Serial No. : 2014-0510
DATE : 2014/05/09

ITEM : CRYSTAL RESONATOR

TYPE :	DST210A
NOMINAL FREQUENCY :	32.768kHz
SPEC No. :	1TJG090DP1A0005

Please acknowledge receipt of this specification by signing and returning a copy to us.

RECEIPT	
DATE	
RECEIVED	(signature) (name)

General Manufacturer of Quartz Devices
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C.ENG. T. Nakamura

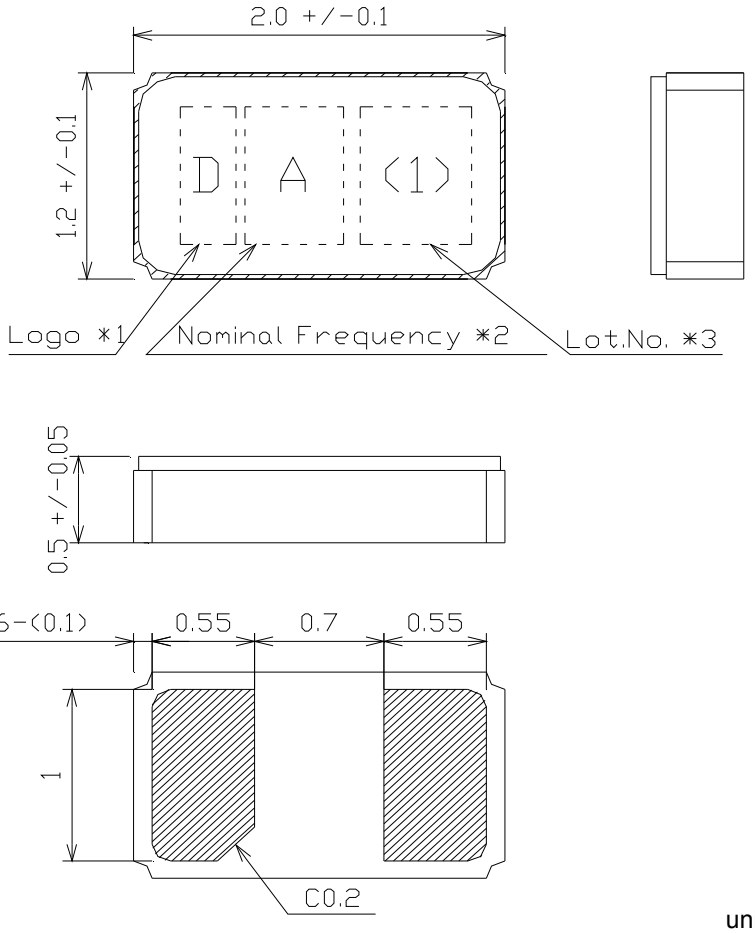
ENG. H. Ichihara

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)	9.0 pF
1.4.	FREQUENCY TOLERANCE	±20 $\times 10^{-6}$ max. (at +25±3°C)
1.5.	DRIVE LEVEL	0.2 μW ± 20% (1μW max.)
1.6.	SERIES RESISTANCE	80 kΩ max. (at Series)
1.7.	TURNOVER TEMPERATURE	+25 ±5°C
1.8.	PARABOLIC COEFFICIENT	-0.04×10^{-6} / $°C^2$ 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:
Logo(*1),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'.

