Serial No, 2005-1169

DATE: 2005.09.14

ITEM: QUARTZ CRYSTAL

TYPE: SM-14J

NOMINAL FREQUENCY: 32.768kHz

SPEC No. JAPAN;1TJJ125DN1A103L TIANJIN;1TJT125DN1A103L

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

| RECEIVED OF SPECIFICATION | |
|---|---|
| DATE | |
| RECEIVED | (signature)<br>(name) |

Pioneering New Breakthroughs in Electronics


DAISHINKU CORP.

1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan Phone(0794)25-3141
Fax(0794)25-1134 Telex J36704 KDSJPN

C.ENG. T. Nakamura

ENG. H. Nasu

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

| | | |
|---|---|---|
| 1-1 | NOMINAL FREQUENCY | 32.768 kHz |
| 1-2 | FREQUENCY TOLERANCE | +/- 20 ppm Max. |
| 1-3 | LOADING CAPACITANCE | 12.5 pF |
| 1-4 | EQUIVALENT RESISTANCE | 70 kohm Max. / SERIES |
| 1-5 | DRIVE LEVEL | 1.0 uW +/- 0.2 uW |
| 1-6 | Q | 30000 Min. |
| 1-7 | TURNOVER TEMPERATURE | 25 deg.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 | - 40 deg.C to + 85 deg.C |
| 1-12 | PARALLEL CAPACITANCE | 1.05 pF TYP. |
| 1-13 | CAPACITANCE RATIO | 520 TYP. |

| MANUFACTURING LOCATION | SPEC No. |
|---|---|
| JAPAN | 1TJJ125DN1A103L |
| TIANJIN | 1TJT125DN1A103L |

2. CONSTRUCTION

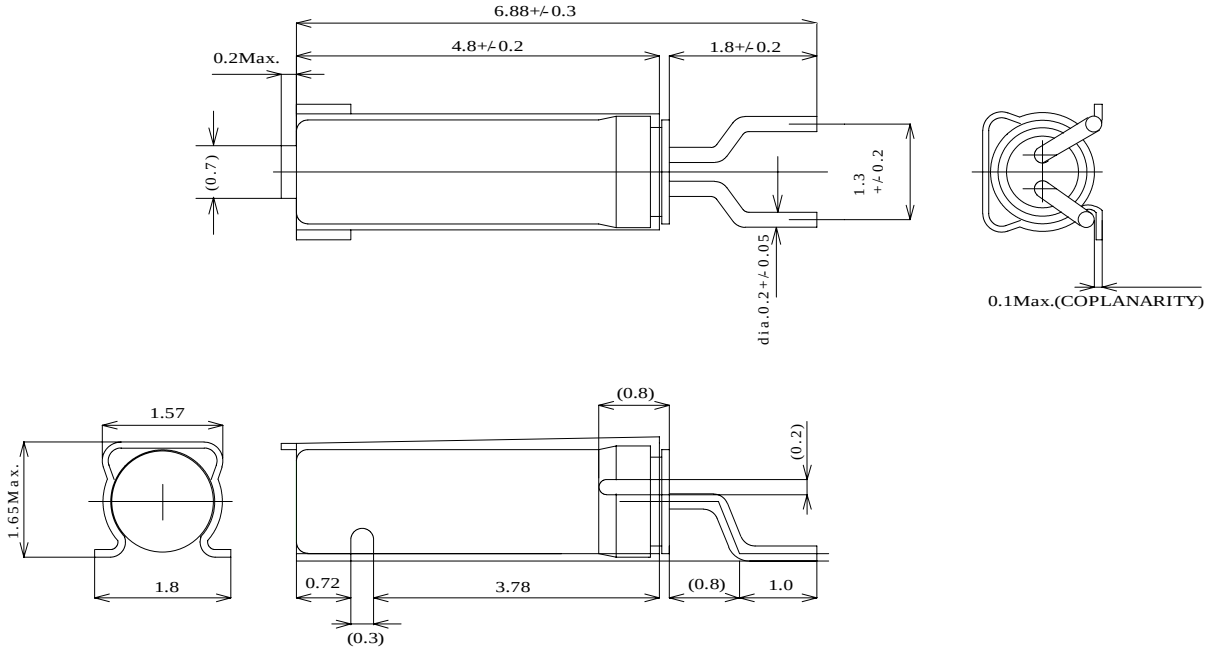
| | | |
|---|---|---|
| 2-1 | HOLDER | SM-14J |
| 2-2 | DIMENSIONS AND MARKING | Refer to Fig-1, Fig-2. |

