**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

CN: 1502002798

| | | |
|---|---|---|
| CUSTOMER | : | |
| PRODUCT TYPE | : | SMD GLASS SEALING XTAL 5.0*3.2 |
| NOMINAL FREQ. | : | 16.000000MHz |
| TXC P/N | : | AA16000006 |
| REVISION | : | A3 |
| 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**

**Pb used in sealing glass material is exempt from EU directive**

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# PRODUCT SPECIFICATION SHEET

CN: 1502002798

| | | |
|---|---|---|
| PRODUCT TYPE | : | SMD GLASS SEALING XTAL 5.0*3.2 |
| NOMINAL FREQ. | : | 16.000000MHz |
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| REVISION | : | A3 |

| PE/RD | QA | MFG |
|---|---|---|
| ZhongLin Wu | Samson Xiong | Jake Liu |
| *31-Mar-14* | *31-Mar-14* | *31-Mar-14* |

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

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

**Pb used in sealing glass material is exempt from EU directive**

| Rev | Revise page | Revise contents | Date | Ref.No. | Reviser |
|---|---|---|---|---|---|
| S1 | N/A | Initial released | 18-Jun-11 | N/A | Jun Wei |
| A1 | N/A | S Turn A | 19-Jul-11 | N/A | Xiaoyan Jiang |
| A2 | 7 | Change Label A& Label B | 11-Oct-11 | ECR-11N092802 | Xiaoyan Jiang |
| A3 | 3 | Storage Temperature Range Change | 31-Mar-14 | ECR-14N040102 | 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:**

0.054±0.05 g/pcs

| | Parameters | SYM. | 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 | - | | ±30 | | ppm | at 25 ℃ ± 3 ℃ |
| 5 | Frequency Stability | - | | ±150 | | ppm | Over Operating Temp. Range (Reference 25℃) |
| 6 | Operating Temperature | - | -40 | ~ | 125 | ℃ | - |
| 7 | Aging | - | | ±3 | | ppm | 1st Year |
| 8 | Drive Level | DL | - | 10 | 100 | uW | - |
| 9 | Effective Resistance Rr | Rr | - | - | 60 | Ω | - |
| 10 | Shunt Capacitance C0 | C0 | - | - | - | pF | - |
| 11 | Insulation Resistance | - | 500 | - | - | MΩ | at DC 100V |
| 12 | Storage Temperature Range | - | -50 | ~ | 125 | ℃ | - |

