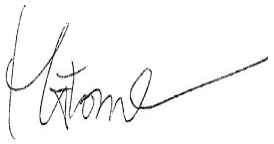
Confidential

APPROVAL SHEET

Customer Name	:	
Customer P/N	:	
Frequency	:	10.000000 MHz
Aker Approved P/N	:	VTOF-010000-3-D4-00
Aker MPN	:	VTOF-010000-3-D4-00
Rev.	:	1
ISSUE DATE	:	Feb.13.2023

APPROVED	CHECKED	PREPARED
		
APPROVED BY CUSTOMER		

AKER TECHNOLOGY CO., LTD.

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TEL：886-4-25335978 FAX ： 886-4-25336011

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MSL:Level 1

RoHS compliant

Rev.	Date	Reviser	Revise contents
1	2023/2/13	Hitome	Initial Released

SMD Temperature compensated crystal oscillator

1 . ELECTRICAL CHARACTERISTICS

■ Standard atmospheric conditions

Unless otherwise specified , the standard range of atmospheric conditions for making measurement and tests are as follow :

Ambient temperature : 25±5℃

Relative humidity : 40%~70%

If there is any doubt about the results , measurement shall be made within the following limits :

Ambient temperature : 25±3℃

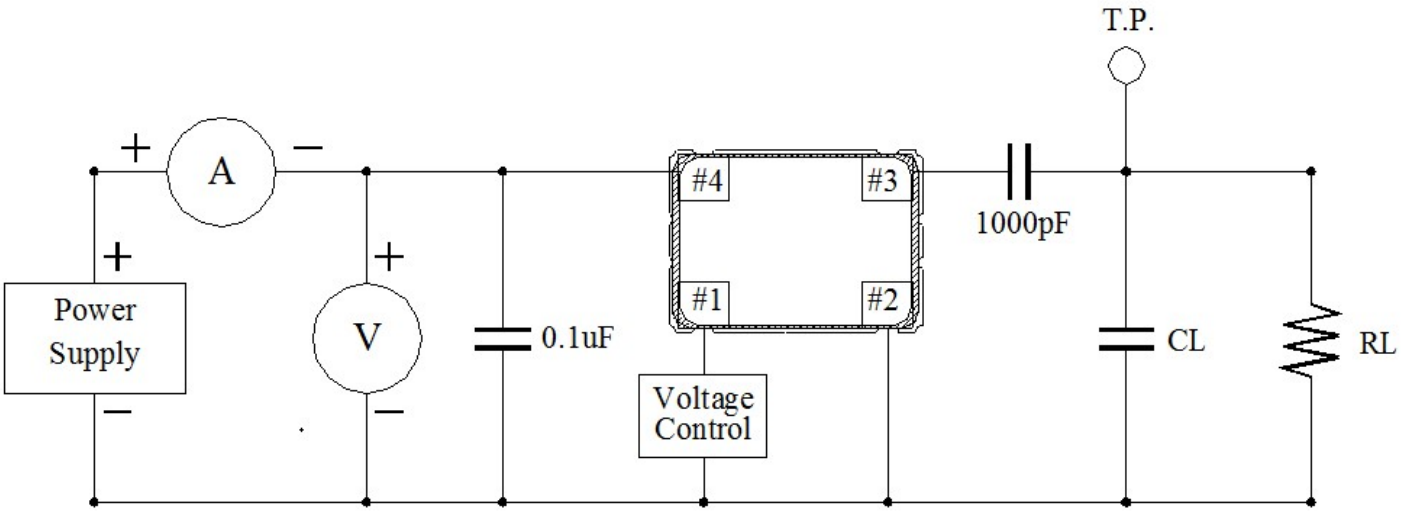
Relative humidity : 40%~70%

■ AKER Model : VTOF-321

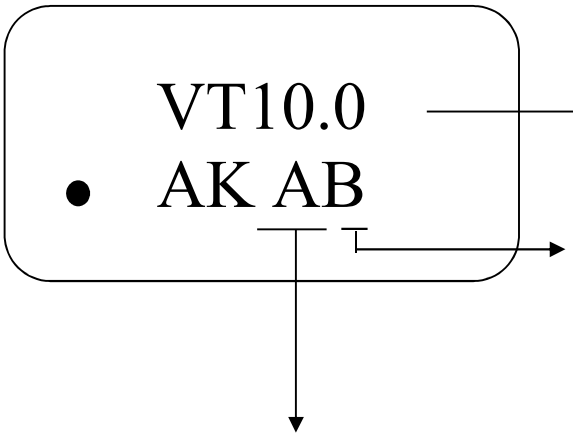
■ Cutting Mode : AT CUT

Parameters	Electrical Spec				Notes
	Min.	Typ.	Max.	Units.	
Nominal Frequency		10.000000		MHz	
Supply voltage	3.135	3.3	3.465	V	
Nominal Frequency Tolerance	-1.5	~	1.5	ppm	After 2 times reflow soldering
