

MHz RANGE CRYSTAL UNIT



Product Number (please contact us)
Q24FA20H0xxxx00

FA - 20H

- Nominal frequency range : 12 MHz to 54 MHz
- External dimensions : 2.5× 2.0×0.55 mm
- Overtone order : Fundamental
- Applications : Mobile phone, Bluetooth, W-LAN
ISM band radio, Clock for MPU



Actual size



Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks
		For RF Reference	For Clock	
Nominal frequency range	f_nom	12.000 MHz to 54.000 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 +85 °C		
Level of drive	DL	100 μW Max.	200 μW Max.	Recommended: 1 μW to 100 μW
Frequency tolerance	f_tol	±10 × 10 ⁻⁶	±30 × 10 ⁻⁶	+25 °C Please contact us for inquiries.
Frequency versus temperature characteristics	f_tem	±10 × 10 ⁻⁶	±30 × 10 ⁻⁶	-20 °C to +75 °C Please contact us for inquiries.
Load capacitance	CL	6 pF to ∞		Please specify.
Motional resistance (ESR)	R1	As per table below		-20 °C to +75 °C
Frequency aging	f_age	±1 × 10 ⁻⁶ to ±3 × 10 ⁻⁶ / year Max. *1		+25 °C, First year

*1 Please contact us for available frequency tolerances as they are dependent upon the nominal frequency.

Motional resistance (ESR)

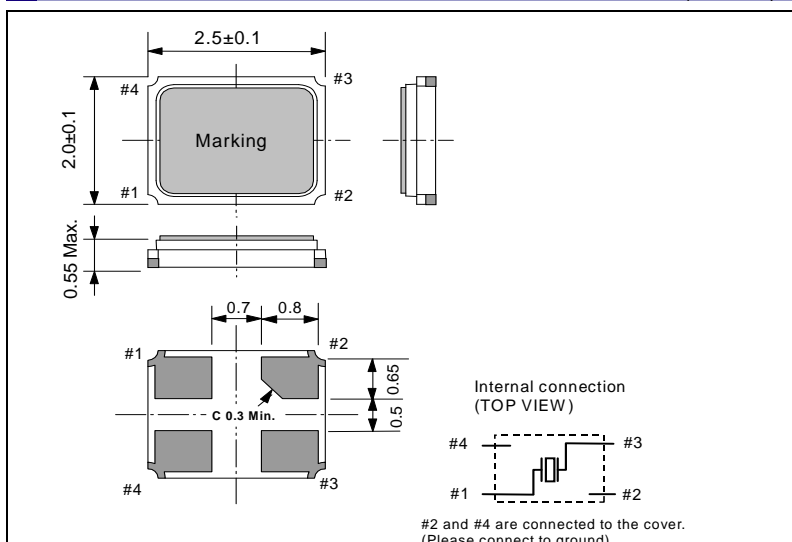
Frequency	Motional resistance
12.0 MHz ≤ f_nom < 16.0 MHz	150 Ω Max.
16.0 MHz ≤ f_nom ≤ 25.0 MHz	80 Ω Max.
25.0 MHz < f_nom ≤ 30.0 MHz	60 Ω Max.
30.0 MHz < f_nom ≤ 35.0 MHz	50 Ω Max.
35.0 MHz < f_nom ≤ 54.0 MHz	40 Ω Max.

Product name FA-20H 24.000000MHz 12.0 +10.0-10.0
(Standard form) ① ② ③ ④

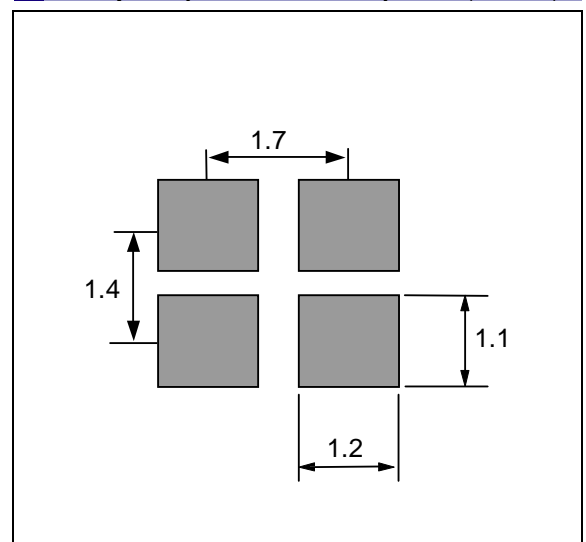
①Model ②Frequency ③Load capacitance(pF) ④Frequency tolerance(x 10⁻⁶, +25 °C)

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.

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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 ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 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.
	► 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.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc.)

