



# APPROVAL SHEET

Customer Name : \_\_\_\_\_  
 Customer P/N : \_\_\_\_\_  
 Frequency : 12.000000 MHz  
 Aker Approved P/N: CXAF-012000-3-AL-34  
 Aker MPN : CXAF-012000-3-AL-34  
 Rev. : 1  
 ISSUE DATE : Feb.5.2024

| APPROVED  | CHECKED | PREPARED  |
|---|---------|---|
|  |         |  |
| APPROVED BY CUSTOMER  |         |   |
|   |         |   |

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**MSL:Level 1**

**RoHS compliance**

**IATF 16949 Certified**

**AEC-Q200 Qualified**





|   |                |
|---|----------------|
| Aker Approved P/N : CXAF-012000-3-AL-34 |                |
| APPROVED : Xtal                         | SHEET : 2 of 8 |
| PREPARED : piy                          | REV. : 1       |
| Confidential                            |                |

## SMD CRYSTAL SPECIFICATION

### 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 °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

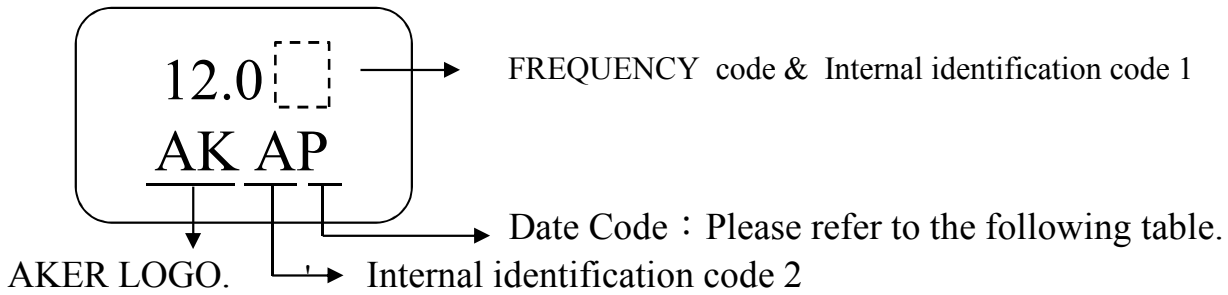
Relative humidity : 40%~70%

- AKER Model : CXAF-321
- Oscillation Mode : Fundamental
- Cutting Mode : AT CUT
- Measurement Equipment : 250B(Measured FL)
- Insulation Resistance : More than 500M ohms at DC 100V

| Parameters                   | Symbol | Electrical Spec |      |      |        | Notes                       |
|------------------------------|--------|-----------------|------|------|--------|-----------------------------|
|                              |        | Min.            | Typ. | Max. | Units. |                             |
| Nominal Frequency            | FL     | 12.000000       |      |      | MHz    |                             |
| Frequency Tolerance          |        | ±10             |      |      | ppm    | at 25°C ± 3°C               |
| Frequency Stability          |        | ±30             |      |      | ppm    | Operating Temp (Refer 25°C) |
| Load Capacitance             | CL     | 8               |      |      | pF     |                             |
| Aging                        |        | ±3              |      |      | ppm    | First Year at 25°C          |
| Operating Temperature        |        | -40             | ~    | 105  | °C     |                             |
| Storage Temperature Range    |        | -55             | ~    | 150  | °C     |                             |
| Drive Level                  | DL     |                 |      | 200  | uW     |                             |
| Equivalent Series Resistance | ESR    |                 |      | 100  | Ω      | @Series                     |
| Shunt Capacitance            | C0     |                 |      | 3    | pF     |                             |

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

## 2 . MARKING :



### Date Code Table

| Month |      | Year   |   |   |   |   |   |   |   |   |    |    |    |   |
|-------|------|--------|---|---|---|---|---|---|---|---|----|----|----|---|
|       |      | 1      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |   |
| 2019  | 2023 | (4N+3) | A | B | C | D | E | F | G | H | J  | K  | L  | M |
| 2020  | 2024 | (4N+0) | N | P | Q | R | S | T | U | V | W  | X  | Y  | Z |
| 2021  | 2025 | (4N+1) | a | b | c | d | e | f | g | h | j  | k  | l  | m |
| 2022  | 2026 | (4N+2) | n | p | q | r | s | t | u | v | w  | x  | y  | z |

