

SPECIFICATION FOR APPROVAL

CUSTOMER : _____

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

NOMINAL FREQ. : 48.000000MHz

TXC P/N : 7M48000149

REVISION : A1

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



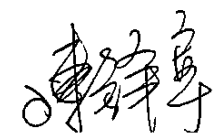
PRODUCT SPECIFICATION SHEET

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

NOMINAL FREQ. : 48.000000MHz

TXC P/N : 7M48000149

REVISION : A1

| PE/RD | QA | MFG |
|---|---|--|
|  |  |  |
| 29-Jun-06 | 29-Jun-06 | 29-Jun-06 |

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> |
|------------|--------------------|------------------------|-------------|----------------|----------------|
| A1 | N/A | Initial released | 29-Jun-06 | N/A | Yachuan Miao |
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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 HP E5100A or equivalent.

Crystal cutting type

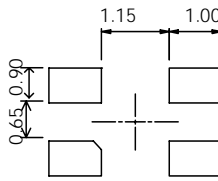
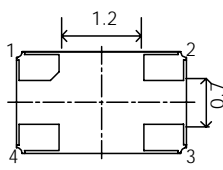
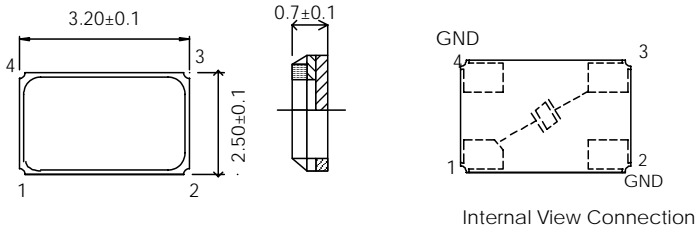
The crystal is using AT CUT (thickness shear mode).

Unit Weight:

0.018±0.001 g/pcs

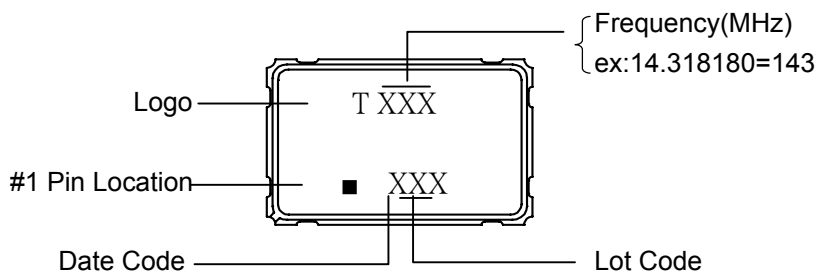
| | Parameters | SYM. | Electrical Spec. | | | | Notes |
|----|---------------------------|------|------------------|------|-----|-------|---|
| | | | MIN | TYPE | MAX | UNITS | |
| 1 | Nominal Frequency | FL | 48.000000 | | | MHz | - |
| 2 | Oscillation Mode | - | Fundamental | | | - | - |
| 3 | Load Capacitance | CL | 9 | | | pF | - |
| 4 | Frequency Tolerance | - | ±20 | | | ppm | at 25 °C ± 3 °C |
| 5 | Frequency Tolerance | - | ±30 | | | ppm | Over Operating Temp. Range (Reference 25°C) |
| 6 | Operating Temperature | - | -40 | ~ | 85 | °C | - |
| 7 | Aging | - | ±2 | | | ppm | 1st Year |
| 8 | Drive Level | DL | - | 100 | - | uW | - |
| 9 | Effective Resistance Rr | Rr | - | - | 40 | Ω | - |
| 10 | Shunt Capacitance C0 | C0 | - | 1.4 | - | pF | - |
| 11 | Insulation Resistance | - | 500 | - | - | MΩ | at DC 100V |
| 12 | Storage Temperature Range | - | -40 | ~ | 85 | °C | - |

