Crystal resonancer
Series 6K2 2.0*1.2mm SURFACE MOUNT PACKAGE FOR TUNING FORK
32.768KHz

SPECIFICATION

MODEL: SJK-6K2-32.768k-12.5-20-90-C

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Issued by: 杨霞

SHENZHEN CRYSTAL TECHNOLOGY INDUSTRIAL CO., LTD.

深圳市晶科鑫实业有限公司
1. ELECTRICAL CHARACTERISTICS
   (This test shall be performed under the conditions of temp. at +25±3°C, Relative humidity 60% max.)

1.1. NOMINAL FREQUENCY 32.768 kHz

1.2. OVERTONE ORDER Fundamental

1.3. LOADING CAPACITANCE (CL) 12.5 pF

1.4. FREQUENCY TOLERANCE ±20 ×10^{-6} max. (at +25±3°C)

1.5. DRIVE LEVEL 0.2 μW ± 20% (1μW max.)

1.6. SERIES RESISTANCE 90 kΩ max. (at Series)

1.7. TURNOVER TEMPERATURE +25 ±5°C

1.8. PARABOLIC COEFFICIENT -0.04×10^{-6} / °C² max.

1.9. SHUNT CAPACITANCE 1.0 pF Typ.

1.10. OPERATING TEMPERATURE RANGE -40 ~ +85 °C

1.11. STORAGE TEMPERATURE RANGE -40 ~ +85 °C

1.12. INSULATION RESISTANCE 500 MΩ min. (at DC100±15V)
2. DIMENSIONS AND MARKING

2.1. DIMENSIONS

Unit: mm
Tolerance ± 0.1

Fig.-1

2.2. MARKING

Marking should be printed as follows:

Nominal Frequency(*2), Lot No.(*3)

*1 Manufacturer's trademark shall be marked 'D' as Logo.

*2 In case of 32.768kHz, nominal frequency shall be marked 'A'.

*3 Lot No. shall be marked three figures.
   (1) Year: The last digit of the year.
   (2) Week: We gave the sequence of week numbers 01 (first week) for production date.
   There are starting from 1st of Jan.
   However, add '0' figure to the first week during the 9th weeks.
   The week means are from Sunday to Saturday.

ex. Manufactured day: 2011.10.04  →  141
   Year  Week
3. PACKING

3.1. EMBOSSED CARRIER TAPE & REEL

(1) Dimensions of Emboss carrier tape

![Diagram of Emboss carrier tape](image1.png)

Pulling direction

unit:mm

Fig.-2

(2) Dimensions of tape reel

![Diagram of tape reel](image2.png)

The direction of drawing out of the tape is made the inside and outside of the reel as shown in figure.

Fig.-3
### Table-1

<table>
<thead>
<tr>
<th>Item</th>
<th>Mark</th>
<th>Dimensions / Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flange</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter A</td>
<td>A</td>
<td>Φ180 +0 -3.0</td>
</tr>
<tr>
<td>Inside width W1</td>
<td>W1</td>
<td>9.0 ± 0.3</td>
</tr>
<tr>
<td>Outside width W2</td>
<td>W2</td>
<td>11.4 ± 1.0</td>
</tr>
<tr>
<td>**Out Line diameter B</td>
<td>B</td>
<td>Φ60 +1.0 -0</td>
</tr>
<tr>
<td>Center core slit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width F1</td>
<td>F1</td>
<td>3.0 ± 0.2</td>
</tr>
<tr>
<td>Width F2</td>
<td>F2</td>
<td>4.0 ± 0.2</td>
</tr>
<tr>
<td>Width F3</td>
<td>F3</td>
<td>5.0 ± 0.2</td>
</tr>
<tr>
<td>Length V</td>
<td>V</td>
<td>11.9</td>
</tr>
<tr>
<td>Position q</td>
<td>q</td>
<td>120 °</td>
</tr>
<tr>
<td>**Spindle diameter C</td>
<td>C</td>
<td>Φ13 ± 0.2</td>
</tr>
<tr>
<td><strong>key Seats</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width E</td>
<td>E</td>
<td>2.0 ± 0.5</td>
</tr>
<tr>
<td>Length U</td>
<td>U</td>
<td>10.5 ± 0.4</td>
</tr>
<tr>
<td>Position q</td>
<td>q</td>
<td>120 °</td>
</tr>
<tr>
<td><strong>Indication of type</strong></td>
<td></td>
<td>Sticker label on one side of flange</td>
</tr>
</tbody>
</table>

(3) **Storage Condition**
- Temperature: +40°C max., Relative Humidity: 80% max.
- Storage Period: 6 months max.

