



SPECIFICATION FOR APPROVAL

CN: 0

CUSTOMER : _____

PRODUCT TYPE : SMD TUNING FORK 3.2X1.5

NOMINAL FREQ. : 32.768KHz

TXC P/N : AH03200021

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

**Halogen Free
RoHS Compliant**



PRODUCT SPECIFICATION SHEET

CN: _____

PRODUCT TYPE : SMD TUNING FORK 3.2X1.5

NOMINAL FREQ. : 32.768KHz

TXC P/N : AH03200021

REVISION : A1

RD	QA	MFG
<i>Wen yuan Chang</i>	<i>ZhongLin Wu</i>	<i>zhi Jun Wu</i>
Wen yuan Chang	ZhongLin Wu	Zhi jun Wu
5-May-20	5-May-20	5-May-20

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

**Halogen Free
RoHS Compliant**



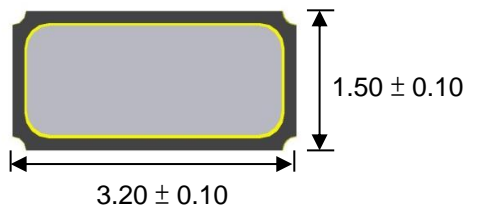
<u>Rev</u>	<u>Revise page</u>	<u>Revise contents</u>	<u>Date</u>	<u>Ref.No.</u>	<u>Reviser</u>
S1	NA	Initial release	2-Feb-18	-	Xiaohua Zhang
A1	NA	S Turn A	5-May-20	-	Xiaohua Zhang

■ ELECTRICAL SPECIFICATIONS

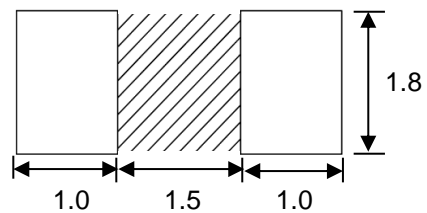
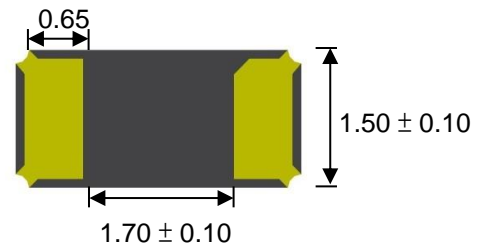
	Parameters	Sym.	Electrical Spec.				Notes
			Min	Typical	Max	Unit	
1	Nominal Frequency	F0	32.768			KHz	-
2	Frequency Tolerance	$\Delta f/f_0$	± 20			ppm	at 25 °C $\pm 3^\circ\text{C}$
3	Load Capacitance	CL	12.5			pF	-
4	Driver Level	DL	-	0.1	1	μW	-
5	Equivalent Series Resistance	ESR	-	-	70	K Ω	at 25 °C $\pm 3^\circ\text{C}$
6	Turnover Temperature	Tp	20	25	30	°C	at 25 °C $\pm 5^\circ\text{C}$
7	Parabolic Curvature Constant	K	-	-	-0.04	ppm/°C ²	-
8	Operating Temperature	-	-40	~	125	°C	-
9	Storage Temperature	-	-40	~	125	°C	-
10	Shunt Capacitance	C0	-	-	2	pF	-
11	Motional Capacitance	C1	-	-	-	fF	-
12	Insulation Resistance	IR	500	-	-	M Ω	at DC 100V $\pm 15\text{V}$
13	Aging	$\Delta f/f$	± 3			ppm	1st Year

■ DIMENSIONS

(UNIT:mm)

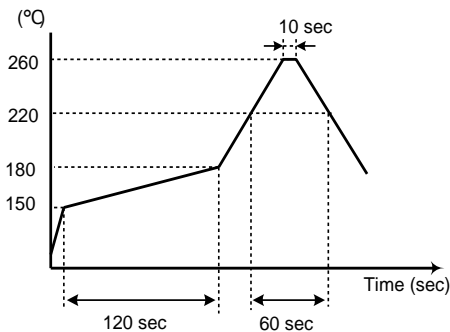
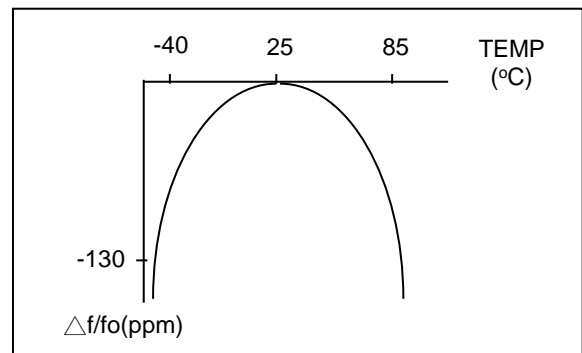

