



DATE: 2005.05.18

Shanghai Tang Electronics Co.,Ltd.

ITEM: QUARTZ CRYSTAL

TYPE: DMX-26S

NOMINAL FREQUENCY: 32.768kHz

SPEC No. _____

Please acknowledge receipt of the specification attached hereto signing and returning to us one copy thereof.

| RECEIVED OF SPECIFICATION | |
|---------------------------|-----------------------|
| DATE | |
| RECEIVED | (signature) (name) |

Pioneering New Breakthroughs in Electronics

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C.ENG.

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ENG.

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1. ELECTRICAL (+25deg.C+/-2deg.C)

| | |
|----------------------------------|--|
| 1-1 NOMINAL FREQUENCY | 32.768 kHz |
| 1-2 FREQUENCY TOLERANCE | +/- 20 ppm Max. |
| 1-3 LOADING CAPACITANCE | 6.0 pF |
| 1-4 EQUIVALENT RESISTANCE | 50 kohm Max. / SERIES |
| 1-5 DRIVE LEVEL | 1.0 uW+/- 0.2 uW |
| 1-6 Q | 40000 Min. |
| 1-7 TURNOVER | 25deg.C +/- 5 deg.C |
| 1-8 PARABOLIC CURVATURE CONSTANT | -0.04ppm / deg.C ² Max. |
| 1-9 INSULATION RESISTANCE | 500Mohm Min./DC100V (Pin to Pin, Pin to Case) |
| 1-10 OPERATING TEMP. RANGE | - 40 deg.C to + 85 deg.C |
| 1-11 STORAGE TEMP. RANGE | - 55 deg.C to + 125 deg.C |
| 1-12 PARALLEL CAPACITANCE | 1.25pF TYP. |
| 1-13 CAPACITANCE RATIO | 518 TYP. |

2. CONSTRUCTION

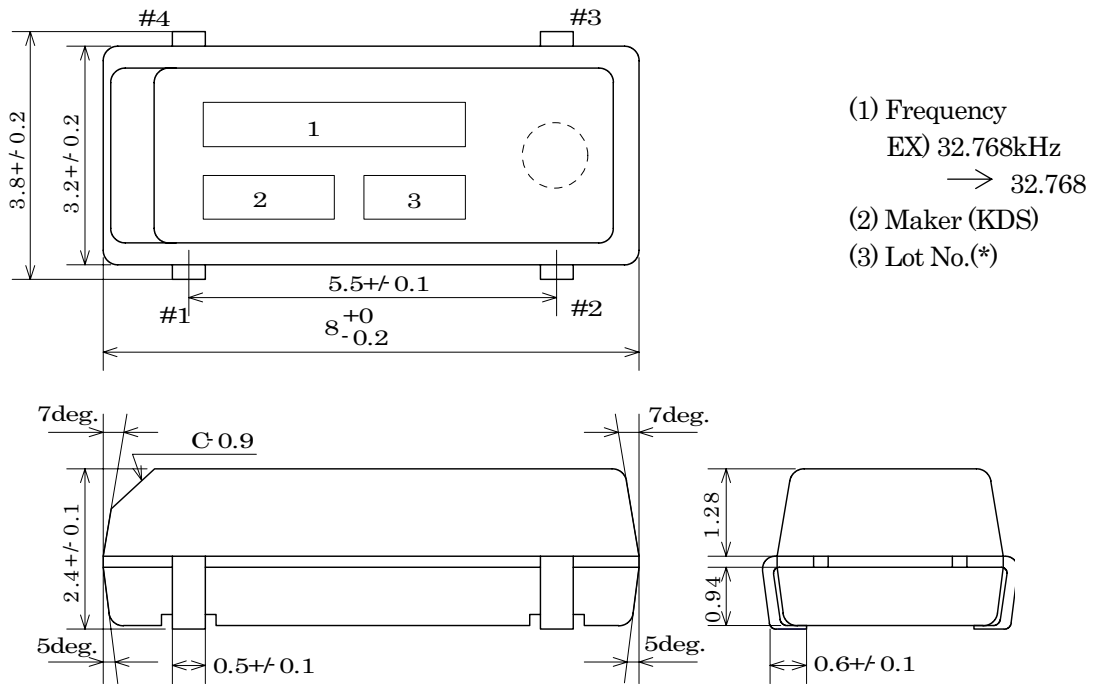
| | |
|----------------------------|-----------------|
| 2-1 HOLDER | DMX-26S |
| 2-2 DIMENSIONS AND MARKING | Refer to Fig-1. |

