

Preliminary Specifications

Drawing No.	USY1M-H1-22090-00
Issued Date.	Aug,31,2022

Messrs: Digi-key

Note : Specifications are subject to change and part numbers will be revised in case of specifications change.

Product Type	Quartz Crystal
Series	CX1210SB
Frequency	48000kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX1210SB48000E9WZLCH
Remarks	Pb-Free, RoHS Compliant, MSL 1 Not applicable for military, automotive, base station, medical use, and applications which may cause loss of life or assets.

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. No. 075-604-3500 FAX. No. 075-604-3501

Manufacturer

Corporate Electronic Components Group
RF Devices Division
Shiga Yohkaichi Plant
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527-8555 Japan
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Design Department	Quality/Assurance	Approved by	Examined by	Written by
KYOCERA Corporation Corporate Electronic Components Group RF Devices Division	A. Muraoka	A.Iwaguchi	A.Hisako	K.Takahashi

Revision History

Rev.No.	Description of revision	Date	Approved by	Checked by	Issued by
00	First Edition	Aug.31,2022	A.Iwaguchi	A.Hisako	K.Takahashi

Preliminary

1. APPLICATION

This specification sheet is applied to quartz crystal "CX1210SB"

2. KYOCERA PART NUMBER

CX1210SB48000E9WZLCH

3. RATINGS

Items	SYMB.	Rating	Unit	Remarks
Operating Temperature Range	Topr	-40~+105	°C	
Storage Temperature Range	Tstg	-40~+105	°C	

4. CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

Items	Electrical Specification					Test Condition	Remarks
	SYMB.	Min	Typ.	Max	Unit		
Mode of Vibration		Fundamental					
Nominal Frequency	F0		48.0		MHz		
Nominal Temperature	T _{NOM}		25		°C		
Load Capacitance	CL		9.9		pF		
Frequency Tolerance	df/F	-20		+20	PPM	+25±3°C	
Tolerance over Temperature	df/F					-40~+100°C	
Frequency Aging Rate	df/F					25°C 5years	
Frequency Perturbation	df/t					-40~+100°C	
Frequency drift after reflow	df/t					After two reflows	
Equivalent Series Resistance	ESR	10		25	Ω	$ESR=RS \sqrt{(CL+C0)/CL^2}$	
Spurious mode series resistance	-	1100			Ω	±0.7MHz	
Motional inductance	L1	4.3	5.6	7.0	mH		
Motional capacitance	C1	1.5	1.9	4.0	fF		
Shunt capacitance	C0	0.3	0.6	1.0	pF		
Drive Level	Pd	0.01	200	300	μW		
Insulation Resistance	IR	500			MΩ	100V(DC)	

5. Measurement Condition

5.1 Frequency measurement

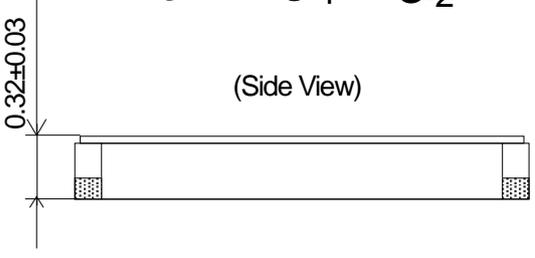
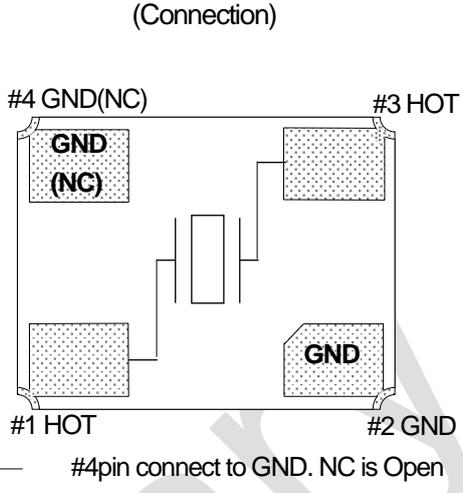
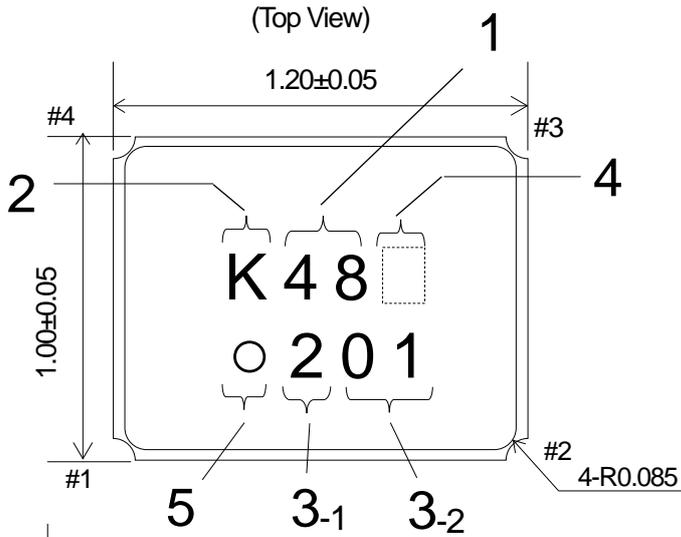
Measuring instrument : IEC PI-Network Test Fixture

