

# Specifications

Drawing No.	USY1N-H1-18404-00
Issued Date.	Jun,4,2018

Messrs: Digikey

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

Product Name	Tuning Fork Crystal
Product Model	ST3215SB
Frequency	32.768 kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	ST3215SB32768A0HPWBB
Remarks	Pb-Free, RoHS Compliant, MSL 1

## Customer Acceptance

Accept Signature	Approved Date	
	Department	
	Person in charge	

### Seller

#### **KYOCERA Corporation**

Corporate Electronic Components Group  
Electronic Components Sales Division  
6 Takeda Tobadono-cho, Fushimi-ku, Kyoto  
612-8501 Japan  
TEL: 075-604-3500 FAX: 075-604-3501

### Manufacturer

Corporate Electronic Components Group  
Crystal Components Division  
Shiga Yohkaichi Plant  
1166-6 Hebimizo-cho, Higashiomi, Shiga  
527-8555 Japan  
TEL: 0748-22-1550 FAX: 0748-22-1590

Design Department	Quality Assurance	Approved by	Examined by	Written by
KYOCERA Corporation Crystal Units Design Engineering Section Crystal Product Division	S.Itoh	T.Soda	A.Muraoka	R.Yoshida Y.Nozaki

### Revision History

Rev.No.	Description of revision	Date	Approved by	Examined by	Written by
0	First Edition	Jun,4,2018	T.Soda	A.Muraoka	R.Yoshida Y.Nozaki

## 1. APPLICATION

This specification sheet is applied to tuning fork crystal "ST3215SB".

## 2. PART NUMBER

ST3215SB32768A0HPWBB

## 3. RATINGS

Items	SYMB.	Rating	Unit
Operating Temperature	Topr	-40~+85	deg. C
Storage Temperature range	Tstg	-55~+125	deg. C

