



NO.

ECAB2601079

# Acknowledgement Book

Customer : \_\_\_\_\_

Production name: MF3215 3.2\*1.5 \_\_\_\_\_

Nominal Freq. : 32.768 KHz \_\_\_\_\_

Customer P/N : \_\_\_\_\_

ECEC P/N : EF3276w014 \_\_\_\_\_

## Receiver

Please return one after acknowledgement

**JinHua East Crystal Electronic Co.,Ltd.**

| Approved By   | MFG   | QA   | PE/RD   |
|---|---|--|---|
|  |  |  |  |
| 总经理: 郭雄伟  | 副总: 郭雄伟   | 副总: 黄文俊  | 部长: 王晓东   |
| 2026/1/13   | 2026/1/13   | 2026/1/13  | 2026/1/13   |

公司名称: 东晶电子金华有限公司

Corporation: JinHua East Crystal Electronic Co.,Ltd.

地址: 浙江省金华市宾虹路二段555号

ADD: No 555,Sec 2,Binghong Road Jinhua Zhejiang , P.R.C

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BOOK OF MODIFICATION

| No. | DATE      | CONTENT OF MODIFICATION | REASON OF MODIFICATION | PAGE | ITEM | APPROVE |
|-----|-----------|-------------------------|------------------------|------|------|---------|
| 0   | 2026/1/13 | INTIAL RELEASED         |                        |      |      |         |
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**SPECIFICATION OF QUARTZ CRYSTAL UNITS**

**1.HOLDER TYPE:** MF3215 3.2\*1.5  
32.768 KHz

**2. ELECTRICAL SPECIFICATIONS**

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement

Ambient temperature : 25±3℃

Relative humidity : 40% ~ 70%

If there is any doubt about the results ,measurement shall be made within the following limits .

Ambient temperature : 25±3℃

Relative humidity : 40% ~ 70%

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

The crystal is using NT CUT (Surface bending mode).

**3.ELECTRICAL CHARACTERISTICS**

|    | Parameters                | SYM | Electrical Spec |     |     |       | Notes              |
|----|---------------------------|-----|-----------------|-----|-----|-------|--------------------|
|    |                           |     | MIN             | TYP | MAX | UNITS |                    |
| 1  | Nominal Frequency         | FL  | 32.768000       |     |     |       | KHz                |
| 2  | Oscillation mode          | -   | Fundamental     |     |     |       | -                  |
| 3  | Load Capacitance          | CL  | 6               |     |     |       | pF                 |
| 4  | Frequency Tolerance       | -   | ±30             |     |     |       | ppm at 25±3℃       |
| 5  | Operating Temperature     | -   | -40             | ~   | 85  | ℃     |                    |
| 6  | Parabolic Coefficient     | -   | -0.04~-0.02     |     |     |       | ppm/℃ <sup>2</sup> |
| 7  | Equivalent Resistance Rr  | Rr  | -               | -   | 70  | KΩ    |                    |
| 8  | Drive Level               | DL  | -               | 0.1 | 0.5 | uW    |                    |
| 9  | Shunt Capacitance C0      | C0  | -               | -   | 1.6 | pF    |                    |
| 10 | Insulation Resistance     | -   | 500             | -   | -   | MΩ    | at DC 100V         |
| 11 | Aging                     | -   | ±2              |     |     |       | ppm Year           |
| 12 | Storage Temperature Range | -   | -55             | ~   | 125 | ℃     |                    |

Notes:

**1. Ultrasonic cleaning**

General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillation frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

**2.Ultrasonic welding**

Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

**3.Storage temperature description**

Storage Temperature is only for the product itself,the temperature for the packing material is 5℃~40℃.

**4. Recommended conditions for manual welding**

Temperature: 350 ± 10 ℃,Time: 3 sec max,Re-solder times: twice max.

