**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 | : | SMD SEAM SEALING X'TAL 3.2×2.5 |
| NOMINAL FREQ. | : | 16.000000MHz |
| TXC P/N | : | 7M16000035 |
| REVISION | : | S1 |
| 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**

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# PRODUCT SPECIFICATION SHEET

| | | |
|---|---|---|
| PRODUCT TYPE | : | SMD SEAM SEALING X'TAL 3.2×2.5 |
| NOMINAL FREQ. | : | 16.000000MHz |
| TXC P/N | : | 7M16000035 |
| REVISION | : | S1 |

| PE/RD | QA | MFG |
|---|---|---|
| Wu ZhongLin | | |
| 25-Jul-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**

| Rev | Revise page | Revise contents | Date | Ref.No. | Reviser |
|---|---|---|---|---|---|
| S1 | N/A | Initial released | 25-Jul-11 | N/A | Xiaoyan Jiang |
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# 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℃

Relative humidity : 40%~70%

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

Ambient temperature : 25±3℃

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 | | 16.000000 | | MHz | - |
| 2 | Oscillation Mode | - | | Fundamental | | - | - |
| 3 | Load Capacitance | CL | | 15 | | pF | - |
| 4 | Frequency Tolerance | - | | ±10 | | ppm | at 25 ℃ ± 3 ℃ |
| 5 | Frequency Stability | - | | ±10 | | ppm | Over Operating Temp. Range (Reference 25℃) |
| 6 | Operating Temperature | - | -20 | ~ | 75 | ℃ | - |
| 7 | Aging | - | | ±5 | | ppm | 1st Year |
| 8 | Drive Level | DL | - | 100 | - | μW | - |
| 9 | Effective Resistance Rr | Rr | - | - | 35 | Ω | - |
| 10 | Shunt Capacitance C0 | C0 | - | - | 5 | pF | - |
| 11 | Insulation Resistance | - | 500 | - | - | MΩ | at DC 100V |
| 12 | Storage Temperature Range | - | -40 | ~ | 85 | ℃ | - |

## ■ FACTORY LOCATION

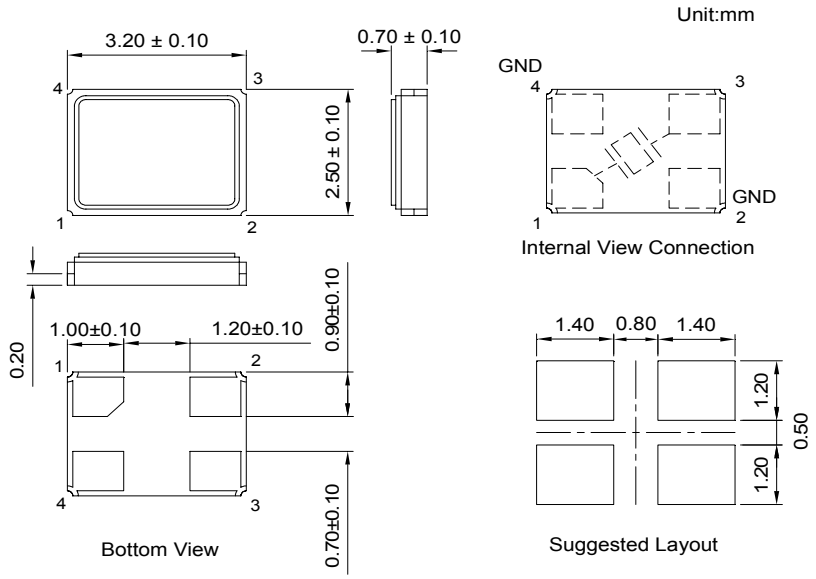
TXC (NINGBO) CORPORATION

NO.189 Huang Shan West Road, Beilun District,

Ningbo Zhejiang China

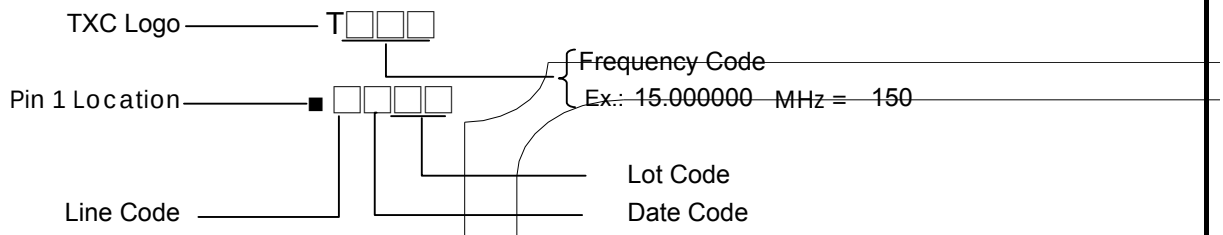
## ■ DIMENSIONS

(Unit:mm)




