

APPROVAL SHEET



CUSTOMER: _____

DESCRIPTION: HC-49/U 4.608MHz Quartz Crystal Resonator

MANUFACTURER PART NO.: FTX4.608M20U

CUSTOMER PART NO.: _____

USED IN MODEL : _____

REVISION A1

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

Date: September 19, 2017

| <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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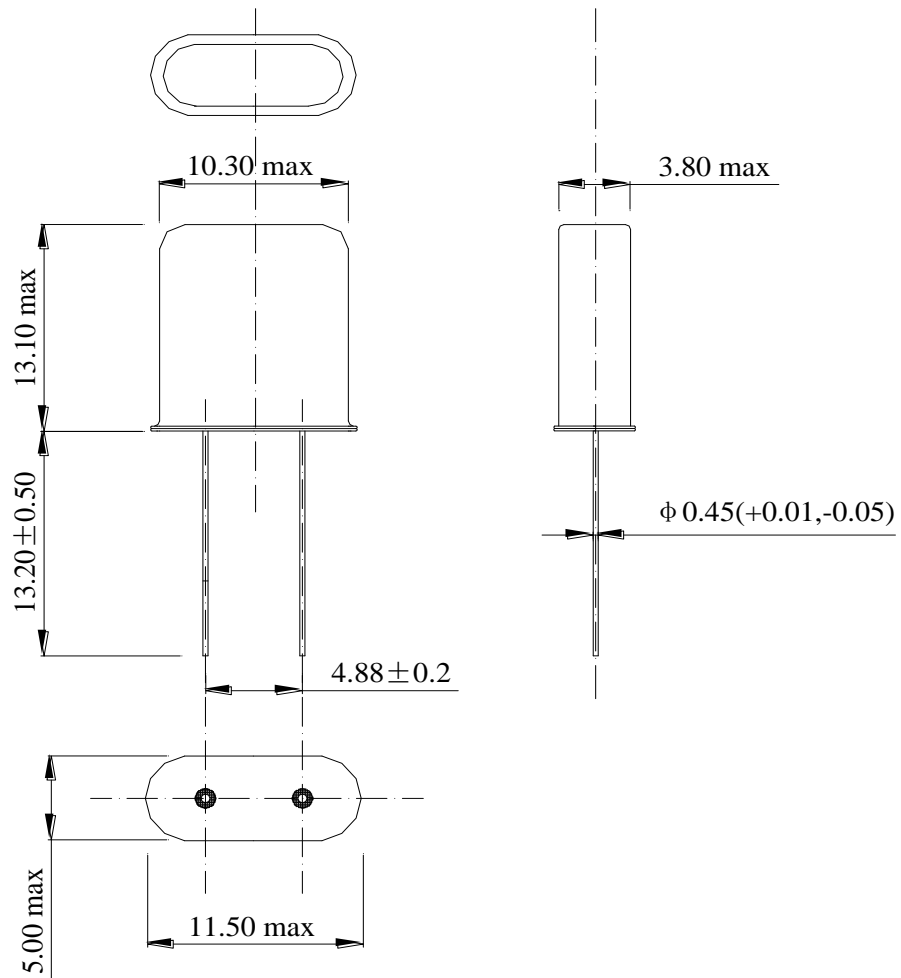
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1. QUARTZ CRYSTAL UNIT SPECIFICATION

| | |
|-----------------------------------|---|
| 1.1 Frequency: | 4.608MHz |
| 1.2 Mode of Oscillation | AT Fundamental |
| 1.3 Holder type : | HC-49/U |
| 1.4 Frequency tolerance: | ±30ppm at 25°C |
| 1.5. Equivalent resistance (Rr): | 200Ω 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) : | 20pF |
| 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 st Year) |
| 1.15 Dimensions and marking | Refer to page.3 |
| 1.16 Other | RoHS Compliant (Pb free) |

2. MARKING & DIMENSIONS

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|--------------------|------------------------------|--------------|
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*Marking should be printed as following:

Logo, Nominal Frequency

Logo:

Nominal Frequency: (ex. 8.000 MHz)

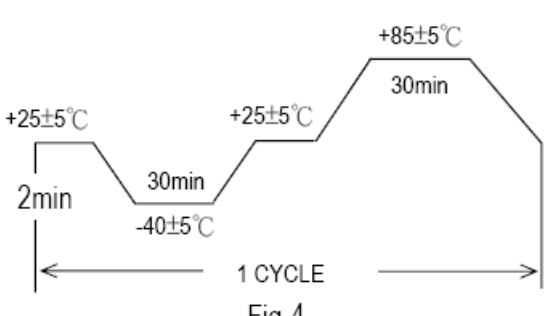
Marking: Laser marking or Ink marking.

