Serial No. : 2012-1339
DATE : 2012/10/29

ITEM : CRYSTAL OSCILLATOR

TYPE :	DSB222MAB
NOMINAL FREQUENCY :	40.000MHz
SPEC No. :	1XXF40000BBA

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

RECEIPT	
DATE	
RECEIVED	(signature) (name)

General Manufacturer of Quartz Devices
DAISHINKU CORP.
1389 Shinzaike, Hiraoka-cho, Kakogawa, Hyogo
675-0194 Japan
Phone (81)79-425-3141 Fax (81)79-425-1134
http://www.kds.info/index_en.htm

C.ENG. T. Okishio

ENG. H. Takase

1. Device Name TCXO Module
2. Model Name DSB222MAB
3. Nominal Frequency 40.000MHz
4. Mass 0.02g max.

5. Absolute Maximum Ratings

	Item	Symbol	Rating	unit
1	Supply Voltage	V_{CC1}	-0.6~+6.0	V
2	Input Voltage	V_{IN}	-0.6~(V_{CC1})+0.6	V
3	Input Current	I_{IN}	±10 max.	mA
4	Output Current	I_{OUT}	±10 max.	mA
5	Storage Temperature Range	T_{STG}	-40~+85	°C

6. Recommended Operating Conditions

	Item	Symbol	min.	typ.	max.	unit
1	Supply Voltage	V_{CC1}	+3.135	+3.3	+3.465	V
2	Supply Voltage for Buffer	V_{CC2}	+1.6	+3.3	+3.63	V
3	Output Load1	L_{CMOS}	-	-	15	pF
4	Output Load2	L_{OAD} R2	9	10	11	kΩ
		L_{OAD} C2	9	10	11	pF
5	Operable Temperature Range	T_{OPR}	-30	-	+85	°C

7. DC Characteristic

	Item	Condition	Symbol	min.	typ.	max.	unit
1	Input Current		I_{AFC}	-20	-	+20	uA
2	Current Consumption	V_{CC2}=L	I_{CC1}	-	-	+2.0	mA
		V_{CC2}=H	I_{CC1}	-	-	+2.0	mA
		V_{CC2}=H	I_{CC2}	-	-	+3.5	mA

8. Electrical Characteristics

T_A=-30~+85°C, V_{CC1}=+3.3V, V_{CC2}=High, L_{OAD}_R2//C2=10kΩ//10pF, L_$_{CMOS}$=15pF, unless otherwise noted

8.1 TCXO Output (Output1 / Output2)

	Item	Condition	Limits			unit	Notes
			min.	typ.	max.		
1	Output Level						
	Output1	V_{OH} / L_$_{CMOS}$=15pF	V_{CC2}x0.8	-	-	V	
		V_{OL} / L_$_{CMOS}$=15pF	-	-	V_{CC2}x0.2	V	
	Output2	L_{OAD}_R2//C2=10kΩ//10pF	0.8	-	-	V_{P-P}	1
2	Harmonics	Output2	-	-	-5	dBc	
3	Symmetry						
	Output1	50% V_{CC2}	40	50	60	%	
	Output2	GND level(DC cut)	40	50	60	%	
4	Frequency Stability						
	1. Tolerance	After 2 times reflow Ref. to nominal frequency	-	-	±1.5	ppm	2,3
	2. vs Temperature	T_A=-30~+85°C Ref. to frequency(T_A=+25°C)	-	-	±2.5	ppm	
	3. vs Supply Voltage	V_{CC1}=+3.3V±0.165V	-	-	±0.2	ppm	
	4. vs Load Variation	L_{OAD}_R2//C2=10kΩ//10pF±10%	-	-	±0.2	ppm	
	5. vs Aging	T_A=Room ambient	-	-	±1.0	ppm/year	
7	Start Up Time	@90% of final Vout level	-	-	2.0	ms	
8	SSB Phase Noise	Relative to F0 level offset 1kHz	-	-	-125	dBc/Hz	

8.2 Tsensor Output (Tsens)

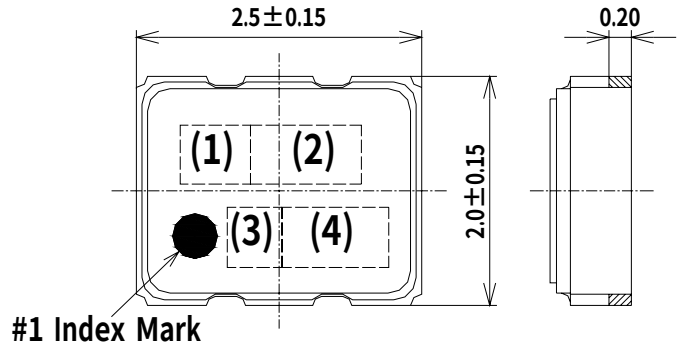
	Item	Condition	Limits			unit	Notes
			min.	typ.	max.		
1	Output Voltage	T_A=-30°C	-	1.961	-	V	
		T_A=+30°C	1.434	1.474	1.514	V	
		T_A=+85°C	-	1.059	-	V	
2	Temperature Sensitivity	T_A=-30~+80°C	-	-8.20	-	mV/°C	
3	Linearity	T_A=-10~+60°C	-	±0.5	-	%	

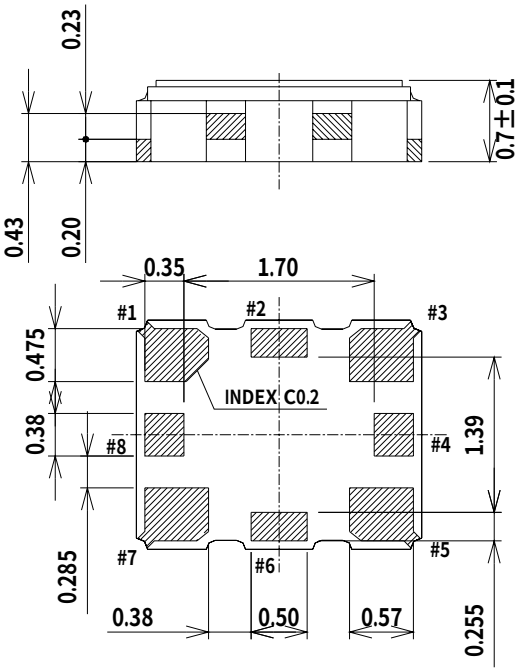
Notes

1. Clipped sine wave (DC-coupled)
2. T_A=+25°C
3. Please leave after reflow in 2h or more at room ambient.

9. Outline, Pin Connections

Outline





Pin Connections

Pin No.	Connection
#1	GND
#2	GND
#3	Output2(Clipped Sine)
#4	GND
#5	Output1(CMOS)
#6	V_{CC2}
#7	V_{CC1}
#8	Tsensor Output

