



福建省长兴电子有限公司

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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:               | Seam3225 4PIN 50.000000MHz |
| Model               |                            |
| 客户名称:               |                            |
| Customer            |                            |
| 客户编号:               |                            |
| Customer's Part No. |                            |
| 长兴编号:               | 8DSC500G0009L              |
| Product No.         |                            |
| 发行日期:               |                            |
| Issue Date          |                            |

承办: 吴丽萍

审核: 林东国

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 :

### 3. 2x2.5x0.7mm SMD Seam Sealing Crystals / 8D Series

#### ■ Features 特点

- . High precision and high frequency stability.
- . Extremely good for reducing EMI effect.
- . The best choice of Bluetooth, wireless communication set, DSC, PDA, and mobile phone.
- . 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

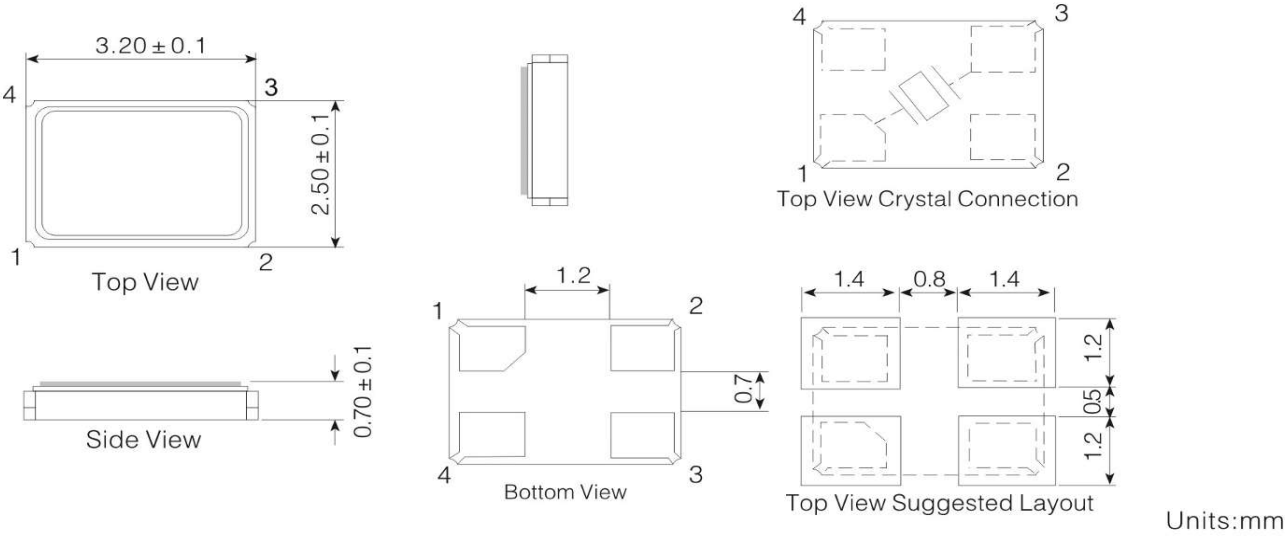
Electrical characteristics measured by HP E5100A or equivalent.

##### Crystal cutting type

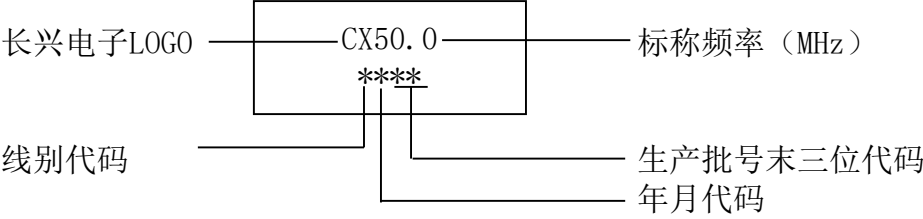
The crystal is using AT CUT (thickness shear mode).

