

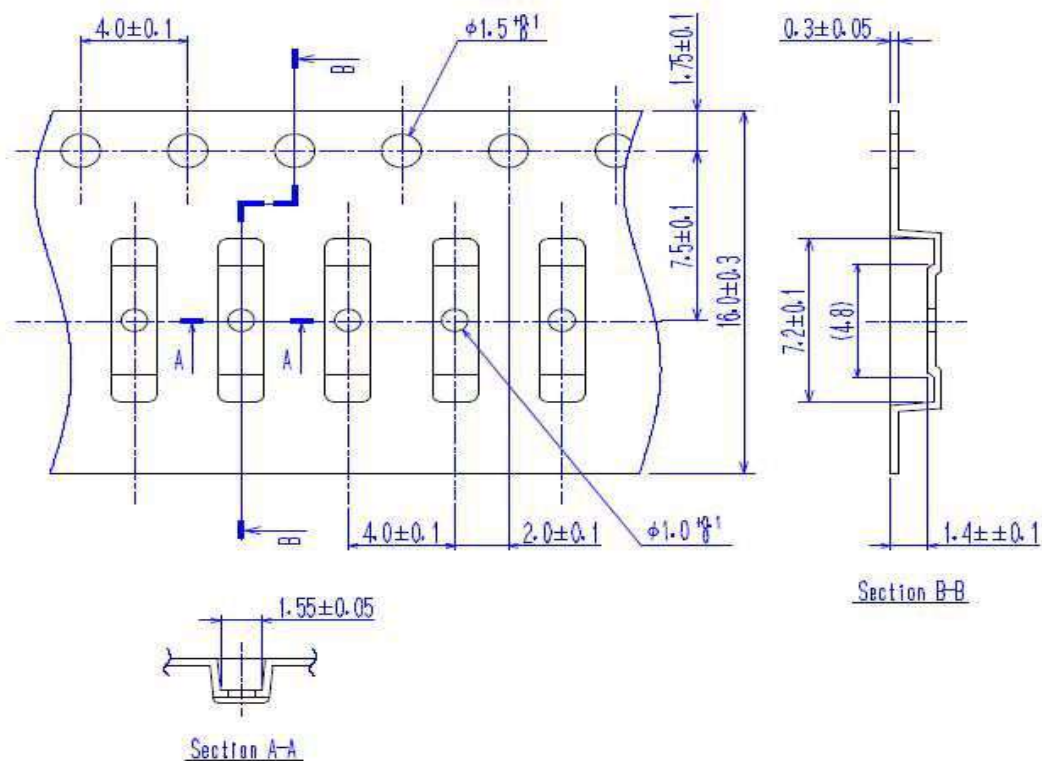
## 1. QUARTZ CRYSTAL UNIT SPECIFICATION

|                                   |                                                         |
|-----------------------------------|---------------------------------------------------------|
| 1.1 Frequency :                   | 32.768KHz                                               |
| 1.2 Holder type :                 | SMD7×1.5×1.4mm                                          |
| 1.3 Frequency tolerance :         | ±20ppm at 25°C                                          |
| 1.4 Equivalent resistance :       | 65Kohms max.                                            |
| 1.5 Operating temperature range : | -40°C To +85°C                                          |
| 1.6 Storage temperature range :   | -55°C To +125°C                                         |
| 1.7 Temperature Coefficient :     | $(-3.5 \pm 1.0) \times 10^{-8} / ^\circ\text{C}^2$ max. |
| 1.8 Turn-over temperature :       | +25°C ±5°C                                              |
| 1.9 Loading capacitance (CL) :    | 12.5pF                                                  |
| 1.10 Drive level :                | 1.0uW max.                                              |
| 1.11 Shunt Capacitance :          | 0.8pF Typical                                           |
| 1.12 Motional Capacitance :       | 1.9fF Typical                                           |
| 1.13 Q-value :                    | 40K min.                                                |
| 1.13 Insulation resistance :      | More than 500M ohms                                     |
| 1.14 Aging :                      | ±3 ppm/Year max. (+25°C First Year)                     |
| 1.15 Reflow Profile :             | +260°C (IR Reflow 5 Sec max.)                           |
| 1.16 Dimensions and marking:      | Refer to page.4                                         |
| 1.17 Emboss carrier tape & reel:  | Refer to page.5~ page.7                                 |
| 1.18 Note                         |                                                         |

