GYZ昀冢科技

产品规格书

Product Datasheet

产品名称　　片式多层陶瓷电容器

Part Name：　Multilayer Ceramic Capacitor (MLCC)

产品系列

Product Series：　2.5V~2KV

产品尺寸

Product Size：　008004～2220

总公司地址：江苏省昆山市宋家港路 269 号

池州分公司地址：安徽省池州市皖江江南新兴产业集中区乐山路以西汉江路以北

联系方式：0566-2099570

备注：本规格书仅供选型参考用

一、规格型号编码 Parts code：

2F01MC	104	X	2	J	7	D	0
①	②	③	④	⑤	⑥	⑦	⑧
产品系列 Product Series	容值代码 Capacitance Value Code	介电材质代码 Dielectric Code	产品尺寸 Product Size	容值允差 Capacitance Tolerance	额定电压 Rated Voltage	包装方式 Package Style	厚度代码 Thickness Code

说明 Description：

① 产品系列 Product Series

2F01MC—消费电子级别产品 Consumer electronics grade products

② 容值代码 Capacitance value

单位用pF表示，前两位数码为有效数字；后一位数码为前两位有效数字后所接“0”的个数，字母R表示小数点。

单位之间的换算关系为：1uF= 10^3nF = 10^6 pF

举例：120=12×10^0=12pF，104=10×10^4=100000 pF=100nF，R47=0.47pF，2R2=2.2pF。

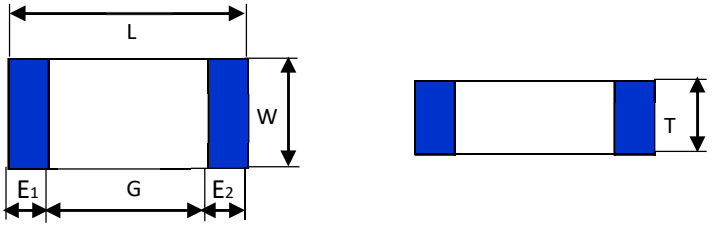
2 significant digits + number of zeros. The third digit signifies the multiplying factor, and letter R is decimal point.

Example: 120=12×10^0=12pF，104=10×10^4=100000 pF=100nF，R47=0.47pF，2R2=2.2pF

③ 介电材质代码 Dielectric Code

陶瓷类别 Ceramic Type	介电质种类 Dielectric Type	最低应用温度 Min. Operating Temperature	最高应用温度 Max. Operating Temperature	参考温度点 Reference Temperature
Class 1	G (C0G)	-55℃	125℃	25℃
	A (X8G)	-55℃	150℃	25℃
	H (CHA)	-55℃	150℃	25℃
	M (M3L)	-55℃	125℃	25℃
	U (U2J)	-55℃	125℃	25℃
Class 2	X (X7R)	-55℃	125℃	25℃
	S (X7S)	-55℃	125℃	25℃
	C (X7T)	-55℃	125℃	25℃
	W (X7U)	-55℃	125℃	25℃
	R (X8R)	-55℃	150℃	25℃
	L (X8L)	-55℃	150℃	25℃
	P (X8T)	-55℃	150℃	25℃
	Q (X8S)	-55℃	150℃	25℃
	D (X6S)	-55℃	105℃	25℃
	E (X6T)	-55℃	105℃	25℃
	B (X5R)	-55℃	85℃	25℃
	F (X5S)	-55℃	85℃	25℃
	Y (Y5V)	-30℃	85℃	25℃

④ 产品尺寸 Product Size



代码 Code	英制 British expression	公制 Metric expression	长度 L mm	宽度 W mm	厚度 T mm	端子 E_1/ E_2 mm	间距 G mm (min.)	识别码 Code
4	008004	0201	0.25±0.013	0.125±0.013	0.125±0.013	0.05~0.10	0.05	F1
0	01005	0402	0.40±0.02	0.20±0.02	0.20±0.02	0.07~0.14	0.12	O1
1	0201	0603	0.60±0.03	0.30±0.03	0.30±0.03	0.10~0.20	0.2	A1
			0.60±0.05	0.30±0.05	0.30±0.05	0.10~0.20	0.2	A2
			0.60±0.09	0.30±0.09	0.30±0.09	0.10~0.25	0.2	A3
			0.60±0.09	0.30±0.09	0.30±0.15	0.10~0.25	0.2	A4
2	0402	1005	1.00±0.05	0.50±0.05	0.50±0.05	0.15~0.35	0.3	B1
			1.00±0.10	0.50±0.10	0.50±0.10	0.15~0.35	0.3	B2
			1.00±0.15	0.50±0.15	0.50±0.15	0.15~0.35	0.3	B3
			1.00±0.20	0.50±0.20	0.50±0.20	0.15~0.35	0.3	B4
3	0603	1608	1.60±0.10	0.80±0.10	0.80±0.10	0.20~0.60	0.4	C1
			1.60±0.15	0.80±0.15	0.80±0.15	0.20~0.60	0.4	C2
			1.60±0.20	0.80±0.20	0.80±0.20	0.20~0.60	0.4	C3
5	0805	2012	2.00±0.10	1.25±0.10	0.60±0.10	0.25~0.75	0.7	D1
			2.00±0.10	1.25±0.10	0.85±0.10	0.25~0.75	0.7	D2
			2.00±0.20	1.25±0.20	1.25±0.20	0.25~0.75	0.7	D3
6	1206	3216	3.20±0.15	1.60±0.15	0.60±0.10	0.25~0.75	1.4	E1
			3.20±0.15	1.60±0.15	0.85±0.10	0.25~0.75	1.4	E2
			3.20±0.20	1.60±0.20	1.00±0.10	0.25~0.75	1.4	E3
			3.20±0.20	1.60±0.20	1.15±0.10	0.25~0.75	1.4	E4
			3.20±0.20	1.60±0.20	1.25±0.20	0.25~0.75	1.4	E5
			3.20±0.30	1.60±0.30	1.60±0.20	0.25~0.75	1.4	E6
			3.20±0.30	1.60±0.30	1.60±0.30	0.25~0.75	1.4	E7
7	1210	3225	3.20±0.20	2.50±0.20	0.85±0.10	0.25~0.75	1.4	G1
			3.20±0.40	2.50±0.30	1.25±0.20	0.25~0.75	1.4	G2
			3.20±0.40	2.50±0.30	1.60±0.20	0.25~0.75	1.4	G3
			3.20±0.40	2.50±0.30	1.90±0.20	0.25~0.75	1.4	G4
			3.20±0.40	2.50±0.30	2.00±0.20	0.25~0.75	1.4	G5
			3.20±0.40	2.50±0.30	2.50±0.20	0.25~0.75	1.4	G6
			3.20±0.40	2.50±0.30	2.50±0.30	0.25~0.75	1.4	G7

8	1808	4520	4.50±0.40	2.00±0.30	1.25±0.20	0.25~0.75	2.2	H1
			4.50±0.40	2.00±0.30	1.35±0.15	0.25~0.75	2.2	H2
			4.50±0.40	2.00±0.30	1.60±0.20	0.25~0.75	2.2	H3
			4.50±0.40	2.00±0.30	2.00±0.20	0.25~0.75	2.2	H4
9	1812	4532	4.50±0.20	3.20±0.20	0.85±0.10	0.25~0.75	2.2	J1
			4.50±0.20	3.20±0.20	1.25±0.20	0.25~0.75	2.2	J2
			4.50±0.40	3.20±0.40	1.60±0.20	0.25~0.75	2.2	J3
A	2220	5750	5.70±0.40	5.00±0.30	2.00±0.20	0.25~0.75	3.4	K1

备注：产品尺寸码请查阅本规格书中第三部分“产品型别与尺寸码”。

Note：Dimension code of products can read part 3 “Products type and dimension code” in this datasheet.

