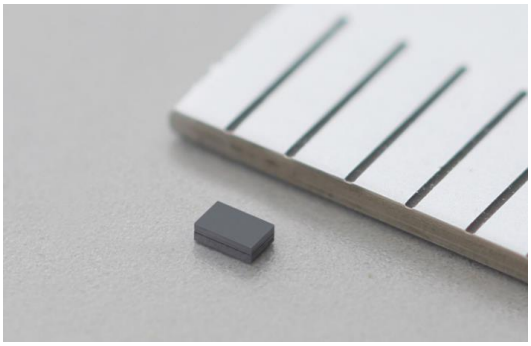
32.768kHz MEMS Resonator

RoHS Lead free

muRata INNOVATOR IN ELECTRONICS



Application

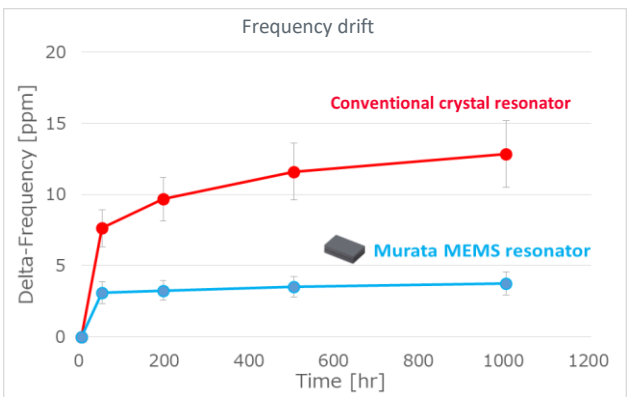
- **Small and low-profile devices**
  Ex. Wearables, Stylus pen, Wireless module, Hearing aids, Smart cards, Medical patch devices, Wireless Earphone, etc.
- **Industrial Equipment**
  Ex. Encoder, PLC (Programmable Logic Controller) FEMS (Factory Energy Management System) BEMS (Building Energy Management System), etc.
- **Lighting**
- **Embedding in ICs**
  Ex. Microcomputers, real-time clocks, etc.

Product Concept

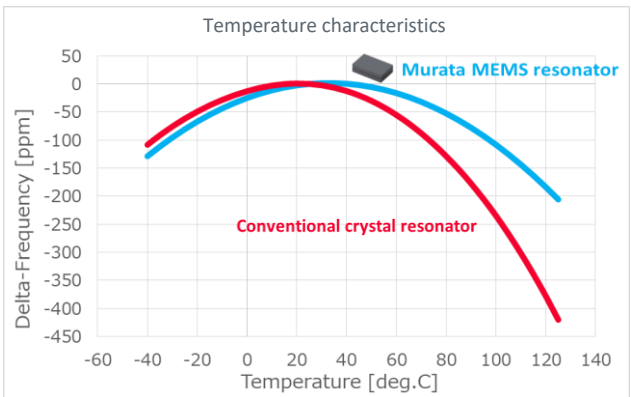
- **World's Smallest Size 0.9 x 0.6 x 0.3** (in mm)
  - Realizing 50% area saving compared with 1.2x1.0mm sized turning fork crystal.
- **High Temperature / High Reliability**
  - Available for use in high temperature applications due to the use of non organic adhesives.
- **Built-in Capacitance**
  - Space saving by reducing the external load capacitance for oscillation circuit.
- **Low ESR**
  - Lower power consumption can be realized by optimizing IC gain.

High Temperature / High Reliability

- **HAST*/PCT** Test**
  [Test condition] Temperature: 120℃, Humidity: 85%, Air pressure: 1.7atm



- **Temperature Characteristics**



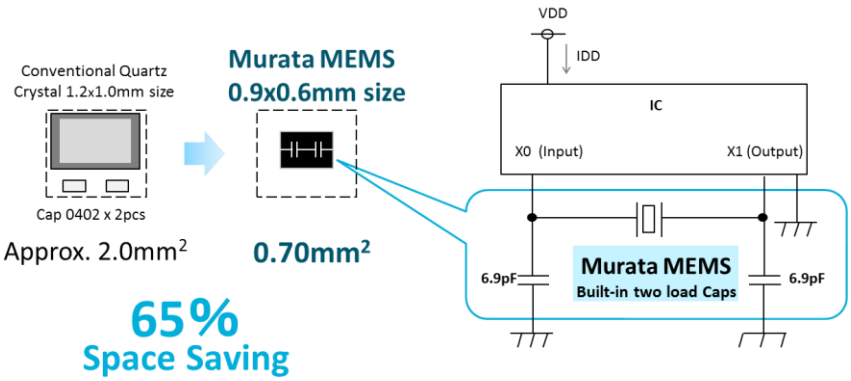
Murata MEMS exhibits stable frequency stability even under harsh environment by eliminating organic material inside the package.

Good temperature characteristics are realized by optimizing device structure and design.

*High Accelerated Stress Test
**Pressure Cooker Test

Space saving

65% space saving is achieved compared to a 1.2x1.0mm sized crystal with 0.4x0.2mm sized load capacitors.



Low power consumption

The low ESR can be utilized to lower the IC gain. This enables a reduction in the current consumption of the oscillation circuit and the power consumption of the overall design.

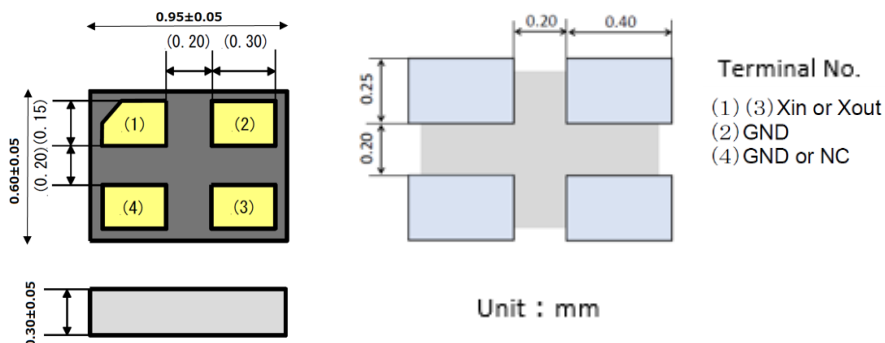
Resonator	ESR spec.	IC gain	Oscillation margin	Current Consumption
General 2012 and 1610 size crystal	**90 kΩ max.**	High	○ Good Enough	**115.6** nA
		Low	△ Not Enough	100.9 nA
Murata MEMS	**75 kΩ max.**	High	◎ Excellent	115.5 nA
		Low	○ **Good Enough**	**100.9** nA

13 % saving!

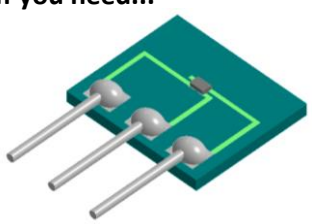
Product lineup and dimensions

Part number	Operating Temperature Range	Frequency Tolerance	Frequency Shift by Temperature	Load Capacitance*	Equivalent Series Resistance
WMRAG32K76CS1C00R0	-30 to +85° C	±20ppm	-150 to +10 ppm	8pF	75 kΩ max.
WMRAG32K76CS2C00R0	-40 to +85° C		-200 to +10 ppm		
WMRAG32K76CS3C00R0	-40 to +105° C				
WMRAG32K76CS4C00R0	-40 to +125° C		-270 to +10 ppm		

*When considering replacement from a crystal resonator, note that the load capacitance value differs for crystal resonators and MEMS resonators.



If you need...



MEMS on PCB Sample Also Available!