

Multilayer Ceramic Chip Capacitor

CC Series

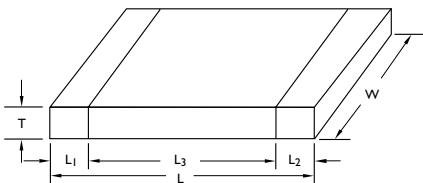


INTRODUCTIONS

Yageo CC Series MLCC is Made by Either Pd/Ag or Nickel Electrode System and Offering Full Range of Chip Ceramic Capacitor in 16, 25, 50, 100, 200V Ratings. The Dielectric Material of CC Series Ranging from NPO to Y5V. The CC Series Chip Capacitor Has Much Lower ESR and ESL Than Most Leaded Type Capacitor; and Its Lower Dissipation Factor Leads to Lower Power is Wasted Than Aluminum Electrolytic and Tantalum Capacitors.

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DIMENSIONS



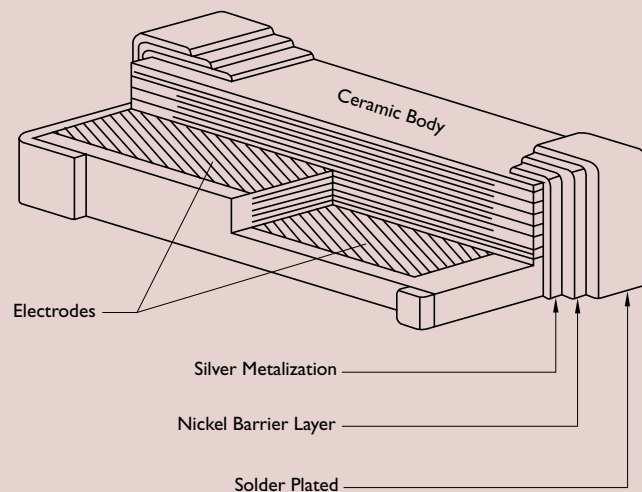
FEATURES

Standard EIA Chip Size Available

Wide Range of Capacitance 0.47pF~4.7uF is Available for Various Circuit Needs

The CC Series is Available in Both Paper and Plastic Embossed Tape and Reel Packaging for Automatic SMD Placement

Rugged Termination is Capable to Use at Both Reflow and Wave Soldering System



Unit : mm

STYLE	L	W	T		L ₁ : L ₂		L ₃
			MIN.	MAX.	MIN.	MAX.	MIN.
CC0402	1.0±0.05	0.5±0.05	0.45	0.55	0.20	0.30	0.40
CC0603	1.6±0.10	0.8±0.10	0.70	0.90	0.25	0.65	0.40
CC0805	2.0±0.10	1.25±0.10	0.51	1.35	0.25	0.75	0.55
CC1206	3.2±0.15	1.6±0.15	0.51	1.35	0.25	0.75	1.40

