FEATURES

①Small size with low ESL
②High self-resonant frequency, excellent filtering performance, can effectively suppress circuit noise
③Reduce the number of capacitors used

USE OCCASIONS

It is suitable for military communication, radar, shell fuze, shipboard, aviation, aerospace systems and other electronic equipment, as well as for civil high-end equipment.

APPLICATIONS

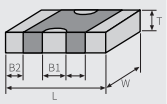
Suitable for filtering and decoupling in digital circuits.

ORDERING INFORMATION

(G)	CTL1	1206	2C1	100V	105	K	N	B
Quality Grade	Series	Case Size	Dielectric	Rated Voltage	Capacitance	Capacitance Tolerance	Termination Finish	Internal Electrode
(G) : (G) LEVEL "S" : "S" LEVEL "J" : "J" LEVEL	CTL1: Class II	0402 0603 0805 1206	2C1 (Class II)	16V 25V 50V	First two digits represent significant figures, Third digit specifies number of zeros. Example: 103=10000pF	M=±20%	N=Tin/Lead solderplated (4%Pb minimum)	Nickel metal

DIMENSIONS

Unit: mm

Appearance		0402	0603	0805	1206
	L	1.00±0.20	1.60±0.20	2.00±0.30	3.20±0.30
	W	0.50±0.20	0.80±0.20	1.25±0.20	1.60±0.20
	Tmax	0.70	1.00	1.45	1.80
	B1	0.30±0.10	0.30±0.20	0.60±0.20	0.95±0.30
	B2	0.25±0.10	0.35±0.25	0.50±0.25	0.50±0.35

ELECTRICAL CHARACTERISTICS

Characteristics	Dissipation Factor(C_R Unit:pF)	Dielectric Strength	Insulation Resistance 25°C (C_R Unit:μF)	Operating Temperature Range
2C1	tgδ≤3.5%	2.5U_R	≥1000MΩ	-55°C~125°C

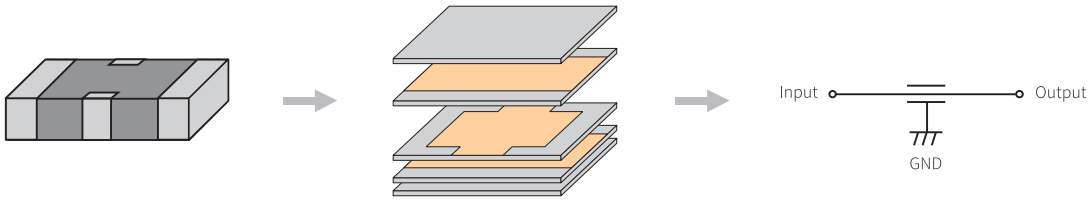
CAPACITANCE AND RATED VOLTAGE RANGE

CTL1

Case Size	Rated Voltage(V)	Capacitance	Dielectric	Rated Current (max) A	Maximum DC Resistance mΩ	Insertion Loss
0402	25	471	2C1	1	300mΩ	30dB(600MHz~4GHz)
		102	2C1	1	300mΩ	30dB(200MHz~4GHz)
		222	2C1	1	300mΩ	30dB(100MHz~4GHz)
		472	2C1	1	300mΩ	30dB(50MHz~4GHz)
	50	101	2C1	1	300mΩ	30dB(1.5GHz~6GHz)
		221	2C1	1	300mΩ	30dB(800MHz~6GHz)
0603	16	223	2C1	1	50mΩ	30dB(10MHz~3GHz)
		104	2C1	2	30mΩ	30dB(10MHz~1GHz)
	50	220	2C1	1	300mΩ	30dB(4GHz~6GHz)
		470	2C1	1	300mΩ	30dB(2GHz~6GHz)
		101	2C1	1	300mΩ	30dB(1.5GHz~6GHz)
		221	2C1	1	300mΩ	30dB(800MHz~6GHz)
		471	2C1	1	300mΩ	30dB(400MHz~6GHz)
		102	2C1	1	300mΩ	30dB(200MHz~3GHz)
		222	2C1	1	300mΩ	30dB(90MHz~3GHz)
		472	2C1	1	300mΩ	30dB(40MHz~3GHz)
		103	2C1	1	80mΩ	30dB(20MHz~3GHz)
0805	16	224	2C1	2	30mΩ	40dB(10MHz~1GHz)
		474	2C1	2	30mΩ	40dB(2MHz~1GHz)
	25	103	2C1	0.4	100mΩ	30dB(20MHz~2GHz)
		223	2C1	1	80mΩ	30dB(20MHz~2GHz)
		473	2C1	1	80mΩ	30dB(20MHz~2GHz)
		104	2C1	1	80mΩ	30dB(20MHz~2GHz)
	50	101	2C1	1	300mΩ	30dB(1GHz~5GHz)
		221	2C1	1	300mΩ	30dB(1GHz~5GHz)
		471	2C1	1	300mΩ	30dB(500MHz~5GHz)
		102	2C1	0.4	300mΩ	30dB(300MHz~5GHz)
		222	2C1	0.4	300mΩ	30dB(100MHz~2GHz)
		472	2C1	0.4	300mΩ	30dB(100MHz~2GHz)
1206	16	224	2C1	2	40mΩ	40dB(3MHz~1GHz)
		474	2C1	2	40mΩ	40dB(3MHz~1GHz)
		105	2C1	2	40mΩ	40dB(1MHz~1GHz)
	50	103	2C1	6	1.5mΩ	40dB(60MHz~2GHz)
		223	2C1	6	1.5mΩ	40dB(60MHz~2GHz)
		104	2C1	6	3mΩ	40dB(10MHz~2GHz)

