

(RoHS)

产品规格书

SPECIFICATION FOR APPROVAL

客户名称

Customer Name:

产品名称

Product Name:

贴片石英晶体谐振器

产品型号:

Product Type:

SMD 3215(2pin)

标称频率

Nominal Freq:

32.768KHz系列

产品编号

Part Coding

规格书编号:

Specification P/N:

客户料号:

Customer P/N:

日期:

Date:

2023-09-07

客户承认

Approved By Customer:

签章

Signature:

日期

Date:



深圳市新天源电子有限公司

SHENZHEN XINTIANYUAN ELECTRONICS CO., LTD.

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批准
Accepted

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审核
Checked

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Issued

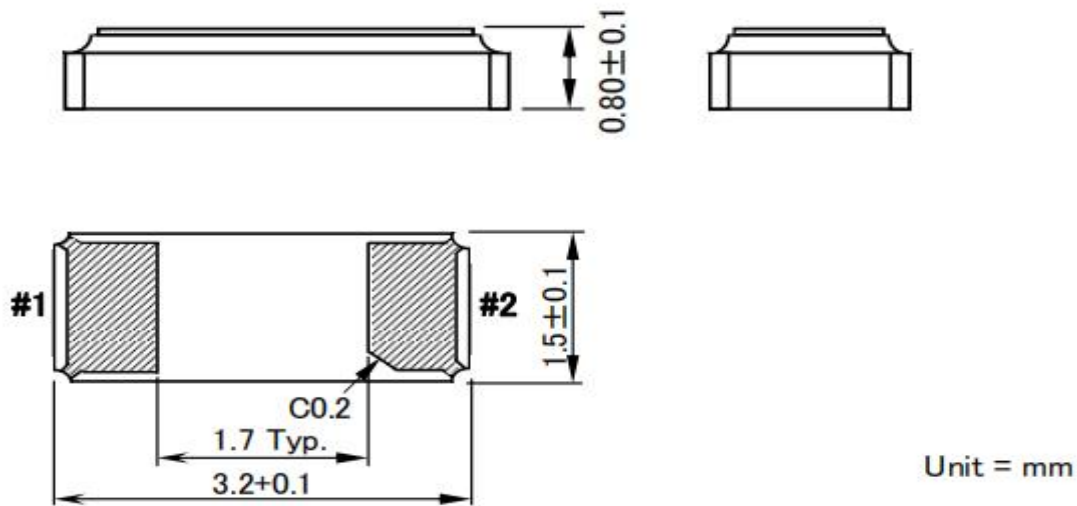
陈梅东

<p>深圳市新天源电子有限公司</p>	<p>石英晶体谐振器规格书 Specification of Quartz Crystal</p>	<p>NO:</p>
<p>Shenzhen Xintianyuan Electronics Co., Ltd.</p>	<p>SMD 3215 (2pin)</p>	<p>Date: 2023/09/07</p>
<p>一、石英晶体规格参数 Quartz Crystal Specification Parameters</p>		
<p>1、产品型号 Holder Type</p>	<p>SMD 3215 (2pin)</p>	
<p>2、标称频率 Nominal Frequency</p>	<p>32.768KHz</p>	
<p>3、振动模式： Mode of Oscillation</p>	<p>NT</p>	
<p>4、调整频差 Frequency Tolerance at 25°C ± 2°C</p>	<p>±10ppm/±20ppm at 25°C ± 2°C</p>	
<p>5、等效电阻 Equivalent Resistance (ESR)</p>	<p>≤70K Ω</p>	
<p>6、负载电容 Load Capacitance (CL)</p>	<p>6PF/7PF/9PF/12.5pF</p>	
<p>7、温度频差 Temperature Characteristics</p>	<p>-0.04 × 10⁻⁶/°C² Max</p>	
<p>8、工作温度范围 Operating Temperature range</p>	<p>-40~+85°C</p>	
<p>9、储存温度范围 Storage Temperature range</p>	<p>-55~+125°C</p>	
<p>10、激励功率 Drive Level</p>	<p>0.1uW</p>	
<p>11、静态电容 Shunt Capacitance (C0)</p>	<p><1.5pF</p>	
<p>12、绝缘电阻 Insulation Resistance</p>	<p>≥500M Ω (DC100V ± 15V)</p>	
<p>13、测试仪器 Measure Instrument</p>	<p>专用仪器 Appointed</p>	
<p>14、年老化率 Aging Rate a Year</p>	<p>≤ ± 3ppm/年</p>	

深圳市新天源电子有限公司 Shenzhen Xintianyuan Electronics Co., Ltd.	石英晶体谐振器规格书 Specification of Quartz Crystal	NO:
	SMD 3215 (2pin)	Date: 2023/09/07

