

承 认 书

SPECIFICATION FOR APPROVAL

客户名称: Customer _____

货 名: Description _____ SMD 1610 石英晶体谐振器

客户料号: Part No _____

物料编号: Code No _____ S11003271C2090CY

频 率: Frequency _____ 32.768KHz

日 期: Date _____ 2020-09-24

备 注: RoHS compliance with Directive (EU) 2015/863

制作(Prepare by)	检查(Check by)	批准 (Approve by)
江丹娜	甘瑛	张刚

客户批准 Approve by customer	
批准日期 Approval date	

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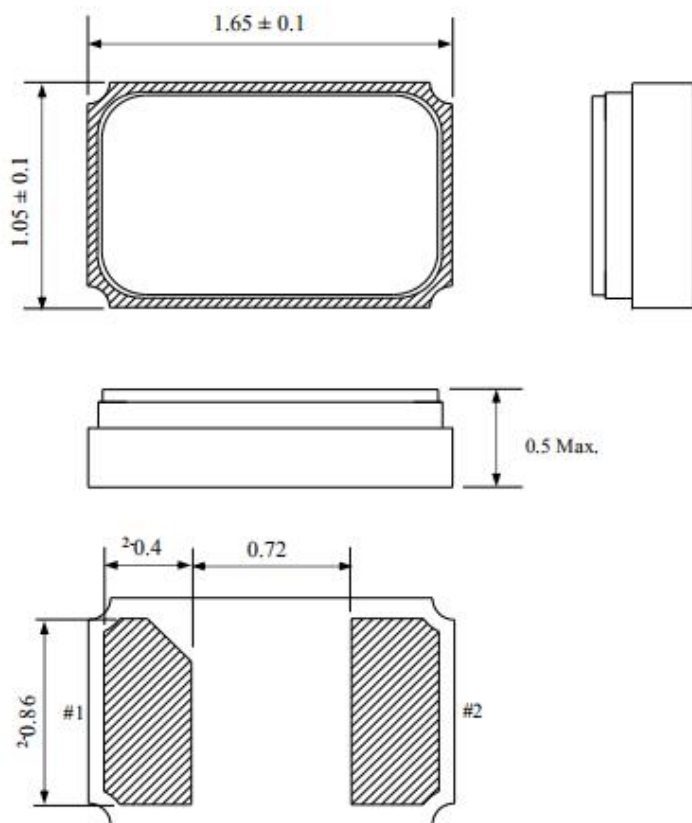
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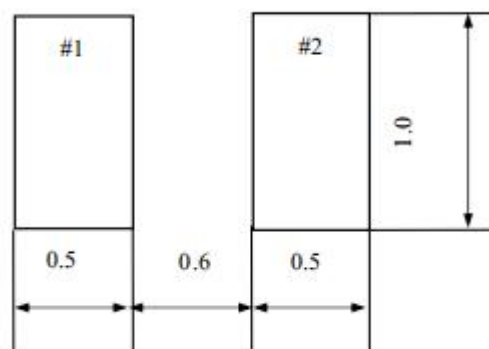
■.电性能参数规格 ELECTRICAL SPECIFICATIONS

1	规格型号 Holder Type	SMD1610
2	标称频率 Nominal Frequency	32.768KHz
3	负载电容 Load Capacitance	12.5pF
4	调整频差 Frequency Tolerance at 25℃	±20ppm
5	激励功率 Drive Level	0.1uW
6	等效电阻 Equivalent Series Resistance	90KΩ Max
7	峰值温度(频率)Peak Temperature (Frequency)	25±5℃
8	工作温度 Operating Temperature Range	-40~85℃
9	贮存温度 Storage Temperature Range	-55~105℃
10	温度频差 Temperature Frequency Stability	-0.04ppm/℃ ²
11	静电容 Shunt capacitance	1.3pFTyp.
12	绝缘阻抗 Insulation Resistance	500MΩ/100V±15V _{DC}
13	年老化率 Aging	±3ppm/First year

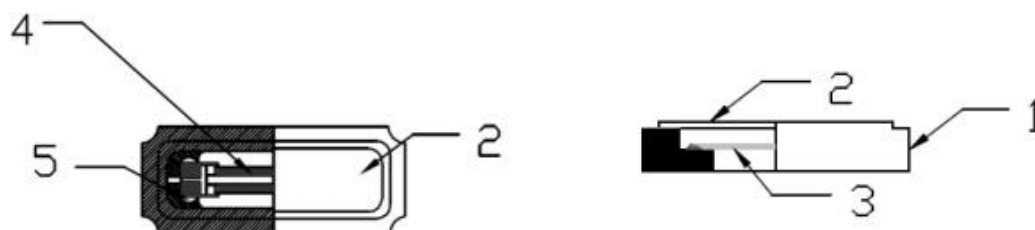
■ 产品尺寸 DIMENSIONS(Units:mm)



