

# SPECIFICATION FOR APPROVAL

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

PRODUCT TYPE : SMD SEAM SEALING X'TAL 2.5 × 2.0

NOMINAL FREQ. : 16.000000MHz

TXC P/N : 8Z16000023

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.

Attachment: Product Specification Sheet

- 1
- 2
- 3
- 4
- 5

**RoHS Compliant**



**TXC CORPORATION**

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# PRODUCT SPECIFICATION SHEET

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REVISION : A2

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| PE/RD  | QA  | MFG  |
|--|---|--|
| <br>Robin Huang | <br>Samson Xiong | <br>Jake Liu |
| 5-Aug-14   | 5-Aug-14  | 5-Aug-14   |

**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**



| <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       | 14-Dec-11   | N/A            | Yachuan Miao   |
| A1         | N/A                | S Turn A               | 5-Jan-12    | N/A            | Xiaoyan Jiang  |
| A2         | 3                  | Dimensions Change      | 5-Aug-14    | ECR-14N080101  | Xiaoyan Jiang  |
|            |                    |                        |             |                |                |
|            |                    |                        |             |                |                |
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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 :  $25 \pm 10^{\circ}\text{C}$   
 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).

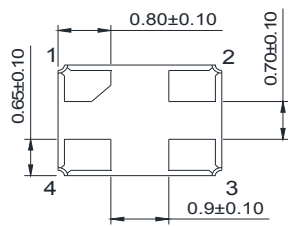
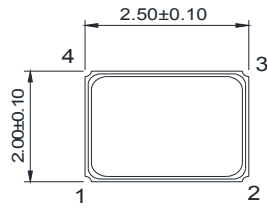
### Unit Weight:

0.009±0.001 g/pcs

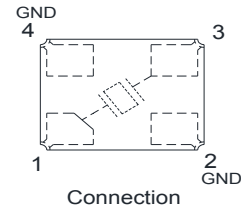
|    | Parameters                   | Symbol | Electrical Spec. |      |      |                    | Notes  |
|----|------------------------------|--------|------------------|------|------|--------------------|--|
|    |                              |        | Min.             | Typ. | Max. | Units              |  |
| 1  | Nominal Frequency            | FL     | 16.000000        |      |      | MHz                | -  |
| 2  | Oscillation Mode             | -      | Fundamental      |      |      | -                  | -  |
| 3  | Load Capacitance             | CL     | 12               |      |      | pF                 | -  |
| 4  | Frequency Tolerance          | -      | $\pm 10$         |      |      | ppm                | at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$                |
| 5  | Frequency Stability          | -      | $\pm 10$         |      |      | ppm                | Over Operating Temp. Range (Reference $25^{\circ}\text{C}$ ) |
| 6  | Operating Temperature        | -      | -10              | ~    | 70   | $^{\circ}\text{C}$ | -  |
| 7  | Aging                        | -      | $\pm 3$          |      |      | ppm                | 1st Year   |
| 8  | Drive Level                  | DL     | -                | 10   | -    | $\mu\text{W}$      | -  |
| 9  | Equivalent Series Resistance | ESR    | -                | -    | 80   | $\Omega$           | -  |
| 10 | Insulation Resistance        | -      | 500              | -    | -    | M $\Omega$         | at DC 100V   |
| 11 | Storage Temperature Range    | -      | -40              | ~    | 85   | $^{\circ}\text{C}$ | -  |

**■ DIMENSIONS**

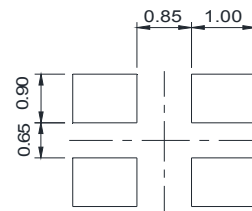
(Unit:mm)



Bottom View

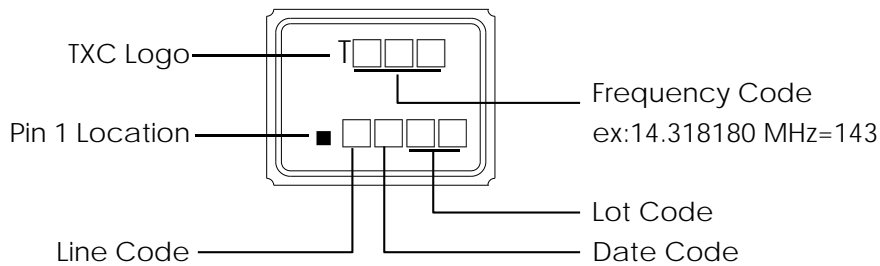


Connection



Suggest Layout

**■ 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 |     |     |     |     |     |     |     |     |     |     |     |     |