5.2 Equivalent series resistance (ESR) measurement

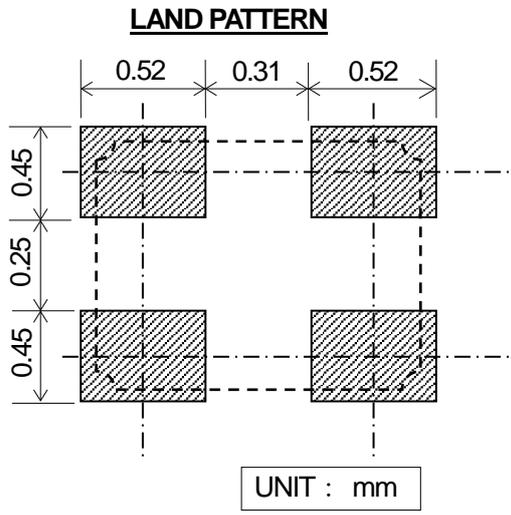
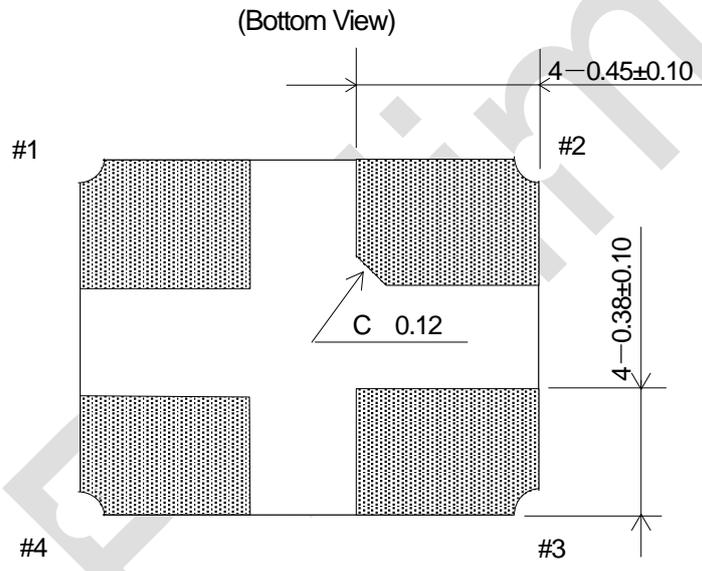
Measuring instrument : IEC PI-Network Test Fixture

Load Capacitance : Series

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



PIN NO.	PIN Layout
#1	HOT
#2	GND
#3	HOT
#4	GND(NC)



