

DATA SHEET

MULTILAYER CERAMIC CAPACITORS

CC Series
Y5V
10V TO 50V



SCOPE

This specification describes Yageo CC Y5V series chip capacitors.

ORDERING INFORMATION

Part number is identified by the series, size, tolerance, packing style, temperature coefficient, rated voltage and capacitance value.

CC XXXX X X **Y5V** X **BB** XXX
(1) (2) (3) (4) (5)

(1) SIZE – INCH BASED (METRIC)

0402 (1005)

0603 (1608)

0805 (2012)

1206 (3216)

(2) TOLERANCE

M = $\pm 20\%$

Z = $-20/+80\%$

(3) PACKING STYLE

R = 7" paper tape

K = 7" blister tape

P = 13" paper tape

F = 13" blister tape

C = Bulk case

(4) RATED VOLTAGE

6 = 10V

7 = 16V

8 = 25V

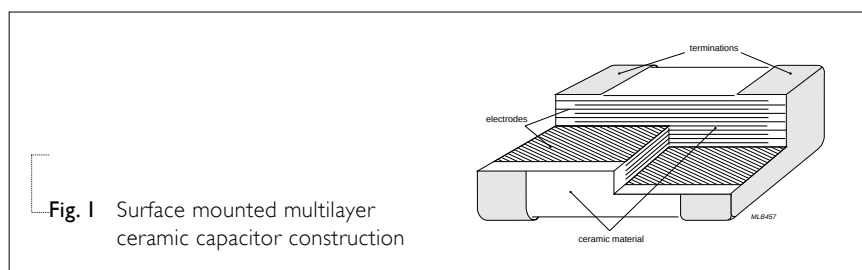
9 = 50V

(5) CAPACITANCE VALUE:

First two for significant figures and 3rd for number of zero

Letter "R" for decimal point

CONSTRUCTION



DIMENSION

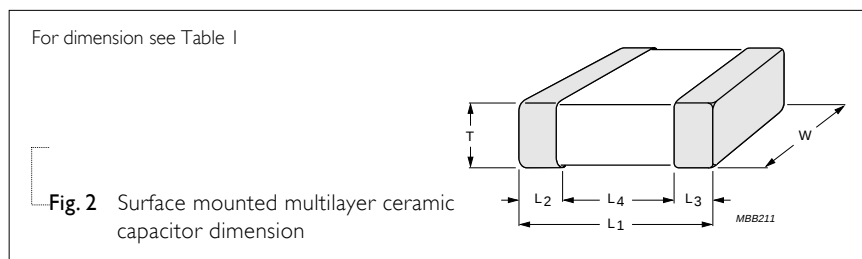


Table I

TYPE		CC0402	CC0603	CC0805	CC1206
L₁ (mm)		1.0 $\pm$ 0.05	1.6 $\pm$ 0.10	2.0 $\pm$ 0.10	3.2 $\pm$ 0.15
W (mm)		0.5 $\pm$ 0.05	0.8 $\pm$ 0.07	1.25 $\pm$ 0.10	1.6 $\pm$ 0.15
T (mm)	min.	0.45	0.73	0.50	0.50
	max.	0.55	0.87	1.35	1.35
L₂/L₃ (mm)	min.	0.15	0.20	0.25	0.25
	max.	0.30	0.60	0.75	0.75
L₄ (mm)	min.	0.40	0.40	0.55	1.40

CAPACITANCE RANGE & THICKNESS FOR 10V & 16V

Table 2

CAPACITANCE (nF)	10V 0603	0805	1206	16V 0402	0603	0805	1206
10				0.5±0.05			
22							
47							
100							
220					0.8±0.07		
470						0.85±0.1	
1,000	0.8±0.07	0.85±0.1				1.25±0.1	0.85±0.1
2,200							1.15±0.1
4,700							
10,000			1.15±0.1				

CAPACITANCE RANGE & THICKNESS FOR 25V & 50V

Table 3

CAPACITANCE (nF)	25V 0603	0805	1206	50V 0603	0805	1206
10	0.8±0.07			0.8±0.07		
22					0.6±0.1	
47						
100		0.6±0.1				0.6±0.1
220		0.85±0.1	0.6±0.1		0.85±0.1	
470			0.85±0.1			0.85±0.1
1,000		1.25±0.1	1.15±0.1			1.15±0.1

THICKNESS CLASSES AND PACKING QUANTITY

Table 4

THICKNESS CLASSIFICATION (mm)	8mm TAPE WIDTH / AMOUNT PER REEL				AMOUNT PER BULK CASE		
	Ø180mm, 7"		Ø330mm, 13"		0402	0603	0805
	Paper	Blister	Paper	Blister			
0.5±0.05	10,000	---	50,000	---	50,000	---	---
0.6±0.10	4,000	---	20,000	---	---	---	10,000
0.8±0.07	4,000	---	15,000	---	---	15,000	---
0.85±0.10	4,000	---	15,000	---	---	---	8,000
1.15±0.10	---	3,000	---	10,000	---	---	---
1.25±0.10	---	3,000	---	10,000	---	---	5,000

