

# Chengdu Kingbri Frequency Technology Co.,Ltd



Headquarter Add: NO.8 Baiye Road, West District of Chengdu international. High-tech Development Zone, Sichuan, China

Tel: +86-28-66118657 66118658 66118659

Fax: +86-28-66118501

Postcode: 611731

E-mail: sales01@chinacrec.com mar@chinacrec.com crecsz01@chinacrec.com

Website: [www.chinacrec.com](http://www.chinacrec.com)

Shenzhen Office Add: NO.2907, Block A, Building 1, Nanguang City Garden, Nanguang Road, Nanshan District, Shenzhen, Guangdong

Tel: +86-755-36931821 83475957 33654281

Fax: +86-755-83475977

Postcode: 518048

E-mail: crecsz@chinacrec.com

Website: [www.chinacrec.com](http://www.chinacrec.com)



## CREC QUARTZ CRYSTAL UNITS

RoHS

## SPECIFICATIONS FOR APPROVAL

CUSTOMER: TR011

CUSTOMER P/NO:

OUR MODEL NO: HC-49S 4.000000MHz 16pF

DESCRIPTION: QUARTZ CRYSTAL HC-49S

SPECIFICATIONS NO: CM4.0000F16G5GB

SPEC NO:

FOR CUSTOMER MODEL:

DATE: 2017-02-11

ENGINEERING DEPT: APPROVED BY CUSTOMER :

*Jack Huang*

SIGNATUER:

DATE:  
2017-02-11

DATE:



Chengdu Kingbri Frequency Technology Co.,Ltd

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## CREC QUARTZ CRYSTAL UNITS

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## SPECIFICATION

Client Name: TR011

Product : Quartz Crystal Resonator

General Part Number and Client Part Number:

General :

Client :

Manufacturer:

Chengdu Kingbri Frequency Technology Co.,Ltd

NO.8 BaiyeRoad,West District of Chengdu international High-tech Development Zone,Sichuan,China.

Post Code: 611731

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Prepared	Checked	Approved
<i>Liu Haiyan</i>	<i>Li Chunyan</i>	<i>Jack Huang</i>

Remarks:

Product Liability, Quality Assurance and Right of the patent shall be under the responsibility of the Manufacturer mentioned above.

Client Acknowledgement:

Date of receipt :



CREC QUARTZ CRYSTAL UNITS



Record of Change

	Issuing Date	Last	New	Page	Contents of the Change	Reason	Remarks
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## CREC QUARTZ CRYSTAL UNITS

RoHS

## APPROVAL SHEET

## SCOPE:

THIS SPECIFICATION SHOULD BE APPLIED TO CRYSTAL RESONATOR, WHICH BE

DELIVERED TO TR011

## CUSTOMER:

TR011

## CREC PART NUMBER:

C - M - 4.0000 - F - 16 - G - 5 - G - B

Marks: CREC

Hold Type: HC-49S

Nominal Frequency: 4.000000MHz

Oscillating Mode: Fundamental

Load Capacitance: 16pF

Package: Bulk

Operating Temperature  
Range: -40°C ~ 85°CFrequency Stability:  $\pm 50$ ppmFrequency Tolerance:  $\pm 50$ ppm

## PART TYPE :

QUARTZ CRYSTAL ( HC-49S )



# CREC QUARTZ CRYSTAL UNITS

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## SPECIFICATION OF QUARTZ CRYSTAL UNITS

### 1.HOLDER TYPE:HC-49S

#### 2.GENERAL

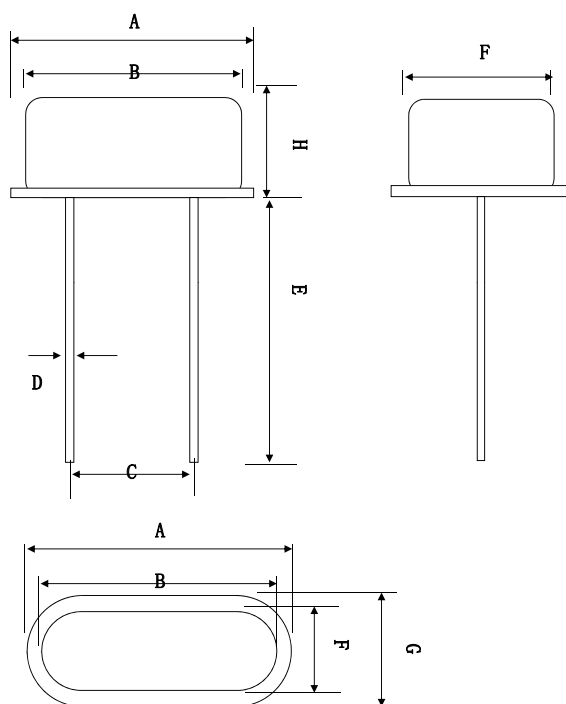
2-1 FREQUENCY (F0)	4.000000MHz
2-2 MODE OF OSCILLATION (Mn)	FUNDAMENTAL(AT)
2-3 OPERATION TEMPERATURE RANGE (T0)	-40°C~85°C
2-4 STORAGE TEMPERATURE RANGE (Ts)	-55°C~+125°C
2-5 TEST SET	S&A 250B Network Analyzer
2-6 DRIVE LEVEL (DL)	100 $\mu$ W/Max
2-7 LOADING CAPACITANCE (CL)	16pF

