



Multilayer Chip Ceramic Capacitor

C Series

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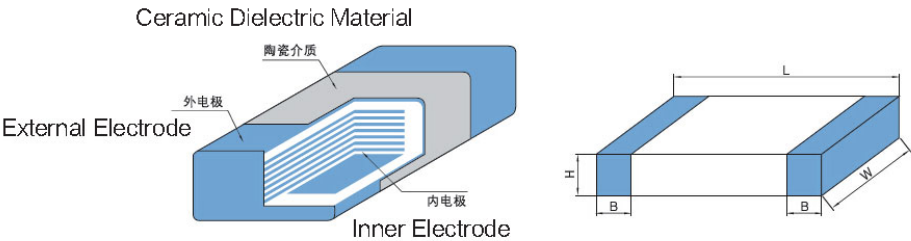
Multilayer Chip Ceramic Capacitor 多层贴片电容

Multilayer Chip Ceramic Capacitor 多层贴片电容

产品特点

产品尺寸精度高，便于自动贴片机高效率装配
端电极三层电极，适合波峰焊与回流焊；介电体与外表为同种材料，环境条件影响小
高绝缘电阻，高可靠性
含有从C0G到Y5V各种温度特性介质，适用于通讯、计算机、家用电器和仪器仪表等普通电子设备
The precision of product size is high,suitable for auto SMT machines high efficiency assembly.
External Electrode has 3 layers,suitable for both wave and reflow soldering.
High Insulation resistance,high reliability.
Consist of all kinds of temperature dielectric material from C0G to Y5V,suitable for communications,computers,home appliances,instruments and other normal electronic equipments.

产品结构图 Construction



产品尺寸 Dimensions

规格Size	MLCC尺寸规格（单位：mm）			
	L	W	H（max）	B（max）
01005	0.40±0.02	0.20±0.02	0.22	0.13
0201	0.60±0.03	0.30±0.03	0.33	0.20
0402	1.00±0.30	0.50±0.30	0.80	0.35
0603	1.60±0.10	0.80±0.10	0.90	0.70
0805	2.00±0.20	1.20±0.20	1.45	0.76
1206	3.20±0.20	1.60±0.20	1.80	0.80
1210	3.20±0.30	2.50±0.20	2.80	0.80
1812	4.50±0.40	3.20±0.30	3.00	1.50
2220	5.60±0.40	5.00±0.40	3.00	2.00
2225	5.60±0.40	6.40±0.40	3.00	2.00

常规电容 General Capacitor

■ 产品特点

※C0G (NP0) : 最常用的温度补偿型电容器, 属于I类介质材料, 其性能稳定, 温度系数在 $0 \pm 30\text{ppm}/^\circ\text{C}$ 以内, 具有好的高频特性。

※X7R: 工业中广泛使用的一种温度稳定型电容器, 属于II类介质材料, 具有较高的介电常数, 在使用温度 ($-55^\circ\text{C} \sim +125^\circ\text{C}$) 范围内容值变化率在 $\pm 15\%$ 以内, 容值老化率为2.5%/十年

※X5R: 工业中广泛使用的一种温度稳定型电容器, 属于II类介质材料, 具有较高的介电常数, 在使用温度 ($-55^\circ\text{C} \sim +85^\circ\text{C}$) 范围内容值变化率在 $\pm 15\%$ 以内, 容值老化率为3%/十年

※Y5V: 普通用途的电容器, 在使用温度 ($-30^\circ\text{C} \sim +85^\circ\text{C}$) 范围内容值变化率较大, $+22/-82\%$ 以内, 具有高介电常数, 可以用小的尺寸做大容量的电容。

※C0G (NP0) : The most normal temperature compensated capacitor,belongs to Class I dielectric material with stable performance,TCR $0 \pm 30\text{ppm}/^\circ\text{C}$,high frequency.

※X7R: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is $\pm 15\%$ for working temperature ($-55^\circ\text{C} \sim +125^\circ\text{C}$),and the capacitance aging rate is 2.5%/ten years.

