

# SPECIFICATION FOR APPROVAL

CUSTOMER : \_\_\_\_\_

PRODUCT TYPE : SMD SEAM SEALING X'TAL 3.2×2.5

NOMINAL FREQ. : 13.560000MHz

TXC P/N : 7M13570001

REVISION : A2

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.

**MSL:Level 1**  
**RoHS Compliant**

# PRODUCT SPECIFICATION SHEET

PRODUCT TYPE : SMD SEAM SEALING X'TAL 3.2×2.5

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NOMINAL FREQ. : 13.560000MHz

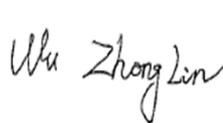
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REVISION : A2

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| PE/RD                                                                               | QA                                                                                  | MFG                                                                                  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |
| 11-Oct-11                                                                           | 11-Oct-11                                                                           | 11-Oct-11                                                                            |

**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

**MSL:Level 1  
RoHS Compliant**



## Spec Sheet Contents

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## ■ 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±3°C  
 Relative humidity : 40%~70%

### Measure equipment

Electrical characteristics measured by S&A250B or equivalent.

### Crystal cutting type

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

### Unit Weight:

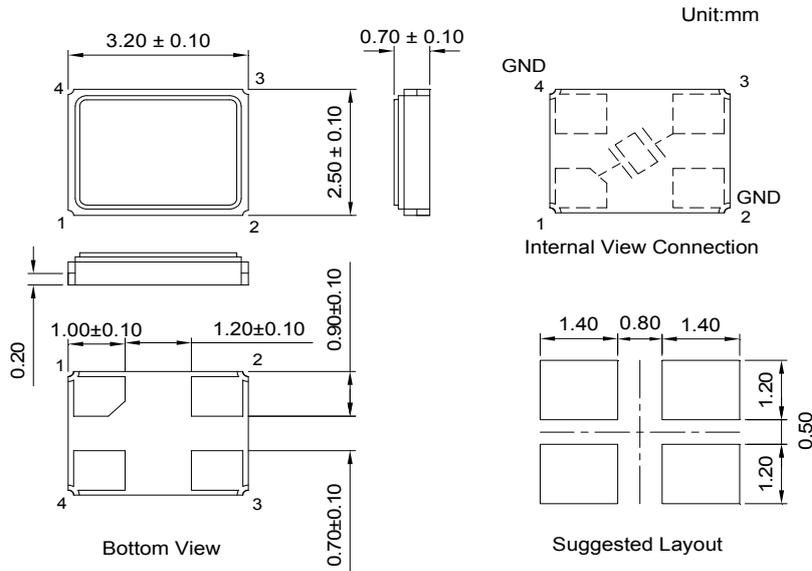
0.018±0.001 g/pcs

|    | Parameters                | SYM. | Electrical Spec. |      |     |       | Notes                                       |
|----|---------------------------|------|------------------|------|-----|-------|---------------------------------------------|
|    |                           |      | MIN              | TYPE | MAX | UNITS |                                             |
| 1  | Nominal Frequency         | FL   | 13.560000        |      |     | MHz   | -                                           |
| 2  | Oscillation Mode          | -    | Fundamental      |      |     | -     | -                                           |
| 3  | Load Capacitance          | CL   | 10               |      |     | pF    | -                                           |
| 4  | Frequency Tolerance       | -    | ±10              |      |     | ppm   | at 25 °C ± 3 °C                             |
| 5  | Frequency Stability       | -    | ±10              |      |     | ppm   | Over Operating Temp. Range (Reference 25°C) |
| 6  | Operating Temperature     | -    | -20              | ~    | 70  | °C    | -                                           |
| 7  | Aging                     | -    | ±3               |      |     | ppm   | 1st Year                                    |
| 8  | Drive Level               | DL   | -                | 100  | -   | μW    | -                                           |
| 9  | Effective Resistance Rr   | Rr   | -                | -    | 100 | Ω     | -                                           |
| 10 | Shunt Capacitance C0      | C0   | -                | -    | -   | pF    | -                                           |
| 11 | Insulation Resistance     | -    | 500              | -    | -   | MΩ    | at DC 100V                                  |
| 12 | Storage Temperature Range | -    | -40              | ~    | 85  | °C    | -                                           |