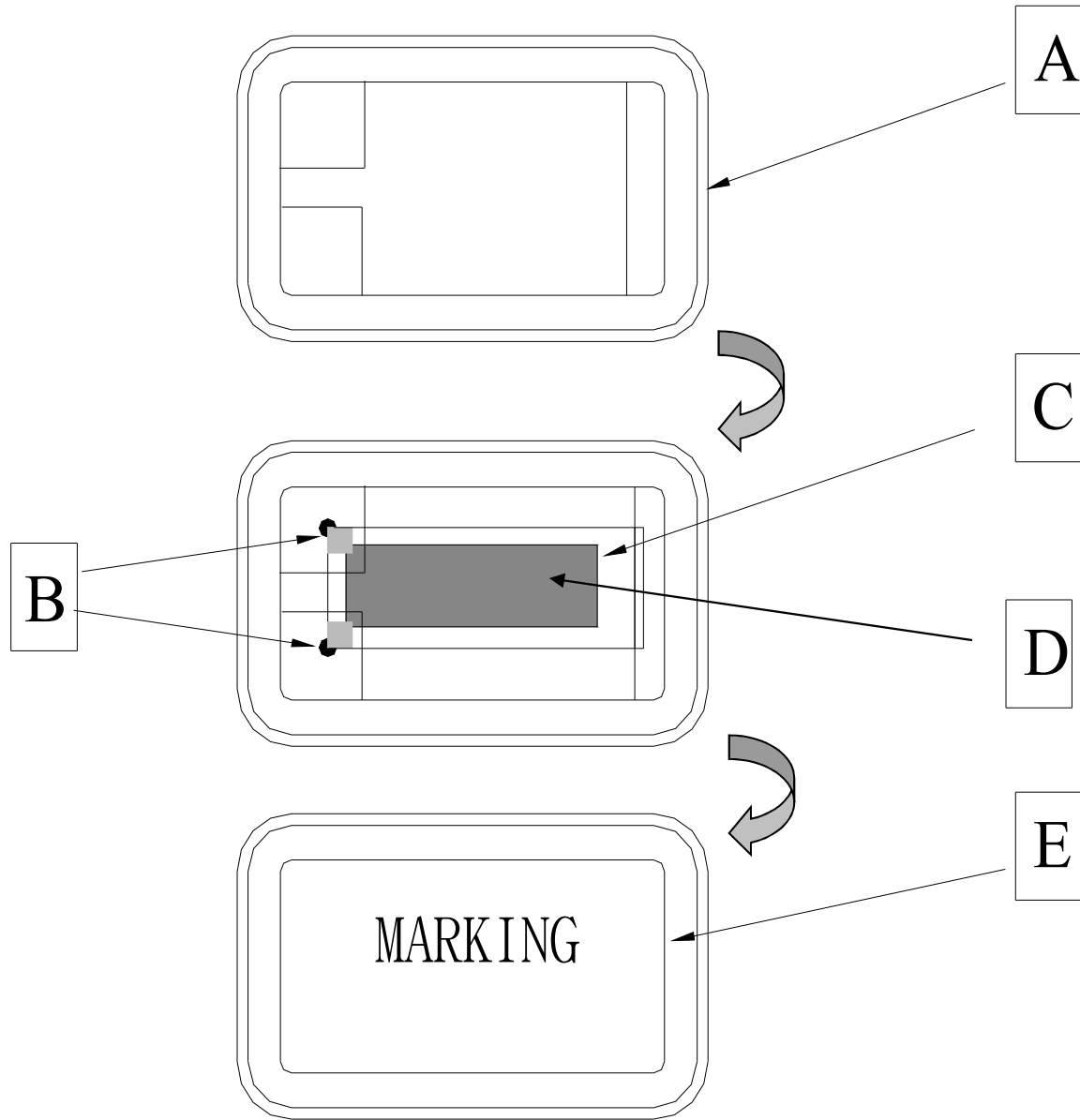
A cycle every four years

## 3 . DIMENSION :

( Unit : mm )