## ■ FACTORY LOCATION

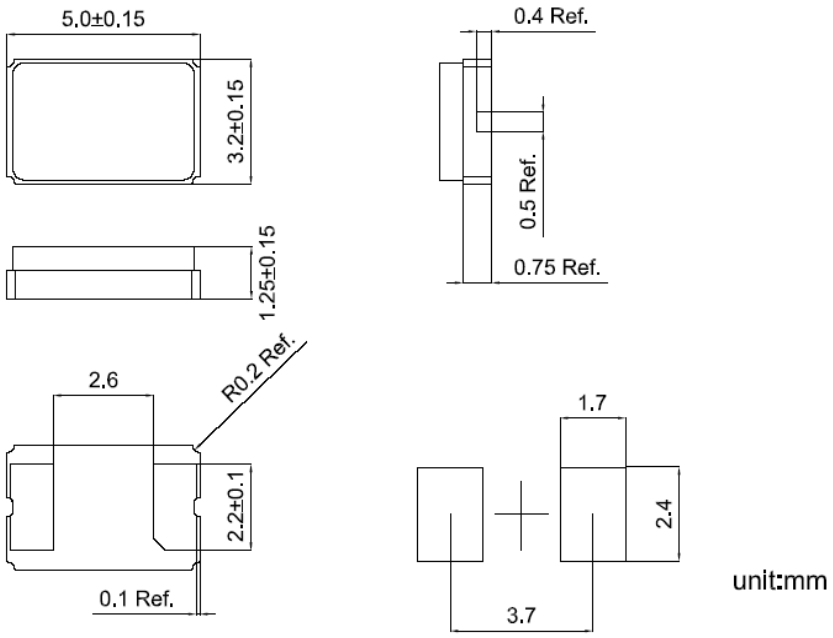
TXC (NINGBO) CORPORATION

NO.189 Huang Shan West Road, Beilun District,

Ningbo Zhejiang China

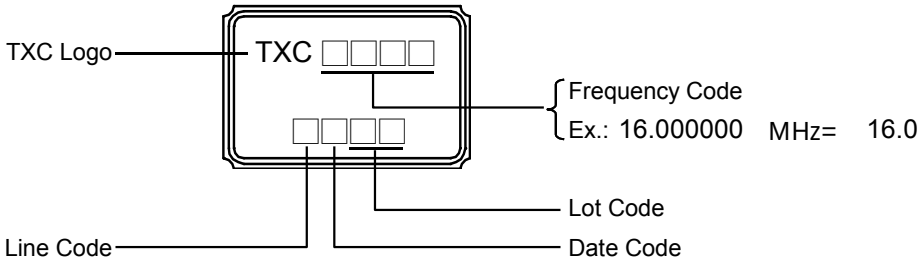
## ■ DIMENSIONS

(Unit:mm)




*Coplanarity of solderable areas Camber 0.10 mm Max

## ■ MARKING




**Date Code:**

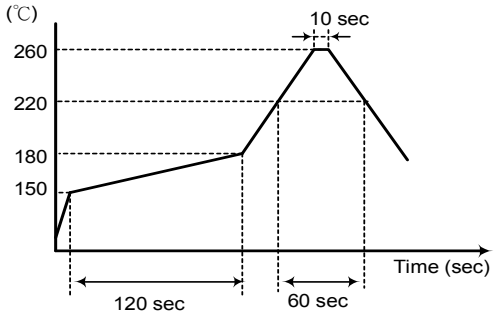
| YEAR \ MONTH | | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 2009 | 2013 | 2017 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2006 | 2010 | 2014 | 2018 | N | P | Q | R | S | T | U | V | 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.



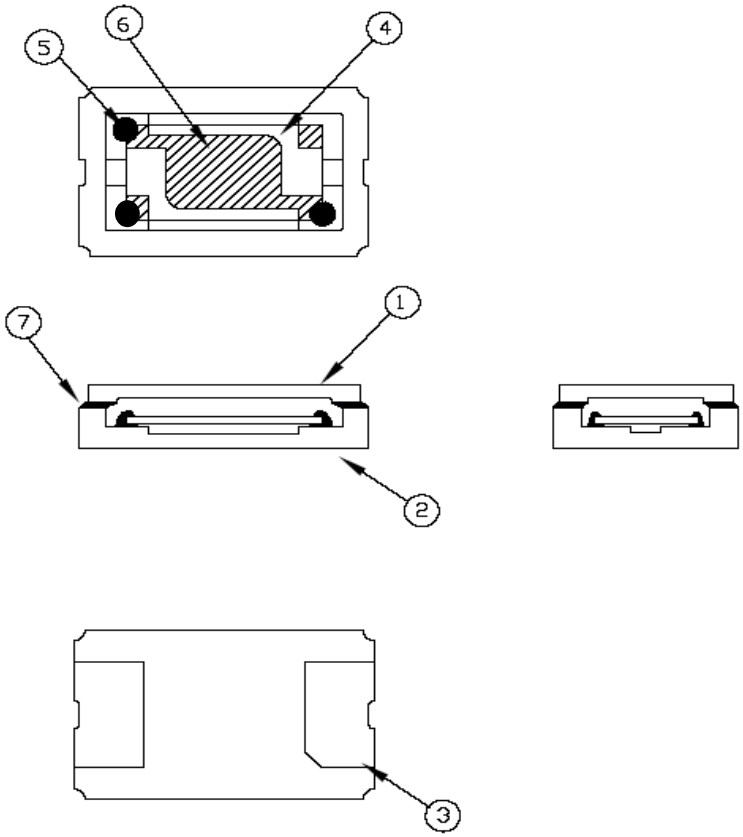

## ■ SUGGESTED MANUAL SOLDER CONDITION

Temperature: 350 ± 10 ℃

Time: 3 sec.