|    | Parameters                | Electrical Spec. | UNITS              | Notes                                         |
|----|---------------------------|------------------|--------------------|-----------------------------------------------|
| 1  | Nominal Frequency         | 50.000000        | MHz                | —                                             |
| 2  | Oscillation Mode          | Fund             | —                  | —                                             |
| 3  | Load Capacitance          | 9                | pF                 | —                                             |
| 4  | Frequency Tolerance       | $\pm 10$         | ppm                | at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ |
| 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              | uW                 | —                                             |
| 9  | Effective Resistance Rr   | 40 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 125 步                         |
| 14 | Insulation Resistance     | 500 Min.         | M $\Omega$         | at DC 100V                                    |
| 15 | Storage Temperature Range | $-55 \sim +125$  | $^{\circ}\text{C}$ | —                                             |
| 16 | RLD2                      | 40 Max.          | $\Omega$           | 0.01~100 $\mu\text{W}$ /Step 30               |
| 17 | FDDL                      | 10 Max.          | ppm                |                                               |
| 18 | DLD2                      | 10 Max.          | $\Omega$           |                                               |
| 19 | FDDLH                     | —                | 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



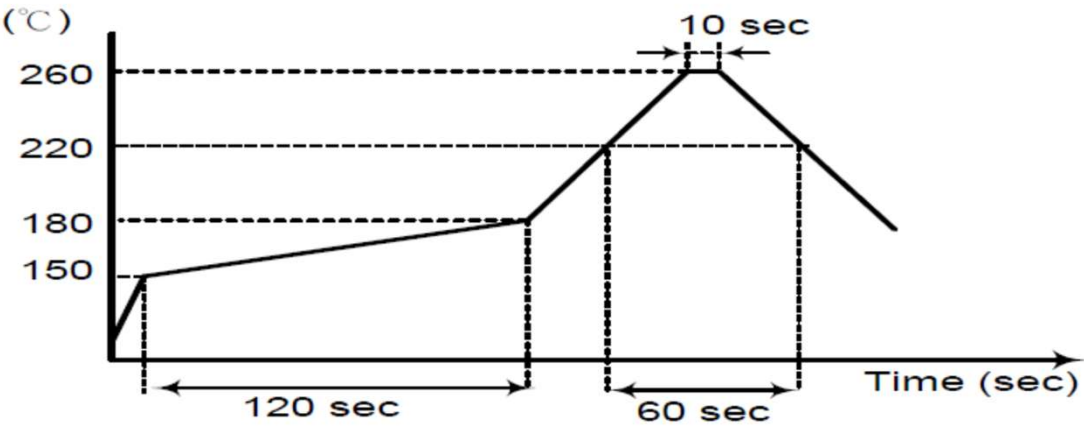
■ Marking印码



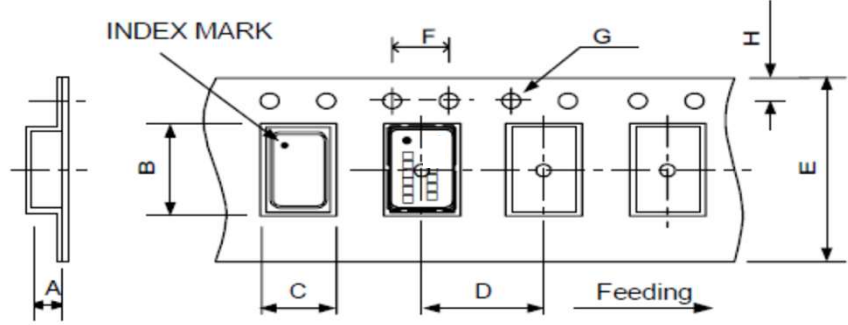
年月代码（四年一个周期）：

| 年份 \ 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 |
|---------|------|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 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   |