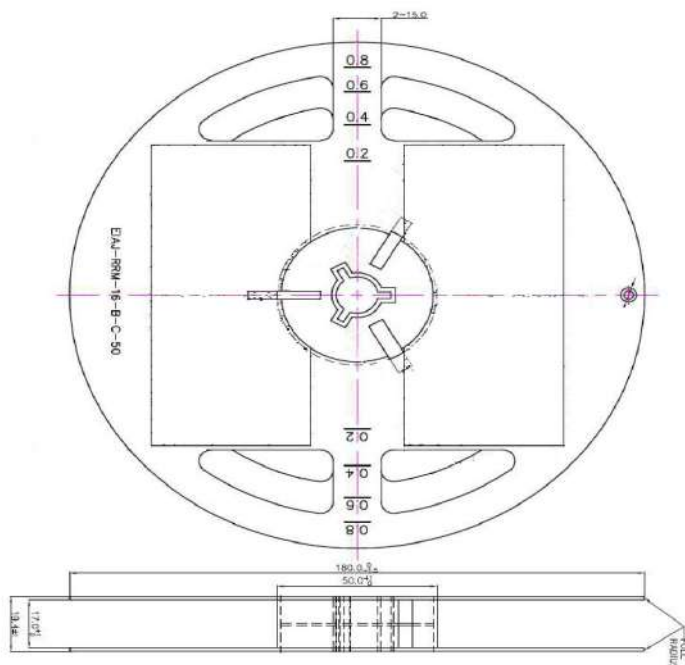


### 3 CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape (Unit: mm)



b.) Dimensions of Reel (Unit: mm)



c.) Storage condition

Temperature: +40deg.C Max.

Relative Humidity: 80% Max.

d.) Standard packing quantity

3,000PCS / REEL

e.) Material of the tape

Material(Carrier tape) : Black conductive PS

Material (Cover tape) : Clear PE

Material (Reel) : PS

f.) Label contents

.The type of product

.Our specification No.

.Your Part No.

.Lot No.

.Nominal Frequency

.Quantity

.Our Company Name

Sticks label for every reel.

INSPECTION RECORDS

PO NO.:

CUSTOMER P/N:

FT P/N:

LOT NO.:

PACKAGE:

FREQUENCY:

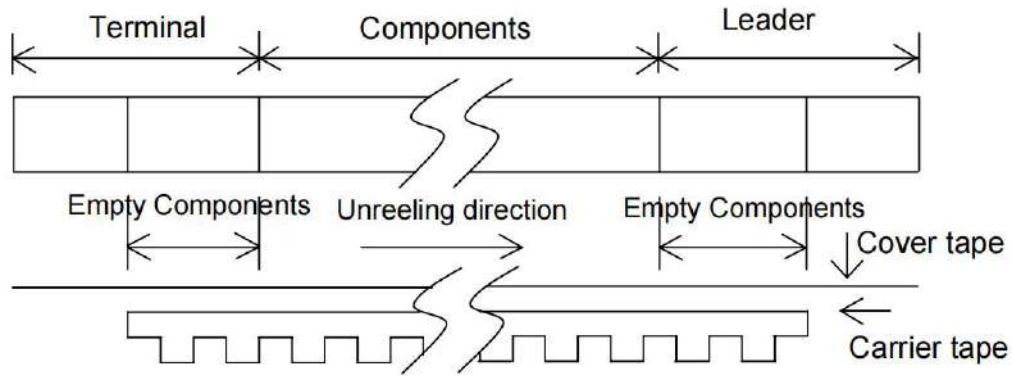
REMARKS:

QUANTITY:

FRONTER ELECTRONICS CO., LTD.

g.) Taping dimension

|          |              |                                                                                                                                   |
|----------|--------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| Terminal | 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 the 40 mm.                                            |



h.) Joint of tape

The carrier-tape and top cover-tape should not be jointed.

