

Specifications

Drawing No.	UKY1C-H1-14491-00[37] 1/10
Issued Date.	Apr,25,2014

TO: Digi-Key

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

Product Name	Quartz Crystal
Product Model	CX2016DB
Frequency	48000kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX2016DB48000C0WPLA2
Remarks	Pb-Free, RoHS Compliant, MSL 1 "NOT AEC-Q200 Qualified"

Qualified for Qualcomm Atheros QCA6174 & QCA9378 chipset

Customer Acceptance

Accept Signature	Approved Date	
	Department	
	Person in charge	

Seller

KYOCERA Crystal Device Corporation

(Crystal products 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 Crystal Units Division	A. Kikuchi	Y.Takahashi	T. Nitoube	Y. Kikuchi

Revision History

Rev.No.	Description of revise	Date	Approved by	Checked by	Issued by
1	First Edition	Dec,25,2013	Y.Takahashi	T. Nitoube	Y. Kikuchi

1. APPLICATION

This specification sheet is applied to quartz crystal “CX2016DB”

2. KYOCERA PART NUMBER

CX2016DB48000C0WPLA2

3. RATINGS

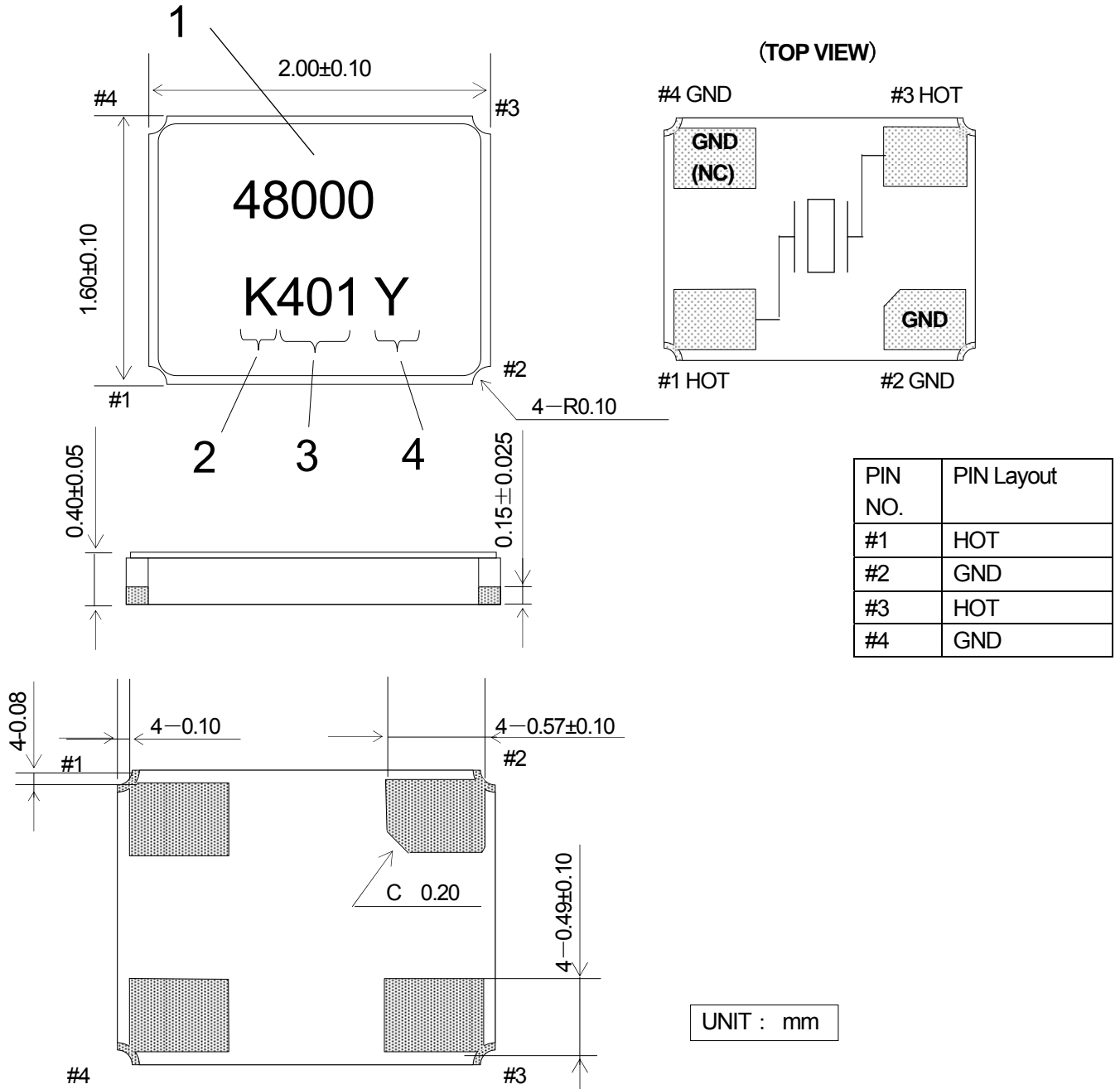
Items	SYMB.	Rating	Unit	Remarks
Operating Temperature	Topr	-40 to +85	°C	
Storage Temperature range	Tstg	-40 to +85	°C	

4. CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

Items	Electrical Specification					Test Condition	Remarks	
	SYMB.	Min	Typ.	Max	Unit			
Mode of Vibration		Fundamental						
Nominal Frequency	F0		48		MHz			
Nominal Temperature	T _{NOM}		+25		°C			
Load Capacitance	CL		7.0		pF	Network Analyzer E5100A		
			8.79			Saunders(S&A) Network Analyzer 250B		
Frequency Tolerance	df/F	-20.0		+20.0	PPM	+25±3°C		
Frequency Temperature Characteristics	df/F						-40 to +85°C	
Frequency drift after reflow							After 2times	
Frequency Aging Rate							5 years	+25±3°C
Equivalent Series Resistance	ESR			22	Ω			
Motional Capacitance	C1	2.16	3.16	4.16	fF	Network Analyzer E5100A		
						Saunders(S&A) Network Analyzer 250B		
Shunt Capacitance	C0	0.51	0.71	0.91	pF	Network Analyzer E5100A		
		0.64	0.84	1.04		Saunders(S&A) Network Analyzer 250B		
Motional Inductance	L1	1.00	3.49	4.00	mH	Network Analyzer E5100A		
						Saunders(S&A) Network Analyzer 250B		
Spurious mode series resistance		1100			Ω		±700kHz	
Drive Level	Pd	10		100	μW			
Insulation Resistance	IR	500			MΩ	100V(DC)		

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

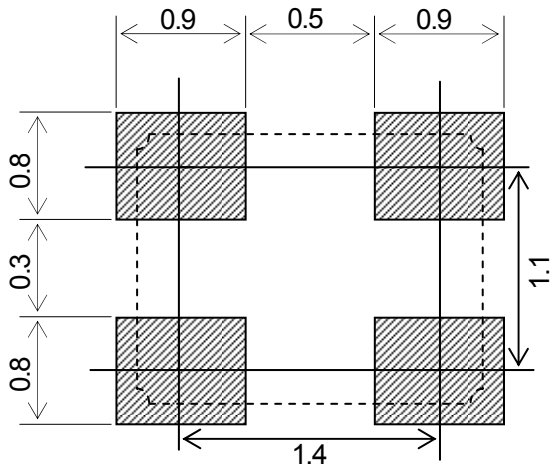


MARKING

- 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··Yamagata
 Z··Shiga Yohkaichi
 T··Thailand
 F··Philippines

※The font of marking is reference.

