

NO. ECAB2508136

# Acknowledgement Book

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

Production name: HC-49S X'TAL 11.50×4.70×3.68

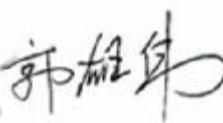
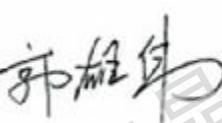
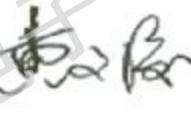
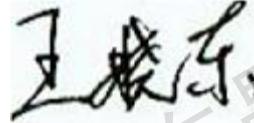
Nominal Freq. : 5.529600MHz

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

P/N : B05529J003

## Receiver

Please return one after acknowledgement

| Approved By   | MFG   | QA   | PE/RD   |
|---|---|--|---|
|  |  |  |  |

## BOOK OF MODIFICATION

| No. | DATE      | CONTENT OF MODIFICATION | REASON OF MODIFICATION | PAGE | ITEM | APPROVE |
|-----|-----------|-------------------------|------------------------|------|------|---------|
| 0   | 2025/8/26 | INTIAL RELEASED         |                        |      |      |         |
| 1   |           |                         |                        |      |      |         |
| 2   |           |                         |                        |      |      |         |
| 3   |           |                         |                        |      |      |         |
| 4   |           |                         |                        |      |      |         |
| 5   |           |                         |                        |      |      |         |
| 6   |           |                         |                        |      |      |         |
| 7   |           |                         |                        |      |      |         |
| 8   |           |                         |                        |      |      |         |
| 9   |           |                         |                        |      |      |         |
| 10  |           |                         |                        |      |      |         |
| 11  |           |                         |                        |      |      |         |
| 12  |           |                         |                        |      |      |         |
| 13  |           |                         |                        |      |      |         |
| 14  |           |                         |                        |      |      |         |
| 15  |           |                         |                        |      |      |         |
| 16  |           |                         |                        |      |      |         |
| 17  |           |                         |                        |      |      |         |
| 18  |           |                         |                        |      |      |         |
| 19  |           |                         |                        |      |      |         |
| 20  |           |                         |                        |      |      |         |

# QUARTZ CRYSTAL UNITS

|       |             |
|-------|-------------|
| No:   | ECAB2508136 |
| Date: | 2025/8/26   |

## SPECIFICATION OF QUARTZ CRYSTAL UNITS

### 1.HOLDER TYPE HC-49S X'TAL 11.50×4.70×3.68

#### 2.GENERAL

|   |                          |
|---|--------------------------|
| 2-1 FREQUENCY (F0)                                | 5.529600MHz              |
| 2-2 MODE OF OSCILLATION (Mn)                      | FUNDAMENTAL              |
| 2-3 OPERATION TEMPERATURE RANGE (T <sub>o</sub> ) | -20°C ~ +70°C            |
| 2-4 STORAGE TEMPERATURE RANGE (Ts)                | -50°C/+125°C             |
| 2-5 TEST SET                                      | S&A 250B ANALYSIS SYSTEM |
| 2-6 DRIVE LEVEL (DL)                              | 100μw TYP                |
| 2-7 LOADING CAPACITANCE (CL)                      | 20PF                     |