Frequency stability over temperature	-2.0	~	2.0	ppm	Between minimum and maximum frequency value over the specified temperature range.
Supply voltage stability	-0.2	~	0.2	ppm	
Load sensitivity	-0.2	~	0.2	ppm	±10% Load change
Load		10//10		KΩ//pF	
Temperature range	-40	~	85	℃	
Storage temperature range	-40	~	85	℃	
Current Consumption			2.0	mA	
Output Waveform		Clipped Sine Wave			
Output voltage level	0.8			Vpp	
VCTL	0.5	1.5	2.5	V	Positive slope(df/dv)
Pulling Range	±8		±15	ppm	
Vcon input impedance	500			KΩ	
Aging	-1.0	~	1.0	ppm	First Year
Typical SSB phase noise power density		-114		dBc/Hz	100Hz offset.
Typical SSB phase noise power density		-131		dBc/Hz	1KHz offset.
Typical SSB phase noise power density		-148		dBc/Hz	10KHz offset.

2 . VCTCXO TESTING CIRCUIT



3 . MARKING :



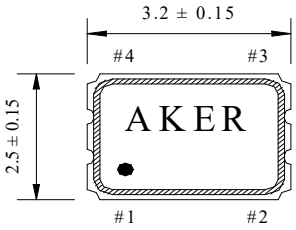
Date Code Guide

Year	2021	2022	2023	2024
	2025	2026	2027	2028
Month	(4N+1)	(4N+2)	(4N+3)	(4N+0)
JAN	a	n	A	N
FEB	b	p	B	P
Mar	c	q	C	Q
Apr	d	r	D	R
May	e	s	E	S
Jun	f	t	F	T
Jul	g	u	G	U
Aug	h	v	H	V
Sep	j	w	J	W
Oct	k	x	K	X
Nov	l	y	L	Y
Dec	m	z	M	Z

A cycle every four years

4 . DIMENSION : (Unit : mm)

<TOP>



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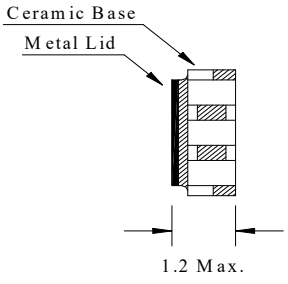
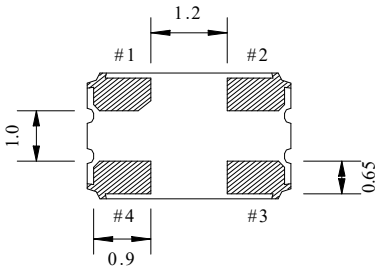
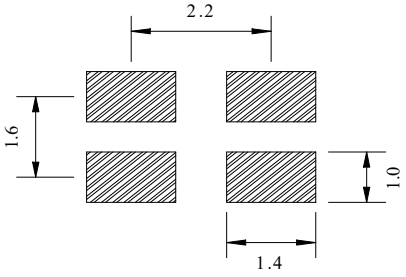