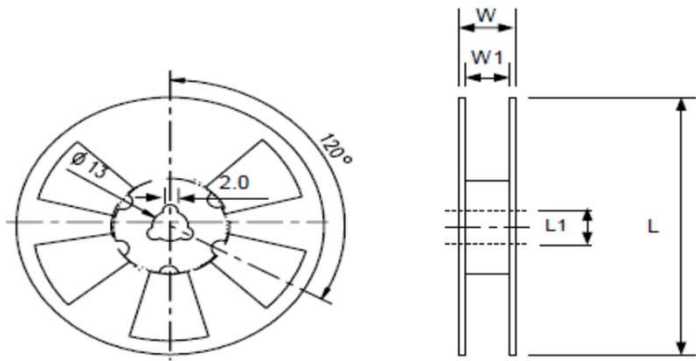
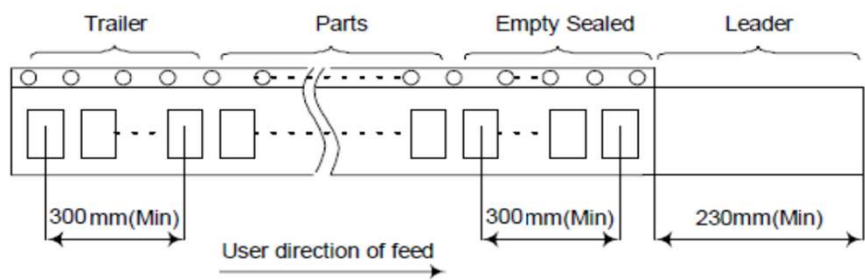
■ Reflow Condition回流焊条件



■ Packing包装 (EIA-481-2)



| DIMENSIONS | A              | B              | C              | D              | E             | F              | G               | H              |
|------------|----------------|----------------|----------------|----------------|---------------|----------------|-----------------|----------------|
| UNIT : mm  | $1.40 \pm 0.1$ | $3.40 \pm 0.1$ | $2.70 \pm 0.1$ | $4.00 \pm 0.1$ | $8.0 \pm 0.2$ | $4.00 \pm 0.1$ | $1.55 \pm 0.05$ | $1.75 \pm 0.1$ |



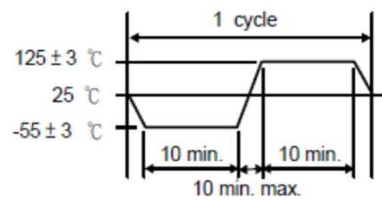
| DIMENSIONS | L             | L1           | W              | W1            | Standard Reel Quantity     |
|------------|---------------|--------------|----------------|---------------|----------------------------|
| UNIT : mm  | $178 \pm 1.0$ | $13 \pm 0.5$ | $11.5 \pm 0.2$ | $8.0 \pm 1.0$ | 3,000 pcs per reel (WHITE) |

## ■ 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        | 150 cm height, 3 times on concrete floor .                                                                                                               | JIS C6701    |
| 1.2 | Shock Test       | 150g/150cm Height, 3 times in the direction of $\pm X, \pm Y, \pm Z$ on concrete floor                                                                   | IEC-68-02-27 |
| 1.3 | 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 |
| 1.4 | 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 |
| 1.5 | Gross Leak       | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm <sup>2</sup>                                                                  | MIL-STD-883E |
| 1.6 | Fine Leak        | Helium Bombing 4.5 Kgf / cm <sup>2</sup> for 2 hr                                                                                                        |              |
| 1.7 | Solderability    | Temperature 260 °C $\pm$ 5°C<br>Immersing depth 0.5 mm minimum<br>Immersion time 5 $\pm$ 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 $\pm$ 5 °C<br>Test time 10 $\pm$ 1 sec.                                                                                                                                                                                                                                                                                                                                                                             | MIL-STD-202F |
| 2.2 | High Temp. Storage           | + 125 °C $\pm$ 3 °C for 500 $\pm$ 12 hours                                                                                                                                                                                                                                                                                                                                                                                                                                                             | MIL-STD-883E |
| 2.3 | Low Temp. Storage            | - 40 °C $\pm$ 3 °C for 500 $\pm$ 12 hours                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |
| 2.4 | Thermal Shock                | Total 100 cycles of the following temperature cycle<br> <p>The diagram shows a temperature cycle with three levels: 125 <math>\pm</math> 3 °C, 25 °C, and -55 <math>\pm</math> 3 °C. The cycle consists of a 10 min. dwell at the high temperature, a 10 min. dwell at the low temperature, and a 10 min. max. dwell at the intermediate temperature. The total duration of one cycle is indicated as 1 cycle.</p> | MIL-STD-883E |
| 2.5 | High Temp & Humidity         | 85°C $\pm$ 3°C , RH 85% , 500Hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | JIS C5023    |
| 2.6 | Pressure Cooker Storage      | 125°C $\pm$ 3°C , RH100% , 2 bar , 240Hrs                                                                                                                                                                                                                                                                                                                                                                                                                                                              | JIS C6701    |

