SPECIFICATION

CUSTOMER	:	
PRODUCT TYPE	:	SMD GLASS SEALING XTAL 3.2 × 2.5
NOMINAL FREQ.	:	24.576000MHz
TXC P/N	:	7V24580009
REVISION	:	A3
CUSTOMER P/N	:	

Customer Signature & Date

(1) TXC requires one copy returned with signature and title of authorized individual that signifies acceptance of the attached specifications.

(2) Orders received and accepted by TXC after return of signed copy of specification will be produced per these specifications.

(3) Any changes to these specifications must be agreed upon by both parties and new revision of the Product Specification Sheet will be issued.

(4) Any issuance of purchase order prior to consigning back the Approval page of "Specification Sheets" from customers will be regarded as the agreement on the contents of these specifications.

PE/RD	QA	MFG
Robin Huang	Samson Xiong	Jake Liu

RoHS Compliant

Rev	Revise page	Revise contents	Date	Ref.No.	Reviser
S1	N/A	Initial released	26-Mar-12	N/A	Xiaoyan Jiang
S2	3	Frequency Stability, Drive Level, Equivalent Resistance Rr Change	13-Aug-12	ECR-12N091004	Xiaoyan Jiang
A1	N/A	S Turn A	3-Sep-12	N/A	Xiaoyan Jiang
A2	P3~P11	Add SHARP's special requirements Add CKG factory Modify marking code instruction	20-Apr-16	ECR-16N042900	Xiaoyan Jiang
A3	P3,4.11	1.Country of origin made in china/TXC chungking factory 2.Making information 3.Add TXC chungking factory	22-Jun-16	ECR-16N062401	Xiaoyan Jiang

Spec Sheet Contents

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1	ELECTRICAL SPECIFICATIONS	P.3
2	DIMENSIONS	P.4
3	MARKING	P.4
4	FACTORY LOCATION	P.4
5	SUGGESTED REFLOW PROFILE& MANUAL SOLDER CONDITION	P.4
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7	EMBOSS CARRIER TAPE & REEL	P.6
8	PACKING	P.7
9	RELIABILITY SPECIFICATIONS	P.8～9

■ ELECTRICAL SPECIFICATIONS

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±5℃

Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature : 25±3℃

Relative humidity : 40%~70%

Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

Unit Weight:

0.018±0.001 g/pcs

Country of origin:

