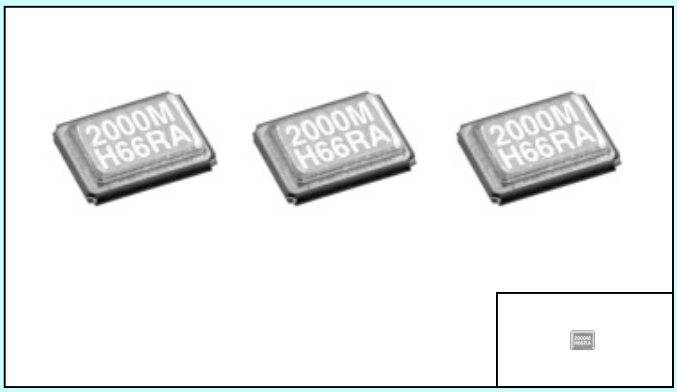
THIN SMD HIGH-STABILITY CRYSTAL UNIT

FA-23H

Product number (please contact us)
Q24FA23H0xxxx00

- •Frequency range : 16 MHz to 32 MHz
- •Thickness : 0.6 mm Typ.
- •Overtone order : Fundamental
- •Applications : Bluetooth and GSM and W – LAN (Sensitivity 26 MHz: 18 × 10^{-6}/pF·at 10 pF (Typ.))
- •Lead(Pb)-free : Complies with EU RoHS directive (Lead free completely)



Actual size

■ Specifications (characteristics)

Item		Symbol	Specifications	Remarks
Nominal frequency range		f	16.000 MHz to 32.000 MHz	Fundamental For the out of standard specifications, please contact us for inquiries.
Recommended applications			W-LAN / Bluetooth / GSM / Mobile communication device	
Temperature range	Storage temperature	T_{STG}	-40 °C to +125 °C	Stored as bare product after unpacking
	Operating temperature	T_{OPR}	-40 °C to +85 °C	Specified equivalent series must be satisfied
	Operable temperature	T_{USE}	As per below table	Specified equivalent series and frequency temperature characteristics must be satisfied.
Recommended drive level		DL	10 µW to 100 µW	
Frequency tolerance (standard)		Δf/f	±10 × 10^{-6}	T_a = +25 °C For the out of standard specifications, please contact us for inquiries.
Frequency temperature characteristics (standard)			±10 × 10^{-6} (For the out of standard specifications, please as per below table)	-20 °C to +70 °C For the out of standard specifications, please contact us for inquiries.
Load capacitance		C_L	10 pF (standard)	For the out of standard specifications, please contact us for inquiries.
Series resistance		R_1	As per below table	Operable temperature range, DL = 100 µW
Shunt capacitance		C_0	5 pF Max.	
Insulation resistance		IR	500 MΩ Min.	
Aging		fa	±1 × 10^{-6} / year Max.	T_a = +25 °C, first year

Standard frequency (MHz)											
16	16.384	17.56	18.432	19.2	19.5	19.68	19.8	20	21.06	22	
23.92	24	24.5535	24.576	25	26	27	30	32			

