



APPROVAL SHEET

Customer Name : _____
 Customer P/N : _____
 Frequency : 48.000000 MHz
 Aker Approved P/N: CXAF-048000-3-AL-02
 Aker MPN : CXAF-048000-3-AL-02
 Rev. : 1
 ISSUE DATE : Nov.22.2022

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

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MSL:Level 1

RoHS compliant

IATF 16949 Certified

AEC-Q200 Qualified



| | |
|---|----------------|
| Aker Approved P/N : CXAF-048000-3-AL-02 | |
| APPROVED : Xtal | SHEET : 2 of 8 |
| PREPARED : piy | REV. : 1 |
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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%

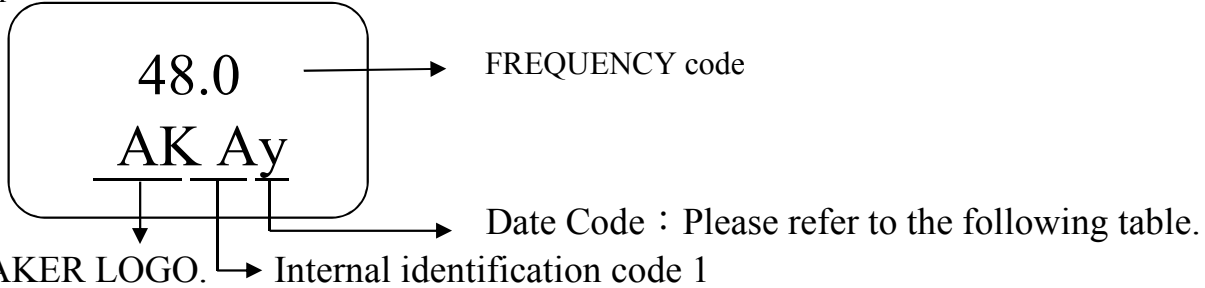
- AKER Model : CXAF-321
- Oscillation Mode : Fundamental
- Cutting Mode : AT CUT
- Measurement Equipment : 250B(Measured FL)
- Insulation Resistance : More than 500M ohms at DC 100V

| Parameters | Symbol | Electrical Spec | | | | Notes |
|------------------------------|--------|-----------------|------|------|--------|-----------------------------|
| | | Min. | Typ. | Max. | Units. | |
| Nominal Frequency | FL | 48.000000 | | | MHz | |
| Frequency Tolerance | | ±20 | | | ppm | at 25°C ± 3°C |
| Frequency Stability | | ±30 | | | ppm | Operating Temp (Refer 25°C) |
| Load Capacitance | CL | 12 | | | pF | |
| Aging | | ±3 | | | ppm | First Year |
| Operating Temperature | | -30 | ~ | 85 | °C | |
| Storage Temperature Range | | -55 | ~ | 150 | °C | |
| Drive Level | DL | | 10 | 100 | uW | |
| Equivalent Series Resistance | ESR | | | 50 | Ω | @Series |
| Shunt Capacitance | C0 | | | 3 | pF | |

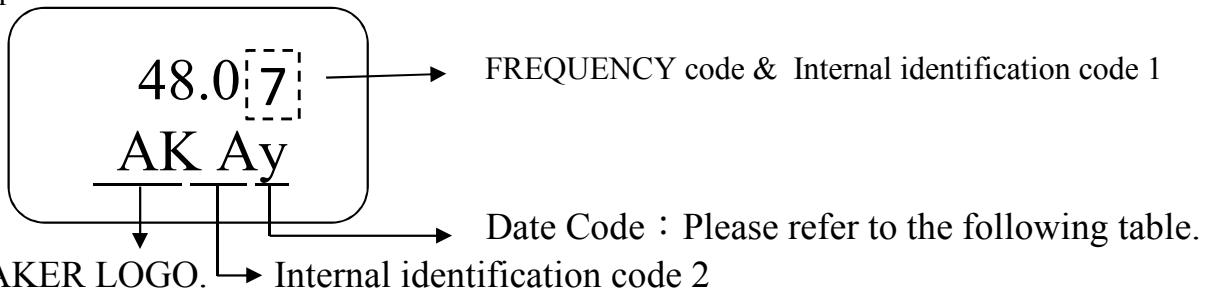
Please kindly be noted that AKER DO NOT guarantee parts quality which involves human security application.

