1. QUARTZ CRYSTAL UNIT SPECIFICATION

1.1 Nominal Frequency :	32.00000MHz
1.2 Holder type :	FTX321S（SMD3225 Seam Type）
1.3 Mode of oscillation :	Fundamental
1.4 Frequency tolerance (Δ FL) :	±10ppm at 25℃±3℃
1.5 Equivalent resistance (RR) :	30ohms max
1.6 Operating temperature range (T_{OPR}) :	-20℃ To +70℃
1.7 Storage temperature range (T_{STG}) :	-55℃ To +125℃
1.8 Frequency Stability :	±10ppm at -20℃ To +70℃
1.9 Loading capacitance (CL) :	12pF
1.10 Drive level (D_L) :	100 uW Typical（200uW max）
1.11 Shunt Capacitance (C0) :	5.0pF max
1.12 Insulation resistance (IR) :	More than 500MΩ at DC 100V
1.13 Circuit :	Measured in HP/E5100A,S&A 250B
1.14 Aging :	±3 ppm Max (+25℃ 1st Year)
1.15 Dimensions and marking :	Refer to page.3
1.16 Emboss carrier tape & reel :	Refer to page.5 and page.6

1.17 Note :

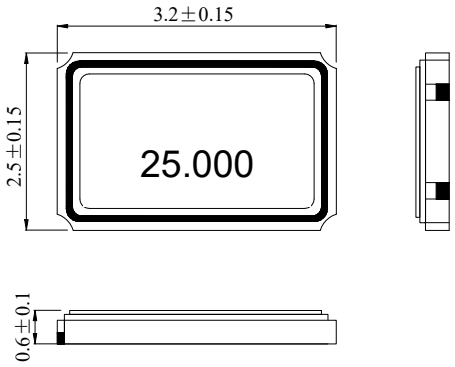
Standard atmospheric conditions

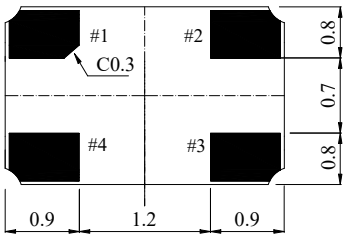
Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±3℃

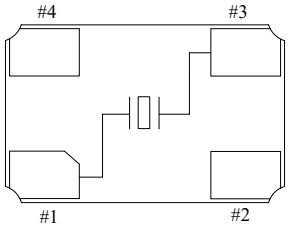
Relative humidity : 40%~70%

2. FTX321S MARKING & DIMENSIONS

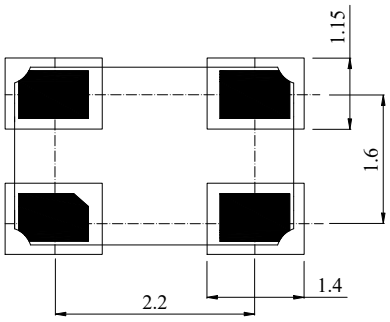




Marking #2, #4 is connected with metal cap of top.



<TOP VIEW>



Recommended Solder Pad Layout:

*Marking should be printed as following:

