

**■ HOW TO ORDER**

Type of MLCC	0805	B	104	K	500	C	T
General Purpose MLCC	<b>Size</b>	<b>Dielectric</b>	<b>Capacitance</b>	<b>Tolerance</b>	<b>Rated voltage</b>	<b>Termination</b>	<b>Packaging</b>
Ultra-small MLCC	Inch (mm) :	N=NP0	Two significant digits	A= ±0.05pF	Two significant digits followed by no. of zeros.	C=Cu/Ni/Sn	T=7" reeled
Middle & High Voltage MLCC	01R5(0402), 0201(0603), 0402(1005), 0603(1608), 0805(2012), 1206(3216), 1210(3225), 1808(4520), 1812(4532), 1825(4563), 2220(5750), 2225(5763)	G=X8G	followed by no. of zeros.	B= ±0.1pF	And R is in place of decimal point.	M= Cu/Ni/Sn	Q=10" reeled
High Vol. Cap. with Surface Coating		R=X8R		C= ±0.25pF		Surface coating	G=13" reeled
	<b>RF</b>	B=X7R		D= ±0.5pF			
	<b>Series</b>	A=X7S		F= ±1%			
	<b>03</b>	S=X6S		G= ±2%	4R0=4 Vdc		
	<b>Size</b>	X=X5R		J= ±5%	6R3=6.3 Vdc		
Microwave MLCC	RF=Microwave	F=Y5V		K= ±10%	100=10 Vdc		
Microwave-Narrow Tolerance	UF=Microwave-Narrow Tolerance			M= ±20%	160=16 Vdc		
Microwave-High reliability	RH=Microwave-High reliability			Z=-20/+80%	250=25 Vdc		
Automotive High-Q MLCC	RT=Automotive High Q Caps			P=±0.02pF**	350=35 Vdc		
High Q / Low ESR MLCC	Qualified to AEC-Q200			Q=±0.03pF**	500=50 Vdc		
Automotive MLCC	HH=High Q/ Low ESR				101=100 Vdc	C=Cu/Ni/Sn	
High Temperature MLCC.	MT=Automotive Cap.				201=200 Vdc		
Safety Certificated MLCC	Qualified to AEC-Q200				251=250 Vdc		
Low Profile MLCC	MG=Automotive Cap.				401=400 Vdc		
Feed Through MLCC	without AEC-Q200				451=450 Vdc		
	HT=High Temperature Cap.				501=500 Vdc		
	TT=Low profile				631=630 Vdc		
	FT=Feed Through(3-terminal)				102=1000 Vdc		
					152=1500 Vdc		
					202=2000 Vdc		
Soft Termination MLCC	ST=Qualified to AEC-Q200				252=2500 Vdc	C=Cu +Conductive resin /Ni /Sn	
	SH=With Ag polymer				302=3000 Vdc		
	SG=With Cu polymer				402=4000 Vdc	C=Cu/Ni/Sn	
Safety Certificated MLCC	S2=X1/Y2 safety class				502=5000 Vdc	E=Cu+Conductive resin /Ni /Sn	
	S3=X2 safety class				602=6000 Vdc		
Mega Cap type (M Series)	M1= Mega Cap. 1 chip					B=3.60±0.35mm	L= L type lead
	M2= Mega Cap. 2 chips					C=4.20±0.35mm	
						F=6.00±0.35mm	
						G=6.60±0.35mm	

\* The packaging code per each size of reel, please refer to following table "packaging style and quantity".

\*\* Tolerance "P" & "Q" only for UF series items.

