Multilayer Ceramic Capacitors
General Purpose Series

RoHS Compliant

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 NP0, X7R and X5R dielectric material and which provides product with high electrical precision, stability and reliability.

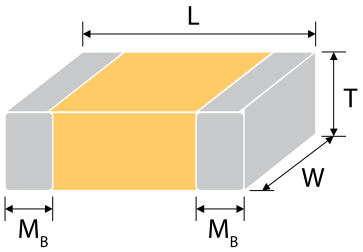
Features:

- A wide selection of sizes is available (0402 to 1210)
- High capacitance in given case size
- Capacitor with lead-free termination (pure Tin)

Applications:

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

External Dimensions:



The outline of MLCC

Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol		Remark	MB (mm)
0402 (1005)	1 ±0.05	0.5 ±0.05	0.5 ±0.05	N	#	0.25 +0.05/-0.1
0603 (1608)	1.6 ±0.1	0.8 ±0.1	0.8 ±0.07	S	-	0.4 ±0.15
	1.6 +0.15/-0.1	0.8 +0.15/-0.1	0.8 +0.15/-0.1	X	-	
0805 (2012)	2 ±0.15	1.25 ±0.1	0.6 ±0.1	A	-	0.5 ±0.2
			0.8 ±0.1	B	-	
			1.25 ±0.1	D	#	
	2 ±0.2	1.25 ±0.2	1.25 ±0.2	I	#	
1206 (3216)	3.2 ±0.15	1.6 ±0.15	0.8 ±0.1	B	-	0.6 ±0.2
			0.95 ±0.1	C	-	
			1.15 ±0.15	J	#	
			1.25 ±0.1	D	#	
			1.6 ±0.2	G	#	
	3.2 +0.3/-0.1	1.6 +0.3/0.1	1.6 +0.3/-0.1	P	#	
1210 (3225)	3.2 ±0.3	2.5 ±0.2	0.95 ±0.1	C	#	0.75 ±0.25
			1.25 ±0.1	D	#	
	3.2 ±0.4	2.5 ±0.3	1.6 ±0.2	G	#	
			2 ±0.2	K	#	
			2.5 ±0.3	M	#	

Reflow soldering only is recommended.

General Electrical Data:

Dielectric	NP0	X7R	X5R
Size	0402, 0603, 0805, 1206 & 1210		
Capacitance*	0.5pF to 0.039μF	100pF to 0.82μF	0.056μF to 10μF
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)	10V, 16V, 25V, 50V, 100V	6.3V, 10V, 16V, 25V, 50V, 100V	6.3V, 10V, 16V, 25V
Tan δ*	Cap<30pF: Q≥400+20C Cap≥30pF: Q≥1000	Note 1	
Insulation resistance at Ur	≥10GΩ or RxC≥500Ω-F whichever is less		
Operating temperature	-55°C to +125°C		-55°C to +85°C
Capacitance change	±30ppm	±15%	
Termination	Ni/Sn (lead-free termination)		

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

NP0: Apply 1 ±0.2Vrms, 1MHz ±10% for Cap≤1,000pF and 1 ±0.2Vrms, 1kHz ±10% for Cap>1,000pF, 25°C at ambient temperature

Measured at 1 ±0.2Vrms, 1kHz ±10% for C≤10μF; 0.5 ±0.2Vrms, 120Hz ±20% for C>10μF, 30~70% related humidity, 25°C ambient temperature for X7R, X5R.

** 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%	0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF
		≦5%	1210≧4.7μF
		≦10%	0603≧1μF; 0805≧1μF;1206≧4.7μF; 1210≧10μF
35V	≦3.5%	≦10%	0805≥2.2μF; 1210≧10μF
25V	≦3.5%	≦5%	0201≧0.01μF;0805≧1μF; 1210≧10μF
		≦7%	0603≧0.33μF; 1206≧4.7μF
		≦10%	0402≧0.10μF;0603≧0.47μF; 0805≧2.2μF; 1206≧6.8μF ; 1210≧22μF
16V	≦3.5%	≦5%	0201≧0.01μF; 0402≧0.033μF; 0805≧0.68μF;1206≧2.2μF;1210≧4.7μF
		≦10%	0402≧0.47uF; 0603≧0.68μF;0805≧2.2μF; 1206≧4.7μF; 1210≧22μF
10V	≦5%	≦10%	0402≧0.33μF; 0603≧0.33μF; 0805≧2.2μF; 1206≧2.2μF; 1210≧22μF
		≦15%	0201≧0.1μF; 0402≧1μF
6.3V	≦10%	≦15%	0201≧0.1μF; 0402≧1μF; 0603≧10μF; 0805≧4.7μF; 1206≧47μF; 1210≧100μF
		≦20%	0402≧2.2μF
4V	≦15%	-	-

Capacitance Range (NP0 Dielectric)

Dielectric		NP0														
Size		0402					0603					0805				
Rated Voltage		10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
Capacitance	0.1pF (0R1)	N	N	N	N											
	0.2pF (0R2)	N	N	N	N											
	0.3pF (0R3)	N	N	N	N											
	0.4pF (0R4)	N	N	N	N											
	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

Capacitance Range (NP0 Dielectric)

Dielectric		NP0														
Size		0402					0603					0805				
Rated Voltage		10	16	25	50	100	10	16	25	50	100	10	16	25	50	100
Capacitance	150pF (151)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	180pF (181)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	220pF (221)	N	N	N	N	N	S	S	S	S	S	A	A	A	A	A
	270pF (271)	N	N	N	N		S	S	S	S	S	A	A	A	A	A
	330pF (331)	N	N	N	N		S	S	S	S	S	A	A	A	A	A
	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)						X	X	X	X		B	B	B	B	B
	1,500pF (152)						X	X	X	X		B	B	B	B	B
	1,800pF (182)						X	X	X	X		B	B	B	B	B
	2,200pF (222)						X	X	X	X		B	B	B	B	B
	2,700pF (272)						X	X	X	X		D	D	D	D	D
	3,300pF (332)						X	X	X	X		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	D	D	
	6,800pF (682)											D	D	D	D	
	8,200pF (822)											D	D	D	D	
	0.010uF (103)											D	D	D	D	
	0.012uF (123)											D^	D^			

1. The letter in cell is expressed the symbol of product thickness.
2. The letter in cell with “^” mark is expressed product with Ag/Ni/Sn terminations.
3. For more information about products with special capacitance or other data, please contact WTC local representative.

Dielectric		NP0									
Size		1206					1210				
Rated Voltage		10	16	25	50	100	10	16	25	50	100
Capacitance	1.0pF (1R0)										
	1.2pF (1R2)	B	B	B	B	B					
	1.5pF (1R5)	B	B	B	B	B					
	1.8pF (1R8)	B	B	B	B	B					
	2.2pF (2R2)	B	B	B	B	B					

Capacitance Range (NP0 Dielectric)

Dielectric		NP0									
Size		1206					1210				
Rated Voltage		10	16	25	50	100	10	16	25	50	100
Capacitance	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	C	C	C	C
	12pF (120)	B	B	B	B	B	C	C	C	C	C
	15pF (150)	B	B	B	B	B	C	C	C	C	C
	18pF (180)	B	B	B	B	B	C	C	C	C	C
	22pF (220)	B	B	B	B	B	C	C	C	C	C
	27pF (270)	B	B	B	B	B	C	C	C	C	C
	33pF (330)	B	B	B	B	B	C	C	C	C	C
	39pF (390)	B	B	B	B	B	C	C	C	C	C
	47pF (470)	B	B	B	B	B	C	C	C	C	C
	56pF (560)	B	B	B	B	B	C	C	C	C	C
	68pF (680)	B	B	B	B	B	C	C	C	C	C
	82pF (820)	B	B	B	B	B	C	C	C	C	C
	100pF (101)	B	B	B	B	B	C	C	C	C	C
	120pF (121)	B	B	B	B	B	C	C	C	C	C
	150pF (151)	B	B	B	B	B	C	C	C	C	C
	180pF (181)	B	B	B	B	B	C	C	C	C	C
	220pF (221)	B	B	B	B	B	C	C	C	C	C
	270pF (271)	B	B	B	B	B	C	C	C	C	C
	330pF (331)	B	B	B	B	B	C	C	C	C	C
	390pF (391)	B	B	B	B	B	C	C	C	C	C
	470pF (471)	B	B	B	B	B	C	C	C	C	C
	560pF (561)	B	B	B	B	B	C	C	C	C	C
	680pF (681)	B	B	B	B	B	C	C	C	C	C
	820pF (821)	B	B	B	B	B	C	C	C	C	C
	1,000pF (102)	B	B	B	B	B	C	C	C	C	C
	1,200pF (122)	B	B	B	B	B	C	C	C	C	C
	1,500pF (152)	B	B	B	B	B	C	C	C	C	C
	1,800pF (182)	B	B	B	B	B	C	C	C	C	C

Capacitance Range (NP0 Dielectric)