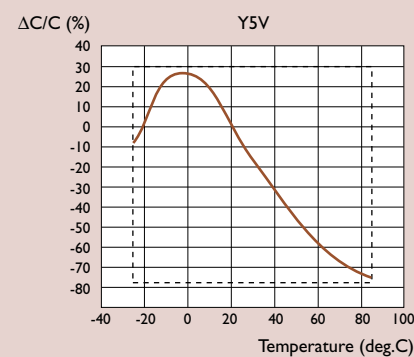
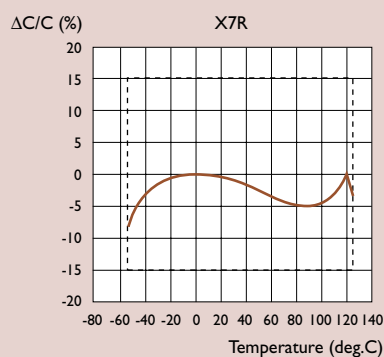
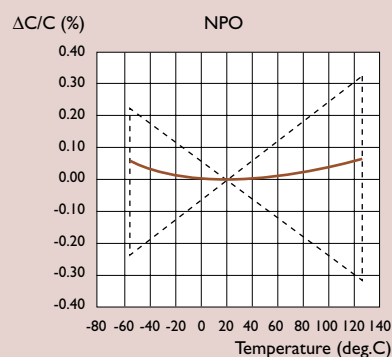
ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	TEST CONDITIONS	REQUIREMENT		
		CLASS I	CLASS II	
		NPO	X7R	Y5V
Operation Temperature Range		-55°C to 125°C	-55°C to 125°C	-25°C to 85°C
Temperature Characteristic/Coefficient (TC)	With Respect to 20°C within Operation Temperature Range	$C < 10\text{pF}, \pm 150\text{ppm}/^\circ\text{C}$ $C \geq 10\text{pF}, \pm 30\text{ppm}/^\circ\text{C}$	$\pm 15\%$	+30% to -80%
Capacitance Tolerance	With Respect to 20°C	In Accordance with Specification		
Dissipation Factor (Tan δ)	NPO :	$C < 10\text{pF}$:	Tan $\delta \leq 2.5\%$, 25/50V	Tan $\delta \leq 5\%$, 25V, 50V
	$C \leq 1000\text{pF}$ 1Vrms/1MHZ $C > 1000\text{pF}$ 1Vrms/1KHZ X7R/Y5V : 1Vrms/1KHZ	Tan $\delta \leq 10 (3/C+0.7) \times 10^{-4}$ or 30×10^{-4} Whichever is Less $C \geq 10\text{pF}$ Tan $\delta \leq 10 \times 10^{-4}$	Tan $\delta \leq 3.5\%$, 16V	Tan $\delta \leq 7\%$, 16V Tan $\delta \leq 9\%$, 16V($\geq 1\mu$)
Insulation Resistance (IR)	At Ur (Rated Voltage) for 1 Minute	Rins $> 100\text{G}\Omega$ or Rins $\times C \geq 1000\text{s}$ Whichever is Less	Rins $> 100\text{G}\Omega$ or Rins $\times C \geq 1000\text{s}$ Whichever is Less	Rins $> 10\text{G}\Omega$ or Rins $\times C \geq 100\text{s}$ Whichever is Less
Dielectric Withstanding Voltage	At 2.5Ur (Rated Voltage) for 1 Minute	No Breakdown		

ENVIRONMENTED CHARACTERISTICS

IEC	TEST ITEMS	CONDITIONS	REQUIREMENT		
384-10			NPO	X7R	Y5V
4.9	Bending	Bending Rate 1mm/s, Jig. Radius 340mm	$\Delta C/C \leq 1\%$	$\Delta C/C \leq 10\%$	$\Delta C/C \leq 20\%$
4.10	Resistance to Soldering Heat	$260 \pm 5^\circ\text{C}$ for $10 \pm 0.5\text{s}$ in Static Soldering Bath	$\Delta C/C \leq 0.5\%$ or 0.5pF Whichever is Greater	$-5\% \leq \Delta C/C \leq 10\%$	$-10\% \leq \Delta C/C \leq 20\%$
4.11	Solderability	$235 \pm 5^\circ\text{C}$ for $2 \pm 0.5\text{s}$ in a Static Soldering Bath	75% Minimum Coverage of Metallic Area		
4.12	Rapid Change of Temperature	NPO/X7R : -55°C to $+125^\circ\text{C}$, 5Cycles Y5V : -25°C to $+85^\circ\text{C}$, 5Cycles	$\Delta C/C \leq 1\%$ or 1pF Whichever is Greater	$\Delta C/C \leq 15\%$	$\Delta C/C \leq 20\%$
4.14	Damp Heat, Steady State	At 40°C , 90 to 95% RH and Ur Applied for 56 Days	$\Delta C/C$: 2% or 1pF Whichever is Greater Tan δ : $\leq 2 \times$ Specified Value IR : $2500\text{M}\Omega$ or $R \times C \geq 25\text{s}$ Whichever is Less	$\Delta C/C \leq 15\%$ Tan δ : $\leq 7\%$ IR : $1000\text{M}\Omega$ or $R \times C \geq 25\text{s}$ Whichever is Less	$\Delta C/C \leq 30\%$ Tan δ : 7% IR : $1000\text{M}\Omega$ or $R \times C \geq 25\text{s}$ Whichever is Less
4.15	Endurance	At Upper Category Temperature, $2 \times U_r$ Applied for 42 Days	$\Delta C/C$: 2% or 1pF Whichever is Greater Tan δ : $\leq 2 \times$ Specified Value IR : $4000\text{M}\Omega$ or $R \times C \geq 40\text{s}$ Whichever is Less	$\Delta C/C \leq 15\%$ Tan δ : $\leq 7\%$ IR : $2000\text{M}\Omega$ or $R \times C \geq 50\text{s}$ Whichever is Less	$\Delta C/C \leq 30\%$ Tan δ : 7% IR : $2000\text{M}\Omega$ or $R \times C \geq 50\text{s}$ Whichever is Less

