Serial No. 2006-1045

DATE : 2006/08/08

ITEM : QUARTZ CRYSTAL

TYPE : DSX321G

NOMINAL FREQUENCY : 19.200000MHz

SPEC No. : 1B319200AA0A
1C319200AA0A

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.

1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan
http://www.kds.info/english.html

Phone(81)79-425-3141

Fax (81)79-425-1134

C.ENG.

ENG.

1. ELECTRICAL CHARACTERISTICS

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

1-1	NOMINAL FREQUENCY	19.200000 MHz
1-2	MODE	Fundamental
1-3	LOADING CAPACITANCE	8.0 pF - 370 Hz = 0
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	70 ohms Max. / Series
1-7	OPERATING TEMPERATURE RANGE	-30 deg.C to +85 deg.C
1-8	FREQUENCY TEMPERATURE CHARACTERISTICS	+/- 12 ppm Max. / -30 deg.C 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
1-12	AGING	+/- 1 ppm Max. / year

2.CONSTRUCTION

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

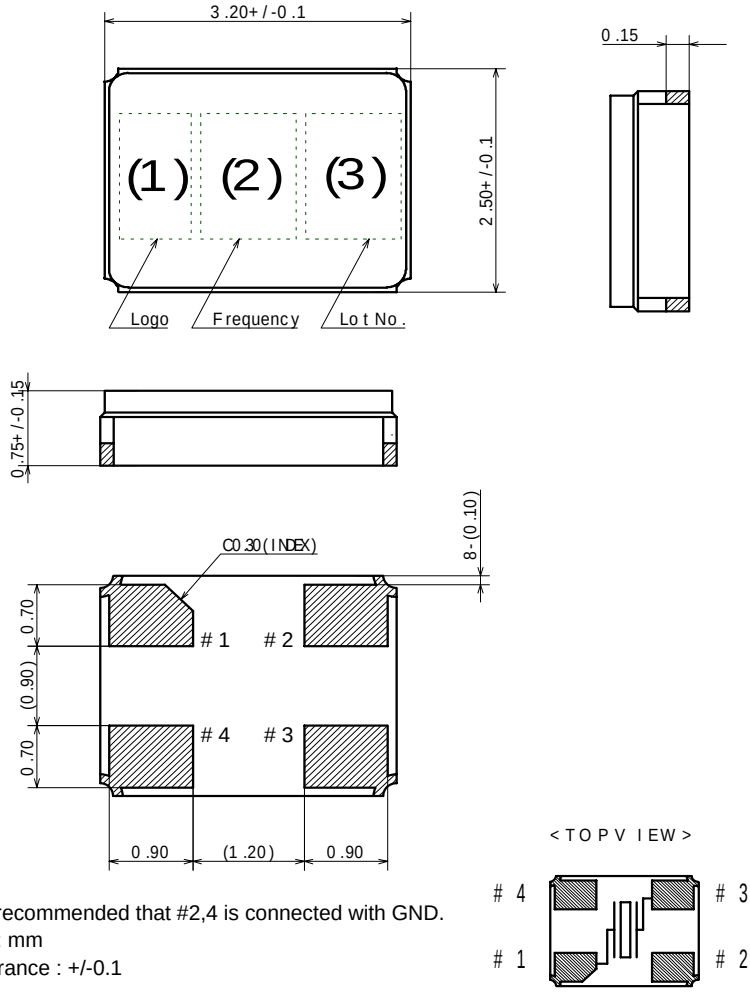
3.OTHER SPECIFICATIONS

3-1	EMBOSS CARRIER TAPE & REEL	Refer to Fig.-2,3,4,5 and Table-2.
3-2	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.

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 1 / 7

< 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	Marking	Our Specification.No.
Japan	D	1B319200AA0A
Indonesia	D	1C319200AA0A

Nominal Frequency (2) = Mark two dights from upper
(ex. 19.2000 MHz --> 19)
Manufacturing lot No.(3)
(year) ex. 2006 shall be marked as ' 6 ' (The last digit of the year)
(Month) ex. August shall be marked as ' H ' (As shown in Table-1.)

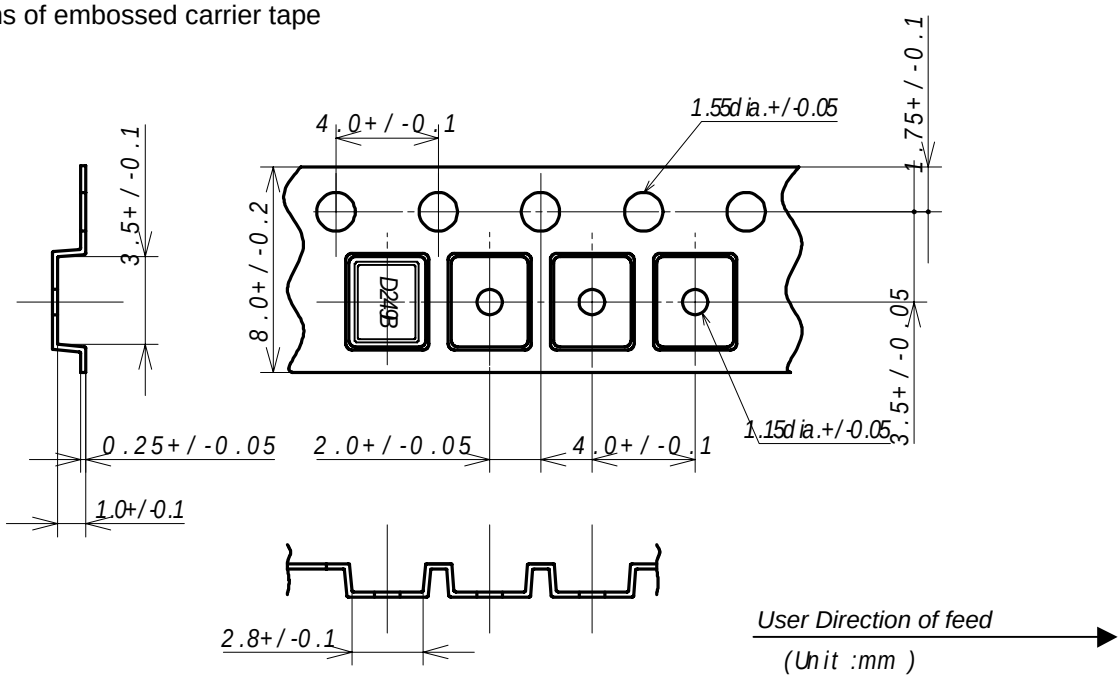
(Table-1)

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

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 2 / 7

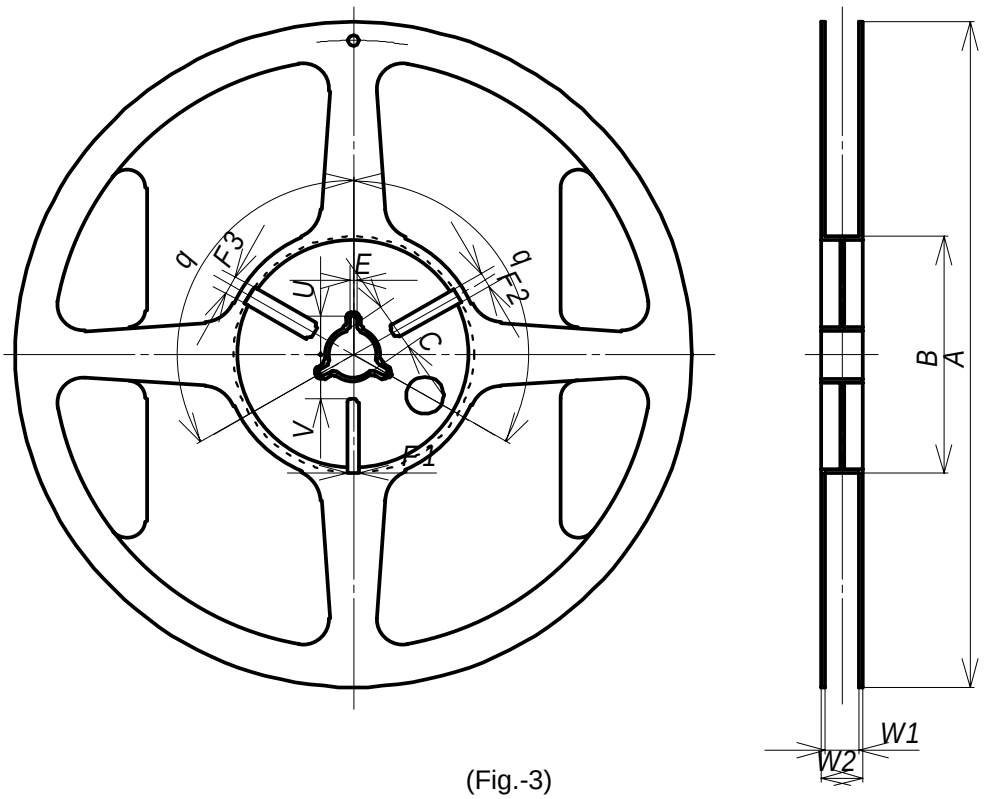
< EMBOSS CARRIER TAPE & REEL >

(1)Dimensions of embossed carrier tape



(Fig.-2)

(2)Dimensions of tape reel



(Fig.-3)

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 3 / 7

(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.

(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

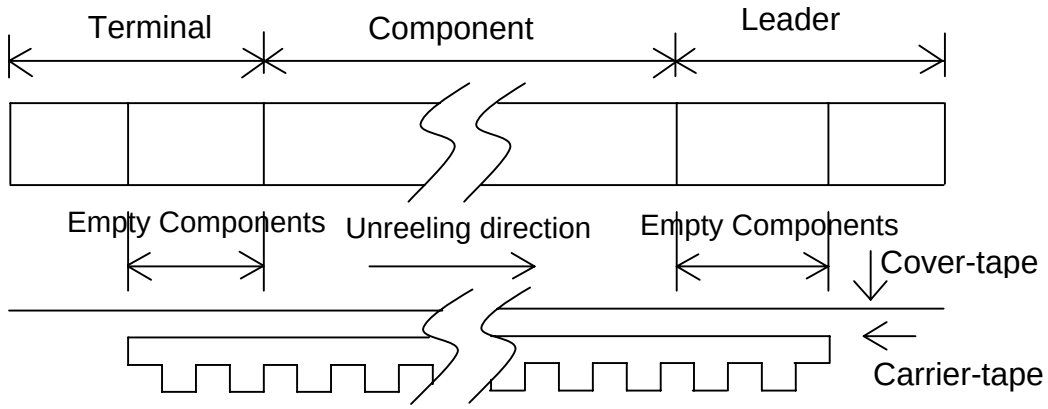
Our Company Name

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.

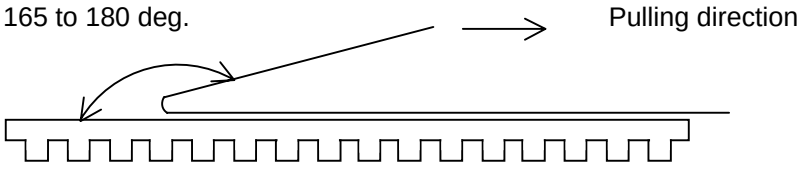
(9)Release strength of cover tape

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.



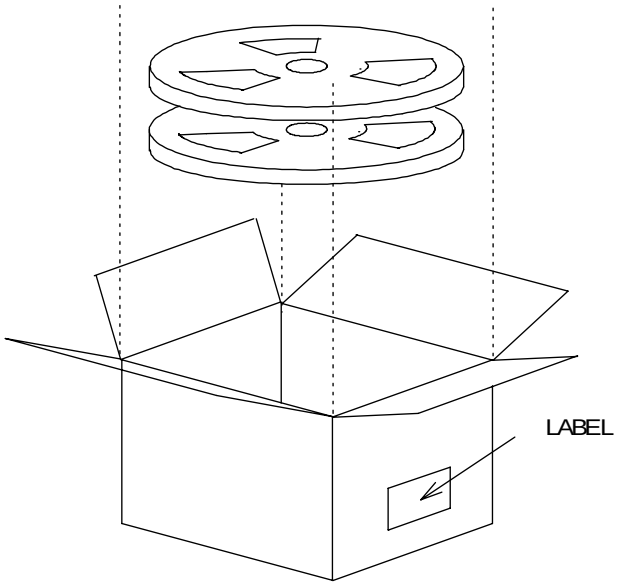
(Fig.-5)

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

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 5 / 7

< PACKING >

(1)STORAGE METHOD



Label contents

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

(Fig-6)

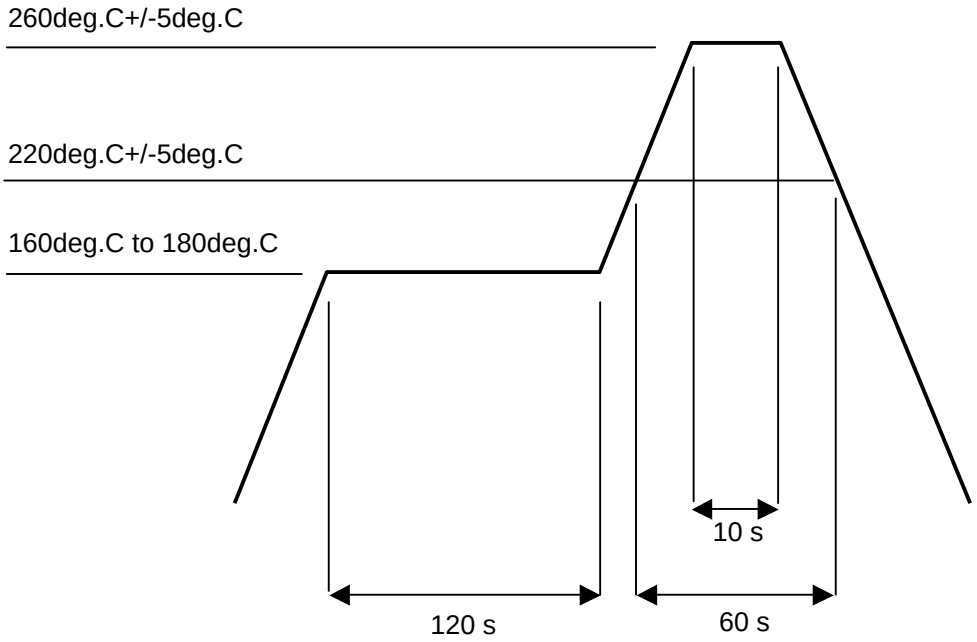
(2)BOX SIZE

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.

