



CERAMIC RESONATOR

MURATA

Ceramic Resonator CSA/CSB Series

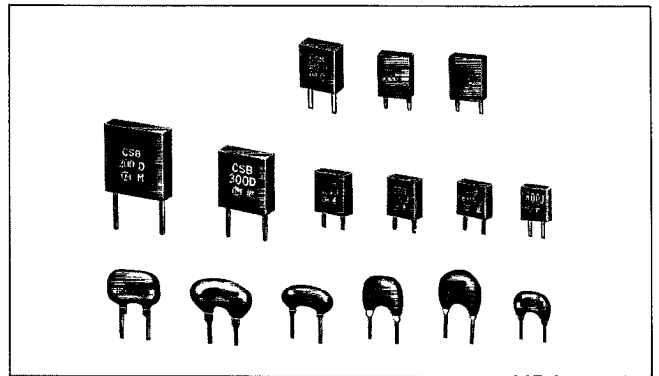
CERALOCK[®] with two leaded terminals.

The CSA and CSB series ceramic resonator owe their development to MURATA's innovative expert technologies and the application of mass production techniques typically utilized in the manufacture of piezoelectric ceramic components. Because of their high mechanical Q and consistent high quality, both the CSA and CSB series are ideally suited to microprocessor and remote control unit applications.

The CSA series is available in two types: one for MOS technology and the other for LS-TTL technology. The CSB series includes the thin and compact J type which is ideal in high-speed 4-bit microprocessor applications. In addition, MURATA offers a special CERALOCK[®] version suitable for automatic insertion utilizing tape and reel and other packaging forms. For further information, please contact your local MURATA representative office or authorized distributor.

FEATURES

1. The series is stable over a wide temperature range and with respect to long-term aging.
2. The series comprises fixed, tuned, solid-state devices.
3. The resonators are miniature and light weight.
4. They exhibit excellent shock resistance performance.
5. Oscillating circuits requiring no adjustment can be designed by utilizing these resonators in conjunction with transistors or appropriate ICs.



APPLICATIONS

1. Square-wave and sine-wave oscillator
2. Clock generator for microprocessors
3. Tone Dialers and Pulse Dialers for telephone
4. Remote control systems
5. Automotive electronics (engine control, digital speed meters, etc.)

SPECIFICATIONS

Item	Type	CSA Series (for MOS)				CSA Series (for LS-TTL)				CSB Series		
		CSA□MK	CSA□MG	CSA□MTZ	CSA□MXZ040	CSA□MK011	CSA□IMG011	CSA□MTZ011	CSA□MXZ011	Not Washable	Washable*7	
Frequency Range		1.26—1.79MHz	1.80—6.30MHz	6.31—13.0MHz	13.01—50.00MHz	1.26—1.79MHz	1.80—6.30MHz	6.31—11.9MHz	12—30MHz	375—699KHz	190—374KHz	375—1250KHz
Oscillation Frequency Initial Tolerance		±0.5%				±0.5%				±2KHz	±1KHz	±0.5%
Oscillation Frequency Temperature Stability*1		±0.3%	±0.5%	±0.3%		±0.3%				±0.3%		
Aging*2		±0.3%	±0.5%	±0.3%		±0.3%	±0.5%	±0.3%		±0.5%		
Oscillation Frequency Measuring Circuit		<p>IC : $\frac{1}{8}$CD4069UBEX2*5 V_{DD} : 5V (MTZ Series : 12V) X : CERALOCK[®] C₁, C₂ : 30pF*6</p>				<p>IC : $\frac{1}{8}$SN74LS04X2 V_{CC} : 5V (Supply Voltage) X : CERALOCK[®] C₁, C₂ : Load Capacitors*3 R_f : 2.2—4.7Ω R_b : 2.2—22KΩ</p>				<p>IC : $\frac{1}{8}$CD4069UBEX2 V_{DD} : 5V X : CERALOCK[®] C₁, C₂ : Load Capacitors*3 R_d : 5.6KΩ*4</p>		

*1. at -20°C—+80°C

*2. For 10 years at room temperature.

*3. Values vary according to frequency. Please contact us for details.

*4. 700—1250KHz (J Type) only.

*5. TC74HCU04 is used as the standard circuit for the MXZ040 series. Please contact us for details.

*6. For the MXZ040 series, the value changes according to frequency.

*7. Washing the resonator is allowed. However, temperature, time and other washing conditions should be evaluated to confirm that stable electrical characteristics are maintained.