Dielectric		NP0									
Size		1206					1210				
Rated Voltage		10	16	25	50	100	10	16	25	50	100
Capacitance	2,200pF (222)	B	B	B	B	B	C	C	C	C	C
	2,700pF (272)	B	B	B	B	B	C	C	C	C	C
	3,300pF (332)	B	B	B	B	B	C	C	C	C	C
	3,900pF (392)	B	B	B	B	B	C	C	C	C	C
	4,700pF (472)	B	B	B	B	B	C	C	C	C	C
	5,600pF (562)	B	B	B	B	B	C	C	C	C	C
	6,800pF (682)	C	C	C	C	C	C	C	C	C	C
	8,200pF (822)	D	D	D	D	D	C	C	C	C	C
	0.010µF (103)	D	D	D	D	D	C	C	C	C	C
	0.012µF (123)	D^	D^				C	C	D	D	D
	0.015µF (153)	D^	D^				C	C	D	D	D
	0.018µF (183)	D^	D^								
	0.022µF (223)	D^	D^								
	0.027µF (273)	D^	D^								
	0.033µF (333)	D^	D^								
	0.039µF (393)	G^	G^								

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Capacitance Range (X7R Dielectric)

Dielectric		X7R													
Size		0402				0603					0805				
Rated Voltage (V DC)		10	16	25	50	10	16	25	50	100	10	16	25	50	100
Capacitance	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

Multilayer Ceramic Capacitors
General Purpose Series

Dielectric		X7R													
Size		0402				0603					0805				
Rated Voltage (V DC)		10	16	25	50	10	16	25	50	100	10	16	25	50	100
Capacitance	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	N		S	S	S	S		B	B	B	B	D
	0.033µF (333)	N	N	N		S	S	S	X		B	B	B	B	D
	0.039µF (393)	N	N	N		S	S	S	X		B	B	B	B	D
	0.047µF (473)	N	N	N		S	S	S	X		B	B	B	B	D
	0.056µF (563)	N	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	N			S	S	S	X		B	B	B	B	D
	0.10µF (104)	N	N			S	S	S	X		B	B	B	B	D
	0.12µF (124)					S	S	X			B	B	B	D	
	0.15µF (154)					S	S	X			D	D	D	D	
	0.18µF (184)					S	S	X			D	D	D	D	
	0.22µF (224)					S	S	X			D	D	D	D	
	0.27µF (274)					X	X	X			D	D	D	I	
	0.33µF (334)					X	X	X			D	D	D	I	
	0.39µF (394)					X	X	X			D	D	D	I	
	0.47µF (474)					X	X	X			D	D	D	I	
	0.56µF (564)					X	X				D	D	D		
	0.68µF (684)					X	X				D	D	D		
	0.82µF (824)					X	X				D	D	D		

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Capacitance Range (X7R Dielectric)

Dielectric		X7R									
Size		1206					1210				
Rated Voltage		10	16	25	50	100	10	16	25	50	100
Capacitance	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
	1,200pF (122)	B	B	B	B	B	C	C	C	C	C
	1,500pF (152)	B	B	B	B	B	C	C	C	C	C
	1,800pF (182)	B	B	B	B	B	C	C	C	C	C
	2,200pF (222)	B	B	B	B	B	C	C	C	C	C
	2,700pF (272)	B	B	B	B	B	C	C	C	C	C
	3,300pF (332)	B	B	B	B	B	C	C	C	C	C
	3,900pF (392)	B	B	B	B	B	C	C	C	C	C
	4,700pF (472)	B	B	B	B	B	C	C	C	C	C
	5,600pF (562)	B	B	B	B	B	C	C	C	C	C
	6,800pF (682)	B	B	B	B	B	C	C	C	C	C
	8,200pF (822)	B	B	B	B	B	C	C	C	C	C
	0.010µF (103)	B	B	B	B	B	C	C	C	C	C
	0.012µF (123)	B	B	B	B	B	C	C	C	C	C
	0.015µF (153)	B	B	B	B	B	C	C	C	C	C
	0.018µF (183)	B	B	B	B	B	C	C	C	C	C
	0.022µF (223)	B	B	B	B	B	C	C	C	C	C
	0.027µF (273)	B	B	B	B	B	C	C	C	C	C
	0.033µF (333)	B	B	B	B	B	C	C	C	C	C
	0.039µF (393)	B	B	B	B	B	C	C	C	C	C
	0.047µF (473)	B	B	B	B	B	C	C	C	C	C
	0.056µF (563)	B	B	B	B	B	C	C	C	C	C

Capacitance Range (X7R Dielectric)

Dielectric		X7R									
Size		1206					1210				
Rated Voltage		10	16	25	50	100	10	16	25	50	100
Capacitance	0.068µF (683)	B	B	B	B	B	C	C	C	C	C
	0.082µF (823)	B	B	B	B	D	C	C	C	C	C
	0.10µF (104)	B	B	B	B	D	C	C	C	C	C
	0.12µF (124)	B	B	B	B	D	C	C	C	C	C
	0.15µF (154)	C	C	C	C	G	C	C	C	C	D
	0.18µF (184)	C	C	C	C	G	C	C	C	C	D
	0.22µF (224)	C	C	C	C	G	C	C	C	C	D
	0.27µF (274)	C	C	C	D	G	C	C	C	C	G
	0.33µF (334)	C	C	C	D	G	C	C	C	D	G
	0.39µF (394)	C	C	J	P	G	C	C	C	D	M
	0.47µF (474)	J	J	J	P	G	C	C	C	D	M
	0.56µF (564)	J	J	J	P	P	D	D	D	D	M
	0.68µF (684)	J	J	J	P	P	D	D	D	D	K
	0.82µF (824)	J	J	J	P	P	D	D	D	D	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.

Capacitance Range (X5R Dielectric)

Dielectric		X5R																	
Size		0402				0603				0805				1206				1210	
Rated Voltage (V DC)		6.3	10	16	25	6.3	10	16	25	6.3	10	16	25	6.3	10	16	25	10	16
Capacitance	0.027µF (273)																		
	0.033µF (333)																		
	0.039µF (393)																		
	0.047µF (473)																		
	0.056µF (563)		N																
	0.068µF (683)		N																
	0.082µF (823)		N																
	0.10µF (104)		N	N															
	0.15µF (154)		N	N															
	0.22µF (224)	N	N	N															
	0.27µF (274)	N	N				X	X	X										
	0.33µF (334)	N	N				X	X	X										
	0.39µF (394)	N					X	X	X										

Capacitance Range (X5R Dielectric)

Dielectric		X5R																	
Size		0402				0603				0805				1206				1210	
Rated Voltage (V DC)		6.3	10	16	25	6.3	10	16	25	6.3	10	16	25	6.3	10	16	25	10	16
Capacitance	0.47μF (474)	N					X	X	X										
	0.68μF (684)	N					X	X	X										
	0.82μF (824)	N				X	X	X	X										
	1.0μF (105)					X	X	X	X										
	1.5μF (155)									I	I				J	J	P	K	K
	2.2μF (225)									I	I	I	I		J	J	P	K	K
	3.3μF (335)											I	I	P	P	P	P	K	K
	4.7μF (475)											I	I	P	P	P	P	K	K
	6.8μF (685)													P	P				
	10μF (106)													P	P				
	22μF (226)																		

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.

Packaging Dimension And Quantity:

Size	Thickness (mm)/Symbol		Paper tape		Plastic tape	
			7" reel	13" reel	7" reel	13" reel
0402 (1005)	0.5 ±0.05	N	10k	50k	-	-
0603 (1608)	0.8 ±0.07	S	4k	15k	-	-
	0.8 +0.15/-0.1	X	4k	15k	-	-
0805 (2012)	0.6 ±0.1	A	4k	15k	-	-
	0.8 ±0.1	B	4k	15k	-	-
	1.25 ±0.1	D	-	-	3k	10k
	1.25 ±0.2	I	-	-	3k	10k
1206 (3216)	0.8 ±0.1	B	4k	15k	-	-
	0.95 ±0.1	C	-	-	3k	10k
	1.15 ±0.15	J	-	-	3k	10k
	1.25 ±0.1	D	-	-	3k	10k
	1.6 ±0.2	G	-	-	2k	10k
	1.6 +0.3/-0.1	P	-	-	2k	9k
1210 (3225)	0.95 ±0.1	C	-	-	3k	10k
	1.25 ±0.1	D	-	-	3k	10k
	1.6 ±0.2	G	-	-	2k	-
	2 ±0.2	K	-	-	1k	6k
	2.5 ±0.3	M	-	-	1k	6k

Unit : pieces

Reliability Test Conditions and Requirements:

<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>1</td><td>Visual and Mechanical</td><td>-</td><td>No remarkable defect.
Dimensions to conform to individual specification sheet.</td></tr>
<tr><td>2</td><td>Capacitance</td><td rowspan="2">Class I: NP0
Cap≤1,000pF 1 ±0.2Vrms, 1MHz±10%
Cap>1,000pF 1 ±0.2Vrms, 1KHz±10%
Class II: X7R, X5R
Cap≤10μF, 1 ±0.2Vrms, 1kHz ±10% **
Cap>10μF, 0.5 ±0.2Vrms, 120Hz ±20%

