深圳市凯越翔电子有限公司

石英谐振器规格书

产品名称：	石英晶振谐振器
产品型号：	1610/32.768KHZ
产品参数：	12.5PF/±10PPM
原厂型号：	K103276812510
尺寸图 ：	P.4
技术部 ：	董宗全

客户确认印栏	
认证印章 年 月 日	负责人印章 年 月 日

拟制	成望生	审核	董宗全	批准	谢为亮

本规格章程连同本页共9页

工厂地址：深圳市龙华区观澜人民路蔡发工业城1栋4楼， TEL:0755-8931582389315866
FAX:0755-89315223 官网： www kaiyuexiang com

1. 石英晶体参数规格 QUARTZ CRYSTAL UNIT SPECIFICATION

※描述Description :Quartz Crystal

※产品型别 Product Type :SF-1610

※测量设备 Measure equipment :S&A 250B

※电气特性Electrical Characteristics

	项 目 Item	代码 Symbol	电气特性规格 Electrical Specification				备注 Notes
			下限 Min.	中心 Typ.	上限 Max.	单位 Units	
1	一般频率 Nominal Frequency	FL	32.768000			KHz	
2	振荡模式 Oscillation Mode		Fundamental				
3	负载电容 Load Capacitance	CL	12.5			pF	
4	频率公差 Frequency Tolerance		-10		10	ppm	At 25℃±3℃
5	等效串联电阻 Equivalent Series Resistance	ESR			90	KΩ	
6	驱动功率 Dr ive Level	DL		0.1	0.5	μW	
7	斜率 Parabol ic Coefficient		-	-	-0.04	PPM/℃^2	
8	动作温度 Operating Temperature		-40		85	℃	
9	储存温度 Stor age Temper ature		-40		85	℃	
10	年老化率 Aging		-3		3	ppm	Per Year
11	绝缘阻抗 Insulation Resistance		500			MΩ	At DC 100V
12	并联电容 Shunt Capacitance	C0		1.25		pF	
13	动态电容 Motional Capacitance	C1		6.50		fF	
14	品质因素 Quality Factor	Q	13			K	

备注Notes:

1.超音波清洗Ultrasonic cleaning

一般的清洁液或超声波清洗方法可以用来清洗我们的产品。但是，在某些情况下，超声波清洗机在我们产品的振荡频率上会产生共振，从而使器件的电气特性恶化，甚至损坏器件的整体结构。因此，建议超音波清洗前进行验证测试。General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However,under certaincircumstances, ultrasonic cleaning machine could generate resonance at the oscillaton frequency of our products and thus deter iorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

2.超音波焊接Ultrasonic welding

避免使用超声波焊接进行安装和加工，这种方法有可能使晶体产品内部产生过大的振动扩散，成为特性退化而不振动的原因。Avoid mount ing and processing by Ul trasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