## 4. CHARACTERISTICS

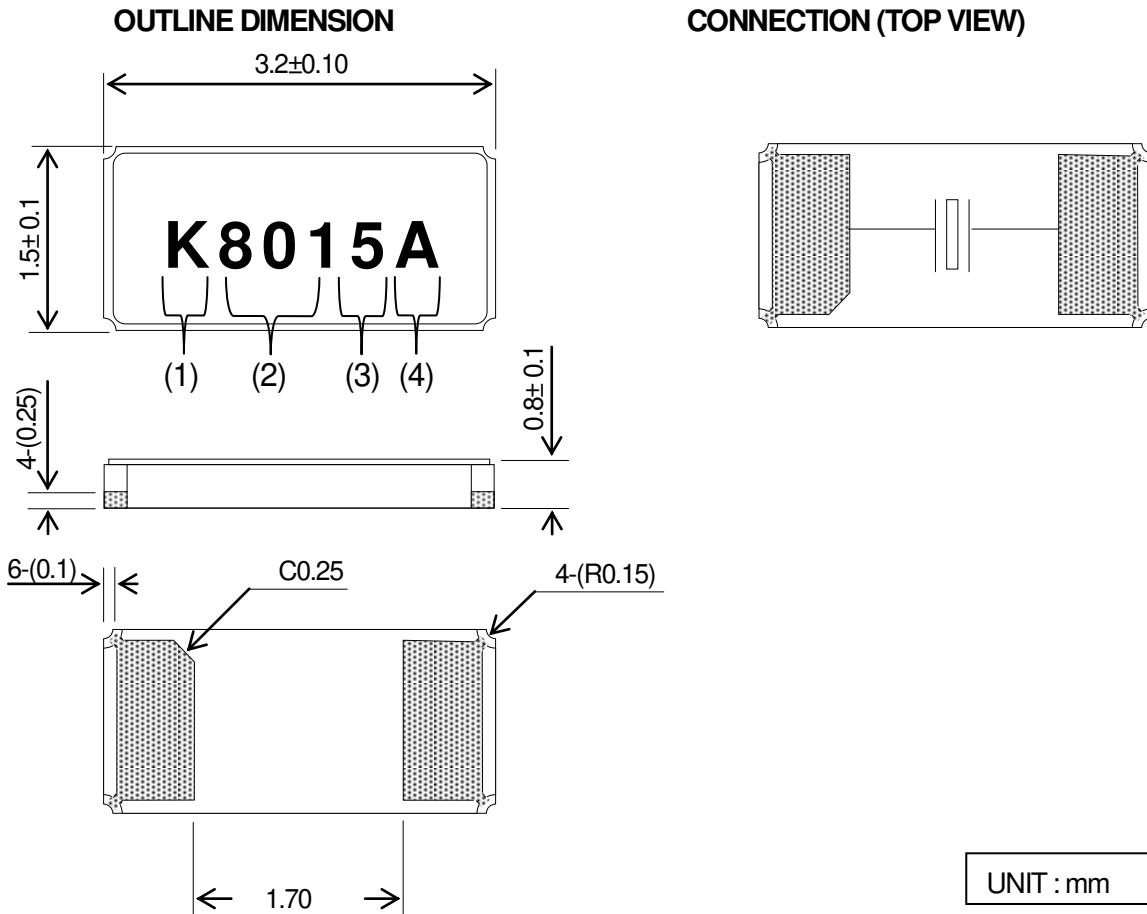
### 4-1 ELECTRICAL CHARACTERISTICS

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	-20		20	ppm
Load Capacitance	CL			5.0		pF
Equivalent series resistance	R1				70	kΩ
Q-Value	Q		13000			
Motional capacitance	C1		3.0		4.4	fF
Shunt capacitance	Co		0.6		1.2	pF
Turning point	Tp		20		30	deg. C
Secondary temperature Coefficient	K		-4.0			10 <sup>-8</sup> /degC <sup>2</sup>
Aging	df/F	Ta = 25 deg. C	-3		3	ppm/year
Drive level	DL			0.1	0.5	μW
Insulation resistance (between electrodes)	IR		500			MΩ

### 4-2 MOISTURE SENSITIVITY LEVEL

Level 1

**5. APPEARANCES, PHYSICAL DIMENSION**

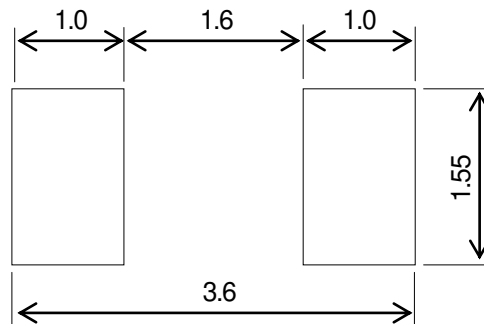


**MARKING**

- |   |                     |                                     |
|---|---------------------|-------------------------------------|
| 1 | Identification      | K                                   |
| 2 | Date Code(3 Digits) | Last 1 digit of year and week Code. |
| 3 | Load Capacitance    | (Example) 5.0pF → 5                 |
| 4 | Management number   | Alphabet or Number 1 digit.         |

\*The font of marking above is for reference purpose.

