



**TXC CORPORATION**

4F, NO. 16, Sec. 2 Chung Yang S Rd., Peitou, Taipei, Taiwan.

TEL : 886-2-2894-1202 , 886-2-2895-2201 FAX : 886-2-2894-1206 , 886-2-2895-6207

www.txccorp.com

# SPECIFICATION FOR APPROVAL

CN: 1404000527

CUSTOMER : \_\_\_\_\_

PRODUCT TYPE : HC-49/S SMD

NOMINAL FREQ. : 20.000000MHz

TXC P/N : AT20000002

REVISION : A2

CUSTOMER P/N : \_\_\_\_\_

PM / SALES : \_\_\_\_\_

DATE : \_\_\_\_\_

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.

Attachment: Product Specification Sheet

1  
2  
3  
4  
5

**RoHS Compliant**



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# PRODUCT SPECIFICATION SHEET

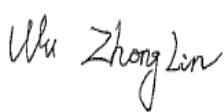
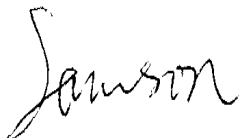

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TXC P/N : AT20000002

REVISION : A2

PE/RD	QA	MFG
		
12-Oct-11	12-Oct-11	12-Oct-11

## NOTE:

- (1)Lead Free Products are "Directive 2002/95/EC of The European Parliament of 27 January 2003 on the restriction of the use of certain hazardous substances (RoHS) in electrical and electronic equipment" Compliant (Attachment: SGS Test Report).
- (2)Revision "Sx" is for engineering samples only. PE/RD's approval required.
- (3)Revision "Ax" is production ready. PE, QA and MFG's approval required

**RoHS Compliant**



<u>Rev</u>	<u>Revise page</u>	<u>Revise contents</u>	<u>Date</u>	<u>Ref.No.</u>	<u>Reviser</u>
A1	N/A	Initial Released	15-Jul-11	N/A	Jun Wei
A2	7	Change Label B& Label C, Deleted Label A "G" Mark	12-Oct-11	ECR-11N092802	Xiaoyan Jiang



## Spec Sheet Contents

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## 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°C

Relative humidity : 40%~70%

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

Ambient temperature : 25+/-1°C

Relative humidity : 40%~70%

### Measure equipment

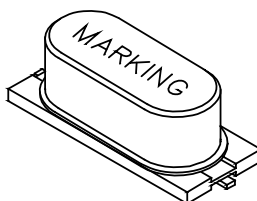
SAUNDERS 250A/250B CRYSTAL IMPEDANCE METER.

### Crystal cutting type

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

### Unit Weight:

0.58±0.050 g/pcs



please refer to marking code page

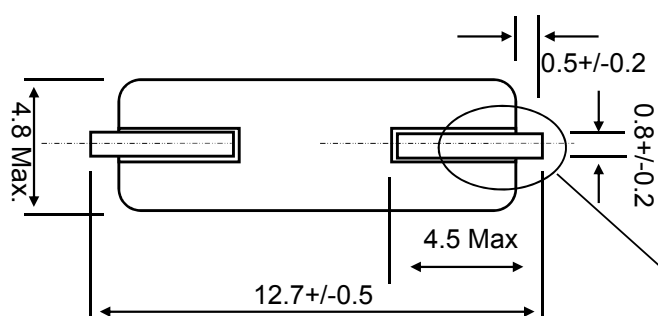
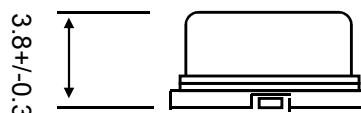
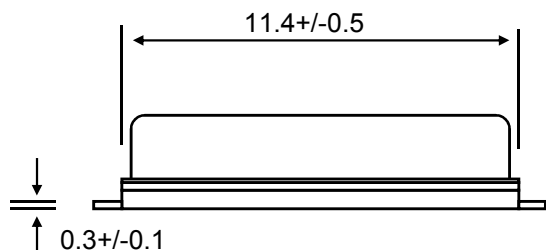
	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYPE	MAX	UNITS	
1	Nominal Frequency	FL	20.000000			MHz	-
2	Oscillation Mode	-	Fundamental			-	-
3	Load Capacitance	CL	12			pF	-
4	Frequency Tolerance	-	±20			ppm	at 25 °C ± 3 °C
5	Frequency Stability	-	±50			ppm	Over Operating Temp. Range (Reference 25°C)
6	Operating Temperature	-	-40	~	85	°C	-
7	Aging	-	±3			ppm	1st Year
8	Drive Level	DL	-	-	300	uW	-
9	Effective Resistance Rr	Rr	-	-	50	Ω	-
10	Shunt Capacitance C0	C0	-	-	-	pF	-
11	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
12	Storage Temperature Range	-	-40	~	105	°C	-

