



# TECH-MEN ELECTRONICS COMPONENTS

Blk 2019 Bukit Batok Street 23 #03-254, Bukit Batok Industrial Park A, Singapore 659524

Tel: (65) 6425 1555 (4 Lines) Fax: (65) 6425 4111/ 6569 7765

Email: tech\_men@pacific.net.sg Web: www.techmen.com.sg

Supply \* Sub Assemblies \* Taping/ Forming Components

Co. Reg. No: 45730100K

## CHIP CAPACITORS

### 1. DESCRIPTION

MLCC consists of a conducting material and electrodes. To manufacture a chip-type SMT and achieve miniaturization, high density and high efficiency, ceramic condensers are used.

WTC's MLCC is made by NPO, X7R and Y5V dielectric material and which provides product with high electrical precision, stability and reliability.

### 2. FEATURES

- A wide selection of sizes is available (0402 to 1812).
- High capacitance in given case size.
- Capacitor with lead-free termination (pure Tin).

### 3. APPLICATIONS

- For general digital circuit.
- For power supply bypass capacitors.
- For consumer electronics.
- For telecommunication.

### 4. HOW TO ORDER

<u>1206</u>	<u>F</u>	<u>104</u>	<u>Z</u>	<u>500</u>	<u>C</u>	<u>I</u>
<u>Size</u>	<u>Dielectric</u>	<u>Capacitance</u>	<u>Tolerance</u>	<u>Rated voltage</u>	<u>Termination</u>	<u>Packaging style</u>
Inch (mm)	N=NPO	Two significant	B=±0.1pF	Two significant digits	L=Ag/Ni/Sn	T=7" reeled
0402 (1005)	(C0G)	digits followed by	C=±0.25pF	followed by no. of zeros.	(for NPO dielectric)	R=7" reeled (2mm
0603 (1608)	B=X7R	no. of zeros. And R	D=±0.5pF	And R is in place of	C=Cu/Ni/Sn	pitch for 0603 size;
0805 (2012)	F=Y5V	is in place of	F=±1%	decimal point.	(for X7R, Y5V dielectric)	paper tape)
1206 (3216)		decimal point.	G=±2%			G=13" reeled
1210 (3225)		eg.:	J=±5%	100=10 VDC		
1812 (4532)		R47=4.7pF	K=±10%	160=16 VDC		
		0R5=0.5pF	M=±20%	250=25 VDC		
		1R0=1.0pF	Z=-20/+80%	500=50 VDC		
		104=10x10 <sup>4</sup>		101=100 VDC		
		=100nF				



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### 5. EXTERNAL DIMENSIONS

Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol	Remark	M <sub>b</sub> (mm)		
0402 (1005)	1.00±0.05	0.50±0.05	0.50±0.05	N #	0.25 +0.05/-0.10		
0603 (1608)	1.60±0.10	0.80±0.10	0.80±0.07	S	0.40±0.15		
	1.60 +0.15/-0.10	0.80 +0.15/-0.10	0.80 +0.15/-0.10	X			
0805 (2012)	2.00±0.15	1.25±0.10	0.60±0.10	A	0.50±0.20		
			0.80±0.10	B			
			1.25±0.10	D #			
1206 (3216)	3.20±0.15	1.60±0.15	0.80±0.10	B	0.60±0.20		
			0.95±0.10	C			
			1.15±0.15	J #			
			1.25±0.10	D #			
			3.20±0.20	1.60±0.20		1.60±0.20	G #
			3.20+0.3/-0.1	1.60+0.3/-0.1		1.60+0.30/-0.10	P #
1210 (3225)	3.20±0.30	2.50±0.20	0.95±0.10	C #	0.75±0.25		
			1.25±0.10	D #			
			1.60±0.20	G #			
1812 (4532)	4.50±0.40	3.20±0.30	2.50±0.30	M #	0.75±0.25		
			1.25±0.10	D #			
			2.00±0.20	K #			