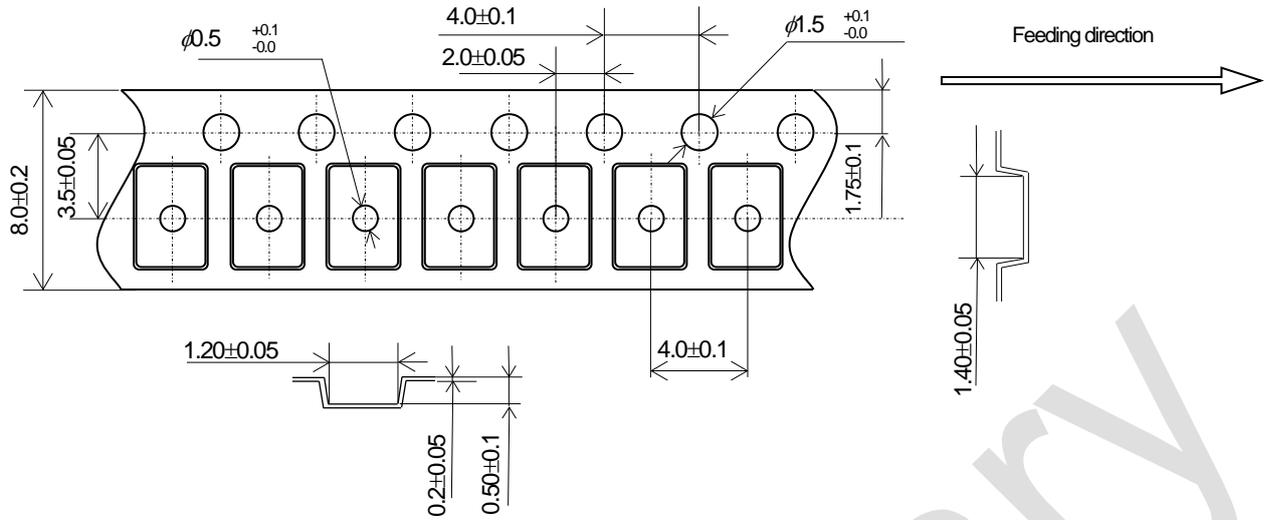
MARKING

- 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 Corporation.
- 3-1 Date Code Year (Ex) 2022 → 2
- 3-2 Date Code Week (Ex) Jan,3 → 1
- 4 Option Code
- 5 1Pin mark

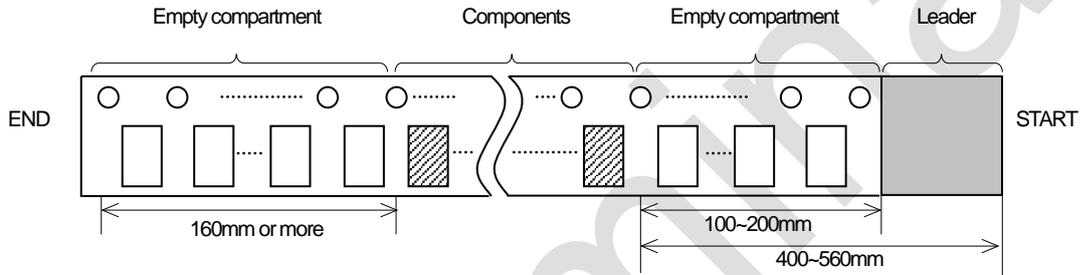
***The font of marking is for reference only.**

7.TAPING & REEL

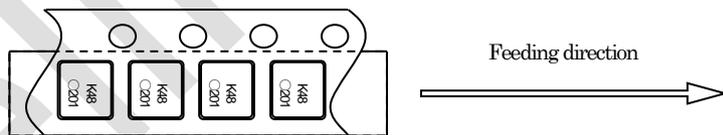
7-1.Dimensions



7-2.Leader and trailer tape

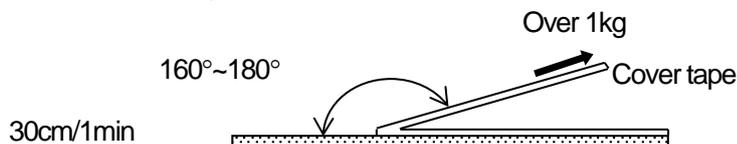


7-3.Direction (Orientation shall be checked from the top cover tape side)

