

APPROVAL SHEET

MULTILAYER CERAMIC CAPACITORS

Microwave Series (RF)

01005 to 1111 Sizes (6.3V to 1500V)

NP0 & X8G Dielectrics

Halogen Free & RoHS Compliance

*Contents in this sheet are subject to change without prior notice.

Multilayer Ceramic Capacitors

1. INTRODUCTION

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 RF series MLCC is used at high frequencies generally have a small temperature coefficient of capacitance, typical within the $\pm 30\text{ppm}/^\circ\text{C}$ required for NP0 (C0G) & X8G classification and have excellent conductivity internal electrode. Thus, WTC RF series MLCC will be with the feature of low ESR and high Q characteristics.

2. FEATURES

- High Q and low ESR performance at high frequency.
- Ultra low capacitance to 0.1pF.
- Can offer high precision tolerance to $\pm 0.05\text{pF}$.
- Quality improvement of telephone calls for low power loss and better performance.

3. APPLICATIONS

- Telecommunication products & equipments: Mobile phone, WLAN, Base station.
- RF module: Power amplifier, VCO.
- Tuners.

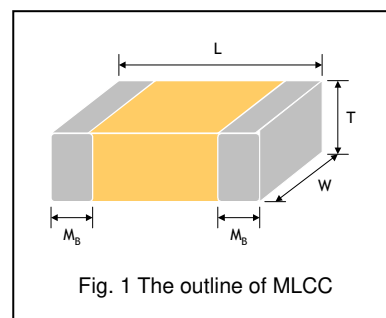
4. HOW TO ORDER

<u>RF</u>	<u>15</u>	<u>N</u>	<u>100</u>	<u>J</u>	<u>500</u>	<u>C</u>	<u>I</u>
Series	Size	Dielectric	Capacitance	Tolerance	Rated voltage	Termination	Packaging
RF=Ultra High Q & Low ESR	02=01005(0402) 03=0201 (0603) 15=0402 (1005) 18=0603 (1608) 11=0505 (1414) 21=0805 (2012) 22=1111 (2828)	N=NP0 G=X8G	Two significant digits followed by no. of zeros. And R is in place of decimal point. eg.: 0R5=0.5pF 1R0=1.0pF 100=10x10 ⁰ =10pF	A= $\pm 0.05\text{pF}$ B= $\pm 0.1\text{pF}$ C= $\pm 0.25\text{pF}$ D= $\pm 0.5\text{pF}$ F= $\pm 1\%$ G= $\pm 2\%$ J= $\pm 5\%$	Two significant digits followed by no. of zeros. And R is in place of decimal point. 6R3=6.3 VDC 100=10 VDC 250=25 VDC 500=50 VDC 101=100 VDC 201=200 VDC 251=250 VDC 501=500 VDC 152=1500 VDC	C=Cu/Ni/Sn	T=7" reeled G= 13" reeled

Multilayer Ceramic Capacitors

5. EXTERNAL DIMENSIONS

Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol	Remark	M _B (mm)
01005 (0402)	0.40±0.02	0.20±0.02	0.20±0.02	V #	0.10±0.03
0201 (0603)	0.60±0.03	0.30±0.03	0.30±0.03	L #	0.15±0.05
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	0.50±0.10	H	
0805 (2012)	2.00±0.15	1.25±0.10	0.60±0.10	A	0.50±0.20
	2.00±0.20	1.25±0.20	0.85±0.10	T	
0505 (1414)	1.40 +0.38/-0.25	1.40±0.38	1.15±0.15	J #	0.25±0.25/-0.13
1111 (2828)	2.79 +0.51/-0.25	2.79±0.38	≤ 1.78	G #	0.38±0.25



Reflow soldering only is recommended.

6. GENERAL ELECTRICAL DATA

Dielectric	NP0	X8G
Size	01005, 0201, 0402, 0505, 0603, 0805, 1111	0402, 0603, 0805
Capacitance*	0.1pF to 1000pF	0.1pF~82pF
Capacitance tolerance	Cap<10pF: A (±0.05pF), B (±0.1pF), C (±0.25pF), D (±0.5pF) Cap≥10pF: F (±1%), G (±2%), J (±5%)	
Rated voltage (WVDC)	6.3V, 10V, 25V, 50V, 100V, 200V, 250V, 500V, 1500V	250V, 500V
Q*	01005, 0201, 0402/25V~50V: Cap<30pF: Q≥400+20C; Cap≥30pF: Q≥1000 0402/100V~200V, 0603, 0805, 0505, 1111: Cap<30pF: Q≥800+20C; Cap≥30pF: Q≥1400	
Insulation resistance at U _r	≥10GΩ or R _x C≥100Ω·F whichever is smaller.	
Operating temperature	-55 to +125°C	-55 to +150°C
Capacitance change	±30ppm/°C	
Termination	Ni/Sn (lead-free termination)	

* Measured at the conditions of 25°C ambient temperature and 30~70% related humidity.

Apply 1.0±0.2Vrms, 1.0MHz±10% for Cap≤1000pF and 1.0±0.2Vrms, 1.0kHz±10% for Cap>1000pF.

7. PACKAGING DIMENSION AND QUANTITY

Size	Thickness (mm)/Symbol		Paper tape	
			7" reel	13" reel
01005 (0402)	0.20±0.02	V	20,000	-
0201 (0603)	0.30±0.03	L	15,000	70,000
0402 (1005)	0.50±0.05	N	10,000	50,000
0603 (1608)	0.80±0.07	S	4,000	15,000
	0.50±0.10	H	4,000	-
0805 (2012)	0.60±0.10	A	4,000	15,000
	0.85±0.10	T	4,000	15,000
Size	Thickness (mm)/Symbol		Plastic tape	
			7" reel	13" reel
0505 (1414)	1.15±0.15	J	3,000	-
1111 (2828)	≤ 1.78	G	2,000	-

Unit: pieces

Multilayer Ceramic Capacitors

8. CAPACITANCE RANGE (NP0)

DIELECTRIC		NP0		Tolerance
SIZE		01005		
RATED VOLTAGE (VDC)		16	25	
Capacitance	0.2pF (0R2)	V	V	A, B
	0.3pF (0R3)	V	V	A, B
	0.4pF (0R4)	V	V	A, B
	0.5pF (0R5)	V	V	A, B, C
	0.6pF (0R6)	V	V	A, B, C
	0.7pF (0R7)	V	V	A, B, C
	0.75pF (R75)	V	V	A, B, C
	0.8pF (0R8)	V	V	A, B, C
	0.9pF (0R9)	V	V	A, B, C
	1.0pF (1R0)	V	V	A, B, C
	1.1pF (1R1)	V	V	A, B, C
	1.2pF (1R2)	V	V	A, B, C
	1.3pF (1R3)	V	V	A, B, C
	1.5pF (1R5)	V	V	A, B, C
	1.6pF (1R6)	V	V	A, B, C
	1.8pF (1R8)	V	V	A, B, C
	2.0pF (2R0)	V	V	A, B, C
	2.2pF (2R2)	V	V	A, B, C
	2.4pF (2R4)	V	V	A, B, C
	2.7pF (2R7)	V	V	A, B, C
	3.0pF (3R0)	V	V	A, B, C
	3.3pF (3R3)	V	V	A, B, C
	3.6pF (3R6)	V	V	A, B, C
	3.9pF (3R9)	V	V	A, B, C
	4.0pF (4R0)	V	V	A, B, C
	4.3pF (4R3)	V	V	A, B, C
	4.7pF (4R7)	V	V	A, B, C
	5.0pF (5R0)	V	V	A, B, C
	5.1pF (5R1)	V	V	B, C, D
	5.6pF (5R6)	V	V	B, C, D
	6.0pF (6R0)	V	V	B, C, D
	6.2pF (6R2)	V	V	B, C, D
	6.7pF (6R7)	V	V	B, C, D
	6.8pF (6R8)	V	V	B, C, D
	7.0pF (7R0)	V	V	B, C, D
	7.5pF (7R5)	V	V	B, C, D
	8.0pF (8R0)	V	V	B, C, D
	8.2pF (8R2)	V	V	B, C, D
	9.0pF (9R0)	V	V	B, C, D
	9.1pF (9R1)	V	V	B, C, D
	10pF (100)	V	V	C, D, G
	12pF (120)	V	V	F, G, J
	15pF (150)	V	V	F, G, J
	20pF (200)	V	V	F, G, J
	22pF (220)	V	V	F, G, J