■ 内部连接 Internal Connection

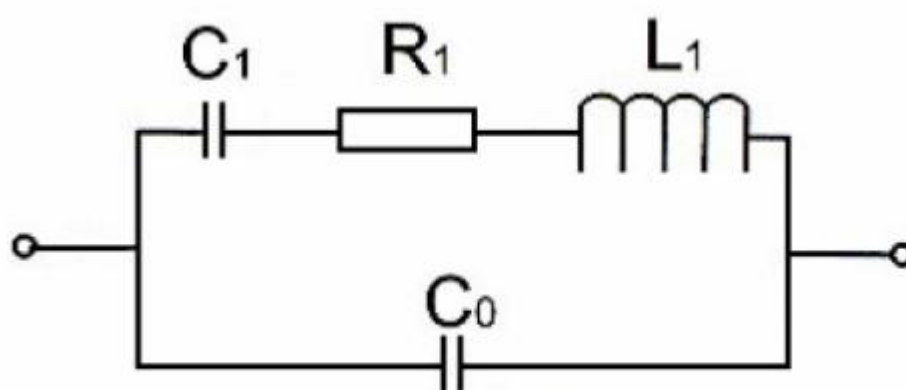
■ Recommended soldering
pattern 建议焊接模式

■ 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 (Al2O3)
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	Au、Ag (Au+Ag)
5	接着剂 Adhesive	树脂、银粉 Resin、Ag

