

SANYEAR

多层片式陶瓷电容器规格书

MULTILAYER CHIP CERAMIC CAPACITOR CATALOG

深圳市叁叶源电子有限公司

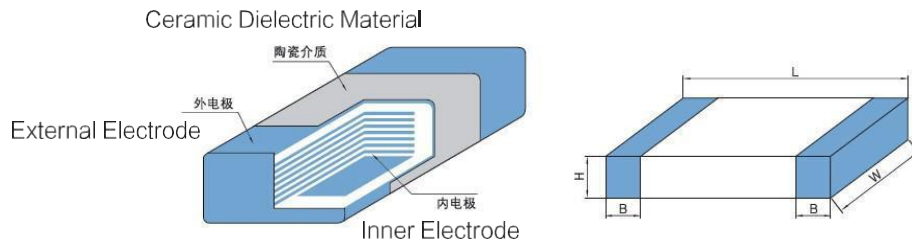
Shenzhen Sanyear electronic co. , ltd

多层片式陶瓷电容器 Multilayer Chip Ceramic Capacitor

■ **产品特点 Product Features**

- 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
 - 含有C0G到Y5V各种温度特性介质，适用于计算机、通讯、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.
 - Consist of all kinds of temperature dielectric material from C0G to Y5V,suitable for computers, communications,home appliances,instruments and other normal electronic equipments.

■ **产品结构 Product Construction**



■ **产品尺寸 Product Dimensions**

尺寸 Size	MLCC尺寸规格 (单位: mm)			
	L	W	H (max)	B (max)
01005	0.40±0.09	0.20±0.09	0.29	0.13
0201	0.60±0.09	0.30±0.09	0.39	0.20
0402	1.00±0.30	0.50±0.30	0.80	0.35
0603	1.60±0.20	0.80±0.20	1.00	0.60
0805	2.00±0.20	1.25±0.20	1.45	0.75
1206	3.20±0.30	1.60±0.30	1.90	0.80
1210	3.20±0.40	2.50±0.30	2.80	0.80
1808	4.50±0.40	2.00±0.30	2.80	1.50
1812	4.50±0.40	3.20±0.40	3.50	1.50
2220	5.70±0.50	5.00±0.40	3.50	1.30
2225	5.70±0.50	6.40±0.50	3.00	1.10

常规多层片式陶瓷电容器 General Multilayer Chip Ceramic Capacitor

■ 产品特点 Product Features

- 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。
 - 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。
 - Y5V: 普通用途的电容器,属于II类介质材料,在使用温度($-30^\circ\text{C} \sim +85^\circ\text{C}$) 范围内容值变化率较大, $+22\% \sim -82\%$ 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, TC $0 \pm 30\text{ppm}/^\circ\text{C}$,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 workingtemperature ($-55^\circ\text{C} \sim +125^\circ\text{C}$).
 - 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 ($-55^\circ\text{C} \sim +85^\circ\text{C}$).
 - Y5V: Y5V dielectric is generally used dielectric material,belongs to Class II dielectric material, it shows a variation of capacitance within $+22\% \sim -82\%$ 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 Part Number

C	0603	X7R	102	K	500	N	T
产品类型 Product Type	尺寸 Size	温度系数 温度特性 T.C.	电容值 Capacitance	允许偏差 Tolerance	额定电压 Rate Voltage	端头类型 Terminal Type	包装 Packaging
多层片式 陶瓷电 容器 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=1 μ F	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= $\pm 1.0\%$ G= $\pm 2.0\%$ J= $\pm 5.0\%$ K= $\pm 10\%$ M= $\pm 20\%$ Z= $+80\%$ - 20%	4R0=4V 6R3=6.3V 250=25V 500=50V 101=100V 251=250V	N:银(或 铜)/镍/锡 N=Ag(or Cu)/Ni/Sn	T=编带 Taping B=袋散装 Bulk

