Serial No. 2008-0980

DATE : 2008/07/22

Inventec Appliances Corp.

ITEM : QUARTZ CRYSTAL

TYPE : DSX221G

NOMINAL FREQUENCY : 14.745600MHz

SPEC No. : 1ZBB14745AB0A
1ZCB14745AB0A

USER PARTS NO . :

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

RECEIPT	
DATE	
RECEIVED	(signature) (name)

General Manufacture of Quartz Devices

DAISHINKU CORP.

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C.ENG. T. Miura

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1. ELECTRICAL CHARACTERISTICS
(This test shall be performed under the conditions of temp.at 25 +/- 3deg. C, humidity 60% max.)

1-1	NOMINAL FREQUENCY	14.745600 MHz
1-2	OVERTONE ORDER	Fundamental
1-3	LOAD CAPACITANCE(CL)	10.0 pF
1-4	FREQUENCY TOLERANCE	+/- 10 ppm Max. at +25 deg.C +/- 3 deg.C
1-5	DRIVE LEVEL	10 uW +/- 2 uW
1-6	SERIES RESISTANCE	150 ohms Max. / Series
1-7	OPERATING TEMPERATURE RANGE	-30 deg.C to +85 deg.C
1-8	FREQUENCY CHARACTERISTICS OVER TEMPERATURE	+/- 15 ppm Max. / -30 deg.C to +85 deg.C (ref. +25deg.C)
1-9	SHUNT CAPACITANCE	2.0 pF Max.
1-10	INSULATION RESISTANCE	500 Mohms Min. / DC100V +/- 15V
1-11	STORAGE TEMPERATURE RANGE	-40 deg.C to +85 deg.C

2. CONSTRUCTION

2-1	HOLDER	DSX221G Ceramic Base
2-2	DIMENSIONS AND MARKING	Refer to Fig.-1 and Table-1.

3. OTHER SPECIFICATIONS

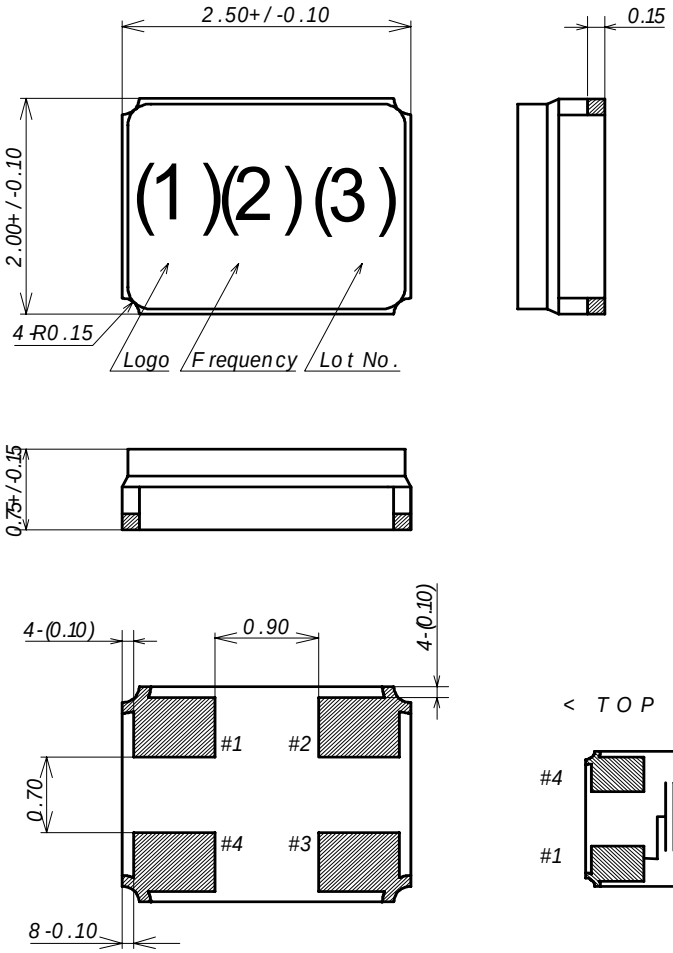
3-1	EMBOSS CARRIER TAPE & REEL	Refer to Fig.-2,3,4,5 and Table-2.
3-2	PACKING	Refer to Fig.-6.
3-3	REFLOW CONDITIONS (REFERENCE)	Refer to Fig.-7.
3-4	LAND PATTERN (REFERENCE)	Refer to Fig.-8.

