuit

PI NETWORK MEASURE CIRCUIT



3. 外形尺寸 External Dimension



4. 外观标识 Marking

(激光刻字 Laser Marking)



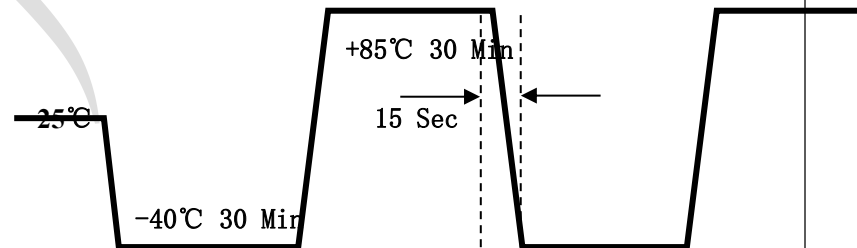


5. 晶体构成材料

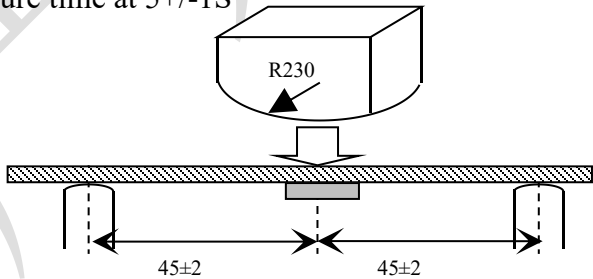
编号 Num	名称 Name	主要材料 Main Material	颜色 Color
1	外壳 Can	Cu、Ni	银白 Silver White
2	玻璃绝缘子 Glass Insulation	Glass	褐色 Brown
3	基座 Base	Fe、Ni	银白 Silver White
4	引线 Down-lead	Fe、Ni	银白 Silver White
5	晶片 Crystal Blank	SiO ₂	透明 Lucency
6	银胶 Silver Glue	Ag	银白 Silver White
7	垫片 Washer	聚苯硫醚 PPS	黑色 Black
8	银层 Silver Tier	Ag	银白 Silver White