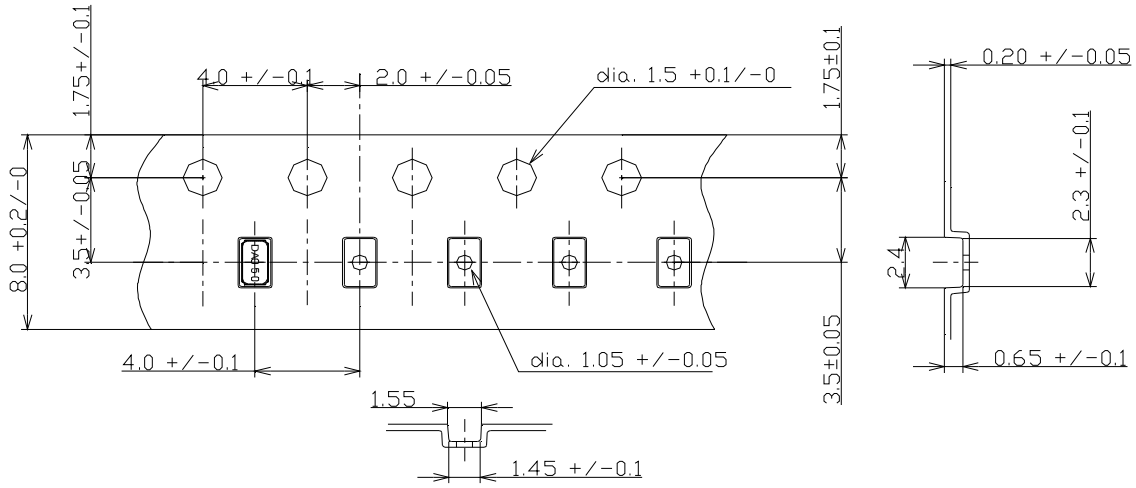
*3 Lot No. shall be marked three figures.
(1) Year:The last digit of the year.
Week:We gave the sequence of week numbers 01(first week) for production date.
There are starting from 1st of Jan.
However,add '0' figure to the first week during the 9th weeks.
The week means are from Sunday to Saturday.

