



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: Model | Seam3225 4PIN 20.000000MHz |
| 客户名称: Customer | _____ |
| 客户编号: Customer's Part No. | _____ |
| 长兴编号: Product No. | 8DSC200G0012L |
| 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)
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- 8、Material Composition Declaration 产品物质成分表

客户 Conclusion:

Conditional Approval Full Approval Reject

| | |
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| 会 签 意 见 | |
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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

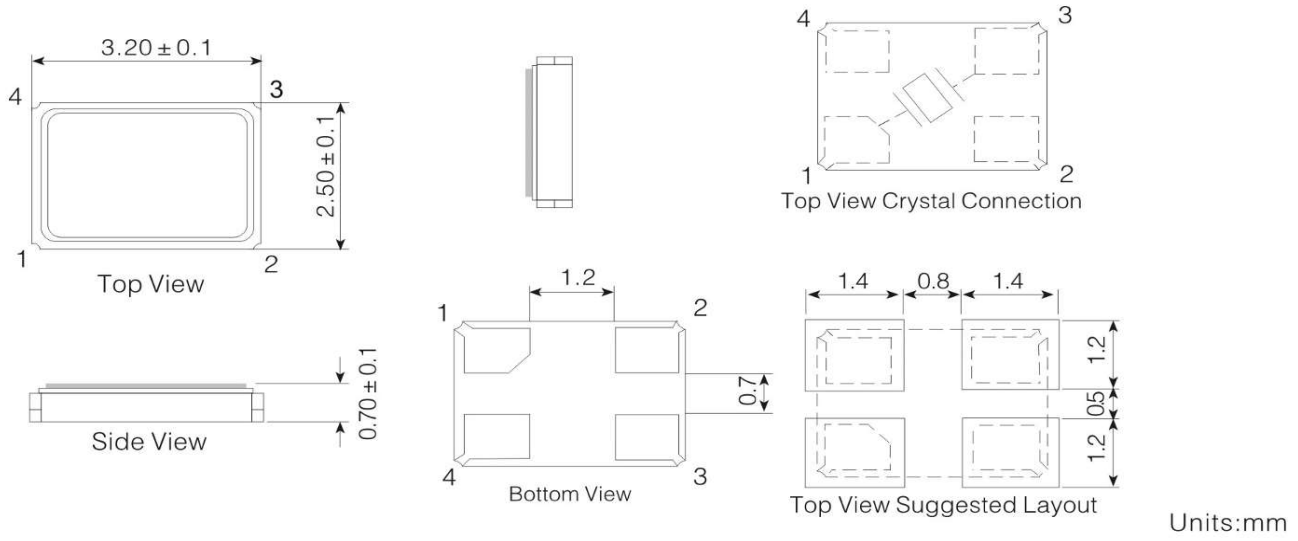
Electrical characteristics measured by HP E5100A or equivalent.

Crystal cutting type

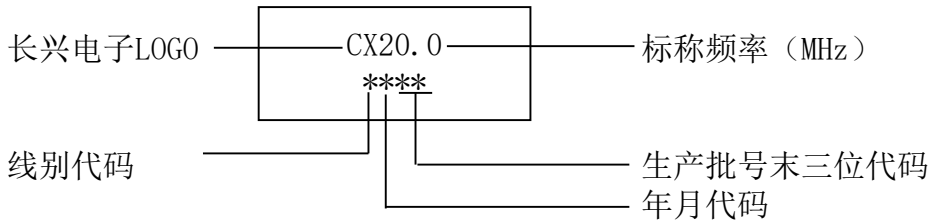
The crystal is using AT CUT (thickness shear mode).

| | Parameters | Electrical Spec. | UNITS | Notes |
|----|----------------------------|------------------|------------------|---|
| 1 | Nominal Frequency | 20.000000 | MHz | - |
| 2 | Oscillation Mode | Fund | - | - |
| 3 | Load Capacitance | 12 | pF | - |
| 4 | Frequency Tolerance | ± 10 | ppm | at $25^\circ\text{C} \pm 3^\circ\text{C}$ |
| 5 | Frequency Tolerance | ± 30 | ppm | Over Operating Temp. Range |
| 6 | Operating Temperature | $-40 \sim +85$ | $^\circ\text{C}$ | - |
| 7 | Aging | ± 3 | ppm | 1st Year |
| 8 | Drive Level | 100 | μW | - |
| 9 | Effective Resistance R_r | 40 Max. | Ω | - |
| 10 | Shunt Capacitance C_0 | 5 Max. | pF | - |
| 11 | Motional Capacitance C_1 | - | fF | - |
| 12 | Pulling Sensitivity T_S | - | ppm/pF | - |
| 13 | Spurious Response | -3.0 | dB | $-1000 \sim +5000$ ppm 125 步 |
| 14 | Insulation Resistance | 500 Min. | $\text{M}\Omega$ | at DC 100V |
| 15 | Storage Temperature Range | $-55 \sim +125$ | $^\circ\text{C}$ | - |
| 16 | RLD2 | 40 Max. | Ω | 0.01~100 μW /Step 30 |
| 17 | FDDL | 10 Max. | ppm | |
| 18 | DLD2 | 10 Max. | Ω | |
| 19 | FDDLH | - | ppm | |
| 20 | DLDH2 | - | Ω | |
| 21 | DLDF | - | Ω | |
| 22 | DLD2 (低) | - | Ω | - |
| 23 | Others | - | - | - |

