

# SPECIFICATIONS

Messrs.  
Yangtech

Approved by

<u>Product</u>	<u>CRYSTAL UNIT</u>
<u>Type of Holder</u>	<u>CM200C</u>
<u>Nominal Frequency</u>	<u>32.768 kHz</u>
<u>Customer's Parts Number</u>	
<u>Our Parts Number</u>	

Sales CITIZEN FINETECH MIYOTA Co.,LTD. Crystal Devices Department.  
Manufacturer 4107-5,MIYOTA,MIYOTA-MACHI,KITASAKU-GUN,NAGANO,389-0295,JAPAN  
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## 1. Scope

This document contains specifications for the crystal unit to be supplied by CITIZEN FINETECH MIYOTA Co.,LTD.

- 1.1 If something defined ambiguously or undefined in document happened, the customer and CITIZEN FINETECH MIYOTA 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 in 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	32.768 kHz
2.2 Operating Temperature Range	-40 ~ +85
2.3 Storage Temperature Range	-55 ~ +125
2.4 Frequency Tolerance	±20ppm Max. at 25
2.5 Frequency Tolerance over Operating Temperature Range	Turnover Temp.; 25±5 Temp.Coefficient: -0.034±0.006ppm / °C <sup>2</sup>
2.6 Equivalent Series Resistance	50kΩ Max.at 25
2.7 Insulation Resistance	500MΩ Min./DC100V±15V
2.8 Shunt Capacitance	1.35pF Typ

## 3. Test Conditions

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

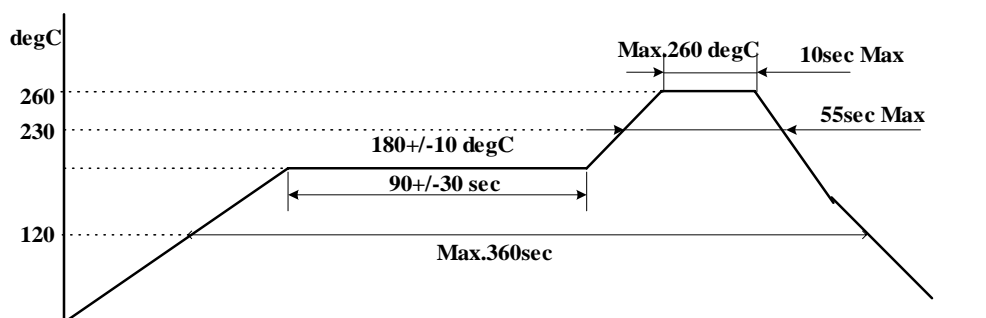
#### 4. Mechanical and Environmental Tests

Test Name	Test Conditions	Criteria
<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 to 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 Solderability	After applying RMA flux, dip in solder. Dipping Time : 5+/-0.5seconds. Soldering Temperature : 230+/-5 degC.	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 .	A
2-2 Storage In High Temperature	Expose the sample in an inoperative mode to 500 hours at +85 .	B
2-3 Humidity	Expose the sample in an inoperative mode to 500 hours at +65 , and 95%RH.	B
2-4 Thermal Shock	Subject the sample to 5 temperature variation cycles at -40 for 30 minutes and +100 for the next 30 minutes in each cycle.	A

#### Criteria

Criteria	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.

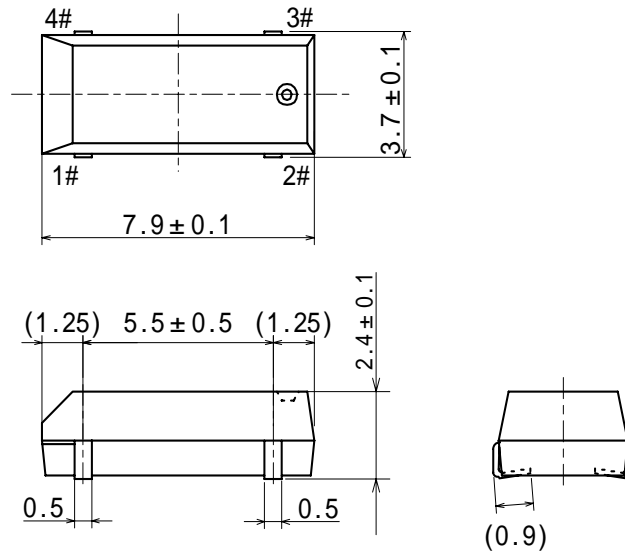
Measurements should be taken place at 25+/-2 degC after each test, the samples shall be left at 25 degC for one to two hours.