ex. Manufactured day: 2014.05.09 ⟶ 4 19
Year Week

3. PACKING

3.1. EMBOSS CARRIER TAPE & REEL

(1)Dimensions of Emboss carrier tape



Pulling direction

unit:mm

Fig.-2

(2)Dimensions of tape reel

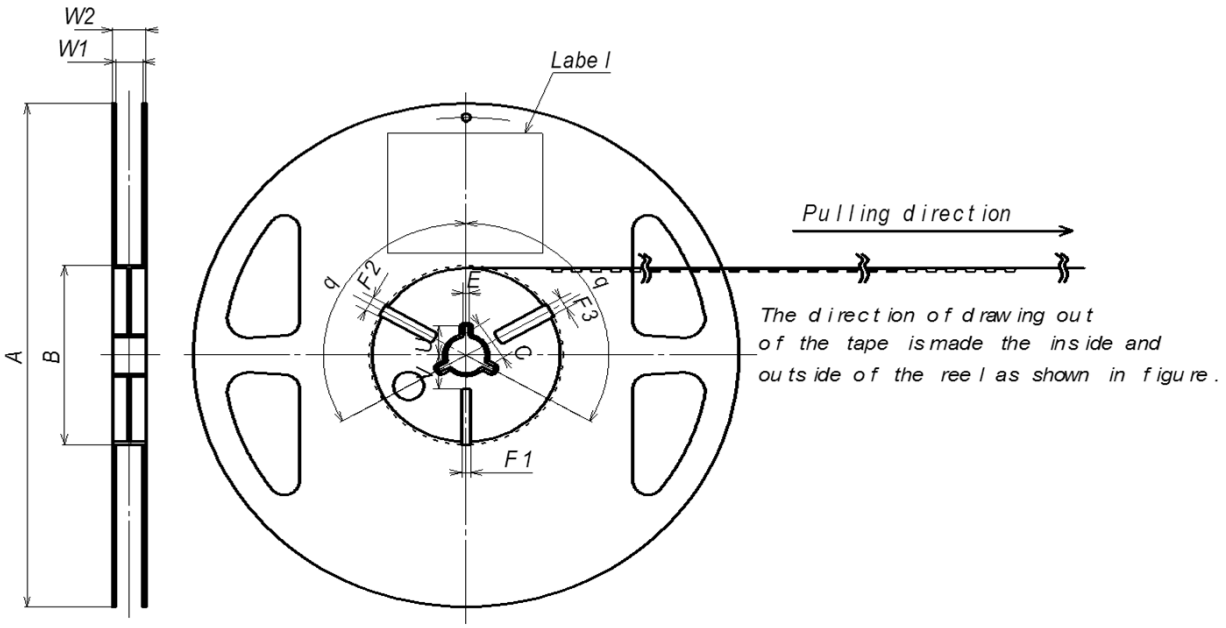


Fig.-3

Title DST210A TYPE QUARTZ CRYSTAL SPECIFICATION	Remark		
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Table-1

unit:mm

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

(3)Storage Condition

Temperature;+40°C max.,Relative Humidity;80% max.

Storage Period:6months max.

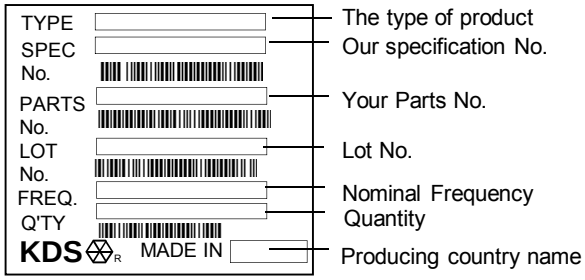
(4)Standard packing quantity

3,000pcs./reel for Φ180

(5)Material of the tape

tape	Material
Carrier tape	Polystyrene,Carbon
Cover tape	Polyethylene

(6)Label Contents



Stick a label on the each reel.

Title	Remark		
DST210A TYPE QUARTZ CRYSTAL SPECIFICATION			
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(7)Taping Dimension

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

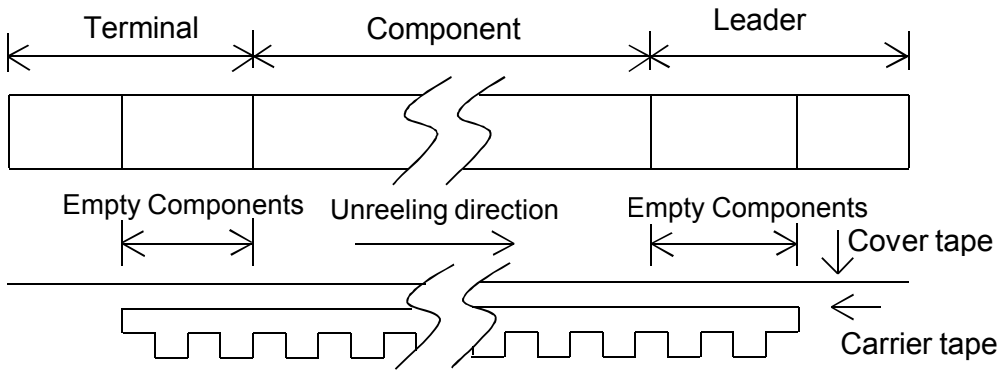


Fig.-4

(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 following condition.
Pulling direction 165~180 °
Speed 300mm/min
Otherwise unless specifiied

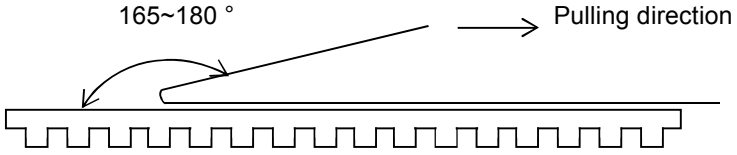
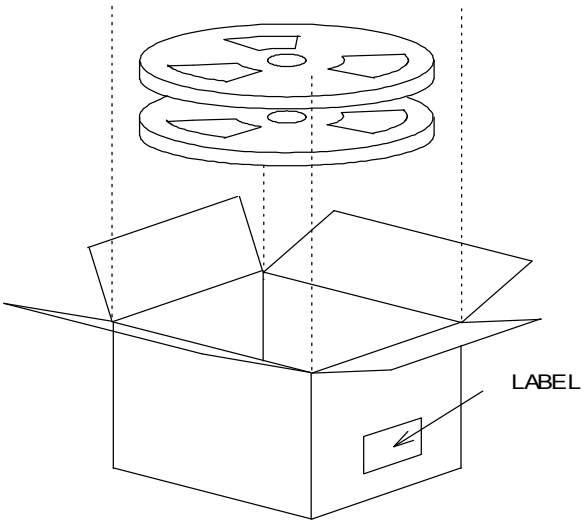