#### 3.ELECTRICAL CHARACTERISTICS

3-1 FREQUENCY TOLERANCE ( $\Delta f$ )	$\pm 50$ ppm/Max at $25 \pm 2^\circ\text{C}$
3-2 EQUIVALENT RESISTANCE (Rr)	120 $\Omega$ /Series
3-3 TEMPERATURE DRIFT (Tc)	$\pm 50$ ppm/ Max -40°C~85°C
3-4 SHUNT CAPACITANCE (Co)	7.0pF/Max
3-5 MOTIONAL CAPACTIONCE(C1)	N/A
3-6 INSULATION RESISTANCE	500M $\Omega$ min/DC100V $\pm 15$ V (Lead to lead ,case to lead)
3-7 AGING RATE PER YEAR:	$\pm 5$ ppm/Year

#### 4.DIMENSIONS AND MARKING

##### 4-1 HOLDER TYPE AND DIMENSION (mm)



A	11.50MAX
B	10.30MAX
C	4.88 $\pm 0.2$
D	0.45 $\pm 0.05$
E	13.2 $\pm 0.5$ mm
F	3.80MAX
G	4.70MAX
H	3.68MAX



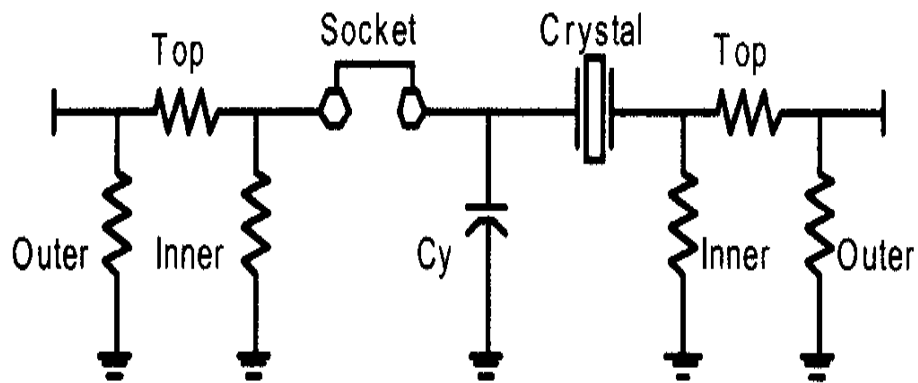
## CREC QUARTZ CRYSTAL UNITS

RoHS

## 4-2 MARKING

CREC4.0000

## 4-3 Crystal Test circuit (TEST SET S&amp;A 250B) :



LNA 12.5 Ohm PI

PI Outer Resistor=159.0

PI Top Resistor=66.2

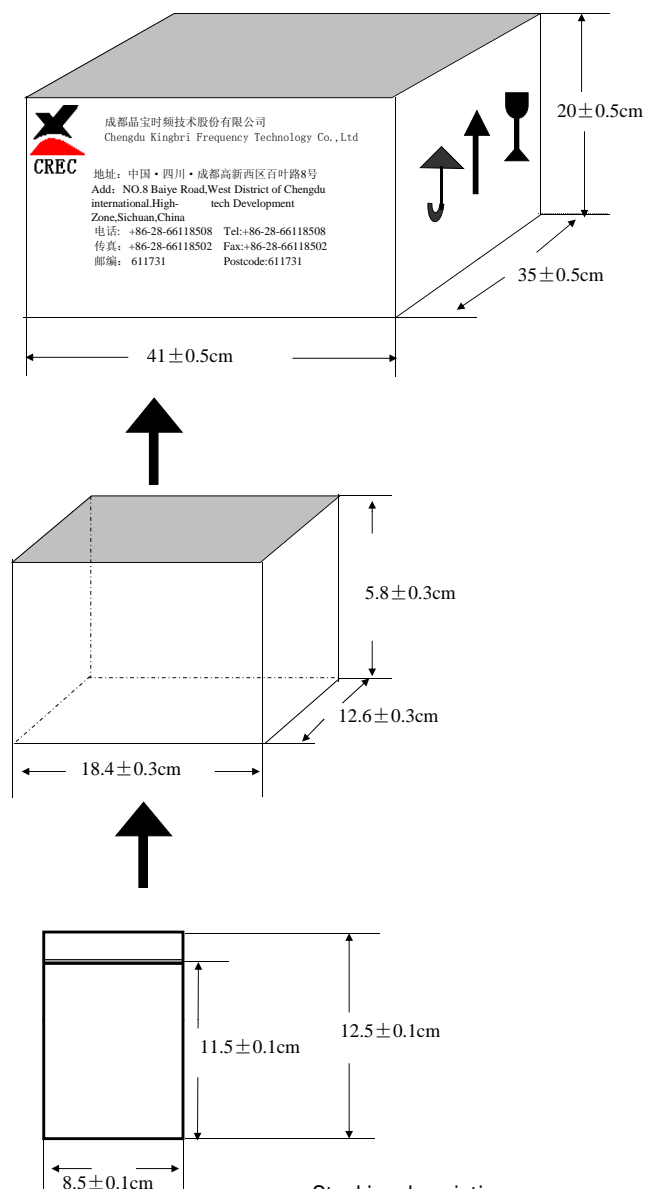
PI Inner Resistor=14.2



# CREC QUARTZ CRYSTAL UNITS

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## 4-4 PACKING FOR APPROVAL



Stanking description:

### ①HC-49U:

100pcs crystal units in 1 small packet, 10 small packets in 1 box, 10 boxes in 1 big box, ( 10000pcs crystal units in 1 big box )

