



Serial No. 2004-0754

DATE : 2004/06/18

MESSRS.:

ITEM : QUARTZ CRYSTAL

ITEM : DSX321G

NOMINAL FREQUENCY : 32.000000MHz

SPEC No. :

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

RECEIVED OF SPECIFICATION	
DATE	
RECEIVED	(signature) (name)

Pioneering New Breakthroughs in Electronics

DAISHINKU CORP.

1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan Phone(0794)25-3141
Fax(0794)25-1134

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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	32.000000 MHz
1. 2 MODE	Fundamental
1. 3 LOADING CAPACITANCE	12.0 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 EQUIVALENT SERIES RESISTANCE	60 ohms Max. / Series
1. 7 OPERATING TEMPERATURE RANGE	-40 deg.C to +85 deg.C
1. 8 FREQUENCY TEMPERATURE CHARACTERISTICS	+/-30 ppm Max. / -40 to +85 deg.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

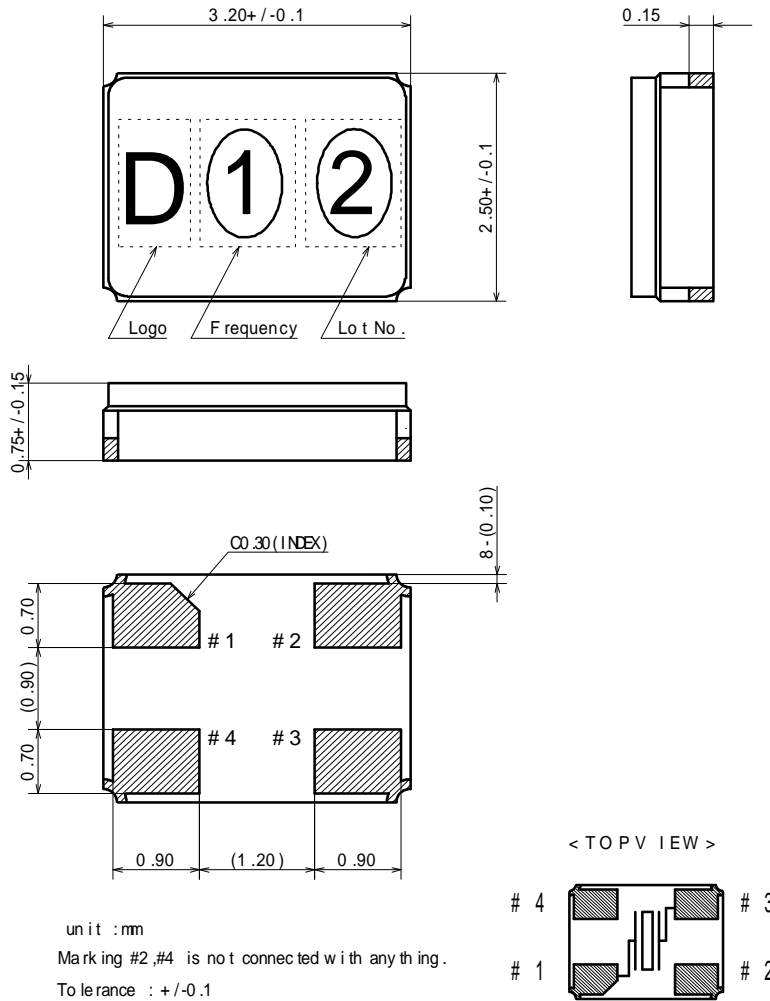
2. 1 HOLDER	DSX321G Ceramic Base
2. 2 DIMENSIONS AND MARKING	Refer to Fig.-1 and Table-1.

3.OTHER SPECIFICATIONS

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

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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
 Nominal Frequency (1) = Mark two digits from upper
 (ex. 32.000000 MHz --> 32)
 Manufacturing lot No.(2)
 (year) ex. 2004 shall be marked as ' 4 ' (The last digit of the year)
 (Month) ex. Jun. shall be marked as ' F '(As shown on the 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
		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
		Angle	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
Top tape	Polyester

(6)Label contents

Type

Our specification No.

Your Part No.

Lot No.