■ DIMENSIONS



Units:mm

■ MARKING



Production location: Taiwan

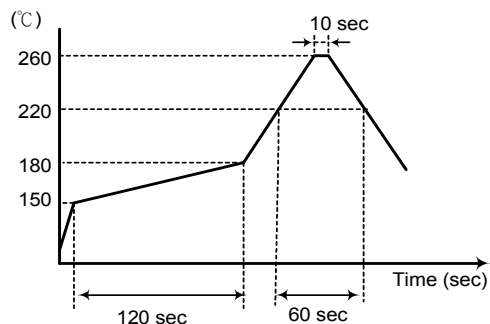
Date Code

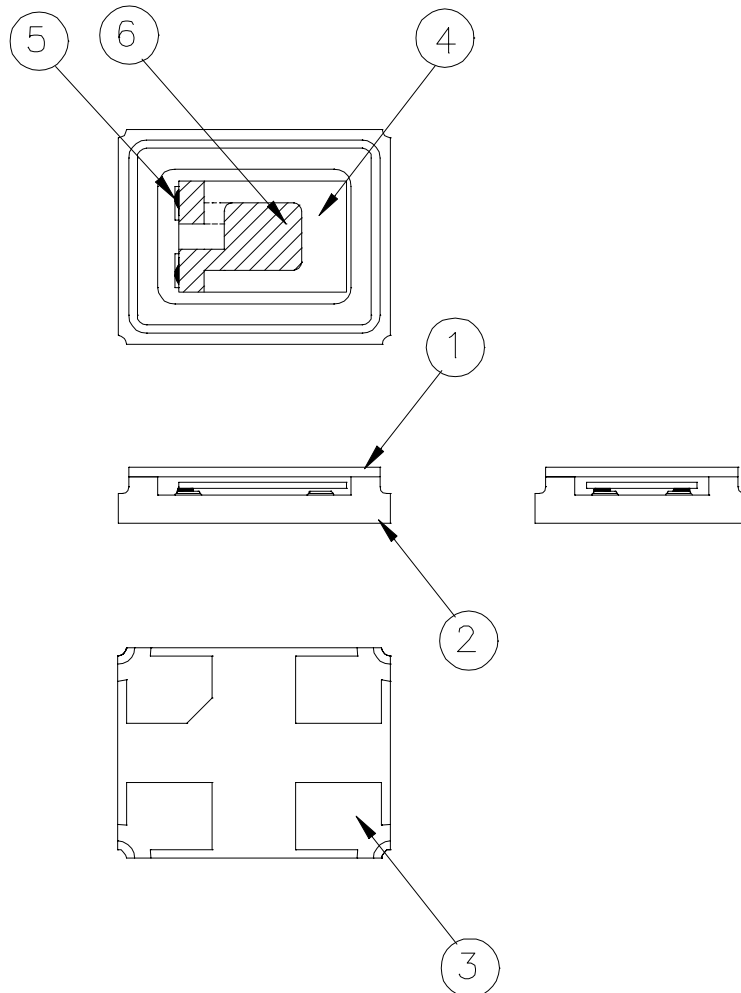
| YEAR \ MONTH | | | | | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|--------------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | A | B | C | D | E | F | G | H | J | K | L | M |
| 2001 | 2005 | 2009 | 2013 | 2017 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2002 | 2006 | 2010 | 2014 | 2018 | a | b | c | d | e | f | g | h | j | k | l | m |
| 2003 | 2007 | 2011 | 2015 | 2019 | n | p | q | r | s | t | u | v | w | x | y | z |
| 2004 | 2008 | 2012 | 2016 | 2020 | | | | | | | | | | | | |