### ■ FACTORY LOCATION

TXC (NINGBO) CORPORATION  
NO.189 Huang Shan West Road, Beilun District,  
Ningbo Zhejiang China

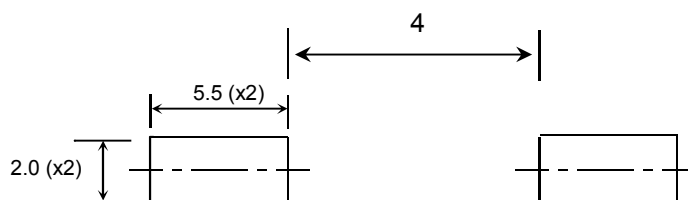
## DIMENSIONS

UNIT:mm



## Suggested Layout

Solder Coating  
(Sn-Ag-Cu Pb Free Coating)



## ■ SUGGESTED REFLOW PROFILE

Solder melting point :220±10 °C, 60 sec. Min.

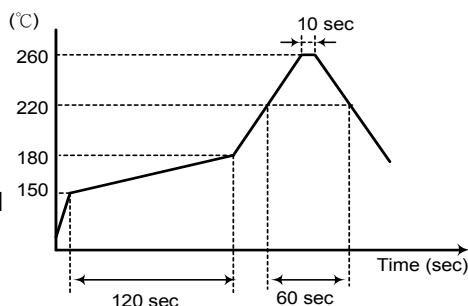
Peak Temperature: 260 ± 5 °C, 10 sec. Max.

## ■ SUGGESTED MANUAL SOLDER CONDITION

Temperature: 350 ± 10 °C

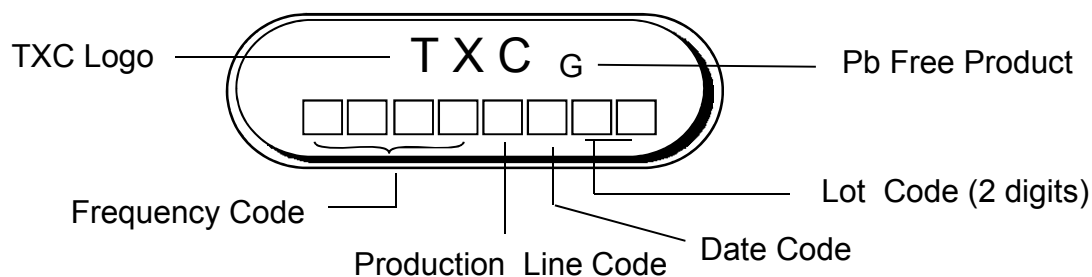
Time: 3 sec.

