

## SPECIFICATIONS

Messrs.

ELECTRONICS SOURCE CO.,LTD.

Approved by

Product	CRYSTAL UNIT
Type of Holder	HCM49
Nominal Frequency	4.000000 MHz
Customer's Parts Number	
Our Parts Number	HCM494000000ABJT

Sales CITIZEN FINEDEVICE CO., LTD. Miyota Works. Crystal Devices Department.  
4107-5, MIYOTA, MIYOTA-MACHI, KITASAKU-GUN, NAGANO, 389-0295, JAPAN  
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## Revision History

Document No. : K-  
Date : 2015/12/24  
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[illegible]

## 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 CO., LTD. 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	4.000000 MHz
2.2 Mode of Vibration	Fundamental
2.3 Operating Temperature Range	-40 ~ +85°C
2.4 Storage Temperature Range	-55 ~ +125°C
2.5 Frequency Tolerance	±30ppm Max. at 25°C
2.6 Frequency Tolerance over Operating Temperature Range	±50ppm (-10~+60°C)
2.7 Equivalent Series Resistance	150Ω Max. at 25°C
2.8 Shunt Capacitance	7pF Max.
2.9 Insulation Resistance	500MΩ Min./DC100V±15V

## 3. Test Conditions

3.1 Load Capacitance	18.0pF This Load Capacitance has been fixed on customer's request.
3.2 Level of Drive	100μW
3.3 Equipment	Crystal Impedance Meter

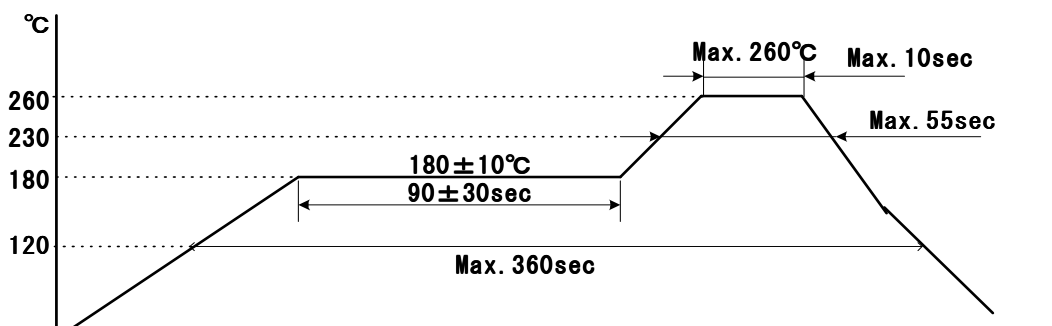
#### 4. Mechanical and Environmental Tests

Test Name	Test Conditions	Criteria No.
<b>1. Mechanical Tests</b>		
1-1 Shock	Drop 3 times from the height of 50 cm onto hard wooden board with thickness of 3 cm.	B
1-2 Vibration	Vibration Frequency : 10 to 55 Hz, 1.5mm, full wave, Cycle : 1.5 minutes, Direction : X.Y.Z., Time : 2 hours in each direction, for 6 hours in total.	A
1-3 Solderability	After applying RMA flux, dip in solder. Dipping Time : $5 \pm 0.5$ seconds. Soldering Temperature : $230 \pm 5^\circ\text{C}$ .	C
1-4 Reflow Soldering Heat Resistance	See Fig.1 reflow condition.	B
1-5 Sealing Tightness	Leak rate shall be measured by using Helium Leak Detector.	D
<b>2. Environmental Tests</b>		
2-1 Storage In Low Temperature	Expose the sample in an inoperative mode to 500 hours at $-40^\circ\text{C}$ .	A
2-2 Storage In High Temperature	Expose the sample in an inoperative mode to 500 hours at $+85^\circ\text{C}$ .	B
2-3 Humidity	Expose the sample in an inoperative mode to 500 hours at $+65^\circ\text{C}$ , and 95%RH.	B
2-4 Thermal Shock	Subject the sample to 5 temperature variation cycles at $-40^\circ\text{C}$ for 30 minutes and $+100^\circ\text{C}$ 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 $\pm 5$ ppm. 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 $\pm 10$ ppm. The equivalent series resistance shall remain within its specified tolerance range, after the post-test.
C	At least 90% of each dipped area shall be covered by fresh solder.
D	$1 \times 10^{-2} \mu\text{Pa} \cdot \text{m}^3/\text{s}$ Max.