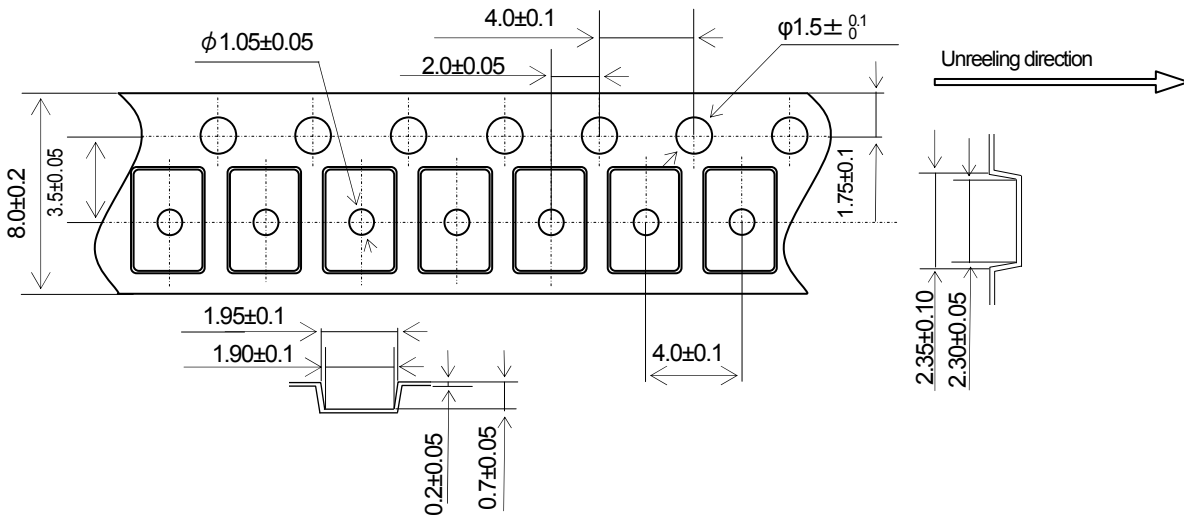
6. RECOMMENDED LAND PATTERN (not to scale)



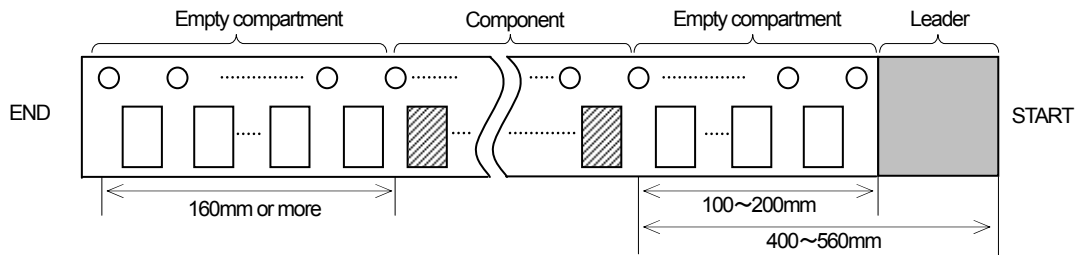
UNIT : mm

7. TAPING & REEL

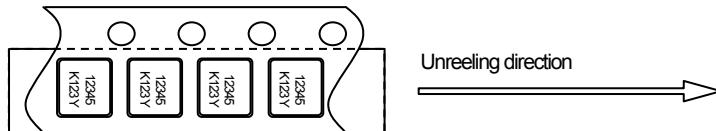
7-1. Dimensions



7-2. Leader and trailer tape

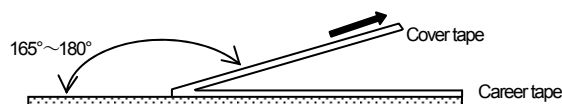


7-3. Direction (The direction shall be seen from the top cover tape side)

