



ITEM : QUARTZ CRYSTAL

TYPE : DSX321G

NOMINAL FREQUENCY : 16.000000MHz

SPEC No. : 1C216000CC0B
1N216000CC0B

"RoHS product "

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

RECEIVED OF SPECIFICATION	
DATE	
RECEIVED	(signature) (name)

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DAISHINKU CORP.

1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan Phone(0794)25-3141
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C.ENG. _____

ENG. _____

1. SCOPE

(This specification applies to DSX321G 16MHz Crystal Unit.)

Country	Spec. No.
Indonesia	1C216000CC0B
Thailand	1N216000CC0B

2. ELECTRICAL CHARACTERISTICS

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

2. 1 NOMINAL FREQUENCY	16.000000 MHz
2. 2 MODE	Fundamental
2. 3 LOADING CAPACITANCE	12.0 pF
2. 4 FREQUENCY TOLERANCE	+/- 10 ppm Max. at +25 deg.C +/- 3 deg.C
2. 5 DRIVE LEVEL	10 uW +/- 2 uW
2. 6 EQUIVALENT SERIES RESISTANCE	60 ohms Max. / Series
2. 7 OPERATING TEMPERATURE RANGE	-40 deg.C to +85 deg.C
2. 8 FREQUENCY TEMPERATURE CHARACTERISTICS	+/-30 ppm Max/ -40 deg. to +85 deg.C
2. 9 SHUNT CAPACITANCE	2.0 pF Max.
2.10 INSULATION RESISTANCE	500 Mohms Min. / DC100V +/- 15V
2.11 STORAGE TEMPERATURE RANGE	-40 deg.C to +85 deg.C

3.CONSTRUCTION

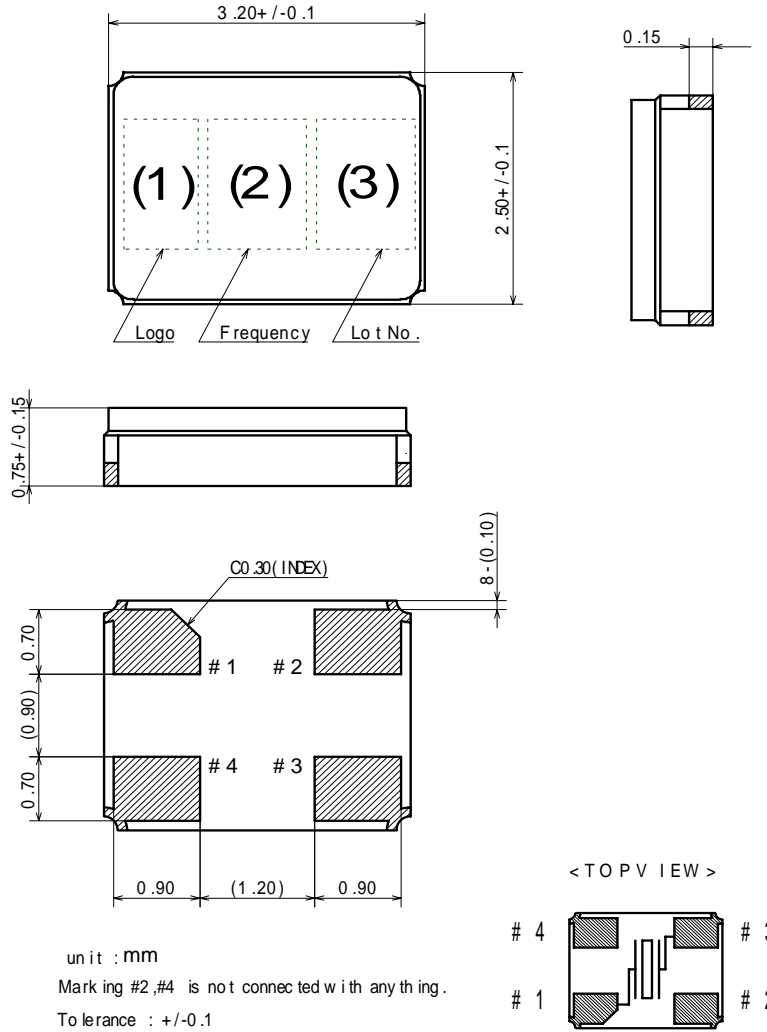
3. 1 HOLDER	DSX321G Ceramic Base
3. 2 DIMENSIONS AND MARKING	Refer to Fig.-1 and Table-1.
3. 3 EMBOSS CARRIER TAPE & REEL	Refer to Fig.-2,3,4,5 and Table-2.
3. 4 PACKING	Refer to Fig.-6.