### ②HC-49S:

200pcs crystal units in 1 small packet, 10 small packets in 1 box, 10 boxes in 1 big box, ( 20000pcs crystal units in 1 big box ) .

### ③Φ3× 9、Φ3× 8、Φ2× 6:

500pcs crystal units in 1 small bag, 10 small bags in 1 box, 10 boxes in 1 big box, (50000pcs crystal units in 1 big box).





## 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 Concrete.

### 5-2.VIBRATION

Electrical characteristics shall be satisfied after supplying following vibration.

a).ENTIRE FREQUENCY RANGE	10~2000Hz
b).REPEATED PERIOD	1~2min
c).AMPLITUDE	1.52mm
d).DIRECTION	X.Y.Z
e).ACCELERATED SPEED	20g
f).PERIOD	4hours/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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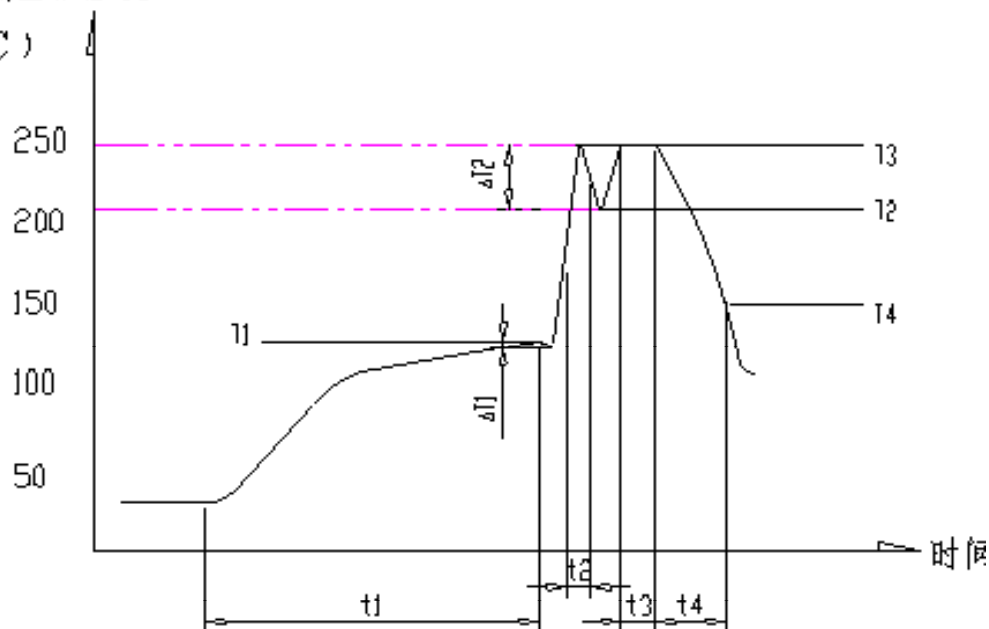
## 5-5.SOLDERING HEAT RESISTANCE

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

### ①.FLOW Soldering

实测基板温度

(℃)



Preheating Time  $t_1=60s$

Transmitting Speed at 1.2M/min

Length of Preheating at Least 1.2M

Time of tin-dipping  $t_2+t_3=3\sim 5S$

Cooling time  $t_4=120S$

### ②.SOLDERING DIP

Terminals/lead-wires of specimen shall be dipped into solder melter tank at  $+245^{\circ}C \pm 5^{\circ}C$  for  $5 \pm 0.5$  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.