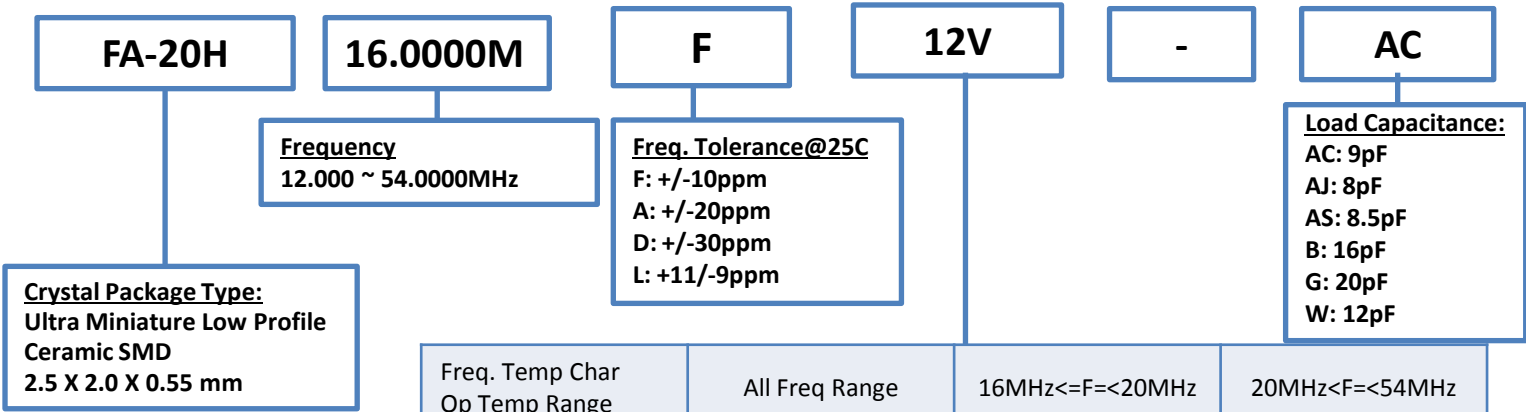
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Product Configuration System

MHz Range Crystals Units



Freq. Temp Char Op Temp Range	All Freq Range	16MHz<=F<=20MHz	20MHz<F<=54MHz
-20C to +70C	+/-20ppm = 20V	+/-12ppm = 12V	+/-10ppm = 10V
-20C to +70C	+/-30ppm = 30V	+/-12ppm = 12V	+/-10ppm = 10V
-20C to +75C	+/-20ppm = 20Z	+/-12ppm = 12Z	+/-10ppm = 10Z
-20C to +80C	+/-20ppm = 20K	+/-12ppm = 12K	+/-10ppm = 10K
-20C to +85C	+/-20ppm = 20P	+/-12ppm = 12P	+/-12ppm = 12P
-30C to +70C	+/-28ppm = 28R	+/-17ppm = 17R	+/-14ppm = 14R
-30C to +75C	+/-28ppm = 28E	+/-17ppm = 17E	+/-14ppm = 14E
-30C to +80C	+30ppm = 30W	+/-17ppm = 17W	+/-14ppm = 14W
-30C to +85C	+/-30ppm = 30Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-30C to +85C	+/-50ppm = 50Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-40C to +85C	+/-40ppm = 40X	+/-22ppm = 22X	+/-20ppm = 20X

NOTE: 81Z = +8/-10ppm / -20C to +75C

NOTES:
1) If you require frequency, tolerance, frequency characteristics over temperature and load capacitance other than the above listed, please contact your EEA representative.



Standard Frequencies

FA-20H MHz Range Crystals

Frequency [Mhz]	Freq. Tolerance@25C		Freq. vs. Temp. Char.		Load Capacitance [pF]	
	Code		Code		Code	
24	F	+/- 10ppm	10Z	+/- 10ppm / -20C to +75C	K	
24	D	+/- 30ppm	30Z	+/- 30ppm / -20C to +75C	K	
24	D	+/- 30ppm	30X	+/- 30ppm / -40C to +85C	K	
24.576	D	+/- 30ppm	10V	+/- 10ppm / -20C to +70C	W	
25	D	+/- 30ppm	30Z	+/- 30ppm / -20C to +75C	K	
25	D	+/- 30ppm	30X	+/- 30ppm / -40C to +85C	R	
26	F	+/- 10ppm	10Z	+/- 10ppm / -20C to +75C	AC	
26	F	+/- 10ppm	15Y	+/- 15ppm / -30C to +85C	AC	
27	F	+/- 10ppm	10Z	+/- 10ppm / -20C to +75C	AG	
27	F	+/- 10ppm	20X	+/- 20ppm / -40C to +85C	AC	
27	D	+/- 30ppm	30Z	+/- 30ppm / -20C to +75C	K	
27.12	D	+/- 30ppm	30Z	+/- 30ppm / -20C to +75C	K	
30	F	+/- 10ppm	20X	+/- 20ppm / -40C to +85C	W	
30	D	+/- 30ppm	30Z	+/- 30ppm / -20C to +75C	AJ	
32	F	+/- 10ppm	10Z	+/- 10ppm / -20C to +75C	W	
32	F	+/- 10ppm	20X	+/- 20ppm / -40C to +85C	K	
38.4	F	+/- 10ppm	10Z	+/- 10ppm / -20C to +75C	K	
40	F	+/- 10ppm	15Z	+/- 15ppm / -20C to +75C	AC	
40	F	+/- 10ppm	20X	+/- 20ppm / -40C to +85C	K	
48	B	+/- 50ppm	30Z	+/- 30ppm / -20C to +75C	AG	

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