

SANYEAR

多层片式陶瓷电容器规格书

MULTILAYER CHIP CERAMIC CAPACITOR CATALOG

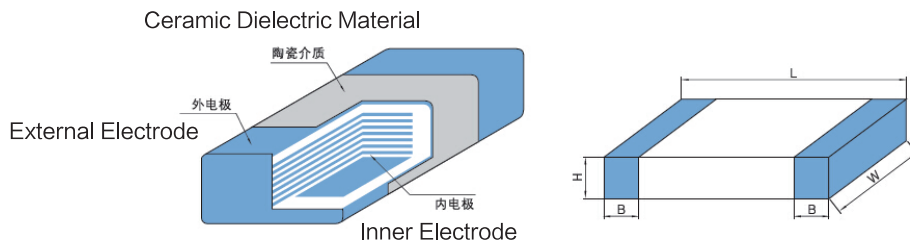
多层片式陶瓷电容器 Multilayer Chip Ceramic Capacitor

■ **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灯普通电子设备

- 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 form 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 Multilayers Chip Ceramic Capacitor

产品特点 Product Features

- COG (NPO)：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。
 - X6S：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（ $-55^\circ\text{C} \sim +105^\circ\text{C}$ ）范围内容值变化率在 $\pm 22\%$ 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，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,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 working temperature($-55^\circ\text{C} \sim +125^\circ\text{C}$).
 - X6S: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is $\pm 22\%$ for working temperature($-55^\circ\text{C} \sim +105^\circ\text{C}$).
 - 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 $+22\%/-85\%$ 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
多层式 陶瓷电 容器 MLCC	01005 0201 0402 0603 0805 1206 1210 1808 1812 2220 2225	COG (NPO) X7R X6S X5R Y5V	1R5=1.5pF 100=10pF 222=2.2NF 105=1uF 475=4.7uF	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= $\pm 5\%$ K= $\pm 10\%$ M= $\pm 20\%$ Z= $+80\%$ -20%	4R0=4V 6R3=6.3V 250=25V 500=50V 101=100V 251=250V 102=1KV	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
V _{DC}	6.3	16	50	10	10	10	16	16	16	16	16	16
	10			16	16							
C _p	16	25	50	25	25	25	50	50	50	50	50	50
	25			50	50							
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												

■ 产品容值范围 Product Capacitance Range

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				
V _{DC}	C _p	6.3			10			16			6.3			10			6.3		10		6.3		10		6.3				
		10	16	50	6.3	10	25	50	6.3	10	25	50	6.3	10	25	50	10	25	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																													

■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

材质	X6S																															
	01005			0201				0402				0603			0805			1206			1210			1812			2220					
V _{DC} C _p	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	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																																

■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

材质	X5R																																				
	01005			0201				0402				0603			0805			1206			1210			1812			2220										
V _{DC} C _p	4	6.3	10	4 6.3	10	16	25	50	6.3 10	16	25	50	6.3 10	16	25	50	6.3 10	16	25	50	6.3	16	50	6.3	10	16	50	6.3	16	50	6.3	16	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																																					

■ 产品容值范围 Product Capacitance Range

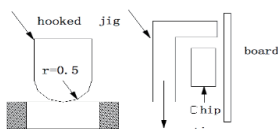
背景色代表：可生产型号

材质		Y5V																																				
尺寸		0402				0603			0805				1206			1210				1808			1812			2220			2225									
V _{bc}	C _p	6.3	16	25	50	6.3	16	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	16	25	50	6.3	10	16	25	50
		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																																						

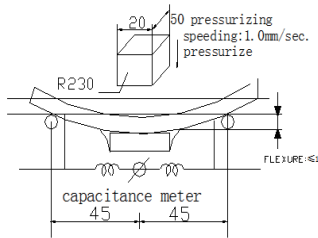
■ 技术指标和实验方法 Specifications and Test Method

