

Ceramic Resonators (CERALOCK®)



MHz Chip Type -Standard Frequency Tolerance for Automotive-

2

Chip type CERALOCK(R) with built-in load capacitors in an extremely small package provides high accuracy. MURATA's frequency adjustment and package technology expertise has enabled the development of the chip CERALOCK(R) with built-in load capacitors. Chip CERALOCK(R) for automotive has achieved importance in the worldwide automotive market. This diverse series owes its development to MURATA's original mass production techniques and high reliability.

■ Features

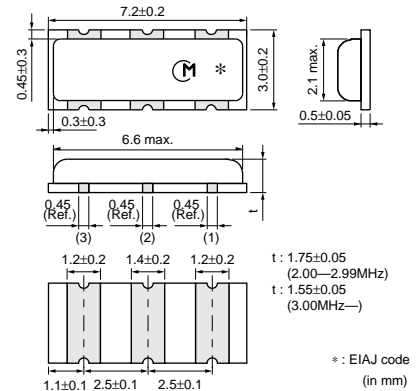
1. The series has high reliability and is available for wide temperature range.
2. Oscillation circuits do not require external load capacitors.
3. The series is available in a wide frequency range.
4. The resonators are extremely small and have a low profile.
5. No adjustment is necessary for oscillation circuits.

■ Applications

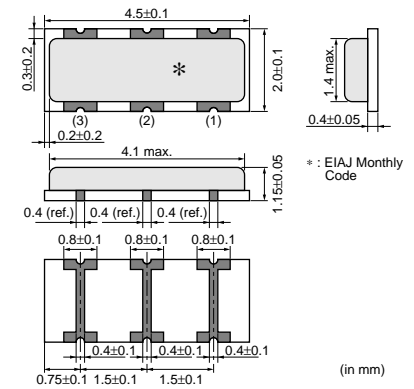
1. Cluster panel and Control panel
2. Safety control
(Anti-lock Brake System, Electronic Stability Control, Airbag, etc.)
3. Engine ECU, Electronic Power Steering, Immobilizer, etc.
4. Car Air-conditioner, Power Window, Remote Keyless Entry system, etc.
5. Electronic Toll Collection system, Car Navigation, etc.