4. Environmental and mechanical performance shall be specified by attached general specification.

5. USE OF FREON:
This related product is not used with any ODC CLASS1.

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< DIMENSIONS AND MARKING >



It is recommended that #2,4 is connected with GND.
unit : mm
Tolerance : +/-0.1

(Fig.-1)

Marking is Laser Marking:
Marking should be printed as follows:
Logo , Nominal Frequency , manufactured year & month
Logo and manufacturing location (1)

Producing District	Our Specification.No.	(1) Logo	(2) Frequency
Japan	1ZBB14745AB0A	D	14
Indonesia	1ZCB14745AB0A	D	14

Nominal Frequency (2) = Mark two dights from upper
(ex. 14.7456 MHz --> 14)
Manufacturing lot No.(3)
(year) ex. 2008 shall be marked as ' 8 ' (The last digit of the year)
(Month) ex. July shall be marked as ' G ' (As shown in Table-1.)

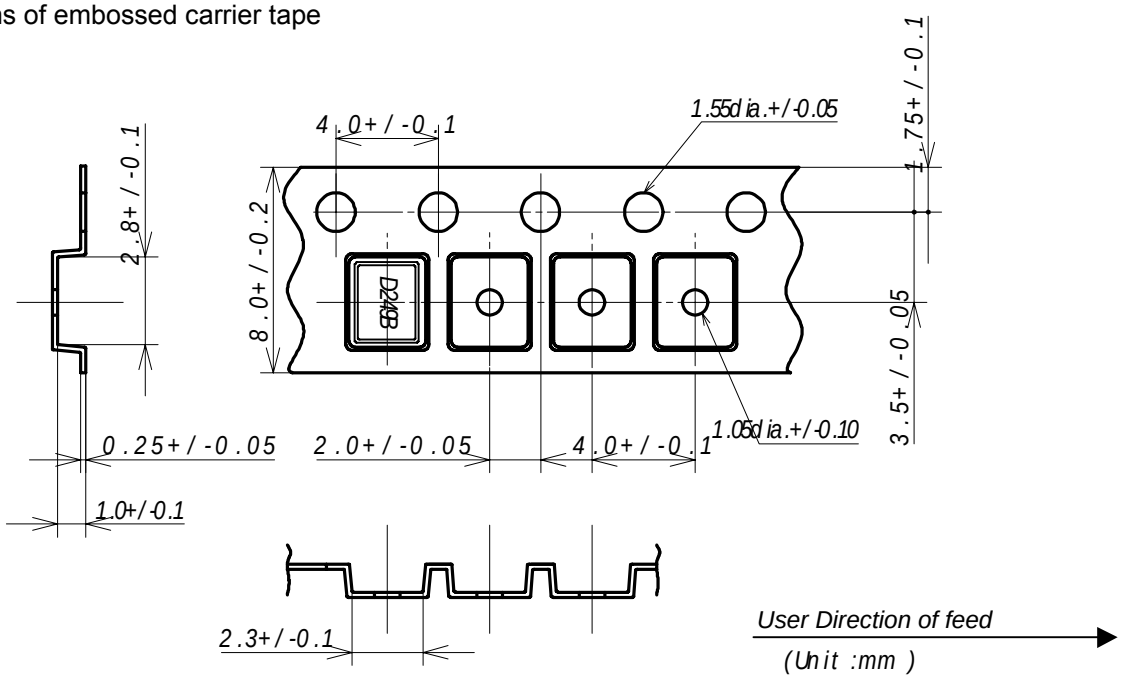
(Table-1)

