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: 1601022653

CUSTOMER	:	
PRODUCT TYPE	:	HC-49/S
NOMINAL FREQ.	:	16.000000MHz
TXC P/N	:	AS16000005
REVISION	:	S1
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

CN: 1601022653

PRODUCT TYPE	:	HC-49/S
NOMINAL FREQ.	:	16.000000MHz
TXC P/N	:	AS16000005
REVISION	:	S1

PE/RD	QA	MFG
Shih-Yung Pao Shih-Yung Pao		
3-May-13		

NOTE:

(1)The green product standard set by TXC is based upon the international standards. Related information is publicly described on the TXC's Website, and updated regularly. The document is compliant with the latest green product quality system directives at the time.

(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

Rev	Revise page	Revise contents	Date	Ref.No.	Reviser
S1	N/A	Initial Released	3-May-13	N/A	Xiaoyan Jiang

Spec Sheet Contents

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2	FACTORY LOCATION	P.3
3	DIMENSIONS	P.4
4	SUGGESTED REFLOW PROFILE& MANUAL SOLDER CONDITION	P.4
5	MARKING	P.5
6	STRUCTURE ILLUSTRATION	P.6
7	PACKING	P.7
8	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°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

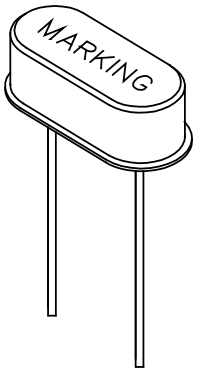
SAUNDERS 250A/250B CRYSTAL IMPEDANCE METER.

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		16.000000		MHz	-
2	Oscillation Mode	-		Fundamental		-	-
3	Load Capacitance	CL		12		pF	-
4	Frequency Tolerance	-		±30		ppm	at 25 ℃ ± 3 ℃
5	Frequency Stability	-		±50		ppm	Over Operating Temp. Range (Reference 25℃)
6	Operating Temperature	-	-40	~	105	℃	-
7	Aging	-		±3		ppm	1st Year
8	Drive Level	DL	-	50	100	uW	-
9	Effective Resistance Rr	Rr	-	-	60	Ω	-
10	Shunt Capacitance C0	C0	-	-	7	pF	-
11	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
12	Storage Temperature Range	-	-40	~	105	℃	-