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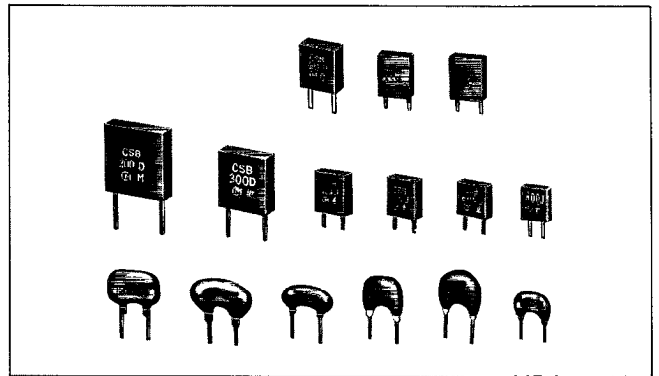
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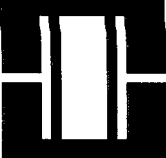
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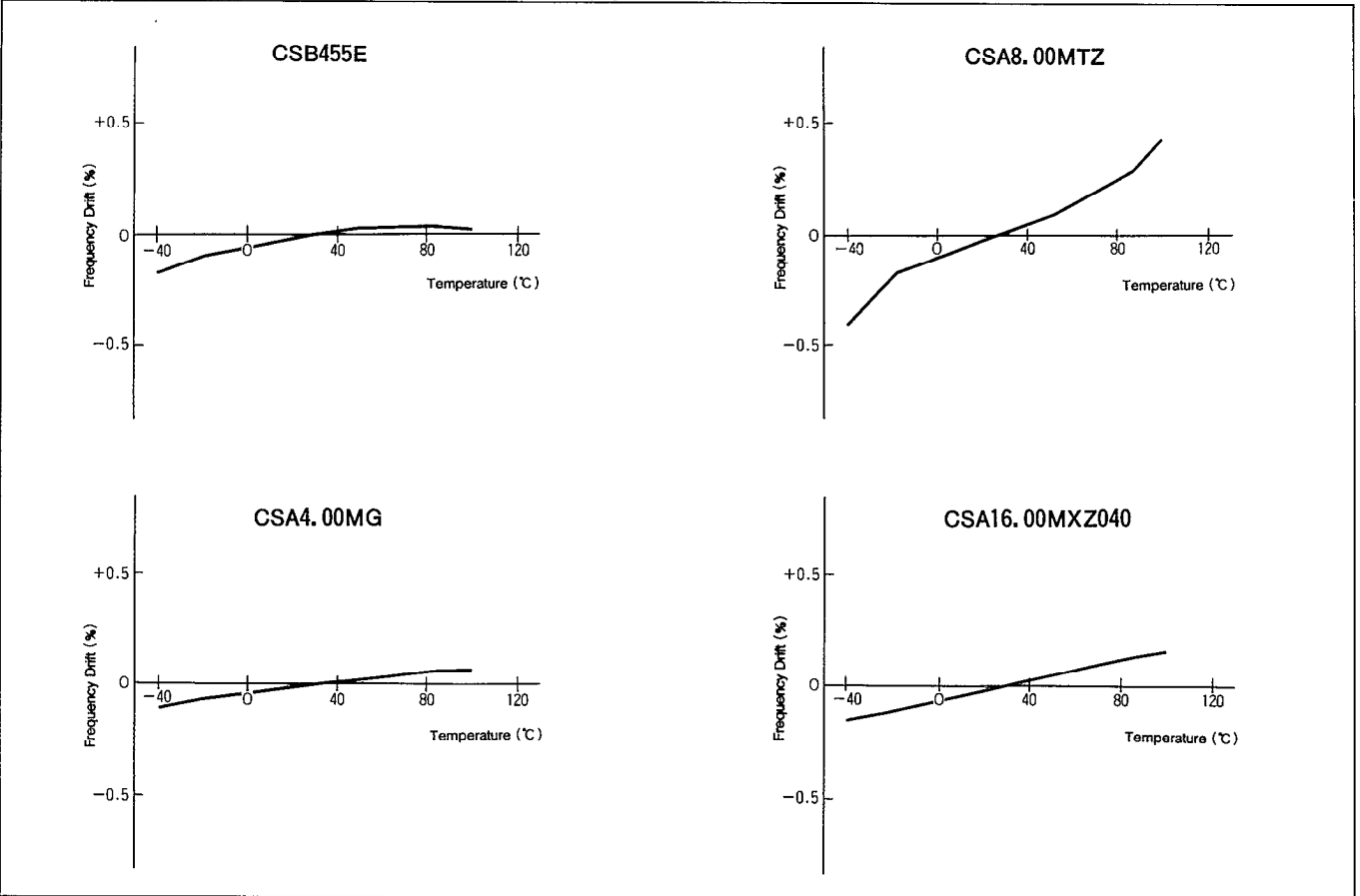