NO	项目 Item	技术指标 Specification	实验方法 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		
4	损耗(Q/DF) Dissipation Factor	C0G	Class I : Cp ≤ 1000pF 1MHz ± 10%, 1.0 ± 0.1Vrms Cp > 1000pF 1KHz ± 10%, 1.0 ± 0.1Vrms Class II: Cp < 10 μ F 1KHz ± 10%, 1.0 ± 0.1Vrms Cp ≥ 10 μ F 120 ± 24Hz, 1.0 ± 0.1Vrms	
		X7R X6S X5R		<p>■ U_R ≥ 100V DF ≤ 7.5%</p> <p>■ 25V ≤ U_R ≤ 50V, DF ≤ 3.5%</p> <p>DF ≤ 10% 0201 ≥ 104, 0402 ≥ 333 0603 ≥ 104, 0805 ≥ 684 1206 ≥ 225, 1210 ≥ 475</p> <p>DF ≤ 12.5% 0402 ≥ 474</p> <p>■ U_R ≤ 16V, DF ≤ 5.0%</p> <p>DF ≤ 10%, 0201 ≥ 104, 0402 ≥ 563 0603 ≥ 564, 0805 ≥ 105 1206 ≥ 475, 1210 ≥ 106</p> <p>■ U_R ≤ 10V, DF ≤ 7.0%</p> <p>DF ≤ 10% 01005, 0201 ≥ 123 0402 ≥ 224, 0603 ≥ 334 0805 ≥ 225, 1206 ≥ 225 1210 ≥ 226</p> <p>DF ≤ 15%, 0201 ≥ 104, 0402 ≥ 105</p> <p>■ U_R = 6.3V, DF ≤ 10%</p> <p>DF ≤ 15%, 0201 ≥ 104, 0402 ≥ 105 0603 ≥ 106, 0805 ≥ 475 1206 ≥ 476, 1210 ≥ 107</p> <p>DF ≤ 20%, 0402 ≥ 225</p> <p>■ U_R = 4V, DF ≤ 15%</p>
		Y5V		<p>■ U_R ≥ 50V, DF ≤ 12.5%</p> <p>■ U_R = 25V, DF ≤ 7.0%</p> <p>DF ≤ 9%, 0402 ≥ 683, 0603 ≥ 474 0805 ≥ 105, 1206 ≥ 475 1210 ≥ 106</p> <p>■ U_R = 16V, DF ≤ 15%</p> <p>■ U_R = 10V, DF ≤ 20%</p> <p>■ U_R ≤ 6.3V, DF ≤ 20%</p>
		高Q		<p>Cp > 30pF Q ≥ 1000</p> <p>1pF < Cp ≤ 30pF Q ≥ 400+20Cp</p> <p>Cp ≤ 1pF Q ≥ 300</p>
5	绝缘电阻(IR) Insulation Resistance	C0G Ri ≥ 10GΩ 或 500Ω · F, 取最小值 Ri ≥ 10 GΩ 或 500Ω · F, whichever is smaller	施加电压: U _R ≤ 400V U _测 = U _R U _R > 400V U _测 = 400V 充电时间: 60 ± 5秒 To apply voltage: U _R ≤ 400V U _测 = U _R U _R > 400V U _测 = 400V Charge time: 60 ± 5sec	