ELECTRICAL CHARACTERISTICS

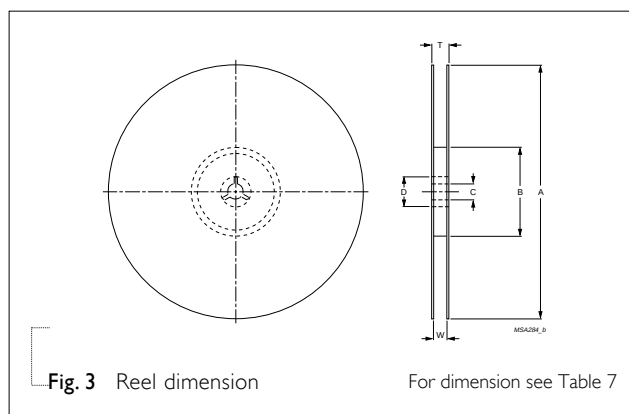
Table 5

CHARACTERISTICS	TEST CONDITIONS	REQUIREMENT
Operation temperature range	---	-30°C to +85°C
Temperature characteristic/coefficient (TC)	With respect to 25°C within operation temperature range	+22% to -82%
Capacitance tolerance	1Vrms/1KHz at 25°C	±20%, -20%~+80%
Dissipation factor (Tan δ)	1Vrms/1KHz at 25°C	Tan δ ≤ 5% or ≤ 7%, 25V/50V (depending on capacitance value) Tan δ ≤ 9% or ≤ 12.5%, 16V (depending on capacitance value) Tan δ ≤ 12.5%, 10V
Insulation resistance (IR)	At Ur (rated voltage) for 1 minute	$R_{ins} \geq 10G\Omega$ or $R_{ins} \times C \geq 100s$ whichever is less
Dielectric withstanding Voltage	At 2.5xUr for 5sec	No breakdown

TAPING REEL

Table 7

TAPE WIDE	8mm	8mm	12mm
ØA (mm)	180	330	180
ØB (mm)	62±1.5	62±1.5	62±1.5
ØD (mm)	20.5	20.5	20.5
ØC (mm)	12.75±0.15/-0	12.75±0.15/-0	12.75±0.15/-0
W (mm)	8.4+1.5/-0	8.4+1.5/-0	12.4+2/-0
T _{max} (mm)	14.4	14.4	18.4

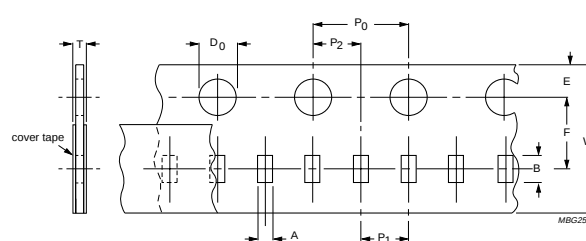


PAPER TAPE SPECIFICATION

Table 8

DIMENSION	0402	0603	0805	1206
A (mm)	0.62±0.05	1.10±0.05	1.65±0.05	2.0±0.1
B (mm)	1.12±0.05	1.90±0.05	2.4±0.05	3.5±0.1
W (mm)	8.0±0.2	8.0±0.2	8.0±0.2	8.0±0.2
E (mm)	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F (mm)	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05
P ₀ (mm)	4±0.05	4±0.05	4±0.05	4±0.05
P ₁ (mm)	2±0.05	4±0.1	4±0.1	4±0.1
P ₂ (mm)	2±0.05	2±0.05	2±0.05	2±0.05
ØD ₀ (mm)	1.5+0.1	1.5+0.1	1.5+0.1/-0	1.5+0.1/-0
T _{max} (mm)	0.6±0.05	0.95±0.05	0.95±0.05	0.95±0.05

For dimension see Table 8

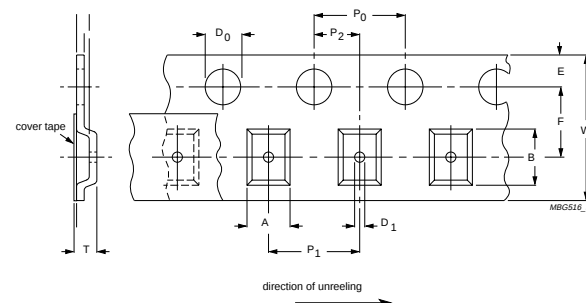


BLISTER TAPE SPECIFICATION

Table 9

DIMENSION	0805	1206	1210	1812
A (mm)	0.20	0.30	0.30	0.40
B (mm)	0.20	0.30	0.30	0.40
W (mm)	8.1±0.2	8.1±0.2	8.1±0.2	12.0±0.2
E (mm)	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F (mm)	3.5±0.05	3.5±0.05	3.5±0.05	5.5±0.05
P ₀ (mm)	4±0.1	4±0.1	4±0.1	4±0.1
P ₁ (mm)	4±0.1	4±0.1	4±0.1	8±0.1
P ₂ (mm)	2±0.05	2±0.05	2±0.05	2±0.05
ØD ₀ (mm)	1.5+0.1/-0	1.5+0.1/-0	1.5+0.1/-0	1.5+0.1/-0
T _{max} (mm)	3.5	3.5	3.5	3.5

