

新品

变更

MDH2408039



## 产品规格书

## SPECIFICATION FOR APPROVAL

产品名称 石英晶体谐振器  
Product Name: Quartz crystal unit

产品型号 SMD3225  
Product Type:

标称频率 25.000000 MHz  
Nominal Freq:

明德亨料号 3134250001  
MDH P/N:

客户料号  
Customer P/N:

客户承认

Approved By Customer

签章

Signature:

日期

Date:

Date: 2024年8月21日

| 批准       | 审核      | 拟制     |
|----------|---------|--------|
| Accepted | Checked | Issued |
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RoHS Compliant

## Revision Record

[illegible]

|         |                                                       |                     |  |         |            |      |      |
|---------|-------------------------------------------------------|---------------------|--|---------|------------|------|------|
| SMD3225 |                                                       | QUARTZ CRYSTAL UNIT |  | MDH P/N | 3134250001 |      |      |
|         |                                                       |                     |  | REV.    | 01         | PAGE | 3/10 |
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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

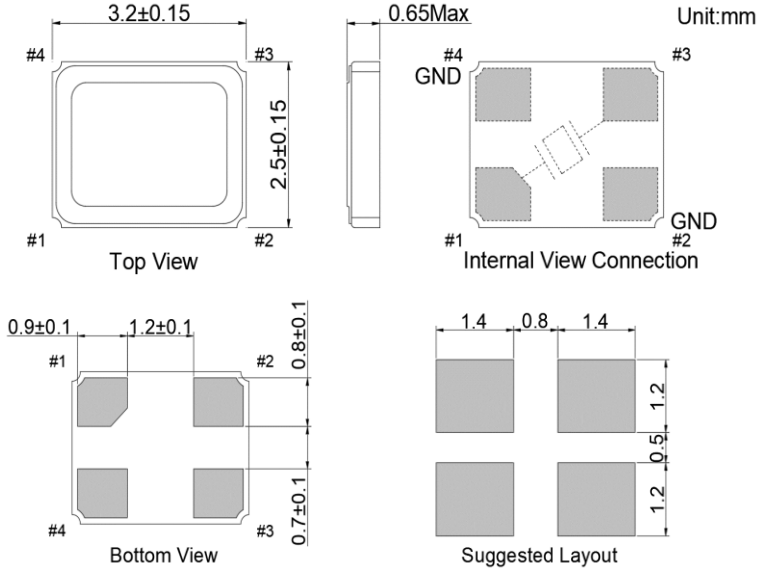
Electrical Characteristics measured by S&amp;A250B or equivalent.

| Parameters                                               | Electrical spec. |      |      | Unit     | Notes                     |
|----------------------------------------------------------|------------------|------|------|----------|---------------------------|
|                                                          | Min.             | Typ. | Max. |          |                           |
| 1.Frequency(FL)                                          | 25.000000        |      |      | MHz      | -                         |
| 2.Mode of oscillation                                    | Fundamental      |      |      | -        | -                         |
| 3.Crystal Cutting Type                                   | AT-CUT           |      |      | -        | -                         |
| 4.Frequency tolerance<br>( $\Delta F/F_0$ )              | -15              | ~    | 15   | ppm      | At 25°C±3°C               |
| 5.Loading capacitance(CL)                                | 13               |      |      | pF       | -                         |
| 6.Equivalent Series resistance<br>(ESR)                  | -                | -    | 40   | Ω        | -                         |
| 7.Drive Level(DL)                                        | 0.01             | 100  | 150  | uW       | -                         |
| 8.Storage temperature range                              | -55              | ~    | 125  | °C       | -                         |
| 9.Operating temperature range                            | -30              | ~    | 105  | °C       | Ref. to 25°C              |
| 10.Temperature stability<br>(over operating temperature) | -20              | ~    | 20   | ppm      | Ref. to 25°C              |
| 11.Shut Capacitance(C0)                                  | -                | -    | 3    | pF       | -                         |
| 12.RLD2                                                  | -                | -    | 40   | Ω        | -                         |
| 13.Aging                                                 | -                | ±3   | -    | ppm/Year | 1st Year                  |
| 14.SPDB                                                  | -                | -    | -3   | dB       | -200 ~ +400kHz / 20points |
| 15.Insulation Resistance                                 | 500              | -    | -    | MΩ       | At DC 100±15V             |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |
|                                                          |                  |      |      |          |                           |

