



No.11-3 Jianguo Rd., T.E.P.Z. 42760 Taiwan, ROC

All dimensions are millimeters.

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|---------|---------------|
| CAD: | TCR |
| Review: | EG |
| Appr: | JL |
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| Date: | April 24,2024 |

Specification Title:

**Microprocessor Crystal Unit
Automotive Grade
3.2 x 2.5 millimeter Surface Mount - 4 Pad
General Product Specification**

**AEC-Q200 Qualified
IATF 16949 Certified**

Series Name: C3E Auto Series

Electrical Specifications:

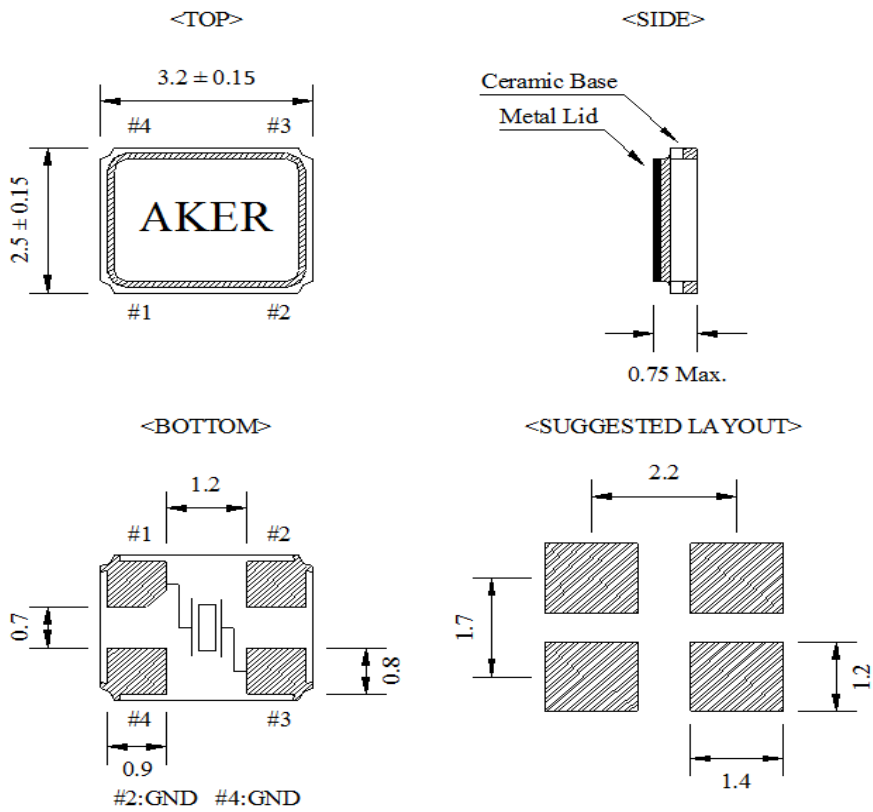
| | | | |
|--|----------------|------------------------------|---------------------|
| Frequency Range | | 8.000 to 156.250 | MHz |
| Mode of Oscillation | Fundamental | 8.000 to 64.000 | MHz |
| | Third Overtone | 60.000 to 156.250 | MHz |
| Frequency Tolerance at 25°C | Standard | ±30 | PPM Max (Note 1) |
| | Optional | ±50 | |
| | | ±20 | |
| | | ±15 | |
| | | ±10 | |
| Frequency Stability over Temperature Range | Standard | ±50 | PPM Max (Note 1) |
| | Optional | ±100 | |
| | | ±30 | |
| | | ±25 | |
| | | ±20 | |
| Operating Temperature Range | Standard | -40 to +85 | °C |
| | Optional | -40 to +105 | |
| | Optional | -40 to +125 | |
| Storage Temperature Range | | -55 to +150 | |
| Aging | | ±3 | PPM Max/Year |
| Load Capacitance | | 6 to 47 and Series Resonance | pF |
| Shunt Capacitance | | 3.0 | |
| Equivalent Series Resistance(ESR) | | See ESR Table | Ohm |
| Drive Level | | 100 | uW Max |
| Insulation Resistance | | 500 at 100 Vdc ± 15 Vdc | M Ohm |

Frequency Range and ESR Values:

| Frequency Range in MHz | ESR Ohm Max | Mode of Operation | Frequency Range in MHz | ESR Ohm Max | Mode of Operation |
|------------------------|-------------|-------------------|------------------------|-------------|-------------------|
| 8.000 to 9.999 | 300 | Fundamental | 60.000 to 124.999 | 100 | Third Overtone |
| 10.000 to 11.999 | 150 | Fundamental | 125.000 to 150.000 | 80 | Third Overtone |
| 12.000 to 15.999 | 80 | Fundamental | | | |
| 16.000 to 19.999 | 60 | Fundamental | | | |
| 20.000 to 24.999 | 50 | Fundamental | | | |
| 25.000 to 39.999 | 40 | Fundamental | | | |
| 40.000 to 64.000 | 30 | Fundamental | | | |

| | | | | |
|--|-----|-----------|------|------|
| RoHS Compliant Pb - Lead Free AEC-Q200 Qualified IATF 16949 Certified | Ltr | Revisions | Date | Appr |
| | | | | |
| | | | | |
| | | | | |