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 6 / 7

< REFLOW CONDITIONS (REFERENCE) >

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

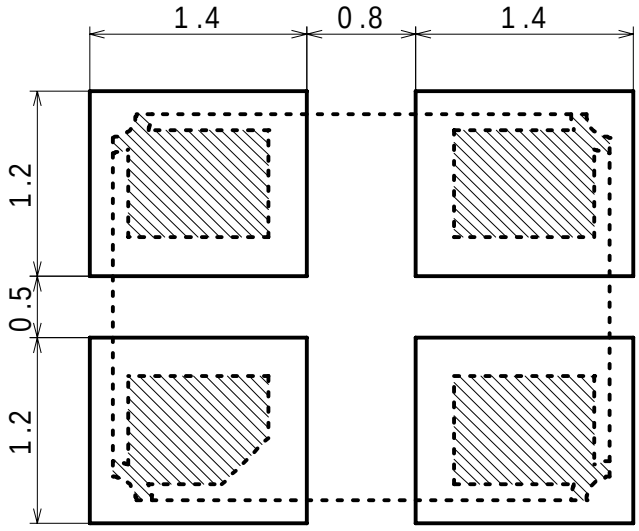


Total time : 240 s Max.

(Fig.-7)

HANDSOLDERING METHOD : 340 [deg.C] Max. / 3[s] Max.
(Please take care so that a soldering iron should not touch a product directly.)

< LAND PATTERN (REFERENCE) >



unit : mm

(Fig.-8)

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page 7 / 7

1.MECHANICAL ENDURANCE

1.1 SHOCK

After the following test,parts shall conform specification3-1-2.
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 specification3-1-1.
and no abnormal appearance shall be observed.

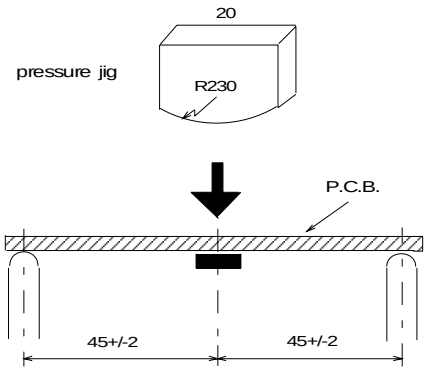
(1)Frequency of Vibration	:	10[Hz] to 55[Hz]
(2)Amplitude(p-p)	:	Sine waves of 1.5[mm]
(3)Vibration axis	:	X.Y.Z
(4)Vibration period	:	2 [h] for each axis

1.3 SUBSTRATE BENDING

After the following test,parts shall conform specification3-1-1.
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	:	0.5 [mm/s]
Hours	:	5 +/- 1 [s]
Amount of substrate	:	3 [mm] Max.



(Fig.-1)

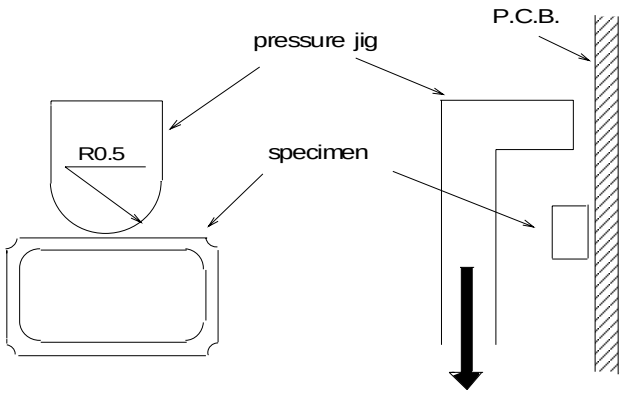
TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page Attached sheet 1 / 5

1.4 SHEAR

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



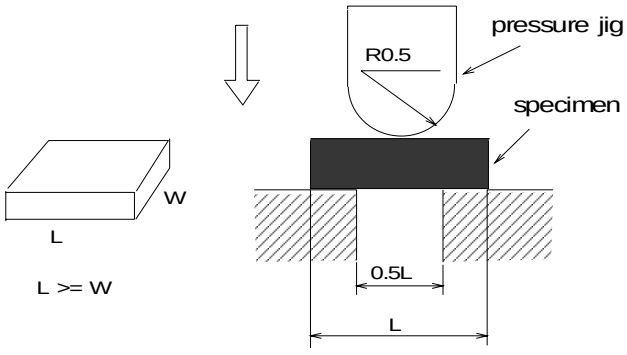
(Fig.-2)

1.5 BODY STRENGTH

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

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page Attached sheet 2 / 5

1.6 SEAL

Less than 2.0×10^{-9} [Pa m^3/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 specification3-1-1.
240 hours +60 [deg.C] +/- 2 [deg.C] , relative humidity 85[%] +/- 5[%].

2.2 LOW TEMPERATURE

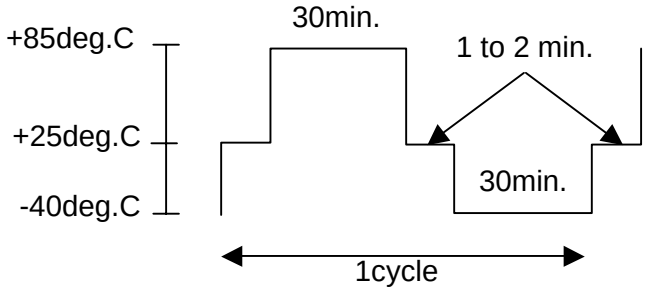
Two hours past at room temperature after following test, parts shall conform specification3-1-1.
240 hours -40 [deg.C] +/- 2 [deg.C].

2.3 HIGH TEMPERATURE

Two hours past at room temperature after following test, parts shall conform specification3-1-1.
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 specification3-1-1.



(Fig.-4)

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page Attached sheet 3 / 5

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)

[DSX321G SERIES , IN USE]

1.SOLDERING

Please perform the attached Reflow conditions to reference within 2 times.

2.MOUNT

Although it corresponds to automatic mounting,
please carry out the loading test by the loading machine to be used,
and check that there is no influence in the characteristic.
Please be careful of the Curve not to influence
the characteristic of a product, and a soldering state
at the process which makes a substrate generate the Curve,
the break of a board etc. .

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 DSX321G 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

DSX321G 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

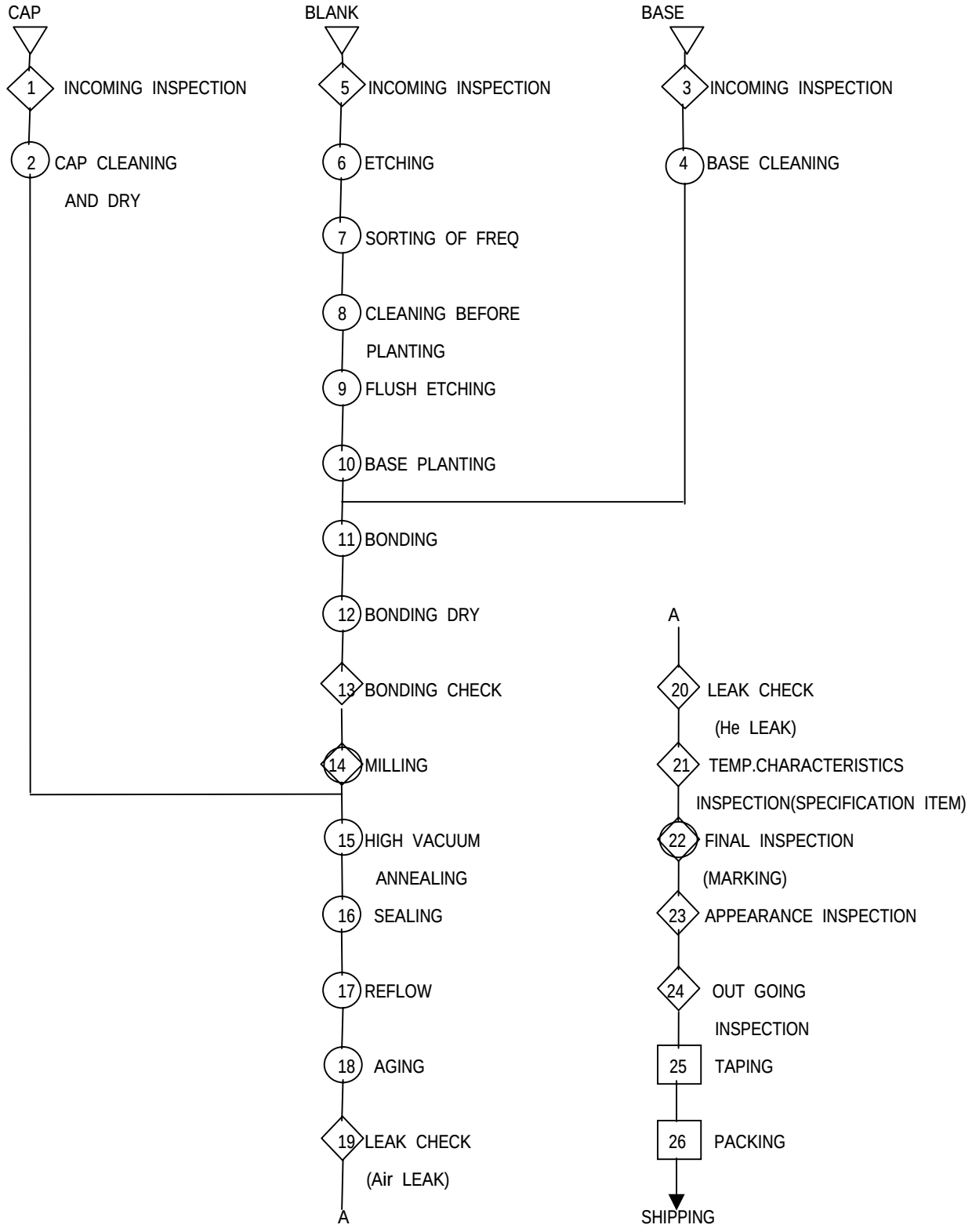
Since the soldering nature of a terminal may be degraded,
please avoid storage in high temperature and a humid place.
Please keep it in the place which direct rays do not hit
and dew condensation does not generate.

