



福建省长兴电子有限公司

CHANGXING ELECTRONICS CO., LTD.

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## 石英晶体谐振器产品确认书

Quartz Crystal Resonator Specification For Approval

|                     |                     |
|---------------------|---------------------|
| 产品型号:               | HC-49S 22.118400MHz |
| Model               |                     |
| 客户名称:               |                     |
| Customer            |                     |
| 客户编号:               |                     |
| Customer's Part No. |                     |
| 长兴编号:               | 8B221G0316          |
| Product No.         |                     |
| 发行日期:               |                     |
| Issue Date          |                     |

承办: 吴丽萍

审核: 杨启付

批准: 吕锡昌

内容:

- 1、Features 特点
- 2、Electrical Specifications 电气参数
- 3、Dimensions 外型尺寸
- 4、Marking 印码
- 5、Reflow Condition 回流焊条件
- 6、Packing 包装 (EIA-481-2)
- 7、Reliability Specifications (可靠性规范)
- 8、Material Composition Declaration (产品物质成分表)

客户 Conclusion:

☐ Conditional Approval ☐ Full Approval ☐ Reject

|                  |  |
|------------------|--|
| 会<br>签<br>意<br>见 |  |
|------------------|--|

APPROVED BY :

ISSUED DATE :

HC-49S Metal Can Type Crystals / 8B Series

■ Features 特点

- . Resistance welded type crystal units.
- . A great number of standard frequencies.
- . High frequency pullability and low equivalent series resistance.
- . Lower cost and highly mass production capability.
- . The best choice of PC, STB, LCDM, and Cable Modem.
- . RoHS Compliant / Pb Free.

■ Electrical Specifications 电气参数

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

- Ambient temperatu:  $22 \pm 5^{\circ}\text{C}$
- Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

- Ambient temperatu:  $22 \pm 1^{\circ}\text{C}$
- Relative humidity : 40%~70%

Measure equipment

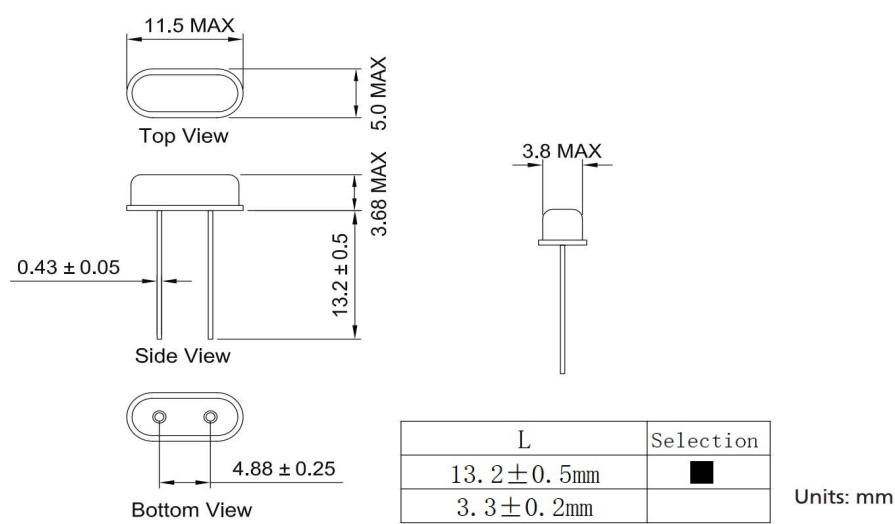
Electrical characteristics measured by S&A 250B or equivalent.

Crystal cutting type

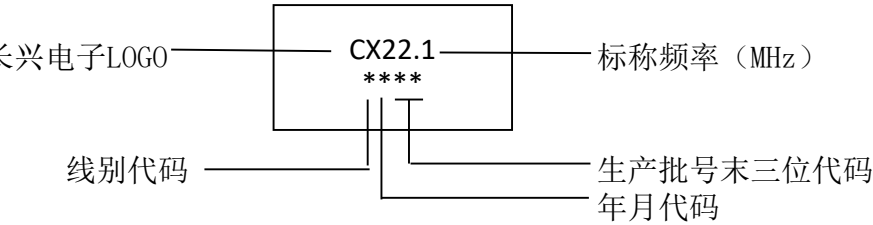
The crystal is using AT CUT (thickness shear mode).

