5.0 max

# Ceramic Resonators(CERALOCK<sup>®</sup>)

# <u>muRa</u>ta

# Lead Type Three-Terminals CSTLA/CSTLS Series

"CERALOCK" with built-in load 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 CSTLS series (MHz band) and CSTLA 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

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- 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.
- 6. There are some variation of built-in capacitance value to apply various of IC.

#### Applications

- DTMF generators.
- · Clock oscillators for microcomputers.
- Automotive electronics. (Suffixed "A" ex. CSTLS G A)
- Remote control units.
- · Automated office equipment.





10.0 max



CSTLA\_T 10.01-13.00MHz





CSTLA X

\* 13.01 to 14.99MHz : 9.0max \* : EIAJ Code (in mm)

13.01-15.99MHz







CSTLS X 16.00-70.00MHz

(in mm)





CSTLS G 3.40-10.00MHz





3.0±1.0

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Part Number	Oscillating Frequency (MHz)	Initial Tolerance (%)	Temp.Stability (%)	Temperature Range (°C)	Aging (10 years) (%)	Use
CSTLA_T	10.01 to 13.00	±0.5	±0.4	-20 to 80	±0.3	-
CSTLA_X	13.01 to 15.99	±0.5	±0.3	-20 to 80	±0.3	-
CSTLS_X	16.00 to 70.00	±0.5	±0.2	-20 to 80	±0.2	-
CSTLS_G	2.00 to 3.39	±0.5	±0.2	-20 to 80	±0.2	-
CSTLS_G	3.40 to 10.00	±0.5	±0.2	-20 to 80	±0.2	-

Irregular or stop oscillation may occur under unmatched circuit conditions. Please check the actual conditions prior to use.

The order quantity should be an integral multiple of the Minimum Quantity shown in the packaging page.

### ■ Oscillation Frequency Measuring Circuit



#### ■ Oscillation Frequency Temperature Stability











Part Numbering (The structure of the "Global Part Numbers" that have been adopted since June 2001 and the meaning of each code are described herein.)

CERALOCK <sup>®</sup> (MHz)
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(Global Part Number)	CS	T	C۷	16M0	X53	***	-R0
	0	2	8	4	6	6	0
Product ID							

Product ID	
CS	Ceramic Resontors

#### Prequency/Capacitance

Code	Frequency/Capacitance
Α	MHz No capacitance built-in
т	MHz Built-in Capacitance

#### 3Structure/Size

Code	Structure/Size
LA	Lead Type
LS	Round Lead Type
СС	Cap Chip Type
CR	Small-cap Chip Type
CV	Monolithic Chip Type
CW	Small Monolithic Chip Type

**4**Nominal Center Frequency

Expressed by four-digit alphanumerics. The unit is in hertz (Hz). A decimal point is expressed by the capital letter " ${\bf M}$ ".

#### Design

Code	Design
G	Thickness Shear Vibration
T	Thickness Longitudinal Vibration
X	Thickness Longitudinal Vibration(3rd overtone)

 $\Box\Box$  indicates initial frequency tolerance and load capacity.

### CERALOCK<sup>®</sup> (kHz)

(Global Part Number) CS B FB

1Product ID

Product ID	
CS	Ceramic Resontors

1M00

J58

#### ②Frequency/Capacitance

Code	Frequency/Capacitance
В	kHz No capacitance built-in

#### 3Structure/Size

Code	Structure/Size
LA	Two-Terminal Lead Type
FB	SMD Type

#### One of the second se

Expressed by four-digit alphanumerics. The unit is in hertz (Hz). If the unit is "kHz", it is expressed by three figures plus "K". If the unit is "MHz", a decimal point is expressed by the capital letter "M".

#### 6 Individual Specification

Code	Individual Specification
***	Three-digit alphanumerics express "Individual Specification".

With standard products, "Individual Specification" is omitted, and Dackage Specification Code" is carried up.

#### Packaging

Code	Packaging
-В0	Bulk
-A0	Radial Taping H <sub>0</sub> =18mm
-A1	Radial Taping H <sub>0</sub> =16mm
-R0	Plastic Taping ø=180mm
-R1	Plastic Taping ø=330mm

Radial taping is applied to lead type and plastic taping to chip type.