Fig.-5

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



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

Fig.-6

(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.

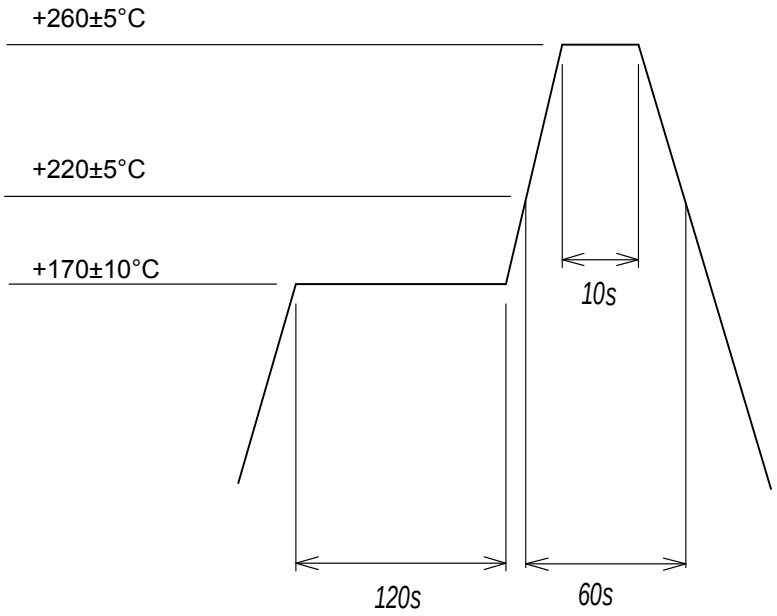
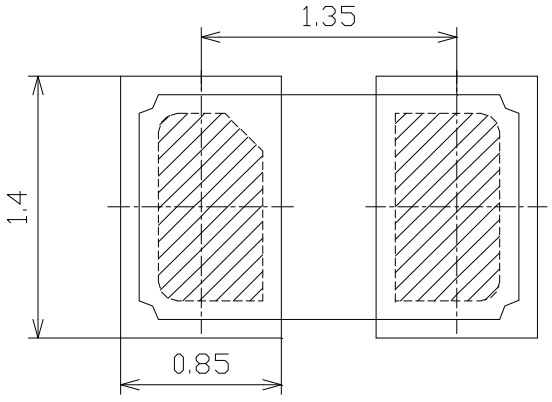


Fig.-7

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)



unit:mm

Fig.-8

Title	Remark		
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6. MECHANICAL ENDURANCE

6.1. SHOCK

After the following test,parts shall conform specification table-2-B.
3times 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 1~2min
(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
tightnen 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.