3. OTHER SPECIFICATIONS

Environmental and mechanical endurance shall be spec

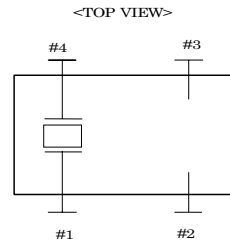
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Dimensions



- (1) Frequency
EX) 32.768kHz
→ 32.768
- (2) Maker (KDS)
- (3) Lot No.(*)

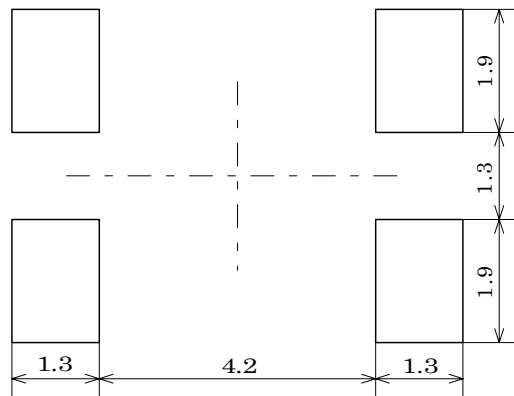
* YEAR : The last two digits of the year
WEEK : Arabic numerals two digits
EX) 2005.05.18 → 0521



(UNIT : mm)

Fig-1

LAND PATTERN



(UNIT : mm)

Fig-2

| | | | |
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1.MECHANICAL ENDURANCE

(1)VIBRATION

After the following test, Frequency tolerance and CI value shall be complied with paragraph 3.(1).

- | | |
|-------------------------|---------------------|
| (1) VIBRATION FREQUENCY | 10 to 55Hz |
| (2) FULL CYCLE | 1.5mm |
| (3) DIRECTION | X.Y.Z |
| (4) TIME | 2h / EACH DIRECTION |

(2)SHOCK

After the following test, Frequency tolerance and CI value shall be complied with paragraph 3.(2).

3 Times free drop from 75 cm heights to hard wood board of thickness more than 30 mm.

(3)HERMETIC SEAL

Less than 3.5×10^{-9} Pa·m³/s by Helium leak detector.

(Checked: Before the molded crystal unit.)

(4)NATURE BILL A SOLDER

Five in the methanol (JIS-K-5101) the solution (7 to 10%) of rosin (JIS-K-5902) to, when I dipped it 3+/-0.5s in during solder melted tank that dips the terminal for 5 to 10s and next melted the solder (Sn-3.0Ag-0.5Cu) in 230deg.C+/-5deg.C 90% or more of the area of the part that I dipped be being covered with a new solder.

(5)SOLDER REFLOW

After 24h past from following test, Frequency tolerance and CI value shall be complied with paragraph 3.(3)

