



APPROVAL SHEET

Customer Name : _____
Customer P/N : _____
Frequency : 11.059200 MHz
Aker Approved P/N : 49M-011059-FX4X10
Aker MPN : 49M-011059-FX4X10
REVISION : A0
ISSUED DATE : 2012/2/2

| APPROVED | CHECKED | PREPARED |
|----------------------|---------|----------|
| Tin | | Kiku |
| APPROVED BY CUSTOMER | | |

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RoHS compliant



| | | | |
|-------------------|---|-------------------|----------------|
| CUST. P/N | : | | |
| Aker Approved P/N | : | 49M-011059-FX4X10 | |
| APPROVED | : | Tin | SHEET : 2 of 6 |
| 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 350A (Measured FL)

(3) Cutting Model : AT CUT

(4) Oscillation Model : Fundamental

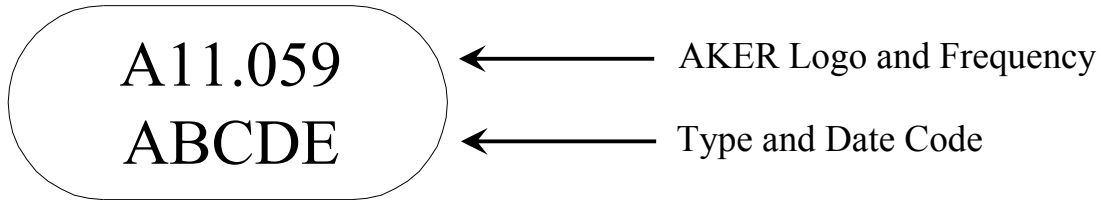
| Parameters | Symbol | Electrical Specification | | | | Notes |
|-----------------------------|--------|--------------------------|------|------|-------|------------------|
| | | Min. | Typ. | Max. | Unit | |
| Nominal Frequency | FL | 11.059200 | | | MHz | |
| Frequency Tolerance | | ±30 | | | ppm | At 25°C ± 3°C |
| Frequency Stability | | ±30 | | | ppm | Related to 25 °C |
| Load Capacitance | CL | 20 | | | pF | |
| Aging Rate | | ±3 | | | ppm | Year |
| Operating Temperature Range | | -10 | ~ | 70 | °C | |
| Storage Temperature Range | | -55 | ~ | 125 | °C | |
| Drive Level | DL | 100 | | | uW | |
| Effective Series Resistance | RR | 60 | | | Ω | |
| Shunt Capacitance | C0 | 7 | | | pF | |
| Insulation Resistance | | 500 | | | Mohms | At DC 100V |

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

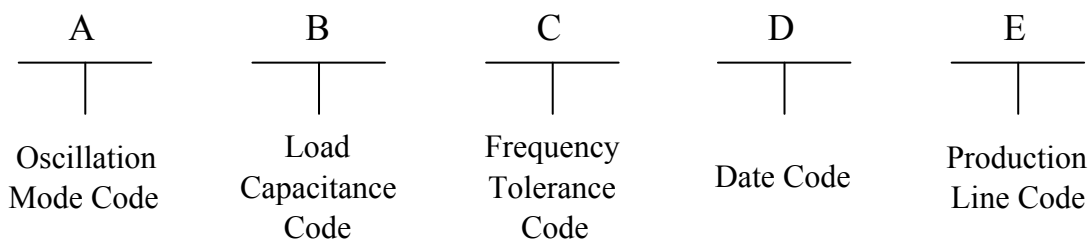


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|-------------------|---|-------------------|
| CUST. P/N | : | |
| Aker Approved P/N | : | 49M-011059-FX4X10 |
| APPROVED | : | Tin |
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| | | SHEET : 3 of 6 |
| | | REV . : A0 |

2 . MARKING



Type and Date Code



Oscillation Mode Code

| | |
|---|-----------------|
| F | AT-FUNDAMENTAL |
| T | AT-3RD OVERTONE |
| B | BT-CUT |

Frquency Tolerance Code

| CODE | DEVIATION | CODE | DEVIATION |
|------|-----------|------|-----------|
| 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 |
| J | 14 | a | 21 |
| K | 15 | b | 24 |
| L | 25 | c | 35 |
| M | 9 | d | 37 |
| N | 13 | | |