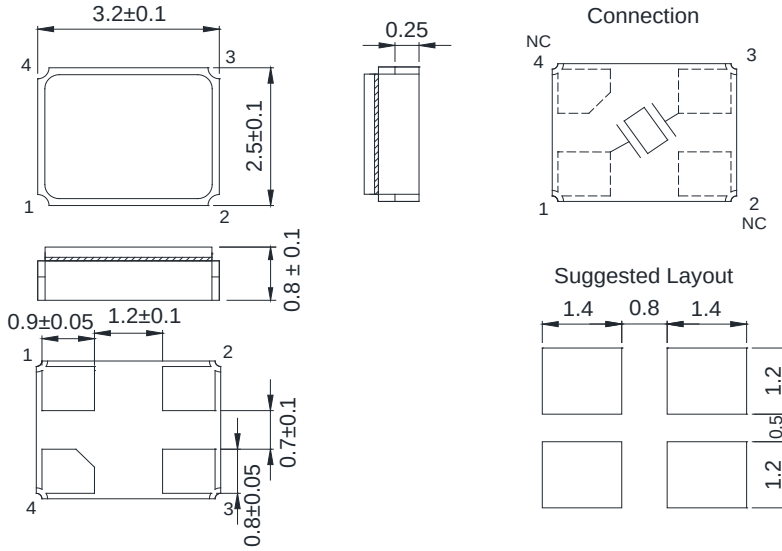
Made in China/TXC Ningbo Factory

Made in China/TXC Chungking Factory

	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYP	MAX	UNITS	
1	Nominal Frequency	FL		24.576000		MHz	-
2	Oscillation Mode	-		Fundamental		-	-
3	Load Capacitance	CL		8		pF	-
4	Frequency Tolerance	-		±15		ppm	at 25 ± 3 ℃
5	Frequency Stability	-		±20		ppm	Over Operating Temp. Range (Reference 25℃)
6	Operating Temperature	-	-10	~	85	℃	-
7	Aging	-		±3		ppm	1st Year
8	Drive Level	DL	-	50	300	uW	-
9	Equivalent Resistance Rr	Rr	-	-	50	Ω	-
10	Shunt Capacitance C0	C0	-	-	3	pF	-
11	2 times reflow	-	-	-	-	-	All electric characteristics should be guaranteed after twice reflow.
12	Spurious	-	-	-	-	-	Frequency of 3F0 +/- 100kHz response 3dB or more.
13	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
14	Storage Temperature Range	-	-40	~	85	℃	-

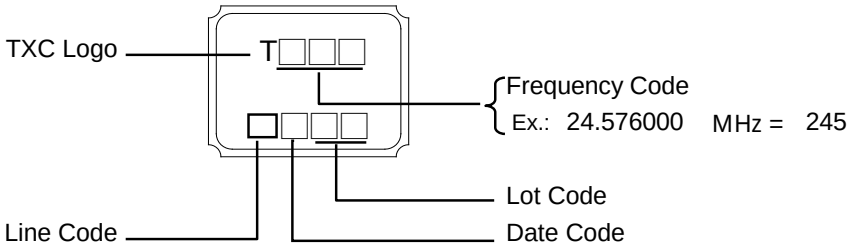
■ DIMENSIONS

(Unit:mm)



*Coplanarity of solderable areas Camber 0.10 mm Max

■ MARKING



Date Code:

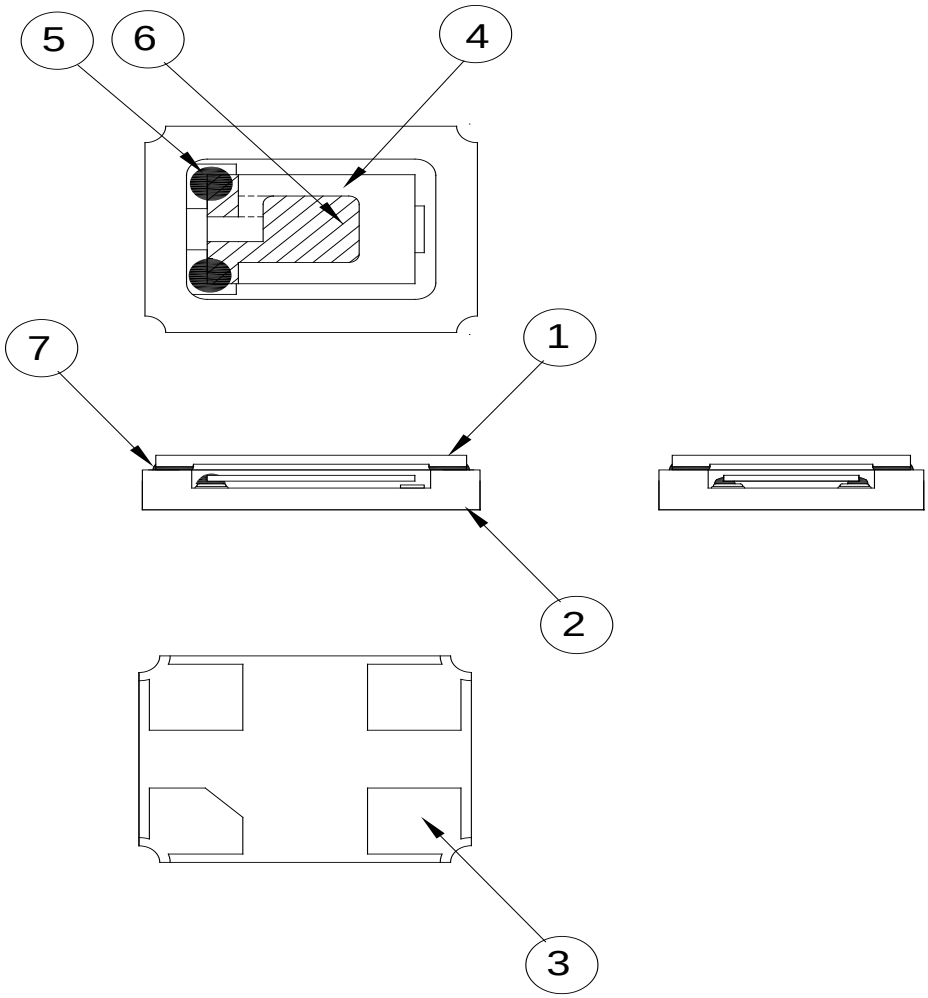
YEAR \ MONTH				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