■ RECOMMENDED SOLDER PAD

(UNIT:mm)

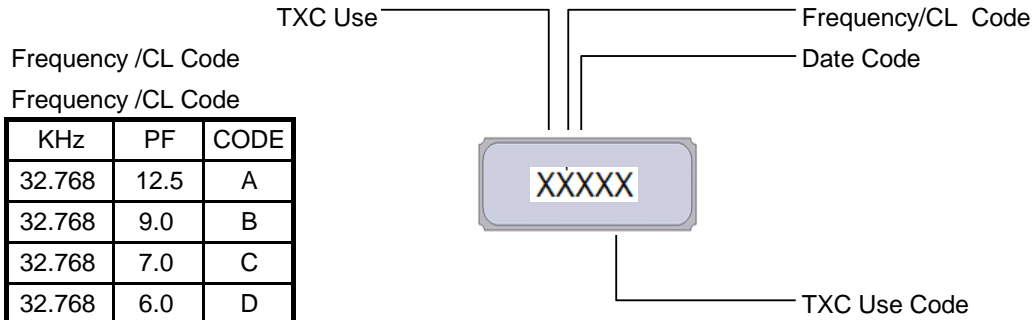

■ SUGGESTED REFLOW PROFILE

Total time : 200 sec. Max.

Solder melting point :220°C


■ TEMPERATURE V.S FREQUENCY CURVE


MARKING



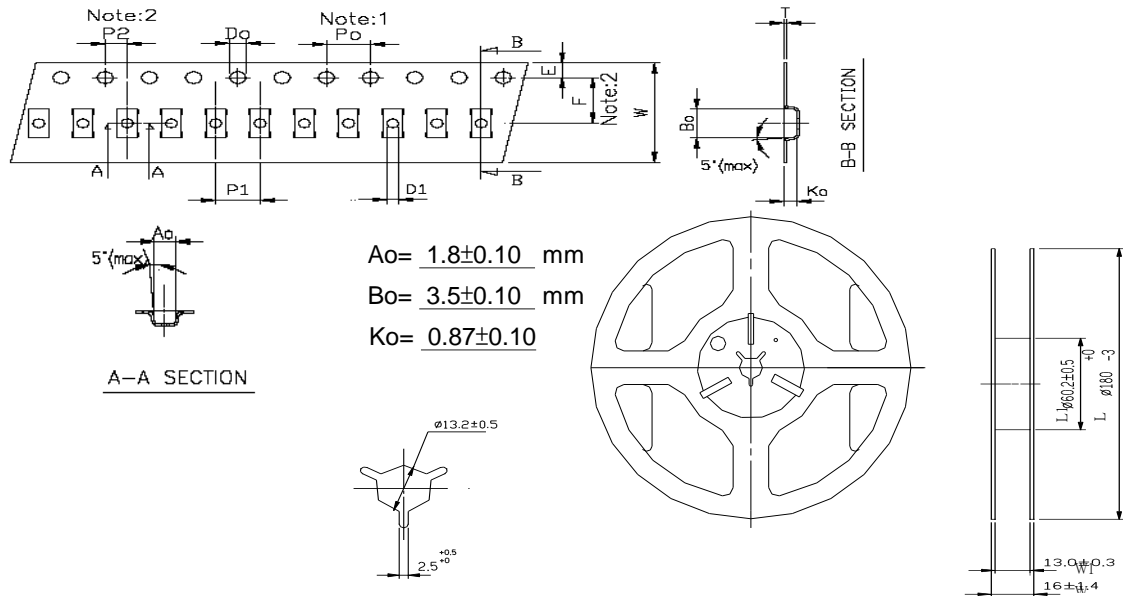
KHz	PF	CODE
32.768	12.5	A
32.768	9.0	B
32.768	7.0	C
32.768	6.0	D
32.768	7.6	E
32.768	18.0	F
32.768	12.0	G
32.768	9.5	H
32.768	8.0	J