■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

材质	COG												
	尺寸	01005	0201		0402	0603	0805	1206	1210	1808	1812	2220	2225
VDC	6.3				10	10	10	16	16	16	16	16	16
	10		16	50	16	16	16	25	25	25	25	25	25
	16		25		25	25	25	50	50	50	50	50	50
	25				50	50	50						
Cp	0R47												
	0R5												
	0R56												
	0R68												
0R82													
1R0													
1R2													
1R3													
1R5													
1R8													
2R2													
2R7													
3R3													
3R9													
4R7													
5R6													
6R8													
8R2													
9R0													
100													
120													
150													
180													
220													
270													
330													
390													
470													
560													
680													
750													
820													
101													
121													
151													
181													
221													
271													
331													
391													
471													
511													
561													
681													
821													
102													
122													
152													
182													
222													
272													
332													
392													
472													
562													
682													
822													
103													
123													
153													
183													
223													
273													
333													
473													
563													
104													

背景色代表：可生产型号

材质		X7R																													
尺寸	01005	0201			0402				0603			0805			1206		1210			1812		2220		2225							
VDC Cp	6.3	10	16	50	6.3	10	16	50	6.3	10	25	6.3	10	25	50	6.3	10	25	6.3	16	50	6.3	10	25	50	6.3	10	16	25	50	
	10	6.3	16	50	6.3	10	25	50	6.3	10	25	6.3	10	25	50	6.3	10	25	6.3	16	50	6.3	10	25	50	6.3	10	16	25	50	
16	6.3	16	50	6.3	10	25	50	6.3	10	25	50	6.3	10	25	50	6.3	10	25	6.3	16	50	6.3	10	25	50	6.3	10	16	25	50	
101																															
121																															
151																															
181																															
221																															
241																															
271																															
331																															
391																															
471																															
511																															
561																															
681																															
821																															
102																															
122																															
152																															
182																															
222																															
272																															
332																															
392																															
472																															
562																															
682																															
822																															
103																															
123																															
153																															
183																															
223																															
273																															
333																															
393																															
473																															
563																															
823																															
104																															
124																															
154																															
184																															
224																															
274																															
334																															
394																															
474																															
564																															
684																															
824																															
105																															
155																															
225																															
275																															
335																															
395																															
475																															
565																															
106																															
226																															
476																															

背景色代表：可生产型号

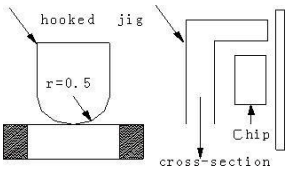
材质	X5R																																			
尺寸	01005			0201					0402				0603			0805			1206			1210			1812			2220								
VDC	4	6.3	10	4	10	16	25	50	6.3	16	25	50	6.3	16	50	6.3	16	50	6.3	16	50	6.3	10	16	50	6.3	16	50	6.3	16	50	6.3	16	25	50	
Cp	4	6.3	10	6.3	10	16	25	50	10	16	25	50	10	25	50	10	25	50	10	25	50	10	25	50	10	25	50	10	25	50	10	25	50	10	25	50
101																																				
121																																				
151																																				
181																																				
221																																				
271																																				
331																																				
391																																				
471																																				
511																																				
561																																				
681																																				
821																																				
102																																				
122																																				
152																																				
182																																				
222																																				
272																																				
332																																				
392																																				
472																																				
562																																				
682																																				
822																																				
103																																				
123																																				
153																																				
183																																				
223																																				
273																																				
333																																				
393																																				
473																																				
563																																				
823																																				
104																																				
124																																				
154																																				
184																																				
224																																				
274																																				
334																																				
394																																				
474																																				
564																																				
684																																				
824																																				
105																																				
225																																				
475																																				
106																																				
226																																				
476																																				
107																																				
227																																				

背景色代表：可生产型号

材质	Y5V																																							
尺寸	0402				0603				0805				1206				1210				1808			1812			2220			2225										
VDC	6.3	16	25	50	6.3	16	25	50	6.3	16	25	50	6.3	10	25	50	6.3	10	16	25	50	16	25	50	6.3	16	25	50	6.3	10	25	50	6.3	10	16	25	50			
Cp	10				10				10				16				16				16				10				16				16				16			
103																																								
123																																								
153																																								
183																																								
223																																								
273																																								
333																																								
393																																								
473																																								
563																																								
823																																								
104																																								
124																																								
154																																								
184																																								
224																																								
274																																								
334																																								
394																																								
474																																								
564																																								
684																																								
824																																								
105																																								
155																																								
225																																								
275																																								
335																																								
395																																								
475																																								
565																																								
106																																								
226																																								
476																																								
107																																								