Marking

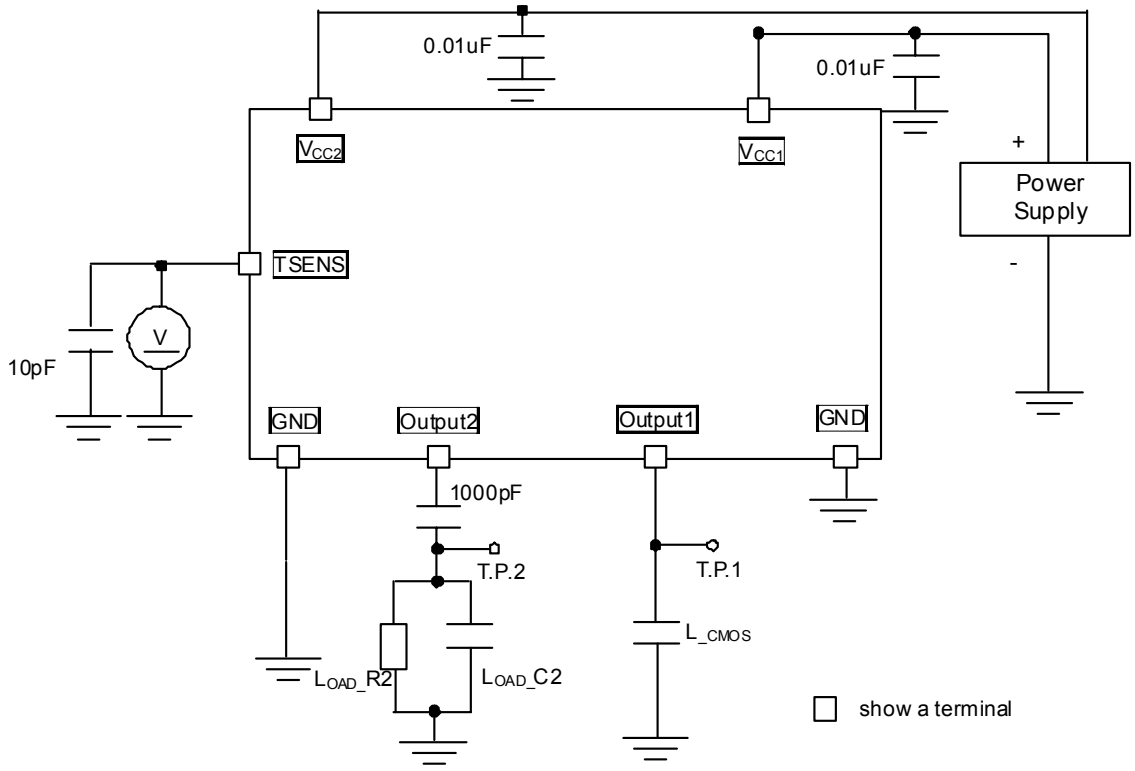
(1) Model Code	MB
(2) Frequency	40.0(MHz, 3digits)
(3) Logo	D
(4) Date code	Year(1digit)+Week(2digits)
	e.g. 2012/1/1 → 201

unit: mm

Dimensional Tolerance: ±0.15

(Unless otherwise noted)

10. Measurement Circuit



LOAD

Output 1 L_{CMOS} = 15pF

Output 2 L_{OAD}_R2//L_{OAD}_C2 = 10kΩ//10pF

TITLE	Remark		
DSB222MAB TYPE SPECIFICATION			
Date	Spec. No.	Rev.	Page
2012/10/29	1XXF40000BBA	-	4/16

11. Mechanical Characteristics

All test is performed after 3times reflow (Clause.13) except 10.10 (Resistance to soldering heat)

	Item	Description	Requirements
1	Drop	Natural drop (On concrete) Mounting on the set or test fixture.(Total weight 100g) Height : 150cm Direction : X,Y,Z, 6directions Test cycle : 3cycles Reference specification : EIAJ-ED-4702A Method5	df/f=<±1.0ppm
2	Vibration	Sweep range : 10~500Hz Sweep speed : 11min/cycle Amplitude : 1.5mm (10~55Hz) Acceleration : 200m/s^2 (55~500Hz) Direction : X,Y,Z, 3directions Test cycle : 10cycles Reference specification : IEC 60068-2-6	df/f=<±0.5ppm
3	Shock	Acceleration : 1000m/s^2 Direction : X,Y,Z, 6directions Duration : 6ms Test cycle : 3cycles/each directions Reference specification : IEC 60068-2-27	df/f=<±0.5ppm
4	PCB bend strength	PWB : t=1.6mm Pressure speed : 1.0mm/s Bend width : 1→2→3mm Duration : 10±1s Reference specification : IEC 60068-2-21 Ue1	df/f=<±0.5ppm No visible damage. No leak damage.
5	Adherence nature	PWB : t=1.6mm Direction : X,Y, 2directions Pressure : 10N Duration : 10±1s Reference specification : IEC 60068-2-21 Ue3	df/f=<±0.5ppm No visible damage. No leak damage.
6	Package strength	Pressure : 10N Duration : 10±1s Reference specification : IEC 60068-2-77	df/f=<±0.5ppm No mechanical damage. No leak damage.
7	Gross leak	It is immersed for 3min into +125±5°C Chlorofluorocarbon (CFCs) liquid. Reference specification : IEC 60068-2-17	No continuous air bubbles.
8	Fine leak	It shall be measured by the helium leak detector after pressurization for 60min by the pressure of (3.92±0.49) x10^5 Pa in a helium gas atmosphere. Reference specification : IEC 60068-2-17	Less than 1.0x10^{-9}Pa m^3/s.
9	Solderability	Solder bath temperature : +245±5°C Duration : 3±0.3s Reference specification : IEC 60068-2-58	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed.
10	Resistance to soldering heat	1) Solder iron method Bit size : B(φ3) Bit temperature : +350±10°C Duration : 3+1/-0s /each terminal It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-20	df/f=<±0.5ppm dV_{OUT}=<±0.2V_{P-P} No visible damage.
		2) Reflow In refer to temperature profile shown in clause13. Test cycle : 3cycles It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-58	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} No visible damage.

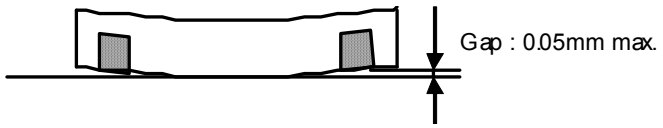
12. Environmental Characteristics

All test is performed after 3times reflow (Clause13)

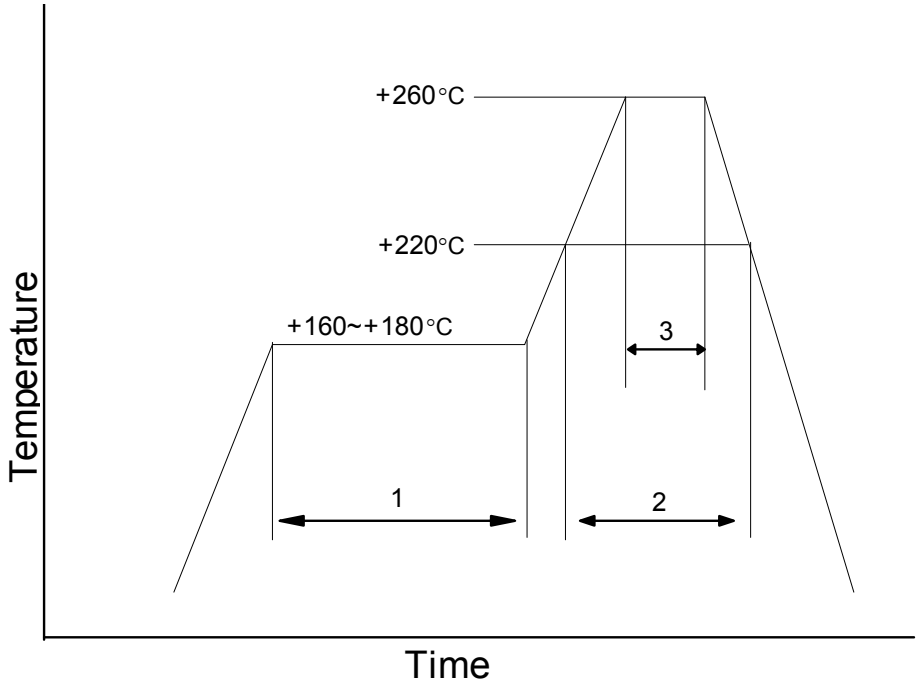
	Item	Description	Requirements
1	Low temperature storage	Temperature : -40±3°C Duration : 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-1 Ab	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
2	High temperature storage	Temperature : +85±2°C Duration : 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-2 Bb	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
3	Humidity	Temperature : +85±2°C R.H. 85±5% Duration : 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-3	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
4	HTB	Temperature : +85±2°C Duration : 1000h BIAS : Max value of supply voltage It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-2 Bb	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
5	THB	Temperature : +40±2°C R.H. 90~95% Duration : 1000h BIAS : Max value of supply voltage It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-3	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
6	Thermal shock	Thermal shock : -40±3°C : 0.5h ⇔ +85±2°C : 0.5h Test cycle : 200cycles Shift time : 2~3min It shall be measured after 2h at room temperature, humidity. Reference specification : IEC pub.68-2-14.Na	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
7	ESD	Model : Machine Model (MM) V=±200V (C1=200pF, R1=0Ω) Number of times : 3times Each terminal except common terminal. (Connect to test terminal) Reference specification : EIA/JESD22-A114	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.
		Model : Human Body Model (HBM) V=±1500V (C1=100pF, R1=1500Ω) Number of times : 3times Each terminal except common terminal. (Connect to test terminal) Reference specification : EIA/JESD22-A115	df/f=<±1.0ppm dV_{OUT}=<±0.2V_{P-P} The electrical characteristics are satisfied.