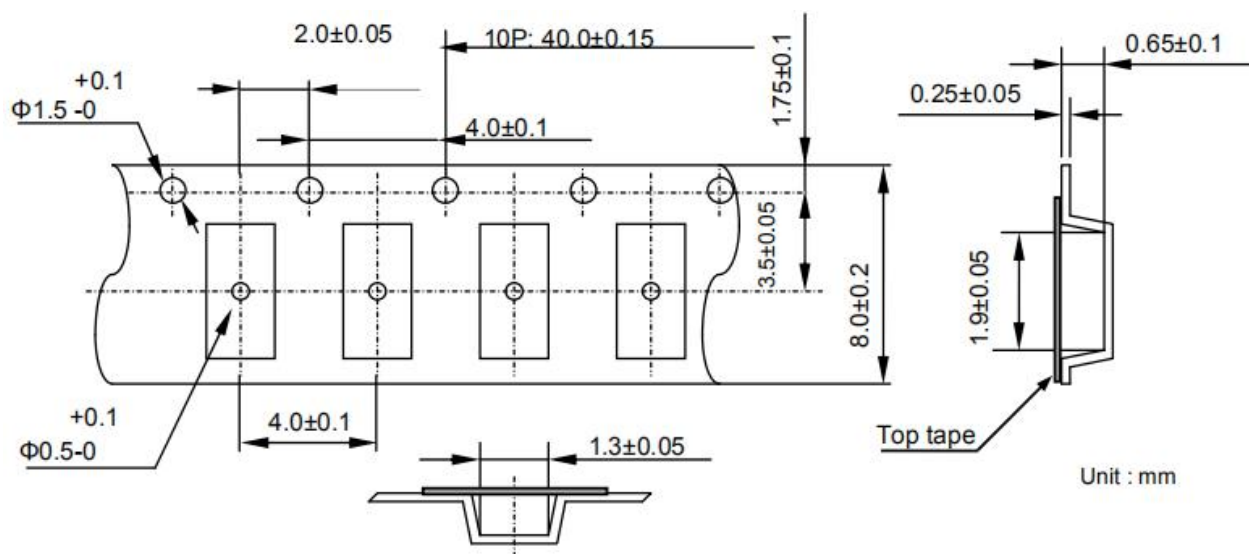
■ 等效电路图 EQUIVALENT CIRCUIT



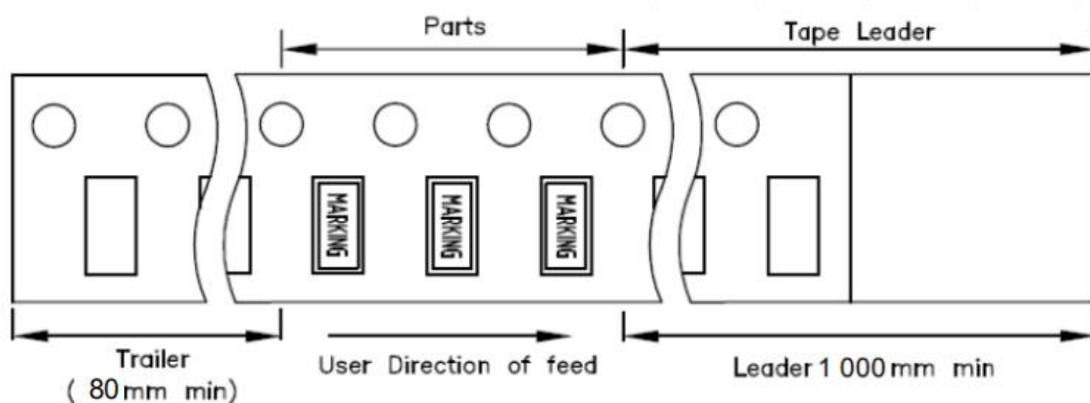
Equivalent Circuit

■ 包装 PACKING (Units:mm)

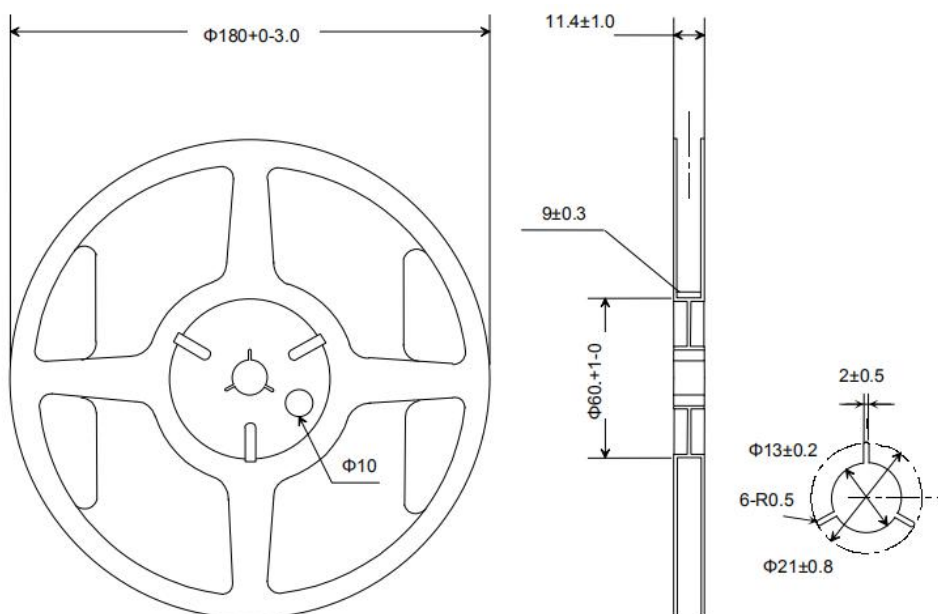
※载带类型 CARRIER TYPE



备注 REMARK:

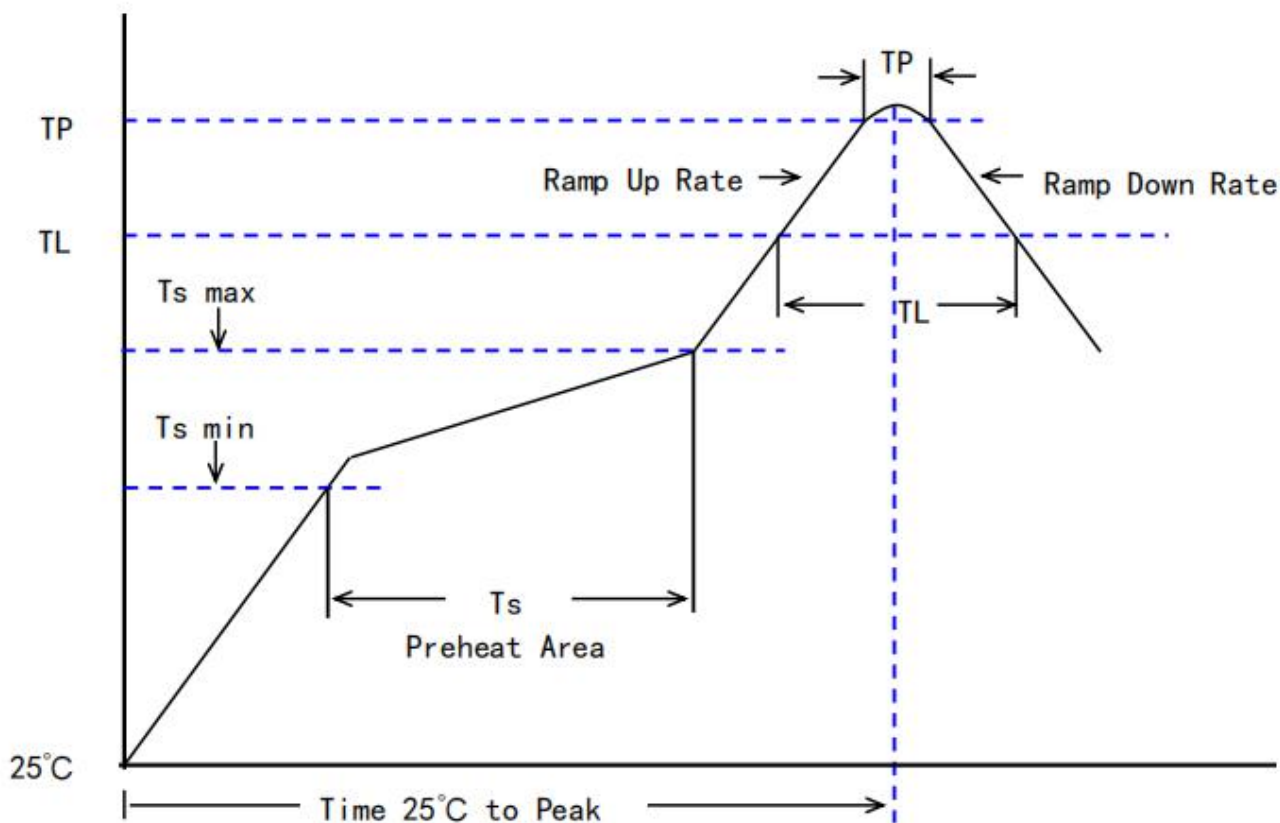


※圆卷 REEL: 5000 PCS/Reel

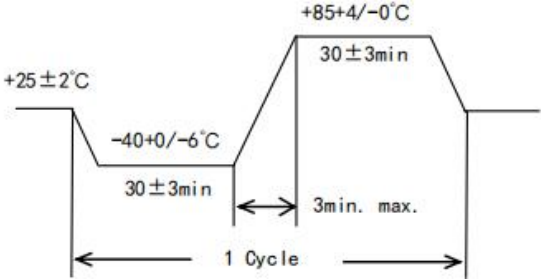


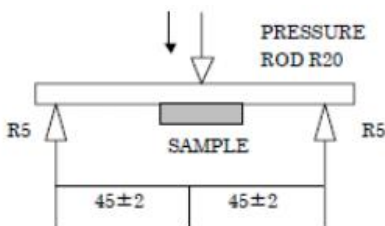
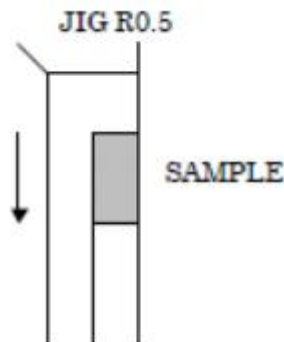
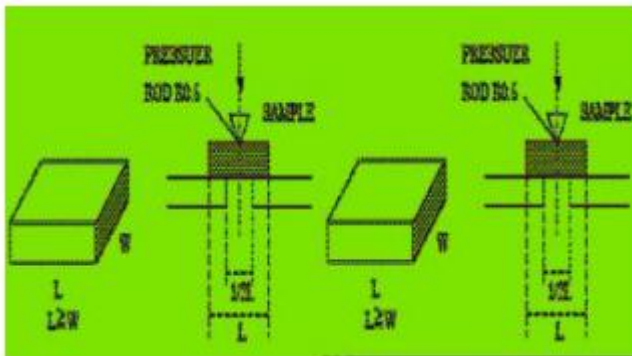
■ 回流焊温度曲线 SUGGESTED REFLOW PROFILE:

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



■可靠性试验 RELIABILITY SPECIFICATIO

参考标准 REFER		JIS C 6701	
NO.	项目 ITEM	测试条件 CONDITIONS	测试标准 Criteria
1	跌落 FREE FALL	从 180cm 位置高度跌落在水泥板上,分 6 个面, 每个面跌落 3 次. Dumy:150g,Height:180cm;Dropped Cycle:3 Cycle DROP IT ONTO A CONCRETE BOARD FOR 6 DIRECTIONS('XX','YY','ZZ') THIS SHOULD BE 1 CYCLE	B. C
2	振动 VIBRATION	振动频率: 10~55 Hz, 振幅: 1.5mm±15%, 时间: 每个方位三面 (X、Y、Z) 各振动 2 小时 FREQUENCY: 10~55Hz;AMPLITUDE (TOTAL EXCURSION): 1.5mm±15%SWEEP TIME: 2-3MIN, 3 DIRECTION(X, Y, Z) EACH FOR 2 Hrs.	A. C
3	冷热冲击 TEMPERATURE CYCLE	晶体放入试验箱中, 高、低温循环 100 次 THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES 	A. C. G
4	气密性 FINE LEAK	氦气压力标准: 5.0~5.5Kg/cm ² , 加压时间: 2 小时 HELIUM BOMBING 5.0~5.5 Kgf / cm ² ,FOR 2 HOURS.	E
5	可焊性 SOLDERABILITY	温度: 260±5°C, 浸锡时间: 2±0.6 秒 THE LEAD IS IMMERSIED IN A 260±5°C SOLDER BATH WITHIN 2±0.6 SECONDS.	F
6	高温高湿 HIGH TEMP. & HUMIDITY	温度: 60±2°C, 湿度: 90%~95%, 保持时间: 500 个小时 STORED AT 60±2°C AND HUMIDITY 90~95% FOR 500±12H.	A. C. D. G
7	高温存储 HIGH TEMPERATURE STORAGE	高温温度: 125±2°C, 时间: 1000±12 个小时 STORED AT 125±2°C FOR 1000±12H. 如果客户的温度要求是高于标准,则必须根据客户的要求测试 If Customer's temperature request is higher than the standard, Temperature test must be done for customer requirements	B. C. G

参考标准 REFER		JIS C 6701	
NO.	项目 ITEM	测试条件 CONDITIONS	测试标准 Criteria
8	低温存储 LOW TEMPERATURE STORAGE	低温温度: $-40 \pm 2^{\circ}\text{C}$, 时间: 500 ± 12 个小时 STORED AT $-40 \pm 2^{\circ}\text{C}$ FOR $500 \pm 12\text{H}$. 如果客户的温度要求是低于标准,则必须根据客户的要求测试 If Customer's temperature request is lower than the standard, Temperature test must be done for customer requirements	A. C. G
9	折板弯曲试验 TERMINAL STRENGTH	弯曲度: 3mm, 保持时间: 5sec, 速度: 0.5mm/sec 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. 	B. C
10	折板推力试验 STICKING TENDENCY	荷重: 10N, 保持时间: 10 秒, 治具: R0.5(制品侧边位置) 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. 	B. C
11	本体荷重试验 ELEMENT ASSEMBLY STRENGTH	荷重: 10N, 保持时间: 10 秒, 治具: R0.5(制品中心位置) A R0.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS. 	B. C

SPECIFICATIONS		
A	FREQUENCY CHANGE PERMITTED.	$\Delta F \leq 10\text{PPM}$
B	FREQUENCY CHANGE PERMITTED.	$\Delta F \leq 20\text{PPM}$
C	EQUIVALENT SERIES RESISTANCE CHANGE PERMITTED.	$\Delta CI \leq 5K\Omega$ or 20%
D	INSULATION RESISTANCE	$> 500M\Omega$
E	LEAK RATE LESS THAN	$< 1*10^{-9} \text{ Pa} \cdot \text{m}^3 / \text{sec}$
F	A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM 95% OF THE SURFACE	
G	THEN $25 \pm 2^\circ\text{C}$ OVER 2Hr BEFORE TESTING	

备注 Notes:

1.超声波清洗 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，建议超声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 certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillation frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

2.超声波焊接 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的原因。

Avoid mounting and processing by Ultrasonic 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 $5^\circ\text{C} \sim 40^\circ\text{C}$ 。

Storage Temperature is only for the product itself, the temperature for the packing material is $5^\circ\text{C} \sim 40^\circ\text{C}$.

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

温度: $350 \pm 10^\circ\text{C}$, 时间: 3 秒 Max, 次数: 2 次 Max.

Temperature: $350 \pm 10^\circ\text{C}$, Time: 3 sec max, Re-solder times: twice max.