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

CUSTOMER	:	
PRODUCT TYPE	:	HC-49/S
NOMINAL FREQ.	:	4.000000MHz
TXC P/N	:	9B04000666
REVISION	:	A1
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

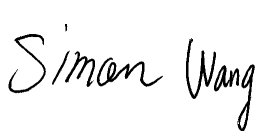
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PRODUCT SPECIFICATION SHEET

PRODUCT TYPE	:	HC-49/S
NOMINAL FREQ.	:	4.000000MHz
TXC P/N	:	9B04000666
REVISION	:	A1

PE/RD	QA	MFG
		
Simon Wang	Ton Hsieh	Shu-Chen Ko
2014/8/26	***2014/8/26***	***2014/8/26***

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
A1	N/A	Initial Release	2014/8/26	N/A	Shu-Chen Ko

CONTENT

SPECIFICATIONS	PAGE
• ELECTRICAL SPECIFICATIONS	4
• DIMENSIONS	5
• SUGGESTED REFLOW PROFILE	5
• MANUAL SOLDER CONDITION	5
• MARKING	6
• STRUCTURE ILLUSTRATION	7
• PACKING	8
• RELIABILITY SPECIFICATIONS	9 , 10

ATTACHMENT(S) (optional)

TESTING DATA

- ELECTRICAL CHARACTERISTICS TEST — A ☐ YES ☑ NO
- TEMPERATURE CHARACTERISTICS TEST — B ☐ YES ☑ NO

ELECTRICAL SPECIFICATIONS

Standard atmospheric conditions

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

**Ambient tempera : ** 25+/-5°C

**Relative humidity : ** 40%~70%

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

**Ambient tempera : ** 25+/-1°C

**Relative humidity : ** 40%~70%

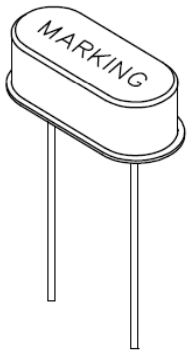
Measure equipment

SAUNDERS 250A/250B CRYSTAL IMPEDANCE METER.