■ 技术指标和试验方法 Specifications and Test Method

NO	项目 Item	技术指标 Specification		试验方法 Test Method
1	外观 Appearance	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千分尺 Using calipers on micrometer with tolerance no less than 0.01mm
*3	容量(C) Capacitance	在要求的范围内 Within the specified dimensions		Class I: $C_p \leq 1000 \text{ pF}$ $1\text{MHz} \pm 10\%$, $1.0 \pm 0.1V_{rms}$ $C_p > 1000 \text{ pF}$ $1\text{KHz} \pm 10\%$, $1.0 \pm 0.1V_{rms}$ Class II: $C_p < 10\mu\text{F}$ $1\text{KHz} \pm 10\%$, $1.0 \pm 0.1V_{rms}$ $C_p \geq 10\mu\text{F}$ $120 \pm 24\text{Hz}$ $1.0 \pm 0.1V_{rms}$
4	损耗(Q/DF) Dissipation Factor	C0G	$C_p < 30\text{pF}$, $Q \geq 400 + 20C_p$ $C_p \geq 30\text{pF}$, $Q \geq 1000$	
		X7R	<ul style="list-style-type: none"> ■ $U_R \geq 100\text{V}$ $DF \leq 7.5\%$ ■ $25\text{V} \leq U_R \leq 50\text{V}$, $DF \leq 3.5\%$ $DF \leq 10\%$ 0201 $\geq 104, 0402 \geq 333$ 0603 $\geq 104, 0805 \geq 684$ 1206 $\geq 225, 1210 \geq 475$ $DF \leq 12.5\%$ 0402 ≥ 474 ■ $U_R \leq 16\text{V}$, $DF \leq 5.0\%$ $DF \leq 10\%$, 0201 $\geq 104, 0402 \geq 563$ 0603 $\geq 564, 0805 \geq 105$ 1206 $\geq 475, 1210 \geq 106$ ■ $U_R \leq 10\text{V}$, $DF \leq 7.0\%$ $DF \leq 10\%$, 01005, 0201 ≥ 123 0402 $\geq 224, 0603 \geq 334$ 0805 $\geq 225, 1206 \geq 225$ 1210 ≥ 226 $DF \leq 15\%$, 0201 $\geq 104, 0402 \geq 105$ ■ $U_R = 6.3\text{V}$, $DF \leq 10\%$ $DF \leq 15\%$, 0201 $\geq 104, 0402 \geq 105$ 0603 $\geq 106, 0805 \geq 475$ 1206 $\geq 476, 1210 \geq 107$ $DF \leq 20\%$, 0402 ≥ 225 ■ $U_R = 4\text{V}$, $DF \leq 15\%$ 	
		X5R	<ul style="list-style-type: none"> ■ $U_R \geq 50\text{V}$, $DF \leq 12.5\%$ ■ $U_R = 25\text{V}$, $DF \leq 7.0\%$ $DF \leq 9\%$, 0402 $\geq 683, 0603 \geq 474$ 0805 $\geq 105, 1206 \geq 475$ 1210 ≥ 106 ■ $U_R = 16\text{V}$, $DF \leq 15\%$ ■ $U_R = 10\text{V}$, $DF \leq 20\%$ ■ $U_R \leq 6.3\text{V}$, $DF \leq 20\%$ 	
		Y5V	<ul style="list-style-type: none"> ■ $U_R = 6.3\text{V}$, $DF \leq 15\%$ ■ $U_R = 4\text{V}$, $DF \leq 15\%$ 	
		高Q	$C_p > 30\text{pF}$ $Q \geq 1000$ $1\text{pF} < C_p \leq 30\text{pF}$ $Q \geq 400 + 20C_p$ $C_p \leq 1\text{pF}$ $Q \geq 300$	
5	绝缘电阻(IR) Insulation Resistance	C0G	$R_i \geq 10 \text{ G}\Omega$ 或 $500 \Omega \cdot \text{F}$, 取较小值 $R_i \geq 10 \text{ G}\Omega$ or $500 \Omega \cdot \text{F}$, whichever is smaller	施加电压: $U_R \leq 400\text{V}$ $U_R > 400\text{V}$ 充电时间: 60 ± 5 秒 To apply voltage: $U_R \leq 400\text{V}$ $U_R > 400\text{V}$ Charge time: 60 ± 5 sec