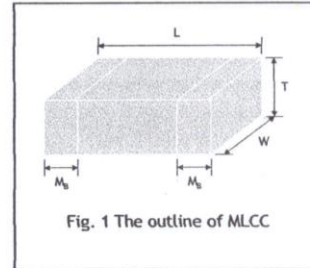


Fig. 1 The outline of MLCC

# Reflow soldering only is recommended.

### 6. GENERAL ELECTRICAL DATA

Dielectric	NP0	X7R	Y5V
Size	0402, 0603, 0805, 1206, 1210, 1812		
Capacitance range*	0.5pF to 0.039uF	100pF to 1.0uF	10nF to 680nF
Capacitance tolerance**	Cap≤5pF: B (±0.1pF), C (±0.25pF) 5pF<Cap<10pF: C (±0.25pF), D (±0.5pF) Cap≥10pF: F (±1%), G (±2%), J (±5%), K (±10%)	J (±5%), K (±10%), M (±20%)	M (±20%), Z (-20/+80%)
Rated voltage (WVDC)	16V, 25V, 50V, 100V	10V, 16V, 25V, 50V, 100V	
Tan δ*	Cap<30pF: Q≥400+20C Cap≥30pF: Q≥1000	Note 1	
Insulation resistance at Ur	≥10GΩ or RxC≥500ΩxF whichever is less		
Operating temperature	-55 to +125°C		-25 to +85°C
Capacitance characteristic	±30ppm	±15%	+30/-80%
Termination	Ni/Sn (lead-free termination)		

\* Measured at the condition of 30-70% related humidity.

NP0: Apply 1.0±0.2Vrms, 1.0MHz±10% for Cap≤1000pF and 1.0±0.2Vrms, 1.0kHz±10% for Cap>1000pF, 25°C at ambient temperature

X7R: Apply 1.0±0.2Vrms, 1.0kHz±10%, at 25°C ambient temperature.

Y5V: Apply 1.0±0.2Vrms, 1.0kHz±10%, at 20°C ambient temperature.

\*\* Preconditioning for Class II MLCC: Perform a heat treatment at 150±10°C for 1 hour, then leave in ambient condition for 24±2 hours before measurement.

Note 1:  
X7R/X5R

Rated vol.	D.F.	Exception of D.F.
≥50V	≤2.5%	≤3% 0603≥0.047μF; 0805≥0.18μF, 1206≥0.47μF
25V	≤3.5%	≤5% 0805≥1μF; ≤7% 0603≥0.33μF
	10%	0402≥0.10μF; 0603≥0.68μF
16V	≤3.5%	≤5% 0402≥0.033μF; 0603≥0.15μF; 0805≥0.68μF;
	≤10%	0603≥0.68μF
10V	≤5.0%	≤10% 0603≥0.33μF;

Y5V

Rated vol.	D.F.	Exception of D.F.
≥50V	≤5.0%	7.0% 0603≥0.1μF; 0805≥0.47μF
25V	≤5.0%	≤7% 0402≥0.047μF; 0603≥0.1μF; 0805≥0.33μF; 1206≥1μF
	≤9%	0402≥0.068μF; 0603≥0.47μF
16V (C<1.0μF)	≤7.0%	≤9% 0402≥0.068μF; 0603≥0.68μF
16V (C≥1.0μF)	≤9.0%	---
10V	≤12.5%	---