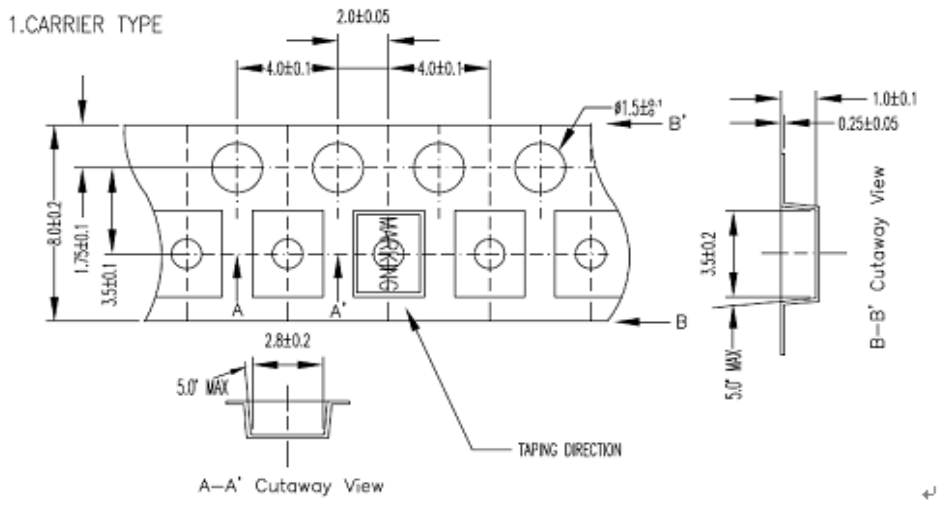
NOTE:Storage Temperature is only for the product itself,the temperature for the packing material is 5~35°C.

2.0 外形尺寸、外观 / Outline dimensions、Appearances

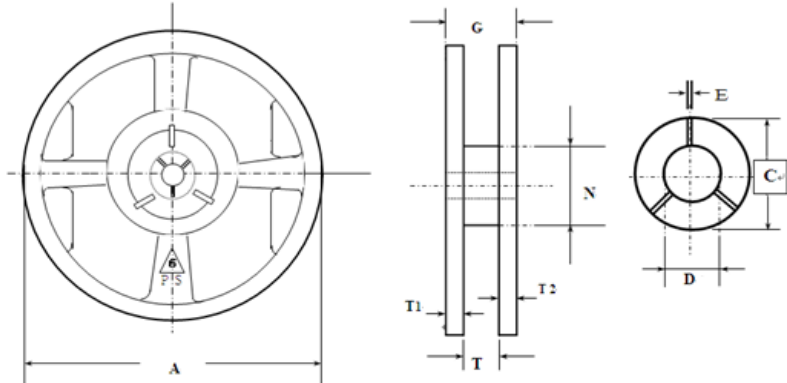
2.1 产品外形尺寸(mm)/ Product outline dimension(mm)



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



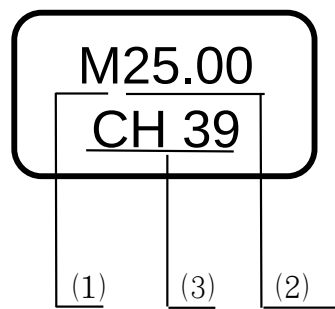
2.3 编带盘外形尺寸图(mm) /Reel Dimensional Drawing (mm)



☆图示尺寸及公差 (mm) :