TITLE DSX321G TYPE SURFACE MOUNT TYPE QUARTZ CRYSTAL SPECIFICATION	Trigonometry	Unit	Scale
Date 2006/08/08	Drawing No. 1B319200AA0A 1C319200AA0A	Rev.	Page Attached sheet 5 / 5

2006-1045 REVISION RECORD

Rev.No	Date	Reason	Contents	Approved	Checked	Drawn
-	2006/08/08		The first edition.	T. Nakamura	H. Matsuda	K. Nakanishi

DSX421G, 321G, 221G SERIES FLOW CHART	APPROVED	REVIEWED	DRAWN	PAGE
	OOTSUBO	TAKAMI	SUGITA	1 / 1



							NOTE	SPEC No.
								NQA-1117
							ENACTMENT DATE	ARRANGEMENT No.
							09/29/2003	NQA-1117R1

DSX421G,321G,221G SERIES CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
1	CAP INCOMING INSPECTION			APPEARANCE			INCOMING INSPECTION SPEC. BOUNDARY SAMPLE	MICROSCOPE	n=200	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
				DIMENSION			INCOMING INSPECTION SPEC.	MICROMETER	n=5	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
2	CAP CLEANNING AND DRY	U.S.CLEANNING BATH			EXCHANGE REQUID		WORKING MANUAL		1	WITHIN 100,000pcs.	CHECK SHEET	MACHINE MAINTEMANCE
		ANEALING OVEN			TEMP.		WORKING MANUAL	TEMP.CONTROLLER	1	DAY	CHECK SHEET	TEMPERATURE ADJUSTMENT
					VACUUM DEGREE		WORKING MANUAL	VACUUM METER	1	DAY	CHECK SHEET	MACHINE MAINTEMANCE
3	BASE INCOMING INSPECTION			APPEARANCE			INCOMING INSPECTION SPEC. BOUNDARY SAMPLE	MICROSCOPE	n=200	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
				DIMENSION			INCOMING INSPECTION SPEC.	MICROMETER	n=5	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
4	BASE CLENNING AND DRY	U.S.CLEANNING BATH			LIQUID EXCHANGE		WORKING MANUAL		1	WITHIN 100,000pcs.	CHECK SHEET	MACHINE MAINTEMANCE
		ANNEALING OVEN			TEMP.		WORKING MANUAL	TEMP. CONTROLLER	1	DAY	CHECK SHEET	TEMPERATURE ADJUSTMENT
					VACUUM DEGREE		WORKING MANUAL	VACUUM METER	1	DAY	CHECK SHEET	MACHINE MAINTEMANCE
5	BLANK INCOMING INSPECTION			FREQUENCY			INCOMING INSPECTION SPEC.	FREQ.SORTING MACHINE	n=5	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
				DIMENSION			INCOMING INSPECTION SPEC.	MICROMETER	n=5	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
				APPEARANCE			INCOMING INSPECTION SPEC.	MICROSCOPE	n=200	LOT	INCOMING INSPECTION SHEET	RETURN TO SUPPLIER
6	ETCHING	DRAFT			MIXTURE RATIO		WORKING MANUAL	EYE CHECK	2	SHIFT	CHECK SHEET	TEMP.&DENSITY ADJUSTMENT
					TEMP.		WORKING MANUAL	THERMOMETER	2	SHIFT	TREND CHART	TEMPERATURE ADJUSTMENT
7	SORTING OF FREQENCY	FREQ' SORTING MACHINE			MACHINE CLEANNING		WORKING MANUAL		1	SHIFT	CHECK SHEET	MACHINE CLEANING
					ELECTRODE DIRT		WORKING MANUAL		1	SHIFT	CHECK SHEET	ELECTRODE CLEANING

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DAISHINKU CORP.

DSX421G,321G,221G SERIES CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
8	CLEANING BEFORE BASE PLATING	WASHING MACHINE FOR BLANK			EXCHANGE ACID		WORKING MANUAL		1	2 DAY	CHECK SHEET	MACHINE MAINTENANCE
					TEMP.		WORKING MANUAL	THERMOMETER	1	SHIFT	TREND CHART	TEMPERATURE ADJUSTMENT.
9	FLASH ETCHING (BLANK INSERTING) (F.Eg) (DRY)	BLANK INSERTING MACHINE			MACHINE CLEANING		WORKING MANUAL		1	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
		FLASH ETCHING MACHINE			WATER EXCHANGE (1,3~6BATH)		WORKING MANUAL		2	DAY	CHECK SHEET	WATER EXHANGE
					WATER EXCHANGE (2BATH)		WORKING MANUAL		1	WEEK	CHECK SHEET	WATER EXHANGE
					WATER TEMP(2BATH)		WORKING MANUAL	THERMOMETER	1	SHIFT	TREND CHART	TEMP. ADJ
		CLEAN OVEN		TEMP			WORKING MANUAL	THERMOMETER	1	SHIFT	TREND CHART	TEMP. ADJ
10	BASE PLATING	BASE PLATING MACHINE			VACUUM DEGREE		WORKING MANUAL	VACUUM METER	1	DAY	TREND CHART	MACHINE MAINTEMANCE
					WASHING BASE PLATING MASK		WORKING MANUAL	EYE CHECK	1	WITHIN 10SHOTS	CHECK SHEET	RE-WASHING
				FREQENCY			WORKING MANUAL	NETWORK ANALYZER	n=5	LOT	LOT CARD	MACHINE MAINTENANCE
				APPEARANCE			WORKING MANUAL	EYE CHECK	ALL	LOT	LOT CARD	MACHINE MAINTENANCE
				FILM STRENGTH			WORKING MANUAL	SEROTAPE	n=5	DAY	LOT CARD	MACHINE MAINTENANCE
		N2 BLOW MACHINE		N2 PRESSURRE			WORKING MANUAL	REGULATER	1	DAY	CHECK SHEET	REGULATER ADJUSTMENT
				TIME			WORKING MANUAL	STOP WATCH	1	DAY	CHECK SHEET	REGULATER ADJUSTMENT
11	BONDING	BLANK MOUNT MACHINE		BONDING CONDITION			WORKING MANUAL BOUNDARY SAMPLE	MICROSCOPE	n=200	LOT	LOT CARD	MACHINE MAINTENANCE
					ADHESIVE AGENT STORAGE TEMP		WORKING MANUAL	THERMOMETER	1	DAY	TREND CHART	TEMPERATURE ADJUSTMENT

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DSX421G,321G,221G SERIES CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
12	BONDING DRY	BONDING DRY OVEN			TEMPERATURE		WORKING MANUAL	DISPLAY TEMPERATURE	1	DAY	CHECK SHEET	TEMPERATURE ADJUSTMENT
					DEW POINT		WORKING MANUAL	DEW INDICATOR OR OXYGEN DENSIMETER	1	DAY	TREND CHART	MACHINE MAINTENANCE
					OVEN TEMP.		WORKING MANUAL	THERMOCOUPLE	1	3 MONTHS	PROFILE	TEMPERATURE ADJUSTMENT
13	BONDING CHECK			BONDING CONDITION DUST CHECK			WORKING MANUAL BOUNDARY SAMPLE	MICROSCOPE	ALL	LOT	LOT CARD	CONTACT TO BONDING PROCESS
				BONDING STRENGTH			WORKING MANUAL	TENSION GAGE	LOT/ITEM (n=3)	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
				BONDING EXFOLIATION CONDITION			WORKING MANUAL BOUNDARY SAMPLE	MICROSCOPE	LOT/ITEM (n=3)	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
14	MILLING	AUTO MILLING MACHINE			VACUUM DEGREE		WORKING MANUAL	VACUUM METER	1	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
				FREQENCY			WORKING MANUAL	NETWORK ANALISER	n=5/LOT	SETTING CHANGE	LOT CARD	MACHINE MAINTENANCE
					MILING MASK CLEANING		WORKING MANUAL		1	MONTH	LOT CARD	MACHINE MAINTENANCE
15	HIGH VACUUM ANNELING	ANNEALING OVEN			VACUUM DEGREE		WORKING MANUAL	VACUUM METER	1	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
					TEMPERATURE		WORKING MANUAL	DISPLAY TEMPERATURE	1	SHIFT	CHECK SHEET	TEMP. ADJUSTMENT
					INTERNAL TEMPERATURE		WORKING MANUAL	THERMOCOUPLE	1	3 MONTHS	TEMPERATURE PROFILE	MACHINE MAINTENANCE
16	SEALING	SEALING OVEN			SEALING TEMPERATURE		WORKING MANUAL	TEMP. CONTROLER	1	DAY	CHECK SHEET	TEMPERATURE ADJUSTMENT
					DEW POINT		WORKING MANUAL	DEW INDICATOR OR OXYGEN DENSIMETER	1	DAY	TREND CHART	MACHINE MAINTENANCE
					SEALING STATE		WORKING MANUAL	INSPECTION TOOL	ALL	LOT	LOT CARD	MACHINE MAINTENANCE

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DSX421G,321G,221G SERIES CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
17	REFLOW	REFLOW OVEN			CONBEA SPEED		WORKING MANUAL	SPEED METER	1	DAY	CHECK SHEET	MACHINE MAINTENANCE
					TEMPERATURE		WORKING MANUAL	DISPLAY TEMPERATURE	1	DAY	CHECK SHEET	TEMPERATURE ADJUSTMENT
					OVEN TEMP.		WORKING MANUAL	THERMOCOUPLE	1	3 MONTHS	TEMPERATURE PROFILE	TEMPERATURE ADJUSTMENT
18	AGING	AGING OVEN			TEMPERATURE		WORKING MANUAL	TEMP. CONTROLLER	1	SHIFT	TREND CHART	TEMPERATURE ADJUSTMENT
					TIME		WORKING MANUAL	TIMER	1	LOT	LOT CARD	MACHINE MAINTENANCE
19	LEAK CHECK (AIR LEAK)	AIR LEAK TES TER		SEALING			WORKING MANUAL	AIR LEAK TESTER	ALL	LOT	LOT CARD	CONTACT TO SEAM SEALING PROCESS
20	LEAK CHECK (He LEAK)	He LEAK DETECTER		SEALING			WORKING MANUAL	He LEAK DETECTER	ALL	LOT	LOT CARD	CONTACT TO SEAM SEALING PROCESS
		He pressurization		TIME(After pressurization)			WORKING MANUAL	TIMER	ALL	LOT	LOT CARD	Again He pressurization
21	TEMPERATURE CHARACTERISTIC CHECK (* SPECIFIED ITEM ONLY)	TEMPERATURE CHARACTERISTIC MEASUREMENT MACHINE		TEMP.CHARAC TERISTIC			WORKING MANUAL	FREQ.SYNCESIZER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
				CI VALUE			WORKING MANUAL	V.V. METER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
22	FINAL INSPECTION (MARKING)	AUTO MEASUREMENT MACHINE INSULATION INSPECTION MACHINE		LOW DRIVE LEVEL			WORKING MANUAL	NETWORK ANALYZER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
				FREQUENCY			WORKING MANUAL	NETWORK ANALYZER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
				CI			WORKING MANUAL	NETWORK ANALYZER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
				INSULATION			WORKING MANUAL	INSULATION METER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DSX421G,321G,221G SERIES CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
		LASER MARKING MACHINE		MARKING			WORKING MANUAL DESIGNED STANDARD BOUNDARY SAMPLE	EYE CHECK	n=256	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
					MACHINE CHECK		WORKING MANUAL		1	SHIFT	CHECK SHEET	MACHINE MAINTENANCE
23	APPEARANCE INSPECTION			APPEARANCE			WORKING MANUAL BOUNDARY SAMPLE	EYE CHECK	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
24	OUT GOING INSPECTION			LOW DRIVE LEVEL			OUT GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	NETWORK ANALYZER	AQL STANDARD II 0.1 %	LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
				FREQENCY DEVIATION		$	OUT-GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	NETWORK ANALYZER	AQL STANDARD II 0.1 %	LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
									n=5 (SPECIFIED)	1LOT/DAY	X-R CHART Cpk	RETURN TO PREVIOUS PROCESS
				CI		$	OUT GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	NETWORK ANALYZER	AQL STANDARD II 0.1 %	LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
									n=5 (SPECIFIED)	1LOT/DAY	X-R CHART Cpk	RETURN TO PREVIOUS PROCESS
				APPEARANCE			OUT-GOING INSPECTION SPEC DESINED STD. WORKING MANUAL BOUNDARY SAMPLE	EYE CHECK	AQL STANDARD I 0.15 %	LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
				INSURATION			OUT GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	IR TESTER	AQL STANDARD I 0.1 %	ONLY FIRST LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
				DIMENSION			OUT GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	CALIPER	AQL STANDARD S-2 1.0 %	ONLY FIRST LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DSX421G,321G,221G SERIES CONTROL PLAN