CAPACITANCE -TEMPERATURE CHARACTERISTICS





SPECIFICATION & PACKING

Tape Width : mm

Y5V		16V		25V		50V	
Cap.	Code 15~17	CC0402		CC0402		CC0402	
(μF) 0.022	222					0.5±0.05	
0.033	332	In Columns : Thickness Class					
0.047	472						
0.068	682						
0.10	103			0.5±0.05			
0.15	153						
0.22	223						
0.33	333	0.5±0.05					
0.47	473						
0.68	683						
1.0	104						

SPECIFICATION & PACKING

Tape Width : mm

Y5V		16V			25V			50V		
Cap.	Code 15~17	CC0603	CC0805	CC1206	CC0603	CC0805	CC1206	CC0603	CC0805	CC1206
(μF) 0.010	103	In Columns : Thickness Class			0.8±0.1	0.6±0.1	0.6±0.1	0.8±0.1	0.6±0.1	0.6±0.1
0.015	153									
0.022	223									
0.033	333									
0.047	473									
0.068	683									
0.10	104									
0.15	154	0.8±0.1				0.8±0.1			0.8±0.1	
0.22	224									
0.33	334		0.8±0.1						1.25±0.1	
0.47	474			1.25±0.1		1.25±0.1	0.8±0.1			0.8±0.1
0.68	684									
1.0	105						1.25±0.1			1.25±0.1
1.5	155		1.25±0.1							
2.2	225									
3.3	335									
4.7	475									

THICKNESS CLASS AND PACKAGING QUANTITIES

Thickness	180mm/7"		330mm/13"		Amount Per Bulk Case			
Classes (mm)	Paper	Embossed	Paper	Embossed	CC0402	CC0603	CC0805	CC1206
0.5 $\pm$ 0.05	10000	—	50000	—	50000	—	—	—
0.6 $\pm$ 0.1	4000	—	15000	—	—	—	10000	4000
0.8 $\pm$ 0.1	4000	—	15000	—	—	15000	—	—
1.25 $\pm$ 0.1	—	3000	—	10000	—	—	—	2000

SPECIFICATION & PACKING

Tape Width : mm

X7R									
		16V				25V			
Cap.	Code 15~17	CC0402	CC0603	CC0805	CC1206	CC0402	CC0603	CC0805	CC1206
(pF) 100	101	In Columns : Thickness Class							
120	121								
150	151								
180	181								
220	221								
270	271								
330	331								
390	391								
470	471								
560	561								
680	681								
820	821								
1000	102								
1200	122								
1500	152								
1800	182								
2200	222								
2700	272								
3300	332								
3900	392								
4700	472					0.5±0.05			
5600	562								
6800	682								
8200	822								
(μF) 0.010	103	0.5±0.05					0.8±0.1	0.6±0.1	
0.012	123								
0.015	153								
0.018	183								
0.022	223								
0.027	273		0.8±0.1						
0.033	333								
0.039	393							0.8±0.1	0.8±0.1
0.047	473								
0.056	563								
0.068	683								
0.082	823								
0.10	104								
0.12	124							1.25±0.1	
0.15	154								
0.18	184								
0.22	224			1.25±0.1					
0.27	274				1.25±0.1				1.25±0.1
0.33	334								
0.47	474								