NO	项目 Item	技术指标 Specification		试验方法 Test Method																								
5	绝缘电阻(IR) Insulation Resistance	X7R X5R Y5V 中高压	$R_i \geq 4 \text{ G}\Omega$ 或 $100 \Omega \cdot \text{F}$ (以下范围为 $50 \Omega \cdot \text{F}$], 取较小值 $R_i \geq 4 \text{ G}\Omega$ or $100 \Omega \cdot \text{F}$ ($50 \Omega \cdot \text{F}$ of below range], whichever is smaller 以下范围 below range: ■50V: 0402 ≥ 104 ; 0603 ≥ 225 ; 0805 ≥ 106 ; 1206 ≥ 106 ■25V: 0201 ≥ 104 ; 0402 ≥ 224 ; 0603 ≥ 106 ; 0805 ≥ 106 ; 1206 ≥ 226 ; 01005(X5R) ■16V: 0603 ≥ 106 ; 01005(X5R) ■10V: 0201 ≥ 104 ; 0603 ≥ 106 ; 0805 ≥ 476 ; 01005(X5R) ■6.3V: 0201 ≥ 104 ; 0603 ≥ 475 ; 1206 ≥ 106 ; 01005(X5R) ■4V: 0603 ≥ 226 ; 0805 ≥ 476 ; 1206 ≥ 107 ; 01005(X5R)	To apply voltage: $U_R \leq 400\text{V}$ $U_R > 400\text{V}$ Charge time: $60 \pm 5\text{sec}$																								
6	耐电压 Dielectric Strength	C0G X7R X5R Y5V	无介质击穿和材料裂缝 No dielectric breakdown or mechanical breakdown	施加电压: $U_R < 100\text{V}$: 250% $100\text{V} \leq U_R < 1000\text{V}$: 150% $U_R \geq 1000\text{V}$: 120% 测试时间: 60 ± 5 秒 最大电流: 不超过50mA To apply voltage: $U_R < 100\text{V}$: 250% $100\text{V} \leq U_R < 1000\text{V}$: 150% $U_R \geq 1000\text{V}$: 120% Test time: $60 \pm 5\text{sec}$ Max current: should not exceed 50mA																								
*7	电容量温度系数或温度特性 Capacitance Temperature Coefficient or Temperature Characteristics	C0G X7R X5R Y5V	温度系数 $\leq 0 \pm 30\text{ppm}/^\circ\text{C}$ Temperature coefficient within $0 \pm 30\text{ppm}/^\circ\text{C}$ 容量变化 $\leq \pm 15\%$ Capacitance change within $\pm 15\%$ 容量变化 $\leq +22\% \sim -82\%$ Capacitance change within $+22\% \sim -82\%$	按系列温度顺序测试电容量 Measure capacitance under follow table list <table border="1"> <thead> <tr> <th>步骤 Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>C0G/X7R</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$-55 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$125 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> </tr> <tr> <td>X5R</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$-55 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$85 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> </tr> <tr> <td>Y5V</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$-30 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> <td>$85 \pm 3^\circ\text{C}$</td> <td>$25 \pm 2^\circ\text{C}$</td> </tr> </tbody> </table> PS: C0G预先干燥: 16~24小时 C0G Preliminary Drying for 16~24hr $\Delta C = [(C_i - C_1) / (C_1 * \Delta T)] * 10^6$ 或 (or) $\Delta C = (C_i - C_1) / C_1 * 100\%$ C _i : 1~5温度下的容值 Capacitance value at 1~5 temperature ΔT : 温度变化量 (Temperature variation) $\Delta T = T_i - T_1$	步骤 Step	1	2	3	4	5	C0G/X7R	$25 \pm 2^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$125 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	X5R	$25 \pm 2^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	Y5V	$25 \pm 2^\circ\text{C}$	$-30 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$
步骤 Step	1	2	3	4	5																							
C0G/X7R	$25 \pm 2^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$125 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																							
X5R	$25 \pm 2^\circ\text{C}$	$-55 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																							
Y5V	$25 \pm 2^\circ\text{C}$	$-30 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$	$85 \pm 3^\circ\text{C}$	$25 \pm 2^\circ\text{C}$																							
8	附着 Adhesion	C0G X7R X5R Y5V	无明显的损伤或端电极脱落, No remarkable damage or removal of the terminations.	施加压力: 5N (0201:2N; 01005:1N) 时间: 10 ± 1 秒 Pressurizing force: 5N (0201:2N; 01005:1N) time: $10 \pm 1 \text{ sec}$ 																								