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

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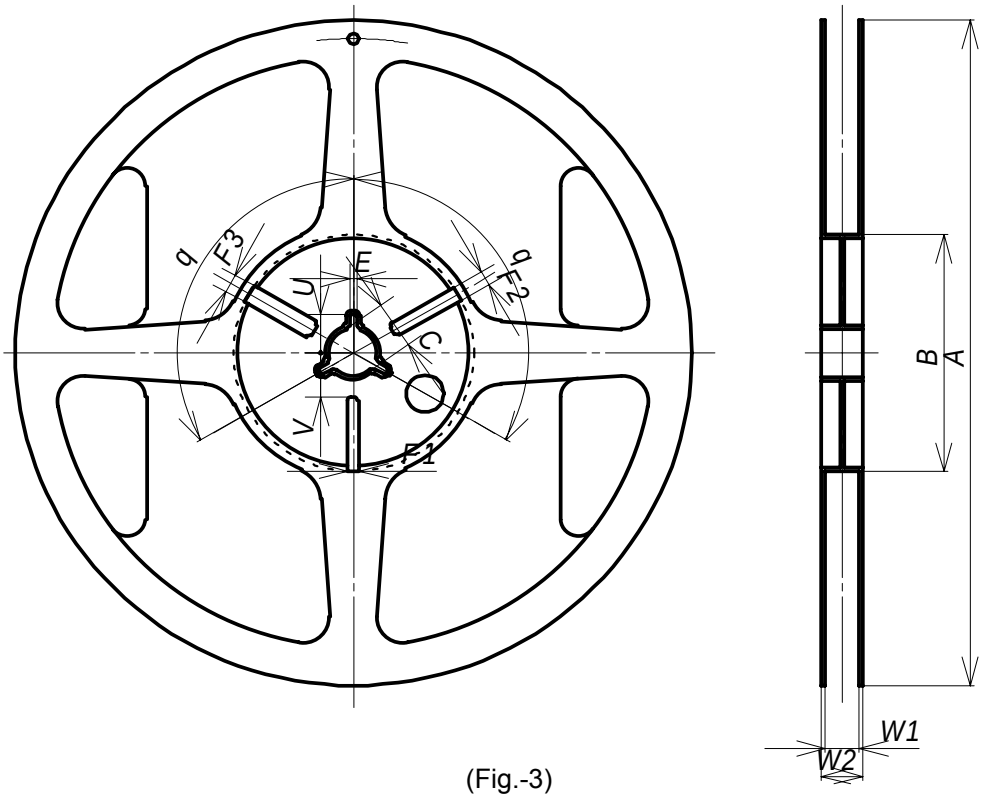
< EMBOSS CARRIER TAPE & REEL >

(1)Dimensions of embossed carrier tape



(Fig.-2)

(2)Dimensions of tape reel



(Fig.-3)

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(Table-2)

(UNIT:mm)

Item			Mark	Dimensions Angle
Flange	Diameter		A	180 dia. +0.0 / -3.0
	Inside of Frange		W1	9.0 + / - 0.3
	Outside of Frange		W2	11.4 + / - 1.0
	Inside Diameter		B	60 dia. +1.0 / -0.0
Center Core	Center Core Slit	Width	F1	3.0 + / - 0.2
			F2	4.0 + / - 0.2
			F3	5.0 + / - 0.2
		Length	V	11.9 +0.5 / -0.0
		Angle	q	120 deg.
	Spindle Diameter		C	13 dia. + / - 0.2
	Key Seats	Width	E	2.0 + / - 0.5
		Length	U	10.5 + / - 0.4
		Angle	q	120 deg.

(3)Storage condition
Temperature : +40 deg.C Max.
Relative Humidity : 80% Max.
(It is a guaranteed term because it obtains an excellent soldering: 6 months)

(4)Standard packing quantity
3,000 pcs/reel for 180 dia.