2 . MARKING :

Type I



Type II



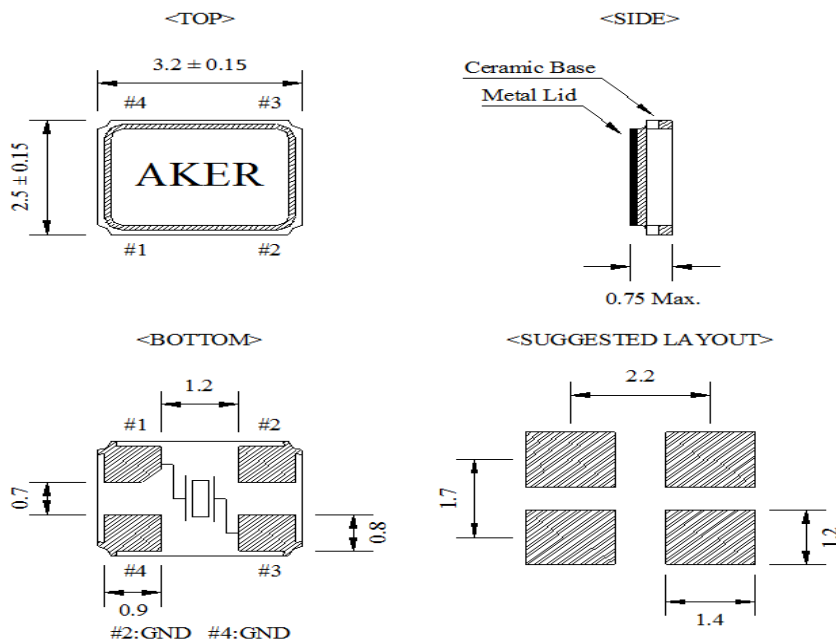
Date Code Table

| 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 |

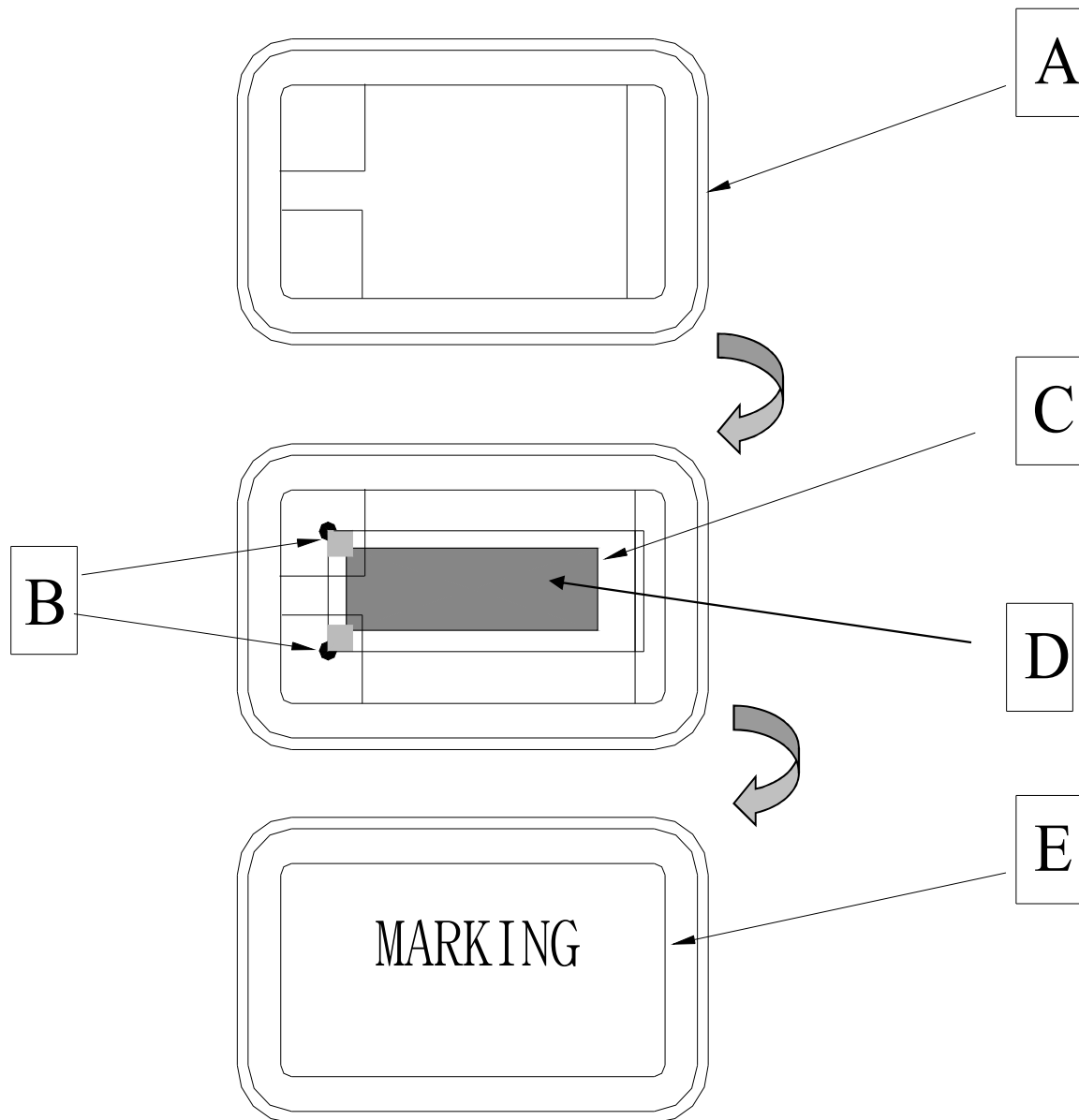
A cycle every four years

3 . DIMENSION :

(Unit : mm)



4. STRUCTURE ILLUSTRATION

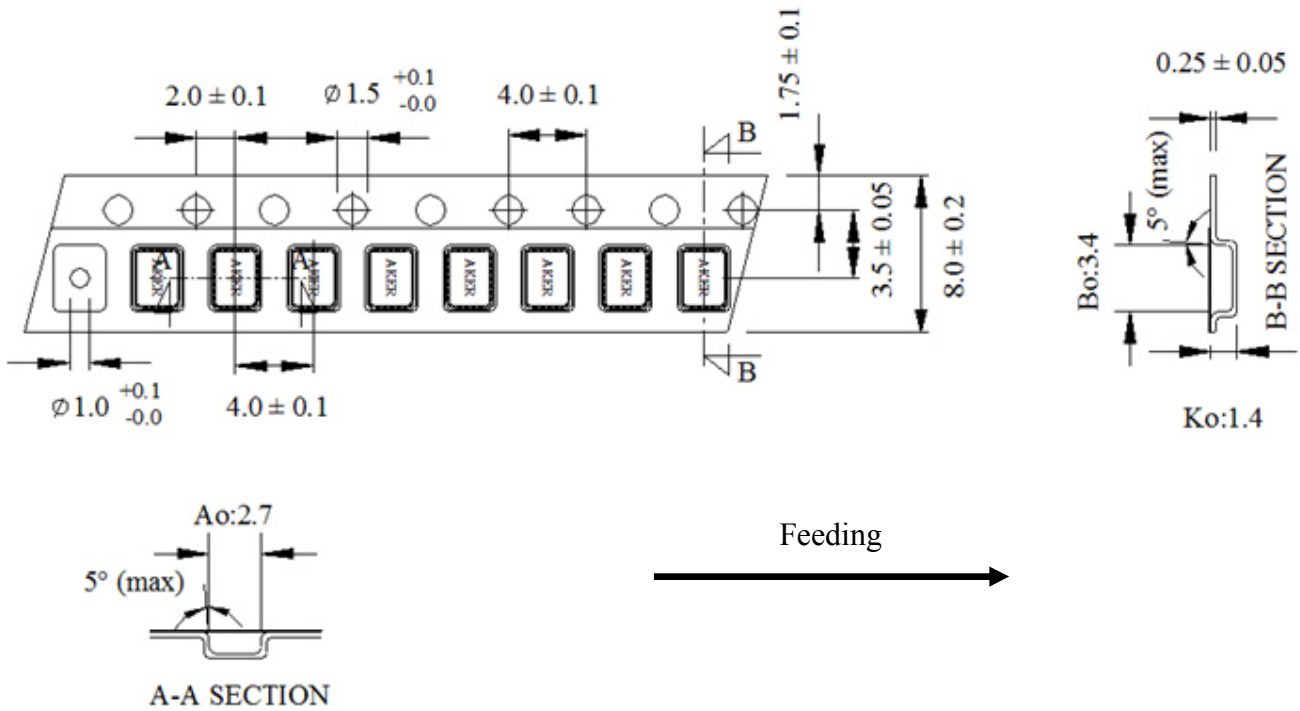


| COMPONENTS | | MATERIALS | COMPONENTS | | MATERIALS |
|------------|---------------------|--------------------------------------|------------|-----------|-----------|
| A | Base (Package) | Ceramic(Al_2O_3)+Kovar(Fe/Co/Ni) | D | Electrode | Cr / Ag |
| B | Conductive adhesive | Ag / Silicon resin | E | Lid | Fe/Co/Ni |
| C | Crystal blank | SiO_2 | | | |