※X5R: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is $\pm 15\%$ for working temperature ($-55^\circ\text{C} \sim +85^\circ\text{C}$),and the capacitance aging rate is 3%/ten years.

※Y5V: Y5V dielectric is generally used dielectric material and it shows a variation of capacitance within $+22/-82\%$ when the temperature is between $-30^\circ\text{C} \sim +85^\circ\text{C}$.This kind of dielectric is with very high dielectric constant and suitable for high value capacitors.

■ 产品规格型号命名规则 Part Numbering

C	0603	X7R	102	K	500	N	T
产品 类型 Product Type	电容规格 Capacitor Size	材质 Material	电容值 Capacitance	容量容差 Tolerance	额定电压 Rated Voltage	端头 类型 Terminal Type	包装 Packing
贴片 电容 MLCC	01005 0201 0402 0603 0805 1206 1210 1808 1812 2220 2225	C0G (NP0) X7R X5R Y5V	1R5=1.5pF 100=10pF 222=2.2nF 105=1uF	B= $\pm 0.1\text{pF}$ C= $\pm 0.25\text{pF}$ D= $\pm 0.5\text{pF}$ F= $\pm 1.0\%$ G= $\pm 2.0\%$ J= $\pm 5.0\%$ K= $\pm 10\%$ M= $\pm 20\%$ Z= $+80\%$ -20%	250=25V 500=50V 101=100V 251=250V	N=Ag (或 Cu) /Ni/Sn3- layer construc- tion	T=编带 Taping B=袋散装 Bulk

■ 产品容值范围Capacitance Range

01005 (0402) 尺寸Size

尺寸规格	额定电压 (U _R)	电容量范围		
		C0G	X7R	X5R
01005	4V	/	/	12nF ~ 100nF
	6.3V	0.5pF ~ 100pF	100pF ~ 1nF	680pF ~ 100nF
	10V	0.5pF ~ 33pF	100pF ~ 1nF	680pF ~ 100nF
	16V	0.2pF ~ 100pF	100pF ~ 1nF	/
	25V	0.5pF ~ 33pF	/	/

General MLCC 常规电容

0201尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R			X5R			
	16	25	50	16	25	50	4	6.3	10	16
0R3										
0R47										
0R5										
0R56										
0R68										
0R75										
0R82										
1R0										
1R2										
1R5										
1R8										
2R0										
2R2										
2R7										
3R3										
3R9										
4R7										
5R6										
6R8										
8R2										
100										
120										
150										
180										
220										
270										
330										
390										
470										
560										
680										
820										
101										
121										
151										
181										
221										
241										
271										
331										
391										
471										
561										
681										
821										
102										

General MLCC 常规电容

0201尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R			X5R			
	16	25	50	16	25	50	4	6.3	10	16
122										
152										
182										
222										
272										
332										
392										
472										
562										
682										
822										
103										
123										
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563										
683										
823										
104										
124										
154										
184										
224										
274										
334										
394										
474										
564										
684										
824										
105										

General MLCC 常规电容

0402尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
0R3																		
0R47																		
0R5																		
0R56																		
0R68																		
0R75																		
0R82																		
1R0																		
1R2																		
1R5																		
1R8																		
2R0																		
2R2																		
2R4																		
2R7																		
3R0																		
3R3																		
3R9																		
4R0																		
4R7																		
5R0																		
5R6																		
6R0																		
6R8																		
7R0																		
8R0																		
8R2																		
9R0																		
100																		
120																		
150																		
180																		
200																		
220																		
240																		
270																		
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330																		
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181																		
201																		
221																		
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271																		
331																		
391																		
471																		
511																		
561																		
681																		

General MLCC 常规电容

0402尺寸Size

背景色代表：可生产型号

Cp	VDC	C0G			X7R					X5R					Y5V				
		16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
821																			
102																			
122																			
152																			
182																			
202																			
222																			
272																			
332																			
392																			
472																			
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395																			
475																			
565																			
685																			
825																			
106																			