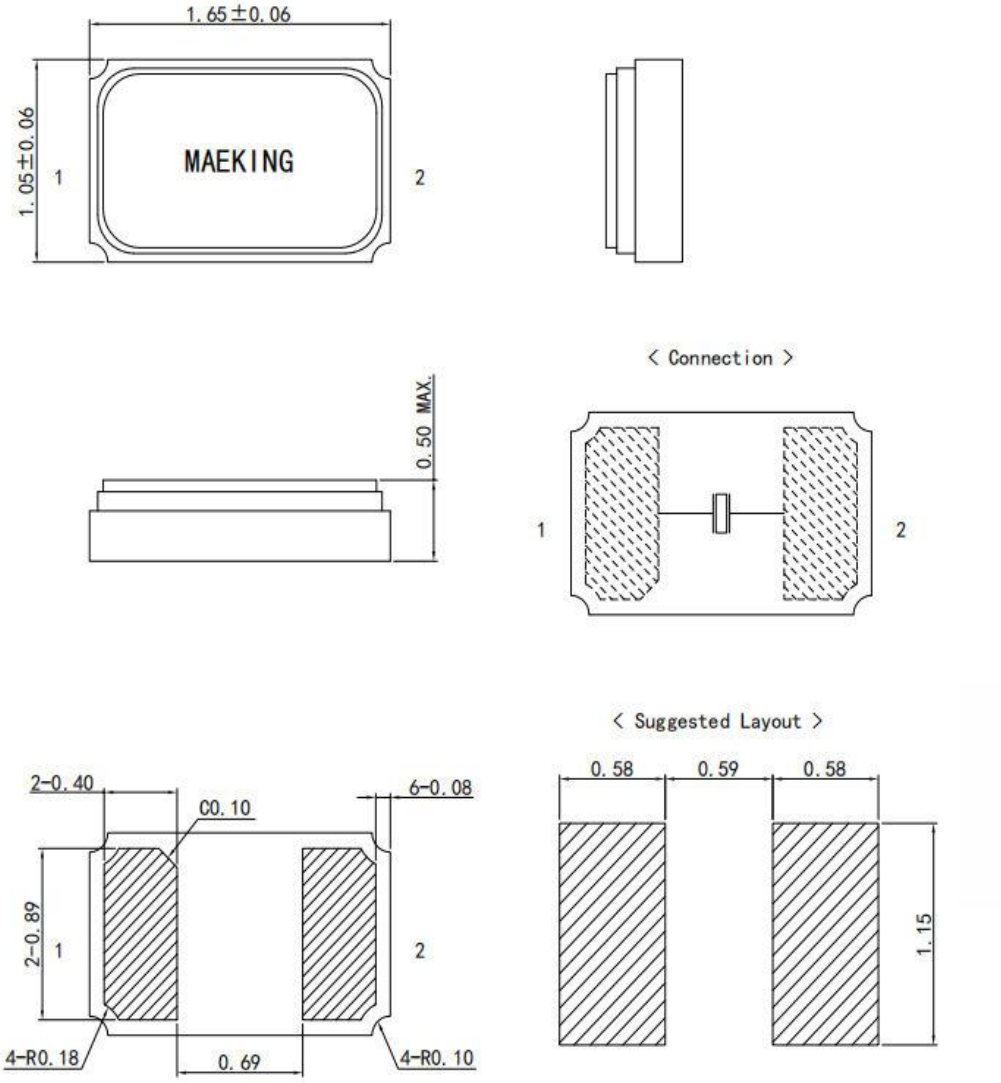
3.储存温度说明Storage temperature description

储存温度仅适用于产品，而包装材料储存温度5℃~40℃。 Storage Temperature is only for the product itself,the temperature for the packing material is 5℃~40℃.

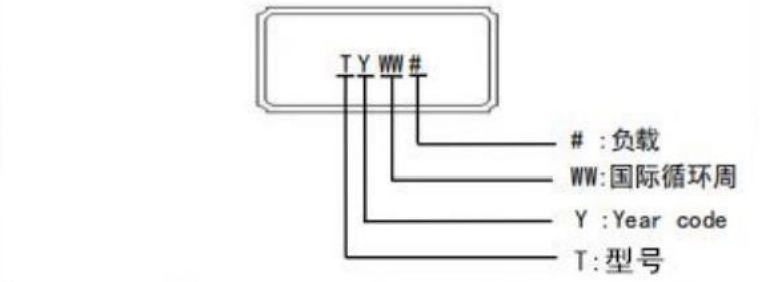
4.手工焊建议条件Recommended conditions for manual welding

温度：350±10℃,时间：3秒Max,次数：2次 Max.Temperature:350 ± 10 ℃,Time: 3 sec max,Re-solder times: twice max.