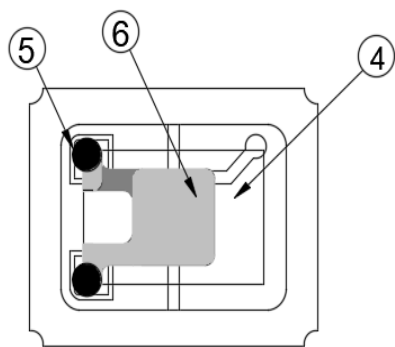
| 部位 | A    | T    | T1, T2 | N    | C    | D    | E    | G    |
|----|------|------|--------|------|------|------|------|------|
| 尺寸 | 178  | 9.0  | 1.4    | 60.2 | 20.2 | 13.2 | 2.5  | 11.5 |
| 公差 | ±2.0 | ±0.5 | ±0.2   | ±0.5 | ±1.0 | ±0.5 | ±0.5 | ±1.4 |

2.4 印字 / Marking

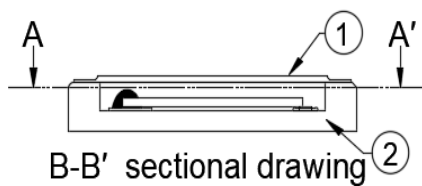
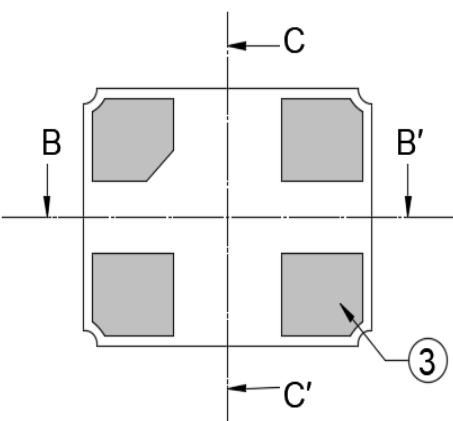


- |     |           |              |
|-----|-----------|--------------|
| (1) | 代表公司 Logo | Company Logo |
| (2) | 代表标称频率    | Nominal Freq |
| (3) | 代表批次号     | Batch number |