二、石英晶体尺寸、结构

Quartz Crystal Dimensions And Structure



三、石英晶体印字

Quartz Crystal Marking

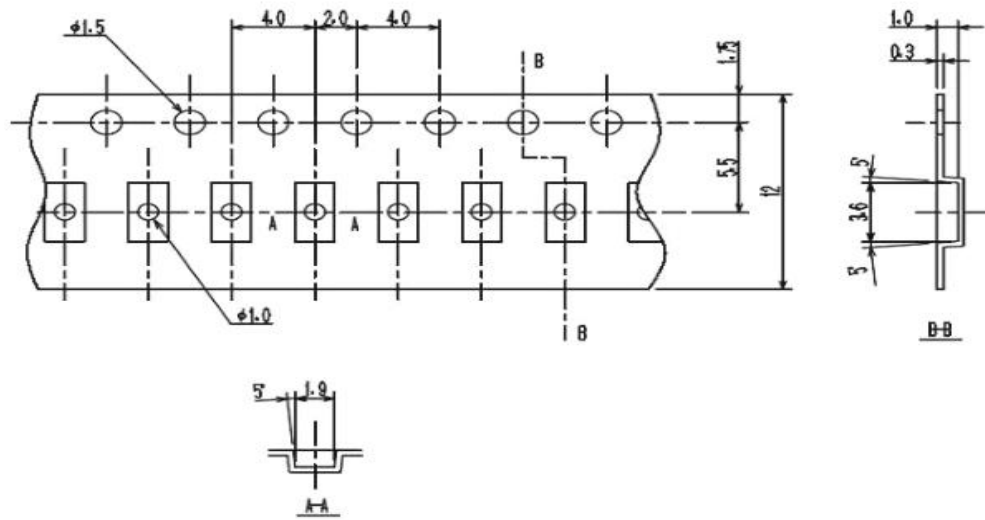


XTY----代表新天源
32---代表频率32.768K
A----代表负载12.5PF A=12.5PF
 B=9PF C=7PF D=6PF

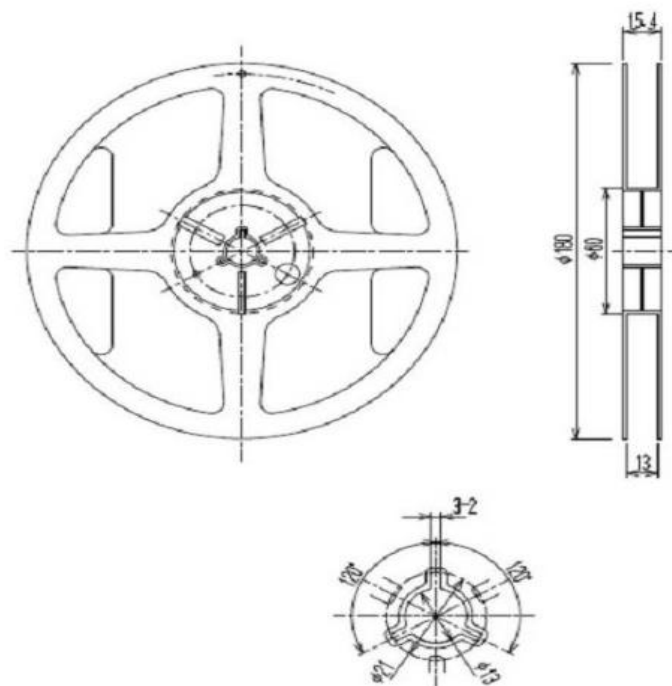
深圳市新天源电子有限公司 Shenzhen Xintianyuan Electronics Co., Ltd.	石英晶体谐振器规格书 Specification of Quartz Crystal	NO:
	SMD 3215 (2pin)	Date: 2023/09/07

四、包装要求 Packaging

1. 编带 Tape



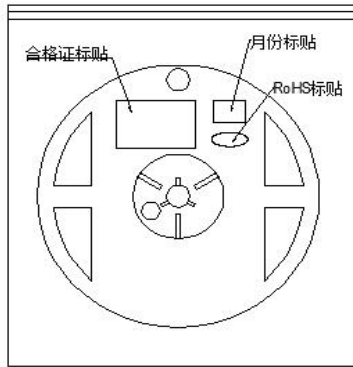
2. 轮 Reel



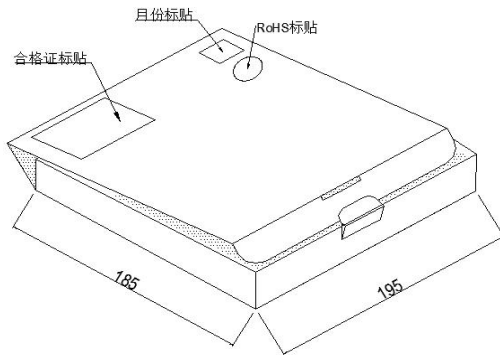
深圳市新天源电子有限公司 Shenzhen Xintianyuan Electronics Co.,Ltd.	石英晶体谐振器规格书 Specification of Quartz Crystal	NO:
	SMD 3215 (2pin)	Date: 2023/09/07

3. 包装
Package

3000只/1卷
3000pcs/Reel



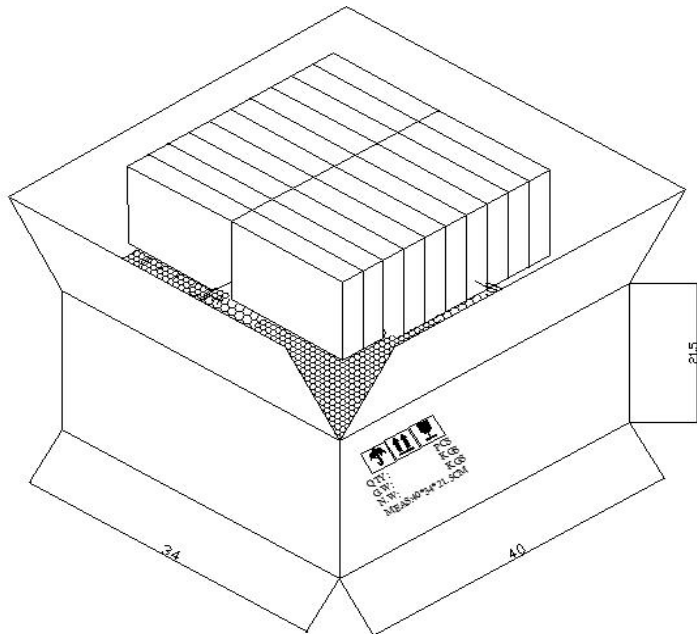
1轮=1盒
1Reel=1Box
Units: mm



合格证	
频率:	型号:
负载:	电阻:
频差:	数量:
日期:	供应商:
批号:	编号:
订单号:	料号:

包装箱
Shipping Carton

40*34*21.5 (20 Box)
27*20*32.2 (12 Box)
27*20*20 (8 Box)
Units: cm



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五、石英晶体可靠性 Reliability Test

NO.	测试项目 Test Item	可靠性条件 Testing Condition	判定标准 Determinant Criteria
1.	跌落 Dropping Test	从75cm高度跌落到30mm厚硬木板上, 跌落三次 Drop the resonators from 75cm height to 30mm thick hardwood board, 3times.	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
2.	振动 Vibration	频率 Frequency:10~60Hz; 幅度 Amplitude:0.75mm; 周期 Cycle time:10-55-10Hz: 1min; 振动方向 Direction:X, Y, Z; 振动时间 Duration: 每个方向2小时 2 h/direction.	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
3.	高温 Heat Resistance	温度Temperature: 125°C \pm 10°C 时间Time: 720 \pm 24 Hours	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
4.	低温 Cold Resistance	温度Temperature: -40°C \pm 10°C 时间Time: 720 \pm 24 Hours	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
5.	回流焊 (2次) Reflow (2times)	 <p>回流焊Reflow 260°C \pm 5°C \leq 10s</p>	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
6.	耐焊接热 Resistance To Soldering Heat	焊接温度Soldering Heat: 320°C \pm 10°C 测试时间Test Time: 3.5s \pm 0.5s;	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)
7.	气密性 Leakage	用氦质谱仪进行检测, 试验气体: He; 真空度: 1 \times 10 ⁻³ Pa; Helium mass-mass-spectrometer detector, and vacuum and reach 1 \times 10 ⁻³ Pa;	$\leq 1 \times 10^{-8}$ atm \cdot cc/S
8.	高温高湿 Constant Temperature and Humidity	在温度60°C \pm 5°C, 湿度90%~99%, 储存720小时, 取出2小时后测试; Stored at 60°C \pm 5°C, Humidity 90%~99% For a period of minimum 720hours. Then 25°C \pm 3°C and 2 hours before testing	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger) Appearance OK
9.	温度冲击 Temperature Shock	低温Low-40°C \pm 2°C (120min) \leftrightarrow 高温High85°C \pm 2°C (120min); 循环10次; For 10 cycles	$\Delta FL \leq \pm 10\text{ppm}$ $\Delta RS \leq \pm 20\%$ or 15k Ω (whichever is larger)

Messrs.

DRAFT

(first) · revised)

Delivery Specifications**Confidential**

Product No : Quartz Crystal Unit SC-20S

Item code : Q-SC20S03220C5AAAF

Product form : 32.768kHz $\pm 20 \times 10^{-6}$ / 12.5 pF

The number of copies : 1 copy

Date of Registrantion : 31 Mar / '15

Receipt Column	Note

<NOTICE>

1. Advance agreement will be needed before changing any contents of the specification herein.
2. Provided that the information herein is subject to change, only revised pages shall be reissued.
3. When the product described herein includes Regulated Products subject The Wassenaar Arrangement etc, they may not be exported without authorization from the appropriate governmental authorities.
4. The contents of this specification including all figures and illustrations are proprietary information (copyright or know-how) of Seiko Instruments Inc. It is strictly prohibited to copy all or part of these specifications to third parties without permission.
5. In the case that the products described herein are used as part of any devices or equipment which might influence any one of the human body, human life and property, such as physical exercise equipment, medical equipment or vehicles, please let us know that.

Seiko Instruments Inc.
 Quartz Crystal Division
 1-8, Nakase, Mihamaku, Chiba shi, Chiba 261-8507 Japan

Dept. of Issue
 Sales Section

SII Crystal Technology Inc.
 1110, Hirai cho, Tochigi shi, Tochigi 328-0054 Japan

Dept. of Control
 Quality Assurance Section

Delivery Specifications

1. Scope

These specifications apply to QUARTZ CRYSTAL RESONATORS (hereinafter referred to as RESONATORS) to be manufactured by Seiko Instruments Inc. (hereinafter referred to as SII) to _____

2. Designation

RESONATORS are designated "SC-20S" (32.768 kHz).

3. Shape and dimensions

As per the SC-20S drawing shown on page 5 .

4. Electrical characteristics

Specified on page 2 through 3 .

5. Shipment and packaging

5.1 (3,000) pcs are the standard lot size to which the lot number shall be allotted

5.2 The packaging shall conform to the resonator packaging standards.

6. Outgoing inspection

6.1 When mutually agreed, the outgoing inspection shall be conducted as per the standard on page 4.

6.2 The outgoing inspection slip is not basically affixed to each packaging.

7. Warranty

In the event that any defective RESONATORS or defective lot is found at incoming inspection at _____ and that

any defect resulting from failures in process-control at SII after incoming inspection is found, good RESONATORS shall be supplied to

_____ free of charge as a replacement.

In the event that any trouble or problems rising directly from RESONATORS occurs, it will be amicably settled between both parties, provided that warranty shall be done within the score of replacement of good RESONATORS.

8. Revision or abolition of the specifications

Revision or abolition of the specifications shall be made upon mutual consent between _____ and SII. If any problem arises, it shall be amicably settled between both parties.

9. Effectiveness of the specifications

These specifications are effective after receipt of returned copies with your approved sign.

10. Others

This product is completely Pb-free and Halogen-free.

[1] Maximum Rating

	Item	Symbol	Rating	Note
1	Storage temperature range	T_stg	-55~+125°C	
2	Maximum drive level	DL max.	1.0 μ W max.	

[2] Recommended Operating Condition

	Item	Symbol	Rating	Note
1	Operating temperature range	T_use	-40~+85°C	
2	Drive level	DL	0.1 μ W typ.	