Logo, Nominal Frequency

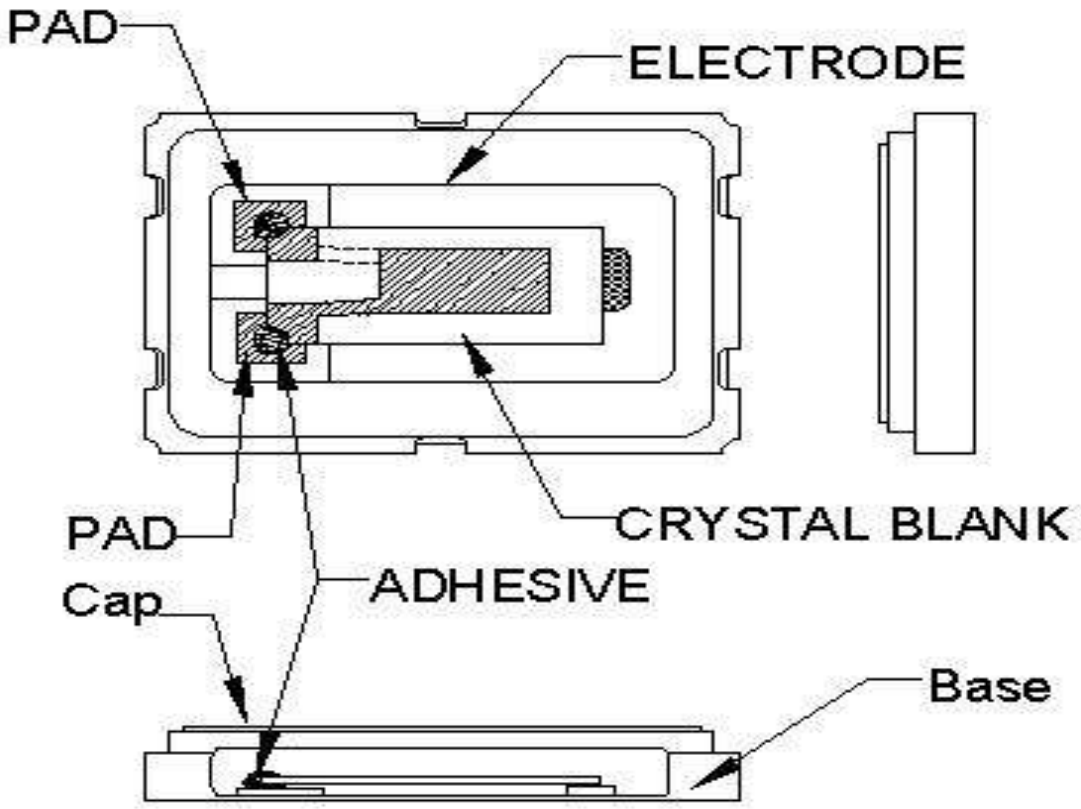
*Manufacturing Logo: FT

*Nominal frequency = 3 number after decimal point MAX.

(ex. 12.000 MHz → 12.000)

Marking: Laser marking

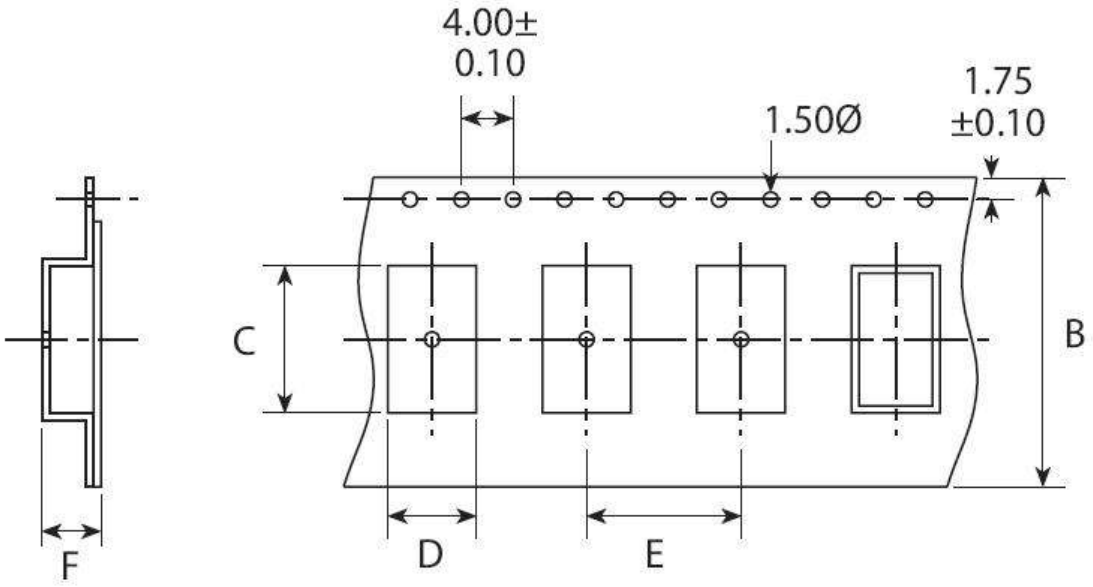
3. INSIDE STRUCTURE



Reference drawing

Base: Alumina Ceramic (Al_2O_3) Metallized Pad: W Ni Plating Au Plating
Cap: Fe-Ni
(3) Crystal Enclosure Seal: Seal Seam
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Polyimide Resin
(6) Electrode Ag
(7) PAD Alumina Ceramic (W. Ni. Au)