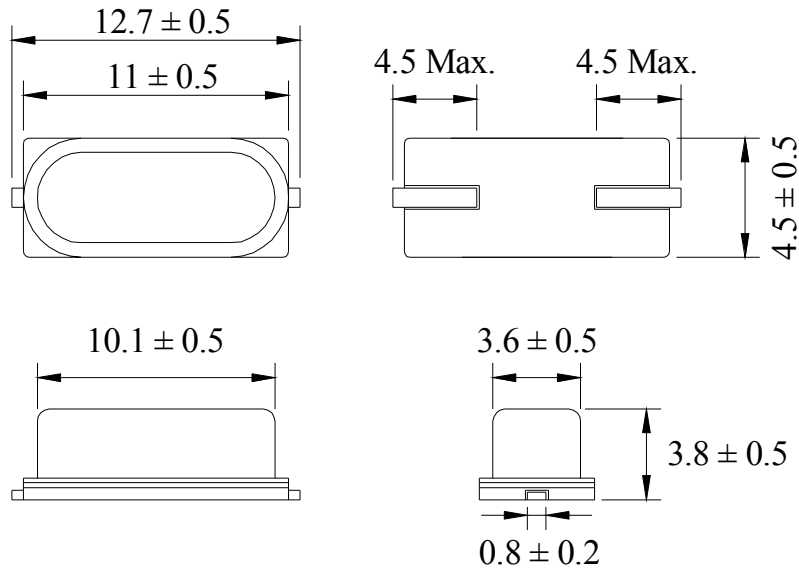
Date Code

| YEAR | 2005 | 2006 | 2007 | 2008 |
|-------|------|------|------|------|
| | 2009 | 2010 | 2011 | 2012 |
| 2013 | 2014 | 2015 | 2016 | |
| MONTH | 2017 | 2018 | 2019 | 2020 |
| 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 |

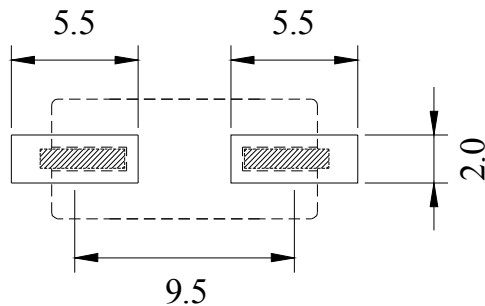


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| | | SHEET : 4 of 6 |
| | | REV . : A0 |

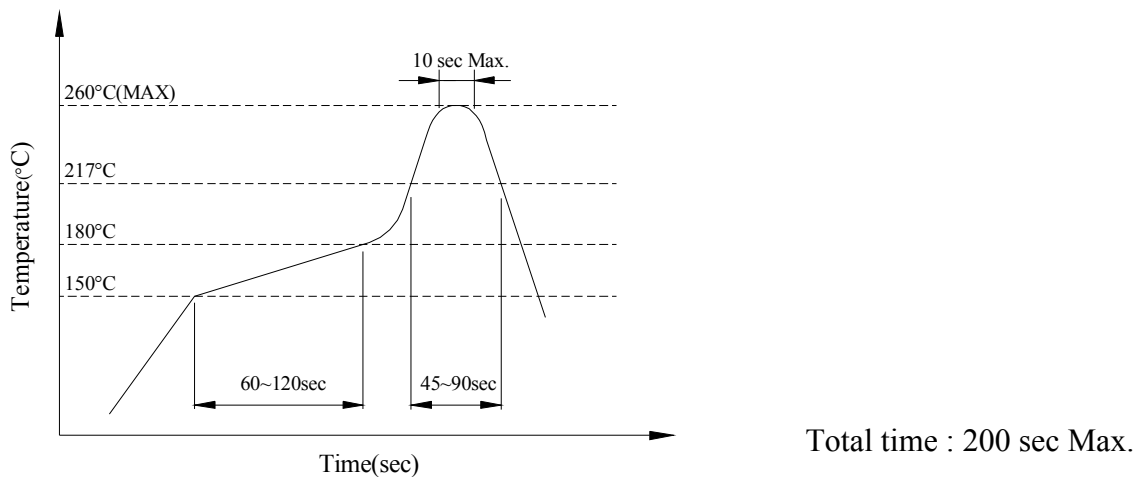
3 . DIMENSIONS : (Unit : mm)



4 . SUGGESTED LAND PATTERN : (Unit : mm)