General MLCC 常规电容

0603尺寸Size

背景色代表：可生产型号

Cp	VDC	C0G					X7R					X5R					Y5V				
		10	16	25	50	100	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
0R25																					
0R47																					
0R5																					
0R56																					
0R68																					
0R75																					
0R82																					
1R0																					
1R2																					
1R5																					
1R8																					
2R0																					
2R2																					
2R4																					
2R7																					
3R0																					
3R3																					
3R6																					
3R9																					
4R0																					
4R3																					
4R7																					
5R0																					
5R1																					
5R6																					
6R0																					
6R2																					
6R8																					
7R0																					
7R5																					
8R0																					
8R2																					
9R0																					
9R1																					
100																					
110																					
120																					
130																					
140																					
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160																					
180																					
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220																					
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270																					
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330																					
360																					
390																					
430																					
470																					
510																					
560																					
620																					
680																					
750																					
820																					
910																					
101																					
111																					

General MLCC 常规电容

0603尺寸Size

背景色代表：可生产型号

Cp	VDC	C0G					X7R					X5R					Y5V				
		10	16	25	50	100	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
121																					
131																					
151																					
181																					
201																					
221																					
241																					
251																					
271																					
301																					
331																					
361																					
391																					
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511																					
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751																					
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272																					
302																					
332																					
392																					
472																					
502																					
512																					
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184																					
224																					
274																					
334																					
394																					
474																					
564																					
684																					
824																					
105																					
125																					

General MLCC 常规电容

0603尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G					X7R					X5R					Y5V				
	10	16	25	50	100	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
155																				
185																				
225																				
275																				
335																				
395																				
475																				
565																				
685																				
825																				
106																				
126																				
156																				
186																				
226																				

0805尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
0R5																		
0R75																		
1R0																		
1R2																		
1R5																		
2R0																		
2R2																		
2R4																		
2R5																		
2R7																		
3R0																		
3R6																		
3R9																		
4R0																		
4R3																		
4R7																		
5R0																		
5R1																		
6R0																		
6R8																		
7R0																		
7R5																		
8R0																		
8R2																		
9R0																		
100																		
120																		
150																		
160																		
180																		
200																		
220																		
240																		
250																		
270																		
300																		

General MLCC 常规电容

0805尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
330																		
360																		
390																		
430																		
470																		
510																		
560																		
620																		
680																		
750																		
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751																		
821																		
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183																		
203																		
223																		
273																		
333																		
393																		
403																		
473																		
563																		

General MLCC 常规电容

0805尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
683																		
823																		
104																		
124																		
154																		
184																		
224																		
274																		
334																		
394																		
474																		
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475																		
565																		
685																		
825																		
106																		
126																		
156																		
186																		
226																		
476																		
107																		

1206尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
0R5																		
1R0																		
2R0																		
2R2																		
3R0																		
4R0																		
5R0																		
6R0																		
7R0																		
8R0																		
9R0																		
100																		
120																		
150																		
180																		
200																		

General MLCC 常规电容

1206尺寸Size

背景色代表：可生产型号

Cp	VDC	C0G			X7R					X5R					Y5V				
		16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
220																			
240																			
270																			
300																			
330																			
390																			
470																			
510																			
560																			
680																			
820																			
101																			
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273																			
333																			
393																			
473																			
563																			
683																			
823																			
104																			
124																			
154																			
184																			
224																			

General MLCC 常规电容

1206尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
274																		
334																		
394																		
474																		
564																		
684																		
824																		
105																		
125																		
155																		
185																		
205																		
225																		
275																		
335																		
395																		
475																		
565																		
685																		
825																		
106																		
126																		
156																		
186																		
226																		
476																		
107																		

1210尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
101																		
121																		
151																		
181																		
201																		
221																		
271																		
331																		
391																		
471																		
561																		
681																		
821																		
102																		
152																		
182																		
222																		
272																		
332																		
474																		
684																		
105																		
225																		
475																		
106																		
226																		
276																		
476																		
107																		

General MLCC 常规电容

1808尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			Y5V			Cp \ VDC	C0G			Y5V		
	16	25	50	16	25	50		16	25	50	16	25	50
101							681						
121							821						
151							102						
181							222						
201							332						
221							225						
271							475						
331							106						
391							226						
471							276						
561							476						

