

深圳市晶鸿辉电子有限公司

SHENZHEN JINGHONG HUI ELECTRONICS CO., LTD

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產品規格書 SPECIFICATION

標題 Title: 石英晶體諧振器規格書 QUARTZ CRYSTAL SPECIFICATION

柱状石英晶体谐振器

SPECIFICATION FOR TUNING FORK CRYSTAL RESONATOR

外型 Holder Type: ϕ 3×9mm

頻率范围 Frequency Range: 3.579~4.5MHz

承认日期 Date of Approval	年 月 日 Year Month Day
承认栏 Approval By	

ACCEPTED/CONFIRMED BY (承认):

设计: Issued by	Allen Liu	审核: Checked by	应泽锋	批准: Approved by	朱海挺
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石英晶體諧振器規格書

QUARTZ CRYSTAL SPECIFICATION

編號 Spec No.

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二、技术指标 Electrical Characteristics

	项目 Item	规格 Specification
1	标称频率 Nominal Frequency	4.000MHz
2	壳形 Holder Type	3×9mm
3	振动模式 Oscillator Mode	AT Fundamental
4	调整频差(25°C) Frequency Stability (25°C)	±20ppm
5	工作温度范围 Operating Temperature Range	-20°C~+75°C
6	温度频差 Frequency Stability vs. Temp.	±30ppm
7	负载电容 Load Capacitance	20 pF
8	谐振电阻 Equivalent Series Resistance	120 max
9	静电容 Shunt Capacitance	7.0pF max
10	激励功率 Drive Level	1~100μW 10μW in standard
11	绝缘电阻 Insulation Resistance	100M at DC100V
12	年老化率 Aging Rate a Year	±3ppm
13	检测仪器 Test Impedance Meter	S&A250B
14	印字形式 Marking	4.000
15	存储温度范围 Storage Temperature Range	-40°C~+85°C
16	存储湿度范围 Storage Humidity Range	0~95% RH

三、外形及尺寸 Appearance and Dimensions

1. 外观：标志清晰，外表光洁无污点和损伤。
Appearance: Marking clear, no visible damage and dirt.
2. 外形尺寸：图一所示。
Dimensions: See figure 1.



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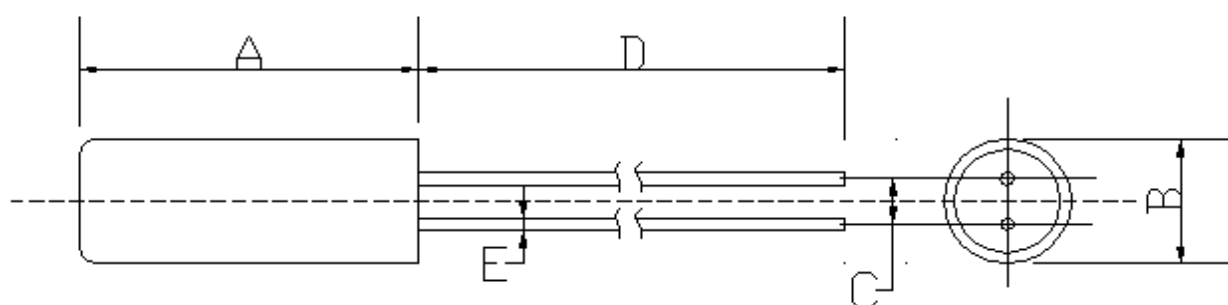
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图一：外形尺寸图 **unit: mm**

Figure 1. Dimensions



Unit: mm

HOLDER	A	B	C	D	E
2×6	6.0	Φ1.95	0.7	7.0	Φ0.2
3×8	8.0	Φ3.0	1.1	10.0	Φ0.3
*3×9	9.0	Φ3.0	1.1	10.0	Φ0.3
3×10	10.0	Φ3.0	1.1	10.0	Φ0.3