### ③.SOLDER HEATING

Terminals/lead-wires of specimen shall be dipped into solder melter tank at  $+260^{\circ}C \pm 5^{\circ}C$  for  $10 \pm 1$  sec.

Electrical characteristics shall be satisfied after dipping depth shall be 2mm from edge of terminals/lead-wires.

**5-6.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  $60 \pm 2^{\circ}\text{C}$  in humidity of 95% for 500 hours.

**②.STORAGE IN LOW TEMPRATURE**

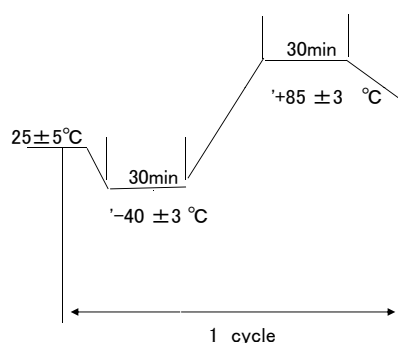
Electrical characteristics shall be satisfied after letting it alone at  $-40 \pm 3^{\circ}\text{C}$  for 168 hours.

**③.STORAGE IN HIGH TEMPRATURE**

Electrical characteristics shall be satisfied after letting it alone at  $125 \pm 2^{\circ}\text{C}$  for 168 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  $1^{\circ}\text{C}/\text{sec}$ .

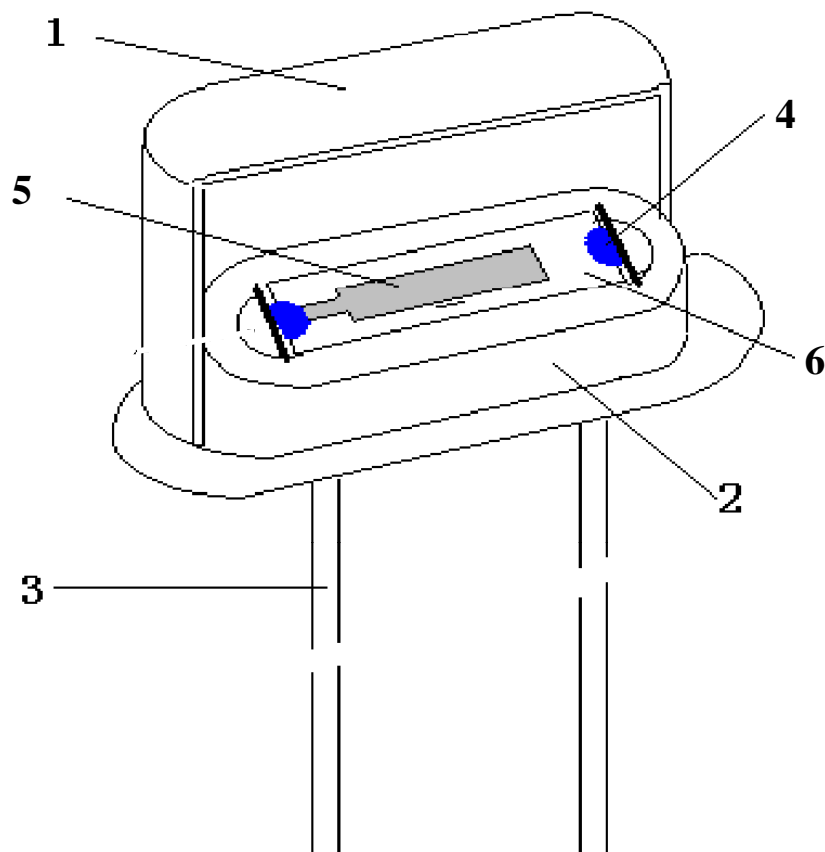




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## 6. INSIDE STRUCTURE



No.	Items	Materials
1	Metal Can	Ni Alloy
2	Substrate	Fe Alloy
3	External Electrode	Kovar (Pb free)
4	Conductive Adhesive	Ag+Epoxy Resin
5	Internal Electrode	Ag
6	BLANK	PZT

Country of Origin: China

Factory Name & Location:

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Confirmation of Advanced notice of significant change

Messrs. TR011

Advanced notice of any significant alteration

We confirm here that in any case of the following alteration, you will have our written pre-notification and we will not put them into practice unless otherwise we receive your acceptance of the alteration.

- 1.Any change of the contents of the agreed specification of the goods
- 2.Any change of anything not mentioned in the specification but deeply related with the quality, performance and/or reliability of the goods.
- 3.Change of materials and/or its supplier of the goods
- 4.Change of the factory and/or sub-contracted factory of the goods
- 5.Any major change of production procedure of the goods including renewal of production machines.

Feb.11, 2017

*Jack Huang*

Authorized Signature

Chengdu Kingbri Frequency Technology Co.,Ltd