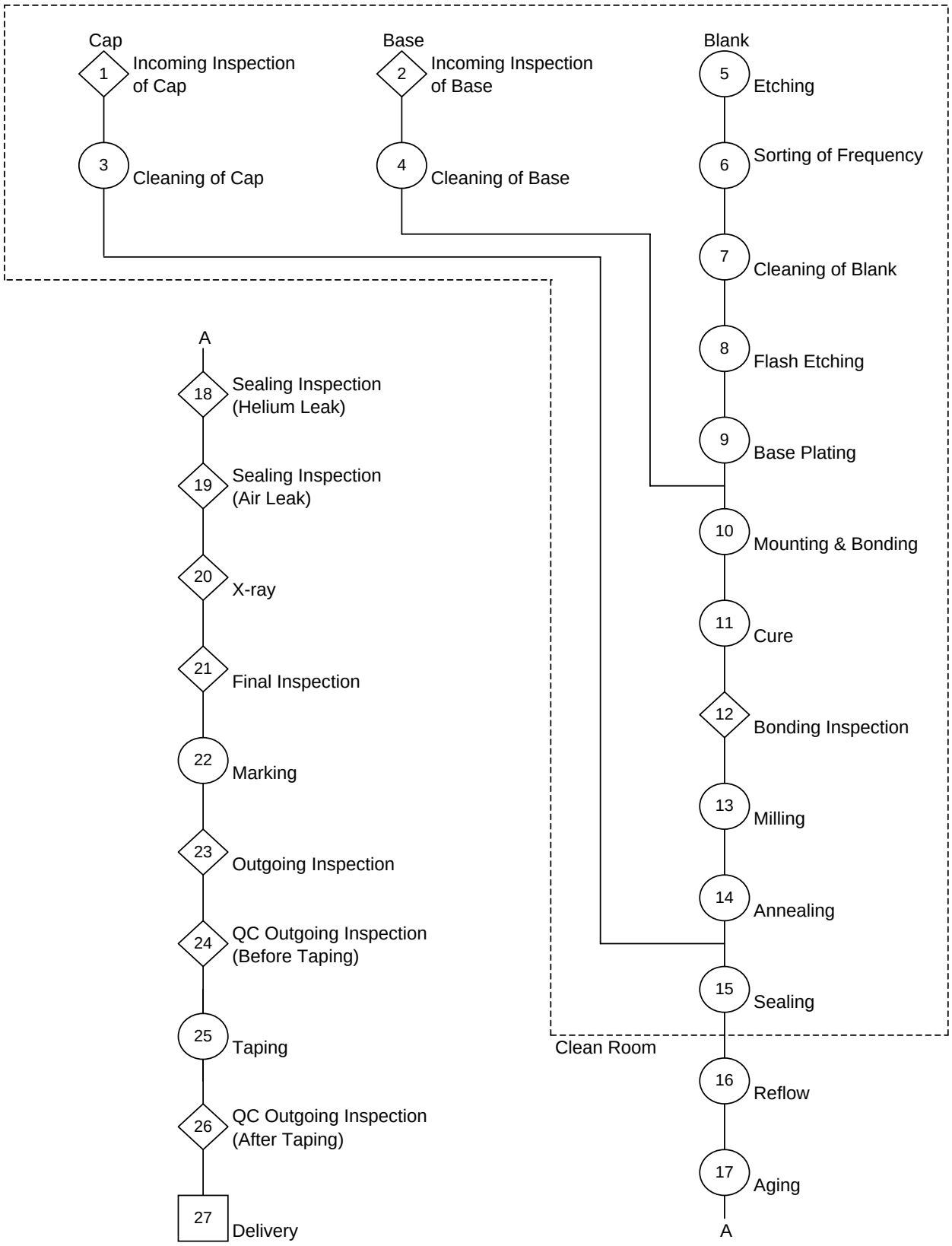
PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	PHONE NO	TOTTORI PLANT (0857)52-4501	DATE (ISSUE)	SEP 29, 2003	DATE (REVISION)	MAY 15, 2006
CONTROL No.	NQA-1118	REV. No.	NQA-1118 R9			CORE TEAM	KISHIMOTO(TEAM LEADER), AOKI(PG) NISHIDA(Q.A.G),SUGITA(Q.A.G),NAGAISHI(Q.A.D), KOMATSU(M.T),MATSUMOTO(ENG)	CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
ITEM	DSX421G,321G,221G SERIES	PART No.						CUSTOMER QUALITY APPROVAL/DATE(IF REQ'D)			
PLANT	TOTTRI FACTRY	PLANT No.				APPROVED BY:	OOTUBO	OTHER APPROVAL/DATE(IF REQ'D)			

PROCESS No.	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE JIG,TOOLS FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			No.	PRODUCT	PROCESS		PRODUCT/ PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQ.	CONTROL METHODS	
				OTHER,GUARANTEE ITEM			DESIGN STD.				INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
				DIMENSION (LAYOUT INSPECTION)			LAYOUT INSPECTION PROCEDURE DOCUMENT	DIGITAL CALIPER MICROMETER PROJECTOR	1 TIME (n=10) SPECIFIED	YEAR	RELIABILITY REPORT	CONTACT TO TOTTORI Q.C. Section. FROM Q.A Division. R.C Gr
				FUNCTIONAL INSPECTION			FUNCTIONAL PROCEDURE DOCUMENT	IR TESTER INPEADANCE ANALYZER	1 TIME (n=10) SPECIFIED	YEAR	RELIABILITY REPORT	CONTACT TO TOTTORI Q.C. Section. FROM Q.A Division. R.C Gr
				SEALING			OUT GOING INSPECTION SPEC DESINED STD. WORKING MANUAL	GALDEN	AQL STANDARD S-4 0.1 %	ONLY FIRST LOT	INSPECTION SHEET	CONTACT TO PREVIOUS PROCESS
25	TAPING	AUTO TAPING MACHINE		Q'TY			WORKING MANUAL	COUNTER	ALL	LOT	LOT CARD	CONTACT TO PREVIOUS PROCESS
				TAPING STRENGTH			WORKING MANUAL	PEELING FORCE GAUGE	1	WEEK	TREND CHART	MACHINE MAINTENANCE
26	OUT GOING PACKING						WORKING MANUAL				SHIPPING DESCRIPTIONS	RE -PACKING

"$" in the column of "Special Characteristics" means critical parameters to be controlled carefully.

DSX321G Series Process Flow Chart

PT. KDS INDONESIA



Note	Enactment date	Control No.
	07-Sep-2004 20-Apr-2006 (R3)	KDS-FC-018

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
1	Incoming Inspection of Cap	Micrometer		Dimension			Incoming inspection spec	Micrometer	Incoming Inspection spec	Lot	Incoming inspection sheet	Return to supplier
		Microscope		Appearance			Boundary sample	Microscope	Incoming Inspection spec	Lot	Incoming inspection sheet	Return to supplier
2	Incoming Inspection of Base	Micrometer		Dimension			Incoming inspection spec	Micrometer	Incoming Inspection spec	Lot	Incoming inspection sheet	Return to supplier
		Microscope		Appearance			Boundary sample	Microscope	Incoming Inspection spec	Lot	Incoming inspection sheet	Return to supplier
3	Cleaning of Cap	Cleaning bath			Shake		Working manual	Visual check	100%	Jig	-	Shake again
					Exchange pure water		Working manual	Visual check	1	Jig	-	Exchange pure water
					Temperature water		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
		Oven			Temperature oven		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Time		Working manual	Watch	100%	Jig	Working note	Time adjustment
					Cleaning oven		Working manual	Visual check	1	Month	Check sheet	Cleaning again
					Wait Time (Cleaning -Partial plating)		Working manual	Watch	100%	Lot	Working note	Cleaning again
4	Cleaning of Base	Cleaning bath			Shake		Working manual	Visual check	100%	Jig	-	Shake again
					Exchange pure water		Working manual	Visual check	1	Jig	-	Exchange pure water
					Temperature water		Working manual	Thermometer	1	Shift	Check sheet	Temperature adjustment
		Oven			Temperature oven		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Time		Working manual	Watch	100%	Jig	Working note	Time adjustment
					Cleaning oven		Working manual	Visual check	1	Month	Check sheet	Cleaning again
					Wait time (Cleaning–bonding)		Working manual	Watch	100%	Lot	Working note	Cleaning again
5	Etching	Fundamental oscillator		Frequency			Production spec.	Fundamental oscillator	5pcs	Lot	Lot card	Return to blank-process

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
		Etching bath			Liquid mixture ratio		Working manual	Glass beaker	1	Shift	Check sheet	Mixture adjustment
					Water level		Working manual	Glass beaker	1	Shift	Check sheet	Water level adjustment
					Etching liquid Temperature		Working manual	Thermometer	1	Shift	Check sheet Control graph	Temperature adjustment
		Stop watch			Etching time		Working manual	Stop watch	100%	Lot	Lot card	Etching again
					Quantity		Working manual	Jig	100%	Lot	-	Quantity adjustment
6	Sorting of Frequency	Automatic quartz sorter		Frequency			Production spec.	Frequency counter	100%	Lot	Lot card	Return to AT-blank
		Magnifying lamp		Appearance			Boundary sample	Magnifying lamp	100%	Lot	Working note	Maintenance
7	Cleaning of Blank	Cleaning machine			Exchange liquid acid		Working manual	Glass beaker	1	42,000pcs +/-10%	Working note	Mixture again
					Exchange liquid Alkali		Working manual	Glass beaker	1	42,000pcs +/-10%	Working note	Exchange liquid alkali
					Liquid level		Working manual	Pipette	1	Shift	Check sheet	Liquid level adjustment
					Liquid temperature (Acid / Alkali)		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Quantity		Working manual	Jig	100%	Lot	-	Quantity adjustment
		Microwave			Time		Working manual	Auto timer	100%	Lot	-	Time adjustment
8	Flash Etching	Flash Etching Machine			Density		Working manual	Density control meter	1	Shift	Check sheet	Shake again
					Exchange DI water		Working manual	-	1	Jig	Check sheet	Exchange DI water
					Temperature DI water		Working manual	Temperature control meter	1	Shift	Temperature control graph	Temperature adjustment
		Oven			Temperature oven		Working manual	Temperature control meter	1	Shift	Temperature control graph	Temperature adjustment
					Time oven		Working manual	Watch	100%	Lot	Working note	Time adjustment
					Cleaning oven		Working manual	Visual check	1	Shift	Check sheet	Cleaning again
9	Base Plating	Base plating Machine (SPUTTER machine)			Vacuum degree		Working manual	Vacuum gauge Control meter	1	Shift	Check sheet	Pump maintenance
					Heater current		Working manual	Ampere control meter	1	Shift	Check sheet	Machine adjustment

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
					Exchange target (Silver)		Working manual	Visual check	1	1,900M MAX	Check sheet	Exchange target
					Exchange target (Chromium)		Working manual	Visual check	1	30,000M MAX	Check sheet	Exchange target
					Time to reach vacuum		Working manual	Stop watch	1	Shift	Control graph	Pump maintenance
				Plating strength			Working manual	Cellophane Tape test	n=5	Lot	Working note	Machine adjustment
					Machine cleaning		Working manual	Visual check	1	Exchange target	Check sheet	Cleaning again
		Frequency counter		Frequency			Production spec.	Frequency counter	n=5	Lot	Lot card	Ag amount adjustment
		Microscope		Appearance			Boundary sample	Microscope	100%	Lot	Lot card	Machine adjustment
		Base plating mask			Mask cleaning		Working manual	Visual check	1	1time	Working note	Cleaning again
		Standing mask			Standing mask cleaning		Working manual	Visual check	1	Shift	Check sheet	Cleaning again
		Magazine tray			Magazine tray Cleaning		Working manual	Visual check	1	Shift	Check sheet	Cleaning again
10	Mounting & Bonding	Mounting & Bonding machine			Exchange conductive paste		Working manual	Visual check	2	Shift	Check sheet	Exchange Conductive paste
					Head needle cleaning		Working manual	Visual check	2	Shift	Check sheet	Cleaning again
					Dispenser cleaning		Working manual	Visual check	2	Shift	Check sheet	Cleaning again
					Storage temperature for conductive paste		Working manual	Thermometer	1	Shift	Check sheet	Temperature adjustment
		Microscope		Bonding condition			Boundary sample	Microscope	100%	Lot	Lot card	Machine adjustment
11	Cure	Oven			Temperature		Working manual	Temperature control meter	1	Shift	Check sheet Control graph	Temperature adjustment
					Dew point		Working manual	Dew point control meter	1	Shift	Check sheet Control graph	Dew point adjustment
					Speed conveyor		Working manual	Speed control meter	1	Shift	Check sheet	Speed adjustment
					Temperature calibration		Working manual	Thermocouple	1	month	Calibration record	Machine maintenance
12	Bonding Inspection	Microscope		Appearance			Boundary sample	Microscope	100%	Lot	Lot card	Contact to foreman Machine adjustment

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
		Push pull gauge		Bonding strength			Working manual	Push pull Gauge	n=5 n=7	1-5,000pcs 5,001pcs -	Control graph	Contact to foreman Oven maintenance
13	Milling	Milling machine			Vacuum degree		Working manual	Vacuum gauge Control meter	1	Shift	Check sheet	Pump maintenance
					Time to reach vacuum		Working manual	Stop watch	1	Shift	Control graph	Pump maintenance
					Machine cleaning		Working manual	Visual check	1	Shift	Check sheet	Cleaning again
		Milling mask			Milling mask cleaning		Working manual	Visual check	1	15,000pcs MAX	Check sheet	Cleaning again
		Milling carrier			Milling cleaning		Working manual	Visual check	1	Shift	Check sheet	Cleaning again
		Over drive machine		Frequency			Working manual	Frequency Counter	100%	Lot	Lot card	Machine adjustment
					Over drive setting		Working manual	Power meter	1	Lot	-	Machine adjustment
		Comparator		Frequency			Production spec.	Comparator	100%	Lot	Lot card	Machine adjustment
		CI-meter		CI			Production spec.	CI-meter	100%	Lot	Lot card	Machine adjustment
		Cap pallet Jig			Cap pallet Jig condition		Working manual	Visual check	100%	Lot	-	Pallet Jig maintenance
				Appearance			Working manual	Visual check	100%	Lot	-	Pallet Jig maintenance
14	Annealing	Annealing machine			Temperature		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Vacuum degree		Working manual	Vacuum gauge control meter	1	Shift	Check sheet	Pump maintenance
					Time		Working manual	Auto timer	1	Shift	Check sheet	Auto timer maintenance
15	Sealing	Sealing oven			Temperature		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Speed conveyor		Working manual	Speed control meter	1	Shift	Check sheet	Speed adjustment
		Dew point meter			Dew point		Working manual	Dew point control meter	1	Shift	Check sheet	Dew point adjustment
		Oxygen meter			Oxygen density		Working manual	Oxygen control meter	1	Shift	Check sheet	Oxygen adjustment
				Appearance			Boundary sample	Visual check	100%	Lot	Lot card	Temperature adjustment