PRODUCT STRUCTURE

1 Product Structure And Equivalent Circuit



2 Noun Explanation

A. Insertion Loss

Insertion loss is an important index to measure the suppression ability of three-terminal chip multilayer ceramic capacitors to interference signals. It is before and after the product is connected to the circuit, the laboratory measurement is generally carried out under a specific 50Q impedance system. Insertion loss (I) is a function of frequency, expressed as dB, and the formula is:

$$IL=20\log(V1/V2)$$

B. Rated Current

Rated current is the maximum operating current without reducing the insertion loss characteristic when the product is operating normally within the operating temperature range. In general, the greater the rated current, the greater the volume and capacity of the product.

C. DC Resistance

DC resistance is the resistance presented by the direct current on the element, that is, the inherent static resistance of the element, does not contain reactance value.

3 Selection of Products

①According to the requirements and characteristics of the circuit to choose the appropriate product size

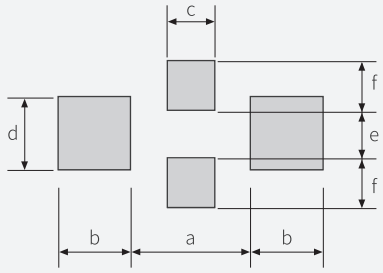
②Choose the appropriate product size based on the requirements and characteristics of the circuit. Whether to use three terminal multilayer ceramic capacitors instead of ordinary ceramic capacitors can be based on the principle of "high replacing low", which means that the rated voltage is high instead of low, with a lower temperature coefficient of capacity instead of one with a higher temperature coefficient of capacity, and the quality level is high instead of low one.

③Select the appropriate product according to the frequency or frequency range of noise removal.

4 Welding and Erection

Adopt correct installation. The basic welding and precautions,please refer to "Electric Installation Process" in "Application Guide Ceramic Capacitors" in this manual.Other instructions are as follows:

A. Bonding Pad Recommended

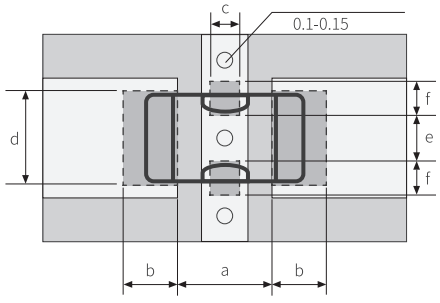


Unit:mm

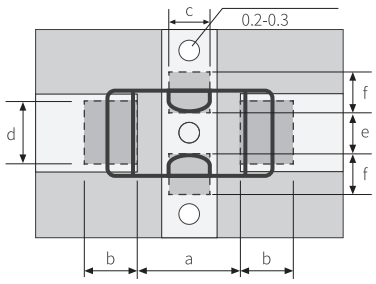
Case Size	Size (mm) ±0.05mm					
	a	b	c	d	e	f
0402	0.70	0.30	0.20	0.60	0.25	0.25
0603	1.00	0.60	0.40	0.60	0.40	0.40
0805	1.40	0.60	0.55	0.80	0.60	0.65
1206	2.50	1.10	1.25	1.25	0.70	0.95

B. Pad Design

To improve the filtering effect, it is recommended to use the through-hole design at the grounding terminal. Pad area should be designed as large as possible; Make through-holes and connect them to the grounding mode mounting side of the chip. The through-holes should be designed to be as close to the grounding end as possible.



0402



0603/0805/1206

Unit:mm

5 Notes

①Do not use the product beyond rated current and rated voltage to avoid thermal breakdown, etc.

②Do not apply the filter to the temperature exceeding the upper limit of the operating temperature.

③Good storage conditions, see the manual "Ceramic capacitor application Guide" in point 4 "supplementary instructions" (2) storage conditions.

TEST LEVEL

"J" LEVEL(Level A)	"S" LEVEL(Level B)	(G) LEVEL(Level C)
Temperature cycling	Temperature cycling	Temperature cycling
Accelerated steady state aging @48h	Accelerated steady state aging @96h	Accelerated steady state aging @96h
Solderability	Solderability	Resistance to moisture
		Terminal strength
		Solderability
		Resistance to soldering heat
		Steeping
		Bending strength