*This date code will be cycled every four years

■ SUGGESTED REFLOW PROFILE(QCII-P1-06)

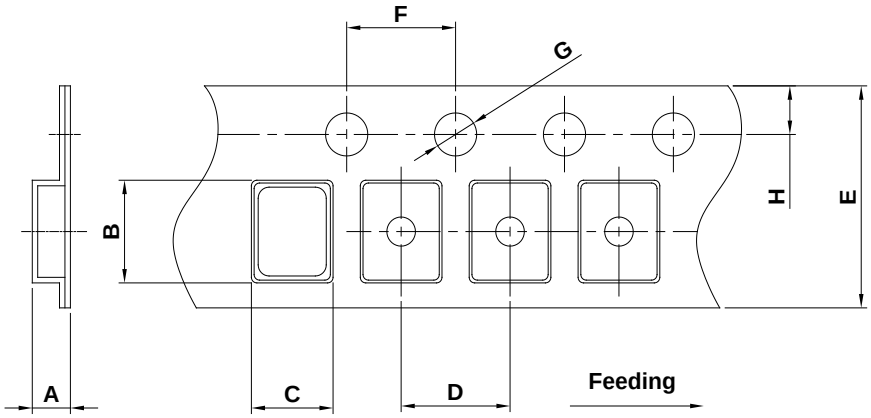
Pb-free Reflow Profile		
CONDITION	S=REFLOW	W=REFLOW
REFLOW		
PEAK TEMP/TIME	240℃/5s≧	230℃/5s
220℃≦	20 ~ 40s	20 ~ 40s
PREHEAT		
150 ~ 190℃	90 ~ 120s	90 ~ 120s
MOISUTURE PROOF	(It is not necessary)	
OPEN-1st REFLOW	-	-
1st-2nd	-	-
Measure Ponit	SURFACE OF COMPONENT	
Storage Condition	0 ~ 30℃, 70%RH≧	

STRUCTURE ILLUSTRATION



NO	COMPONENTS	MATERIALS		FINISH/SPECIFICATIONS
			supplier	
1	Cap	Ceramic (Al_2O_3)	Kyocera	-
2	Package	Ceramic (Al_2O_3)	Kyocera	-
3	PAD	Au	included in Kyocera base	Tungsten metalize +W plating 10~20um + Ni plating 1.27~8.89um + Au plating 0.2~1.0um The substrate(W or Ni) should not be seen due to less Au.
4	Crystal blank	SiO_2	TXC	-
5	Conductive adhesive	Resin+Ag	FUJIKURA	-
6	Electrode	Noble Metal	SOLAR	-
7	Sealing Glass	Glass(PbO)	included in Kyocera base	-