(5)Material of the tape

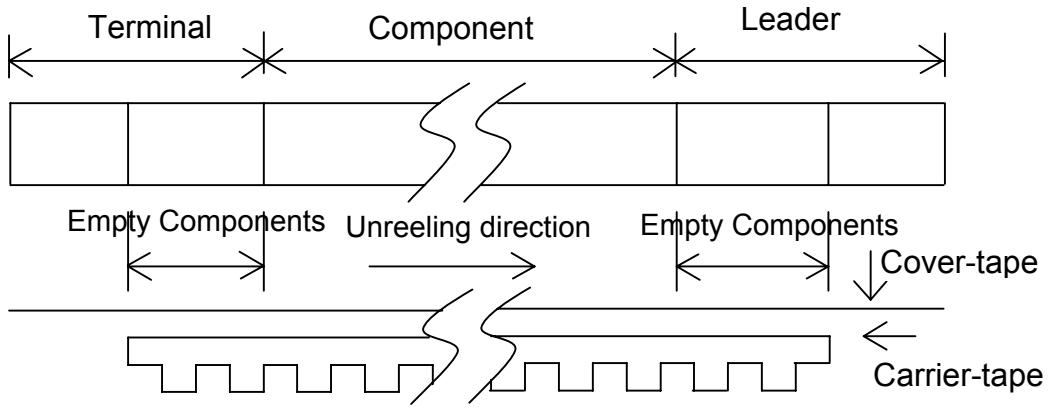
Tape	Material
Carrier tape	Polystyrene+Carbon
Cover tape	Polyester

(6)Label contents
Type
Our specification No.
Your Part No.
Lot No.
Nominal Frequency
Quantity
Our Company Name
Producting Country

Stick a label on the each reel.

(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 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)

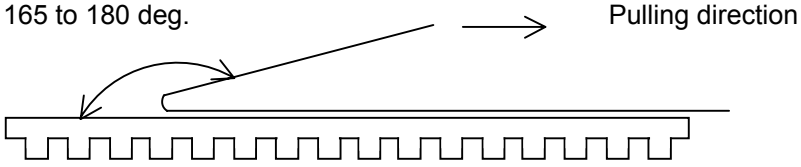
(8)Joint of tape

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

(9)Release strength of cover tape

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

Pulling direction 165 deg. to 180 deg.
Speed 300mm/min.
Otherwise unless specified.

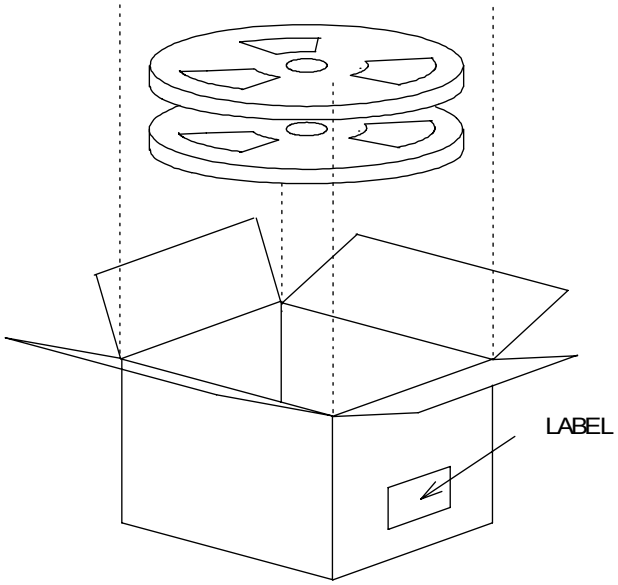


(Fig.-5)

