



福建省长兴电子有限公司

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## 石英晶体振荡器产品确认书

Quartz Crystal Oscillator Specification For Approval

|                     |                          |
|---------------------|--------------------------|
| 产品型号:               | 2.0×1.6 OSC 16.000000MHz |
| Model               |                          |
| 客户名称:               |                          |
| Customer            |                          |
| 客户编号:               |                          |
| Customer's Part No. |                          |
| 长兴编号:               | 3ESC160C0033L            |
| 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、Test Diagram 测试电路
- 5、Marking 印码
- 6、Reflow Condition 回流焊条件
- 7、Packing 包装 (EIA-481-2)
- 8、Reliability Specifications 可靠性规范
- 9、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 :

2.0x1.6x0.75mm SMD Crystal Oscillators CMOS Output / 3E Series

■ Features 特点

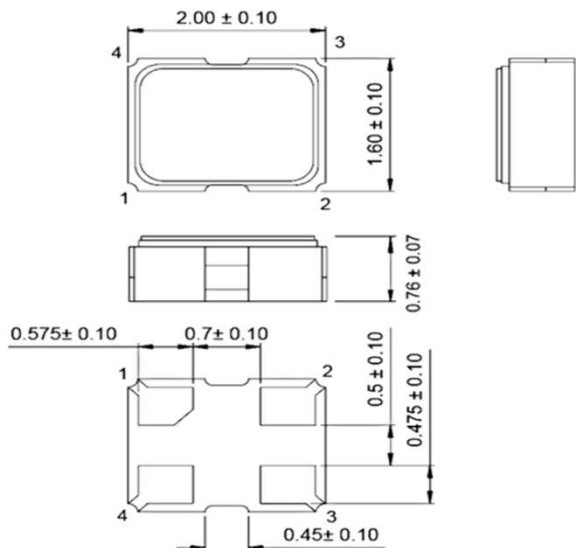
- . Ultra Small SMD seam sealed clock crystal oscillator units.
- . For applications in WLAN, Bluetooth, DSC, DSL and other IT product.
- . Tri-state function available.
- . RoHS Compliant / Pb Free.

■ Electrical Specifications 电气参数

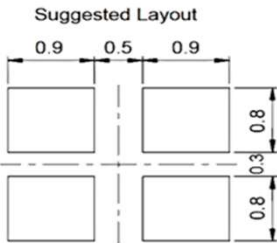
|     |                                 |                |                      |
|-----|---------------------------------|----------------|----------------------|
| 1、  | Nominal Frequency:              | 16.000000      | MHz                  |
| 2、  | Tolerance @ 25 Degree:          | ±10            | ppm                  |
| 3、  | Stability over Operation Temp.: | ±20            | ppm                  |
| 4、  | Aging:                          | ±3             | ppm/year             |
| 5、  | Operating Temperature Range:    | -40~85         | °C                   |
| 6、  | Storage Temperature Range:      | -55~125        | °C                   |
| 7、  | Input Voltage (VDD):            | 1.8V~3.3V      | Vdc                  |
| 8、  | Input Current (IDD):            | 8              | mA max               |
| 9、  | Output Waveform:                | COMS           |                      |
| 10、 | Output Symmetry:                | 50±10%         |                      |
| 11、 | Rise/Fall Time:                 | 5              | ns max               |
| 12、 | Output Voltage VOL:             | 10%VDD         | max                  |
|     | Output Voltage VOH:             | 90%VDD         | min                  |
| 13、 | Output Load:                    | 15             | pF                   |
| 14、 | Output State Control:           | Enable/disable |                      |
| 15、 | Start-up Time:                  | 5              | ms max               |
| 16、 | Standby current:                | 10             | μA max               |
| 17、 | Jitter (rms):                   | 3              | ps max               |
| 18、 | Oscillation mode:               | Fundamental    |                      |
| 19、 | MSL                             | Level 1        | IPC/JEDEC J-STD-033C |