■ EMBOSS CARRIER TAPE & REEL

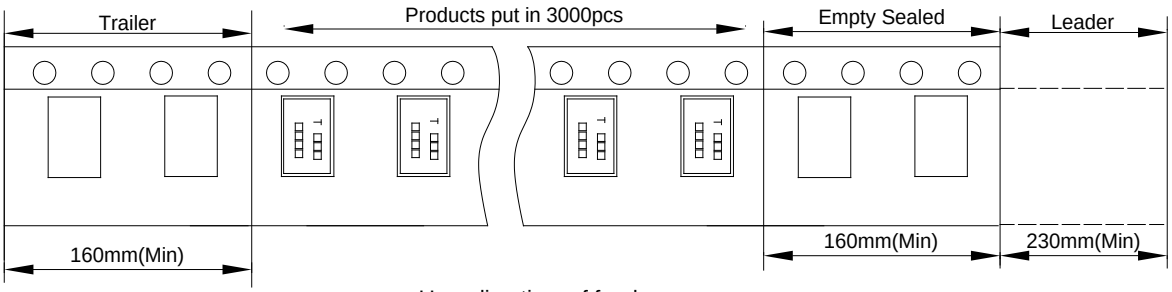


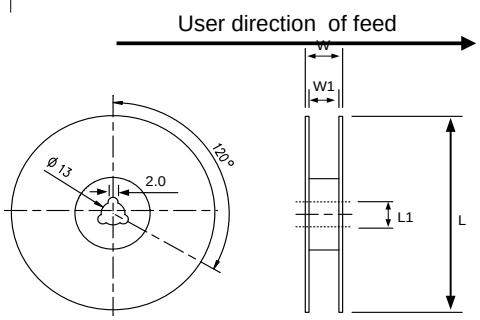
DIMENSIONS	A	B	C	D	E	F	G	H	
	1.65±0.10	3.40±0.10	2.70±0.10	4.00±0.10	8.00±0.20	4.00±0.10	1.55±0.10	1.75±0.10	(UNIT：mm)

Release strength of cover tape. It has to between 20g～80g under following condition.
Pulling Direction : keep angle 165°to 180°
Speed : 300mm/Min.

TAPE	Material	TAPE	Material
Carrier tape	ABS or PS	Cover tape	PS or PET

REMARK :



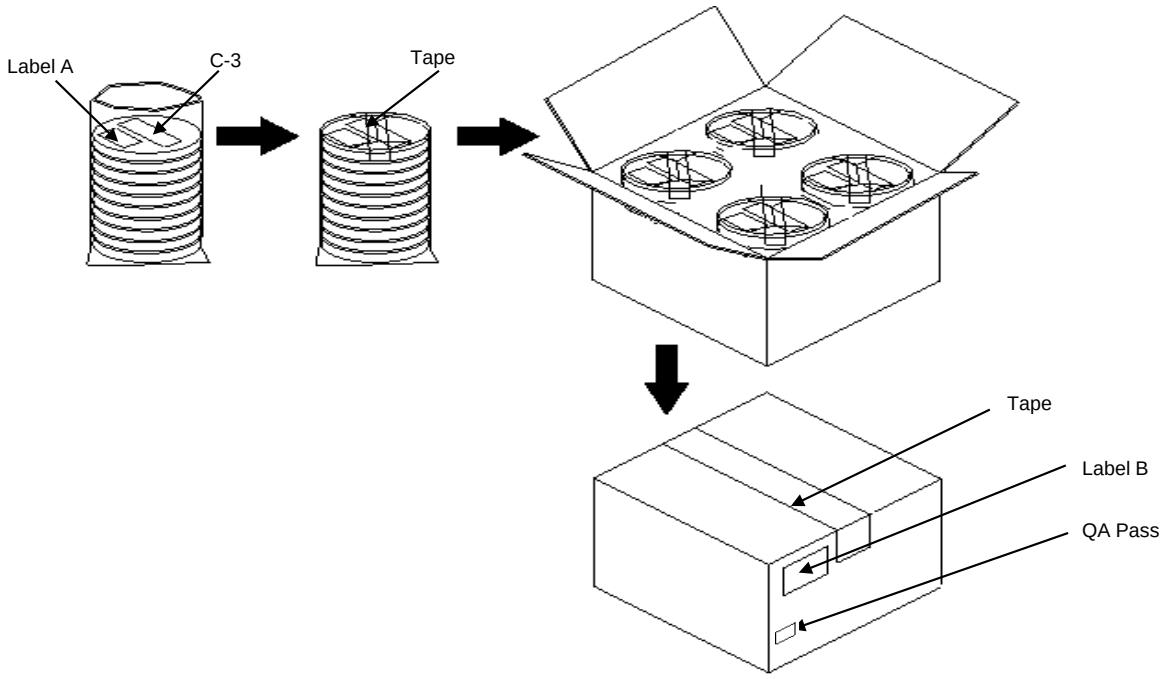


DIMENSIONS	L	L1	W	W1	
	178±1.00	13±0.50	11.5±0.20	8±0.10	(UNIT：mm)