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DIELECTRIC		NP0								Tolerance
SIZE		0201				0402				
RATED VOLTAGE (VDC)		6.3	10	25	50	25	50	100	200	
Capacitance	0.1pF (0R1)	L	L	L	L	N	N	N	N	A, B
	0.2pF (0R2)	L	L	L	L	N	N	N	N	A, B
	0.3pF (0R3)	L	L	L	L	N	N	N	N	A, B
	0.4pF (0R4)	L	L	L	L	N	N	N	N	A, B
	0.5pF (0R5)	L	L	L	L	N	N	N	N	A, B, C
	0.6pF (0R6)	L	L	L	L	N	N	N	N	A, B, C
	0.7pF (0R7)	L	L	L	L	N	N	N	N	A, B, C
	0.75pF (R75)	L	L	L	L	N	N	N	N	A, B, C
	0.8pF (0R8)	L	L	L	L	N	N	N	N	A, B, C
	0.9pF (0R9)	L	L	L	L	N	N	N	N	A, B, C
	1.0pF (1R0)	L	L	L	L	N	N	N	N	A, B, C
	1.1pF (1R1)	L	L	L	L	N	N	N	N	A, B, C
	1.2pF (1R2)	L	L	L	L	N	N	N	N	A, B, C
	1.3pF (1R3)	L	L	L	L	N	N	N	N	A, B, C
	1.4pF (1R4)	L	L	L	L	N	N	N	N	A, B, C
	1.5pF (1R5)	L	L	L	L	N	N	N	N	A, B, C
	1.6pF (1R6)	L	L	L	L	N	N	N	N	A, B, C
	1.7pF (1R7)	L	L	L	L	N	N	N	N	A, B, C
	1.8pF (1R8)	L	L	L	L	N	N	N	N	A, B, C
	1.9pF (1R9)	L	L	L	L	N	N	N	N	A, B, C
	2.0pF (2R0)	L	L	L	L	N	N	N	N	A, B, C
	2.1pF (2R1)	L	L	L	L	N	N	N	N	A, B, C
	2.2pF (2R2)	L	L	L	L	N	N	N	N	A, B, C
	2.3pF (2R3)	L	L	L	L	N	N	N	N	A, B, C
	2.4pF (2R4)	L	L	L	L	N	N	N	N	A, B, C
	2.5pF (2R5)	L	L	L	L	N	N	N	N	A, B, C
	2.6pF (2R6)	L	L	L	L	N	N	N	N	A, B, C
	2.7pF (2R7)	L	L	L	L	N	N	N	N	A, B, C
	2.8pF (2R8)	L	L	L	L	N	N	N	N	A, B, C
	2.9pF (2R9)	L	L	L	L	N	N	N	N	A, B, C
	3.0pF (3R0)	L	L	L	L	N	N	N	N	A, B, C
	3.1pF (3R1)	L	L	L	L	N	N	N	N	A, B, C
	3.2pF (3R2)	L	L	L	L	N	N	N	N	A, B, C
	3.3pF (3R3)	L	L	L	L	N	N	N	N	A, B, C
	3.4pF (3R4)	L	L	L	L	N	N	N	N	A, B, C
	3.5pF (3R5)	L	L	L	L	N	N	N	N	A, B, C
	3.6pF (3R6)	L	L	L	L	N	N	N	N	A, B, C
	3.7pF (3R7)	L	L	L	L	N	N	N	N	A, B, C
	3.8pF (3R8)	L	L	L	L	N	N	N	N	A, B, C
	3.9pF (3R9)	L	L	L	L	N	N	N	N	A, B, C
	4.0pF (4R0)	L	L	L	L	N	N	N	N	A, B, C
	4.1pF (4R1)	L	L	L	L	N	N	N	N	A, B, C
	4.2pF (4R2)	L	L	L	L	N	N	N	N	A, B, C
	4.3pF (4R3)	L	L	L	L	N	N	N	N	A, B, C
	4.4pF (4R4)	L	L	L	L	N	N	N	N	A, B, C
	4.5pF (4R5)	L	L	L	L	N	N	N	N	A, B, C
	4.6pF (4R6)	L	L	L	L	N	N	N	N	A, B, C
	4.7pF (4R7)	L	L	L	L	N	N	N	N	A, B, C
	4.8pF (4R8)	L	L	L	L	N	N	N	N	A, B, C
	4.9pF (4R9)	L	L	L	L	N	N	N	N	A, B, C
	5.0pF (5R0)	L	L	L	L	N	N	N	N	A, B, C
	5.1pF (5R1)	L	L	L	L	N	N	N	N	A, B, C, D
	5.2pF (5R2)	L	L	L	L	N	N	N	N	A, B, C, D
	5.3pF (5R3)	L	L	L	L	N	N	N	N	A, B, C, D
	5.4pF (5R4)	L	L	L	L	N	N	N	N	A, B, C, D
	5.5pF (5R5)	L	L	L	L	N	N	N	N	A, B, C, D
	5.6pF (5R6)	L	L	L	L	N	N	N	N	A, B, C, D
	5.7pF (5R7)	L	L	L	L	N	N	N	N	A, B, C, D
	5.8pF (5R8)	L	L	L	L	N	N	N	N	A, B, C, D
	5.9pF (5R9)	L	L	L	L	N	N	N	N	A, B, C, D
6.0pF (6R0)	L	L	L	L	N	N	N	N	A, B, C, D	

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Multilayer Ceramic Capacitors

Approval Sheet

DIELECTRIC		NP0								Tolerance
SIZE	0201				0402					
RATED VOLTAGE (VDC)	6.3	10	25	50	25	50	100	200		
Capacitance	6.1pF (6R1)	L	L	L	L	N	N	N	N	A, B, C, D
	6.2pF (6R2)	L	L	L	L	N	N	N	N	A, B, C, D
	6.3pF (6R3)	L	L	L	L	N	N	N	N	A, B, C, D
	6.4pF (6R4)	L	L	L	L	N	N	N	N	A, B, C, D
	6.5pF (6R5)	L	L	L	L	N	N	N	N	A, B, C, D
	6.6pF (6R6)	L	L	L	L	N	N	N	N	A, B, C, D
	6.7pF (6R7)	L	L	L	L	N	N	N	N	A, B, C, D
	6.8pF (6R8)	L	L	L	L	N	N	N	N	A, B, C, D
	6.9pF (6R9)	L	L	L	L	N	N	N	N	A, B, C, D
	7.0pF (7R0)	L	L	L	L	N	N	N	N	A, B, C, D
	7.1pF (7R1)	L	L	L	L	N	N	N	N	A, B, C, D
	7.2pF (7R2)	L	L	L	L	N	N	N	N	A, B, C, D
	7.3pF (7R3)	L	L	L	L	N	N	N	N	A, B, C, D
	7.4pF (7R4)	L	L	L	L	N	N	N	N	A, B, C, D
	7.5pF (7R5)	L	L	L	L	N	N	N	N	A, B, C, D
	7.6pF (7R6)	L	L	L	L	N	N	N	N	A, B, C, D
	7.7pF (7R7)	L	L	L	L	N	N	N	N	A, B, C, D
	7.8pF (7R8)	L	L	L	L	N	N	N	N	A, B, C, D
	7.9pF (7R9)	L	L	L	L	N	N	N	N	A, B, C, D
	8.0pF (8R0)	L	L	L	L	N	N	N	N	A, B, C, D
	8.1pF (8R1)	L	L	L	L	N	N	N	N	A, B, C, D
	8.2pF (8R2)	L	L	L	L	N	N	N	N	A, B, C, D
	8.3pF (8R3)	L	L	L	L	N	N	N	N	A, B, C, D
	8.4pF (8R4)	L	L	L	L	N	N	N	N	A, B, C, D
	8.5pF (8R5)	L	L	L	L	N	N	N	N	A, B, C, D
	8.6pF (8R6)	L	L	L	L	N	N	N	N	A, B, C, D
	8.7pF (8R7)	L	L	L	L	N	N	N	N	A, B, C, D
	8.8pF (8R8)	L	L	L	L	N	N	N	N	A, B, C, D
	8.9pF (8R9)	L	L	L	L	N	N	N	N	A, B, C, D
	9.0pF (9R0)	L	L	L	L	N	N	N	N	A, B, C, D
	9.1pF (9R1)	L	L	L	L	N	N	N	N	A, B, C, D
	9.2pF (9R2)	L	L	L	L	N	N	N	N	A, B, C, D
	9.3pF (9R3)	L	L	L	L	N	N	N	N	A, B, C, D
	9.4pF (9R4)	L	L	L	L	N	N	N	N	A, B, C, D
	9.5pF (9R5)	L	L	L	L	N	N	N	N	A, B, C, D
	9.6pF (9R6)	L	L	L	L	N	N	N	N	A, B, C, D
	9.7pF (9R7)	L	L	L	L	N	N	N	N	A, B, C, D
	9.8pF (9R8)	L	L	L	L	N	N	N	N	A, B, C, D
	9.9pF (9R9)	L	L	L	L	N	N	N	N	A, B, C, D
	10pF (100)	L	L	L	L	N	N	N	N	F, G, J
	11pF (110)	L	L	L	L	N	N	N	N	F, G, J
	12pF (120)	L	L	L	L	N	N	N	N	F, G, J
	13pF (130)	L	L	L	L	N	N	N	N	F, G, J
	15pF (150)	L	L	L	L	N	N	N	N	F, G, J
	16pF (160)	L	L	L	L	N	N	N	N	F, G, J
	18pF (180)	L	L	L	L	N	N	N	N	F, G, J
	20pF (200)	L	L	L	L	N	N	N	N	F, G, J
	22pF (220)	L	L	L		N	N	N	N	F, G, J
	24pF (240)	L	L	L		N	N	N	N	F, G, J
	27pF (270)	L	L	L		N	N	N	N	F, G, J
30pF (300)	L	L	L		N	N	N	N	F, G, J	
33pF (330)	L	L	L		N	N	N	N	F, G, J	
36pF (360)					N	N	N		F, G, J	
39pF (390)					N	N	N		F, G, J	
43pF (430)					N	N	N		F, G, J	
47pF (470)					N	N	N		F, G, J	
56pF (560)					N	N	N		F, G, J	
68pF (680)					N	N			F, G, J	
82pF (820)					N	N			F, G, J	
100pF (101)					N	N			F, G, J	

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Multilayer Ceramic Capacitors