## Material Composition Declaration

### 材 料 成 份 表

1.PRODUCTION NAME : Seam 3225

2.PRODUCTION WEIGHT(mg) : 17.322

| 编号<br>No. | 构成部件<br>Name of<br>Part | 部件材质名<br>Material<br>Name | 材质质量<br>Material<br>Mass(mg) | 材质质量百分比<br>Mat er i al<br>mass ( %) | 构成之元素名称<br>Constituent name | CAS编号<br>CAS No. | 元素百分比<br>Material<br>Analysis(%) |
|-----------|-------------------------|---------------------------|------------------------------|-------------------------------------|-----------------------------|------------------|----------------------------------|
| 1         | 基座<br>Base              | 陶瓷<br>Ceramics            | 6.40                         | 36.95%                              | Al2O3<br>Aluminum oxide     | 1344-28-1        | 92.40%                           |
|           |                         |                           |                              |                                     | SiO2<br>Siliconoxide        | 7631-86-9        | 4.31%                            |
|           |                         |                           |                              |                                     | Cr2o3                       | 1308-38-9        | 1.50%                            |
|           |                         |                           |                              |                                     | MgO<br>Magnesium oxide      | 1309-48-4        | 0.69%                            |
|           |                         |                           |                              |                                     | CaO<br>Calcium oxide        | 1305-78-8        | 1.10%                            |
|           |                         | KV环                       | 2.60                         | 15.01%                              | Fe<br>Iron                  | 7439-89-6        | 40.70%                           |
|           |                         |                           |                              |                                     | Ni<br>Nickel                | 7440-02-0        | 21.80%                           |
|           |                         |                           |                              |                                     | Co                          | 7440-48-4        | 12.80%                           |
|           |                         | 焊料                        |                              |                                     | Ag<br>silver                | 7440-22-4        | 21.00%                           |
|           |                         |                           |                              |                                     | Cu                          | 7440-50-8        | 3.70%                            |
|           |                         | 金属化<br>(Metal)            | 4.00                         | 23.09%                              | W<br>Tungsten               | 7440-33-7        | 100.00%                          |
|           |                         | 镀层<br>Metallizing         |                              |                                     | Au<br>Gold                  | 7440-57-5        | 100.00%                          |
|           |                         |                           |                              |                                     |                             | Ni<br>Nickel     | 7440-02-0                        |
| 2         | 外壳<br>Cover             | 4J29<br>(基材)              | 3.62                         | 20.91%                              | Fe                          | 7439-89-6        | 53.45%                           |
|           |                         |                           |                              |                                     | Ni                          | 7440-02-0        | 29.25%                           |
|           |                         |                           |                              |                                     | Co                          | 7440-48-4        | 17.30%                           |
|           |                         | Ni (镀层)                   |                              |                                     | Ni                          | 7440-02-0        | 100.00%                          |
| 3         | 黏合剂<br>Adhesive         | 金属<br>Metal               | 0.20                         | 1.15%                               | Ag<br>Silver                | 7440-22-4        | 75.00%                           |
|           |                         | 聚合物<br>Polymer            |                              |                                     | C11H24<br>Undecane          | 1120-21-4        | 5.00%                            |
|           |                         |                           |                              |                                     | C12H26<br>Dodecane          | 112-40-3         | 5.00%                            |
|           |                         |                           |                              |                                     | Silicone resin              | —                | 15.00%                           |
| 4         | Blank                   | 晶片<br>Quartz              | 0.45                         | 2.60%                               | SiO2<br>Silicon oxide       | 14808-60-7       | 100.00%                          |
| 5         | Electrode               | 电极<br>Electrode           | 0.05                         | 0.29%                               | Cr<br>Chromium              | 7440-47-3        | 5.56%                            |
|           |                         |                           |                              |                                     | Ag<br>silver                | 7440-22-4        | 94.44%                           |