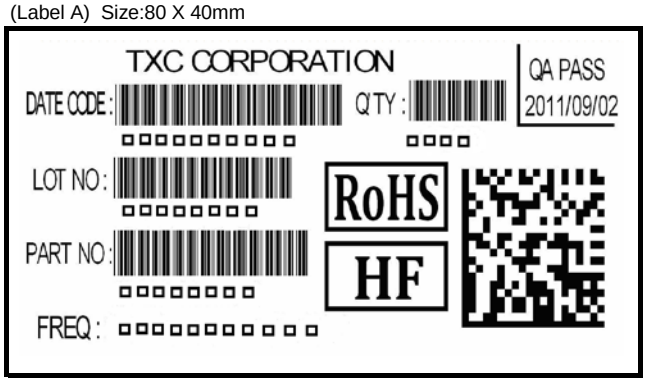
■ PACKING

Reel Quantity :
1. Reel X 6 (6 Reels)
2. Reel X 12 (12 Reels)
3. Reel X 25 (12 Reels + 13 Reels)
4. Reel X 50 (12 Reelsx2 + 13 Reelsx2)

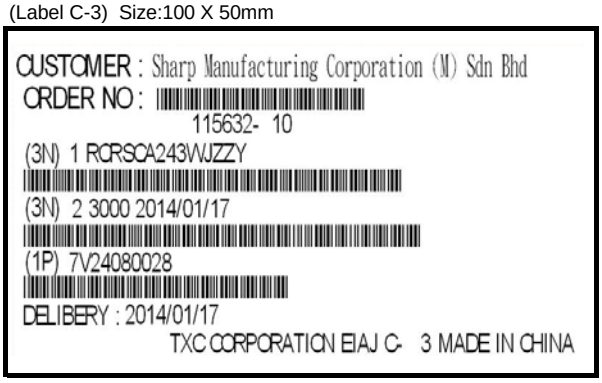
Box Size:
1. L200 X W200 X H140mm
2. L200 X W200 X H250mm
3. L400 X W200 X H250mm
4. L400 X W400 X H280mm



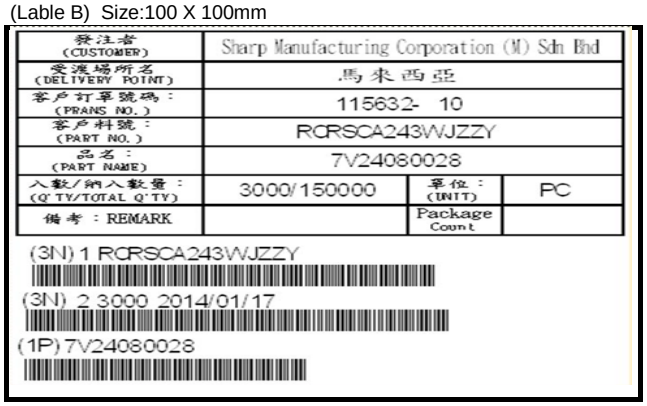
(Label A) Size:80 X 40mm



(Label C-3) Size:100 X 50mm



(Lable B) Size:100 X 100mm



[STORAGE]

1.The storage time to be 1 year maximum.

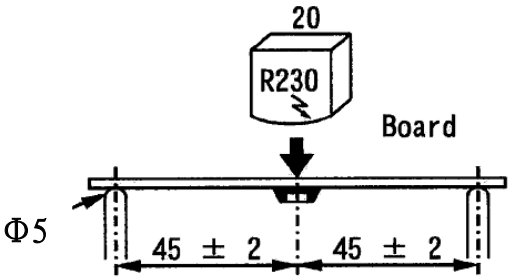
2.Don't be caught in the rain.

3.The storage environment shall be 5℃ ~40℃ temperature and 30% ~ 75%RH humidity and free from the sun shine.

4.If customers have special requirements, we can paste labels according to it.