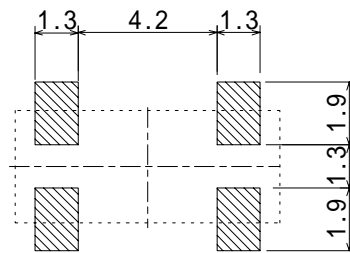
**Fig.1**

## 5. Dimensions

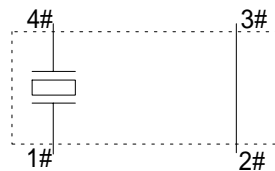
(unit:mm)



## 6. Solder Pad Layout

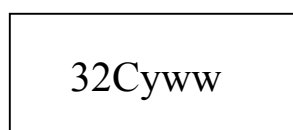


## 7. Internal connection



Do not connect to external with #2 and #3.

## 8. Marking Standards



32C: Manufacture's ID Code

y: The last digit of production year.

ww: Week Code

Table 1

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

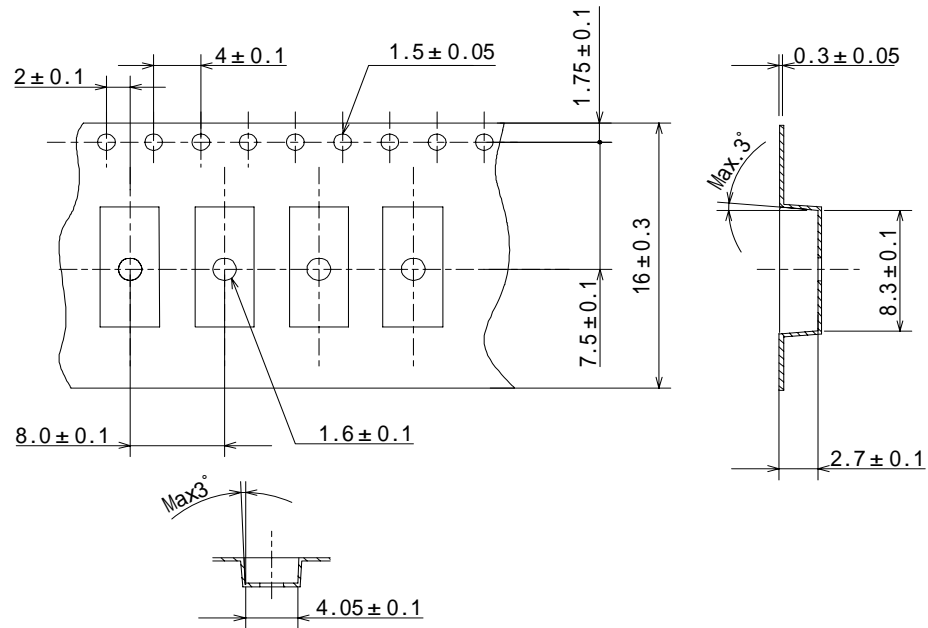
## 9. Tape and Reel Packaging

(unit:mm)