■ Dimensions外型尺寸

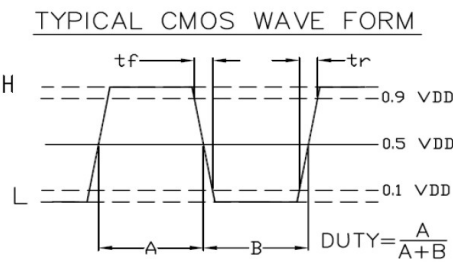
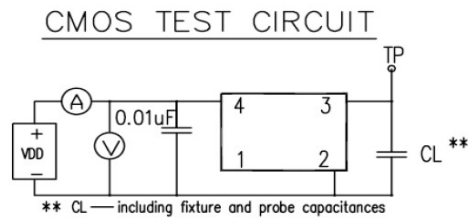
Unit : mm



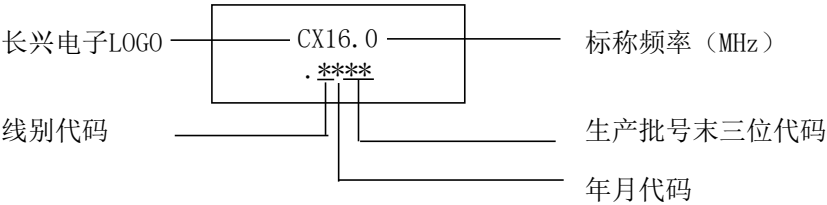
PAD FUNCTION:  
1: ENABLE CONTROL  
2: GND  
3: OUT  
4: VDD



■ Test Diagram测试电路



■ Marking印码



年月代码（四年一个周期）：

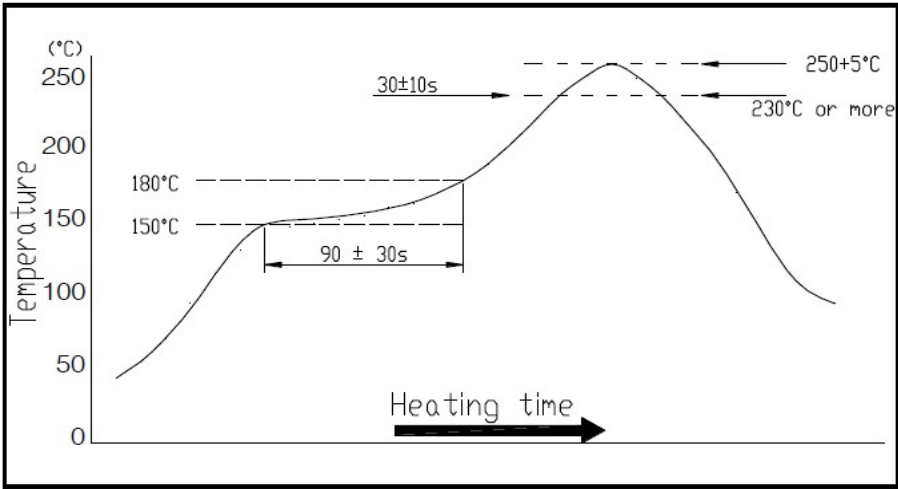
| 年份   | 月份   | 一月 | 二月 | 三月 | 四月 | 五月 | 六月 | 七月 | 八月 | 九月 | 十月 | 十一月 | 十二月 |
|------|------|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 2023 | 2027 | a  | b  | c  | d  | e  | f  | g  | h  | j  | k  | l   | m   |
| 2024 | 2028 | n  | p  | q  | r  | s  | t  | u  | v  | w  | x  | y   | 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

Solder profile

Peak: 250+50°C Soldering zone: 230°C or more, 30±10s.