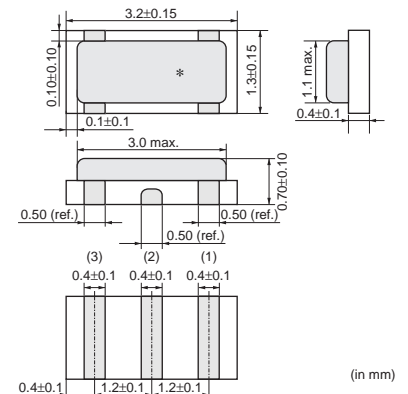
CSTCC_G_A
2.00-3.99MHz



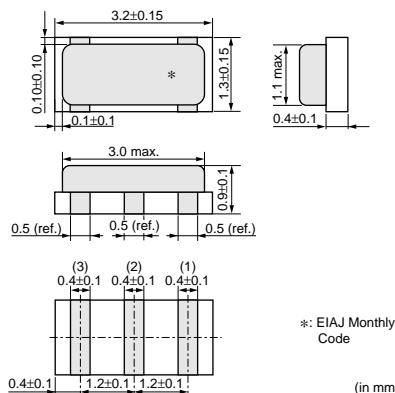
CSTCR_G_B
4.00-7.99MHz



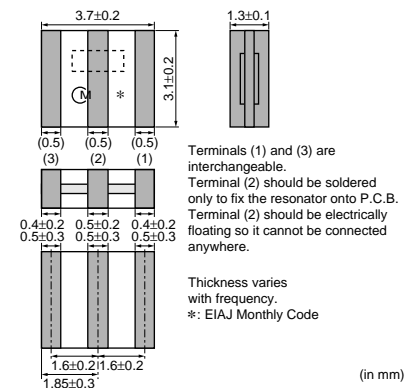
CSTCE_G_A
8.00-13.99MHz



CSTCE_V_C
14.00-20.00MHz

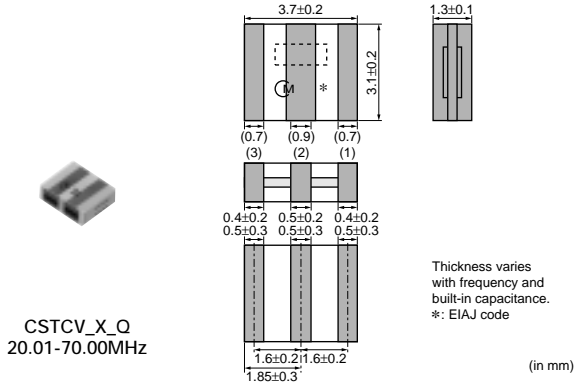


CSACV_X_Q
20.01-70.00MHz



Continued on the following page. ↗

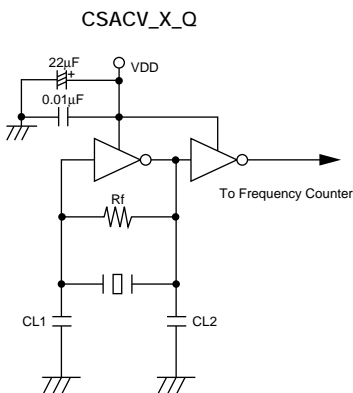
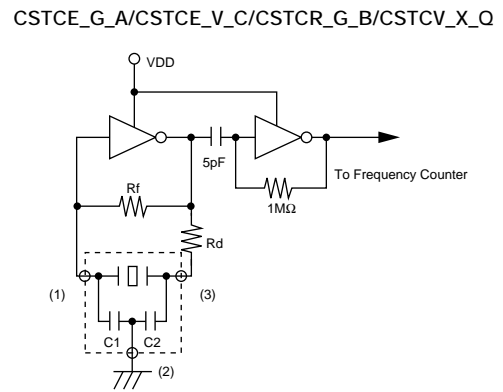
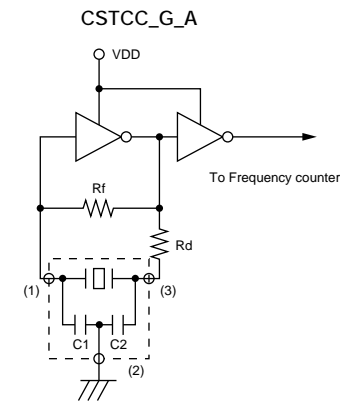
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Part Number	Oscillating Frequency (MHz)	Initial Tolerance	Temp. Stability (%)	Temperature Range (°C)
CSTCC_G_A	2.00 to 3.99	±0.5%	±0.4 [-0.6% to +0.3%: Built-in Capacitance 47pF type within Freq.2.00 to 3.49MHz]	-40 to 125
CSTCR_G_B	4.00 to 7.99	±0.5%	±0.15	-40 to 125
CSTCE_G_A	8.00 to 13.99	±0.5%	±0.2	-40 to 125
CSTCE_V_C	14.00 to 20.00	±0.5%	±0.15	-40 to 125
CSACV_X_Q	20.01 to 70.00	±0.5%	±0.3	-40 to 125
CSTCV_X_Q	20.01 to 70.00	±0.5%	±0.3	-40 to 125

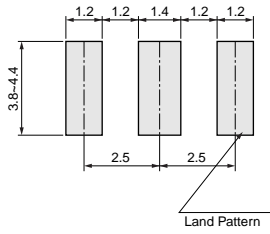
Irregular or stop oscillation may occur under unmatched circuit conditions. Please check the actual conditions prior to use.

■ Oscillation Frequency Measuring Circuit



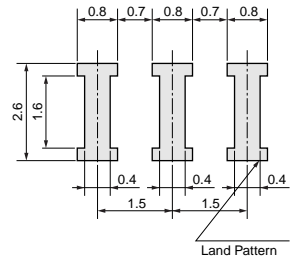
Standard Land Pattern Dimensions

CSTCC_G_A



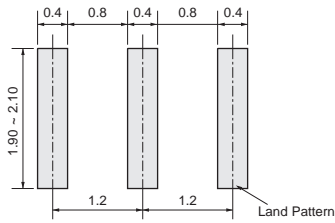
(in mm)

CSTCR_G_B



(in mm)

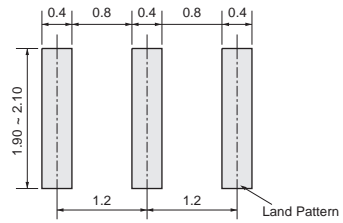
CSTCE_G_A



(in mm)

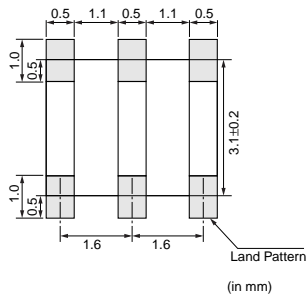
CSTCE_V_C

(* This Land Pattern is not common to CSTCE_V.)



