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 SMD
NOMINAL FREQ.	:	16.000000MHz
TXC P/N	:	AT16000003
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

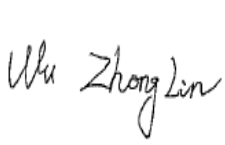
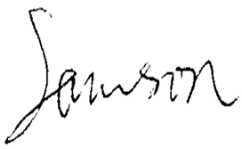
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PRODUCT SPECIFICATION SHEET

PRODUCT TYPE	:	HC-49/S SMD
NOMINAL FREQ.	:	16.000000MHz
TXC P/N	:	AT16000003
REVISION	:	A1

PE/RD	QA	MFG
		
11-Aug-09	*11-Aug-09*	*11-Aug-09*

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

Rev	Revise page	Revise contents	Date	Ref.No.	Reviser
A1	N/A	Initial Released	2009-8-11	N/A	Xiaoyan Jiang

Spec Sheet Contents

No.	Content	Page
1	ELECTRICAL SPECIFICATIONS	P.3
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	EMBOSS CARRIER TAPE & REEL	P.7
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°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

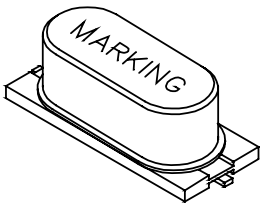
SAUNDERS 250A/250B CRYSTAL IMPEDANCE METER.

Crystal cutting type

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

Unit Weight:

0.58±0.050 g/pcs



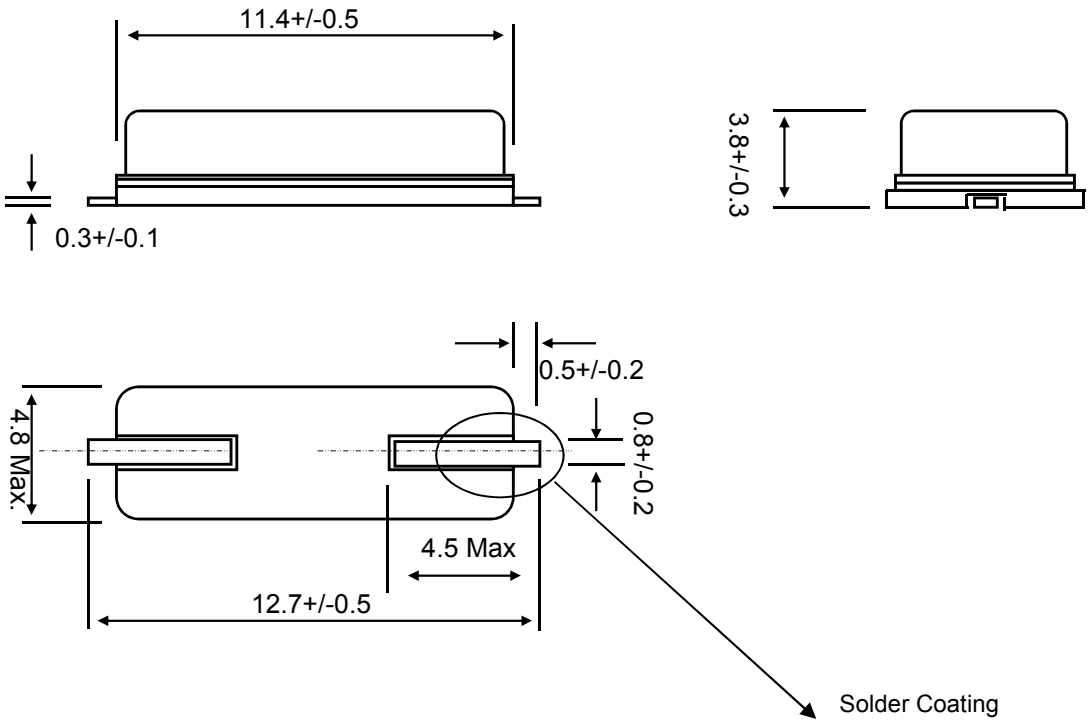
please refer to marking code page

	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYPE	MAX	UNITS	
1	Nominal Frequency	FL		16.000000		MHz	-
2	Oscillation Mode	-		Fundamental		-	-
3	Load Capacitance	CL		20		pF	-
4	Frequency Tolerance	-		±20		ppm	at 25 ℃ ± 3 ℃
5	Frequency Tolerance	-		±30		ppm	Over Operating Temp. Range (Reference 25℃)
6	Operating Temperature	-	-40	~	85	℃	-
7	Aging	-		±5		ppm	1st Year
8	Drive Level	DL	-	100	-	uW	-
9	Effective Resistance Rr	Rr	-	-	60	Ω	-
10	Shunt Capacitance C0	C0	0	-	7	pF	-
11	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
12	Storage Temperature Range	-	-40	~	85	℃	-