|    | Parameters                | Electrical Spec. | UNITS              | Notes                                         |
|----|---------------------------|------------------|--------------------|-----------------------------------------------|
| 1  | Nominal Frequency         | 22.118400        | MHz                | -                                             |
| 2  | Oscillation Mode          | Fund             | -                  | -                                             |
| 3  | Load Capacitance          | 16               | pF                 | -                                             |
| 4  | Frequency Tolerance       | $\pm 20$         | ppm                | at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ |
| 5  | Frequency Stability       | $\pm 30$         | ppm                | Over Operating Temp. Range                    |
| 6  | Operating Temperature     | $-40 \sim +85$   | $^{\circ}\text{C}$ | -                                             |
| 7  | Aging                     | $\pm 3$          | ppm                | 1st Year                                      |
| 8  | Drive Level               | 100              | $\mu\text{W}$      | -                                             |
| 9  | Effective Resistance Rr   | 30 Max.          | $\Omega$           | -                                             |
| 10 | Shunt Capacitance C0      | 5 Max.           | pF                 | -                                             |
| 11 | Motional Capacitance C1   | -                | fF                 | -                                             |
| 12 | Pulling Sensitivity TS    | -                | ppm/pF             | -                                             |
| 13 | Spurious Response         | -3.0             | dB                 | -1000~+5000 ppm 步                             |
| 14 | Insulation Resistance     | 500 Min.         | M $\Omega$         | at DC 100V                                    |
| 15 | Storage Temperature Range | $-40 \sim +85$   | $^{\circ}\text{C}$ | -                                             |
| 16 | RLD2                      | 30 Max.          | $\Omega$           | 0.1, 1, 10, 50, 100, 500 $\mu\text{W}$        |
| 17 | FDDL                      | 10 Max.          | ppm                |                                               |
| 18 | DLD2                      | 10 Max.          | $\Omega$           |                                               |
| 19 | FDLDH                     | -                | ppm                |                                               |
| 20 | DLDH2                     | -                | $\Omega$           |                                               |
| 21 | DLDF                      | -                | $\Omega$           |                                               |
| 22 | DLD2 (低)                  | -                | $\Omega$           | -                                             |
| 23 | MSL                       | Level 1          | -                  | IPC/JEDEC J-STD-033C                          |
| 24 | Others                    | -                | -                  | -                                             |