Approval Sheet

DIELECTRIC		NP0										Tolerance
SIZE		0505			0603			0805				
RATED VOLTAGE (VDC)		50	100	250	25 50	100	250	50	100	250	500	
Capacitance	0.1pF (0R1)				H	H	H					A, B
	0.2pF (0R2)				H	H	H	A	A	A	A	A, B
	0.3pF (0R3)				S	S	S	T	T	T	T	A, B
	0.4pF (0R4)	J	J	J	S	S	S	T	T	T	T	A, B
	0.5pF (0R5)	J	J	J	S	S	S	T	T	T	T	A, B, C
	0.6pF (0R6)	J	J	J	S	S	S	T	T	T	T	A, B, C
	0.7pF (0R7)	J	J	J	S	S	S	T	T	T	T	A, B, C
	0.8pF (0R8)	J	J	J	S	S	S	T	T	T	T	A, B, C
	0.9pF (0R9)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.0pF (1R0)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.1pF (1R1)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.2pF (1R2)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.3pF (1R3)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.4pF (1R4)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.5pF (1R5)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.6pF (1R6)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.7pF (1R7)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.8pF (1R8)	J	J	J	S	S	S	T	T	T	T	A, B, C
	1.9pF (1R9)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.0pF (2R0)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.1pF (2R1)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.2pF (2R2)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.3pF (2R3)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.4pF (2R4)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.5pF (2R5)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.6pF (2R6)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.7pF (2R7)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.8pF (2R8)	J	J	J	S	S	S	T	T	T	T	A, B, C
	2.9pF (2R9)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.0pF (3R0)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.1pF (3R1)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.2pF (3R2)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.3pF (3R3)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.4pF (3R4)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.5pF (3R5)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.6pF (3R6)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.7pF (3R7)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.8pF (3R8)	J	J	J	S	S	S	T	T	T	T	A, B, C
	3.9pF (3R9)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.0pF (4R0)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.1pF (4R1)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.2pF (4R2)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.3pF (4R3)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.4pF (4R4)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.5pF (4R5)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.6pF (4R6)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.7pF (4R7)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.8pF (4R8)	J	J	J	S	S	S	T	T	T	T	A, B, C
	4.9pF (4R9)	J	J	J	S	S	S	T	T	T	T	A, B, C
	5.0pF (5R0)	J	J	J	S	S	S	T	T	T	T	A, B, C
	5.1pF (5R1)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.2pF (5R2)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.3pF (5R3)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.4pF (5R4)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.5pF (5R5)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.6pF (5R6)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.7pF (5R7)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.8pF (5R8)	J	J	J	S	S	S	T	T	T	T	B, C, D
	5.9pF (5R9)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.0pF (6R0)	J	J	J	S	S	S	T	T	T	T	B, C, D

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

Multilayer Ceramic Capacitors

DIELECTRIC		NP0										Tolerance
SIZE	0505			0603			0805					
RATED VOLTAGE (VDC)	50	100	250	25 50	100	250	50	100	250	500		
Capacitance	6.1pF (6R1)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.2pF (6R2)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.3pF (6R3)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.4pF (6R4)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.5pF (6R5)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.6pF (6R6)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.7pF (6R7)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.8pF (6R8)	J	J	J	S	S	S	T	T	T	T	B, C, D
	6.9pF (6R9)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.0pF (7R0)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.1pF (7R1)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.2pF (7R2)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.3pF (7R3)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.4pF (7R4)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.5pF (7R5)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.6pF (7R6)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.7pF (7R7)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.8pF (7R8)	J	J	J	S	S	S	T	T	T	T	B, C, D
	7.9pF (7R9)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.0pF (8R0)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.1pF (8R1)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.2pF (8R2)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.3pF (8R3)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.4pF (8R4)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.5pF (8R5)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.6pF (8R6)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.7pF (8R7)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.8pF (8R8)	J	J	J	S	S	S	T	T	T	T	B, C, D
	8.9pF (8R9)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.0pF (9R0)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.1pF (9R1)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.2pF (9R2)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.3pF (9R3)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.4pF (9R4)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.5pF (9R5)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.6pF (9R6)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.7pF (9R7)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.8pF (9R8)	J	J	J	S	S	S	T	T	T	T	B, C, D
	9.9pF (9R9)	J	J	J	S	S	S	T	T	T	T	B, C, D
	10pF (100)	J	J	J	S	S	S	T	T	T	T	F, G, J
	11pF (110)	J	J	J	S	S	S	T	T	T	T	F, G, J
	12pF (120)	J	J	J	S	S	S	T	T	T	T	F, G, J
	13pF (130)	J	J	J	S	S	S	T	T	T	T	F, G, J
	15pF (150)	J	J	J	S	S	S	T	T	T	T	F, G, J
	16pF (160)	J	J	J	S	S	S	T	T	T	T	F, G, J
	18pF (180)	J	J	J	S	S	S	T	T	T	T	F, G, J
	20pF (200)	J	J	J	S	S	S	T	T	T	T	F, G, J
	22pF (220)	J	J	J	S	S	S	T	T	T	T	F, G, J
24pF (240)	J	J	J	S	S	S	T	T	T	T	F, G, J	
27pF (270)	J	J	J	S	S	S	T	T	T	T	F, G, J	
30pF (300)	J	J	J	S	S	S	T	T	T	T	F, G, J	
33pF (330)	J	J	J	S	S	S	T	T	T	T	F, G, J	
36pF (360)	J	J	J	S	S	S	T	T	T	T	F, G, J	
39pF (390)	J	J	J	S	S	S	T	T	T	T	F, G, J	
43pF (430)	J	J	J	S	S	S	T	T	T	T	F, G, J	
47pF (470)	J	J	J	S	S	S	T	T	T	T	F, G, J	
56pF (560)	J	J	J	S	S	S	T	T	T	T	F, G, J	
68pF (680)	J	J	J	S	S	S	T	T	T	T	F, G, J	
82pF (820)	J	J	J	S	S	S	T	T	T	T	F, G, J	
100pF (101)	J	J	J	S	S	S	T	T	T	T	F, G, J	
120pF (121)				S			T	T	T		F, G, J	
150pF (151)				S			T	T	T		F, G, J	
180pF (181)				S			T	T	T		F, G, J	
220pF (221)				S			T	T	T		F, G, J	

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Multilayer Ceramic Capacitors

DIELECTRIC		NP0						Tolerance
SIZE		1111						
RATED VOLTAGE (VDC)		50	100	200	250	500	1500	
Capacitance	0.6pF (0R6)	G	G	G	G	G	G	A, B, C
	0.7pF (0R7)	G	G	G	G	G	G	A, B, C
	0.8pF (0R8)	G	G	G	G	G	G	A, B, C
	0.9pF (0R9)	G	G	G	G	G	G	A, B, C
	1.0pF (1R0)	G	G	G	G	G	G	A, B, C
	1.1pF (1R1)	G	G	G	G	G	G	A, B, C
	1.2pF (1R2)	G	G	G	G	G	G	A, B, C
	1.3pF (1R3)	G	G	G	G	G	G	A, B, C
	1.5pF (1R5)	G	G	G	G	G	G	A, B, C
	1.6pF (1R6)	G	G	G	G	G	G	A, B, C
	1.8pF (1R8)	G	G	G	G	G	G	A, B, C
	2.0pF (2R0)	G	G	G	G	G	G	A, B, C
	2.2pF (2R2)	G	G	G	G	G	G	A, B, C
	2.4pF (2R4)	G	G	G	G	G	G	A, B, C
	2.7pF (2R7)	G	G	G	G	G	G	A, B, C
	3.0pF (3R0)	G	G	G	G	G	G	A, B, C
	3.3pF (3R3)	G	G	G	G	G	G	A, B, C
	3.6pF (3R6)	G	G	G	G	G	G	A, B, C
	3.9pF (3R9)	G	G	G	G	G	G	A, B, C
	4.0pF (4R0)	G	G	G	G	G	G	A, B, C
	4.3pF (4R3)	G	G	G	G	G	G	A, B, C
	5.0pF (5R0)	G	G	G	G	G	G	A, B, C
	5.1pF (5R1)	G	G	G	G	G	G	B, C, D
	5.6pF (5R6)	G	G	G	G	G	G	B, C, D
	6.0pF (6R0)	G	G	G	G	G	G	B, C, D
	6.8pF (6R8)	G	G	G	G	G	G	B, C, D
	7.0pF (7R0)	G	G	G	G	G	G	B, C, D
	8.0pF (8R0)	G	G	G	G	G	G	B, C, D
	8.2pF (8R2)	G	G	G	G	G	G	B, C, D
	10pF (100)	G	G	G	G	G	G	F, G, J
	12pF (120)	G	G	G	G	G	G	F, G, J
	15pF (150)	G	G	G	G	G	G	F, G, J
	18pF (180)	G	G	G	G	G	G	F, G, J
	22pF (220)	G	G	G	G	G	G	F, G, J
	27pF (270)	G	G	G	G	G	G	F, G, J
	33pF (330)	G	G	G	G	G	G	F, G, J
	39pF (390)	G	G	G	G	G	G	F, G, J
	47pF (470)	G	G	G	G	G	G	F, G, J
	56pF (560)	G	G	G	G	G	G	F, G, J
	68pF (680)	G	G	G	G	G	G	F, G, J
82pF (820)	G	G	G	G	G	G	F, G, J	
100pF (101)	G	G	G	G	G	G	F, G, J	
120pF (121)	G	G	G	G	G	G	F, G, J	
150pF (151)	G	G	G	G	G	G	F, G, J	
180pF (181)	G	G	G	G	G	G	F, G, J	
220pF (221)	G	G	G	G	G	G	F, G, J	
270pF (271)	G	G	G	G	G	G	F, G, J	
330pF (331)	G	G	G	G	G	G	F, G, J	
390pF (391)	G	G	G	G	G	G	F, G, J	
470pF (471)	G	G	G	G	G	G	F, G, J	
560pF (561)	G	G	G	G	G	G	F, G, J	
680pF (681)	G	G	G	G	G	G	F, G, J	
820pF (821)	G	G	G	G	G	G	F, G, J	
1000pF (102)	G	G	G	G	G	G	F, G, J	

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Multilayer Ceramic Capacitors

CAPACITANCE RANGE (X8G)