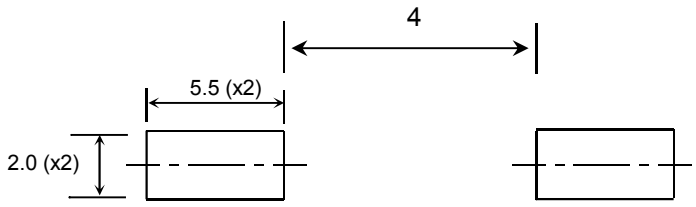
■ FACTORY LOCATION

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

DIMENSIONS UNIT:mm



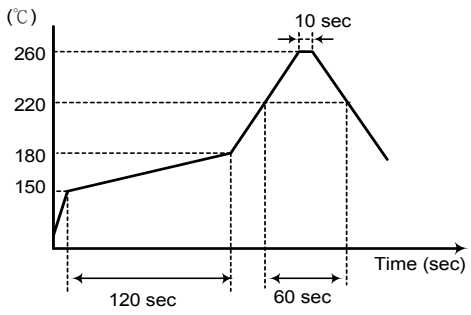
Suggested Layout



■ SUGGESTED REFLOW PROFILE

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

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



■ SUGGESTED MANUAL SOLDER CONDITION

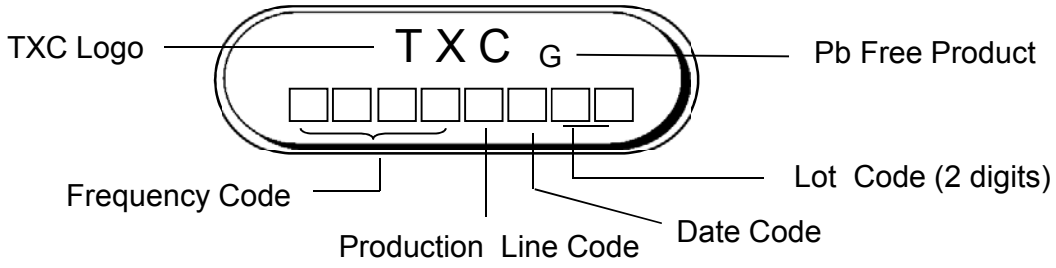
Temperature: 350 ± 10 ℃

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.

