

# APPROVAL SHEET

Customer Name : \_\_\_\_\_  
Customer P/N : \_\_\_\_\_  
Frequency : 13.560000 MHz  
Aker Approved P/N: CXAF-013560-5-AL-01  
Aker MPN : CXAF-013560-5-AL-01  
Rev. : 1  
ISSUE DATE : Feb.3.2023

| APPROVED             | CHECKED | PREPARED   |
|----------------------|---------|------------|
| <i>Tin</i>           |         | <i>PTY</i> |
| 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

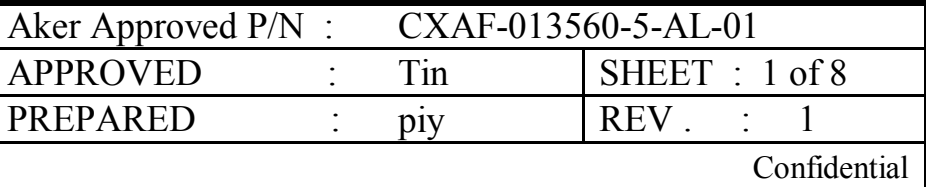
Web: [www.aker.com.tw](http://www.aker.com.tw)

**MSL:Level 1**

**RoHS compliant**

**IATF 16949 Certified**

**AEC-Q200 Qualified**

[illegible]

## 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 :  $25 \pm 5^{\circ}\text{C}$

Relative humidity : 40%~70%

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

Ambient temperature :  $25 \pm 3^{\circ}\text{C}$

Relative humidity : 40%~70%

■ AKER Model : CXAF-531

■ Oscillation Mode : Fundamental

■ Cutting Mode : AT CUT

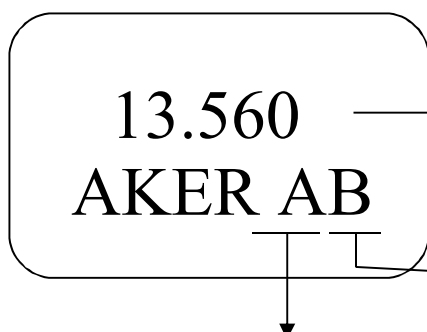
■ Measurement Equipment : 250B(Measured FL)

■ Insulation Resistance : More than 500M ohms at DC 100V

| Parameters                   | Symbol | Electrical Spec |      |      |                    | Notes                                         |
|------------------------------|--------|-----------------|------|------|--------------------|-----------------------------------------------|
|                              |        | Min.            | Typ. | Max. | Units.             |                                               |
| Nominal Frequency            | FL     | 13.560000       |      |      | MHz                |                                               |
| Frequency Tolerance          |        | $\pm 20$        |      |      | ppm                | at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ |
| Frequency Stability          |        | $\pm 30$        |      |      | ppm                | Operating Temp (Refer $25^{\circ}\text{C}$ )  |
| Load Capacitance             | CL     | 20              |      |      | pF                 |                                               |
| Aging                        |        | $\pm 3$         |      |      | ppm                | First Year                                    |
| Operating Temperature        |        | -20             | ~    | 70   | $^{\circ}\text{C}$ |                                               |
| Storage Temperature Range    |        | -55             | ~    | 150  | $^{\circ}\text{C}$ |                                               |
| Drive Level                  | DL     |                 |      | 100  | uW                 |                                               |
| Equivalent Series Resistance | ESR    |                 |      | 40   | $\Omega$           | @Series                                       |
| Shunt Capacitance            | C0     |                 |      | 7    | pF                 |                                               |

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

## 2 . MARKING :



Internal identification code

FREQUENCY

Date Code : Please refer to the following table.

