SCOPE

This specification describes Yageo CC NP0 series chip capacitors.

ORDERING INFORMATION

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

CC xxxx x x NPO x BN xxx
(1) (2) (3) (4) (5)

(1) SIZE

- 0402 (1005)
- 0603 (1608)
- 0805 (2012)
- 1206 (3216)
- 1210 (3225)
- 1812 (4832)

(2) TOLERANCE

- B = ±0.1pF
- C = ±0.25pF
- D = ±0.5pF
- F = ±1%
- G = ±2%
- J = ±5%

(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

- 7 = 16V
- 8 = 25V
- 9 = 50V
- 0 = 100V

(5) CAPACITANCE VALUE:

- First two for significant figures and 3rd for number of zero
- Letter "R" for decimal point

CONSTRUCTION

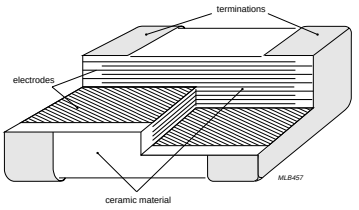

Fig. 1 Surface mounted multilayer ceramic capacitor construction

DIMENSION

For dimensions see Table 1

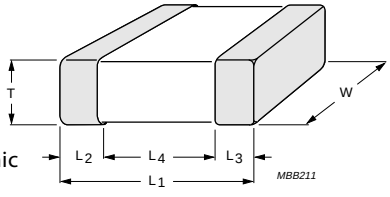

Fig. 2 Surface mounted multilayer ceramic capacitor dimension

Table 1

TYPE		CC0402	CC0603	CC0805	CC1206	CC1210	CC1812
L_1 (mm)		1. 0±0.05	1.6±0.10	2.0±0. 10	3.2±0.15	3.2±0.20	4.5±0.20
W (mm)		0.5±0.05	0.8±0.07	1.25±0.10	1.6±0.15	2.5±0.20	3.2±0.20
T (mm)	min.	0.45	0.73	0.50	0.50	0.50	0.50
	max.	0.55	0.87	1.35	1.35	1.80	1.80
L_2/L_3 (mm)	min.	0.15	0.20	0.25	0.25	0.25	0.25
	max.	0.30	0.50	0.75	0.75	0.75	0.75
L_4 (mm)	min.	0.40	0.60	0.55	1.40	1.40	2.20

CAPACITANCE RANGE & THICKNESS FOR 16V & 25V

Table 2

CAPACITANCE	16V		25V				
(pF)	0402	0603	0402	0603	0805	1206	1210
150							
180			0.5±0.05				
220							
270	0.5±0.05						
330							
390							
470							
560							
680							
820				0.8±0.07			
1,000							
1,200							
1,500							
1,800		0.8±0.07					
2,200							
2,700							
3,300					0.85±0.1		
3,900					1.25±0.1		
4,700							
5,600							
6,800							
8,200						0.85±0.1	
10,000							
12,000							0.6±0.1
15,000							0.85±0.1
18,000							
22,000							1.15±0.1

CAPACITANCE RANGE & THICKNESS FOR 50V & 100V

Table 3

CAPACITANCE (pF)	50V 0402	0603	0805	1206	1210	1812	100V 0603	0805	1206	1210	1812
0.47											
0.56											
0.68											
0.82											
1.0											
1.2											
1.5											
1.8											
2.2											
2.7											
3.3											
3.9											
4.7											
5.6											
6.8											
8.2											
10	0.5±0.05	0.8±0.07	0.6±0.1	0.6±0.1							
12											
15											
18											
22											
27											
33											
39											
47							0.8±0.07	0.6±0.1	0.6±0.1		
56											
82											
100											
120											
150											
180											
220											

CAPACITANCE RANGE & THICKNESS FOR 50V & 100V (CONT.)

