

# Specifications

Drawing No.	USY1N-H1-15378-00 1 / 6
Issued Date.	Jul,28,2015

Messrs: Digi-key

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

Product Type	Tuning Fork Crystal
Series	ST2012SB
Frequency	32.768 kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	ST2012SB32768H5WZZAP
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

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TEL. No. 075-604-3500

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### **Manufacturer**

#### **KYOCERA Crystal Device Corporation**

(Crystal Units Division)

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999-3701 Japan

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Design Department	Quality Assurance	Approved by	Checked by	Issued by
KYOCERA Crystal Device Corporation Crystal Unit Application Engineering Section Crystal Units Division	F.Mukae	T.Soda	A.Muraoka	Y.Nozaki

## Revision History

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

## 1. APPLICATION

This specification sheet is applied to tuning fork crystal "ST2012SB".

## 2. PART NUMBER

ST2012SB32768H5WZZAP

## 3. RATINGS

Items	SYMB.	Rating	Unit
Operating Temperature range	Topr	-25~+75	deg. C
Storage Temperature range	Tstg	-40~+85	deg. C

## 4. CHARACTERISTICS

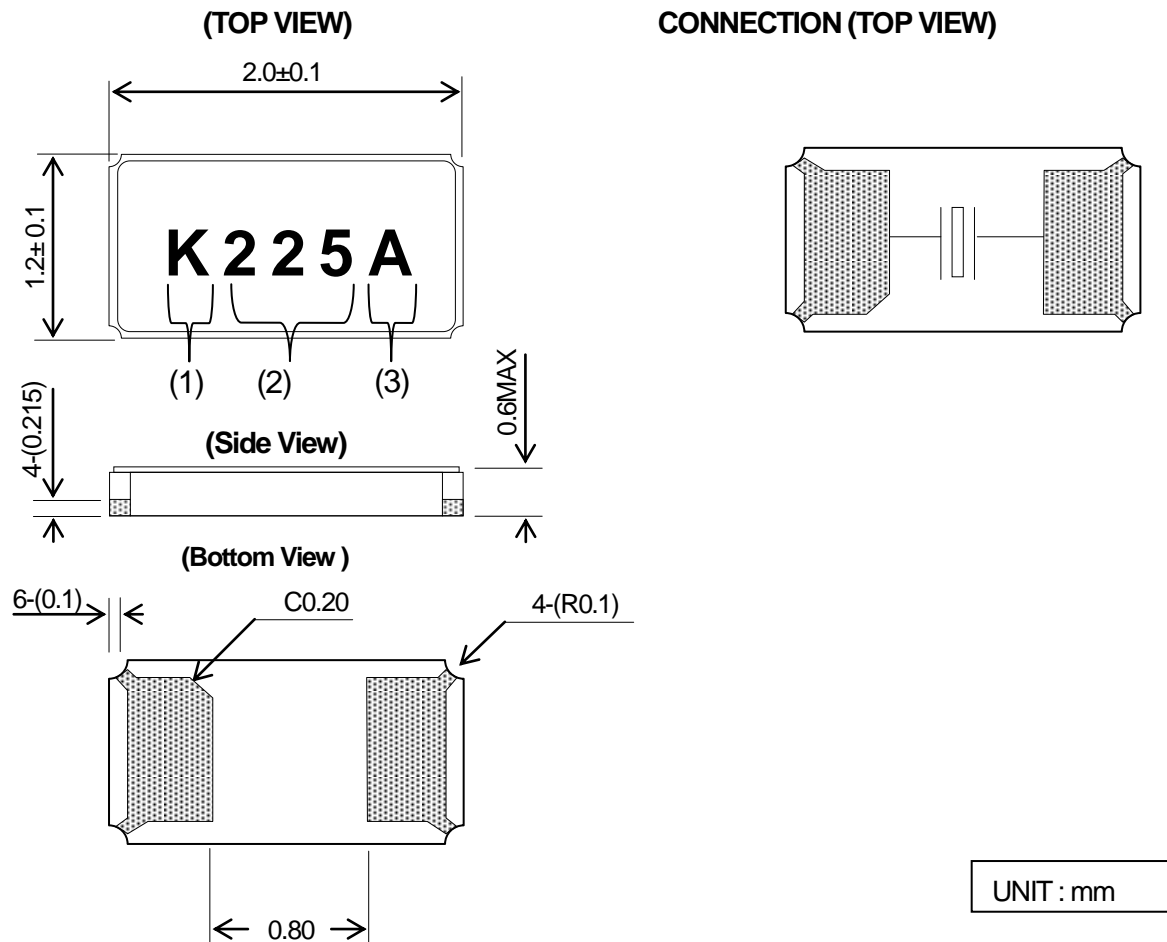
### 4-1 ELECTRICAL CHARACTERISTICS

Item	Symbol	Electrical Specification				
		Condition	Min	Typ.	Max	Unit
Nominal Frequency	fo	Ta = 25 deg. C		32.768		kHz
Frequency Tolerance	df/fo	Ta = 25 deg.C	-250		250	ppm
Frequency Stability	df/T	Operating Temperature				
Aging	df/F	Ta = 25 deg. C 1year				
Load Capacitance	CL			12.5		pF
Equivalent series resistance	R1				75	kΩ
Q-Value	Q		9000			
Motional capacitance	C1		4.8		6.8	fF
Shunt capacitance	Co		0.9		1.7	pF
Turning point	Tp		20		30	deg. C
Secondary temperature Coefficient	K		-4.0			10 <sup>-8</sup> /°C <sup>2</sup>
Drive level	DL			0.1	0.5	μW
Insulation resistance (between electrodes)	IR		500			MΩ

