

新品 变更



产品规格书

SPECIFICATION FOR APPROVAL

| | |
|-----------------------|--------------------------------|
| 产品名称 Product Name: | 石英晶体谐振器 Quartz crystal unit |
| 产品型号 Product Type: | SMD3225 |
| 标称频率 Nominal Freq: | 32.000000 MHz |
| 明德亨料号 MDH P/N: | 2.3.3.320001207 |
| 客户料号 Customer P/N: | |

| | |
|------------------------------|-------------|
| 客户承认 Approved By Customer | |
| 签章 Signature: | 日期 Date: |

Date: 2024年12月21日

| 批准 Accepted | 审核 Checked | 拟制 Issued |
|----------------|---------------|--------------|
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MSL:Level 1

RoHS Compliant

SMD3225**QUARTZ CRYSTAL UNIT****MDH P/N**

2.3.3.320001207

REV.

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1 石英晶体产品规格及特性 / Product specification and features

1.1 电气特性 / Electrical Specifications

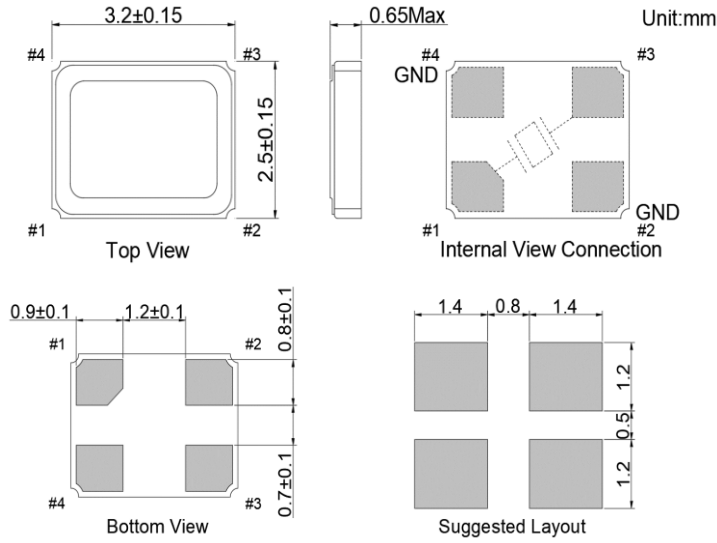
Electrical Characteristics measured by S&A250B or equivalent.

| Parameters | Electrical spec. | | | Unit | Notes |
|--|------------------|------|------|----------|---------------------------|
| | Min. | Typ. | Max. | | |
| 1.Frequency(FL) | 32.000000 | | | MHz | - |
| 2.Mode of oscillation | Fundamental | | | - | - |
| 3.Crystal Cutting Type | AT-CUT | | | - | - |
| 4.Frequency tolerance ($\Delta F/F_0$) | -10 | ~ | 10 | ppm | At 25°C±3°C |
| 5.Loading capacitance(CL) | 12 | | | pF | - |
| 6.Equivalent Series resistance (ESR) | - | - | 40 | Ω | - |
| 7.Drive Level(DL) | 0.01 | 100 | 150 | uW | - |
| 8.Storage temperature range | -55 | ~ | 125 | °C | - |
| 9.Operating temperature range | -40 | ~ | 85 | °C | Ref. to 25°C |
| 10.Temperature stability (over operating temperature) | -20 | ~ | 20 | ppm | Ref. to 25°C |
| 11.Shut Capacitance(C0) | - | - | 3 | pF | - |
| 12.Aging | - | ±3 | - | ppm/Year | 1st Year |
| 13.SPDB | - | - | -3 | dB | -200 ~ +400kHz / 20points |
| 14.Insulation Resistance | 500 | - | - | MΩ | At DC 100±15V |
| | | | | | |
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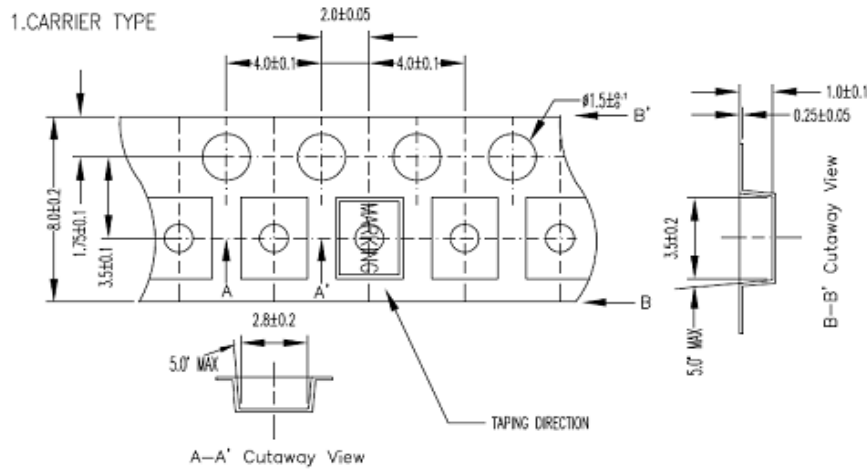
NOTE:Storage Temperature is only for the product itself,the temperature for the packing material is 5~35°C.