■ Dimensions外型尺寸



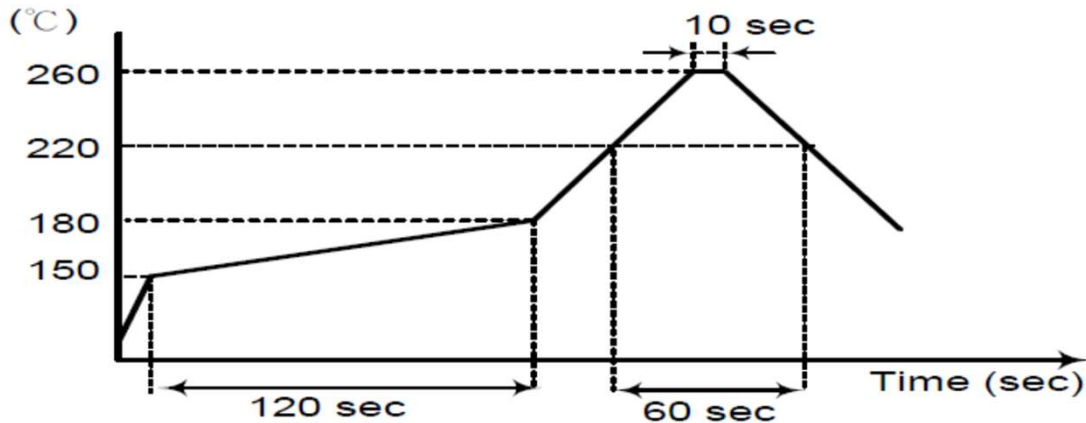
■ Marking印码



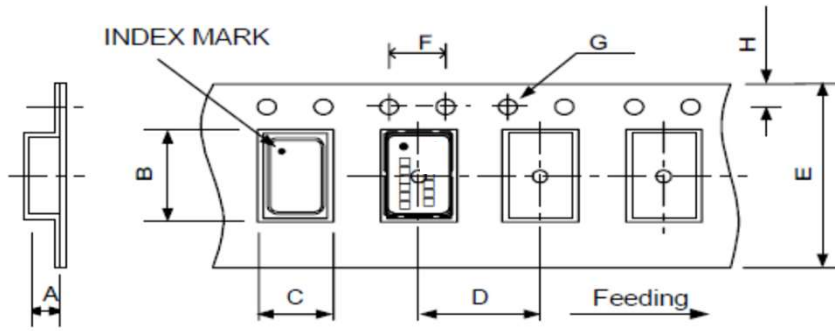
年月代码（四年一个周期）：

| 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 | |
|---------|------|----|----|----|----|----|----|----|----|----|-----|-----|---|
| 2015 | 2019 | a | b | c | d | e | f | g | h | j | k | l | m |
| 2016 | 2020 | n | p | q | r | s | t | u | v | w | x | y | z |
| 2017 | 2021 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2018 | 2022 | N | P | Q | R | S | T | U | V | W | X | Y | Z |

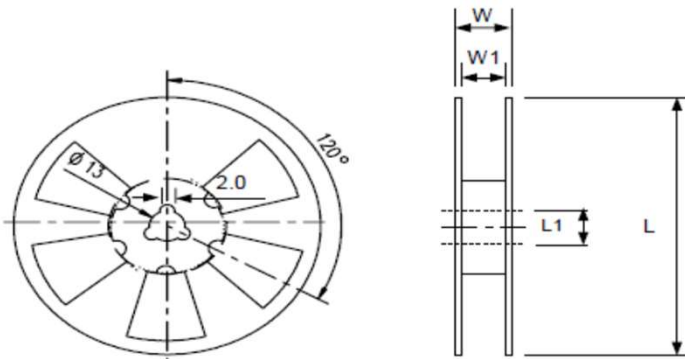
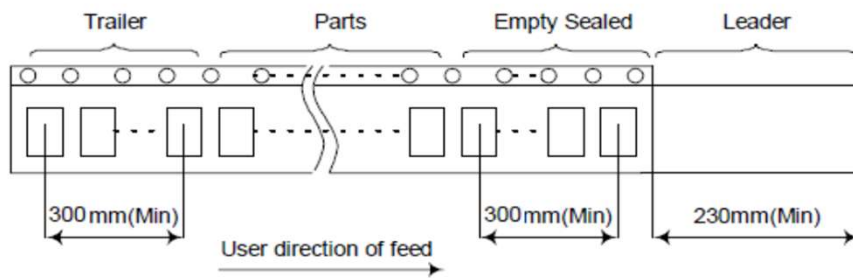
■ Reflow Condition回流焊条件



