





## 1. Scope

This document contains specifications for the crystal unit to be supplied by CITIZEN FINEDEVICE CO., LTD.

- 1.1 If something defined ambiguously or undefined in document happened, the customer and CITIZEN FINEDEVICE. would discuss and take necessary steps by mutual consent.
- 1.2 Product test data can't be attached to this document.  
The contents except Electrical Specifications are subject the change without notice.
- 1.3 This product is not authorized for use as a critical component in life support devices or systems.

## 2. Electrical Specifications

2.1 Nominal Frequency	32.000 kHz
2.2 Operating Temperature Range	-20 ~ +70°C
2.3 Storage Temperature Range	-40 ~ +85°C
2.4 Frequency Tolerance	±30ppm Max. at 25°C
2.5 Frequency Tolerance over Operating Temperature Range	Turnover Temp.; 25±5°C Temp.Coefficient: -0.034±0.006ppm/°C <sup>2</sup>
2.6 Equivalent Series Resistance	50kΩ Max.at 25°C
2.7 Insulation Resistance	500MΩ Min./DC100V±15V

## 3. Test Conditions

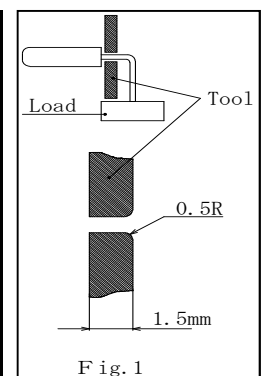
3.1 Load Capacitance	12.5pF This Load Capacitance has been fixed on customer's request.
3.2 Level of Drive	1μW Max.

#### 4. Mechanical and Environmental Tests

Test Name	Test Conditions	Criteria No.
<b>1. Mechanical Tests</b>		
1-1 Shock	Drop 3 times from the height of 75 cm onto hard wooden board with thickness of 3 cm.	A
1-2 Vibration	Vibration Frequency : 10~500 Hz, 1.5mm, full wave, or acceleration 10G, Cycle : 1.5 minutes, Direction : X.Y.Z. Time : 2 hours in each direction, for 6 hours in total.	A
1-3 Lead Pull	Weight : 1.0kg , Time : 30±5 seconds.	A•C
1-4 Bending strength	Weight : 0.5kg , Bending Angle : 90 degrees, Bending Count : 2 times. (See Fig.1)	A•C
1-5 Solderability	After applying RMA flux, dip in solder. Dipping Time : 5±0.5seconds. Soldering Temperature : 230±5°C. Dipping Depth : 2 mm from the edge of terminals of samples.	D
1-6 Resistance to Soldering Heat	Dip in solder. Dipping Time : 10±0.5 seconds. Soldering Temperature : 260±5°C. Dipping Depth : 2mm from the edge of lead-wires of samples	B
1-7 Sealing Tightness	Leak rate shall be measured by using Helium Leak Detector.	E
<b>2. Environmental Tests</b>		
2-1 Storage In Low Temperature	Expose the sample in an inoperative mode to 240 hours at -40°C.	A
2-2 Storage In High Temperature	Expose the sample in an inoperative mode to 240 hours at +85°C.	B
2-3 Humidity	Expose the sample in an inoperative mode to 240 hours at +65°C, and 95%RH.	B
2-4 Thermal Shock	Subject the sample to 5 temperature variation cycles at -40°C for 30 minutes and +100°C for the next 30 minutes in each cycle.	A