#### 3.ELECTRICAL CHARACTERISTICS

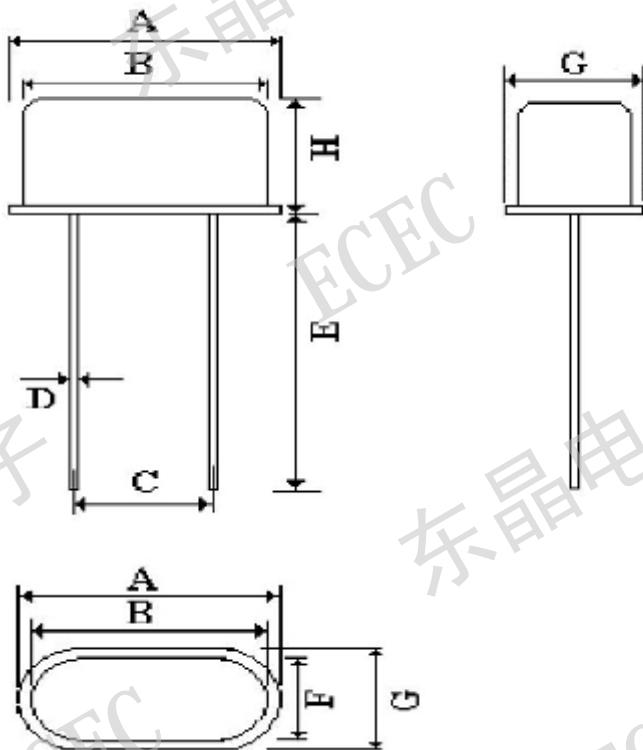
(This test shall be performed under the condition of temperature at 25±3°C.)

|   |  |
|---|--|
| 3-1 FREQUENCY TOLERANCE (△f)                | ±20 ppmMAX   |
| 3-2 EQUIVALENT RESISTANCE (R <sub>r</sub> ) | 55ΩMax/Series  |
| 3-3 TEMPERATURE DRIFT (T <sub>c</sub> )     | ±20ppm/MAX -20°C+70°C                                |
| 3-4 SHUNT CAPACITANCE (C <sub>0</sub> )     | <7.0PF   |
| 3-5 INSULATION RESISTANCE                   | 500MΩmin/DC 100V±15V<br>(Lead to lead ,case to lead) |

#### 4.DIMENSIONS AND MARKING

##### 4-1 HOLDER TYPE

HC-49S X'TAL 11.50×4.70×3.68



可根据客户需求增加垫片

JinHua East Crystal Electronic  
Co.,Ltd.

| DESIGN | INSPECTION |
|--------|------------|
| 郑紫薇    | 王晓东        |

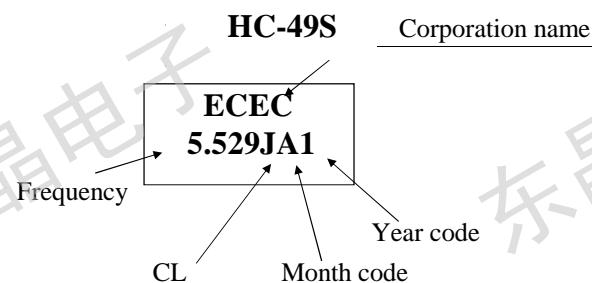
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## 4-2 DIMENSION (mm)

|   | HC-49U/S  |
|---|-----------|
| A | 11.50MAX  |
| B | 10.30MAX  |
| C | 4.88±0.2  |
| D | 0.45±0.05 |
| E | 13.2±0.5  |
| F | 3.80MAX   |
| G | 4.70MAX   |
| H | 3.68MAX   |

## 4-3 MARKING



Frequency: as shown in the table  
EX)

|                |          |            |           |
|----------------|----------|------------|-----------|
| Frequency      | 4.000MHz | 16.9344MHz | 20.000MHz |
| Frequency Code | 4.000    | 16.934     | 20.000    |

Month code: as shown in the table

EX) December shall be marked as "M"

| Month  | Jan. | Feb. | Mar. | Apr. | May. | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| Symbol | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L    | M    |

Year code: as shown in the table

EX) 2021 Shall be marked as "1"

|        |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| Year   | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | ---- |
| Symbol | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | ---- |