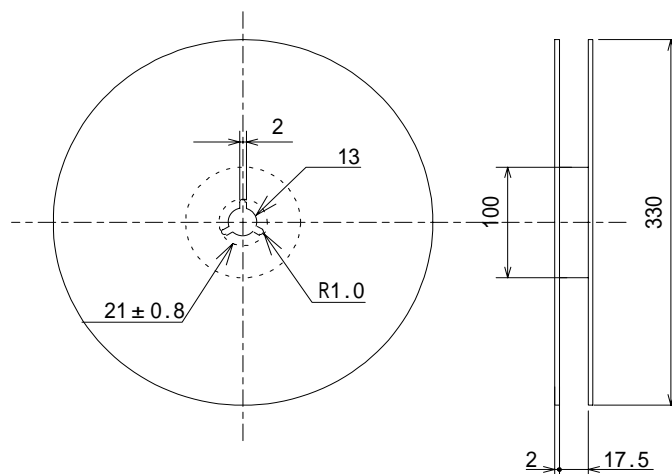
### (1) Taping Specification

Conforming to JIS C 0806-3

#### [Tape Dimensions]

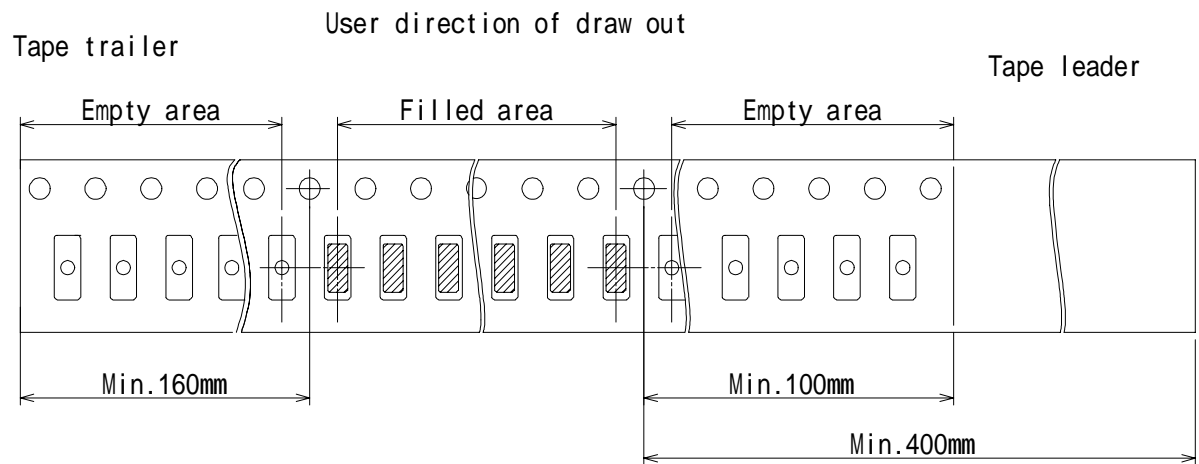


#### [Reel Dimensions]



Material(Carried tape) : Clear PS  
 Material (Cover tape) : Clear PS  
 Material (Reel) : PS

[Packing]



(2) Inner Carton

[Bar Code Label]

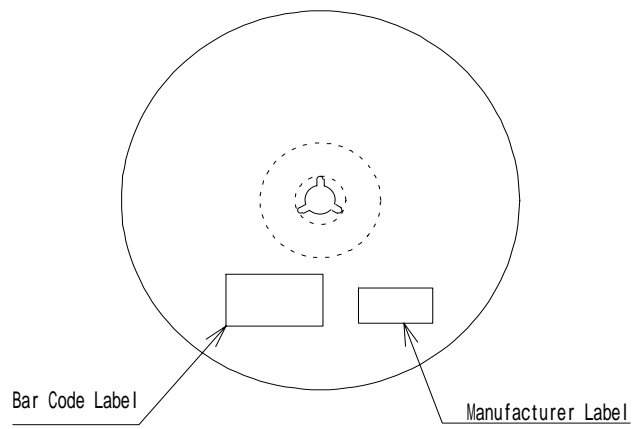
a	Customer P/N [Barcode]	CITIZEN CM200C	f
b	Quantity [Barcode]	Made in China RoHS Compliance	g
c	CITIZEN P/N [Barcode]		h
d	Ctl No. [Barcode]	Spec	i
e	LotNo [Barcode]		

- a. Customer P/N
- b. Quantity
- c. Our P/N
- d. Control No.
- e. Lot No.
- f. Manufacturer's name or symbol
- g. Type of Holder
- h. Country of Origin
- i. RoHS Compliance
- j. Spec.

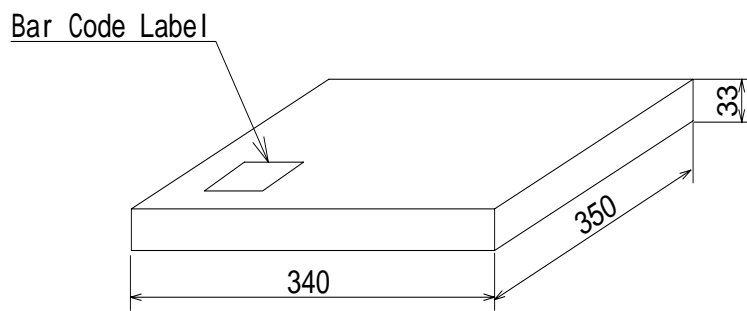
Nominal Frequency  
 Load Capacitance  
 Frequency Tolerance  
 Equivalent Series Resistance  
 Our character code

(unit:mm)

[Reel]



[Inner Carton for 1 reel]



(3)Quantity

3000pcs/reel



## 10 . 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 FINETECH MIYOTA CO.,LTD.

## 11 . Ozone Depleting Substance (ODS)

This Product doesn't use the class 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.