3.MECHANICAL/ENVIRONMENTAL CHARACTERISTICS

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| NO. | 项 目 ITEM | 条 件 CONDITIONS | 规 格 SPECIFICATIONS |
|-----|-----------------------------------|---|--|
| 3.1 | 漏气试验 Leaking Test | 完全浸入 90±3℃热水中 3 分钟。 Fully immersed into hot water at 90℃±3℃ for 3 minutes. | 无气泡存在 no air bubble are visible. |
| 3.2 | | 用氦质谱仪测试或加压测绝缘电阻 Take measurements with a helium leakage detector, or measure insulation resistance under pressure. | $1 \times 10^{-8} \text{ Pa.m}^3/\text{s}$ Max or $IR \geq 500 \text{ M}\Omega$ |
| 3.3 | 跌落试验 Drop Test | 高度 75cm, 自由落体于 3cm 木板上, 6 次 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, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5 \text{ ppm}$ $\Delta R \leq 15\%$ |
| 3.4 | 振动试验 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。 Vibration Frequency: 10~55Hz Cycle: 1.5 Min. Amplitude: 1.5mm P-P. Direction: X.Y.Z Time: 2 Hours / Each Direction | 频率变化±5ppm 以内, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5 \text{ ppm}$ $\Delta R \leq 15\%$ |
| 3.5 | 可焊性 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。 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, 电阻变化 15% 以内 Tin over the wire ≥90% The crystal must meet: $\Delta f \leq \pm 5 \text{ ppm}$ $\Delta R \leq 15\%$ |
| 3.6 | 耐低温性 Low Temperature Enduring | 在-40℃±3℃下,放置 96 小时,取出后在常温下恢复 2 小时。 The samples crystal is to be tested after being placed in the environment of -40C±3℃ for 96 hours, and recovered to room temperature for 2 hours. | 频率变化±5ppm 以内, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5 \text{ ppm}$ $\Delta R \leq 15\%$ |
| 3.7 | 耐高温性 High Temperature Enduring | 在+85℃±3℃下放置 96 小时,取出后在常温下恢复 2 小时。 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, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5 \text{ ppm}$ $\Delta R \leq 15\%$ |

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| 3.8 | 恒定湿热 Humidity | <p>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。 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.</p> | <p>外观无异常, 频率变化$\pm 5\text{ppm}$ 以内, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5\text{ppm}$ $\Delta R \leq 15\%$</p> |
| 3.9 | 耐焊接热 Resistance to Solder Heat | <p>引线端子应插入 $350\pm 5^{\circ}\text{C}$ 的焊接槽中 3 ± 0.5 秒或 $260\pm 5^{\circ}\text{C}$ 的焊接槽中 10 ± 0.5 秒, 插入深度为从引线末端至距底部 2mm 处, 而后放在自然环境中 1 小时, 再进行测试。 Lead terminals are immersed up to 1.5mm from resonator's body in soldering bath of $350\pm 5^{\circ}\text{C}$ for 3 ± 0.5 sec. And then resonator shall be measured after being placed in room temperature for 1 hour.</p> | <p>外观无异常, 频率变化$\pm 5\text{ppm}$ 以内, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5\text{ppm}$ $\Delta R \leq 15\%$</p> |
| 3.10 | 热冲击 Thermal shock | <p>在 -40°C 保持 30 分钟, $+85^{\circ}\text{C}$ 保持 30 分钟, 循环 10 次。 Should be satisfied after supplying the following temperature cycle (10 cycles). (Refer to Fig-4). Temperature shift from low to high, high to low shall be done in $1^{\circ}\text{C}/\text{min}$.</p>  <p style="text-align: center;">Fig-4</p> | <p>外观无异常, 频率变化$\pm 5\text{ppm}$ 以内, 电阻变化 15% 以内 The crystal must meet: $\Delta f \leq \pm 5\text{ppm}$ $\Delta R \leq 15\%$</p> |

4. PACKAGE 包装

4.1 Quantity of package:

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|-------------------------------------|----------------------------|
| 100 pieces of crystal unit | per bag |
| 1000 pieces of crystal unit | per inner box, 10 bags |
| 10000 pieces of crystal unit | per carton, 10 inner boxes |

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