



Confidential

# APPROVAL SHEET

Customer Name : \_\_\_\_\_  
Customer P/N : \_\_\_\_\_  
Frequency : 32.768000 KHz  
Aker Approved P/N : D31N-032768-B-AL-03  
Aker MPN : D31N-032768-B-AL-03  
REVISION : A0  
ISSUED DATE : 2022/8/25

APPROVED	CHECKED	PREPARED
APPROVED BY CUSTOMER		

**AKER TECHNOLOGY CO., LTD.**

ADDRESS : NO 11-3, Jianguo Rd., Tanzi Dist., Taichung City 427, Taiwan.

TEL : 886-4-25335978

FAX : 886-4-25336011

Web: [www.aker.com.tw](http://www.aker.com.tw)

**MSL:Level 1**

**RoHS compliant**



Aker Approved P/N : D31N-032768-B-AL-03

APPROVED : Earnest SHEET : 1 of 4

PREPARED : Kiku REV. : A0

---

Confidential

\*Please kindly be noted that AKER DO NOT guarantee parts quality which involves human security application.\*



Aker Approved P/N :	D31N-032768-B-AL-03	
APPROVED :	Earnest	SHEET : 2 of 4
PREPARED :	Kiku	REV. : A0
Confidential		

## TUNING FORK CRYSTAL SPECIFICATION

### 1. ELECTRICAL CHARACTERISTICS

Item	Symbol	Rating	Note
Storage temperature range	T_stg	-55~+125°C	
Maximum drive level	DL max.	0.5 $\mu$ W max.	

Item	Symbol	Rating	Note
Operating temperature range	T_use	-40~+85°C	
Drive level	DL	0.1 $\mu$ W typ.	

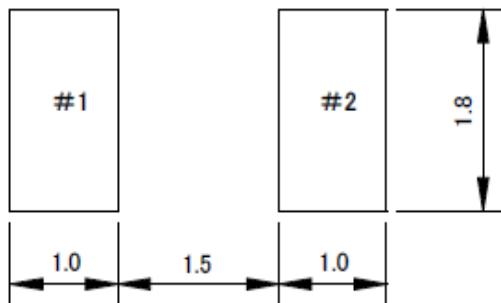
Measurement temperature :25±2°C

	Item	Symbol	Specifications	Conditions
1	Nominal frequency	f_nom	32.768 kHz	
2	Frequency tolerance	f_tol	$\pm 20 \times 10^{-6}$	
3	Load capacitance	C_L	9.0 pF	
4	Motional resistance	R <sub>1</sub>	70 k $\Omega$ 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 3 points of 10°C, 25°C, 40°C using C-MOS circuit
8	Parabolic coefficient	B	(-3±1) $\times 10^{-8}/^{\circ}\text{C}^2$	
9	Frequency aging	f_age	$\pm 3 \times 10^{-6}/\text{year}$	25±3°C, First year
10	Insulation resistance	IR	500 M $\Omega$ min.	Measured with ATI 4329A Insulation Resistance Meter Apply DC100V

## 2 . INTERNAL CONNECTION:

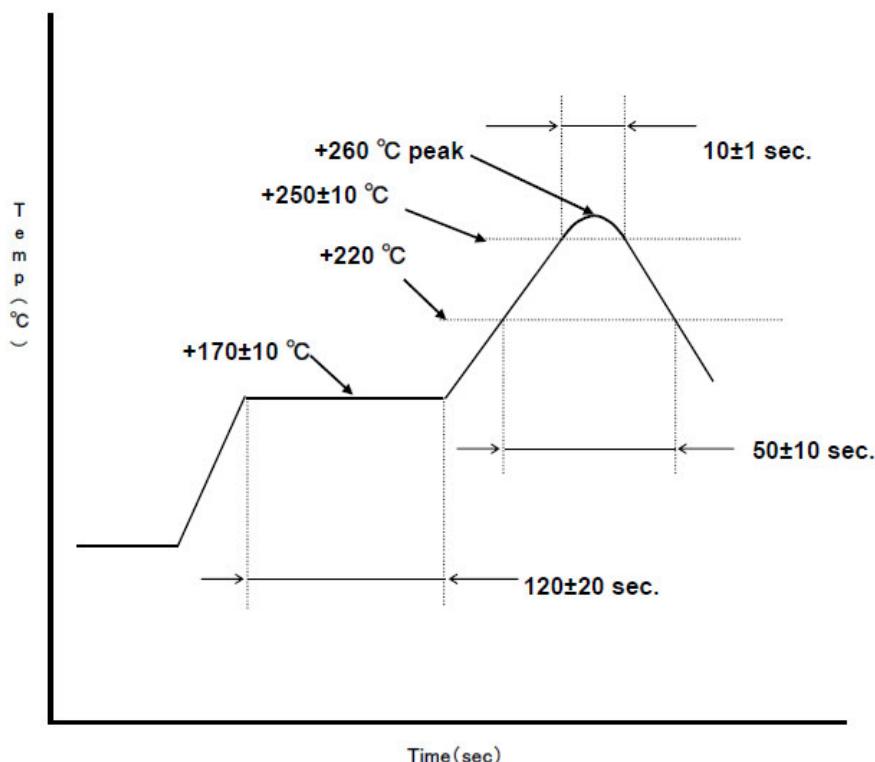


## 3 . RECOMMENDED SOLDERING PATTERN:( Unit : mm )



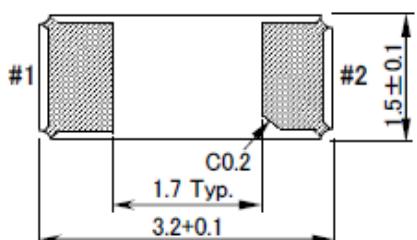
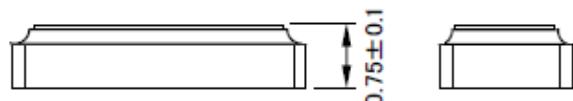
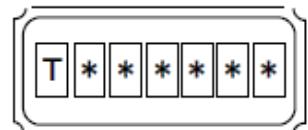
## 4. SOLDERING REFLOW PROFILE :

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



\*Please kindly be noted that AKER DO NOT guarantee parts quality which involves human security application.\*

## 5. DIMENSIONS : ( Unit : mm )



T         
 \*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)