Crystal cutting type

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

Unit Weight : 0.54 g +/- 0.05g

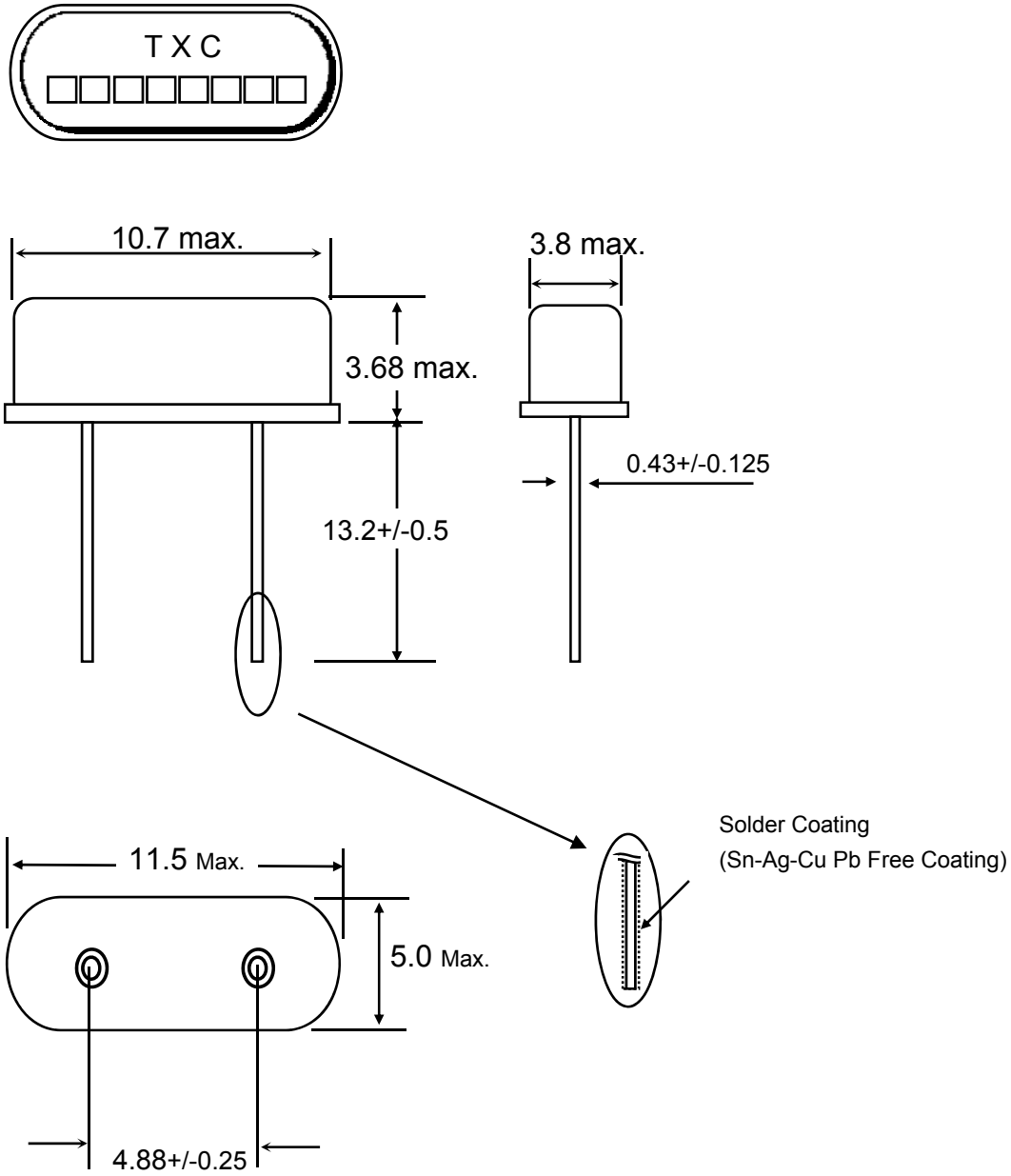


please refer to marking code page

	Parameters	SYM	Electrical				Notes
			MIN.	TYP.	MAX.	UNITS	
1	Nominal Frequency	FL	4.000000 MHz			MHz	
2	Oscillation Mode		Fundamental				
3	Load Capacitance	CL		20.0		pF	
4	Frequency Tolerance	FT	-30		+30	ppm	at 25 °C +/- 3 °C
5	Frequency Stability	ST	-30		+30	ppm	Over Operating Temp.Range
6	Operating Temperature	OT	-40		+85	°C	
7	Aging		-5		+5	ppm	1st year
8	Drive level	DL		100	500	uW	
9	Effective Resistance Rr	Rr			100	ohm	
10	Shunt Capacitance	C0			7	pF	
11	Motional Capactiance	C1				fF	
12	Insulation Resisstance		500			Mohm	at DC 100V
13	Storage Tempeature Range		-40		+85	°C	
14	SPDB(+/-5000ppm)				-3.0	dB	

■ FACTORY LOCATION : CHINA

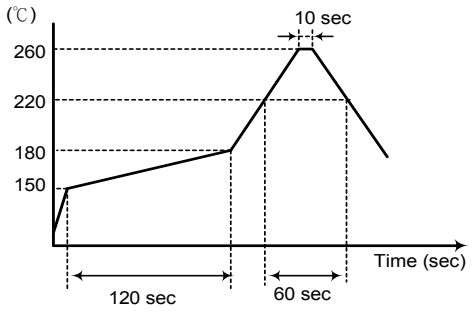
DIMENSIONS UNIT:mm



■ SUGGESTED REFLOW PROFILE

Solder melting point :220+/-10 °C, 60 sec. Min.