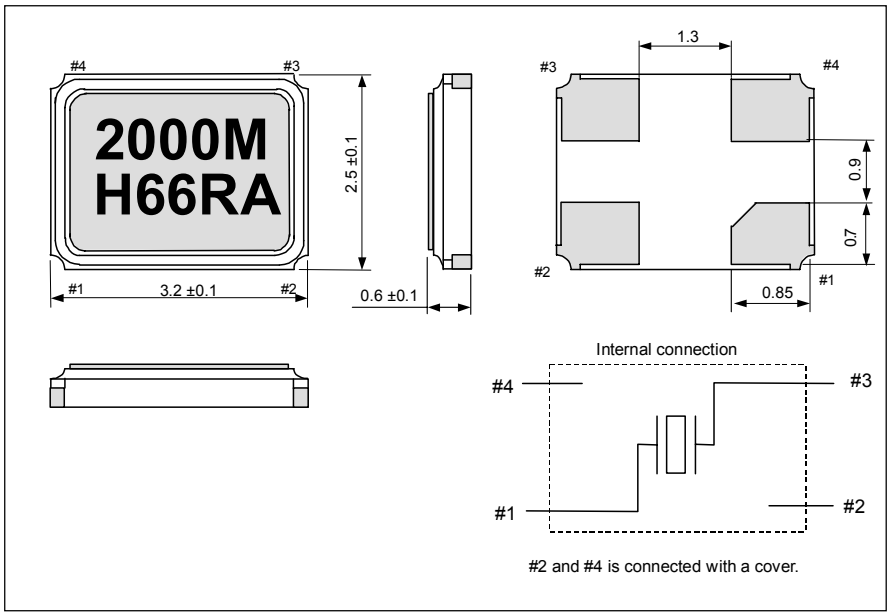
■ Frequency temperature characteristics

Operable temperature	Available Frequency tolerance
0 °C to +50 °C	Over than ± 5 × 10^{-6}
-10 °C to +60 °C	Over than ± 7 × 10^{-6}
-20 °C to +70 °C	Over than ±10 × 10^{-6}
-30 °C to +80 °C	Over than ±15 × 10^{-6}
-40 °C to +85 °C	Over than ±20 × 10^{-6}

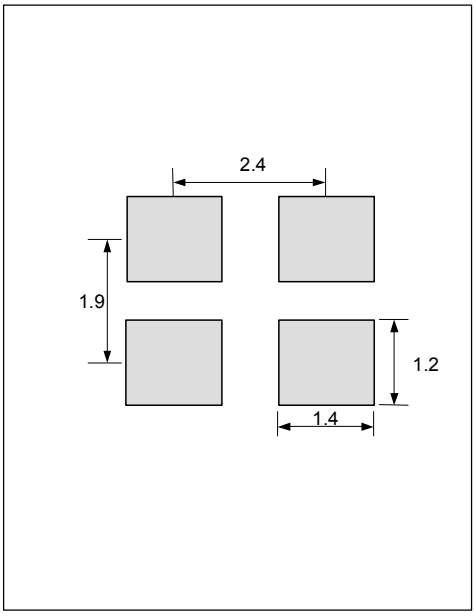
■ Series resistance (R_1)

Frequency	Series resistance
16.0 MHz ≤ f < 20.0 MHz	80 Ω Max.
20.0 MHz ≤ f < 25.0 MHz	60 Ω Max.
25.0 MHz ≤ f < 30.0 MHz	50 Ω Max.
30.0 MHz ≤ f ≤ 32.0 MHz	40 Ω Max.

■ External dimensions (Unit:mm)



■ Recommended soldering pattern (Unit:mm)



ENERGY SAVING EPSON

EPSON offers effective savings to its customers through a wide range of electronic devices, such as semiconductors, liquid crystal display (LCD) modules, and crystal devices. These savings are achieved through a sophisticated melding of three different efficiency technologies.

Power saving technology provides low power consumption at low voltages.

Space saving technology provides further reductions in product size and weight through super-precise processing and high-density assembly technology.

Time saving technology shortens the time required for design and development on the customer side and shortens delivery times.

Our concept of Energy Saving technology conserves resources by blending the essence of these three efficiency technologies. The essence of these technologies is represented in each of the products that we provide to our customers.

In the industrial sector, leading priorities include measures to counter greenhouse effect by reducing CO_2,measures to preserve the global environment, and the development of energy-efficient products. Environmental problems are of global concern, and although the contribution of energy-saving products by our customers through the utilization of our electronic devices. EPSON is committed to the conservation of energy, both for the sake of people and of the planet on which we live.

WORKING WITH ENVIRONMENTAL ISSUES

In 1988, Seiko Epson led in working to abolish CFCs, and perfect abolition of those ozone layer-destroying substances was achieved in 1992. In 1998, the 10th year of start of the CFC-free activity,Seiko Epson set this year as the "Second Environmental Benchmark Year" And established a new corporate General Environment Policy. Seiko Epson is tackling with environmental issues comprehensively.

At the end of Fiscal 1988,Seiko Epson succeeded in abolishing chloric solvents doubted to be harmful to human body. In fiscal 1999, Seiko Epson started the activity with a goal of abolishing lead solder Pointed out possibility of environmental pollutant.

Co-existence Mark

The environmental mark symbolizing Epson's basic stance of "Co-existence With Nature". The design incorporates a fish,flower,and water,representing mutually supportive co-existence.

PROMOTION OF ENVIRONMENT MANAGEMENT SYSTEM CONFORMING INTERNATIONAL STANDARD

At 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.
In May 2001, all of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.
In the future, new Group companies will be expected to acquire the certification around the third year of operations.

ISO14000 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

Seiko-Epson quickly began working to aquire company-wide ISO9000 series certification, and has acquired ISO9001 or ISO 9002 certification with all targeted products manufactured in Japanese and overseas plants.

The Quarts Device Operations Division (Ina Japan,EPM and SZE) have acquired QS-9000 certification, which are of higher Level.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S.automobile manufacturers based on the international ISO 9000 series.

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