*Coplanarity of solderable areas Camber 0.10 mm Max

## ■ MARKING




**Date Code:**

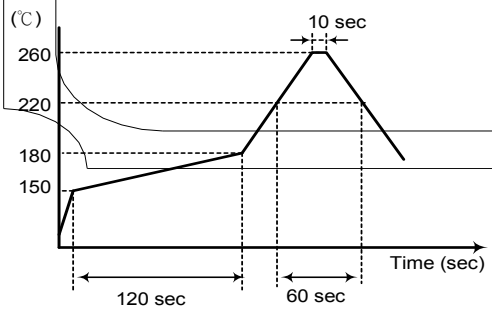
| YEAR \ MONTH | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 2009 2013 2017 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2006 2010 2014 2018 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2007 2011 2015 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 ℃, 60 sec. Min.

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



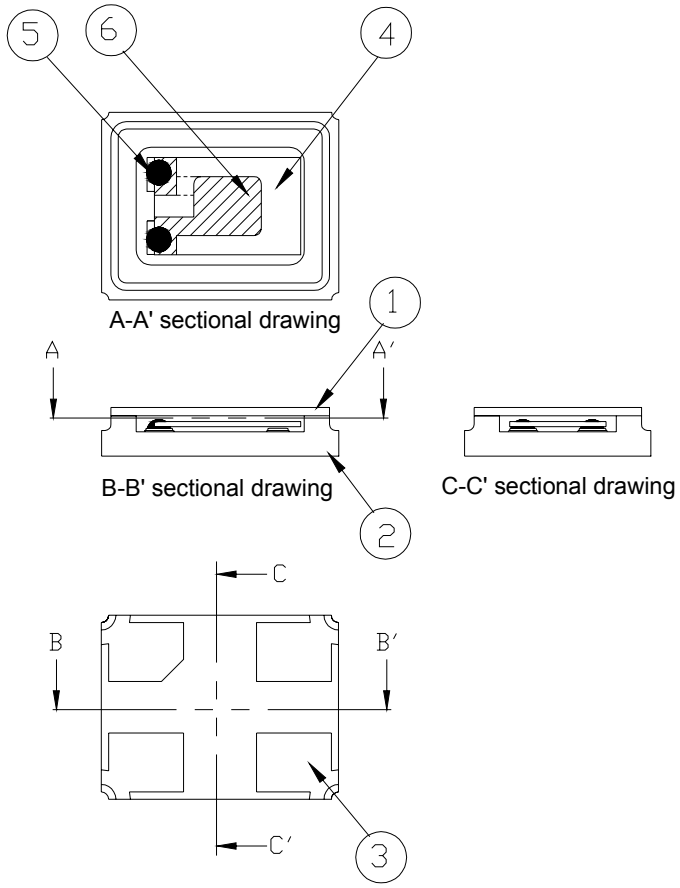

## ■ SUGGESTED MANUAL SOLDER CONDITION

Temperature: 350 ± 10 ℃

Time: 3 sec.