⑤ 容值允差 Capacitance Tolerance

B=±0.1pF	F=±1%	K=±10%
C=±0.25pF	G=±2%	M=±20%
D=±0.5pF	J=±5%	Z=－20%~＋80%

⑥ 额定电压 Rated Voltage

2=2.5V	7=16V	0=100V	Z=630V
4=4V	8=25V	A=200V	C=1KV
5=6.3V	3=35V	Y=250V	D=2KV
6=10V	9=50V	B=500V	

⑦ 包装方式 Package style

B=散包装 (Bulk)

D=纸带包装，7 英寸胶盘 (Paper Tape & 7" Reel)

E=塑料载带包装，7 英寸胶盘 (Plastic Tape & 7" Reel)

F=纸带包装，13 英寸胶盘 (Paper Tape & 13" Reel)

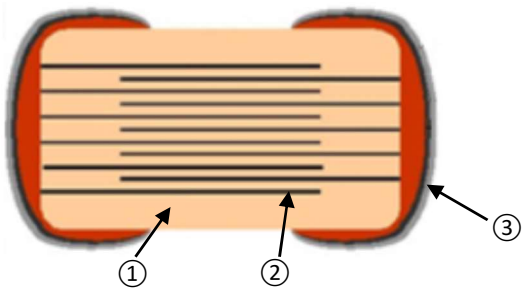
G=塑料载带包装，13 英寸胶盘 (Plastic Tape & 13" Reel)

⑧ 厚度代码 Thickness Code

尺寸（英制） Dimension (British expression)	尺寸（公制） Dimension (Metric expression)	厚度中心值 Thickness central value mm	厚度代码 Thickness Code
008004	0201	0.125	0
01005	0402	0.20	0
0201	0603	0.30	0
0402	1005	0.50	0
0603	1608	0.80	0
0805	2012	0.60	0
		0.85	1
		1.25	2

1206	3216	0.60	0
		0.85	1
		1.00	2
		1.15	3
		1.25	4
		1.60	5
1210	3225	0.85	0
		1.25	1
		1.60	2
		1.90	3
		2.00	4
		2.50	5
1808	4520	1.25	0
		1.35	1
		1.60	2
		2.00	3
1812	4532	0.85	0
		1.25	1
		1.60	2
2220	5750	2.00	0

二、产品结构及组成 Structure：



序号 No.	名称 Name
①	陶瓷介质 Ceramic Dielectric
②	内电极 Electrode
③	端电极 Termination

三、产品型别与尺寸码 Products type and dimension code

3.1 产品型别与尺寸码（X7R）：Production type & Dimension code (X7R)

容值	01005/X7R			0201/X7R				
	6.3V	10V	16V	6.3V	10V	16V	25V	50V
100pF	O1	O1	O1	A1	A1	A1	A1	A1
120pF	O1	O1	O1	A1	A1	A1	A1	A1
150pF	O1	O1	O1	A1	A1	A1	A1	A1
180pF	O1	O1	O1	A1	A1	A1	A1	A1
220pF	O1	O1	O1	A1	A1	A1	A1	A1
330pF	O1	O1	O1	A1	A1	A1	A1	A1
390pF	O1	O1	O1	A1	A1	A1	A1	A1
470pF	O1	O1	O1	A1	A1	A1	A1	A1
560pF	O1	O1	O1	A1	A1	A1	A1	A1
680pF	O1	O1	O1	A1	A1	A1	A1	A1
820pF	O1	O1	O1	A1	A1	A1	A1	A1
1nF	O1	O1	O1	A1	A1	A1	A1	A1
1.2nF				A1	A1	A1	A1	
1.5nF				A1	A1	A1	A1	
1.8nF				A1	A1	A1	A1	
2.2nF				A1	A1	A1	A1	
3.3nF				A1	A1	A1	A1	
3.9nF				A1	A1	A1	A1	
4.7nF				A1	A1	A1	A1	
6.8nF				A1	A1	A1	A1	
8.2nF				A1	A1	A1	A1	
10nF				A1	A1	A1	A1	
12nF				A1	A1			
15nF				A1	A1			
18nF				A1	A1			
22nF				A1	A1			
33nF				A1	A1			
39nF				A1	A1			
47nF				A1	A1			
56nF				A1	A1			
68nF				A1	A1			
82nF				A1	A1			
100nF				A1	A1			

容值	0402/X7R							
	6.3V	10V	16V	25V	50V	100V	200V	250V
100pF	B1	B1	B1	B1	B1	B1	B1	B1
150pF	B1	B1	B1	B1	B1	B1	B1	B1
220pF	B1	B1	B1	B1	B1	B1	B1	B1
330pF	B1	B1	B1	B1	B1	B1	B1	B1
470pF	B1	B1	B1	B1	B1	B1	B1	B1
680pF	B1	B1	B1	B1	B1	B1	B1	B1
1nF	B1	B1	B1	B1	B1	B1	B1	B1
1.2nF	B1	B1	B1	B1	B1	B1	B1	B1
1.5nF	B1	B1	B1	B1	B1	B1	B1	B1
1.8nF	B1	B1	B1	B1	B1	B1	B1	B1
2.2nF	B1	B1	B1	B1	B1	B1	B1	B1
3.3nF	B1	B1	B1	B1	B1	B1	B1	B1
3.9nF	B1	B1	B1	B1	B1	B1	B1	B1
4.7nF	B1	B1	B1	B1	B1	B1	B1	B1
6.8nF	B1	B1	B1	B1	B1	B1	B1	B1
8.2nF	B1	B1	B1	B1	B1	B1	B1	B1
10nF	B1	B1	B1	B1	B1	B1	B1	B1
12nF	B1	B1	B1	B1	B1			
15nF	B1	B1	B1	B1	B1			
18nF	B1	B1	B1	B1	B1			
22nF	B1	B1	B1	B1	B1			
33nF	B1	B1	B1	B1	B1			
39nF	B1	B1	B1	B1	B1			
47nF	B1	B1	B1	B1	B1			
56nF	B1	B1	B1	B1	B1			
68nF	B1	B1	B1	B1	B1			
82nF	B1	B1	B1	B1	B1			
100nF	B1	B1	B1	B1	B1			
220nF	B1	B1	B1	B1				
330nF	B1	B1						
470nF	B1	B1						
680nF	B1	B1						
1.0uF	B1	B1						
2.2uF	B4							

容值	0603/X7R							
	6.3V	10V	16V	25V	50V	100V	200V	250V
100pF	C1	C1	C1	C1	C1	C1	C1	C1
150pF	C1	C1	C1	C1	C1	C1	C1	C1
220pF	C1	C1	C1	C1	C1	C1	C1	C1
330pF	C1	C1	C1	C1	C1	C1	C1	C1
470pF	C1	C1	C1	C1	C1	C1	C1	C1
680pF	C1	C1	C1	C1	C1	C1	C1	C1
1nF	C1	C1	C1	C1	C1	C1	C1	C1
1.5nF	C1	C1	C1	C1	C1	C1	C1	C1
2.2nF	C1	C1	C1	C1	C1	C1	C1	C1
3.3nF	C1	C1	C1	C1	C1	C1	C1	C1
4.7nF	C1	C1	C1	C1	C1	C1	C1	C1
6.8nF	C1	C1	C1	C1	C1	C1	C1	C1
10nF	C1	C1	C1	C1	C1	C1	C1	C1
15nF	C1	C1	C1	C1	C1	C1	C1	C1
22nF	C1	C1	C1	C1	C1	C1	C1	C1
33nF	C1	C1	C1	C1	C1	C1		
47nF	C1	C1	C1	C1	C1	C1		
68nF	C1	C1	C1	C1	C1	C1		
100nF	C1	C1	C1	C1	C1	C1		
150nF	C1	C1	C1	C1	C1			
220nF	C1	C1	C1	C1	C1			
330nF	C1	C1	C1	C1	C1			
470nF	C1	C1	C1	C1	C1			
680nF	C1	C1	C1	C1	C2			
1.0uF	C1	C1	C1	C1	C2			
2.2uF	C1	C1	C3					
4.7uF	C3	C3	C3					