1812尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
101																		
121																		
151																		
181																		
201																		
221																		
271																		
331																		
391																		
471																		
561																		
681																		
821																		
102																		
474																		
684																		
105																		
225																		
475																		
106																		
226																		
476																		

General MLCC 常规电容

2220尺寸Size

背景色代表：可生产型号

Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
101																		
121																		
151																		
181																		
201																		
221																		
271																		
331																		
391																		
471																		
561																		
681																		
821																		
102																		
222																		
474																		
684																		
105																		
155																		
225																		
475																		
106																		
226																		
476																		
107																		

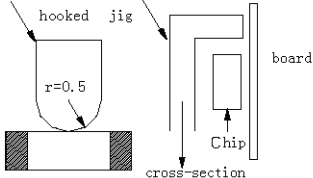
2225尺寸Size

背景色代表：可生产型号

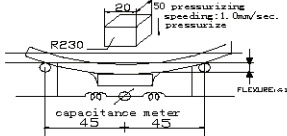
Cp \ VDC	C0G			X7R					X5R					Y5V				
	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
101																		
121																		
151																		
181																		
201																		
221																		
271																		
331																		
391																		
471																		
561																		
681																		
821																		
102																		
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■ 可靠性测试Environmental Characteristics

NO	项目 Item	性能 Performance		测试条件 Test Condition
1	外观 Appreance	外观无异常 No abnormalities		通过显微镜视觉检测 (X10) On microscope
2	尺寸 Dimension	在要求的范围内 Within the specified dimensions		采用精度不低于0.01mm用千分尺 Using calipers on micrometer with tolerance no less than 0.01mm
3	容量 Capacitance(C)	C0G	在要求的容值容差范围内 Within the specified tolerance	1.0±0.1Vrms, 1MHz±10%, 25℃±2℃ (C>1000 pF, 1.0±0.1Vrms, 1KHz±10%,)
		X7R/X5R		1.0±0.1Vrms, 1KHz±10%, 25℃±2℃ (Cp≥10uF, 1.0±0.1Vrms, 120±24Hz)
		Y5V		1.0±0.1Vrms, 1KHz±10%, 25℃±2℃ (Cp≥10uF, 1.0±0.1Vrms, 120±24Hz)
4	损耗 Dissipation Factor (Q/DF)	C0G	Cp<30pF, Q≥400+20Cp; Cp≥30pF, Q≥1000	1.0±0.1Vrms, 1MHz±10%, 25℃ (Cp>1000pF, 1.0±0.1Vrms, 1KHz±10%)
		X7R/ X5R	25V≤UR≤50V, DF≤3.5%, DF≤10% (0402≥0.033μF, 0603≥0.15μF, 0805≥0.68μF, 1206≥2.2μF, 1210≥6.8μF) UR≤16V, DF≤5.0% DF≤10% (0402≥0.056μF, 0603≥0.56μF, 0805≥1μF, 1206≥4.7μF, 1210≥10μF) UR≤10V, DF≤7.0% DF≤10% (0402≥1μF, 0603≥2.2μF, 0805≥4.7μF, 1206≥10μF, 1210≥22μF) UR=6.3V, DF≤10%	1.0±0.1Vrms, 1KHz±10%, (Cp > 10uF, 1.0±0.1Vrms, 120±24Hz) *X7R/X5R/Y5V电容器的初始值测量 在140~150℃进行1小时的热处理后在室温下放置 48±4小时测量初始值 *Initial measurement for X7R/X5R/Y5V Perform a heat treatment at 140~150℃ for 1hr and let sit for 48±4hrs at room temperature. Perform the initial measurement.
		Y5V	UR≥50V, DF≤9.0% UR=25V, DF≤7.0% (0402≥0.047μF, 0603≥0.1μF, 0805≥0.33μF, 1206≥ 0.68μF, 1210≥1μF) DF≤9.0% (0402≥0.068μF, 0603≥ 0.47μF, 0805≥1μF, 1206≥4.7μF, 1210≥10μF) UR=16V, DF≤9.0% UR=10V, DF≤12.5% UR=6.3V, DF≤15.0%	
5	绝缘电阻 Insulation Resistance (Ri)	C0G/X7R/ X5R/Y5V	UR≤50V, 大于10 GΩ 或 500 Ω·F(取 最小值) more than 10 GΩ or 500 Ω·F, whichever is smaller	UR≤50V U测=UR; 充电时间:60±5秒 温度: 25℃ Charge time:60±5sec Temperature:25℃

