

深圳市炬烜科技有限公司  
CHIP SUN TECHNOLOGY CO., LTD

**APPROVAL  
SHEET**



CUSTOMER: \_\_\_\_\_  
DESCRIPTION: HC-49/SMD 28.63636MHz Quartz Crystal Resonator  
MANUFACTURER PART NO.: FTX28.63636M18SM-30/30B  
CUSTOMER PART NO: \_\_\_\_\_  
USED IN MODEL: \_\_\_\_\_  
REVISION A1

| 承 认 APPROVAL            |                      |                         |
|-------------------------|----------------------|-------------------------|
| 工程部<br>TECHNOLOGY DEPT. | 品质部<br>QUALITY DEPT. | 采购部<br>PURCHASING DEPT. |
|                         |                      |                         |

Date: March 22, 2023



深圳市炬烜科技有限公司

CHIP SUN TECHNOLOGY CO., LTD

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| <u>Rev</u> | <u>Revise page</u> | <u>Revise contents</u> | <u>Date</u> | <u>Ref.No.</u> | <u>Reviser</u> |
|------------|--------------------|------------------------|-------------|----------------|----------------|
| A1         | ALL                | Initial released       |             | N/A            | DavidJiang     |
|            |                    |                        |             |                |                |
|            |                    |                        |             |                |                |
|            |                    |                        |             |                |                |
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# 1. QUARTZ CRYSTAL UNIT SPECIFICATION

| Parameter                              | Specification                           |
|--|---|
| 1.1 Frequency:                         | 28.63636MHz                             |
| 1.2 Mode of Oscillation                | AT Fundamental                          |
| 1.3 Holder type :                      | HC-49/SMD                               |
| 1.4 Frequency tolerance:               | ±30ppm at 25°C ±3°C                     |
| 1.5 Equivalent series resistance (Rr): | 30Ω Max.                                |
| 1.6 Operating temperature range:       | -20°C To +70°C                          |
| 1.7 Storage temperature range:         | -40°C To +85°C                          |
| 1.8 Frequency stability:               | ±30ppm at -20°C To +70°C                |
| 1.9 Loading capacitance (CL) :         | 18 pF                                   |
| 1.10 Drive level (DL):                 | 100 uW Typical                          |
| 1.11 Shunt Capacitance (C0):           | 7.0pF MAX                               |
| 1.12 Insulation resistance (IR):       | More than 500M ohms at DC 100V          |
| 1.13 Circuit:                          | Measured in S&A 250B                    |
| 1.14 Aging:                            | ±5 ppm Max (+25°C 1 <sup>st</sup> Year) |
| 1.15 Dimensions and marking            | Refer to page.4                         |
| 1.16 Emboss carrier tape & reel        | Refer to page.4                         |
| 1.17 Note:                             |   |