DIELECTRIC		X8G				Tolerance
SIZE		0402	0603	0805		
RATED VOLTAGE (VDC)		200	250	250	500	
Capacitance	0.1pF (0R1)	N				A, B
	0.2pF (0R2)	N		A	A	A, B
	0.3pF (0R3)	N	S	T	T	A, B
	0.4pF (0R4)	N	S	T	T	A, B
	0.5pF (0R5)	N	S	T	T	A, B, C
	0.6pF (0R6)	N	S	T	T	A, B, C
	0.7pF (0R7)	N	S	T	T	A, B, C
	0.8pF (0R8)	N	S	T	T	A, B, C
	0.9pF (0R9)	N	S	T	T	A, B, C
	1.0pF (1R0)	N	S	T	T	A, B, C
	1.1pF (1R1)	N	S	T	T	A, B, C
	1.2pF (1R2)	N	S	T	T	A, B, C
	1.3pF (1R3)	N	S	T	T	A, B, C
	1.4pF (1R4)	N	S	T	T	A, B, C
	1.5pF (1R5)	N	S	T	T	A, B, C
	1.6pF (1R6)	N	S	T	T	A, B, C
	1.7pF (1R7)	N	S	T	T	A, B, C
	1.8pF (1R8)	N	S	T	T	A, B, C
	1.9pF (1R9)	N	S	T	T	A, B, C
	2.0pF (2R0)	N	S	T	T	A, B, C
	2.1pF (2R1)	N	S	T	T	A, B, C
	2.2pF (2R2)	N	S	T	T	A, B, C
	2.3pF (2R3)	N	S	T	T	A, B, C
	2.4pF (2R4)	N	S	T	T	A, B, C
	2.5pF (2R5)	N	S	T	T	A, B, C
	2.6pF (2R6)	N	S	T	T	A, B, C
	2.7pF (2R7)	N	S	T	T	A, B, C
	2.8pF (2R8)	N	S	T	T	A, B, C
	2.9pF (2R9)	N	S	T	T	A, B, C
	3.0pF (3R0)	N	S	T	T	A, B, C
	3.1pF (3R1)	N	S	T	T	A, B, C
	3.2pF (3R2)	N	S	T	T	A, B, C
	3.3pF (3R3)	N	S	T	T	A, B, C
	3.4pF (3R4)	N	S	T	T	A, B, C
	3.5pF (3R5)	N	S	T	T	A, B, C
	3.6pF (3R6)	N	S	T	T	A, B, C
	3.7pF (3R7)	N	S	T	T	A, B, C
	3.8pF (3R8)	N	S	T	T	A, B, C
	3.9pF (3R9)	N	S	T	T	A, B, C
	4.0pF (4R0)	N	S	T	T	A, B, C
	4.1pF (4R1)	N	S	T	T	A, B, C
	4.2pF (4R2)	N	S	T	T	A, B, C
	4.3pF (4R3)	N	S	T	T	A, B, C
	4.4pF (4R4)	N	S	T	T	A, B, C
	4.5pF (4R5)	N	S	T	T	A, B, C
	4.6pF (4R6)	N	S	T	T	A, B, C
	4.7pF (4R7)	N	S	T	T	A, B, C
	4.8pF (4R8)	N	S	T	T	A, B, C
	4.9pF (4R9)	N	S	T	T	A, B, C
	5.0pF (5R0)	N	S	T	T	A, B, C
	5.1pF (5R1)	N	S	T	T	B, C, D
	5.2pF (5R2)	N	S	T	T	B, C, D
	5.3pF (5R3)	N	S	T	T	B, C, D
	5.4pF (5R4)	N	S	T	T	B, C, D
	5.5pF (5R5)	N	S	T	T	B, C, D
	5.6pF (5R6)	N	S	T	T	B, C, D
	5.7pF (5R7)	N	S	T	T	B, C, D
	5.8pF (5R8)	N	S	T	T	B, C, D
	5.9pF (5R9)	N	S	T	T	B, C, D

DIELECTRIC		X8G				Tolerance
SIZE		0402	0603	0805		
RATED VOLTAGE (VDC)		200	250	250	500	
Capacitance	6.0pF (6R0)	N	S	T	T	B, C, D
	6.1pF (6R1)	N	S	T	T	B, C, D
	6.2pF (6R2)	N	S	T	T	B, C, D
	6.3pF (6R3)	N	S	T	T	B, C, D
	6.4pF (6R4)	N	S	T	T	B, C, D
	6.5pF (6R5)	N	S	T	T	B, C, D
	6.6pF (6R6)	N	S	T	T	B, C, D
	6.7pF (6R7)	N	S	T	T	B, C, D
	6.8pF (6R8)	N	S	T	T	B, C, D
	6.9pF (6R9)	N	S	T	T	B, C, D
	7.0pF (7R0)	N	S	T	T	B, C, D
	7.1pF (7R1)	N	S	T	T	B, C, D
	7.2pF (7R2)	N	S	T	T	B, C, D
	7.3pF (7R3)	N	S	T	T	B, C, D
	7.4pF (7R4)	N	S	T	T	B, C, D
	7.5pF (7R5)	N	S	T	T	B, C, D
	7.6pF (7R6)	N	S	T	T	B, C, D
	7.7pF (7R7)	N	S	T	T	B, C, D
	7.8pF (7R8)	N	S	T	T	B, C, D
	7.9pF (7R9)	N	S	T	T	B, C, D
	8.0pF (8R0)	N	S	T	T	B, C, D
	8.1pF (8R1)	N	S	T	T	B, C, D
	8.2pF (8R2)	N	S	T	T	B, C, D
	8.3pF (8R3)	N	S	T	T	B, C, D
	8.4pF (8R4)	N	S	T	T	B, C, D
	8.5pF (8R5)	N	S	T	T	B, C, D
	8.6pF (8R6)	N	S	T	T	B, C, D
	8.7pF (8R7)	N	S	T	T	B, C, D
	8.8pF (8R8)	N	S	T	T	B, C, D
	8.9pF (8R9)	N	S	T	T	B, C, D
	9.0pF (9R0)	N	S	T	T	B, C, D
	9.1pF (9R1)	N	S	T	T	B, C, D
	9.2pF (9R2)	N	S	T	T	B, C, D
	9.3pF (9R3)	N	S	T	T	B, C, D
	9.4pF (9R4)	N	S	T	T	B, C, D
	9.5pF (9R5)	N	S	T	T	B, C, D
	9.6pF (9R6)	N	S	T	T	B, C, D
	9.7pF (9R7)	N	S	T	T	B, C, D
	9.8pF (9R8)	N	S	T	T	B, C, D
	9.9pF (9R9)	N	S	T	T	B, C, D
	10pF (100)	N	S	T	T	F, G, J
	11pF (110)	N	S	T	T	F, G, J
	12pF (120)	N	S	T	T	F, G, J
	13pF (130)	N	S	T	T	F, G, J
	15pF (150)	N	S	T	T	F, G, J
	16pF (160)	N	S	T	T	F, G, J
	18pF (180)	N	S	T	T	F, G, J
	20pF (200)	N	S	T	T	F, G, J
	22pF (220)	N	S	T	T	F, G, J
	24pF (240)	N	S	T		F, G, J
27pF (270)	N	S	T		F, G, J	
30pF (300)	N	S	T		F, G, J	
33pF (330)	N	S	T		F, G, J	
36pF (360)		S	T		F, G, J	
39pF (390)		S	T		F, G, J	
43pF (430)		S	T		F, G, J	
47pF (470)			T		F, G, J	
56pF (560)			T		F, G, J	
68pF (680)			T		F, G, J	
82pF (820)			T		F, G, J	

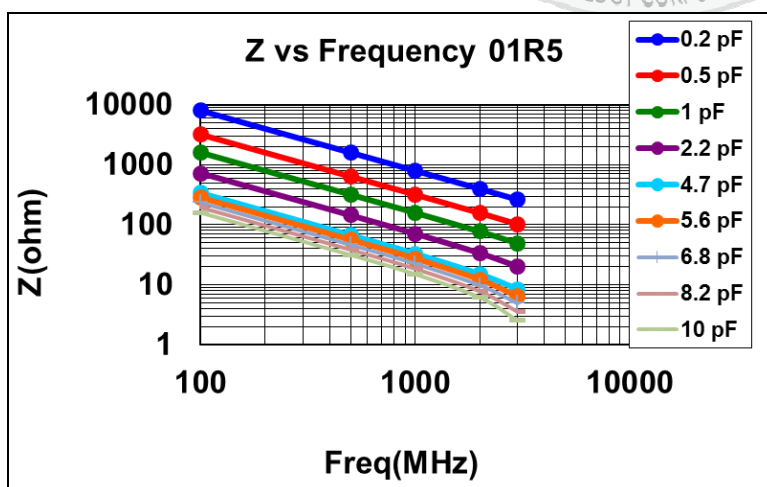
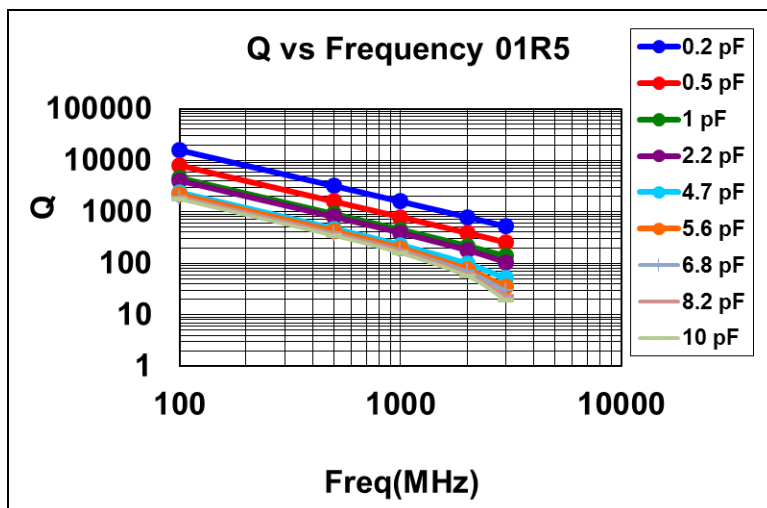
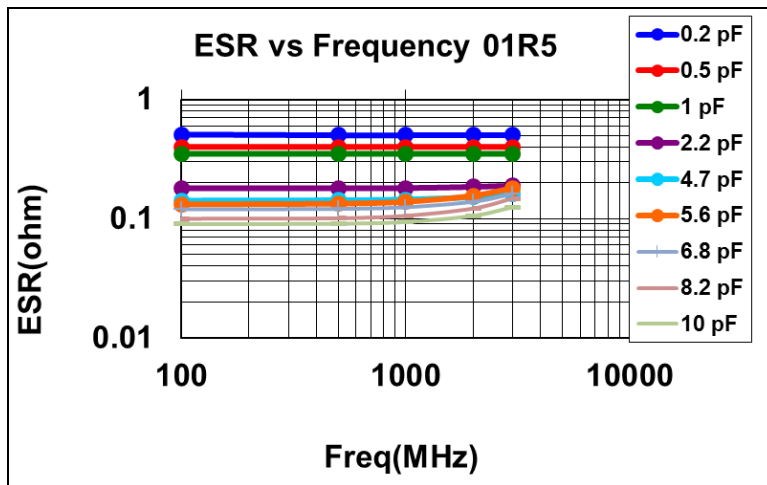
1. The letter in cell is expressed the symbol of product thickness.