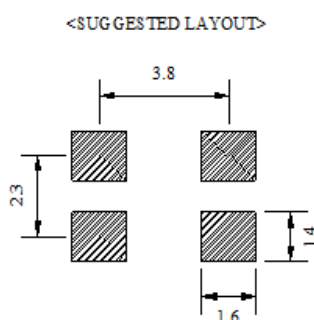
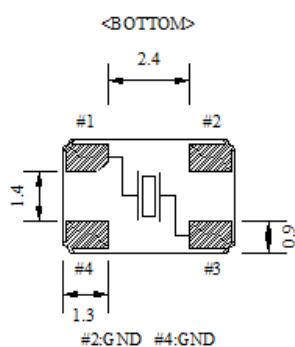
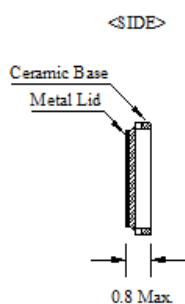
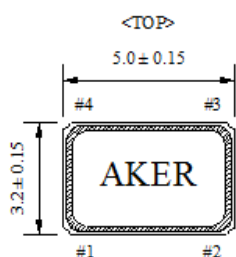
Date Code Guide

| 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      |

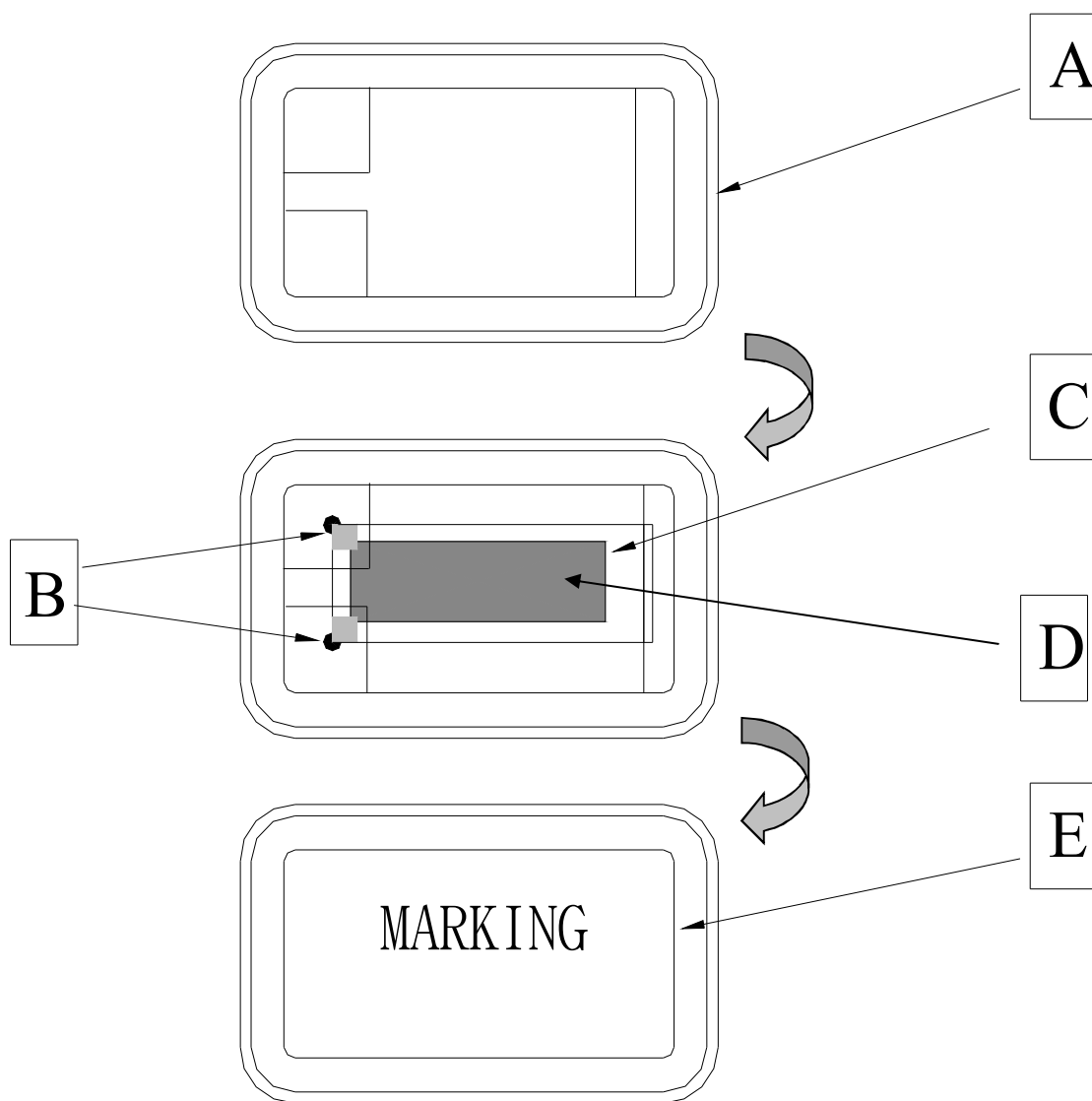
A cycle every four years

## 3 . DIMENSION :

( Unit : mm )



## 4. STRUCTURE ILLUSTRATION

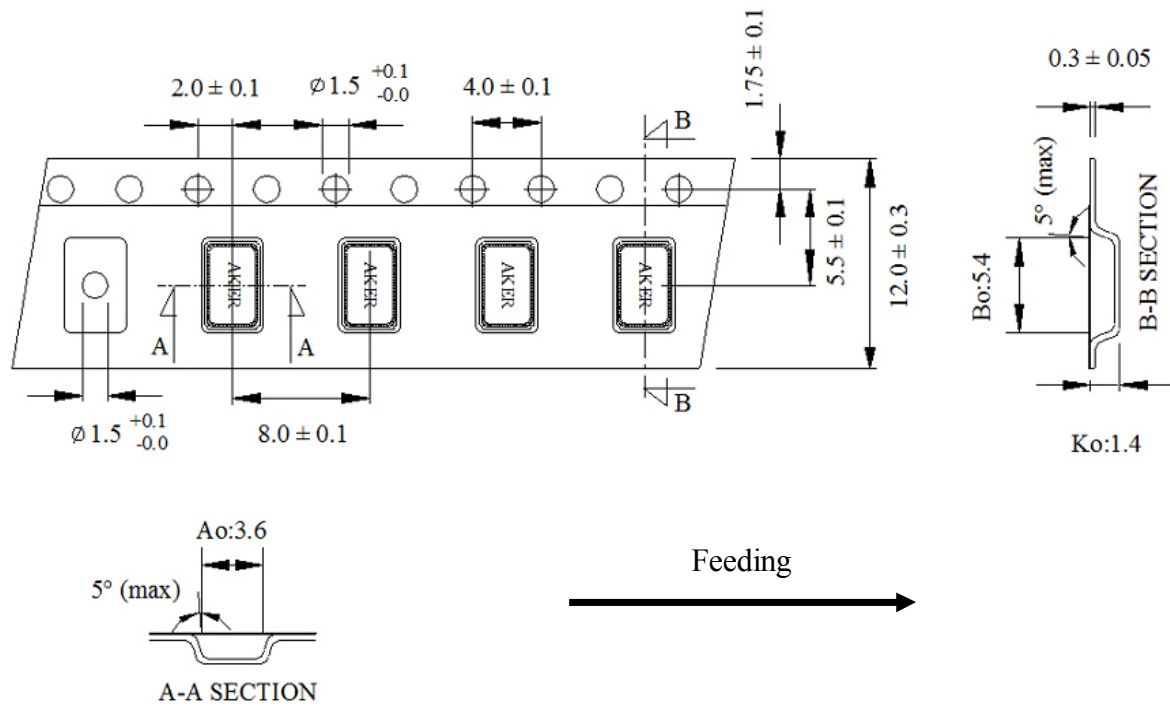


| COMPONENTS |                     | MATERIALS                                                | COMPONENTS |           | MATERIALS |
|------------|---------------------|----------------------------------------------------------|------------|-----------|-----------|
| A          | Base (Package)     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