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
16	Reflow	Reflow machine			Temperature		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Speed		Working manual	Speed control meter	1	Shift	Check sheet	Speed adjustment
17	Aging	Oven			Temperature		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
					Time		Working manual	Watch	100%	Lot	Working note	Time adjustment
18	Sealing Inspection (Helium Leak)	Helium press			Vacuum		Working manual	Vacuum gauge Control meter	1	Shift	Check sheet	Pump maintenance
					Pressure		Working manual	Pressure control meter	1	Shift	Check sheet	Pressure adjustment
					Time pressure		Working manual	Watch	100%	Lot	Working note	Time adjustment
		Helium leak Detector		Sealing			Working manual	Helium leak Detector	100%	Lot	Lot card	Contact to sealing process
					Time (He press - He leak check)		Working manual	Watch	100%	Lot	Working note	Helium press again
19	Sealing Inspection (Air Leak)	Air leak tester machine			O-ring		Working manual	Visual check	1	200,000pcs MAX	Working note	Cleaning again
				Sealing			Working manual	Air leak tester	100%	Lot	Lot card	Contact to sealing process
20	X-ray	X-ray machine		Sealing condition			Boundary sample	X-ray machine	30%	Lot	Lot card	Contact to sealing process
21	Final Inspection	Comparator CI-meter		Frequency			Production spec.	Comparator	100%	Lot	Lot card	Contact to DSX-Assy.
				CI		$	Production spec.	CI-meter	100%	Lot	Lot card	Contact to DSX-Assy.
		Network analyzer		Low drive level			Production spec.	Network analyzer	100%	Lot	Lot card	Contact to DSX-Assy.
		IR-meter		Insulation			Production spec.	IR-meter	100%	Lot	Lot card	Contact to DSX-Assy.
				Appearance			Boundary sample	Visual check	100%	Lot	Lot card	Contact to DSX-Assy.
22	Marking	Marking machine			Marking condition		Working manual	Visual check	n=5	Lot	Lot card	Machine adjustment
				Marking strength			Working manual	Alcohol	n=5	Lot	Lot card	Machine adjustment
				Appearance			Boundary sample	Visual check	100%	Lot	Lot card	Machine adjustment
23	Outgoing Inspection	Comparator CI-meter		Frequency			Production spec.	Comparator	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.
				CI			Production spec.	CI-meter	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)			
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)			
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)			

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
		IR-meter		Insulation			Production spec.	IR-meter	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.
		Caliper		Dimension			Production spec.	Caliper	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.
		Flourinert		Sealing			Production spec.	Flourinert	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.
					Temp flourinert		Working manual	Thermometer	1	Shift	Check sheet	Temperature adjustment
					Time		Working manual	Stop watch	100%	Lot	-	Check again
				Appearance			Boundary sample	Visual check	Outgoing inspection spec	Lot	Outgoing Inspection result	Contact to DSX-Assy.
		Pallet Jig			Quantity		Working manual	Pallet Jig	100%	Lot	Lot card	Contact to DSX-Assy.
24	QC Outgoing Inspection (Before Taping)	Flourinert		Sealing			Working manual	Flourinert	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
					Temp flourinert		Working manual	Thermometer	1	Shift	Check sheet	Temperature adjustment
					Time		Working manual	Stop watch	100%	Lot	-	Check again
		Network analyzer		Low drive level			Production spec.	Network analyzer	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
		Comparator CI-meter		Frequency			Engineering spec. QC outgoing inspection spec. Working manual	Comparator	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
				CI			Engineering spec. QC outgoing inspection spec. Working manual	CI-meter	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
		Caliper		Dimension			Engineering spec. QC outgoing inspection spec. Working manual	Caliper	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
				Appearance			Boundary sample	Visual check	QC Outgoing Inspection spec	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.

"$" in the column of "class" means critaical parameters to be controled carefully.

DSX321G Series ASSEMBLY CONTROL PLAN

PROTOTYPE		PRE-LAUNCH		PRODUCTION	O	KEY CONTACT /PHONE	Tiarma (62)21 - 8980120 - 4 EXT 132	DATE (ORIG)	07-Sep-2004	DATE (REV.)	20-Apr-2006 (R2)	
CONTROL No.	KDS-CP-018					CORE TEAM	Kristianto, Rini, Ropensius, Samsul (PROD) Endaria, Bowo, Benariya (QC) Aveltri (QA)	CUSTOMER ENGINEERING APPROVAL DATE (IF REQ'D)				
PART NAME / DESCRIPTION	DSX321G Series					APPROVAL / DATE	T.Ikeda	CUSTOMER QUALITY APPROVAL DATE (IF REQ'D)				
SUPPLIER	PT. KDS INDONESIA		SUPPLIER CODE			OTHER APPROVAL DATE (IF REQ'D)		OTHER APPROVAL DATE (IF REQ'D)				

PROC No.	PROCESS NAME / OPERATION DESCRIPTION	MACHINE, DEVICE JIG, TOOLS FOR WORKING MANUFACTURING	No.	CHARACTERISTICS		SPECIAL CHARA. CLASS	METHODS					REACTION PLAN / PERSON WHO TAKE RESPONSIBILITY
				PRODUCT	PROCESS		PRODUCT / PROCESS SPECIFICATION / TOLERANCE	EVALUATION / MEASUREMENT TECHNIQUE	SIZE	FREQ	CONTROL METHOD	
25	Taping	Taping machine		Quantity			Taping spec.	Quantity counter	100%	Lot	Working note	Quantity adjustment
					Check sensor		Working manual	Visual check	1	Shift	Check sheet	Machine adjustment
					Temperature heater		Working manual	Temperature control meter	1	Shift	Check sheet	Temperature adjustment
		Strength taping machine		Strength taping			Working manual	Strength taping machine	1	Shift	Check sheet Control graph	Temperature adjustment
		Comparator		Frequency			Production spec.	Comparator	1	Shift	Check sheet	Contact to DSX-Assy.
				Appearance			Boundary sample	Visual check	100%	Lot	Lot card	Contact to DSX-Assy.
26	QC Outgoing Inspection (After Taping)	Jig quantity taping		Quantity			Taping spec.	Jig	100%	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
		Standard sinker		Strength taping			Working manual	Standard sinker	1	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
				Appearance			Boundary sample	Visual check	1reel	Lot	QC Outgoing Inspection result	Contact to DSX-Assy.
27	Delivery			Quantity			Working manual	-	100%	Lot	Export data	-

"$" in the column of "class" means critaical parameters to be controled carefully.

KDS

Prepared for: ***No.R06NH57201***

Techfaith Wireless Communication Technology Limited

Reliability Test Data

Product : Crystal Resonator

Type : DSX321G 19.200MHz

(Test Data on 24.576MHz substituted for 19.200MHz)

RoHS Compliance Part
JEITA : Phase 3A

(KDS JAPAN)

Date : Aug. 8. 2006

Daishinku Corporation

Quality Assurance Department

A. Homma

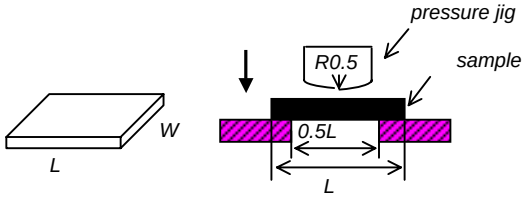
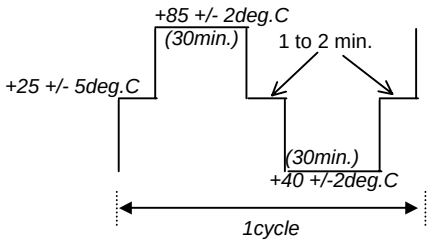
Akihiro Homma / Manager

Daishinku Corporation - Quality Assurance Department
1192-8 Tsuruike, Shinzaike, Hiraoka-cho, Kakogawa, Hyogo Japan 675-0101
Phone 81-794-25-6701 Fax 81-794-25-6725

TEST PROCEDURES AND RESULTS

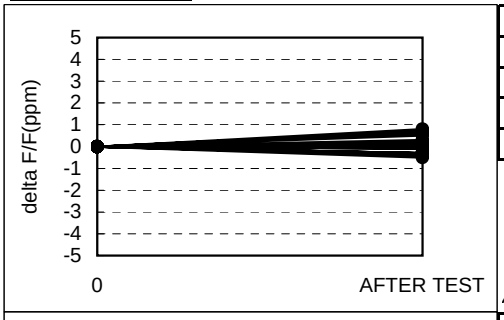
No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
1	SHOCK	A SAMPLE BOX (BAKELITE : 100g) WHICH INCLUDES A P.C. BOARD (GLASS - EPOXY : 1.6mm) SOLDERED SHALL BE DROPPED ONTO CONCRETE FROM THE HIGHT OF 150cm 10 CYCLES. (1CYCLE = 6 AXES)	Freq. Variation delta F/F = +/- 5ppm MAX. CI Variation delta CI = +/- 20% or +/- 3ohms MAX.	r/n = 0/20 GOOD	1
2	VIBRARION	SUPPLYING FOLLOWING VIBRATION; VIBRATION FREQ.:10 to 55Hz,1.5mm or 5G FULL WAVE DIRECTION:X,Y,Z TIME:120min. TO EACH DIRECTIN	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
3	SEALING TIGHTNESS	(1) DIPPING IN THE GALDEN (SVX) AT 125 deg.C FOR 5 min.	THERE IS NO OBSERVATION OF ANY GAS BUBBLE FROM TJ\HE INSIDE OF THE CAN	r/n = 0/20 GOOD	1
		(2) LEAK RATE SHALL BE MEASURED BY USING HELIUM LEAK DETECTOR	2.0 E-9 Pa.m^3/sec MAX	r/n = 0/20 GOOD	3
4	SOLDERABILITY	AFTER APPLYING ROSIN FLUX. DIPPING IN MOTEN SOLDER IN TANK AS FOLLOWS; DIPPING TIME:3 +/- 0.5sec SOLDERING TEMP.:+235 +/-5 deg.C DIPPING DEPTH : WHOLE GOLD PLATED TERMINAL	OVER 90% GOLD PLATING DIPPED IS COVERED SOLDER	r/n = 0/20 GOOD	-
5	REFLOW	THE FOLLOWING REFLOW SHALL BE PERFORMED 2TIMES (deg.C) PEAK 260deg.C 10sec 260 220 160 100 120 sec (TIME)	Freq. Variation delta F/F = +/- 5ppm MAX. CI Variation delta CI = +/- 20% or +/- 3ohms MAX.	r/n = 0/20 GOOD	1
6	BOARD BENDING STRENGTH	MOUNT A SAMPLE ON BOARD APPLY PRESSURE TO THE CENTER OF BOARD UNTIL IT IS BENT TO 3mm AND HOLD FOR 5 +/-1 sec PRESSURE SPEED : 0.5mm / sec pressure jig 20 R230 board 45 +/- 2 45 +/- 2	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
7	ADHESION TO BOARD	MOUNT A SAMPLE ON THE CIRCUIT BOARD APPLY PRESSURE VERTICALLY TO THE SIDE OF SPECIMEN ATTACHED TO THE CIRCUIT BOARD WITH THE PRESSURE JIG. PRESSURE : 10N FOR 10 +/- 1sec board pressure jig R0.5 sample	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1

TEST PROCEDURES AND RESULTS

No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
8	BODY STRENGTH	APPLY PRESSURE TO THE CENTER OF BODY WITH THE R0.5 PRESSURE JIG PRESSURE : 10N FOR 10 +/- 1sec 	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
9	HUMIDITY	KEEP SAMPLE(S) AT +60 +/-2deg.C IN HUMIDITY 90 to 95% FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
10	STORAGE IN LOW TEMP.	KEEP SAMPLE(S) AT -40 +/-2deg.C FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
11	STORAGE IN HIGH TEMP.	KEEP SAMPLE(S) AT +85 +/-2deg.C FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
12	VPS (VAPOR PHASE SOLDERING)	PART IS LEFT IN FC-70 (THE BOILING POINT = 215degC) VAPOR FOR 30sec.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
13	TEMP. CYCLE	SUPPLYING 25CYCLES AS FOLLOWS; 	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2

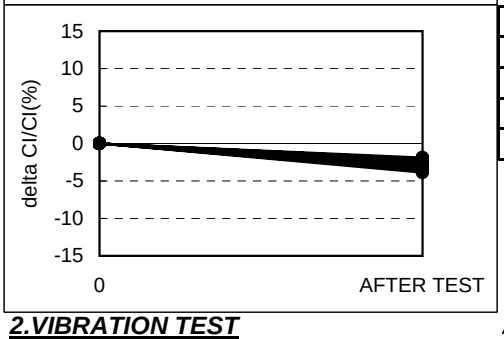
DSX321G 24.576MHz (RoHS Compliance Part)
(KDS JAPAN)

1.SHOCK TEST



AFTER TEST

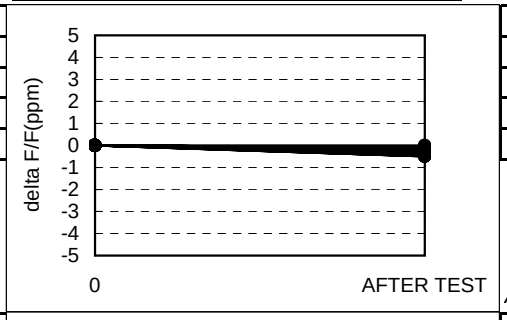
delta F/F(ppm)	
X-bar	0.10
3S	1.31
MAX	0.8
MIN	-0.5