Pre-heating zone 1: 150~180°C, 90±30s



Temperature profile for reflow soldering

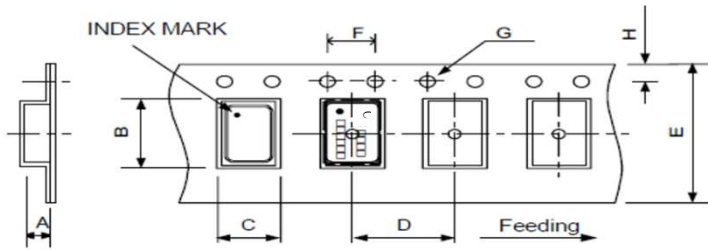
Soldering iron method

Bit temperature: 350±10°C Application time of soldering iron:3+1 s

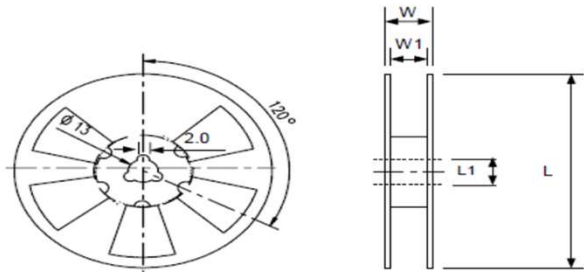
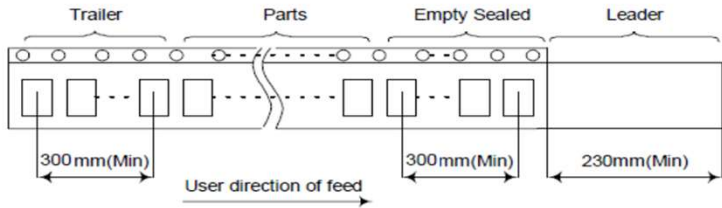
For other procedures, refer to IEC 60068-2-20.

■ Packing包装 (EIA-481-2)

TAPE (CARRIER) DIMENSIONS



| DIMENSIONS | A        | B        | C        | D        | E       | F        | G        | H        |
|------------|----------|----------|----------|----------|---------|----------|----------|----------|
| UNIT : mm  | 0.65±0.1 | 2.30±0.1 | 1.90±0.1 | 4.00±0.1 | 8.0±0.2 | 4.00±0.1 | 1.55±0.0 | 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

This is the quality control and quality assurance and reliability tests performance data for the 2.0×1.6 OSC 24.000000MHz

Standard test condition (TEMP.: 20±15°C. Relative humidity: 65±20%)

For any discrepancy in GO/NG, test will be done at TEMP. 25±2°C. R.H. 65±5%.

| NO | ITEM                                                                | SPECIFICATION                                                            | TEST METHOD                                                                                                                                                                                                                                             |
|----|---------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Temperature Cycle (GB/T2423.22-2002, Method Nb)                     | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | 10 cycles from -25° C to 85° C. Measurement taken after DUT being left at room temperature for 24±2 hours.                                                                                                                                              |
| 2  | Low Temperature Storage (GB/T 2423.1-2001, Method Aa)               | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | Spending 72 hrs at -55° C $\pm 3^\circ$ C constant temperature. Measurement taken after DUT being left at room temperature for 24±2 hours.                                                                                                              |
| 3  | High Temperature Storage (GB/T 2423.2-2001, Method Ba)              | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | Spending 72 hrs at 125° C $\pm 3^\circ$ C constant temperature. Measurement taken after DUT being left at room temperature for 24±2 hours.                                                                                                              |
| 4  | Humidity (GB/T 2423.3-2006, Method Cab)                             | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | Spending 96 hrs at 40 ° C $\pm 3^\circ$ C, with 90± 3% R.H. Measurement taken after DUT being left at room temperature for 24±2 hours.                                                                                                                  |
| 5  | Vibration (GB/T 2423.10-1995, Method Fc)                            | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | Apply 0.75mm vibration at sweep frequency 10~500 Hz, for 2h. 10 cycles in each direction of 3 axis. Measurement taken after 1 hour.                                                                                                                     |
| 6  | Shock (GB/T 2423.5-1995, Method Ea)                                 | Frequency change after test $\leq \pm 5\text{ppm}$ . No visible damages. | Peak 1000m/s <sup>2</sup> , normal width 6ms half sine wave form, 3.7m/s, 3 perpendicular axis of samples, 3 cycles /direction, total 18 cycles. Measurement taken after 1 hour.                                                                        |
| 7  | Drop (GB/T 2423.8-1995, Method Ed)                                  | Frequency change after test $\leq \pm 5\text{ppm}$ . No visible damages. | Free drop to the wooden plate from 1.0 m heights for 3 times.                                                                                                                                                                                           |
| 8  | Solderability (GB/T 2423.28-2005, Method Tc)                        | Terminals shall be covered more than 95% with solder.                    | In 255 $\pm 5^\circ$ C solder bath for 2 $\pm 0.5$ seconds. There is no need to do functioned test. 8-12X magnifier.                                                                                                                                    |
| 9  | Terminal Strength (JIS-C-6429 Method 1 & 2 )                        | No visible damage                                                        | Mount on a glass-epoxy board (100x50x1.6mm), then bend to 2mm displacement (velocity 1mm/sec) and keep for 5 seconds. or pulling force 0.5 kg for at least 60 seconds.                                                                                  |
| 10 | Resistance to Soldering Heat (GB/T 2423.28-2005, Test Tb Method 1B) | Frequency change after test $\leq \pm 5\text{ppm}$ .                     | Passed through the re-flow oven under the following condition. Preheat to 150 ° C $\pm 5^\circ$ C for 60 to 120sec, and peak 265 ° C $\pm 5^\circ$ C for 10s $\pm 3$ sec. Measurement taken after DUT being left at room temperature for at 24±2 hours. |

