



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 TUNING FORK 3.2X1.5 |
| NOMINAL FREQ. | : | 32.768KHz |
| TXC P/N | : | 9H03200031 |
| 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.

Attachment: Product Specification Sheet

- 1
- 2
- 3
- 4
- 5

**Halogen Free
RoHS Compliant**



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PRODUCT SPECIFICATION SHEET

PRODUCT TYPE : SMD TUNING FORK 3.2X1.5

NOMINAL FREQ. : 32.768KHz

TXC P/N : 9H03200031

REVISION : S1

| RD | QA | MFG |
|----------|----|-----|
| 王敏和 | | |
| 8-Aug-12 | | |

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

**Halogen Free
RoHS Compliant**



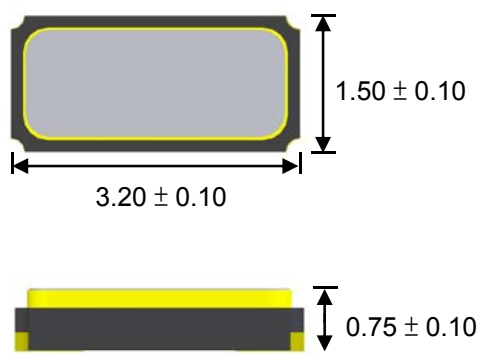
| <u>Rev</u> | <u>Revise page</u> | <u>Revise contents</u> | <u>Date</u> | <u>Ref.No.</u> | <u>Reviser</u> |
|------------|--------------------|------------------------|-------------|----------------|----------------|
| S1 | NA | Initial release | 8-Aug-12 | - | Alan Cheng |
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ELECTRICAL SPECIFICATIONS

| | Parameters | Sym. | Electrical Spec. | | | | Notes |
|----|------------------------------|----------------|------------------|---------|-------|-------------------------|--------------------------------|
| | | | Min | Typical | Max | Unit | |
| 1 | Nominal Frequency | F0 | 32.768 | | | KHz | - |
| 2 | Frequency Tolerance | $\Delta f/f_0$ | ± 20 | | | ppm | at 25 °C $\pm 3^\circ\text{C}$ |
| 3 | Load Capacitance | CL | 12.5 | | | pF | - |
| 4 | Driver Level | DL | - | 0.1 | 1 | μW | - |
| 5 | Equivalent Series Resistance | ESR | - | - | 70 | K Ω | at 25 °C $\pm 3^\circ\text{C}$ |
| 6 | Turnover Temperature | Tp | 20 | 25 | 30 | $^\circ\text{C}$ | at 25 °C $\pm 5^\circ\text{C}$ |
| 7 | Parabolic Curvature Constant | K | - | - | -0.04 | ppm/ $^\circ\text{C}^2$ | - |
| 8 | Operating Temperature | - | -40 | ~ | 85 | $^\circ\text{C}$ | - |
| 9 | Storage Temperature | - | -55 | ~ | 125 | $^\circ\text{C}$ | - |
| 10 | Insulation Resistance | IR | 500 | - | - | M Ω | at DC 100V $\pm 15\text{V}$ |
| 11 | Shunt Capacitance | C0 | - | 1.0 | - | pF | - |
| 12 | Motional Capacitance | C1 | - | 3.4 | - | fF | - |
| 13 | Aging | $\Delta f/f$ | ± 3 | | | ppm | 1st Year |

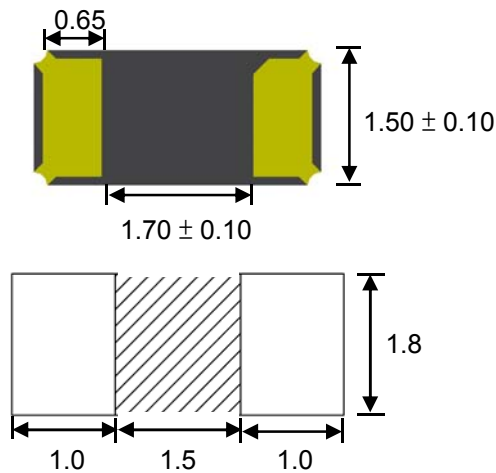
DIMENSIONS

(UNIT:mm)



RECOMMENDED SOLDER PAD

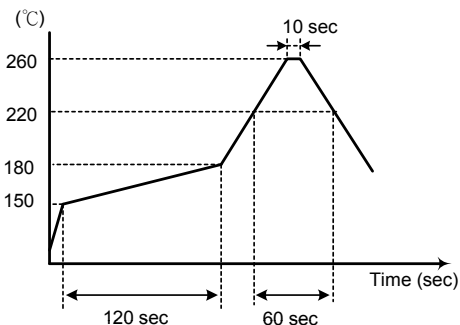
(UNIT:mm)



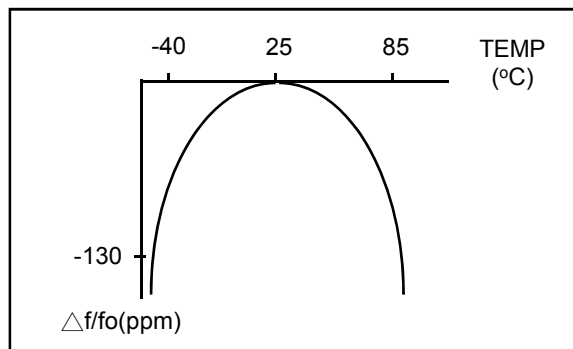
SUGGESTED REFLOW PROFILE

Total time : 200 sec. Max.