5. PACKING :

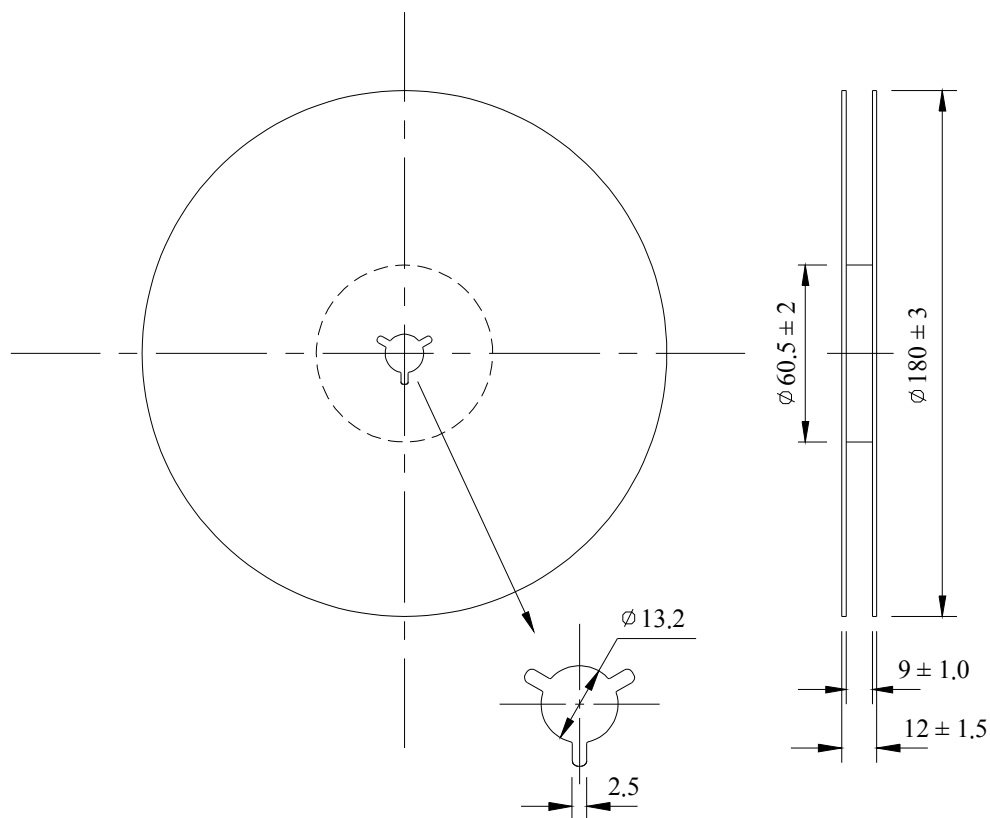
TAPE SPECIFICATION

(Unit : mm)

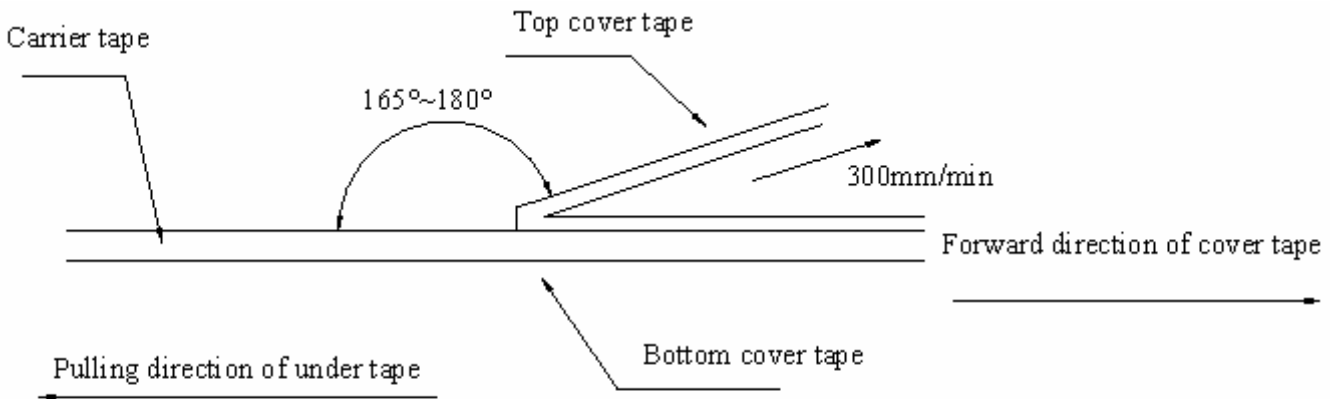


OUTLINE DIMENSION

(Unit : mm)