2.0 外形尺寸、外观 / Outline dimensions、Appearances

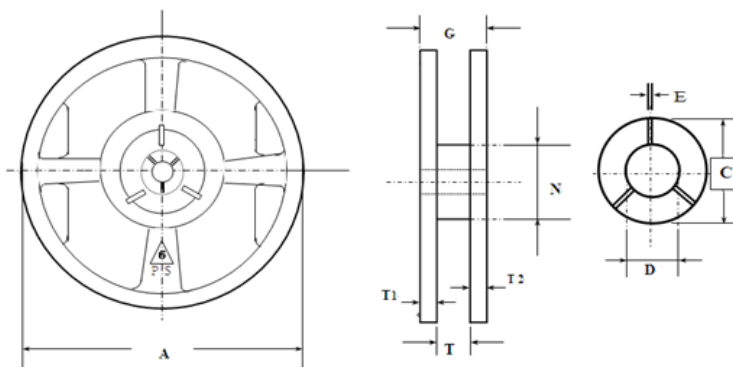
2.1 产品外形尺寸(mm)/ Product outline dimension(mm)



2.2 载带外形尺寸图 (mm) /Carrier Dimensional Drawing (mm)



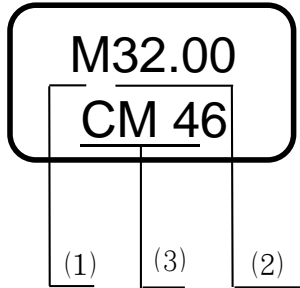
2.3 编带盘外形尺寸图(mm) /Reel Dimensional Drawing (mm)



☆图示尺寸及公差 (mm) :

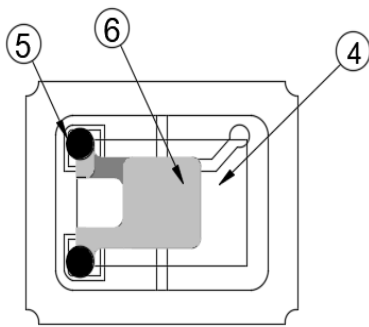
| 部位 | A | T | T1, T2 | N | C | D | E | G |
|----|------|------|--------|------|------|------|------|------|
| 尺寸 | 178 | 9.0 | 1.4 | 60.2 | 20.2 | 13.2 | 2.5 | 11.5 |
| 公差 | ±2.0 | ±0.5 | ±0.2 | ±0.5 | ±1.0 | ±0.5 | ±0.5 | ±1.4 |

2.4 印字 / Marking

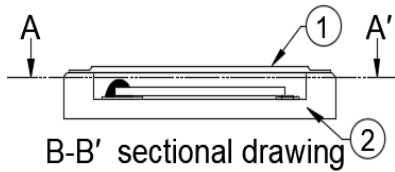
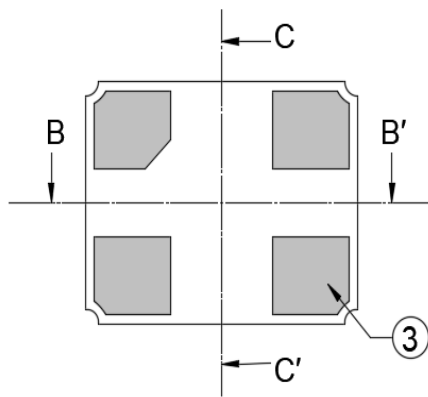


