Specifications

Drawing No.	UKY1C-H1-14E51-00[31] 1/11
Issued Date.	Dec,26,2014

TO: KED USA

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

Product Name	Quartz Crystal
Product Model	CX2520DB
Frequency	12000kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX2520DB12000C0WLSC1
Remarks Pb-Free、RoHS Compliant、MSL 1	

Customer Acceptance

Accept Signature	Approved Date	
	Department	
	Person in charge	

Seller
KYOCERA Crystal Device Corporation
(Sales Division)
6 Takeda Tobadono-cho, Fushimi-ku, Kyoto
612-8501 Japan
TEL. No. 075-604-3500
FAX. No. 075-604-3501

Manufacturer

Crystal Units Division
5850, Higashine-Koh, Higashine-Shi, Yamagata
999-3701 Japan
TEL. No. 0237-43-5611
FAX. No. 0237-43-5615

Design Department	Quality Assurance	Approved by	Checked by	Issued by
KYOCERA Crystal Device Corporation Crystal Units Engineering Section 1 Crystal Units Division	T. Noritake	K. Yamazaki	T. Nitoube	Y. Kikuchi

Revision History

Rev.No.	Description of revise	Date	Approved by	Checked by	Issued by
1	First Edition	Dec,26,2014	K. Yamazaki	T. Nitoube	Y. Kikuchi

1. APPLICATION

This specification sheet is applied to quartz crystal "CX2520DB12000C0WLSC1"

2. KYOCERA PART NUMBER

CX2520DB12000C0WLSC1

3. RATINGS

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

4. CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

Items	Electrical Specification					Test Condition	Remarks
	SYMB.	Min	Typ.	Max	Unit		
Mode of Vibration		Fundamental					
Nominal Frequency	F0		12		MHz		
Nominal Temperature	T_{NOM}		25		°C		
Load Capacitance	CL		7.0		pF		
Frequency Tolerance	df/F	-50.0		+50.0	PPM	+25±3°C	
Frequency Temperature characteristics	df/F					-30 to +85°C	
Frequency drift after reflow						After 2times	
Frequency Aging Rate						1st year	+25±3°C
Equivalent Series Resistance	ESR			100	Ω		
Drive Level	Pd	0.01		300	μW		
Insulation Resistance	IR	500			MΩ	100V(DC)	

5. Measurement Condition

5.1 Frequency measurement

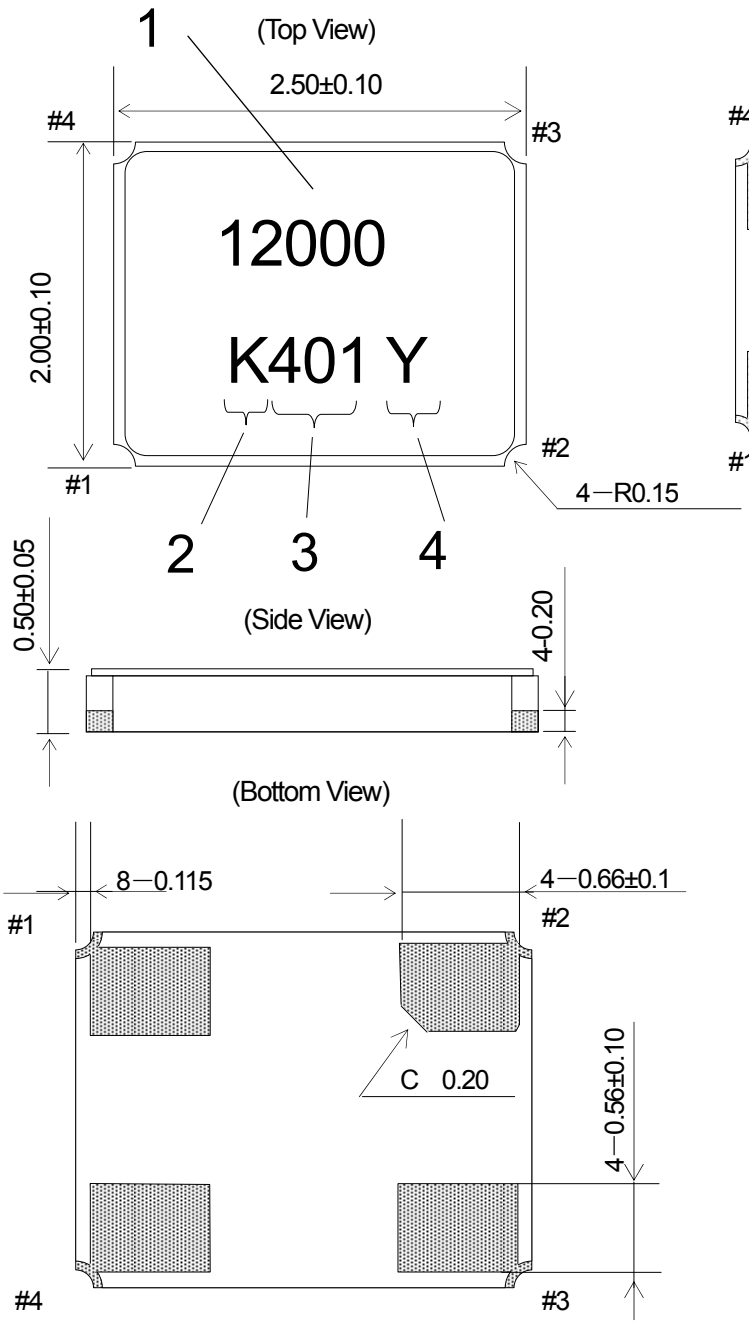
Measuring instrument : IEC PI-Network Test Fixture
Load Capacitance : 7.0pF
Drive Level : 10μW