## 5 . PACKING :

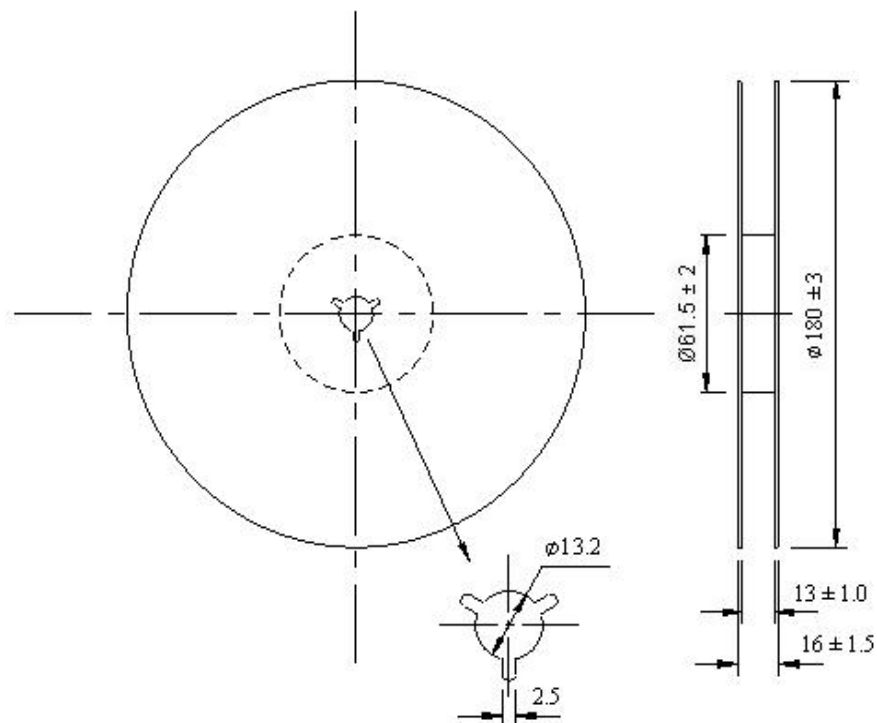
### TAPE SPECIFICATION

( Unit : mm )

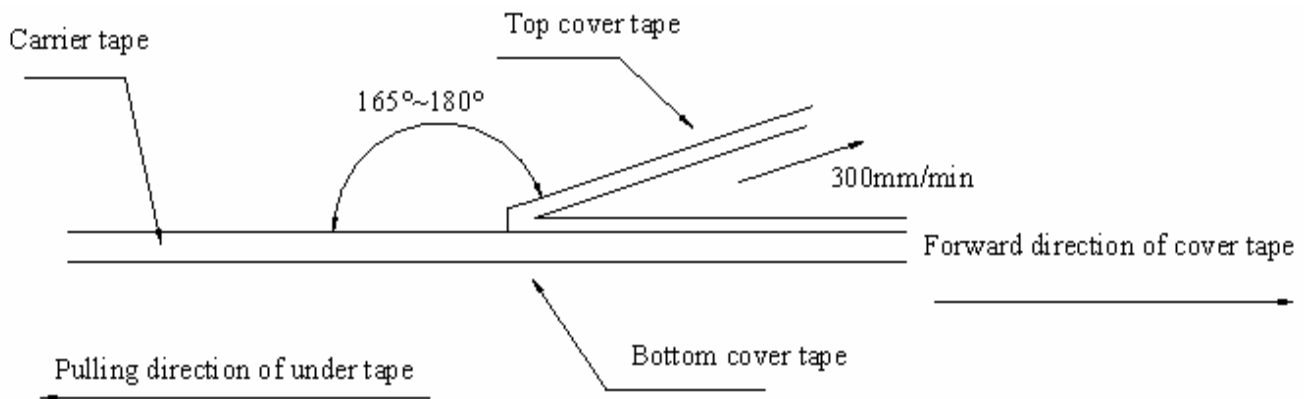


### OUTLINE DIMENSION

( Unit : mm )