This date code will be cycled every four years

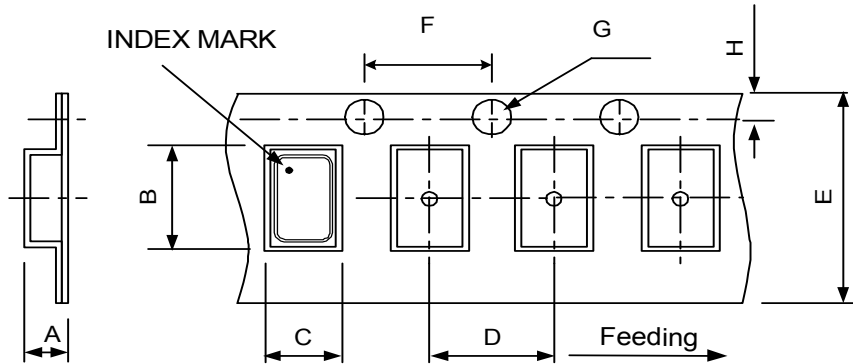
■ SUGGESTED REFLOW PROFILE

Total time : 200 sec. Max.
Solder melting point :220 °C

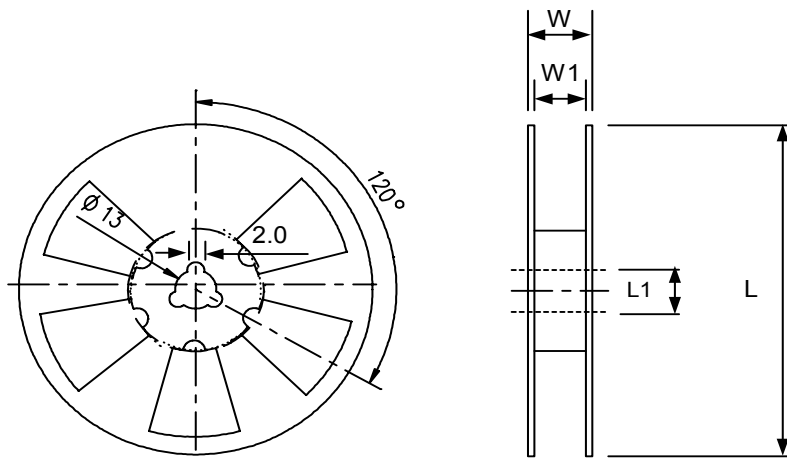
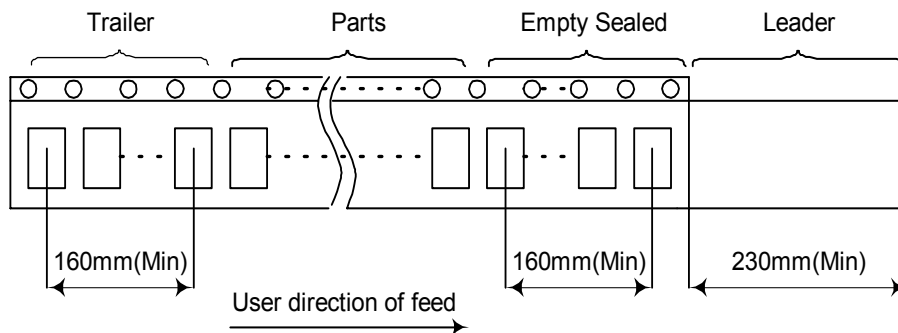


■ STRUCTURE ILLUSTRATION


| NO | COMPONENTS | MATERIALS | QTY | FINISH/SPECIFICATIONS |
|----|---------------------|---|-----|---|
| 1 | Lid | Kovar (Fe/Co/Ni) | 1 | - |
| 2 | Base(Package) | Ceramic (Al ₂ O ₃) + Kovar (Fe/Co/Ni)+ Ag/Cu | 1 | Color black |
| 3 | PAD | Au | 4 | Tungsten metalize + Ni plating + Au plating |
| 4 | Crystal blank | SiO ₂ | 1 | - |
| 5 | Conductive adhesive | Ag | 4 | Silicon resin |
| 6 | Electrode | Au + Cr | 2 | - |

PACKING : (EIA-481-2)


| DIMENSIONS | A | B | C | D | E | F | G | H | (UNIT : mm) |
|------------|------|------|------|------|------|------|------|------|-------------|
| | 1.40 | 3.40 | 2.70 | 4.00 | 8.00 | 4.00 | 1.50 | 1.75 | |

REMARK :


| DIMENSIONS | L | L1 | W | W1 | pcs / Reel (UNIT : mm) |
|------------|-----|----|------|----|--|
| | 178 | 13 | 11.5 | 8 | Standard Reel Quantity is 3,000 pcs per reel |

■ 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-202F |
| 1.3 | Vibration | Frequency range 10 ~ 2000 Hz Amplitude 1.52 mm/20G Sweep time 20 minute Perpendicular axes each test time 4 hours (Total test time 12 hours) | MIL-STD-883E |
| 1.4 | Gross Leak | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / c | MIL-STD-883E |
| 1.5 | Fine Leak | Helium Bombing 4.5 Kg/ cm ² for 2 hr | |
| 1.6 | Solder ability | Temperature 260 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4) | MIL-STD-883E |

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-202F |
| 2.2 | High Temp. Storage | + 125 °C ± 3 °C for 500 ± 12 hours | MIL-STD-883E |
| 2.3 | Low Temp. Storage | - 40 °C ± 3 °C for 500 ± 12 hours | |
| 2.4 | Thermal Shock | Total 100 cycles of the following temperature cycle | MIL-STD-883E |
| 2.5 | High Temp & Humidity | 85°C ± 3°C, RH 85% , 500Hrs | JIS C5023 |
| 2.6 | Pressure Cooker Storage | 121 ± 3°C , RH100% , 2 bar , 240Hrs | JIS C6701 |