AFTER TEST

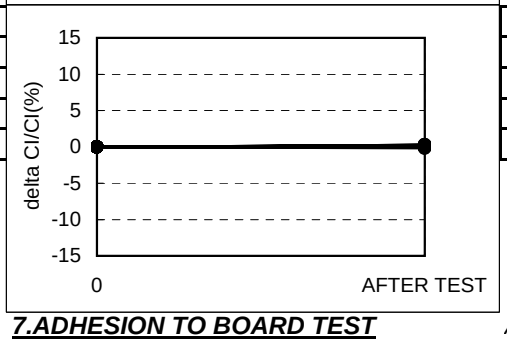
deltaCI/CI(%)	
X-bar	-2.80
3S	1.90
MAX	-1.9
MIN	-3.9

6.BOARD BENDING STRENGTH TEST



AFTER TEST

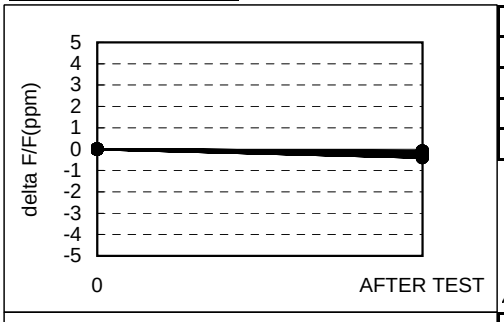
delta F/F(ppm)	
X-bar	-0.27
3S	0.47
MAX	0.0
MIN	-0.5



AFTER TEST

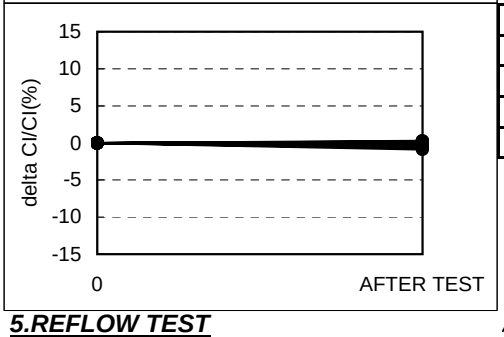
deltaCI/CI(%)	
X-bar	0.08
3S	0.42
MAX	0.3
MIN	-0.2

2.VIBRATION TEST



AFTER TEST

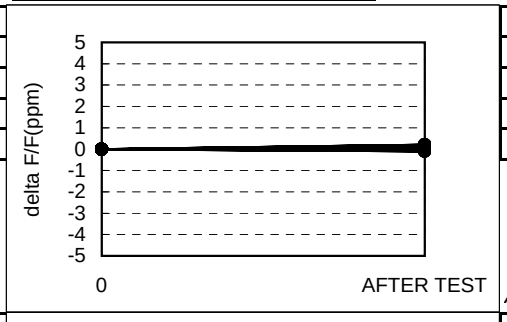
delta F/F(ppm)	
X-bar	-0.25
3S	0.33
MAX	-0.1
MIN	-0.4



AFTER TEST

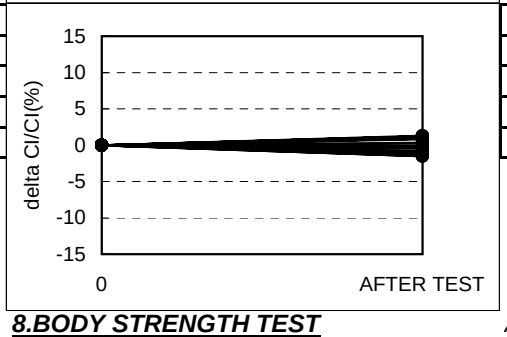
deltaCI/CI(%)	
X-bar	-0.22
3S	1.02
MAX	0.3
MIN	-0.9

7.ADHESION TO BOARD TEST



AFTER TEST

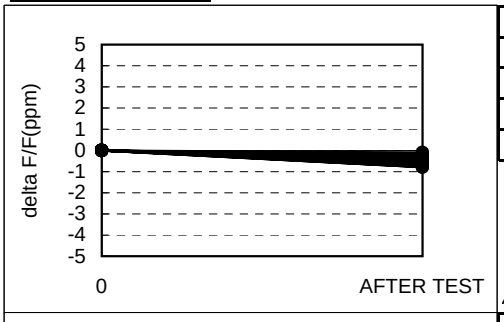
delta F/F(ppm)	
X-bar	0.06
3S	0.31
MAX	0.2
MIN	-0.1



AFTER TEST

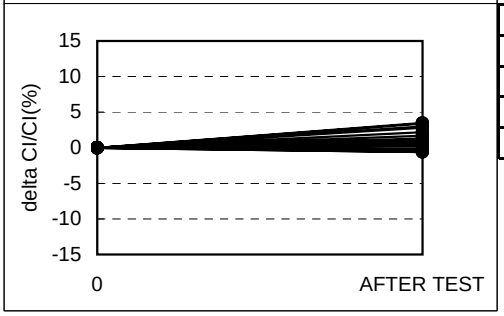
deltaCI/CI(%)	
X-bar	-0.14
3S	3.10
MAX	1.3
MIN	-1.5

5.REFLOW TEST



AFTER TEST

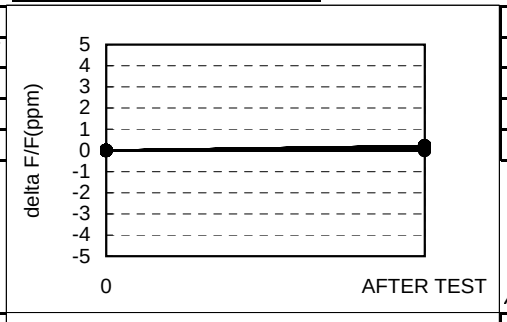
delta F/F(ppm)	
X-bar	-0.47
3S	0.62
MAX	-0.1
MIN	-0.8



AFTER TEST

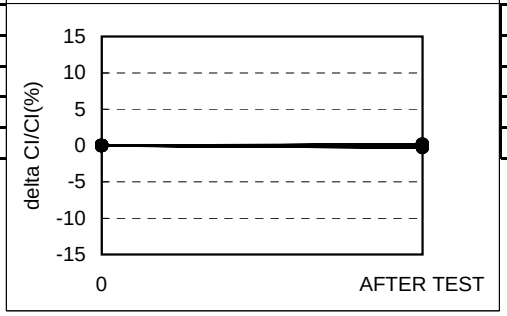
deltaCI/CI(%)	
X-bar	1.15
3S	3.82
MAX	3.5
MIN	-0.6

8.BODY STRENGTH TEST



AFTER TEST

delta F/F(ppm)	
X-bar	0.15
3S	0.21
MAX	0.2
MIN	0.0

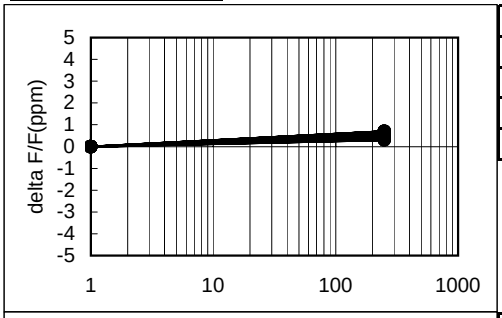


AFTER TEST

deltaCI/CI(%)	
X-bar	-0.07
3S	0.47
MAX	0.2
MIN	-0.3

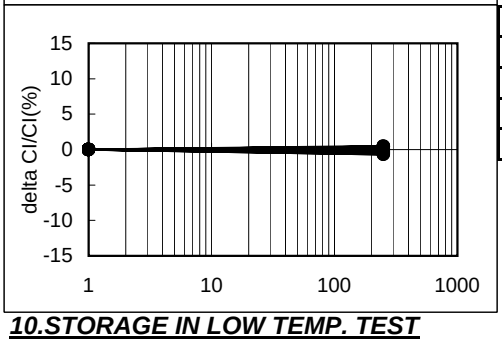
DSX321G 24.576MHz (RoHS Compliance Part)
(KDS JAPAN)

9.HUMIDITY TEST



AFTER 250hours

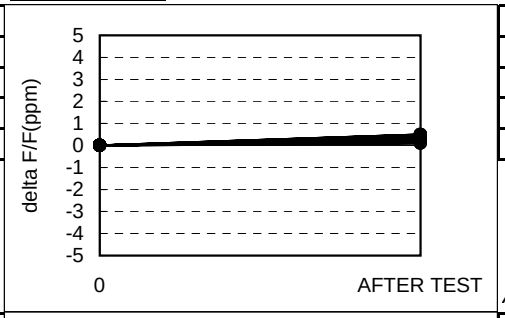
delta F/F(ppm)	
X-bar	*0.51*
3S	*0.42*
MAX	*0.7*
MIN	*0.3*



AFTER 250hours

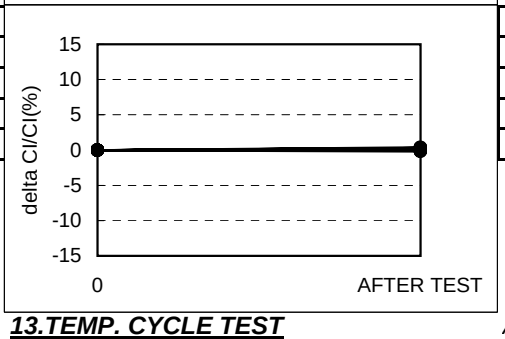
deltaCI/CI(%)	
X-bar	*-0.10*
3S	*1.19*
MAX	*0.5*
MIN	*-0.7*

12.VPS TEST



AFTER TEST

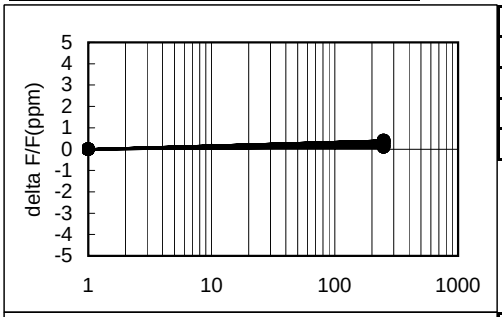
delta F/F(ppm)	
X-bar	*0.30*
3S	*0.38*
MAX	*0.5*
MIN	*0.1*



AFTER TEST

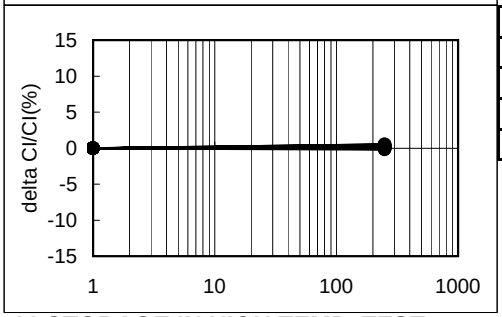
deltaCI/CI(%)	
X-bar	*0.08*
3S	*0.53*
MAX	*0.4*
MIN	*-0.2*

10.STORAGE IN LOW TEMP. TEST



AFTER 250hours

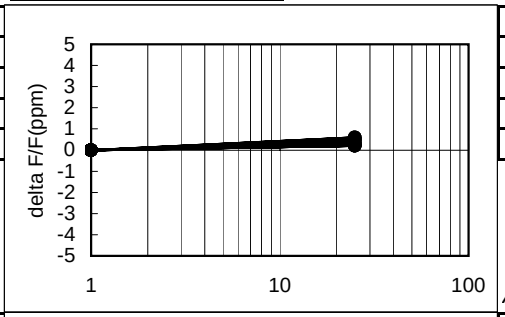
delta F/F(ppm)	
X-bar	*0.26*
3S	*0.36*
MAX	*0.4*
MIN	*0.1*



AFTER 250hours

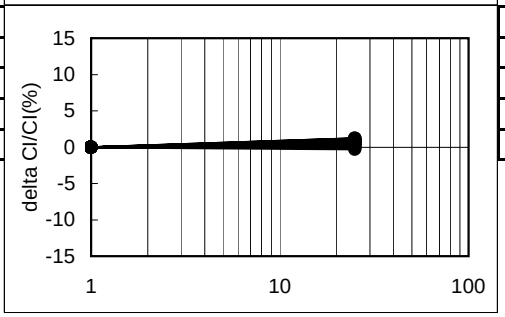
deltaCI/CI(%)	
X-bar	*0.18*
3S	*0.62*
MAX	*0.5*
MIN	*-0.2*

13.TEMP. CYCLE TEST



AFTER 25cycles

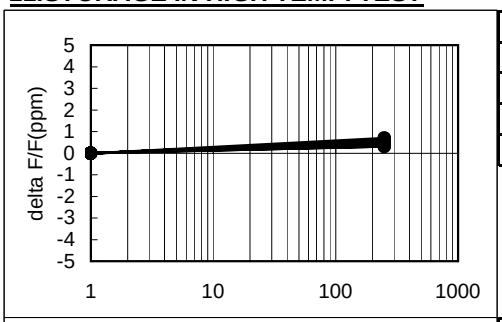
delta F/F(ppm)	
X-bar	*0.37*
3S	*0.45*
MAX	*0.6*
MIN	*0.2*



AFTER 25cycles

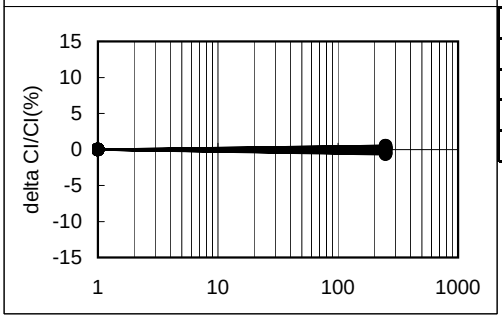
deltaCI/CI(%)	
X-bar	*0.61*
3S	*1.21*
MAX	*1.2*
MIN	*-0.3*

11.STORAGE IN HIGH TEMP. TEST



AFTER 250hours

delta F/F(ppm)	
X-bar	*0.50*
3S	*0.33*
MAX	*0.7*
MIN	*0.3*



AFTER 250hours

deltaCI/CI(%)	
X-bar	*-0.04*
3S	*1.10*
MAX	*0.5*
MIN	*-0.7*

DSX321G 24.576MHz (RoHS Compliance Part)
(KDS JAPAN)

3(2).SEALING TIGHTNESS TEST

SPEC : 2.0E-9 Pa.m^3/sec MAX.