Date Code

YEAR					MONTH											
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2005	2009	2013	2017	2021	A	B	C	D	E	F	G	H	J	K	L	M
2006	2010	2014	2018	2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2007	2011	2015	2019	2023	a	b	c	d	e	f	g	h	j	k	l	m
2008	2012	2016	2020	2024	n	p	q	r	s	t	u	v	w	x	y	z

This date code will be cycled every four years

PACKING

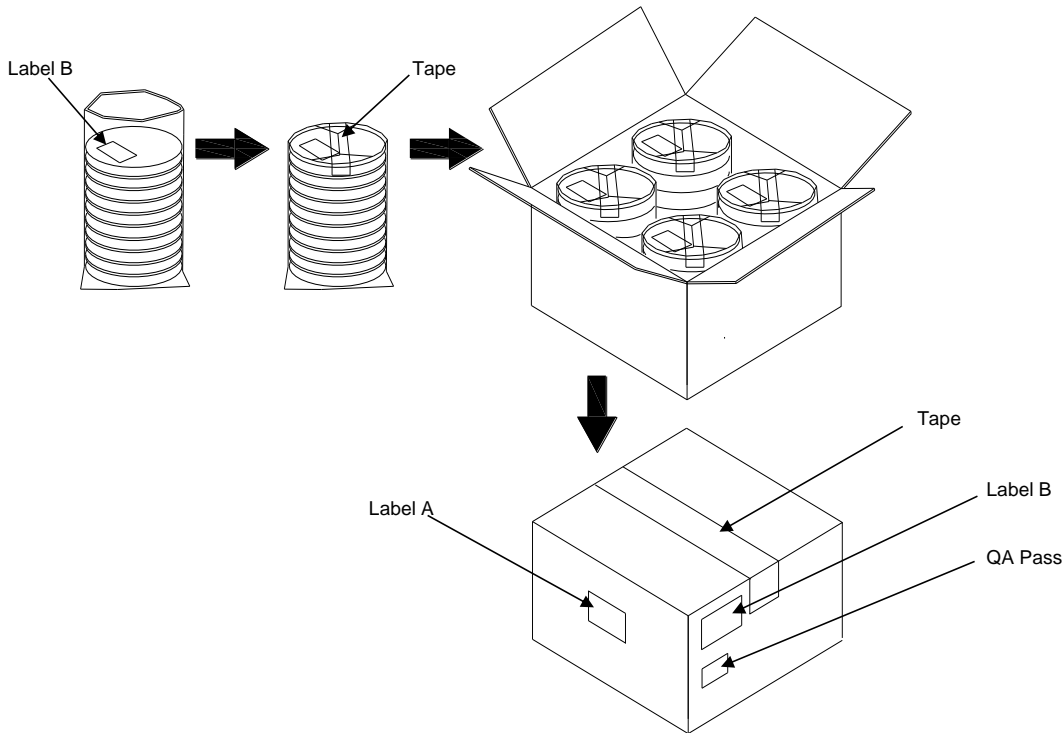


CARRIER TAPE DIMENSIONS	K1	P0	P1	P2	D0	D1	E	F	10P0	W	T	pcs / Reel
	-	4	4	2	1.55	1.1	1.75	5.5	40	12	0.25	3K

REEL DIMENSIONS	W	W1	L	L1
	16±1.4	13±0.3	180+0/-3	60.2±0.5

- REMARK :
- 230 mm (9.05) minimum leader which consist of carrier and/or tape followed by a minimum of 160 mm (6.3) of empty carrier tape sealed with cover tape.
 - 160 mm (6.3) minimum trailer of empty carrier tape sealed with cover tape.