13. Flatness of Terminal

When the component is placed on the flat surface, the gap from the connecting terminal shall not exceed 0.05 mm.

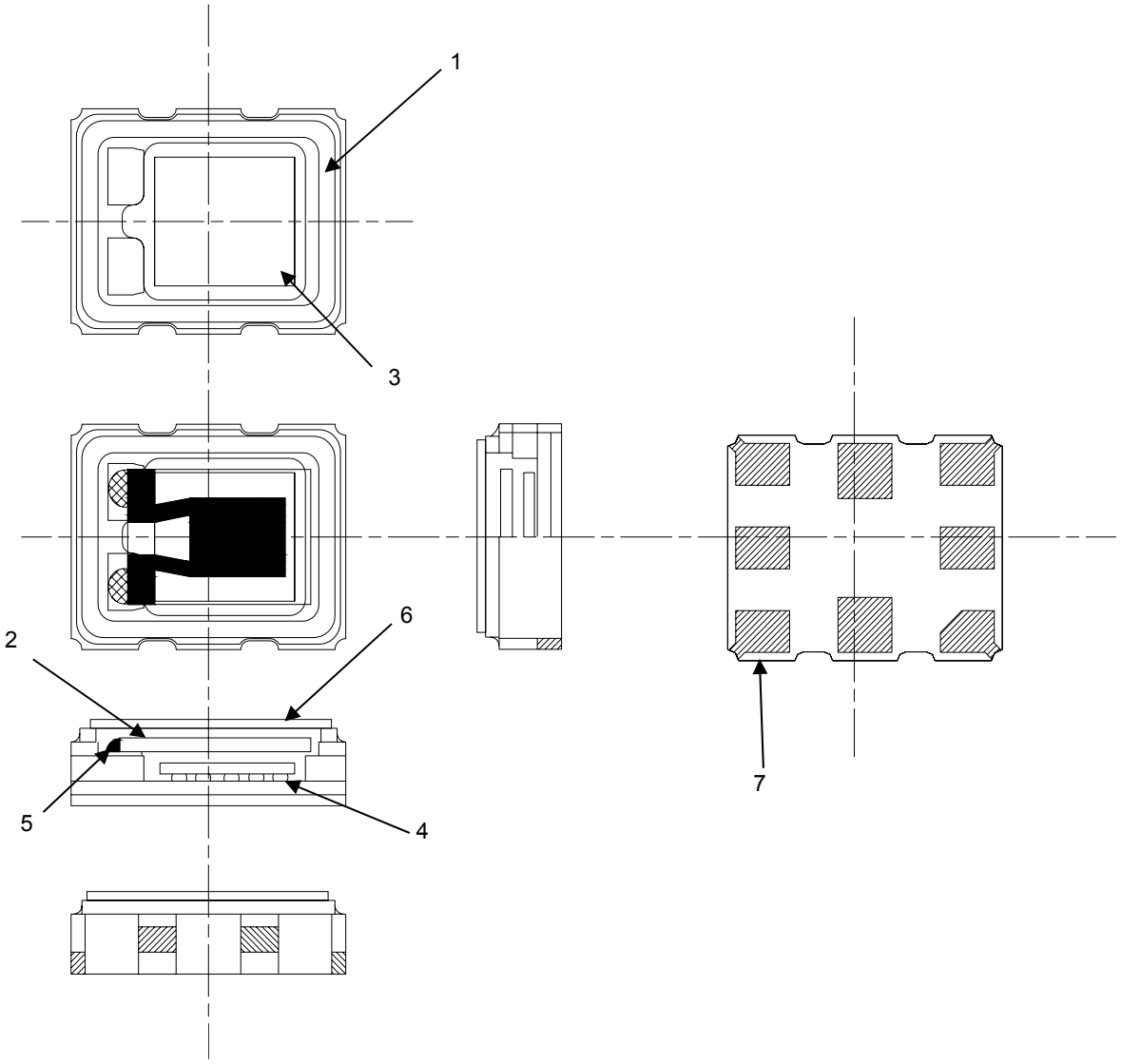


14. Reflow Profile



1	Preheat	+160~+180°C 120s
2	Primary Heat	+220°C 60s
3	Peak	+260°C 10s max.

15. Internal Structure



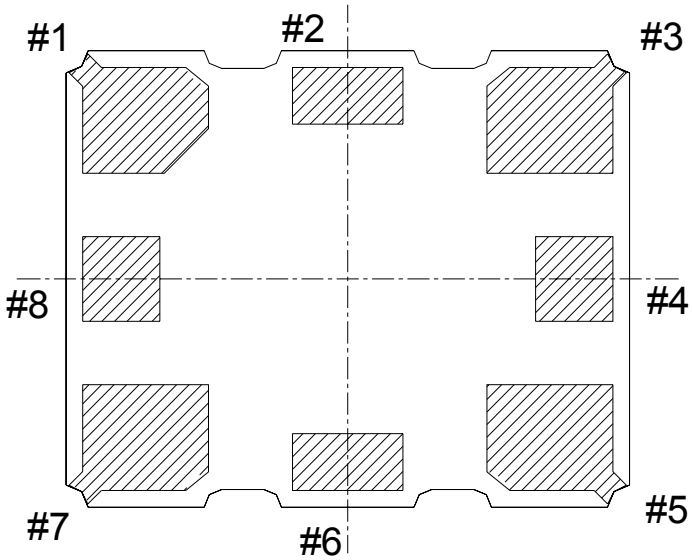
No.	Item	Material / Spec / Finish
1	Ceramic base	Alumina Ceramics
2	Crystal Blank	SiO2
3	IC	-
4	Au bump	Au
5	Conductive adhesives agent	Si Resin
6	Lid	Kovar + Ni plating
7	Terminal	Ni plating + Au plating (Finish)

(1) As semiconductor parts, one C-MOS IC (bare chip) is used, and IC is mounted by the flip-chip-bonding
(2) The parts built in this product are placed in the hermetically shielding environment by seam weld method.

16. Terminals / Land Pattern Layout / Metal Mask Hole

16.1 Terminals

A through hole is not located on the bottom (mounting side).

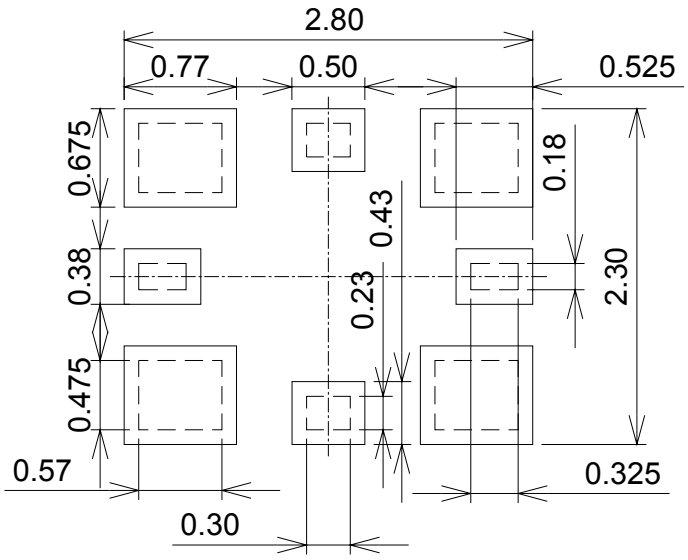


unit: mm
Dimensional Tolerance: ±0.15mm

Mounting Terminal

16.2 Land Pattern Layout / Metal Mask Hole

The following land pattern is reference design. The electrical characteristic shall be satisfied with mounting to this land. The land pattern can be changed in the limits to which a test land and a mounting land are not connected. And it does not any effect to the electrical characteristics. Mask thickness recommends 0.12mm.



unit: mm

Land Pattern
Metal Mask Hole

17. Packing Condition

17.1 Taping package

(1) Emboss tape format and dimensions
See Fig.1

(2) Quantity on reel
2000pcs. max. / reel

(3) Taping specification
See Fig.2
No lack of a product.