[3] Electrical characteristicsMeasurement temperature: 25 \pm 2°C

	Item	Symbol	Specification	Condition
1	Nominal frequency	f_nom	32.768 kHz	
2	Frequency tolerance	f_tol	$\pm 20 \times 10^{-6}$	
3	Load capacitance	C _L	12.5 pF	
4	Motional resistance	R ₁	70 k Ω max.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
5	Motional capacitance	C ₁	6 fF typ.	
6	Shunt capacitance	C ₀	1.3 pF typ.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
7	Turnover temperature	T _i	25 \pm 5°C	Measure this coefficient at 5 points of -40°C、-20°C、25°C、60°C、85°C using C-MOS circuit.
8	Parabolic coefficient	B	$(-0.03 \pm 10\%) \times 10^{-6} / ^\circ\text{C}^2$	
9	Frequency aging	f_age	$\pm 3 \times 10^{-6} / \text{year}$	25 \pm 3°C, First year
10	Insulation resistance	IR	500 M Ω min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V

[4] Environment and Mechanical Characteristics

	Item	Specification	Condition	
1	High temperature storage 1	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under 85°C for 1000 hours, measure at room temperature.	*1 *3
	High temperature storage 2	$\Delta f/f_0 = \pm 15 \times 10^{-6}$	After storage under 125°C for 1000 hours, measure at room temperature.	*1 *3
2	Low temperature storage	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under -55°C for 1000 hours, measure at room temperature.	*1 *3
3	High temperature and high humidity storage	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	After storage under +85±2°C , 85 % RH for 1000h, measure at room temperature.	*1 *3
4	Temperature cycle	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure at room temperature after 100 cycles. -55°C ⇔ +125°C for 30 minutes.	*1 *3
5	Mechanical shock resistance	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure after 100g-dummy(SII Standard) drop from 1500mm height on the concrete at 3 directions for 10 times each.	*2
6	Vibration resistance	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Amplitude 1.5mm and 10~60Hz with cycle time 2~3 minutes in 3 direction (X,Y, and Z axis) each for 2 h.	*2
7	IR Reflow	$\Delta f/f_0 = \pm 10 \times 10^{-6}$	Measure after 2 time reflow under reflow profile specified in page 10	*1
8	Shear strength	No peeling-off	Pressuring force 10N × 10 ± 1sec. according to IEC60068-2-21	*2
9	Peel strength	No peeling-off	Pressuring force 10N × 10 ± 1sec. according to IEC60068-2-21	*2
10	Bending test	No peeling-off	Bending: 3mm × 5 ± 1sec. Thickness of the testing board: 1mm	*2

Note:

1. Each test shall be done independently. (not in series tests)
2. *1: Measure after 24 hours left at room temperature.
3. *2: Measure after 2 hours left at room temperature.
4. *3: Pre conditions
 - (1) IR Reflow : 2 times
 - (2) Initial values shall be measured after 24 hours at room temperature.
5. Shift in series resistance after the above tests shall be less than ±20% or less than ±15kΩ .
In case of resistance to IR reflow, shift in series resistance after the above tests shall be less than ±30% or ±20kΩ .
In case of resistance to high temperature storage(±125°C for 1000 hours), shift in series resistance after the above tests shall be less than ±40% or ±30kΩ .

[5] Precautions

(1) Recommended mounting conditions

Reflow profile As per reflow profile shown in page 10.
Manual soldering 350°Cmax. for 4 sec. Max.

(2) Cleaning

The crystal resonator may be destroyed by ultrasonic cleaning.

We don't guarantee the quality of the product with that cleaning method because such conditions as type of the washing machine, power, time, position in the bath, and etc. can not be specified.

Please confirm ultrasonic cleaning is not giving any damage to the product before use when that cleaning method must be used.

[6] Outgoing Inspection Standard

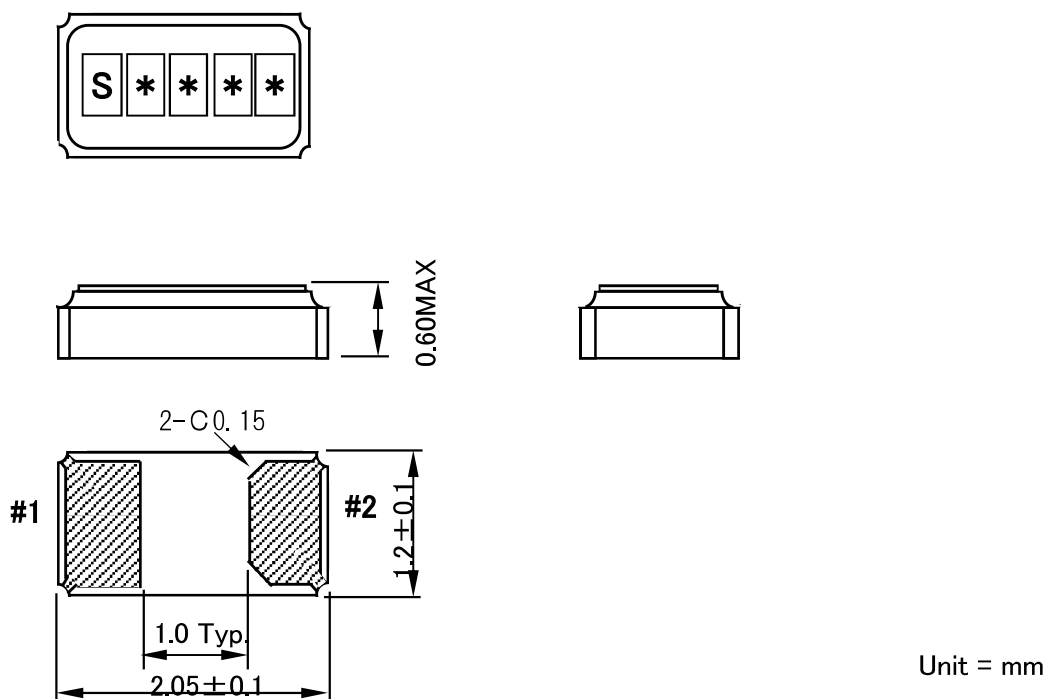
•The outgoing inspection shall be conducted as per the following standard.