5 . SOLDERING REFLOW PROFILE



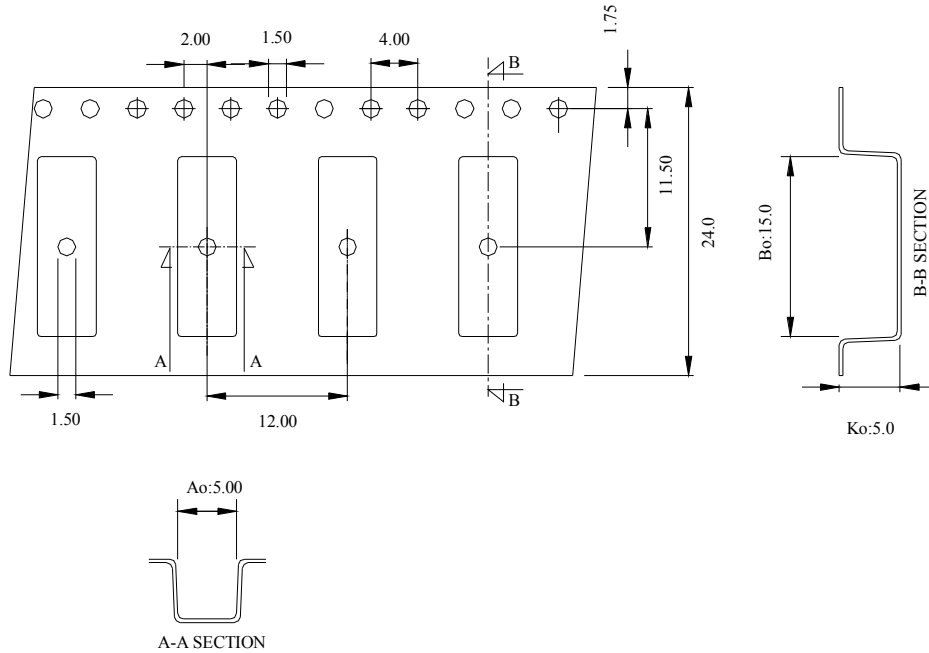
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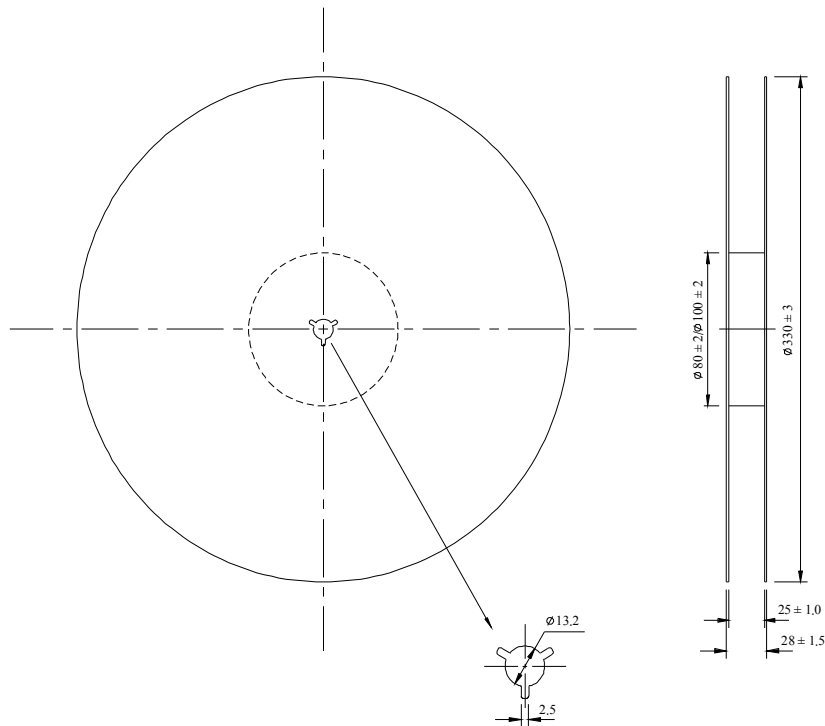
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| APPROVED | : | Tin | SHEET : 5 of 6 |
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6. PACKING : (Unit : mm) 1000pcs/reel

6.1 TAPE SPECIFICATION



6.2 REEL SPECIFICATION



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7 . RELIABILITY SPECIFICATION

| No | Test Item | Test Methods | Performance |
|----|-------------------------------|---|---|
| 1 | Drop Test | Free drop from 50 cm height onto a hard wooden board for 3 times | To satisfy the electrical characteristics |
| 2 | Mechanical Shock | 1000 G, 0.5m-sec, 3 times for each direction (X, Y, Z) | |
| 3 | Vibration | Frequency range : 20 ~ 2000 Hz Amplitude : 1.52mm/20G Sweep time : 20 minutes Test time for each direction : 2 Hours (Total 6 Hours) | |
| 4 | Gross Leak | Alcohol, Test Pressure : > -40cm-Hg | No bubbles stream |
| 5 | Fine Leak | 5 kgf /cm ² Helium Bomging for 2 Hours | ≤10-8atm.cc./sec |
| 6 | Solderability | Temperature : 260°C ± 5°C Immersion time : 5 ± 1 seconds | 90% min. coverage of new solder |
| 7 | Resistance To Soldering Heat | Solder pot test Test temperature : 260°C ± 5°C Test time : 10 ± 1 seconds | To satisfy the electrical characteristics |
| 8 | High Temperature Storage | + 125 °C ± 3 °C for 500 ± 12 Hours | |
| 9 | Low Temperature Storage | - 55 °C ± 3 °C for 500 ± 12 Hours | |
| 10 | Thermal Shock | Total 100 cycles of the following temperature cycle | |
| 11 | High Temperature And Humidity | 85°C ± 5°C, RH 85% ± 5%, 500 ± 12 Hours | |