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## CHIP CAPACITORS

### 7. CAPACITANCE RANGE (NP0 Dielectric - Noble Metal Electrode)

7-1 0402, 0603, 0805 Sizes

DIELECTRIC	SIZE	NP0														
		0402					0603					0805				
		10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
RATED VOLTAGE (VDC)																
Capacitance	0.5pF (0R5)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	0.6pF (0R6)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	0.7pF (0R7)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	0.8pF (0R8)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	0.9pF (0R9)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	1.0pF (1R0)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	1.2pF (1R2)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	1.5pF (1R5)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	1.8pF (1R8)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	2.2pF (2R2)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	2.7pF (2R7)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	3.3pF (3R3)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	3.9pF (3R9)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	4.7pF (4R7)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	5.6pF (5R6)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	6.8pF (6R8)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	8.2pF (8R2)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	10pF (100)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	12pF (120)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	15pF (150)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	18pF (180)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	22pF (220)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	27pF (270)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	33pF (330)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	39pF (390)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	47pF (470)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	56pF (560)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	68pF (680)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	82pF (820)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	100pF (101)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
120pF (121)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A	
150pF (151)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A	
180pF (181)	N	N	N	N		S	S	S	S	S	A	A	A	A	A	
220pF (221)	N	N	N	N		S	S	S	S	S	A	A	A	A	A	
270pF (271)	N	N	N			S	S	S	S	S	A	A	A	A	A	
330pF (331)	N	N				S	S	S	S	S	A	A	A	A	A	
390pF (391)	N	N				S	S	S	S	S	B	B	B	B	B	
470pF (471)	N	N				S	S	S	S	S	B	B	B	B	B	
560pF (561)						S	S	S	S	S	B	B	B	B	B	
680pF (681)						S	S	S	S	S	B	B	B	B	B	
820pF (821)						S	S	S	S		B	B	B	B	B	
1,000pF (102)						S	S	S	S		B	B	B	B	B	

1. The letter in cell is expressed the symbol of product thickness.



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## CHIP CAPACITORS

### 7-1 0402, 0603, 0805 Sizes (Continued)

DIELECTRIC	SIZE	NPO																		
		0402					0603					0805								
		10	16	25	50	100	10	16	25	50	100	10	16	25	50	100				
Capacitance	1,200pF (122)						S	S								B	B	B	B	B
	1,500pF (152)						S	S								B	B	B	B	B
	1,800pF (182)						S	S								B	B	B	B	B
	2,200pF (222)						S	S								B	B	B	B	B
	2,700pF (272)						S	S								D	D	D	D	D
	3,300pF (332)						S	S								D	D	D	D	D
	3,900pF (392)															D	D	D	D	D
	4,700pF (472)															D	D	D	D	D
	5,600pF (562)															D	D			
	6,800pF (682)															D	D			
	8,200pF (822)															D	D			
	0.010μF (103)															D	D			
	0.012μF (123)															D	D			

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### 7-2 1206, 1210, 1812 Sizes

DIELECTRIC	SIZE	NPO																		
		1206					1210					1812								
		10	16	25	50	100	10	16	25	50	100	16	50	100						
Capacitance	1.0pF (1R0)																			
	1.2pF (1R2)																			
	1.5pF (1R5)	B	B	B	B	B														
	1.8pF (1R8)	B	B	B	B	B														
	2.2pF (2R2)	B	B	B	B	B														
	2.7pF (2R7)	B	B	B	B	B														
	3.3pF (3R3)	B	B	B	B	B														
	3.9pF (3R9)	B	B	B	B	B														
	4.7pF (4R7)	B	B	B	B	B														
	5.6pF (5R6)	B	B	B	B	B														
	6.8pF (6R8)	B	B	B	B	B														
	8.2pF (8R2)	B	B	B	B	B														
	10pF (100)	B	B	B	B	B										C				D
	12pF (120)	B	B	B	B	B										C				D
	15pF (150)	B	B	B	B	B										C				D
	18pF (180)	B	B	B	B	B										C				D
	22pF (220)	B	B	B	B	B	C	C	C	C	C					C				D
	27pF (270)	B	B	B	B	B	C	C	C	C	C					C				D
	33pF (330)	B	B	B	B	B	C	C	C	C	C					C				D
	39pF (390)	B	B	B	B	B	C	C	C	C	C					C				D
	47pF (470)	B	B	B	B	B	C	C	C	C	C					C				D
	56pF (560)	B	B	B	B	B	C	C	C	C	C					C				D
	68pF (680)	B	B	B	B	B	C	C	C	C	C					C				D
	82pF (820)	B	B	B	B	B	C	C	C	C	C					C				D
	100pF (101)	B	B	B	B	B	C	C	C	C	C					C				D

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7-2 1206, 1210, 1812 Sizes (Continued)