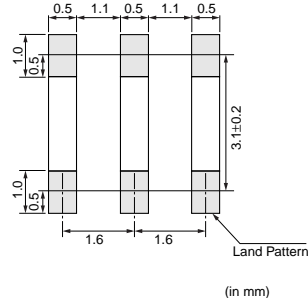
(in mm)

CSTCV_X_Q



(in mm)

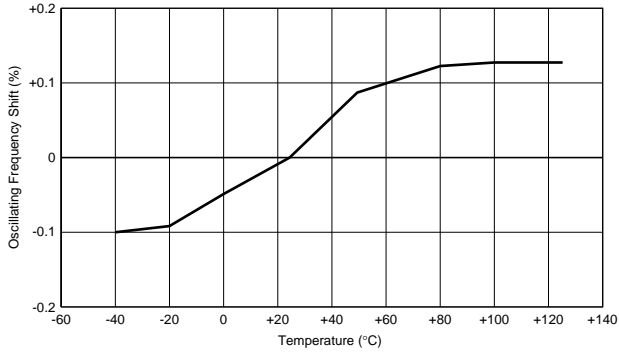
CSACV_X_Q



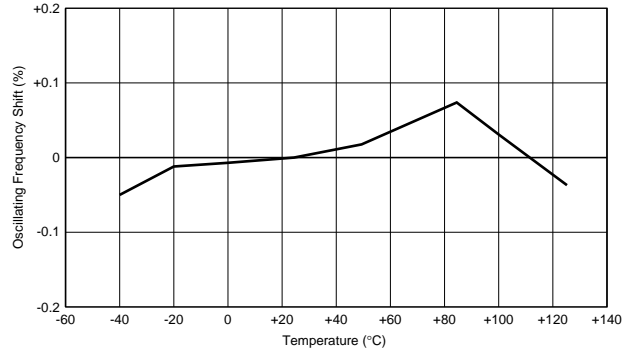
(in mm)

