

SPECIFICATION FOR APPROVAL

CN: _____

CUSTOMER : _____

PRODUCT TYPE : SMD X'TAL 2.0×1.6

NOMINAL FREQ. : 24.000000MHz

TXC P/N : AY24000002

REVISION : S2

CUSTOMER P/N : _____

PM / SALES : _____

DATE : _____

CUSTOMER CONFIRMATION : _____
(Singnature)

(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.

**MSL:Level 1
RoHS Compliant**

(for glass crystal only : Pb used in sealing glass material is exempt from EU directive)



PRODUCT SPECIFICATION SHEET

CN: _____

PRODUCT TYPE : SMD X'TAL 2.0×1.6

NOMINAL FREQ. : 24.000000MHz

TXC P/N : AY24000002

REVISION : S2

PE/RD	QA	MFG
<i>Minlin Tseng</i>		
Minlin Tseng		
<i>1-Apr-16</i>		

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.

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<u>Rev</u>	<u>Revise page</u>	<u>Revise contents</u>	<u>Date</u>	<u>Ref.No.</u>	<u>Reviser</u>
S1	N/A	Initial released	15-Sep-15	PNR15091101	Yoyo Wang
S2	2	Change Frequency Tolerance $\pm 15\text{ppm}$ to $\pm 10\text{ppm}$, Frequency Stability $\pm 50\text{ppm}$ to $\pm 150\text{ppm}$	17-Sep-15	PNR15091609	Yoyo Wang
S3	4	Change STRUCTURE ILLUSTRATION	1-Apr-16	PNR16040107	Yoyo Wang

■ ELECTRICAL SPECIFICATIONS

AEC-Q200 Qualified

Standard atmospheric conditions

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

Ambient temperature : $25 \pm 5^{\circ}\text{C}$
 Relative humidity : 40%~70%

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

Ambient temperature : $25 \pm 3^{\circ}\text{C}$
 Relative humidity : 40%~70%

Measure equipment

Electrical characteristics measured by HP E5100A or equivalent.

Crystal cutting type

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

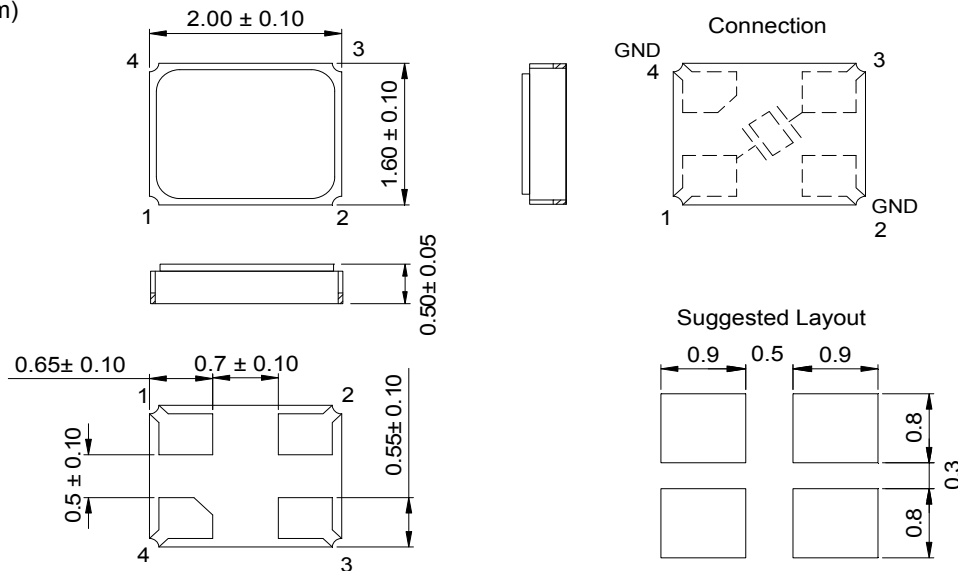
Unit Weight:

0.0065±0.001 g/pcs

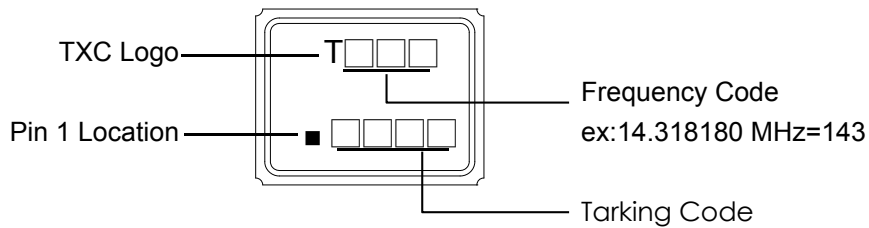
	Parameters	SYM.	Electrical Spec.				Notes
			MIN	TYPE	MAX	UNITS	
1	Nominal Frequency	FL	24.000000			MHz	-
2	Oscillation Mode	-	Fundamental			-	-
3	Load Capacitance	CL	7			pF	-
4	Frequency Tolerance	-	±10			ppm	at 25 °C ± 3 °C
5	Frequency Stability	-	±150			ppm	Over Operating Temp. Range (Reference 25°C)
6	Operating Temperature	-	-40	~	125	°C	-
7	Aging	-	±5			ppm	10 Years
8	Drive Level	DL	-	100	200	μW	-
9	Effective Resistance R _r	R _r	-	-	80	Ω	-
10	Insulation Resistance	-	500	-	-	MΩ	at DC 100V
11	Storage Temperature Range	-	-40	~	125	°C	-

■ DIMENSIONS

(Unit:mm)



■ MARKING



Date Code:

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

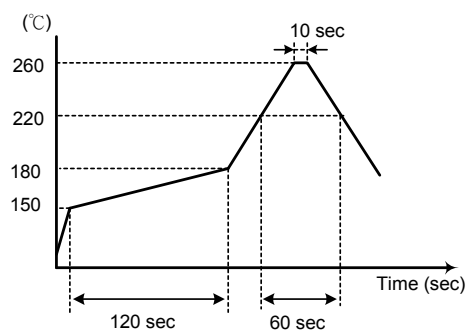
*This date code will be cycled every four years