**■ FACTORY LOCATION**

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No 555,Sec 2,Binghong Road Jinhua Zhejiang , P.R.C

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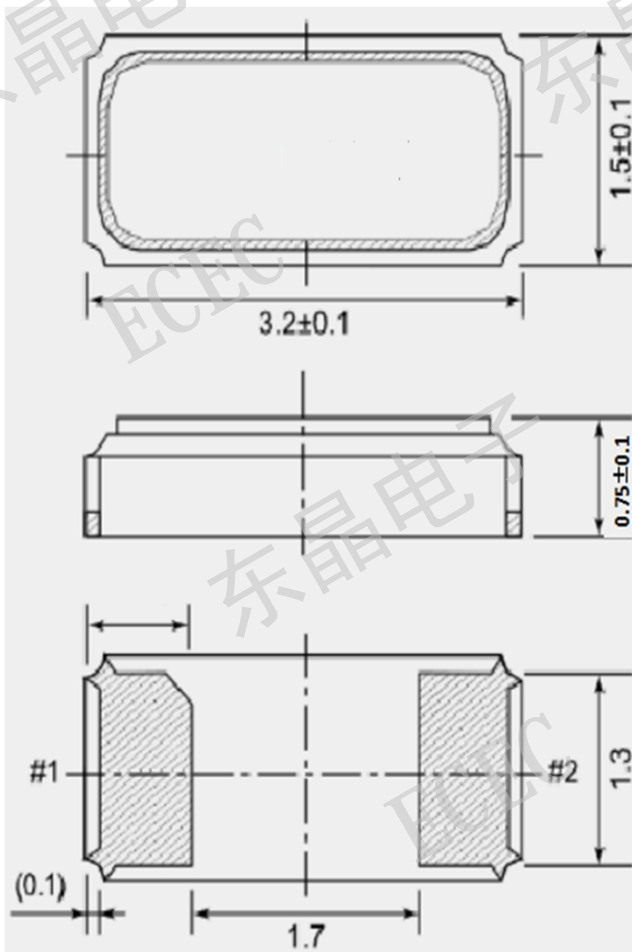
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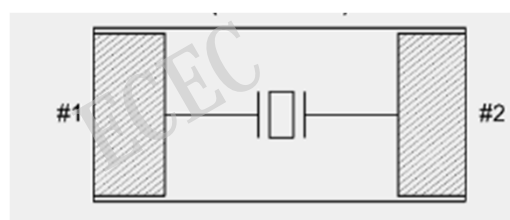
#### 4.DIMENSIONS AND MARKING

4-1 HOLDER TYPE MF3215 3.2\*1.5  
32.768 KHz

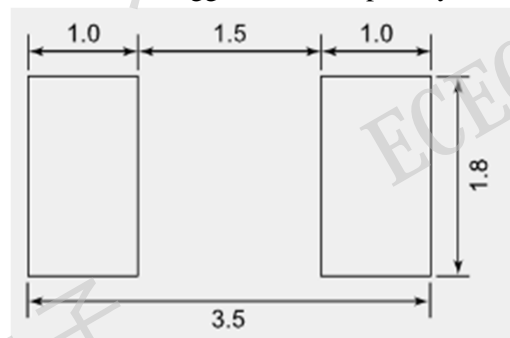
#### 4-2 DIMENSION (mm)



\*Internal Connections(Top View)



\*Suggested solder pad layout



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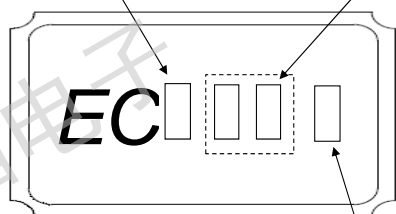
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## 4-3 MARKING

Year/Month Code

LOT NO



Load Code

Year/Month code:as shown in the table

EX) December of 2020 shall be marked as "z"

Four year 1 cycle

| Year \ Month |      |      |      |      |      |      |      |      |      | Jan. | Feb. | Mar. | Apr. | May. | Jun. | Jul. | Aug. | Sep. | Oct. | Nov | Dec. |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|------|
| 2001         | 2009 | 2017 | 2025 | 2033 | 2041 | 2049 | 2057 | 2065 | 2073 | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L   | M    |
| 2002         | 2010 | 2018 | 2026 | 2034 | 2042 | 2050 | 2058 | 2066 | 2074 | N    | P    | Q    | R    | S    | T    | U    | V    | W    | X    | Y   | Z    |
| 2003         | 2011 | 2019 | 2027 | 2035 | 2043 | 2051 | 2059 | 2067 | 2075 | a    | b    | c    | d    | e    | f    | g    | h    | j    | k    | l   | m    |
| 2004         | 2012 | 2020 | 2028 | 2036 | 2044 | 2052 | 2060 | 2068 | 2076 | n    | p    | q    | r    | s    | t    | u    | v    | w    | x    | y   | z    |
| 2005         | 2013 | 2021 | 2029 | 2037 | 2045 | 2053 | 2061 | 2069 | 2077 | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L   | M    |
| 2006         | 2014 | 2022 | 2030 | 2038 | 2046 | 2054 | 2062 | 2070 | 2078 | N    | P    | Q    | R    | S    | T    | U    | V    | W    | X    | Y   | Z    |
| 2007         | 2015 | 2023 | 2031 | 2039 | 2047 | 2055 | 2063 | 2071 | 2079 | a    | b    | c    | d    | e    | f    | g    | h    | j    | k    | l   | m    |
| 2008         | 2016 | 2024 | 2032 | 2040 | 2048 | 2056 | 2064 | 2072 | 2080 | n    | p    | q    | r    | s    | t    | u    | v    | w    | x    | y   | z    |