4.OTHER SPECIFICATIONS

4. 1 REFLOW CONDITIONS (REFERENCE)	Refer to Fig.-7.
4. 2 LAND PATTERN (REFERENCE)	Refer to Fig.-8.
4. 3 Environmental and mechanical performance shall be specified by attached general specification.	

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< DIMENSIONS AND MARKING >



(Fig.-1)

Marking is Laser Marking:

Marking should be printed as follows:

Logo , Nominal Frequency , manufactured year & month

Logo and manufacturing location (1)

Made in Thailand -> marked as "D" upper bar.

Made in Indonesia -> marked as "D" under bar.

Nominal Frequency (2) = Mark two digits from upper

(ex. 16.0000 MHz --> 16)

Manufacturing lot No.(3)

(year) ex. 2005 shall be marked as ' 5 ' (The last digit of the year)

(Month) ex. September shall be marked as ' J '(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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(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
	Center Core Slit	Length	V	11.9	
			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
			q	120 deg.	

(3)Storage condition

Temperature : +40 deg.C Max.

Relative Humidity : 80% Max.

(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

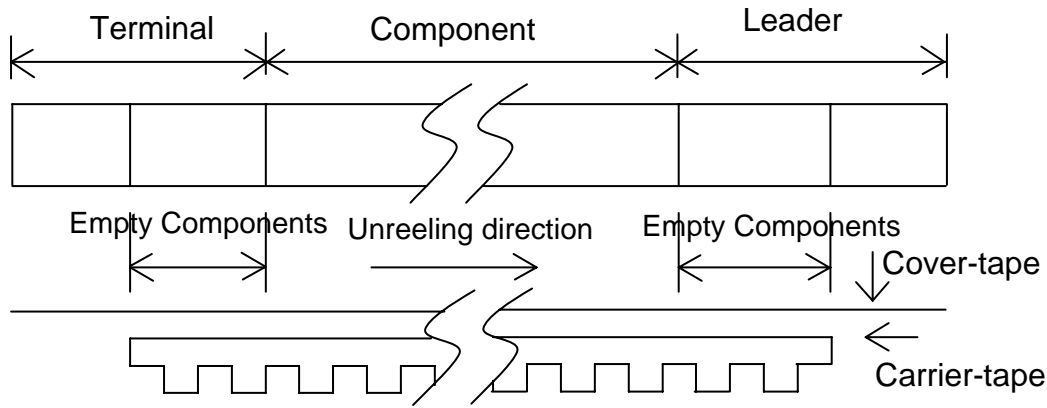
Producing Country

Stick a label on the each reel.

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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 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.

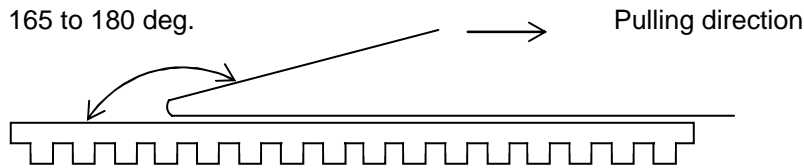
(9) Release strength of cover tape

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.



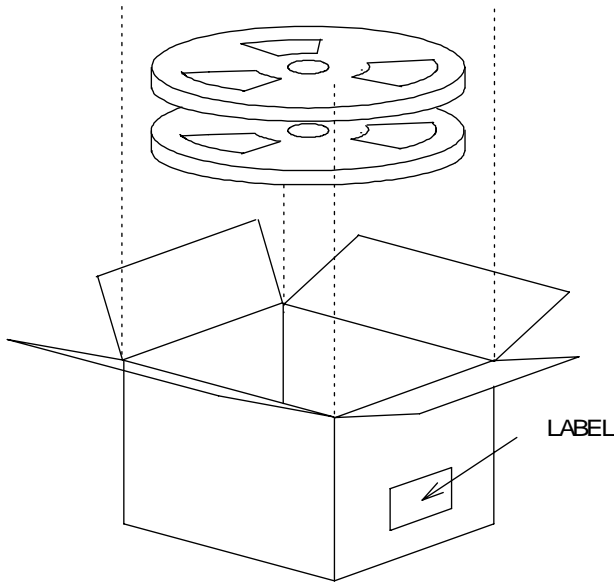
(Fig.-5)

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

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< PACKING >

(1) STORAGE METHOD



Label contents

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

(Fig-6)

