



NO. ECAB1801004

# Acknowledgement Book

Customer : 深圳金东晶电子科技有限公司

Production name: HC-49S/SMD X'TAL 12.50×4.80×3.80

Nominal Freq. : 16.000000MHz

Customer P/N :

ECEC P/N : C16000J119

## Receiver

Please return one after acknowledgement

## JinHua East Crystal Electronic Co.,Ltd.

Approved By	MFG	QA	PE/RD
总经理: 骆红利	副总: 林土全	副总: 黄文俊	部长: 辜批林
2018/1/4	2018/1/4	2018/1/4	2018/1/4

公司名称: 东晶电子金华有限公司

Corporation: JinHua East Crystal Electronic Co.,Ltd.

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# BOOK OF MODIFICATION

No.	DATE	CONTENT OF MODIFICATION	REASON OF MODIFICATION	PAGE	ITEM	APPROVE
0	2018/1/4	INITIAL RELEASED				
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# QUARTZ CRYSTAL UNITS

No:	ECAB1801004
Date:	2018/1/4

## SPECIFICATION OF QUARTZ CRYSTAL UNITS

**1.HOLDER TYPE HC-49S/SMD X'TAL 12.50×4.80×3.80**

### 2.GENERAL

2-1 FREQUENCY (F0)	16.000000MHz
2-2 MODE OF OSCILLATION (Mn)	FUNDAMENTAL
2-3 OPERATION TEMPERATURE RANGE (T <sub>o</sub> )	-10℃ ~ +60℃
2-4 STORAGE TEMPERATURE RANGE (T <sub>s</sub> )	-55℃ ~ +125℃
2-5 TEST SET	S&A 250B ANALYSIS SYSTEM
2-6 DRIVE LEVEL (DL)	10μw TYP
2-7 LOADING CAPACITANCE (CL)	20pF

### 3.ELECTRICAL CHARACTERISTICS

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

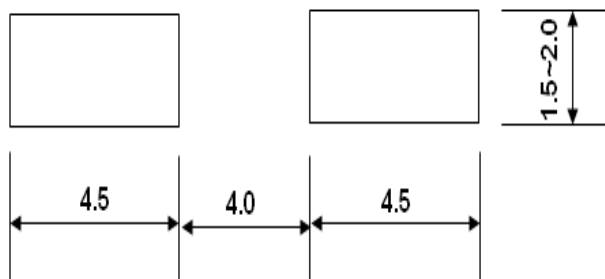
3-1 FREQUENCY TOLERANCE (Δf)	±20ppm Max
3-2 EQUIVALENT RESISTANCE (Rr)	50ΩMax/Series
3-3 TEMPERATURE DRIFT (Tc)	±30ppm (-10℃ ~ +60℃)
TEMPERATURE DRIFT (Tc)	NA
TEMPERATURE DRIFT (Tc)	NA
3-4 SHUNT CAPACITANCE (C <sub>0</sub> )	<5.0pF
3-5 INSULATION RESISTANCE	500MΩmin/DC 100V±15V (Lead to lead ,case to lead)
3-6 AGING	±3ppm /Year
3-7 REFERENCE WEIGHT(g)	0.55g
3-8 SPURIOUS * SEARCH RANGE (f <sub>0</sub> ±500kHz)	3db or more

**\*Standard Atmospheric conditions.**

Ambient temperature	: 15 °C to 35 °C
Relative humidity	: 25 % to 85 %
Air pressure	: 860 hPa to 1060hPa

### 4.DIMENSIONS AND MARKING

4-1 HOLDER TYPE	<b>HC-49S/SMD X'TAL 12.50×4.80×3.80</b>
4-2 LAND DIMENSION(mm)	