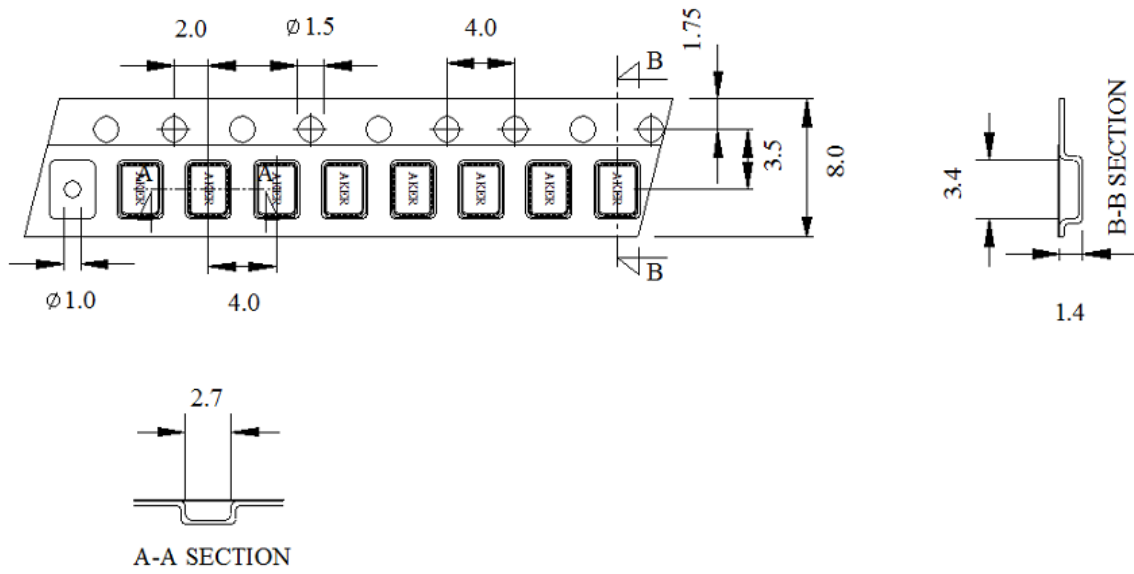
Mechanical Outline:



**Package is Seam Sealed Ceramic-Metal.
Dimensions are millimeters.**

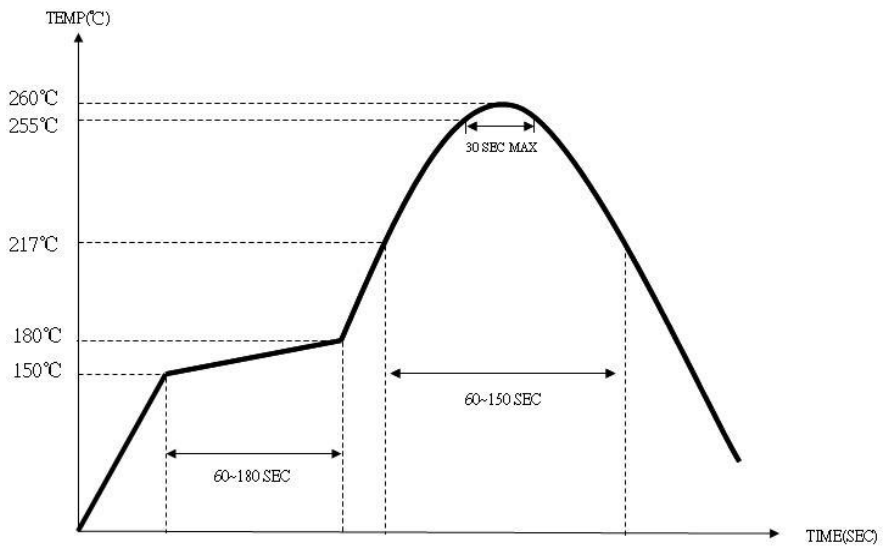
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Carrier Tape Dimensions:



Dimensions are millimeters.

Solder Reflow Characteristics:



How to build a Part Number:

| | | | |
|------------------------------|----------|------------------|-------------------------------|
| Series | | C | Parameter |
| Package | | 3E | 3.2 x 2.5 mm - 4 Pad |
| - | | | |
| Frequency | | 8.000 to 156.250 | MHz |
| - | | | |
| Load Capacitance | 7 | | 7 pF |
| | 10 | | 10 pF |
| | 12 | | 12 pF |
| | 16 | | 16 pF |
| | 18 | | 18 pF |
| | 20 | | 20 pF |
| | 32 | | 32 pF |
| S | | Series | |
| - | | | |
| Frequency Tolerance (Note 1) | Standard | 30 | ±30PPM |
| | Option | 50 | ±50PPM |
| | | 20 | ±20PPM |
| | | 15 | ±15PPM |
| | | 10 | ±10PPM |
| Frequency Stability (Note 1) | Standard | 50 | ±50PPM |
| | Option | 100 | ±100PPM |
| | | 30 | ±30PPM |
| | | 25 | ±25PPM |
| | | 20 | ±20PPM |
| - | | | |
| Mode of Oscillation | | See Notes 3 | Fundamental Third Overtone |
| - | | | |
| AECQ-200 | | A | Automotive |
| - | | | |
| Temperature Range | Standard | X | -40 to +85 °C |
| | Option | X1 | -40 to +125 °C |
| | Option | X2 | -40 to +105 °C |
| | Option | X3 | -40 to +150 °C |
| - | | | |
| Packaging | | M | 250pcs Reel |
| | | R | 1000pcs Reel |
| | | R3 | 3000pcs Reel |

Part Number Example:

C3E-24.000-18-3050-A-X-R

C3E- 3.2 x 2.5 mm SMD Seam Seal Crystal Unit - 4 Pad

24.000 MHz Nominal Frequency

18 pF Load Capacitance

3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability

Fundamental Mode

A: Automotive Grade

X: -40 to +85° C Temperature Range

R: Tape and Reel Packaging - 1000pcs Reel

Notes:

1- Product is shipped in Tape and Reel configuration.

2- Quantities less than 250pcs are shipped in tape.

3- Specification subject to change without notice.

4- Fundamental mode does not need to be included in Part Number description.

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