■ Oscillation Frequency Temperature Stability

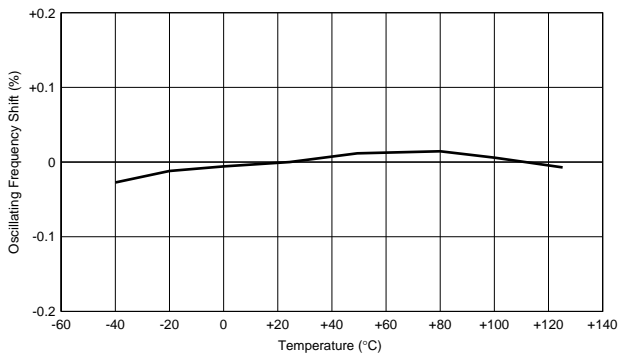
CSTCC_G_A



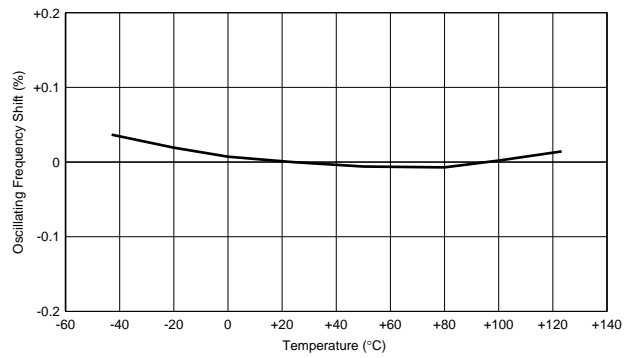
CSTCR_G_B



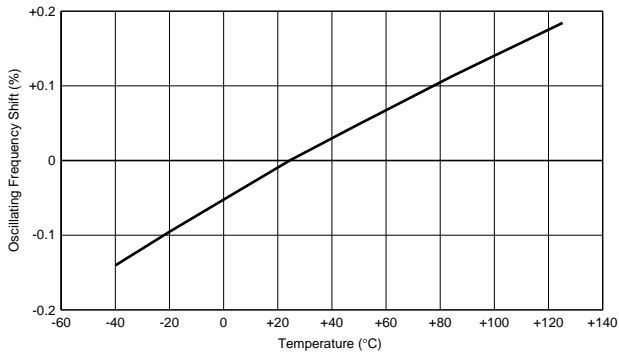
CSTCE_G_A



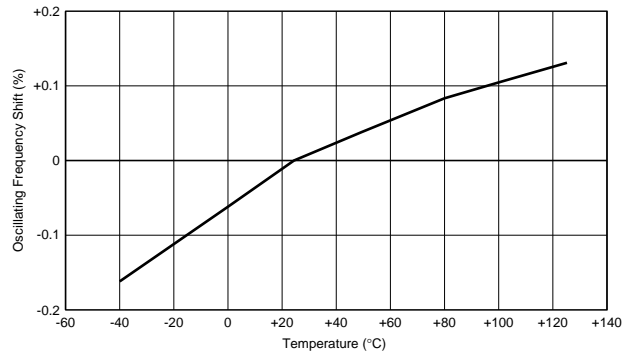
CSTCE_V_C



CSTCV_X_Q



CSACV_X_Q

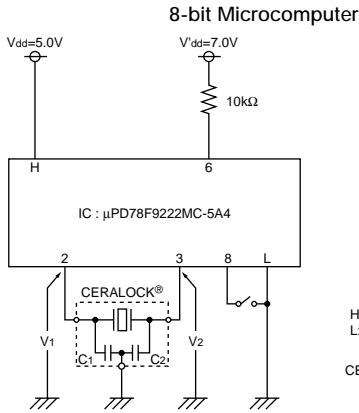


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Application Circuits Utilization

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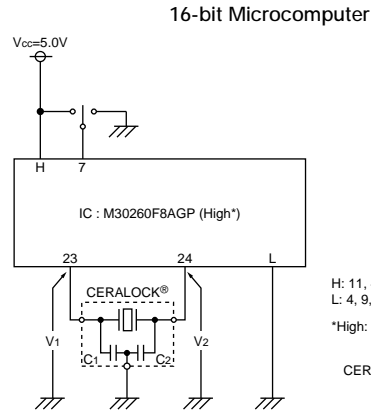
■ uPD78F9222MC-5A4 (NEC Electronics)



H: 5, 20
L: 1

CERALOCK®: CSTCR6M00G55B-R0
C1=39pF (Typ.)
C2=39pF (Typ.)

■ M30260F8AGP (Renesas)

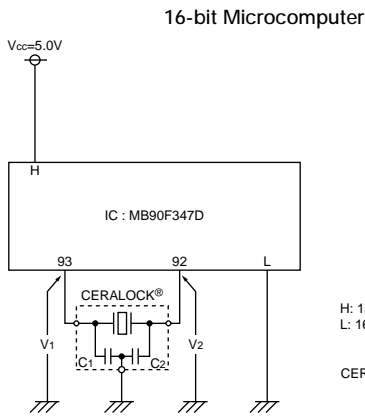


H: 11, 46, 47, 48
L: 4, 9, 44

*High: XIN-XOUT Drive Capacity Select Bit

CERALOCK®: CSTCE10M0G55A-R0
C1=33pF (Typ.)
C2=33pF (Typ.)

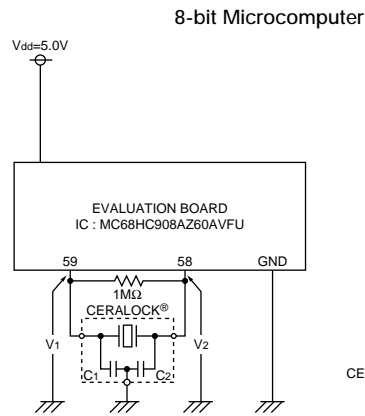
■ MB90F347D (Fujitsu)



H: 15, 32, 65, 90
L: 16, 35, 44, 66, 91

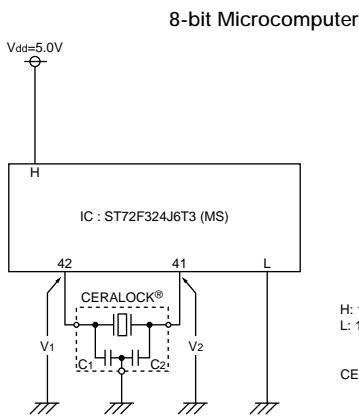
CERALOCK®: CSTCE8M00G55A-R0
C1=33pF (Typ.)
C2=33pF (Typ.)