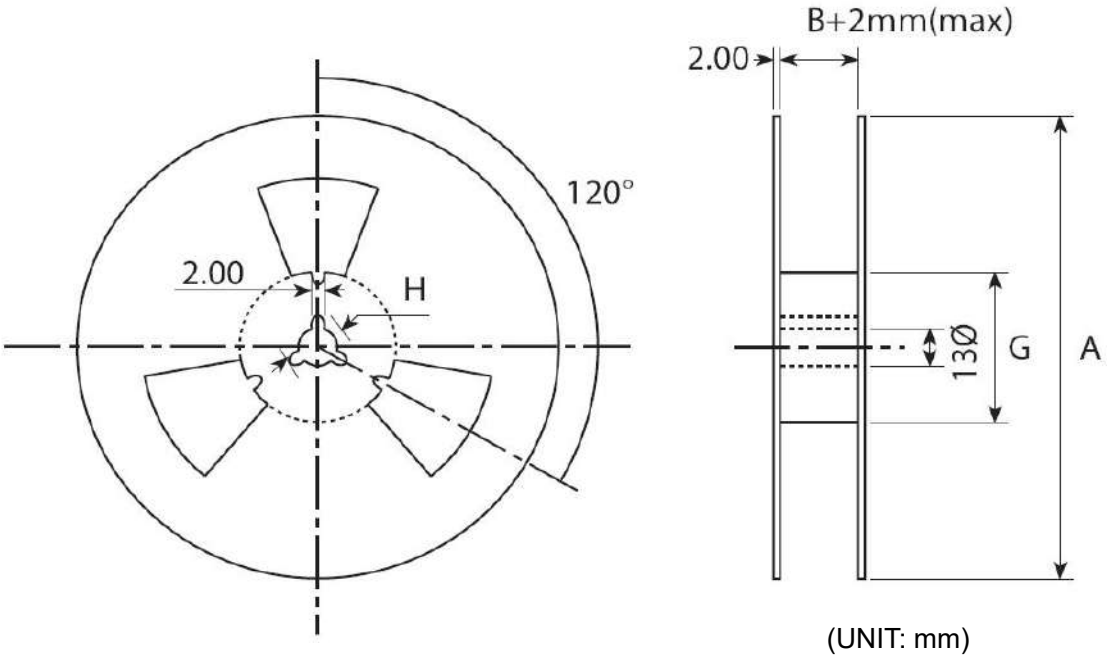
4. FTX321S EMBOSS CARRIER TAPE & REEL



	A	B	C	D	E	F	G
SMD3225	178±2.0	8.0±0.3	3.55±0.10	2.80±0.10	4.0±0.1	0.85±0.10	60.5±1.0

(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

Tape	Material
Carrier tape	A – PET
Top tape	Polyester

f.) Label contents

.The type of product

.Our specification No.

.Your Part No.

.Lot No.

.Nominal Frequency

.Quantity

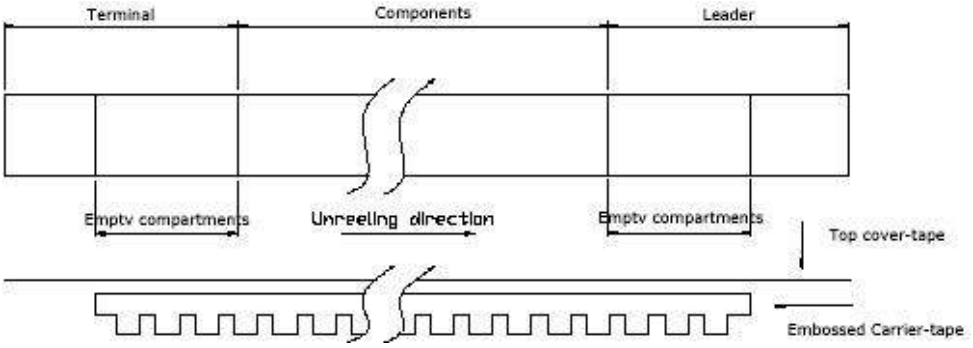
.Our Company Name

Sticks label for every reel.