2. 产品图纸 DIMENSIONS(Units:mm)



3. 印字 MARKING



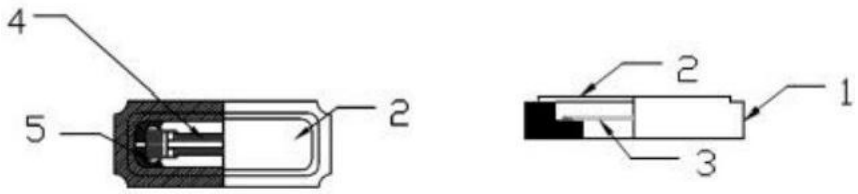
Year	:	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	:	1	2	3	4	5	6	7	8	9	0

(*The Year code will be cycled every ten years.)

WW : 国际循环周

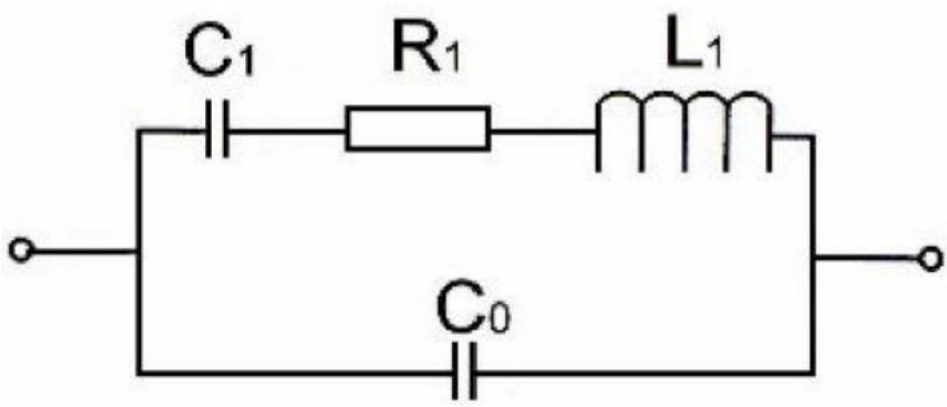
#负载: A→12.5PF、B→9PF、C→7PF、D→6PF

4. 内部结构产品图纸 INSIDE STRUCTURE



No.	组件 COMPONENTS	材料成份 MATERIALS
1	基座 Package	陶瓷 Ceramic(A 1203)
2	外壳 LID	KV合金 KV(Fe/Co/Ni)
3	水晶片 Crystal blank	二氧化硅 SiO2
4	电极 Electrode	Cr、Au (Cr+Au)
5	接着剂 Adhesive	树脂、银粉 Resin,Ag

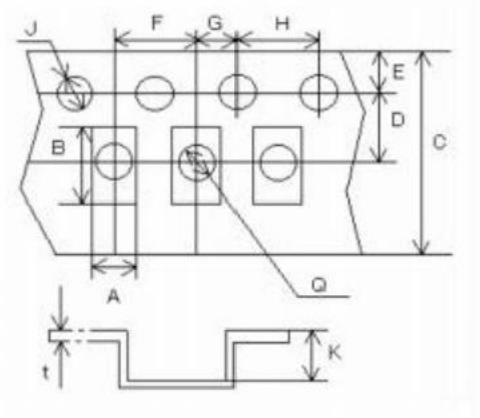
5. 等效电路图 EQUIVALENT CIRCUIT

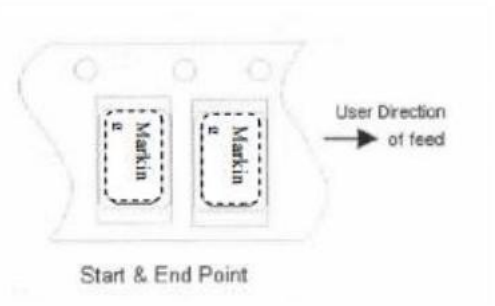


Equivalent Circuit

6. 包装 PACKING(Units:mm)

