Accurate Kinetic Energy

APPROVAL SHEET

Customer Name	:	
Customer P/N	:	
Frequency	:	8.000000 MHz
AKER Approved P/N	:	49M-008000-FX4B01
AKER MPN	:	49M-008000-FX4B01
REVISION	:	A0
ISSUED DATE	:	2022/2/15

APPROVED	CHECKED	PREPARED
Earnest		Kiku

APPROVED BY CUSTOMER

AKER TECHNOLOGY CO., LTD.

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RoHS compliant

	Customer P/N			
AKER Accurate Kinetic Energy	AKER Approved P/N	49M-008000-FX4B01		
	APPROVED	Earnest	SHEET	1 OF 6
	PREPARED	Kiku	REV.	A0

Revison	Date	Reviser	Revised contents
A0	2022/2/15	Kiku	Initial Released

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

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	PREPARED	Kiku	REV.	A0

HC-49US SMD CRYSTAL SPECIFICATION

1 . ELECTRICAL CHARACTERISTICS

(1) Standard atmospheric conditions

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

Ambient temperature : 25±5°C

Relative humidity : 40%~70%

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

Ambient temperature : 25±3°C

Relative humidity : 40%~70%

(2) Measurement Equipment : SAUNDERS 250B (Measured FL)

(3) Cutting Mode : AT CUT

(4) Oscillation Mode : Fundamental

Parameters	Symbol	Electrical Specification				Notes
		Min.	Typ.	Max.	Unit	
Nominal Frequency	FL	8.000000			MHz	
Load Capacitance	CL	20			pF	
Frequency Tolerance		-30	~	30	ppm	At 25°C ± 3°C
Frequency Stability		-50	~	50	ppm	Related to 25 °C
Drive Level	DL			1000	uW	
Operating Temperature Range		-40	~	85	°C	
Storage Temperature Range		-55	~	125	°C	
Effective Series Resistance	RR			60	Ω	
Shunt Capacitance	C0			7	pF	
Motional Capacitance	C1		N/A		fF	
Ratio Of Capacitance	r		N/A			C0/C1
Aging Rate		-3	~	3	ppm	First Year
Insulation Resistance		500			MOhms	At DC 100V

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2 . MARKING

A8.000 ← AKER Logo and Frequency

FB3P? ← Type and Date Code

Type and Date Code

F	B	3	P	?
Oscillation Mode Code	Load Capacitance Code	Frequency Tolerance Code	Date Code	Internal identification code

Oscillation Mode Code

Code	Oscillation Mode
F	AT Cut / Fundamental
T	AT Cut / 3rd Overtone
B	BT Cut / Fundamental

Frquency Tolerance Code

Code	Tolerance	Code	Tolerance
1	±20 ppm	6	±50 ppm
2	±25 ppm	9	±10 ppm
3	±30 ppm	0	±100 ppm
5	±15 ppm		

Load Capacitance Code

Code	CL	Code	CL
S	Series	P	4
A	16	Q	39
B	20	R	12.5
C	30	T	8
D	18	U	33
E	32	V	7
F	12	W	6
G	22	X	17
H	27	Y	8.5
I	10	Z	19.5
J	14	a	21.5
K	15	b	24
L	25	c	35
M	9	d	37
N	13		

Date Code

Year / Month	2017	2018	2019	2020
	2021	2022	2023	2024
	2025	2026	2027	2028
	(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