PART NUMBER	
PO NO	
PR. NO:	
HOLDER TYPE	
FREQUENCY	
REMAKS	
QUANTITY	

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.

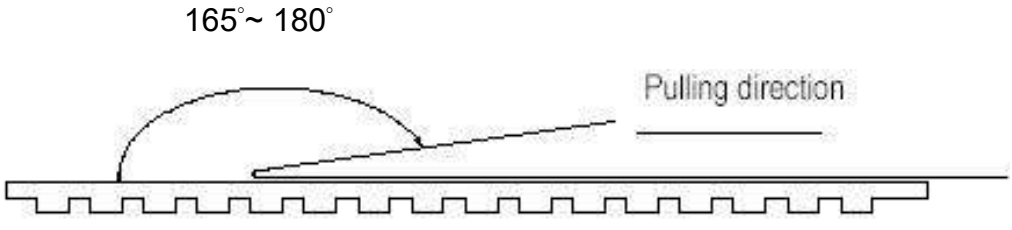


h.) Joint of tape

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

i.) Release strength of cover tape

It has to between 0.1N to 0.7N under following condition.
Pulling direction 165° to 180°
Speed 300mm/min.
Otherwise unless specified.



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

5. Mechanical Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour min.

5.1	Drop	Method：fallen on the concrete (thickness is 3cm or more) Height：75 cm Direction：each direction of 3 mutually perpendicular (x、y、z) axis. Number of shocks：2 shocks in each direction	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max
5.2	Vibration	Should be satisfied after supplying following vibration. (1)Vibration Frequency: 10~55Hz (2)Cycle: 1 to 2 Min. (3)Full Cycle: 1.5mm P-P. (4)Direction: X.Y.Z (5)Time: 2 Hours / Each Direction	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max
5.3	Substrate Bending	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –1 Speed: 0.5 mm/sec Hours: 5 ± 1 sec Amount of substrate: 3 mm Max.	Without mechanical damage such as breaks. Without electrode peeling. Electrical characteristics shall be satisfied.
5.4	Adhesion	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –2 Weight: 10N Hours: 10 ± 1 sec	
5.5	Body strength	Mount the specimen on substrate. Apply the following pressure Direction: see Fig –3 Weight: 10N Hours: 10 ± 1 sec	