(4) **Standard packing quantity**
- 3,000 pcs./reel for Φ180

(5) **Material of the tape**

<table>
<thead>
<tr>
<th>tape</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier tape</td>
<td>Polystyrene, Carbon</td>
</tr>
<tr>
<td>Cover tape</td>
<td>Polyethylene</td>
</tr>
</tbody>
</table>

(6) **Label Contents**
- Type
- Our specification No.
- Your Part No.
- Lot No.
- Nominal Frequency
- Quantity
- Our Company Name

Stick a label on each reel.
### (7) Taping Dimension

<table>
<thead>
<tr>
<th>Leader</th>
<th>Cover tape</th>
<th>The length of cover tape in the leader is more than 400mm including empty embossed area.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carrier tape</td>
<td>After all products were packaged, must remain more than twenty pieces or 400mm empty embossed area, which should be sealed by cover tape.</td>
</tr>
<tr>
<td>Terminal</td>
<td>Cover tape</td>
<td>The tip of cover tape shall be fixed temporarily by paper tape and roll around the core of reel one round.</td>
</tr>
<tr>
<td></td>
<td>Carrier tape</td>
<td>The empty embossed area which are sealed by cover tape must remain more than 40mm.</td>
</tr>
</tbody>
</table>

![Taping Dimension Diagram](image)

#### (8) Joint of tape

The carrier tape and cover tape should not be jointed.

#### (9) Release strength cover tape

It has between 0.1~0.7N under the following condition.

- **Pulling direction**: 165~180 °
- **Speed**: 300mm/min.
- Otherwise unless specified

![Release Strength Diagram](image)

The component must be free fall, when tear away the cover tape with upside-down the emboss carrier tape.
3.2. PACKING

(1) The way of packing and label

![Diagram of packing carton and label]

**Label contents**
- The type of product
- Lot No.
- Specification
- Quantity
- Shipment Day
- Remark

(2) The size of packing carton

There may be different size of packing carton used depending on the lot size. Also, the product packed inside shall be protected by air cushion.
4. REFLOW CONDITIONS (REFERENCE)

During the solder reflow process, please complete within following temperature period. Reflow soldering shall be allowed only 2 times.

- 260±5°C
- 260±5°C
- 170±10°C

Fig.-7

HANDSOLDERING METHOD

HANDSOLDERING METHOD: 350±10°C, 3+1/-0s Each terminal once
(Please take care so that a soldering iron should not touch a lid directly.)

5. LAND PATTERN (REFERENCE)

Fig.-8
6. MECHANICAL ENDURANCE

6.1. SHOCK

After the following test, parts shall conform specification table-2 B.
3 times free drop from 75cm heights to hard wood board of minimum thickness 30mm.

6.2. VIBRATION

After the following test, parts shall conform specification table-2 B,
and no abnormal appearance shall be observed.

(1) Frequency of Vibration : 10~55Hz 15min
(2) Amplitude total : 1.5mm
(3) Vibration axis : X, Y, Z
(4) Vibration period : 2h for X, Y, Z axis

6.3. SUBSTRATE BENDING

After the following test, parts shall conform specification table-2 B,
and no abnormality shall be observed in external appearance and sealing
and others shall be based on ET-7403 of EIAJ.

Mount the specimen on substrate.
Apply the following pressure:
  Direction : see Fig.-9
  Speed : 0.5mm/s
  Hours : 5±1s
  Amount of substrate: 3mm max.