**■ PACKAGING STYLE AND QUANTITY**

Unit: pieces

Size Inch (mm)	Thickness (mm)/Symbol		Paper tape		Plastic tape	
			7" reel	13" reel	7" reel	13" reel
01005 (0402)	0.20±0.02	V	20,000	-	40,000(W4P1)-	-
0201 (0603)	0.30±0.03	L	15,000	70,000	-	-
0402 (1005)	0.50±0.05	N	10,000	50,000	-	-
	0.50+0.02/-0.05	Q	10,000	50,000	-	-
	0.50±0.20	E	10,000	40,000	-	-
0603 (1608)	0.50±0.10	H	4,000	20,000	-	-
	0.80±0.07	S	4,000	15,000	-	-
	0.80+0.15/-0.10	X	4,000	15,000	-	-
0805 (2012)	0.50±0.10	H	4,000	15,000	-	-
	0.60±0.10	A	4,000	15,000	-	-
	0.80±0.10	B	4,000	15,000	-	-
	0.85±0.10	T	4,000	15,000	-	-
	1.25±0.10	D	-	-	3,000	10,000
	1.25±0.20	I	-	-	3,000	10,000
1206 (3216)	0.80±0.10	B	4,000	15,000	-	-
	0.85±0.10	T	4,000	15,000	-	-
	0.95±0.10	C	-	-	3,000	10,000
	1.15±0.15	J	-	-	3,000	10,000
	1.25±0.10	D	-	-	3,000	10,000
	1.60±0.20	G	-	-	2,000	10,000
	1.60+0.30/-0.10	P	-	-	2,000	9,000
1210 (3225)	0.85±0.10	T	-	-	3,000	10,000
	0.95±0.10	C	-	-	3,000	10,000
	1.25±0.10	D	-	-	3,000	10,000
	1.60±0.20	G	-	-	2,000	8,000
	2.00±0.20	K	-	-	1,000	6,000
1808 (4520)	2.50±0.30	M	-	-	1,000	6,000
	1.25±0.10	D	-	-	2,000	10,000
	1.40±0.15	F	-	-	2,000	10,000
	1.60±0.20	G	-	-	2,000	8,000
1812 (4532)	2.00±0.20	K	-	-	1,000	6,000
	1.25±0.10	D	-	-	1,000	5,000
	1.60±0.20	G	-	-	1,000	4,000
	2.00±0.20	K	-	-	1,000	3,000
	2.50±0.30	M	-	-	500	3,000
1825 (4563) 2220 (5750) 2225 (5763)	2.80±0.30	U	-	-	500	1,500
	1.60±0.20	G	-	-	1,000	-
	2.00±0.20	K	-	-	1,000	-
	2.50±0.30	M	-	-	500	-
0505 (1414)	1.15±0.15	J	-	-	3,000	-
1111 (2828)	≤ 1.78	G	-	-	2,000	-

■ SINGLE CHIP CAPACITORS

Outline	Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol	Soldering Method *	M <sub>B</sub> (mm)
	01R5 (0402)	0.4±0.02	0.2±0.02	0.2±0.02	V R	0.10±0.03
	0201 (0603)	0.6±0.03	0.3±0.03	0.3±0.03	L R	0.15±0.05
		0.6±0.05 <sup>#2</sup>	0.3±0.05 <sup>#2</sup>	0.3±0.05 <sup>#2</sup>		0.15±0.1/-0.05
		0.6±0.09 <sup>#3</sup>	0.3±0.09 <sup>#3</sup>	0.3±0.09 <sup>#3</sup>		
	0402 (1005)	1.00±0.05	0.50±0.05	0.50±0.05	N R	0.25 +0.05/-0.10
		1.00±0.20	0.50±0.20	0.50±0.20	Q R	
		1.60±0.10	0.80±0.10	0.80±0.07	E R	
	0603 (1608)	1.60±0.10	0.80±0.10	0.80±0.10	S R / W	0.40±0.15
		1.60+0.15/-0.10	0.80+0.15/-0.10	0.50±0.10	H R / W	
				0.80+0.15/-0.10	X R / W	
	1.60±0.20 <sup>#1</sup>	0.80±0.20 <sup>#1</sup>	0.80±0.10	R / W		
			0.80±0.20 <sup>#1</sup>	R / W		
	0805 (2012)	2.00±0.15	1.25±0.10	0.50±0.10	H R / W	0.50±0.20
				0.60±0.10	A R / W	
				0.80±0.10	B R / W	
				1.25±0.10	D R	
		2.00±0.20	1.25±0.20	0.85±0.10	T R / W	
				1.25±0.20	I R	
	1206 (3216)	3.20±0.15	1.60±0.15	0.80±0.10	B R / W	0.60±0.20 (0.5±0.25) <sup>***</sup>
				0.95±0.10	C R	
1.25±0.10				D R		
3.20±0.20		1.60±0.20	1.15±0.15	J R		
			1.60±0.20	G R		
3.20+0.30/-0.1		3.30+0.30/-0.1 <sup>#5</sup>	1.60+0.30/-0.10	1.60+0.30/-0.10	P R	
1210 (3225)	3.20±0.30	2.50±0.20	0.95±0.10	C R	0.75±0.25	
			0.85±0.10	T R		
			1.25±0.10	D R		
	3.20±0.40	2.50±0.30	1.60±0.20	G R		
			2.00±0.20	K R		
			2.50±0.30	M R		
3.20±0.60 <sup>#4</sup>	2.50±0.50 <sup>#4</sup>	2.50±0.50 <sup>#4</sup>	2.50±0.50 <sup>#4</sup>	R		
1808 (4520)	4.50±0.40 (4.5+0.5/-0.3) <sup>**</sup>	2.03±0.25	1.25±0.10	D R	0.75±0.25 (0.5±0.25) <sup>***</sup>	
			1.40±0.15	F R		
			1.60±0.20	G R		
			2.00±0.20	K R		
1812 (4532)	4.50±0.40 (4.5+0.5/-0.3) <sup>**</sup>	3.20±0.30	1.25±0.10	D R	0.75±0.25 (0.5±0.25) <sup>***</sup>	
			1.60±0.20	G R		
			2.00±0.20	K R		
		3.20±0.40	2.50±0.30	M R		
			2.80±0.30	U R		
1825 (4563)	4.50±0.40	6.30±0.40	1.60±0.20 (G)	R	0.75±0.35	
2211 (5728)	5.70±0.40	2.80±0.30	2.00±0.20 (K)	R	0.85±0.35	
2220 (5750)	5.70±0.40	5.00±0.40	2.50±0.30 (M)	R	0.85±0.35	
2225 (5763)	5.70±0.40	6.30±0.40	2.80±0.30 (U)	R	0.85±0.35	