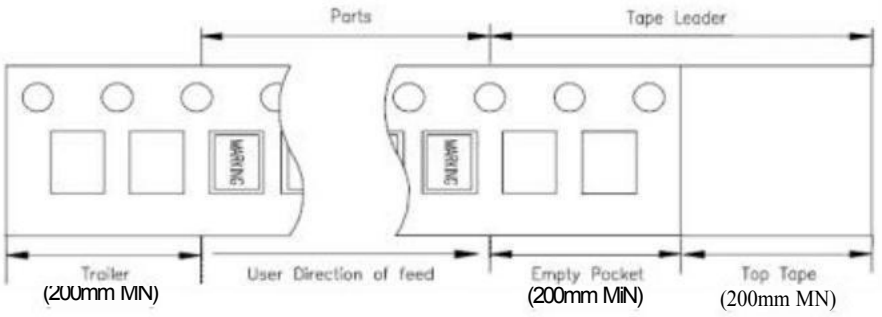
※载带类型 CARRIER TYPE



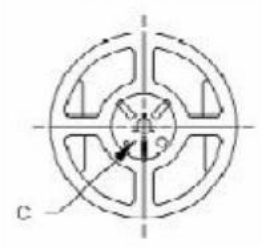


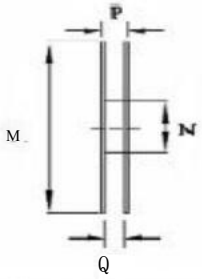
A	B	C	D	E	F	G	H	J	K	t
1.75	3.45	12.0	5.5	1.75	4.0	2.0	4.0	1.5	1.0	0.25

备 注REMARK:

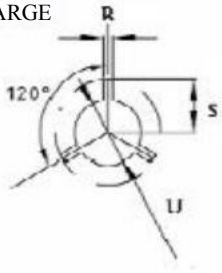


※圆卷 REEL:3000 PCS/Reel





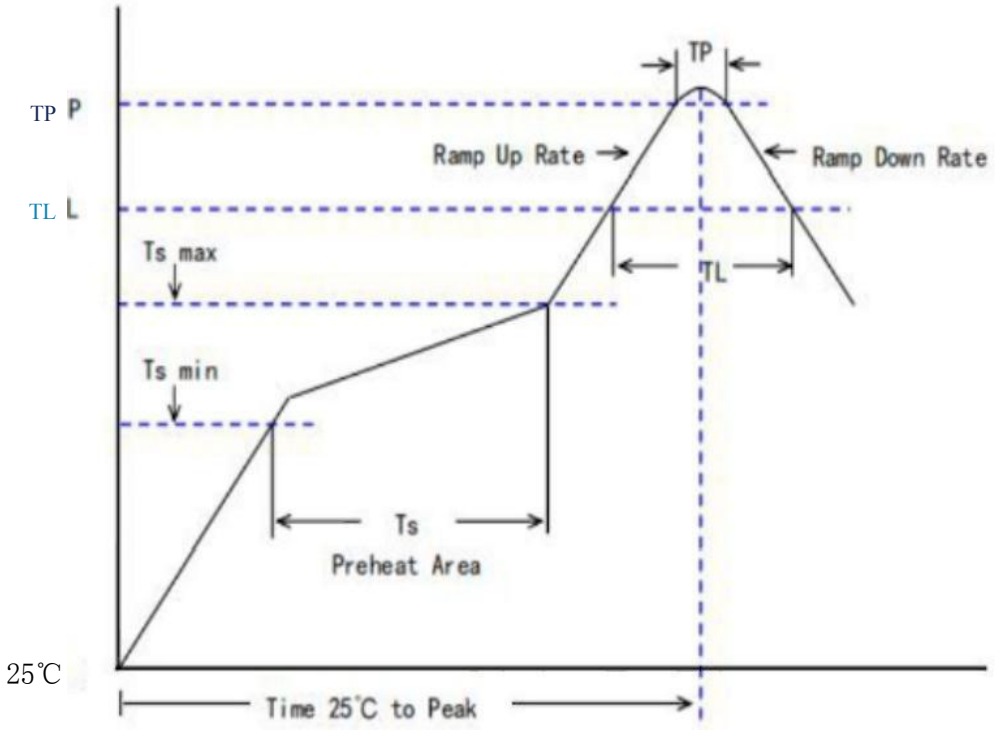
C.ENLARGE



M	N	P	Q	R	S	U
180	60	15.4	13.0	2.0	10.5	13.0

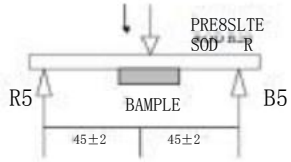
7. 回流焊温度曲线 REFLOW PROFILES

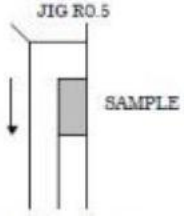
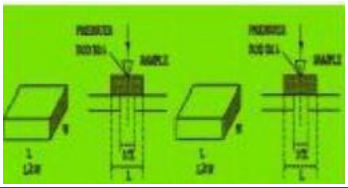
参考标准REFER:JEDEC JSTD-020D	
Profiles Feature	Pb-Freo Aasembly
Preheat/Soak Temperature Min(Ts min) Temperature Max(Ts max) Time(Ts)from(Ts min to Ts max)	 150℃ 200℃ 60-120 seconds
Ramp-up rate(TL to TP)	3℃/second max
Liquidous temperature(TL) Time(TL) maintained above TL	217℃ 60-150 seconds
Peak/Classification Temperature(TP)	260±5℃
Time within 5C of actual Peak Temperature(TP)	 20~40 seconds
Ramp-down rate(TP to TL)	6℃/second max.
Time 25 •C to peak temperature	8 minutes max
Suggest reflow times	3 Times max



8. 可靠性试验 RELIABILITY SPECIFICATION

参考标准REFER		JIS C 6701	
No.	项 目 ITBM	测试条件 CONDITIONS	测试标准 Criteria
1	高温试验 HIGH TEMPERATURE	温度125±2℃存储500±12小时；然后在常温(25±2℃)下静置2H以上24H内使用250B测试特性参数。 如果客户的温度要求是高于标准，温度测试必须完成客户的需求 。 STORED AT 125±2℃ for 500±12H. THE CHARACTERISTIC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃) If Custamer's temperature request is higher than the standard,Temperature test must be done for customer Requi rements.	A.C
2	低温试验 LOW TEMPERATURE	温度-40±2℃存储500±12小时；然后在常温(25±2℃)下静置2H以上24H内测试250B。 如果客户的温度要求是高于标准，温度测试必须完成客户的需求 。 STORED AT -40±2Cfor 500±12H. THE CHARACTERIST IC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃). If Customer's temperature request is higher than the standard.Temperature test must be done for customer Requirements.	A.C
3	高温高湿 HIGH TEMP.8 HUMI DITY	温度85±2℃,湿度85%环境下存储500±12小时；然后在常温(25±2℃)下静置2H以上24H内测试250B。 STORED AT 85±2℃ AND HUMIDITY 85% FOR 500±12H THE CHARACTERISTIC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BE ING STAT IC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃).	A.C.D
4	温度冲击 TEMPERATURE SHOCK	晶振单元应运行100个温度冲击，然后在常温(25±2℃)下静置2H以上24H内测试250B。每个温度冲击条件如下： 温度 持续时间 1.-40+0/-6℃ 30 ±3MINUTES分钟 2.25 ℃±2℃ 2 ～3MINUTES分钟 3. 125+4/-0 ℃30 ±3MINUTES分钟 4. 25 ℃±2℃ 2 ～3MINUTES分钟 THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES. THE CHARACTERIST IC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃).	A.C