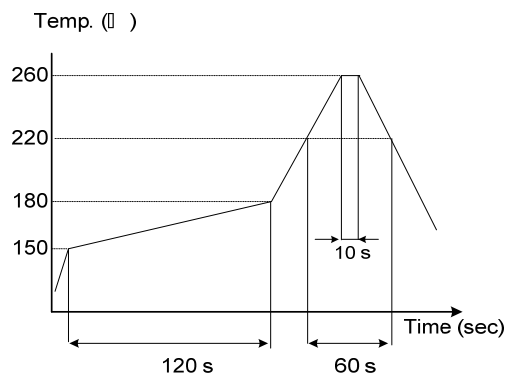
\*This date code will be cycled every four years

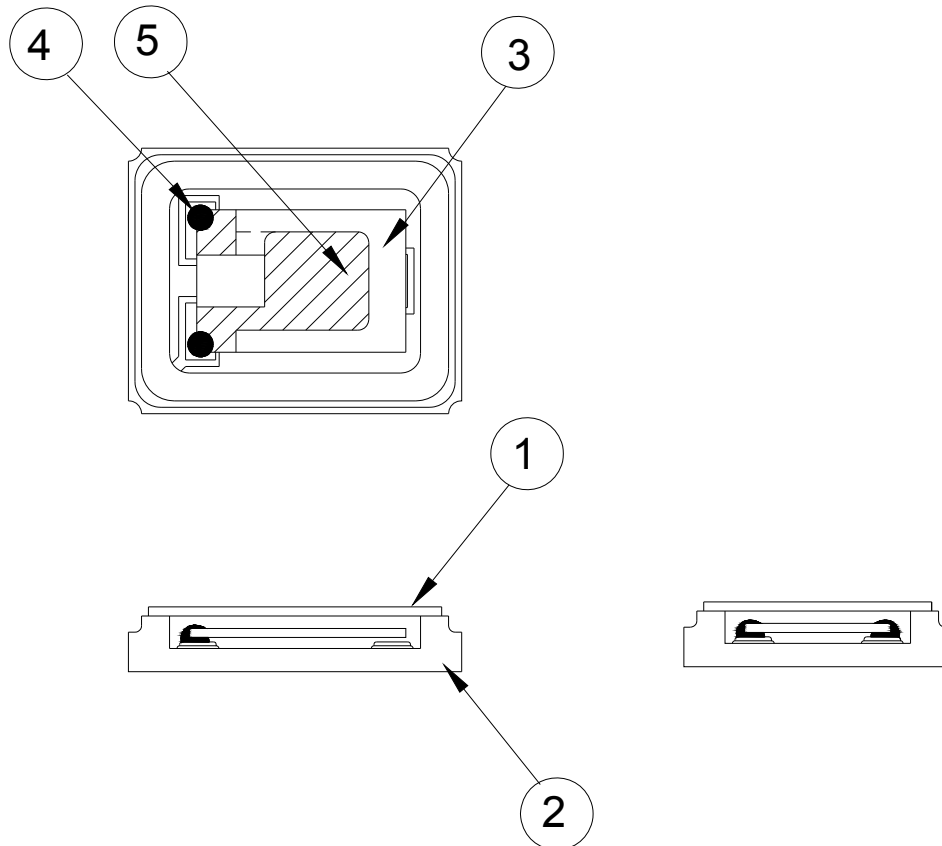
**Production location: Taiwan**

**■ SUGGESTED REFLOW PROFILE**

Total time : 200 sec. Max.

