

Preliminary Specifications

Drawing No.	USY1M-H1-21012-00
Issued Date.	Mar,26,2021

Messrs.:

Note: In case of specification change, KYOCERA Part Number also will be changed.

Product Type	Quartz Crystal
Series	CX1008SB
Frequency	59970kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX1008SB59970D0DLFC1
Remarks	Pb-Free, RoHS Compliant, MSL 1

Customer Approval

Approval Signature	Approved Date	
	Department	
	Person in charge	

Seller

KYOCERA Corporation

Corporate Electronic Components Group
Electronic Components Sales Division
6 Takeda Tobadono-cho, Fushimi-ku, Kyoto
612-8501 Japan
TEL: 075-604-3500 FAX: 075-604-3501

Manufacturer

Corporate Electronic Components Group
Crystal Components Division
Shiga Yohkaichi Plant
1166-6 Hebimizo-cho, Higashiomi, Shiga
527-8555 Japan
TEL: 0748-22-1550 FAX: 0748-22-1590

Design Department	Quality Assurance	Approved by	Checked by	Issued by
KYOCERA Corporation Application Engineering Section 3 Crystal Components Division	A. Muraoka	M. Tsukada	A. Hisako	K. Takahashi

Revision History

Rev.No.	Description of revision	Date	Approved by	Checked by	Issued by
00	First Edition	Mar,26,2021	M.Tsukada	A,Hisako	K.Takahashi

Preliminary

1. APPLICATION

This specification sheet is applied to quartz crystal "CX1008SB" for Communication Grade

2. KYOCERA PART NUMBER

CX1008SB59970D0DLFC1

3. RATINGS

Items	SYMB.	Rating	Unit	Remarks
Operating Temperature range	Topr	-30~+85	°C	
Storage Temperature range	Tstg	-40~+125	°C	

4. CHARACTERISTICS

4-1 ELECTRICAL CHARACTERISTICS

※Due to the developed product, electrical characteristics may change

Items	Electrical Specification					Test Condition	Remarks
	SYMB.	Min	Typ.	Max	Unit		
Mode of Vibration		Fundamental					
Nominal Frequency	F0		59.97		MHz		
Nominal Temperature	T _{NOM}		27		°C		
Load Capacitance	CL		8.0		pF		
Frequency Tolerance	dF	-8		+8	ppm	+25±3°C	
Frequency Temperature Characteristics	dF _T	-10		+10		-30~+85°C	
Frequency Aging Rate	Fa	-1		+1		1st Year	+25±3°C
Equivalent Series Resistance	ESR			50	Ω		
Drive Level	Pd	10		200	μW		
Insulation Resistance	IR	500			MΩ	100V(DC)	
Frequency drift after reflow		-3.0		+3.0	ppm	1 time	
Shunt capacitance	Co			1.0	pF	No GND terminal connection	
Motional capacitance	C1	1.0		2.0	fF		
Motional Inductance	L1	3.3		6.2	mH		
Pullability	S	-25%	9.5	+25%	ppm/pF		
ESD				+/-2	kV	HBM	

4-2 ELECTRICAL CHARACTERISTIC (DLD)

Items	Electrical Specification					Test Condition /Remarks
	SYMB.	Min	Typ.	Max	Unit	
DLD Max R	RLD2			50	Ω	
Max R-Min R	DLD2			6	Ω	
Max FR-Min FR	FDLD			12	ppm	
Min FR	FDDL1	-5			ppm	Min FR-ReffR(at 10μW)