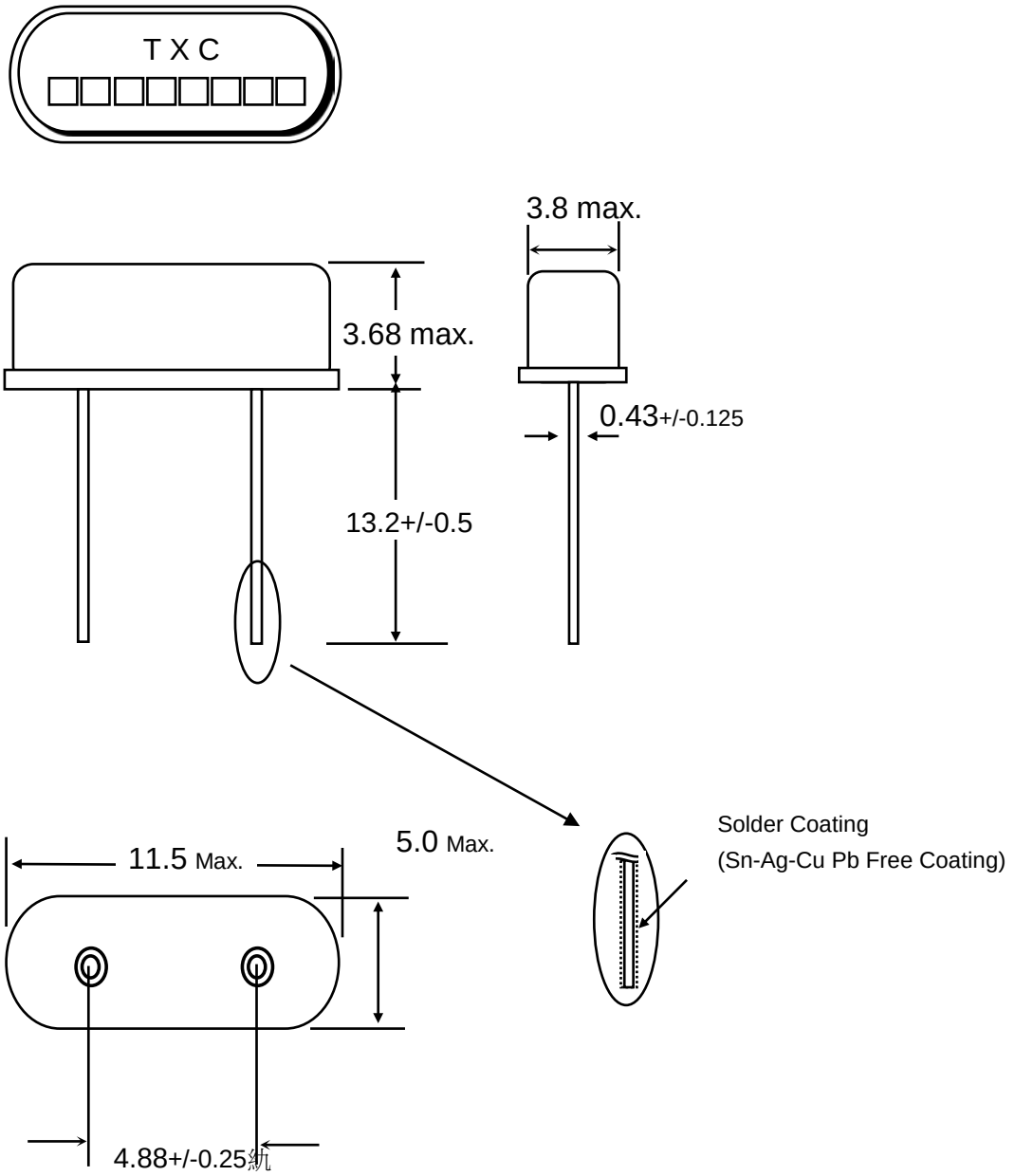
■ FACTORY LOCATION

TXC (NINGBO) CORPORATION

NO.189 Huang Shan West Road, Dagong Industrial City,

Ningbo Economics & Technical Development Zone, Ningbo Zhejiang China

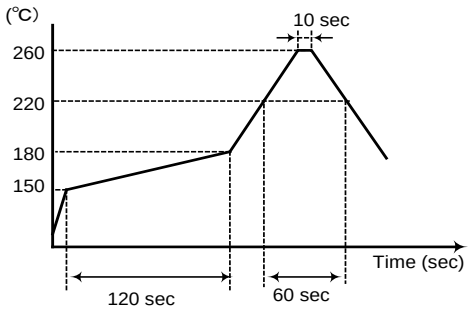
DIMENSIONS UNIT:mm



■ SUGGESTED REFLOW PROFILE

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

Peak Temperature: 260 ± 5 ℃, 10 sec. Max.



■ SUGGESTED MANUAL SOLDER CONDITION

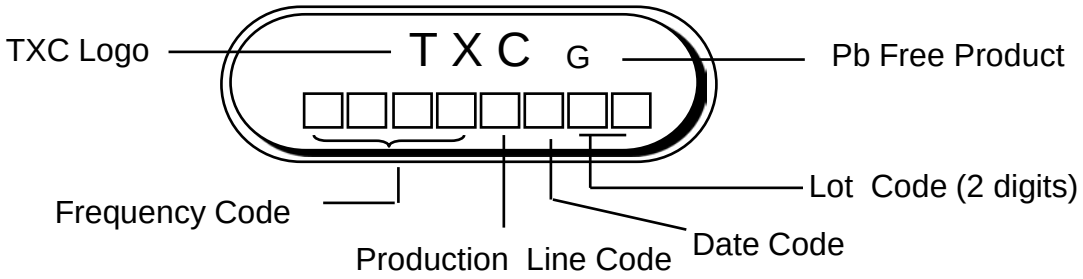
Temperature: 350 ± 10 ℃

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.