** Test condition: 0.5±0.2Vrms, 1KHz±10%
X7R: 0603≧225(10V),
0805=106(6.3V&10V)
X5R: 01R5≧103, 0201≧224 (6.3V),
0402≧475 (6.3V),
0402≧225(10V),
0603=106 (6.3V)</td><td>Shall not exceed the limits given in the detailed spec.</td></tr>
<tr><td>3</td><td>Q/ D.F. (Dissipation Factor)</td><td>NP0: Cap≥30pF, Q≥1000; Cap<30pF,Q≥400+20C
X7R, X5R:
<table>
<tr><th>Rated vol.</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧50V</td><td rowspan="3">≦2.5%</td><td>≦3%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦5%</td><td>1210≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0603≧1μF; 0805≧1μF;1206≧4.7μF; 1210≧10μF</td></tr>
<tr><td>35V</td><td>≦3.5%</td><td>≦10%</td><td>0805≥2.2μF; 1210≧10μF</td></tr>
<tr><td rowspan="3">25V</td><td rowspan="3">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF;0805≧1μF; 1210≧10μF</td></tr>
<tr><td>≦7%</td><td>0603≧0.33μF; 1206≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0402≧0.10μF;0603≧0.47μF; 0805≧2.2μF; 1206≧6.8μF ; 1210≧22μF</td></tr>
<tr><td rowspan="2">16V</td><td rowspan="2">≦3.5%</td><td>≦5%</td><td>0201≧0.01μF; 0402≧0.033μF; 0805≧0.68μF;1206≧2.2μF; 1210≧4.7μF</td></tr>
<tr><td>≦10%</td><td>0402≧0.47uF; 0603≧0.68μF;0805≧2.2μF; 1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">10V</td><td rowspan="2">≦5%</td><td>≦10%</td><td>0402≧0.33μF; 0603≧0.33μF; 0805≧2.2μF; 1206≧2.2μF; 1210≧22μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td rowspan="2">6.3V</td><td rowspan="2">≦10%</td><td>≦15%</td><td>0201≧0.1μF; 0402≧1μF; 0603≧10μF; 0805≧4.7μF; 1206≧47μF; 1210≧100μF</td></tr>
<tr><td>≦20%</td><td>0402≧2.2μF</td></tr>
<tr><td>4V</td><td>≦15%</td><td>-</td><td>-</td></tr>
</table></td></tr>
<tr><td>4</td><td>Dielectric Strength</td><td>To apply voltage (≤100V) 250%.
Duration: 1 to 5 sec.
Charge and discharge current less than 50mA.</td><td>No evidence of damage or flash over during test.</td></tr>
</table>

<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>5</td><td>Insulation Resistance</td><td>To apply rated voltage for max. 120 sec.</td><td>10G or RxC≧500-F whichever is smaller
Class II (X7R, X5R)
<table>
<tr><th>Rated voltage</th><th>Insulation Resistance</th></tr>
<tr><td>100V: X7R</td><td rowspan="7">10G or RxC≧100ΩF whichever is smaller.</td></tr>
<tr><td>50V:0603≥1μF;0805≥1μF;1206≥4.7μF; 1210≥4.7μF</td></tr>
<tr><td>35V:0805≥2.2μF;1210≧10μF</td></tr>
<tr><td>25V:0402≥1μF;0603≥2.2μF;0805≥2.2μF; 1206≥10μF;1210≥10μF</td></tr>
<tr><td>16V:0402≥0.22μF;0603≥1μF;0805≥2.2μF; 1206≥10μF;1210≥47μF</td></tr>
<tr><td>10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF;1210≥47μF</td></tr>
<tr><td>6.3V ; 4V</td></tr>
</table></td></tr>
<tr><td>6</td><td>Temperature Coefficient</td><td>With no electrical load.
<table>
<tr><td>T.C.</td><td>Operating Temp</td></tr>
<tr><td>NPO</td><td>-55~125°C at 25°C</td></tr>
<tr><td>X7R</td><td>-55~125°C at 25°C</td></tr>
<tr><td>X5R</td><td>-55~ 85°C at 25°C</td></tr>
</table></td><td>
<table>
<tr><td>T.C.</td><td>Capacitance Change</td></tr>
<tr><td>NPO</td><td>Within ±30ppm/°C</td></tr>
<tr><td>X7R</td><td>Within ±15%</td></tr>
<tr><td>X5R</td><td>Within ±15%</td></tr>
</table></td></tr>
<tr><td>7</td><td>Adhesive Strength of Termination</td><td>Pressurizing force:
5N (≤0603) and 10N (>0603)
Test time: 10±1 sec.</td><td>No remarkable damage or removal of the terminations.</td></tr>
<tr><td>8</td><td>Vibration Resistance</td><td>Vibration frequency: 10~55 Hz/min.
Total amplitude: 1.5mm
Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.)
Measurement to be made after keeping at room temp. for 24±2 hrs.</td><td>No remarkable damage.
Cap change and Q/D.F.: To meet initial spec.</td></tr>
<tr><td>9</td><td>Solderability</td><td>Solder temperature : 235 ±5°C
Dipping time : 2 ±0.5 sec.</td><td>95% min. coverage of all metalized area.</td></tr>
</table>

<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>10</td><td>Bending Test</td><td>The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm per second until the deflection becomes 1mm and then the pressure shall be maintained for 5 ±1 sec.
Measurement to be made after keeping at room temp. for 24 ±2 hrs.</td><td>No remarkable damage.
Cap change:
NP0: within ±5% or 0.5pF whichever is larger
X7R, X5R: within ±12.5%
(This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.)</td></tr>
<tr><td>11</td><td>Resistance to Soldering Heat</td><td>Solder temperature: 260 ±5°C
Dipping time: 10 ±1sec
Preheating: 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder.
Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hr and then set for 24 ±2hrs at room temp.
Measurement to be made after keeping at room temp. for 24±2 hrs.</td><td>No remarkable damage.
Cap change:
NP0: within ±2.5% or 0.25pF whichever is larger
X7R, X5R: within ±7.5%
Q/D.F., I.R. and dielectric strength: To meet initial requirements
25% max. leaching on each edge.</td></tr>
<tr><td>12</td><td>Temperature Cycle</td><td>Conduct the five cycles according to the temperatures and time.
<table>
<tr><th>Step</th><th>Temp. (°C)</th><th>Time (min.)</th></tr>
<tr><td>1</td><td>Min. operating temp. +0/-3</td><td>30±3</td></tr>
<tr><td>2</td><td>Room temp.</td><td>2~3</td></tr>
<tr><td>3</td><td>Max. operating temp. +3/-0</td><td>30±3</td></tr>
<tr><td>4</td><td>Room temp.</td><td>2~3</td></tr>
</table>
Before initial measurement (Class II only): Perform 150 +0/-10°C for 1 hour and then set for 24 ±2hrs at room temp.
Measurement to be made after keeping at room temp. for 24±2 hrs.</td><td>No remarkable damage.
Cap change:
NP0: within ±2.5% or 0.25pF whichever is larger
X7R, X5R: within ±7.5%
Q/D.F., I.R. and dielectric strength: To meet initial requirements.</td></tr>
</table>

<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>13</td><td>Humidity
(Damp Heat)
Steady State</td><td>Test temp.: 40±2°C
Humidity: 90~95% RH
Test time: 500+24/-0hrs.
Before initial measurement (Class II only): Perform 150+0/-10°C for 1 hour and then set for 24 ±2 hrs at room temp.
Measurement to be made after keeping at room temp. for 24 ±2 hrs.</td><td>
No remarkable damage.
Cap change: NP0 : within ±5% or 0.5pF whichever is larger
X7R, X5R : ≥10V**,within ±12.5%;6.3V within ±25%;
Q/D.F. value: NP0: More than 30pF Q≥350, 10pF≤C≤30pF, Q≥275+2.5C. Less than 10pF Q≥200+10C
X7R, X5R:
<table>
<tr><th>Rated vol.</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧50V</td><td rowspan="3">≦3%</td><td>≦6%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦10%</td><td>1210≧4.7μF</td></tr>
<tr><td>≦20%</td><td>0603≧1μF; 0805≧1μF;1206≧4.7μF; 1210≧10μF</td></tr>
<tr><td>35V</td><td>≦5%</td><td>≦20%</td><td>0805≥2.2μF; 1210≧10μF</td></tr>
<tr><td rowspan="3">25V</td><td rowspan="3">≦5%</td><td>≦10%</td><td>0201≧0.01μF;0805≧1μF; 1210≧10μF</td></tr>
<tr><td>≦14%</td><td>0603≧0.33μF; 1206≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0402≧0.10μF;0603≧0.47μF; 0805≧2.2μF;1206≧6.8μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">16V</td><td rowspan="2">≦5%</td><td>≦10%</td><td>0603≧0.15μF;0805≧0.68μF; 1206≧2.2μF;1210≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.01μF;0402≧0.033μF; 0603≧0.68μF;0805≧2.2μF; 1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">10V</td><td rowspan="2">≦75%</td><td>≦15%</td><td>0201≧0.012μF;0402≧0.33μF; 0603≧0.33μF; 0805≧2.2μF; 1206≧2.2μF; 1210≧22μF</td></tr>
<tr><td>≦20%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td>6.3V</td><td>≦15%</td><td>≦30%</td><td>0201≧0.1μF; 0402≧1μF; 0603≧10μF; 0805≧4.7μF; 1206≧47μF; 1210≧100μF</td></tr>
<tr><td>4V</td><td>≦20%</td><td>-</td><td>-</td></tr>
</table>
I.R.: ≥10V, 1GΩ or 50Ω-F whichever is smaller.
Class II (X7R, X5R)
<table>
<tr><th>Rated voltage</th><th>Insulation Resistance</th></tr>
<tr><td>100V: X7R</td><td rowspan="7">10G or RxC≧ 100ΩF whichever is smaller.</td></tr>
<tr><td>50V:0603≥1μF;0805≥1μF;1206≥4.7μF; 1210≥4.7μF</td></tr>
<tr><td>35V:0805≥2.2μF;1210≧10μF</td></tr>
<tr><td>25V:0402≥1μF;0603≥2.2μF;0805≥2.2μF; 1206≥10μF;1210≥10μF</td></tr>
<tr><td>16V:0402≥0.22μF;0603≥1μF;0805≥2.2μF; 1206≥10μF;1210≥47μF</td></tr>
<tr><td>10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF;1210≥47μF</td></tr>
<tr><td>6.3V ; 4V</td></tr>
</table>
</td></tr>
</table>