(4) Reel specification
See Fig.3

(5) Taping material list
See right table.

Taping material List
Cover Tape : PET + Olefin Resin (Conductivity)
Emboss : PS (Conductivity)
Reel : PS (Conductivity)

17.2 Packing

The products packed in the antistatic bag.
*Moisture sensitivity level : IPC/JEDEC Standard J-STD-033 / Level 1
No dry pack required and baking after re-storage is unnecessary.

17.3 Packing box

Max 10 reels/packing box. However, in the case of less than 10 reels, It is contained by any boxes.
The space in a box is fill up with a cushion.

17.4 Label detail

A Lot label is put on a reel and a shipping label and Pb-Free label is put on a packing box.

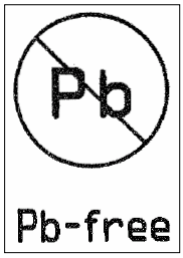
Lot label

TYPE	(Model Name)
SPEC NO.	(Spec. Number)
PARTS NO.	(User's Parts Number)
LOT NO.	(Lot Number)
FREQ.	(Nominal Frequency)
Q'TY	(Quantity)
KDS	DAISHINKU CORP.

Shipping label

ITEM	(Model Name)
SPEC	(Spec. Number)
DELIVERY DATE	(Delivery Date)
Q'TY	(Quantity)
NOTES	(User's Parts Number)
DAISHINKU CORP.	

Pb-free Label



Lot label (Example)

TYPE	XXXXXXXX
SPEC NO.	XXXXXXXXXXX
PARTS NO.	XXXXXXXXXXX
LOT NO.	XXXXXXXXX
FREQ	XX.XXX MHz
Q'TY	2000pcs.
KDS	Made in Japan

Formation of a lot number

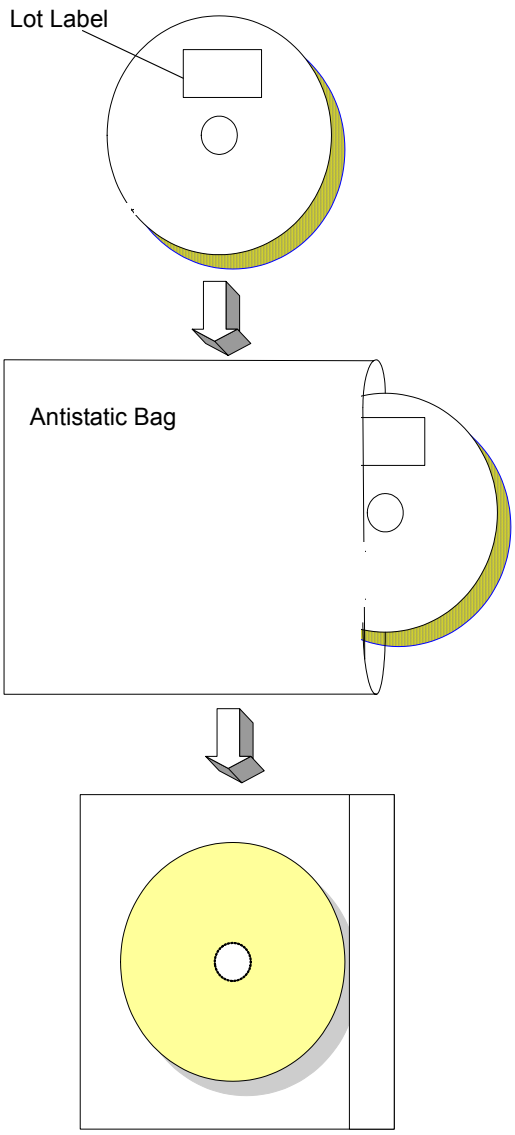
e.g. AH2101001

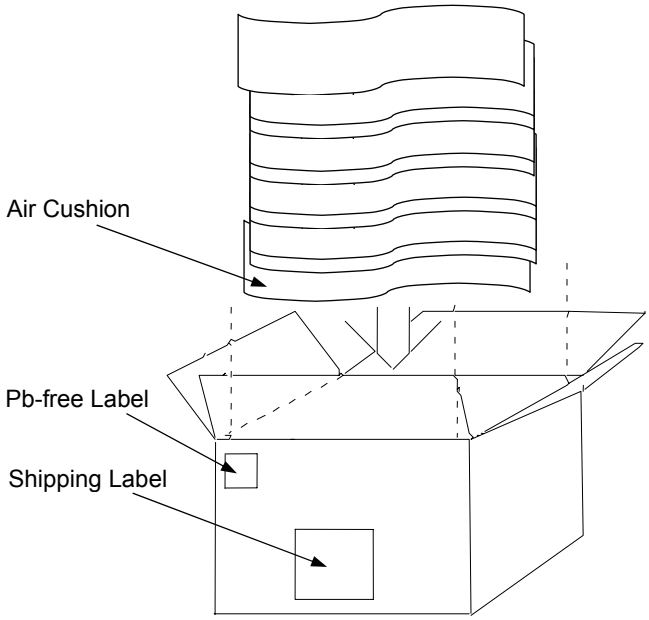
A	H	2101	001
Manufacturing site code	Product code	year/ month/ day	Serial No.

The notation method of a manufacture year, month, and day. (4digits alphanumeric character)

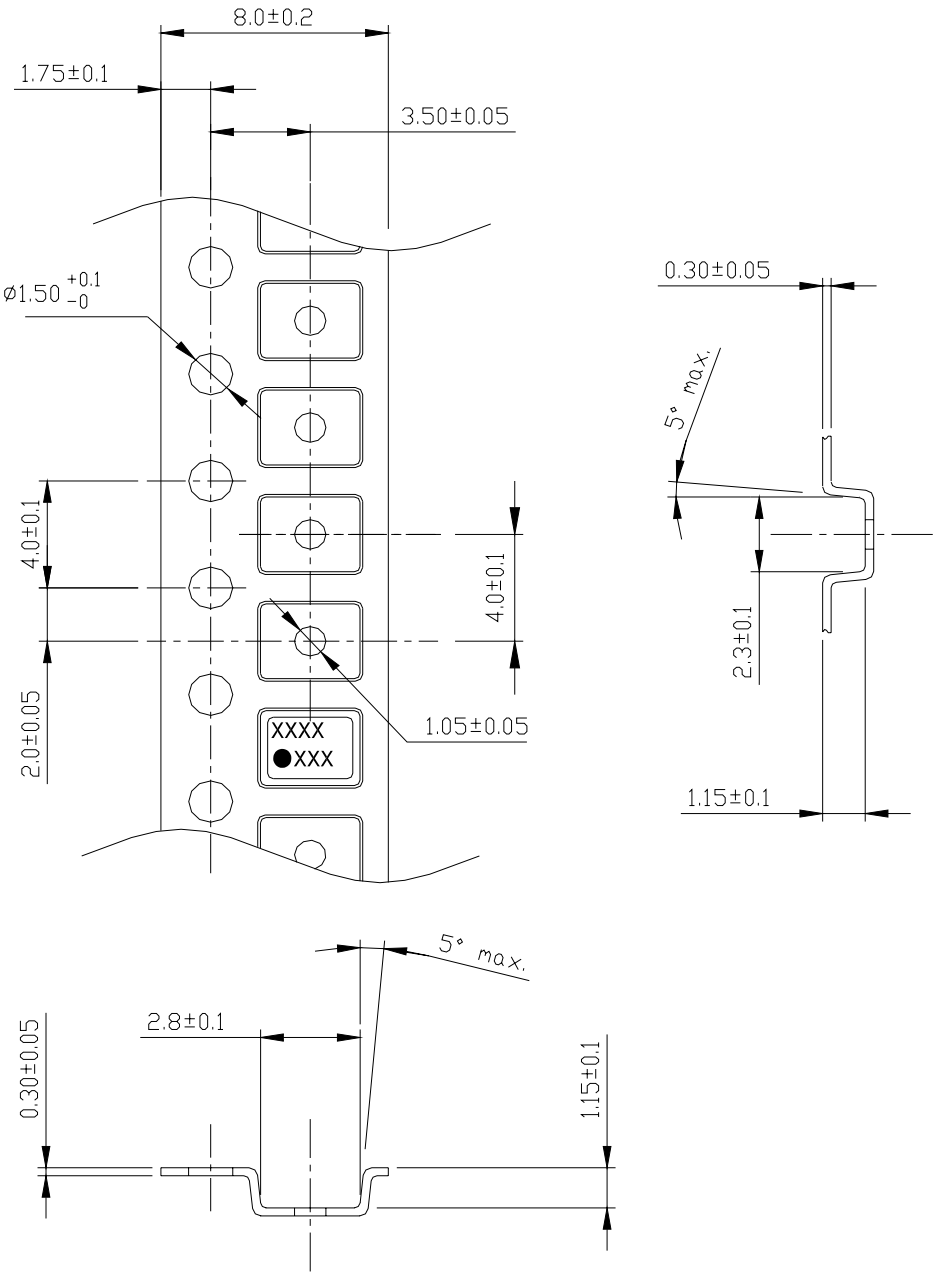
YMDD	(4digits)	e.g.) 2012 /01 /01→ 2101
Y	Year	1digit (Last digit of Year)
M	Month	1digit alphanumeric symbol
DD	Day	2digits numerical characters of day