NO	项目 Item	技术指标 Specification		试验方法 Test Method
9	可焊性 Solderability	C0G X7R X5R Y5V	端电极挂锡面积不小于95% 95% min.coverage of both terminal electrodes	锡炉温度: 245 ± 5°C 浸入时间: 2 ± 1秒 Solder temperature: 245 ± 5°C Dipping time: 2 ± 1 seconds.
10	弯曲强度 Bending	外观 Appearance	无明显可见损伤 No remarkable visual damage.	将电容安在测试夹具上, 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 putt on testing stand. The middle part of substrateshall successively be pressurized by pressuringrod at a rated of about 1.0mm/sec.Until the deflection become means of the 1.0mm.
		容量变化 Cap change	C0G: ± 5% 或 ± 0.5pF,取较大值 X7R/X5R: ± 12.5% Y5V : ± 30% C0G: within ± 5% or ± 0.5pF, whichever is larger X7R/X5R within ± 12.5% Y5V: within ± 30%	
*11	耐焊接热 Resistance to Soldering Heat	外观 Appearance	无明显可见损伤 No remarkable visual damage.	预热: 120 ~ 150°C 60秒 焊接温度: 270 ± 5°C 浸入时间: 10 ± 1秒 Preheating: 120 ~ 150°C 60sec Soldering temperature: 270 ± 5°C Dipping time: 10 ± 1 seconds
		容量变化 Cap change	C0G: ± 2.5% 或 ± 0.5pF,取较大值 X7R/X5R: ± 15% Y5V : ± 30% C0G: within ± 2.5% or ± 0.5pF, whichever is larger X7R/X5R within ± 15% Y5V: within ± 30%	
		DF/IR	满足产品初始值的要求 Meets initial standard value	
*12	温度快速循环 Temperature Cycle	外观 Appearance	无明显可见损伤 No remarkable visual damage	按下列步骤进行5次循环: To perform 5 cycles of the stated environment
		容量变化 Cap change	C0G: ± 2.5% 或 ± 0.25pF,取较大值 X7R/X5R: ± 15% Y5V : ± 30% C0G: within ± 2.5% or ± 0.25pF, whichever is larger X7R/X5R within ± 15% Y5V: within ± 30%	
		DF/IR	满足产品初始值的要求 Meets initial standard value	



步骤 Step	温度 Temperature	时间 Time
1	下限温度+0/-3°C Min.operating Temp.+0/-3°C	30min
2	25°C	2~3 min
3	上限温度+3/-0°C Max.operating Temp.+3/-0°C	30min
4	25°C	2~3 min