容值	0805/X7R										
	6.3V	10V	16V	25V	50V	100V	200V	250V	500V	630V	1KV
100pF	D1	D1	D1	D1	D1	D1	D2	D2			
150pF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
220pF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
330pF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
470pF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
680pF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
1nF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D2
1.5nF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D3
2.2nF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D3
3.3nF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	D3
4.7nF	D1	D1	D1	D1	D1	D1	D2	D2	D2	D2	
6.8nF	D1	D1	D1	D1	D1	D1	D3	D3	D2	D2	
10nF	D1	D1	D1	D1	D1	D1	D3	D3	D3	D3	
15nF	D1	D1	D1	D1	D1	D2	D3	D3	D3		
22nF	D1	D1	D1	D1	D1	D2	D3	D3	D3		
33nF	D2	D2	D2	D2	D2	D3	D3	D3			
47nF	D2	D2	D2	D2	D2	D3	D3	D3			
68nF	D2	D2	D2	D2	D2	D3					
100nF	D2	D2	D2	D2	D2	D3					
150nF	D2	D2	D2	D2	D2	D3					
220nF	D2	D2	D2	D2	D2/D3	D3					
330nF	D3	D3	D3	D3	D2/D3	D3					
470nF	D3	D3	D3	D3	D2/D3	D3					
680nF	D3	D3	D3	D3	D2/D3	D3					
1.0uF	D3	D3	D2/D3	D2/D3	D2/D3	D3					
2.2uF	D3	D3	D3	D3	D3						
4.7uF	D3	D3	D3	D3							
10uF	D3	D3	D3								

容值	1206/X7R											
	6.3V	10V	16V	25V	50V	100V	200V	250V	500V	630V	1KV	2KV
220pF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
330pF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
470pF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
560pF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
680pF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
1nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
1.5nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	E5
2.2nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	
3.3nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	
4.7nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	
6.8nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	
10nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5	E5	
15nF	E2	E2	E2	E2	E2	E2	E2	E2	E5	E5		
22nF	E2	E2	E2	E2	E2	E2	E5	E5	E6	E6		
33nF	E2	E2	E2	E2	E2	E2	E5	E5	E6	E6		
47nF	E2	E2	E2	E2	E2	E2	E5	E5				
68nF	E2	E2	E2	E2	E2	E2/E5	E5	E5				
100nF	E2	E2	E2	E2	E2	E2/E5	E6	E6				
150nF	E2	E2	E2	E2	E2	E2/E5	E6	E6				
220nF	E2	E2	E2	E2	E2	E2/E5	E6	E6				
330nF	E2	E2	E2	E2	E2/E5	E6						
470nF	E2	E2	E2	E2	E2/E5	E6						
680nF	E4	E4	E4	E4	E5/E6	E6						
1.0uF	E4	E4	E4	E4	E5/E6	E6						
2.2uF	E4	E4	E4	E4/E6	E6							
4.7uF	E6	E6	E6	E6	E6							
10uF	E6	E6	E6	E6	E7							
22uF	E6	E6	E7									

容值	1210/X7R											
	6.3V	10V	16V	25V	50V	100V	200V	250V	500V	630V	1KV	2KV
220pF											G2	G2
330pF											G2	G2
470pF											G2	G2
560pF											G2	G2
680pF											G2	G2
1nF											G2	G2
1.5nF											G2	G2
2.2nF	G1	G1	G1	G1	G1	G1	G1	G1			G2	G3
3.3nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G2	G2	
4.7nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G2	G2	
6.8nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G2	G2	
10nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G2	G2	
15nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G2	G2	
22nF	G1	G1	G1	G1	G1	G1	G1	G1	G2	G3	G3	
33nF	G1	G1	G1	G1	G1	G1	G2	G2	G2	G5		
47nF	G1	G1	G1	G1	G1	G1	G2	G2	G2	G5		
68nF	G1	G1	G1	G1	G1	G1	G2	G2	G3			
100nF	G1	G1	G1	G1	G1	G1	G2	G2	G5			
150nF	G1	G1	G1	G1	G2	G2	G2	G2				
220nF	G1	G1	G1	G1	G2	G2	G2	G2				
330nF	G1	G1	G1	G1	G2	G2						
470nF	G2	G2	G2	G2	G2	G2						
680nF	G2	G2	G2	G2	G2	G5						
1.0uF	G2	G2	G2	G2	G2	G5						
2.2uF	G5	G5	G5	G5	G5	G5						
4.7uF	G4	G4	G4	G4	G7							
10uF	G4	G4	G4	G4	G7							
22uF	G6	G6	G6	G6								
47uF	G6	G6										

容值	1808/X7R		1812/X7R							
	1KV	2KV	50V	100V	200V	250V	500V	630V	1KV	2KV
220pF										
330pF										
470pF	H2	H2								
560pF	H2	H2								
680pF	H2	H2								
1nF	H2	H2					J1	J1	J1	J1
1.5nF	H2	H2					J1	J1	J1	J1
2.2nF	H2	H3					J1	J1	J1	J1
3.3nF	H2						J1	J1	J1	J1
4.7nF	H2		J1	J1	J1	J1	J1	J1	J1	J1
6.8nF	H3		J1	J1	J1	J1	J1	J1	J1	
10nF	H3		J1	J1	J1	J1	J1	J1	J1	
15nF			J1	J1	J1	J1	J1	J1	J1	
22nF			J1	J1	J1	J1	J1	J1	J1	
33nF			J1	J1	J1	J1	J1	J2	J2	
47nF			J1	J1	J1	J1	J1	J2		
68nF			J1	J1	J1	J1	J1	J3		
100nF			J2	J2	J2	J2	J2	J3		
150nF			J2	J2	J2	J2	J2			
220nF			J2	J2	J2	J2	J2			
330nF			J2	J2	J2	J2	J2			
470nF			J2	J2	J2	J2	J2			
680nF			J3	J3	J3	J3	J3			
1.0uF			J3	J3	J3	J3	J3			

3.2 产品型别与尺寸码（C0G）：Production type & Dimension code (C0G)

容值	01005/C0G			0201/C0G			0402/C0G		
	16V	25V	50V	25V	50V	100V	25V	50V	100V
0.47pf	O1	O1	O1	A1	A1	A1	B1	B1	B1
0.82pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
1.0pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
1.2pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
1.5pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
1.8pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
2.2pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
2.7pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
3.3pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
3.9pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
4.7pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
5.6pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
6.8pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
8.2pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
10pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
12pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
15pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
18pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
22pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
27pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
33pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
39pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
47pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
56pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
68pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
82pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
100pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
120pF	O1	O1	O1	A1	A1	A1	B1	B1	B1
150pF	O1	O1	O1				B1	B1	B1
180pF	O1	O1					B1	B1	B1
220pF	O1	O1					B1	B1	B1
270pF	O1	O1					B1	B1	B1
330pF	O1	O1					B1	B1	B1
390pF	O1	O1					B1	B1	B1
470pF	O1	O1					B1	B1	B1
560pF							B1	B1	B1
680pF							B1	B1	B1
820pF							B1	B1	B1
1nF							B1	B1	B1