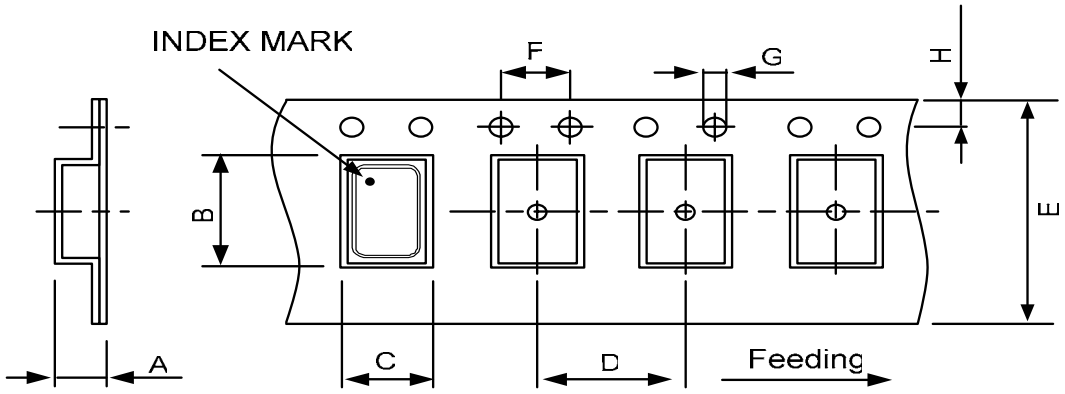
Re-solder times: twice

## STRUCTURE ILLUSTRATION



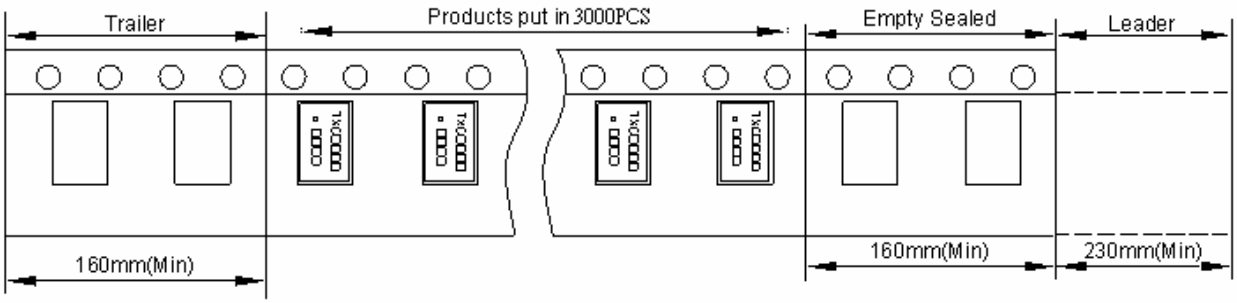

| NO | COMPONENTS | MATERIALS | FINISH/SPECIFICATIONS |
|---|---|---|---|
| 1 | Lid | Kovar (Fe/Co/Ni) | Manganese(Mn)<br>+Electro Ni Plating |
| 2 | Package | Ceramic (AI2O3) + Kovar (Fe/Co/Ni)+ Ag/Cu | - |
| 3 | PAD | Au | Tungsten metalize<br>+ Ni plating<br>+ Au plating |
| 4 | Crystal blank | $SiO_2$ | - |
| 5 | Conductive adhesive | Resin+Ag | - |
| 6 | Electrode | Noble Metal | - |

## EMBOSS CARRIER TAPE & REEL

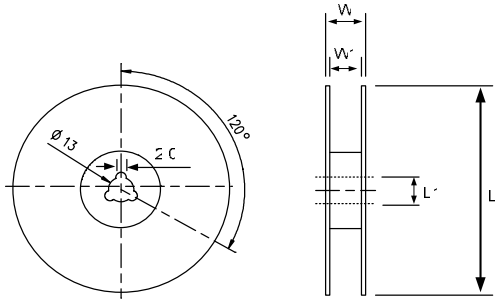



| DIMENSIONS | A | B | C | D | E | F | G | H | |
|---|---|---|---|---|---|---|---|---|---|
| | 1.65±0.10 | 3.40±0.10 | 2.70±0.10 | 4.00±0.10 | 8.00±0.20 | 4.00±0.10 | 1.55±0.10 | 1.75±0.10 | (UNIT：mm) |

REMARK :