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Symbol	1	2	3	4	5	6	7	8	9	O	N	D





The product is packed up with the method which does not break in the handling by a shipping agent.



1. Clearance of an embossing tape, and a product unit: mm

Direction	Pocket size	TCXO size	Clearance
L	2.8±0.1	2.5±0.15	0.3±0.25
W	2.3±0.1	2.0±0.15	0.3±0.25
H	1.15±0.1	0.8max.	0.35 min.

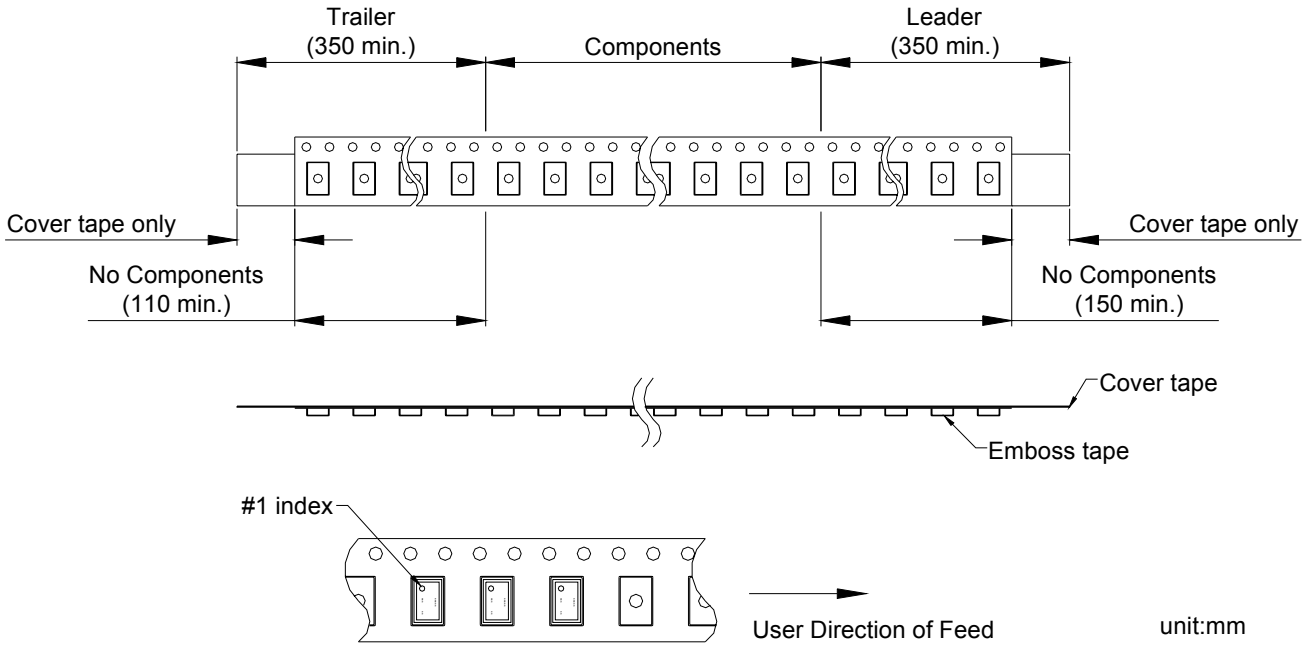
2. Quality : Polystyrene (Conductivity)

3. Tensile strength of an embossing tape : more than 14N

unit: mm

Fig.1. Emboss tape format and dimensions

TITLE DSB222MAB TYPE SPECIFICATION	Remark		
Date 2012/10/29	Spec. No. 1XXF40000BBA	Rev. -	Page 12/16



When a tape end is taken out to the front, sprocket holes becomes right hand side.

Peel strength
Pulling angle 165~180°, pulling speed at 300mm/min, strength should be 0.2~0.7N.

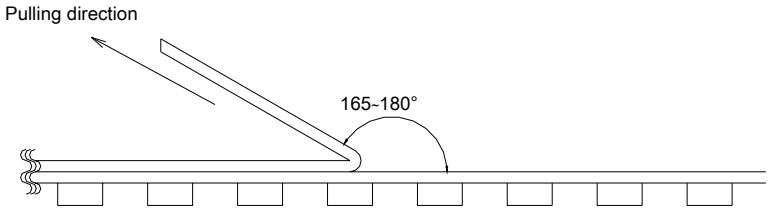
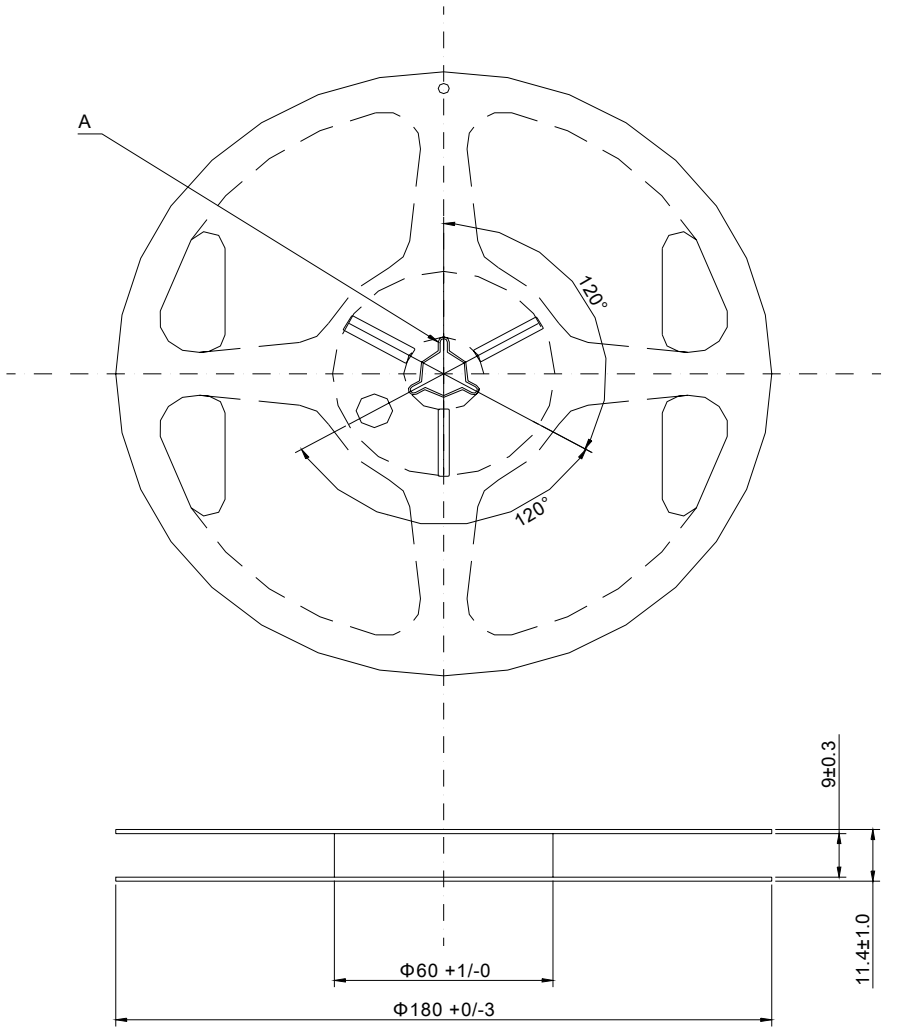