容值	0603/C0G					
	16V	25V	50V	100V	200V	250V
0.47pf	C1	C1	C1	C1	C1	C1
0.82pF	C1	C1	C1	C1	C1	C1
1.0pF	C1	C1	C1	C1	C1	C1
1.2pF	C1	C1	C1	C1	C1	C1
1.5pF	C1	C1	C1	C1	C1	C1
1.8pF	C1	C1	C1	C1	C1	C1
2.2pF	C1	C1	C1	C1	C1	C1
2.7pF	C1	C1	C1	C1	C1	C1
3.3pF	C1	C1	C1	C1	C1	C1
3.9pF	C1	C1	C1	C1	C1	C1
4.7pF	C1	C1	C1	C1	C1	C1
5.6pF	C1	C1	C1	C1	C1	C1
6.8pF	C1	C1	C1	C1	C1	C1
8.2pF	C1	C1	C1	C1	C1	C1
10pF	C1	C1	C1	C1	C1	C1
12pF	C1	C1	C1	C1	C1	C1
15pF	C1	C1	C1	C1	C1	C1
18pF	C1	C1	C1	C1	C1	C1
22pF	C1	C1	C1	C1	C1	C1
27pF	C1	C1	C1	C1	C1	C1
33pF	C1	C1	C1	C1	C1	C1
39pF	C1	C1	C1	C1	C1	C1
47pF	C1	C1	C1	C1	C1	C1
56pF	C1	C1	C1	C1	C1	C1
68pF	C1	C1	C1	C1	C1	C1
82pF	C1	C1	C1	C1	C1	C1
100pF	C1	C1	C1	C1	C1	C1
120pF	C1	C1	C1	C1	C1	C1
150pF	C1	C1	C1	C1	C1	C1
180pF	C1	C1	C1	C1	C1	C1
220pF	C1	C1	C1	C1	C1	C1
270pF	C1	C1	C1	C1	C1	C1
330pF	C1	C1	C1	C1	C1	C1
390pF	C1	C1	C1	C1	C1	C1
470pF	C1	C1	C1	C1	C1	C1
560pF	C1	C1	C1	C1	C1	C1
680pF	C1	C1	C1	C1	C1	C1
820pF	C1	C1	C1	C1	C1	C1
1nF	C1	C1	C1	C1		
1.2nF	C1	C1	C1	C1		
1.5nF	C1	C1	C1	C1		

1.8nF	C1	C1	C1	C1		
2.2nF	C1	C1	C1	C1		
2.7nF	C1	C1	C1	C1		
3.3nF	C1	C1	C1	C1		
3.9nF	C1	C1	C1	C1		
4.7nF	C1	C1	C1	C1		
5.6nF	C1	C1	C1	C1		
6.8nF	C1	C1	C1	C1		
8.2nF	C1	C1	C1	C1		
10nF	C1	C1	C1	C1		

容值	0805/C0G								
	16V	25V	50V	100V	200V	250V	500V	630V	1KV
0.47pf	D1	D1	D1	D1	D1	D1	D1	D1	D1
0.82pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
1.0pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
1.2pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
1.5pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
1.8pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
2.2pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
2.7pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
3.3pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
3.9pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
4.7pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
5.6pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
6.8pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
8.2pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
10pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
12pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
15pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
18pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
22pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
27pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
33pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
39pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
47pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
56pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
68pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
82pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
100pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
120pF	D1	D1	D1	D1	D1	D1	D1	D1	D1
150pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
180pF	D1	D1	D1	D1	D2	D2	D2	D2	D2

220pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
270pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
330pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
390pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
470pF	D1	D1	D1	D1	D2	D2	D2	D2	D2
560pF	D1	D1	D1	D1	D2	D2	D3	D3	D3
680pF	D1	D1	D1	D1	D2	D2	D3	D3	D3
820pF	D1	D1	D1	D1	D2	D2	D3	D3	D3
1nF	D1	D1	D1	D1	D2	D2	D3	D3	D3
1.2nF	D2	D2	D2	D2	D3	D3			
1.5nF	D2	D2	D2	D2	D3	D3			
1.8nF	D2	D2	D2	D2	D3	D3			
2.2nF	D3	D3	D3	D3	D3	D3			
2.7nF	D3	D3	D3	D3	D3	D3			
3.3nF	D3	D3	D3	D3	D3	D3			
3.9nF	D3	D3	D3	D3	D3	D3			
4.7nF	D3	D3	D3	D3	D3	D3			
5.6nF	D3	D3	D3	D3					
6.8nF	D3	D3	D3	D3					
8.2nF	D3	D3	D3	D3					
10nF	D3	D3	D3	D3					

容值	1206/C0G									
	16V	25V	50V	100V	200V	250V	500V	630V	1KV	2KV
0.47pf	E1	E1	E1	E1	E1	E1				
0.82pF	E1	E1	E1	E1	E1	E1				
1.0pF	E1	E1	E1	E1	E1	E1			E2	
1.2pF	E1	E1	E1	E1	E1	E1			E2	
1.5pF	E1	E1	E1	E1	E1	E1			E2	
1.8pF	E1	E1	E1	E1	E1	E1			E2	
2.2pF	E1	E1	E1	E1	E1	E1			E2	
2.7pF	E1	E1	E1	E1	E1	E1			E2	
3.3pF	E1	E1	E1	E1	E1	E1			E2	
3.9pF	E1	E1	E1	E1	E1	E1			E2	
4.7pF	E1	E1	E1	E1	E1	E1			E2	
5.6pF	E1	E1	E1	E1	E1	E1			E2	
6.8pF	E1	E1	E1	E1	E1	E1			E2	
8.2pF	E1	E1	E1	E1	E1	E1			E2	
10pF	E1	E1	E1	E1	E1	E1	E1	E5	E2/E5	E5
12pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
15pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
18pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
22pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5

27pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
33pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
39pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
47pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
56pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
68pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
82pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
100pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
120pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
150pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
180pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
220pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	E5
270pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	
330pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	
390pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	
470pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	
560pF	E1	E1	E1	E1	E1	E1	E1	E5	E5	
680pF	E1	E1	E1	E1	E2	E2	E1	E5	E5	
820pF	E1	E1	E1	E1	E2	E2	E2	E5	E5	
1nF	E1	E1	E1	E1	E2	E2	E2	E5	E5	
1.2nF	E1	E1	E1	E1	E2	E2	E2	E5		
1.5nF	E1	E1	E1	E1	E2	E2	E2	E5		
1.8nF	E1	E1	E1	E1	E5	E5	E5	E5		
2.2nF	E1	E1	E1	E1	E5	E5	E5	E5		
2.7nF	E1	E1	E1	E1	E5	E5	E5	E5		
3.3nF	E2	E2	E2	E2	E5	E5	E5	E5		
3.9nF	E2	E2	E2	E2	E5	E5	E5	E5		
4.7nF	E2	E2	E2	E2			E5	E5		
5.6nF	E2	E2	E2	E2			E5	E5		
6.8nF	E2	E2	E2	E2			E5	E5		
8.2nF	E5	E5	E5	E5			E6	E6		
10nF	E5	E5	E5	E5			E6	E6		
12nF	E2	E2	E2							
15nF	E2	E2	E2							
18nF	E2	E2	E2							
22nF	E2	E2	E2							
33nF	E2	E2	E2							
47nF	E5	E5	E5							
56nF	E6	E6	E6							
68nF	E6	E6	E6							
82nF	E6	E6	E6							
100nF	E6	E6	E6							