5	可焊性 SOLDERABILITY	焊锡温度260±5℃,时间2±0.6秒，无铅锡料，加助焊剂。 THE LEAD IS IMMERSED IN A 260±5℃ SOLDER BATH WITHIN 2±0.6 SECONDS	F
6	氮漏 FINE LEAK	5.0~5.5 Kgf /cm的氮气加压2小时 HELIUM BOMBING 5.0～5.5 Kgf / am ,FOR 2 HOURS	E
7	耐焊接热性 WELDING HEAT RESISTANCE	过回流焊2次，最高温度8时间265℃±5℃,15±5Sec;然后在常温(25±2℃)下静置4H以上24H内测试250B。 2 REFLOWS, THE MAXIMUM TEMPERATURE & TIME IS 265℃±5℃,15±5SEC. THE CHARACTERISTIC PARAMETERS OF 250B MUST BE TESTED IN 24H AFTER BEING STATIC FOR MORE THAN 2H AT ROOM TEMPERATURE(25±2℃).	A.C
8	跌落 FREE FALL	从100cm的高度自由落体3次，落在坚硬的木板上。 FREE DROPPING FROM 100cm HEIGHT 3 TIMES ON A HARD	B.C
9	振动 VIBRATION	振动频率：10～55Hz,振幅(全程):扫频率0.75oct/min,加速度峰值5g,3个方向(X,Y,Z)各2小时。 FREQUENCY:10～55Hz AMPLI TUDE(TOTAL EXCURSION):THE SCANNING FREQUENCY IS 0.75OCT/MIN, AND THE PEAK ACCELERAT ION IS 5G SWEEP TIME:3 DIRECT ION(X,Y,Z)EACH FOR 2 Hrs.	A.C
10	板弯曲 TERMINAL STRENGTH	以约0.5mm/秒的速度施加压力，直到折板弯曲达到3mm,维持5秒钟。 SHALL BE PRESSURIZED AT A SPEED OF APPROX.0.5mm/sec IN THE DIRECTION INDICATED BY THE ARROW UNTIL THE BENDING WIDTH REACHES 3mm AND HELD FOR 5 SECONDS 	A.C

11	折板推力试验 ST ICKING TENDENCY	在R0.5的可移动治具上最终施加一个10N的力，维持10秒钟。 A R0.5 JIG SHALL BE USED TO APPLY A 10N DEAD LOAD IN THE DIRECTION INDICATED BY THE ARROW TO THE ELEMENT AND RETAIN IT FOR 10 SECONDS. 	A.C
12	本体荷重试验 ELEMENT ASSEMBLY STRENGTH	使用一个R0.5的压杆在元件中心施加一个10N的力，维持10秒钟。 A R0.5 PRESSURI ZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS 	A.C
13	机械冲击 Mechanical Shock	100g.6ms,半正弦冲击脉冲6轴*3次 100G, 6MS, HALF SINE SHOCK PULSE, 6AXIS*3TIMES	A.C

8PECIFICATIONS		
A	FREQUENCY CHANGE PERMITTED.	△F≤10PPM
B	FREQUENCY CHANGE PERMITTED.	△F≤20PPM
C	EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED	△CI≤5KΩ or 20% Make use larger value
D	INSULATION RESISTANCE	>500MΩ
E	LEAK RATE LESS THAN	<1*1E-9 Pa·m³/sec
F	A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM 95% OF THE SURFACE	

Remark:

※ Each test done independently

※ Measurcment condition:Eloctrical characteristics measured by SA250B or equivalent.

9. 有害物质含量声明 HARMFUL SUBSTANCE CONTENT STATEMENT

有毒有客物质或元素的名称及含量表

材料名称	有毒有害物质或元素						备注
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬(Cr(VI))	多溴联苯(PBB)	多溴二苯醚(PBDE)	
BLANK	0	0	0	0	0	0	
Package	0	0	0	0	0	0	
LID	0	0	0	0	0	0	
Electrode	0	0	0	0	0	0	
Adhes ive	0	0	0		0	0	
拆分部件n							
0:表示该有毒有害物质在该部件所有均质材料中的含量均在ROHS/REACH/无卤标准规定的限量要求以下; X:表示该有毒有害物质至少在该部件的某一均质材料中的含量超出FOHS/REACH/无卤标准规定的限量要求。							