- (1) 代表公司 Logo Company Logo
- (2) 代表标称频率 Nominal Freq
- (3) 代表批次号 Batch number

3.0 内部构造图 / Product internal structure



A-A' sectional drawing



B-B' sectional drawing

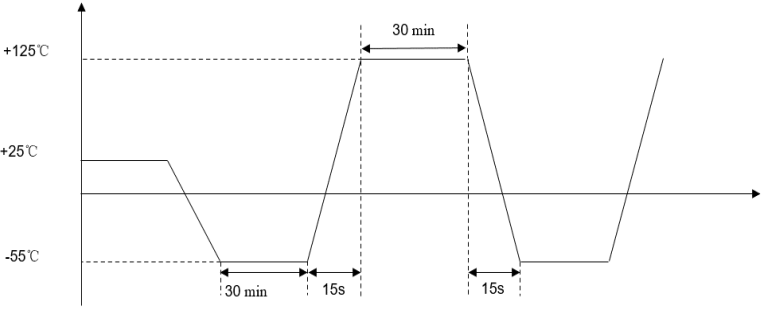


C-C' sectional drawing

Unit Weight: 0.014±0.002g/pcs

| NO. | COMPONENETS | MATERIALS | SPECIFICATIONS |
|-----|---------------------|---|---|
| 1 | LID | Kovar (Fe/Co/Ni) | - |
| 2 | Package | Ceramic (Al ₂ O ₃) + Au/Ni | Ni plating + Au plating |
| 3 | Pad | Au/Ni/W | Tungsten metalize + Ni plating + Au plating |
| 4 | Crystal blank | SiO ₂ | - |
| 5 | Conductive adhesive | Resin+Ag | Silicon resin |
| 6 | Electrode | Ag | - |

4.0 石英晶体之可靠性 / Product reliability

| 项目 (Item) | 条件 (Condition) | 结果 (Result) |
|--------------|--|----------------|
| A.1 | 耐低温性 (耐寒性) 测试 (Cold resistance) Stored at $-55\pm 2^{\circ}\text{C}$ for 500 ± 2 hrs then $25\pm 2^{\circ}\text{C}$ 2 hrs before testing | (I) |
| A.2 | 耐高温性 (耐热性) 测试 (Heat resistance) Stored at $125\pm 2^{\circ}\text{C}$ for 500 ± 2 hrs then $25\pm 2^{\circ}\text{C}$ 2 hrs before testing | (I) |
| A.3 | 耐湿热性 (Humidity Resistance Result) 稳态温度: $85\pm 2^{\circ}\text{C}$; 湿度: $85\pm 3\% \text{RH}$; 时间: 500 ± 2 hrs Steady temperature: $85\pm 2^{\circ}\text{C}$; humidity: $85\pm 3\% \text{RH}$; time: 500 ± 2 hrs | (I) |
| A.4 | 老化测试 (Aging) Stored at $85\pm 2^{\circ}\text{C}$ for 720 ± 2 Hrs then $25\pm 2^{\circ}\text{C}$ 2 Hrs before testing Stored at $25\pm 2^{\circ}\text{C}$ for 1 year | (I) |
| A.5 | 气密性 (Leakage) 细漏 Fine leak: Put the product in the Helium pressure tank, 4 ~ 5kgf/cm^2 , 0.5hrs. | (IV) |
| A.6 | 冷热冲击实验 温度循环 (Temperature Cycle) $-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$, Retain 30Min, 100 cycles  <p>温度循环 (Temperature Cycle)</p> | (I) |

4.1 机械性能 / Mechanism characteristics

| | | |
|--|--|----------------|
| <p>B.1</p> | <p>跌落测试 (Drop Test) Device are dropped from a height of 150 cm onto 2cm thickness stainless plate executing 3 times of random drops.</p> | <p>(II)</p> |
| <p>B.2</p> | <p>耐振性 (Resistance of Vibration) Frequency: 10~55Hz, amplitude(total excursion): 1.5mm±15%,3 direction (X,Y,Z) each 2 hrs then 25±2°C 2 hrs before testing</p> | <p>(I)</p> |
| <p>B.3</p> | <p>可焊性试验 (Solderability) 245±5°C, 5±1s</p> | <p>(III)</p> |
| <p>B.4</p> | <p>耐焊接热 (Reflow) Resistance to soldering heat (Reflow) 参考曲线图 (Reference Curve) :</p> | <p>(II)</p> |
| <p>The graph shows the temperature profile for the reflow test. The y-axis is labeled 'TBMP. (°C)' and ranges from 50 to 300. The x-axis is labeled 'TIME (sec)'. The curve starts at 50°C, rises to 180°C (90-120s), then to a peak of 260±5°C (10-30s), and finally levels off at 180±10°C (≥40s).</p> | | |