## Standard atmospheric conditions

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

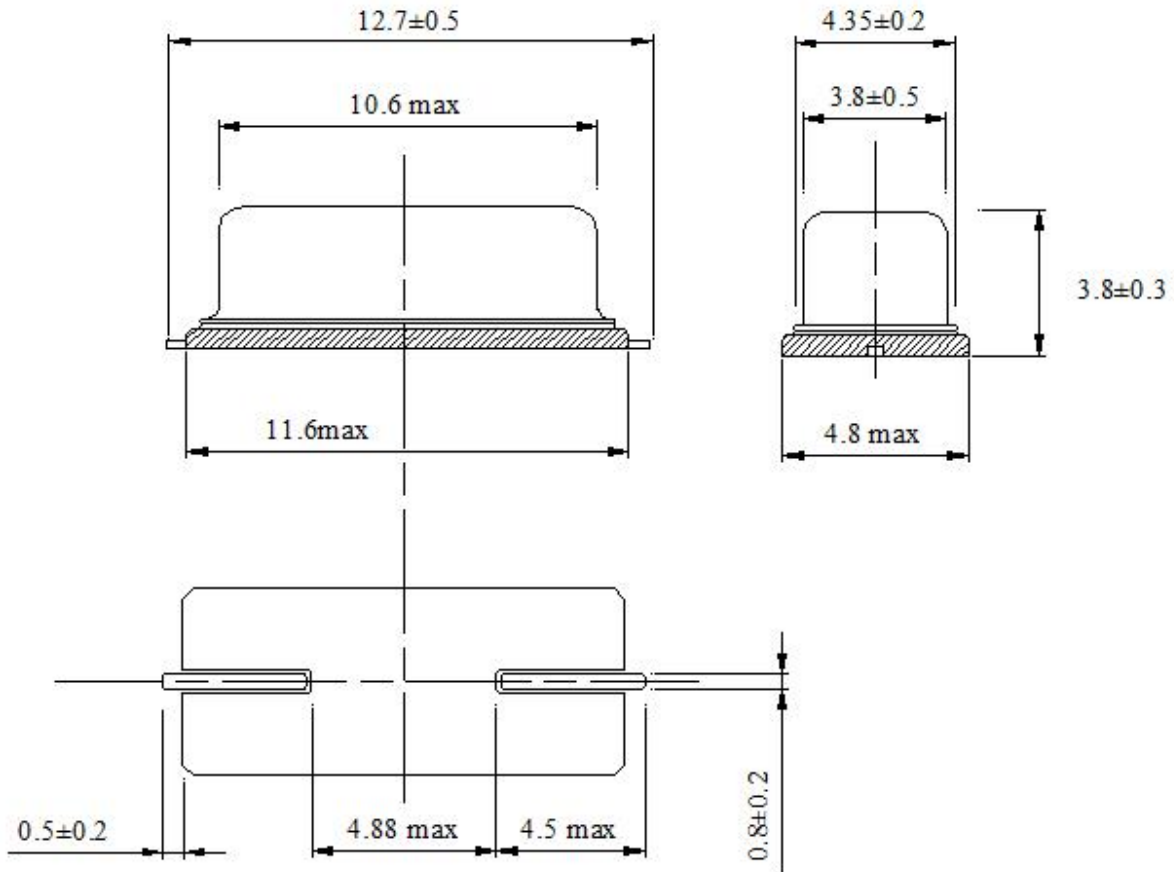
Ambient temperature : 25±3°C

Relative humidity : 40%~70%

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## 2. MARKING & DIMENSIONS



\*Marking should be printed as following:

Logo, Nominal Frequency

Logo: T

Nominal Frequency: (ex. 8.000 MHz $\sqrt{8.000}$ )