Peak Temperature: 260 +/- 5 °C, 10 sec. Max.



■ SUGGESTED MANUAL SOLDER CONDITION

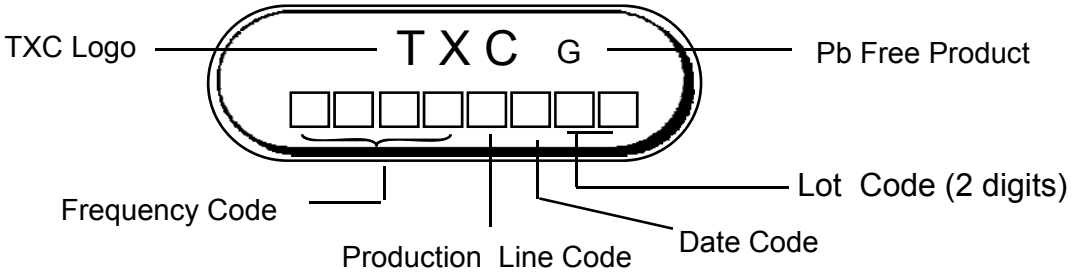
Temperature: 350 +/- 10 °C

Time: 3 sec.

Re-solder times: twice

MARKING

Marking For Pb Free Parts：

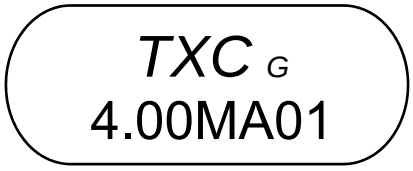


Date Code:

YEAR \ MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2013 2017 2021 2025 2029	A	B	C	D	E	F	G	H	J	K	L	M
2014 2018 2022 2026 2030	N	P	Q	R	S	T	U	V	W	X	Y	Z
2015 2019 2023 2027 2031	a	b	c	d	e	f	g	h	j	k	l	m
2016 2020 2024 2028 2032	n	p	q	r	s	t	u	v	w	x	y	z

*This date code will be cycled every four years.

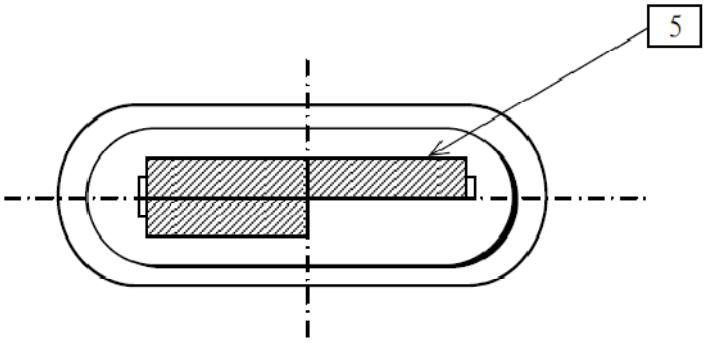
For example : Marking

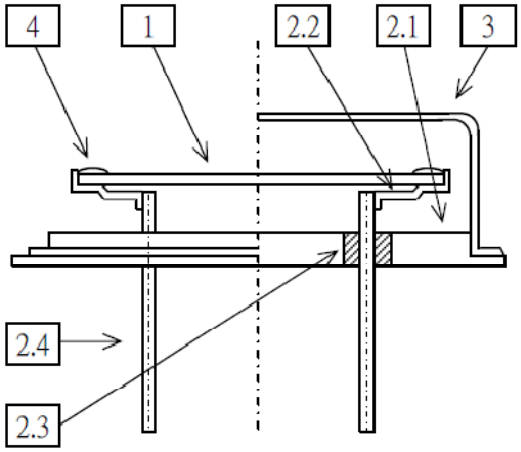


→

Introduction：
Pb Free Product
49S 4.000 MHz
Made in 2013/JAN. 01Lot

STRUCTURE ILLUSTRATION :

