

Ceramic Resonators CERALOCK[®]

for **USB** Applications

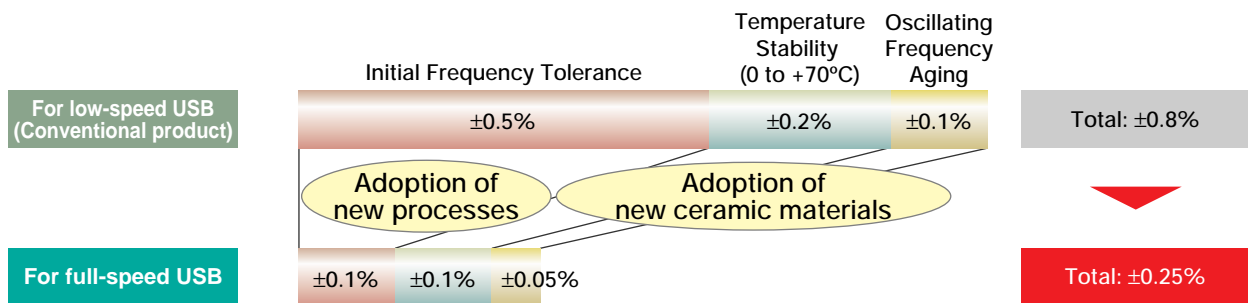


muRata *Innovator
in Electronics*

Murata
Manufacturing Co., Ltd.

Ceramic Resonators (CERALOCK®) for USB Applications

As the leading manufacturer of ceramic resonators, Murata started development for USB earlier than other manufacturers. Taking advantage of innovative proprietary design elements and manufacturing processes, Murata offers a variety of ceramic resonators for full-speed USB (12Mbps) with a total frequency tolerance of ± 2500 ppm. Murata has also succeeded in the miniaturization of ceramic resonators that surpasses competitors' models. With a comprehensive product lineup, Murata's ceramic resonators contribute to miniaturization of sets.

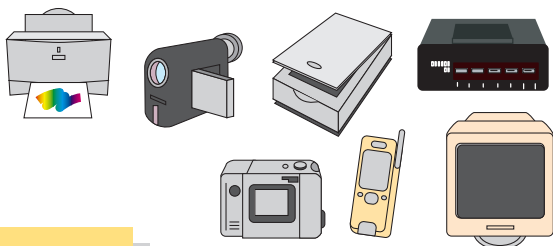


Features

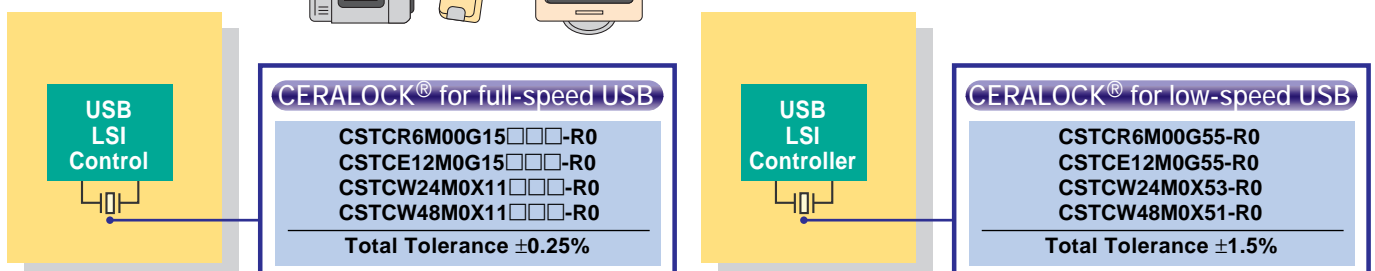
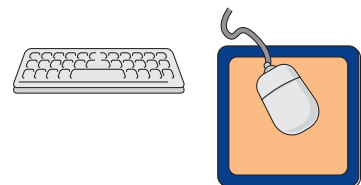
1. Taking advantage of innovative proprietary design elements and manufacturing processes, ceramic resonators provide an accuracy of ± 2500 ppm under normal operating conditions. Murata offers a variety of ceramic resonators covering all oscillation frequencies for both low-speed and full-speed USB.
2. The package size is the smallest in the industry, contributing to high-density mounting of components.
3. Since ceramic resonators are less expensive than quartz resonators, they contribute to cost reduction.
4. As ceramic resonators incorporate the load capacitors required for correct operation, the number of components can be reduced.