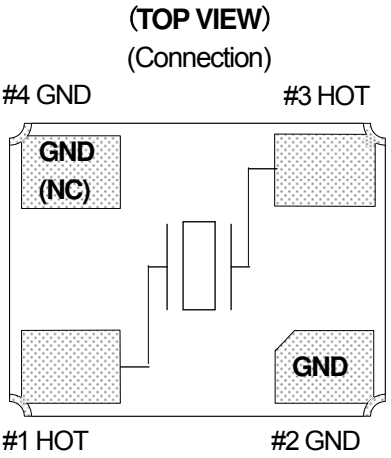
5.2 Equivalent series resistance (ESR) measurement

Measuring instrument : IEC PI-Network Test Fixture
Load Capacitance : Series
Drive Level : 10μW

6. APPEARANCES, PHYSICAL DIMENSION

OUTLINE DIMENSION (not to scale)





PIN NO.	PIN Layout
#1	HOT
#2	GND
#3	HOT
#4	GND

UNIT : mm

MARKING

1 Nominal Frequency Move the number of maximum indication beams of the frequency to five digits, and omit less than kHz.

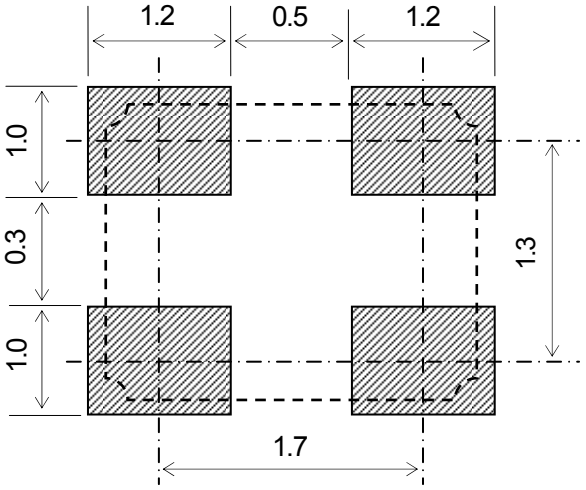
2 Identification [K] mark is surely 1Pin direction.

3 Date Code Year···LAST 1 DIGIT of YEAR AND WEEK
(Ex)Jan,01, 2014 → 401

4 Manufacturing Location
Y···Japan(Yamagata)
Z···Japan(Shiga Yohkaichi)
T···Thailand
F···Philippines

※The font of marking is reference.