## 6. COVER TAPE ADHESION STRENGTH :

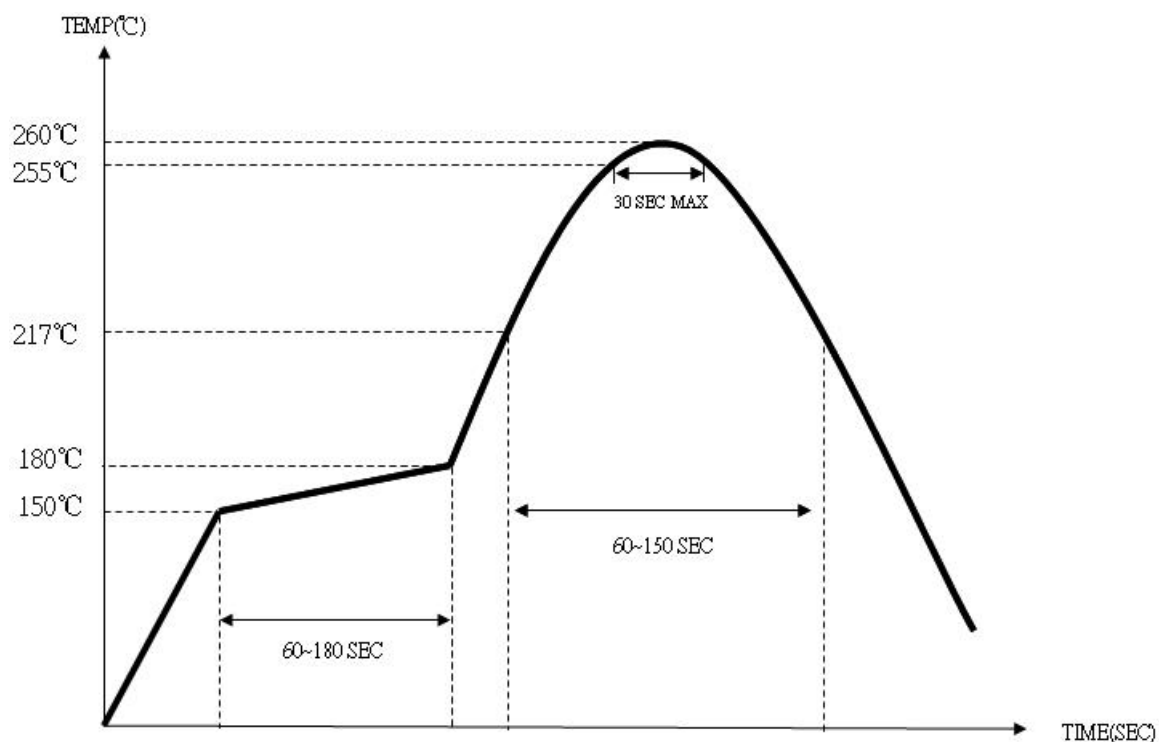


\*\*\* In the case, the cover tape is pulled off under the above conditions, the cover tape adhesion strength should be 10.2g~71.4g