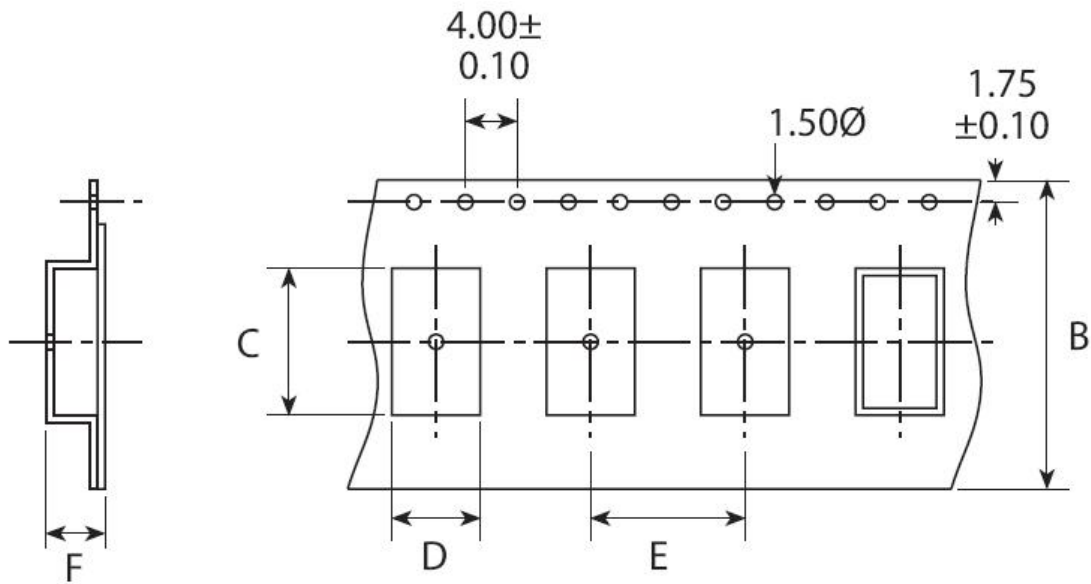
Marking: Laser marking

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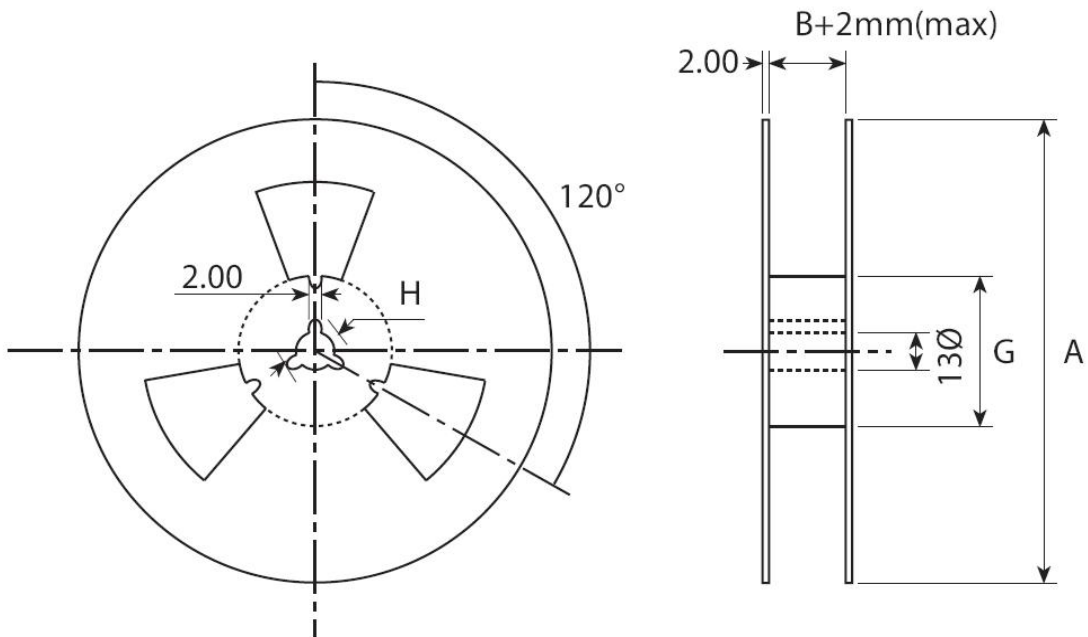
|                    |   |              |
|--------------------|---|--------------|
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### 3.CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape



b.) Dimensions of Reel

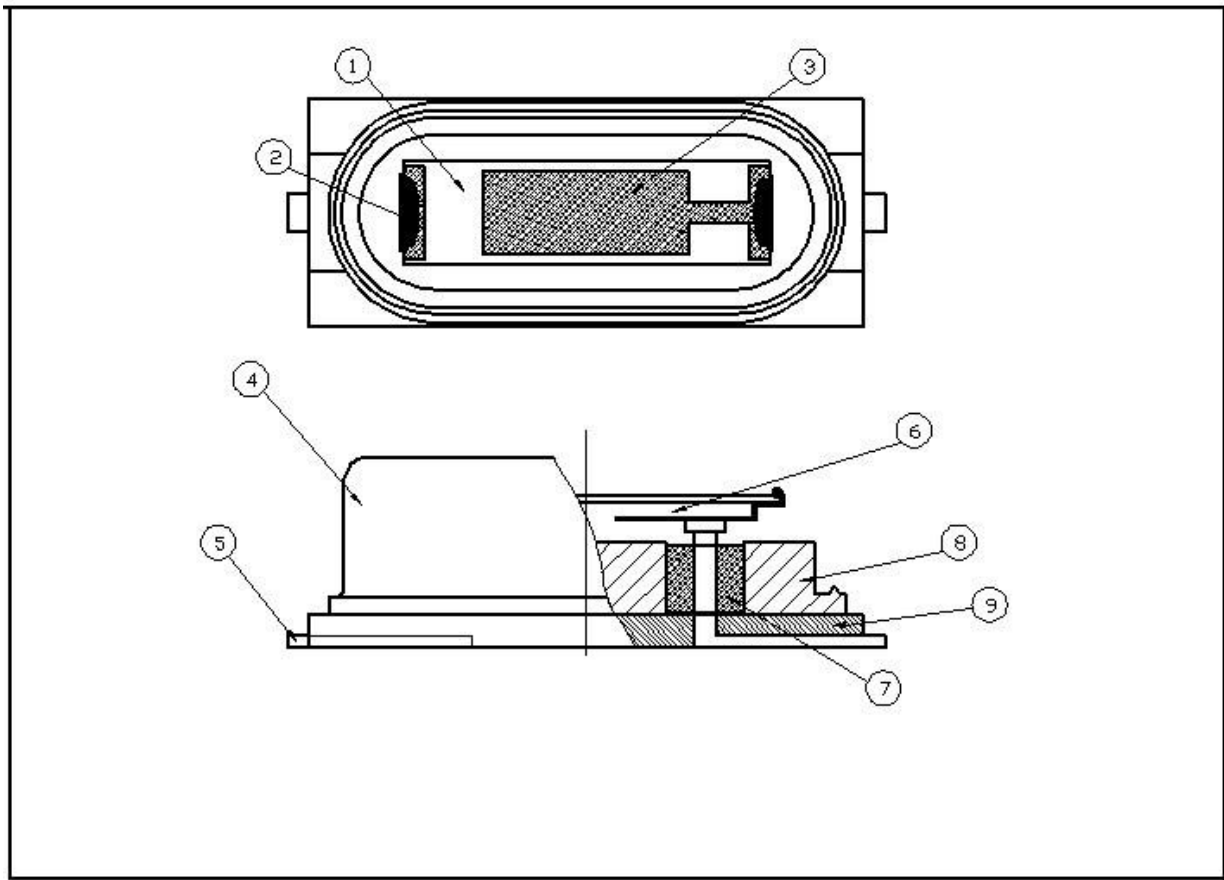


|   | A       | B      | C    | D   | E    | F   | G   |
|---|---------|--------|------|-----|------|-----|-----|
| 49SMD                                       | 330±2.0 | 24±0.2 | 13.9 | 5.6 | 12.0 | 4.8 | 100 |
| <b>1000 pieces of crystal unit per reel</b> |         |        |      |     |      |     |     |

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## 4. INSIDE STRUCTURE



| NO. | Product name<br>部件名称 | MATERIALS<br>材质 | QTY<br>数量 |
|-----|----------------------|-----------------|-----------|
| 1   | Blank 晶片             | SIO2            | 1         |
| 2   | Silver paste 导电胶     | 3301F           | 2         |
| 3   | Silver 电极            | Ag              | 2         |
| 4   | Cover 外壳             | Au              | 1         |
| 5   | Lead 引线              | Kovar           | 2         |
| 6   | Pin 簧片               | C7701           | 2         |
| 7   | GLASS 玻璃珠            | GLASS           | 2         |
| 8   | Base 底板              | SPCC-SD         | 1         |
| 9   | Insulation 垫片        | PPA             | 1         |

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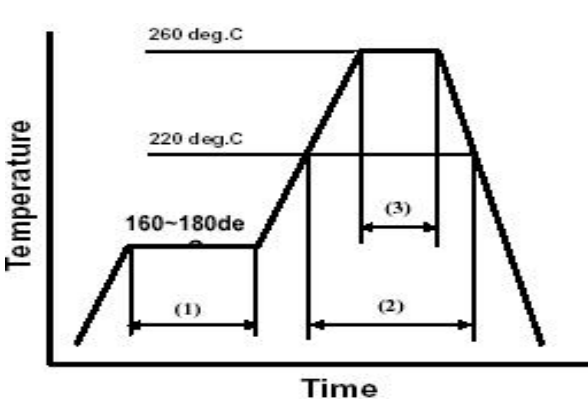
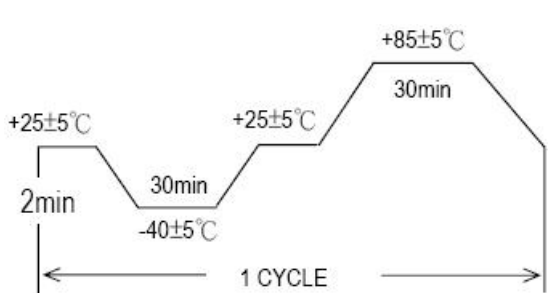
|                    |                                   |              |
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## 5.MECHANICAL/ENVIRONMENTAL CHARACTERISTICS