DIELECTRIC	SIZE															
	1206					NPO					1812					
	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100	
Capacitance	120pF (121)	B	B	B	B	B	C	C	C	C	C					D
	150pF (151)	B	B	B	B	B	C	C	C	C	C					D
	180pF (181)	B	B	B	B	B	C	C	C	C	C					D
	220pF (221)	B	B	B	B	B	C	C	C	C	C					D
	270pF (271)	B	B	B	B	B	C	C	C	C	C					D
	330pF (331)	B	B	B	B	B	C	C	C	C	C					D
	390pF (391)	B	B	B	B	B	C	C	C	C	C					D
	470pF (471)	B	B	B	B	B	C	C	C	C	C					D
	560pF (561)	B	B	B	B	B	C	C	C	C	C					D
	680pF (681)	B	B	B	B	B	C	C	C	C	C					D
	820pF (821)	B	B	B	B	B	C	C	C	C	C					D
	1,000pF (102)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	1,200pF (122)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	1,500pF (152)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	1,800pF (182)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	2,200pF (222)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	2,700pF (272)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	3,300pF (332)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	3,900pF (392)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	4,700pF (472)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	5,600pF (562)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D
	6,800pF (682)	C	C	C	C	C	C	C	C	C	C	D	D	D	D	D
	8,200pF (822)	D	D	D	D	D	C	C	C	C	C	D	D	D	D	D
	0.010µF (103)	D	D	D	D		C	C	C	C	C	D	D	D	D	D
	0.012µF (123)	D	D				C	C	D	D	D	D	D	D	D	D
	0.015µF (153)	D	D				C	C	D	D	D	D	D	D	D	D
	0.018µF (183)	D	D									D	D	D	D	D
	0.022µF (223)	D	D									D	D	D	D	D
	0.027µF (273)	D	D									D	D	D	D	D
	0.033µF (333)	D	D									D	D	D	D	D
0.039µF (393)	G	G														

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2. For more information about products with special capacitance or other data, please contact WTC local representative.



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## CHIP CAPACITORS

### 8. CAPACITANCE RANGE (X7R Dielectric - Based Metal Electrode)

8-1 0402, 0603, 0805 Sizes

RATED VOLTAGE (VDC)	0402				0603					0805				
	SIZE				X7R									
	10	16	25	50	10	16	25	50	100	10	16	25	50	100
100pF (101)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
120pF (121)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
150pF (151)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
180pF (181)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
220pF (221)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
270pF (271)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
330pF (331)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
390pF (391)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
470pF (471)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
560pF (561)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
680pF (681)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
820pF (821)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
1,000pF (102)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
1,200pF (122)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
1,500pF (152)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
1,800pF (182)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
2,200pF (222)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
2,700pF (272)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
3,300pF (332)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
3,900pF (392)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
4,700pF (472)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
5,600pF (562)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
6,800pF (682)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
8,200pF (822)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
0.010µF (103)	N	N	N	N	S	S	S	S	S	B	B	B	B	B
0.012µF (123)	N	N	N		S	S	S	S		B	B	B	B	B
0.015µF (153)	N	N	N		S	S	S	S		B	B	B	B	B
0.018µF (183)	N	N	N		S	S	S	S		B	B	B	B	B
0.022µF (223)	N	N	N		S	S	S	S		B	B	B	B	B
0.027µF (273)	N	N			S	S	S	S		B	B	B	B	D
0.033µF (333)	N	N			S	S	S	X		B	B	B	B	D
0.039µF (393)	N	N			S	S	S	X		B	B	B	B	D
0.047µF (473)	N	N			S	S	S	X		B	B	B	B	D
0.056µF (563)	N				S	S	S	X		B	B	B	B	D
0.068µF (683)	N	N			S	S	S	X		B	B	B	B	D
0.082µF (823)	N				S	S	S	X		B	B	B	B	D
0.10µF (104)	N	N								B	B	B	B	D
0.12µF (124)										B	B	B	D	
0.15µF (154)										D	D	D	D	
0.18µF (184)										D	D	D	D	
0.22µF (224)										D	D	D	D	
0.27µF (274)										D	D	D		
0.33µF (334)										D	D	D		
0.39µF (394)										D	D	D		
0.47µF (474)										D	D	D		
0.56µF (564)										D	D	D		
0.68µF (684)										D	D	D		
0.82µF (824)										D	D	D		
1.0µF (105)										D	D	D		

1. The letter in cell is covered the number of product thickness



# TECH-MEN ELECTRONICS COMPONENTS

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Email: tech\_men@pacific.net.sg Web: www.techmen.com.sg