■ MC68HC908AZ60AVFU (Freescale)



CERALOCK®: CSTCE16M0G53C-R0
C1=15pF (Typ.)
C2=15pF (Typ.)

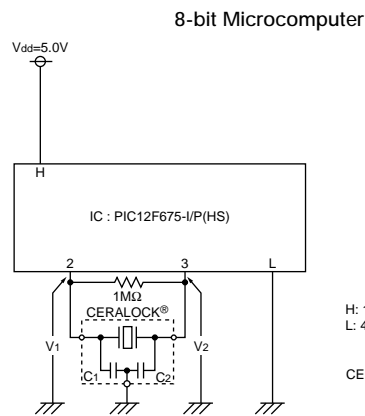
■ ST72F324J6T3 (MS) (ST Microelectronics)



H: 13, 21, 32, 43
L: 14, 22, 33, 39, 40

CERALOCK®: CSTCR4M00G55B-R0
C1=39pF (Typ.)
C2=39pF (Typ.)

■ PIC12F675-I/P (HS) (Microchip)



H: 1
L: 4, 8

CERALOCK®: CSTCE8M00G52A-R0
C1=10pF (Typ.)
C2=10pF (Typ.)

MHz Chip Type Notice (Soldering and Mounting) for Automotive

■ CSTCC/CSTCR/CSTCE_V/CSTCE_G/CSTCV/CSACV Series

1. Soldering Conditions

(1) Reflow

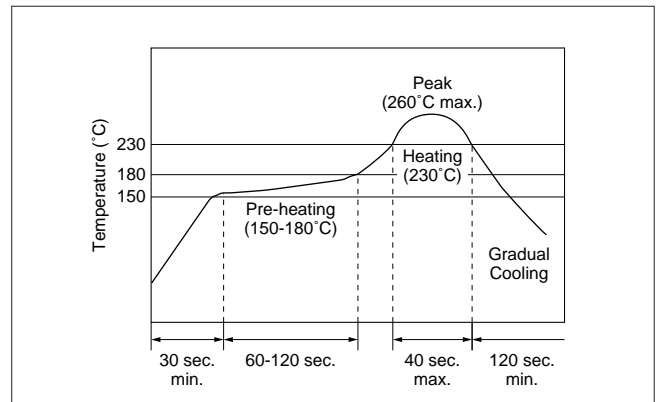
One heat stress, shown in the profile at right, is applied to resonator, then after being placed in natural conditions for 1 hour, the resonator is measured.

(a) Pre-heating conditions should be +150 to +180°C for 60 to 120 seconds. Ascending time up to +150°C should be longer than 30 seconds.

(b) Heating conditions should be within 40 seconds at +230°C min., but peak temperature should be lower than +260°C.

(2) Soldering Iron

Components shall be measured after soldering on PCB at +350±5°C for 3.0±0.5 seconds and leaving in natural condition for 24 hours. The soldering iron shall not touch the components while soldering.



2. Wash

(1) Cleaning Solvents

HCFC, Isopropanol, Tap water, Demineralized water, Cleanthrough750H, Pine alpha 100S, Techno care FRW

(2) Temperature Difference : dT *1

$dT \leq 60^\circ\text{C}$ (dT=Component-solvent)

*1 ex. In case the component at +90°C immerses into cleaning solvent at +60°C, then dT=30°C.

(3) Conditions

(a) Ultrasonic Wash

1 minute max. in above solvent at +60°C max.
(Frequency: 28kHz, Output: 20W/l)

(b) Immersion Wash

5 minutes max. in above solvent at +60°C max.

(c) Shower or Rinse Wash

5 minutes max. in above solvent at +60°C max.

(4) Drying

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

(5) Others

(a) Total washing time should be within 10 minutes.