Other standards shall be based on JIS C 0806$_{-1990.}$

< PACKING >

(1)STORAGE METHOD



Label contents

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

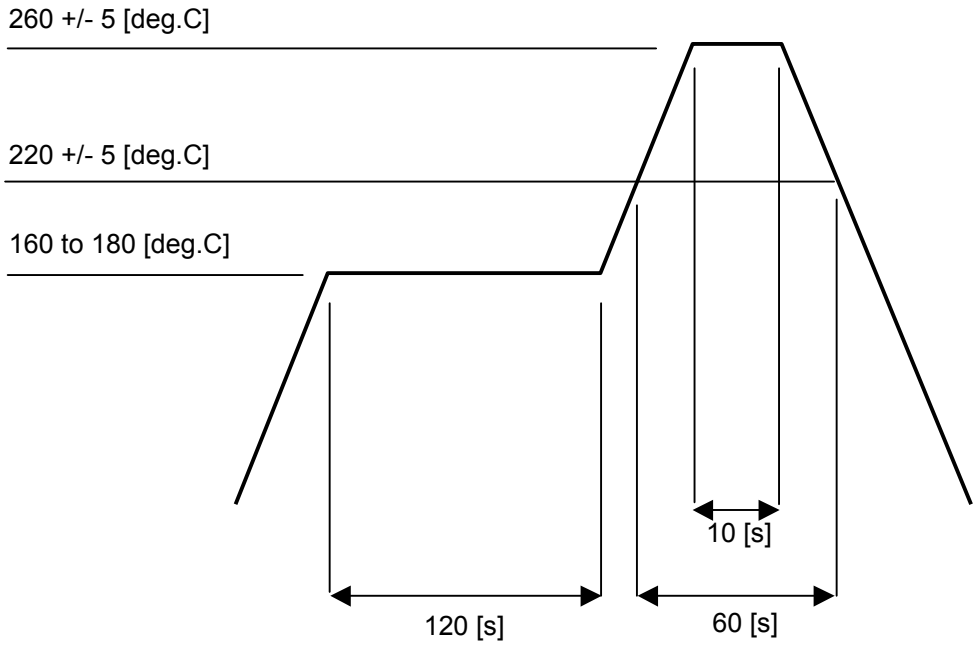
(Fig-6)

(2)BOX SIZE

From lot size packingsize shall be changed.
In the upper and lower part and the opening in box it shall be protected products using aircushion sheets.

< REFLOW CONDITIONS (REFERENCE) >

During the solder reflow process, please complete within following temperature, period.
Reflow soldering shall be allowed only 3 times.

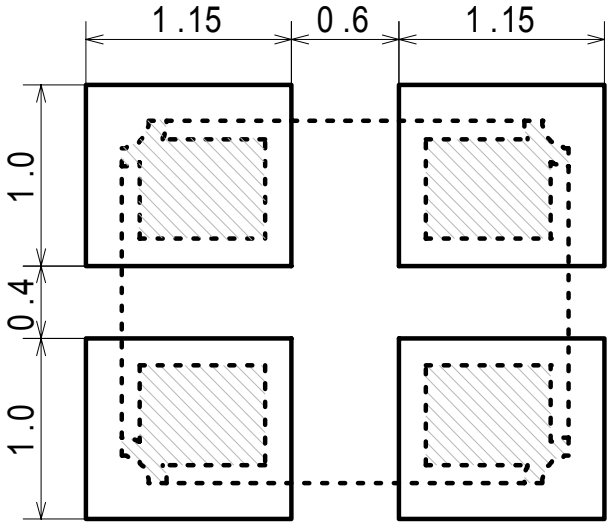


Total time : 240 [s] Max.

(Fig.-7)

HANDSOLDERING METHOD : 350 +/- 10 [deg.C] , 3+1/-0[s] Each terminal once
(Please take care so that a soldering iron should not touch a product directly.)