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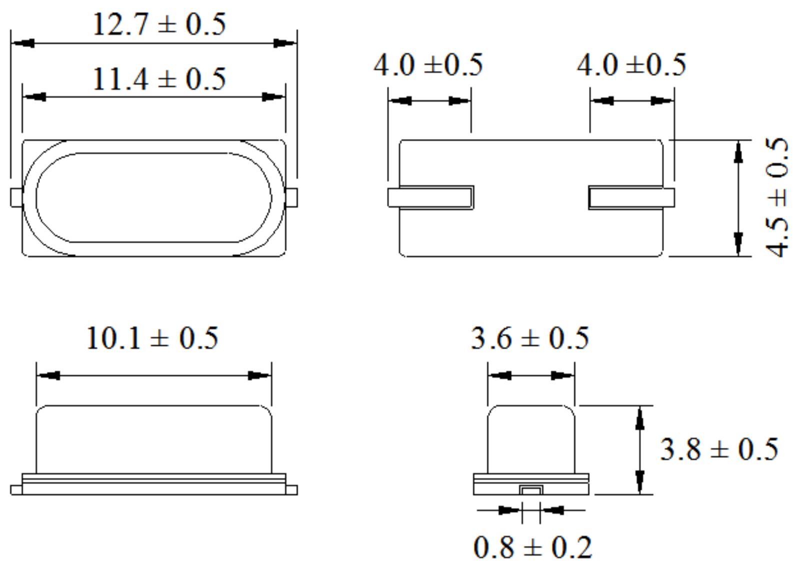
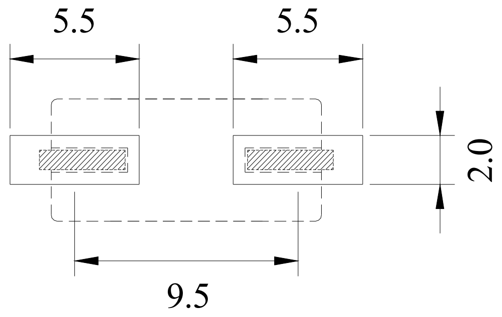
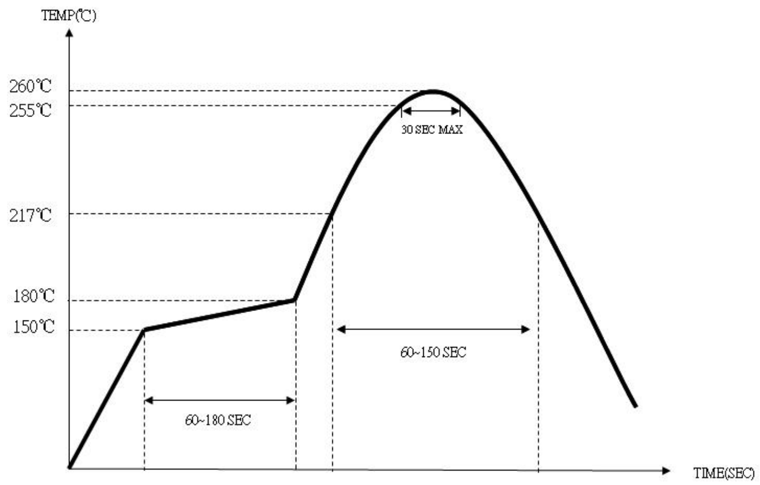
3 . DIMENSIONS : (Unit : mm)



4 . SUGGESTED LAND PATTERN : (Unit : mm)



5 . SOLDERING REFLOW PROFILE



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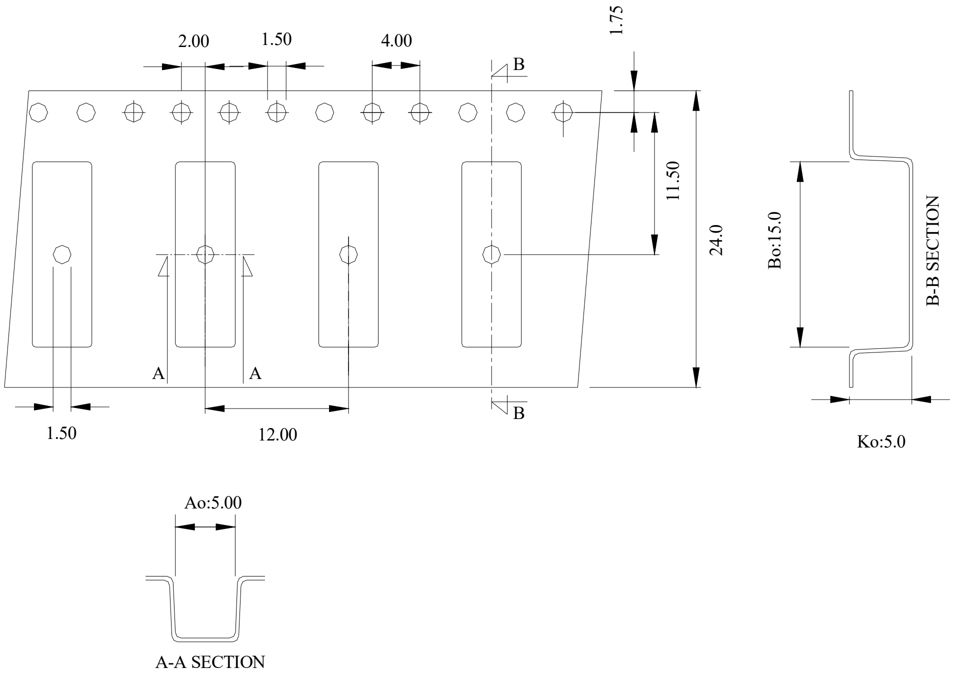
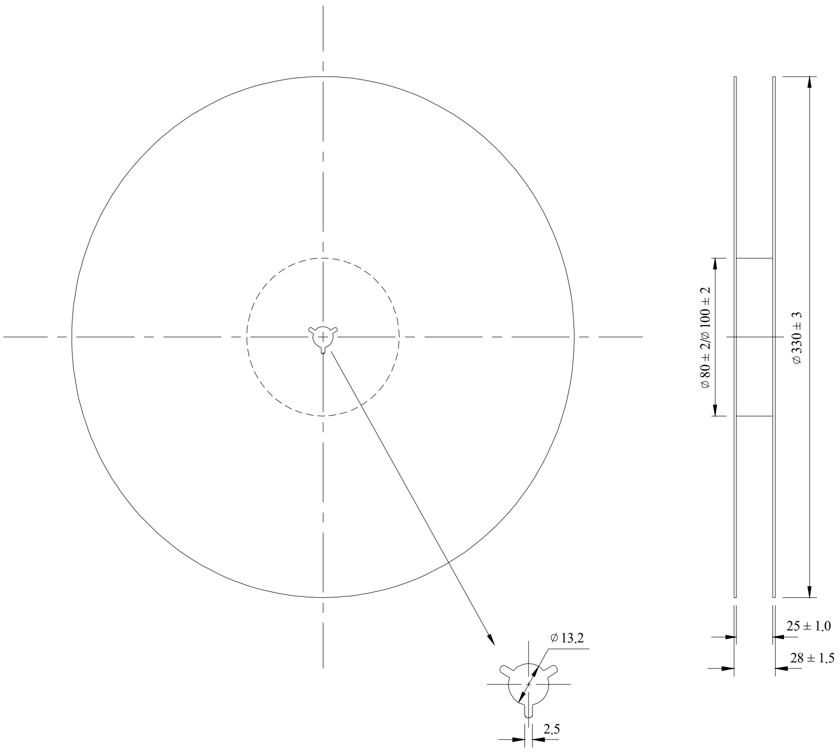
6 . PACKING : (Unit : mm) 1000pcs/reel