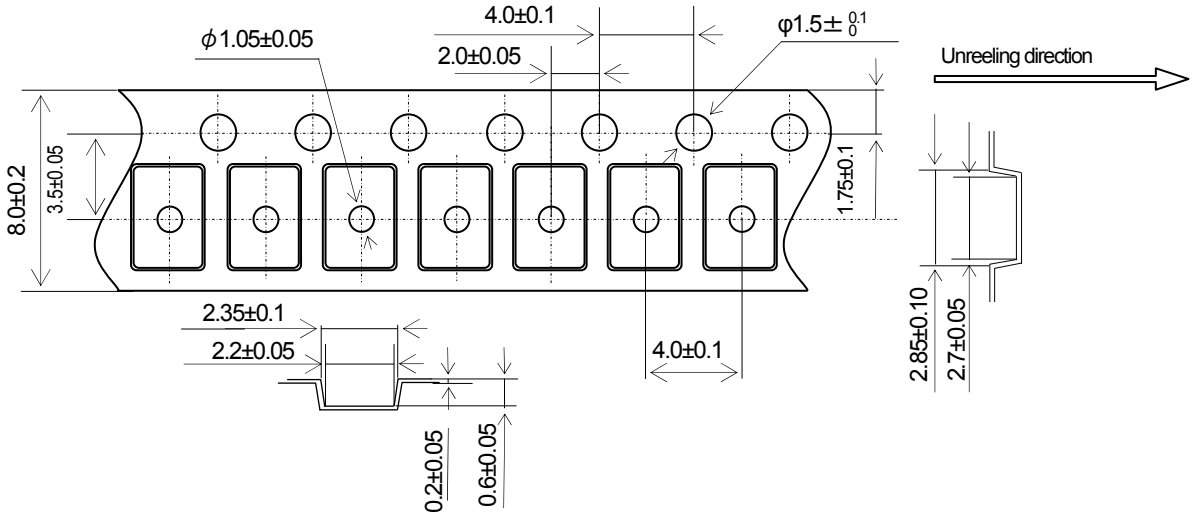
7. RECOMMENDED LAND PATTERN (not to scale)



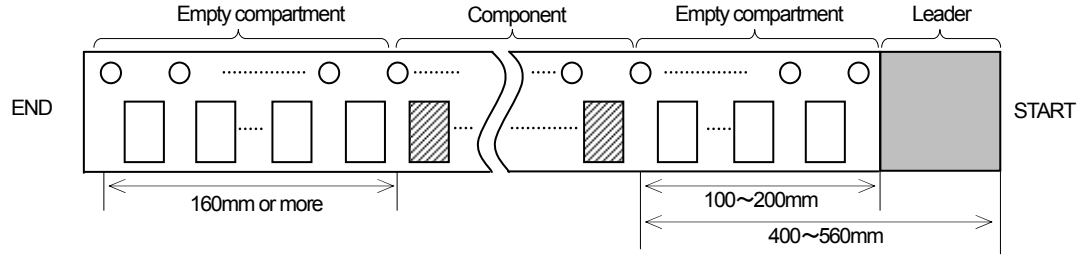
UNIT : mm

8. TAPING&REEL

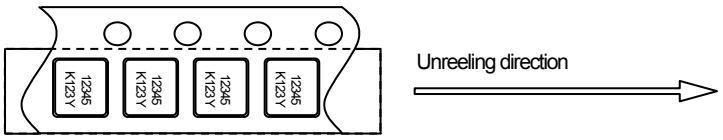
8-1.Dimensions



8-2.Leader and trailer tape

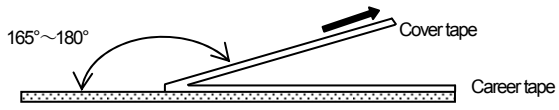


8-3.Direction (The direction shall be seen from the top cover tape side)

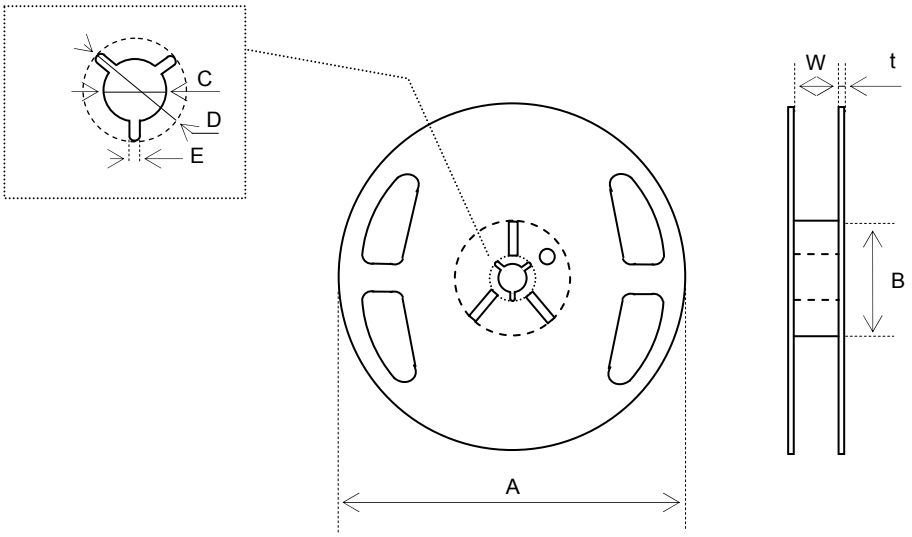


8-4.Specification

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 8-3.
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.