■ PACKING



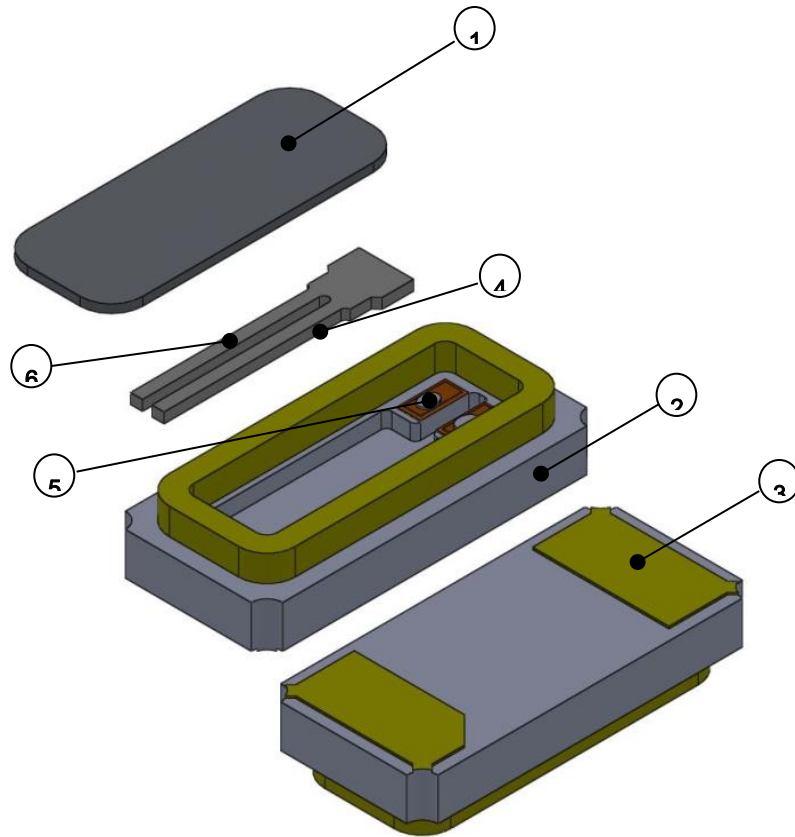
Label :

TXC CORPORATION		QA PASS
DATE CODE:	Q' TY:	<input type="text"/>
LOT NO:		<input type="text"/>
PART NO:	RoHS	
FREQ: <input type="text"/>	HF	

[STORAGE]

1. Do not get wet by the rain.
2. The storage environment shall be 5°C ~40°C and 30% ~ 75%RH humidity and avoid exposure to sunlight.
3. If customers have special requirements, we can coordinate.

■ **STRUCTURE ILLUSTRATION**



NO	COMPONENTS	MATERIALS	FINISH/SPECIFICATIONS
1	Lid	Kovar(Fe+Co+Ni) Alloy	-
2	Base(Package)	Ceramic(Al_2O_3)	Alumina Ceramics
3	PAD	Au	Tungsten metalize + Ni plating + Au plating
4	Crystal chip	SiO_2	-
5	Conductive adhesive	Ag	Silicon resin
6	Electrode	Au+Cr	-

■ **UNIT WEIGHT:**

0.01197g/pcs

■ SUGGESTED MANUAL SOLDER CONDITION

Temperature: 350 ± 10 °C

Time: 3 sec.

Re-solder times: twice

■ FACTORY LOCATION

TXC (NINGBO) CORPORATION

NO.189 Huang Shan West Road, Beilun District,

Ningbo Zhejiang China

■ RELIABILITY SPECIFICATIONS (AEC-Q200 Compliant)
1.Mechanical Endurance

No.	Test Item	Test Methods	REF. DOC
1.1	Drop Test	150 cm height, fall freely onto concrete floor 3 times.	'B C
1.2	Mechanical Shock	Device are shocked to half sine wave (2000 G) three mutually perpendicular axes each 3 times. 0.3m sec. duration time	B C
1.3	Vibration	Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm,20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours)	B C
1.4	Solderability	Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	E

2.Environmental Endurance

No.	Test Item	Test Methods	REF. DOC
2.1	Resistance To Soldering Heat	Pre-heat temperature 125 °C Pre-heat time 60 ~ 120 sec. Test temperature 260 ± 5 °C Test time 10 ± 1 sec.	BCD
2.2	High Temp. Storage	+ 125 °C ± 3 °C for 1000 ± 12 hours	BCD
2.3	Low Temp. Storage	- 55 °C ± 3 °C for 1000 ± 12 hours	BCD
2.4	Thermal Shock	Total 1000 cycles of the following temperature cycle : - 55°C ± 3 to 125°C ± 3 , Dwell time:30min.	BCD
2.5	Biased Humidity	+ 85°C ± 3°C , RH 85% , 1000 Hrs.	BCD



RELIABILITY SPECIFICATIONS

Specifications	
A	Frequency change: Within ± 5 ppm or in customer's specification.
B	Frequency change: Within ± 10 ppm or in customer's specification.
C	Equivalent series resistance(E.S.R) change: Within $\pm 15\%$ 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

Electrical characteristics measured by S&A250B or equivalent.