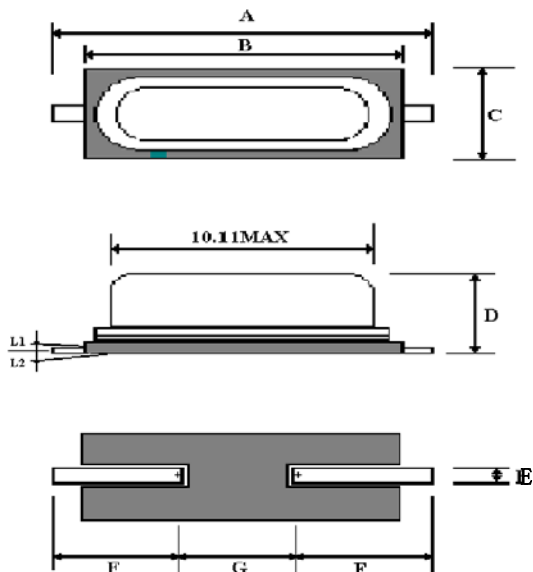
**JinHua East Crystal Electronic Co.,Ltd.**

DESIGN	INSPECTION
劳宏景	潘春琴

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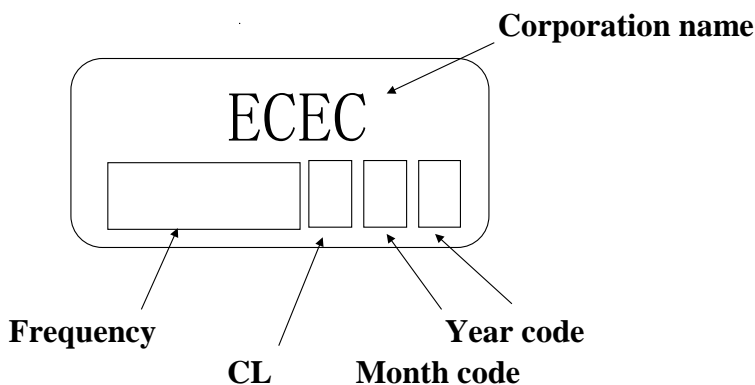
## 4-3 DIMENSION (mm)



Items	Size(mm)
A	12.5±0.4
B	11.4±0.3
C	4.8±0.1
D	3.8±0.3
E	0.75±0.3
F	4.5 MAX
G	4.88±0.2
L1	0.1 MAX
L2	0.1 MAX

## 4-4 MARKING

HC-49S/SMD



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) 2010 shall be marked as "0"

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	-----
Symbol	0	1	2	3	4	5	6	7	8	9	0	-----

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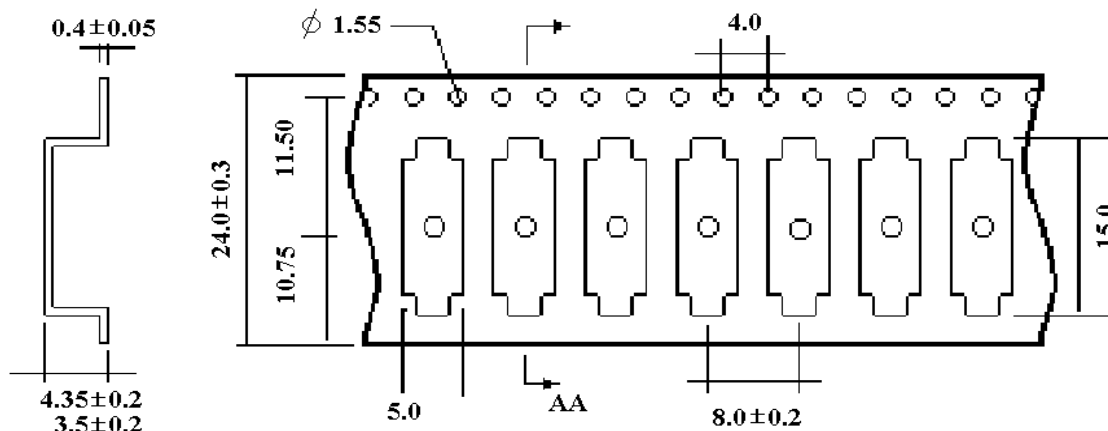
# QUARTZ CRYSTAL UNITS