Measurement Condition

Frequency measurement

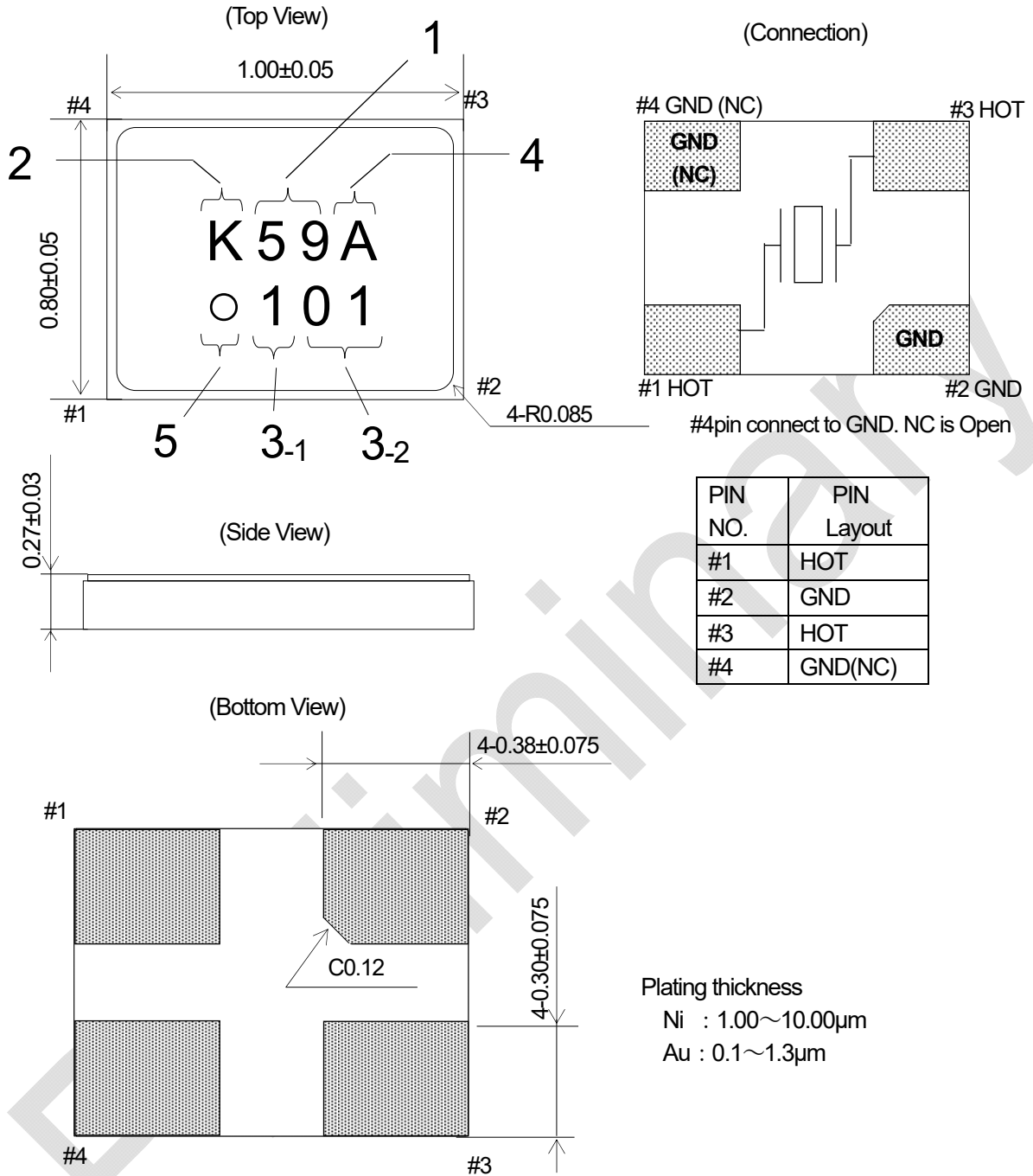
Measuring instrument: IEC PI-Network Test Fixture

Equivalent series resistance (ESR) measurement

Measuring instrument: IEC PI-Network Test Fixture

Load Capacitance: Series

5. APPEARANCES, DIMENSIONS
OUTLINE DIMENSION (not to scale)



MARKING

1 Nominal Frequency

Move the number of maximum indication beams of the frequency to two digits, and omit less than 1MHz.