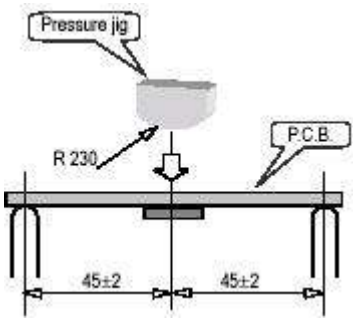


Fig-1

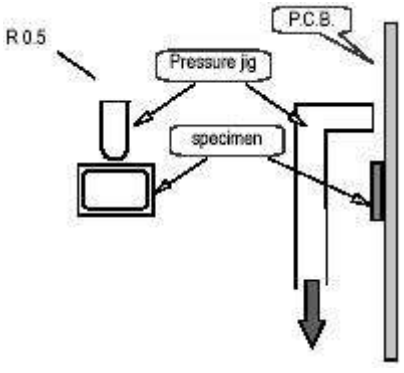


Fig-2

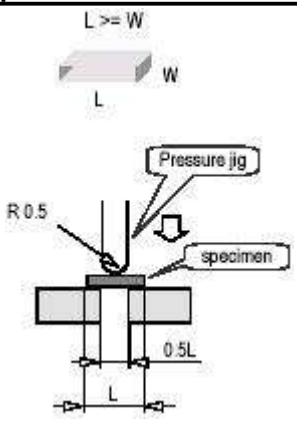
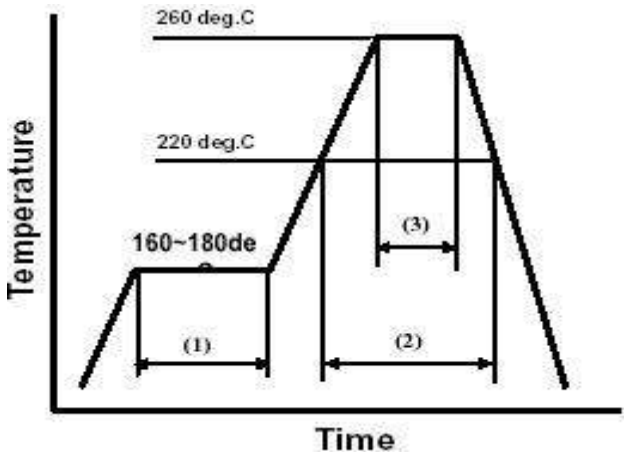


Fig-3

<table>
<tr><td>5.6</td><td>Seal</td><td>Less than 3.0 x 10^{-8} atm.cc/sec by Helium leak detector.
Also, no serial bubble is observed by Fluorinate tests.</td><td></td></tr>
<tr><td>5.7</td><td>Solder ability</td><td>3 sec Dip in 235℃±5℃ solder.
(Use ROSIN type flux for solder.)</td><td>More than 90% of lead shall be covered by new solder.</td></tr>
<tr><td>5.8</td><td>Resistance to Soldering Heat</td><td>Run in Reflow
Reflow soldering shall be allowed
Only two(2) time.

Available for Lead Free Soldering
 

<table>
<tr><td>(1)</td><td>Preheat</td><td>160~180 deg.C</td><td>120sec.</td></tr>
<tr><td>(2)</td><td>Primary heat</td><td>220 deg.C</td><td>60sec.</td></tr>
<tr><td>(3)</td><td>Peak</td><td>260 deg.C</td><td>10sec. Max.</td></tr>
</table></td><td>Freq. Drift
±5ppm Max.

Resistance Drift
±20% Max.</td></tr>
</table>

6. Environmental Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour min.

	Item	Conditions	Specifications
6.1	Humidity	Should be satisfied after letting it alone at +60℃±2℃ in humidity of 90%～95% for 500 hours.	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max
6.2	Storage in Low Temperature	Should be satisfied after letting it alone at -40℃±3℃ for 500 hours.	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max
6.3	Storage in High Temperature	Should be satisfied after letting it alone at +85℃±3℃ for 500 hours.	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max
6.4	Temperature Cycle	Should be satisfied after supplying the following temperature cycle (100 cycles). (Refer to Fig-4). Temperature shift from low to high, high to low shall be done in 1℃/min.	Freq. Drift ± 5ppm Max Resistance Drift ± 15% Max

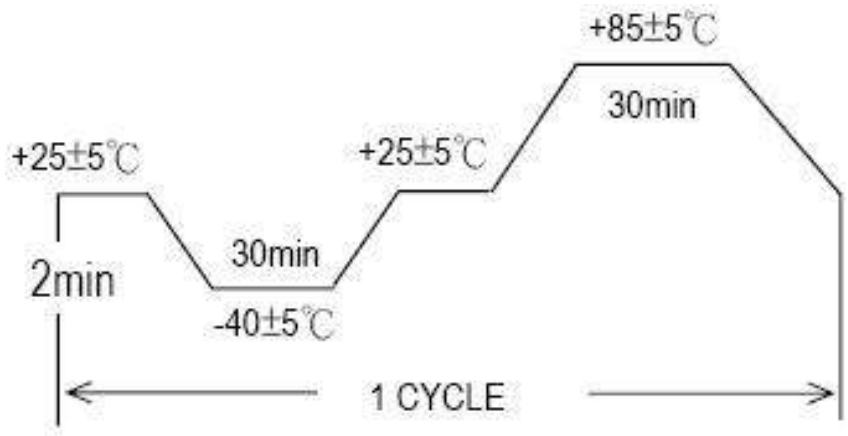


Fig-4