(b) The component may be damaged if it is washed with chlorine, petroleum, or alkali cleaning solvent.

3. Notice for Mounting

(a) The component is recommended for use with placement machines which employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure to evaluate by using placement machines before going into mass production. Do not use placement machines which utilize mechanical positioning. Please contact Murata for details beforehand.

(b) Please insure the component is thoroughly evaluated in your application circuit.

(c) Please do not apply excess mechanical stress to the component and terminals during soldering.

MHz Chip Type Notice for Automotive

■ Notice (Storage and Operating Conditions)

1. Product Storage Condition

Please store the products in room where the temperature/humidity is stable. And avoid such places where there are large temperature changes. Please store the products under the following conditions:

Temperature: -10 to + 40 degrees C

Humidity: 15 to 85% R.H.

2. Expire Date on Storage

Expire date (Shelf life) of the products is six months after delivery under the conditions of a sealed and an unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because the products may be degraded in the solderability and/or rusty. Please confirm solderability and characteristics for the products regularly.

3. Notice on Product Storage

- (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality, and/or be degraded in the solderability due to the storage in a chemical atmosphere.

- (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
- (3) Please do not store the products in the places such as: in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.
- (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.
- (5) Please do not drop the products to avoid cracking of ceramic element.

4. Others

Conformal coating of the component is acceptable. However, the resin material, curing temperature, and other process conditions should be evaluated to confirm that stable electrical characteristics are maintained.

Please be sure to consult with our sales representative or engineer whenever and prior to using the products.

■ Notice (Rating)

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

■ Notice (Handling)

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

MHz Chip Type Packaging for Automotive

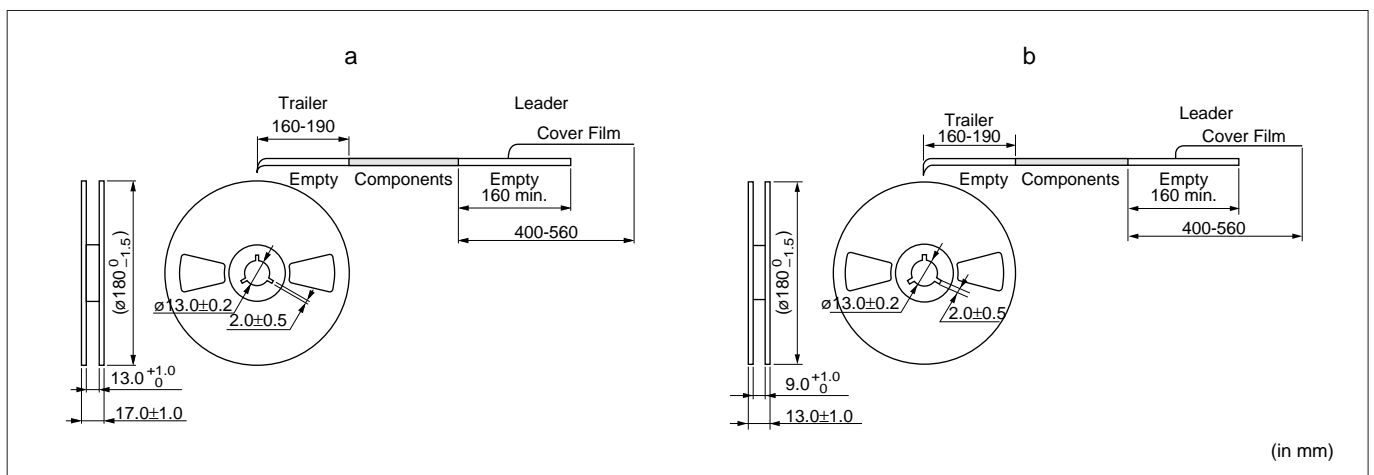
Minimum Quantity

Part Number	Plastic Tape ø180mm	Plastic Tape ø330mm	Bulk	Dimensions
CSTCC_G_A	2,000	6,000	500	a
CSTCR_G_B	3,000	9,000	500	a
CSTCR_G15C	3,000	9,000	500	a
CSTCE_G_A	3,000	9,000	500	b
CSTCE_G15C	3,000	9,000	500	b
CSTCE_V_C	3,000	9,000	500	b
CSTCE_V13C	3,000	9,000	500	b
CSTCV_X_Q	2,000	6,000	500	a
CSACV_X_Q	2,000	6,000	500	a