| NO. | 项 目<br>ITEM                             | 条 件<br>CONDITIONS  | 规 格<br>SPECIFICATIONS  |
|-----|---|--|--|
| 5.1 | 漏气试验<br>Leaking Test                    | 完全浸入 90±3℃热水中 3 分钟。<br>Fully immersed into hot water at 90℃ ±3℃ for 3 minutes.   | 无气泡存在<br>no air bubble are visible.  |
|     |   | 用氦质谱仪测试或酒精加压法测试绝缘电阻。<br>Take measurements with a helium leakage detector, or measure insulation resistance under pressure.   | $1 \times 10^{-8} \text{ Pa.m}^3/\text{s}$ Max<br>or $IR \geq 500\text{M}\Omega$   |
| 5.2 | 跌落试验<br>Drop Test                       | 高度 75cm, 自由落体于 3cm 木板上, 6 次<br>Dropping 6 times from the height of 75 cm onto hard wooden board of thickness more than 30mm.   | 频率变化±5ppm 以内,<br>电阻变化±15%以内<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$                                     |
| 5.3 | 振动试验<br>Vibration Test                  | 频率 10~55Hz, 振幅 1.5mm, 时间 1.5 分钟循环, 在 XYZ 方向各 2 小时。<br>Vibration Frequency: 10~55Hz<br>Cycle: 1.5 Min.<br>Amplitude: 1.5mm P-P.<br>Direction: X.Y.Z<br>Time: 2 Hours / Each Direction     | 频率变化±5ppm 以内,<br>电阻变化±15%以内<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$                                     |
| 5.4 | 可 焊 性<br>Solderability Test             | 从引线末端至距底部 2mm 处放入 230℃ ±5℃ 焊槽内,时间: 5 ±0.5 秒。<br>The terminal lead wire is to be soaked in a 230℃ ±5℃ tin trough for 5 ±0.5 seconds.  | 沾锡面 ≥90%. 频率变化±5ppm 以内,<br>电阻变化±15%以内<br>Tin over the wire ≥90%<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$ |
| 5.5 | 耐低温性<br>Low<br>Temperature<br>Enduring  | 在 -40℃ ±3℃ 下放置 96 小时,取出后在常温下恢复 2 小时。<br>The samples crystal is to be tested after being placed in the environment of -40±3℃ for 96 hours, and recovered to room temperature for 2 hours. | 频率变化±5ppm 以内,<br>电阻变化±15%以内<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$                                     |
| 5.6 | 耐高温性<br>High<br>Temperature<br>Enduring | 在 +85℃ ±3℃ 下放置 96 小时,取出后在常温下恢复 2 小时。<br>The samples crystal is to be tested after being heated at +85±3℃ for 96 hours, and cooled to room temperature for 2 hours.                       | 频率变化±5ppm 以内,<br>电阻变化±15%以内<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$                                     |

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|-----|---|---|--|---------|---------------|---------|-----|--------------|-----------|--------|-----|------|-----------|-------------|--|
| 5.7 | 恒定湿热<br>Humidity  | 在 $40 \pm 3^\circ\text{C}$ 、RH $93\% \pm 2\%$ 下放置 96 小时,取出后恢复 2 小时。<br>The temperature is at $40 \pm 3^\circ\text{C}$ , and at $93\% \pm 2\%$ RH after 96 hours, and cooled to room temperature for 2 hours.  | 外观无异常,性能检验同振动<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$ |         |               |         |     |              |           |        |     |      |           |             |  |
| 5.8 | 耐焊接热<br>Resistance to Solder Heat<br><br>回流焊<br>1)Reflow solder | After resonator is soldered for 1 time in following temperature conditions, and then be placed in natural condition for 24-25 hours. Resonator shall be measured.<br><br> <table border="1" data-bbox="510 1064 1069 1198"> <tr> <td>(1)</td> <td>Preheat</td> <td>160~180 deg.C</td> <td>120sec.</td> </tr> <tr> <td>(2)</td> <td>Primary heat</td> <td>220 deg.C</td> <td>60sec.</td> </tr> <tr> <td>(3)</td> <td>Peak</td> <td>260 deg.C</td> <td>10sec. Max.</td> </tr> </table> | (1)  | Preheat | 160~180 deg.C | 120sec. | (2) | Primary heat | 220 deg.C | 60sec. | (3) | Peak | 260 deg.C | 10sec. Max. | 外观无异常,性能检验同振动<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$ |
| (1) | Preheat   | 160~180 deg.C   | 120sec.  |         |               |         |     |              |           |        |     |      |           |             |  |
| (2) | Primary heat  | 220 deg.C   | 60sec.   |         |               |         |     |              |           |        |     |      |           |             |  |
| (3) | Peak  | 260 deg.C   | 10sec. Max.  |         |               |         |     |              |           |        |     |      |           |             |  |
| 5.9 | 热冲击<br>Thermal shock  | 在 $-40^\circ\text{C}$ 保持 30 分钟, $+85^\circ\text{C}$ 保持 30 分钟, 循环 10 次。<br>Should be satisfied after supplying the following temperature cycle ( 10 cycles). (Refer to Fig-4).<br>Temperature shift from low to high, high to low shall be done in $1^\circ\text{C}/\text{min}$ .<br><br>  | 外观无异常,性能检验同振动<br>The crystal must meet:<br>$ \Delta f  \leq \pm 5\text{ppm}$<br>$ \Delta R  \leq 15\%$ |         |               |         |     |              |           |        |     |      |           |             |  |

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