■ 技术指标和实验方法 Specifications and Test Method

NO	项目 Item	技术指标 Specification	实验方法 Test Method																								
5	绝缘电阻(IR) Insulation Resistance	<p>$R_i \geq 4G\Omega$ 或 $100\Omega \cdot F$ (以下范围为 $50\Omega \cdot F$) 取较小值</p> <p>$R_i \geq 4 G\Omega$ or $100\Omega \cdot F$ (50 $\Omega \cdot F$ of below range), whichever is smaller</p> <p>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 (X6S/X5R) ■ 16V: 0603 ≥ 106; 01005 (X6S/X5R) ■ 10V: 0201 > 104; 0603 ≥ 106; 0805 ≥ 476; 01005 (X6S/X5R) ■ 6.3V: 0201 ≥ 104; 0603 ≥ 475; 1206 ≥ 106; 0100 (X6S/X5R) ■ 4V: 0603 ≥ 226; 0805 ≥ 476; 1206 ≥ 107; 01005 (X6S/X5R)</p>	<p>施加电压: $U_R \leq 400V$ $U_{测} = U_R$ $U_R > 400V$ $U_{测} = 400V$ 充电时间: 60 ± 5秒</p> <p>To apply voltage: $U_R \leq 400V$ $U_{测} = U_R$ $U_R > 400V$ $U_{测} = 400V$ Charge time: 60 ± 5sec</p>																								
6	耐电压 Dielectric Strength	<p>C0G X7R X6S X5R Y5V</p> <p>无介质击穿和材料裂缝 No dielectric breakdown or mechanical breakdown</p>	<p>施加电压: $U_R < 100V$: 250% $100V \leq U_R < 1000V$: 150% $U_R \geq 1000V$: 120%</p> <p>测试时间: 60 ± 5秒, 最大电流: 不超过50mA</p> <p>To apply voltage: $U_R < 100V$: 250%; $100V \leq U_R < 1000V$: 150%; $U_R \geq 1000V$: 120%</p> <p>Test time: 60 ± 5sec, Max current: should not exceed 50mA</p>																								
*7	电容量温度系数或温度特性 Capatiance Temperature Coefficient Or Temperature Characteristics	<p>C0G 温度系数 $\leq 0 \pm 30$ppm/°C Temperature coefficient within 0 ± 30ppm/°C</p> <p>X7R X6S X5R 容量变化 $\leq \pm 15\%$ Capacitance change within $\pm 15\%$</p> <p>Y5V 容量变化 $\leq +22\% \sim -82\%$ Capacitance change within $+22\% \sim -82\%$</p>	<p>按系列温度顺序测试电容量 Measure capacitance under follow table list</p> <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>$25 \pm 2^\circ C$</td> <td>$-55 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> <td>$125 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> </tr> <tr> <td>X6S/X5R</td> <td>$25 \pm 2^\circ C$</td> <td>$-55 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> <td>$85 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> </tr> <tr> <td>Y5V</td> <td>$25 \pm 2^\circ C$</td> <td>$-30 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> <td>$85 \pm 3^\circ C$</td> <td>$25 \pm 2^\circ C$</td> </tr> </tbody> </table> <p>PS: C0G预先干燥: 16~24小时. C0G Preliminary Drying for 16~24hr. ▶ $C = [(C_i - C_1) / (C_1 * T)] * 10^6$ 或 (or) ▶ $C = (C_i - C_1) / C_1 * 100\%$ C_1: 1~5温度下的容值 Capacitance value at 1~5 temperature ▶ T: 温度变化量 (Temperature variation) ▶ $T = T_i - T_1$</p>	步骤Step	1	2	3	4	5	C0G/X7R	$25 \pm 2^\circ C$	$-55 \pm 3^\circ C$	$25 \pm 2^\circ C$	$125 \pm 3^\circ C$	$25 \pm 2^\circ C$	X6S/X5R	$25 \pm 2^\circ C$	$-55 \pm 3^\circ C$	$25 \pm 2^\circ C$	$85 \pm 3^\circ C$	$25 \pm 2^\circ C$	Y5V	$25 \pm 2^\circ C$	$-30 \pm 3^\circ C$	$25 \pm 2^\circ C$	$85 \pm 3^\circ C$	$25 \pm 2^\circ C$
步骤Step	1	2	3	4	5																						
C0G/X7R	$25 \pm 2^\circ C$	$-55 \pm 3^\circ C$	$25 \pm 2^\circ C$	$125 \pm 3^\circ C$	$25 \pm 2^\circ C$																						
X6S/X5R	$25 \pm 2^\circ C$	$-55 \pm 3^\circ C$	$25 \pm 2^\circ C$	$85 \pm 3^\circ C$	$25 \pm 2^\circ C$																						
Y5V	$25 \pm 2^\circ C$	$-30 \pm 3^\circ C$	$25 \pm 2^\circ C$	$85 \pm 3^\circ C$	$25 \pm 2^\circ C$																						
8	附着力 Adhesion	<p>C0G X7R X6S X5R</p> <p>无明显的损伤或端电极脱落 No remarkable damage or removal of the terminations.</p>	<p>施加压力: 5N(0201:2N; 01005:1N) 时间: 10 ± 1秒 Pressurizing force: 5N(0201:2N; 01005:1N) time: 10 ± 1sec</p> 																								