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

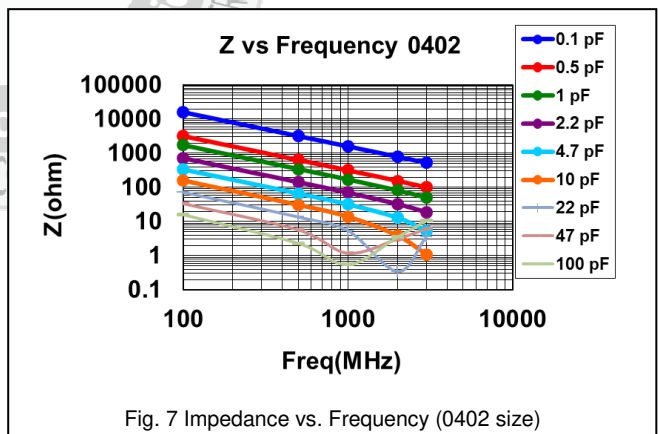
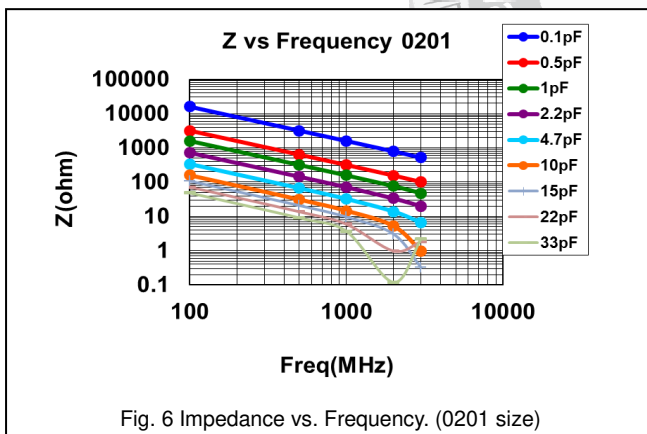
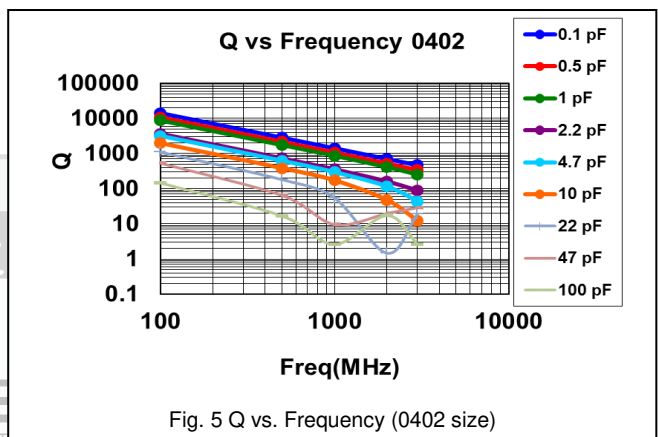
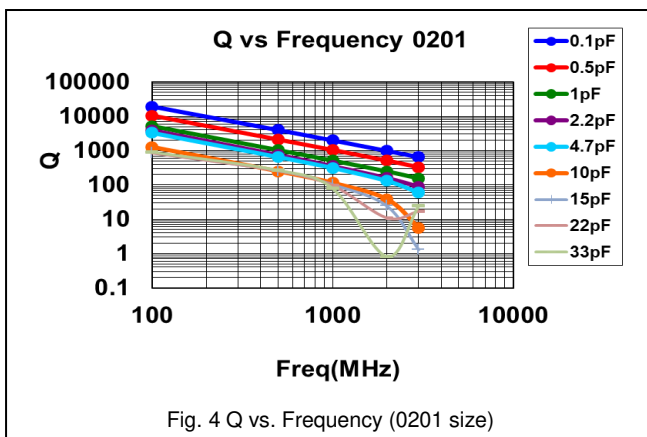
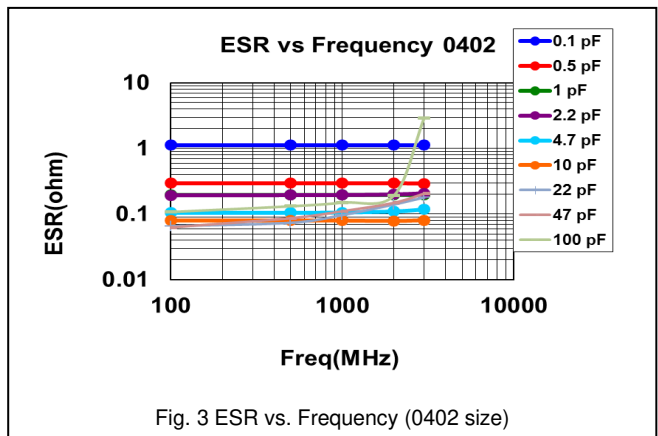
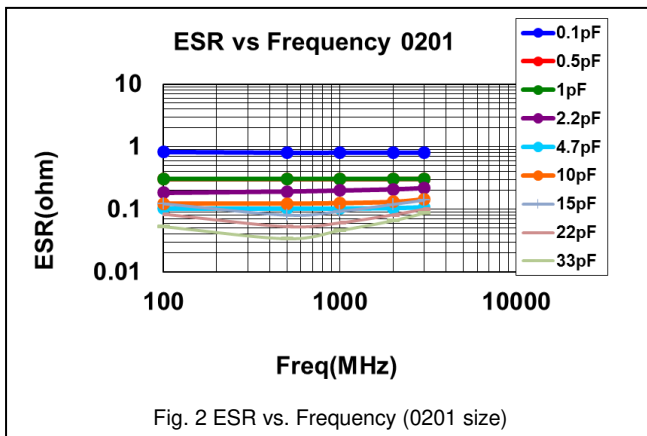
Multilayer Ceramic Capacitors

9. ELECTRICAL CHARACTERISTICS

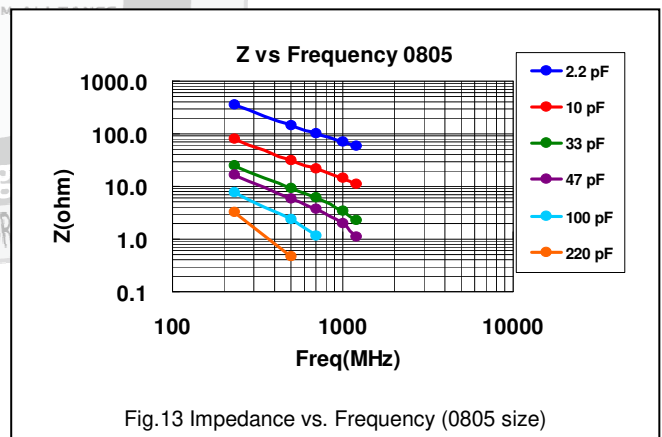
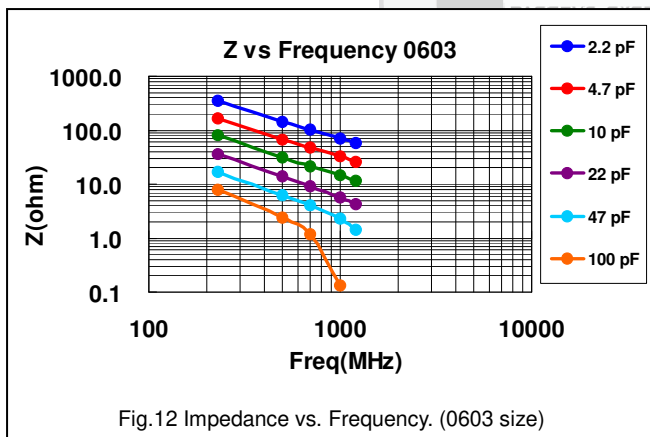
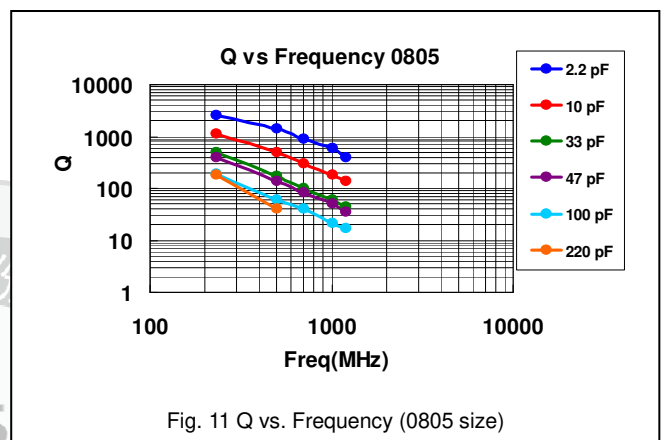
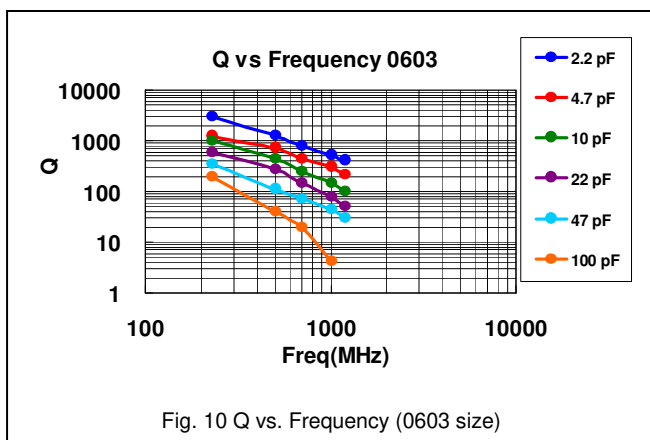
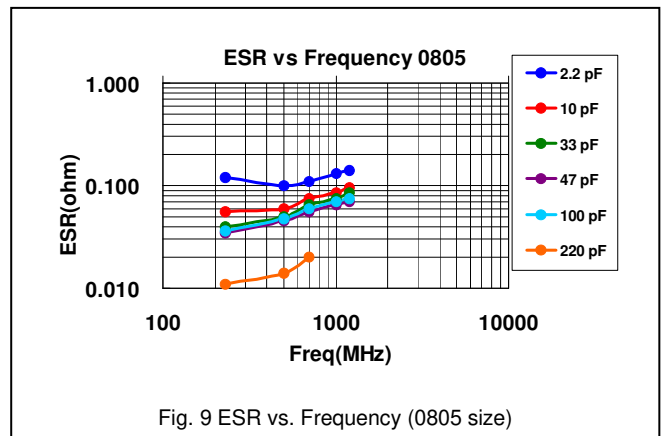
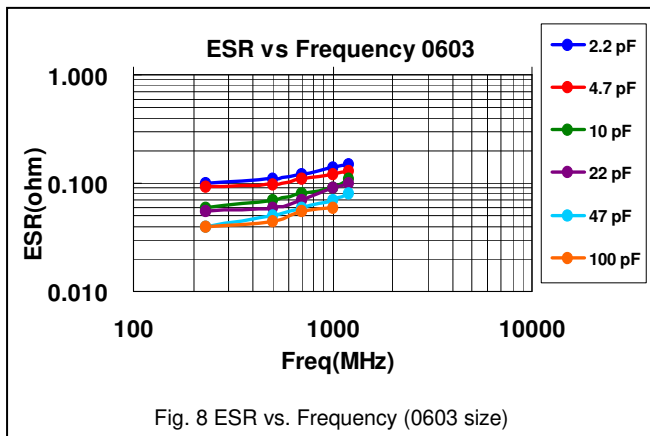
Please refer ECD on website (by items) for detail ELECTRICAL CHARACTERISTICS:
<http://www.passivecomponent.com/product-search/mlcc/>