NO	项目 Item	技术指标 Specification		试验方法 Test Method
*13	耐湿负荷 Damp heat with load	外观 Appreance	无明显可见损伤 No remarkable visual damage	测试温度: 40 ± 2℃ 相对湿度: 90 ~ 95% RH 测试电压: 额定电压 (最大500V) 测试时间: 500 ± 12hrs Test temperature: 40 ± 2℃ Humidity: 90 ~ 95% RH Voltage: 100% of the rated voltage (max:500V) Testing time: 500 ± 12hrs
		容量变化 Cap change	C0G: ± 7.5% 或 ± 0.75pF,取较大值 X7R/X5R: ± 25% Y5V : ± 30%或-40% ~ +30% C0G: within ± 7.5% or ± 0.75pF, whichever is larger X7R/X5R within ± 25% Y5V: within ± 30% or -40% ~ +30%	
		DF	初始值的2倍以下 Not more than 2 times of initial value	
		IR	Ri > 500MΩ 或 25Ω · F (☆为5Ω · F), 取较小值 Ri > 500MΩ or 25Ω · F (5Ω · F of ☆), whichever is smaller	
*14	耐久性 Life Test	外观 Appreance	无明显可见损伤 No remarkable visual damage.	测试温度: 上限类别温度 ± 3℃ 测试电压: UR < 100V 150% 100V ≤ UR < 1000V 120% UR ≥ 1000V 100% 测试时间: 1000 小时 Test temperature: Max. Operating Temp ± 3℃ Voltage: UR < 100V 150% 100V ≤ UR < 1000V 120% UR ≥ 1000V 100% Testing time : 1000hrs
		容量变化 Cap change	C0G: ± 3% 或 ± 0.5pF, 取较大值 X7R/X5R: ± 25% Y5V : ± 30%或-40% ~ +30% C0G: within ± 3% or ± 0.5pF, whichever is larger. X7R/X5R within ± 25% Y5V: within ± 30% or -40% ~ +30%	
		DF	初始值的2倍以下 Not more than 2 times of initial value	
		IR	Ri > 1GΩ 或 50Ω · F (☆为10Ω · F), 取较小值 Ri > 1GΩ or 50Ω · F (10Ω · F of ☆), whichever is smaller	

注:

- *A.3.7.11.12.13.14项需对II类电容器做预处理(将电容器在160℃下热处理1小时),然后在标准大气条件下恢复48 ± 4小时测量初始值;
- B.3.11.12.13.14项试验后在室温下放置24 ± 2 (C0G) 或48 ± 4(X7R、X5R、Y5V)小时以后再测量;
- C.3.11.12.13.14项电性能测量的环境条件, 温度: 25℃ ± 2℃ 相对湿度: 25% ~ 80% RH。

☆ ■100V: X7R

■50V: 0402 > 103; 0603 ≥ 105; 0805 ≥ 105; 1206 ≥ 475; 1210 ≥ 475

■25V: 0201 ≥ 104; 0402 ≥ 224; 0603 ≥ 225; 0805 ≥ 225; 1206 ≥ 106; 1210 ≥ 106; 01005 (X5R)

■16V: 0201 ≥ 104; 0402 ≥ 224; 0603 ≥ 105; 0805 ≥ 225; 1206 ≥ 106; 1210 ≥ 476; 01005 (X5R)

■10V: 0201 ≥ 473; 0402 ≥ 474; 0603 ≥ 474; 0805 ≥ 225; 1206 ≥ 475; 1210 ≥ 476; 01005 (X5R)

■ ≤ 6.3V Class II; 01005 (X5R)

Note:

- *A.3.7.11.12.13.14 Item need to do the pretreatment of class II type capacitor (Perform a heat treatment at 160℃ for 1hour, Then recovery the capacitor at standard pressure conditions for 48 ± 4hours, Perform the initial measurement
- B.3.11.12.13.14 Item end of experiment Measurement to be made after being kept at room temperature for 24 ± 2 (C0G) or 48 ± 4(X7R, X5R, Y5V) hrs.
- C.3.11.12.13.14 Item environmental conditions for electrical performance measurement, Temperature: 25℃ ± 2℃ Humidity: 25% ~ 80% RH

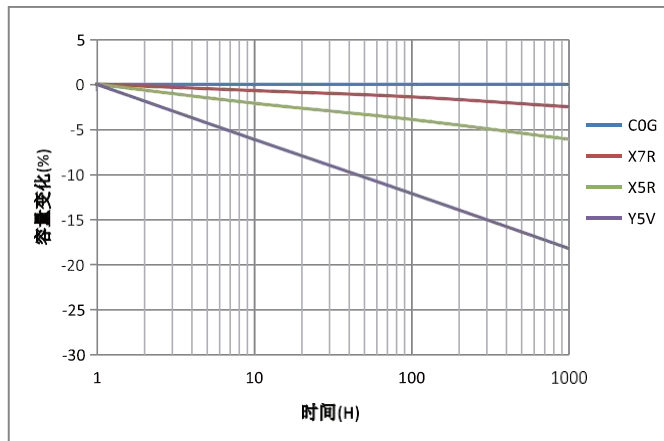
■ II类陶瓷介质电容器容量衰减特性

Ceramic Dielectric Capacitor Capacitance Attenuation Characteristic (Type II)