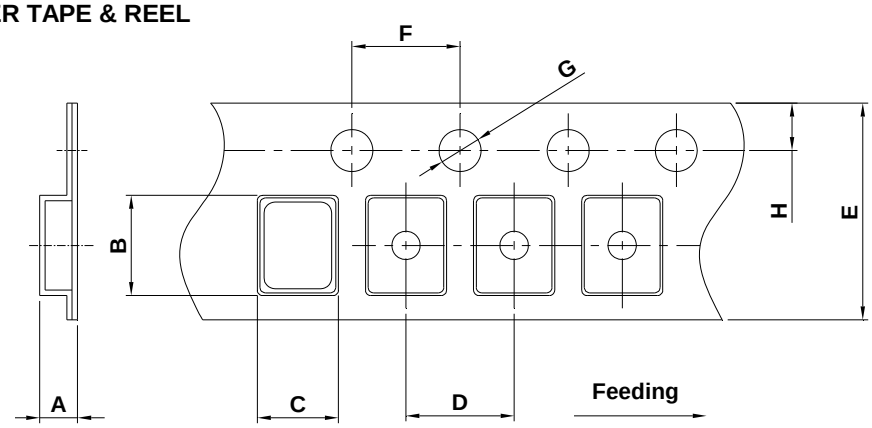
Re-solder times: twice

## STRUCTURE ILLUSTRATION



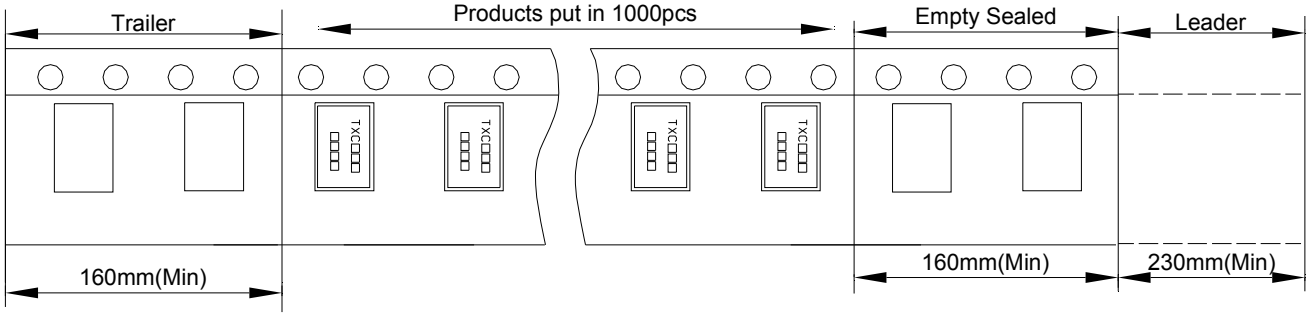

| NO | COMPONENTS | MATERIALS | FINISH/SPECIFICATIONS |
|---|---|---|---|
| 1 | Cap | Ceramic ($Al_2O_3$) | - |
| 2 | Base(Package) | Ceramic ($Al_2O_3$) | - |
| 3 | PAD | Au | Tungsten metalize<br>+ Ni plating<br>+ Au plating |
| 4 | Crystal blank | $SiO_2$ | - |
| 5 | Conductive adhesive | Resin+Ag | - |
| 6 | Electrode | Noble Metal | - |
| 7 | Sealing Glass | Glass(PbO) | - |

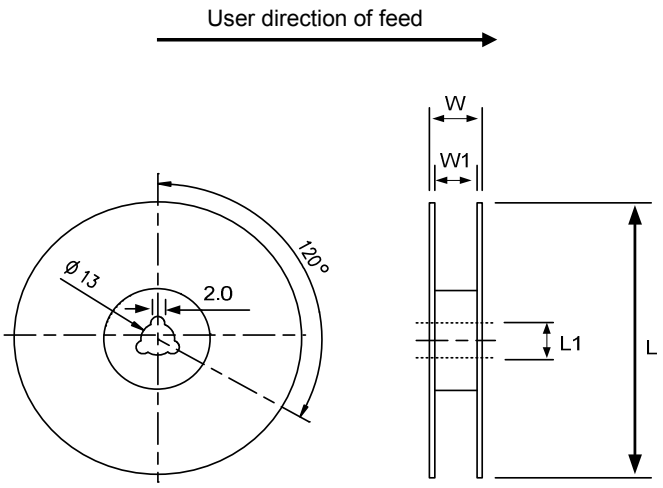
## ■ EMBOSS CARRIER TAPE & REEL




| DIMENSIONS | A | B | C | D | E | F | G | H | |
|---|---|---|---|---|---|---|---|---|---|
| | 1.65±0.10 | 5.40±0.10 | 3.50±0.10 | 8.00±0.10 | 12.00±0.30 | 4.00±0.10 | 1.55±0.10 | 1.75±0.10 | (UNIT：mm) |