#### 4. STRUCTURE ILLUSTRATION

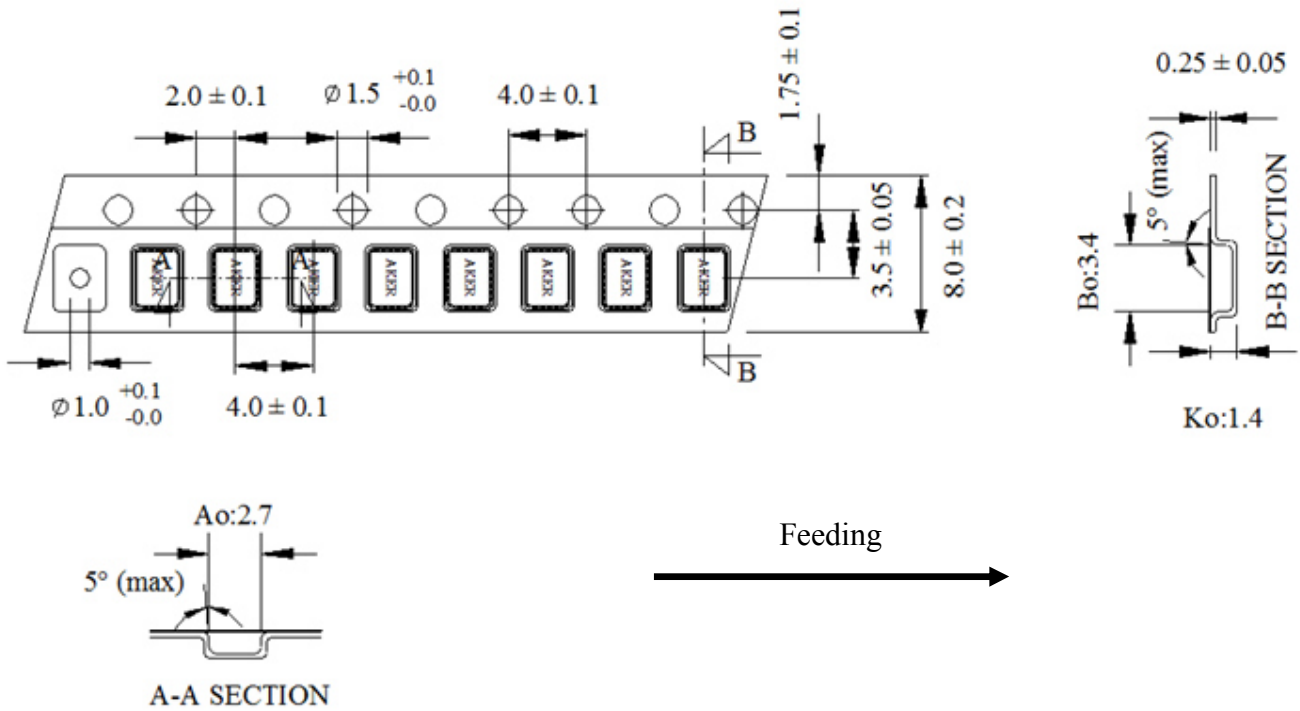


| COMPONENTS |                     | MATERIALS  |  | COMPONENTS |           | MATERIALS   |  |
|------------|---------------------|--|--|------------|-----------|-------------|--|
| A          | Base(Package)       | Ceramic(Al <sub>2</sub> O <sub>3</sub> )+Kovar(Fe/Co/Ni) |  | D          | Electrode | Noble metal |  |
| B          | Conductive adhesive | Ag / Silicon resin                                       |  | E          | Lid       | Fe/Co/Ni    |  |
| C          | Crystal blank       | SiO <sub>2</sub>   |  |            |           |             |  |