\* Recommended soldering method : R = Reflow soldering process; W = Wave soldering process.

\*\* For 1808/1812/1825\_200V~4000V and safety certificated products.

\*\*\* For 1206\_≥1000V, 1808/1812\_200V~4000V and safety certificated products.

#1: For 0603/Cap ≥ 10μF or 0603(≤6.3V)/Cap ≥ 4.7μF or 0603(>10V)/Cap > 1μF products.

#2: For 0201/ 0.1μF < Cap < 0.68μF products, Excluding 0201X334~474(≤6.3V) & 0201X224(≤10V)

#3: For 0201/Cap ≥ 0.68μF products.

#4: For 1210(100V)/Cap > 1μF or 1210(250V)/Cap > 0.47μF or 1210(400V~630V)/Cap > 0.22μF.

#5: For 1206(100V)/Cap ≥ 1.2μF products.

The table only for General Purpose Series, Soft termination and others please refer to individual sheet for details.

■ Feed Through Type Capacitor

Outline	Size Inch (mm)	L (mm)	W (mm)	T (mm)/Symbol	e (mm)	g (mm)	i (mm)	J (mm)	
	0402 (1005)	1.00±0.10	0.50±0.20	0.40±0.10	W	0.17±0.10	0.10 min	0.35±0.10	0.15±0.10
	0805 (2012)	2.00±0.20	1.25±0.10	0.85±0.10	T	0.30±0.20	0.40±0.20	0.60±0.20	0.25±0.20

Reflow soldering process only.

■ **FEATURES**

- \* A wide selection of sizes is available (0201 to 2225).
- \* High capacitance in given case size.
- \* Capacitor with lead-free termination (pure Tin).

■ **GENERAL ELECTRICAL DATA**

Dielectric	NP0	X7R	X7S	X6S	X5R	Y5V
Size	0201, 0402, 0603, 0805, 1206, 1210, 1812, 1825, 2220, 2225					
Capacitance range	0.1pF to 0.1μF	100pF to 47μF	0.1μF to 100μF	0.1μF to 100μF	100pF to 220μF	0.01μF to 100μF
Capacitance tolerance	Cap≤5pF <sup>#1</sup> : A (±0.05pF), 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%)	K (±10%), M (±20%)	K (±10%), M (±20%)	K (±10%), M (±20%)	M (±20%), Z (-20/+80%)
Rated voltage (WVDC)	10V, 16V, 25V, 50V, 100V	4V, 6.3V, 10V, 16V, 25V, 50V, 100V				
Operating temperature	-55 to +125°C			-55 to +105°C	-55 to +85°C	-25 to +85°C
Capacitance characteristic	±30ppm	±15%	±22%		±15%	+30/-80%
Termination	Ni/Sn (lead-free termination)					

