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Specification

Drawing No.	K1101-13752-431 1/10
Issued Date.	Jul.29,2013

TO: Digi-Key

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

Product Name	Quartz Crystal
Product Model	CX3225CA
Frequency	16000kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX3225CA16000H0HSSCC
Remarks	RoHS Compliant, MSL 1

Confirmation of stable oscillation of a crystal oscillation circuit is necessary at the design stage to prevent critical failures for automotive crystal units which are used to control vehicles and secure safety. It is strongly recommended to provide us a test circuit board and let us implement the circuit verification upon your use of our automotive crystal units.

Customer Acceptance

Accept Signature	Approved Date	
	Department	
	Person in charge	

Seller

KYOCERA Corporation

6 Takeda Tobadono-cho, Fushimi-ku, Kyoto

612-8501 Japan

TEL. No. 075-604-3500

FAX. No. 075-604-3501

Manufacturer

KYOCERA Crystal Device Corporation

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 Design Section Crystal Units Division	A.Kikuchi	Y.Takahashi	T.Nitoube	M.Konno

Revision History

Rev.No.	Description of revise	Date	Approved by	Checked by	Issued by
1	First Edition	Jul.29,2013	Y.Takahashi	T.Nitoube	M.Konno

1. APPLICATION

This specification sheet is applied to quartz crystal "CX3225CA"

2. KYOCERA PART NUMBER

CX3225CA16000H0HSSCC

3. RATINGS

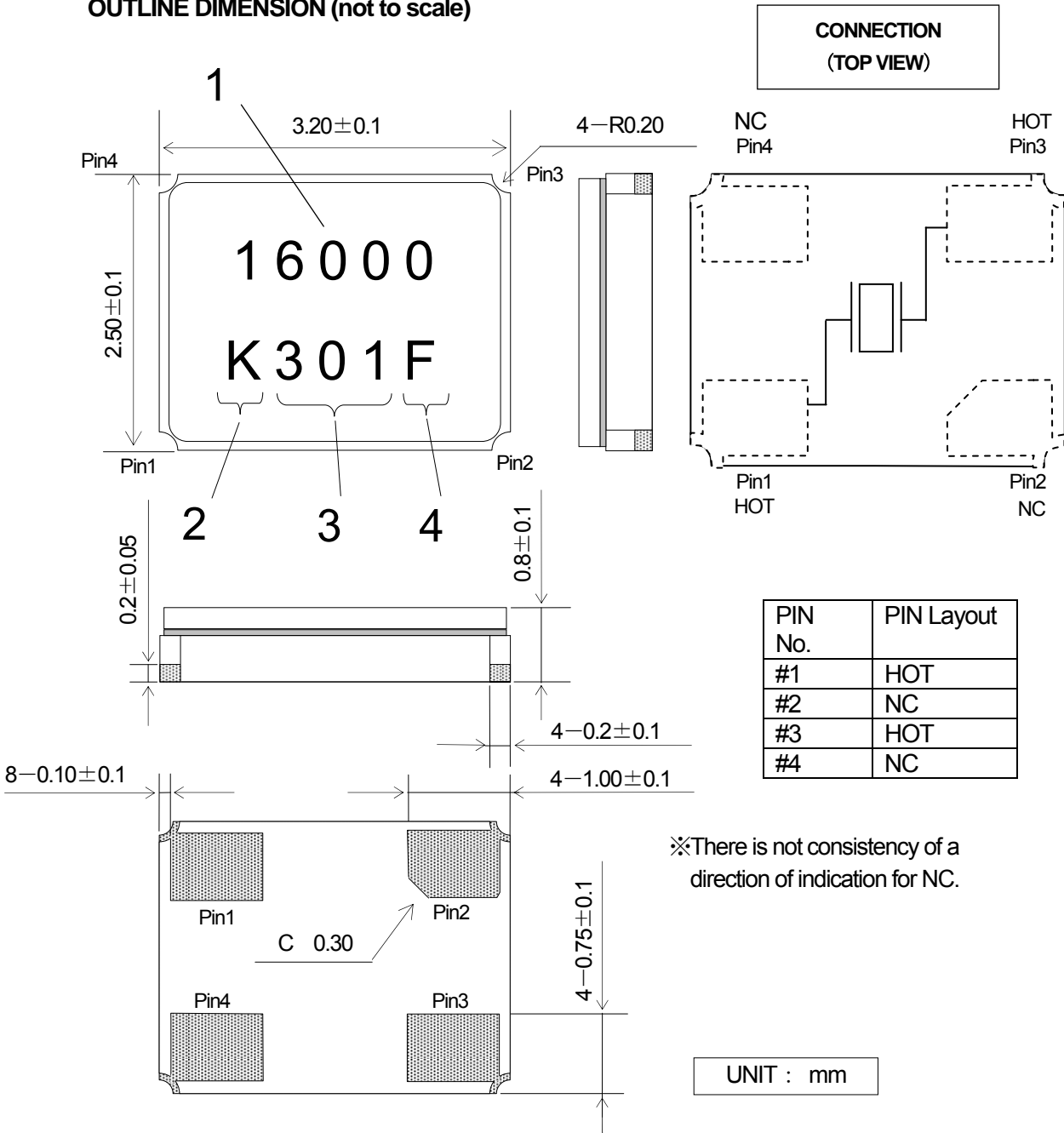
Items	SYMB.	Rating	Unit	Remarks
Operating Temperature	Topr	-40 to +125	°C	
Storage Temperature Range	Tstg	-40 to +150	°C	