**6. RECOMMENDED LAND PATTERN**



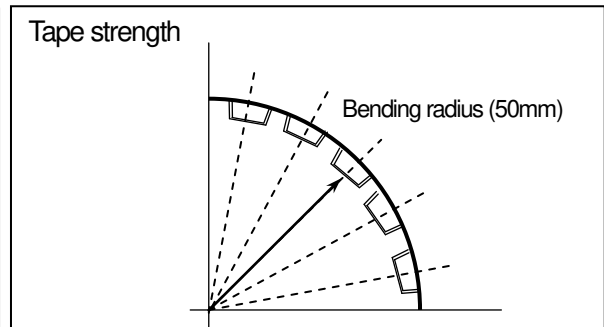
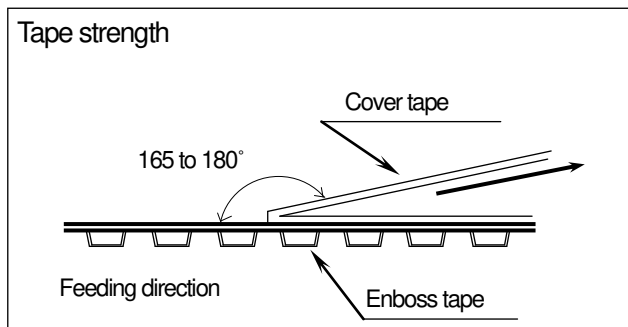
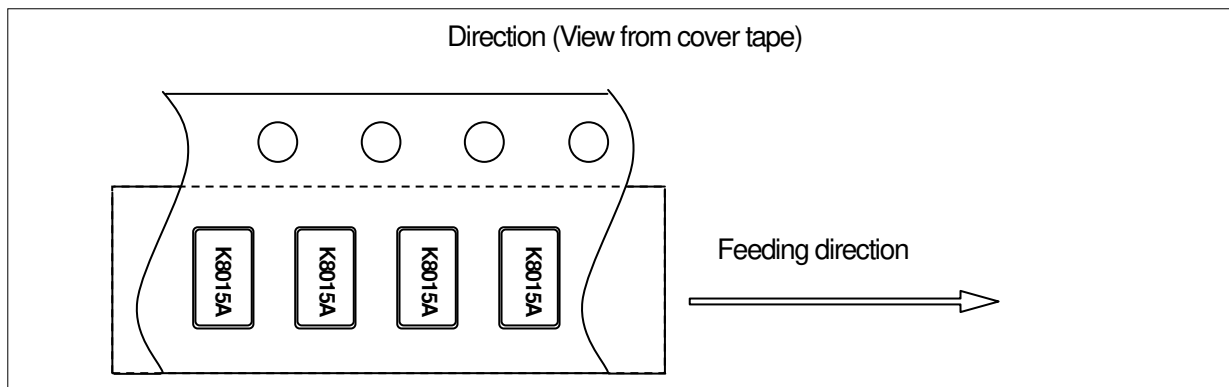
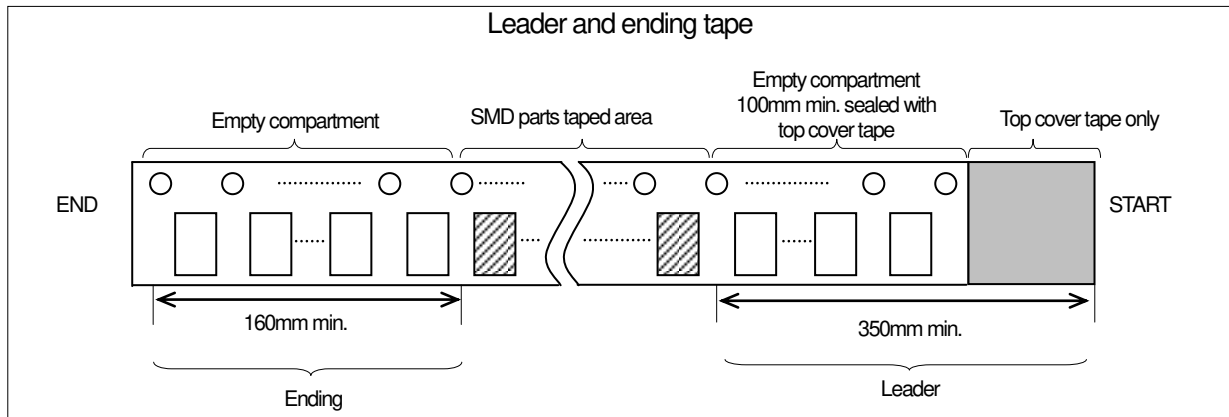
UNIT : mm