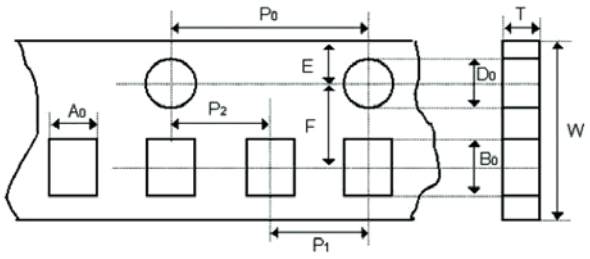
<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>14</td><td>Humidity
(Damp Heat)
Load</td><td>Test temp.: 40±2°C
Humidity: 90~95%RH
Test time: 500+24/-0 hrs.
To apply voltage : rated voltage.
Before initial measurement (Class II only): To apply test voltage for 1hour at 40°C and then set for 24 ±2 hrs at room temp.
Measurement to be made after keeping at room temp. for 24 ±2 hrs.</td><td>No remarkable damage.
Cap change: NP0 : within ±7.5% or 0.75pF whichever is larger
X7R, X5R : ≥10V**,within ±12.5%;6.3V within ±25%;
Q/D.F. value: NP0: C≥30pF,Q≥200;C<30pF, Q≥100+10/3C
X7R, X5R:
<table>
<tr><th>Rated vol.</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧50V</td><td rowspan="3">≦3%</td><td>≦6%</td><td>0201(50V); 0603≧0.047μF;
0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦10%</td><td>1210≧4.7μF</td></tr>
<tr><td>≦20%</td><td>0603≧1μF; 0805≧1μF;1206≧4.7μF;
1210≧10μF</td></tr>
<tr><td>35V</td><td>≦5%</td><td>≦20%</td><td>0805≥2.2μF; 1210≧10μF</td></tr>
<tr><td rowspan="3">25V</td><td rowspan="3">≦5%</td><td>≦10%</td><td>0201≧0.01μF;0805≧1μF; 1210≧10μF</td></tr>
<tr><td>≦14%</td><td>0603≧0.33μF; 1206≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0402≧0.10μF;0603≧0.47μF;
0805≧2.2μF;1206≧6.8μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">16V</td><td rowspan="2">≦5%</td><td>≦10%</td><td>0603≧0.15μF;0805≧0.68μF;
1206≧2.2μF;1210≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.01μF;0402≧0.033μF;
0603≧0.68μF;0805≧2.2μF;
1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">10V</td><td rowspan="2">≦75%</td><td>≦15%</td><td>0201≧0.012μF;0402≧0.33μF;
0603≧0.33μF; 0805≧2.2μF;
1206≧2.2μF; 1210≧22μF</td></tr>
<tr><td>≦20%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td>6.3V</td><td>≦15%</td><td>≦30%</td><td>0201≧0.1μF; 0402≧1μF; 0603≧10μF;
0805≧4.7μF; 1206≧47μF;
1210≧100μF</td></tr>
<tr><td>4V</td><td>≦20%</td><td>-</td><td>-</td></tr>
</table>
I.R.: ≥10V, 500M or 25Ω-F whichever is smaller.
Class II (X7R, X5R)
<table>
<tr><th>Rated voltage</th><th>Insulation Resistance</th></tr>
<tr><td>100V: X7R</td><td rowspan="7">10G or RxC≧ 100ΩF whichever is smaller.</td></tr>
<tr><td>50V:0603≥1μF;0805≥1μF;1206≥4.7μF; 1210≥4.7μF</td></tr>
<tr><td>35V:0805≥2.2μF;1210≧10μF</td></tr>
<tr><td>25V:0402≥1μF;0603≥2.2μF;0805≥2.2μF;
1206≥10μF;1210≥10μF</td></tr>
<tr><td>16V:0402≥0.22μF;0603≥1μF;0805≥2.2μF;
1206≥10μF;1210≥47μF</td></tr>
<tr><td>10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF;
0805≥2.2μF; 1206≥4.7μF;1210≥47μF</td></tr>
<tr><td>6.3V ; 4V</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No</th><th>Item</th><th>Test Condition</th><th>Requirements</th></tr>
<tr><td>15</td><td>High Temperature Load (Endurance)</td><td>
Test temp.:
NP0, X7R : 125 ±3°C
X5R : 85 ±3°C
Test time: 1000+24/-0 hrs.
To apply voltage
(1) 6.3V or C≧10μF or TT series: 150% of rated voltage.
(2) 10V ≦ Ur<500V: 200% of rated voltage.
(3) 500V: 150% of rated voltage.
(4) Ur≧630V: 120% of rated voltage.
(5) 100% of rated voltage for below range.
<table>
<tr><th>Size</th><th>Dielectric</th><th>Rated voltage</th><th>Capacitance range</th></tr>
<tr><td>0201</td><td>X5R/X7R</td><td>6.3V,10V</td><td>C≧0.1μF</td></tr>
<tr><td>0402</td><td>X5R/X7R</td><td>6.3V,10V</td><td>C≧1.0μF</td></tr>
<tr><td>0603</td><td>X5R/X7R</td><td>6.3V,10V</td><td>C≧4.7μF</td></tr>
<tr><td>0805</td><td>X5R/X7R</td><td>6.3V</td><td>C≧22μF</td></tr>
<tr><td rowspan="2">1206</td><td>X5R/X7R</td><td>6.3V</td><td>C≧47μF</td></tr>
<tr><td>NP0</td><td>3000V</td><td>C≧1.5pF</td></tr>
</table>
(6) 150% of rated voltage for below range.
<table>
<tr><th>Size</th><th>Dielectric</th><th>Rated voltage</th><th>Capacitance range</th></tr>
<tr><td rowspan="2">0402</td><td>X5R/X7R</td><td>10V,16V, 25V</td><td>C≧0.22μF</td></tr>
<tr><td>Y5V</td><td>16V</td><td>C≧0.47μF</td></tr>
<tr><td rowspan="2">0603</td><td>X5R/X7R</td><td>10V,16V</td><td>C≧1μF</td></tr>
<tr><td>Y5V</td><td>16V</td><td>C≧2.2μF</td></tr>
<tr><td rowspan="2">1206</td><td>X5R/X7R</td><td>10V</td><td>C≧4.7μF</td></tr>
<tr><td>Y5V</td><td>16V</td><td>C≧4.7pF</td></tr>
</table>
Before initial measurement (Class II only): To apply test voltage for 1hr at test temp. and then set for 24 ±2 hrs at room temp