2 Identification [K] mark is KYOCERA Crystal Device Corporation.

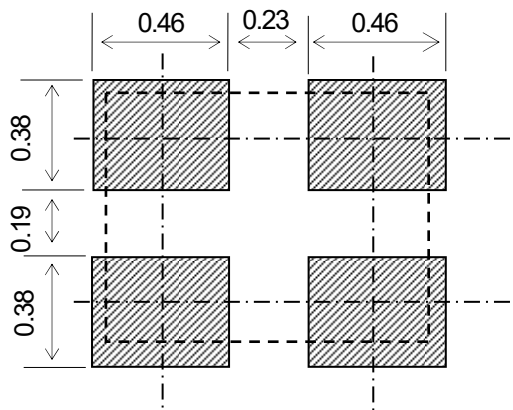
3-1 Date Code Year (Ex) 2021 → 1

3-2 Date Code Week (Ex) Jan, 4 → 01

4 Option Code

5 1Pin mark

6. One of RECOMMENDED LAND PATTERN (not to scale)



7. Soldering condition

1.) Type of solder

Material : lead free solder paste
 Melting point : $+220\pm 5^{\circ}\text{C}$

2.) PCB

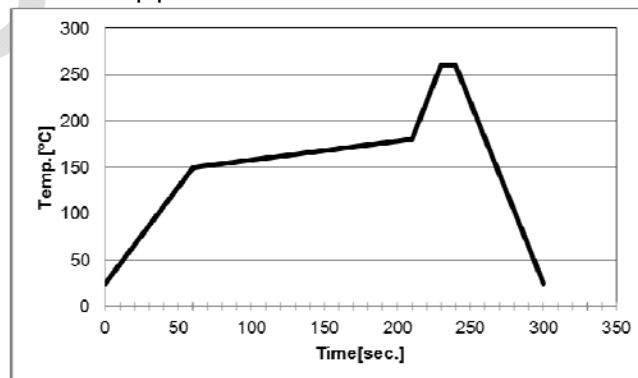
Material: FR4 (One Layer)
 Thickness: 1.6 mm
 Pattern: Cu 40 μm , Ni 4 ± 2 μm , Au min 0.05 μm

3.) Reflow temp.profile

	Temp [$^{\circ}\text{C}$]	Time[sec]
Preheating	+150 to +180	150 (typ.)
Peak	$+260\pm 5$	10 (max.)
Total	-	300 (max.)

4.) Reflow Times 6 times in below Reflow temp. profile

Reflow temp.profile



8. Environmental requirements

After conducting the following tests, component needs to meet below conditions.

Frequency: Fluctuation within $\pm 10 \times 10^{-6}$

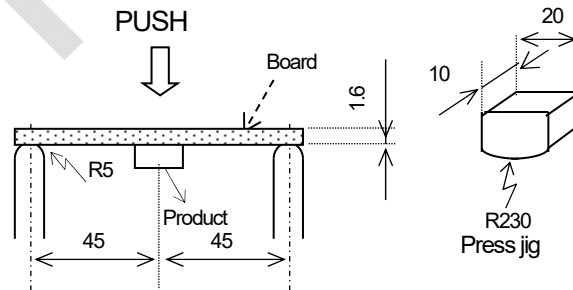
CI: Fluctuation within $\pm 20\%$ or 5Ω whichever is larger

- | | | |
|-----|-------------------------|--|
| 8.1 | Resistance to Shock | <p>Test condition</p> <p>3 times natural drop from 100cm onto hard wooden board.</p> |
| 8.2 | Resistance to Vibration | <p>Test condition</p> <p>frequency : 10 - 55 - 10 Hz</p> <p>Amplitude : 1.5mm</p> <p>Cycle time : 15 minutes</p> <p>Direction : X,Y,Z (3direction),2h each.</p> |
| 8.3 | Resistance to Heat | <p>Test condition</p> <p>The quartz crystal unit shall be stored at a temperature of $+85\pm 2^\circ\text{C}$ for 500h and subjected to room temperature for 1h before measurement.</p> |
| 8.4 | Resistance to Cold | <p>Test condition</p> <p>The quartz crystal unit shall be stored at a temperature of $-40\pm 2^\circ\text{C}$ for 500h and subjected to room temperature for 1h before measurement.</p> |
| 8.5 | Thermal Shock | <p>Test condition</p> <p>The quartz crystal unit shall be subjected to 500 temperature cycles shown in table below, Then it shall be subjected to room temperature for 1h before measurement.</p> <p>Cycle : $-40\pm 2^\circ\text{C}$ (30min.) \rightarrow $+25\pm 2^\circ\text{C}$ (5min.)
 \rightarrow $+85\pm 2^\circ\text{C}$ (30min.) \rightarrow $+25\pm 2^\circ\text{C}$ (5min.)</p> |
| 8.6 | Resistance to Moisture | <p>Test condition</p> <p>The quartz crystal unit shall be stored at a temperature of $+60\pm 2^\circ\text{C}$ with relative humidity of 90% to 95% for 240 h. Then it shall be subjected to room temperature for 1h before measurement.</p> |

8.7 Bending Strength

Solder this product in center of the circuit board (40mm X 100mm), and add deflection of 3mm.