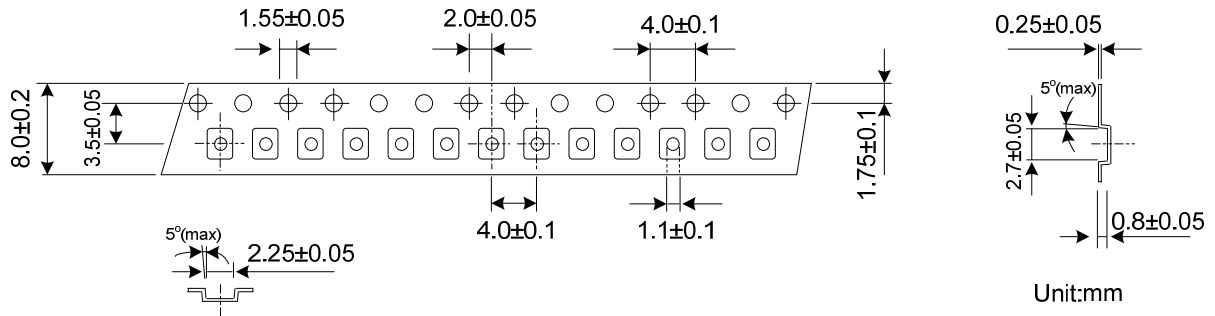
Solder melting point :220 °C



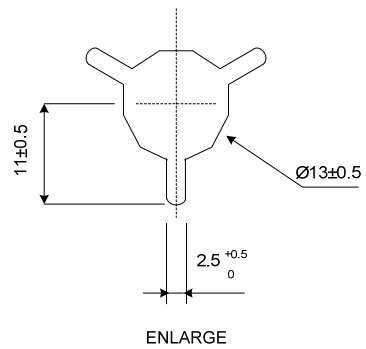
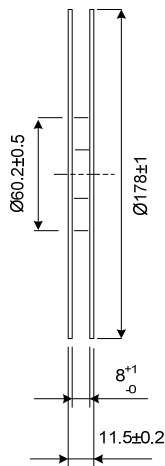
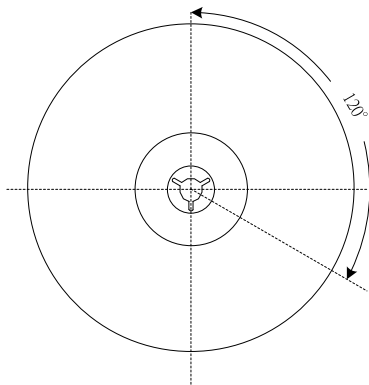
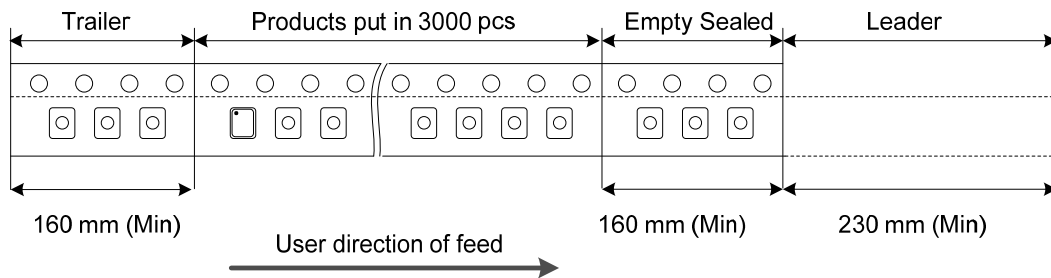
**■ STRUCTURE ILLUSTRATION**


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

■ PACKING



REMARK :



## ■ RELIABILITY SPECIFICATIONS

### 1. Mechanical Endurance

| No. | Test Item        | Test Methods  | REF.DOC     |
|-----|------------------|---|-------------|
| 1.1 | Drop Test        | 150 cm height, 3 times on concrete floor.   | JIS C6701   |
| 1.2 | Mechanical Shock | Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time   | MIL-STD-202 |
| 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)   | MIL-STD-883 |
| 1.4 | Gross Leak       | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2kg / cm <sup>2</sup>   | MIL-STD-883 |
| 1.5 | Fine Leak        | Helium Bombing 4.5 kg/ cm <sup>2</sup> for 2 Hrs  |             |
| 1.6 | Solder ability   | 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 ) | MIL-STD-883 |

### 2. Environmental Endurance

| No. | Test Item                    | Test Methods   | REF. DOC    |
|-----|------------------------------|--|-------------|
| 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. | MIL-STD-202 |
| 2.2 | High Temp. Storage           | + 125 °C ± 3 °C for 500 ± 12 Hrs   | MIL-STD-883 |
| 2.3 | Low Temp. Storage            | - 40 °C ± 3 °C for 500 ± 12 Hrs  |             |
| 2.4 | Thermal Shock                | Total 100 cycles of the following temperature cycle<br>  | MIL-STD-883 |
| 2.5 | High Temp & Humidity         | 85°C ± 3°C, RH 85% , 500Hrs  | EIA-JESD22  |
| 2.6 | Pressure Cooker Storage      | 121 ± 3°C , RH100% , 2 bar , 240Hrs  | EIA-JESD22  |