**5. PACKING :**

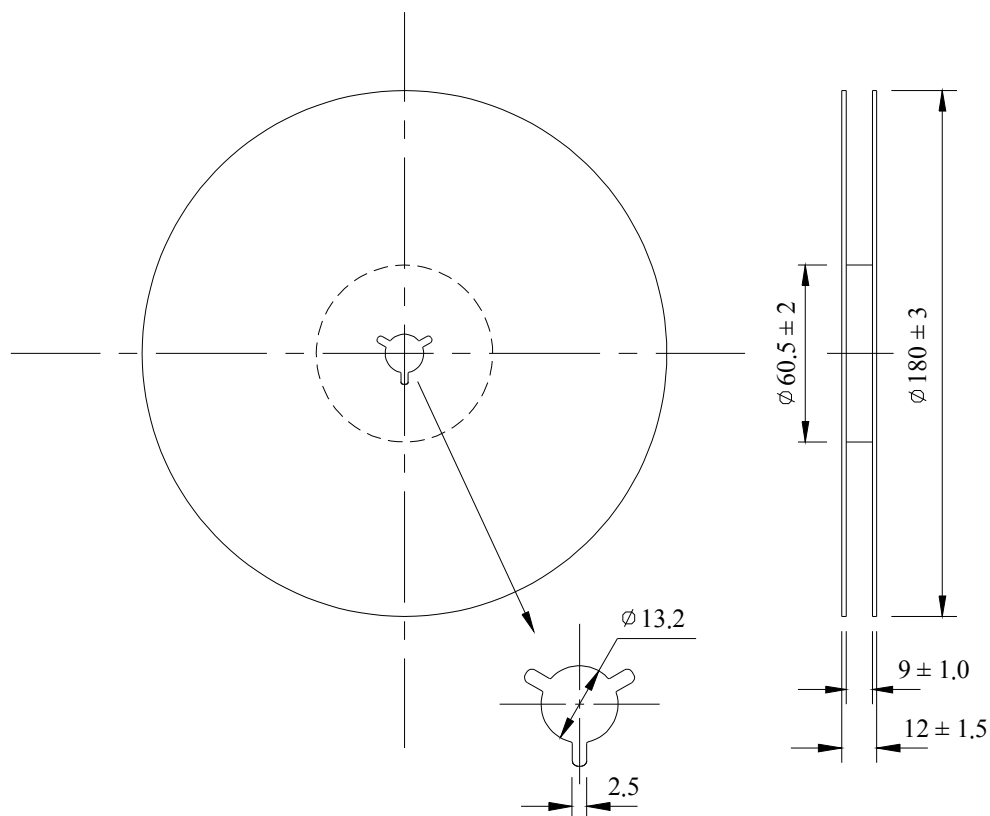
**TAPE SPECIFICATION**

( Unit : mm )

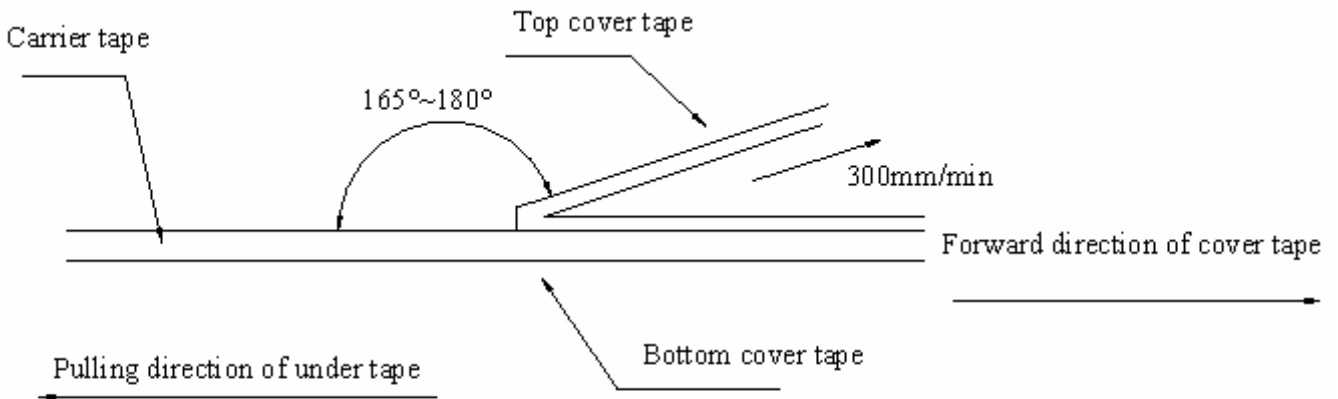


**OUTLINE DIMENSION**

( Unit : mm )



## 6. COVER TAPE ADHESION STRENGTH :



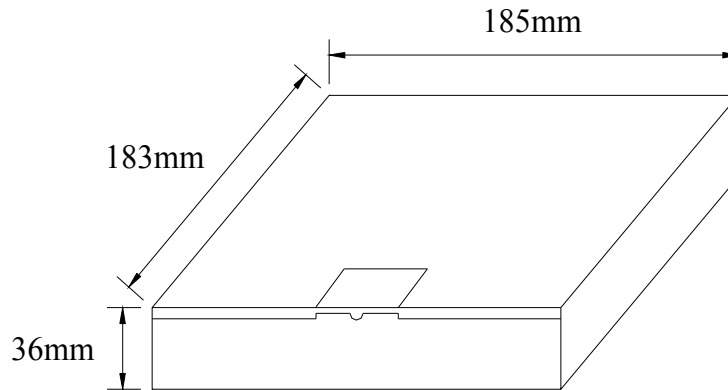
\*\*\* In the case, the cover tape is pulled off under the above conditions, the cover tape adhesion strength should be 10.2g~71.4g Plastic tape: 10.2g~71.4g