No: ECAB1801004

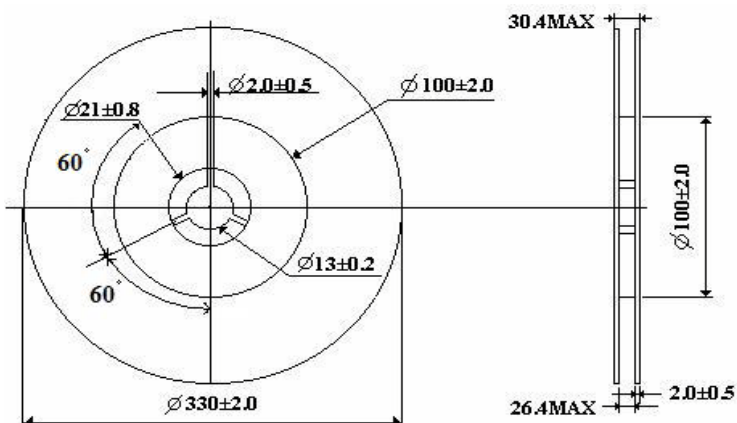
Date: 2018/1/4

## 4-5 PACKING

### 4-5-1 Dimensions of the tape

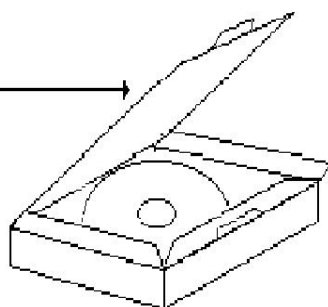


### 4-5-2 Dimensions of the reel



### 4-5-3 Packing and Label

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



1 Reel=1000pcs

Box type(Reel quantity)	Box size(L×W×H) mm
1Reel x 1000pcs	335*335*38
5Reel max	355*355*220

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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**

- 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.
- After above test a),there is no distinct damage or damage to sealing.

**②BENDING**

- 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.
- 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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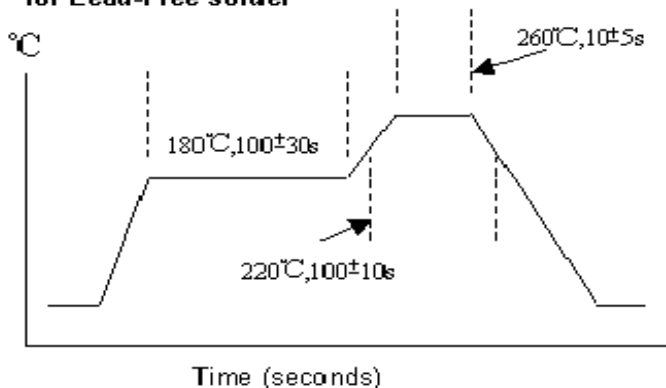
## 5-5.SOLDERING HEAT RESISTANCE

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±5 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 ceater 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 electical 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.

### ①HUMIDITY

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.

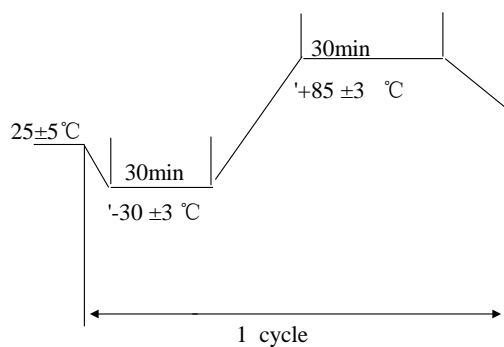
### ③.STORAGE IN HIGH TEMPRATURE

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  $1^{\circ}\text{C}/\text{sec}$ .