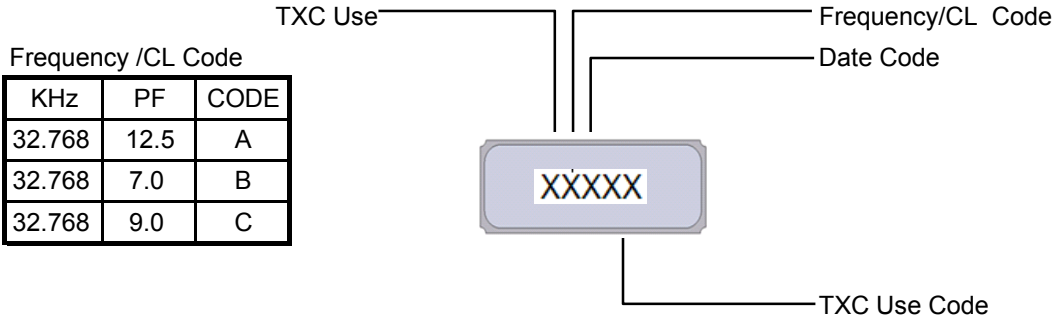
Solder melting point :220°C



TEMPERATURE V.S FREQUENCY CURVE



MARKING

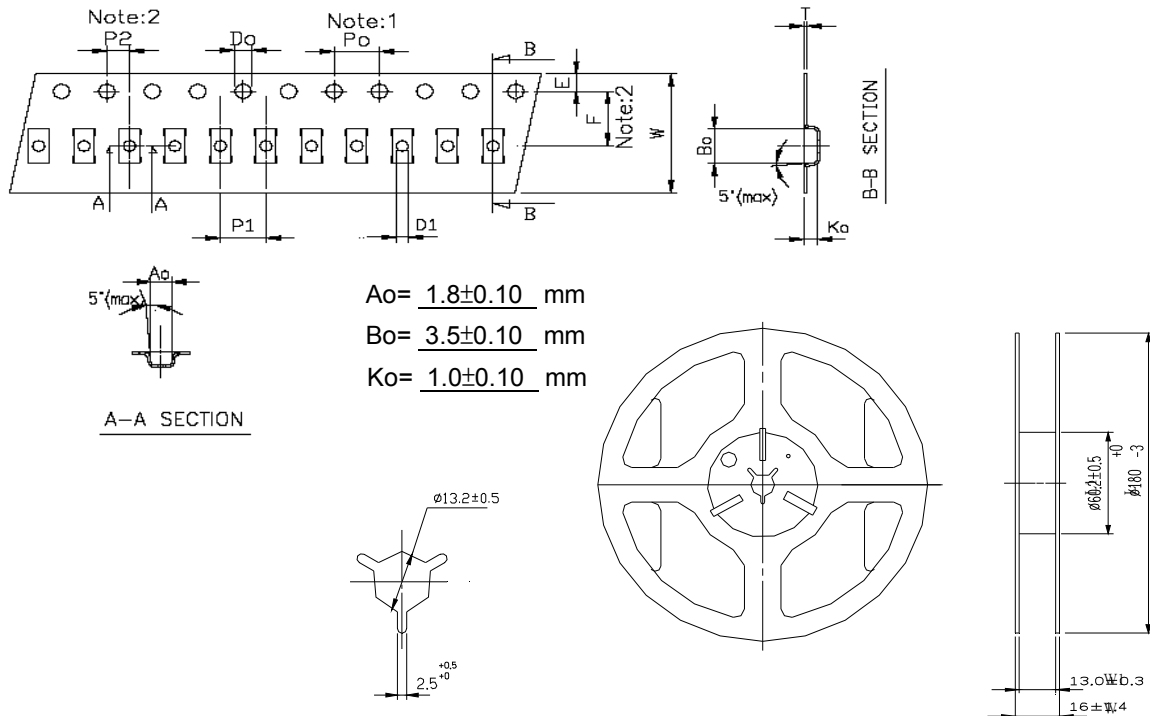


Date Code

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

PACKING

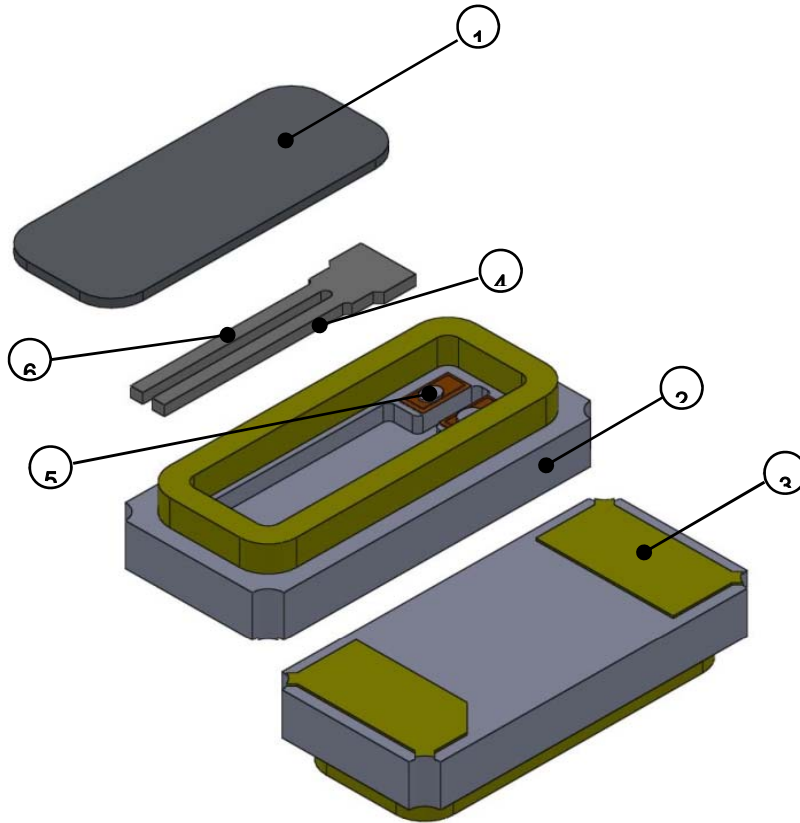


| CARRIER TAPE DIMENSIONS | K1 | P0 | P1 | P2 | D0 | D1 | E | F | 10P0 | W | T | pcs / Reel |
|-------------------------|----|----|----|----|------|-----|------|-----|------|----|------|------------|
| | - | 4 | 4 | 2 | 1.55 | 1.1 | 1.75 | 5.5 | 40 | 12 | 0.25 | 3K |

| REEL DIMENSIONS | W | W1 | L | L1 |
|-----------------|--------------|--------------|--------------|----------------|
| | 16 ± 1.4 | 13 ± 0.3 | $180 + 0/-3$ | 60.2 ± 0.5 |

- REMARK :
- 230 mm (9.05) minimum leader which consist of carrier and/or tape followed by a minimum of 160 mm (6.3) of empty carrier tape sealed with cover tape.
 - 160 mm (6.3) minimum trailer of empty carrier tape sealed with cover tape.

■ **STRUCTURE ILLUSTRATION**



| NO | COMPONENTS | MATERIALS | FINISH/SPECIFICATIONS |
|----|---------------------|-----------------------|---|
| 1 | Lid | Kovar(Fe+Co+Ni) Alloy | - |
| 2 | Base(Package) | Ceramic(Al_2O_3) | Alumina Ceramics |
| 3 | PAD | Au | Tungsten metalize + Ni plating + Au plating |