Fig.2. Taping specification

TITLE DSB222MAB TYPE SPECIFICATION	Remark		
Date 2012/10/29	Spec. No. 1XXF40000BBA	Rev. -	Page 13/16



Material:Polystyrene (Conductivity)
unit:mm

Section A

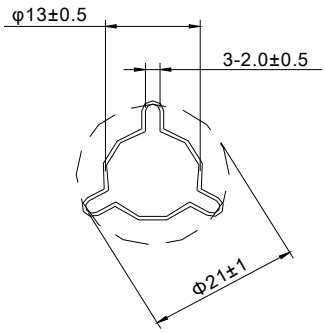


Fig.3. Reel specification

TITLE DSB222MAB TYPE SPECIFICATION		Remark	
Date 2012/10/29	Spec. No. 1XXF40000BBA	Rev. -	Page 14/16

18. Notes on mounting and handling

18.1 Storage environment

(1) The temperature and humidity of a storage place, Please give +5~+40°C and 40~85% as a standard.

(2) Please use this product within one year from the packing label date of issue.

(3) Please avoid the place which generates corrosive gas, and the place with much dirt.

(4) Please keep it in a place with little temperature change.
Dew condensation arises owing to a rapid temperature change and solderability becomes bad.

18.2 Be cautions to static electricity and high voltage.

18.3 This product has sufficient durability to fall and vibration. However, conditions may change to the fall after mounting to a PWB, and vibration. When you should drop on a floor the PWB which mounted the product or too much shock is added. Please use after a performance check.

18.4 Please check that the curvature of the substrate at the time of substrate cutting does not affect product. Moreover, especially when a product is near the position of a PWB guide pin, and the position of PWB break, be careful.

18.5 The part concerned does not correspond to washing.

18.6 Please repair at +260°C in 10s with hot air or +350°C in 5s with solder Iron.

19. Mandatory control

19.1 Ozone-depleting substance

It regulates by the U.S. air purifying method (November, 1990 establishment). ODS of CLASS1 and CLASS2 is not contained or used.

19.2 PBDE, PBBs

PBDE, PBBs are not contained into all the material currently used for this product.

19.3 RoHS

Following material restricted by RoHS (2011/65/EU) is not included or used. Lead, mercury, cadmium, hexavalent , chromium ,PBB and PBDE.

19.4 Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances

All the material currently used for this product is based on "Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances". It is a registered material.

19.5 Lead

Leads, such as solder, are not used for this product. (Lead Free)

19.6 About the existence of silver and mercury use

The silver of very small quantity is contained in the conductive adhesives used for adhesion of Blank.
Moreover, mercury is used. It does not get down.

20. The country of origin / factory name / address

Country of origin: Japan
Factory name: DAISHINKU Corp. Tottori Production Div.
Address: 7-3-21 Wakabadai minami, Tottori 689-1112

2012-1339 REVERSION RECORD

Rev. No.	Date	Reason	Contents	Approved	Checked	Drawn
-	2012/10/29	-	Initial Release	T.Okishio	H.Takase	S.Fujihira

Confirmation for Environmental Protection

For the product which we deliver to your company, we report as follows:

Product Name: DSB222MAB 40.000MHz (Our Specification No. : 1XXF40000BBA)

- Ozone Depleting Substances

  As defined under Montreal Protocol on substances that deplete the ozone layer, our domestic/overseas production plants and related cooperative companies do not use any ozone depleting substances.

- Specified Bromine-based Flame Retardants

  The following specified bromine-based flame retardants are not included:
  PBBOs, PBDOs, PBDPOs, PBDE, PBDPE, DBDO, OBDO, TBDO, PBBs

- Heavy Metals

  The following heavy metals are less than the threshold, and Products above comply with the RoHS Directive (2011/65/EU) :
  Mercury and its compounds, Leads and its compounds, Cadmiums and its compounds, Hexavalent chromium compounds

- Others

  The following chemical substances are not included:
  Trichloroethylene, Chloroform, Polychlorobiphenyl, Asbestos

Supplier: DAISHINKU CORP.

Function: Quality Assurance Div.

Name : Kana Matsui

Signature: K. Matsui

Date : Nov. / 1 / 2012

Prepared for:

MACE COMPANY

Report No. R12NT59201

Reliability Test Data

Product : TCXO

Type : DSB222MAB 40.000MHz
(Test Data on DSB222MA 26.000MHz substituted for DSA222MAB 40.000MHz)

Pb Free (RoHS Compliant Part)
JEITA : Phase 3

(KDS JAPAN)

Date: Oct. 30, 2012

Daishinku Corporation

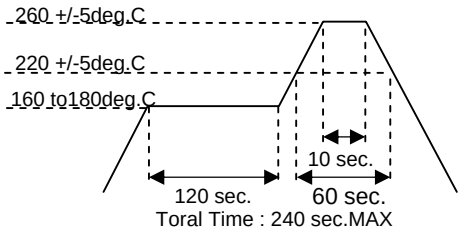
Quality Assurance Div

Akihiro Homma / Senior Manager

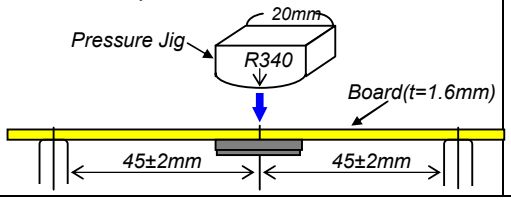
Daishinku Corporation - Quality Assurance Department
1192-8 Tsuruike,Shinzaike,Hiraoka-cho,Kakogawa,Hyogo Japan 675-0101

TEST PROCEDURES AND RESULTS

(Pre-treatment)

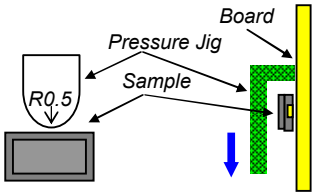
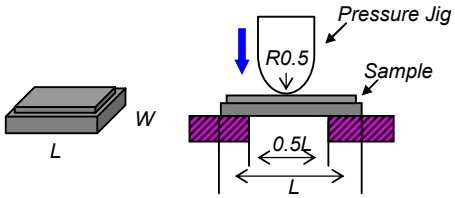
No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
1	Resistance to Soldering Heat (Reflow)	The following reflow shall be performed(3 times) 	Freq.variation delta F/F=+/- 1.0ppm Max Sample should meet requirements of the electrical characteristics	r/n = 0/20 Passed	1

(Mechanical Characteristics)