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

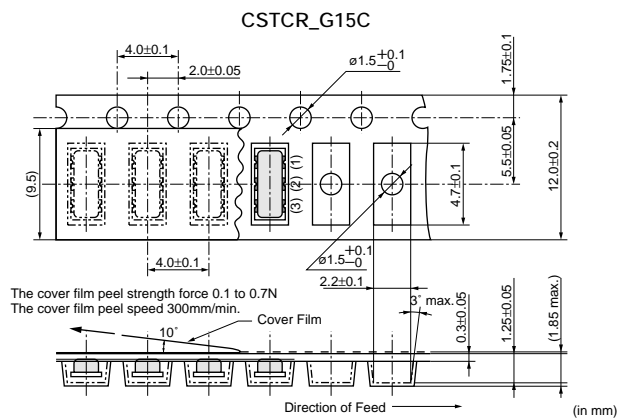
(pcs.)

Dimensions of Reel

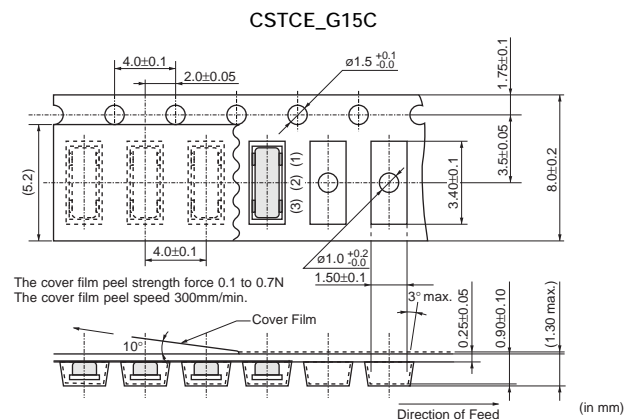


(in mm)

Dimensions of Taping



(in mm)