| 项目 Item | 结果编号 Result NO. | 规格要求 Specification Requirements |
|------------|--------------------|--|
| 1 | (I) | 频率变化 $<\pm 10\text{ppm}$; 电阻变化 $<\pm 5\Omega$ 或规格电阻的15%，取大者 Frequency variation $<\pm 10\text{ppm}$; Resistance variation $<\pm 5\Omega$ or $\pm 15\%$ of RR spec., select the bigger value. |
| 2 | (II) | 频率变化 $<\pm 5\text{ppm}$; 电阻变化 $<\pm 5\Omega$ 或规格电阻的15%，取大者 Frequency variation $<\pm 5\text{ppm}$; Resistance variation $<\pm 5\Omega$ or $\pm 15\%$ of RR spec., select the bigger value. |
| 3 | (III) | 上锡覆盖率高于95% The covering rate of Tin-plating is more than 95%. |
| 4 | (IV) | $<1 \times 10^{-9}\text{Pa}\cdot\text{m}^3/\text{s}$ Max |

5.0 生产商及产地说明 / Manufacturer and origin

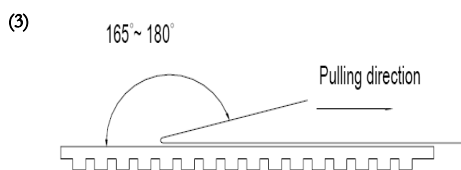
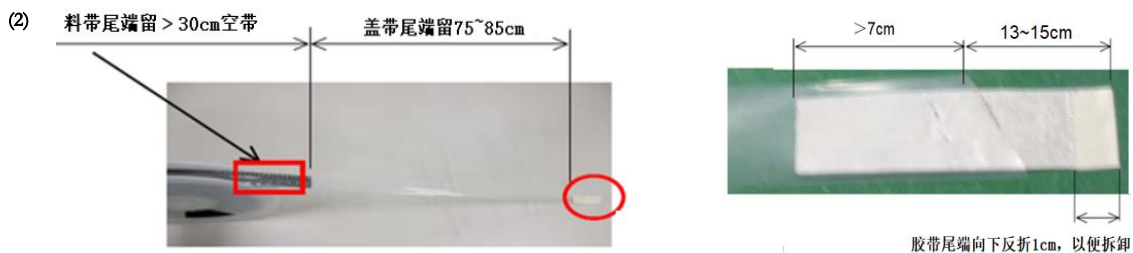
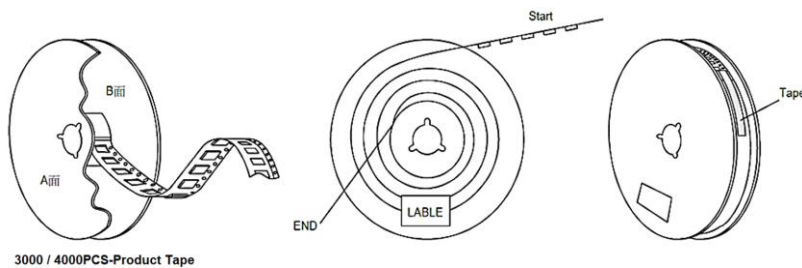
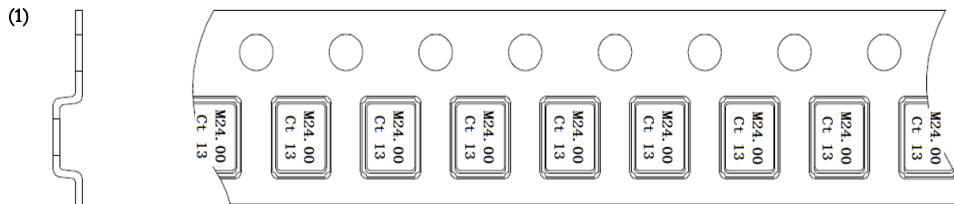
生产商/Manufacturer: 烟台明德亨电子科技有限公司

YanTai MDH Technology Co.,Ltd

四川明德亨电子科技有限公司

SiChuan MDH Technology Co.,Ltd

5.1 包装规格 / Package specification



[STORAGE]

1. 未开封状态下的贮存期限为交货后12个月, 请在期限内使用。如果日期已超, 请在使用前对其电气特性再次确认。
The storage period in unopened condition is 12 months after delivery, please use within the period. If the date is over, double-check its electrical characteristics before use.

2. 本产品为电子元件, 请勿在结露状态下储存和使用。
This product is electronic component. Please do not store and use it in Dewy State.

3. 贮存环境温度为5 °C ~35 °C, 相对湿度为30% ~ 75%, 无阳光照射。
The storage environment shall be 5°C ~35°C temperature and 30% ~ 75%RH humidity and free from the sun shine.