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DESIGN

郑紫薇

INSPECTION

王晓东

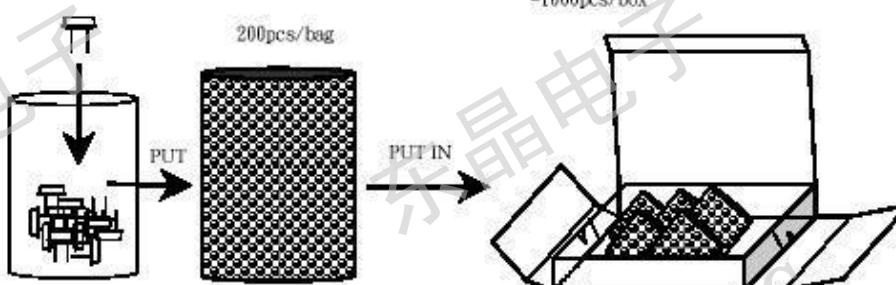
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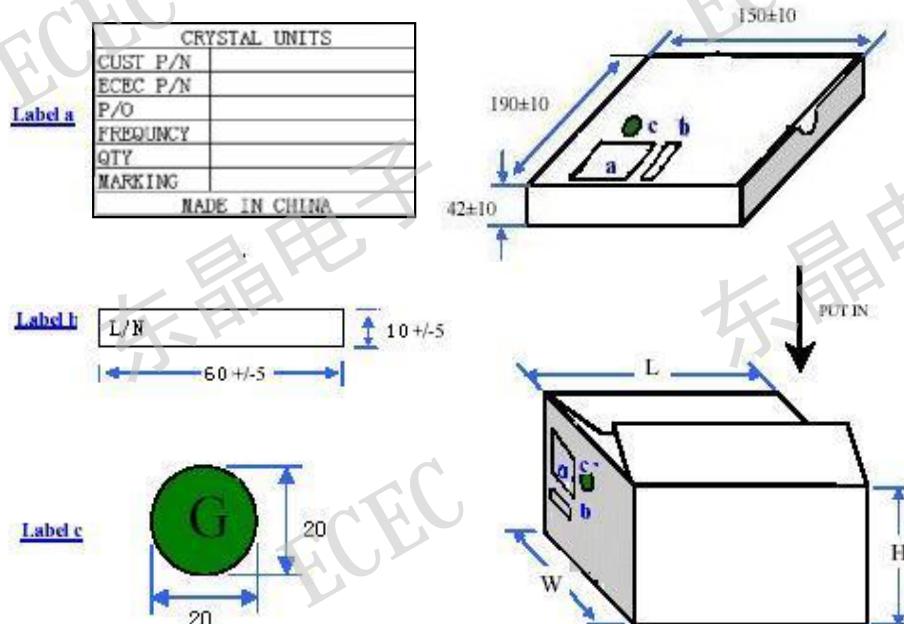
## 4-4 PACKING

Put 200pcs crystals into a plastic bags with bubbly sheet surrounded into inner-box, put 20 inner-boxes with foam sheet surrounded into a paper case, then write HOLD.FREQ.QTY in inner-box and paper case.

1. INNER BOX : (Unit : mm)



2. LOGO STICKER(CARTON and INNER BOX) : (Unit : mm)



| Box type           | size (L×W×H) mm |
|--------------------|-----------------|
| Atype (Box 1~3K)   | 200×200×165     |
| Btype (Box 4~6K)   | 205×205×290     |
| Ctype (Box 7~10K)  | 400×205×290     |
| Dtype (Box 11~20K) | 420×320×250     |

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## 5.MECHANICAL ENDURANCE

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.

### 5-1.SHOCK

Electrical characteristics shall be satisfied after dropping three times from the height of 75cm onto the board of the 3cm thickness.

### 5-2.VIBRATION

Electrical characteristics 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.STRENGTH OF TERMINALS/LEAD-WIRES

#### ①TENSILE

- a).Body of specimen shall be fixed, and 900g of tension weight shall be supplied gradually to axial direction of terminals/lead-wires for 30 sec.
- b).After above test a), there is no distinct damage or damage to sealing.

#### ②BENDING

- a).Body of specimen shall be fixed, and 90 degree bending shall be given, being supplied 225g tension weight. After that, terminals/lead-wires shall be straightened gradually. Then the same bending and straightening shall be supplied to the opposite direction in the same axial.
- b).After above test a), there is no observation of any visual damages on the specimen.