Load Code:

w: 6pf; j: 7pf; c: 9pf; E: 12.5pf

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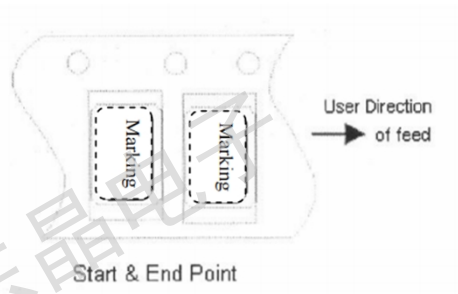
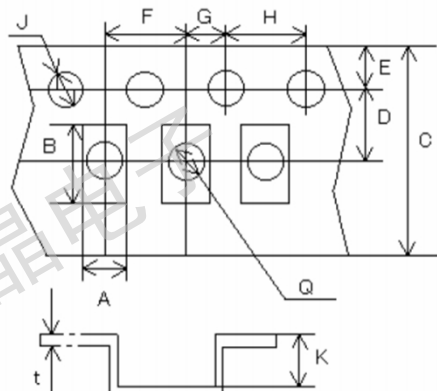
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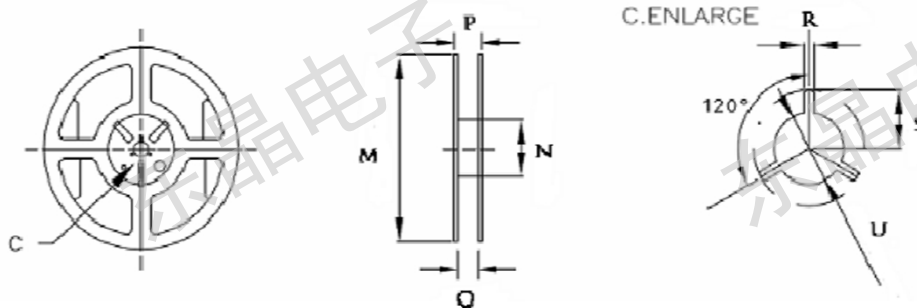
## 4-4 PACKING

## 4-4-1 Dimensions of the tape



| A    | B    | C    | D   | E    | F   | G   | H   | J   | K   | t    |
|------|------|------|-----|------|-----|-----|-----|-----|-----|------|
| 1.75 | 3.45 | 12.0 | 5.5 | 1.75 | 4.0 | 2.0 | 4.0 | 1.5 | 1.0 | 0.25 |

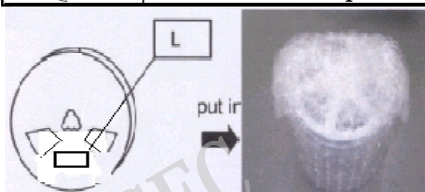
## 4-4-2 Dimensions of the reel



| M   | N  | P    | Q    | R   | S    | U    |
|-----|----|------|------|-----|------|------|
| 180 | 60 | 15.4 | 13.0 | 2.5 | 10.5 | 13.0 |

## 4-4-3 Packing and Label

| QUARTZ CRYSTAL UNITS |      |
|----------------------|------|
| P/O                  |      |
| P/N                  |      |
| HOLD                 |      |
| FREQ.                | MHz  |
| Q'TY                 | Kpcs |



1 Reel=3000pcs

| Box type(Reel quantity)    | Box size(L×W×H) mm |
|----------------------------|--------------------|
| Atype<br>(Reel x 5pcs max) | 200×200×140        |
| Btype<br>(Reel x 6~15pcs)  | 200×200×255        |
| Ctype<br>(Reel x 16~30pcs) | 395×200×255        |
| Dtype<br>(Reel x 31~60pcs) | 395×400×255        |

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## 5.RELIABILITY TEST

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.(Test SPEC as list 1)

### 5-1.SHOCK

Electrical charateristics shall be satisfied after dropping three times from the height of 100cm onto the board of the 3cm thickness.