## 7. TAPING

### 7.1 TAPING

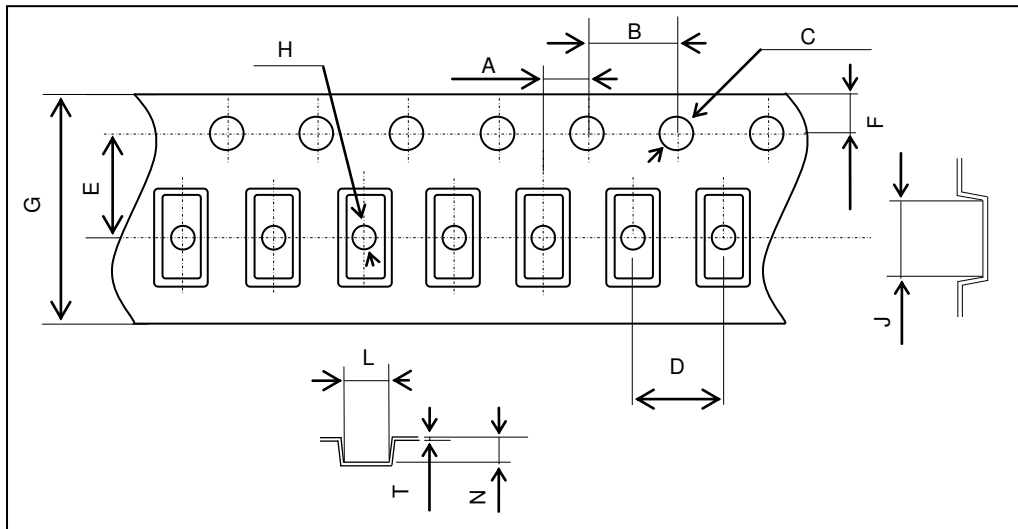
Maximum quantity per 1 reel is Max 3,000pcs(φ180 Reel) and oriented part in 1 direction

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. The R of the corner without designation is 0.2R MAX.
5. Misalignment between centers of the cavity and a sprocket hole shall be 0.05mm or less.
6. Cumulative pitch tolerance of "G" shall be  $\pm 0.2\text{mm}$  at 10 pitches.
7. The directivity of printing in an embossing tape shall be unified as shown in the above-mentioned figure.
8. Peeling force of the seal tape is in the range of 0.1 to 0.7N.



7-2 Carrier tape specifications

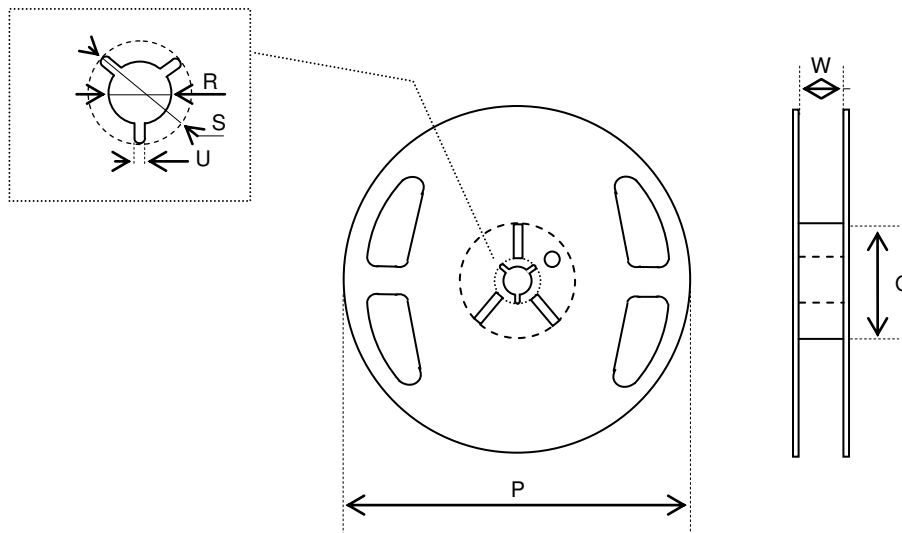
(Unit: mm)



Symbol	A	B	C	D	E	F
Dimension	2.0±0.1	4.0±0.1	1.5+0.1/-0	4.0±0.1	5.5±0.1	1.75±0.1
Symbol	G	H	J	L	N	T
Dimension	12.0±0.3	1.0+0.1/-0	3.6±0.1	1.8±0.1	1.0±0.1	0.3±0.05

7-3 Reel specifications

(Unit: mm)



In the case of  $\phi 180$  Reel (3,000 pcs Max.)