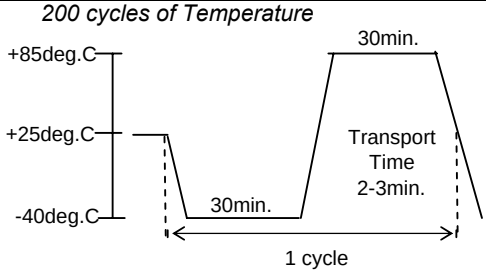
No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
2	Shock	<Shock(Pulse)> Acceleration 1000m/s^2 Duration 6ms Test cycle 3times/each Direction Direction X,Y,Z-6 directions	Freq.variation delta F/F=+/- 0.5ppm Max	r/n = 0/20 Passed	1
		<Drop > Mounting on the set or test fixture. (Total weight 100g) Height 150cm Test cycle 3cycles Direction X,Y,Z-6 directions Flooring material Concrete	Freq.variation delta F/F=+/- 1.0ppm Max	r/n = 0/20 Passed	1
3	Vibration	Supplyng following vibration ; Sweep range 10Hz to 500Hz to 10Hz Sweep speed 11min./cycle Amplitude 1.5mm(10 to 55Hz) Acceleration 200m/s^2 (55 to 500Hz) Direction X,Y,Z-3 directions Test cycle 10cycles	Freq.variation delta F/F=+/- 0.5ppm Max	r/n = 0/20 Passed	1
4	Sealing Tightness	<Gross leak > Solution Chlorofluorocarbon Temp. +125+/-5 deg.C Time 3min.	There is no observation of any gas bubble from the inside of the devices.	r/n = 0/20 Passed	-
		<Fine leak> It shall be measured by the helium leak detector.	1.0 E-9 Pa.m^3/sec. Max	r/n = 0/20 Passed	2
5	Solderability	<Solder bath method > After applying rosin flux.Dipping in molten solder in tank as follows; Soldering temp. 245+/-5 deg.C Duration 3sec. Flux NA-200(rosin flux) Solder Sn3Ag0.5Cu	A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed.	r/n=0/20 Passed	-
6	Resistance to Soldering Heat	<Solder iron > Bit 3.0 phi Bit temp. 350+/-10deg.C Time 3sec. each terminal	Freq.variation delta F/F=+/- 0.5ppm Max	r/n = 0/20 Passed	1
7	Board Bending Strength	Mount a sample on board. Apply pressure as following. Bend width 3mm Time 10sec. Pressure speed 1mm/sec. 	Freq.variation delta F/F=+/- 0.5ppm Max No visible damage.	r/n = 0/20 Passed	1

TEST PROCEDURES AND RESULTS

(Mechanical Characteristics)

No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
8	Shear	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. 	Freq.variation delta F/F=+/- 0.5ppm Max No visible damage.	r/n = 0/20 Passed	1
9	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=+/- 0.5ppm Max No visible damage.	r/n = 0/20 Passed	1

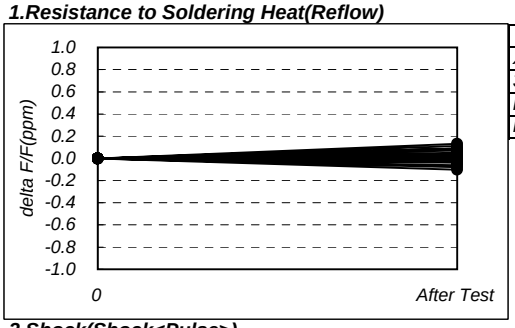
(Environmental Characteristics)

No.	TEST ITEM	TEST PROCEDURES	REQUIREMENT	RESULT	PAGE
10	Low Temperature Storage	Temp. -40+/- 3 deg.C Duration 1000h	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	1
11	High Temperature Storage	Temp. +85+/- 2 deg.C Duration 1000h	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	1
12	Humidity	Temp. +85+/- 2 deg.C Humidity 85+/-5%RH Duration 1000h	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	1
13	HTB	Temp. +85+/- 2deg.C Duration 1000h Vcc Max	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	1
14	THB	Temp. +40+/- 2deg.C Humidity 90 to 95%RH Duration 1000h Vcc Max	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	2
15	Temperature Cycle	200 cycles of Temperature 	Freq.variation delta F/F=+/- 1.0ppm Max	r/n=0/20 Passed	2
16	ESD	<Machine Model> Vs=+/-200V (C1=200pF,R2=0Ω) Number of times 3times Each terminals except common termina	Freq.variation delta F/F=+/- 1.0ppm Max No visible damage.	r/n=0/20 Passed	2
		<Human Body Model> Vs=+/-1500V (C1=100pF,R2=1.5kohms) Number of times 3times Each terminals except common termina	Freq.variation delta F/F=+/- 1.0ppm Max No visible damage.	r/n=0/20 Passed	2

* No.10-16 are tested after pretreatment(Reflow)

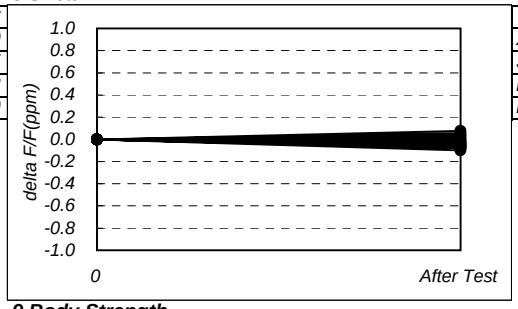
DSB222MA 26.000MHz (RoHS Compliant Part)
(KDS JAPAN)

1.Resistance to Soldering Heat(Reflow)



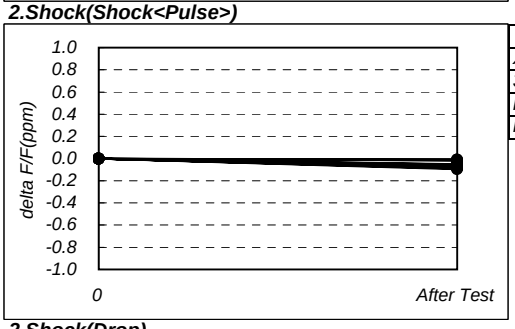
	After Test
X-BAR	0.010
3S	0.195
MAX	0.13
MIN	-0.10

8.Shear



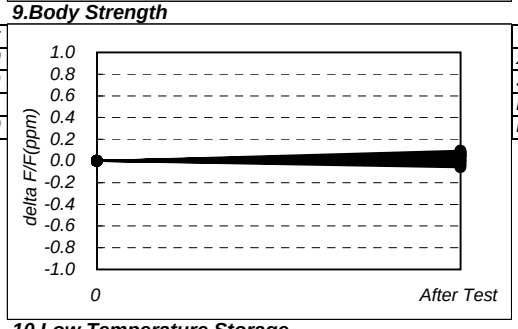
	After Test
X-BAR	-0.028
3S	0.147
MAX	0.08
MIN	-0.10

2.Shock(Shock<Pulse>)



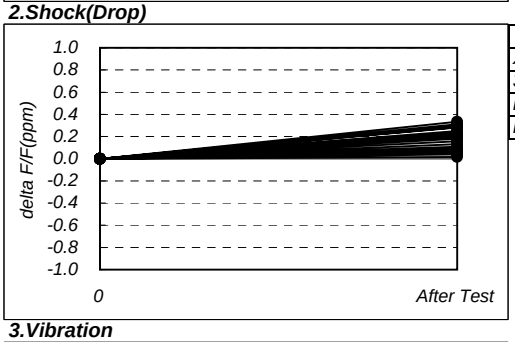
	After Test
X-BAR	-0.060
3S	0.079
MAX	-0.01
MIN	-0.10

9.Body Strength



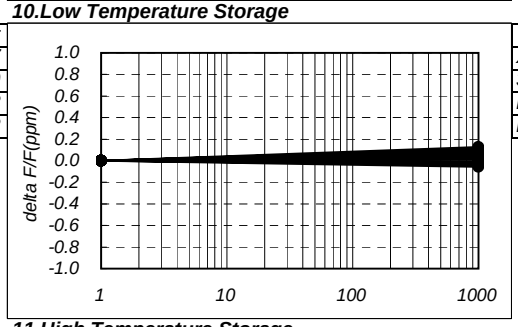
	After Test
X-BAR	0.030
3S	0.132
MAX	0.10
MIN	-0.06