## Material Composition Declaration

### 材 料 成 份 表

1.PRODUCTION NAME :

OSC 2016

2.PRODUCTION WEIGHT(mg) :

8.144

| 编号<br>No. | 构成部件<br>Name of Part | 部件材质名<br>Material Name | 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         | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1        | 63.88%                           |
|           |                      |                        | SiO <sub>2</sub><br>Silica                       | 14464-46-1       | 3.79%                            |
|           |                      |                        | Cr <sub>2</sub> O <sub>3</sub><br>Chromium oxide | 1308-38-9        | 1.29%                            |
|           |                      |                        | Mo<br>Molybdenum                                 | 7439-98-7        | 1.00%                            |
|           |                      | Pin                    | Fe<br>Iron                                       | 7440-33-7        | 9.25%                            |
|           |                      |                        | Ni<br>Nickel                                     | 7439-89-6        | 8.85%                            |
|           |                      |                        | Co<br>Cobalt                                     | 7440-02-0        | 4.75%                            |
|           |                      | 焊料<br>Solder           | Ag<br>silver                                     | 7440-48-4        | 2.98%                            |
|           |                      |                        | Cu<br>Copper                                     | 7440-22-4        | 2.80%                            |
|           |                      | 金属化<br>Metallization   | W<br>Tungsten                                    | 7440-50-8        | 1.04%                            |
|           |                      | 电镀层<br>Plate           | Au<br>Gold                                       | 7440-02-0        | 0.24%                            |
|           |                      |                        | Ni<br>Nickel                                     | 7440-57-5        | 0.13%                            |
| 2         | 外壳<br>Lid            | Kovar                  | Fe<br>Iron                                       | 7439-89-6        | 54.00%                           |
|           |                      |                        | Co<br>Cobalt                                     | 7440-48-4        | 17.02%                           |
|           |                      |                        | Ni<br>Nickel                                     | 7440-02-0        | 28.32%                           |
|           |                      | Ni<br>(镀层)             | Ni<br>Nickel                                     | 7440-02-0        | 0.66%                            |
| 3         | Adhesive             | Resin                  | -                                                | -                | 100.00%                          |
| 4         | Blank                | 晶片<br>Quartz           | SiO <sub>2</sub><br>Silicon oxide                | 14808-60-7       | 100.00%                          |
| 5         | Wire                 | Gold                   | Au<br>Gold                                       | 7440-57-5        | 100.00%                          |
| 6         | IC                   | Ssilicon               | Silicon                                          | 7440-21-3        | 100.00%                          |
| 7         | Electrode            | 电极<br>Electrode        | Ag<br>Silver                                     | 7440-22-4        | 100.00%                          |
| 8         | Epoxy                | Conductive Resin       | Silver                                           | 7440-22-4        | 74.00%                           |
|           |                      |                        | Ethyl alcohol                                    | 64-17-5          | 0.60%                            |
|           |                      |                        | Bisphenol<br>A-epichlorohydrin polymer           | 25068-38-6       | 0.60%                            |
|           |                      |                        | Xylenes (o-, m-, p-isomers)                      | 1330-20-7        | 0.60%                            |
|           |                      |                        | Ethylbenzene                                     | 100-41-4         | 0.06%                            |
|           |                      |                        | Silicone resin                                   | -                | 8.62%                            |
|           |                      |                        | Silica                                           | -                | 8.52%                            |
|           |                      |                        | Petroleumsolvents                                | -                | 7.00%                            |