

# Specifications

Drawing No.	USY1N-H1-18402-00	1 / 7
Issued Date.	Jun,3,2018	

**Messrs: Mouser**

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

Product Type	Tuning Fork Crystal
Series	ST3215SB
Frequency	32.768 kHz
Customer Part Number	-
Customer Specification Number	-
KYOCERA Part Number	ST3215SB32768H5MRXA1
Remarks Pb-Free, RoHS Compliant, MSL 1 AEC Q200 conformity.	

**Customer Approval**

Approval 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	Checked by	Issued by
KYOCERA Corporation Crystal Units Design Engineering Section Crystal Product Division	S.Honma	T.Soda	A.Muraoka	R.Yoshida Y.Nozaki

### Revision History

Rev.No.	Description of revision	Date	Approved by	Checked by	Issued by
0	First Edition	Jun,3,2018	T.Soda	A.Muraoka	R.Yoshida Y.Nozaki

**1. APPLICATION**

This specification sheet is applied to tuning fork crystal "ST3215SB"  
for Automotive(Non-Safety Application).

**2. PART NUMBER**

ST3215SB32768H5MRXA1

**3. RATINGS**

Items	SYMB.	Rating	Unit
Operating Temperature range	Topr	-40~+105	deg. C
Storage Temperature range	Tstg	-55~+125	deg. C

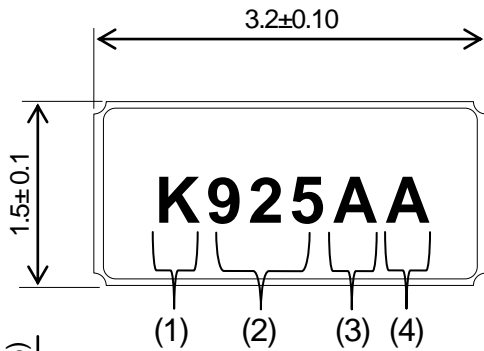
**4. CHARACTERISTICS****4-1 ELECTRICAL CHARACTERISTICS**

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	-40		40	ppm
Frequency Temperature Characteristics	dFT	At Operating Temperature	-300		300	ppm
Load Capacitance	CL			12.5		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
Tuning 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

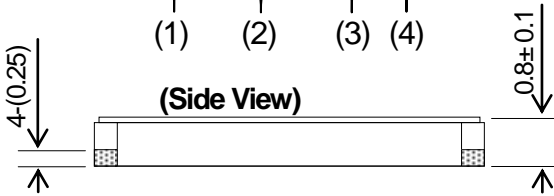
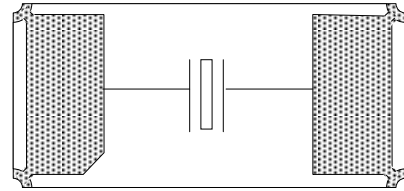
**4-2 MOISTURE SENSITIVITY LEVEL**

Level 1

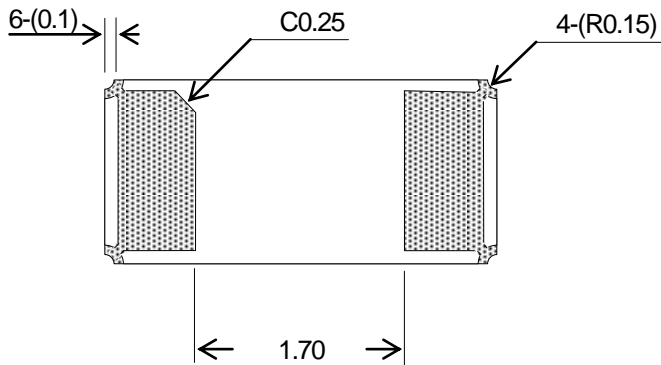
**5. APPEARANCES, DIMENSIONS**  
**OUTLINE DIMENSIONS (not to scale)**  
**(TOP VIEW)**



**CONNECTION (TOP VIEW)**



**(Bottom View)**



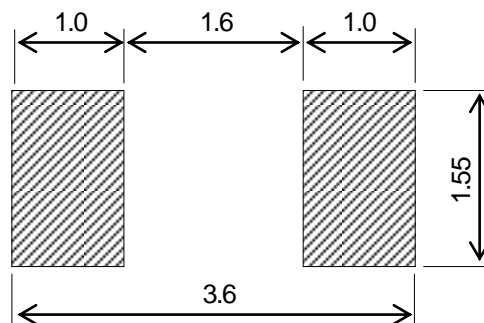
UNIT : mm

**MARKING**

- |                         |                                     |
|-------------------------|-------------------------------------|
| (1) Identification      | K                                   |
| (2) Date Code(3 Digits) | Last 1 digit of year and week Code. |
| (3) Load Capacitance    | (Example) 12.5pF → A                |
| (4) Management number   | Alphabet or Number 1digit.          |