•The sampling shall be performed according to the ANSI/ASQC Z1.4-1996.

NO	Item	Sampling level	AQL(%)
1	Frequency tolerance	I	1.0
2	Equivalent series resistance	I	1.0
3	Outer appearance	I	1.5
4	Others characteristics	Periodical quality inspection	

[7] Dimensions and Marking Layout

1. Out Line Drawing

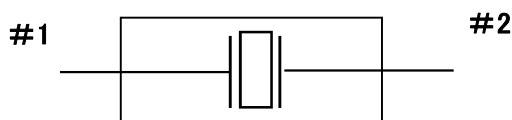


2. Marking

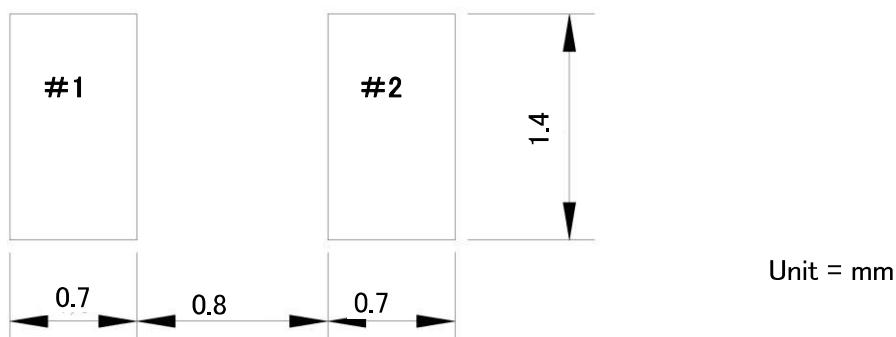


- *1 Specification
- *2 CL (7pF: B, 9pF: J, 12.5pF: F)
- *3 Year of Production (Last Digit of Year)
- *4, 5 Week of Production (01 ~ 52)

3. Lead Connection



4. Recommended PAD Lay-out



Please make sure that there is no pattern under SC-20S on the circuit board.

Materials:

Case: Alumina ceramics, Ni-plated, Au-plated

Lead: Kovar material, Ni-plated

[8] Taping Specification

1. Drawing of tape dimensions

- ① Carrier tape : Refer to page 8.
- ② Taping reel : Refer to page 9.

2. Material

- ① Carrier tape : PC black conductive
- ② Taping reel : PS conductive

3. Taping method

- (1) Taping shall be placed in tapes in such manner as to assure that marking of the components is visible as per Fig.1

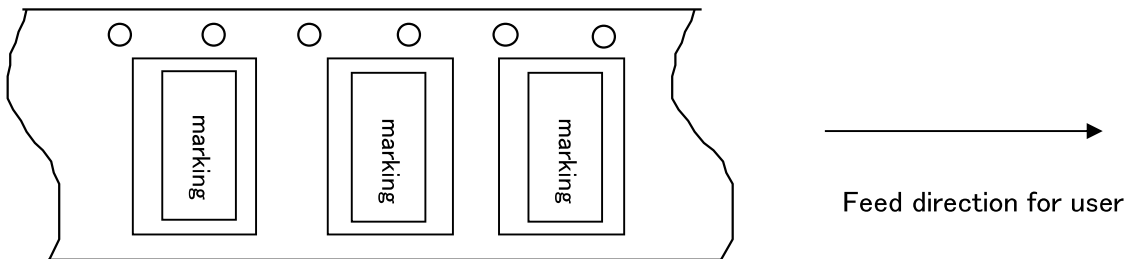


Fig. 1

(2) Reel

- ① On the side of reel there shall be more than 160 mm of "No components".
- ② The beginning of Carrier Tape shall be bent vertically and hooked on groove of reel.

(3) Leader

- ① On the side of leader, there shall be more than 160 mm of "No components"
- ② The length of Leader shall be over 400 mm.
- ③ The Length of Stick Tape for Cover Tape shall be about 100 mm and Stick Tape shall never be detached.