#### 5 Design

-R1

Code	Design					
E	Area Shear Vibration					
J	Area Shear Vibration (Closed Type)					

□□ indicates initial frequency tolerance and load capacity.

#### 6 Individual Specification

Code	Individual Specification			
***	Three-digit alphanumerics express "Individual Specification".			

With standard products, "③Individual Specification" is omitted, and "④Package Specification Code" is carried up.

#### Packaging

Code	Packaging			
-В0	Bulk			
-R1	Plastic Taping ø=330mm			



# MHz Lead type Notice

#### Notice (Soldering and Mounting)

CSTLA\_T/CSTLA\_X/CSALA\_T/CSALA\_X (1)Cleaning Solvent

HCFC, Isopropanol, Tap water, Demineralized water, Cleanthrough750H, Pine alpha 100S, Techno care FRW (2)Condition

- 1. Ultrasonic Wash
- 1 minute max. in above solvent at +60°C max. (Frequency:28kHz. Output:20W/L)
- 2. Immersion Wash
- 5 minutes max. in above solvent at +60°C max.
- 3. Shower or Rinse Wash5 minutes max. in above solvent at +60°C max.

#### ■ Notice (Soldering and Mounting)

### CSTLS\_G/CSTLS\_X/CSALS\_X

The component cannot be withstand washing.

# Notice (Storage and Operating Conditions)

CSTLA\_T/CSTLA\_X/CSALA\_T/CSALA\_X

Please do not apply excess mechanical stress to the component and lead terminals at soldering. Conformal coating of the component is acceptable. However, the resin material, curing temperature, and other process conditions should be evaluated to confirm stable electrical characteristics are maintained.

#### ■ Notice (Storage and Operating Conditions) CSTLS G/CSTLS X/CSALS X

Please do not apply excess mechanical stress to the component and lead terminals at soldering. Conformal coating or washing to the component is not acceptable. Because it is not hermetically sealed.

#### ■ Notice (Rating)

The component may be damaged if excess mechanical stress is applied.

#### ■ Notice (Handling)

"CERLOCK" may stop oscillating or oscillate irregularly under improper circuit conditions.

#### (3)Drying

5 minutes max. by air blow at +80°C max.

#### (4)Others

- 1. In case of immersing in cleaning solvent, the temperature of component must be returned to room temperature after soldering
- 2. Total washing time should be within 10 minutes.
- 3. Please insure the component is thoroughly evaluated in your application circuit.
- 4. The component may be damaged if it is washed with chlorine, pertroleum or alkali cleaning solvent.



(pcs.)

# MHz Lead Type CSTLA/CSTLS Series Packaging

### ■ CSTLA/CSTLS Series Minimum Quantity

Part Number	Ammo Pack	Bulk
CSTLA_T (10.01 to 13.00MHz)	1,000	500
CSTLA_X (13.01 to 15.99MHz)	1,000	500
CSTLS_X (16.00 to 70.00MHz)	2,000	500
CSTLS_G (2.00 to 3.39MHz)	1,500	500
CSTLS_G (3.40 to 10.0MHz)	2,000	500

The order quantity should be an integral multiple of the "Minimum Quantity" shown above.

### ■ Tape Dimensions of CSTLA\_T



Item	Code	Dimensions	Tolerance	Remarks
Width of diameter	D	10.0 max.	-	
Height of resonator	А	8.0 max.	-	
Dimensions of terminal	D1×t1	0.5×0.3	±0.1	
Lead length under the hold down tape	L1	3.0 min.	-	
Pitch of component	Р	12.7	±0.5	Tolerance for pitches 10xP0=127±1
Pitch of sprocket hole	P0	12.7	±0.2	
Length from sprocket hole center to lead	<b>P</b> 1	3.85	±0.5	
Length from sprocket hole center to	Do	6.25	±0 5	
component center	F2	0.35	±0.5	
Lead spacing (I)	F1	2.5	±0.2	
Lead spacing (II)	F2	2.5	±0.2	
Slant to the forward or backward	Δh	0	±1.0	1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	Wo	6.0 min.	-	Hold down tape doesn't exceed the carrier tape.
Position of sprocket hole	W1	9.0	±0.5	
Gap of hold down tape and carrier tape	W2	0	+0.5 -0	
Distance between the center of	Цо	40.0	10.5	
sprocket hole and lead stopper	по	10.0	±0.5	
Total heigth of resonator	H1	26.5 max.	-	
Diameter of sprocket hole	D0	ø4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Body tilt	ΔS	0	±1.0	

(in mm)



Continued from the preceding page.