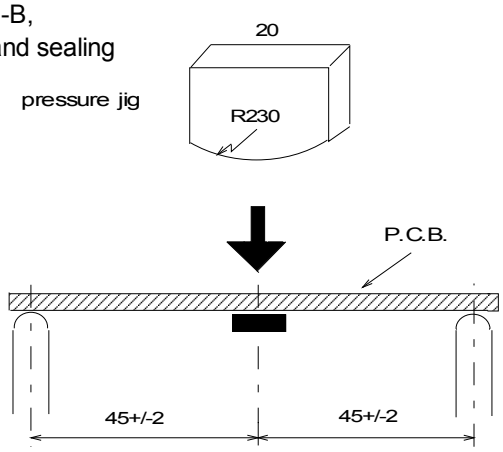


Fig.-9

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

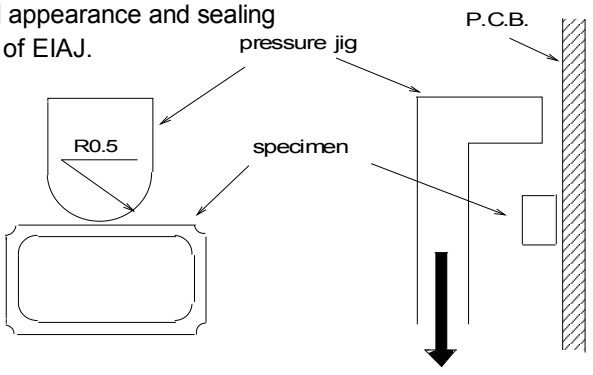


Fig.-10

6.5. BODY STRENGTH

After the following test,parts shall conform specification table-2-B,
and no abnormality shall be observed in external appearance and sealing
tightnen 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

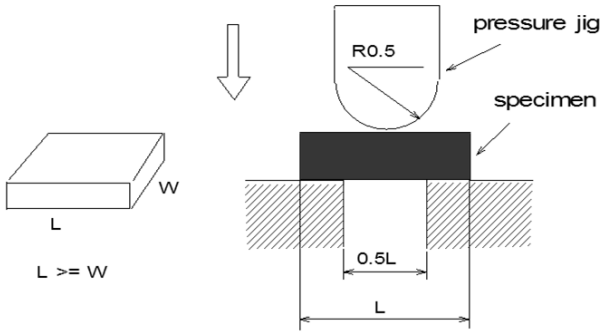


Fig.-11

6.6. SEAL

Less than 2.0×10^{-9} Pa*m^3/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)

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

6.9. RESISTANCE TO SOLDERING HEAT (HAND SOLDERING METHOD)

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

7. ENVIRONMENTAL ENDURANCE

7.1. HUMIDITY

2h past at room temperature after following test,parts shall conform specification table-2-C.
240h +85±2°C,relative humidity 85±5%.

7.2. LOW TEMPERATURE

2h past at room temperature after following test,parts shall conform specification table-2-C.
240h -40±3°C

7.3. HIGH TEMPERATURE

2h past at room temperature after following test,parts shall conform specification table-2-C.
240h +85±2°C

7.4. TERMAL SHOCK TEST

2h past at room temperature after 25cycles of following test,parts shall conform specification table-2-C.

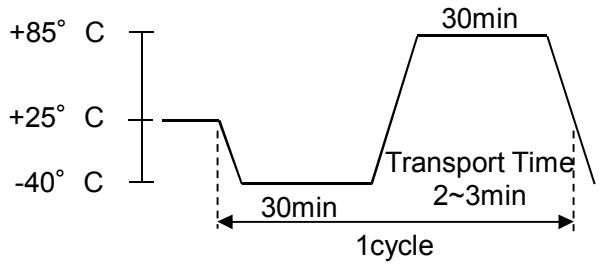


Fig.-12

8. SPECIFICATION

Table-2

	Frequency Variation	Equivalent Resistance
A	$\pm 3\times10^{-6}$	±15 % or ±5kΩ max. (Use larger specification)
B	$\pm 5\times10^{-6}$	±25 % or ±10kΩ max. (Use larger specification)
C	$\pm 10\times10^{-6}$	±25 % or ±10kΩ max. (Use larger specification)

9. THE CAUTIONS ON USE FOR DST210A

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 boad 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.

2014-0510 REVISION RECORD

Rev.No	Date	Reason	Contents	Approved	Checked	Drawn
-	2014/05/09	-	The first edition.	T.Nakamura	T.Fujii	H.Ishihara