### 5-4.SEALING TIGHTNESS

Put the specimens in  $C_2H_5OH$ , raise pressure it with 0.5Mpa for 10 min, test the insulation resistance at DC.100V, the result shall be over 500M  $\Omega$ . Electrical characteristics shall be satisfied and no sealing damage.

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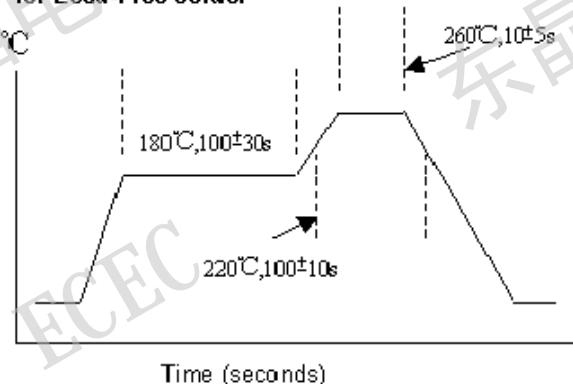
## 5-5.SOLDERING HEAT RESISTANCE

Electrical characteristics shall be satisfied .Without distinct looseness of terminals.

### ①.FLOW(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.

**Recommendation of flow condition  
for Lead-Free solder**



|  |         |
|--|---------|
| Peak temperature                       | 260°C   |
| Dipping time                           | 10± sec |
| Soldering                              | 1 time  |
| Dipping to the lead joint of component |         |

### ②.SOLDERING DIP

Terminals/lead-wires of specimen shall be dipped into solder melter tank at +230°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.

## 5-6.BEND STRENGTH PCB

①.Resonator is soldered into the center of PCB which is laid on the 2 small supporters spaced 90cm. PCB deflected to 1mm below from horizontal level by the pressing force with 20 x10.R10 stick.

The force is supplied for 1 second,5 times repeatedly.

②.After above test ①.there is no observation of any visual damages on specimen and the electrical characteristic shall be satisfied.

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## 5-7.ENVIRONMENTAL ENDURANCE

Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.

### ① HUMIDITY

Electrical characteristics shall be satisfied after letting it alone at  $65 \pm 2^\circ\text{C}$  in humidity of 90~95% for 250 hours.

### ② STORAGE IN LOW TEMPRATURE

Electrical characteristics shall be satisfied after letting it alone at  $-45 \pm 2^\circ\text{C}$  for 250 hours.

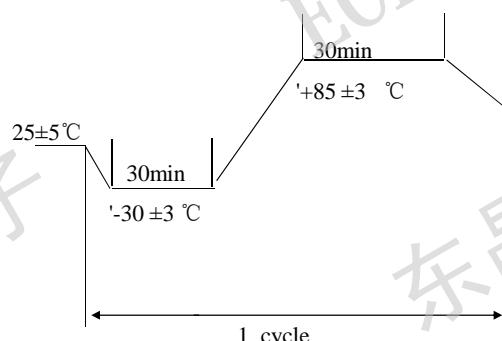
### ③ STORAGE IN HIGH TEMPRATURE

Electrical characteristics shall be satisfied after letting it alone at  $85 \pm 2^\circ\text{C}$  for 250 hours.

### ④ TEMPERATURE CYCLE

Electrical characteristics shall be satisfied after supplying the following temperature cycle(3cycle). Temperature shift from low to high, high to low shall be done in  $1^\circ\text{C/sec}$ .

(refer to Fig-3)



(Fig-3)