RESULT

CAL

(Pa.m^3/sec)

QMIN 9.9 E-11

CLN

TEMP. 27 DEG C

No.			
1	**1**	*4.1*	*E-10*
2	**1**	*4.2*	*E-10*
3	**1**	*4.1*	*E-10*
4	**1**	*4.2*	*E-10*
5	**1**	*4.3*	*E-10*
6	**1**	*4.4*	*E-10*
7	**1**	*4.2*	*E-10*
8	**1**	*4.4*	*E-10*
9	**1**	*4.3*	*E-10*
10	**1**	*4.1*	*E-10*
11	**1**	*4.3*	*E-10*
12	**1**	*4.3*	*E-10*
13	**1**	*4.0*	*E-10*
14	**1**	*4.0*	*E-10*
15	**1**	*4.1*	*E-10*
16	**1**	*4.2*	*E-10*
17	**1**	*4.3*	*E-10*
18	**1**	*4.1*	*E-10*
19	**1**	*4.3*	*E-10*
20	**1**	*4.2*	*E-10*

KDS

Prepared for: ***No.R06NH57202***

Techfaith Wireless Communication Technology Limited

Reliability Test Data

Product : Crystal Resonator

Type : DSX321G 19.200MHz

(Test Data on 24.576MHz substituted for 19.200MHz)

RoHS Compliance Part
JEITA : Phase 3A

(PT.KDS INDONESIA)

Date : Aug. 8. 2006

Daishinku Corporation

Quality Assurance Department

A. Homma

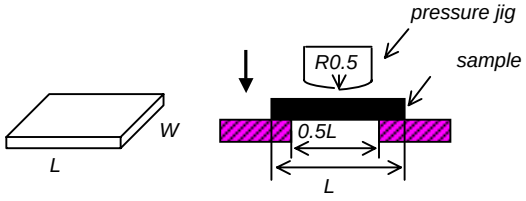
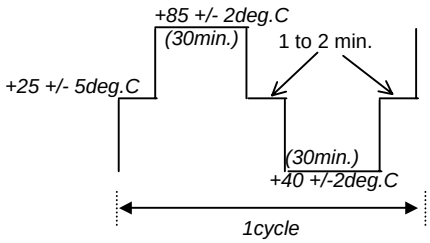
Akihiro Homma / Manager

Daishinku Corporation - Quality Assurance Department
1192-8 Tsuruike, Shinzaike, Hiraoka-cho, Kakogawa, Hyogo Japan 675-0101
Phone 81-794-25-6701 Fax 81-794-25-6725

TEST PROCEDURES AND RESULTS

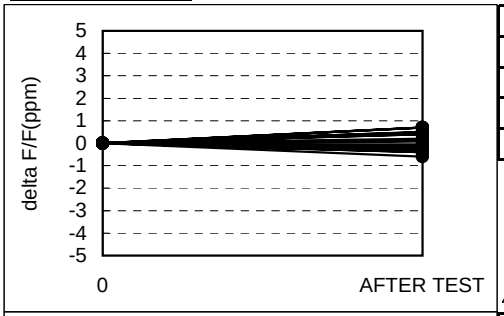
No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
1	SHOCK	A SAMPLE BOX (BAKELITE : 100g) WHICH INCLUDES A P.C. BOARD (GLASS - EPOXY : 1.6mm) SOLDERED SHALL BE DROPPED ONTO CONCRETE FROM THE HIGHT OF 150cm 10 CYCLES. (1CYCLE = 6 AXES)	Freq. Variation delta F/F = +/- 5ppm MAX. CI Variation delta CI = +/- 20% or +/- 3ohms MAX.	r/n = 0/20 GOOD	1
2	VIBRARION	SUPPLYING FOLLOWING VIBRATION; VIBRATION FREQ.:10 to 55Hz,1.5mm or 5G FULL WAVE DIRECTION:X,Y,Z TIME:120min. TO EACH DIRECTIN	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
3	SEALING TIGHTNESS	(1) DIPPING IN THE GALDEN (SVX) AT 125 deg.C FOR 5 min.	THERE IS NO OBSERVATION OF ANY GAS BUBBLE FROM TJ\HE INSIDE OF THE CAN	r/n = 0/20 GOOD	1
		(2) LEAK RATE SHALL BE MEASURED BY USING HELIUM LEAK DETECTOR	2.0 E-9 Pa.m^3/sec MAX	r/n = 0/20 GOOD	3
4	SOLDERABILITY	AFTER APPLYING ROSIN FLUX. DIPPING IN MOTEN SOLDER IN TANK AS FOLLOWS; DIPPING TIME:3 +/- 0.5sec SOLDERING TEMP.:+235 +/-5 deg.C DIPPING DEPTH : WHOLE GOLD PLATED TERMINAL	OVER 90% GOLD PLATING DIPPED IS COVERED SOLDER	r/n = 0/20 GOOD	-
5	REFLOW	THE FOLLOWING REFLOW SHALL BE PERFORMED 2TIMES (deg.C) PEAK 260deg.C 10sec 260 220 160 100 120 sec (TIME)	Freq. Variation delta F/F = +/- 5ppm MAX. CI Variation delta CI = +/- 20% or +/- 3ohms MAX.	r/n = 0/20 GOOD	1
6	BOARD BENDING STRENGTH	MOUNT A SAMPLE ON BOARD APPLY PRESSURE TO THE CENTER OF BOARD UNTIL IT IS BENT TO 3mm AND HOLD FOR 5 +/-1 sec PRESSURE SPEED : 0.5mm / sec pressure jig 20 R230 board 45 +/- 2 45 +/- 2	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
7	ADHESION TO BOARD	MOUNT A SAMPLE ON THE CIRCUIT BOARD APPLY PRESSURE VERTICALLY TO THE SIDE OF SPECIMEN ATTACHED TO THE CIRCUIT BOARD WITH THE PRESSURE JIG. PRESSURE : 10N FOR 10 +/- 1sec board pressure jig R0.5 sample	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1

TEST PROCEDURES AND RESULTS

No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
8	BODY STRENGTH	APPLY PRESSURE TO THE CENTER OF BODY WITH THE R0.5 PRESSURE JIG PRESSURE : 10N FOR 10 +/- 1sec 	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	1
9	HUMIDITY	KEEP SAMPLE(S) AT +60 +/-2deg.C IN HUMIDITY 90 to 95% FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
10	STORAGE IN LOW TEMP.	KEEP SAMPLE(S) AT -40 +/-2deg.C FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
11	STORAGE IN HIGH TEMP.	KEEP SAMPLE(S) AT +85 +/-2deg.C FOR 250 HOURS.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
12	VPS (VAPOR PHASE SOLDERING)	PART IS LEFT IN FC-70 (THE BOILING POINT = 215degC) VAPOR FOR 30sec.	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2
13	TEMP. CYCLE	SUPPLYING 25CYCLES AS FOLLOWS; 	Freq. Variation delta F/F = +/- 2ppm MAX. CI Variation delta CI = +/- 15% or +/- 2ohms MAX.	r/n = 0/20 GOOD	2

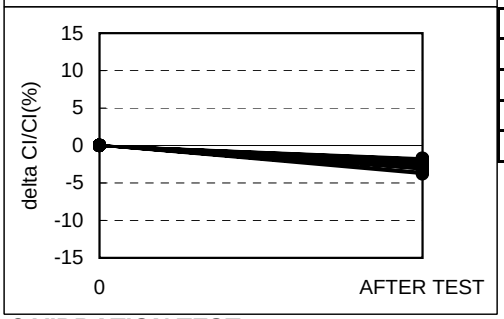
DSX321G 24.576MHz (RoHS Compliance Part)
(PT.KDS INDONESIA)

1.SHOCK TEST



AFTER TEST

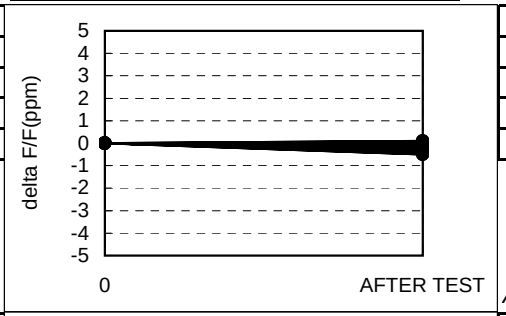
delta F/F(ppm)	
X-bar	*0.09*
3S	*1.22*
MAX	*0.7*
MIN	*-0.6*



AFTER TEST

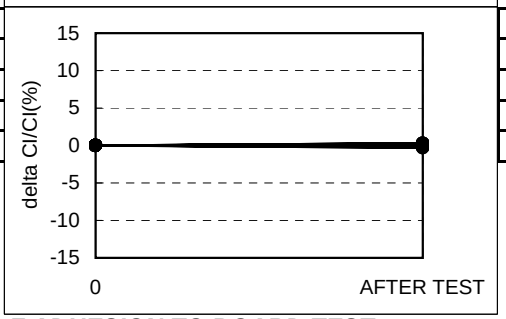
deltaCI/CI(%)	
X-bar	*-2.61*
3S	*1.84*
MAX	*-1.7*
MIN	*-3.8*

6.BOARD BENDING STRENGTH TEST



AFTER TEST

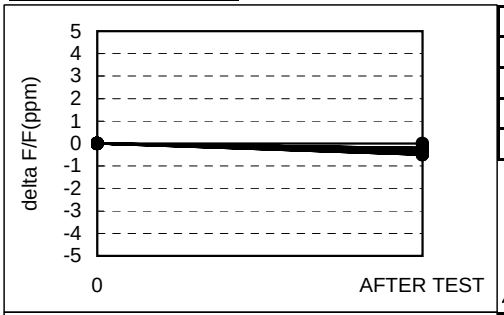
delta F/F(ppm)	
X-bar	*-0.19*
3S	*0.61*
MAX	*0.1*
MIN	*-0.5*



AFTER TEST

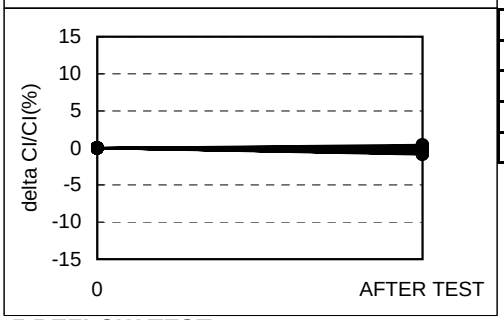
deltaCI/CI(%)	
X-bar	*0.01*
3S	*0.61*
MAX	*0.3*
MIN	*-0.3*

2.VIBRATION TEST



AFTER TEST

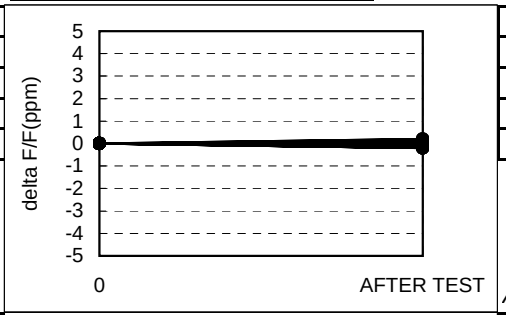
delta F/F(ppm)	
X-bar	*-0.33*
3S	*0.38*
MAX	*0.0*
MIN	*-0.5*



AFTER TEST

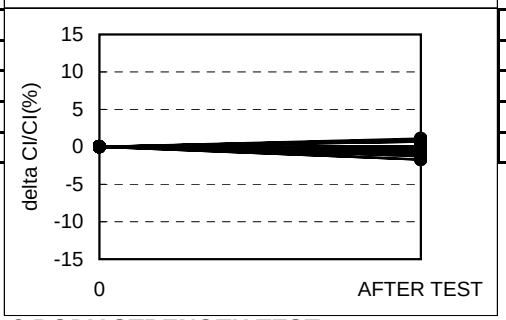
deltaCI/CI(%)	
X-bar	*-0.27*
3S	*1.35*
MAX	*0.4*
MIN	*-0.9*

