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Specifications

Drawing No.	USY1M-H1-15382-00 1 / 8
Issued Date.	Jul,28,2015

Messrs: Digi-key

Note: Part Number will be revised in case of specification change.

Product Type	Quartz Crystal
Series	CX2016DB
Frequency	16000kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	CX2016DB16000D0WZRC1
Remarks Pb-Free, RoHS Compliant, MSL 1	

Customer Approval

Approval 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
KYOCERA Crystal Device Corporation
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 Unit Application Engineering Section Crystal Units Division	S.Itoh	T.Soda	A.Muraoka	Y.Nozaki

Revision History

Rev.No.	Description of revise	Date	Approved by	Checked by	Issued by
00	First Edition	Jul,28,2015	T.Soda	A.Muraoka	Y.Nozaki

1. APPLICATION

The purpose of this document is applied to CX2016DB quartz crystal.

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2. KYOCERA PART NUMBER

CX2016DB16000D0WZRC1

3. RATINGS

Items	SYMB.	Rating	Unit	Remarks
Operating Temperature range	Topr	-25~+75	deg. C	
Storage Temperature range	Tstg	-40~+85	deg. 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		deg. C		
Load Capacitance	CL		8.0		pF		
Frequency tolerance	df/F	-40.0		+40.0	PPM	25deg.C	
Frequency Temperature Characteristics	df/t					-25~+75deg.C	
Frequency Aging Rate						25deg.C	1st year
Equivalent Series Resistance	ESR			130	Ohms	CL=SERIES	
Shunt Capacitance	C0			3.0	pF		
Drive Level	Pd	0.01		100	μW		
Insulation Resistance	IR	500			M ohms	100V(DC)	

Measurement Condition

Frequency measurement

Measuring instrument : IEC PI-Network Test Fixture

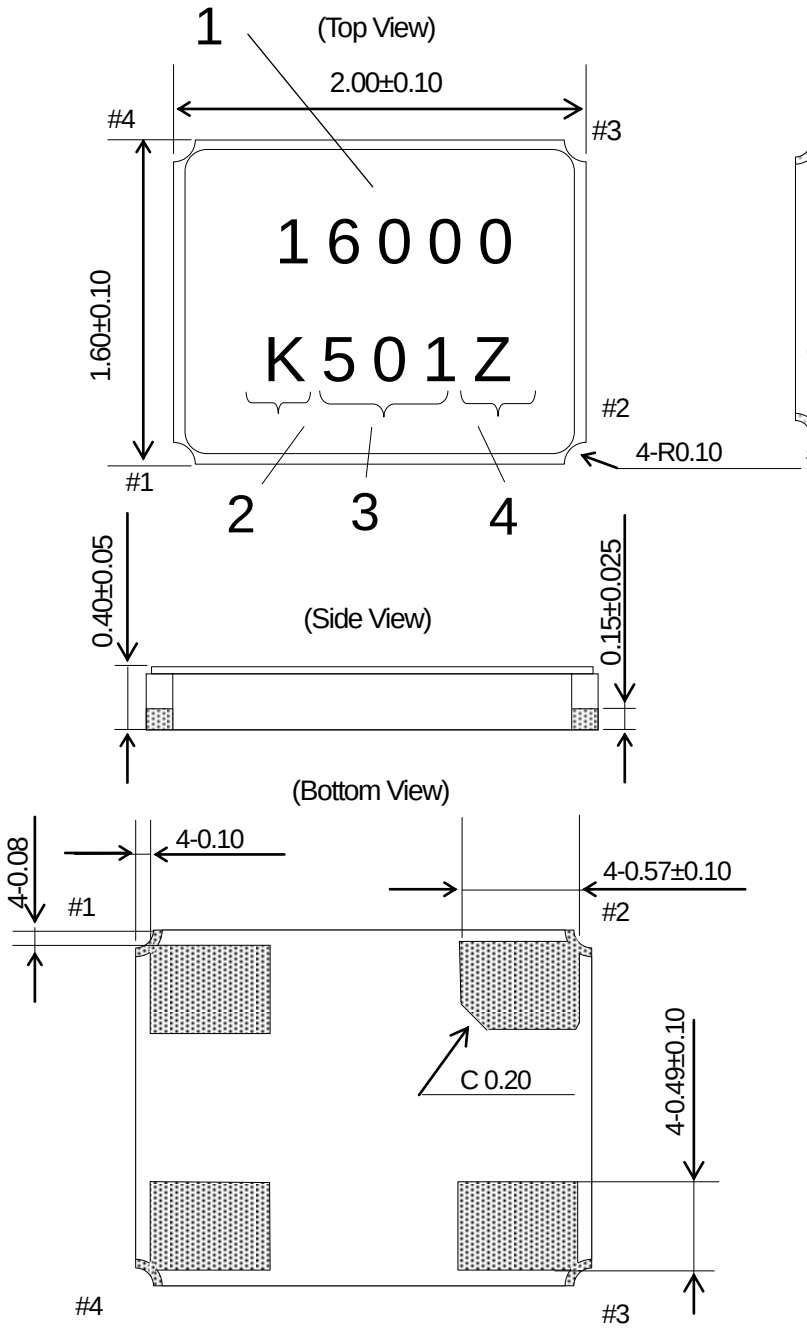
Equivalent series resistance (ESR) measurement