Nominal Frequency

Quantity

Our Company Name

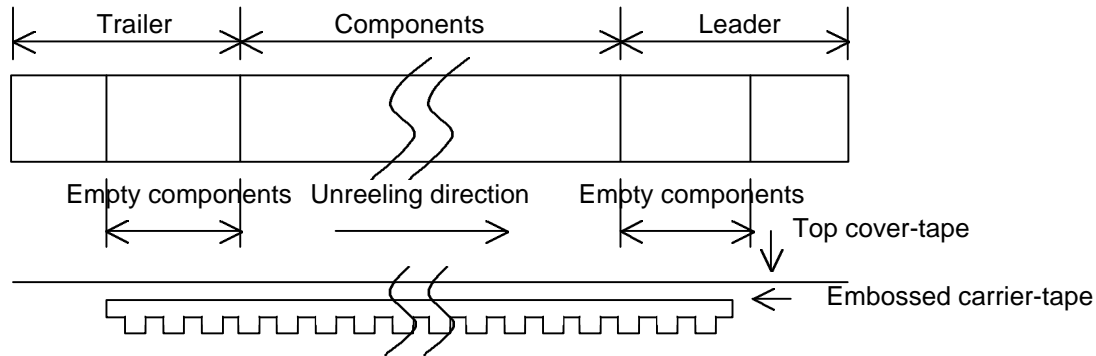
Producing Country

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.
Trailer	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 than 40mm.



(Fig.-4)

(8) Joint of tape

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

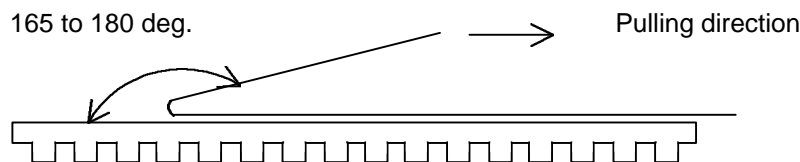
(9) Release strength of cover tape

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)

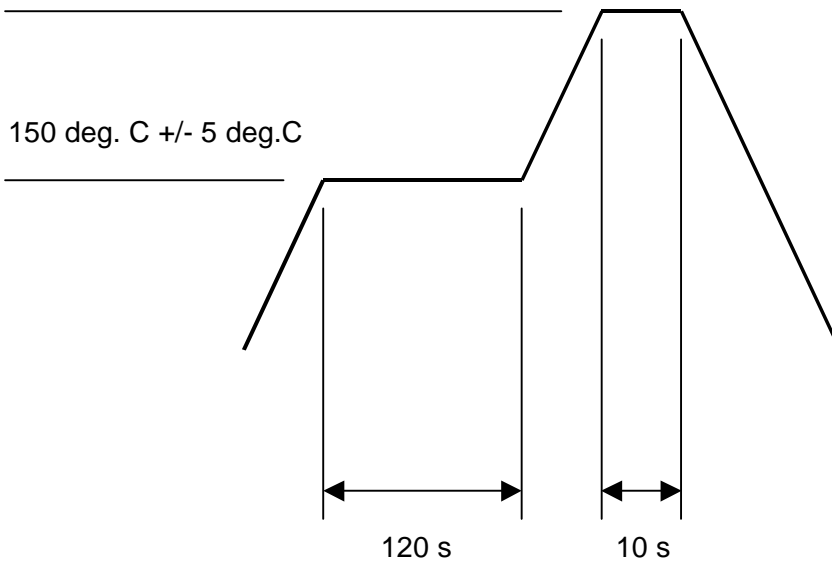
Other standards shall be based on JIS C 0806 -1990.

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< REFLOW CONDITIONS (REFERENCE) >

During the solder reflow process, please complete within following temperature, period.
 Reflow soldering shall be allowed only two(2) times.

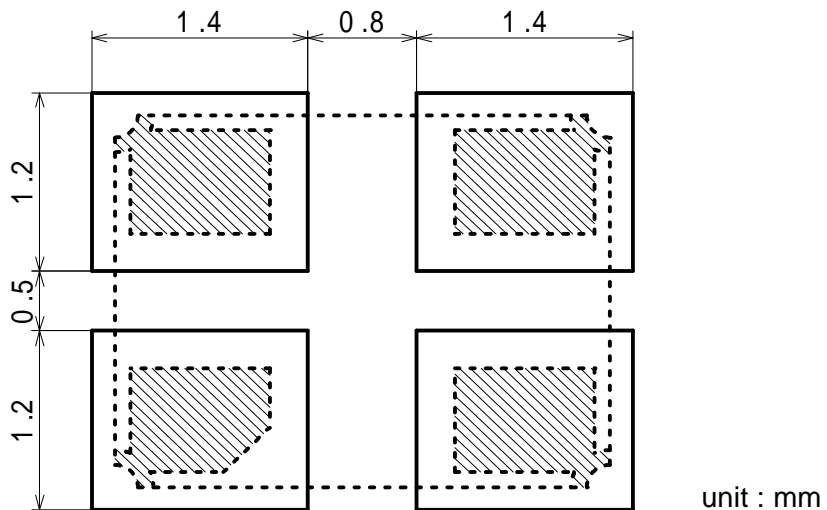
260 deg. C +/- 5 deg.C



Total Time : 200s Max.
 Solder melting point : 183 deg.C

(Fig.-6)