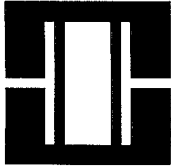
CERAMIC RESONATOR

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Ceramic Resonator CSA/CSB Series

THE STABILITY OF OSCILLATION FREQUENCY WITH TEMPERATURE VARIATION





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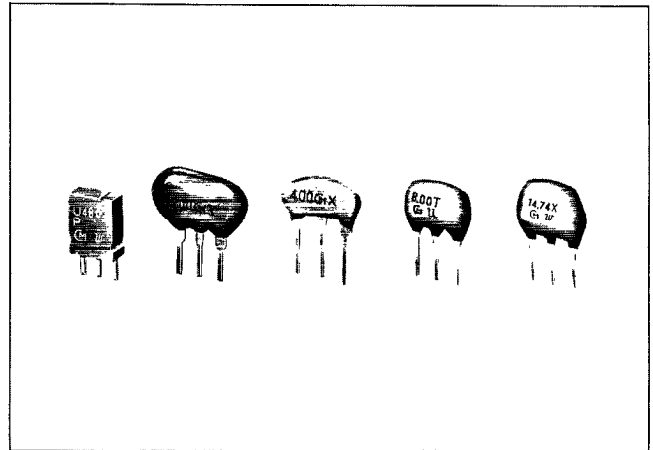
Ceramic Resonator CSU/CST Series

CERALOCK[®] with built in loading capacitors.

MURATA's ceramic resonator, CERALOCK[®], has been widely applied as the most suitable component for clock oscillators in a broad range of microprocessors. The CSU series (KHz band) and CST series (MHz band) can be used in the design of oscillation circuits not requiring external load capacitors, enabling both high-density mounting and cost reduction.

FEATURES

1. Oscillation circuits do not require external load capacitors.
2. The series is stable over a wide temperature range.
3. The resonators are compact, light weight and exhibit superior shock resistance performance.
4. They enable the design of oscillator circuits requiring no adjustment.
5. The series is inexpensive and available in stable supply.



APPLICATIONS

1. DTMF generators • Remote control units
2. Clock oscillators for microcomputers
3. Automated office equipment • Automotive electronics

SPECIFICATIONS

Item \ Type	CSU Series	CST Series			
		CST□MG	CST□MGW	CST□MTW	CST□MXW040
Frequency Range	450—500KHz	1.80—2.44MHz	2.45—6.30MHz	6.31—13.0MHz	13.01—25.99MHz
Oscillation Frequency Initial Tolerance	±2KHz	±0.5%	±0.5%	±0.5%	±0.5%
Oscillation Frequency Temp. Stability ^{*1}	±0.3%	±0.3%	±0.3%	±0.4%	±0.3%
Aging ^{*2}	±0.5%	±0.3%	±0.3%	±0.3%	±0.3%
Oscillation Frequency Test circuit	<p>IC : $\frac{1}{2}$CD4069UBEX2 V_{DD} : 5V X : CERALOCK[®]</p>	<p>IC : $\frac{1}{2}$CD4069UBEX2^{*3} V_{DD} : 5V (MTW : 12V) X : CERALOCK[®]</p>			

*1 -20°C—+80°C (Temp. Condition)

*2 Room Temp., 10 years.

*3 MXW040 Series are used with the TC74HCU04 IC.

*4 Input terminal (1) should be connected to the input of an inverter.

*5 If connected with incorrect orientation, the above specification may not be guaranteed.



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Ceramic Resonator CSU/CST Series

DIMENSIONS

Frequency	450—500KHz	1.80—2.44MHz	2.45—6.30MHz	6.31—13.0MHz	13.01—25.99MHz
Part number	CSU□P	CST□MG	CST□MGW	CST□MTW	CST□MXW040
Dimensions (Unit : mm)					

- ※1. 6.01—7.99MHz, 9.0mm max.
- ※2. 13.01—14.99MHz, 9.0mm max.
- ※3. Terminals have directionality : ①Input ②Ground ③Output
- ※4. The CSU□P is not washable.

THE STABILITY OF OSCILLATION FREQUENCY WITH TEMPERATURE VARIATION