容值		1210/C0G							
	25V	50V	100V	200V	250V	500V	630V	1KV	2KV
33pF							G2	G2	G2
39pF							G2	G2	G2
47pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
56pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
68pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
82pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
100pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
120pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
150pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
180pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
220pF	G2	G2	G2	G2	G2	G2	G2	G2	G2
270pF	G2	G2	G2	G2	G2	G2	G2	G2	
330pF	G2	G2	G2	G2	G2	G2	G2	G2	
390pF	G2	G2	G2	G2	G2	G2	G2	G2	
470pF	G2	G2	G2	G2	G2	G2	G2	G2	
560pF	G2	G2	G2	G2	G2	G2	G2	G2	
680pF	G2	G2	G2	G2	G2	G2	G2	G2	
820pF	G2	G2	G2	G2	G2	G2	G2	G2	
1nF	G2	G2	G2	G2	G2	G2	G2	G2	
1.2nF	G2	G2	G2	G2	G2	G2			
1.5nF	G2	G2	G2	G2	G2	G2			
1.8nF	G2	G2	G2	G2	G2	G2			
2.2nF	G2	G2	G2	G2	G2	G2			
2.7nF	G2	G2	G2	G2	G2				
3.3nF	G2	G2	G2	G2	G2				
3.9nF	G2	G2	G2	G2	G2				
4.7nF	G2	G2	G2	G2	G2				
5.6nF	G2	G2	G2						
6.8nF	G2	G2	G2						
8.2nF	G2	G2	G2						
10nF	G2	G2	G2						
12nF	G2	G2	G2						
15nF	G2	G2	G2						
18nF	G2	G2	G3						
22nF	G2	G2	G3						
33nF	G3	G3							
47nF	G3	G3							
56nF									
68nF									
82nF									
100nF									

容值	1808/C0G		1812/COG						
	1KV	2KV	100V	200V	250V	500V	630V	1KV	2KV
10pF								J2	J2
12pF								J2	J2
15pF								J2	J2
18pF								J2	J2
22pF								J2	J2
27pF								J2	J2
33pF	H1	H1						J2	J2
39pF	H1	H1						J2	J2
47pF	H1	H1						J2	J2
56pF	H1	H1				J2	J2	J2	J2
68pF	H1	H1				J2	J2	J2	J2
82pF	H1	H1				J2	J2	J2	J2
100pF	H1	H1				J2	J2	J2	J2
120pF	H1	H1				J2	J2	J2	J2
150pF	H1	H1				J2	J2	J2	J2
180pF	H1	H1				J2	J2	J2	J2
220pF	H1	H1				J2	J2	J2	J2
270pF	H1	H1				J2	J2	J2	J2
330pF	H1	H1	J2	J2	J2	J2	J2	J2	J2
390pF	H1	H1	J2	J2	J2	J2	J2	J2	J2
470pF	H1	H1	J2	J2	J2	J2	J2	J2	J2
560pF	H1	H1	J2	J2	J2	J2	J2	J2	J2
680pF			J2	J2	J2	J2	J2	J2	J2
820pF			J2	J2	J2	J2	J2	J2	J2
1nF			J2	J2	J2	J2	J2	J2	J2
1.2nF			J2	J2	J2	J2	J2	J2	
1.5nF			J2	J2	J2	J2	J2	J2	
1.8nF			J2	J2	J2	J2			
2.2nF			J2	J2	J2	J2			
2.7nF			J2	J2	J2	J2			
3.3nF			J2	J2	J2	J2			
3.9nF			J2	J2	J2	J2			
4.7nF			J2	J2	J2	J2			
5.6nF			J2	J2					
6.8nF			J2						
8.2nF			J2						
10nF			J2						
12nF			J2						
15nF			J2						
18nF			J2						
22nF			J2						

3.3 产品型别与尺寸码（X5R）：Production type & Dimension code (X5R)

容值	01005/X5R			
	4V	6.3V	10V	16V
100pF	O1	O1	O1	O1
150pF	O1	O1	O1	O1
220pF	O1	O1	O1	O1
330pF	O1	O1	O1	O1
470pF	O1	O1	O1	O1
680pF	O1	O1	O1	O1
1nF	O1	O1	O1	O1
1.5nF	O1	O1	O1	O1
1.8nF	O1	O1	O1	O1
2.2nF	O1	O1	O1	O1
3.3nF	O1	O1	O1	O1
4.7nF	O1	O1	O1	O1
6.8nF	O1	O1	O1	O1
10nF	O1	O1	O1	O1
15nF	O1	O1	O1	
22nF	O1	O1	O1	
33nF	O1	O1	O1	
47nF	O1	O1	O1	
68nF	O1	O1	O1	
100nF	O1	O1	O1	
150nF	O1	O1		
220nF	O1	O1		

容值	0201/X5R						
	2.5V	4V	6.3V	10V	16V	25V	50V
100pF			A1	A1	A1	A1	A1
150pF			A1	A1	A1	A1	A1
220pF			A1	A1	A1	A1	A1
330pF			A1	A1	A1	A1	A1
470pF			A1	A1	A1	A1	A1
680pF			A1	A1	A1	A1	A1
1nF			A1	A1	A1	A1	A1
1.5nF			A1	A1	A1	A1	A1
1.8nF			A1	A1	A1	A1	A1
2.2nF			A1	A1	A1	A1	A1
3.3nF			A1	A1	A1	A1	A1
4.7nF			A1	A1	A1	A1	A1
6.8nF			A1	A1	A1	A1	A1
10nF			A1	A1	A1	A1	A1
15nF			A1	A1	A1	A1	
22nF			A1	A1	A1	A1	
33nF			A1	A1	A1	A1	
47nF			A1	A1	A1	A1	
68nF			A1	A1	A1	A1	
100nF			A1	A1	A1	A1	
150nF			A1	A1	A1	A1	
220nF	A1	A1	A1	A1	A1	A1	
330nF	A1	A1	A1	A2	A3		
470nF	A1	A1	A1	A2	A3		
680nF	A2	A2	A2	A2	A3		
1.0uF	A2	A2	A2	A2/A3			
2.2uF	A3	A3	A3	A3			
4.7uF	A4	A4					

容值	0402/X5R						
	2.5V	4V	6.3V	10V	16V	25V	50V
22nF			B1	B1	B1	B1	B1
33nF			B1	B1	B1	B1	B1
47nF			B1	B1	B1	B1	B1
68nF			B1	B1	B1	B1	B1
100nF			B1	B1	B1	B1	B1
150nF			B1	B1	B1	B1	B2
220nF			B1	B1	B1	B1	B2
330nF			B1	B1	B1	B1	B2
470nF			B1	B1	B1	B1	B2
680nF			B1	B1	B1	B1	B4
1.0uF			B1	B1	B1	B1	B4
2.2uF	B1	B1	B1	B1	B3	B3	
4.7uF	B3	B3	B3	B3	B3/B4		
10uF	B4	B4	B4	B4			

容值	0603/X5R						
	4V	6.3V	10V	16V	25V	35V	50V
10nF		C1	C1	C1	C1	C1	C1
15nF		C1	C1	C1	C1	C1	C1
22nF		C1	C1	C1	C1	C1	C1
33nF		C1	C1	C1	C1	C1	C1
47nF		C1	C1	C1	C1	C1	C1
68nF		C1	C1	C1	C1	C1	C1
100nF		C1	C1	C1	C1	C1	C1
150nF		C1	C1	C1	C1	C1	C1
220nF		C1	C1	C1	C1	C1	C1
330nF		C1	C1	C1	C1	C1	C1
470nF		C1	C1	C1	C1	C1	C1
680nF		C1	C1	C1	C1	C1	C1
1.0uF		C1	C1	C1	C1	C1	C1
2.2uF		C1	C1	C1	C2	C2	C3
4.7uF		C1	C1	C2	C2	C2	
10uF		C2	C3	C3	C3	C3	
22uF		C3	C3				
47uF	C3	C3					

容值	0805/X5R					
	6.3V	10V	16V	25V	35V	50V
470nF	D2/D3	D2/D3	D2/D3	D3	D3	D3
680nF	D2/D3	D2/D3	D2/D3	D3	D3	D3
1.0uF	D2/D3	D2/D3	D2/D3	D3	D3	D3
2.2uF	D2/D3	D2/D3	D2/D3	D3	D3	D3
4.7uF	D2/D3	D2/D3	D2/D3	D3	D3	D3
10uF	D2/D3	D2/D3	D2/D3	D3	D3	
22uF	D3	D3	D3	D3		
47uF	D3					