3. OTHER SPECIFICATIONS

Environmental and mechanical endurance shall be specified by attached general specifications.

| TITLE SM-14J TYPE QUARTZ CRYSTAL SPECIFICATION | Trigonometry | Unit MM | Scale |
|---|---|---|---|
| Date 2005/05/10 | Drawing No. | Rev. | Page 1/2 |

Dimensions



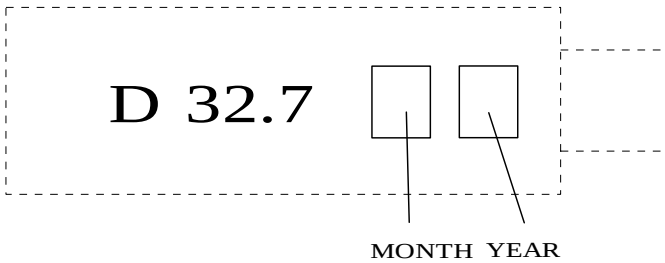

(UNIT: mm)

Fig-1

Marking

Manufacturer's code and manufacturing date should be marked on the surface of holder as an applicable drawing shows.

Marking direction is not specified.




MONTH : As shown in the Table

EX) May. shall be marked as "E"

YEAR : The last digit of the year

EX) 2005 shall be marked as "5"

| MONTH | Jan. | Feb. | Mar. | Apr. | May. | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SYMBOL | A | B | C | D | E | F | G | H | J | K | L | M |

Fig-2

| TITLE<br>SM-14J TYPE QUARTZ CRYSTAL SPECIFICATION | Trigonometry | Unit<br>MM | Scale |
|---|---|---|---|
| Date<br>2005/05/10 | Drawing No. | Rev. | Page<br>2/2 |

(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-$m^3$ /s by Helium leak detector.

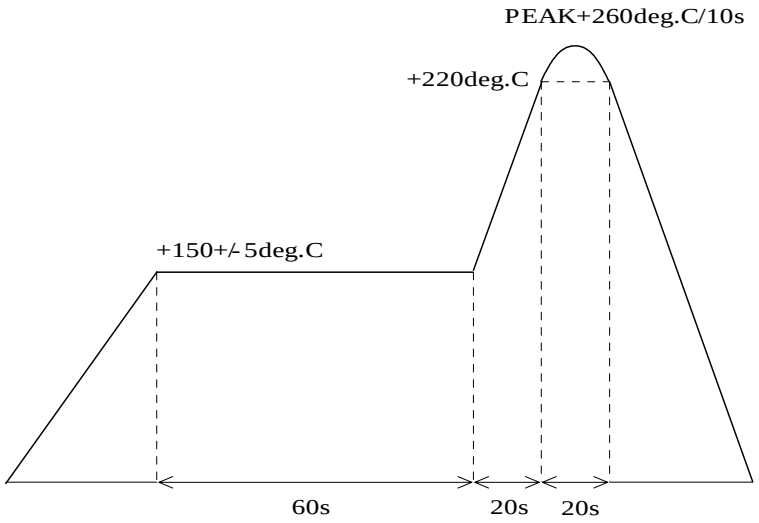
4) SOLDERING DIP

Terminals/lead-wires of specimen shall be dipped into solder melted tank at +230deg.C+/-5deg.C for 3+/-0.5s. (After applying ROSIN flux)

Soldering portion shall be covered in over 70% of terminals/lead-wires dipped.