Re-solder times: twice



## MARKING

### Marking For Pb Free Parts :

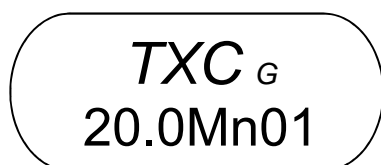


#### Date Code:

YEAR					MONTH											
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

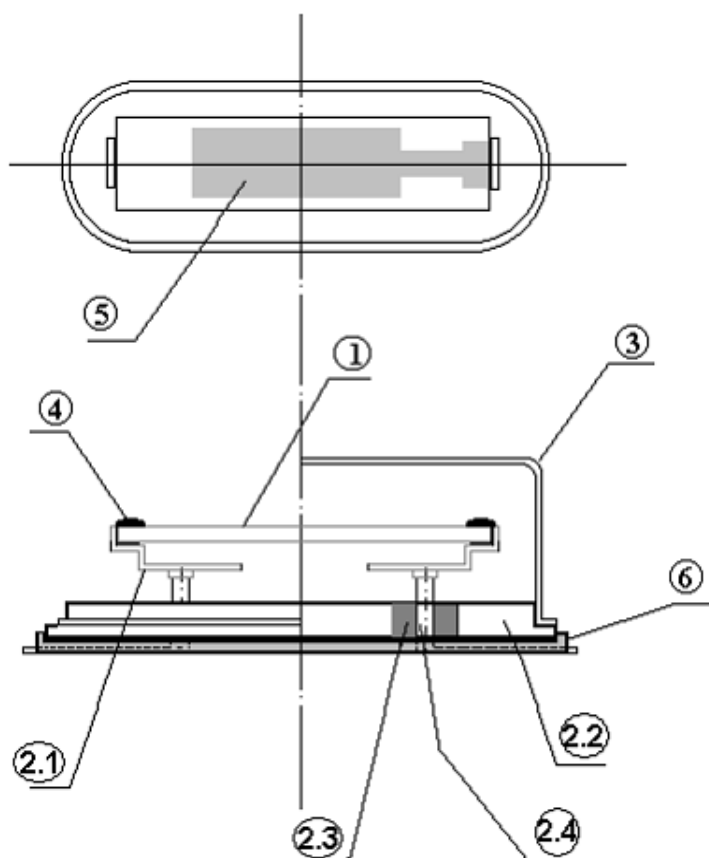
\*This date code will be cycled every four years.

### For example : Marking



→  
Introduction : Pb Free Product  
49S/SMD 20.0 MHz  
Made in NGB 2008/JAN 01Lot