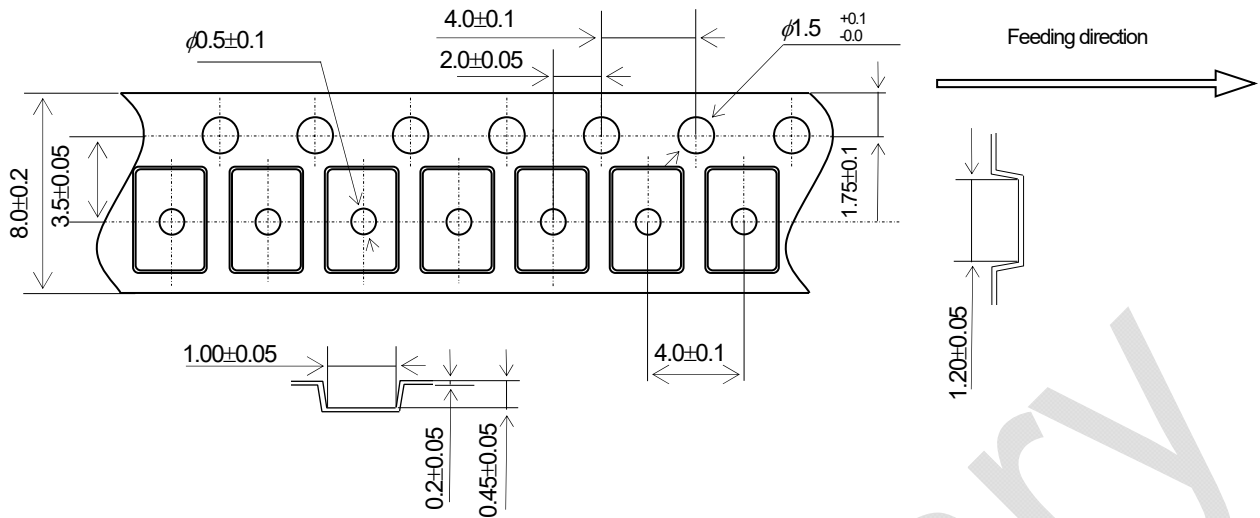
Test board : $t=1.6\text{mm}$



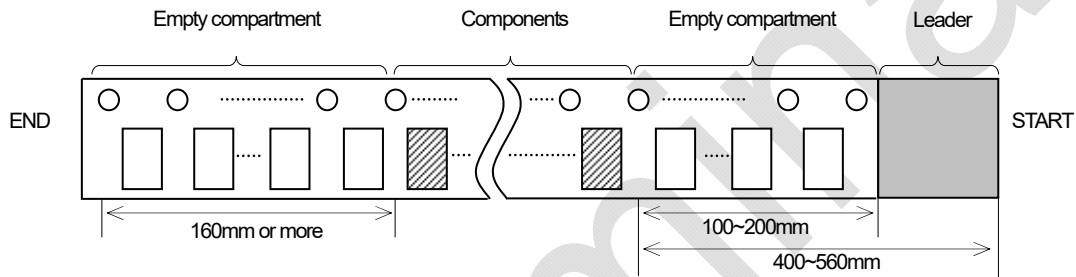
UNIT: mm

9. TAPING & REEL

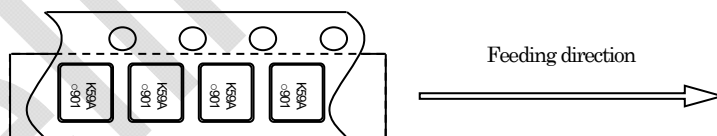
9-1. Dimensions



9-2. Leader and trailer tape

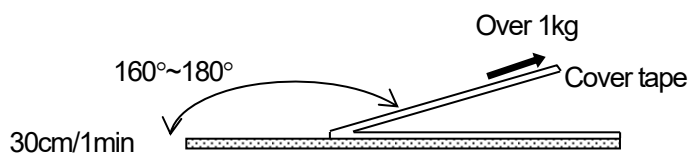


9-3. Direction (Orientation shall be checked from the top cover tape side)