NO	项目 Item	性能 Performance		测试条件 Test Condition																									
6	耐电压 Dielectric Strength	C0G	无介质击穿和材料裂缝 No dielectric breakdown or mechanical breakdown	$U_R \leq 50V$	施加额定电压的300%,5秒,最大电流不超过50mA Force 300% rated voltage for 5 sec,max current should not exceed 50mA																								
		X7R/X5R/Y5V		$U_R \leq 50V$	施加额定电压的250%,5秒,最大电流不超过50mA Force 250% rated voltage for 5 sec,max current should not exceed 50mA																								
7	温度系数或静电容量温度特性 Temperature Coefficient of Capacitance	C0G	温度系数在 $0 \pm 30\text{ppm}/^\circ\text{C}$ 以内 Temperature coefficient within $0 \pm 30\text{ppm}/^\circ\text{C}$;	按系列温度顺序测试电容容量 Measure capacitance under follow table list <table><tr><th>步骤</th><th>C0G X7R</th><th>X5R</th><th>Y5V</th></tr><tr><td>1</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td></tr><tr><td>2</td><td>$-55 \pm 3^\circ\text{C}$</td><td>$-55 \pm 3^\circ\text{C}$</td><td>$-30 \pm 3^\circ\text{C}$</td></tr><tr><td>3</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td></tr><tr><td>4</td><td>$125 \pm 3^\circ\text{C}$</td><td>$85 \pm 3^\circ\text{C}$</td><td>$85 \pm 3^\circ\text{C}$</td></tr><tr><td>5</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td><td>$25 \pm 2^\circ\text{C}$</td></tr></table> 与25°C时的电容容量相比较, 电容容量在温度范围内的变化在要求的范围之内。 The ranges of capacitance change compared within the above 25°C value over the temperature ranges shall be within the specified ranges.		步骤	C0G X7R	X5R	Y5V	1	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	2	$-55 \pm 3^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$-30 \pm 3^\circ\text{C}$	3	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	4	$125 \pm 3^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	5	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$
		步骤	C0G X7R			X5R	Y5V																						
		1	$25 \pm 2^\circ\text{C}$			$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																						
2	$-55 \pm 3^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$-30 \pm 3^\circ\text{C}$																										
3	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																										
4	$125 \pm 3^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$85 \pm 3^\circ\text{C}$																										
5	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																										
X7R/X5R	容量变化在 $\pm 15\%$ 以内 Capacitance change within $\pm 15\%$																												
Y5V	容量变化在+22%, -82%以内 Capacitance change within +22%, -82%																												
8	附着力 Adhesion	C0G/X7R/X5R/Y5V	端电极无松动, 也无其它不良现象 No removal of the terminations or other defect shall occur.	施加5N的压力, 并保持 10 ± 1 秒 The pressurizing force shall be 5N (=500g*f) and the duration of application shall be $10 \pm 1\text{sec}$. 																									
9	可焊性 Solderability of Termination	C0G X7R/X5R Y5V	端电极挂锡面积不小于95%, 针孔或粗糙面积小于5% 95% min. coverage of both terminal electrodes and less than 5% have pin holes or rough spots.	锡炉温度: $245 \pm 5^\circ\text{C}$ 浸入时间: 2 ± 1 秒 两侧端电极完全浸入焊锡炉 Solder temperature: $245 \pm 5^\circ\text{C}$ Dipping time: 2 ± 1 seconds. Completely soak both terminal electrodes in solder																									