## 13 . QC Process Chart

Refer to attached sheet

QC工程図 QC Process Chart		水晶振動子 CM200C/CM250C Quartz Crystal Unit		2009年4月28日 April 28 2008 水晶デバイス部 技術課 Crystal Devices Div. Production Dept. Product Engineering Section		承認 Approved	審査 Checked	担当 Prepared
工程図 Flowchart				管理仕様 Control Specifications		記録 Record		
				工程名 Process Name	管理項目 Control Item			
				仕様 Specification	納入仕様書 Specifications	品質受入 検査基準書 Quality Acceptance Inspection Standard	検査表 (水晶片) Inspection Sheets (Crystal Element)	
				蒸着 Evaporation	湿度 Humidity 真空度 Pressure トータル膜厚 Total Thickness	作業指示書 Manufacturing Process Instruction	- - -	記録紙 Printed Data 稼働表 Operating Sheets 推移グラフ Change Graph
				周波数粗調整 Frequency Rough Tuning	周波数 Frequency 外観 Appearance	作業指示書 Manufacturing Process Instruction	採取 Sampling 採取 Sampling	チェックシート Check Sheets 送品検査表 Process Inspection Sheets
				受入検査 (気密端子) Acceptance Inspection (Heametically Sealed Base)	仕様 Specification	納入仕様書 Specifications	品質受入 検査基準書 Quality Acceptance Inspection Standard	検査表 Inspection Sheets
				組立 Assembly	外観 Appearance	作業指示書 Manufacturing Process Instruction	全数 100%	チェックシート Check sheets
				周波数微調整 Fine Tuning	周波数 Frequency	作業指示書 Manufacturing Process Instruction	採取 Sampling	分布図 Distribution Chart
				アニール (半成品) Annealing	真空度 Pressure 温度 Temperature 時間 Time	作業指示書 Manufacturing Process	- - -	チェックシート Check Sheets チェックシート Check Sheets チェックシート Check Sheets
				受入検査 (封止管) Acceptance Inspection (Cap)	仕様 Specification	納入仕様書 Specifications	品質受入 検査基準書 Quality Acceptance Inspection Standard	検査表 Inspection Sheets
				封止 Sealing	真空度 Pressure 寸法 Dimension	作業指示書 Manufacturing Process	- 採取 Sampling	チェックシート Check Sheets Xbar-R管理図 Xbar-R Control Chart
				ベーキング Baking	温度 Temperature 時間 Time	作業指示書 Manufacturing Process Instruction	- -	チェックシート Check Sheets 作業履歴票 Manufacturing Record
				電気特性検査1 Electrical Characteristics Inspection 1	電気的特性 Electrical Characteristics	作業指示書 Manufacturing Process Instruction	全数 100%	チェックシート Check Sheets
				樹脂成型 Molding	外観 Appearance	作業指示書 Manufacturing Process Instruction	全数 100%	チェックシート Check Sheets
				印刷 Marking	印刷外観 Marking Appearance	印刷外観 Marking Appearance	全数 100%	チェックシート Check Sheets
				電気特性検査2 Electrical Characteristics Inspection 2	電気的特性 Electrical Characteristics	作業指示書 Manufacturing Process Instruction	全数 1	チェックシート Check Sheets
				テーピング Taping	テープ剥離強度 Strength of Peeling-Tapes	作業指示書 Manufacturing Process Instruction	採取 Sampling	強度推移グラフ Strength -Transition Graph
				出荷判定 Delivery Judgment	電気的特性 Electrical Characteristics	出荷判定基準書 Delivery Judgment Standard	採取 Sampling	出荷判定成績表 Delivery Judgment Sheets
				梱包 Packing	個数 Quantity	梱包仕様書 Packing Specification	-	-