Table 4

CAPACITANCE (pF)	50V 0402	0603	0805	1206	1210	1812	100V 0603	0805	1206	1210	1812
270		0.8±0.07	0.6±0.1	0.6±0.1			0.8±0.07	0.6±0.1	0.6±0.1		
330											
390											
470											
560											
680											
820											
1,000					0.6±0.1						
1,200			0.85±0.1					0.85±0.1			
1,500											
1,800											
2,200			1.25±0.1			0.6±0.1		1.25±0.1			
2,700											
3,300				0.85±0.1					0.85±0.1		
3,900											
4,700											
5,600				1.15±0.1	0.85±0.1				1.15±0.1		
6,800											
8,200										0.85±0.1	
10,000											
12,000						0.85±0.1					0.85±0.1
15,000											
18,000						1.15±0.1					1.15±0.1
22,000											

THICKNESS CLASSES AND PACKING QUANTITY

Table 5

THICKNESS CLASSIFICATION (mm)	8mm TAPE WIDTH / AMOUNT PER REEL				12mm TAPE WIDTH / AMOUNT PER REEL	AMOUNT PER BULK CASE		
	Ø180mm, 7"		Ø330mm, 13"		Ø180mm, 7" Blister			
	Paper	Blister	Paper	Blister	1812	0402	0603	0805
0.5±0.05	10,000	---	50,000	---	---	50,000	---	---
0.6±0.1	4,000	---	20,000	---	---	---	---	10,000
0.8±0.07	4,000	---	15,000	---	---	---	15,000	---
0.85±0.1	4,000	---	15,000	---	---	---	---	8,000
1.15±0.1	---	3,000	---	10,000	---	---	---	---
1.25±0.1	---	3,000	---	10,000	---	---	---	5,000

ELECTRICAL CHARACTERISTICS

Table 6

CHARACTERISTICS	TEST CONDITIONS	REQUIREMENT
Operation temperature range	---	–55°C to +125°C
Temperature characteristic/coefficient (TC)	With respect to 20°C within operation temperature range	NP0=16V, 0±60ppm/K NP0>16V, 0±30ppm/K
Capacitance tolerance	With respect to 20°C C≤1000pF 1Vrms/1MHz C>1000pF 1Vrms/1KHz	C<5; ±0.1pF, ±0.25pF C≥5; ±0.25pF, ±0.5pF C≥10pF; ±2%, ±5%
Dissipation factor (D.F.)	With respect to 20°C C≤1,000pF 1Vrms/1MHz C>1,000pF 1Vrms/1KHz	C<10pF D.F. ≤10(3/C+0.7) x10^{-4} or 30x10^{-4} whichever is less C≥10pF, D.F. ≤10x10^{-4}
Insulation resistance (IR)	At U_r (rated voltage) for 1 minute U_r >500V, at 500V(DC) for 1minute	R_{ins}>10GΩ or R_{ins}x C≥500s whichever is less
Dielectric withstanding Voltage	At 2.5x U_r (for U_r ≤100V) 1.5x U_r +100V (for U_r >100V) 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

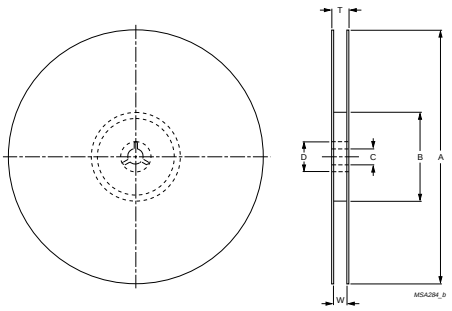

Fig. 3 Reel dimension

For dimension see Table 7

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 (mm)	0.6±0.05	0.95±0.05	0.95±0.05	0.95±0.05