5) SOLDER REFLOW

After 24h past from following test, Frequency tolerance shall be complied with paragraph (3).3).and the CI value shall be complied with paragraph 1-4




TOTAL:180s Max.

Fig-3

| TITLE SM-14J TYPE QUARTZ CRYSTAL SPECIFICATION | Trigonometry | Unit MM | Scale |
|---|---|---|---|
| Date 2005/05/10 | Drawing No. | Rev. | Page 1/2 |

(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).
120h 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).3).
120h 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).
120h at +85deg.C+/-2deg.C, relative humidity 90% to 95%.

4) TEMPERATURE CYCLE
After supplying the following temperature cycle (25 cycles).
Frequency tolerance and CI value shall be complied with paragraph (3).3).

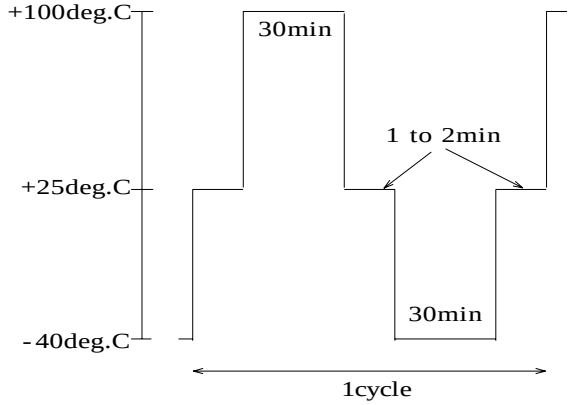



Fig-4

(3) SPECIFICATION

| | | |
|---|---|---|
| 1) | FREQUENCY TOLERANCE(delta F/F)<br>CI VALUE(delta CI) | +/-3ppm Max.<br>+/-15% Max. or 5kohm Max. |
| 2) | FREQUENCY TOLERANCE(delta F/F)<br>CI VALUE(delta CI) | +/-5ppm Max.<br>+/-25% Max. or 10kohm Max. |
| 3) | FREQUENCY TOLERANCE(delta F/F)<br>CI VALUE(delta CI) | +/-10ppm Max.<br>+/-25% Max. or 10kohm Max. |

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

[NOTE]
1)A cap side isn't to 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.

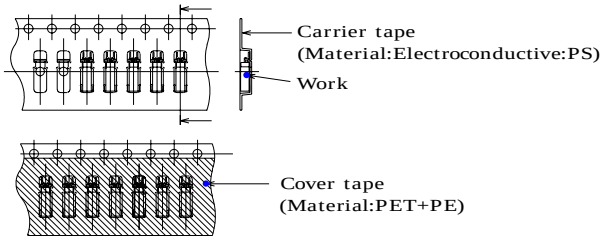
[Carrier tape and tape reel]

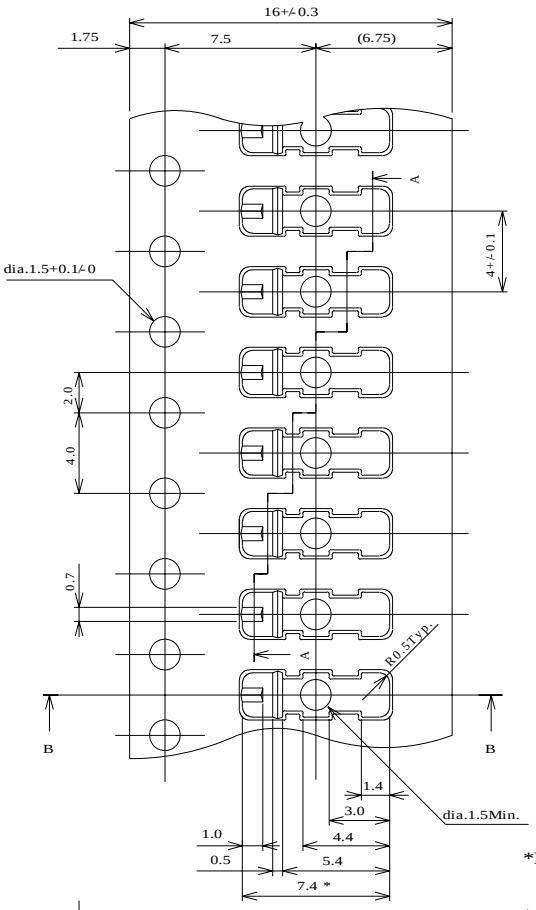
Refer to EIA-481A and EIAJ RC-1009.

