

# APPROVAL SHEET

Customer Name : \_\_\_\_\_  
Customer P/N : \_\_\_\_\_  
Frequency : 32.768000 KHz  
Aker Approved P/N : D31-032768-BDPD43  
Aker MPN : D31-032768-BDPD43  
REVISION : A0  
ISSUED DATE : 2022/8/25

APPROVED	CHECKED	PREPARED
<i>Earnest</i>		<i>Kiku</i>
APPROVED BY CUSTOMER		

**AKER TECHNOLOGY CO., LTD.**

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**MSL:Level 1**

**RoHS compliant**



## TUNING FORK CRYSTAL SPECIFICATION

### 1. ELECTRICAL CHARACTERISTICS

#### [1] The maximum rating

	Item	Symbol	Rating	Note
1	Storage temperature range	T <sub>stg</sub>	-55~+125°C	
2	Maximum drive level	DL max.	1.0 μW max.	

#### [2] Recommended Operating Condition

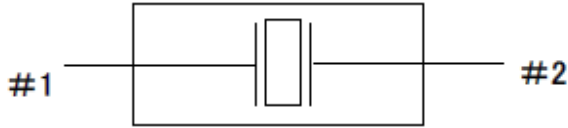
	Item	Symbol	Rating	Note
1	Operating temperature range	T <sub>use</sub>	-40~+85°C	
2	Drive level	DL	0.1 μW typ.	

#### [3] Electrical-Characteristics

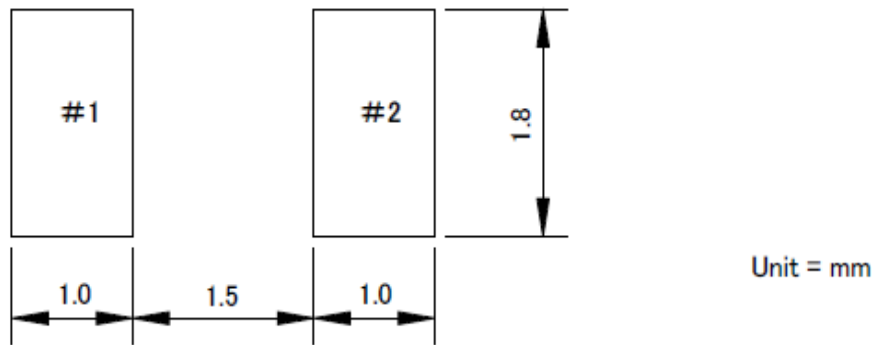
Measurement temperature :25±2°C

	Item	Symbol	Specification	Condition
1	Nominal frequency	f <sub>nom</sub>	32.768 kHz	
2	Frequency tolerance	f <sub>tol</sub>	± 20 × 10 <sup>-6</sup>	
3	Load capacitance	C <sub>L</sub>	7.0 pF	
4	Motional resistance	R <sub>1</sub>	70 kΩ max.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
5	Motional capacitance	C <sub>1</sub>	3 fF typ.	
6	Shunt capacitance	C <sub>0</sub>	1 pF typ.	Measured with ATI 4192A Impedance analyzer OSC LEVEL = 0.1V
7	Turnover temperature	T <sub>i</sub>	25 ± 5°C	Measure this coefficient at 5 points of -40°C, -20°C, 25°C, 60°C, 85°C
8	Parabolic coefficient	B	(-0.03±10%) × 10 <sup>-6</sup> /°C <sup>2</sup>	using C-MOS circuit.
9	Frequency aging	f <sub>age</sub>	± 3 × 10 <sup>-6</sup> /year	25±3°C, First year
10	Insulation resistance	IR	500 MΩ min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V

## 2 . INTERNAL CONNECTION:

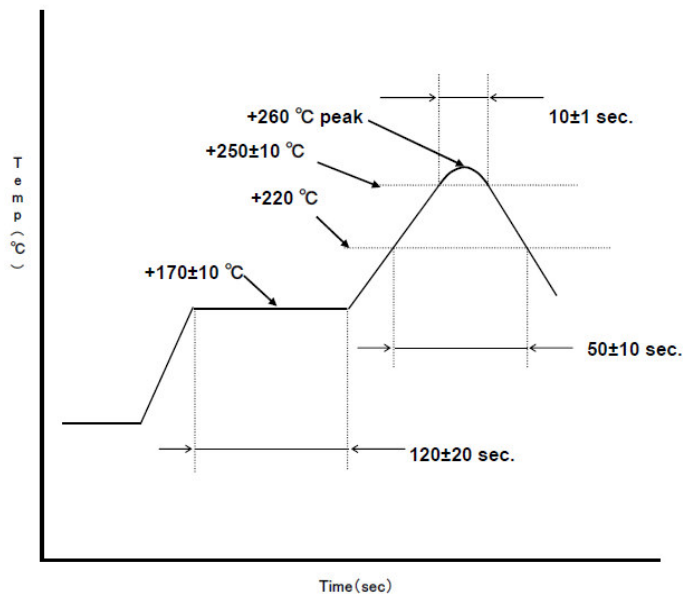


## 3 . RECOMMENDED SOLDERING PATTERN:

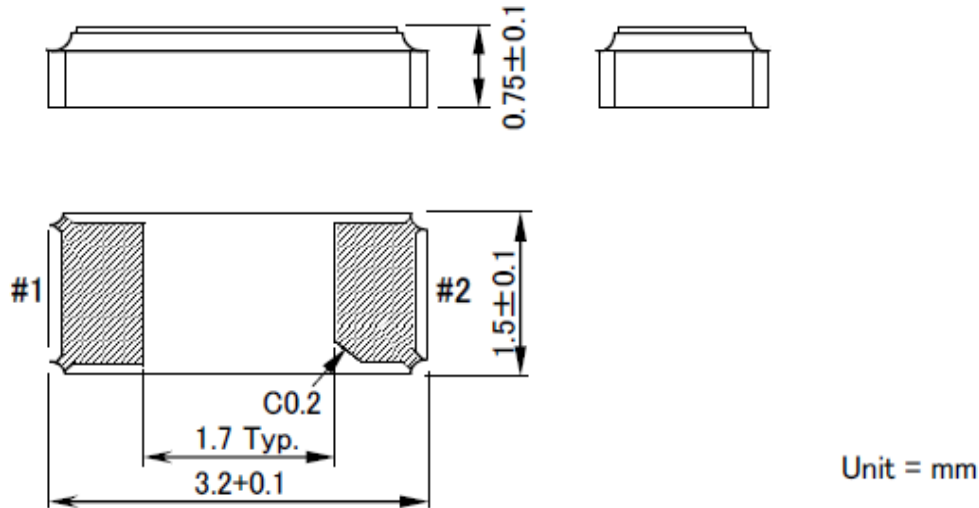


## 4. SOLDERING REFLOW PROFILE :

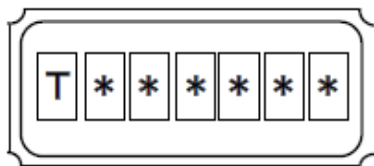
Pre-Heating temperature: +170°C    Pre-Heating time: 120sec  
 Heating temperature : +220°C        Heating time : 50sec



## 5 . DIMENSIONS : ( Unit : mm )



## 6 . MARKING:



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\*1 \*2 \*3 \*4 \*5 \*6 \*7

- : \*1 Product name
- : \*2 Type of product
- : \*3 Specification
- : \*4 CL (7pF : B, 9pF : J, 12.5pF : F)
- : \*5 Year of production (Last digit of year)
- : \*6,7 Week of production (01 ~ 52)