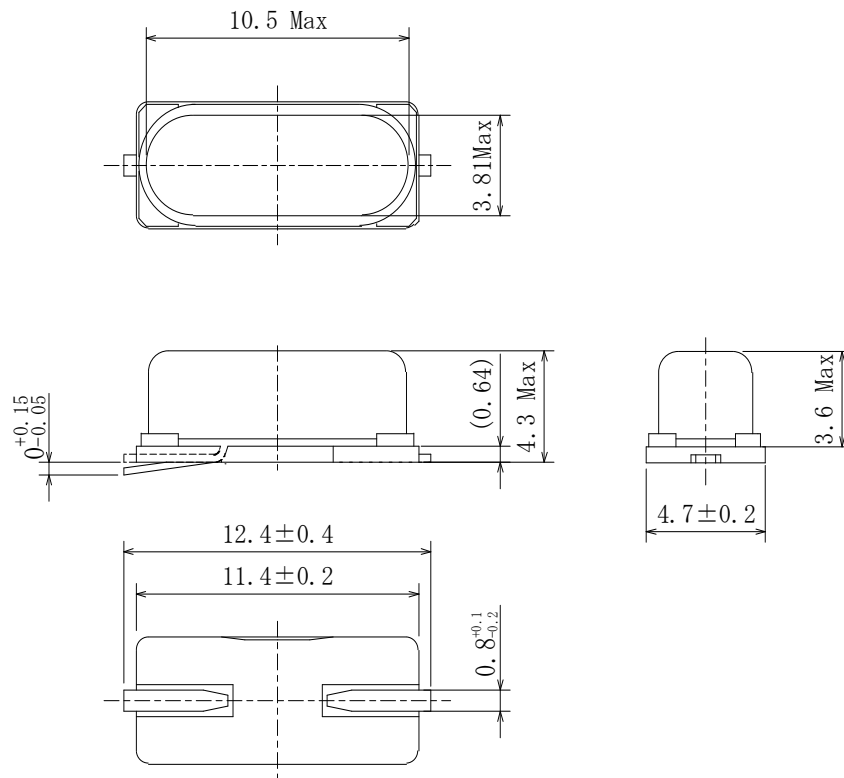
※ Measurements should be taken place at  $25 \pm 2^\circ\text{C}$  after each test, the samples shall be left at  $25^\circ\text{C}$  for one to two hours.



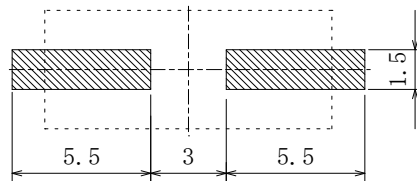
**Fig. 1**

## 5. Dimensions

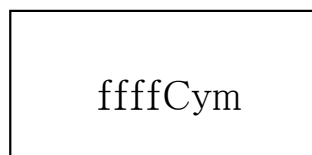
(unit:mm)



## 6. Solder Pad Layout



## 7. Marking Standards



ffff: The first 4digits of Frequency.  
(Inlude a decimal point)  
C: Manufacture's ID Code  
y: The last digit of production year.  
m: Production month.(See Table 1)