Supply \* Sub Assemblies \* Taping/ Forming Components

Co. Reg. No: 45730100K

## CHIP CAPACITORS

8-2 1206, 1210, 1812 Sizes

DIELECTRIC	X7R															
	SIZE	1206					1210					1812				
	RATED VOLTAGE (VDC)	10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
100pF (101)																
120pF (121)																
150pF (151)	B	B	B	B	B											
180pF (181)	B	B	B	B	B											
220pF (221)	B	B	B	B	B											
270pF (271)	B	B	B	B	B											
330pF (331)	B	B	B	B	B											
390pF (391)	B	B	B	B	B											
470pF (471)	B	B	B	B	B											
560pF (561)	B	B	B	B	B											
680pF (681)	B	B	B	B	B											
820pF (821)	B	B	B	B	B											
1,000pF (102)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
1,200pF (122)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
1,500pF (152)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
1,800pF (182)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
2,200pF (222)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
2,700pF (272)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
3,300pF (332)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
3,900pF (392)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
4,700pF (472)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
5,600pF (562)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
6,800pF (682)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
8,200pF (822)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.010µF (103)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.012µF (123)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.015µF (153)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.018µF (183)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.022µF (223)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.027µF (273)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.033µF (333)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.039µF (393)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.047µF (473)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.056µF (563)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.068µF (683)	B	B	B	B	B	C	C	C	C	C	D	D	D	D	D	D
0.082µF (823)	B	B	B	B	D	C	C	C	C	C	D	D	D	D	D	D
0.10µF (104)	B	B	B	B	D	C	C	C	C	C	D	D	D	D	D	D
0.12µF (124)	B	B	B	B	D	C	C	C	C	C	D	D	D	D	D	D
0.15µF (154)	C	C	C	C	G	C	C	C	C	D	D	D	D	D	D	D
0.18µF (184)	C	C	C	C	G	C	C	C	C	D	D	D	D	D	D	D
0.22µF (224)	C	C	C	C	G	C	C	C	C	D	D	D	D	D	D	D
0.27µF (274)	C	C	C	D		C	C	C	C	G	D	D	D	D	D	D
0.33µF (334)	C	C	C	D		C	C	C	D	G	D	D	D	D	D	D
0.39µF (394)	C	C	J	P		C	C	C	D	M	D	D	D	D	D	D
0.47µF (474)	J	J	J	P		C	C	C	D	M	D	D	D	D	D	K
0.56µF (564)	J	J	J	P		D	D	D	D	M	D	D	D	D	D	K
0.68µF (684)	J	J	J	P		D	D	D	D	k	D	D	D	D	K	K
0.82µF (824)	J	J	J	P		D	D	D	D	k	D	D	D	D	K	K
1.0µF (105)										k						K

1. The letter in cell is expressed the symbol of product thickness.

2. For more information about products with special capacitance or other data, please contact WTC local representative.

3. [^] means the said item is made by NME (Noble Metal Electrode) process.



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## CHIP CAPACITORS

### 10. PACKAGING STYLE AND QUANTITY

Size	Thickness (mm)/Symbol		Paper tape		Plastic tape	
			7" reel	13" reel	7" reel	13" reel
0402 (1005)	0.50±0.05	N	10k	50k	-	-
0603 (1608)	0.80±0.07	S	4k	15k	-	-
	0.80±0.15/-0.10	X	4k	15k	-	-
0805 (2012)	0.60±0.10	A	4k	15k	-	-
	0.80±0.10	B	4k	15k	-	-
	1.25±0.10	D	-	-	3k	10k
1206 (3216)	0.80±0.10	B	4k	15k	-	-
	0.95±0.10	C	-	-	3k	10k
	1.15±0.15	J	-	-	3k	10k
	1.25±0.10	D	-	-	3k	10k
	1.60±0.20	G	-	-	2k	-
	1.60±0.30/-0.10	P	-	-	2k	-
1210 (3225)	0.95±0.10	C	-	-	3k	10k
	1.25±0.10	D	-	-	3k	10k
	1.60±0.20	G	-	-	2k	-
	2.50±0.30	M	-	-	1K	-
1812 (4532)	1.25±0.10	D	-	-	1k	-
	2.00±0.20	K	-	-	1k	-