REMARK :



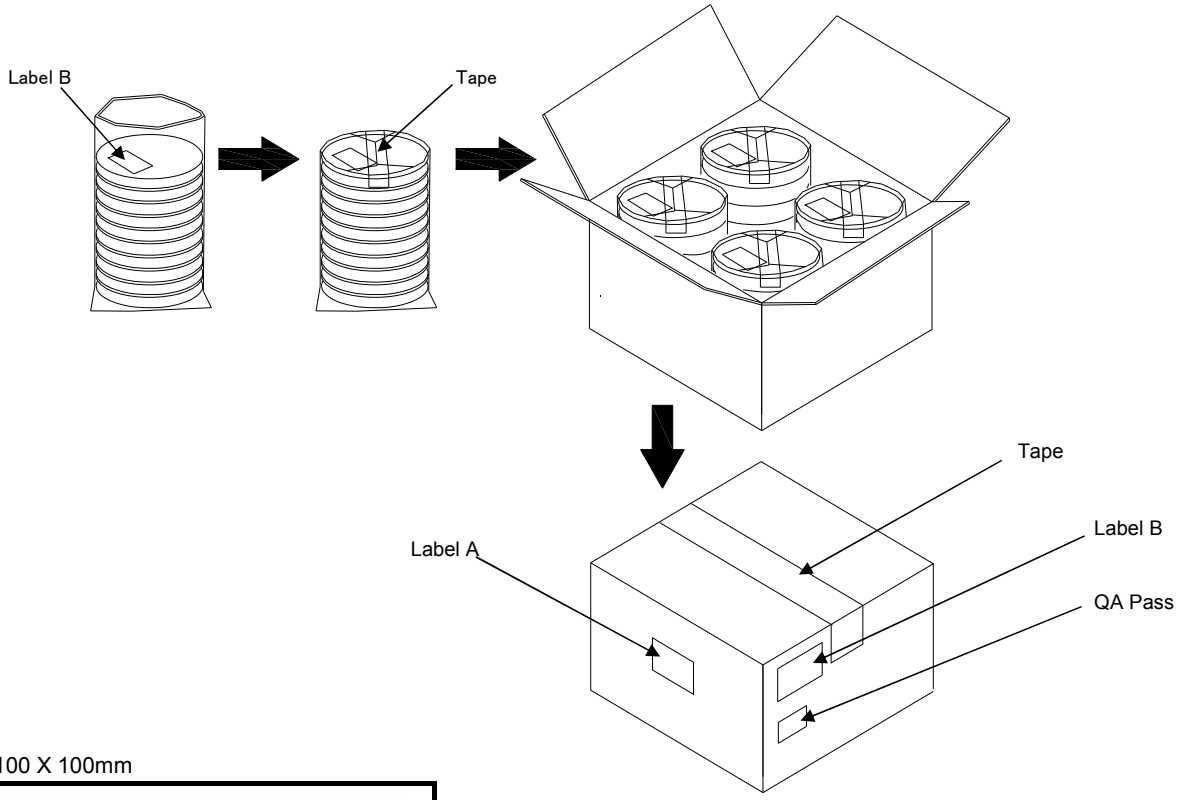




| DIMENSIONS | L | L1 | W | W1 | |
|---|---|---|---|---|---|
| | 180±1.00 | 13±0.50 | 16.5±0.20 | 12±0.10 | (UNIT：mm) |

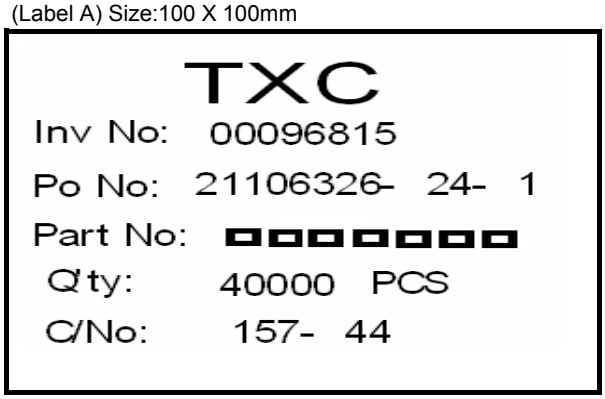
## ■ PACKING

Reel Quantity :
1. Reel X 5 (5 Reels x1 )
2. Reel X 10 (10 Reels x1 )
3. Reel X 20 (10 Reels x2 )
4. Reel X 40 (10 Reels x4 )

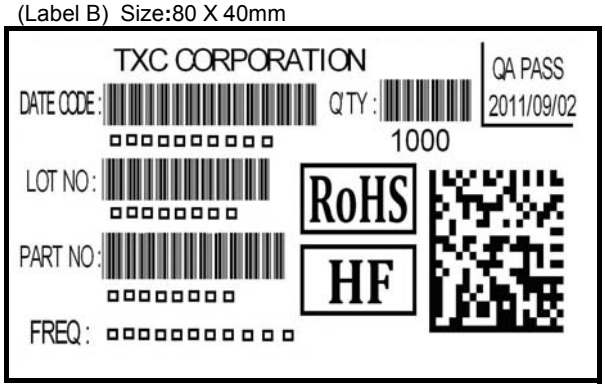
Box Size:
1. L200 X W200 X H140mm
2. L200 X W200 X H250mm
3. L400 X W200 X H250mm
4. L400 X W400 X H280mm




(Label A) Size:100 X 100mm




(Label 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.

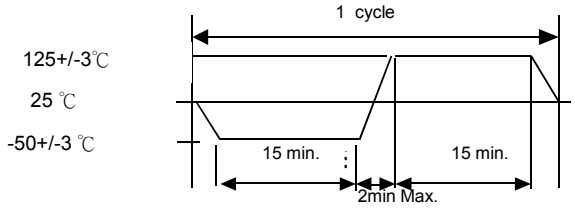
4.If customers have special requirements, we can paste labels according to it.

## ■ RELIABILITY SPECIFICATIONS (AEC-Q200 Compliant)

1.Mechanical Endurance

| No. | Test Item | Test Methods | | Test Criteria |
|---|---|---|---|---|
| 1.1 | Mechanical Shock | 2000 G , 0.3 m Sec. ,3 times for all 3 directions. | | B C |
| 1.2 | Vibration | Frequency range<br>Acceleration<br>Sweep time<br>Pendicular axes each test time | 10 ~ 2000 Hz<br>20G<br>20 minute<br>4 hours<br>(Total test time 12 hours) | B C |