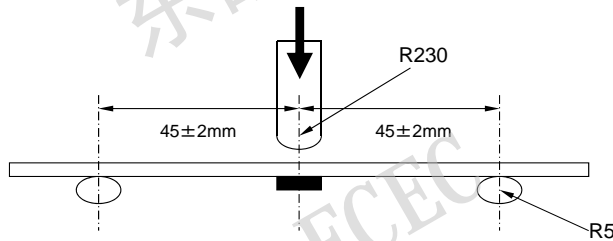
### 5-2.VIBRATION

Electrical charateristics shall be satisfied after supplying following vibration.

- |                           |                       |
|---------------------------|-----------------------|
| a).ENTIRE FREQUENCY RANGE | 10~55Hz               |
| b).REPEATED PERIOD        | 1~2min                |
| c).AMPLITUDE              | 1.5mm                 |
| d).DIRECTION              | X.Y.Z                 |
| e).PERIOD                 | 2hours/Each Direction |

### 5-3.SUBSTRATE BENDING TEST

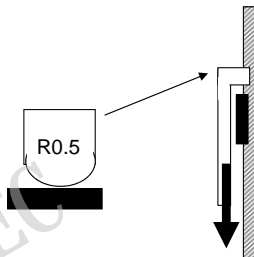
Resonator is soldered into the ceater of PCB which is laid on the 2 small supporters spaced 90cm. PCB deflected to 3mm below from horizontal level by the pressing force with stick. The force is supplied for 10 second by 0.5mm/s speed. After above test there is no observation of any visual damages on specimen and the electical characteristic shall be satisfied.



### 5-4.ADHESION TEST

A static load of 5N using a R0.5 scrach tool shall be applied on the center at long direction side of the component and for 10sec.

After above test a),there is no observation of any visual damages on the specimen.



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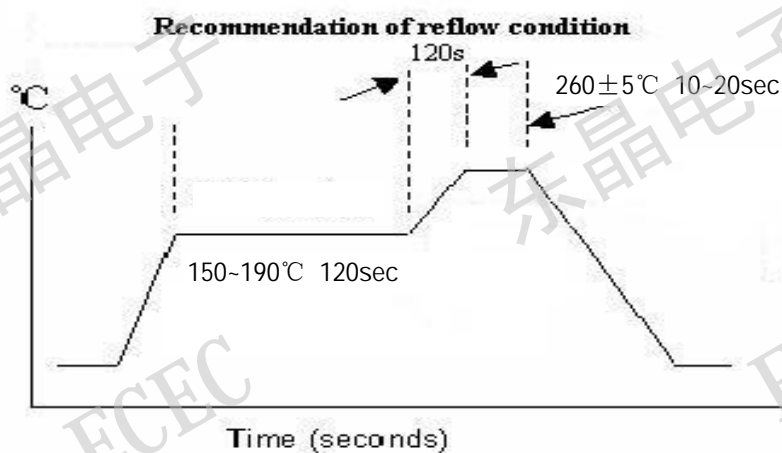
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**5-5.REFLOW(WAVE)SOLDERING**

Following profile of heat stress is applied to resonator,then being place in the natural condition for 1 hour,resonator shall be measured.

**5-6.SOLDERING DIP**

Terminals/lead-wires of specimen shall be dipped into solder melter tank at +260°C±5°C for 3 sec.

Dipping depth shall be 2mm from the bottom of specimens body.(After applying ROSIN FLUX) soldering portion shall be covered in over 95% of Terminals/lead-wires dipped.

**5-7.HUMIDITY**

Electrical characteristics shall be satisfied after letting it alone at 85±2°C in humidity of 80~85% for 500 hours.

**5-8.STORAGE IN LOW TEMPRATURE**

Electrical characteristics shall be satisfied after letting it alone at -40±2°C for 500 hours.

**5-9.STORAGE IN HIGH TEMPRATURE**

Electrical characteristics shall be satisfied after letting it alone at 85±2°C for 500 hours.