## ■ FACTORY LOCATION

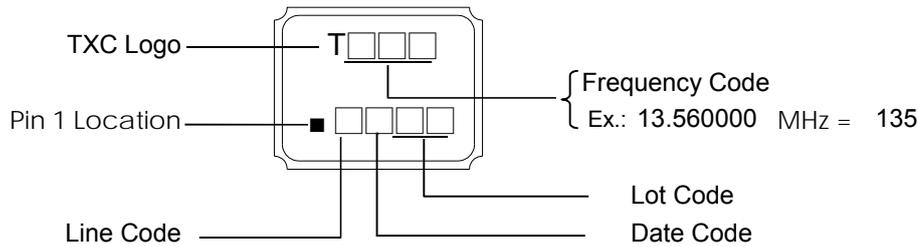
TXC (NINGBO) CORPORATION  
 NO.189 Huang Shan West Road, Beilun District,  
 Ningbo Zhejiang China

**■ DIMENSIONS**  
(Unit:mm)



\*Coplanarity of solderable areas Camber 0.10 mm Max

**■ MARKING**



**Date Code:**

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

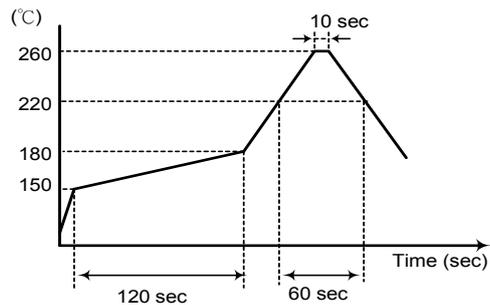
\*This date code will be cycled every four years

**■ SUGGESTED REFLOW PROFILE**

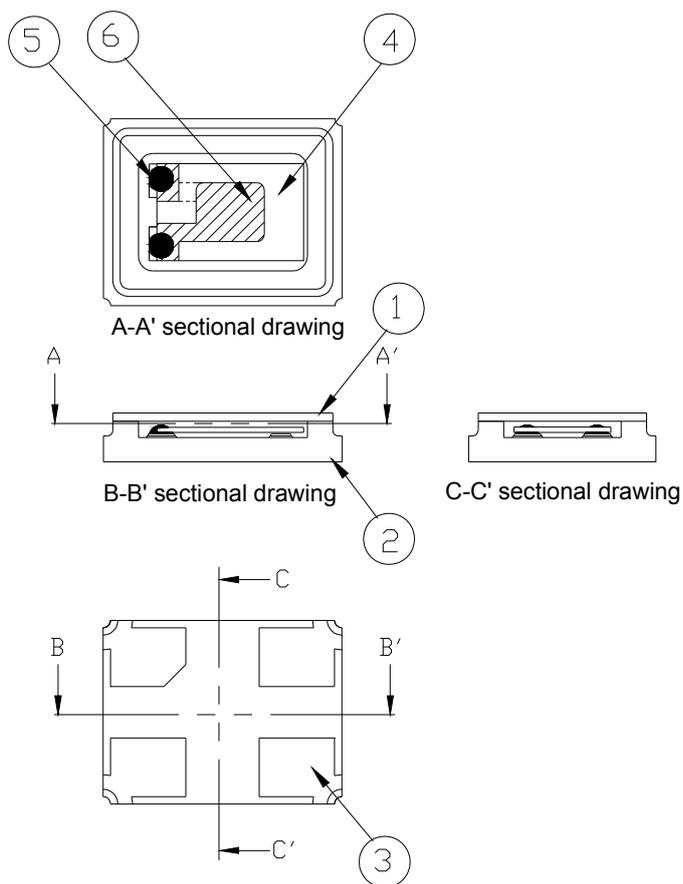
Solder melting point :220±10 °C, 60 sec. Min.  
Peak Temperature: 260 ± 5 °C, 10 sec. Max.