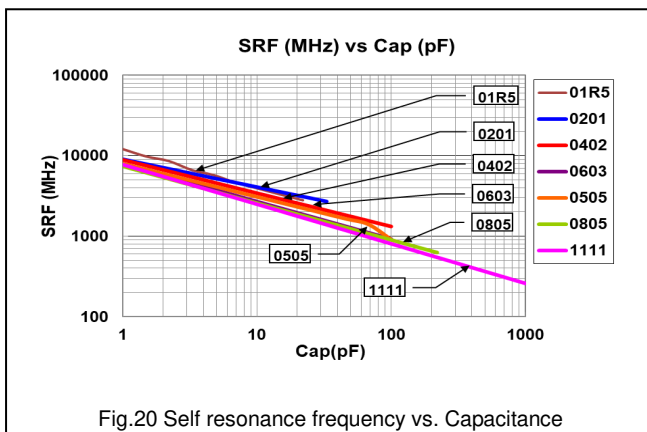
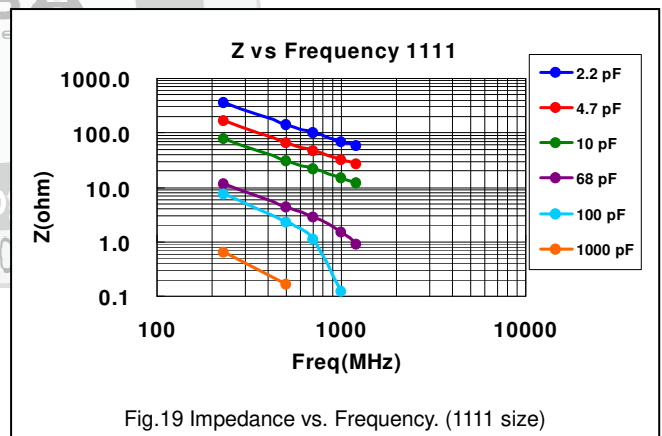
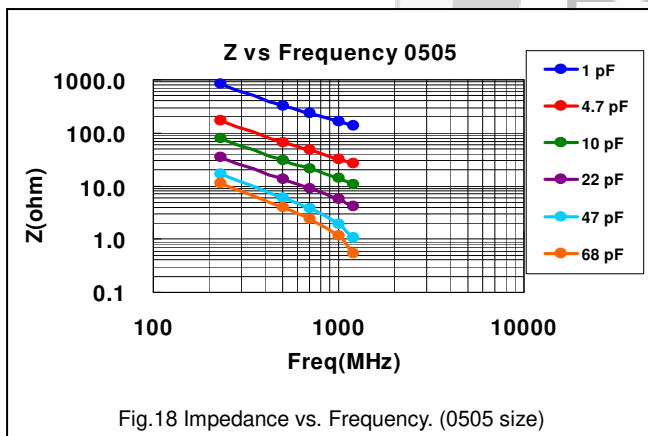
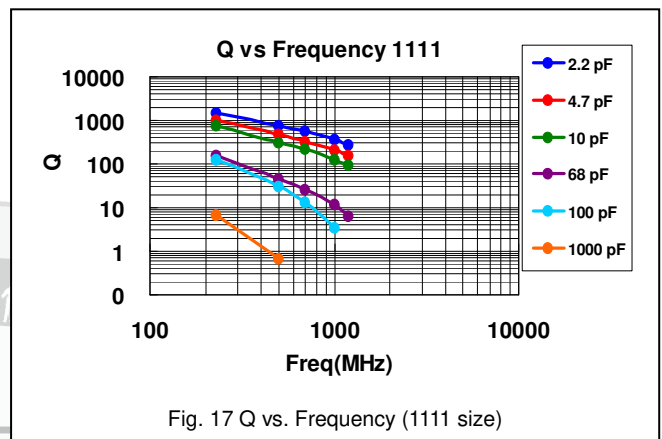
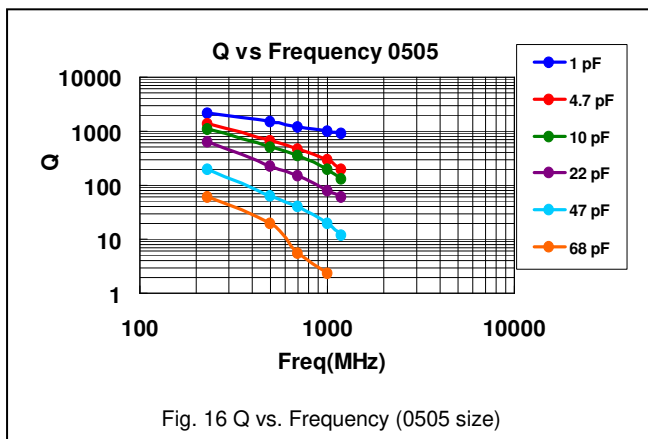
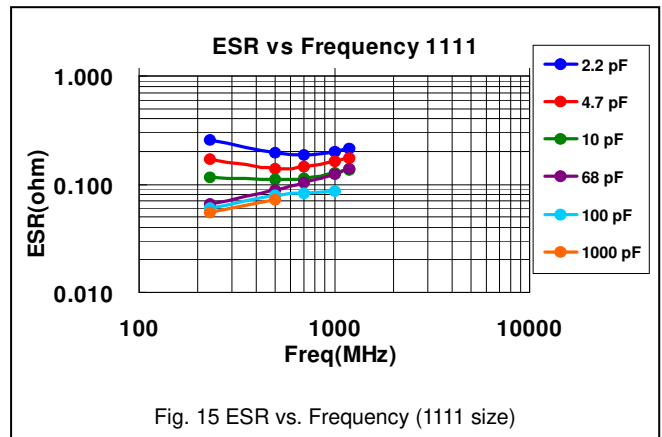
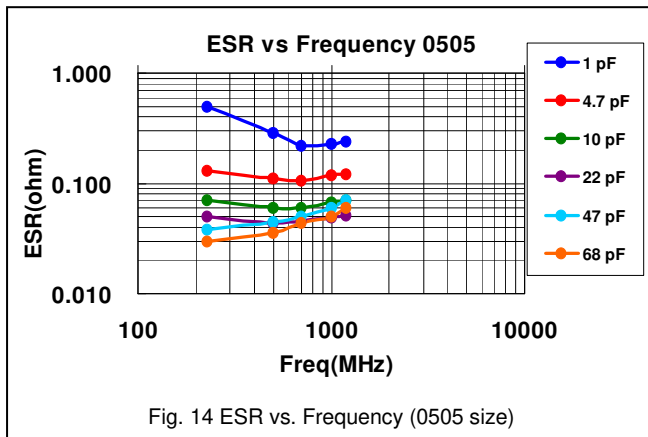
Multilayer Ceramic Capacitors