Table 1

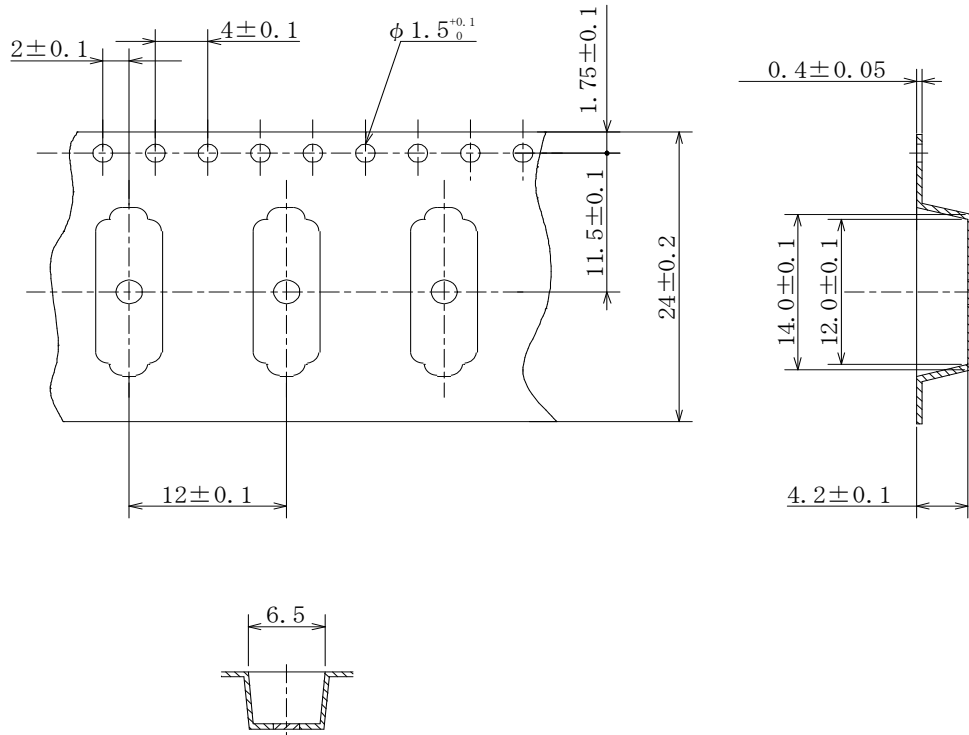
Month	1	2	...	9	10	11	12
Code	1	2	...	9	X	Y	Z