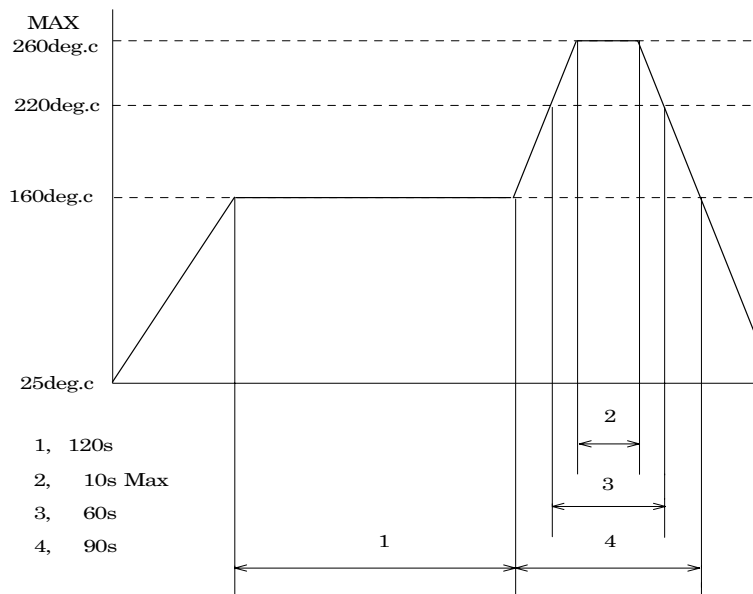


Fig-3

<NOTICE>

Using the infrared lamp at soldering process may cause uneven temperature rise on plastic surface of the parts, so that please keep the package temperature within the above conditions.

Also DO NOT dip the plastic part into solder.

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2.ENVIRONMENTAL ENDURANCE

(1)HIGH TEMPERATURE

After 1 to 2h past at room temperature from following test, Frequency tolerance and CI value shall be complied with paragraph 3.(3).
240h at +85deg.C+/-2deg.C.

(2)LOW TEMPERATURE

After 1 to 2h past at room temperature from following test, Frequency tolerance and CI value shall be complied with paragraph 3.(2).
240h at -40deg.C+/-2deg.C.

(3)HUMIDITY

After 1 to 2h past at room temperature from following test, Frequency tolerance and CI value shall be complied with paragraph 3.(3).
240h at +85deg.C+/-2deg.C, relative humidity 90% to 95%.

(4)VPS

After 2h past at room temperature from following test, Frequency tolerance and CI value shall be complied with paragraph 3.(3).
20s in FC-70 vapor (215deg.C Boiling Point)

(5)TEMPERATURE CYCLE

After supplying the following temperature cycle (50 cycles).
Frequency tolerance and CI value shall be complied with paragraph 3.(3).

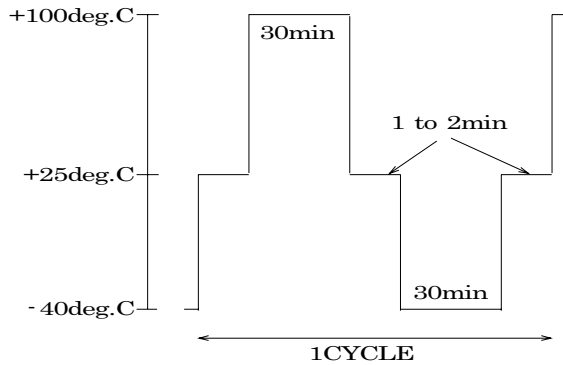


Fig-4

3.SPECIFICATION

| | | |
|-----|--|---|
| (1) | FREQUENCY TOLERANCE($\Delta F/F$) CI VALUE(ΔCI) | +/-3ppm Max. +/-15% Max. or 5kohm Max. |
| (2) | FREQUENCY TOLERANCE($\Delta F/F$) CI VALUE(ΔCI) | +/-5ppm Max. +/-15% Max. or 5kohm Max. |
| (3) | FREQUENCY TOLERANCE($\Delta F/F$) CI VALUE(ΔCI) | +/-10ppm Max. +/-25% Max. or 10kohm Max. |

Provided that measurement shall be carried out after letting it alone in the room temperature for 1h.

<NOTE>

- 1)It may be seen a part of the inside metal case from mold.
As for the ground side terminal, please do not connect the outside.
- 2)Ultrasonic Welding
Tuning fork crystals can not be guaranteed for ultrasonic welding.
- 3) Ultrasonic Cleaning
Please make sure whether or not tuning fork crystals withstand your ultrasonic cleaning conditions.