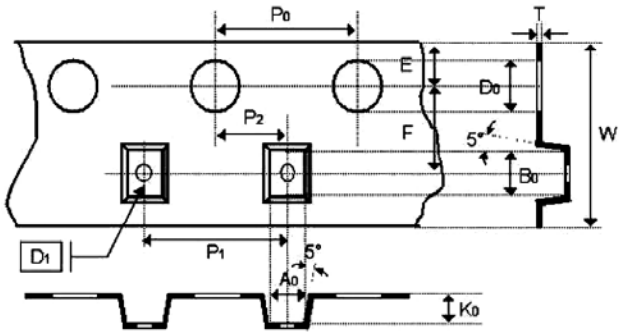
Measurement to be made after keeping at room temp. for 24 ±2hrs
</td><td>
No remarkable damage.
Cap change: NP0 : ±3.0% or ±0.3pF whichever is larger
X7R, X5R : ≥10V**,within ±12.5%;6.3V within ±25%;
Q/D.F. value: NP0: More than 30pF, Q≥350; 10pF≤C<30pF, Q≥275+2.5C; Less than 10pF, Q≥200+10C
X7R, X5R:
<table>
<tr><th>Rated vol.</th><th>D.F.≦</th><th colspan="2">Exception of D.F. ≦</th></tr>
<tr><td rowspan="3">≧50V</td><td rowspan="3">≦3%</td><td>≦6%</td><td>0201(50V); 0603≧0.047μF; 0805≧0.18μF;1206≧0.47μF</td></tr>
<tr><td>≦10%</td><td>1210≧4.7μF</td></tr>
<tr><td>≦20%</td><td>0603≧1μF; 0805≧1μF;1206≧4.7μF; 1210≧10μF</td></tr>
<tr><td>35V</td><td>≦5%</td><td>≦20%</td><td>0805≥2.2μF; 1210≧10μF</td></tr>
<tr><td rowspan="3">25V</td><td rowspan="3">≦5%</td><td>≦10%</td><td>0201≧0.01μF;0805≧1μF; 1210≧10μF</td></tr>
<tr><td>≦14%</td><td>0603≧0.33μF; 1206≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0402≧0.10μF;0603≧0.47μF; 0805≧2.2μF;1206≧6.8μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">16V</td><td rowspan="2">≦5%</td><td>≦10%</td><td>0603≧0.15μF;0805≧0.68μF; 1206≧2.2μF;1210≧4.7μF</td></tr>
<tr><td>≦15%</td><td>0201≧0.01μF;0402≧0.033μF; 0603≧0.68μF;0805≧2.2μF; 1206≧4.7μF; 1210≧22μF</td></tr>
<tr><td rowspan="2">10V</td><td rowspan="2">≦75%</td><td>≦15%</td><td>0201≧0.012μF;0402≧0.33μF; 0603≧0.33μF; 0805≧2.2μF; 1206≧2.2μF; 1210≧22μF</td></tr>
<tr><td>≦20%</td><td>0201≧0.1μF; 0402≧1μF</td></tr>
<tr><td>6.3V</td><td>≦15%</td><td>≦30%</td><td>0201≧0.1μF; 0402≧1μF; 0603≧10μF; 0805≧4.7μF; 1206≧47μF; 1210≧100μF</td></tr>
<tr><td>4V</td><td>≦20%</td><td>-</td><td>-</td></tr>
</table>
I.R.: ≥10V, 1GΩ or 50Ω -F whichever is smaller
Class II (X7R, X5R)
<table>
<tr><th>Rated voltage</th><th>Insulation Resistance</th></tr>
<tr><td>100V: X7R</td><td rowspan="7">10G or RxC≧ 100ΩF whichever is smaller.</td></tr>
<tr><td>50V:0603≥1μF;0805≥1μF;1206≥4.7μF; 1210≥4.7μF</td></tr>
<tr><td>35V:0805≥2.2μF;1210≧10μF</td></tr>
<tr><td>25V:0402≥1μF;0603≥2.2μF;0805≥2.2μF; 1206≥10μF;1210≥10μF</td></tr>
<tr><td>16V:0402≥0.22μF;0603≥1μF;0805≥2.2μF; 1206≥10μF;1210≥47μF</td></tr>
<tr><td>10V:0201≥47nF;0402≥0.47μF;0603≥0.47μF; 0805≥2.2μF; 1206≥4.7μF;1210≥47μF</td></tr>
<tr><td>6.3V ; 4V</td></tr>
</table>
</td></tr>
</table>

Appendixes

Tape & Reel Dimensions

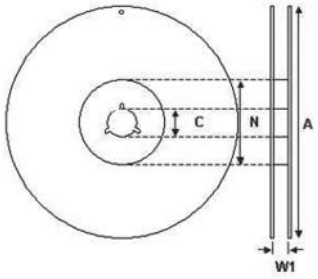


The dimension of paper tape



The dimension of plastic tape

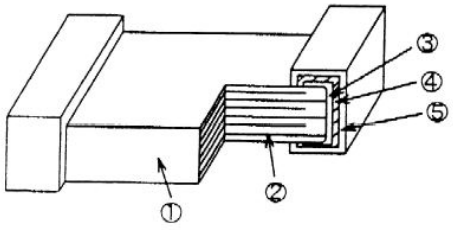
Size	0402	0603	0805			1206			1210	
Thickness	N	S, X	A	B	C, D, I	B	C, J, D	G	C, D, G	M
A0	0.62±0.05	1.02 ±0.05	1.5 ±0.10	1.5 ±0.1	<1.57	2 ±0.1	<1.85	<1.95	<2.97	<2.97
B0	1.12±0.05	1.80 ±0.05	2.3 ±0.10	2.3 ±0.1	<2.40	3.5 ±0.1	<3.46	<3.67	<3.73	<3.73
T	0.60±0.05	0.95 ±0.05	0.75 ±0.05	0.95 ±0.05	0.23 ±0.05	0.95 ±0.05	0.23±0.05	0.23 ±0.05	0.23 ±0.05	0.23 ±0.05
K0	-	-	-	-	<2.50	-	<2.5	<2.5	<2.5	<3
W	8 ±0.1	8 ±0.1	8 ±0.1	8 ±0.10	8 ±0.1	8 ±0.1	8 ±0.1	8 ±0.1	8 ±0.1	8 ±0.1
P0	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.10	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1
10xP0	40 ±0.1	40 ±0.1	40 ±0.1	40 ±0.10	40 ±0.1	40 ±0.1	40 ±0.1	40 ±0.1	40 ±0.1	40 ±0.1
P1	2 ±0.05	4 ±0.1	4 ±0.1	4 ±0.10	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1	4 ±0.1
P2	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05	2 ±0.05
D0	1.55±0.05	1.55 ±0.05	1.55 ±0.05	1.55±0.05	1.5 ±0.05	1.5 ±0.05	1.5 ±0.05	1.5 ±0.05	1.5 ±0.05	1.5 ±0.05
D1	-	-	-	-	1 ±0.1	-	1 ±0.1	1 ±0.1	1 ±0.1	1 ±0.1
E	1.75±0.05	1.75 ±0.05	1.75 ±0.05	1.75 ±0.05	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1
F	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.05



The dimension of reel

Size	0402, 0603, 0805, 1206, 1210		
Reel size	7”	10”	13”
C	13 +0.5/-0.2	13 +0.5/-0.2	13 +0.5/-0.2
W1	8.4 +1.5/-0	8.4 +1.5/-0	8.4 +1.5/-0
A	178 ±0.10	250 ±1	330 ±1
N	60 +1/-0	100 ±1	100 ±1

Constructions:



No.	Name		NP0*	NP0
1	Ceramic material		$BaTiO_3$ based	
2	Inner electrode		AgPd alloy	Ni
3	Termination	Inner layer	Ag	Cu
4		Middle layer	Ni	
5		Outer layer	Sn	

* Partial NPO items are with Ag/Ni/Sn terminations, please ref to product range of NPO dielectric for detail.

Storage and handling conditions

(1) To store products at 5°C to 40°C ambient temperature and 20 to 70%. related humidity conditions.

(2) The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

Cautions:

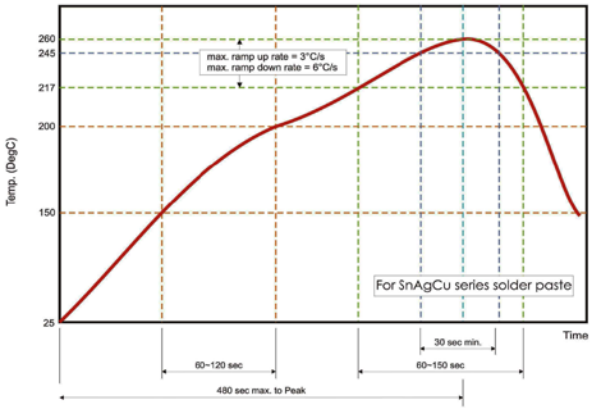
a. The corrosive gas reacts on the terminal electrodes of capacitors, and results in the poor solderability. Do not store the capacitors in the ambience of corrosive gas (e.g., hydrogen sulfide, sulfur dioxide, chlorine, ammonia gas etc.)

b. In corrosive atmosphere, solderability might be degraded, and silver migration might occur to cause low reliability.

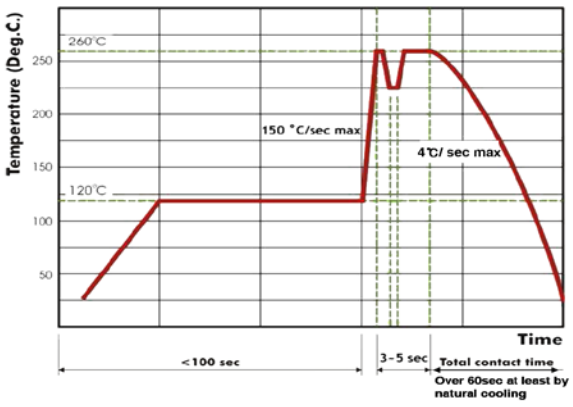
c. Due to the dewing by rapid humidity change, or the photochemical change of the terminal electrode by direct sunlight,the solderability and electrical performance may deteriorate. Do not store capacitors under direct sunlight or dewing condition. To store products on the shelf and avoid exposure to moisture.

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_2 within oven are recommended.



Recommended reflow soldering profile for SMT process with SnAgCu series solder paste.