< LAND PATTERN (REFERENCE) >



unit : mm

(Fig.-8)

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1.MECHANICAL ENDURANCE

1.1 SHOCK (ACCELERATION)

After the following test,parts shall conform specification 3-1-1.
1000[m/s^2] by 6[ms] X,Y,Z each axis (6 directions) , 3cycles

1.2 SHOCK (MOUNTING DROP)

After the following test,parts shall conform specification 3-1-1.
3cycles(18times) drop from 150 [cm] heights to concrete.
Further,parts shall be solderd on substrate, fixed Aluminum materials(about 100[g]).

Substrate materials	:	Glass Epoxy
1 cycle	:	each 1 times of 6 directions

1.3 VIBRATION

After the following test,parts shall conform specification 3-1-1.
and no abnormal appearance shall be observed.

Frequency of Vibration	:	10 to 500 to 10[Hz]
Amplitude(p-p)	:	Sine waves of 1.5[mm] or 100[m/s^2]
Cycle	:	11[min]
Vibration axis	:	X.Y.Z
Vibration period	:	2 [h] for each axis

1.4 SEAL

Less than 2.0×10^{-9} [Pa m^3/s]. by Helium leak detector.
Also, no serial bubble is observed by Fluorocarbon tests.

1.5 SOLDERABILITY

After the following test, more than 95[%] of terminal shall be covered by new solder.
3 +/- 0.5 [s] dip in 245 [deg.C] +/- 5 [deg.C] solder.
(Solder composition : Sn-3Ag-0.5Cu) (Use rosin type flux for solder.)

1.6 RESISTANCE TO SOLDERING HEAT (REFLOW)

48 [h] past at room temperature from following test,parts shall conform specification 3-1-2.
perform the attached Reflow conditions to reference.

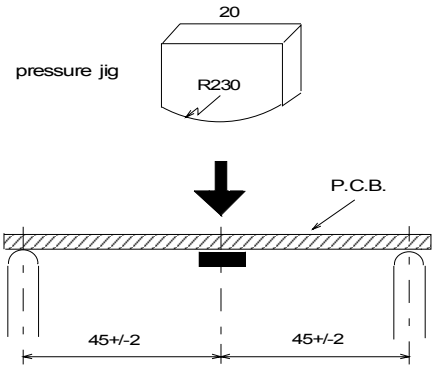
1.7 RESISTANCE TO SOLDERING HEAT (HAND SOLDERING METHOD)

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

1.8 SUBSTRATE BENDING

After the following test,parts shall conform specification 3-1-1.
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.-1
Speed	:	about 1.0 [mm/s]
Hours	:	5 +/- 1 [s]
Amount of substrate	:	3 [mm] Max.



(Fig.-1)

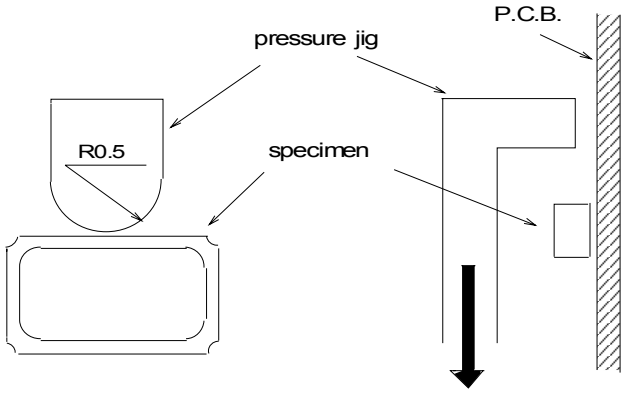
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1.9 SHEAR

After the following test,parts shall conform specification 3-1-1.
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

Weight	:	10 [N]
Hours	:	10 +/- 1 [s]
Direction	:	see Fig.-2



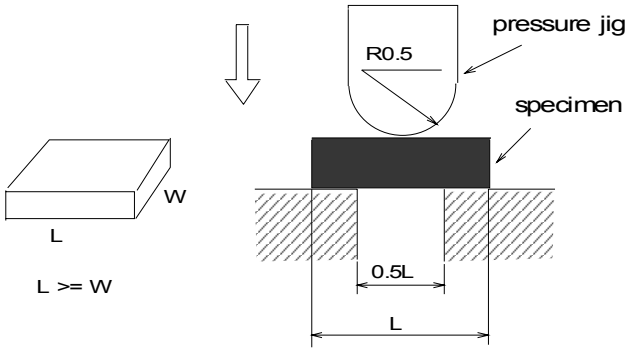
(Fig.-2)