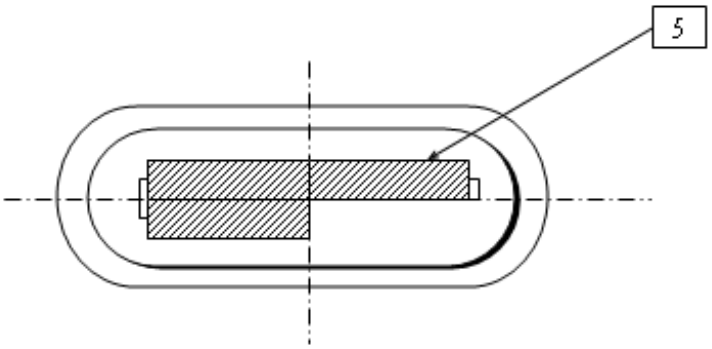
For example : Marking

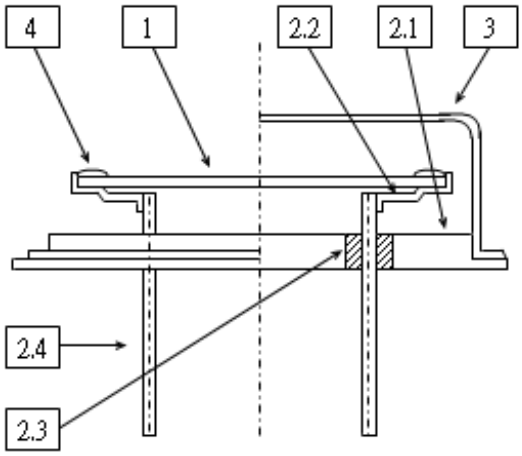


→

Introduction：
Pb Free Product
49S 16.000MHz
Made in 2009/JAN. 01Lot

■ STRUCTURE ILLUSTRATION

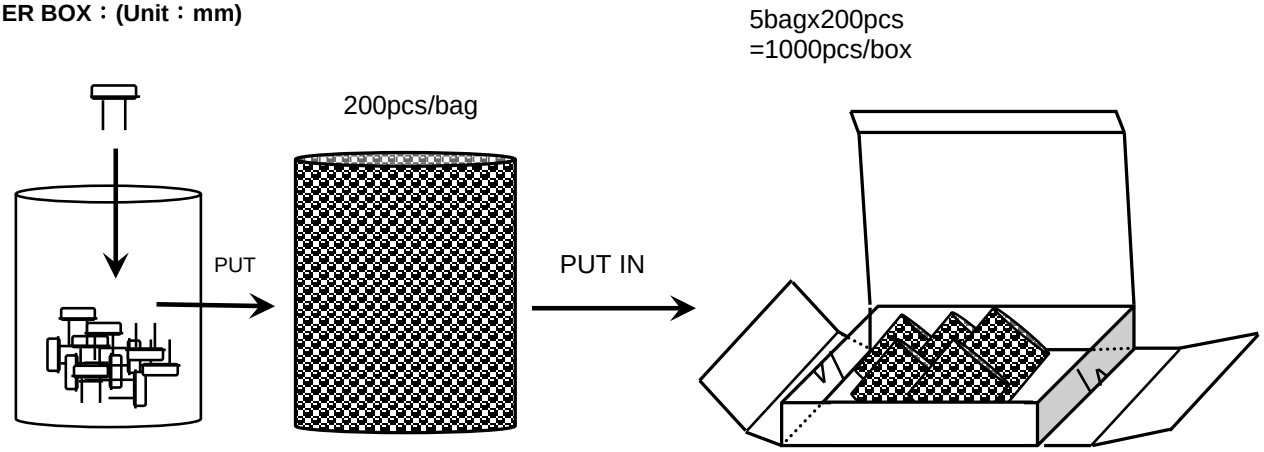




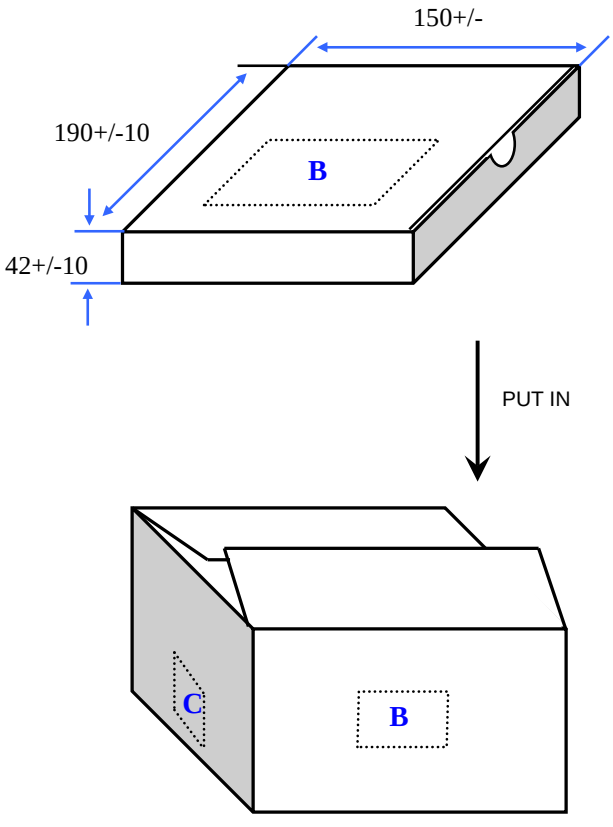
NO		COMPONENTS		MATERIALS	FINISH/SPECIFICATIONS
1		CRYSTAL BLANK		QUARTZ(SiO_2)	-
2	2.1	CRYSTAL BASE	HOLDER	SPCC(Fe)	Ni Plated
	2.2		SUPPORTER	Nickel Silver(Cu/Zn/Ni)	-
	2.3		GLASS	GLASS	-
	2.4		LEAD	Kovar (Fe/Co/Ni)	Ni Plated+Solder(Sn/Ag/Cu) Dipped
3		CRYSTAL COVER		Nickel Silver(Cu/Zn/Ni)	Ni Plated
4		CONDUCTIVE ADHESIVE		Resin + Ag	-
5		ELECTRODE		Noble Metal	-

Packing For Pb Free Parts ：

1.INNER BOX：(Unit：mm)

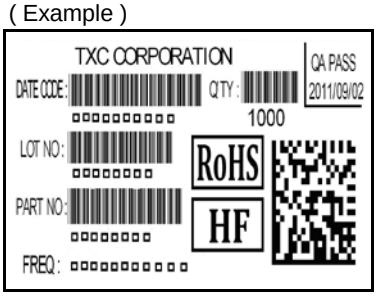


2.LOGO STICKER(CARTON and INNER BOX)：(Unit：mm)



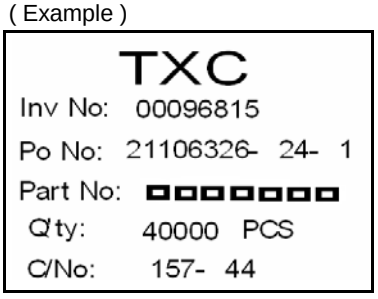
Label B

(Example)



Label C

(Example)



Put in stuff between space.

[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.