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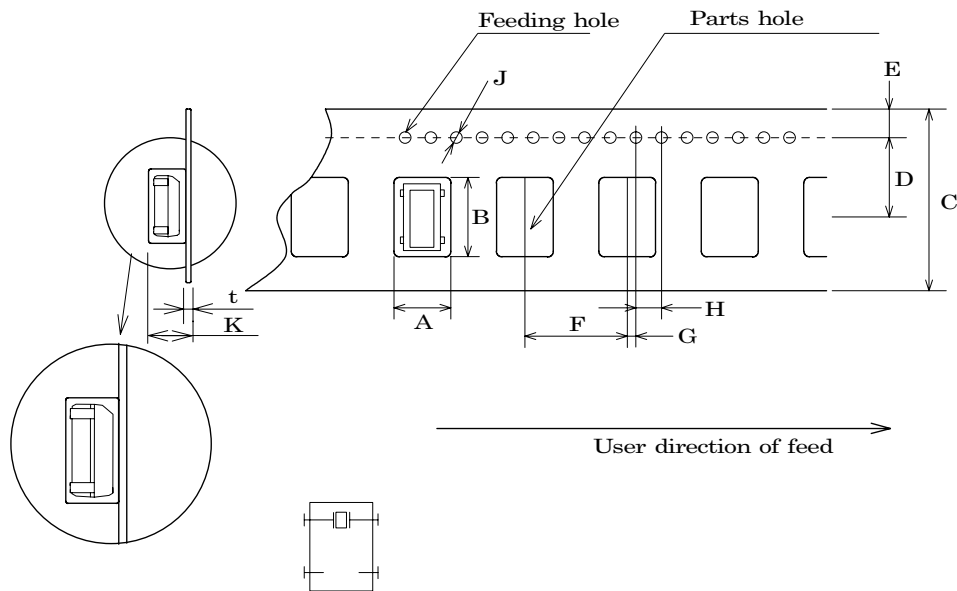
[Carrier tape and tape reel]

Refer to EIA-481A and EIAJ RC-1009.

Tape materials Carrier tape:PS

Top tape :PET+PE

1. Dimensions of carrier tape



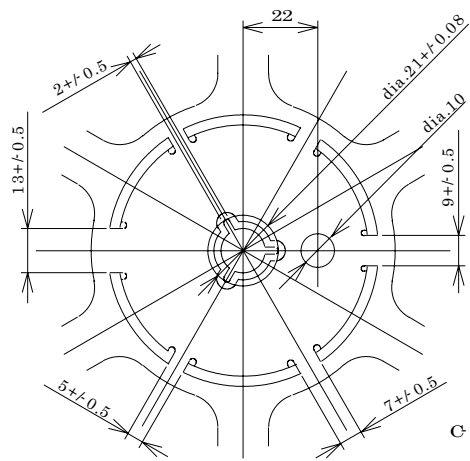
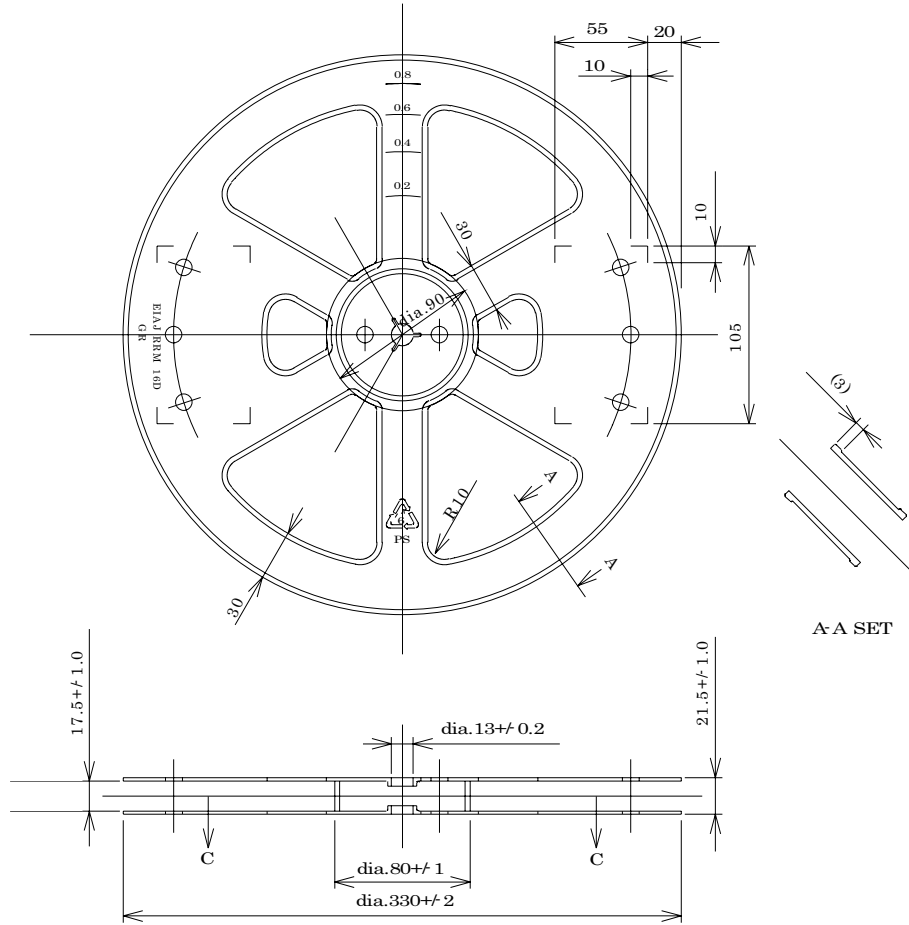
DIMENSIONS