容值	1206/X5R				
	6.3V	10V	16V	25V	50V
1.0uF	E4	E4	E4	E4	E6
2.2uF	E4	E4	E4	E4	E6
4.7uF	E6	E6	E6	E6	E6
10uF	E6	E6	E6	E6	E7
22uF	E6	E6	E6	E7	
47uF	E6	E6	E7	E7	
100uF	E7	E7			

容值	1210/X5R				
	6.3V	10V	16V	25V	50V
1.0uF	G2	G2	G2	G2	G2
2.2uF	G4	G4	G4	G4	G4
4.7uF	G4	G4	G4	G4	G6
10uF	G4	G4	G4	G4	G7
22uF	G6	G6	G6	G7	
47uF	G6	G6	G6		
100uF	G7	G7	G7		
220uF	G7				

四、信赖性测试及要求 Reliability test and judgement condition

<table>
<tr><th>编号
No.</th><th>项目
Item</th><th colspan="2">技术规格
Specification</th><th colspan="3">测试方法
Test Method</th></tr>
<tr><td rowspan="6">1</td><td rowspan="6">容值
Capacitance
(IEC60384-21/22
8.6.1)</td><td rowspan="3">C0G</td><td rowspan="3">符合指定的精度要求
Within the specified tolerance</td><td>额定容值
Capacitance</td><td>测试频率
Measuring
Frequency</td><td>测试电压
Measuring
Voltage</td></tr>
<tr><td>≤1000pF</td><td>1MHz±10%</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td>>1000pF</td><td>1KHz±10%</td></tr>
<tr><td rowspan="3">X7R
X5R</td><td rowspan="3">符合指定的精度要求
Within the specified tolerance</td><td>额定容值
Capacitance</td><td>测试频率
Measuring
Frequency</td><td>测试电压
Measuring
Voltage</td></tr>
<tr><td>≤10uF (Ur>6.3V)</td><td>1KHz±10%</td><td>1.0±0.2Vrms</td></tr>
<tr><td>≤10uF (Ur≤6.3V)</td><td>1KHz±10%</td><td>0.5±0.1Vrms</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">损耗角正切
（DF, tanδ）
Dissipation Factor
(IEC60384-21/22
8.6.2)</td><td>C0G</td><td>30pFmin: DF≤0.1%
30pFmax: DF≤1/(400+20C)</td><td colspan="3" rowspan="2">参考容值测试方法
Refer to test method of capacitance</td></tr>
<tr><td>X7R
X5R</td><td>参考损耗角规格表
See the table of DF specification</td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">绝缘阻抗（IR）
Insulation
Resistance
(IEC60384-21/22
8.6.3)</td><td>C0G</td><td>10,000MΩ 或 RC500Ω·F，取较小值
10,000MΩ or 500Ω·F, whichever is less</td><td colspan="3" rowspan="2">测试电压：额定电压(超过 500V 的产品使用 500V 测试)
测试时间：60 秒
Measurement voltage: Rated voltage (if rated voltage is above 500V, I.R should be measured with 500V)
Charging time:60s</td></tr>
<tr><td>X7R
X5R</td><td>10,000MΩ 或 500/100/50Ω·F，取较小值
10,000MΩ or 500/100/50Ω·F, whichever is less</td></tr>
<tr><td>4</td><td>耐电压
Voltage proof
(IEC60384-21/22
8.6.4)</td><td colspan="2">没有击穿或闪火
No breakdown or flashover</td><td colspan="3">测试电压：
Ur≤100V 系列: 2.5Ur
100V<Ur≤200V 系列：1.5Ur+100
200V<Ur≤500V 系列：1.3Ur+100
500V<Ur<1000V 系列：1.3Ur
电压施加时间 1~5 秒，充/放电电流不超过 50mA
Measurement voltage:
Ur≤100V series: 2.5Ur
100V<Ur≤200V series: 1.5Ur=100
200V<Ur≤500V series: 1.3Ur=100
500V<Ur<1000V series: 1.3Ur
Test time：1~5 second
Charge/discharge current is less than 50mA</td></tr>
</table>

<table>
<tr><td>编号
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Specification</td><td colspan="2">测试方法
Test Method</td></tr>
<tr><td>5</td><td>焊锡性
Solderability
(IEC60384-21/22 8.11)</td><td colspan="3">端子的上锡率大于 95%
The solder should cover over 95% of the critical area of each termination</td><td>有铅焊料:(Sn/Pb:63/37)
浸锡温度:235±5°C
浸锡时间:2±0.5s
Solder temperature:235±5°C
Dipping time:2±0.5s</td><td>无铅焊料:(Sn3.0Ag0.5Cu)
浸锡温度:245±5°C
浸锡时间:3±0.5s
Solder temperature:245±5°C
Dipping time:3±0.5s</td></tr>
<tr><td rowspan="4">6</td><td rowspan="4">抗焊锡热
Resistance to Soldering Heat
(IEC60384-21/22 8.10)</td><td rowspan="2">△C/C</td><td>C0G</td><td>±0.5% or ±0.5pF 取较大值
±0.5% or ±0.5pF, whichever large</td><td colspan="2" rowspan="4">初始测量：
150+0/-10°C预热 1 小时，然后室温放置 24±2 小时测量。
测试条件：
测试温度：260±5°C；
浸锡时间：10±1s
焊锡要求：Sn3.0Ag0.5Cu
Initial Measurement:
Perform a heat treatment at 150+0/-10°C for 1h then sit for 24±2h at room temperature and measure initial values.
Test method:
Immerse the capacitor in Sn-3.0Ag-0.5Cu solder solution at 260±5°C for 10±1s.</td></tr>
<tr><td>X7R
X5R</td><td>±10%</td></tr>
<tr><td>DF</td><td colspan="2">同产品初始规格
Within initial specification</td></tr>
<tr><td>IR</td><td colspan="2">同产品初始规格
Within initial specification</td></tr>
<tr><td>7</td><td>侧推
Adhesion Test
(IEC60384-21/22 8.8)</td><td colspan="3">外观无可见损伤
Appearance: No visible damage

端子没有脱离且无其他损伤
No removal of the terminations and other defect occur.</td><td colspan="2">电容焊接在测试板上，从产品侧面施加一个平行与测试板面的力量保持 10 秒钟。
力量要求：
尺寸≥0603:5N(0.51Kg)
尺寸 =0402:2.5N(0.256Kg)
尺寸 =0201:1N(0.102Kg)
Solder capacitor on the test substrate (glass epoxy board), apply a force for 10s to the line joining the terminations and in a plane parallel to the substrate.</td></tr>
</table>

<table>
<tr><th>编号
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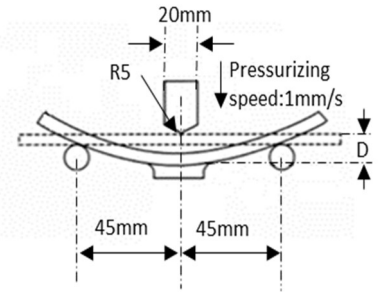
Specification</th><th>测试方法
Test Method</th></tr>
<tr><td rowspan="3">8</td><td rowspan="3">弯折性
Board Flex
(IEC60384-21/22 8.9)</td><td rowspan="2">△C/C</td><td>C0G</td><td>±1% or ±0.5pF 取较大值
±1% or ±0.5pF, whichever large</td><td rowspan="2">测试基板：PCB
弯曲深度：1mm
下压速度：1mm/s
在弯曲状态进行测量。


