

NO. ECAB2306090

# Acknowledgement Book

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

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

Nominal Freq. : 16.000000MHz

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

P/N : B16000J157

## Receiver

Please return one after acknowledgement

Approved By	MFG	QA	PE/RD
张伟宾	张伟宾	许加伟	王振东

## BOOK OF MODIFICATION

No.	DATE	CONTENT OF MODIFICATION	REASON OF MODIFICATION	PAGE	ITEM	APPROVE
0	2023/6/25	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:	ECAB2306090
Date:	2023/6/25

## SPECIFICATION OF QUARTZ CRYSTAL UNITS

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

#### 2. GENERAL

2-1 FREQUENCY (F0)	16.000000MHz
2-2 MODE OF OSCILLATION (Mn)	FUNDAMENTAL
2-3 OPERATION TEMPERATURE RANGE (T <sub>0</sub> )	-20°C ~ +70°C
2-4 STORAGE TEMPERATURE RANGE (T <sub>s</sub> )	-50°C/+125°C
2-5 TEST SET	S&A 250B ANALYSIS SYSTEM
2-6 DRIVE LEVEL (DL)	100μw TYPE (500μw MAX)
2-7 LOADING CAPACITANCE (CL)	20PF

#### 3. ELECTRICAL CHARACTERISTICS

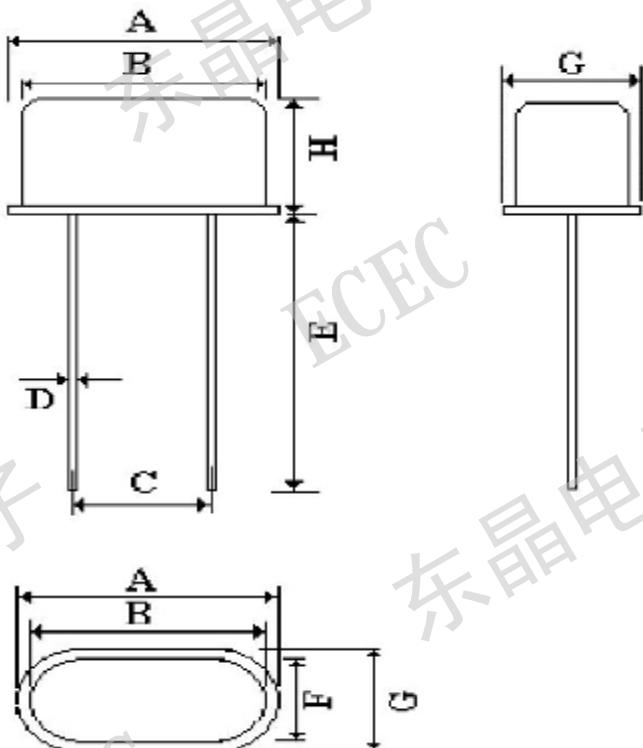
(This test shall be performed under the condition of temperature at 25±3°C.)

3-1 FREQUENCY TOLERANCE (△f)	±10 ppmMAX
3-2 EQUIVALENT RESISTANCE (R <sub>r</sub> )	30ΩMax/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 (Lead to lead ,case to lead)

#### 4. DIMENSIONS AND MARKING

##### 4-1 HOLDER TYPE

HC-49S X'TAL 11.50×4.70×3.68



JinHua East Crystal Electronic  
Co.,Ltd.

DESIGN	INSPECTION
郑紫薇	王晓东

## QUARTZ CRYSTAL UNITS

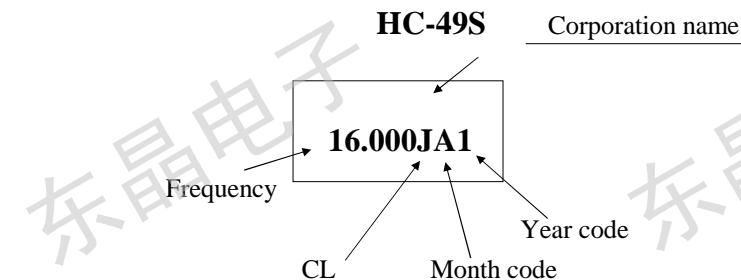
No:	ECAB2306090
Date:	2023/6/25

## 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

可根据客户需求放绝缘垫片

## 4-3 MARKING



Frequency: as shown in the table  
EX)

Frequency	4.000MHz	16.934MHz	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	----

JinHua East Crystal Electronic  
Co.,Ltd.