For dimension see Table 9



PACKING METHOD

LEADER/TRAILER TAPE SPECIFICATION

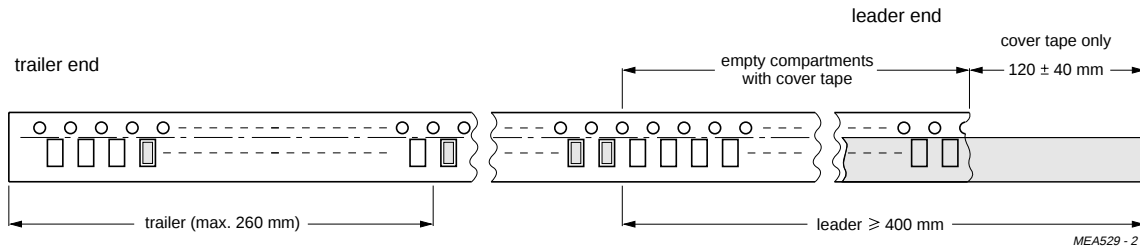


Fig. 6 Leader and trailer tape dimension

METHOD OF MOUNTING

For normal use the capacitors may be mounted on printed-circuit boards or ceramic substrates by applying wave soldering, reflow soldering (including vapor phase soldering) or conductive adhesive in accordance with CECC 00802 classification A.

Typical values (solid line)
Process limits (dotted lines)

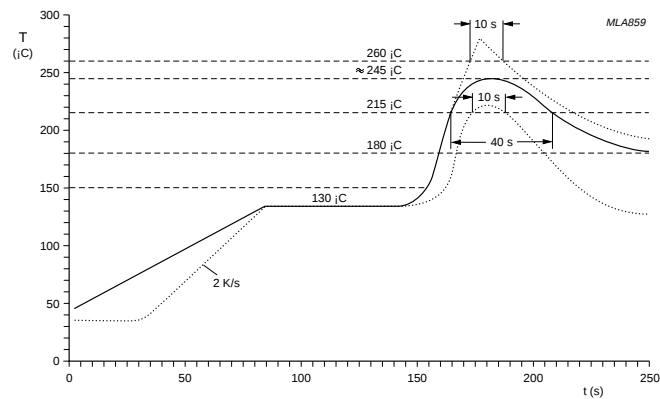


Fig. 7 Recommended reflow soldering profile

Typical values (solid line)
Process limits (dotted lines)

The capacitors may be soldered twice in accordance with this method if desired

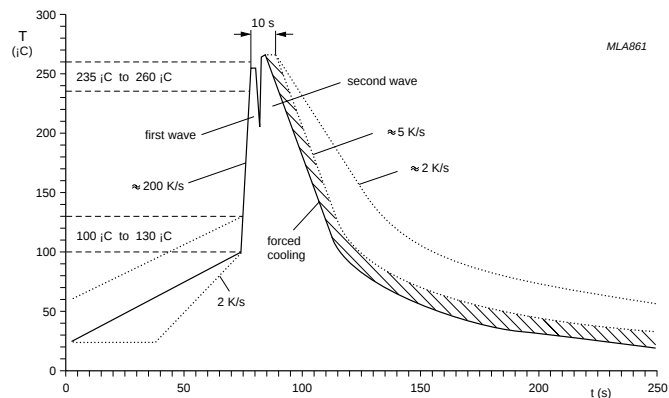


Fig. 8 Recommended wave soldering profile

TEST AND REQUIREMENT

Table 10

IEC384-10	TEST ITEMS	CONDITIONS	REQUIREMENTS
4.9	Bending	Bending rate 1mm/s, jig. radius 340mm	$\Delta C/C \leq 20\%$
4.10	Resistance to soldering heat	$260 \pm 5^\circ\text{C}$ for $10 \pm 0.5\text{s}$ in static solder bath	$-10\% \leq \Delta C/C \leq 20$
4.11	Solderability	$235 \pm 5^\circ\text{C}$ for $2 \pm 0.5\text{s}$ in a static solder bath	75% minimum coverage of metallic area
4.12	Rapid change of temperature	Y5V: -30°C to $+85^\circ\text{C}$, 5 cycles	$\Delta C/C$ within 20%
4.14	Damp heat	Preconditioning At 40°C , 90 to 95% RH and U_r applied for 500 hours	$\Delta C/C$ within $\pm 30\%$ or -40% to $+30\%$ $\text{Tan } \delta \leq 7\%, 12.5\%, 15\%$ (depending on capacitance value) $IR \geq 500\text{M}\Omega$ or $R_x C \geq 25\text{s}$ whichever is less
4.15	Endurance	Preconditioning $2 \times U_r$ applied for 1,000 hours, at upper category temperature	$\text{Tan } \delta \leq 7\%, 12.5\%, 15\%$ (depending on capacitance value) $IR \geq 1,000\text{M}\Omega$ or $R_x C \geq 50\text{s}$ whichever is less