# ■ Tape Dimensions of CSTLA\_X



Item	Code	Dimensions	Tolerance	Remarks
Width of diameter	D	10.0 max.	-	
Height of resonator	А	8.0 max.	-	13.01 to 14.99MHz : 9.0 max.
Dimensions of terminal	D1×t1	0.5×0.3	±0.1	
Lead length under the hold down tape	L1	3.0 min.	-	
Pitch of component	Р	12.7	±0.5	Tolerance for pitches 10xP0=127±1
Pitch of sprocket hole	P0	12.7	±0.2	
Length from sprocket hole center to lead	P1	3.85	±0.5	
Length from sprocket hole center to	Da	0.05	10.5	
component center	P2	0.30	±0.5	
Lead spacing (I)	F1	2.5	±0.2	
Lead spacing (II)	F2	2.5	±0.2	
Slant to the forward or backward	Δh	0	±1.0	1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	Wo	6.0 min.	-	Hold down tape doesn't exceed the carrier tape.
Position of sprocket hole	W1	9.0	±0.5	
Gap of hold down tape and carrier tape	W2	0	+0.5	
Distance between the center of		10.0	10.5	
sprocket hole and lead stopper	H0	18.0	±0.5	
Total heigth of resonator	H1	26.5 max.	-	13.01 to 14.99MHz : 27.5 max.
Diameter of sprocket hole	D0	ø4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Body tilt	ΔS	0	±1.0	

(in mm)

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#### ■ Tape Dimensions of CSTLS\_X



Item	Code	Dimensions	Tolerance	Remarks
Width of diameter	D	5.5	±1.0	
Height of resonator	А	6.5	±0.5	
Dimensions of terminal	d	ø0.48	±0.05	
Lead length under the hold down tape	L1	5.0 min.	_	
Pitch of component	Р	12.7	±0.5	Tolerance for Pitches 10xP0=127±1
Pitch of sprocket hole	P0	12.7	±0.2	
Length from sprocket hole center to lead	<b>P</b> 1	3.85	±0.5	
Length from sprocket hole center to	Do	6.25	10.5	
component center	P2	0.35	±0.5	
Lead spacing (I)	F1	2.5	±0.2	
Lead spacing (II)	F2	2.5	±0.2	
Slant to the forward or backward	Δh	0	±1.0	1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	Wo	6.0 min.	_	Hold down tape doesn't exceed the carrier tape.
Position of sprocket hole	W1	9.0	±0.5	
Gap of hold down tape and carrier tape	W2	0	+0.5 -0.0	
Distance between the center of	11.	(0.0		
sprocket hole and lead stopper	H0	18.0	±0.5	
Total heigth of resonator	H1	24.5	±0.1	
Diameter of sprocket hole	D0	ø4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Body tilt	ΔS	0	±1.0	

(in mm)