■ 技术指标和实验方法 Specifications and Test Method

NO	项目 Item	技术指标 Specification		实验方法 Test Method															
9	可焊性 Solderability	C0G X7R X6S X5R Y5V	端电极挂锡面积小于95% 95%min.coverage of both terminal electrodes	锡炉温度: 245 ± 5℃ 浸入时间: 2 ± 1秒 Solder temperature:245 ± 5℃ Dipping time: 2 ± 1sec.															
10	弯曲强度 Bending	外观 Appearance	无明显可见损伤 No remarkable visual damage	<p>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.</p> <p>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.</p> 															
		容量变化 Cap change	C0G: ± 5%或 ± 0.5pF, 取较大值 X7R/X6S/X5R: ± 12.5% Y5V: ± 30% C0G:within ± 5% or ± 0.5pF, whichever is larger X7R/X6S/X5R: within ± 12.5% Y5V: within ± 30%																
*11	耐焊锡热 Resistance to Soldering Heat	外观 Appearance	无明显可见损伤 No remarkable visual damage	预热: 120~150℃ 60秒 焊接温度: 270 ± 5℃ 浸入时间: 10 ± 1秒 Preheating:120~150℃ 60sec Soldering temperature :270 ± 5℃ Dipping time:10 ± 1seconds															
		容量变化 Cap change	C0G: ± 2.5%或 ± 0.5pF,取较大值 X7R/X6S/X5R: ± 15% Y5V: ± 30% C0G:within ± 2.5% or ± 0.5pF, whichever is larger X7R/X6S/X5R: within ± 15% Y5V: within ± 30%																
		DF/IR	满足产品初始值得要求 Meets initial standard damage																
*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 5cycles of the stated environment <table border="1" data-bbox="935 1608 1375 1925"> <thead> <tr> <th>步骤 Step</th> <th>温度 Temperature</th> <th>时间 Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>下限温度+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>上限温度+3/-0℃ Min.operating Temp.+3/-0℃</td> <td>30min</td> </tr> <tr> <td>4</td> <td>25℃</td> <td>2~3min</td> </tr> </tbody> </table>	步骤 Step	温度 Temperature	时间 Time	1	下限温度+0/-3℃ Min.operating Temp.+0/-3℃	30min	2	25℃	2~3min	3	上限温度+3/-0℃ Min.operating Temp.+3/-0℃	30min	4	25℃	2~3min
		步骤 Step	温度 Temperature		时间 Time														
		1	下限温度+0/-3℃ Min.operating Temp.+0/-3℃		30min														
2	25℃	2~3min																	
3	上限温度+3/-0℃ Min.operating Temp.+3/-0℃	30min																	
4	25℃	2~3min																	
容量变化 Cap change	C0G: ± 2.5%或 ± 0.25pF,取较大值 X7R/X6S/X5R: ± 15% Y5V: ± 30% C0G:within ± 2.5% or ± 0.25pF, whichever is larger X7R/X6S/X5R: within ± 15% Y5V: within ± 30%																		
DF/IR	满足产品初始值得要求 Meets initial standard damage																		

NO	项目 Item	技术指标 Specification		实验方法 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/X6S/X5R: ± 25% Y5V: ± 30%或-40%~+30% C0G:within ± 7.5% or ± 0.75pF, whichever is larger X7R/X6S/X5R: within ± 25% Y5V:within ± 30%或-40%~+30%	
		DF	初始值的2倍以下 Not more than 2 times of initial value	
		IR	Ri > 500MΩ 或 25 Ω · F (☆为5 Ω · F), 取较小值 Ri > 500MΩ 或 25 Ω · F (5 Ω · 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	温度测试: 上限类别温度 ± 3℃ 测试电压: U _R < 100V 150% 100V ≤ U _R < 1000V 120% U _R ≥ 1000V 100% 测试时间: 1000小时 Test temperature:Max.Operating Temp. ± 3℃ Voltage: U _R < 100V 150% 100V ≤ U _R < 1000V 120% U _R ≥ 1000V 100% Testing time: 1000hrs
		容量变化 Cap change	C0G: ± 3%或 ± 0.5pF,取较大值 X7R/X6S/X5R: ± 25% Y5V: ± 30%或-40%~+30% C0G:within ± 3% or ± 0.5pF, whichever is larger X7R/X6S/X5R: within ± 25% Y5V:within ± 30%或-40%~+30%	
		DF	初始值的2倍以下 Not more than 2 times of initial value	
		IR	Ri > 1G Ω 或 50 Ω · F (☆为10 Ω · F), 取较小值 Ri > 1G Ω 或 50 Ω · F (10 Ω · 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,再测量初始值;

B.3.11.12.13.14项实验后在室温下放置24 ± 2(C0G)或48 ± 4(X7R、X6S、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(X6S/X5R)

■ 16V: 0201 ≥ 104; 0402 ≥ 224; 0603 ≥ 105; 0805 ≥ 225; 1206 ≥ 106; 1210 ≥ 476; 01005(X6S/X5R)

■ 10V: 0201 ≥ 473; 0402 ≥ 474; 0603 ≥ 474; 0805 ≥ 225; 1206 ≥ 475; 1210 ≥ 476; 01005(X6S/X5R)

■ ≤ 6.3V Class II; 01005(X6S/X5R)

Note:

A.3.7.11.12.13.14Item need to do the pretreatment of class II type capacitor(Perform a heat treatment at 160℃ for 1 hour), Then recovery the capacitor at standard pressure conditions for 48 ± 4 hours,Perform the initial measurement

B.3.11.12.13.14Item end of experiment Measurement to be made after being kept at room temperature for 24 ± 2(C0G) or 48 ± 4(X7R、X6S、X5R、Y5V)hrs.

C.3.11.12.13.14Item environmental conditions for electrical performance measurement, Temperature: 25℃ ± 2℃ Humidity: 25%~80%RH