## ■ STRUCTURE ILLUSTRATION

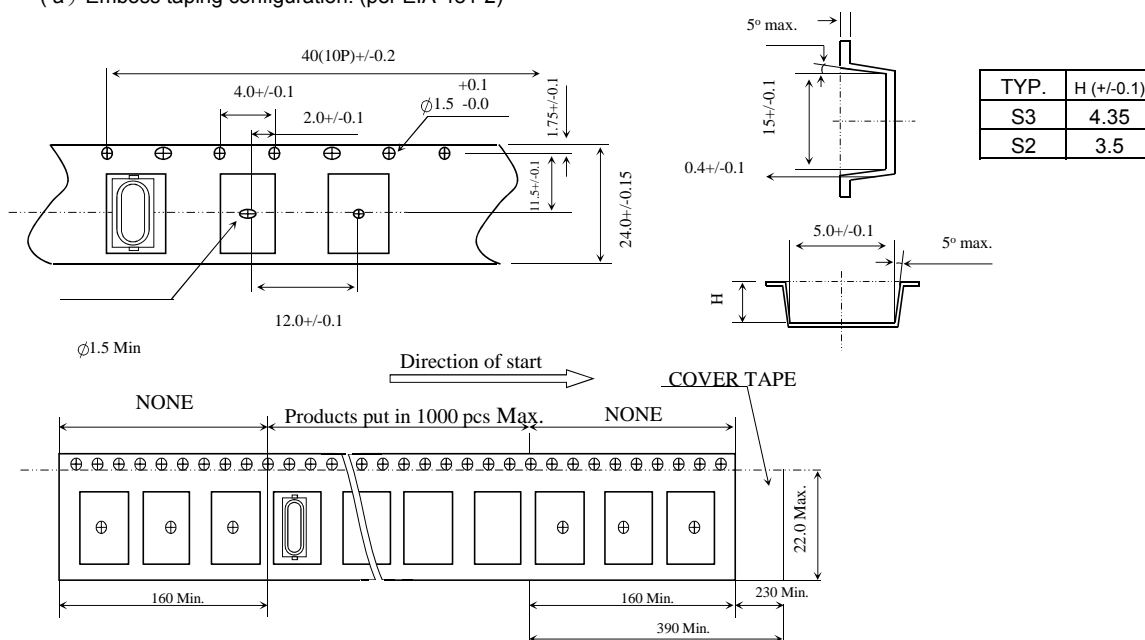


NO	COMPONENTS		MATERIALS	FINISH/SPECIFICATIONS
1	CRYSTAL BLANK		QUARTZ( $\text{SiO}_2$ )	-
2	2	SUPPORTER	Nickel Silver( $\text{Cu/Zn/Ni}$ )	-
	2	HOLDER	SPCC( $\text{Fe}$ )	Ni Plated
	2	GLASS	GLASS	-
	2	LEAD	Kovar ( $\text{Fe/Co/Ni}$ )	Ni Plated+Solder( $\text{Sn/Ag/Cu}$ ) Dipped
3	CRYSTAL COVER		Nickel Silver( $\text{Cu/Zn/Ni}$ )	Ni Plated
4	CONDUCTIVE ADHESIVE		Resin + Ag	-
5	ELECTRODE		Noble Metal	-
6	INSULATION PAD		PPS	-



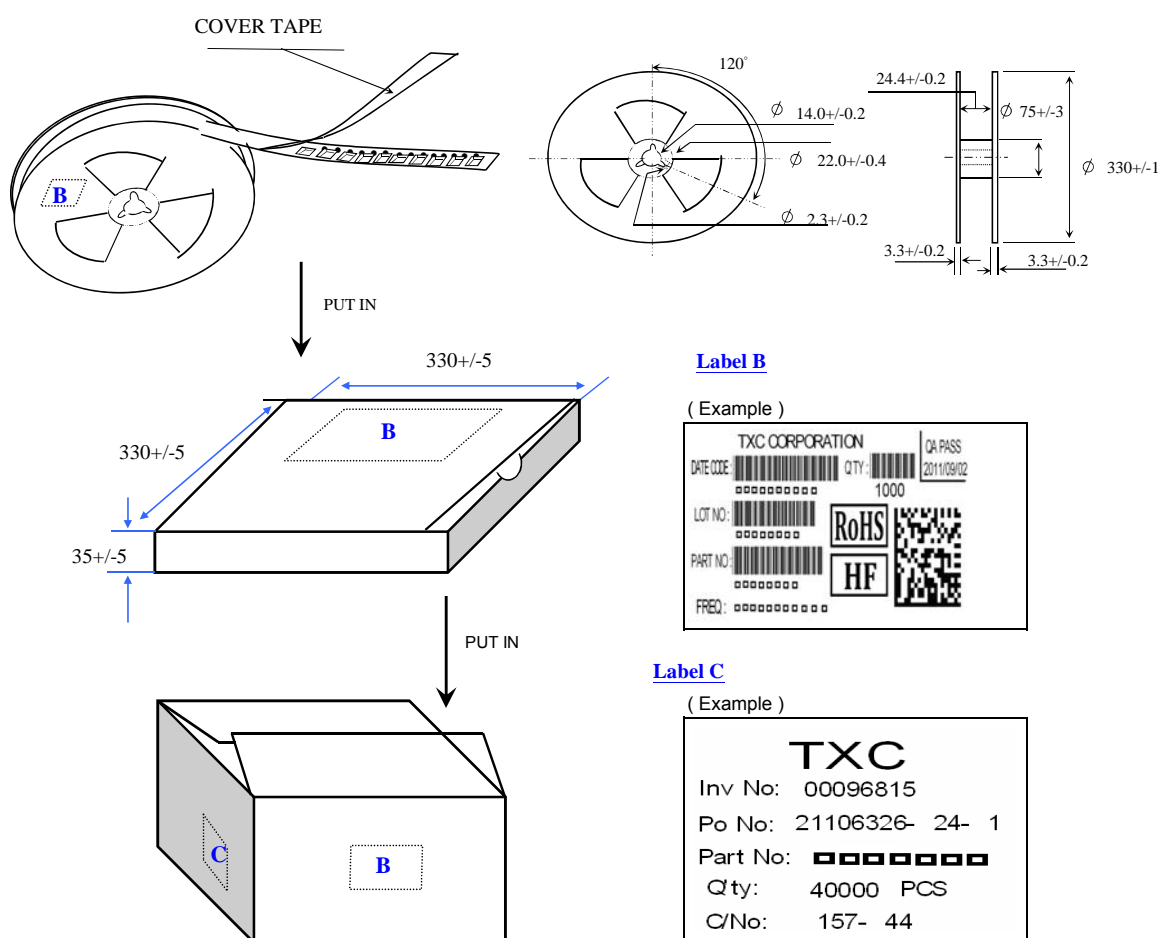
## (A) Tape and reel configuration:(Unit : mm)