General MLCC 常规电容

NO	项目 Item	性能 Performance		测试条件 Test Condition
10	耐焊性 Resistance to leaching	C0G X7R/X5R Y5V	端电极挂锡面积不小于95%，针孔或粗糙面积小于5%，外观无开裂 95% min. coverage of both terminal electrodes and less than 5% have pin holes or rough spots. No remarkable visual damage.	预热: 120℃~150℃/60秒 锡炉温度: 270 ± 5℃ 浸入时间: 10 ± 1秒 两侧端电极完全浸入焊锡炉 Solder temperature: 270 ± 5℃ preheated: 120℃~150℃/60sec Dipping time: 10 ± 1 seconds. Completely soak both terminal electrodes in solder
11	端电极结合强度 Bending	C0G	无可见损伤; 容量变化小于等于 ± 5% 或 0.5 pF No remarkable visual damage Cp change ≤ ± 5% or ≤ 0.5 pF	将片状电容器安装在测试夹具上，按图所示方向以1.0mm/s的速率施加压力，弯曲1mm。 Solder the capacitor on testing substrate and put it on testing stand. The middle part of substrate shall successively be pressurized by pressuring rod at a rated of about 1.0mm/sec. Until the deflection become means of the 1.0mm. 
		X7R/X5R	无可见损伤; 容量变化小于等于 ± 12.5% No remarkable visual damage Cp change ≤ ± 12.5%	
		Y5V	无可见损伤; 容量变化小于等于 ± 30% No remarkable visual damage Cp change ≤ ± 30%	
12	耐焊接热 Resistance to Soldering Heat	C0G	无明显可见损伤 容量变化在 ± 2.5% 或 ± 0.25pF (取较大值) 以内 DF满足产品初始值的要求 IR满足产品初始值的要求 No remarkable visual damage Cp change within ± 2.5% or ± 0.25pF, whichever is larger. DF meets initial standard value. IR meets initial standard value.	预热: 120~150℃ 60秒 焊接温度: 270 ± 5℃ 浸入时间: 10 ± 1秒 在室温下放置24 ± 2 (C0G) 或48 ± 4 (X7R、X5R、Y5V) 小时以后测量 试验后在标准条件下恢复 *X7R/X5R/Y5V电容器的初始值测量 在140~150℃进行1小时的热处理后在室温下放置48 ± 4小时 测量初始值 Preheating: 120~150℃ 60sec. Soldering temperature: 270 ± 5℃ Dipping time: 10 ± 1 seconds. Measurement to be made after being kept at room temperature for 24 ± 2 (C0G) or 48 ± 4 (X7R, X5R, Y5V) hours. Recovery for the following period under the standard condition after test. *Initial measurement for X7R/X5R/Y5V Perform a heat treatment at 140~150℃ for 1hr and let sit for 48 ± 4hrs at room temperature. Perform the initial measurement.
		X7R/X5R	无明显可见损伤 容量变化在 ± 7.5% 以内 DF满足产品初始值的要求 IR满足产品初始值的要求 No remarkable visual damage Cp change within ± 7.5% DF meets initial standard value. IR meets initial standard value.	
		Y5V	无明显可见损伤 容量变化在 ± 20% 以内 DF满足产品初始值的要求 IR满足产品初始值的要求 No remarkable visual damage Cp change within ± 20% DF meets initial standard value. IR meets initial standard value.	