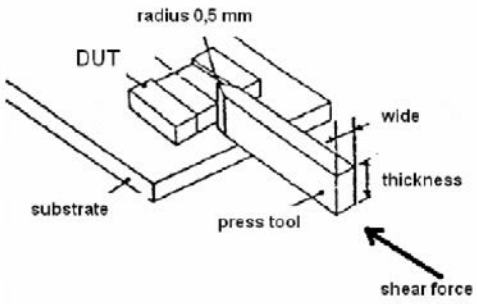
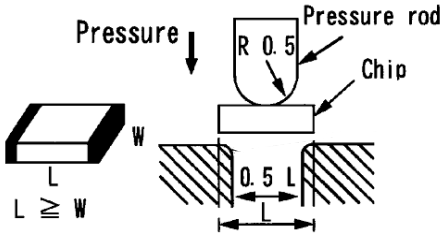
■ RELIABILITY SPECIFICATIONS

■ It guarantees after reflow twice by pretreatment.

	Items	Conditions	Specifications
1	FINE LEAK	He bombing 4.5kg/cm^2 for 2 hours	<1 × 10^{-9} Pa.m^3/sec
	GROSS LEAK	Standard sample for automatic gross leak detector, test pressure: 2kg/cm^2	<1.5 × 10^{-5} Pa.m^3/sec
2	Solder heat-resistance Test (Flow Soldering)	Flow Soldering ：260℃±3℃，≧5 Sec；（Preheating：110~120℃ ≧70 Sec)	Based on QCII-P1-04 '-8ppm≤△F≤8ppm -5Ω≤△F≤5Ω
3	Solder heat-resistance Test (Hand Soldering)	Hand Soldering ：380℃ ，≧3 Sec	Based on QCII-P1-04 '-8ppm≤△F≤8ppm -5Ω≤△F≤5Ω
4	Solder heat-resistance Test (Reflow Soldering)	Reflow Soldering（Whole Heating） Peak Temperature（Solder joint） 240℃ MAX ≦5S 220℃以上 ≧40S（Preheat 150～190℃ 90±30S） The Reflow count is 2 times or more.	Based on QCII-P1-04 '-8ppm≤ △F≤8ppm -5Ω≤ △F≤5Ω
5	Solderability	Pb free:240℃±5℃，5 Sec. 8hours±15min Steam Conditioning(125℃，120Sec. Preheated)	Based on QCII-P1-02 95% Covered
6	Solder Joint Strength	1. TEMP. CYCLE TEST MINI TEMP. -40℃ MAX TEMP. +125℃ TIME Each 30 minutes CYCLES 200 2. Measurement Item Bend Test（EIAJ ED-4702) 3.Measurement cycle：INITIAL,（100）, 200 4.Measurement SMPL：≧5POINTS	Based on SHARP reliability standard Reliability Test Standard for QC Ⅱ-P1-05 1.The variation must be 50% 2.After test measured items mustbe 75%
7	Board Flex	Apply pressure in the direction of the arrow at a rate of about 0.5 mm/s until bent width reaches 3 mm and hold for 60 s. 	-10ppm≤△F≤10ppm -5Ω≤△F≤5Ω

■ **RELIABILITY SPECIFICATIONS**

■ It guarantees after reflow twice by pretreatment.

	Items	Conditions	Specifications
8	Terminal Strength(SMD)	Applied Force: 1.8 kg , Duration Time: 60 ±1 Sec Refer to AEC_Q200 METHOD - 006 	-10ppm≤△F≤10ppm -5Ω≤△F≤5Ω
9	Core body strength	A static load of 10 N using a R 0.5 scratch tool shall be applied on the core of the component and in the direction of the arrow and held for 10 ±1S. 	-10ppm≤△F≤10ppm -5Ω≤△F≤5Ω
10	Elecrical resistance to solvents	Ultrasonic cleaning Cleaning agent shall be Isopropyl Alcohol. Condition shall be 20mW/cm^3, 28KHz, 60 sec (at room temperature.) Immersion cleaning the specimen shall be cleansed at normal temperature for 90s using isopropyl alcohol.	-10ppm≤△F≤10ppm -5Ω≤△F≤5Ω Appearance without distinct

■ RELIABILITY SPECIFICATIONS

■ It guarantees after reflow twice by pretreatment.