6.4. SHEAR

After the following test, parts shall conform specification table-2 B,
and no abnormality shall be observed in external appearance and sealing
tightness and others shall be based on ET-7403 of EIAJ.
Mount the specimen on substrate.
Apply the following pressure:
  Pressure jig : R0.5
  Weight : 10N
  Hours : 10±1s
  Direction : see Fig.-10
6.5. BODY STRENGTH

After the following test, parts shall conform to specification table-2 B, and no abnormality shall be observed in external appearance and sealing tightness and others shall be based on ET-7403 of EIAJ.

Mount the specimen on substrate.

Apply the following pressure:
- Pressure jig: R0.5
- Weight: 10N
- Hours: 10±1s
- Direction: see Fig.-11

![Image of pressure jig and specimen](image)

6.6. SEAL

Less than $2.0 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{s}$ by Helium leak detector.
Also, no bubble is observed by Fluorinert tests.

6.7. SOLDERABILITY

After the following test. More than 90% of lead shall be covered by new solder.
- 3±1s dip in 235±5°C solder.
  (Use rosin type flux for solder.)

6.8. RESISTANCE TO SOLDERING HEAT (REFLOW)

48 hours past at room temperature from following test, parts shall conform to specification table-2 C.
perform the attached reflow conditions to reference.

6.9. RESISTANCE TO SOLDERING HEAT (HAND SOLDERING METHOD)

48 hours past at room temperature from following test, parts shall conform to specification table-2 C.
- 350±10°C, 3+1/-0s Each terminal once
7. ENVIRONMENTAL ENDURANCE

7.1. HUMIDITY
2 hours past at room temperature after following test, parts shall conform specification table-2 C.
240h \( +85\pm2^\circ C \), relative humidity \( 85\pm5\% \).

7.2. LOW TEMPERATURE
2 hours past at room temperature after following test, parts shall conform specification table-2 C.
240h \(-40\pm3^\circ C \).

7.3. HIGH TEMPERATURE
2 hours past at room temperature after following test, parts shall conform specification table-2 C.
240h \( +85\pm2^\circ C \).

7.4. TERMAL SHOCK TEST
2 hours past at room temperature after 25 cycles of following test, parts shall conform specification table-2 C.

![Fig.-12](image)

8. SPECIFICATION

<table>
<thead>
<tr>
<th>Table-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Variation</td>
</tr>
<tr>
<td>A ( \pm3\times10^{-6} )</td>
</tr>
<tr>
<td>B ( \pm5\times10^{-6} )</td>
</tr>
<tr>
<td>C ( \pm10\times10^{-6} )</td>
</tr>
</tbody>
</table>
9. THE CAUTIONS ON USE FOR 6K2

9.1. SOLDERING

Please perform reflow conditions within 2 times.

9.2. MOUNT

Crystal products are designed to be compatible with automatic mounting. Be sure to have a mounting test in advance by using the actual mounting machine and check that the characteristics of the products are not damaged by the automatic mounting. In the process where the board is warped, such as board separation process, be careful that the warping does not influence the characteristics and soldering of crystal products. Since mounting by Ultrasonic welding and processing have a possibility of an excessive vibration spreading inside a tuning fork crystal resonator and becoming the cause of characteristic deterioration and not oscillating, it does not recommend.

9.3. WASHING

About use of the washing liquid of a basin system, an alcoholic system, and a chlorofluorocarbon-replacing material system, it is checking that it is satisfactory. However please consult in advance about other washing liquid. Tuning fork crystal resonators should not have ultrasonic washing because their frequency band is close to the washing frequency band of ultrasonic washing machines, very probably causing resonance destruction. To use ultrasonic washing to clean these resonators, tests must be performed in advance under actual application conditions.

9.4. DRIVE LEVEL

The piece of crystal it is processed very smaller than the conventional thing inside DST210A series crystal unit may be damaged, if crystal resonators are exposed to an excessively high drive level. Please use the products within the limits specified in the catalogs and specifications.

9.5. HANDLING OF A PRODUCT

DST210A series has sufficient intensity to fall and vibration. Crystal resonators should not have pattern to avoid causing base crack.

9.6. STORAGE

Since the solderability of pins may deteriorate, please avoid storage in high-temperature, high-humidity place. Please store crystal products in a place free from direct sunlight and condensation.