General MLCC 常规电容

NO	项目 Item	性能 Performance		测试条件 Test Condition															
13	温度快速循环 Temperature Cycle	C0G	无明显可见损伤 容量变化在±2.5%或 ±0.25pF (取较大值) 以内 No remarkable visual damage Cp change within ±2.5% or ±0.25pF, whichever is larger.	按下列步骤进行5次循环: To perform 5 cycles of the stated environment <table><tr><th>步骤 Step</th><th>温度 Temperat ure</th><th>时间 Time</th></tr><tr><td>1</td><td>下限类别 温度 +0/-3℃ Min.operating Temp. +0/- 3℃</td><td>30min</td></tr><tr><td>2</td><td>25℃</td><td>2~3min</td></tr><tr><td>3</td><td>上限类别 温度 +3/-0℃ Max.operating Temp. +3/-0℃</td><td>30min</td></tr><tr><td>4</td><td>25℃</td><td>2~3min</td></tr></table>	步骤 Step	温度 Temperat ure	时间 Time	1	下限类别 温度 +0/-3℃ Min.operating Temp. +0/- 3℃	30min	2	25℃	2~3min	3	上限类别 温度 +3/-0℃ Max.operating Temp. +3/-0℃	30min	4	25℃	2~3min
		步骤 Step	温度 Temperat ure	时间 Time															
		1	下限类别 温度 +0/-3℃ Min.operating Temp. +0/- 3℃	30min															
2	25℃	2~3min																	
3	上限类别 温度 +3/-0℃ Max.operating Temp. +3/-0℃	30min																	
4	25℃	2~3min																	
X7R/X5R	无明显可见损伤 容量变化在±7.5%以内 No remarkable visual damage Cp change within ±7.5%	在室温下放置24±2 (C0G) 或48±4(X7R、X5R、Y5V) 小时以后测量 *X7R/X5R/Y5V电容器的初始值测量 在140~150℃进行1小时的热处理后在室温下放置48±4小时 测量初始值 Measurement to be made after being kept at room temperature for 24±2hrs (C0G) or 48±4hrs (X7R, X5R, Y5V) at room temperature, then measure. *X7R/X5R/Y5V Perform a heat treatment at 140~150℃ for 1hr and let sit for 48±4hrs at room temperature. Perform the initial measurement.																	
Y5V	无明显可见损伤 容量变化在±20%以内 No remarkable visual damage Cp change within ±20%																		

General MLCC 常规电容

NO	项目 Item	性能 Performance		测试条件 Test Condition
14	耐湿负荷 Damp heat with load	C0G	外观无明显可见损伤 容量变化在 $\pm 7.5\%$ 或 $\pm 0.75\text{pF}$ (取较大值) 以内 $C_p < 30\text{pF}$, $Q \geq 100 + 10/3 \cdot C_p$ $C_p \geq 30\text{pF}$, $Q \geq 200$ IR: 大于 $500\text{M}\Omega$ 或 $25\Omega \cdot \text{F}$ (取较小值) No remarkable visual damage $C_p \text{ change} \leq \pm 7.5\%$ or $\pm 0.75\text{pF}$, whichever is larger. $C_p < 30\text{pF}$, $Q \geq 100 + 10/3 \cdot C_p$ $C_p \geq 30\text{pF}$, $Q \geq 200$ IR $\geq 500\text{M}\Omega$ or $25\Omega \cdot \text{F}$, whichever is smaller	测试温度: $40 \pm 2^\circ\text{C}$ 湿度: 90~95% RH 电压: 额定电压 测试时间: $500 \pm 12\text{hrs}$ 在室温下放置 24 ± 2 (C0G) 或 48 ± 4 (X7R、X5R、Y5V) 小时以后测量
		X7R/X5R	外观无明显可见损伤 容量变化在 $\pm 12.5\%$ 以内 DF为初始值的2倍以下 IR: 大于 $500\text{M}\Omega$ 或 $25\Omega \cdot \text{F}$ (取较小值) No remarkable visual damage $C_p \text{ change} \leq \pm 12.5\%$ DF: Not more than 2 times of initial value IR $\geq 500\text{M}\Omega$ or $25\Omega \cdot \text{F}$, whichever is smaller	*X/R/X5R/Y5V电容器的初始值测量 在 $140 \sim 150^\circ\text{C}$ 进行1小时的热处理后在室温下放置 48 ± 4 小时测量初始值 Test temperature: $40 \pm 2^\circ\text{C}$ Humidity: 90~95% RH Voltage: 100% of the rated voltage Testing time: $500 \pm 12\text{hrs}$ Measurement to be made after being kept at room temperature for $24 \pm 2\text{hrs}$ (C0G) or $48 \pm 4\text{hrs}$ (X7R, X5R, Y5V)
		Y5V	外观无明显可见损伤 容量变化在 $\pm 30\%$ 以内或 $-40\% \sim +30\%$ DF为初始值的1.5倍以下 IR: 大于 $500\text{M}\Omega$ 或 $25\Omega \cdot \text{F}$ (取较小值)No remarkable visual damage $C_p \text{ change} \leq \pm 30\%$ or $-40\% \sim +30\%$ DF: Not more than 1.5 times of initial value IR $\geq 500\text{M}\Omega$ or $25\Omega \cdot \text{F}$, whichever is smaller	*Initial measurement for X7R/X5R/Y5V Perform a heat treatment at $140 \sim 150^\circ\text{C}$ for 1hr and let sit for $48 \pm 4\text{hrs}$ at room temperature. Perform the initial measurement.