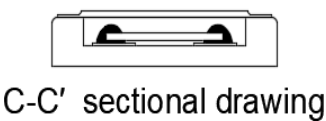
3.0 内部构造图 / Product internal structure



A-A' sectional drawing



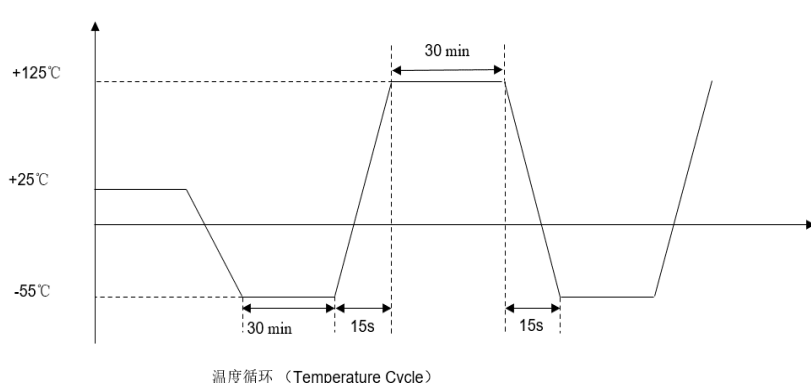
B-B' sectional drawing



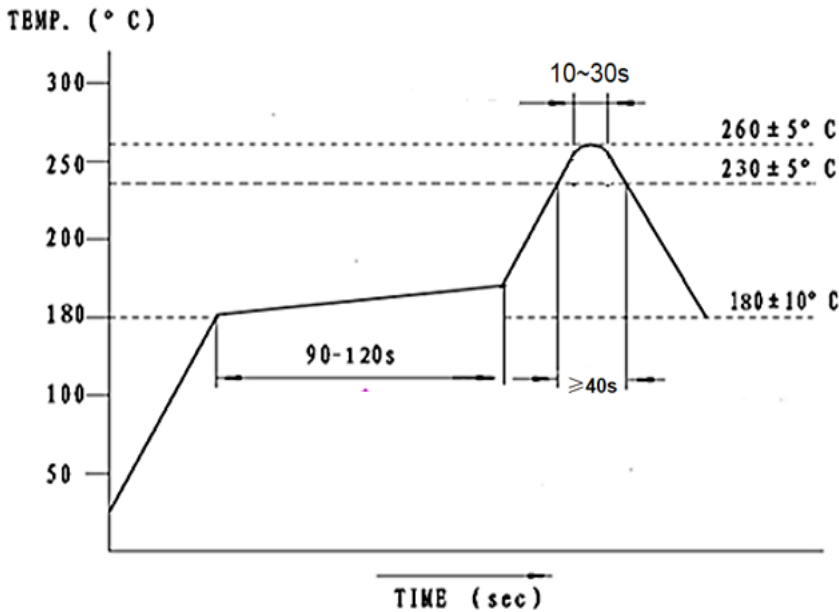
C-C' sectional drawing

| Unit Weight: 0.014±0.002g/pcs |                     |                                                   |                                             |
|-------------------------------|---------------------|---------------------------------------------------|---------------------------------------------|
| NO.                           | COMPONENETS         | MATERIALS                                         | SPECIFICATIONS                              |
| 1                             | LID                 | Kovar (Fe/Co/Ni)                                  | -                                           |
| 2                             | Package             | Ceramic (Al <sub>2</sub> O <sub>3</sub> ) + Au/Ni | Ni plating + Au plating                     |
| 3                             | Pad                 | Au/Ni/W                                           | Tungsten metalize + Ni plating + Au plating |
| 4                             | Crystal blank       | SiO <sub>2</sub>                                  | -                                           |
| 5                             | Conductive adhesive | Resin+Ag                                          | Silicon resin                               |
| 6                             | Electrode           | Ag                                                | -                                           |

## 4.0 石英晶体之可靠性 / Product reliability

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

4.1机械性能 / Mechanism characteristics

|     |                                                                                                                          |         |
|-----|--------------------------------------------------------------------------------------------------------------------------|---------|
| B.1 | 跌落测试 (Drop Test)                                                                                                         | ( II )  |
|     | Device are dropped from a height of 150 cm onto 2cm thickness stainless plate executing 3 times of random drops.         |         |
| B.2 | 耐振性 (Resistance of Vibration)                                                                                            | ( I )   |
|     | Frequency: 10~55Hz, amplitude(total excursion): 1.5mm±15%,3 direction (X,Y,Z) each 2 hrs then 25±2℃ 2 hrs before testing |         |
| B.3 | 可焊性试验 (Solderability)                                                                                                    | ( III ) |
|     | 245±5℃, 5±1s                                                                                                             |         |
| B.4 | 耐焊接热 (Reflow) Resistance to soldering heat (Reflow)                                                                      | ( II )  |
|     | 参考曲线图 (Reference Curve) :                                                                                                |         |
|     |                                       |         |



|            |                    |                                                                                                                                              |  |         |            |      |      |
|------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--|---------|------------|------|------|
| SMD3225    |                    | QUARTZ CRYSTAL UNIT                                                                                                                          |  | MDH P/N | 3134250001 |      |      |
|            |                    |                                                                                                                                              |  | REV.    | 01         | PAGE | 9/10 |
|            |                    |                                                                                                                                              |  |         |            |      |      |
|            |                    |                                                                                                                                              |  |         |            |      |      |
| 项目<br>Item | 结果编号<br>Result NO. | 规格要求    Specification Requirements                                                                                                           |  |         |            |      |      |
| 1          | ( I )              | 频率变化<±10ppm；电阻变化<±5Ω或规格电阻的15%，取大者<br>Frequency variation <±10ppm；<br>Resistance variation <±5Ω or ±15% of RR spec., select the bigger value. |  |         |            |      |      |
| 2          | ( II )             | 频率变化<±5ppm；电阻变化<±5Ω或规格电阻的15%，取大者<br>Frequency variation <±5ppm；<br>Resistance variation <±5Ω or ±15% of RR spec., select the bigger value.   |  |         |            |      |      |
| 3          | ( III )            | 上锡覆盖率高于95％<br>The covering rate of Tin-plating is more than 95%.                                                                             |  |         |            |      |      |
| 4          | ( IV )             | <1*10 <sup>-9</sup> Pa.m³/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