#1: NP0, 0.1pF product only provide B tolerance

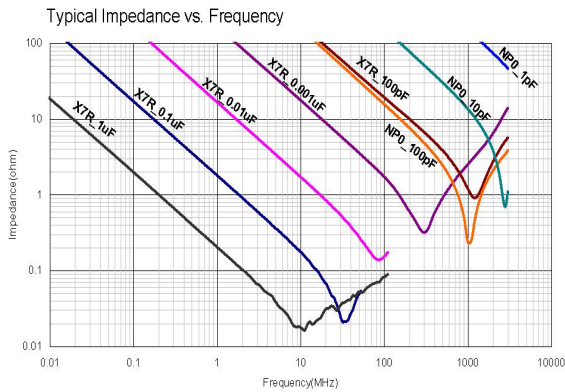
■ **EXPLANATION OF PART NUMBERS**

1206	B	104	K	500	C	I
<b>Size (Inch (mm))</b>	<b>Dielectric</b>	<b>Capacitance</b>	<b>Tolerance</b>	<b>Rated voltage</b>	<b>Termination</b>	<b>Packaging style</b>
1206 (3216)	B=X7R	104=10x10 <sup>4</sup> =100nF	K= ±10%	500=50 VDC	C=Cu/Ni/Sn	T=7" reeled

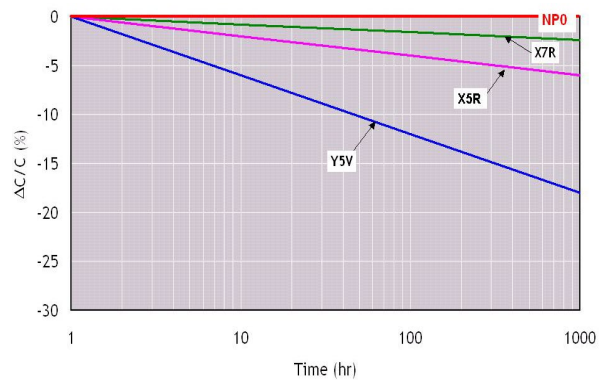
Please refer to page 2 "How to order" for more information.

■ **ELECTRICAL CHARACTERISTICS**

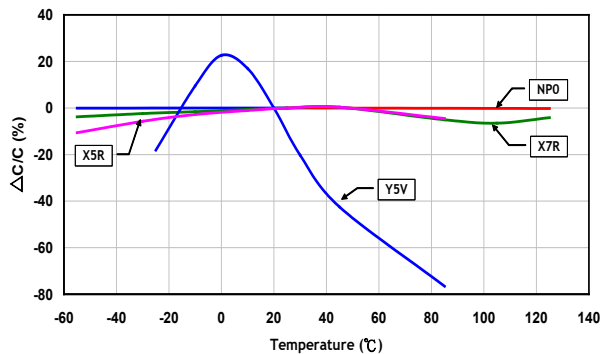
1) Frequency characteristics



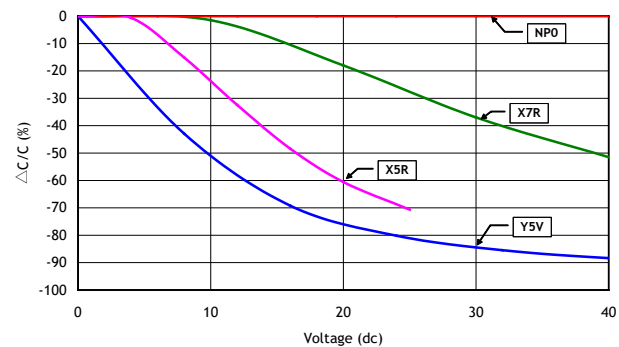
2) Capacitance Change - Typical aging rate



3) Temperature characteristics of capacitance (TCC)



4) DC Bias characteristics



All above typical electronic characteristics are for reference only.  
Please contact with Walsin representative for detail information of any specific item.