General MLCC 常规电容

NO	项目 Item	性能 Performance		测试条件 Test Condition
15	耐久性 Life Test	C0G	外观无明显可见损伤 容量变化在 $\pm 3\%$ 或 $\pm 0.3\text{pF}$ (取较大值) 以内 $Q \geq 350$ ($C_p \geq 30\text{ PF}$) $Q \geq 275 + (2.5 * C_p)$ ($10\text{ pF} \leq C_p < 30\text{ PF}$) $Q \geq 200 + 10 * C_p$ ($C_p < 10\text{ PF}$) IR : 大于 $1000\text{M}\Omega$ 或 $50\Omega \cdot F$ (取较小值) No remarkable visual damage $C_p \text{ change} \leq \pm 3\% \text{ or } \pm 0.3\text{pF}$, whichever is larger. $Q \geq 350$ ($C_p \geq 30\text{ PF}$) $Q \geq 275 + (2.5 * C_p)$ ($10\text{ pF} \leq C_p < 30\text{ PF}$) $Q \geq 200 + 10 * C_p$ ($C_p < 10\text{ PF}$) $IR \geq 1000\text{M}\Omega \text{ or } 50\Omega \cdot F$, whichever is smaller	测试温度: 上限类别温度 $\pm 3^\circ\text{C}$ 电压: 2倍额定电压 测试时间: 1000 小时
		X7R/X5R	外观无明显可见损伤 容量变化在 $\pm 12.5\%$ 以内 DF 为初始值的2倍以下 IR : 大于 $1000\text{M}\Omega$ 或 $50\Omega \cdot F$ (取较小值) No remarkable visual damage $C_p \text{ change} \leq \pm 12.5\%$ DF : Not more than 2 times of initial value $IR \geq 1000\text{M}\Omega \text{ or } 50\Omega \cdot F$, whichever is smaller	在室温下放置 24 ± 2 (C0G) 或 48 ± 4 (X7R、X5R、Y5V) 小时以后测量 *X7R/X5R/Y5V电容器的初始值测量 在 $140 \sim 150^\circ\text{C}$ 进行1小时的热处理后在室温下放置 48 ± 4 小时测量初始值 Test temperature: Max. Operating Temp. $\pm 3^\circ\text{C}$ Voltage: 200% of the rated voltage Testing time: 1000 hrs Measurement to be made after being kept at room temperature for $24 \pm 2\text{hrs}$ (C0G) or $48 \pm 4\text{hrs}$ (X7R, X5R, Y5V)
		Y5V	外观无明显可见损伤 容量变化在 $\pm 30\%$ 以内或 $-40\% \sim +30\%$ DF 为初始值的1.5倍以下 IR : 大于 $1000\text{M}\Omega$ 或 $50\Omega \cdot F$ (取较小值) No remarkable visual damage $C_p \text{ change} \leq \pm 30\% \text{ or } -40\% \sim +30\%$ DF : Not more than 1.5 times of initial value $IR \geq 1000\text{M}\Omega \text{ or } 50\Omega \cdot F$, whichever is smaller	*Initial measurement for X7R/X5R/Y5V Perform a heat treatment at $140 \sim 150^\circ\text{C}$ for 1hr and let sit for $48 \pm 4\text{hrs}$ at room temperature. Perform the initial measurement.