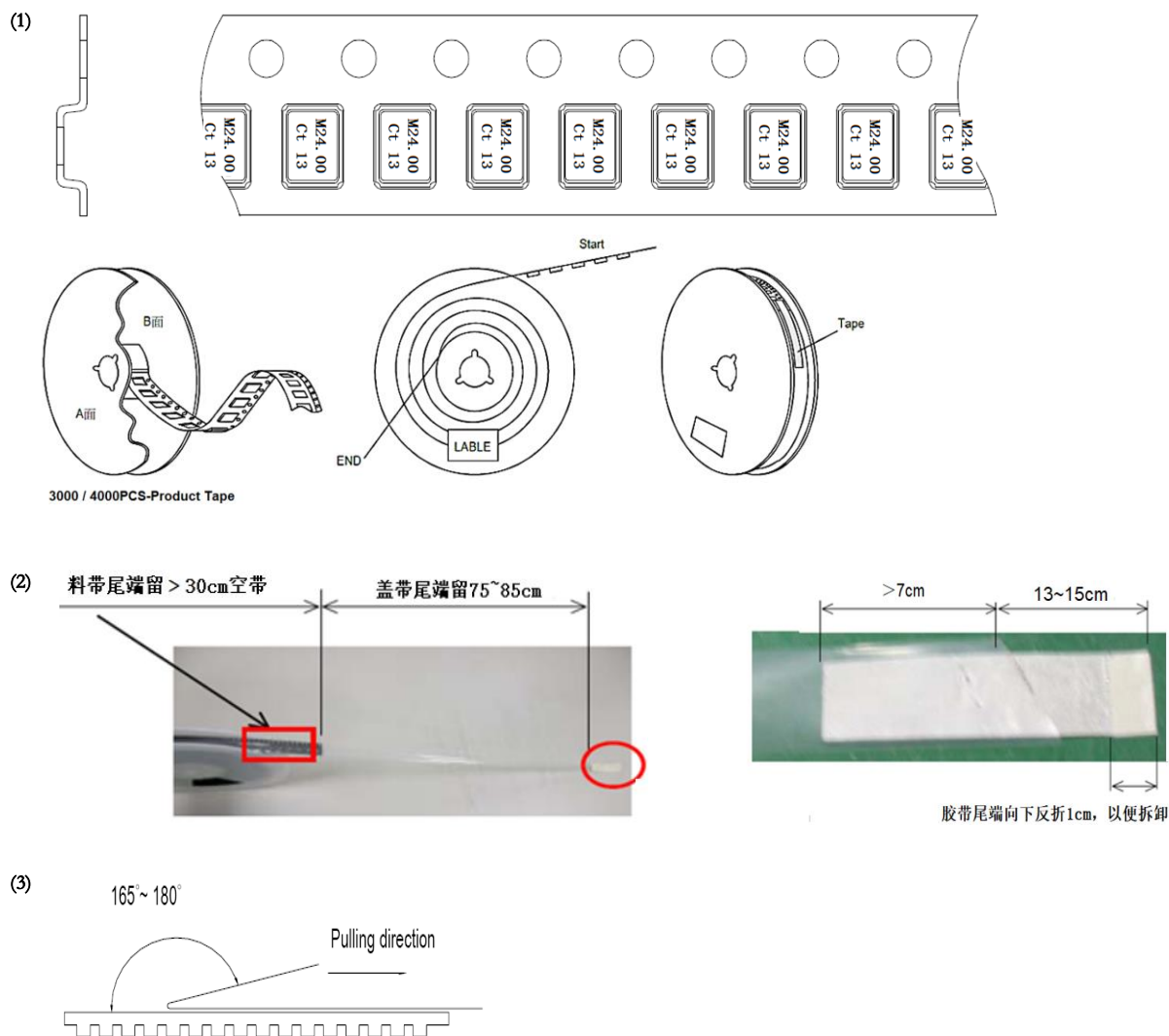
YanTai MDH Technology Co.,Ltd

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℃~35℃，相对湿度为30%~75%，无阳光照射。  
The storage environment shall be 5℃~35℃ temperature and 30%~75%RH humidity and free from the sun shine.