DESIGN

郑紫薇

INSPECTION

王晓东

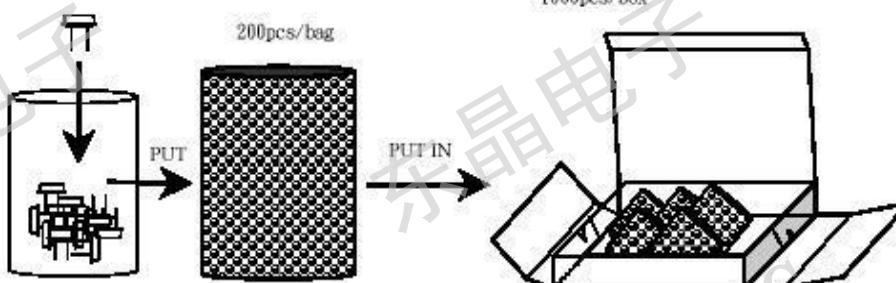
## QUARTZ CRYSTAL UNITS

No:	ECAB2306090
Date:	2023/6/25

## 4-4 PACKING

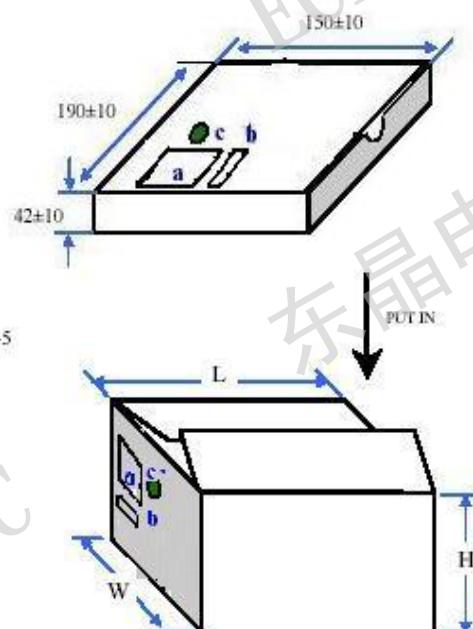
Put 200pcs crystals into a plastic bags with bubbly sheet surrounded into inner-box, put 20 inner-boxes with foam sheet surrounded into a paper case, then write HOLD.FREQ.QTY in inner-box and paper case.

## 1. INNER BOX : (Unit : mm)



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

CRYSTAL UNITS	
CUST P/N	
ECEC P/N	
P/O	
FREQUENCY	
QTY	
MARKING	MADE IN CHINA



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

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

DESIGN	INSPECTION
郑紫薇	王晓东

<b>QUARTZ CRYSTAL UNITS</b>	No:	ECAB2306090										
	Date:	2023/6/25										
<b>5.MECHANICAL ENDURANCE</b>												
<p>Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.</p>												
<p><b>5-1.SHOCK</b></p> <p>Electrical characteristics shall be satisfied after dropping three times from the height of 75cm onto the board of the 3cm thickness.</p>												
<p><b>5-2.VIBRATION</b></p> <p>Electrical characteristics shall be satisfied after supplying following vibration.</p> <table> <tr> <td>a).ENTIRE FREQUENCY RANGE</td> <td>10~55Hz</td> </tr> <tr> <td>b).REPEATED PERIOD</td> <td>1~2min</td> </tr> <tr> <td>c).AMPLITUDE</td> <td>1.5mm</td> </tr> <tr> <td>d).DIRECTION</td> <td>X.Y.Z</td> </tr> <tr> <td>e).PERIOD</td> <td>2hours/Each Direction</td> </tr> </table>			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
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											
<p><b>5-3.STRENGTH OF TERMINALS/LEAD-WIRES</b></p> <p><b>①TENSILE</b></p> <p>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.</p> <p>b).After above test a), there is no distinct damage or damage to sealing.</p>												
<p><b>②BENDING</b></p> <p>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.</p> <p>b).After above test a), there is no observation of any visual damages on the specimen.</p>												
<p><b>5-4.SEALING TIGHTNESS</b></p> <p>Put the specimens in <math>C_2H_5OH</math>, raise pressure it with 0.5Mpa for 10 min, test the insulation resistance at DC.100V, the result shall be over 500M <math>\Omega</math> . Electrical characteristics shall be satisfied and no sealing damage.</p>												
<b>JinHua East Crystal Electronic Co.,Ltd.</b>	<b>DESIGN</b>	<b>INSPECTION</b>										
	郑紫薇	王晓东										

# QUARTZ CRYSTAL UNITS

No:	ECAB2306090
Date:	2023/6/25

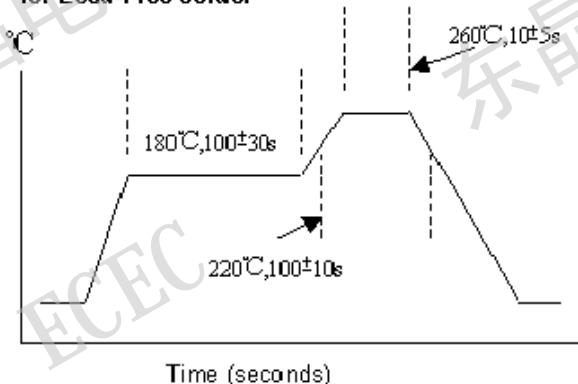
## 5-5.SOLDERING HEAT RESISTANCE

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.