#### Criteria

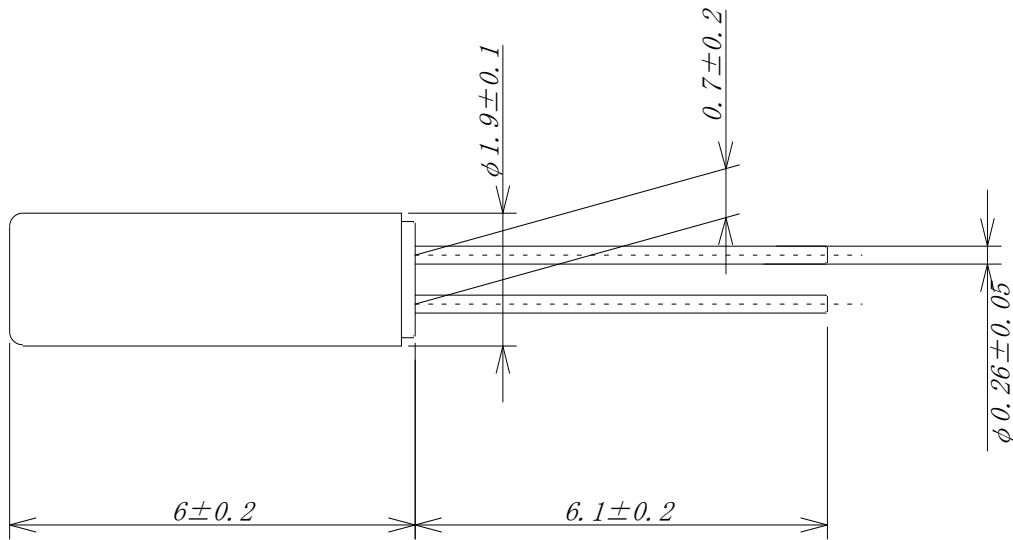
Criteria No.	Criteria
A	Any variation between the pre- and post-test frequencies shall remain within ±5ppm. The equivalent series resistance shall remain within its specified tolerance range after the post-test.
B	Any variation between the pre- and post-test frequencies shall remain within ±10ppm. The equivalent series resistance shall remain within its specified tolerance range, after the post-test.
C	After each test, no visible damage, nor the hermetic seal break down.
D	At least 90% of each dipped area shall be covered by fresh solder.
E	$1 \times 10^{-2} \mu\text{Pa} \cdot \text{m}^3/\text{s}$ Max.



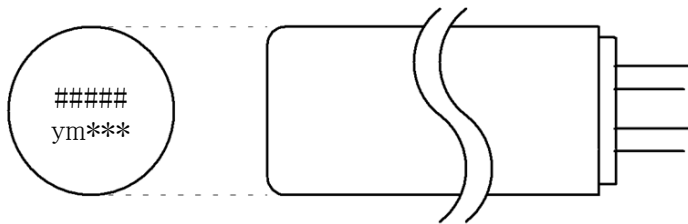
※ Measurements should be taken place at 25±2°C after each test, the samples shall be left at 25°C for one to two hours.

## 5. Dimensions

(unit:mm)



## 6. Marking Standards



#####: Frequency (Hz)

y: The last digit of production year.

m: Production month.(See Table 1)

\*\*\*: Lot no.

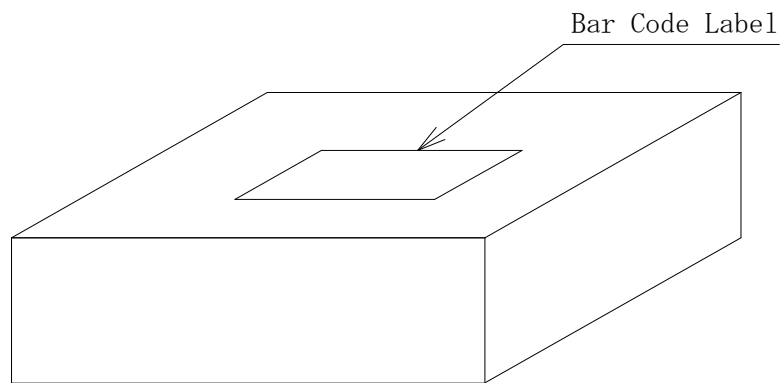
## 7. Packing

(1) Inner Carton

### 【Bar Code Label Item】

- \* Customer P/N
- \* Lot.No.
- \* CITIZEN P/N
- \* Ctl No
- \* Date Code      yy : The last 2 digits of shipment year  
                         ww : Week Code
- \* Quantity
- \* Country Code    CN=China/JP=Japan

### 【Inner Carton for 10000pcs】



(2) Quantity

1000pcs/bag at max. 10000pcs/carton (10 bags)

## 8. Storage Condition

8.1 Storage Condition	Temperature	5 ~ 35°C
	Humidity	45 ~ 75%
8.2 A period of guarantee	Twelve months	

## 9. Manufacturer

MASTER CROWN ELECTRONICS (WUZHOU) LIMITED.  
No3 BUILDING 137.XINXING ER ROAD, WUZHOU, GUANGXI, CHINA  
TEL : +86-774-3863148

Country of Origin : CHINA

\* This manufacture is under the control of CITIZEN FINEDEVICE CO., LTD.