### 4-2 MOISTURE SENSITIVITY LEVEL

Level 1

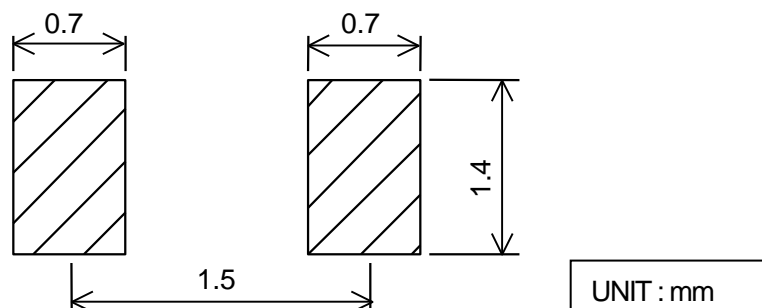
## 5. APPEARANCES, DIMENSION



## MARKING

- |      |                      |                                     |
|------|----------------------|-------------------------------------|
| (1.) | Identification       | K                                   |
| (2.) | Date Code (3 Digits) | Last 1 digit of year and week Code. |
| (3.) | Load Capacitance     | (Example) 12.5pF → A                |
- \*The font of marking above is for reference purpose.

## 6. RECOMMENDED LAND PATTERN



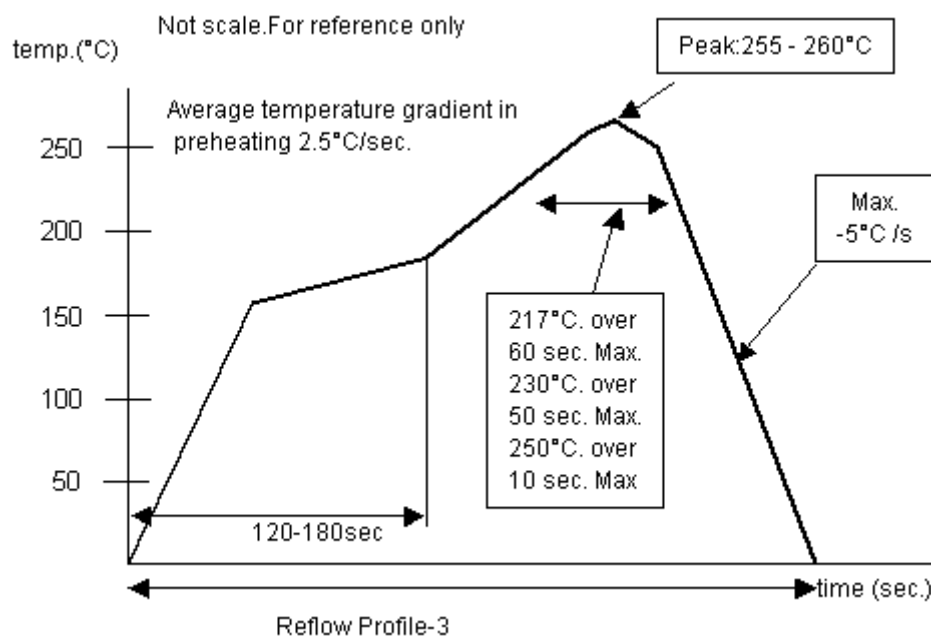
## 7. RELIABILITY

Frequency Stability, and ESR Stability, After stressing.

TEST ITEM		Frequency Stability (ppm)	ESR Stability	Remarks
7.1	High temp. use/storage	$\pm 10$	$\pm 5 \text{ k}\Omega$ Max or $\pm 30\%$	Ta=25 deg. C
7.2	Low temp. use/storage	$\pm 10$		
7.3	Shock	$\pm 20$		
7.4	Vibration	$\pm 10$		
7.5	Soldering Heat Resistance reflow	$\pm 10$		
7.6	High temp. With humidity	$\pm 10$		
7.7	Temperature cycle	$\pm 10$		

## 8. REFLOW PROFILE

Pb-free reflow requirements for soldering heat resistance



**9. Cautions for use****(1) Soldering upon mounting**

Characteristics may be affected 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.

**10. 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.

**11. Manufacturing location**

Kyocera Crystal Device Corporation Shiga Yohkaichi Plant

**12. Quality Assurance**

To be guaranteed by Kyocera Crystal Device Quality Assurance Division

**13. Quality guarantee**

When Kyocera Crystal Device Corporation rooted failure occurs within 1 year after its delivery, substitute product will be arranged based on discussion. Quality guarantee of product after 1 year of its delivery will be 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.