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

DESIGN	INSPECTION
郑紫薇	王晓东

# QUARTZ CRYSTAL UNITS

No:	ECAB2306090
Date:	2023/6/25

## 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.

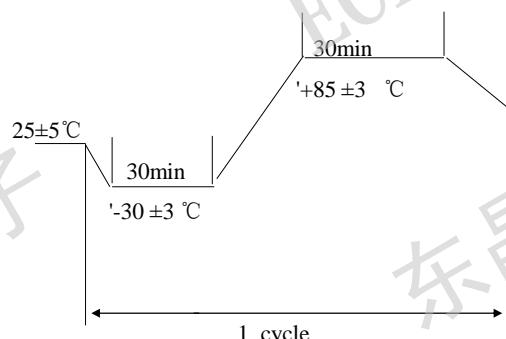
### ③ STORAGE IN HIGH TEMPRATURE

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 )

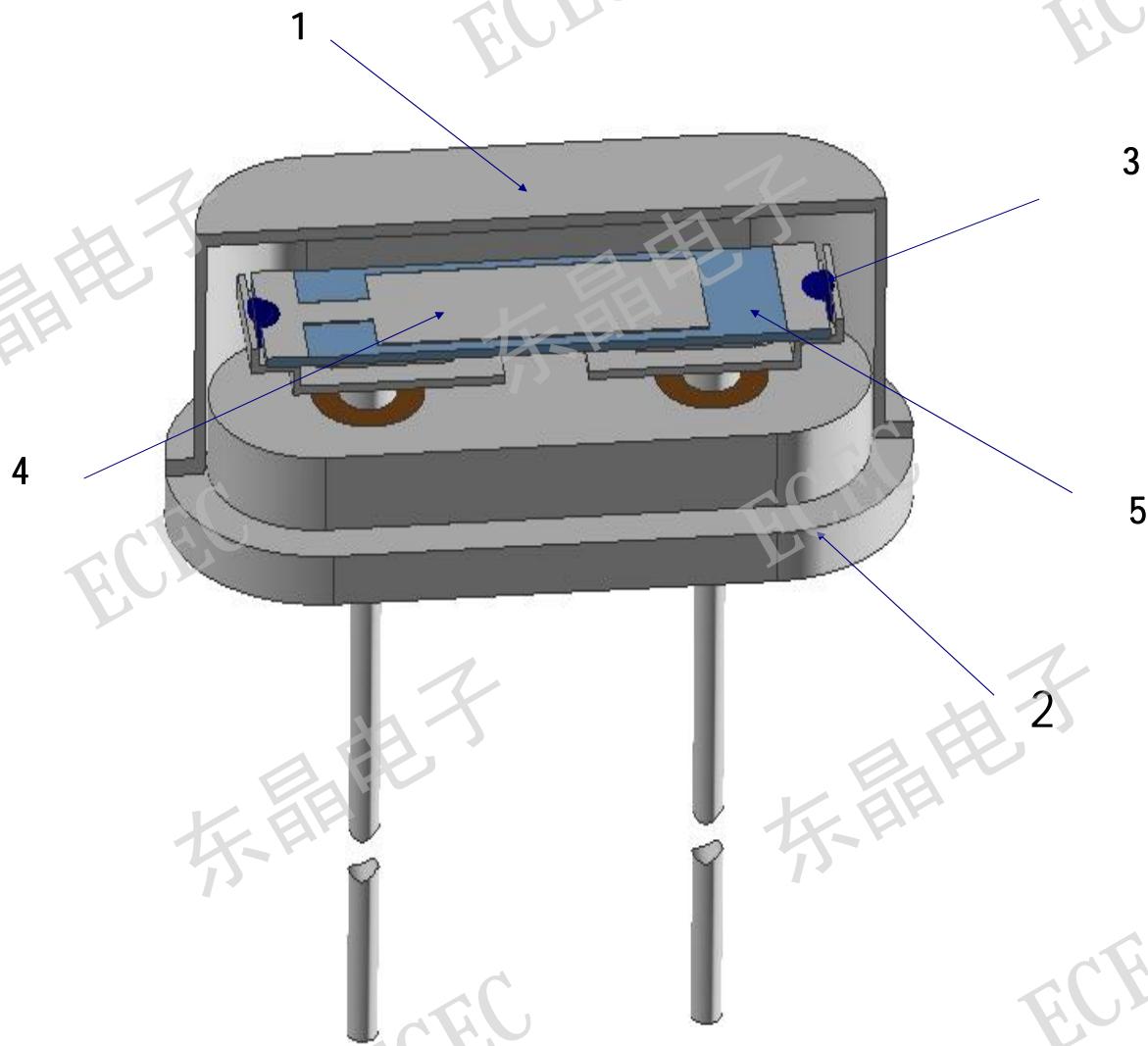
**JinHua East Crystal Electronic  
Co.,Ltd.**

DESIGN	INSPECTION
郑紫薇	王晓东

## QUARTZ CRYSTAL UNITS

No:	ECAB2306090
Date:	2023/6/25

## 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	Shanghai TOP Sunshine
4	Internal Electrode	Ag	SOLAR CHINA
5	Element(Blank)	SiO <sub>2</sub>	ECEC CHINA

<b>JinHua East Crystal Electronic Co.,Ltd.</b>	DESIGN	INSPECTION
	郑紫薇	王晓东