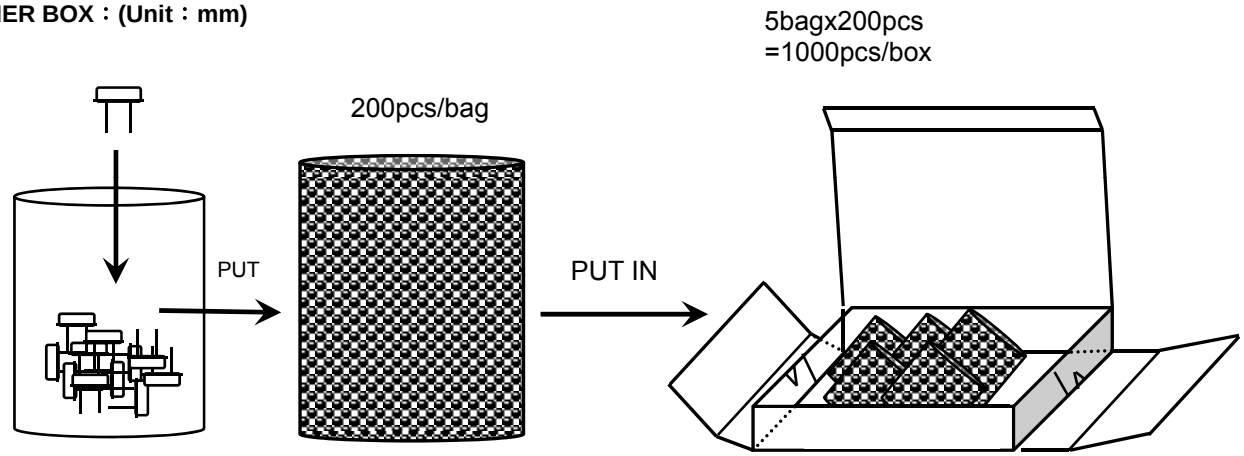




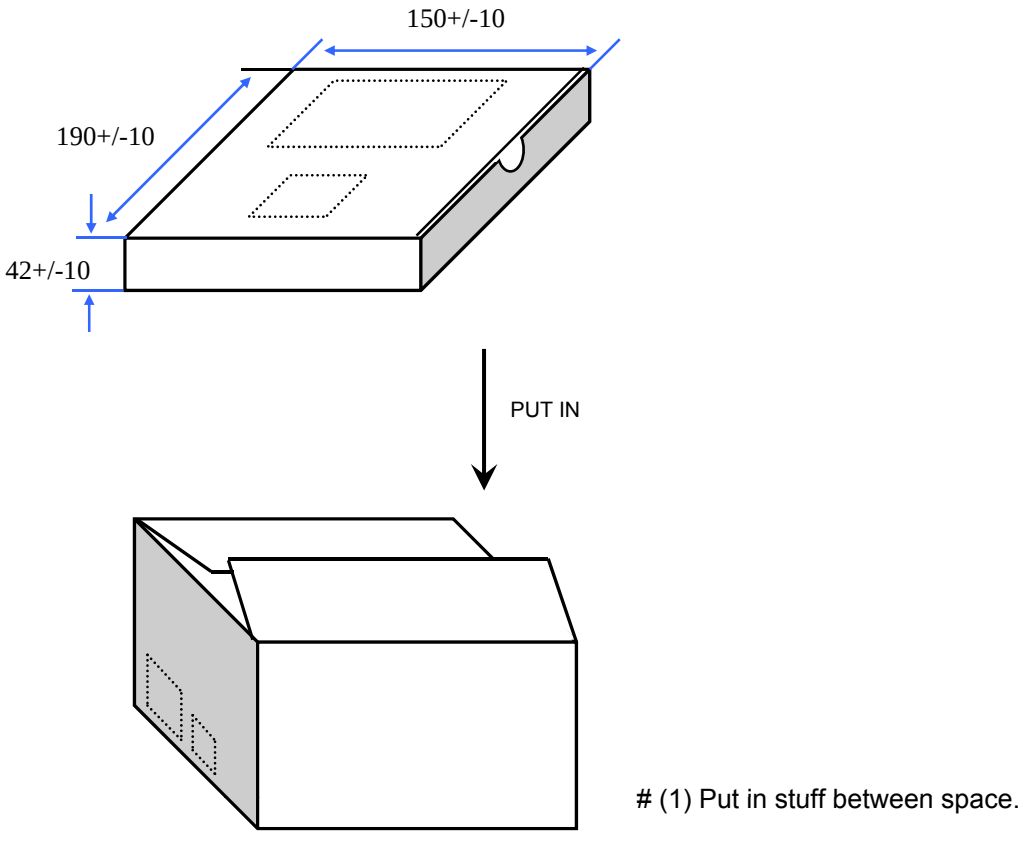
NO		COMPONENTS		MATERIALS	FINISH/SPECIFICATIONS
1		CRYSTAL BLANK		QUARTZ (SiO_2)	/
2	2.1	CRYSTAL BASE	HOLDER	SPCC	Ni PLATED
	2.2		SUPPORTER	NICKEL SILVER	/
	2.3		GLASS	GLASS	/
	2.4		LEAD	KOVAR	/
					(Coating : Sn/Ag/Cu)
3		COVER		NICKEL SILVER	/
4		CONDUCTIVE ADHESIVE		Ag + RESIN	/
5		ELECTRODE		Noble Metal	/