**■ SUGGESTED MANUAL SOLDER CONDITION**

Temperature: 350 ± 10 °C  
Time: 3 sec.  
Re-solder times: twice

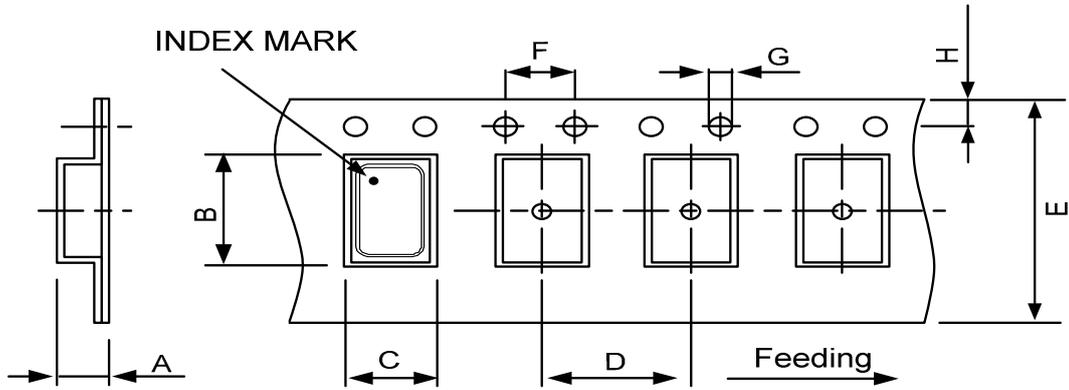


■ **STRUCTURE ILLUSTRATION**



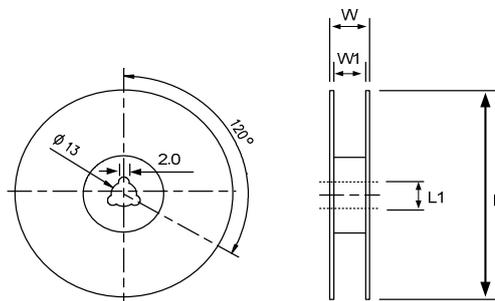
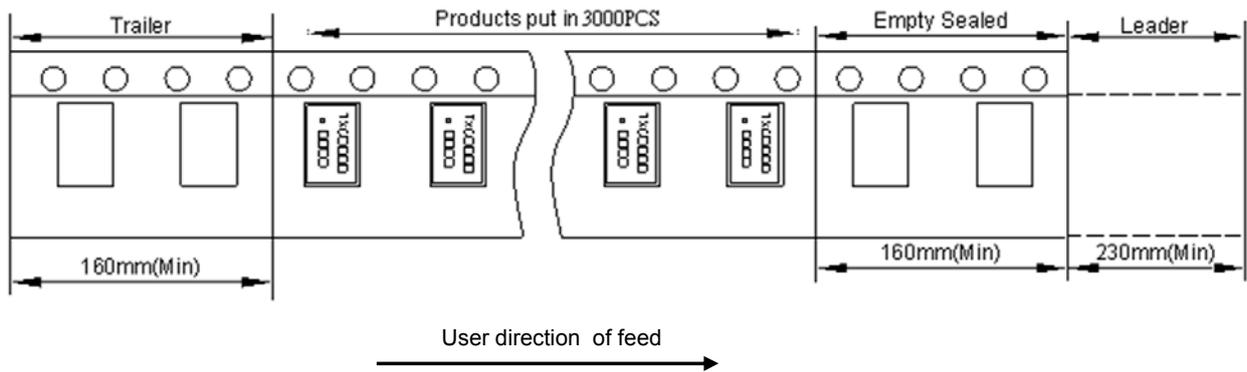
| NO | COMPONENTS          | MATERIALS                                                           | FINISH/SPECIFICATIONS                             |
|----|---------------------|---------------------------------------------------------------------|---------------------------------------------------|
| 1  | Lid                 | Kovar (Fe/Co/Ni)                                                    | -                                                 |
| 2  | Package             | Ceramic (Al <sub>2</sub> O <sub>3</sub> ) + Kovar (Fe/Co/Ni)+ Ag/Cu | -                                                 |
| 3  | PAD                 | Au                                                                  | Tungsten metalize<br>+ Ni plating<br>+ Au plating |
| 4  | Crystal blank       | SiO <sub>2</sub>                                                    | -                                                 |
| 5  | Conductive adhesive | Resin+Ag                                                            | -                                                 |
| 6  | Electrode           | Noble Metal                                                         | -                                                 |