■ Dimensions外型尺寸



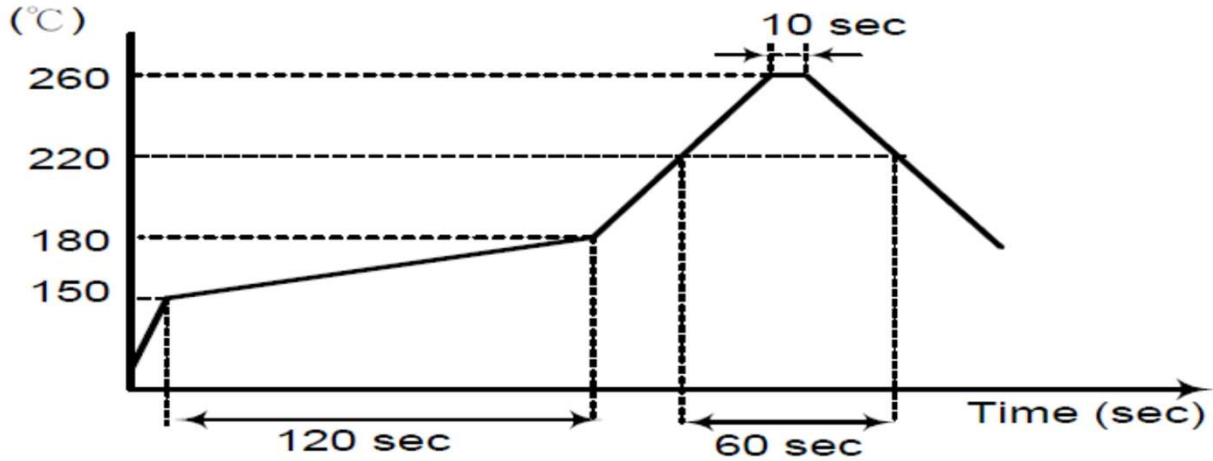
■ Marking印码



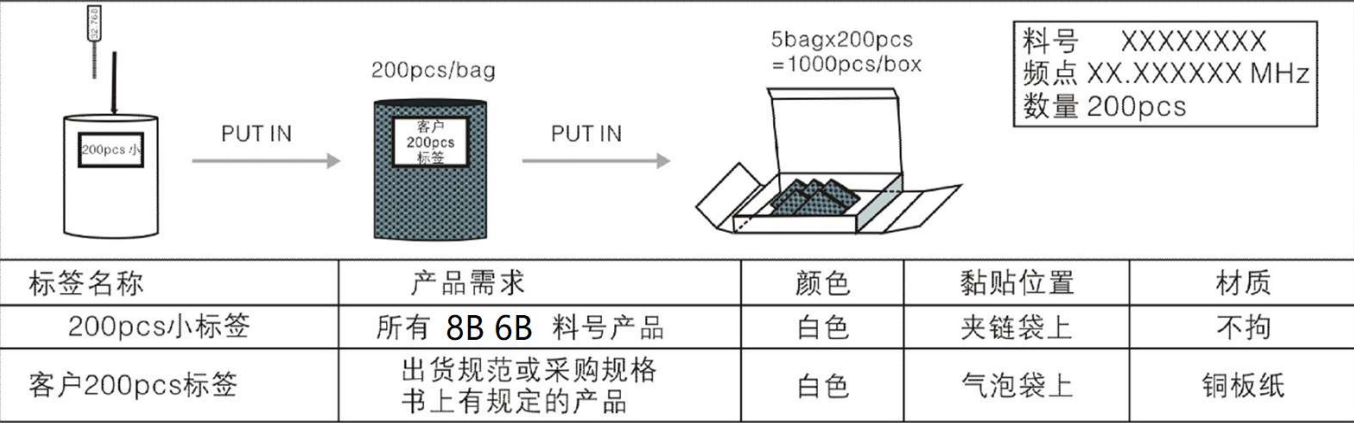
年月代码（四年一个周期）：

| 月份   |      | 一 月 | 二 月 | 三 月 | 四 月 | 五 月 | 六 月 | 七 月 | 八 月 | 九 月 | 十 月 | 十 一 月 | 十 二 月 |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|
| 年份   |      |     |     |     |     |     |     |     |     |     |     |       |       |
| 2023 | 2027 | a   | b   | c   | d   | e   | f   | g   | h   | j   | k   | l     | m     |
| 2024 | 2028 | n   | p   | q   | r   | s   | t   | u   | v   | w   | x   | y     | z     |
| 2025 | 2029 | A   | B   | C   | D   | E   | F   | G   | H   | J   | K   | L     | M     |
| 2026 | 2030 | N   | P   | Q   | R   | S   | T   | U   | V   | W   | X   | Y     | Z     |

■ Reflow Condition回流焊条件



■ Packing包装 (EIA-481-2)

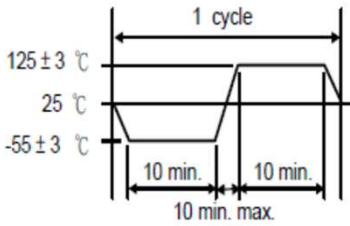


■ Reliability Specifications (可靠性规范)

1. Mechanical Endurance (机械耐久性)

| No. | Test Item        | Test Methods                                                                                                                                             | REF. DOC     |
|-----|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1.1 | Drop Test        | 75 cm height, 3 times on concrete floor .                                                                                                                | JIS C6701    |
| 1.2 | Mechanical Shock | Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time                                  | MIL-STD-202F |
| 1.3 | Vibration        | Frequency range 10 ~ 2000 Hz<br>Amplitude 1.52 mm/20G<br>Sweep time 20 minute<br>Perpendicular axes each test time 4 hours<br>(Total test time 12 hours) | MIL-STD-883E |
| 1.4 | Gross Leak       | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm2                                                                              | MIL-STD-883E |
| 1.5 | Fine Leak        | Helium Bombing 4.5 Kgf / cm2 for 2 hr                                                                                                                    |              |
| 1.6 | Solderability    | Temperature 260 °C ± 5°C<br>Immersing depth 0.5 mm minimum<br>Immersion time 5 ± 1 seconds<br>Flux Rosin resin methyl alcohol solvent ( 1 : 4 )          | MIL-STD-883E |