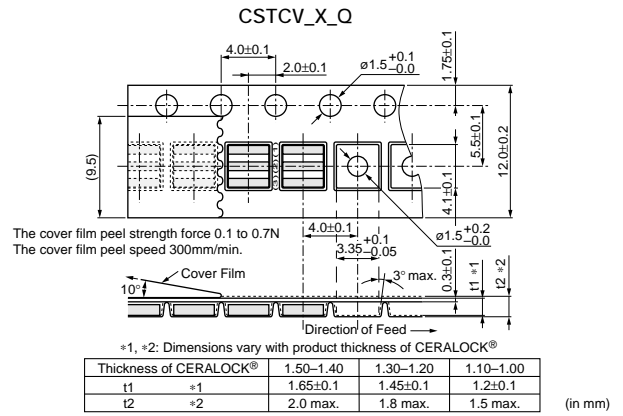
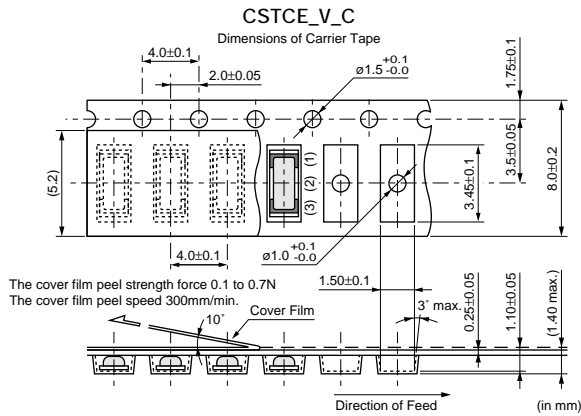
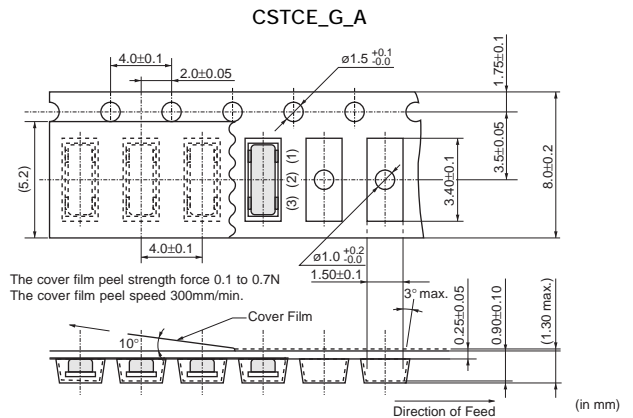
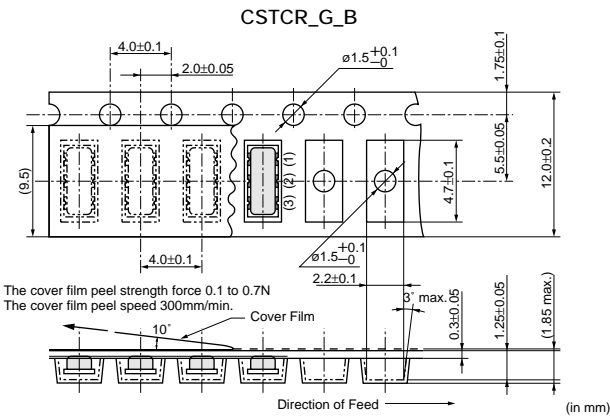
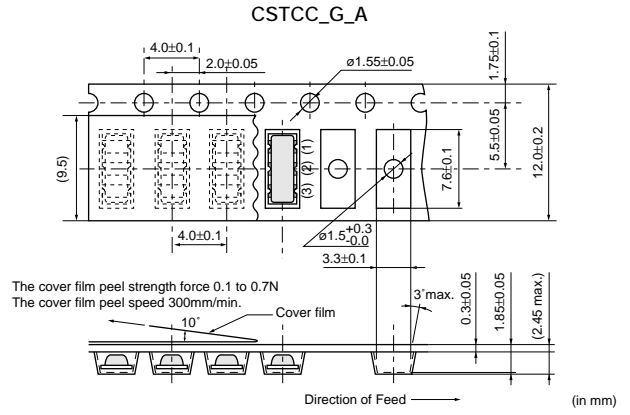
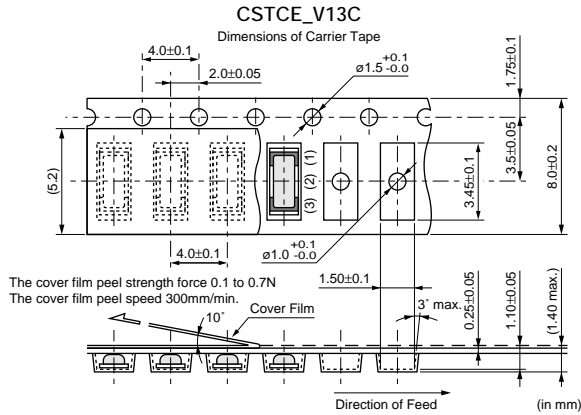
(in mm)

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MHz Chip Type Packaging for Automotive

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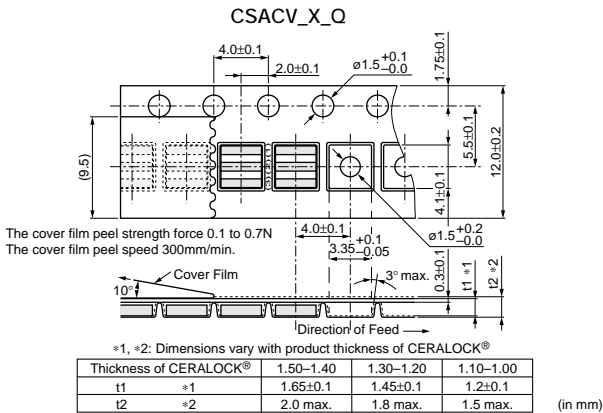
Dimensions of Taping



*1, *2: Dimensions vary with product thickness of CERALOCK®

Thickness of CERALOCK®	1.50-1.40	1.30-1.20	1.10-1.00
t1	≠1	1.65±0.1	1.45±0.1
t2	≠2	2.0 max.	1.8 max.

(in mm)



*1, *2: Dimensions vary with product thickness of CERALOCK®

Thickness of CERALOCK®	1.50-1.40	1.30-1.20	1.10-1.00
t1	≠1	1.65±0.1	1.45±0.1
t2	≠2	2.0 max.	1.8 max.

(in mm)