(refer to Fig-3)



( Fig-3 )

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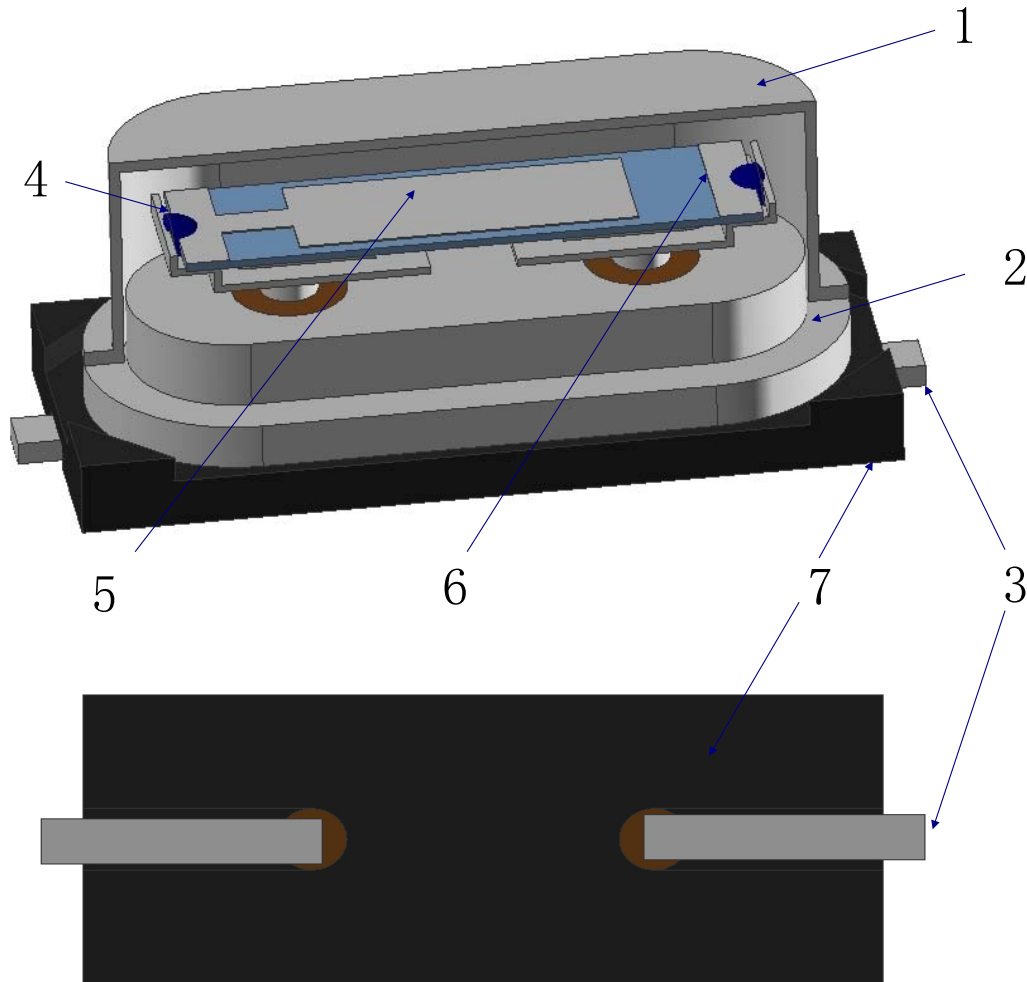


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## 6. Structure Illustration



(BOTTOM VIEW)

No.	Items	Materials
1	Metal Can(Cap)	Ni Alloy
2	Substrate(Base)	Fe Alloy
3	External Electrode	Kovar (Pb free)
4	Conductive Adhesive	Ag+Epoxy Resin
5	Internal Electrode	Ag
6	Element(Blank)	SiO <sub>2</sub>
7	Insulation spacer	PPA

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