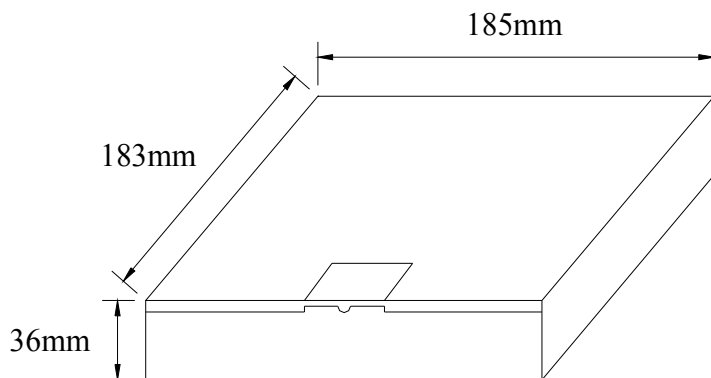
Plastic tape: 10.2g~71.4g

(Cover tape adhesion strength)

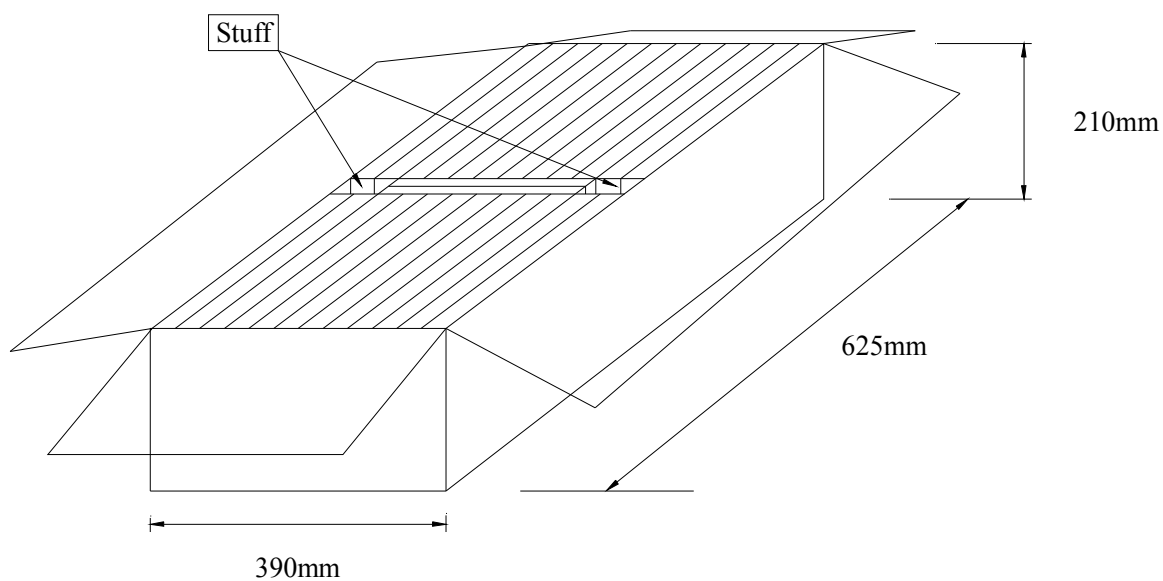
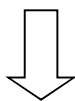
## 7. SOLDERING REFLOW PROFILE



## 8. PACKING :



BOX = 1000 PCS / REEL



SMD product packs 32 BOX = The outside box packs ( 1000 PCS \* 32 BOX = 32000 PCS )(MAX)

## 9 . MECHANICAL PERFORMANCE

| TEST ITEMS                            | TEST METHODS AND TEST CONDITION                                                                                                                                    | PERFORMANCE                             |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 9.1 Temperature Cycling               | -55±3℃/30min maximum~+125±3℃/30min maximum , 1000cycles                                                                                                            | To satisfy the electrical performance . |
| 9.2 Operational Life                  | 125℃±3℃ , 1000hrs±12hrs                                                                                                                                            |                                         |
| 9.3 Biased Humidity                   | 85℃±5℃&85%±5%R.H. , 1000±12hrs                                                                                                                                     |                                         |
| 9.4 Resistance To Soldering Heat Test | Reflow test 2 times.                                                                                                                                               |                                         |
| 9.5 High Temperature Exposure         | 150℃±3℃ , 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℃ , 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.                                                                                                                                   |                                         |