Test Board: PCB
Bending Depth:1mm
The measurement should be made with the board in the bending position</td></tr>
<tr><td>X5R
X7R</td><td>±10%</td></tr>
<tr><td colspan="3">外观无可见损伤
Appearance: No visible damage</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">容值温度特性
（TCC）
Temperature Characteristic of Capacitance
(IEC60384-21/22 8.7)</td><td rowspan="4">△C/C</td><td>C0G</td><td>±30ppm/℃</td><td rowspan="4">电容的容值应该在下表所规定的每一个步骤的温度点做测量。
Capacitance shall be measured by the steps shown in the following table
<table><tr><th>步骤Step</th><th>温度Temp.（℃）</th></tr><tr><td>1</td><td>参考温度±2
Reference Temp.±2</td></tr><tr><td>2</td><td>最小使用温度±3
Min operation Temp.±3</td></tr><tr><td>3</td><td>参考温度±2
Reference Temp.±2</td></tr><tr><td>4</td><td>最大使用温度±3
Max operation Temp.±3</td></tr><tr><td>5</td><td>参考温度±2
Reference Temp.±2</td></tr></table>容值温度特性计算方法：
TCC calculation method:
Class I(C0G):
$\frac{C_2 - C_1}{C_1 \times \triangle T} \times 10^6$
Class II(X7R/X5R/Y5V):
$\frac{C_2 - C_1}{C_1} \times 100\%$
C1：步骤 3 的容值
C1: Capacitance of step 3
C2：为步骤 2 或 4 的容值
C2: Capacitance of step 2 or 4</td></tr>
<tr><td>X5R
X7R
X8R</td><td>±15%</td></tr>
<tr><td>X7S
X6S</td><td>±22%</td></tr>
<tr><td>X7T
X6T</td><td>-33%~+22%</td></tr>
</table>

编号 No.	项目 Item	技术规格 Specification			测试方法 Test Method
10	温度快速变化 Rapid Change of Temperature (IEC60384-21/22 8.9)	△C/C	C0G	±1% or ±1pF 取较大值 ±1% or ±1pF, whichever is larger	前处理条件：150+0/-10℃预热 1 小时，然后室温放置 24±2 小时。 测试条件：高温保持 30 分钟，低温保持 30 分钟，温度切换时间小于 1 分钟 测试循环：5 个循环 Precondition: Perform a heat treatment at 150+0/-10℃ for 1h then sit for 24±2h at room temperature and measure initial values. Test condition: 30 minutes at upper category temperature 30 minutes at Lower category temperature Test cycle: 5 cycles，transfer time less than 1min.
			X5R X7R	±10%	
		DF	同产品初始规格 Within initial specification		
		IR	同产品初始规格 Within initial specification		
		外观无可见损伤 Appearance: No visible damage			
11	湿热特性 Damp Heat (IEC60384-21/22 8.14)	△C/C	C0G	±2% or ±1pF 取较大值 ±2% or ±1pF, whichever is larger	初始测量： 150+0/-10℃预热 1 小时，然后室温放置 24±2 小时测量。 测试电压：额定电压 测试时间：500 小时 温度：40±2℃ 湿度：90%~95%RH 充放电电流：不超过 50mA Initial Measurement: Perform a heat treatment at 150+0/-10℃ for 1h then sit for 24±2h at room temperature and measure initial values. Applied Voltage: Rated Voltage Duration:500h Temperature: 40±2℃ Humidity: 90%~95%RH Charge/Discharge Current: 50mA max.
			X5R X7R	常规产品：±15% 高容产品：±20% General parts: ±15% High capacitance parts: ±20%	
		DF	≤2 倍产品初始规格 Not more than twice of initial specification		
		IR	C0G	≥2.5E3MΩ 或 RC≥25ΩF，取较小的值 ≥2.5E3MΩ or RC≥25ΩF, whichever is smaller	
			X5R X7R	常规产品： ≥5E2MΩ 或 RC≥25ΩF，取较小的值 高容产品： RC≥5ΩF General Product: ≥5E2MΩ or RC≥25ΩF, whichever is smaller High cap product RC≥5ΩF	
		外观无可见损伤 Appearance: No visible damage			

<table>
<tr><th>编号
No.</th><th>项目
Item</th><th colspan="3">技术规格
Specification</th><th>测试方法
Test Method</th></tr>
<tr><td rowspan="5">12</td><td rowspan="5">耐久性
Operational Life
(IEC60384-21/22 8.15)</td><td rowspan="2">△C/C</td><td>C0G</td><td>±2% or ±1pF 取较大值
±2% or ±1pF, whichever is larger</td><td rowspan="5">初始测量：
150+0/-10℃预热 1 小时，然后室温放置 24±2 小时测量。
测试电压：
常规产品：2 倍额定电压
高容产品：1/1.5 倍额定电压
中高压产品：
<table><tr><td>额定电压(Ur)</td><td>C0G</td><td>X7R</td><td>X5R</td></tr><tr><td>Ur≤100V</td><td>2.0Ur</td><td>2.0Ur</td><td>2.0Ur</td></tr><tr><td>100V<Ur≤250V</td><td>1.5Ur</td><td>1.5Ur</td><td>/</td></tr><tr><td>250V<Ur≤630V</td><td>1.3Ur</td><td>1.2Ur</td><td>/</td></tr><tr><td>Ur≥1KV</td><td>1.2Ur</td><td>1.1Ur</td><td>/</td></tr></table>测试时间：1000 小时
温度：C0G/X7R:125℃；X5R：85℃
充放电电流：不超过 50mA
Initial Measurement:
Perform a heat treatment at 150+0/-10℃ for 1h then sit for 24±2h at room temperature and measure initial values.
Applied Voltage:
2 x Rated Voltage(General products)
1/1.5 x Rated Voltage(High cap products)
Applied voltage for medium/high voltage series as below:
<table><tr><td>额定电压(Ur)</td><td>C0G</td><td>X7R</td><td>X5R</td></tr><tr><td>Ur≤100V</td><td>2.0Ur</td><td>2.0Ur</td><td>2.0Ur</td></tr><tr><td>100V<Ur≤250V</td><td>1.5Ur</td><td>1.5Ur</td><td>/</td></tr><tr><td>250V<Ur≤630V</td><td>1.3Ur</td><td>1.2Ur</td><td>/</td></tr><tr><td>Ur≥1KV</td><td>1.2Ur</td><td>1.1Ur</td><td>/</td></tr></table>Duration:1000h
Temperature:C0G/X7R:125℃；X5R/Y5V：85℃
Charge/Discharge Current: 50mA max.</td></tr>
<tr><td>X7R
X5R</td><td>常规产品：±15%
高容产品：±20%
General parts: ±15%
High capacitance parts: ±20%</td></tr>
<tr><td>DF</td><td colspan="2">≤2 倍产品初始规格
Not more than twice of initial specification</td></tr>
<tr><td rowspan="2">IR</td><td>C0G</td><td>≥4E3MΩ or RC≥40ΩF 取较小的值
≥4E3MΩ or RC≥40ΩF, whichever is smaller</td></tr>
<tr><td>X5R
X7R</td><td>一般产品：
≥1E3MΩ or RC≥50ΩF 取较小的值
高容产品：
RC≥10ΩF
General Product
≥1E3MΩ or RC≥50ΩF, whichever is smaller
High cap product
RC≥10ΩF</td></tr>
<tr><td colspan="3">外观无可见损伤
Appearance: No visible damage</td></tr>
</table>

