# MHz RANGE CRYSTAL UNIT
**For Automotive**

**Product Number**
**X1E000381Axxx18**

# FA2016AA




- Nominal frequency range : 16 MHz to 54 MHz
- External dimensions : 2.0 × 1.6 × 0.5 mm
- Overtone order : Fundamental
- Applications : Car audio, Vehicle camera system, Car navigation system, ECU clock, Clock, Meter, Remote keyless entry
- AEC-Q200 compliant

## Specifications (characteristics)

| Item | Symbol | Specifications<br>For Automotive | Conditions / Remarks |
|---|---|---|---|
| Nominal frequency range | f_nom | 16 MHz to 54 MHz | Fundamental<br>Please contact us about available frequencies. |
| Storage temperature range | T_stg | -40 °C to +125 °C | Storage as single product. |
| Operating temperature range | T_use | -40 °C to +125 °C | |
| Level of drive | DL | 200 μW Max. | Recommended: 1 μW to 100 μW |
| Frequency tolerance | f_tol | $\pm 10 \times 10^{-6}$ | +25 °C<br>Please contact us for requirements not listed in this specifications. |
| Frequency versus temperature characteristics | f_tem | $\pm 20 \times 10^{-6}$ / -40 °C to +85 °C<br>$\pm 50 \times 10^{-6}$ / -40 °C to +125 °C | Please contact us for requirements not listed in this specifications. |
| Load capacitance | CL | 6 pF to ∞ | Please specify. |
| Motional resistance (ESR) | R1 | As per table below | -40 °C to +125 °C, DL=100 μW |
| Frequency aging | f_age | $\pm 3 \times 10^{-6}$ / year Max. | +25 °C, First year |

## Motional resistance (ESR)

| Frequency | Motional resistance |
|---|---|
| 16 MHz ≤ f_nom < 18 MHz | 200 Ω Max. |
| 18 MHz ≤ f_nom < 20 MHz | 150 Ω Max. |
| 20 MHz ≤ f_nom < 24 MHz | 100 Ω Max. |
| 24 MHz ≤ f_nom < 26 MHz | 80 Ω Max. |
| 26 MHz ≤ f_nom ≤ 54 MHz | 60 Ω Max. |

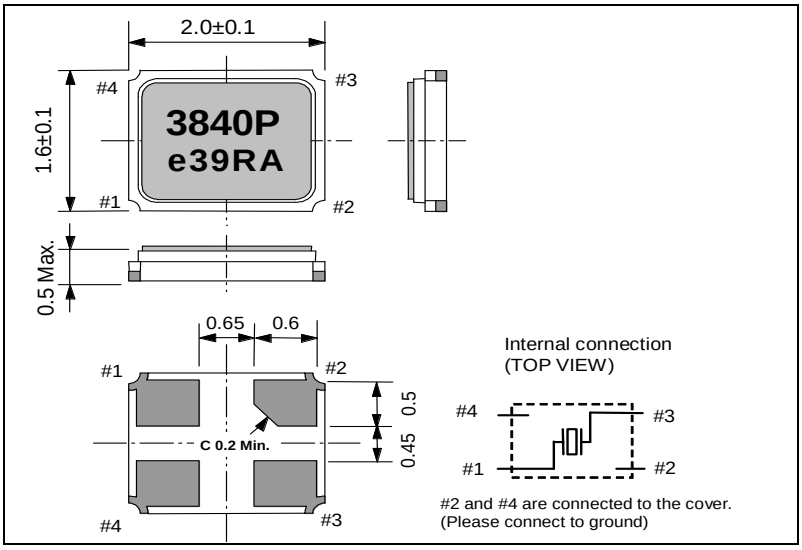
Product name (Standard form)

FA2016AA ① 24.000000MHz ② 12.0 ③ +10.0-10.0 ④

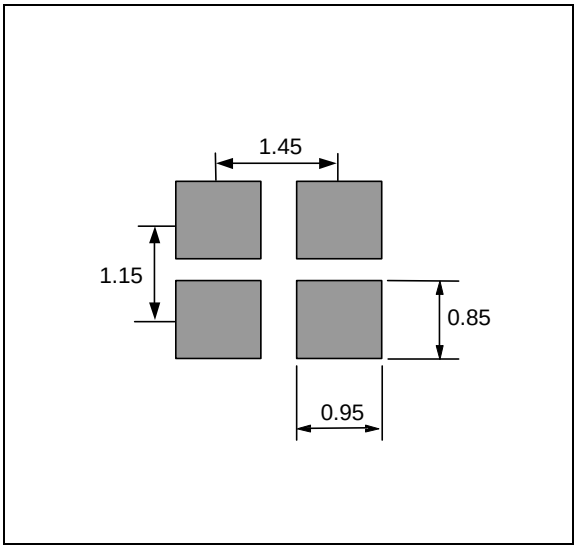
①Model ②Frequency ③Load capacitance(pF) ④Frequency tolerance(× $10^{-6}$, +25 °C)

In addition to the above mentioned specification item, please specify frequency temperature characteristics and operating temperature range in case of inquiry.

## External dimensions (Unit:mm)




## Footprint (Recommended) (Unit:mm)



## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

## WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

IATF 16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

**►Explanation of the mark that are using it for the catalog**

| | |
|---|---|
| Pb Free | ►Pb free. |
| RoHS Compliant | ►Complies with EU RoHS directive.<br>*About the products without the Pb-free mark.<br>Contains Pb in products exempted by EU RoHS directive.<br>(Contains Pb in sealing glass, high melting temperature type solder or other.) |
| For Automotive | ►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc. |
| Automotive Safety | ►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ). |

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