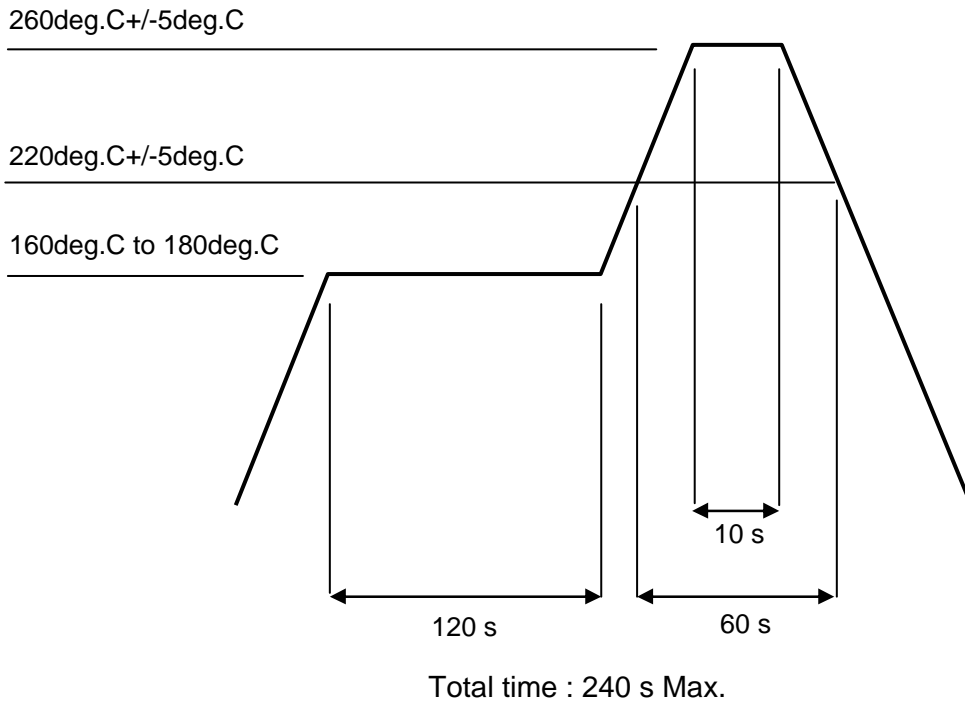
(2) BOX SIZE

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.

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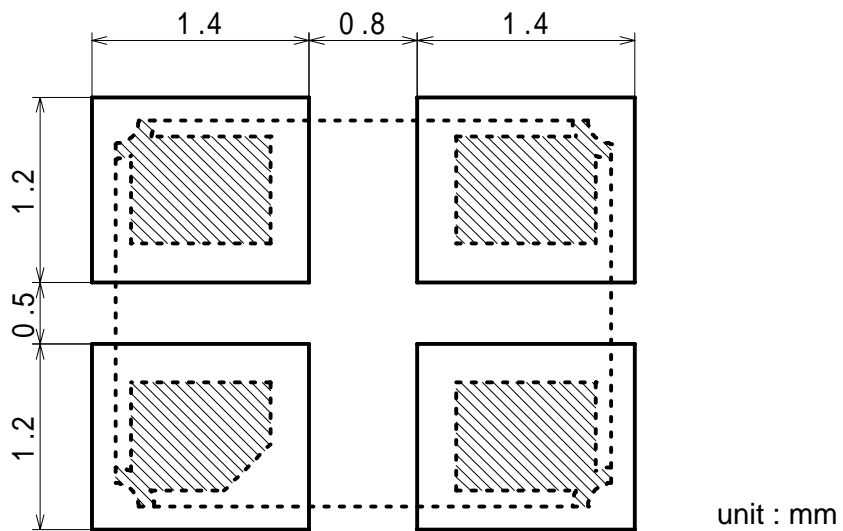
< REFLOW CONDITIONS (REFERENCE) >

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



(Fig.-7)

< LAND PATTERN (REFERENCE) >



(Fig.-8)

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1.MECHANICAL ENDURANCE

1.1 SHOCK

After the following test,parts shall conform specification3-1-3.

10cycles(60times) drop from 150 [cm] heights to concrete.

Further,parts shall be solderd on substrate, fixed bakelite materials(about 100[g]).

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

1.2 VIBRATION

After the following test,parts shall conform specification3-1-2.

and no abnormal appearance shall be observed.

- (1)Frequency of Vibration : 10[Hz] to 55[Hz]
- (2)Amplitude(p-p) : Sine waves of 1.5[mm]
- (3)Vibration axis : X.Y.Z
- (4)Vibration period : 2 [h] for each axis

1.3 SUBSTRATE BENDING

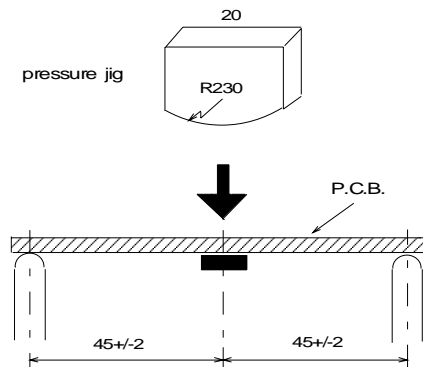
After the following test,parts shall conform specification3-1-2.