| 4 | Crystal chip | SiO_2 | - |
| 5 | Conductive adhesive | Ag | Silicon resin |
| 6 | Electrode | Au+Cr | - |

RELIABILITY SPECIFICATIONS
1. Mechanical Endurance

| No. | Test Item | Test Methods | REF. DOC |
|-----|------------------|--|-------------|
| 1 | Drop Test | 150 cm height, fall freely onto concrete floor 3 times. | MIL-STD-202 |
| 1 | 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 | 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-883 |
| 1 | Solderability | Temperature 245 °C ± 5°C Immersing depth 0.5 mm minimum Immersion time 5 ± 1 seconds Flux Rosin resin methyl alcohol solvent (1 : 4) | MIL-STD-883 |

2. Environmental Endurance

| No. | Test Item | Test Methods | REF. DOC |
|-----|------------------------------|--|-------------|
| 2 | 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-202 |
| 2 | High Temp. Storage | + 125 °C ± 3 °C for 1000 ± 12 hours | MIL-STD-883 |
| 2 | Low Temp. Storage | - 40 °C ± 3 °C for 1000 ± 12 hours | MIL-STD-883 |
| 2 | Thermal Shock | Total 100 cycles of the following temperature cycle | MIL-STD-883 |
| 3 | Pressure Cooker Storage | 121 ± 3°C, RH100%, 2 bar, for 240 hours | EIA-JESD22 |
| 3 | High Temp & Humidity | 85°C ± 3°C, RH 85% , 1000Hrs | EIA-JESD22 |