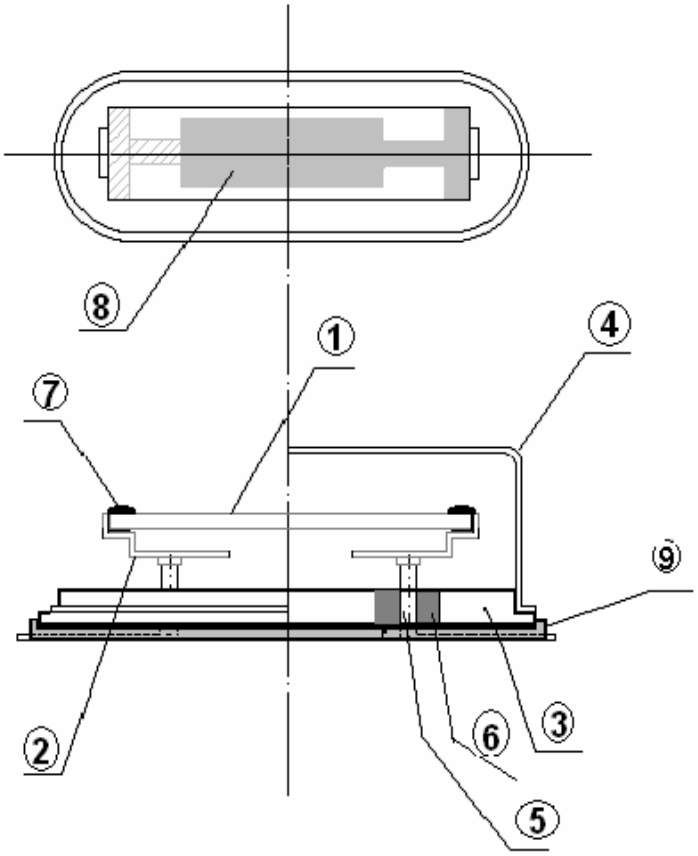
For example： Marking



→

Introduction： Pb Free Product
49S/SMD 16.000000 MHz
Made in NGB 2008/JAN 01Lot

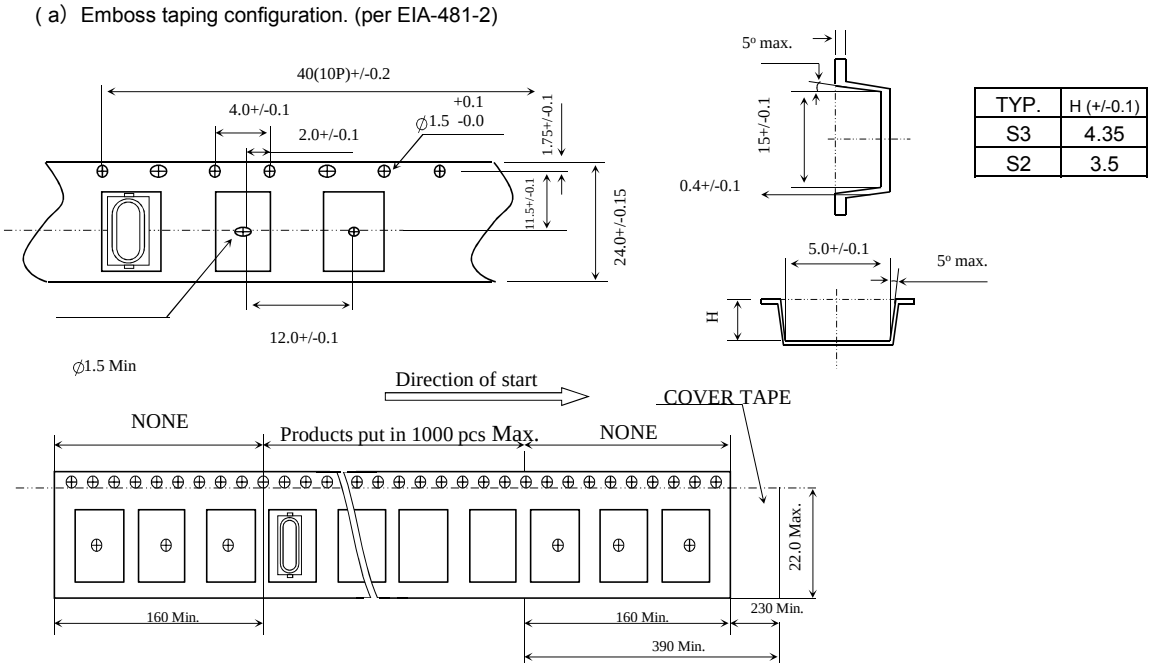
■ STRUCTURE ILLUSTRATION



NO	COMPONENTS	MATERIALS	FINISH/SPECIFICATIONS
1	CRYSTAL BLANK	SiO_2	-
2	SUPPORTER	Nickel Silver(Cu/Zn/Ni)	-
3	BASE	Fe	Ni Plated
4	CAN	Nickel Silver(Cu/Zn/Ni)	-
5	LEAD	Kovar (Fe/Co/Ni)	Ni Plated+Solder(Sn/Ag/Cu) Dipped
6	GLASS	GLASS	-
7	CONDUCTIVE ADHESIV	Resin + Ag	-
8	ELECTRODE	Ag	-
9	INSULATION PAD	PPS	-