THICKNESS CLASS AND PACKAGING QUANTITIES

Thickness	180mm/7"		330mm/13"		Amount Per Bulk Case			
Classes (mm)	Paper	Embossed	Paper	Embossed	CC0402	CC0603	CC0805	CC1206
0.5 ± 0.05	10000	—	50000	—	50000	—	—	—
0.6 ± 0.1	4000	—	15000	—	—	—	10000	4000
0.8 ± 0.1	4000	—	15000	—	—	15000	—	—
0.9 to 1.3	—	3000	—	10000	—	—	—	—
1.25 ± 0.1	—	3000	—	10000	—	—	—	2000



SPECIFICATION & PACKING

Tape Width : mm

X7R

		50V				100V			200V			
Cap.	Code 15~17	CC0402	CC0603	CC0805	CC1206	CC0603	CC0805	CC1206	CC0805	CC1206		
(pF) 100	101	0.5±0.05	0.8±0.1			0.8±0.1						
120	121											
150	151											
180	181											
220	221						0.6±0.1		0.6±0.1		0.8±0.1	
270	271							0.8±0.1		0.8±0.1		
330	331											
390	391											
470	471											
560	561											
680	681											
820	821											
1000	102											
1200	122											
1500	152											
1800	182											
2200	222											
2700	272											
3300	332											
3900	392											
4700	472											
5600	562											
6800	682											
8200	822											
(μF) 0.010	103											
0.012	123											
0.015	153											
0.018	183											
0.022	223											
0.027	273											
0.033	333											
0.039	393											
0.047	473											
0.056	563											
0.068	683											
0.082	823											
0.10	104											
0.12	124											
0.15	154											
0.18	184											
0.22	224											
0.27	274											
0.33	334											

In Columns :
Thickness Class

THICKNESS CLASS AND PACKAGING QUANTITIES

Thickness Classes (mm)	180mm/7"		330mm/13"		Amount Per Bulk Case			
	Paper	Embossed	Paper	Embossed	CC0402	CC0603	CC0805	CC1206
0.5 ± 0.05	10000	—	50000	—	50000	—	—	—
0.6 ± 0.1	4000	—	15000	—	—	—	10000	4000
0.8 ± 0.1	4000	—	15000	—	—	15000	—	—
0.9 to 1.3	—	3000	—	10000	—	—	—	—
1.25 ± 0.1	—	3000	—	10000	—	—	—	2000

SPECIFICATION & PACKING

Tape Width : mm

NPO									
Cap.	Code 15~17	25V	50V	CC0603	CC0805	CC1206	100V	CC0805	CC1206
		CC0402	CC0402				CC0603		
(pF) 0.47	478		0.5±0.05	0.8±0.1	0.6±0.1	0.6±0.1	0.8±0.1	0.6±0.1	
0.56	568								
0.68	688								
0.82	828								
1.0	109								
1.2	129								
1.5	159								
1.8	189								
2.2	229								
2.7	279								
3.3	339								
3.9	399								
4.7	479								
5.6	569								
6.8	689								
8.2	829								
10	100								
12	120								
15	150								
18	180								
22	220								
27	270								
33	330								
39	390								
47	470								
56	560								
68	680								
82	820								
100	101								
120	121								
150	151								
180	181								
220	221	0.5±0.05							
270	271								
330	331								
390	391								
470	471								
560	561								
680	681				0.8±0.1				
820	821								
1000	102								
1200	122					0.8±0.1			
1500	152								
1800	182								
2200	222								
2700	272								