For dimension see Table 8

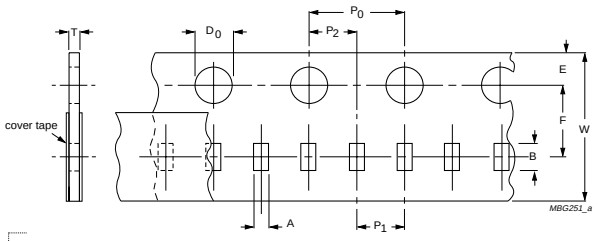

Fig. 4 Paper tape dimension

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

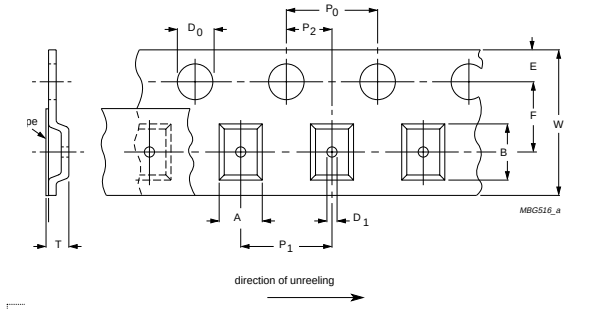

Fig. 5 Leader/trailer tape dimension

PACKING METHOD

LEADER/TRAILER TAPE SPECIFICATION

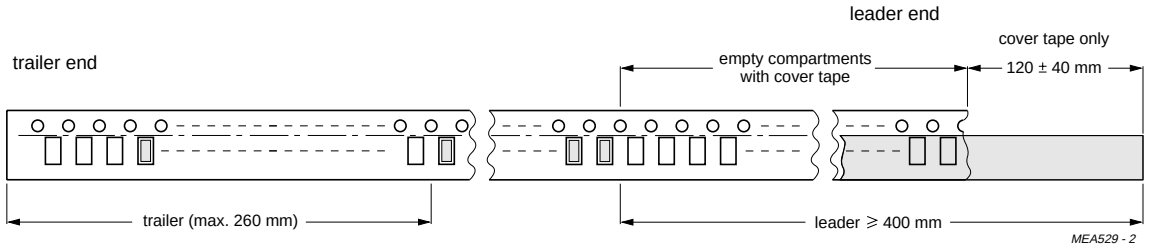

Fig. 6 Leader and trailer tape dimension

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 (sold line)
Process limits (dotted lines)

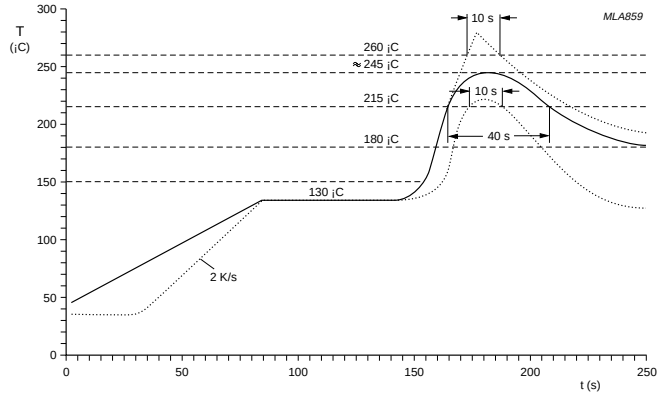

Fig. 7 Recommended reflowsoldering profile

Typical values (sold line)
Process limits (dotted lines)
The capacitors may be soldered twice in accordance with this method if desired

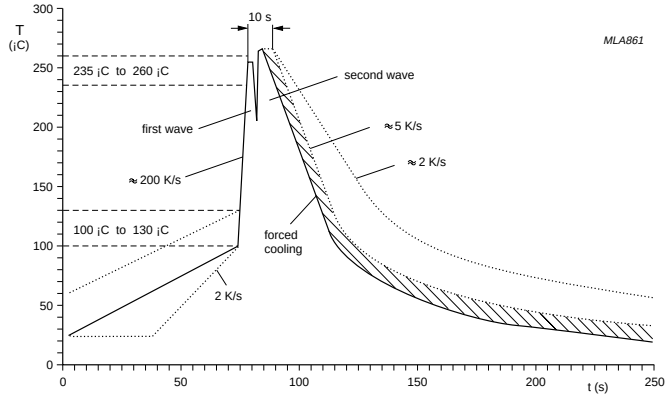

Fig. 8 Recommended wave soldering profile.