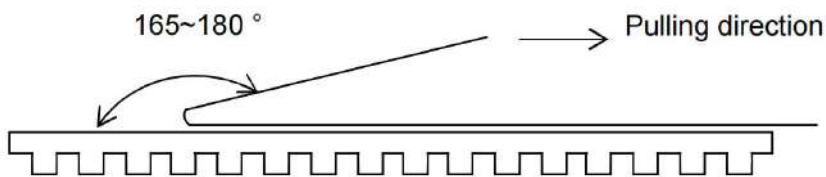
i.) Release strength of cover tape

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

Pulling direction  $165^{\circ}$  to  $180^{\circ}$

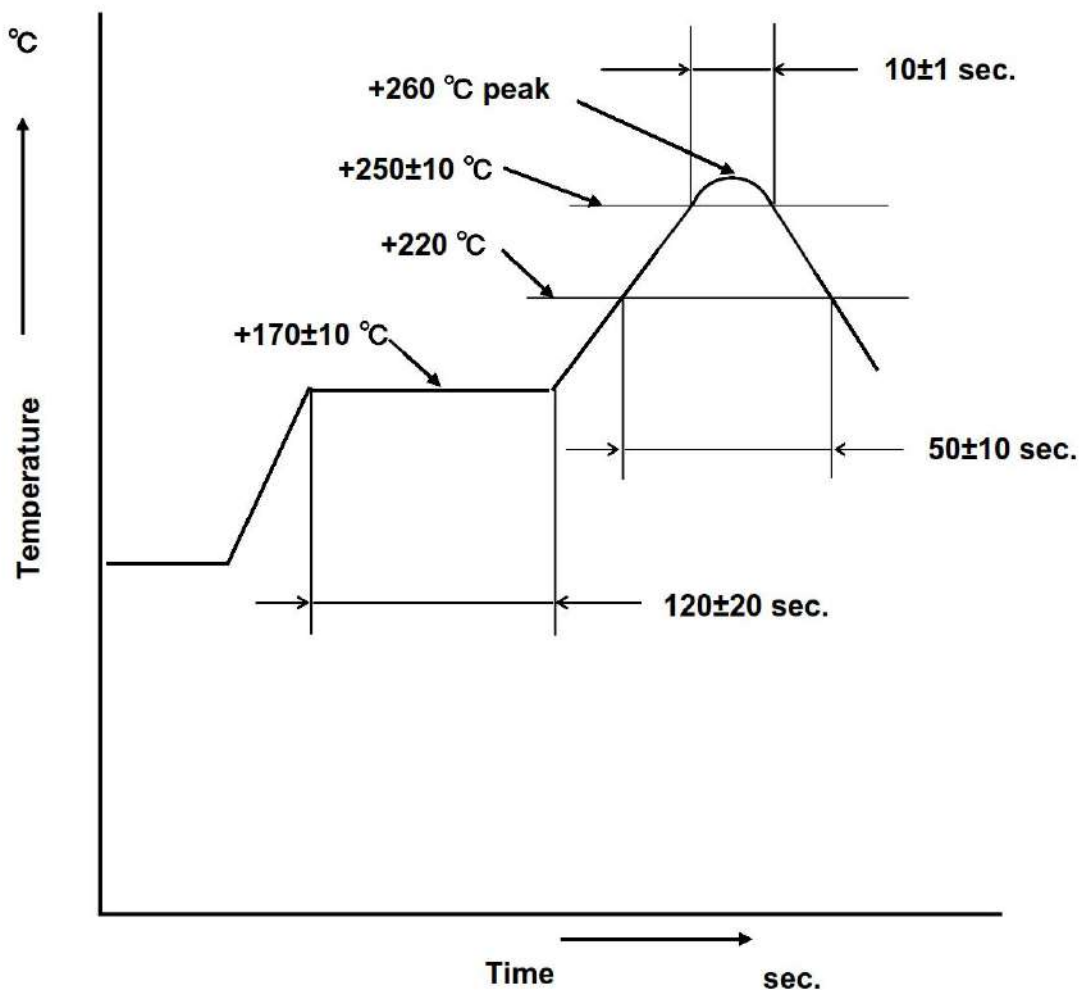
Speed 300mm/min.

Otherwise unless specified.



Other standards shall be based on JIS C 0806-1990.

#### 4. Reflow Profile



Note: The temperature used herein means the temperature on the circuit board.

Reflow : 2 times max.

## 5. Environment-proof •Mechanical property

| No | Item                                       | Specifications                       | Conditions                                                                                                  |    |
|----|--------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------|----|
| 1  | High temperature storage                   | $\Delta f/f = \pm 10 \times 10^{-6}$ | After storage under 85 °C for 500 hrs, measure at room temperature                                          | *1 |
| 2  | Low temperature storage                    | $\Delta f/f = \pm 10 \times 10^{-6}$ | After storage under -40 °C for 500hrs, measure at room temperature.                                         | *1 |
| 3  | High temperature and high humidity storage | $\Delta f/f = \pm 10 \times 10^{-6}$ | After storage under 60 °C $\pm$ 2 °C, 90 to 95% RH for 500 hrs, measure at room temperature.                | *1 |
| 4  | Thermal shock resistance                   | $\Delta f/f = \pm 10 \times 10^{-6}$ | Measured at room temperature after 20 cycles.<br>-25 °C $\leftrightarrow$ +80 °C for 30 minutes.            | *1 |
| 5  | Mechanical shock resistance                | $\Delta f/f = \pm 5 \times 10^{-6}$  | Measure after free drop of the RESONATOR three times from the height of 75cm onto a wooden board.           | *2 |
| 6  | Vibration resistance                       | $\Delta f/f = \pm 5 \times 10^{-6}$  | Amplitude 1.5mm and 10 ~ 60Hz with *2 cycle time 2~3 minutes in 3 direction (X,Y,and Z axis)each for 2 hrs. | *1 |
| 7  | IR Reflow                                  | $\Delta f/f = \pm 10 \times 10^{-6}$ | Measure after 1 time reflow under reflow profile specified in page 8                                        | *1 |

Note:

1. The above tests no. 1 to 7 must be conducted independently (not series tests)
2. \*1: Measure after 24 hours soak at room temperature .
3. \*2: Measure after 2 hours soak at room temperature .
4. R1 is 85kΩ max. after the each above tests.