6.1 TAPE SPECIFICATION



6.2 REEL SPECIFICATION



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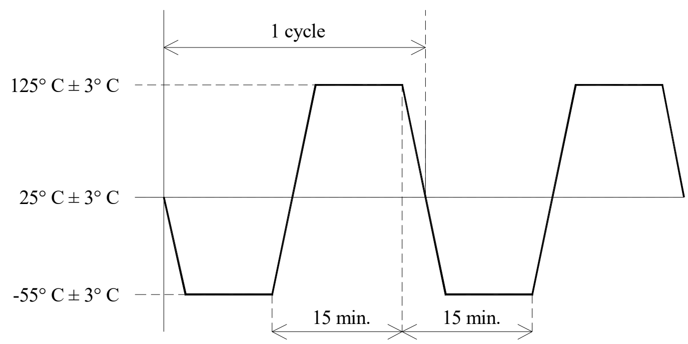
7 . RELIABILITY SPECIFICATION

<table>
<tr><th>No</th><th>Test Item</th><th>Test Methods</th><th>Performance</th></tr>
<tr><td>1</td><td>Drop Test</td><td>Free drop from 50 cm height onto a hard wooden board for 3 times</td><td rowspan="3">To satisfy the electrical characteristics</td></tr>
<tr><td>2</td><td>Mechanical Shock</td><td>1000 G, 0.5 msec, 3 times for each direction (X, Y, Z)</td></tr>
<tr><td>3</td><td>Vibration</td><td>Frequency range : 20 ~ 2000 Hz
Amplitude : 1.52 mm / 20G
Sweep time : 20 minutes
Test time for each direction : 2 Hours (Total 6 Hours)</td></tr>
<tr><td>4</td><td>Gross Leak</td><td>Alcohol, Test Pressure : > -40cm-Hg</td><td>No bubbles stream</td></tr>
<tr><td>5</td><td>Fine Leak</td><td>5 kgf /cm^2 Helium bombing for 2 Hours</td><td>$\leq 10^{-8}$atm.cc./sec</td></tr>
<tr><td>6</td><td>Solderability</td><td>Temperature : 260℃ ± 5℃
Immersion time : 5 ± 1 seconds</td><td>90% min. coverage of new solder</td></tr>
<tr><td>7</td><td>Resistance To Soldering Heat</td><td>Solder pot test
Test temperature : 260℃ ± 5℃
Test time : 10 ± 1 seconds</td><td rowspan="5">To satisfy the electrical characteristics</td></tr>
<tr><td>8</td><td>High Temperature Storage</td><td>+ 125 ℃ ± 3 ℃ for 500 ± 12 Hours</td></tr>
<tr><td>9</td><td>Low Temperature Storage</td><td>- 55 ℃ ± 3 ℃ for 500 ± 12 Hours</td></tr>
<tr><td>10</td><td>Temperature Cycle</td><td>Total 100 cycles of the following temperature cycle

</td></tr>
<tr><td>11</td><td>High Temperature And Humidity</td><td>85℃ ± 5℃, RH 85% ± 5%, 500 ± 12 Hours</td></tr>
</table>

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