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

**6. RECOMMENDED LAND PATTERN**



UNIT : mm

## 7. RELIABILITY

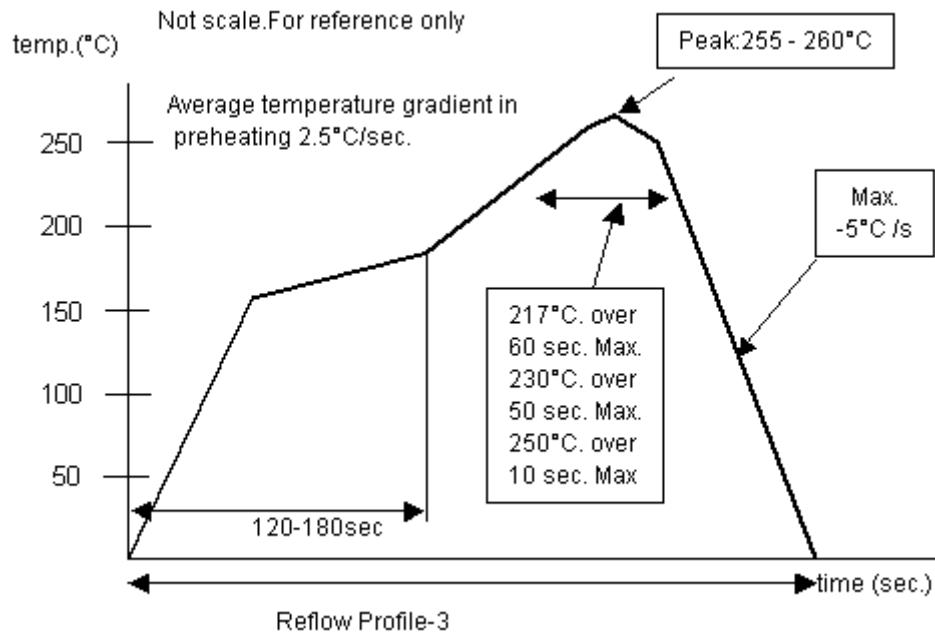
(Reference: AEC-Q200 Rev. D. The solder used by examination is hereafter set to Sn-3Ag-0.5Cu.)

Frequency Stability and ESR Stability After stressing.

No	Stress	Reference	Additional Requirements
7.1	High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. at rated operating temperature (e.g. 85°C part can be stored for 1000 hrs at 85°C. Same applies for 125°C). Unpowered. Measurement at 24±4 hours after test conclusion.
7.2	Temperature Cycling	JESD22 Method JA-104	1000 cycles (-55°C to 125°C) Note: If -40°C , 85°C part the 1000 cycles will be at that temperature rating. Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.
7.3	Biased Humidity	MIL-STD-202 Method 103	1000 hours 85°C/85%RH. Rated VDD applied with 1 MW and inverter in parallel, 2X crystal CL capacitors between each crystal leg and GND. Measurement at 24±4 hours after test conclusion.
7.4	Operational Life	MIL-STD-202 Method 108	Note: 1000 hrs @ 125°C. If 85°C part will be tested at that temperature. Rated VDD applied with 1 MW and inverter in parallel, 2X crystal CL capacitors between each crystal leg and GND. Measurement at 24±4 hours after test conclusion.
7.5	Terminal Strength (Leaded)	MIL-STD-202 Method 211	Test leaded device lead integrity only. Conditions: A (227 g), C (227 g).
7.6	Resistance to Solvents	MIL-STD-202 Method 215	Note: Also aqueous wash chemical - OKEM clean or equivalent. Do not use banned solvents.
7.7	Mechanical Shock	MIL-STD-202 Method 213	Figure 1 of Method 213. Condition C
7.8	Vibration	MIL-STD-202 Method 204	5g's for 20 minutes 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick with 7 secure points on one 8" side and 2 secure points on corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.
7.9	Resistance to Soldering Heat	MIL-STD-202 Method 210	Condition B No pre-heat of samples. Note: Single Wave solder - Procedure 1 with solder within 1.5 mm of device body for Leaded. Procedure 1 except 230°C and immerse only to level to cover terminals for SMD.
7.10	Solderability	J-STD-002	For both Leaded & SMD. Electrical Test not required. Magnification 50 X. Conditions: Leaded: Method A @ 235°C, category 3. SMD: a) Method B, 4 hrs @ 155°C dry heat @ 235°C b) Method B @ 215°C category 3. c) Method D category 3 @ 260°C.
7.11	Flammability	UL-94	V-0 or V-1 Acceptable
7.12	Board Flex	AEC Q200-005	60 sec minimum holding time.
7.13	Terminal Strength(SMD)	AEC Q200-006	The static load of 1.8Kg is added in the direction of the arrow and it maintains it in the prime fields of parts for 60 sec with a scratch treatment device of R0.5.

## 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.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Kyocera:](#)

[ST3215SB32768H5MRXA1](#)



## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9