II类陶瓷介质（包括X7R、X5R及Y5V特性类）的电容器使用的是铁电体材料。当温度低于居里温度时，介质的立方晶体结构转为四方相，其对称性降低，晶体点阵中的离子会连续移动到势能较小的位置，引起电容量按对数规律随时间不断地减小，这一现象称为II类陶瓷介质材料的老化现象。

Ceramic dielectric (including X7R, X5R and Y5V characteristic types) capacitors use a ferroelectric material. When the temperature is below the Curie temperature, the cubic crystal structure of the dielectric changes to the tetragonal phase, which reduce the symmetry. Crystal lattice ions will continuously move to a smaller location potential, which causes capacitance logarithmically reduced by time, and this phenomenon is called aging of Type II ceramic dielectric material.

■ MLCC容量衰减特性 MLCC Capacitance Attenuation Characteristic

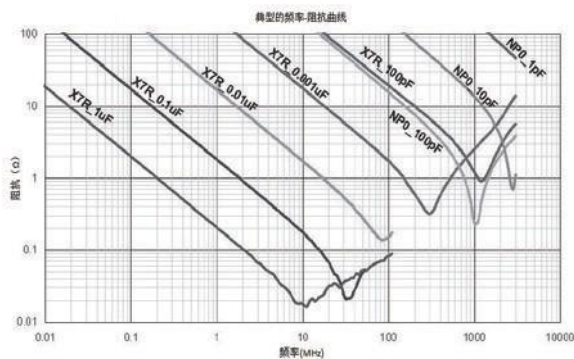


上述现象是可逆的，如果将电容器加热至高于居里温度的某一温度（160℃）后容量就可以恢复到初始值。故电容贴在PCB板上过炉焊接时，电容容值就会恢复到初始值。

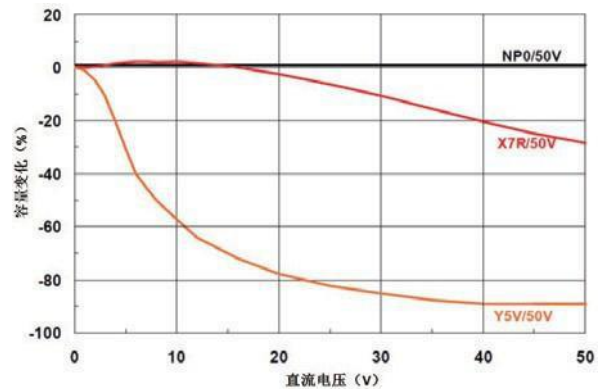
The above phenomenon is reversible, if the capacitor is heated to a temperature above the Curie temperature (160 °C) after the capacity can be restored to the initial value. Therefore, when the capacitor attached to the PCB board is being soldering, the value of capacitance will return to the initial.

■ 电气特性 Electrical Characteristics

1) 频率特性 Frequency characteristics



2) 直流偏压特性 DC Bias characteristics



以上所有典型的电气特性仅供参考。

对于任何特定项目详细信息请与SUP代表联系。

All above typical electronic characteristics are for reference only.

Please contact with SUP representative for detail information of any specific item.

IEC-63 标称电容 Nominal Capacitance

E1	1.0																							
E3	1.0				2.2				4.7															
E6	1.0		1.5		2.2		3.3		4.7		6.8													
E12	1.0	1.2	1.5	1.8	2.2	2.7	3.3	3.9	4.7	5.6	6.8	8.2												
E24	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4	2.7	3.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2	6.8	7.5	8.2	9.1

E6: $\sqrt[6]{10} \approx 1.46$ E12: $\sqrt[12]{10} \approx 1.2$

E1系列电容 (Series Capacitance) :1pF 10pF 100pF 1000pF 10000pF 100000pF...