4. CHARACTERISTICS

4-1 ELECTRICAL CHARACTERISTICS

Items	Electrical Specification					Test Condition	Remarks
	SYMB.	Min.	Typ.	Max.	Unit		
Mode of Vibration		Fundamental					
Nominal Frequency	F0		16		MHz		
Nominal Temperature	T _{NOM}		+25		°C		
Load Capacitance	CL		12.0		pF		
Frequency Tolerance	df/F	-20.0		+20.0	PPM	+25±3°C	
Frequency Temperature Characteristics	df/F	-50.0		+50.0		-40~+125°C	
Frequency Aging Rate		-5.0		+5.0		1 year	+25±3°C
Equivalent Series Resistance	ESR			100	Ω		
Drive Level	Pd	0.01		200	μW		
Insulation Resistance	IR	500			MΩ	100V(DC)	

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

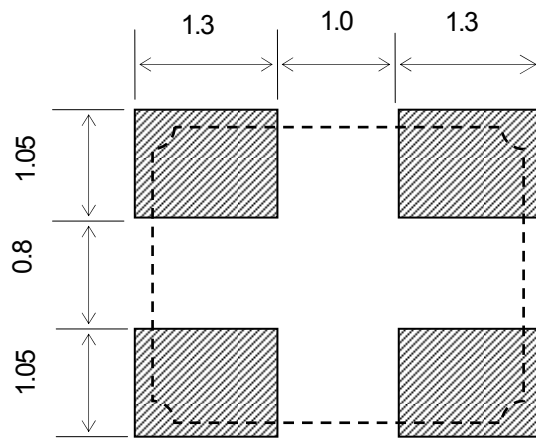


※There is not consistency of a direction of indication for NC.

MARKING

- | | |
|--------------------------|--|
| 1 Nominal Frequency | Move the number of maximum indication beams of the frequency to five digits, and omit less than kHz. |
| 2 Identification | |
| 3 Date Code | Year ···LAST 1 DIGIT of YEAR AND WEEK
(Ex) Jan. 1, 2013 → 301 |
| 4 Manufacturing Location | F··KYOCERA Crystal Device Philippines, Inc |