Pad	Function
#1	VCON
#2	GND
#3	Output
#4	Vdd

<BOTTOM>



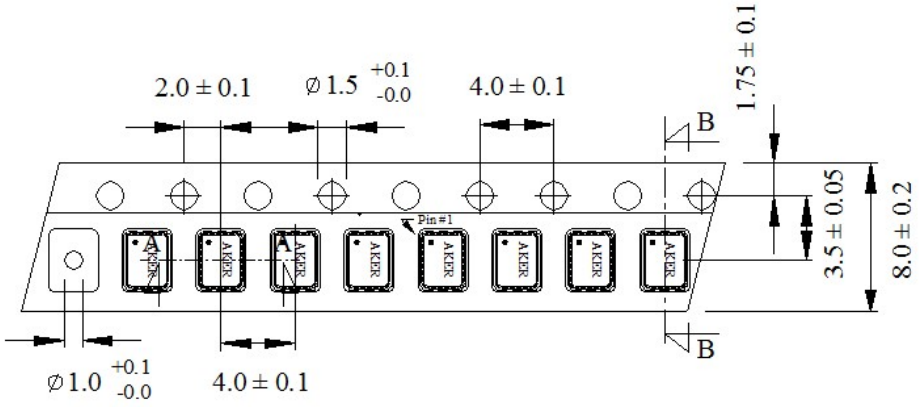
<SUGGESTED LAYOUT>

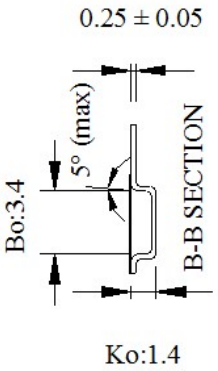


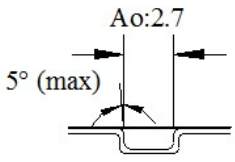
5 . PACKING :

TAPE SPECIFICATION

(Unit : mm)