8-5.Reel Specification



φ180 Reel (3,000 pcs .)

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

(Unit : mm)

3000pcs taping Only

9.Enviromental requirements

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

Frequency: Fluctuation within +/-10 x 10^{-6}

CI: Fluctuation within +/-20% or 5Ω whichever is larger

9.1 Resistance to Shock　　Test condition

3 times natural drop from 100cm onto hard wooden board.

9.2 Resistance to Vibration　　Test condition

frequency	:	10 - 55 - 10 Hz
Amplitude	:	1.5mm
Cycle time	:	15 minutes
Direction	:	X,Y,Z (3direction),2h each.

9.3 Resistance to Heat　　Test condition

The quartz crystal unit shall be stored at a temperature of +85±2°C for 500h and subjected to room temperature for 1h before measurement.

9.4 Resistance to Cold　　Test condition

The quartz crystal unit shall be stored at a temperature of -40±2°C for 500h and subjected to room temperature for 1h before measurement.

9.5 Thermal Shock　　Test condition

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 mesurement.

Cycle : -40±2°C（30min.）→ +25±2°C（5min.）→ +85±2°C（30min.）→ +25±2°C（5min.）

9.6 Resistance to Moisture Test condition

The quartz crystal unit shall be stored at a temperature of +60±2°C with relative humidity of 90% to 95% for 240 h. Then it shall be subjected to room temperature for 1h before measurement.

9.7 Soldering condition 1.) Type of solder

Material ··· lead free solder paste

Melting point ··· +220±5°C

2.) Reflow temp.profile

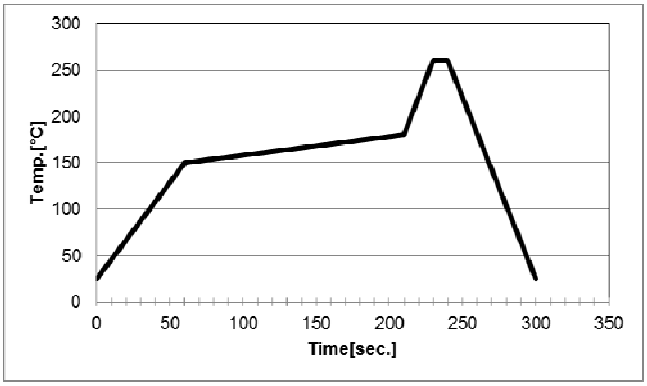
	Temp [°C]	Time[sec]
Preheating	+150 to +180	150 (typ.)
Peak	+260±5	10 (max.)
Total	—	300 (max.)

Frequency shift : ±2ppm

3.) Hand Soldering +350°C 3 sec max

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

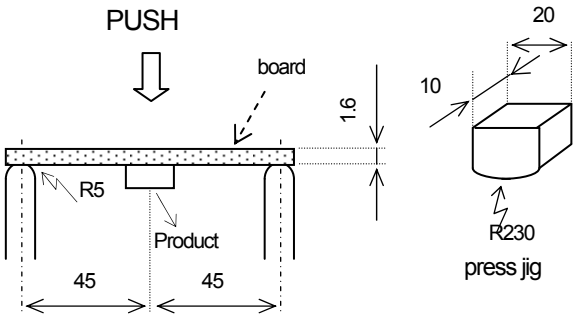
Reflow temp.profile



9.8 Bending Strength

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

Test board : t=1.6mm



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 5 times the ESR (Equivalent Series Resistance) of crystal unit.

11. Storage conditions

Please store product in below conditions, and use within 6 months.
Temperature +18 to +30°C, and Humidity of 20 to 70 % in the packaging condition.

12. Manufacturing location

Kyocera Crystal Device Corporation Yamagata Plant
Kyocera Crystal Device Corporation Shiga Yohkaichi Plant
Kyocera Crystal Device (Thailand) Co., Ltd
Kyocera Crystal Device Philippines, Inc.

13. Quality Assurance

To be guaranteed by Kyocera Crystal Device Quality Assurance Division

14. Quality guarantee

In case when Kyocera Crystal Device 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 waivered.

15. Others

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