Unit: pieces





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## CHIP CAPACITORS

### 11. APPENDIXES

#### ■ Tape & reel dimensions

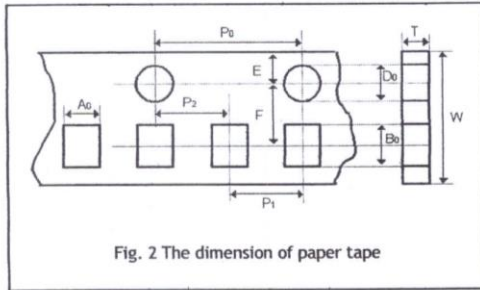


Fig. 2 The dimension of paper tape

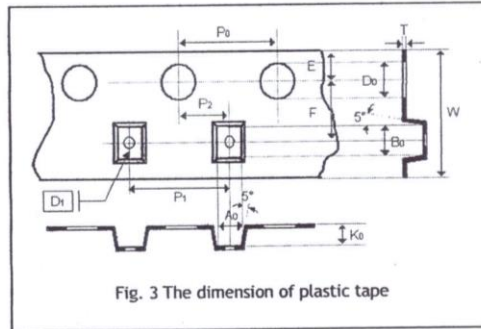


Fig. 3 The dimension of plastic tape

Size	0402	0603	0805			1206			1210		1812
Thickness	N	S, X	A	B	C, D, I	B	C, J, D	G	C, D, G	M	D, K
A <sub>0</sub>	0.62±0.05	1.02±0.05	1.50±0.10	1.50±0.10	<1.57	2.00±0.10	<1.85	<1.95	<2.97	<2.97	<3.81
B <sub>0</sub>	1.12±0.05	1.80±0.05	2.30±0.10	2.30±0.10	<2.40	3.50±0.10	<3.46	<3.67	<3.73	<3.73	<5.30
T	0.60±0.05	0.95±0.05	0.75±0.05	0.95±0.05	0.23±0.05	0.95±0.05	0.23±0.05	0.23±0.05	0.23±0.05	0.23±0.05	0.25±0.05
K <sub>0</sub>	-	-	-	-	<2.50	-	<2.50	<2.50	<2.50	<3.00	<2.50
W	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10	12.0±0.20
P <sub>0</sub>	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
10xP <sub>0</sub>	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10	40.0±0.10
P <sub>1</sub>	2.00±0.05	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	8.00±0.10
P <sub>2</sub>	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05
D <sub>0</sub>	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05	1.50±0.05
D <sub>1</sub>	-	-	-	-	1.00±0.10	-	1.00±0.10	1.00±0.10	1.00±0.10	1.00±0.10	1.50±0.10
E	1.75±0.05	1.75±0.05	1.75±0.05	1.75±0.05	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10
F	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	5.50±0.05

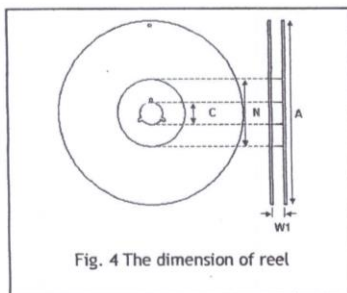


Fig. 4 The dimension of reel

Size	0402, 0603, 0805, 1206, 1210			1812
Reel size	7"	10"	13"	7"
C	13.0+0.5/-0.2	13.0+0.5/-0.2	13.0+0.5/-0.2	13.0+0.5/-0.2
W <sub>1</sub>	8.4+1.5/-0	8.4+1.5/-0	8.4+1.5/-0	12.4+2.0/-0
A	178.0±1.0	250.0±1.0	330.0±1.0	178.0±1.0
N	60.5±1.0	100.0±1.0	100±1.0	60.5±1.0



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## CHIP CAPACITORS

### ■ Recommended soldering conditions

The lead-free termination MLCCs are not only to be used on SMT against lead-free solder paste, but also suitable against lead-containing solder paste. If the optimized solder joint is requested, increasing soldering time, temperature and concentration of N<sub>2</sub> within oven are recommended.