7.ADHESION TO BOARD TEST



AFTER TEST

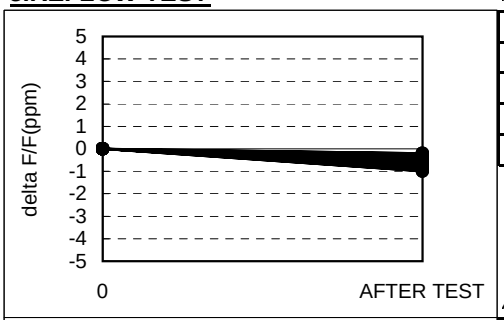
delta F/F(ppm)	
X-bar	*-0.05*
3S	*0.40*
MAX	*0.2*
MIN	*-0.2*



AFTER TEST

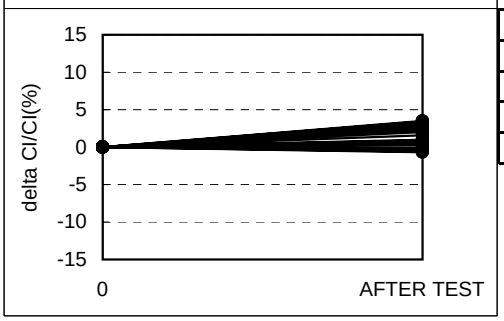
deltaCI/CI(%)	
X-bar	*-0.22*
3S	*2.69*
MAX	*1.1*
MIN	*-1.7*

5.REFLOW TEST



AFTER TEST

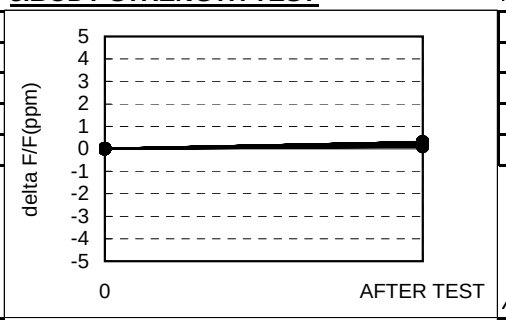
delta F/F(ppm)	
X-bar	*-0.61*
3S	*0.79*
MAX	*-0.2*
MIN	*-1.0*



AFTER TEST

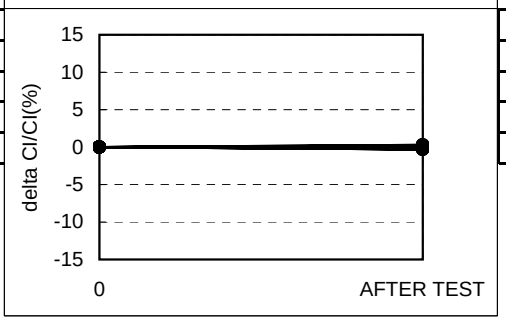
deltaCI/CI(%)	
X-bar	*1.51*
3S	*4.13*
MAX	*3.5*
MIN	*-0.7*

8.BODY STRENGTH TEST



AFTER TEST

delta F/F(ppm)	
X-bar	*0.24*
3S	*0.22*
MAX	*0.3*
MIN	*0.1*

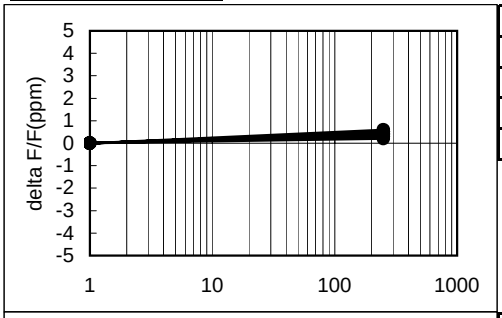


AFTER TEST

deltaCI/CI(%)	
X-bar	*-0.06*
3S	*0.63*
MAX	*0.3*
MIN	*-0.3*

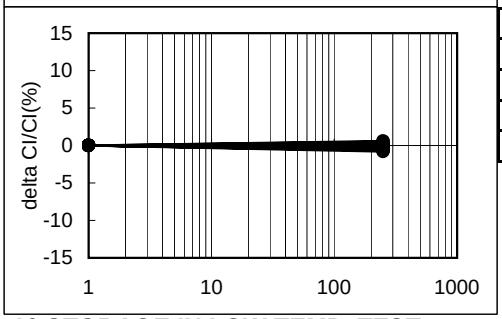
DSX321G 24.576MHz (RoHS Compliance Part)
(PT.KDS INDONESIA)

9.HUMIDITY TEST



AFTER 250hours

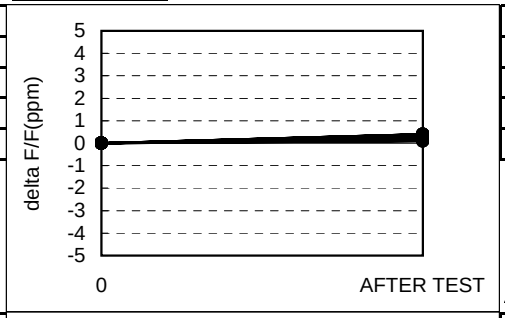
delta F/F(ppm)	
X-bar	0.41
3S	0.30
MAX	0.6
MIN	0.2



AFTER 250hours

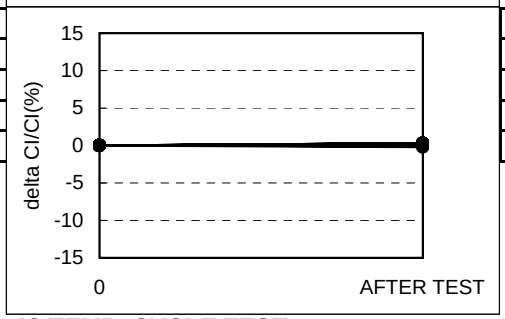
deltaCI/CI(%)	
X-bar	-0.19
3S	1.22
MAX	0.6
MIN	-0.8

12.VPS TEST



AFTER TEST

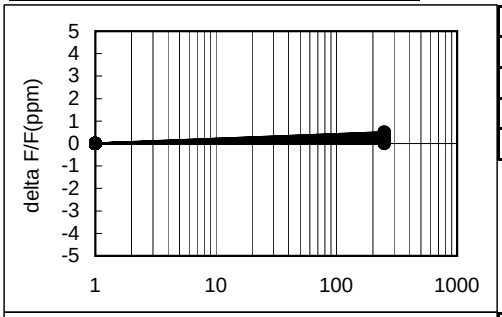
delta F/F(ppm)	
X-bar	0.27
3S	0.30
MAX	0.4
MIN	0.1



AFTER TEST

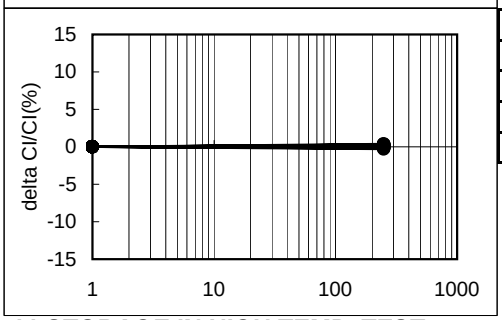
deltaCI/CI(%)	
X-bar	0.10
3S	0.47
MAX	0.3
MIN	-0.2

10.STORAGE IN LOW TEMP. TEST



AFTER 250hours

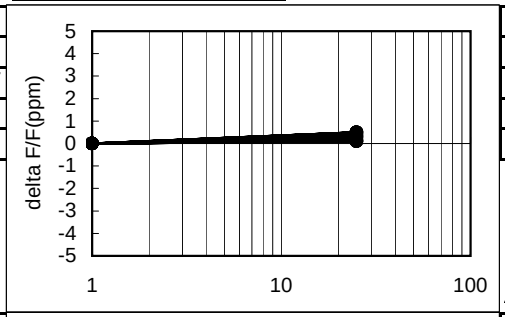
delta F/F(ppm)	
X-bar	0.24
3S	0.47
MAX	0.5
MIN	0.0



AFTER 250hours

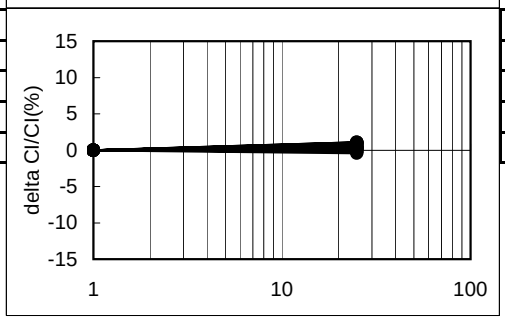
deltaCI/CI(%)	
X-bar	0.05
3S	0.60
MAX	0.4
MIN	-0.3

13.TEMP. CYCLE TEST



AFTER 25cycles

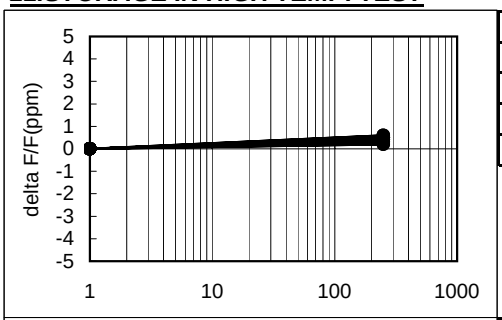
delta F/F(ppm)	
X-bar	0.30
3S	0.48
MAX	0.5
MIN	0.1



AFTER 25cycles

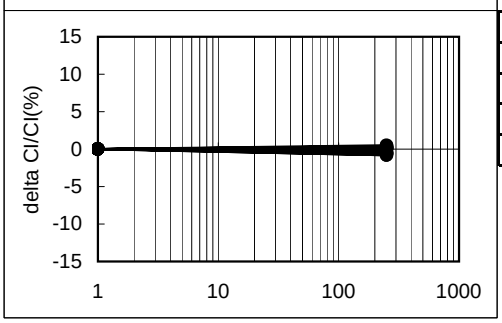
deltaCI/CI(%)	
X-bar	0.45
3S	1.34
MAX	1.1
MIN	-0.4

11.STORAGE IN HIGH TEMP. TEST



AFTER 250hours

delta F/F(ppm)	
X-bar	0.43
3S	0.35
MAX	0.6
MIN	0.2



AFTER 250hours

deltaCI/CI(%)	
X-bar	-0.12
3S	1.27
MAX	0.5
MIN	-0.8

DSX321G 24.576MHz (RoHS Compliance Part)
(PT.KDS INDONESIA)

3(2).SEALING TIGHTNESS TEST

SPEC : 2.0E-9 Pa.m^3/sec MAX.

RESULT

CAL

(Pa.m^3/sec)

QMIN 9.9 E-11

CLN

TEMP. 27 DEG C

No.			
1	**1**	*4.4*	*E-10*
2	**1**	*4.0*	*E-10*
3	**1**	*4.1*	*E-10*
4	**1**	*4.1*	*E-10*
5	**1**	*4.2*	*E-10*
6	**1**	*4.0*	*E-10*
7	**1**	*4.3*	*E-10*
8	**1**	*4.0*	*E-10*
9	**1**	*4.2*	*E-10*
10	**1**	*4.0*	*E-10*
11	**1**	*4.0*	*E-10*
12	**1**	*4.3*	*E-10*
13	**1**	*4.3*	*E-10*
14	**1**	*4.2*	*E-10*
15	**1**	*4.4*	*E-10*
16	**1**	*4.4*	*E-10*
17	**1**	*4.3*	*E-10*
18	**1**	*4.1*	*E-10*
19	**1**	*4.2*	*E-10*
20	**1**	*4.3*	*E-10*

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Crystals ***category:***

Click to view products by KDS ***manufacturer:***

Other Similar products are found below :

CX3225GB25000M0PPSZ1 718-13.2-1 MC405 32.0000K-R3:PURE SN 7A-40.000MAAE-T FL2000085 99-BU 9B-15.360MBBK-B 9C-7.680MBBK-T H10S-12.000-18-EXT-TR ABC2-6.000MHZ-D4Z-T ABLS-20.000MHZ-D2-T ABS071-32.768KHZ-6-T R38-32.768-12.5-5PPM-NPB BTD1062E05A-513 21U15A-21.4MHZ RTX-781DF1-S-20.950 LFXTAL066198Cutt 9C-14.31818MBBK-T A-11.000MHZ-27 ABL-27.000MHZ-B4Y-T ABM11-132-24.000MHZ-T3 ABM3B1-25.000MHZ-D2Y-T SPT2A-.032768B SPT2A.032768G SSPT7F-9PF20-R FX325BS-38.88EEM1201 LFXTAL065253Cutt LFXTAL066431Cutt XT9S20ANA14M7456 XT9SNLANA16M 646G-24-2 7A-24.576MBBK-T 7B-30.000MBBK-T 7A-14.31818MBBK-T 6504-202-1501 6526-202-1501 ABLS-12.000MHZ-B2Y-T ABLS-10.000MHZ-D3W-T 7A-10.000MBBK-T SG636PCE-20.000MC 3404 E1SAA18-25.000M TR CM315D32768EZFT C1E-24.000-7-2020-R C1E-19.200-12-1530-X-R C1E-16.000-12-1530-X-R FL5000014 EUCA18-3.1872M FX0800015 425F35E027M0000