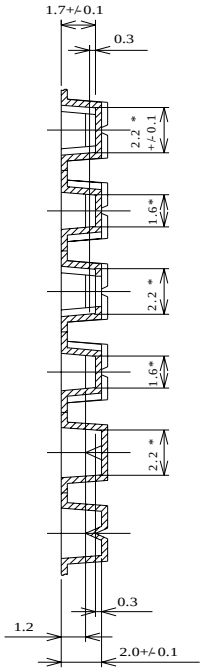
Tape materials Carrier tape : PS

Top tape : PET+PE

(1) Dimensions of carrier tape

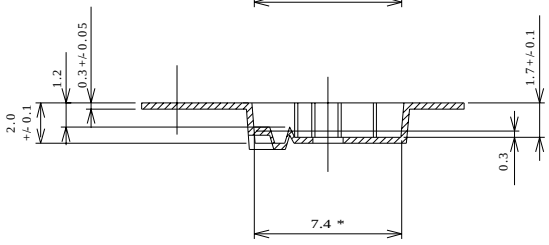



A-A CROSS SECTION

*Measure it in the position of 0.3mm from the bottom.

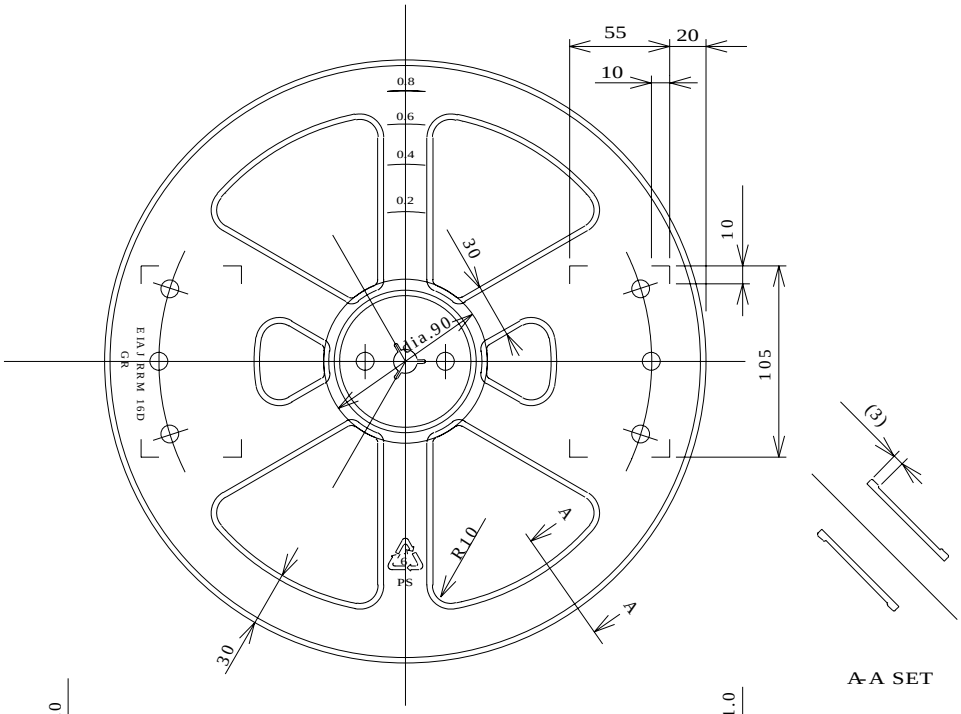



B-B CROSS SECTION

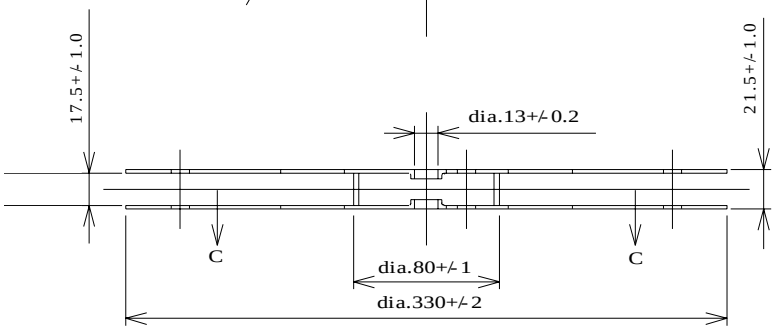
(UNIT:mm)

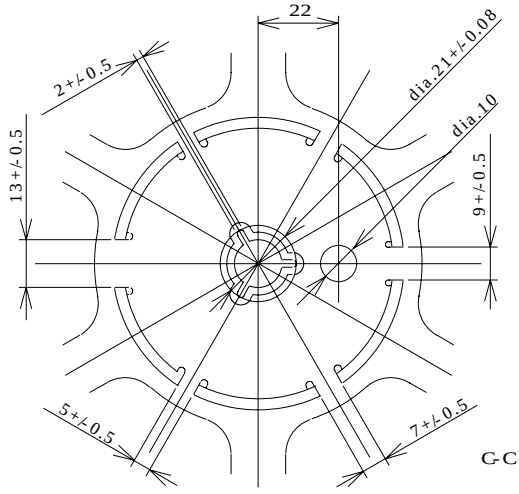
| TITLE<br>SM-14J TYPE QUARTZ CRYSTAL SPECIFICATION | Trigonometry | Unit<br>MM | Scale |
|---|---|---|---|
| Date<br>2005/05/10 | Drawing No. | Rev. | Page<br>1/4 |