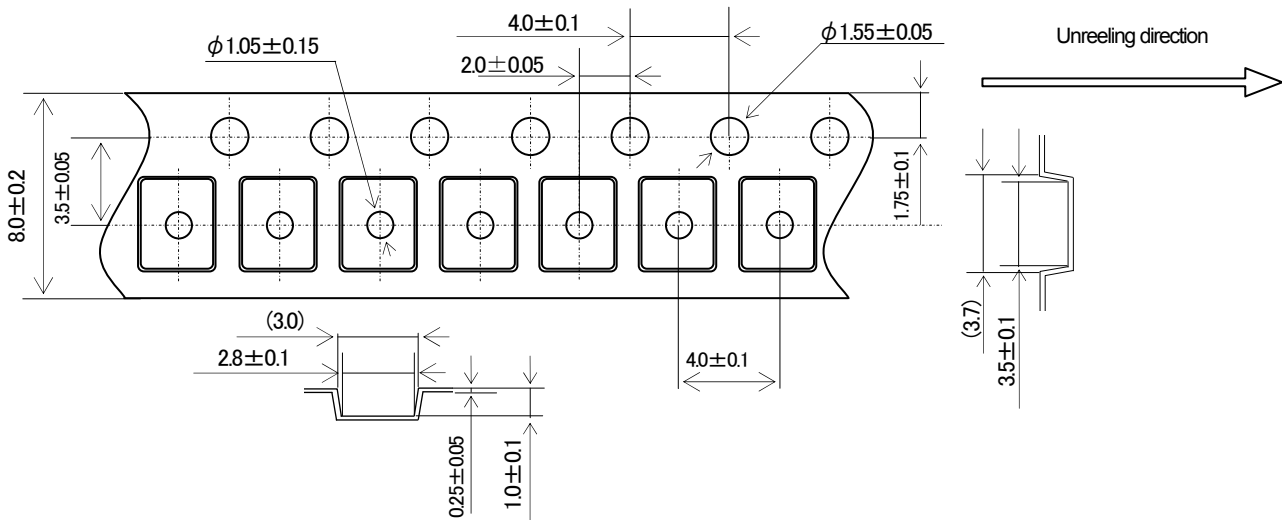
※The font of marking is reference.

6. RECOMMENDED LAND PATTERN (not to scale)

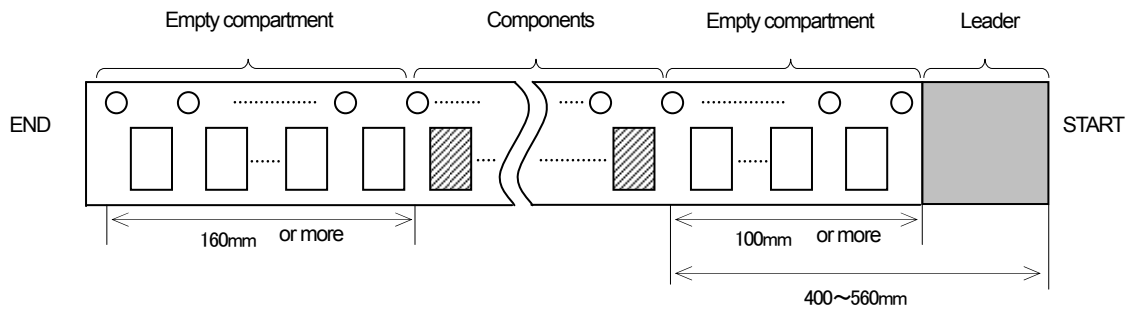
UNIT : mm

7.TAPING & REEL

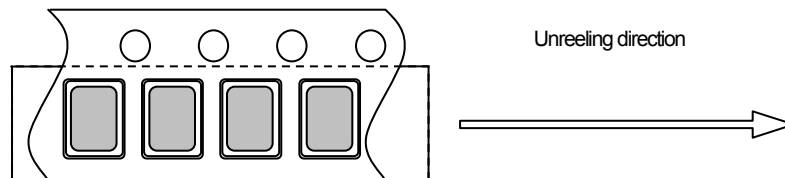
7-1.Dimensions



7-2.Leader and trailer tape

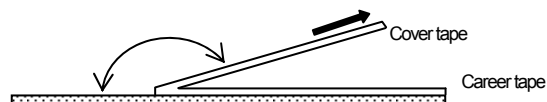


7-3.Direction (The direction shall be seen from the top cover tape side)