Symbol	P	Q	R
Dimension	$\phi 180 +0/-1.5$	$\phi 60 +1.0/-0$	$\phi 13 \pm 0.2$
Symbol	S	U	W
Dimension	$\phi 21 \pm 0.8$	$2.0 \pm 0.5$	$13.0 +1.0/-0$

In the case of  $\phi 330$  Reel (10,000 pcs Max.)

Symbol	P	Q	R
Dimension	$\phi 330 +/ -2.0$	$\phi 100 +/ -1.0$	$\phi 13 \pm 0.2$
Symbol	S	U	W
Dimension	$\phi 21 \pm 0.8$	$2.0 \pm 0.5$	$13.4 +/ -1.0$

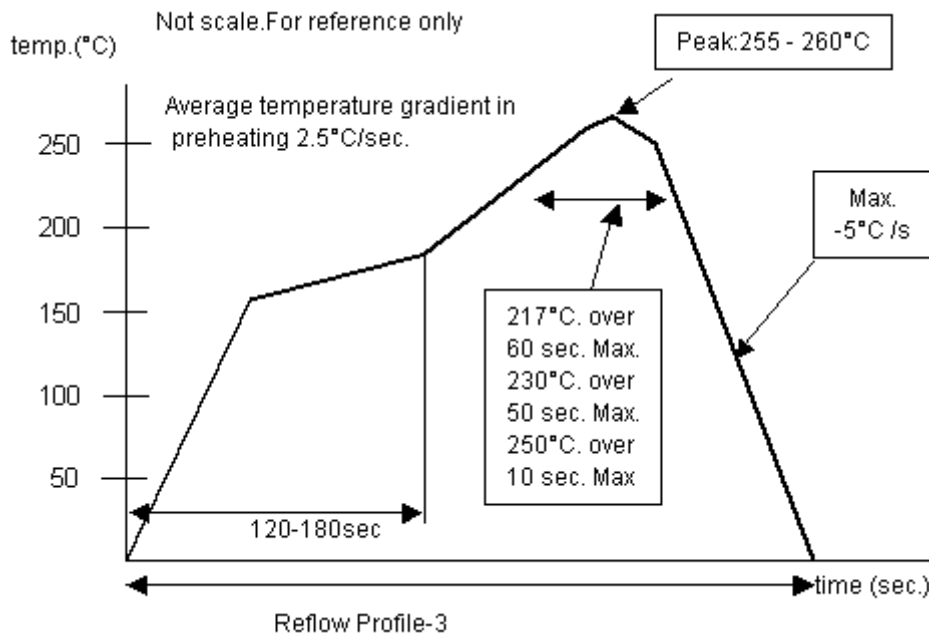
## 8. RELIABILITY

Frequency Stability and ESR Stability After stressing.

TEST ITEM		Frequency Stability (ppm)	ESR Stability (%)	Remarks
8.1	Low temp. use/storage	± 5	± 30	Ta=25 deg. C
8.2	High temp. use/storage	± 5		
8.3	Shock	± 20		
8.4	Vibration	± 5		
8.5	Soldering iron resistance	± 5		
8.6	Manual hot gas resistance	± 10		
8.7	High temp. With humidity	± 5		
8.8	Temperature cycle	± 5		

## 9. REFLOW PROFILE

Pb-free reflow requirements for soldering heat resistance



## 10. 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.

## 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 Corporation Shiga Yohkaichi Plant

## 13. Quality Assurance

Location

KYOCERA Corporation Shiga Yohkaichi Plant: Quality Assurance Division

## 14. Quality guarantee

In the case when KYOCERA Corporation rooted failure occurred within 1 year after its delivery, substitute product will be arranged based on discussion. Quality guarantee of product after 1 year of its delivery is waived.

## 15. Others

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