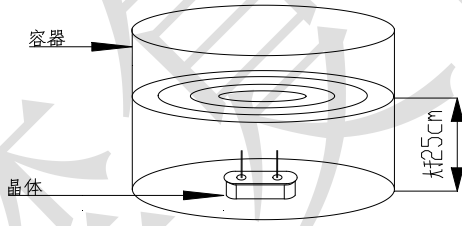
6. 石英晶体之可靠性 Quartz Crystal Reliability

A. 电气性能 Electric Capability

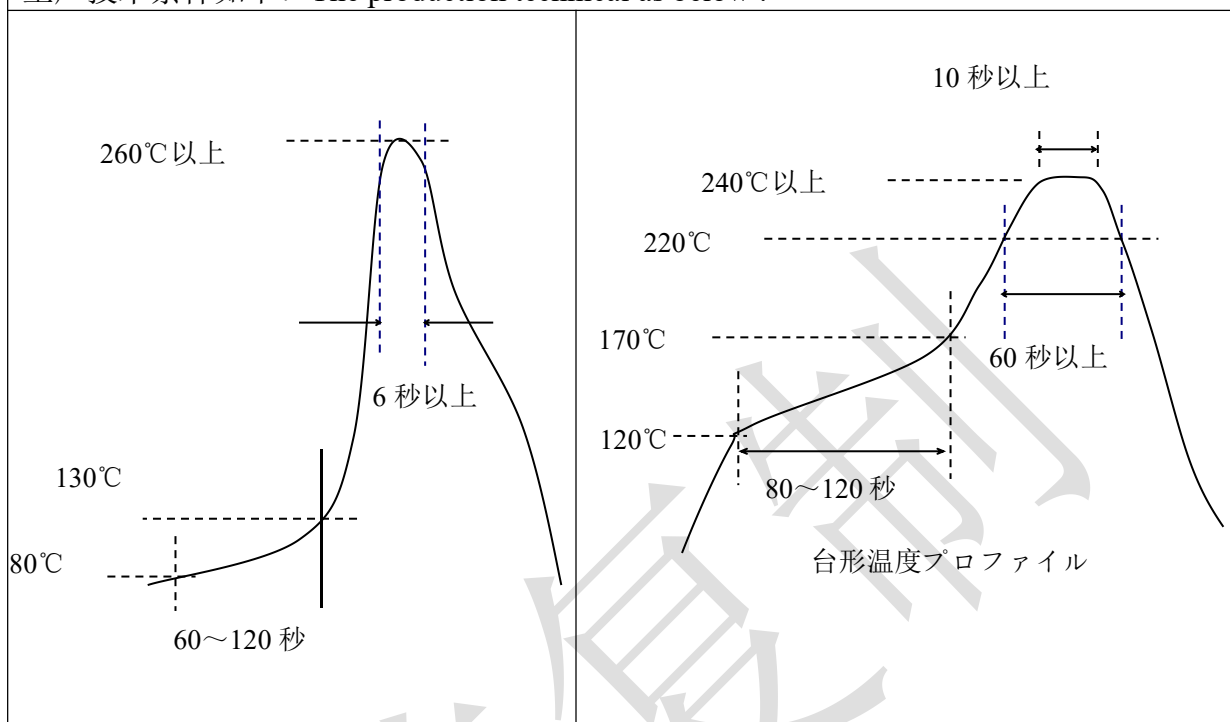
项 目 Item	条 件 Conditions	结 果 Result
A. 1	耐低温性(耐寒性)测试 Resistance Low-Temperature Test 石英晶体放于 $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 之恒温箱内 500 小时 ± 2 小时, 完成后放于室温中自然恢复 1 小时后检测。Put the crystal into the $-40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ constant temperature box for 500 ± 2 H, then test after put in the room temperature 1H to come back natural.	(I)
A. 2	耐高温性(耐热性)测试 Resistance High-Temperature Test 石英晶体放于 $+100^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 之恒温箱内 500 小时 ± 2 小时完成后放于室温中自然恢复 1 小时后检测。Put the crystal into the $+100^{\circ}\text{C} \pm 5^{\circ}\text{C}$ constant temperature box for 500 ± 2 H, then test after put in the room temperature 1H to come back natural.	(I)
A. 3	高温高湿测试 High-Temperature & High-Humidity Test 将石英晶体放于温度 $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 及相对湿度 90-98% 之恒温恒湿箱内 500 小时 ± 2 小时, Put the crystal into the constant temperature & humid with the temperature $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and the humidity 90-98% for 500 ± 2 H.	(I)
A. 4	温度循环 Temperature Circle 石英晶体放于 $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 恒温箱内 30 分钟 ± 1 分钟, 再放于 $+85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 恒温箱内 30 分钟 ± 1 分钟, 共 100 次, 完成后, 放于室温中自然冷却 2 小时。Put the crystal into the constant $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ temperature for 30 ± 1 M, then change the temperature to $+85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 30 ± 1 M, the total circle is 100 times .Then put in the room temperature 2H to come back natural	(I)
		

B. 机械性能 Mechanical Capability

项 目 Item	条 件 Conditions	结 果 Result
B. 1	跌落测试 Drop Test. 石英晶体在 75cm±5cm 之高度自由跌落在厚度 3cm 的木板上 3 次, 放置 1 小时后测试. The crystal fall off from height of 100cm onto hard wooden board of thickness more than 30mm for 3 times . Then put in the room temperature 2H to come back natural.	(I)
B. 2	振动测试 Vibration Test. 周波数 10-55Hz, 振幅 1.5mm。X、Y、Z 轴各振动 2 小时 ±10 分钟 Frequency 10-55Hz ,swing 1.5mm. X、Y、Z axis Vibrate for 2H±10M	(I)
B. 3	端子弯曲强度测试 固定本体引线扭曲 45° 后, 再慢慢复原	(II)
B. 4	端子强度 装基板后, 按照箭头方向以 0.5mm/s 的速度、2 mm 的弯曲度、加压 5±1S 的时间。 after Installed base-board, according to the direction of arrow at 0.5 mm/s speed, 2 mm the curvature degree, pressure time at 5+/-1S  单位: mm	(II)