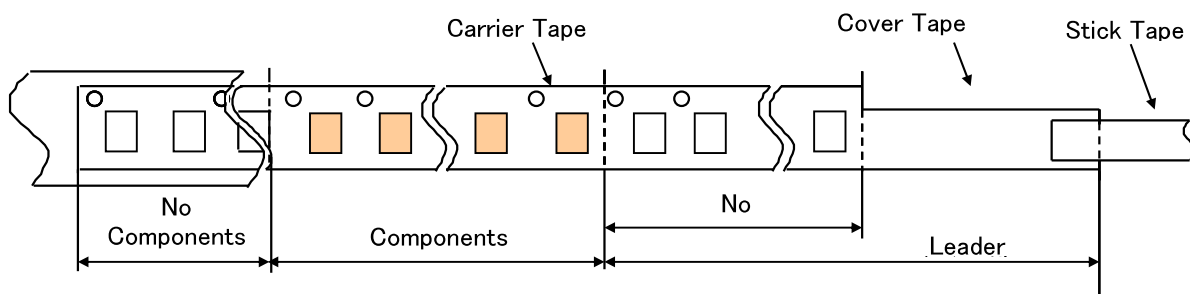


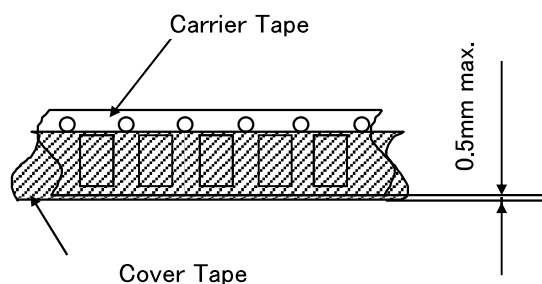
Fig. 2

Feed direction for user

(4) Gap between Carrier Tape and Cover Tape

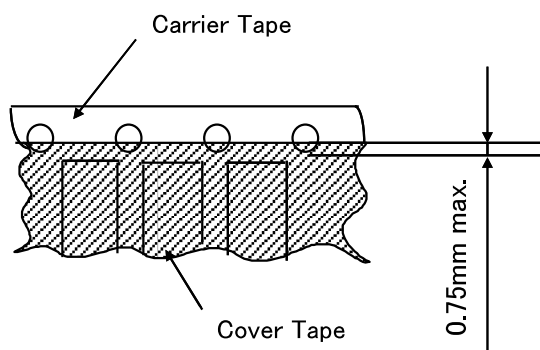
- ① Cover Tape protrudes from Carrier Tape by 0.5mm max.

Fig. 3



- ② Holes of Carrier Tape are covered with Cover Tape by 0.75mm max.

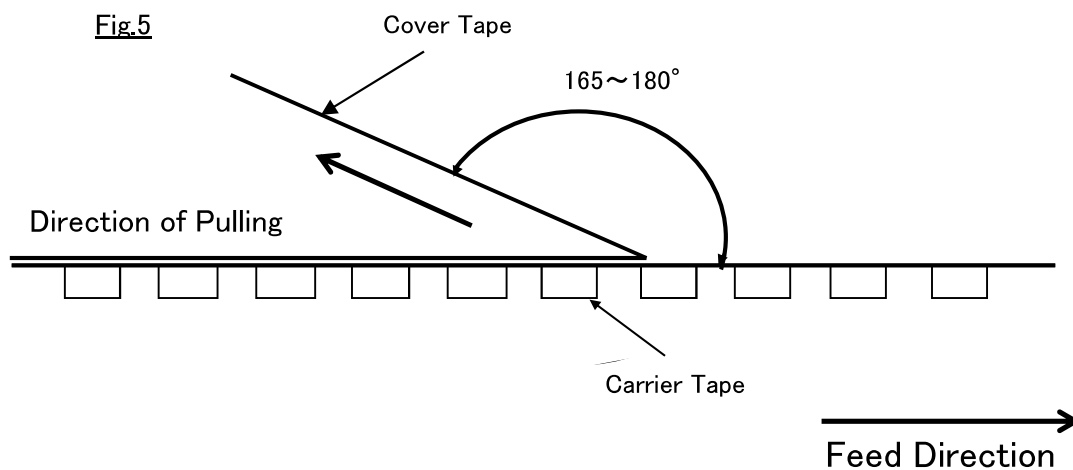
Fig. 4



(5) Peel strength

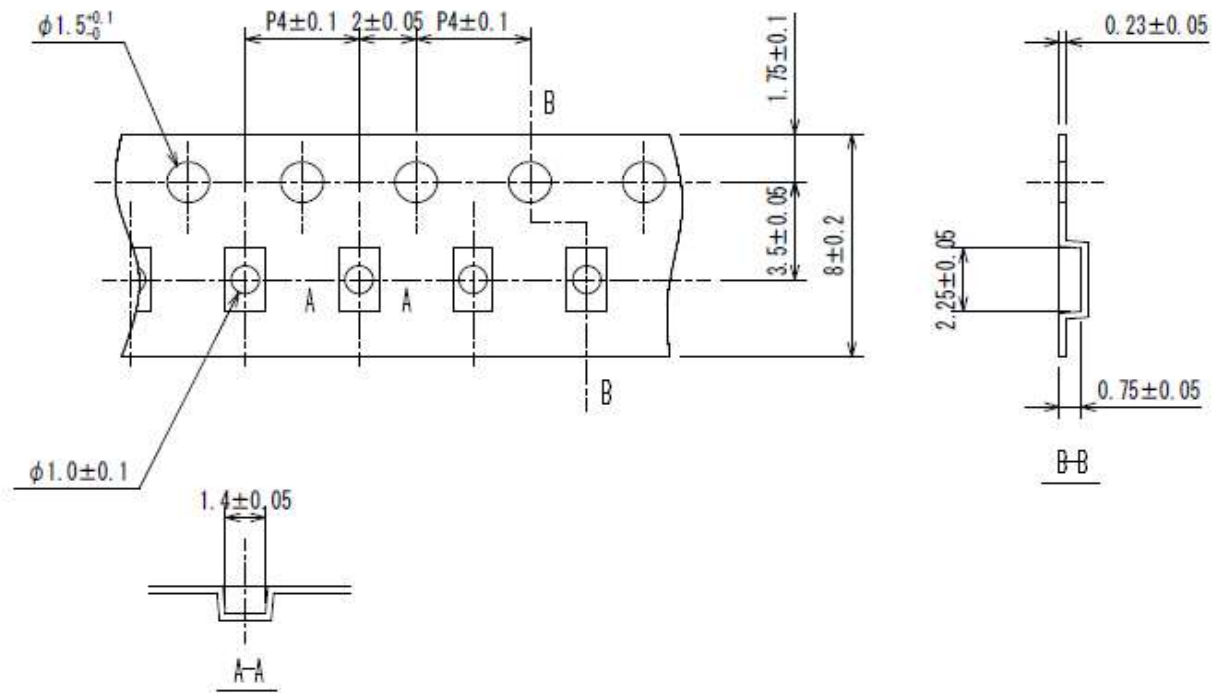
- ① The method of testing is done as shown below.
 ② The value of force is at the beginning of desealing.
 ③ The Cover Tape peel forth shall be 0.1~1.3N at a peel speed of 300 ± 10 mm/min.