In Columns :
Thickness Class

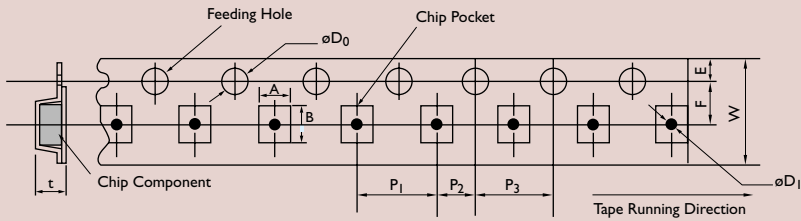
THICKNESS CLASS AND PACKAGING QUANTITIES

Thickness	180mm/7"		330mm/13"		Amount Per Bulk Case			
Classes (mm)	Paper	Embossed	Paper	Embossed	CC0402	CC0603	CC0805	CC1206
0.5 ± 0.05	10000	—	50000	—	50000	—	—	—
0.6 ± 0.1	4000	—	15000	—	—	—	10000	4000
0.8 ± 0.1	4000	—	15000	—	—	15000	—	—
0.9 to 1.3	—	3000	—	10000	—	—	—	—
1.25 ± 0.1	—	3000	—	10000	—	—	—	2000



EMBOSSED TAPING

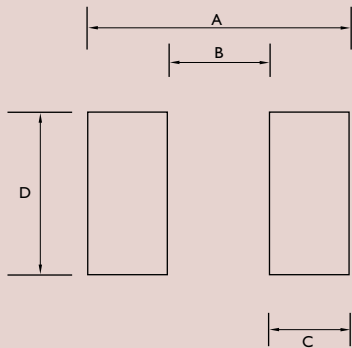
Unit : mm



STYLE	A	B	W	E	F	P ₀	P ₁	P ₂	øD ₀	øD ₁	T _{max}
CC0805	1.45±0.1	2.2±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4±0.1	4±0.1	2±0.05	1.5 ^{+0.1} ₋₀	≥1	2.0±0.1
CC1206	1.9±0.15	3.5±0.15	8.0±0.2	1.75±0.1	3.5±0.05	4±0.1	4±0.1	2±0.05	1.5 ^{+0.1} ₋₀	≥1	2.5±0.1

RECOMMENDED LAND PATTERN DESIGN

Unit : mm



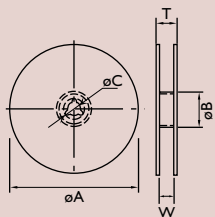
REFLOW SOLDERING

STYLE	FOOTPRINT DIMENSION (mm)				PLACEMENT ACCURACY (mm)
	A	B	C	D	
CC0402	1.5	0.5	0.5	0.5	±0.15
CC0603	2.3	0.5	0.9	0.9	±0.25
CC0805	2.8	0.9	0.95	1.4	±0.25
CC1206	4.0	2.0	1.0	1.8	±0.25

WAVE SOLDERING

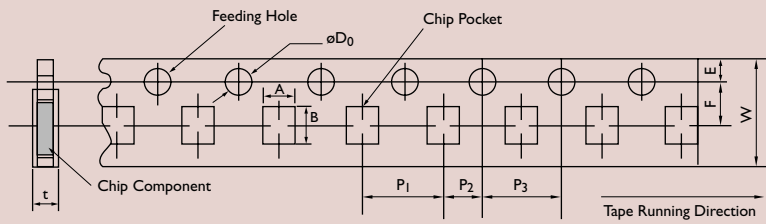
STYLE	FOOTPRINT DIMENSION (mm)				PLACEMENT ACCURACY (mm)
	A	B	C	D	
CC0603	2.7	0.9	0.9	0.8	±0.25
CC0805	3.4	1.3	1.05	1.3	±0.25
CC1206	4.8	2.3	1.25	1.7	±0.25