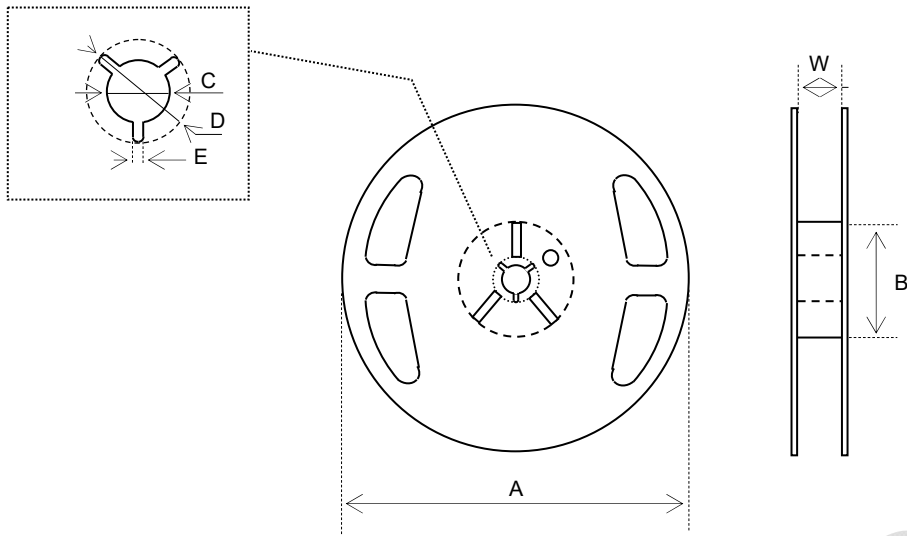


9-4. Specification

1. Material of the carrier tape is either polystyrene or A-PET (ESD).
2. Material of the cover tape is polyester (ESD).
3. The seal tape shall not cover the sprocket holes and not protrude from the carrier tape.
4. Tensile strength of carrier tape: 10N or more.
5. The R of the corner of each cavity is 0.2RMAX.
6. The alignment between centers of the cavity and sprocket hole shall be 0.05mm or less.
7. The orientation shall be checked from the top cover tape side as shown in 7-3.
8. Peeling force of cover tape: 0.1 to 1.0N.
9. The component will fall out naturally when cover tape is removed and set upside down.



9-5.Reel Specification



φ180 Reel (5000pcs max)

Symbol	A	B	C
Dimension	φ180 +0/-3	φ60 +1/-0	φ13±0.2
Symbol	D	E	W
Dimension	φ21±0.8	2.0±0.5	9±1

(Unit: mm)

φ330 Reel (21000pcs max)

Symbol	A	B	C
Dimension	φ330±2.0	φ100±1.0	φ13±0.2
Symbol	D	E	W
Dimension	φ21±0.8	2.0±0.5	9.4±1.0

(Unit: mm)

10. Cautions for use

(1) Soldering upon mounting

There is a possibility to influence product characteristics when Solder paste or conductive glue comes in contact with product lid or surface.

(2) When using mounting machine

Please minimize the shock when using Mounting Machine to avoid any excess stress to the product.

(3) Conformity of a circuit

We strongly recommend to make sure that Negative resistance (Gain) of IC is designed to be 3 times the ESR (Equivalent Series Resistance) of Crystal unit.

(4) In case of the manual soldering, please do not apply the excess heat to the product. There's a risk that Au/Sn melts down at 270 deg.C and above, which may cause the malfunction of the crystal unit.

(5) When removing the product from the board manually, please do not apply the excess heat to the product and try to remove in a short time. There's a risk that Au/Sn melts down when the high heat is applied for a long time, which may cause the malfunction of the crystal unit.

(6) When the solder is attached to the Au/Sn sealing part, melting temp of the sealing part will become lower. Accordingly, there's a risk that Au/Sn melts down, which may cause the malfunction of the crystal unit.

(7) Application instructions

This product is designed to be used for general electronic device and is not designed in the high reliability application listed below.

Please inform the department in charge when using the product for following applications.

Utility in nuclear power plant	Traffic signal control system
Utility in space	security and disaster-prevention
Aircraft	Transporter (car, train, ship, etc.)
under water or ground	Medical
other - applications requires same environmental status as above.	

This product must not be used in every application which are primary - intended to damage human race or their property.

Arms (missile, bomb and other application to damage human)

Weapons (transports act for combat)

Controller with primary – intended to military use.

(8) This product is not applicable for molding

11. Storage conditions

Please store product in below conditions, and use within 6months.

Temperature +18 to +30°C, and the humidity of 20 to 70 % in the packaging condition.

12. Manufacturing location

KYOCERA Corporation Shiga Yohkaichi Plant

KYOCERA Corporation Yamagata Higashine Plant

13. Quality Assurance

Location

KYOCERA Corporation Yamagata Higashine Plant: Quality Assurance Division

KYOCERA Corporation Shiga Yohkaichi Plant: Quality Assurance Division

14. Quality guarantee

In the case when KYOCERA Corporation rooted failure occurred within 1year after its delivery, substitute product will be arranged based on discussion. Quality guarantee of product after 1year of its delivery is waived.

15. Others

In case of any questions or opinions regarding the Specification, please have it in written manner within 45 days after issued date.

Preliminary