(2) Dimensions of tape reel and marking




A-A SET



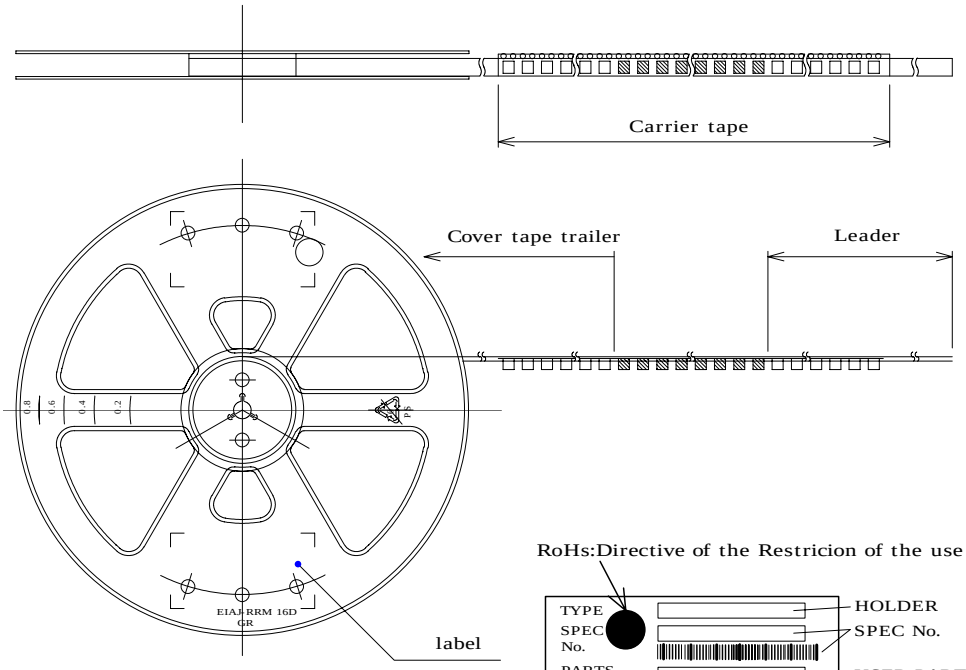




C-C Expension figure

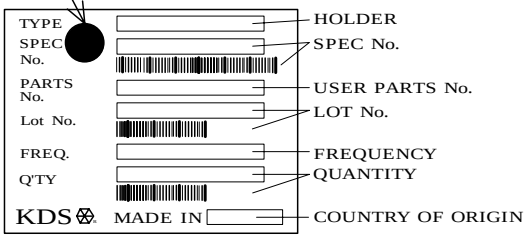
REEL:P.S
(UNIT::mm)

| TITLE<br>SM-14J TYPE QUARTZ CRYSTAL SPECIFICATION | Trigonometry | Unit<br>MM | Scale |
|---|---|---|---|
| Date<br>2005/05/10 | Drawing No. | Rev. | Page<br>2/4 |

(3) Carrier tape leader and trailer specifications




RoHs:Directive of the Restricion of the use of the Hazardous Substances.




| | | |
|---|---|---|
| Leader | Cover tape | The length of cover-tape in the leader is more than 400 mm including empty embossed area. |
| | Carrier tape | After all products were packaged, must remain more than twenty pieces or 400 mm 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 40 mm. |

(4) Storage condition