TAPING REEL



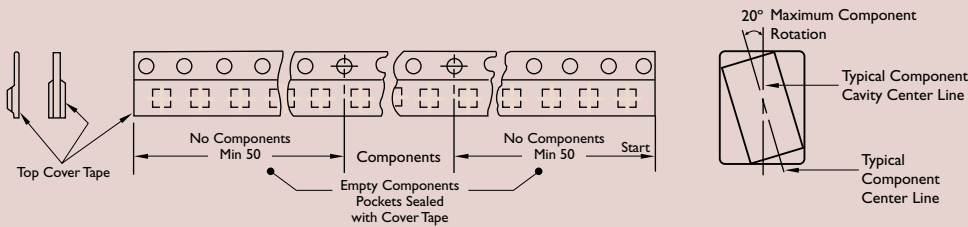
STYLE	TAPE WIDE	øA	øB	øC	W	T _{max}
CC0402/0603/0805/1206	8	180 ⁺⁰ ₋₃	60 ⁺¹ ₋₀	13±0.2	9.0±0.3	11.4±1
CC0402/0603/0805/1206	8	330±3	60 ⁺¹ ₋₀	13±0.2	9.0±0.3	11.4±1

TAPING REEL

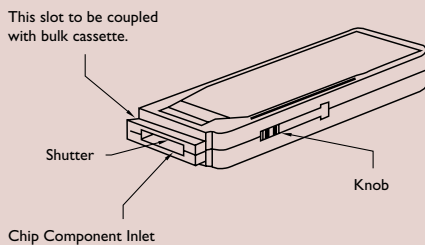


STYLE	A	B	W	E	F	P_0	P_1	P_2	ϕD_0	T_{max}
CC0402	0.62 ± 0.05	1.12 ± 0.05	8.0 ± 0.2	1.75 ± 0.1	3.5 ± 0.05	4 ± 0.05	2 ± 0.05	2 ± 0.05	$1.5^{+0.1}_{-0}$	0.6 ± 0.05
CC0603	1.10 ± 0.1	1.9 ± 0.1	8.0 ± 0.2	1.75 ± 0.1	3.5 ± 0.05	4 ± 0.1	4 ± 0.1	2 ± 0.05	$1.5^{+0.1}_{-0}$	1.0 ± 0.05
CC0805	1.65 ± 0.1	2.4 ± 0.1	8.0 ± 0.2	1.75 ± 0.1	3.5 ± 0.05	4 ± 0.1	4 ± 0.1	2 ± 0.05	$1.5^{+0.1}_{-0}$	1.0 ± 0.05
CC1206	2.0 ± 0.1	3.5 ± 0.1	8.0 ± 0.2	1.75 ± 0.1	3.5 ± 0.5	4 ± 0.1	4 ± 0.1	2 ± 0.05	$1.5^{+0.1}_{-0}$	1.0 ± 0.05

TAPING REEL

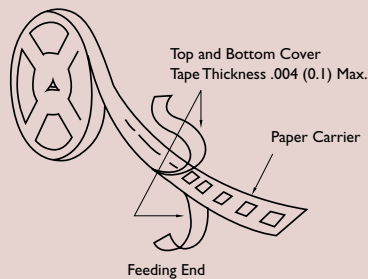


BULK CASSETTE

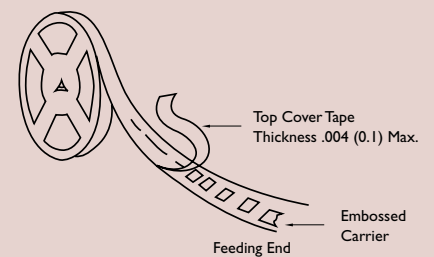


Dimension of Bulk Case
 110(L) x 36(W) x 12(T) mm
 Bulk case was standardized in Mar. 1992 (EIA-7201)

PAPER CARRIER



EMBOSSED PLASTIC CARRIER



1. **SUBJECT** : This specification applies on the chip capacitor made by Yageo Corporation.
2. **PART NUMBER** : Part number of the chip capacitor is identified by the size, tolerance, packing, material and capacitor value.

Example :