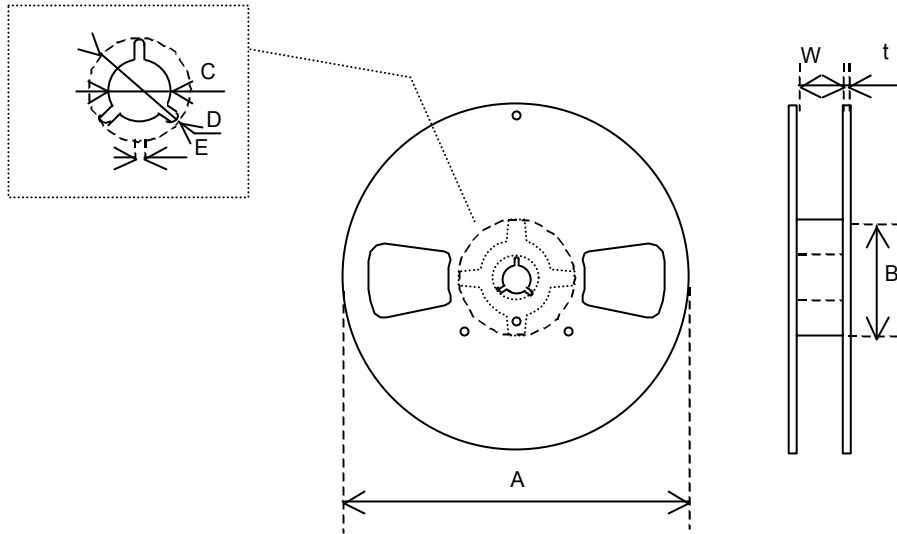


7-4.Specification

1. Material of the carrier tape shall be PS (ESD).
2. Material of the seal tape shall be polyester(ESD).
3. The seal tape shall not cover the sprocket holes. And not protrude from the carrier tape.
4. Tensile strength of the tape : 10N or more.
5. The R of the corner without designation is 0.2RMAX.
6. Disalignment between centers of the cavity and sprocket hole shall be 0.05mm or less.
7. Cumulative pitch tolerance of "P₀" shall be ± 0.2 mm at 10 pitches.
8. The number of lack is 0.1% of 1 reel total part number (the number of the table letters) or the part following whose 1 either is big.
(But, the thing which lack of the continuance is not in.)
9. The marking on parts is not fixed its direction, its electrical characteristic is equal.
10. Peeling force of the seal tape: 0.1 to 1.0N.



7-5.Reel specifications



(Nonconductor type Reel)

In the case of Φ 180 Reel (3000 pcs max)

	A	B	C	D
Dimension	ϕ 180 +0/-1.5	ϕ 60 +1/-0	ϕ 13±0.2	ϕ 21±0.8
Symbol	E	W	t	
Dimension	2.0±0.5	9±1	2.0±0.5	

(Unit : mm)

8.Environmental requirements

After following test, frequency shall not change more than $\pm 10 \times 10^{-6}$

And CI, $\pm 20\%$ or 5Ω of large value.

8.1 Resistance to Shock

Test condition

Natural dropped from height 100cm onto hard wood board in 3 times

8.2 Resistance to Vibration

Test condition

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

8.3 Resistance to Heat

Test condition

The quartz crystal unit shall be stored at a temperature of $+150 \pm 2^\circ\text{C}$ for 500 h.

Then it shall be subjected to standard atmospheric conditions for 1 h ,after whichi measurement shall be made.

8.4 Resistance to Cold

Test condition

The quartz crystal unit shall be stored at a temperature of $-40 \pm 2^\circ\text{C}$ for 500 h.

Then it shall be subjected to standard atmospheric conditions for 1 h ,after whichi measurement shall be made.

8.5 Thermal Shock

Test condition

The quartz crystal unit shall be subjected to 500 succesive change of temperature cycles , each as shown in table below, Then it shall be subjected to standard atmospheric conditions for 1h, after which measurements shall be made.

Cycle : $-40 \pm 2^\circ\text{C}$ (30min.) to $25 \pm 2^\circ\text{C}$ (5min.)
 to $+150 \pm 2^\circ\text{C}$ (30min.) to $25 \pm 2^\circ\text{C}$ (5min.)

