

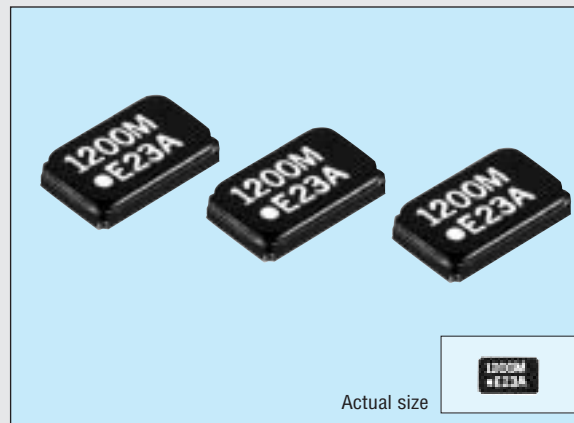
## THIN SMD HIGH-FREQUENCY CRYSTAL UNIT

## FA-248

Product number (please refer to page 1)

Q22FA248xxx00

- High-density mounting-type SMD.
- Excellent shock resistance.
- Capable of covering a wide frequency range. (from 12 MHz to 27 MHz)
- 1.0 mm Max. thickness is equal to SMD-type IC.
- Most suitable for small communication devices.



## ■ Specifications (characteristics)

Item	Symbol	Specifications	Remarks	
Nominal frequency range	f	12.000 MHz to 27.000 MHz	Fundamental mode 27 MHz < f ≤ 32 MHz Please contact us for inquiries.	
Temperature range	Storage temperature	T <sub>STG</sub>	-40 °C to +125 °C	Stored as bare product after unpacking
	Operating temperature	T <sub>OPR</sub>	-20 °C to +70 °C / -40 °C to +85 °C	Specified equivalent series must be satisfied.
	Operable temperature	T <sub>USE</sub>	As per below table	Specified equivalent series and frequency temperature characteristics must be satisfied.
Drive level	Maximum drive level	GL	2 mW Max.	Only crystal oscillation is guaranteed
	Recommended drive level	DL	10 μW to 100 μW	
Frequency tolerance	Δf/f	±10 x 10 <sup>-6</sup> , ±15 x 10 <sup>-6</sup> , ±20 x 10 <sup>-6</sup> *1	Ta=+25 °C±3 °C	
Frequency temperature characteristics		±15 x 10 <sup>-6</sup> , ±20 x 10 <sup>-6</sup> (Standard) *1 As per below table	-20 °C to +70 °C	
Load capacitance	C <sub>L</sub>	10 pF to ∞	Please specify	
Series resistance	R <sub>1</sub>	As per below table	Operable temperature range, DL=100 μW	
Shunt capacitance	C <sub>0</sub>	5.0 pF Max.		
Insulation resistance	IR	500 M Ω Min.		
Aging	fa	±2 x 10 <sup>-6</sup> /year Max.	Ta=+25 °C ±1 °C, first year	
Shock resistance	S. R.	±5 x 10 <sup>-6</sup> Max.	100 g dummy (Seiko Epson Standard) drop from 1500 mm height on to the concrete 3 directions 10 times.	

\*1 Please ask tighter tolerance.

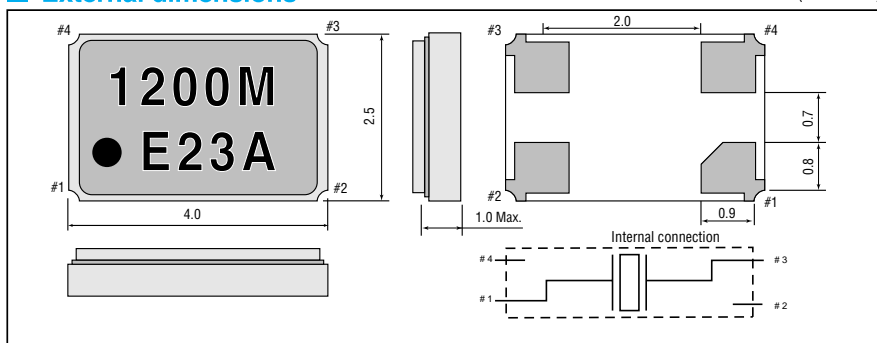
## ■ Frequency temperature characteristics

Operable temperature	Frequency tolerance
0 °C to +50 °C	±5 x 10 <sup>-6</sup> Min.
-10 °C to +60 °C	±7 x 10 <sup>-6</sup> Min.
-20 °C to +70 °C	±10 x 10 <sup>-6</sup> Min.
-30 °C to +80 °C	±15 x 10 <sup>-6</sup> Min.
-40 °C to +85 °C	±20 x 10 <sup>-6</sup> Min.

## ■ Series resistance (R1)

Frequency	Series resistance
12.0 MHz ≤ f < 13.0 MHz	70 Ω Max.
13.0 MHz ≤ f < 16.0 MHz	60 Ω Max.
16.0 MHz ≤ f < 20.0 MHz	50 Ω Max.
20.0 MHz ≤ f ≤ 27.0 MHz	40 Ω Max.

## ■ External dimensions



## ■ Recommended soldering pattern (Unit: mm)