#### Continued from the preceding page.

# ■ Tape Dimensions of CSTLS\_G (2.00 to 3.39MHz)



Item	Code	Dimensions	Tolerance	Remarks
Width of diameter	D	9.0	±1.0	
Height of resonator	А	5.5	±0.5	
Dimensions of terminal	d	ø0.48	±0.05	
Lead length under the hold down tape	L1	5.0 min.	-	
Pitch of component	Р	12.7	±0.5	Tolerance for Pitches 10xP0=127±1
Pitch of sprocket hole	P0	12.7	±0.2	
Length from sprocket hole center to lead	<b>P</b> 1	3.85	±0.5	
Length from sprocket hole center to	Da	0.05	10.5	
component center	F2	0.35	±0.5	
Lead spacing (I)	F1	2.5	±0.2	
Lead spacing (II)	F2	2.5	±0.2	
Slant to the forward or backward	Δh	0	±1.0	1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	Wo	6.0 min.	-	Hold down tape doesn't exceed the carrier tape.
Position of sprocket hole	W1	9.0	±0.5	
Gap of hold down tape and carrier tape	W2	0	+0.5 -0	
Distance between the center of	115	40.0	10.5	
sprocket hole and lead stopper	H0	18.0	±0.5	
Total heigth of resonator	H1	23.5	±0.1	
Diameter of sprocket hole	D0	ø4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Body tilt	ΔS	0	±1.0	

(in mm)

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#### Continued from the preceding page.

# ■ Tape Dimensions of CSTLS\_G (3.40 to 10.00MHz)



Item	Code	Dimensions	Tolerance	Remarks
Width of diameter	D	8.0	±1.0	
Height of resonator	А	5.5	±0.5	
Dimensions of terminal	d	ø0.48	±0.05	
Lead length under the hold down tape	L1	5.0 min.	_	
Pitch of component	Р	12.7	±0.5	Tolerance for Pitches 10xP0=127±1
Pitch of sprocket hole	P0	12.7	±0.2	
Length from sprocket hole center to lead	P1	3.85	±0.5	
Length from sprocket hole center to	Da	0.05	10.5	
component center	P2	0.30	±0.5	
Lead spacing (I)	F1	2.5	±0.2	
Lead spacing (II)	F2	2.5	±0.2	
Slant to the forward or backward	Δh	0	±1.0	1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	Wo	6.0 min.	_	Hold down tape does not exceed the carrier tape.
Position of sprocket hole	W1	9.0	±0.5	
Gap of hold down tape and carrier tape	W2	0	+0.5 -0	
Distance between the center of	11.	40.0	10.5	
sprocket hole and lead stopper	H0	18.0	±0.5	
Total heigth of resonator	H1	23.5	±1.0	
Diameter of sprocket hole	D0	ø4.0	±0.2	
Total tape thickness	t	0.6	±0.2	
Body tilt	ΔS	0	±1.0	

(in mm)



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### ■ TMP87CM40AN(TOSHIBA)

8-bit Microcomputer



#### ■ uPD78018F(NEC)

8-bit Microcomputer



#### ■ MC68HC908JB8(MOTOROLA)



■ HD64F3337(HITACHI)

8-bit Microcomputer



#### ■ ML66517(OKI)

8-bit Microcomputer



#### ■ M38039MF(MITSUBISHI)

8-bit Microcomputer



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## ■ M34280M1(MITSUBISHI)

Remote Control Unit



# ■ uPD754304(NEC)

4-bit Microcomputer



#### ■ uPD65(NEC)



### ■ LC651154F(SANYO)

4-bit Microcomputer



### ■ LC7367JM(SANYO)

Tone/Pulse Dialer



## ML7005MB(OKI)

Tone/Pulse Dialer





C1=22pF

C2=22pF

T

H : 1,30,44,58,67,76,85,89 L : 2,29,45,56,62,72,88,93,94

Digital Signal Processing IC for CD

IC : CXD2598Q

CSTCV16M9X54J-R0

Continued from the preceding page.

#### ■ uPD70F3102GJ(NEC)

32-bit Microcomputer



#### ■ LC895299(SANYO)



# ■ TMP47C660AN(TOSHIBA)

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■ CXD2598Q(SONY)

VDD (+5V)

4-bit Microcomputer



#### ■ TA8690AN(TOSHIBA)

TV Horizontal/Compatible with Synthesizer Circuit



CERALOCK®: CSBLA503KEZZF46-B0

#### ■ LA3410(SANYO)

FM Stereo MPX





Continued from the preceding page.

# ■ TEA2130(THOMSON)

TV Horizontal/Compatible with Synthesizer Circuit



■ LA7687(SANYO)

TV Horizontal/Compatible with Synthesizer Circuit



#### Oscillation Circuit Incorporationg Transistor