Recommended wave soldering profile for SMT process with SnAgCu series solder.

Part Number Table

Description	Part Number
Cap, MLCC, 100PF, 25V, NP0, 0402, Reel	MC000365
Cap, MLCC, 100NF, 25V, X7R, 0402, Reel	MC000366
Cap, MLCC, 4.7NF, 25V, X7R, 0402, Reel	MC000367
Cap, MLCC, 10NF, 25V, X7R, 0402, Reel	MC000368
Cap, MLCC, 100NF, 25V, X5R, 0402, Reel	MC000369
Cap, MLCC, 10PF, 50V, NP0, 0402, Reel	MC000370
Cap, MLCC, 100PF, 50V, NP0, 0402, Reel	MC000371
Cap, MLCC, 100PF, 50V, NP0, 0402, Reel	MC000372
Cap, MLCC, 12PF, 50V, NP0, 0402, Reel	MC000373
Cap, MLCC, 15PF, 50V, NP0, 0402, Reel	MC000374
Cap, MLCC, 150PF, 50V, NP0, 0402, Reel	MC000375
Cap, MLCC, 18PF, 50V, NP0, 0402, Reel	MC000376
Cap, MLCC, 20PF, 50V, NP0, 0402, Reel	MC000377
Cap, MLCC, 22PF, 50V, NP0, 0402, Reel	MC000378
Cap, MLCC, 220PF, 50V, NP0, 0402, Reel	MC000379
Cap, MLCC, 27PF, 50V, NP0, 0402, Reel	MC000380
Cap, MLCC, 33PF, 50V, NP0, 0402, Reel	MC000381
Cap, MLCC, 330PF, 50V, NP0, 0402, Reel	MC000382
Cap, MLCC, 47PF, 50V, NP0, 0402, Reel	MC000383
Cap, MLCC, 470PF, 50V, NP0, 0402, Reel	MC000384
Cap, MLCC, 56PF, 50V, NP0, 0402, Reel	MC000385
Cap, MLCC, 68PF, 50V, NP0, 0402, Reel	MC000386
Cap, MLCC, 1NF, 50V, X7R, 0402, Reel	MC000387
Cap, MLCC, 1NF, 50V, X7R, 0402, Reel	MC000388
Cap, MLCC, 1.5NF, 50V, X7R, 0402, Reel	MC000389
Cap, MLCC, 1.5NF, 50V, X7R, 0402, Reel	MC000390
Cap, MLCC, 220PF, 50V, X7R, 0402, Reel	MC000391
Cap, MLCC, 2.2NF, 50V, X7R, 0402, Reel	MC000392
Cap, MLCC, 2.2NF, 50V, X7R, 0402, Reel	MC000393
Cap, MLCC, 330PF, 50V, X7R, 0402, Reel	MC000394
Cap, MLCC, 330PF, 50V, X7R, 0402, Reel	MC000395
Cap, MLCC, 3.3NF, 50V, X7R, 0402, Reel	MC000396
Cap, MLCC, 470PF, 50V, X7R, 0402, Reel	MC000397
Cap, MLCC, 470PF, 50V, X7R, 0402, Reel	MC000398
Cap, MLCC, 4.7NF, 50V, X7R, 0402, Reel	MC000399
Cap, MLCC, 560PF, 50V, X7R, 0402, Reel	MC000400
Cap, MLCC, 100NF, 6.3V, X5R, 0402, Reel	MC000401

Description	Part Number
Cap, MLCC, 1UF, 6.3V, X5R, 0402, Reel	MC000402
Cap, MLCC, 220NF, 6.3V, X5R, 0402, Reel	MC000403
Cap, MLCC, 470NF, 6.3V, X5R, 0402, Reel	MC000405
Cap, MLCC, 1NF, 16V, X7R, 0402, Reel	MC000406
Cap, MLCC, 10NF, 16V, X7R, 0402, Reel	MC000407
Cap, MLCC, 100NF, 16V, X7R, 0402, Reel	MC000408
Cap, MLCC, 22NF, 16V, X7R, 0402, Reel	MC000409
Cap, MLCC, 100NF, 16V, X5R, 0402, Reel	MC000410
Cap, MLCC, 100NF, 10V, X5R, 0402, Reel	MC000411
Cap, MLCC, 1UF, 10V, X5R, 0402, Reel	MC000412
Cap, MLCC, 10PF, 100V, NP0, 0603, Reel	MC000413
Cap, MLCC, 100PF, 100V, NP0, 0603, Reel	MC000414
Cap, MLCC, 12PF, 100V, NP0, 0603, Reel	MC000415
Cap, MLCC, 15PF, 100V, NP0, 0603, Reel	MC000416
Cap, MLCC, 18PF, 100V, NP0, 0603, Reel	MC000417
Cap, MLCC, 22PF, 100V, NP0, 0603, Reel	MC000418
Cap, MLCC, 220PF, 100V, NP0, 0603, Reel	MC000419
Cap, MLCC, 27PF, 100V, NP0, 0603, Reel	MC000420
Cap, MLCC, 33PF, 100V, NP0, 0603, Reel	MC000421
Cap, MLCC, 330PF, 100V, NP0, 0603, Reel	MC000422
Cap, MLCC, 47PF, 100V, NP0, 0603, Reel	MC000423
Cap, MLCC, 68PF, 100V, NP0, 0603, Reel	MC000424
Cap, MLCC, 1NF, 100V, X7R, 0603, Reel	MC000425
Cap, MLCC, 1NF, 100V, X7R, 0603, Reel	MC000426
Cap, MLCC, 10NF, 100V, X7R, 0603, Reel	MC000427
Cap, MLCC, 10NF, 100V, X7R, 0603, Reel	MC000428
Cap, MLCC, 1.5NF, 100V, X7R, 0603, Reel	MC000429
Cap, MLCC, 2.2NF, 100V, X7R, 0603, Reel	MC000430
Cap, MLCC, 330PF, 100V, X7R, 0603, Reel	MC000431
Cap, MLCC, 470PF, 100V, X7R, 0603, Reel	MC000432
Cap, MLCC, 470PF, 100V, X7R, 0603, Reel	MC000433
Cap, MLCC, 4.7NF, 100V, X7R, 0603, Reel	MC000434
Cap, MLCC, 4.7NF, 100V, X7R, 0603, Reel	MC000435
Cap, MLCC, 10NF, 25V, X7R, 0603, Reel	MC000437
Cap, MLCC, 100NF, 25V, X7R, 0603, Reel	MC000438
Cap, MLCC, 100NF, 25V, X7R, 0603, Reel	MC000439
Cap, MLCC, 22NF, 25V, X7R, 0603, Reel	MC000440

Part Number Table

Description	Part Number
Cap, MLCC, 220NF, 25V, X7R, 0603, Reel	MC000441
Cap, MLCC, 33NF, 25V, X7R, 0603, Reel	MC000442
Cap, MLCC, 47NF, 25V, X7R, 0603, Reel	MC000443
Cap, MLCC, 47NF, 25V, X7R, 0603, Reel	MC000444
Cap, MLCC, 470NF, 25V, X7R, 0603, Reel	MC000445
Cap, MLCC, 1UF, 25V, X5R, 0603, Reel	MC000446
Cap, MLCC, 220NF, 25V, X5R, 0603, Reel	MC000447
Cap, MLCC, 10PF, 50V, NP0, 0603, Reel	MC000448
Cap, MLCC, 100PF, 50V, NP0, 0603, Reel	MC000449
Cap, MLCC, 1NF, 50V, NP0, 0603, Reel	MC000450
Cap, MLCC, 12PF, 50V, NP0, 0603, Reel	MC000451
Cap, MLCC, 120PF, 50V, NP0, 0603, Reel	MC000452
Cap, MLCC, 15PF, 50V, NP0, 0603, Reel	MC000453
Cap, MLCC, 150PF, 50V, NP0, 0603, Reel	MC000454
Cap, MLCC, 18PF, 50V, NP0, 0603, Reel	MC000455
Cap, MLCC, 180PF, 50V, NP0, 0603, Reel	MC000456
Cap, MLCC, 22PF, 50V, NP0, 0603, Reel	MC000457
Cap, MLCC, 220PF, 50V, NP0, 0603, Reel	MC000458
Cap, MLCC, 27PF, 50V, NP0, 0603, Reel	MC000459
Cap, MLCC, 270PF, 50V, NP0, 0603, Reel	MC000460
Cap, MLCC, 33PF, 50V, NP0, 0603, Reel	MC000461
Cap, MLCC, 330PF, 50V, NP0, 0603, Reel	MC000462
Cap, MLCC, 39PF, 50V, NP0, 0603, Reel	MC000463
Cap, MLCC, 47PF, 50V, NP0, 0603, Reel	MC000464
Cap, MLCC, 470PF, 50V, NP0, 0603, Reel	MC000465
Cap, MLCC, 56PF, 50V, NP0, 0603, Reel	MC000466
Cap, MLCC, 560PF, 50V, NP0, 0603, Reel	MC000467
Cap, MLCC, 68PF, 50V, NP0, 0603, Reel	MC000468
Cap, MLCC, 680PF, 50V, NP0, 0603, Reel	MC000469
Cap, MLCC, 82PF, 50V, NP0, 0603, Reel	MC000470
Cap, MLCC, 820PF, 50V, NP0, 0603, Reel	MC000471
Cap, MLCC, 1NF, 50V, X7R, 0603, Reel	MC000472
Cap, MLCC, 1NF, 50V, X7R, 0603, Reel	MC000473
Cap, MLCC, 10NF, 50V, X7R, 0603, Reel	MC000474
Cap, MLCC, 10NF, 50V, X7R, 0603, Reel	MC000475
Cap, MLCC, 100NF, 50V, X7R, 0603, Reel	MC000476
Cap, MLCC, 100NF, 50V, X7R, 0603, Reel	MC000477