Packing For Pb Free Parts ：

1.INNER BOX：(Unit：mm)



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



(1) 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°C ~40°C temperature and 30% ~ 75%RH humidity and free from the sun shine.

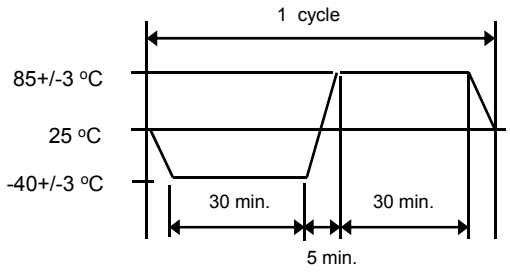
4.If customers have special requirements, we can paste labels according to it.

■ RELIABILITY SPECIFICATIONS

1.Mechanical Endurance

No.	Test Item	Test Methods	Test Criteria
1.1	Drop test	50 cm Height, Fall freely onto firm wood for 3 times.	B C
1.2	Mechanical Shock	1000 G , 0.5 m Sec. , 3 times for all 3 directions.	B C
1.3	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
1.4	Terminal Strength	17.7N force for 60sec +/-1sec.	F
1.5	Solderability	Pb free :Temperature 235+/-5°C,Immersion time:5+/-1sec Pb :Temperature 215+/-5°C,Immersion time:5+/-1sec	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. Emersion Rate 25 +/- 6 mm/s Immersed of specimen 1.5mm	ACD
2.2	High Temp. Storage	+ 85°C +/- 3 °C for 500 +/- 12 Hrs	ACD
2.3	Low Temp. Storage	- 40 °C +/- 3 °C for 500 +/-12 Hrs	ACD
2.4	Temperature cycle	-40°C~85°C,for 300 cycles. 	ACD
2.5	High Temp&Humidity	85°C +/- 3°C , RH 85% , 500 Hrs	ACD

■HANDING CAUTIONS

Prohibit the use of ultrasonic welding in Assemblying

RELIABILITY SPECIFICATIONS

Specifications	
A	Frequency change: Within +/-20ppm or in customer's specification.
B	Frequency change: Within +/-10ppm or in customer's specification.
C	Equivalent series resistance(E.S.R) change: Within +/-15% or 10Ω(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).