| MARK | DIMENSION |
|------|-----------------|
| A | 4.1 +/-0.1 |
| B | 8.5 +/-0.1 |
| C | 16.0 +/-0.3 |
| D | 7.5 +/-0.1 |
| E | 1.75+/-0.1 |
| F | 8.0+/- 0.1 |
| G | 2.0+/- 0.1 |
| H | 4.0+/- 0.1 |
| J | dia. 1.5+0.1,-0 |
| K | 2.7 +/-0.1 |
| t | 0.3 +/-0.05 |

(UNIT :mm)

| | | | |
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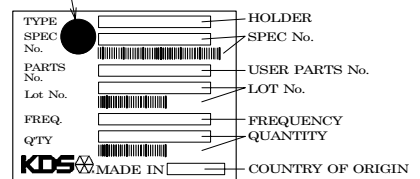
2. Dimensions of tape reel and marking



REEL :PS
(UNIT :mm)

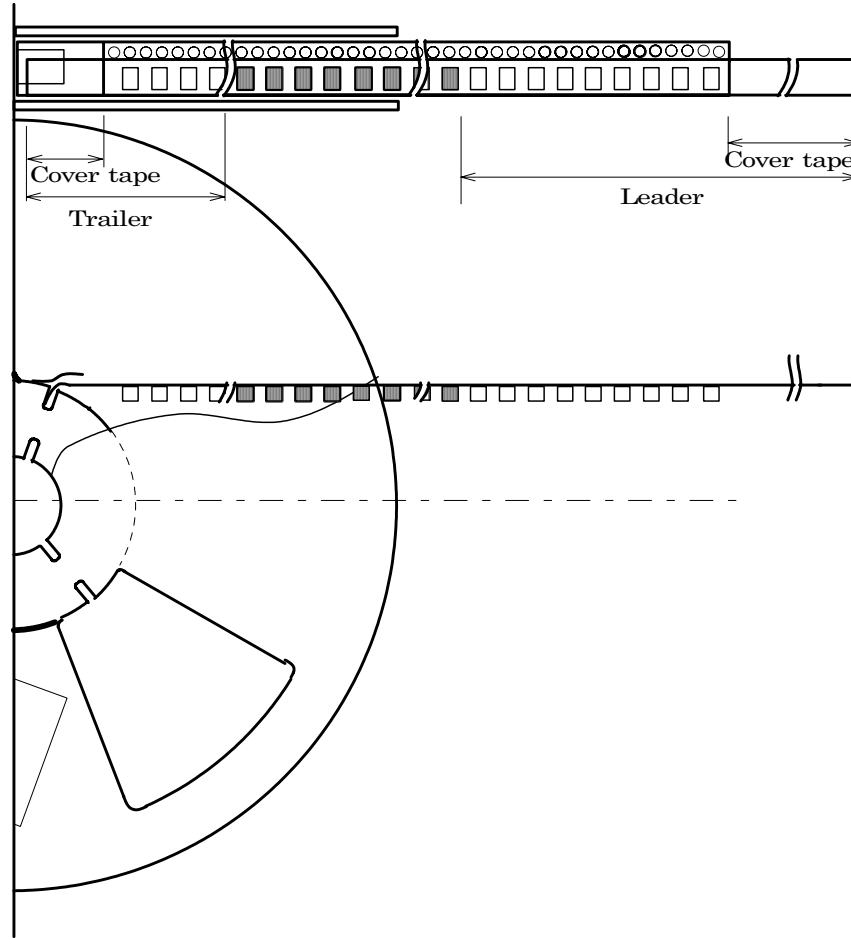
C-C Expansion figure
label

A green dot is marked onto the shipping label.



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3. Carrier tape leader and trailer specifications



| | | |
|---------|--------------|---|
| Leader | Cover tape | The length of cover-tape in the leader is more than 400mm to 560mm including empty embossed area. |
| | Carrier tape | After all products were packaged, must remain more than twenty pieces or 30mm to 70mm empty area, which should be sealed by cover-tape. |
| Trailer | Cover tape | The tip of cover-tape shall be fixed temporary by paper tape and roll around the core of reel one round. |