■ EMBOSS CARRIER TAPE & REEL



|            |           |           |           |           |           |           |           |           |             |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| DIMENSIONS | A         | B         | C         | D         | E         | F         | G         | H         | (UNIT : mm) |
|            | 1.65±0.10 | 3.40±0.10 | 2.70±0.10 | 4.00±0.10 | 8.00±0.20 | 4.00±0.10 | 1.55±0.10 | 1.75±0.10 |             |

REMARK :



|            |          |         |           |        |             |
|------------|----------|---------|-----------|--------|-------------|
| DIMENSIONS | L        | L1      | W         | W1     | (UNIT : mm) |
|            | 178±1.00 | 13±0.50 | 11.5±0.20 | 8±0.10 |             |

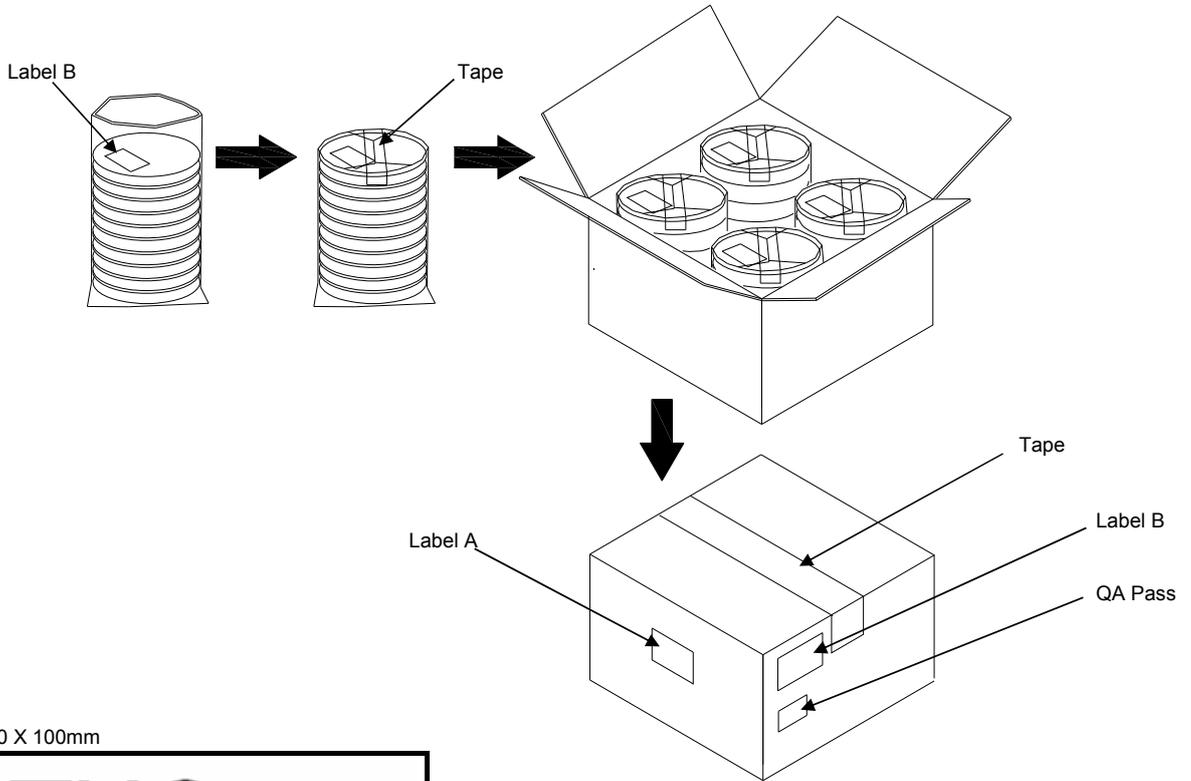
**PACKING**

Reel Quantity :