<table>
<tr><th></th><th>Items</th><th>Conditions</th><th>Specifications</th></tr>
<tr><td>11</td><td>Vibration</td><td>Frequency range: 10-2000Hz, Amplitude: 1.52m/20G, Sweep time: 20 minutes
3 directions for X,Y,Z axis 12 hours</td><td>Frequency: ±5ppm
CI: ±5Ω</td></tr>
<tr><td>12</td><td>Mechanical Shock</td><td>Peak Acceleration:1000G,Number of Shock: 3 Planes* 6 Shock ;Duration Time:0.3ms.</td><td>Frequency: ±5ppm
CI: ±5Ω.</td></tr>
<tr><td>13</td><td>Drop Test</td><td>Height 150cm, 3 times on concrete</td><td>Frequency: ±5ppm
CI: ±8Ω</td></tr>
<tr><td>14</td><td>Thermal shock test</td><td>-40°C to 125°C ,15min dwell time at each temperatureextreme.1 min. maximum transition time.300cycles.
measurement taken after 1 hours.
<table>
<tr><td></td><td>Temperature</td><td>Duration</td></tr>
<tr><td>1</td><td>-40±3℃</td><td>15 minutes</td></tr>
<tr><td>2</td><td>25℃</td><td>Within 1 minute</td></tr>
<tr><td>3</td><td>125±2℃</td><td>15 minutes</td></tr>
<tr><td>4</td><td>25℃</td><td>Within 1 minute</td></tr>
</table></td><td>Frequency: ±10ppm
CI: ±5Ω</td></tr>
<tr><td>15</td><td>High Temp. Storage test</td><td>125℃ ± 3℃, 500 hours,measurement taken after 1 hours.</td><td>Frequency: ±10ppm
CI: ±5Ω</td></tr>
<tr><td>16</td><td>Low Temp. Storage test</td><td>-40℃ ± 3℃, 500 hours,measurement taken after 1 hours.</td><td>Frequency: ±10ppm
CI: ±5Ω</td></tr>
<tr><td>17</td><td>High Temp and Humidity test</td><td>85℃ ± 3℃, RH 85% , 1000 hours,measurement taken after 1 hours.</td><td>Frequency: ±10ppm
CI: ±5Ω</td></tr>
<tr><td>18</td><td>Packing Test-Vibration</td><td>10~55~10Hz..1minute, 2 hours for each directions (X,Y,Z axis)
Box Material: Carton</td><td>Frequency: ±10ppm
CI: ±5Ω</td></tr>
<tr><td>19</td><td>Packing Test-Drop test</td><td>Height 100cm, onto stainless steel. 1edge, 3 corner, 6 side,
Box Material: Carton</td><td>Frequency: ±15ppm
CI: ±10Ω</td></tr>
</table>

■ **REMARK**

1. Connection before change

When the alternation of specification, material, production process and control system of this product is changed, Quality and reliability data shall be submitted in advance, and information documents shall be submitted to both of Engineering Department and Quality and Reliability Control Center in SHARP Degital Information Appliance Group.

2. Use regulation of ozone depleting substances

The substances for regulation:CFCs, Furiong, 4 chiorination carbon, 1-1-1 trichioroethane(Methyl Chloroform)

2-1 The above-mentioned substances is not contained on this products or parts.

2-2 The above-mentioned substances is not contained in the manufacturing process of this produce of parts.

3. Manufacturing Factory

TXC Ningbo Factory

No. 189 Huang Shan West Road, Dagong Industrial City

Ningbo Economic &Technical Development Zone, Ningbo Zhejiang China PC315800

TEL : 86-574-86874666 FAX : 86-574-86874066

TXC Chungking Factory

Post cpde:401329

No.22 Fung Sheng Rd.,Jiulongpo District,Chungking.China

TEL : 86-023-61511888 FAX : 86-023-61511889

4. This product will be screening by 2 times reflow (Peak temp. 240℃/5s Min.)

■ **Notice**

1. Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

2. If you intend to use products listed on this specification for application that may result in loss of life or assets (controls relating to safety, medical equipments, aeronautical equipment, space equipment, etc.) not please do fail to advise us of your intention beforehand.

3. Infomation contained in this specification must not be quoted, reproduced or used for other purposes

4. Please do not use of ultrasonic cleaning machines for clean crystals due to avoid influence for performance.

5. Storing crystal unit at high temperature and humidity may deteriorate the soldring condition of terminal. Please do not store in direct sunlight and damp environments.