四、机械及环境性能

序号	类别	规范	检验标准
1	自由跌落	从75cm高度自由跌落到30mm厚硬木板上，跌落三次	满足电器性能规定
2	振动	频率10~55Hz，振幅1.50mm，X、Y、Z方向各振动30分钟	满足电器性能规定
3	引出端强度	a.拉力：固定谐振器主体，沿引脚轴向施加0.9Kg拉力，保持30±5秒。 b.弯曲：引脚端头悬挂450g的重物，弯曲90°，时间2~3秒，以相同速度返回原位置，再反向操作一次。	引脚无拔出或断裂现象
4	密封性	将谐振器浸在酒精中，加压4Kg/cm ² ，时间五分钟。	测量引脚与基座间绝缘电阻>100M (DC100V)
5	波峰焊接热	从引脚末端至底部2~2.5mm放入235°C±10°C的焊槽内，时间3~5秒。	沾锡面>95%，频率变化 ±10ppm
6	人工焊接热	从引脚末端至底部2~2.5mm处放入260°C±10°C的焊槽内，时间2~3秒	外观无异常，满足电器性能规定
7	温度循环	将谐振器放置在高低温箱中，将温度设置在-10°C，温度到达后保持30分钟，再将温箱升温到+70°C，保持30分钟，这是一个循环；再将温箱降温到-10°C，开始下一个循环，如此循环三次	外观无损伤，满足电器性能规定
8	恒定湿热	在40±3°C，RH90%~95%，放置96小时，取出后恢复2小时	外观无异常，满足电器性能规定
9	耐低温	在-40°C±3°C下，放置96小时，取出后在常温下恢复2小时，	外观无异常，满足电器性能规定
10	高温老化	85°C±3°C老化96小时，取出后常温下恢复2小时	外观无异常，满足电器性能规定

四、Physical and Environment Characteristics

Item	Condition of test	Performance Requirements
Mechanical Shock	Resonator shall be measured after 3 times random dropping from the height of 75cm onto hard wooden board of thickness more than 30mm	No visible damage, and measured Values shall meet Table 1
Vibration	Subject resonator to following vibration: Frequency: 10~55Hz Amplitude: 1.5mm Duration: 3 mutually perpendicular planes in each 30 min. Direction: X Y and Z axis	No visible damage, and measured Values shall meet Table 1
Terminal Strength Terminal Pulling Terminal Bending	Force of 5N is applied to each lead in axial direction for 30±5 sec. When force of 5N is applied to each lead in axial direction, the lead shall folded up 90° from the axial direction and folded back to the axial direction. The speed of folding shall be each 3 seconds.	No visible damage, nor shall the hermetic seal break down and measured Values shall meet Table 1
Solder ability	Lead terminals are immersed up to 2mm from Resonator's body in soldering bath of 235±10°C for 3~5 sec.	More than 95% of the terminal surface of the resonator shall be covered with fresh solder
Resistance to Soldering Heat	Lead terminals are immersed up to 2~2.5mm from Resonator's body in soldering bath of 260±10°C for 2~3 seconds and then resonator shall be measured after being placed in natural conditions for 1 hour.	No visible damage, and measured Values shall meet Table 1
Temperature Cycling	Subject the resonator to -10°C for 30 min, followed by a high temperature of +70°C for 30 min. Cycling shall be repeated 3 times, resonator shall be measured after being placed in natural conditions for 1 hour.	No visible damage, and measured Values shall meet Table 1
Heat Resistance	Subject the resonator to +85°C±3°C for 96 hours, resonator shall be measured after being placed in natural conditions for 1 hour.	No visible damage, and measured Values shall meet Table 1
Cold Resistance	Subject the resonator to -40°C±3°C for 96 hours, resonator shall be measured after being placed in natural conditions for 1 hour.	No visible damage, and measured Values shall meet Table 1
Humidity	Subject the resonator at +40°C±3°C and 90%~95% R.H. for 96 hours, resonator shall be measured after being placed in natural conditions for 1 hour.	No visible damage, and measured Values shall meet Table 1

parameter	Specification
Frequency change	No more than ±5ppm (Reference to the initial value)
Crystal Impedance	No more than 10% (Reference to the initial value)

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谐振电阻和振动模式		
Frequency Range 频率范围	ESR (Ω) 谐振电阻	Mode 振动模式
$3.579 \leq f < 4.000\text{MHz}$	180max	基频Fundamental
$4.000 \leq f < 4.500\text{MHz}$	150max	基频Fundamental