■ Packing包装 (EIA-481-2)



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



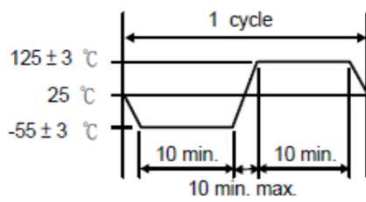
| DIMENSIONS | L | L1 | W | W1 | Standard Reel Quantity |
|------------|---------|--------|----------|---------|----------------------------|
| UNIT : mm | 178±1.0 | 13±0.5 | 11.5±0.2 | 8.0±1.0 | 3,000 pcs per reel (WHITE) |

■ 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 Amplitude 1.52 mm/20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours) | MIL-STD-883E |
| 1.5 | Gross Leak | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm ² | MIL-STD-883E |
| 1.6 | Fine Leak | Helium Bombing 4.5 Kgf / cm ² for 2 hr | |
| 1.7 | Solderability | Temperature 260 °C \pm 5°C Immersing depth 0.5 mm minimum Immersion time 5 \pm 1 seconds 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 Pre-heat time 60 ~ 120 sec. Test temperature 260 \pm 5 °C 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  | 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 No. | 构成部件 Name of Part | 部件材质名 Material Name | 材质质量 Material Mass(mg) | 材质质量百分比 Mat er i al mass (%) | 构成之元素名称 Constituent name | CAS编号 CAS No. | 元素百分比 Material Analysis(%) |
|-----------|-------------------------|---------------------------|------------------------------|-------------------------------------|--|------------------|----------------------------------|
| 1 | 基座 Base | 陶瓷 Ceramics | 6.40 | 36.95% | Al ₂ O ₃ Aluminum oxide | 1344-28-1 | 92.40% |
| | | | | | SiO ₂ Siliconoxide | 7631-86-9 | 4.31% |
| | | | | | Cr ₂ O ₃ Chromium oxide | 1308-38-9 | 1.50% |
| | | | | | MgO Magnesium oxide | 1309-48-4 | 0.69% |
| | | | | | CaO Calcium oxide | 1305-78-8 | 1.10% |
| | | KV环 | 2.60 | 15.01% | Fe Iron | 7439-89-6 | 40.70% |
| | | | | | Ni Nickel | 7440-02-0 | 21.80% |
| | | | | | Co Cobalt | 7440-48-4 | 12.80% |
| | | 焊料 | 4.00 | 23.09% | Ag silver | 7440-22-4 | 21.00% |
| | | | | | Cu | 7440-50-8 | 3.70% |
| | | 金属化 (Metal) | 4.00 | 23.09% | W Tungsten | 7440-33-7 | 62.50% |
| | | | | | 镀层 Metallizing | Au Gold | 7440-57-5 |
| 2 | 外壳 Cover | 4J29 (基材) | 3.62 | 20.91% | Ni Nickel | 7440-02-0 | 32.89% |
| | | | | | Fe Iron | 7439-89-6 | 47.71% |
| | | | | | Co Cobalt | 7440-48-4 | 15.44% |
| | | Ni (镀层) | Ni Nickel | 7440-02-0 | 10.74% | | |
| 3 | 黏合剂 Adhesive | 金属 Metal | 0.20 | 1.15% | Ag Silver | 7440-22-4 | 75.00% |
| | | 聚合物 Polymer | | | 晶态二氧化硅 | - | 5.00% |
| | | | | | 石油溶剂 | - | 5.00% |
| | | | | | 有机硅树脂 Silicone resin | - | 15.00% |
| 4 | Blank | 晶片 Quartz | 0.45 | 2.60% | SiO ₂ Silicon oxide | 14808-60-7 | 100.00% |
| 5 | Electrode | 电极 Electrode | 0.05 | 0.29% | Cr Chromium | 7440-47-3 | 5.56% |
| | | | | | Ag Silver | 7440-22-4 | 94.44% |