- 1. Reel X 6 (6 Reels)
- 2. Reel X 12 (12 Reels)
- 3. Reel X 25 (12 Reels + 13 Reels)
- 4. Reel X 50 ( 12 Reelsx2 + 13 Reelsx2 )

Box Size:

- 1. L200 X W200 X H140mm
- 2. L200 X W200 X H250mm
- 3. L400 X W200 X H250mm
- 4. L400 X W400 X H280mm



(Label A) Size:100 X 100mm

|                                                                |
|----------------------------------------------------------------|
| TXC                                                            |
| Inv No: 00096815                                               |
| Po No: 21106326- 24- 1                                         |
| Part No: <span style="font-family: monospace;">□□□□□□□□</span> |
| Qty: 40000 PCS                                                 |
| C/No: 157- 44                                                  |

(Label B) Size:80 X 40mm

|                                                                  |                                                        |            |
|------------------------------------------------------------------|--------------------------------------------------------|------------|
| TXC CORPORATION                                                  |                                                        | QA PASS    |
| DATE CODE: <span style="font-family: monospace;">□□□□□□□□</span> | QTY: <span style="font-family: monospace;">□□□□</span> | 2011/09/02 |
| LOT NO: <span style="font-family: monospace;">□□□□□□□□</span>    | <b>RoHS</b>                                            |            |
| PART NO: <span style="font-family: monospace;">□□□□□□□□</span>   | <b>HF</b>                                              |            |
| FREQ: <span style="font-family: monospace;">□□□□□□□□□□</span>    |                                                        |            |

**[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        | 150 cm height,3 times on concrete floor .                                                                                                                                                                                         | A . C         |
| 1.2 | Mechanical Shock | Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5 ms duration time                                                                                                              | A . C         |
| 1.3 | Vibration        | Frequency range            10 ~ 2000 Hz<br>Amplitude                      1.52 mm/20G<br>Sweep time                      20 minutes<br>Perpendicular axes each test time    4 Hrs<br>(Total test time 12 Hrs)                     | A . C         |
| 1.4 | Solderability    | Temperature                    245 °C ± 5°C<br>Immersing depth                0.5 mm minimum<br>Immersion time                 5 ± 1 seconds<br>Flux                                 Rosin resin methyl alcohol solvent ( 1 : 4 ) | E             |

**2.Environmental Endurance**

| No. | Test Item                    | Test Methods                                                                                                                                                                                  | Test Criteria |
|-----|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 2.1 | Resistance To Soldering Heat | Pre-heat temperature            125 °C<br>Pre-heat time                      60 ~ 120 sec.<br>Test temperature                 260 ± 5 °C<br>Test time                            10 ± 1 sec. | B . C . D     |
| 2.2 | High Temp. Storage           | + 125 °C ± 3 °C for 500 ± 12 Hrs                                                                                                                                                              | B . C . D     |
| 2.3 | Low Temp. Storage            | - 40 °C ± 3 °C for 500 ± 12 Hrs                                                                                                                                                               | B . C . D     |
| 2.4 | Temperature cycle            | Total 100 cycles of the following temperature cycle<br>                                                                                                                                       | B . C . D     |
| 2.5 | High Temp & Humidity         | 85°C ± 3°C , RH 85% , 500 Hrs                                                                                                                                                                 | B . C . D     |

**RELIABILITY SPECIFICATIONS**

| Specifications |                                                                                                                           |
|----------------|---------------------------------------------------------------------------------------------------------------------------|
| A              | Frequency change: Within $\pm 5$ ppm or in customer's specification.                                                      |
| B              | Frequency change: Within $\pm 10$ ppm or in customer's specification.                                                     |
| C              | Equivalent series resistance(E.S.R) change: Within $\pm 15\%$ or $10\Omega$ (larger value).                               |
| D              | After conditioning , quartz crystal units shall be subjected to standard atmospheric conditions for 2 hour, and measured. |
| E              | Minimum 95% of immersed terminal shall be covered with new uniform solder.                                                |

**Measurement condition**

Electrical characteristics measured by S&A250B or equivalent.