1.10 BODY STRENGTH

After the following test,parts shall conform specification 3-1-1.
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

Weight	:	10 [N]
Hours	:	10 +/- 1 [s]
Direction	:	see Fig.-3



(Fig.-3)

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2.ENVIRONMENTAL ENDURANCE

2.1 LOW TEMPERATURE

2 [h] past at room temperature after following test, parts shall conform specification 3-1-1.
240 [h] -40 +/- 3 [deg.C].

2.2 HUMIDITY

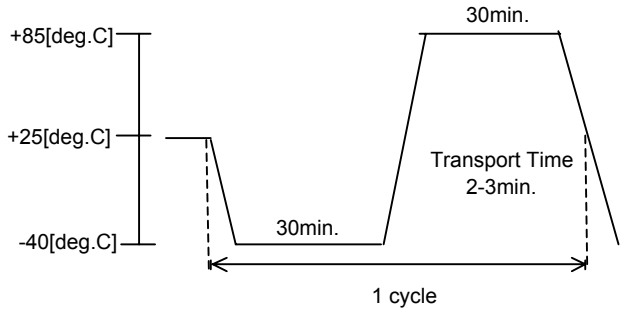
2 [h] past at room temperature after following test, parts shall conform specification 3-1-1.
240 [h] +85 +/- 2 [deg.C] , relative humidity 85 +/- 5[%].

2.3 HIGH TEMPERATURE

2 [h] past at room temperature after following test, parts shall conform specification 3-1-1.
240 [h] +85 +/- 2 [deg.C].

2.4 TEMPERATURE CYCLE

2 [h] past at room temperature after 25 cycles of following test, parts shall conform specification 3-1-1.



(Fig.-4)

3.SPECIFICATION

Frequency Variation and Equivalent Resistance shall be within Table-1 after the test.

(Table-1)

	Frequency Variation	Equivalent Resistance
3-1-1	±2[ppm]	±15[%] or 2[ohms] max. (Use larger specification)
3-1-2	±5[ppm]	±20[%] or 3[ohms] max. (Use larger specification)
3-1-3	±10[ppm]	±20[%] or 3[ohms] max. (Use larger specification)

[DSX221G SERIES , IN USE]

1.SOLDERING

Please perform the attached Reflow conditions to reference within 3 times.

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 crystal resonator and becoming the cause of characteristic deterioration and not oscillating, it does not recommend.

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.
Although the check about ultrasonic washing is performed, since it is an examination with a simple substance, the check for the second time by the use state is recommended.

4.THE CAUTIONS ON USE

The piece of crystal it is processed very smaller than the conventional thing inside DSX221G series crystal unit may be damaged, if excessive excitation electric power is applied.
Please use it below with the value specified on a catalog and specifications.
Please refrain from forming patterns under crystal resonators since there is a possibility to cause crack in base.
If the temperature is higher than 280 [deg.C], there is a possibility for the sealing glass to remelt.
Avoid using the product at temperature higher than specified.

5.HANDLING OF A PRODUCT

DSX221G series has sufficient intensity to fall and vibration.
However when too much shock is added according to a certain cause, the use after a characteristic check is recommended.

6.STORAGE

Since the soldering nature of a terminal may be degraded, please avoid storage in high temperature and a humid place.
Please keep it in the place which direct rays do not hit and dew condensation does not generate.

2008-0980 REVISION RECORD

Rev.No	Date	Reason	Contents	Approved	Checked	Drawn
-	2008/07/22		The first edition.	T. Miura	H. Matsuda	M.Shikai