## 8. Tape and Reel Packaging

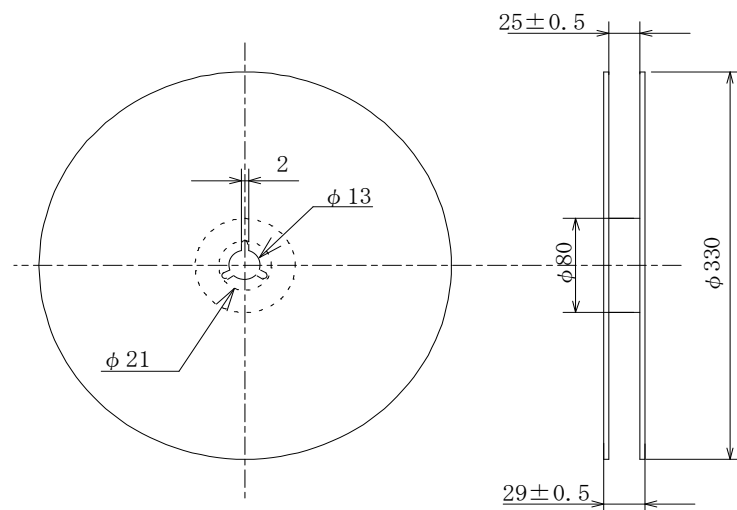
### (1) Taping Specification

Conforming to JIS C 0806-3

#### 【Tape Dimensions】



#### 【Reel Dimensions】

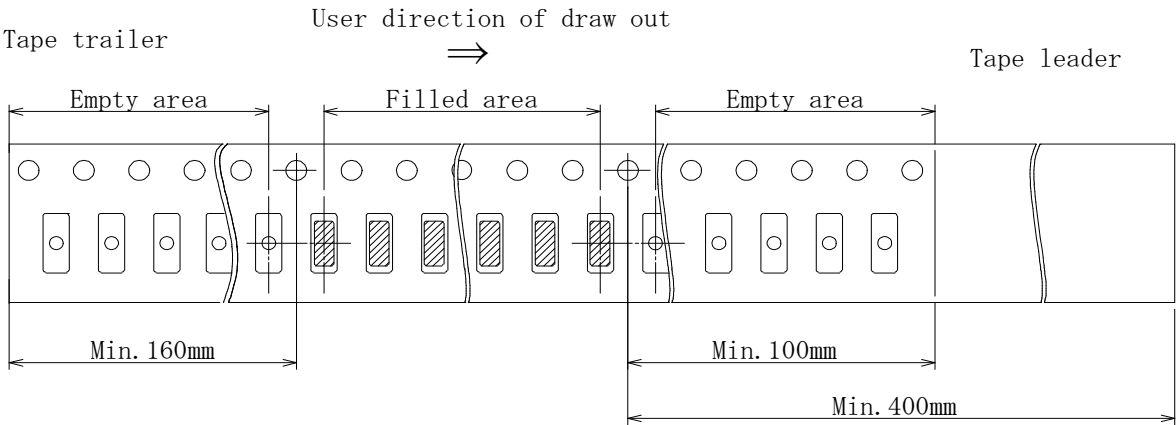


Material(Carried tape) : PS

Material (Cover tape) : PS

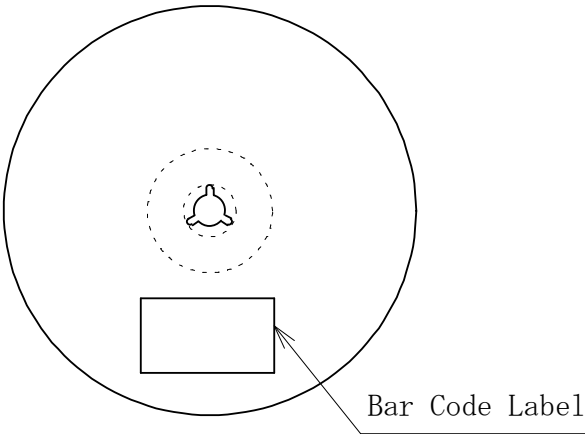
Material (Reel) : PS

【Packing】

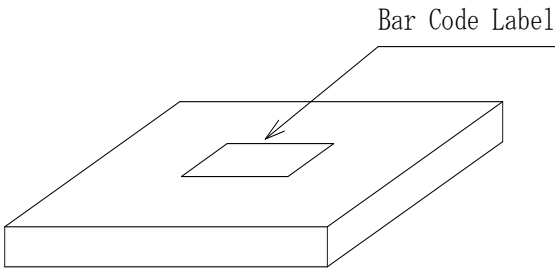


(2)Inner Carton

【Reel】



【Inner Carton】



(3)Quantity  
1000pcs/reel

9. Storage Condition

9.1 Storage Condition	Temperature	5 ~ 35℃
	Humidity	45 ~ 75%
9.2 A period of guarantee	Twelve months	

## 10. Sales

CITIZEN FINEDEVICE CO., LTD. Miyota Works.  
4107-5, MIYOTA, MIYOTA-MACHI, KITASAKU-GUN, NAGANO, 389-0295, JAPAN  
TEL : +81-267-31-1111

Country of Origin : China

## 11. Ozone Depleting Substance (ODS)

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

## 12. Precautionary Statement

### 12-1 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.

### 12-2 Mounting of quartz crystal units onto circuit board

When using an automatic loading machine, test and confirm to cause on the crystal products before mounting.

Bending the circuit board in the process of cleaving boards after mounting and soldering crystal products may cause peeling off the soldering or package cracks by mechanical stress. Please be sure that the layout of crystal products position is on the less stressed and the cleaving process is under less stressed for crystal products.

### 12-3 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.

### 12-4 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.

### 12-5 Replacement

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



### 13. Note

- 13-1 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.
- 13-2 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.
- 13-3 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.