Fig.5



Carrier tape

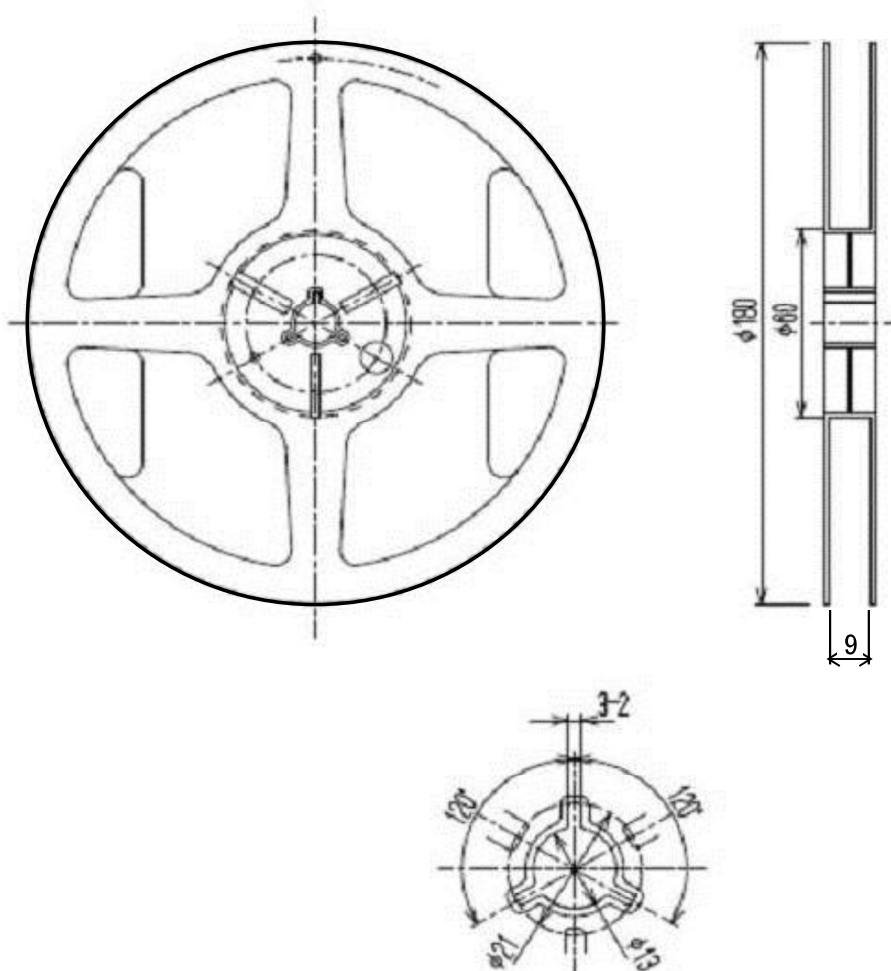
- (1) Conformity with EIA-481
- (2) Tolerance : ± 0.2



Unit=mm

Taping reel

- (1) Conformity with EIAJ ET-7200B
 (2) Quantity per reel : 3,000pcs./for a reel