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

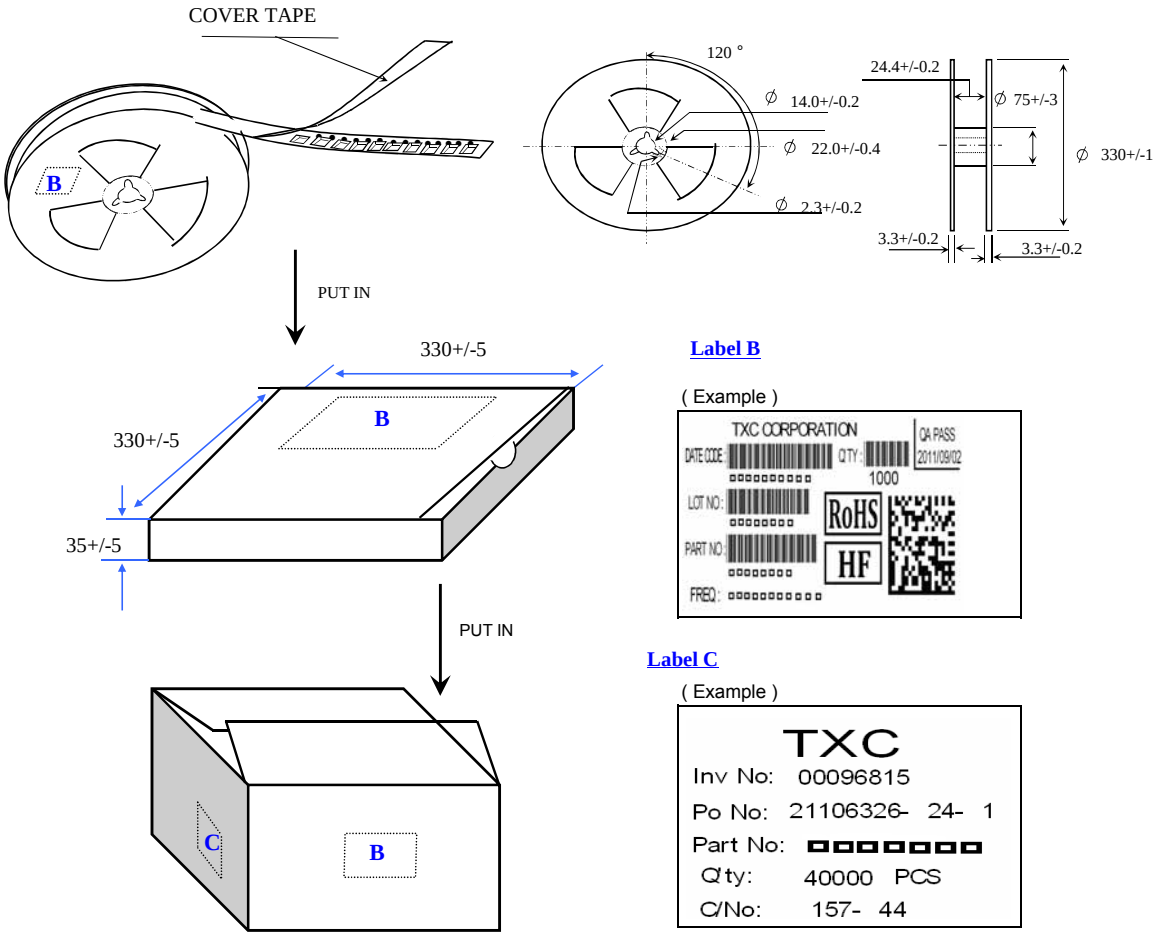
(a) Emboss taping configuration. (per EIA-481-2)



TYP.	H (+/-0.1)
S3	4.35
S2	3.5

(b) Reel configuration.

(B) Packing & Label :(Unit：mm)



Label B

(Example)

Label C

(Example)

(1) Put in stuff between space.
(2) Tie Up the Carton with 4 Packthreads.

[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.

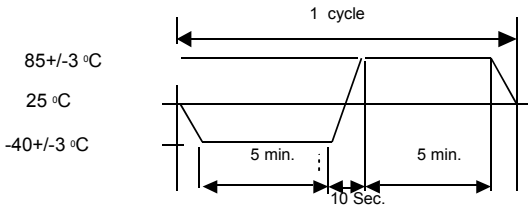
4.If customers have special requirements, we can paste labels according to it.

■ RELIABILITY SPECIFICATIONS

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

2.Environmental Endurance

No.	Test Item	Test Methods	SPEC
2.1	Solderability	Pb free :Temperature 235±5℃,Immersion time:5±1sec Pb :Temperature 215±5℃,Immersion time:5±1sec	E
2.2	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
2.3	High Temp. Storage	+ 85℃ ± 3 ℃ for 1000 ± 12 Hrs	ACD
2.4	Low Temp. Storage	- 40 ℃ ± 3 ℃ for 1000 ± 12 Hrs	ACD
2.5	Thermal Shock	-40℃~85℃,for 1000 cycles. 	ACD
2.6	Operational Life	1000 hrs @ 85± 3°C. Rated VDD applied with 1 MΩ.	ACD
2.7	High Temp & Humidity	85℃ ± 3℃ , RH 85% , 1000 Hrs	ACD

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).