B. 机械性能 Mechanical Capability		
项 目 Item	条 件 Conditions	结 果 Result
B. 5	熔焊性测试 Solder-ability Test. 引线粘上助焊液(浓度 7-10%), 约 5 秒后, 放在 $230 \pm 5^{\circ}\text{C}$ 之熔锅中 3 ± 0.5 秒. The lead was adhibited aid-soldering fluid(consistence 7-10%) ,after 5 S,put into the $230 \pm 5^{\circ}\text{C}$ melt pan for $3 \pm 0.5\text{S}$.	(III)
B. 6	密封性测试 Hermetical Test 石英晶体放于 $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 温水中浸 5 分钟, 温水水高覆盖晶体, 高度大于 25cm. Put the crystal into the $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ water for 5 M, the height of the water should cover with the crystal ,the height should higher than 25cm.. 	(IV)
B. 7	熔焊耐热性 Resistance to the Solder Heat. (1) 石英晶体放在 $265 \pm 5^{\circ}\text{C}$ 之熔锅上晶体与熔锅面相距 $2.0\text{mm} \pm 0.2\text{mm}$, 3 分钟(共 2 次) Put the crystal above the $265 \pm 5^{\circ}\text{C}$ with the distance for $2.0\text{mm} \pm 0.2\text{mm}$,last 3 M(2 times in total) (2) 石英晶体放在 $350 \pm 10^{\circ}\text{C}$ 之熔锅上晶体与熔锅面相距 $2.0\text{mm} \pm 0.2\text{mm}$, 3 ± 0.5 秒(共 2 次) Put the crystal above the $350 \pm 10^{\circ}\text{C}$ with the distance for $1.3\text{mm} \pm 0.2\text{mm}$,last 3 ± 0.5 M(2 times) (3) 以上需使用 $1.6 \pm 0.16\text{mm}$ PCB 板做隔热板。 (4) 完成后放在室温中自然冷却 1 小时后检测. Then test after put in the room temperature 1H to come back natural.	(I)