## 10. Ozone Depleting Substance (ODS)

This Product doesn't use the class I ODS at any of production processes, and component parts.

## 11. Precautionary Statement

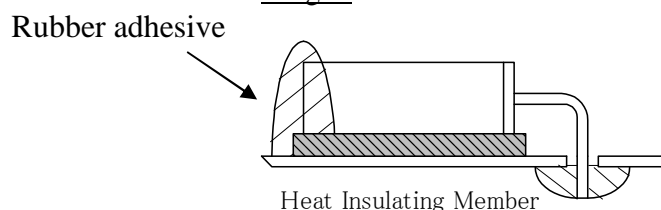
### 11-1 When dropped by mistake

The crystal products are designed and manufactured to resist physical shocks. However, in the event the crystal is subjected to excessive impact such as being dropped onto the floor or giving shocks during mounting. Need to make sure its satisfactory performance before using it.

### 11-2 Soldering and Mounting

- (1) Lead wires should be soldered within 3 seconds with the iron heated to a temperature no higher than 380°C.
- (2) In solder-dip mounting, it should be within 10 seconds with a temperature no higher than 260°C.  
And beware not to heat the whole crystal unit in the dip mounting process.  
Mounting in upright bearing is recommendable (prevent heat conduction directly to the body of a crystal unit.)  
(Such as by isolating the unit body from the board with a heat insulating member, see Fig.2.)
- (3) Heating the whole crystal unit, for example, in a reflow oven may deteriorate the performance. Because the holder is quite small and it is sealed by solder material with press sealing so that such reflow process not allowed to be proceeded.
- (4) Soldering on the body of the cylinder type crystal unit must be strictly avoided due to deteriorate the characteristics or damage the products.  
Rubber adhesive is recommended. (See Fig.-2)

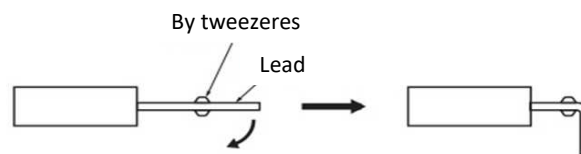
Fig.-2



(5) When the lead of cylinder type crystal units need to be bent, leave more than 1.5mm (3.0mm is recommendable) of lead from the case in order to prevent from occurrence of any cracks of the hermetic seal glass at the root of the lead and use a jig for bending if possible.

(6) When the lead needs to be bent by hand, follow the next instructions.

- ① Pick at the part with tweezers, which you intend to bend. There should be more than 1.5mm (3.0mm is recommendable) from the body case.
- ② Bend the lead 90° by tweezers without pulling the lead strongly.  
If pulling the lead strongly may cause any cracks of the hermetic seal glass at the root of the lead and may cause the airtightness and the characteristics to deteriorate.



(7) Please do not shave off the solder plating of the lead wire when you bend the lead wire of the crystal oscillator.

### 11-3 Cleaning

- (1) Crystal products may be affected and destroyed at worst by ultrasonic cleaning. Please be sure to check if your cleaning process affects any damage to crystal products prior to use.
- (2) Some kind of cleaning fluid may cause any damage to crystal products .  
Please be sure to check suitability of the cleaning fluid in advance.

### 11-4 Storage

Storage of Crystal products under higher temperature or high humidity for a long term may affect frequency stability or solderability. Please store the Crystal products under the normal temperature and humidity without exposing to direct sunlight and dew condensation, and avoid the storage of Crystal products for more than 6 months, and mount them as soon as possible after unpacking.

### 11-5 Replacement

If the defect is caused by our company within one year from the delivery time, we provide the replacements with free of charge.



## 12. Note

- 12-1 CITIZEN FINEDEVICE CO., LTD. absolutely does not assume any liability for the occurrence of any defectives recalls and etc. caused by inadequate use beyond the specifications.
- 12-2 CITIZEN FINEDEVICE CO., LTD. absolutely does not assume any liability for the occurrence of any losses caused by customers products used it in this specifications or infringement of any rights, which is industrial property, intellectual property and other rights of third party.
- 12-3 The product in this specifications are designed to be used for general electronic equipment. It is absolutely recommended to consult with our sales representative in advance if you plan to use it for medical equipment,safety control device and others that are requiring extremely high quality and reliability.  
CITIZEN FINEDEVICE CO., LTD. does not assume any liability for using it for the applications as above may cause any losses.