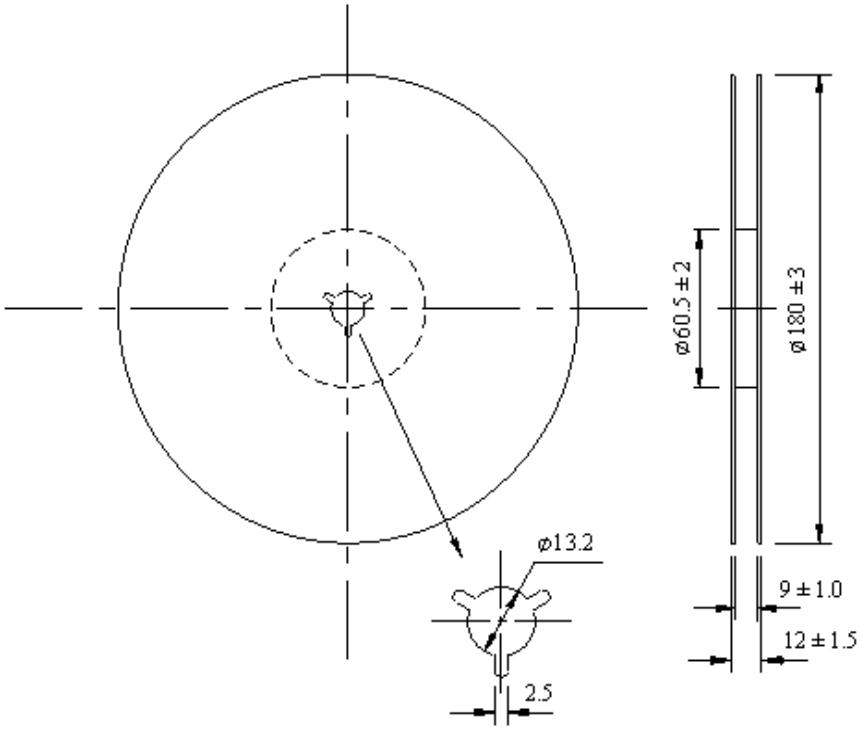


A-A SECTION

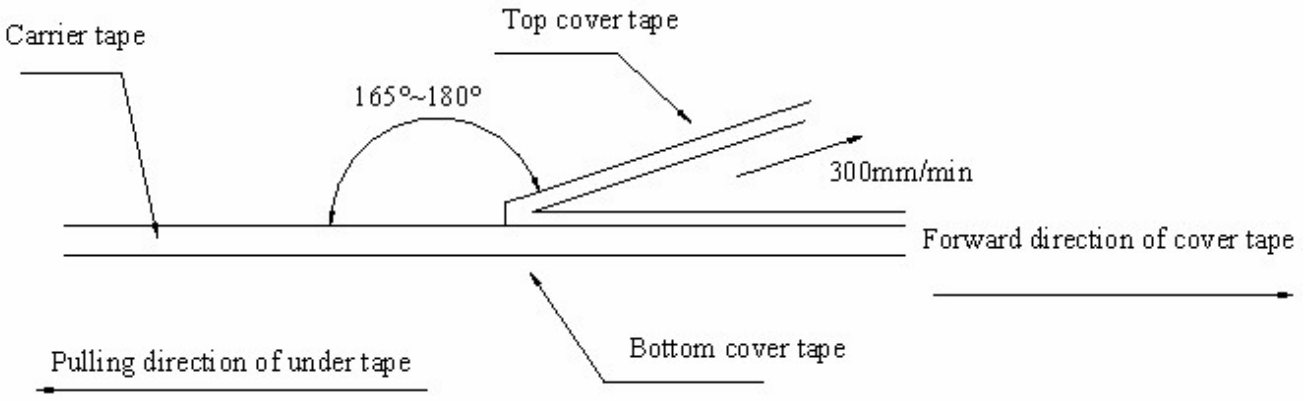
Feeding →

OUTLINE DIMENSION

(Unit : mm)



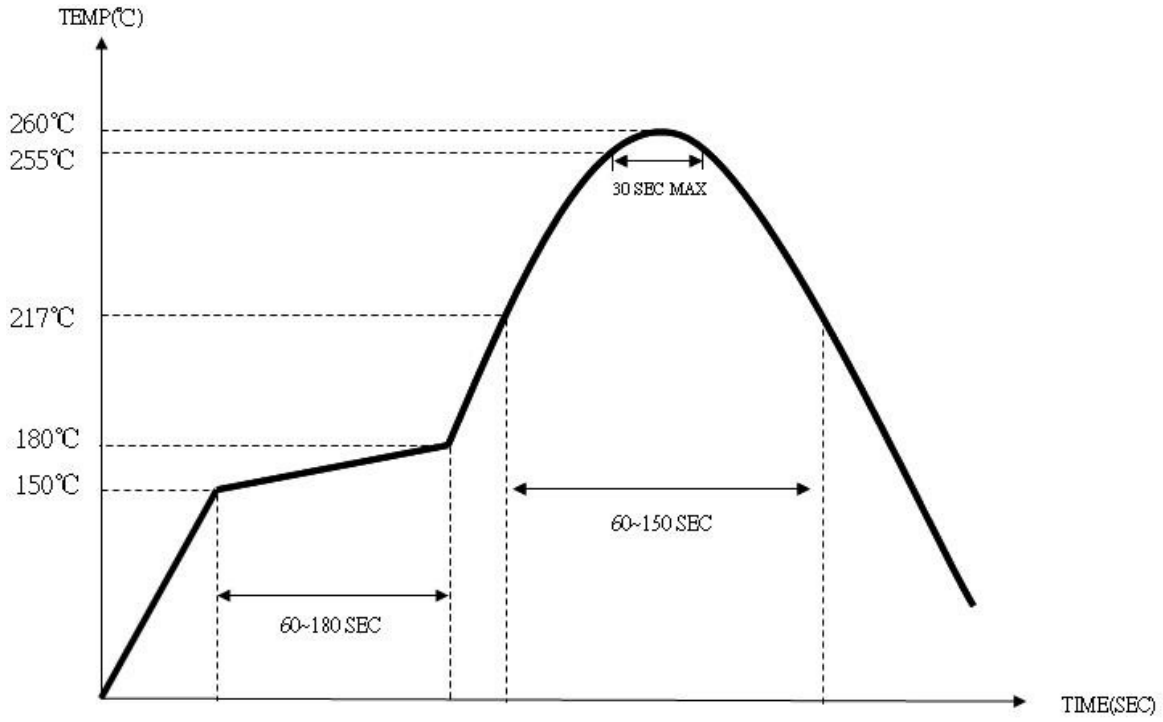
6. COVER TAPE ADHESION STRENGTH：



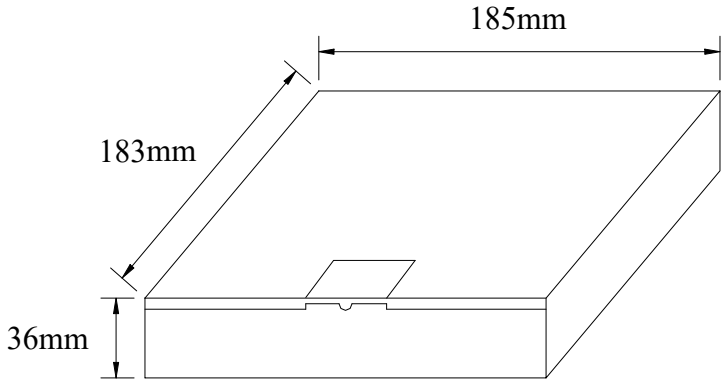
*** In the case, the cover tape is pulled off under the above conditions, the cover tape adhesion strength should be 10.2g~71.4g Plastic tape: 10.2g~71.4g

