



## 深圳市凯越翔电子有限公司

### 石英谐振器规格书

|          |                |
|----------|----------------|
| 产 品 名 称: | 石英晶体谐振器        |
| 产 品 型 号: | 49US/16.000MHZ |
| 产 品 参 数: | 16PF/±10ppm    |
| 原 厂 型 号: | KUS160001610   |
| 凯越翔技术部:  | 董宗全            |

### 客 户 确 认 印 栏

|         |           |
|---------|-----------|
| 认 证 印 章 | 负 责 人 印 章 |
| 年 月 日   | 年 月 日     |

本规格章程连同本页合共 5 页

# 产 品 规 格 书

|                                   |                                                                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                                   |                                                                                                                 |
| <b>1.GENERAL</b>                  |                                                                                                                 |
| 1.1 HOLDER TYPE                   | 49US                                                                                                            |
| 1.2 MODE OF VIBRATION             | AT CUT                                                                                                          |
| 1.3 OSCILLATION MODE              | FUND                                                                                                            |
| 1.4 TEST FACILITIES               | S&A KH-1240                                                                                                     |
| 1.5 STORAGE TEMPERATURE           | -40℃ TO +85℃                                                                                                    |
| 1.6 DRIVER LEVEL                  | 100 μ W                                                                                                         |
| <b>2.ELECTRICAL PARAMETER</b>     |                                                                                                                 |
| 2.1 NORMAL FREQUENCY              | 16.000 MHz                                                                                                      |
| 2.2 FREQUENCY TOLERANCE (25℃ ±2℃) | ±10ppm                                                                                                          |
| 2.3 TEMPERATURE STABILITY         | ±20ppm                                                                                                          |
| 2.4 OPERATING TEMPERATURE RANGE   | -20℃ TO +70℃                                                                                                    |
| 2.5 LOAD CAPACITANCE              | 16 PF                                                                                                           |
| 2.6 MOTIONAL CAPACITANE           |                                                                                                                 |
| 2.7 SHUNT CAPACITANCE             | 5PF MAX                                                                                                         |
| 2.8 EFFECTIVE SERIES RESISTANCE   | 60 Ω MAX                                                                                                        |
| 2.9 INSULATION RESISTANCE         | 500M OHMS MIN AT DC 100V                                                                                        |
| <b>3.MECHANICAL PARAMETER</b>     |                                                                                                                 |
| 3.1 SOLDERABILITY                 | 95%COVERAGE BY USING 90/10<br>SOLD AT 245℃ FOR 5 SEC. DIPING<br>AFTER IMMERSION IN ALPHA 611<br>FLUX FOR 5 SEC. |

## I MECHANICAL ENDURANCE 机械特性

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.

试验产品应在室温下放置 1 小时后方可进行以下试验。

### ①SHOCK 抗击测试

Electrical characteristics shall be satisfied after dropping three time from the height of 50 cm onto Hard wooden board .

产品从 50 cm 高度自由落下到硬木板 3 次电气参数仍符合要求。

### ②VIBRATION 抗振测试

Electrical characteristics shall be satisfied after supplying following Vibration .

电气性能应满足以下的振动要求。

|              |           |       |                                 |
|--------------|-----------|-------|---------------------------------|
| (1)VIBRATION | FREQUENCY | 振动频率  | 10—55Hz                         |
| (2)REPEATED  | PERIOD    | 周 期   | 1—2min                          |
| (3)FULL      | CYCLE     | 全 振 幅 | 1.5mm P—P                       |
| (4)DIRECTION |           | 振动方向  | X.Y.Z                           |
| (5)TIME      |           | 振动时间  | 2hours/each direction 2 小时/每个方向 |

### ③STRENGTH OF TERMINALS/LEAD—WIRES 引脚与基座底部的强度测试

#### -1 PULLING 拉力测试

a)Body of specimen shall be fixed, and 900g of tension weight shall be supplied gradually to axial direction of terminals/lead-wires for 30 sec .

产品应固定在 900g 的拉力的情况下逐渐延基座底部/引线脚中轴方向拉 30 秒钟。

b)After above test a), there is no observation of any visual damages on the specimen.

经过 a)的测试，产品应没有任何可以目测到的损坏。

#### -2 BENDING 弯曲度测试

a)Body of specimen shall be fixed, and 90degree bending shall be given, being supplied 225gs tension weight .

After that, terminals/lead-wires shall be straightened gradually .

Then the same bending and straightening shall be supplied to the opposite direction in the same axial . (Refer to Fig-1)

产品固定后，以 90° 的弯曲并供以 225g 的拉力，然后沿同一轴线并与相反的方向 90° 的弯曲及伸直。（如图 1 所示）

b)After above test a), there is no observation of any visual damages on the specimen .