| 1.3 | Terminal Strength | 17.7N force for 60sec +/-1sec. | | F |
| 1.4 | Board Flex | Duration time:60 Sec Minimum,Deviation:3mm | | B C |
| 1.5 | Solderability | Temperature<br>Immersing depth<br>Immersion time<br>Flux | 245 ºC +/- 5ºC<br>0.5 mm minimum<br>5 +/- 0.5 seconds<br>Rosin resin methyl alcohol solvent ( 1 : 4 ) | E |

2.Environmental Endurance

| No. | Test Item | Test Methods | | SPEC |
|---|---|---|---|---|
| 2.1 | Resistance To Soldering Heat | Test temperature<br>Test time | 260 +/- 5 ºC<br>10 +/- 1 sec. | BCD |
| 2.2 | High Temp. Storage | + 125℃ ± 3 ℃ for 1000 ± 12 Hrs | | BCD |
| 2.3 | Low Temp. Storage | - 50 ℃ ± 3 ℃ for 1000 ± 12 Hrs | | BCD |
| 2.4 | Temperature cycle | -50℃~125℃,for 1000 cycles.<br> | | BCD |
| 2.5 | Operational Life | 1000 hrs @ 125± 3°C. Rated VDD applied with 1 MΩ. | | BCD |
| 2.6 | High Temp＆Humidity | 85℃ ± 3℃ , RH 85% , 1000 Hrs | | BCD |

**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 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.