Description	Part Number
Cap, MLCC, 1.5NF, 50V, X7R, 0603, Reel	MC000478
Cap, MLCC, 1.5NF, 50V, X7R, 0603, Reel	MC000479
Cap, MLCC, 15NF, 50V, X7R, 0603, Reel	MC000480
Cap, MLCC, 15NF, 50V, X7R, 0603, Reel	MC000481
Cap, MLCC, 220PF, 50V, X7R, 0603, Reel	MC000482
Cap, MLCC, 2.2NF, 50V, X7R, 0603, Reel	MC000483
Cap, MLCC, 2.2NF, 50V, X7R, 0603, Reel	MC000484
Cap, MLCC, 22NF, 50V, X7R, 0603, Reel	MC000485
Cap, MLCC, 3.3NF, 50V, X7R, 0603, Reel	MC000486
Cap, MLCC, 3.3NF, 50V, X7R, 0603, Reel	MC000487
Cap, MLCC, 33NF, 50V, X7R, 0603, Reel	MC000488
Cap, MLCC, 33NF, 50V, X7R, 0603, Reel	MC000489
Cap, MLCC, 470PF, 50V, X7R, 0603, Reel	MC000490
Cap, MLCC, 4.7NF, 50V, X7R, 0603, Reel	MC000491
Cap, MLCC, 4.7NF, 50V, X7R, 0603, Reel	MC000492
Cap, MLCC, 47NF, 50V, X7R, 0603, Reel	MC000493
Cap, MLCC, 680PF, 50V, X7R, 0603, Reel	MC000494
Cap, MLCC, 6.8NF, 50V, X7R, 0603, Reel	MC000495
Cap, MLCC, 68NF, 50V, X7R, 0603, Reel	MC000496
Cap, MLCC, 1UF, 6.3V, X5R, 0603, Reel	MC000498
Cap, MLCC, 10NF, 16V, X7R, 0603, Reel	MC000501
Cap, MLCC, 100NF, 16V, X7R, 0603, Reel	MC000502
Cap, MLCC, 100NF, 16V, X7R, 0603, Reel	MC000503
Cap, MLCC, 47NF, 16V, X7R, 0603, Reel	MC000505
Cap, MLCC, 1UF, 16V, X5R, 0603, Reel	MC000506
Cap, MLCC, 220NF, 16V, X5R, 0603, Reel	MC000507
Cap, MLCC, 330NF, 16V, X5R, 0603, Reel	MC000508
Cap, MLCC, 470NF, 16V, X5R, 0603, Reel	MC000509
Cap, MLCC, 150NF, 10V, X7R, 0603, Reel	MC000510
Cap, MLCC, 220NF, 10V, X7R, 0603, Reel	MC000511
Cap, MLCC, 1UF, 10V, X5R, 0603, Reel	MC000512
Cap, MLCC, 470NF, 10V, X5R, 0603, Reel	MC000514
Cap, MLCC, 10PF, 100V, NP0, 0805, Reel	MC000516
Cap, MLCC, 100PF, 100V, NP0, 0805, Reel	MC000517
Cap, MLCC, 1NF, 100V, NP0, 0805, Reel	MC000518
Cap, MLCC, 15PF, 100V, NP0, 0805, Reel	MC000519
Cap, MLCC, 150PF, 100V, NP0, 0805, Reel	MC000520

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Description	Part Number
Cap, MLCC, 18PF, 100V, NP0, 0805, Reel	MC000521
Cap, MLCC, 22PF, 100V, NP0, 0805, Reel	MC000522
Cap, MLCC, 220PF, 100V, NP0, 0805, Reel	MC000523
Cap, MLCC, 33PF, 100V, NP0, 0805, Reel	MC000524
Cap, MLCC, 330PF, 100V, NP0, 0805, Reel	MC000525
Cap, MLCC, 47PF, 100V, NP0, 0805, Reel	MC000526
Cap, MLCC, 470PF, 100V, NP0, 0805, Reel	MC000527
Cap, MLCC, 680PF, 100V, NP0, 0805, Reel	MC000528
Cap, MLCC, 1NF, 100V, X7R, 0805, Reel	MC000529
Cap, MLCC, 10NF, 100V, X7R, 0805, Reel	MC000530
Cap, MLCC, 100NF, 100V, X7R, 0805, Reel	MC000531
Cap, MLCC, 1.5NF, 100V, X7R, 0805, Reel	MC000532
Cap, MLCC, 2.2NF, 100V, X7R, 0805, Reel	MC000533
Cap, MLCC, 2.2NF, 100V, X7R, 0805, Reel	MC000534
Cap, MLCC, 22NF, 100V, X7R, 0805, Reel	MC000535
Cap, MLCC, 3.3NF, 100V, X7R, 0805, Reel	MC000536
Cap, MLCC, 33NF, 100V, X7R, 0805, Reel	MC000537
Cap, MLCC, 470PF, 100V, X7R, 0805, Reel	MC000538
Cap, MLCC, 4.7NF, 100V, X7R, 0805, Reel	MC000539
Cap, MLCC, 47NF, 100V, X7R, 0805, Reel	MC000540
Cap, MLCC, 6.8NF, 100V, X7R, 0805, Reel	MC000541
Cap, MLCC, 100NF, 25V, X7R, 0805, Reel	MC000547
Cap, MLCC, 220NF, 25V, X7R, 0805, Reel	MC000549
Cap, MLCC, 220NF, 25V, X7R, 0805, Reel	MC000550
Cap, MLCC, 330NF, 25V, X7R, 0805, Reel	MC000552
Cap, MLCC, 470NF, 25V, X7R, 0805, Reel	MC000553
Cap, MLCC, 1UF, 25V, X5R, 0805, Reel	MC000554
Cap, MLCC, 10UF, 25V, X5R, 0805, Reel	MC000555
Cap, MLCC, 10PF, 50V, NP0, 0805, Reel	MC000557
Cap, MLCC, 100PF, 50V, NP0, 0805, Reel	MC000558
Cap, MLCC, 1NF, 50V, NP0, 0805, Reel	MC000559
Cap, MLCC, 12PF, 50V, NP0, 0805, Reel	MC000560
Cap, MLCC, 15PF, 50V, NP0, 0805, Reel	MC000561
Cap, MLCC, 150PF, 50V, NP0, 0805, Reel	MC000562
Cap, MLCC, 1.5NF, 50V, NP0, 0805, Reel	MC000563
Cap, MLCC, 18PF, 50V, NP0, 0805, Reel	MC000564
Cap, MLCC, 22PF, 50V, NP0, 0805, Reel	MC000565

Description	Part Number
Cap, MLCC, 220PF, 50V, NP0, 0805, Reel	MC000566
Cap, MLCC, 2.2NF, 50V, NP0, 0805, Reel	MC000567
Cap, MLCC, 27PF, 50V, NP0, 0805, Reel	MC000568
Cap, MLCC, 270PF, 50V, NP0, 0805, Reel	MC000569
Cap, MLCC, 33PF, 50V, NP0, 0805, Reel	MC000570
Cap, MLCC, 330PF, 50V, NP0, 0805, Reel	MC000571
Cap, MLCC, 47PF, 50V, NP0, 0805, Reel	MC000572
Cap, MLCC, 470PF, 50V, NP0, 0805, Reel	MC000573
Cap, MLCC, 510PF, 50V, NP0, 0805, Reel	MC000574
Cap, MLCC, 560PF, 50V, NP0, 0805, Reel	MC000575
Cap, MLCC, 68PF, 50V, NP0, 0805, Reel	MC000576
Cap, MLCC, 680PF, 50V, NP0, 0805, Reel	MC000577
Cap, MLCC, 82PF, 50V, NP0, 0805, Reel	MC000578
Cap, MLCC, 820PF, 50V, NP0, 0805, Reel	MC000579
Cap, MLCC, 1NF, 50V, X7R, 0805, Reel	MC000580
Cap, MLCC, 1NF, 50V, X7R, 0805, Reel	MC000581
Cap, MLCC, 10NF, 50V, X7R, 0805, Reel	MC000582
Cap, MLCC, 10NF, 50V, X7R, 0805, Reel	MC000583
Cap, MLCC, 100NF, 50V, X7R, 0805, Reel	MC000584
Cap, MLCC, 100NF, 50V, X7R, 0805, Reel	MC000585
Cap, MLCC, 1.5NF, 50V, X7R, 0805, Reel	MC000586
Cap, MLCC, 15NF, 50V, X7R, 0805, Reel	MC000587
Cap, MLCC, 2.2NF, 50V, X7R, 0805, Reel	MC000588
Cap, MLCC, 2.2NF, 50V, X7R, 0805, Reel	MC000589
Cap, MLCC, 22NF, 50V, X7R, 0805, Reel	MC000590
Cap, MLCC, 22NF, 50V, X7R, 0805, Reel	MC000591
Cap, MLCC, 220NF, 50V, X7R, 0805, Reel	MC000592
Cap, MLCC, 3.3NF, 50V, X7R, 0805, Reel	MC000593
Cap, MLCC, 33NF, 50V, X7R, 0805, Reel	MC000594
Cap, MLCC, 33NF, 50V, X7R, 0805, Reel	MC000595
Cap, MLCC, 330NF, 50V, X7R, 0805, Reel	MC000596
Cap, MLCC, 39NF, 50V, X7R, 0805, Reel	MC000597
Cap, MLCC, 470PF, 50V, X7R, 0805, Reel	MC000598
Cap, MLCC, 4.7NF, 50V, X7R, 0805, Reel	MC000599
Cap, MLCC, 4.7NF, 50V, X7R, 0805, Reel	MC000600
Cap, MLCC, 47NF, 50V, X7R, 0805, Reel	MC000601
Cap, MLCC, 47NF, 50V, X7R, 0805, Reel	MC000602