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 500 h. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurements shall be made

8.7 Soldering condition

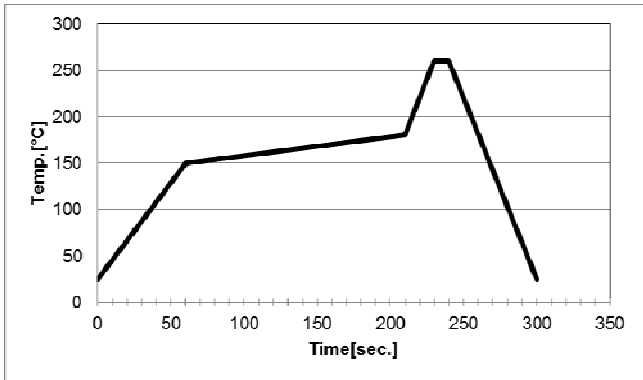
- 1.) Material of solder
 Kind ... lead free solder paste
 Melting point ... $+220 \pm 5^\circ\text{C}$
- 2.) Reflow temp.profile

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

Frequency shift : $\pm 2\text{ppm}$

- 3.) Hand Soldering +350°C 3 sec MAX
- 4.) Reflow Times 2 times

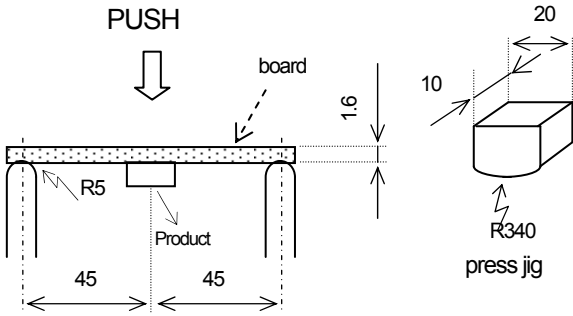
Reflow temp.profile



8.8 Intensity for bending in circuit board

Solder this product in center of the circuit board of $40\text{mm} \times 100\text{mm}$, and add the deflection of 3mm as the bottom figure.

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



UNIT : mm

9. Cautions for use

(1) Automatic mounting machine use

Please use after affirmation that select the mounting machine model with a shock small if possible in the case of use of an automatic mounting machine, and it does not have breakage. There is a risk of a quartz crystal unit breakage occurring and not functioning normally by too much shock etc..

(2) Conformity of a circuit

In case of use of an oscillation circuit, please insert in a quartz crystal unit in series resistance 20 times as many as the standard value of equivalent in-series resistance, and confirm oscillating. Please remove resistance which inserted after the notes above-mentioned examination in the quartz crystal unit in series, and use it.

(3) After making the Quartz Crystal mount on a printed circuit board ,if it is required to divide the printed circuit board into another one, use it with attentive confirmation so that a warp caused by this dividing might not affect any damage. When designing a printed circuit board as well as handling the mounting As much as possible. The quartz crystal shall be passed through the reflow furnace. Then it shall be subjected to standard atmospheric conditions, after which cleaning shall be made.

10. Storage conditions

Storage at prolonged high temperature or low temperature and the storage by high humidity cause degradation of frequency accuracy, and degradation of soldering nature. Storage is performed at the temperature of 18-30 degrees C, and the humidity of 20-70 Percent in the state of packing, and a term is 6 months.

11. Manufacturing location

KYOCERA Crystal Device Philippines, Inc.

12. Quality Assurance

Kyocera Crystal Device Quality Assurance Division

13. Quality guarantee

When the failure by the responsibility of our company occurs clearly after delivery within 1 year, a substitute article etc. is appropriated gratuitously and this is guaranteed. However, when passing 1 year after delivery, there is a case where I am allowed to consider as onerous repair after both consultation.

14. Others

When any questions and opinions are in the written matter of these delivery specifications, I will ask connection of you from the our company issue day within 45 days. In a connection no case, a written matter is consented to it and employed within a term.