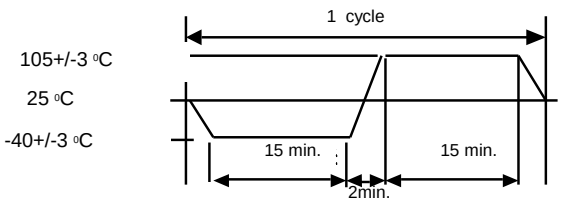
4.If customers have special requirements, we can paste labels according to it.

■ RELIABILITY SPECIFICATIONS (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	A: 10N force in axes of terminal, 10±1sec. B: A bend through 90°and return to normal position shall be defined as one bend for a total of three ,the rate of bending shall be approximately 3sec per bend in each direction.	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	+ 105℃ ± 3 ℃ for 1000 ± 12 Hrs	ACD
2.3	Low Temp. Storage	- 40 ℃ ± 3 ℃ for 1000 ± 12 Hrs	ACD
2.4	Temperature cycle	-40℃~105℃,for 1000 cycles. 	ACD
2.5	Operational Life	1000 hrs @ 105± 3°C. Rated VDD applied with 1 MΩ.	ACD
2.6	High Temp&Humidity	85℃ ± 3℃ , RH 85% , 1000 Hrs	ACD

RELIABILITY SPECIFICATIONS

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

Measurement condiction

Measurements are carried out with Network-analyzer(S&A 250B or equival