(Cover tape adhesion strength)

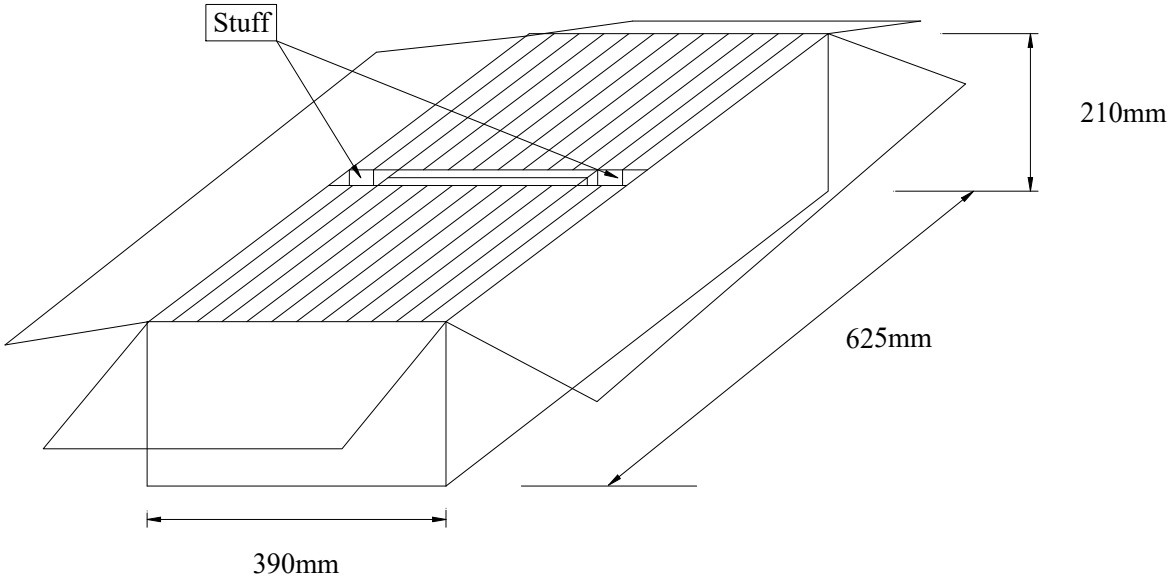
7 . SOLDERING REFLOW PROFILE



8 . PACKING



BOX = 3000 PCS / REEL(MAX)



SMD product packs 32 BOX=The outside box packs (3000 PCS * 32 BOX = 96000 PCS)(MAX)

9 .RELIABILITY SPECIFICATION

Mechanical Endurance

TEST ITEMS	TEST METHODS AND TEST CONDITION	PERFORMANCE
9.1 Temperature Cycling	-40±3℃/30min maximum~+85±3℃/30min maximum，1000cycles	ΔF≤±2ppm
9.2 Operational Life	85℃±3°C，1000hrs±12hrs Rated VDD applied.	ΔF≤±2ppm
9.3 Biased Humidity	85°C±5°C&85%±5%R.H.，1000±12hrs Rated VDD applied.	ΔF≤±2ppm
9.4 Resistance To Soldering Heat Test	Reflow test 2 times.	ΔF≤±2ppm
9.5 High Temperature Exposure	85℃±3°C，1000hrs±12hrs	ΔF≤±2ppm
9.6 Vibration Test	Freq.range: 10~2000Hz，Peak to peak amplitude:1.52mm Peak acceleration:5G (49m/s2)，3 direction(X, Y,Z) ，20min 12cycles each of 3 orientations.	ΔF≤±2ppm
9.7 Mechanical Shock	100G，6mS，3 times for each direction(X, Y, Z)，3 cycles	ΔF≤±2ppm
9.8 Physical Dimension	Verify physical dimensions to the applicable device detail specification.	
9.9 Solderability	260℃ ，Coated > 95%	
9.10 Board Flex	PCB=100*40(mm)，Bending=2 mm (min)，Duration=60+5/-0 sec	ΔF≤±2ppm
9.11 External Visual	Inspect device construction and marking.	
9.12 Terminal Strength	A force of 17.7N for 60 seconds.	ΔF≤±2ppm