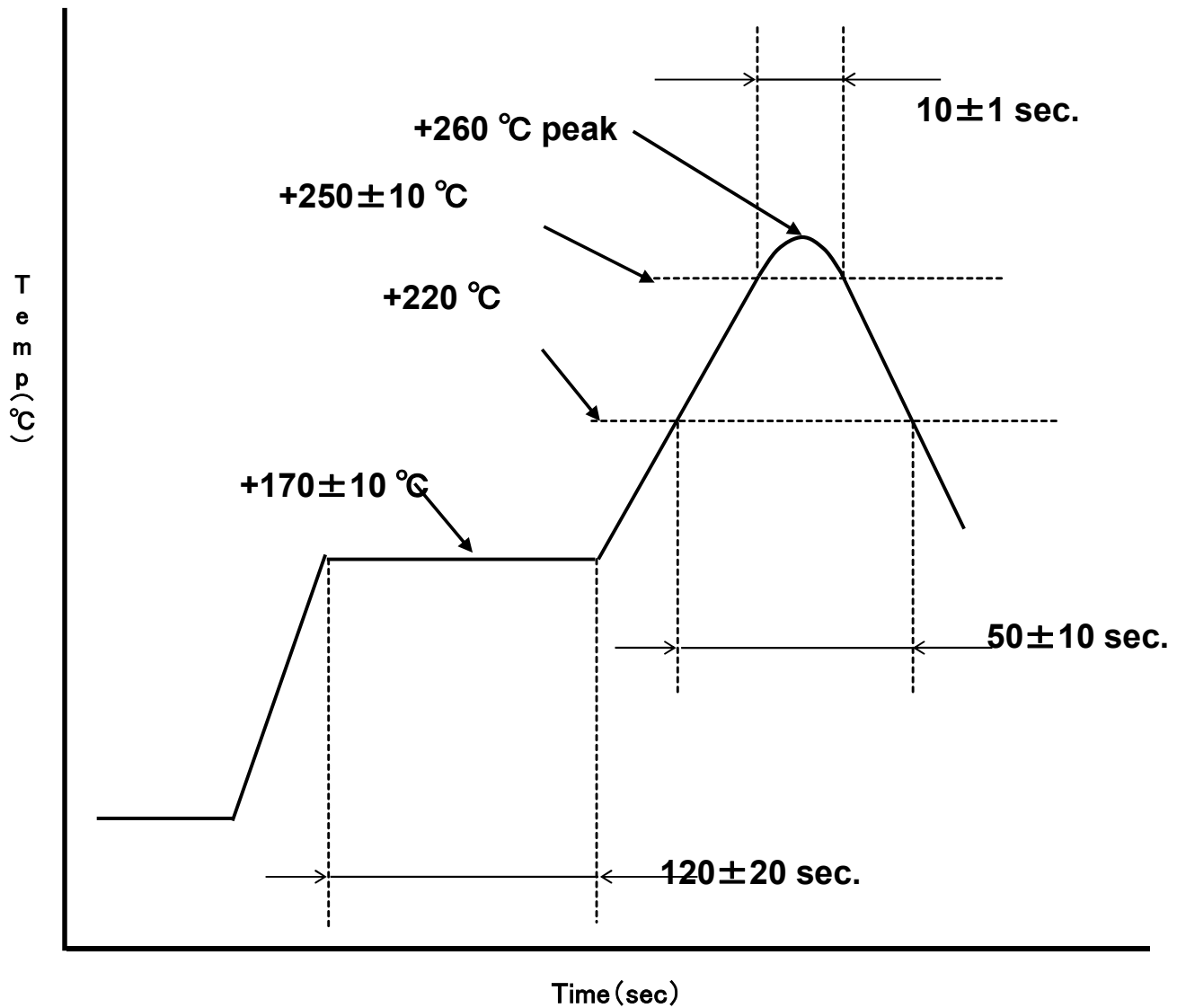
Tolerance: ± 0.2 mm

Item	Specification	Unit
Materials	PS(anti statics)	-
Inside reel wise W1	$9.0+1.0/-0$	mm
Outside reel wise W2	11.4 ± 1.0	mm

Unit = mm

[9] Reflow Profile

Pre-heating temperature: +170°C Pre-heating time: 120sec
 Heating temperature : +220°C Heating time : 50sec

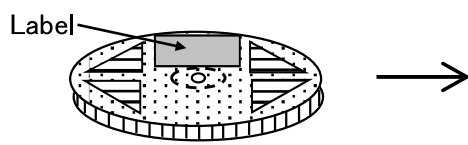


Note:

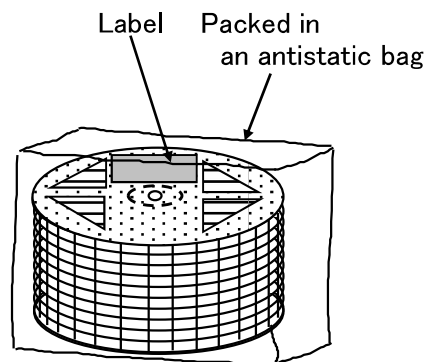
- (1) The temperature used herein means the temperature on the circuit board.
- (2) Reflow is permitted 2 times.

[10] Outside Box Packing Specification

- 1) A label is attached on each reel.
- 2) 10 reels are placed in each antistatic polyethylene bag.



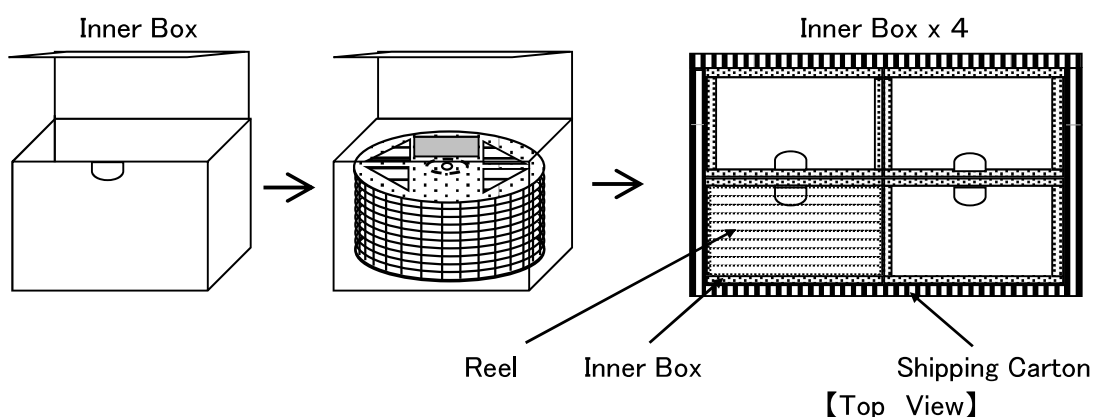
【Figure 1】



【Figure 2】

3) Package

- 10 reels are placed in each inner box.
- 4 inner boxes are placed in each shipping carton.



4) Storage quantity

- Lot = Reel
- N = 3,000 pcs /Reel

5) Sample of the label display (Please refer to【 Figure 1 】【 Figure 2 】)

Product bar code	Part	SC-20S	: Our company's product name
	Lot No.	000001	: Lot No.
	Quantity	3, 000 pcs	: Quantity
Item bar code *	Spec.	32.768kHz 12.5pF/±20 × 10 ⁻⁶	: Frequency, CL value, F0 deviation
	Quantity Lot.No.bar code 3,000 XXXX	Remarks	RoHS Compliant Pb Free : Environment adaptability, and etc.

6) Storage environment

Please keep the products under the following conditions

- * No direct rays
- * Temperature condition : +15 to 35 °C
- * Humidity condition : 25 to 85%RH

7) Storage term

We recommend using within a year of shipment under the environment set in the specification (Temperature : 15-35°C, Humidity: 25-85%RH) regardless of opening the product or not. Crystal oscillator doesn't have a lifetime by reason of little performance change caused by secular variation. Nevertheless, please note that you should confirm the specification of our product whose storage period expires before use.