Applications

Full Speed USB Devices / HUB [12Mbps]







Low Speed USB Devices [1.5Mbps]







Specifications

for full-speed USB (SMD)

Part Number	Oscillating Frequency	Initial Frequency Tolerance	Resonant Impedance	Temp. Stability (0 to +70°C)	Oscillating Frequency Aging	Built-in Load Capacitance (ref.)	Appearance	Dimensions (WxLxT)*1
CSTCR6M00G15□□□-R0	6.000MHz	±0.1% max.	50Ω max.	±0.1% max. (from initial value)	±0.05% max. (from initial value)	39pF±20%		4.5x2.0x1.2mm
CSTCE12M0G15□□□-R0	12.000MHz	±0.1% max.	30Ω max.	±0.1% max. (from initial value)	±0.05% max. (from initial value)	33pF±20%		3.2x1.3x0.8mm
CSTCW24M0X11□□□-R0	24.000MHz	±0.1% max.	100Ω max.	±0.1% max. (from initial value)	±0.05% max. (from initial value)	6±2pF		2.5x2.0x1.25mm
CSTCW48M0X11□□□-R0	48.000MHz	±0.1% max.	70Ω max.	±0.1% max. (from initial value)	±0.05% max. (from initial value)	6±2pF		2.5x2.0x1.1mm

□□□ are the alphanumeric characters indicating individual specifications.

for low-speed USB (SMD*2)

Part Number	Oscillation Frequency	Initial Frequency Tolerance	Resonant Impedance	Temp. Stability (0 to +70°C)	Oscillating Frequency Aging	Built-in Load Capacitance (ref.)	Appearance	Dimensions (WxLxT)*1
CSTCR6M00G55-R0	6.000MHz	±0.5% max.	50Ω max.	±0.2% max. (from initial value)	±0.1% max. (from initial value)	39pF±20%		4.5x2.0x1.2mm
CSTCE12M0G55-R0	12.000MHz	±0.5% max.	30Ω max.	±0.2% max. (from initial value)	±0.1% max. (from initial value)	33pF±20%		3.2x1.3x0.8mm
CSTCW24M0X53-R0	24.000MHz	±0.5% max.	80Ω max.	±0.2% max. (from initial value)	±0.1% max. (from initial value)	15pF±20%		2.5x2.0x1.35mm
CSTCW48M0X51-R0	48.000MHz	±0.5% max.	50Ω max.	±0.2% max. (from initial value)	±0.1% max. (from initial value)	6±2pF		2.5x2.0x1.2mm

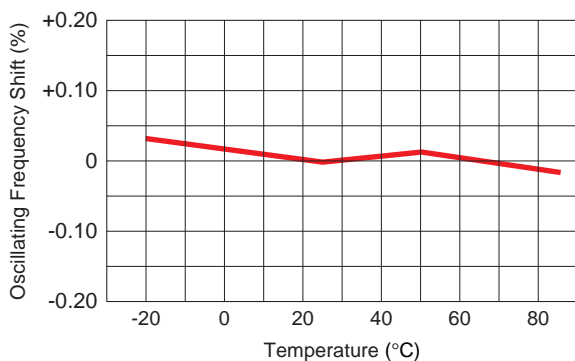
Depending on the conditions of the IC or oscillation circuit being used, an oscillation error (abnormal oscillation or oscillation stop) may occur. Before using the ceramic resonators, be sure to check the circuit conditions.

*1: The length (L) and width (W) listed in "Dimensions" are typical dimensions, and the thickness (T) is the maximum dimension.

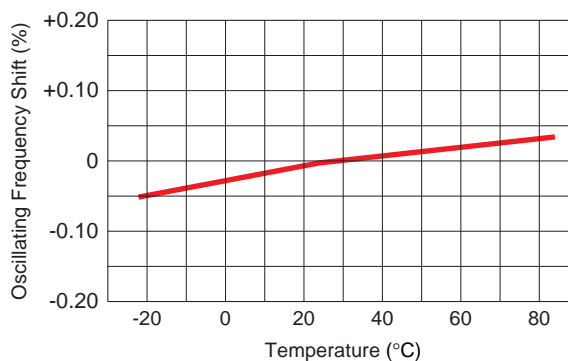
*2: In addition to the above, leaded ceramic resonators (CERALOCK®) for low-speed USB are also available. For details, contact Murata.

Temperature Characteristics of CERALOCK® for full-speed USB

CSTCE12M0G15□□□-R0



CSTCW48M0X11□□□-R0



⚠ Note:

1. Export Control

〈For customers outside Japan〉

Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

〈For customers in Japan〉

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage to a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

- | | |
|-----------------------------|---|
| ① Aircraft equipment | ② Aerospace equipment |
| ③ Undersea equipment | ④ Power plant equipment |
| ⑤ Medical equipment | ⑥ Transportation equipment (vehicles, trains, ships, etc.) |
| ⑦ Traffic signal equipment | ⑧ Disaster prevention / crime prevention equipment |
| ⑨ Data-processing equipment | ⑩ Application of similar complexity and/or reliability requirements to the applications listed in the above |

3. Product specifications in this catalog are as of September 2004. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

4. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering. Especially, please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in them to prevent smoking and/or burning, etc.

5. You are able to read a detailed specification in the website of Search Engine (<http://search.murata.co.jp/>) or catalog library (<http://www.murata.com/catalog/>) before to require our product specification or to transact the approval sheet for product specification.

6. Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7. No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

 **Murata Manufacturing Co., Ltd.**

<http://www.murata.com/>

Head Office

1-10-1, Higashi Kotari, Nagaokakyo-shi, Kyoto 617-8555, Japan Phone: 81-75-951-9111

International Division

3-29-12, Shibuya, Shibuya-ku, Tokyo 150-0002, Japan
Phone: 81-3-5469-6123 Fax: 81-3-5469-6155 E-mail: intl@murata.co.jp

Cat. No. P63E-1