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

(5) Standard quantity

5000pcs. / Reel

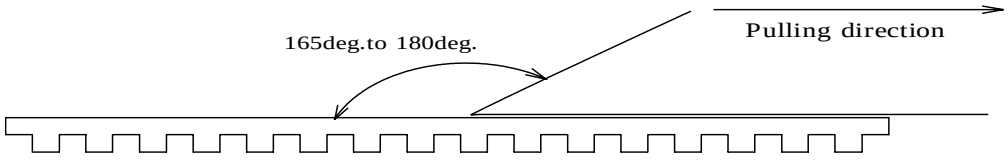
(6) Release strength of cover tape

It has to 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

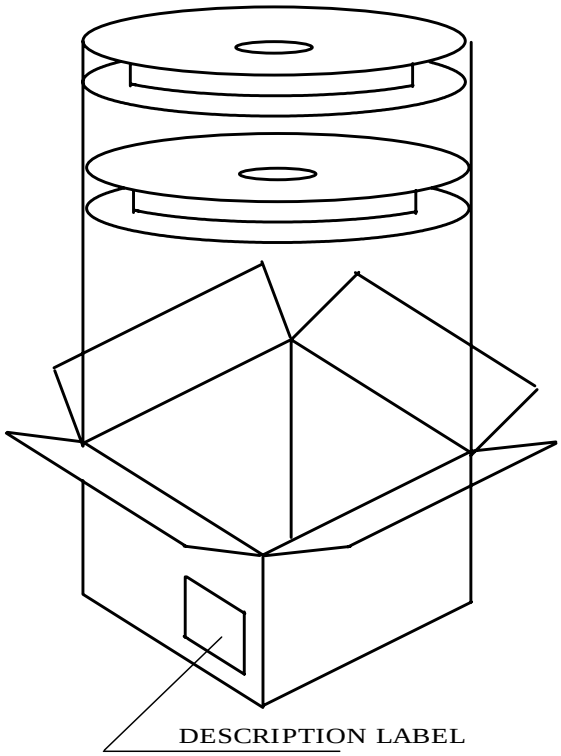
In case we find any failure after taping, we may cut the top-covertape along the direction of tension to exchange or remove the products and re-pack with the cellophane tape in the state that according to the specification as shown above.

(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.



# 2005-1169REVISION RECORD

| Rev.No. | Date | Reason | Contents | Approved | Checked | Drawn |
|---|---|---|---|---|---|---|
| - | 2005/05/10 | | The first edition. | T.N | | H.N |
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