EIA温度特性代码 Temperature Characteristics Symbol

温度系数(ppm/°C) Temp.coeff of Cap	代码 Symbol	温度系数倍数 Multiplier	代码 Symbol	温度系数公差(ppm) Tolerance of Temp. coeff	代码 Symbol
0	C	-1	0	±30	G
0.3	B	-10	1	±60	H
0.8	L	-100	2	±120	J
0.9	A	-1000	3	±250	K
1.0	M	-10000	4	±500	L
1.5	P	1	5	±1000	M
2.2	R	10	6	±2500	N
3.3	S	100	7		
4.7	T	1000	8		
7.5	U	10000	9		

例(eg): C0G

C: 0

0: -'

G: ±30ppm

下限温度(°C) Min.Temp	代码 Symbol	上限温度(°C) Max.Temp	代码 Symbol	温度范围内最大容值偏差(%) Max.Cap.change over temp. range	代码 Symbol
+10	Z	+45	2	±1.0	A
-30	Y	+65	4	±1.5	B
-55	X	+85	5	±2.2	C
		+105	6	±3.3	D
		+125	7	±4.7	E
		+150	8	±7.5	F
		+200	9	±10	P
				±15	R
				±22	S
				+22to-33	T
				+22to-56	U
				+22to-82	V

例(eg): X7R

X5R

Y5V

X: -55°C

X: -55°C

Y: -30°C

7: +25°C

5: +85°C

5: +85°C

R: ±15%

R: ±15%

V: +22% to -82%

深圳市叁叶源电子有限公司

Shenzhen Sanyear electronic co. , ltd

工厂地址：台湾新北市新店区

深圳办事处：深圳市福田区华富路南光大厦6楼

电话：0755-83666866 83232952

传真：0755-83666899

公司网址：www.sanyear.cn

阿里店铺：<http://sanyear.1688.com>



微信公众号

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Multilayer Ceramic Capacitors MLCC - SMD/SMT](#) category:

Click to view products by [SANYEAR](#) manufacturer:

Other Similar products are found below :

[M39014/01-1467](#) [M39014/02-1218V](#) [M39014/02-1225V](#) [M39014/02-1262V](#) [M39014/02-1301](#) [M39014/22-0631](#) [1210J5000102JCT](#)
[1210J2K00102KXT](#) [1210J5000103KXT](#) [1210J5000223KXT](#) [D55342E07B379BR-TR](#) [D55342E07B523DR-T/R](#) [1812J1K00103KXT](#)
[1812J1K00473KXT](#) [1812J2K00680JCT](#) [1812J4K00102MXT](#) [1812J5000102JCT](#) [1812J5000103JCT](#) [1812J5000682JCT](#) [NIN-FB391JTRF](#)
[NIN-FC2R7JTRF](#) [NPIS27H102MTRF](#) [C1206C101J1GAC](#) [C1608C0G1E472JT000N](#) [C2012C0G2A472J](#) [2220J2K00101JCT](#)
[KHC201E225M76N0T00](#) [LRC-LRF1206LF-01R025FTR1K](#) [1812J1K00222JCT](#) [1812J2K00102KXT](#) [1812J2K00222KXT](#)
[1812J2K00472KXT](#) [2-1622820-7-CUT-TAPE](#) [2220J3K00102KXT](#) [2225J2500824KXT](#) [CCR07CG103KM](#) [CGA2B2C0G1H010C](#)
[CGA2B2C0G1H040C](#) [CGA2B2C0G1H050C](#) [CGA2B2C0G1H060D](#) [CGA2B2C0G1H070D](#) [CGA2B2C0G1H151J](#) [CGA2B2C0G1H1R5C](#)
[CGA2B2C0G1H2R2C](#) [CGA2B2C0G1H3R3C](#) [CGA2B2C0G1H680J](#) [CGA2B2C0G1H6R8D](#) [CGA2B2X8R1H221K](#) [CGA2B2X8R1H472K](#)
[CGA3E1X7R1C474K](#)