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 : 0.5 [mm/s]
- Hours : 5 +/- 1 [s]
- Amount of substrate : 3 [mm] Max.



(Fig.-1)

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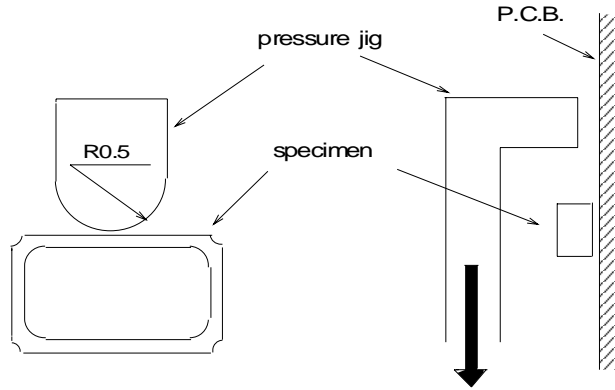
1.4 SHEAR

After the following test, parts shall conform specification3-1-2.
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)

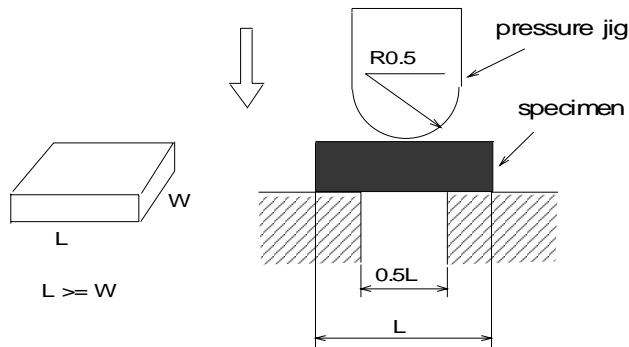
1.5 BODY STRENGTH

After the following test, parts shall conform specification3-1-2.
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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1.6 SEAL

Less than 2.0×10^{-9} [Pa m³/sec]. by Helium leak detector.
Also, no serial bubble is observed by Fluorinert tests.

1.7 SOLDERABILITY

After the following test, more than 90[%] of terminal shall be covered by new solder.
3 seconds +/- 1 second dip in 235 [deg.C] +/- 5 [deg.C] solder.
(Use rosin type flux for solder.)

2. ENVIRONMENTAL ENDURANCE

2.1 HUMIDITY

Two hours past at room temperature after following test, parts shall conform specification 3-1-3.
240 hours +60 [deg.C] +/- 2 [deg.C] , relative humidity 85[%] +/- 5[%].

2.2 LOW TEMPERATURE

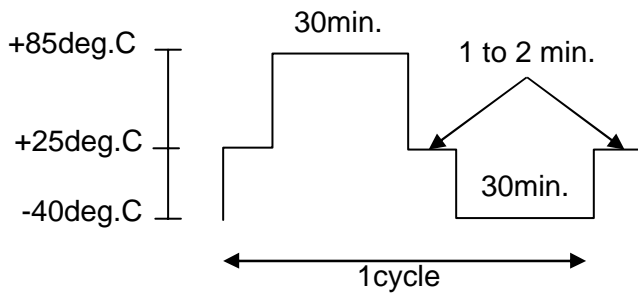
Two hours past at room temperature after following test, parts shall conform specification 3-1-3.
240 hours -40 [deg.C] +/- 2 [deg.C].

2.3 HIGH TEMPERATURE

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

2.4 TEMPERATURE CYCLE

Two hours past at room temperature after 25 cycles of following test, parts shall conform specification 3-1-3.



(Fig.-4)

2.5 RESISTANCE TO SOLDERING HEAT

24 hours past at room temperature from following test, parts shall conform specification 3-1-2.
VPS:30 Seconds in FC-70 vapor(215 [deg.C] Boiling Point)

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3.SPECIFICATION

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

(Table-1)

	Frequency Variation	Equivalent Resistance
3-1-1	±1[ppm]	±10[%] or 1.5[ohm] max. (Use larger specification)
3-1-2	±2[ppm]	±15[%] or 2[ohms] max. (Use larger specification)
3-1-3	±5[ppm]	±20[%] or 3[ohms] max. (Use larger specification)
3-1-4	±10[ppm]	±20[%] or 3[ohms] max. (Use larger specification)

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