(Cover tape adhesion strength)

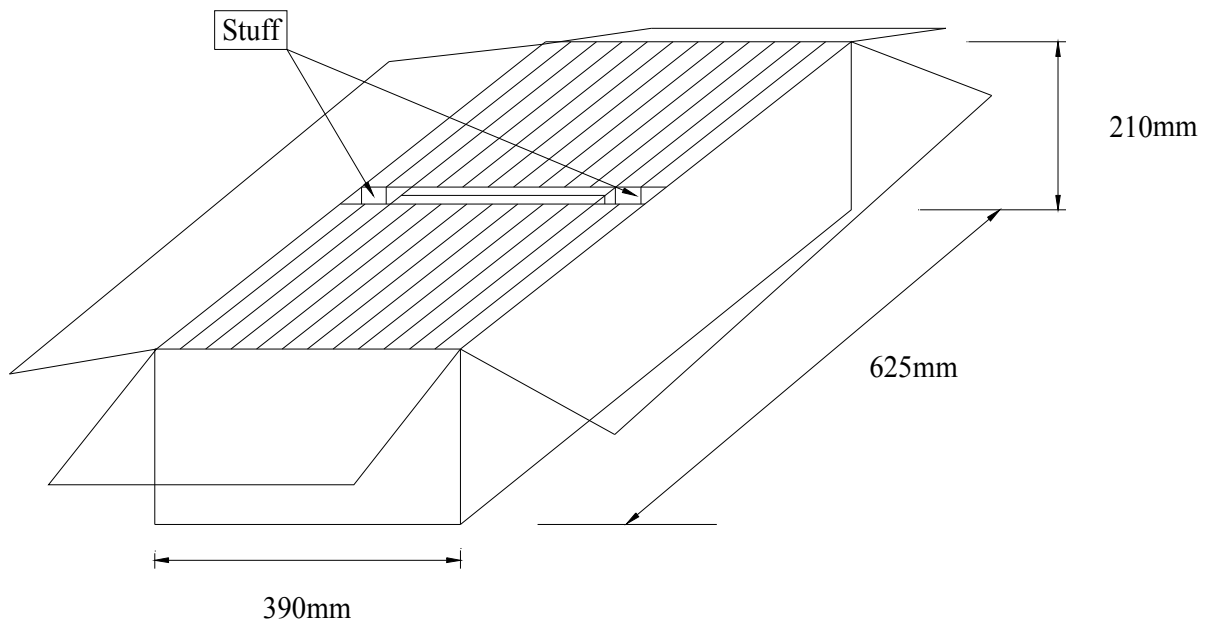
## 7. SOLDERING REFLOW PROFILE



**8. PACKING :**



BOX = 3000 PCS / REEL(MAX)



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





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## 9 . MECHANICAL PERFORMANCE

| TEST ITEMS                            | TEST METHODS AND TEST CONDITION  | PERFORMANCE                             |
|---------------------------------------|--|---|
| 9.1 Temperature Cycling               | -55±3°C/30min maximum~+125±3°C/30min maximum , 1000cycles  | To satisfy the electrical performance . |
| 9.2 Operational Life                  | 125°C±3°C , 1000hrs±12hrs  |   |
| 9.3 Biased Humidity                   | 85°C±5°C&85%±5%R.H. , 1000±12hrs   |   |
| 9.4 Resistance To Soldering Heat Test | Reflow test 2 times.   |   |
| 9.5 High Temperature Exposure         | 150°C±3°C , 1000hrs±12hrs  |   |
| 9.6 Vibration Test                    | Freq.range: 10~2000Hz , Peak to peak amplitude:1.52mm<br>Peak acceleration:5G (49m/s <sup>2</sup> ) , 3 direction(X, Y,Z) , 20min 12cycles each of 3 orientations. |   |
| 9.7 Mechanical Shock                  | 100G , 6mS , 3 times for each direction(X, Y, Z ) , 3 cycles   |   |
| 9.8 Physical Dimension                | Verify physical dimensions to the applicable device detail specification.  |   |
| 9.9 Solderability                     | 260°C , Coated > 95%   |   |
| 9.10 Board Flex                       | PCB=100*40(mm) , Bending=2 mm (min) , Duration=60+5/-0 sec   |   |
| 9.11 External Visual                  | Inspect device construction and marking.   |   |
| 9.12 Terminal Strength                | A force of 17.7N for 60 seconds.   |   |

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