2.Shock(Drop)



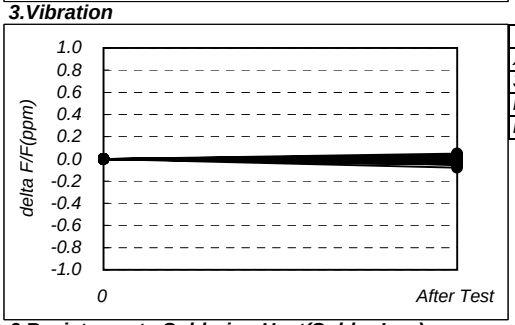
	After Test
X-BAR	0.177
3S	0.299
MAX	0.33
MIN	0.02

10.Low Temperature Storage



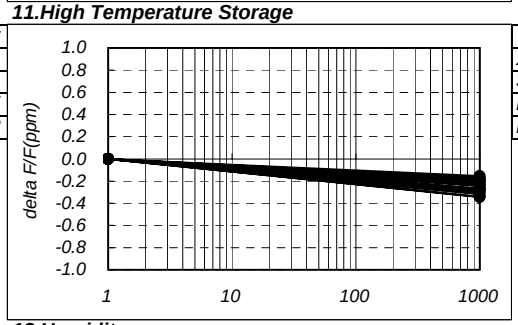
	1000hours
X-BAR	0.050
3S	0.154
MAX	0.13
MIN	-0.06

3.Vibration



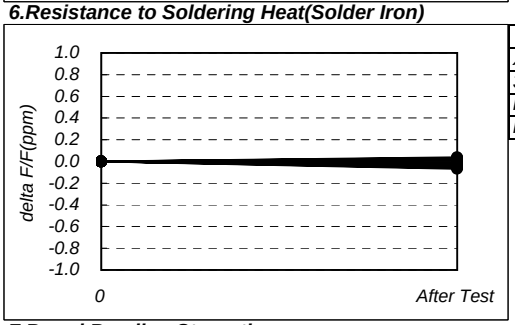
	After Test
X-BAR	-0.011
3S	0.101
MAX	0.05
MIN	-0.08

11.High Temperature Storage



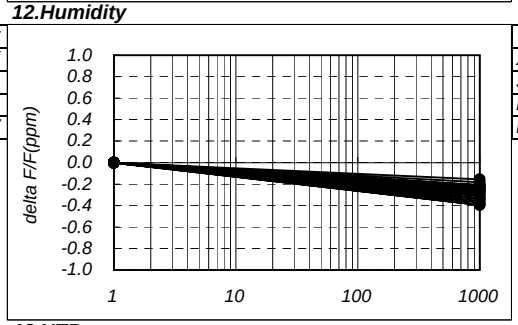
	1000hours
X-BAR	-0.246
3S	0.170
MAX	-0.15
MIN	-0.35

6.Resistance to Soldering Heat(Solder Iron)



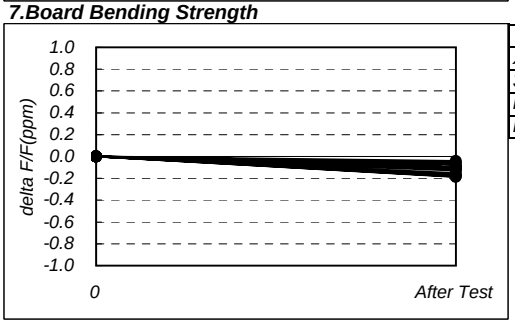
	After Test
X-BAR	-0.015
3S	0.104
MAX	0.04
MIN	-0.07

12.Humidity



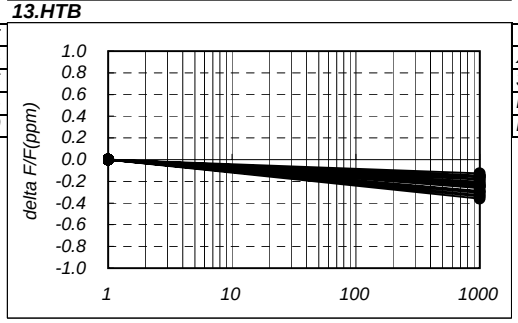
	1000hours
X-BAR	-0.279
3S	0.209
MAX	-0.16
MIN	-0.40

7.Board Bending Strength



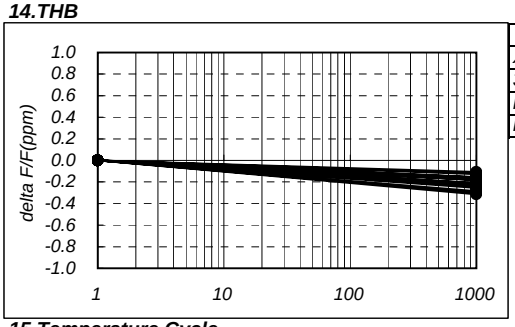
	After Test
X-BAR	-0.114
3S	0.126
MAX	-0.04
MIN	-0.19

13.HTB



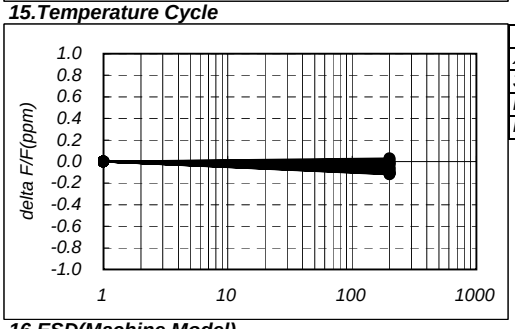
	1000hours
X-BAR	-0.234
3S	0.210
MAX	-0.13
MIN	-0.36

14.THB



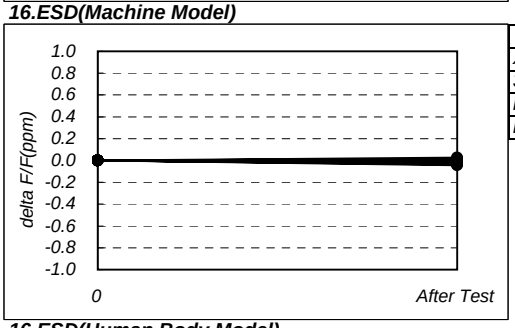
	1000hours
X-BAR	-0.203
3S	0.177
MAX	-0.11
MIN	-0.31

15.Temperature Cycle



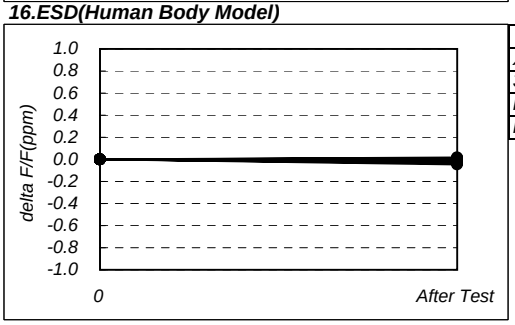
	200cycles
X-BAR	-0.057
3S	0.150
MAX	0.03
MIN	-0.12

16.ESD(Machine Model)



	After Test
X-BAR	-0.012
3S	0.060
MAX	0.03
MIN	-0.04

16.ESD(Human Body Model)



	After Test
X-BAR	-0.014
3S	0.054
MAX	0.02
MIN	-0.05

4 . SEALING TIGHTNESS TEST

OMIN 2.0 E-12(Pa*m ^{3}/sec)

No.	Result (Pa.m ^{3}/sec)	
1	5.1	E-10
2	5.2	E-10
3	5.4	E-10
4	5.1	E-10
5	5.0	E-10
6	5.0	E-10
7	4.9	E-10
8	5.0	E-10
9	5.4	E-10
10	5.5	E-10
11	5.4	E-10
12	5.4	E-10
13	4.8	E-10
14	5.0	E-10
15	5.1	E-10
16	5.3	E-10
17	5.1	E-10
18	4.9	E-10
19	5.0	E-10
20	5.1	E-10