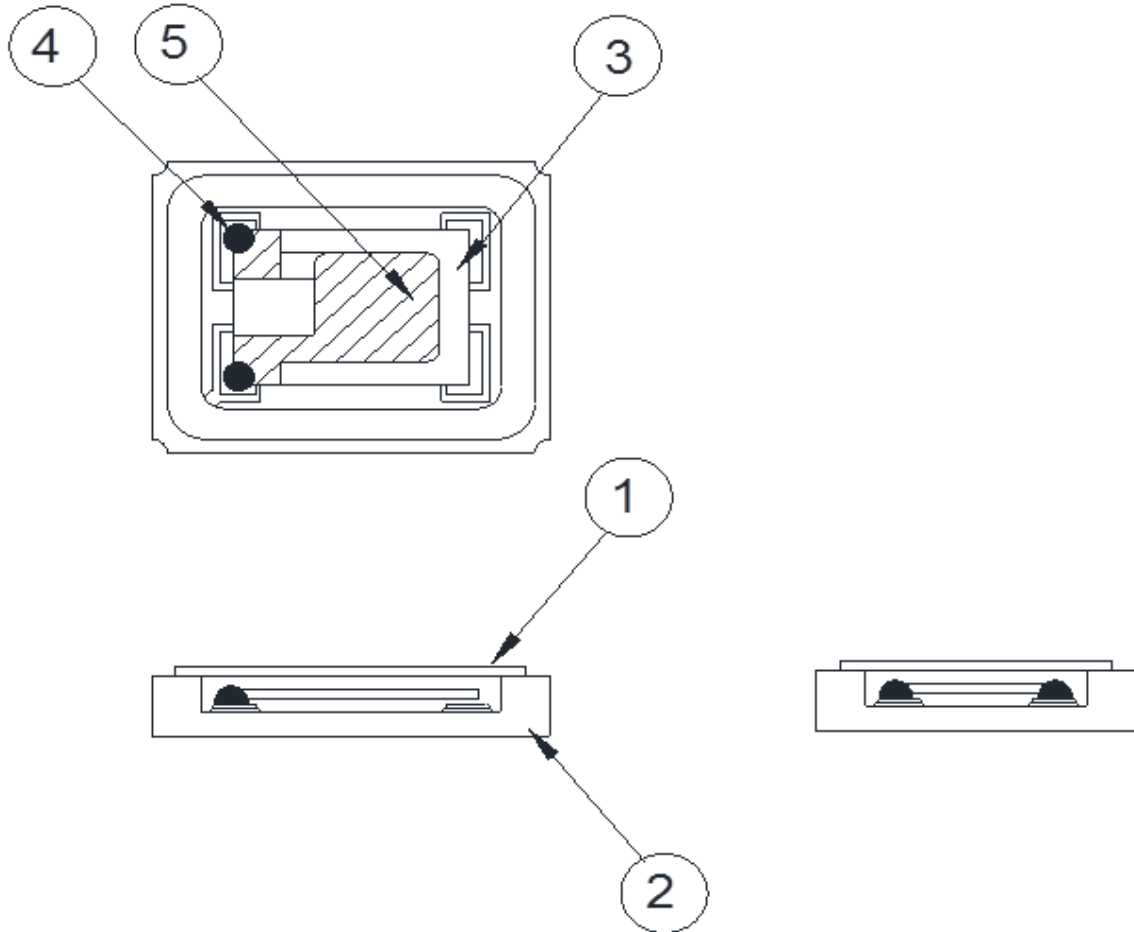
Production location: Taiwan

■ SUGGESTED REFLOW PROFILE

Total time : 200 sec. Max.