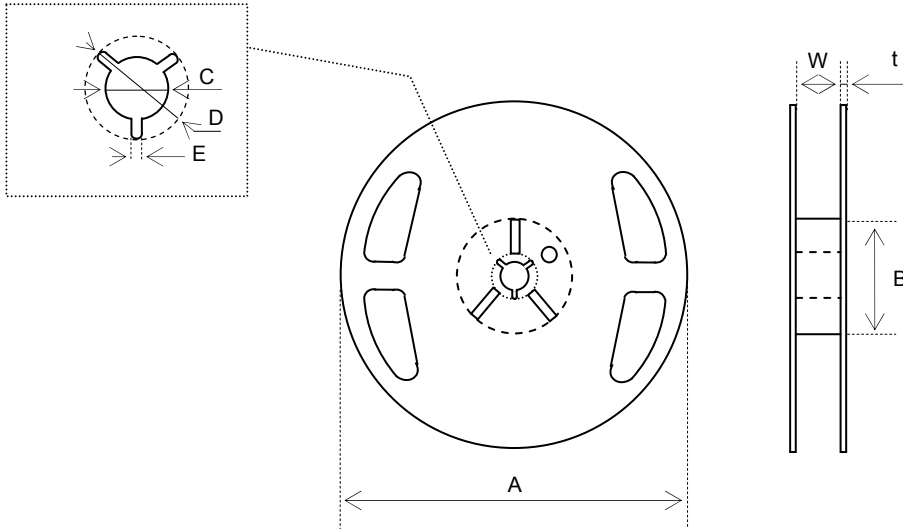


7-4. Specification

1. Material of the carrier tape shall be polystyrene or A-PET (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 $0.2R_{MAX}$.
6. The alignment 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. Suppose that it unifies as shown in the above-mentioned figure to the directivity of printing in an embossing tape.
9. Peeling force of the seal tape: 0.1 to 1.0N.
10. The component can fall headlong naturally from taping in the environment, such dry conditions, when this components were transferred to, cover was removed and the component was moved upside down.



7-5.Reel Specification



In the case of $\phi 180$ Reel (3,000 pcs max, every 1,000 pcs)

Symbol	A	B	C	D
Dimension	$\phi 180 +0/-3$	$\phi 60 +1/-0$	$\phi 13 \pm 0.2$	$\phi 21 \pm 0.8$
Symbol	E	W	t	
Dimension	2.0 ± 0.5	9 ± 1	2.0 ± 0.5	

(Unit : mm)

In the case of $\phi 330$ Reel (12,000 pcs max, every 1,000 pcs)

Symbol	A	B	C	D
Dimension	$\phi 330 \pm 2.0$	$\phi 100 \pm 1.0$	$\phi 13 \pm 0.2$	$\phi 21 \pm 0.8$
Symbol	E	W	t	
Dimension	2.0 ± 0.5	9.5 ± 0.5	2.2 ± 0.1	

(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 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

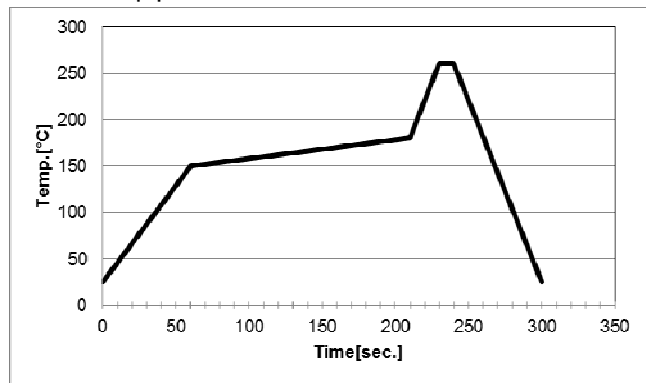
	Temp [$^\circ\text{C}$]	Time[sec]
Preheating	+150 to +180	150 (typ.)
Peak	$+260 \pm 5$	10 (max.)
Total	—	300 (max.)

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

3.) Hand Soldering $+350^\circ\text{C}$ 3 sec MAX

4.) Reflow Times 2 times

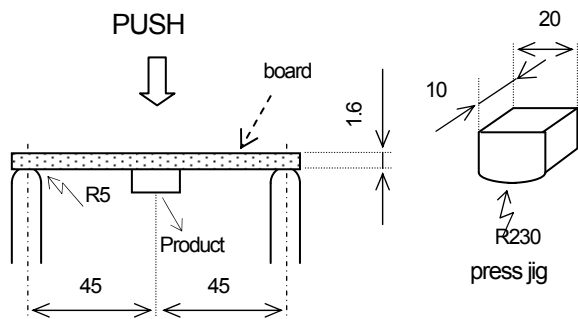
Reflow temp.profile



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) Soldering in mounting
In case of Solder paste and conductive glue contact product lid or product side face exception for product terminal it's possible to influence product characteristics.
Please be careful above contents.
- (2) 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 crystal oscillating child's breakage occurring and not functioning normally by too much shock etc.
- (3) Conformity of a circuit
In case of use of an oscillation circuit, please insert in a crystal oscillating child in series resistance 5 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 crystal oscillating child in series, and use it.

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 to +30°C, and the humidity of 20 to 70 % in the state of packing, and a term is 6 months.

11. Manufacturing location

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

- (1) When any questions and opinions are in the written matter of these delivery specifications, I will ask connection of you from the company issue day within 45 days. In a connection no case, a written matter is consented to it and employed within a term.
- (2) NOT AEC-Q200 Qualified. Please inquire your local Sales for AEC-Q200 Complied Product.