(a) Emboss taping configuration. (per EIA-481-2)



(b) Reel configuration.

## (B) Packing & Label :(Unit : mm)



### [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.

# (1) Put in stuff between space.

## ■ RELIABILITY SPECIFICATIONS (AEC-Q200 Compliant)

### 1. Mechanical Endurance

No.	Test Item	Test Methods	Test Criteria
1.1	Mechanical Shock	1000 G , 0.5 m Sec. , 3 times for all 3 directions.	B C
1.2	Vibration	Frequency range 10 ~ 2000 Hz Acceleration 5G Sweep time 20 minute Pendicular axes each test time 4 hours (Total test time 12 hours)	B C
1.3	Terminal Strength	17.7N force for 60sec +/-1sec.	F
1.4	Board Flex	Duration time:60 Sec Minimum, Deviation:3mm	B C
1.5	Solderability	Temperature 245 °C +/- 5°C Immersing depth 0.5 mm minimum Immersion time 5 +/- 0.5 seconds Flux Rosin resin methyl alcohol solvent ( 1 : 4 )	E

### 2. Environmental Endurance

No.	Test Item	Test Methods	SPEC
2.1	Resistance To Soldering Heat	Test temperature 260 +/- 5 °C Test time 10 +/- 1 sec.	ACD
2.2	High Temp. Storage	+ 85°C ± 3 °C for 1000 ± 12 Hrs	ACD
2.3	Low Temp. Storage	- 40 °C ± 3 °C for 1000 ± 12 Hrs	ACD
2.4	Temperature cycle	-40°C~85°C, for 1000 cycles. 	ACD
2.5	Operational Life	1000 hrs @ 85± 3°C. Rated VDD applied with 1 MΩ.	ACD
2.6	High Temp & Humidity	85°C ± 3°C , RH 85% , 1000 Hrs	ACD

**RELIABILITY SPECIFICATIONS**

Specifications	
A	Frequency change: Within $\pm 20$ ppm or in customer's specification.
B	Frequency change: Within $\pm 10$ ppm or in customer's specification.
C	Equivalent series resistance(E.S.R) change: Within $\pm 15\%$ or $10\Omega$ (larger value).
D	After conditioning , quartz crystal units shall be subjected to standard atmospheric conditions for 24 hour, and measured.
E	Minimum 95% of immersed terminal shall be covered with new uniform solder.
F	No damage on specimen

**Measurement condition**

Measurements are carried out with Network-analyzer( S&A 250B or equivalent).