通过 a)测试后，晶体上应没有任何可以目测到的损坏。

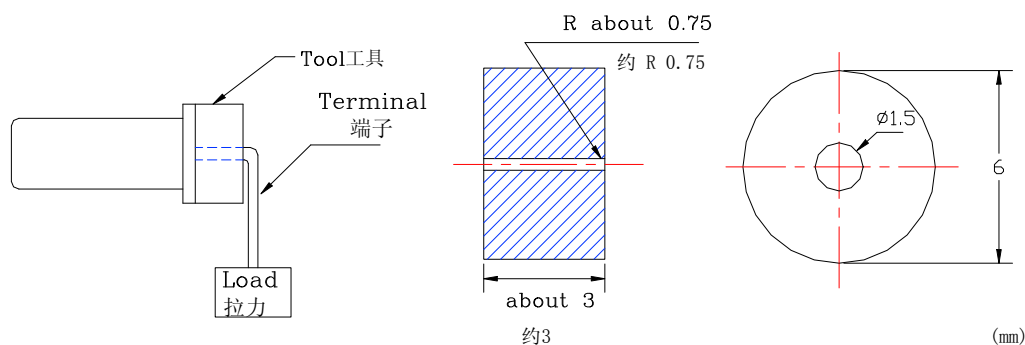


FIG-1

④SEALING TIGHTNESS 气密性测试

There is no observation of gas bubble after specimen put in hot water at  $+90^{\circ}\text{C}$ — $+95^{\circ}\text{C}$  for 5 min .

晶体置于 $+90^{\circ}\text{C}$ — $+95^{\circ}\text{C}$ 的热水中 5 分钟，应没有气泡产生。

⑤SOLDERING DIP 浸锡测试

Terminals/lead-wires of specimen shall be dipped into solder melted tank at  $+230^{\circ}\text{C}$ — $\pm 5^{\circ}\text{C}$  for 3sec . Dipping depth shall be 2mm from the bottom of specimens body . (After applying ROSIN flux) Soldering portion shall be covered in over 90% of terminals/lead-wires dipped .

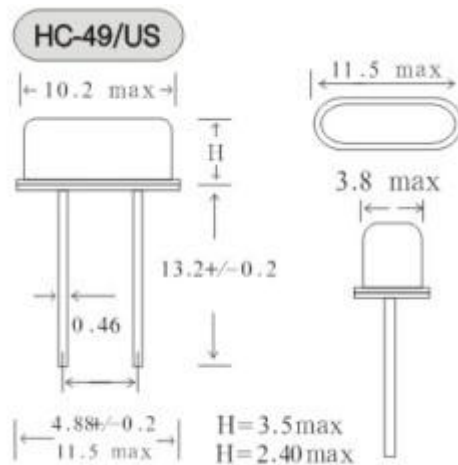
将晶体引线脚置于 $+230^{\circ}\text{C}$ — $\pm 5^{\circ}\text{C}$ 的锡桶中 3 分钟，基座底部离锡表面 2mm，（加上松香焊剂后）引线脚的沾锡率为 90% 以上。

⑥SOLDER HEATING 沾锡耐热性测试

Terminals/lead-wires of specimen shall be dipped into solder melted tank at  $+350^{\circ}\text{C}$ — $\pm 10^{\circ}\text{C}$  for  $\frac{1}{3}$  sec .

Electrical characteristics shall be satisfied after dipping depth shall be 2mm from edge of terminals/lead-wires .

将已沾锡的产品的引线脚置于 $+350^{\circ}\text{C}$ — $\pm 10^{\circ}\text{C}$ 的锡桶中 3-4 秒钟后 基座底部离锡表面



2mm，电气性能仍符合要求。7. 图示结构：

II ENVIRONMENTAL ENDURANCE 环境特性

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour .

必须将试验产品在室温下放置 1 小时后方可进行测试。

①HUMIDITY 耐湿测试

Electrical characteristics shall be satisfied after letting it alone at 60℃—±2℃ in humidity of 90—95% for 250 hours .

试验产品在温度为 60℃—±2℃，相对湿度 90—95%的试验箱内放置 250 小时后电气性能仍符合要求。

②STORAGE IN LOW TEMPERATURE 低温储存测试

Electrical characteristics shall be satisfied after letting it alone at -30℃—±2℃ for 250 hours .

试验产品在温度为-30℃—±2℃的试验箱中放置 250 小时后电气性能仍符合要求。

③STORAGE IN HIGH TEMPERATURE 高温储存测试

Electrical characteristics shall be satisfied after letting it alone at +85℃—±2℃ for 250 hours .

试验产品在温度为+85℃—±2℃的试验箱中放置 250 小时后电气性能仍符合要求。

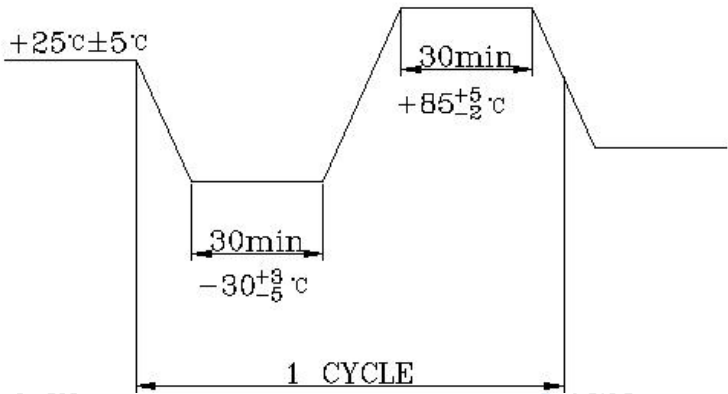
④TEMPERATURE CYCLE 温度变换测试

Electrical characteristics shall be satisfied after supplying the following temperature cycle (3cycles) .

Temperature shift from low to high, high to low shall be done in 1℃/min (Refer to Fig-2) .

电气性能应满足以下温度周期要求（3 个周期）

温度变换从低到高，从高到低变化量为 1℃/分。（如图 2 所示）



PIG — 2

|     |     |     |     |     |     |
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| 拟 制 | 成望生 | 审 核 | 董宗全 | 批 准 | 谢为亮 |
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