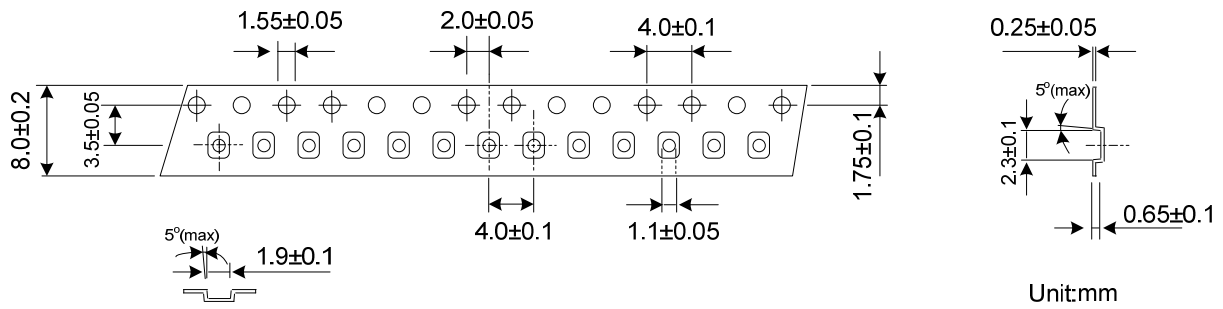
Solder melting point : 220 °C



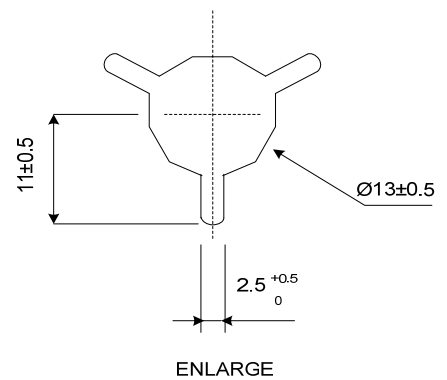
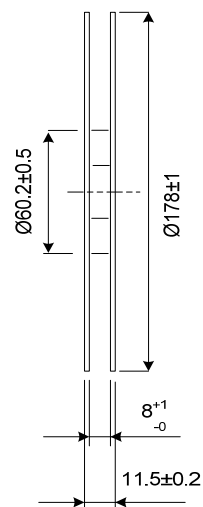
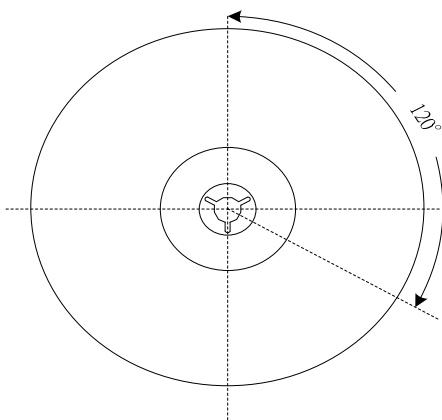
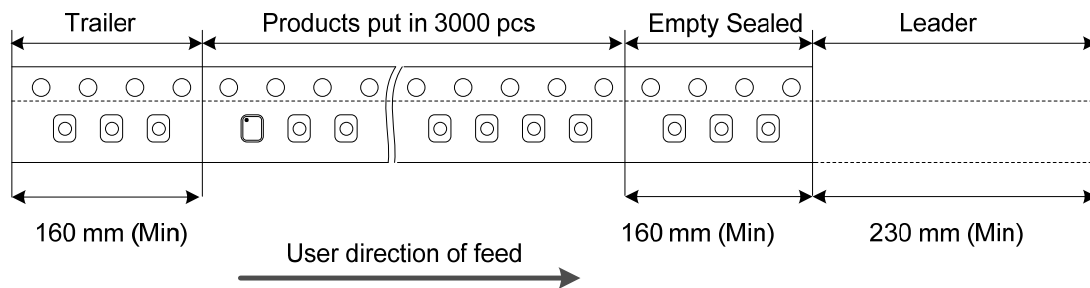
■ STRUCTURE ILLUSTRATION


NO	COMPONENTS	MATERIALS	FINISH/SPECIFICATIONS
1	Lid	Kovar	-
2	Base(Package)	Ceramic (Al ₂ O ₃)+Pad(Au)	Alumina ceramics
3	Crystal blank	SiO ₂	-
4	Conductive adhesive	Ag	Silicone resin
5	Electrode	Noble Metal + Cr	-

■ PACKING



REMARK :



■ RELIABILITY SPECIFICATIONS (AEC-Q200 Compliant)

1. Mechanical Endurance

No.	Test Item	Test Methods	REF.DOC
1.1	Drop Test	120 cm height, 20 times on Stainless Plate .	JIS C 6701
1.2	Mechanical Shock	Device are shocked to half sine wave (5000 G) three mutually perpendicular axes each 3 times. 0.3m sec. duration time	MIL-STD-202 Method 213
1.3	Vibration	Frequency range 10 ~ 2000 Hz~10 Hz Amplitude 1.52 mm/20G Sweep time 20 minute Perpendicular axes each test time 4 Hrs (Total test time 12 Hrs)	MIL-STD-202 Method 204
1.4	Solderability	Temperature 245 °C ± 5°C Immersing depth 1.25 mm Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4)	J-STD-002
1.5	Terminal Strength	Mount on PCB board and shear strength 1.8kg for 60 sec.	AEC-Q200-006
1.6	Board Flex	Duration Time: 60 sec, Deviation: 3mm	AEC-Q200-005

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.	MIL-STD 202 Method 210
2.2	High Temp. Storage	+ 125 °C ± 3 °C for all 1000 Hrs.	MIL-STD-202 Method 108
2.3	Low Temp. Storage	- 40 °C ± 3 °C for all 1000 Hrs.	JIS C 6701
2.4	Thermal Shock	Total 1000 cycles of the following Thermal Shock : 	MIL-STD-202 Method 107
2.5	Temperature Cycle	Total 1000 cycles of the following temperature cycle : - 40°C ± 3 to 125°C ± 3 , Dwell time:15min.	JESD 22 Method JA-104
2.6	Biased Humidity	+ 85°C ± 3°C , RH 85% , 1000 Hrs.	MIL-STD-202 Method 103
2.7	Moisture Resistance	20 cycles (+25°C~65°C , 80%~100% RH) , 24hrs/cycle.	MIL-STD 202 Method 106
2.8	Operational Life	+ 125 °C ± 3 °C for 1000 Hrs.	MIL-STD-202 Method 108