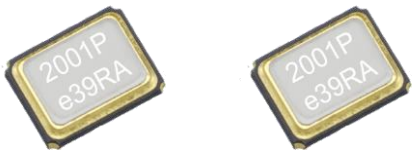
MHz RANGE CRYSTAL UNIT
For Automotive

Product Number
X1E000341xxxx00

FA-238A

- Nominal frequency range : 12 MHz to 50 MHz
- External dimensions : 3.2× 2.5×0.7 mm
- Overtone order : Fundamental
- Applications : Car audio, ECU clock, Clock, Car navigation system, Meter, Remote keyless entry
- AEC-Q200 compliant



Specifications (characteristics)

Item	Symbol	Specifications	Conditions / Remarks
		For Automotive	
Nominal frequency range	f_nom	12 MHz to 50 MHz	Fundamental 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	±15 × 10^{-6} to ±50 × 10^{-6}	+25 °C Please contact us for requirements not listed in this specifications.
Frequency versus temperature characteristics	f_tem	±30 × 10^{-6} / -40 °C to +85 °C ±50 × 10^{-6} / -40 °C to +125 °C	Please contact us for requirements not listed in this specifications.
Load capacitance	CL	7 pF to ∞	Please specify.
Motional resistance (ESR)	R1	As per table below	-40 °C to +125 °C, DL=100 μW
Frequency aging	f_age	±5 × 10^{-6} / year Max.	+25 °C, First year

Motional resistance (ESR)

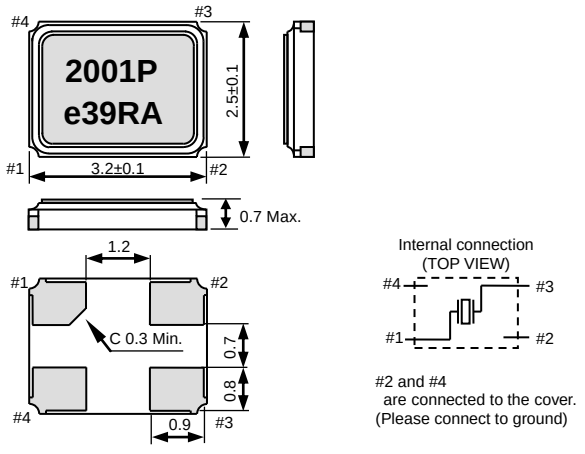
Frequency	Motional resistance
12 MHz ≤ f_nom ≤ 13 MHz	120 Ω Max.
13 MHz < f_nom < 20 MHz	80 Ω Max.
20 MHz ≤ f_nom < 25 MHz	60 Ω Max.
25 MHz ≤ f_nom ≤ 50 MHz	50 Ω Max.

Product name (Standard form): FA-238A ① 28.636360MHz ② 18.0 ③ +15.0-15.0 ④

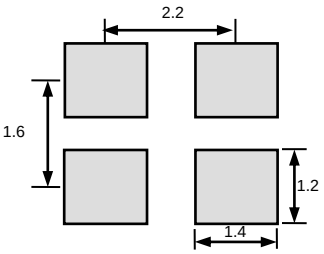
①Model ②Frequency ③Load capacitance(pF) ④Frequency tolerance(× 10^{-6}, +25 °C)

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. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (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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