生产技术条件如下：The production technical as below：

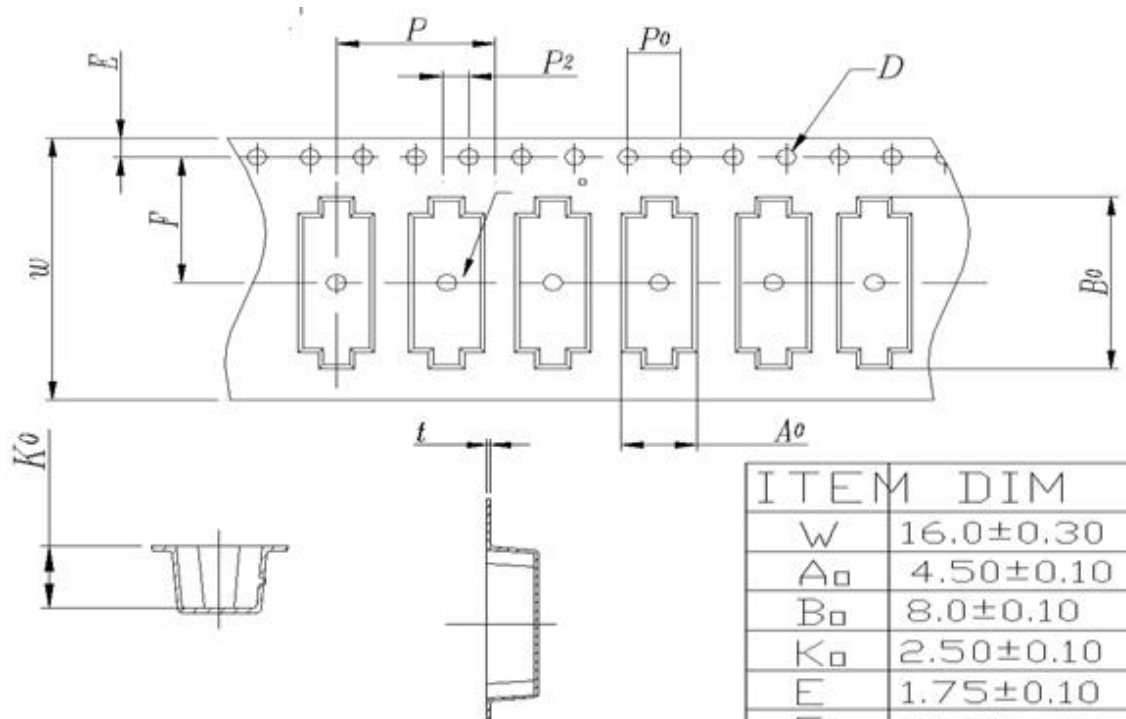


C. 标准 Judgment Standard

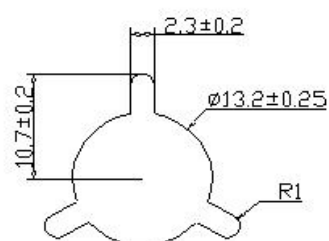
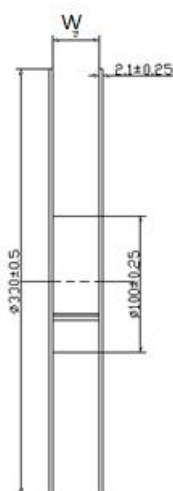
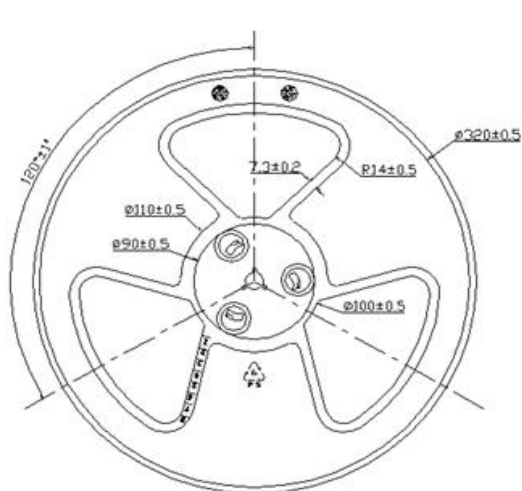
结果编号 Num	规格要求 Spec conditions
(I)	频率在规格要求以内 Frequency should be within Specification 电阻在规格范围以内 The ESR should be within Specification
(II)	引线无折断及符合 B. 5 项要求 (密封性) The lead can not be break ,and canaccord with B.5 hermetical.
(III)	上锡幅盖率高于 90%. The bestrow rate for going up the tin is more than 90%.
(IV)	无气泡在晶体表面沉淀或冒出水面 No air bladderon on the surface of the crystal or above the water .

7 包装图 Packing Drawing UNIT 单位: mm

1. 编带尺寸 Taping Dimension



ITEM	DIM
W	16.0±0.30
A ₀	4.50±0.10
B ₀	8.0±0.10
K ₀	2.50±0.10
E	1.75±0.10
F	11.5±0.10
P	8.00±0.10
P ₀	4.00±0.10
P ₂	2.00±0.10
D	∅1.5 ^{+0.10} _{-0.00}
D ₁	∅1.5 ^{+0.10} _{-0.00}
t	0.35±0.05



Available Reel Size (mm) ^①	
Tape width ^②	W±0.3 mm ^③
24 mm ^④	24.4 ^⑤