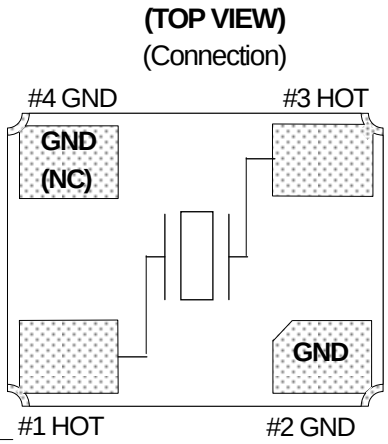
Measuring instrument : IEC PI-Network Test Fixture

Load Capacitance : Series

5. APPEARANCES, PHYSICAL DIMENSION

OUTLINE DIMENSION (not to scale)





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

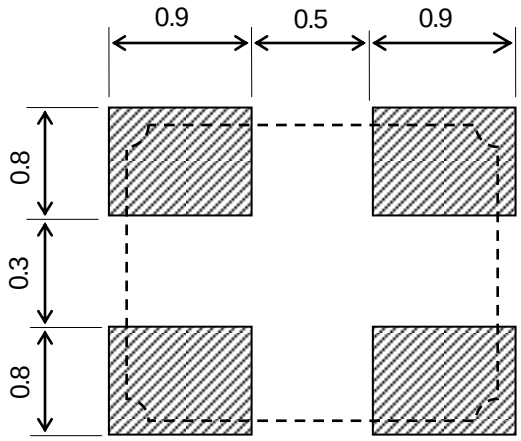
UNIT: mm

MARKING

1	Nominal Frequency	First 5digit of the frequency is indicated.
2	Identification	[K] is to indicate 1Pin direction.
3	Date Code	Last 1 Digit of YEAR and WEEK (Ex) 2015,Jan,01 → 501
4	Manufacturing Location	Y→Japan (Yamagata) Z→Japan (Shiga Yohkaichi) T→Thailand

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

6. RECOMMENDED LAND PATTERN (not to scale)



UNIT : mm

7. 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

7.1 Resistance to Shock — Test condition

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

7.2 Resistance to Vibration — Test condition

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

7.3 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.

7.4 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.

7.5 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.)

7.6 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.

7.7 Soldering condition 1.) Type of solder

Material → lead free solder paste

Melting point → +220±5°C

2.) Reflow temp.profile

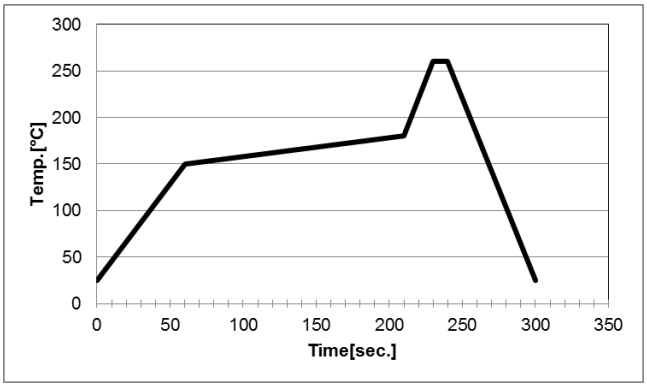
	Temp [°C]	Time[sec]
Preheating	+150 to +180	150 (typ.)
Peak	+260±5	10 (max.)
Total	-	300 (max.)

Frequency shift : ±2ppm

3.) Hand Soldering +350°C 3 sec max

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

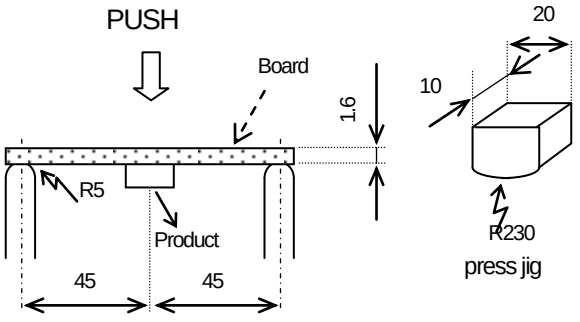
Reflow temp.profile



7.8 Bending Strength

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

Test board : t=1.6mm



UNIT : mm

8. 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.

9. 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.

10. Manufacturing location

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

11. Quality Assurance

To be guaranteed by Kyocera Crystal Device Quality Assurance Division

12. 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.

13. Others

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