6. COVER TAPE ADHESION STRENGTH :



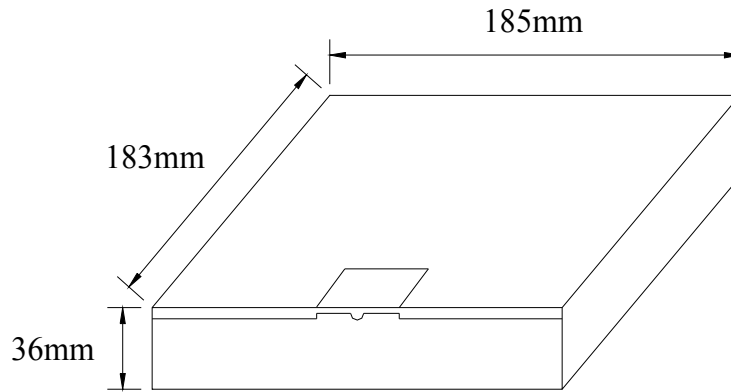
*** In the case, the cover tape is pulled off under the above conditions, the cover tape adhesion strength should be 10.2g~71.4g Plastic tape: 10.2g~71.4g

(Cover tape adhesion strength)

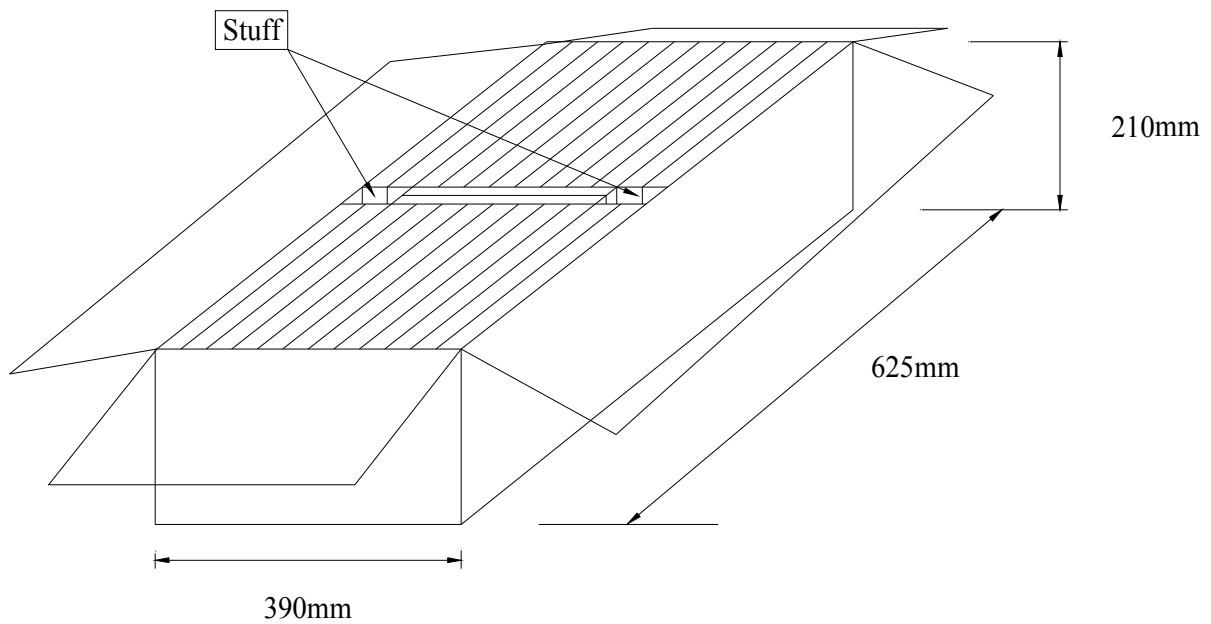
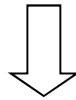
7. SOLDERING REFLOW PROFILE



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 Peak acceleration:5G (49m/s ²) , 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. | |