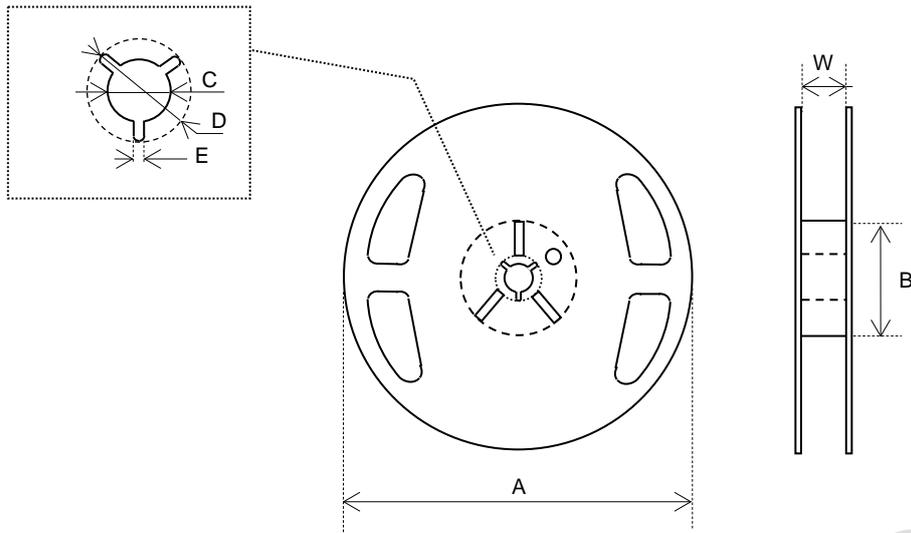


7-4.Specification

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.
10. Surface resistivity → Carrier tape: $\geq 1 \times 10^7$, Cover tape: $> 1 \times 10^{11}$



7-5.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)

8.6 Resistance to Moisture Test condition

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.

8.7 Soldering condition 1.) Type of solder

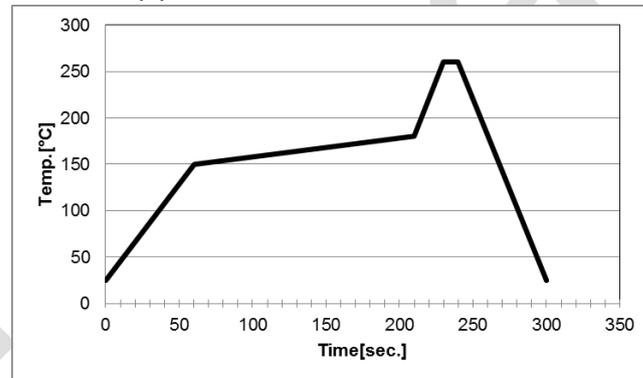
Material : lead free solder paste
 Melting point : $+220\pm 5^{\circ}\text{C}$

2.) Reflow temp.profile

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

3.) Reflow Times 2 times in below Reflow temp. profile

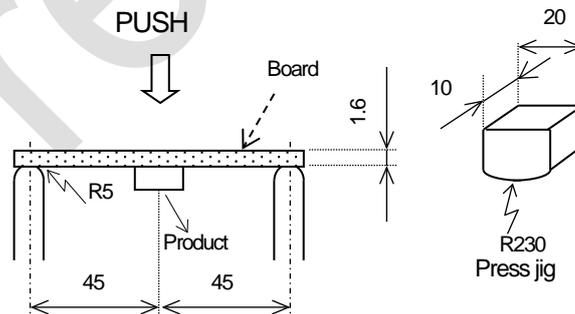
Reflow temp.profile



8.8 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. 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.

10. 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.

11. Manufacturing location

KYOCERA Corporation Shiga Yohkaichi Plant

KYOCERA Corporation Yamagata Higashine Plant

12. Quality Assurance

Location

KYOCERA Corporation Yamagata Higashine Plant: Quality Assurance Division

KYOCERA Corporation Shiga Yohkaichi Plant: Quality Assurance Division

KYOCERA Corporation

13. Quality guarantee

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

14. Others

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

Preliminary