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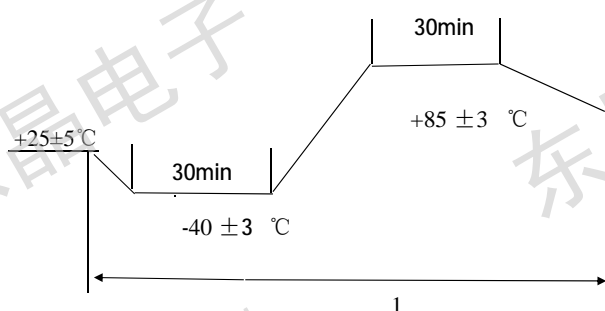
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## 5-10.TEMPERATURE CYCLE

THE CRYSTAL UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE  
CHANGE OF TEMPERATURE CYCLES



## 5-11.FINE LEAK

HELIUM BOMBING  $5.0 \sim 5.5\text{ Kg/cm}^2$ , FOR 2 HOURS.

## Spec of the reliability test

## List 1

| Item                   | $\Delta F$                                       | $\Delta CI$                      |
|------------------------|--|----------------------------------|
| 5-1、SHOCK              | $\pm 20\text{ppm} \quad \text{max}$              | $\pm 5\text{K}\Omega$ or 20% max |
| 5-5、REFLOW SOLDERING   |  |                                  |
| 5-7、HUMIDITY           |  |                                  |
| 5-8、LOW TEMPRATURE     |  |                                  |
| 5-2、VIBRATION          | $\pm 10\text{ppm} \quad \text{max}$              | $\pm 5\text{K}\Omega$ or 20% max |
| 5-9、HIGH TEMPRATURE    |  |                                  |
| 5-10、TEMPERATURE CYCLE |  |                                  |
| 5-11、FINE LEAK         |  |                                  |
|                        | $< 1*1\text{E-9 Pa} \cdot \text{m}^3/\text{sec}$ |                                  |

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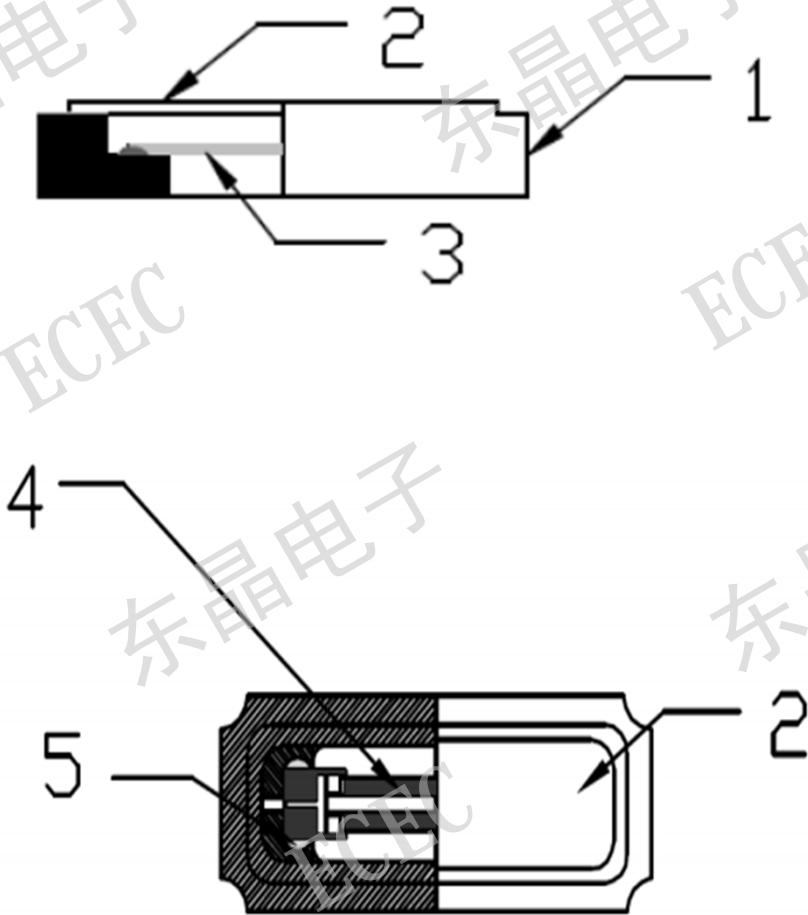
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6.Structure Illustration



| No. | Items               | Materials          |
|-----|---------------------|--------------------|
| 1   | PKG(Base)           | CERAMIC+Au PLATING |
| 2   | LID(Cap)            | Fe ALLOY           |
| 3   | Element(Blank)      | SiO2               |
| 4   | Internal Electrode  | Ag、 Au             |
| 5   | Conductive Adhesive | Ag+Slicon          |

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