User direction of feed

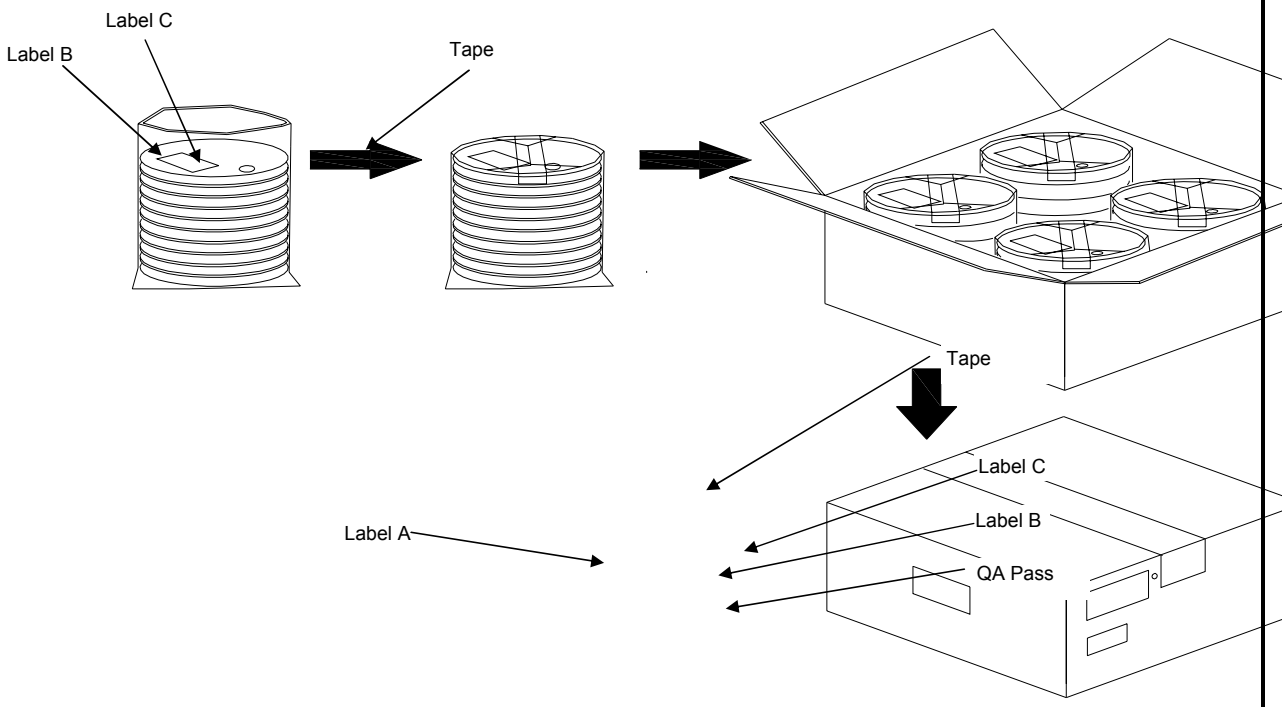



| DIMENSIONS | L | L1 | W | W1 | |
|---|---|---|---|---|---|
| | 178±1.00 | 13±0.50 | 11.5±0.20 | 8±0.10 | (UNIT：mm) |

## ■ 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

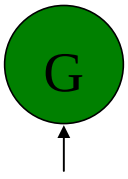
NO: TXC

P/O: □□□□□□□□-□□

P/N: □□□□□□□□□□

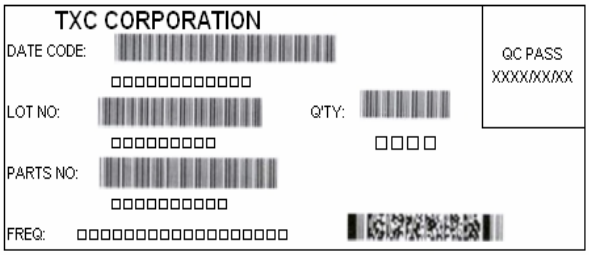
NUM: □□□□□PCS

(Label C) Size: $\phi$ 20mm




GREEN PARTNER

(Lable B) Size:80 X 40mm




**[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.

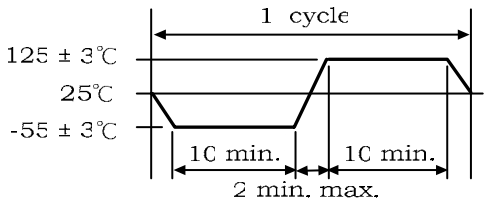
4.If customers have special requirements, we can paste labels according to it.

## ■ RELIABILITY SPECIFICATIONS

1.Mechanical Endurance

| No. | Test Item | Test Methods | | Test Criteria |
|---|---|---|---|---|
| 1.1 | Drop Test | 75 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<br>Amplitude<br>Sweep time<br>Perpendicular axes each test time | 10 ~ 2000 Hz<br>1.52 mm/20G<br>20 minutes<br>4 Hrs<br>(Total test time 12 Hrs) | A . C |
| 1.4 | Solderability | Temperature<br>Immersing depth<br>Immersion time<br>Flux | 245 ℃ ± 5℃<br>0.5 mm minimum<br>5 ± 1 seconds<br>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<br>Pre-heat time<br>Test temperature<br>Test time | 125 ℃<br>60 ~ 120 sec.<br>260 ± 5 ℃<br>10 ± 1 sec. | B . C . D |
| 2.2 | High Temp. Storage | + 125 ℃ ± 3 ℃ for 500 ± 12 Hrs | | B . C . D |
| 2.3 | Low Temp. Storage | - 40 ℃ ± 3 ℃ for 500 ± 12 Hrs | | B . C . D |
| 2.4 | Thermal Shock | Total 100 cycles of the following temperature cycle   | | B . C . D |
| 2.5 | High Temp & Humidity | 85℃ ± 3℃ , RH 85% , 500 Hrs | | B . C . D |

## RELIABILITY SPECIFICATIONS

| | Specifications |
|---|---|
| A | Frequency change: Within ±5ppm 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 condictions 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.