2. Environmental Endurance (环境耐久性)

| No. | Test Item                    | Test Methods                                                                                                                                | REF. DOC     |
|-----|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 2.1 | Resistance To Soldering Heat | Pre-heat temperature 125 °C<br>Pre-heat time 60 ~ 120 sec.<br>Test temperature 260 ± 5 °C<br>Test time 10 ± 1 sec.                          | MIL-STD-202F |
| 2.2 | High Temp. Stora             | + 125 °C ± 3 °C for 1000 ± 12 hours                                                                                                         | MIL-STD-883E |
| 2.3 | Low Temp. Storag             | - 40 °C ± 3 °C for 1000 ± 12 hours                                                                                                          |              |
| 2.4 | Thermal Shock                | Total 100 cycles of the following temperature cycle<br> | MIL-STD-883E |
| 2.5 | High Temp&Humid              | 85°C ± 3°C , RH 85% , 1000Hrs                                                                                                               | JIS C5023    |

# Material Composition Declaration

## 材 料 成 份 表

1.PRODUCTION NAME : 49S  
2.PRODUCTION WEIGHT(mg) : 561.669

| 编号<br>No. | 构成部件<br>Name of Part | 部件材质名<br>Material Name | 材质质量<br>Material Mass(mg) | 材质质量百分比<br>Mat er i al mass ( %) | 构成之元素名称<br>Constituent name                      | CAS编号 CAS No. | 元素百分比<br>Material Analysis(%) |
|-----------|----------------------|------------------------|---------------------------|----------------------------------|--------------------------------------------------|---------------|-------------------------------|
| 1         | 基座<br>Base           | 底板                     | 309.10                    | 55.03%                           | Fe<br>Iron                                       | 7439-89-6     | 99.80%                        |
|           |                      |                        |                           |                                  | Mn<br>Manganese                                  | 7439-96-5     | 0.20%                         |
|           |                      | 引线                     | 41.21                     | 7.34%                            | Fe<br>Iron                                       | 7439-89-6     | 53.03%                        |
|           |                      |                        |                           |                                  | Mn<br>Manganese                                  | 7439-96-5     | 0.06%                         |
|           |                      |                        |                           |                                  | Ni<br>Nickel                                     | 7440-02-0     | 28.63%                        |
|           |                      |                        |                           |                                  | Co<br>Cobalt                                     | 7440-48-4     | 16.79%                        |
|           |                      |                        |                           |                                  | Cr<br>chromium                                   | 7440-47-3     | 0.12%                         |
|           |                      |                        |                           |                                  | Cu<br>copper                                     | 7440-50-8     | 0.11%                         |
|           |                      |                        |                           |                                  | others                                           | -----         | 1.26%                         |
|           |                      | 绝缘珠                    | 14.32                     | 2.55%                            | SiO <sub>2</sub><br>Silicon oxide                | 7631-86-9     | 84.78%                        |
|           |                      |                        |                           |                                  | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1     | 14.72%                        |
|           |                      |                        |                           |                                  | others                                           | -----         | 0.50%                         |
|           |                      | 弹片                     | 8.50                      | 1.51%                            | Ni<br>Nickel                                     | 7740-02-0     | 16.61%                        |
|           |                      |                        |                           |                                  | Cu<br>copper                                     | 7440-50-8     | 63.28%                        |
|           |                      |                        |                           |                                  | Zn<br>Zinc                                       | 7440-66-6     | 20.11%                        |
|           |                      | 焊锡                     | 1.40                      | 0.25%                            | Sn<br>tin                                        | 7440-31-5     | 99.34%                        |
|           |                      |                        |                           |                                  | Cu<br>copper                                     | 7440-50-8     | 0.66%                         |
| 2         | 外壳<br>Cover          | 金属<br>Metal            | 182.00                    | 32.40%                           | Cu<br>copper                                     | 7440-50-8     | 64.00%                        |
|           |                      |                        |                           |                                  | Ni<br>Nickel                                     | 7440-02-0     | 18.00%                        |
|           |                      |                        |                           |                                  | Zn<br>Zinc                                       | 7440-66-6     | 18.00%                        |
| 3         | 黏合剂<br>Adhesive      | 金属<br>Metal            | 0.55                      | 0.10%                            | Ag<br>Silver                                     | 7440-22-4     | 79.36%                        |
|           |                      |                        |                           |                                  | Epoxy resin                                      | 2425-79-8     | 20.64%                        |
| 4         | Blank                | 晶片<br>Quartz           | 4.50                      | 0.80%                            | SiO <sub>2</sub><br>Siliconoxide                 | 14808-60-7    | 100.00%                       |
| 5         | Electrode            | 电极<br>Electrode        | 0.09                      | 0.02%                            | Cr<br>Chromium                                   | 7440-47-3     | 5.56%                         |
|           |                      |                        |                           |                                  | Ag<br>silver                                     | 7440-22-4     | 94.44%                        |