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Description	Part Number
Cap, MLCC, 470NF, 50V, X7R, 0805, Reel	MC000603
Cap, MLCC, 6.8NF, 50V, X7R, 0805, Reel	MC000604
Cap, MLCC, 68NF, 50V, X7R, 0805, Reel	MC000605
Cap, MLCC, 1UF, 50V, X5R, 0805, Reel	MC000606
Cap, MLCC, 10UF, 6.3V, X7R, 0805, Reel	MC000607
Cap, MLCC, 10UF, 6.3V, X5R, 0805, Reel	MC000608
Cap, MLCC, 220NF, 16V, X7R, 0805, Reel	MC000611
Cap, MLCC, 330NF, 16V, X7R, 0805, Reel	MC000612
Cap, MLCC, 470NF, 16V, X7R, 0805, Reel	MC000613
Cap, MLCC, 1UF, 16V, X5R, 0805, Reel	MC000615
Cap, MLCC, 10UF, 16V, X5R, 0805, Reel	MC000616
Cap, MLCC, 10UF, 10V, X5R, 0805, Reel	MC000620
Cap, MLCC, 2.2UF, 10V, X5R, 0805, Reel	MC000621
Cap, MLCC, 100PF, 100V, NP0, 1206, Reel	MC000625
Cap, MLCC, 1NF, 100V, NP0, 1206, Reel	MC000626
Cap, MLCC, 22PF, 100V, NP0, 1206, Reel	MC000627
Cap, MLCC, 220PF, 100V, NP0, 1206, Reel	MC000628
Cap, MLCC, 2.2NF, 100V, NP0, 1206, Reel	MC000629
Cap, MLCC, 33PF, 100V, NP0, 1206, Reel	MC000630
Cap, MLCC, 330PF, 100V, NP0, 1206, Reel	MC000631
Cap, MLCC, 47PF, 100V, NP0, 1206, Reel	MC000632
Cap, MLCC, 470PF, 100V, NP0, 1206, Reel	MC000633
Cap, MLCC, 1NF, 100V, X7R, 1206, Reel	MC000634
Cap, MLCC, 10NF, 100V, X7R, 1206, Reel	MC000635
Cap, MLCC, 10NF, 100V, X7R, 1206, Reel	MC000636
Cap, MLCC, 100NF, 100V, X7R, 1206, Reel	MC000637
Cap, MLCC, 100NF, 100V, X7R, 1206, Reel	MC000638
Cap, MLCC, 2.2NF, 100V, X7R, 1206, Reel	MC000640
Cap, MLCC, 22NF, 100V, X7R, 1206, Reel	MC000641
Cap, MLCC, 220NF, 100V, X7R, 1206, Reel	MC000642
Cap, MLCC, 3.3NF, 100V, X7R, 1206, Reel	MC000643
Cap, MLCC, 33NF, 100V, X7R, 1206, Reel	MC000644
Cap, MLCC, 4.7NF, 100V, X7R, 1206, Reel	MC000645
Cap, MLCC, 47NF, 100V, X7R, 1206, Reel	MC000646
Cap, MLCC, 470NF, 100V, X7R, 1206, Reel	MC000647
Cap, MLCC, 68NF, 100V, X7R, 1206, Reel	MC000648
Cap, MLCC, 10NF, 25V, NP0, 1206, Reel	MC000655

Description	Part Number
Cap, MLCC, 220NF, 25V, X7R, 1206, Reel	MC000657
Cap, MLCC, 330NF, 25V, X7R, 1206, Reel	MC000659
Cap, MLCC, 470NF, 25V, X7R, 1206, Reel	MC000660
Cap, MLCC, 680NF, 25V, X7R, 1206, Reel	MC000662
Cap, MLCC, 10UF, 25V, X5R, 1206, Reel	MC000663
Cap, MLCC, 10PF, 50V, NP0, 1206, Reel	MC000665
Cap, MLCC, 100PF, 50V, NP0, 1206, Reel	MC000666
Cap, MLCC, 1NF, 50V, NP0, 1206, Reel	MC000667
Cap, MLCC, 22PF, 50V, NP0, 1206, Reel	MC000668
Cap, MLCC, 220PF, 50V, NP0, 1206, Reel	MC000669
Cap, MLCC, 2.2NF, 50V, NP0, 1206, Reel	MC000670
Cap, MLCC, 33PF, 50V, NP0, 1206, Reel	MC000671
Cap, MLCC, 330PF, 50V, NP0, 1206, Reel	MC000672
Cap, MLCC, 3.3NF, 50V, NP0, 1206, Reel	MC000673
Cap, MLCC, 47PF, 50V, NP0, 1206, Reel	MC000674
Cap, MLCC, 470PF, 50V, NP0, 1206, Reel	MC000675
Cap, MLCC, 680PF, 50V, NP0, 1206, Reel	MC000676
Cap, MLCC, 1NF, 50V, X7R, 1206, Reel	MC000677
Cap, MLCC, 10NF, 50V, X7R, 1206, Reel	MC000678
Cap, MLCC, 100NF, 50V, X7R, 1206, Reel	MC000679
Cap, MLCC, 100NF, 50V, X7R, 1206, Reel	MC000680
Cap, MLCC, 2.2NF, 50V, X7R, 1206, Reel	MC000683
Cap, MLCC, 22NF, 50V, X7R, 1206, Reel	MC000684
Cap, MLCC, 220NF, 50V, X7R, 1206, Reel	MC000685
Cap, MLCC, 220NF, 50V, X7R, 1206, Reel	MC000686
Cap, MLCC, 3.3NF, 50V, X7R, 1206, Reel	MC000687
Cap, MLCC, 33NF, 50V, X7R, 1206, Reel	MC000688
Cap, MLCC, 330NF, 50V, X7R, 1206, Reel	MC000689
Cap, MLCC, 4.7NF, 50V, X7R, 1206, Reel	MC000690
Cap, MLCC, 47NF, 50V, X7R, 1206, Reel	MC000691
Cap, MLCC, 470NF, 50V, X7R, 1206, Reel	MC000692
Cap, MLCC, 470NF, 50V, X7R, 1206, Reel	MC000693
Cap, MLCC, 68NF, 50V, X7R, 1206, Reel	MC000695
Cap, MLCC, 10UF, 6.3V, X5R, 1206, Reel	MC000696
Cap, MLCC, 10UF, 16V, X7R, 1206, Reel	MC000709
Cap, MLCC, 470NF, 16V, X7R, 1206, Reel	MC000711
Cap, MLCC, 10UF, 16V, X5R, 1206, Reel	MC000712

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Description	Part Number
Cap, MLCC, 10UF, 10V, X5R, 1206, Reel	MC000715
Cap, MLCC, 100NF, 100V, X7R, 1210, Reel	MC000716
Cap, MLCC, 220NF, 100V, X7R, 1210, Reel	MC000718
Cap, MLCC, 470NF, 100V, X7R, 1210, Reel	MC000720
Cap, MLCC, 10UF, 25V, X7R, 1210, Reel	MC000723
Cap, MLCC, 470NF, 25V, X7R, 1210, Reel	MC000725
Cap, MLCC, 10UF, 25V, X5R, 1210, Reel	MC000726
Cap, MLCC, 100NF, 50V, X7R, 1210, Reel	MC000729
Cap, MLCC, 220NF, 50V, X7R, 1210, Reel	MC000731
Cap, MLCC, 330NF, 50V, X7R, 1210, Reel	MC000732
Cap, MLCC, 470NF, 50V, X7R, 1210, Reel	MC000733
Cap, MLCC, 10UF, 16V, X5R, 1210, Reel	MC000741
Cap, MLCC, 10UF, 10V, X5R, 1210, Reel	MC000744