Multilayer Ceramic Capacitors



Multilayer Ceramic Capacitors



Multilayer Ceramic Capacitors

10. RELIABILITY TEST CONDITIONS AND REQUIREMENTS

No.	Item	Test Conditions	Requirements
1.	Visual and Mechanical		- No remarkable defect. - Dimensions to conform to individual specification sheet.
2.	Capacitance	* 1.0±0.2Vrms, 1MHz±10%	Shall not exceed the limits given in the detailed spec.
3.	Q/ D.F. (Dissipation Factor)	* Test temp.: Room Temperature.	01005, 0201, 0402/25V~50V: Cap<30pF, Q≥400+20C; Cap≥30pF, Q≥1000 0402/100V~200V, 0603, 0805, 0505, 1111: Cap<30pF: Q≥800+20C; Cap≥30pF: Q≥1400
4.	Dielectric Strength	*To apply voltage: ≤ 100V : 250% of rated voltage.(RF02: 300% of rated voltage.) 200V ~ 300V : 200% of rated voltage. 500V ~ 999V : 150% of rated voltage. 1000V ~ 3000V : 120% of rated voltage. 4000V : 110% of rated voltage. *Duration: 1 to 5 sec. *Charge & discharge current less than 50mA.	No evidence of damage or flash over during test.
5.	Insulation Resistance	* Test temp.: Room Temperature. ≤100V : To apply rated voltage for max. 120 sec. ≥200V :To apply rated voltage (500V max.) for 60 sec.	≥10GΩ or RxC≥100Ω·F whichever is smaller
6.	Temperature Coefficient	- With no electrical load. - Operating temperature: NP0: -55~125°C at 25°C X8G: -55~150°C at 25°C	Capacitance change: within ±30ppm/°C;
7.	Adhesive Strength of Termination	- Pressurizing force : 01005: 1N 0201: 2N 0402 to 0603: 5N >0603: 10N * Test time: 10±1 sec.	No remarkable damage or removal of the terminations.
8.	Vibration Resistance	* Vibration frequency: 10~55 Hz/min. * Total amplitude: 1.5mm * Test time: 6 hrs. (Two hrs each in three mutually perpendicular directions.) * Cap./DF(Q) Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.	- No remarkable damage. - Cap change and Q/D.F.: To meet initial spec.
9.	Solderability	* Solder temperature: 235±5°C * Dipping time: 2±0.5 sec.	95% min. coverage of all metalized area.
10.	Bending Test	* 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 1 mm and then the pressure shall be maintained for 5±1 sec. * Measurement to be made after keeping at room temp. for 24±2 hrs.	- No remarkable damage. - Cap change: within ±5.0% or ±0.5pF whichever is larger. (This capacitance change means the change of capacitance under specified flexure of substrate from the capacitance measured before the test.)
11.	Resistance to Soldering Heat	* Solder temperature: 260±5°C * Dipping time: 10±1 sec * Preheating: 120 to 150°C for 1 minute before immerse the capacitor in a eutectic solder. * Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.	- No remarkable damage. - Cap change: within ±2.5% or ±0.25pF whichever is larger. - Q/D.F., I.R. and dielectric strength: To meet initial requirements. 25% max. leaching on each edge.

* "Room condition" Temperature: 15 to 35°C, Relative humidity: 25 to 75%, Atmospheric pressure: 86 to 106kPa.

No.	Item	Test Condition	Requirements													
12.	Temperature Cycle	* Conduct the five cycles according to the temperatures and time.	* No remarkable damage.													
		<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>	Step	Temp. (°C)	Time (min.)	1	Min. operating temp. +0/-3	30±3	2	Room temp.	2~3	3	Max. operating temp. +3/-0	30±3	4	Room temp.
Step	Temp. (°C)	Time (min.)														
1	Min. operating temp. +0/-3	30±3														
2	Room temp.	2~3														
3	Max. operating temp. +3/-0	30±3														
4	Room temp.	2~3														
		* Q/D.F., I.R. and dielectric strength: To meet initial requirements.														
		* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.														
13.	Humidity (Damp Heat) Steady State	* Test temp.: 40±2°C	* No remarkable damage.													
		* Humidity: 90~95% RH	* Cap change: within ±5.0% or ±0.5pF whichever is larger.													
		* Test time: 500+24/-0hrs.	* Q/D.F. value: Cap≥30pF, Q≥350;													
		* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.	10pF≤Cap<30pF, Q≥275+2.5C													
			Cap<10pF; Q≥200+10C													
			* I.R.: ≥1GΩ.													
14.	Humidity (Damp Heat) Load	* Test temp.: 40±2°C	* No remarkable damage.													
		* Humidity: 90~95%RH	* Cap change: within ±7.5% or ±0.75pF whichever is larger.													
		* Test time: 500+24/-0 hrs.	* Q/D.F. value: Cap≥30pF, Q≥200;													
		* To apply voltage : rated voltage (MAX. 500V)	Cap<30pF, Q≥100+10/3C													
		* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp.	* I.R.: ≥500MΩ.													
15.	High Temperature Load (Endurance)	* Test temp.: NP0: 125±3°C	* No remarkable damage.													
		X8G: 150±3°C	* Cap change: within ±3.0% or ±0.3pF whichever is larger.													
		* To apply voltage:	* Q/D.F. value: Cap≥30pF, Q≥350													
		(1) 10V ≤ Ur<500V: 200% of rated voltage.	10pF≤Cap<30pF, Q≥275+2.5C													
		(2) ≤ 6.3V or 500V: 150% of rated voltage.	Cap<10pF, Q≥200+10C													
		(3) Ur ≥ 630V: 120% of rated voltage.														
		* Test time: 1000+24/-0 hrs.	* I.R.: ≥1GΩ.													
		* Cap. / DF(Q) / I.R. Measurement to be made after de-aging at 150°C for 1hr then set for 24±2 hrs at room temp														
16.	ESR	The ESR should be measured at room temperature and tested at frequency 1±0.1 GHz.	01005	0505												
			0.2pF≤Cap≤1pF:< 700mΩ/pF	0.4pF≤Cap<1.0pF: < 1500mΩ												
			1pF<Cap≤2pF:< 600mΩ	1.0pF≤Cap<10pF: < 250mΩ												
			2pF<Cap≤5pF:< 500mΩ	10pF≤Cap≤100pF: < 200mΩ												
			5pF<Cap≤10pF:< 300mΩ													
			10pF<Cap≤22pF:< 350mΩ													
			0201	0402												
			0.1pF≤Cap≤1pF:< 350mΩ/pF	0.1pF≤Cap≤1pF: < 350mΩ/pF												
			1pF<Cap≤5pF:< 300mΩ	1pF<Cap≤5pF:< 300mΩ												
			5pF<Cap≤22pF:< 250mΩ	5pF<Cap≤100pF:< 250mΩ												
			0603	0805												
			0.1pF≤Cap≤1pF:< 1500mΩ	0.3pF≤Cap≤1pF: < 1500mΩ												
			1pF<Cap≤10pF:< 250mΩ	1pF<Cap≤10pF: < 250mΩ												
			10pF<Cap≤220pF:< 200mΩ	Cap>10pF: < 200mΩ												
	0201, 22pF≤Cap≤33pF: < 300mΩ															
	1111, 100pF<Cap≤1000pF: < 150mΩ															

* "Room condition" Temperature: 15 to 35°C, Relative humidity: 25 to 75%, Atmospheric pressure: 86 to 106kPa.