< LAND PATTERN (REFERENCE) >



(Fig.-7)

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1.MECHANICAL ENDURANCE

1.1 SHOCK

After the following test,parts shall conform para.3-1-3. of this specifications
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 para.3-1-2. of this specifications,
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

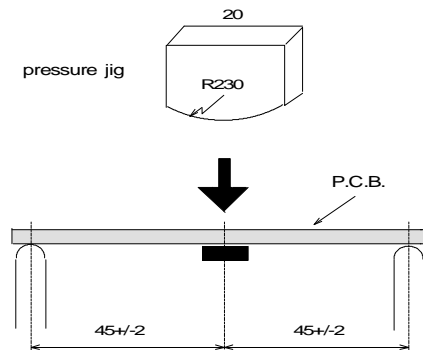
1.3 SUBSTRATE BENDING

After the following test,parts shall conform para.3-1-2. of this specifications
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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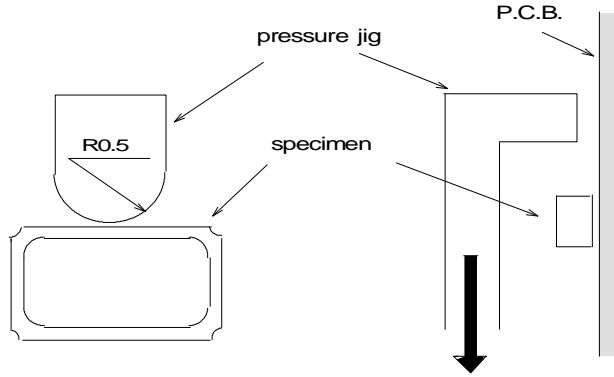
1.4 SHEAR

After the following test, parts shall conform para.3-1-2. of this specifications 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)

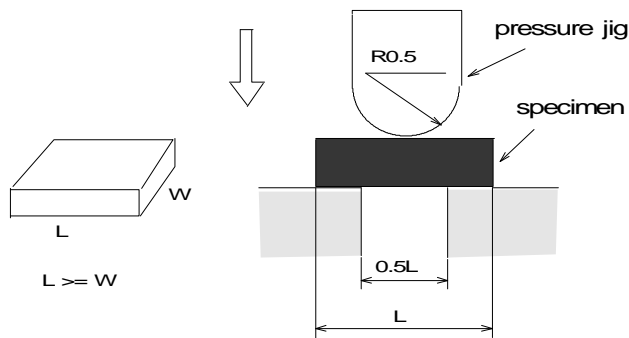
1.5 BODY STRENGTH

After the following test, parts shall conform para.3-1-2. of this specifications 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 lead 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 para.3-1-4. of this specifications.
240 hours +60 deg.C +/- 2 deg.C , relative humidity 85% +/- 5%.

2.2 LOW TEMPERATURE

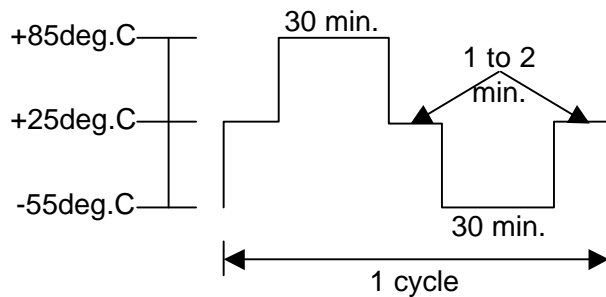
Two hours past at room temperature after following test, parts shall conform para.3-1-3. of this specifications.
240 hours -30 deg.C +/- 2 deg.C.

2.3 HIGH TEMPERATURE

Two hours past at room temperature after following test, parts shall conform para.3-1-4. of this specifications.
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 para.3-1-3. of this specifications.



2.5 RESISTANCE TO SOLDERING HEAT

24 hours past at room temperature from following test, parts shall conform para.3-1-2. of this specifications.
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[ohm] max. (Use larger specification)
3-1-2	±2[ppm]	±15[%] or 2[ohm] max. (Use larger specification)
3-1-3	±5[ppm]	±20[%] or 3[ohm] max. (Use larger specification)
3-1-4	±10[ppm]	±20[%] or 3[ohm] max. (Use larger specification)

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