| | Carrier tape | The empty embossed area which are sealed by top cover-tape must remain more than 110 mm. |

4. Storage condition

Temperature : +40deg.C Max. Relative humidity : 80% Max.

5. Standard quantity

2500pcs./Reel

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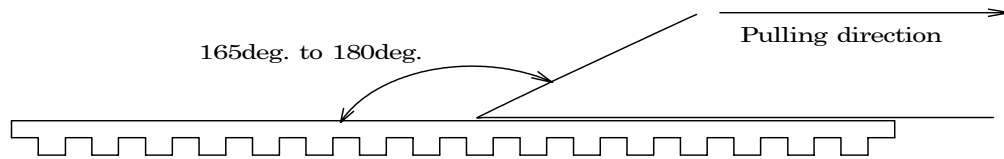
6. Release strength of cover tape

It has to be between 0.1N to 0.7N under following condition.

Pulling direction : 165deg. to 180deg.

Speed : 300mm/min

Otherwise unless specified



7. Vacant sections of the products

There is no more than two vacant sections in series except for the area of leader and terminal.

8. Removal and repair of the failure products

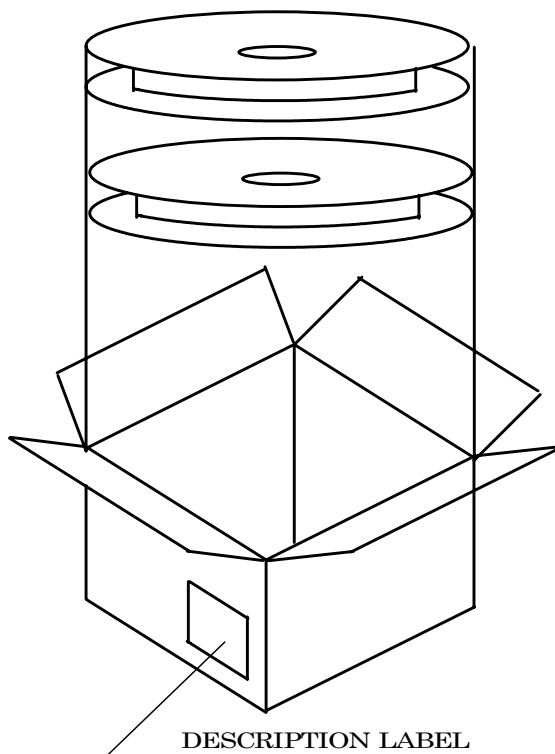
In case we find any failure after taping, we may cut the top-covertape along the direction of tension to exchange or remove the products and re-pack with the cellophane tape in the state that according to the specification as shown above.

9. Outer box

Crystal unit shall be packed in inner box by production lot.

Outer carton size would be changed depending on lot size.

The direction label shall be put on outer carton.



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