Multilayer Ceramic Capacitors

APPENDIXES

■ Tape & reel dimensions

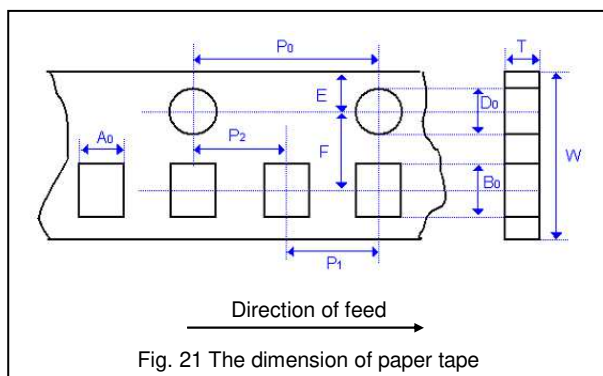


Fig. 21 The dimension of paper tape

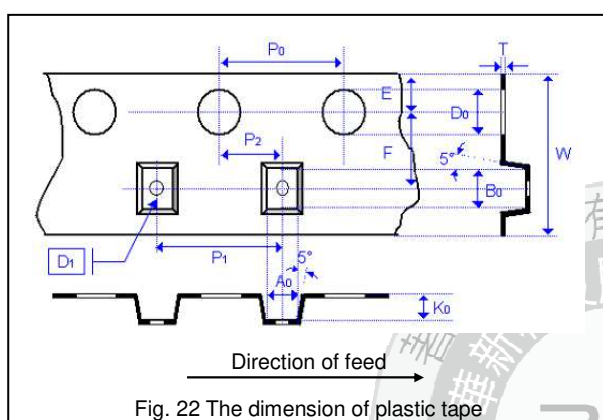


Fig. 22 The dimension of plastic tape

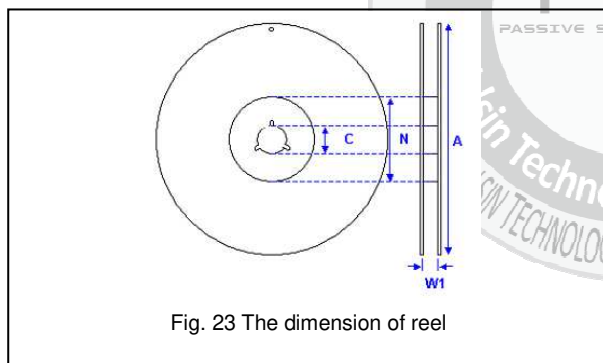


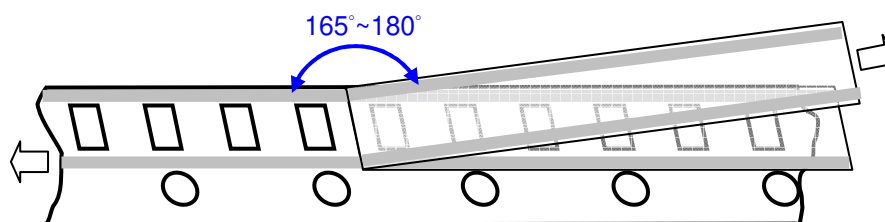
Fig. 23 The dimension of reel

Size	01005	0201	0402	0505	0603	0805	1111
Thickness	V	L	N	J	S	T	G
A ₀	0.25 +/-0.05	0.40 +/-0.10	0.70 +/-0.20	< 1.90	1.05 +/-0.30	1.50 +/-0.20	< 3.05
B ₀	0.45 +/-0.05	0.70 +/-0.10	1.20 +/-0.20	< 1.90	1.80 +/-0.30	2.30 +/-0.20	< 3.80
T	≤ 0.50	≤ 0.55	≤ 0.80	0.23 +/-0.1	≤ 1.20	≤ 1.20	0.23 +/-0.1
K ₀	-	-	-	< 1.50	-	-	< 2.50
W	8.00 +/-0.30	8.00 +/-0.30	8.00 +/-0.30	8.00 +/-0.30	8.00 +/-0.30	8.00 +/-0.30	8.00 +/-0.30
P ₀	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 ₀	40.00 +/-0.10	40.00 +/-0.10	40.00 +/-0.10	40.00 +/-0.20	40.00 +/-0.20	40.00 +/-0.20	40.00 +/-0.20
P ₁	2.00 +/-0.05	2.00 +/-0.05	2.00 +/-0.05	4.00 +/-0.10	4.00 +/-0.10	4.00 +/-0.10	4.00 +/-0.10
P ₂	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 ₀	1.50 +0.1/-0	1.50 +0.1/-0	1.50 +0.1/-0	1.50 +0.1/-0	1.50 +0.1/-0	1.50 +0.1/-0	1.50 +0.1/-0
D ₁	-	-	-	1.00 +/-0.10	-	-	1.00 +/-0.10
E	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

Size	01005, 0201, 0402, 0505, 0603, 0805, 1111	
Reel size	7"	13"
C	13.0±0.5	13.0±0.5
W ₁	10.0±1.5	10.0±1.5
A	178.0±2.0	330.0±2.0
N	60.0+1.0/-0	50 min

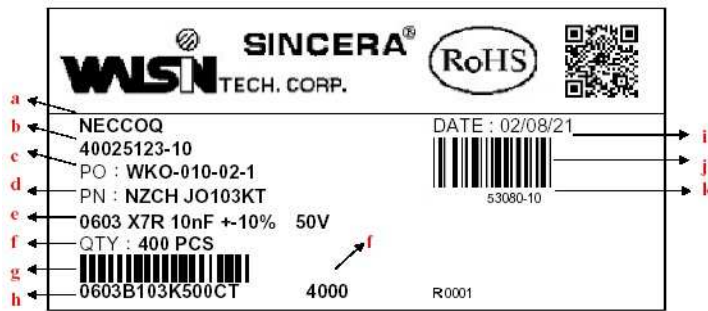
■ Peeling force (EIA-481)

Peel-off force should be in the range of 10 grams to 100 grams at a peel-off speed of 300±10 mm/min.



Multilayer Ceramic Capacitors

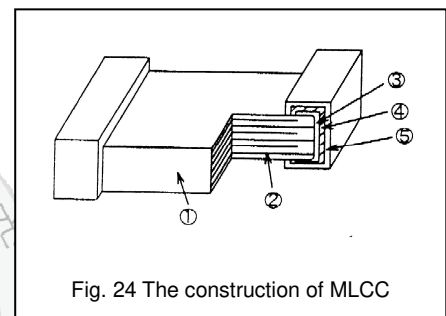
Example of customer label



*Customized label is available upon request

Constructions

No.	Name	X8G, NP0
①	Ceramic material	Hi-Q dielectric ceramic
②	Inner electrode	Cu
③	Termination	Inner layer
④		Middle layer
⑤		Outer layer
		Sn (Matt)



Storage and handling conditions

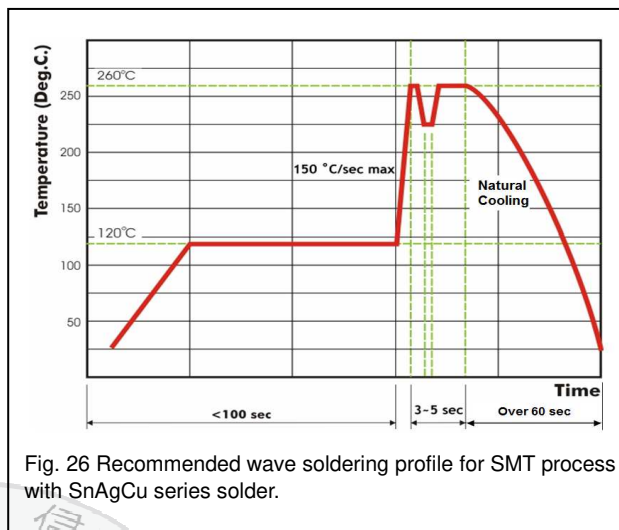
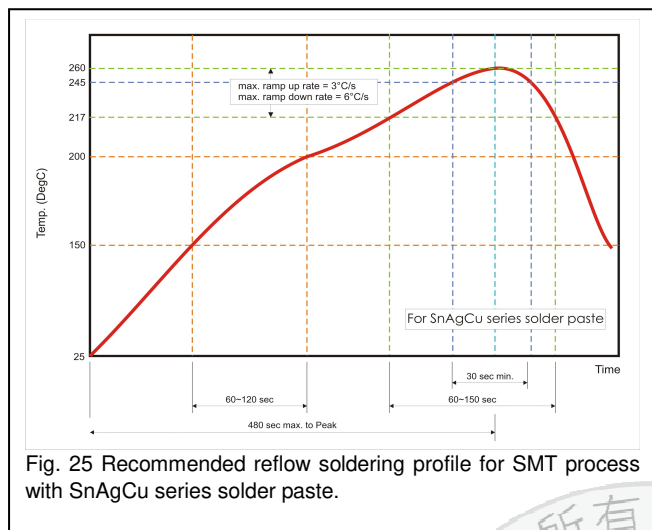
- To store products at 5 to 40°C ambient temperature and 20 to 70% related humidity conditions; MSL Level 1.
- The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

Cautions:

- 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.)
- In corrosive atmosphere, solderability might be degraded, and silver migration might occur to cause low reliability.
- 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 N₂ within oven are recommended.



Mouser Electronics

Authorized Distributor

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[Walsin:](#)

RF15N0R6B500CTNA	RF15N270J500CTNA	RF15N3R9B500CTNA	RF15N0R1B250CTNA	RF15N0R2B250CTNA
RF15N0R9B250CTNA	RF15N1R2C250CTNA	RF15N3R3B250CTNA	RF15N4R7C250CTNA	RF15N4R7C500CTNA
RF15N0R3B500CTNA	RF15N0R7B500CTNA	RF15N0R8B500CTNA	RF15N101J250CTNA	RF15N120J100CTNA
RF15N1R5B500CTNA	RF15N1R8C500CTNA	RF15N220J100CTNA	RF15N390J500CTNA	RF15N3R6B500CTNA
RF15N3R9B250CTNA	RF15N5R0C500CTNA	RF15N680J250CTNA	RF18N0R3B250CTSA	RF18N1R0B500CTSA
RF15N5R0B500CTNA	RF15N820J250CTNA	RF18N3R0B250CTSA	RF18N6R0B500CTSA	RF18N7R0B500CTSA
RF15N0R4B250CTNA	RF15N0R8B250CTNA	RF15N101J500CTNA	RF15N1R0C250CTNA	RF15N0R8C500CTNA
RF15N1R1B250CTNA	RF15N1R5B250CTNA	RF15N1R8C250CTNA	RF15N200J500CTNA	RF15N3R6B250CTNA
RF15N3R6C500CTNA	RF15N5R6B500CTNA	RF15N8R2C250CTNA	RF18N2R0B250CTSA	RF18N2R2B500CTSA
RF18N4R7B500CTSA	RF18N5R0C250CTSA	RF15N0R4B500CTNA	RF15N120J500CTNA	RF15N1R5C500CTNA
RF15N1R8B500CTNA	RF15N2R7B500CTNA	RF15N3R9C500CTNA	RF15N6R0B500CTNA	RF18N1R8B250CTSA
RF18N1R8B500CTSA	RF18N200J500CTSA	RF18N4R0B250CTSA	RF18N4R0B500CTSA	RF18N5R0C500CTSA
RF18N7R0C500CTSA	RF18N8R0C250CTSA	RF15N2R4C500CTNA	RF15N330J500CTNA	RF15N3R0C250CTNA
RF15N4R0C500CTNA	RF15N7R0B250CTNA	RF18N3R9B250CTSA	RF18N8R0B500CTSA	RF18N8R0C500CTSA
RF18N4R7B250CTSA	RF15N0R9B500CTNA	RF15N100J100CTNA	RF15N1R2B250CTNA	RF15N220J250CTNA
RF15N220J500CTNA	RF15N270J100CTNA	RF15N2R0B250CTNA	RF15N3R3C500CTNA	RF15N4R7B500CTNA
RF15N5R0C250CTNA	RF15N7R5B500CTNA	RF15N820J500CTNA	RF18N0R9B250CTSA	RF18N0R9B500CTSA
RF18N390J500CTSA	RF18N6R8B500CTSA	RF15N2R2B500CTNA	RF15N4R0B500CTNA	RF15N4R3B500CTNA
RF15N6R8C500CTNA	RF15N7R0B500CTNA	RF15N8R2B500CTNA	RF18N2R0B500CTSA	RF18N3R3B500CTSA
RF18N5R0B500CTSA	RF15N0R5B250CTNA	RF15N0R5B500CTNA	RF15N0R6B250CTNA	RF15N150J100CTNA