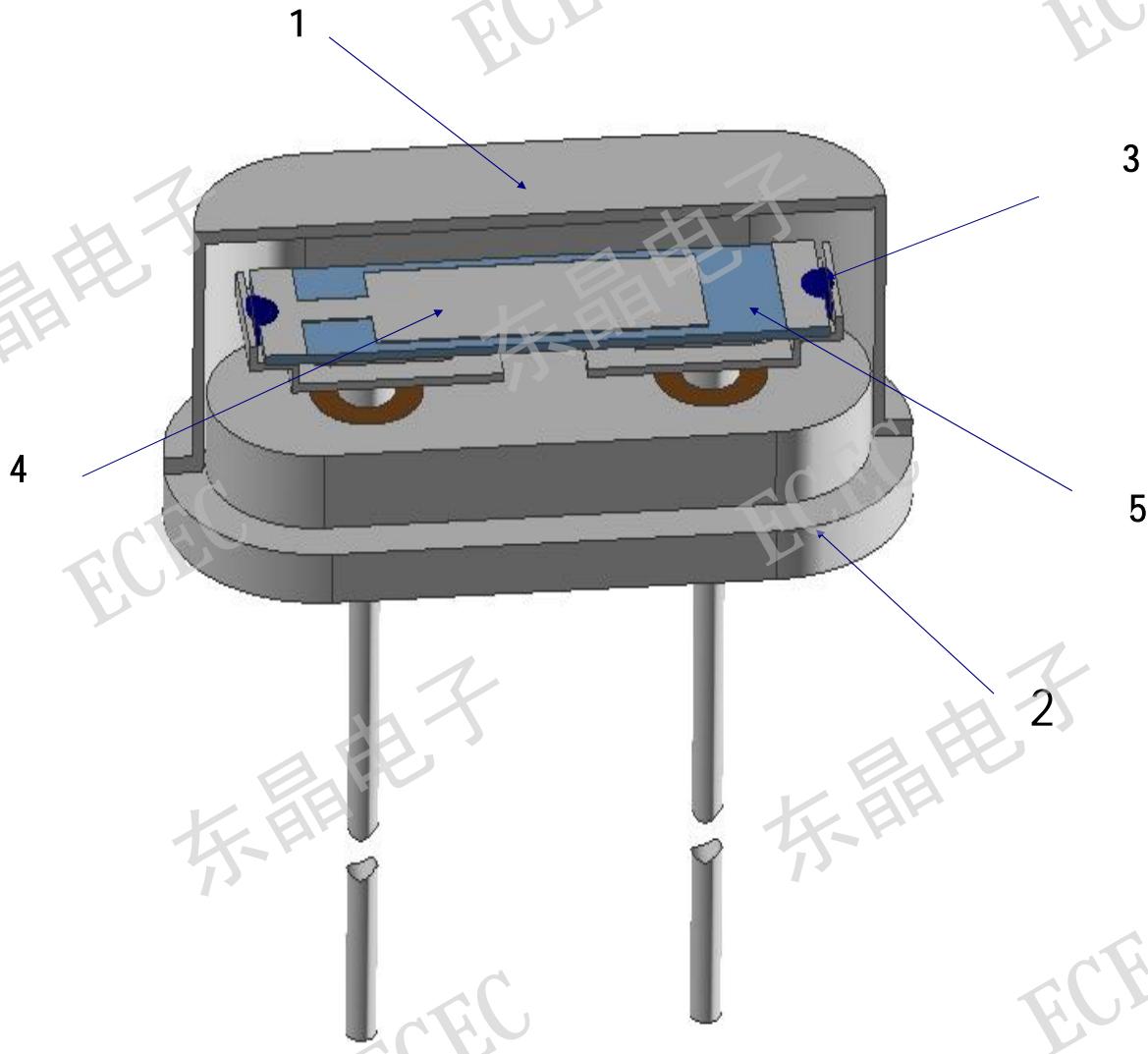
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## 6. Structure Illustration



(BOTTOM VIEW)

| No. | Items               | Materials        | Manufacturer's name |
|-----|---------------------|------------------|---------------------|
| 1   | Metal Can(Cap)      | Ni Alloy         | TOGAWA SEIKO CHINA  |
| 2   | Substrate(Base)     | Kovar (Pb free)  | XURI ELEC. CHINA    |
| 3   | Conductive Adhesive | Ag+Epoxy Resin   | Three Bond JAPAN    |
| 4   | Internal Electrode  | Ag               | SOLAR CHINA         |
| 5   | Element(Blank)      | SiO <sub>2</sub> | ECEC CHINA          |

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