※耐久性测试电压要求 Requirement for applied voltage of operational life test

X7R	尺寸 Size					测试电压
	01005	0201	0402	0603	0805	Test Voltage
≤6.3V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	2.0*Ur
		12nF~100nF	220nF~2.2uF	560nF~4.7uF	2.2uF~10uF	1.5*Ur
10V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	2.0*Ur
		100nF	150nF~1uF	560nF~4.7uF	2.2uF~10uF	1.5*Ur
16V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	2.0*Ur
			150nF~220nF	560nF~2.2uF	2.2uF~10uF	1.5*Ur
25V		100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	2.0*Ur
			150nF~220nF	560nF~1uF	2.2uF~4.7uF	1.5*Ur
50V		100pF~1nF	100pF~47nF	100pF~330nF	220pF~680nF	2.0*Ur
			56nF~100nF	470nF~1uF	1uF~4.7uF	1.5*Ur
100V			100pF~10nF	100pF~100nF	220pF~680nF	2.0*Ur
					1uF	1.5*Ur
250V				220pF~22nF	220pF~100nF	1.5Ur
X7R	尺寸 Size					测试电压
	1206	1210	1808	1812	2220	Test Voltage
≤6.3V	220pF~1uF	2.2nF~1uF				2.0*Ur
	2.2uF~22uF	2.2uF~47uF				1.5*Ur
10V	220pF~1uF	2.2nF~1uF				2.0*Ur
	2.2uF~22uF	2.2uF~47uF				1.5*Ur
16V	220pF~1uF	2.2nF~1uF				2.0*Ur
	2.2uF~22uF	2.2uF~22uF				1.5*Ur
25V	220pF~1uF	2.2nF~1uF				2.0*Ur
	2.2uF~10uF	2.2uF~22uF				1.5*Ur
50V	220pF~1uF	2.2nF~1uF		4.7nF~1uF	470nF~1uF	2.0*Ur
	2.2uF~10uF	2.2uF~10uF				1.5*Ur
100V	220pF~1uF	2.2nF~1uF		4.7nF~1uF		2.0*Ur
	2.2uF	2.2uF~4.7uF				1.5*Ur
250V	200Pf~100nF	22nF~220nF				1.5*Ur

X5R	尺寸 Size							测试电压 Test Voltage
	01005	0201	0402	0603	0805	1206	1210	
≤4V		100pF~82nF						2*Ur
	100pF~68n F	100nF~330nF	1uF~2.2uF					1.5*Ur
	100nF~220nF	470nF~4.7uF	4.7uF~22uF	22uF,47uF				1*Ur
6.3V		100pF~82nF	100pF~820nF	10nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	2*Ur
	100pF~68n F	100nF~330nF	1uF~2.2uF	2.2uF~10uF	4.7uF~22uF	4.7uF~100uF	4.7uF~220uF	1.5*Ur
	100nF~220nF	470nF~4.7uF	4.7uF~22uF	22uF,47uF	47uF			1*Ur
10V		100pF~82nF	22nF~820nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	2*Ur
	100pF~68n F	100nF~820nF	1.uF,2.2uF	2.2uF,4.7uF	4.7uF,10uF	4.7uF~47uF	4.7uF~100uF	1.5*Ur
	100nF	1uF,2.2uF	4.7uF,10uF	10uF,22uF	22uF,47uF			1*Ur
16V		100pF~82nF	22nF~820nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	2*Ur
	100pF~1nF	100nF~470nF	1uF,.2uF	2.2uF,4.7uF	4.7uF~10uF	4.7uF~22uF	4.7uF~100uF	1.5*Ur
			4.7uF	10uF	22uF			1*Ur
25V		100pF~82nF	22nF~220nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	2*Ur
		220nF	270nF~2.2uF	2.2uF	4.7uF	4.7uF~22uF	4.7uF~22uF	1.5*Ur
		100nF		4.7uF,10uF	10uF,22uF			1*Ur
50V		100pF~82nF	22nF~100nF	220nF~820nF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	2*Ur
			220nF~1uF	1uF,2.2uF	4.7uF	4.7uF~10uF	4.7uF,10uF	1.5*Ur
		100nF						1*Ur

※常规产品及高容产品表 General product and high cap product table

X7R	尺寸 Size					产品分类
	01005	0201	0402	0603	0805	Product type
≤6.3V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	G
		12nF~100nF	220nF~2.2uF	560nF~4.7uF	2.2uF~10uF	H
10V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	G
		12nF~100nF	150nF~1uF	560nF~4.7uF	2.2uF~10uF	H
16V	100pF~1nF	100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	G
			150nF~220nF	560nF~2.2uF	2.2uF~10uF	H
25V		100pF~10nF	100pF~100nF	100pF~470nF	220pF~1uF	G
			150nF~220nF	560nF~1uF	2.2uF~4.7uF	H
50V		100pF~1nF	100pF~47nF	100pF~330nF	220pF~1uF	G
			100nF	470nF~1uF	2.2uF	H
100V			100pF~10nF	100pF~100nF	220pF~680nF	G
					1uF	H
X7R	尺寸 Size					产品分类
	1206	1210	1808	1812	2220	Product type
≤6.3V	220pF~1uF	2.2nF~1uF				G
	2.2uF~22uF	2.2uF~47uF				H
10V	220pF~1uF	2.2nF~1uF				G
	2.2uF~22uF	2.2uF~47uF				H
16V	220pF~1uF	2.2nF~1uF				G
	2.2uF~22uF	2.2uF~22uF				H
25V	220pF~1uF	2.2nF~1uF				G
	2.2uF~10uF	2.2uF~22uF				H
50V	220pF~1uF	2.2nF~1uF		6.8nF ~ 1uF	470nF~1uF	G
	2.2uF~10uF	2.2uF~10uF				H
100V	220pF~1uF	2.2nF~1uF		6.8nF ~ 1uF		G
	2.2uF	2.2uF				H

X5R	尺寸 Size							产品分类 Product type
	01005	0201	0402	0603	0805	1206	1210	
≤4V	100pF~10nF	100pF~82nF						G
	12nF~220nF	100nF~4.7uF	1uF~22uF	2.2uF~47uF				H
6.3V	100pF~15nF	100pF~82nF	100pF~820nF	10nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	G
		100nF~4.7uF	1uF~22uF	2.2uF~47uF	4.7uF~47uF	4.7uF~100uF	4.7uF~220uF	H
10V	100pF~10nF	100pF~82nF	22nF~820nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	G
		100nF~2.2uF	1.uF~10uF	2.2uF~22uF	4.7uF~47uF	4.7uF~47uF	4.7uF~100uF	H
16V	100pF~1.5nF	100pF~82nF	22nF~820nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	G
		100nF~470nF	1uF~4.7uF	2.2uF~10uF	4.7uF~22uF	4.7uF~22uF	4.7uF~100uF	H
25V		100pF~82nF	22nF~220nF	220nF~1uF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	G
		100nF~220nF	270nF~2.2uF	2.2uF~10uF	4.7uF~22uF	4.7uF~22uF	4.7uF~22uF	H
50V		100pF~82nF	22nF~100nF	220nF~820nF	470nF~2.2uF	1uF,2.2uF	1uF,2.2uF	G
		100nF	220nF~1uF	1uF,2.2uF	4.7uF	4.7uF,10uF	4.7uF,10uF	H

产品分类字母意义：G--代表常规产品，H--代表高容产品

Product type letter meaning: G—General product; H—High cap product

※损耗角（DF）规格表（X7R/X5R）: Table of DF specification (X7R/X5R)

材质 Dielectric	电压 Rated Voltage	尺寸 Size					损耗角 DF
		01005	0201	0402	0603	0805	
X7R	≤6.3V		100pF ~ 10nF	100pF ~ 100nF	100pF ~ 1uF	100pF~ 680nF	≤5%
						1uF ~ 2.2uF	≤7%
		100pF~1nF	12nF~100nF	220nF ~ 470nF	2.2uF ~ 4.7uF	4.7uF ~ 10uF	≤10%
				1uF			≤12.5%
	10V		100pF ~ 10nF	100pF ~ 100nF	100pF ~ 1uF	100pF~ 680nF	≤5%
						1uF ~ 2.2uF	≤7%
		100pF~1nF	12nF~100nF	220nF ~ 470nF	2.2uF~4.7uF	4.7uF ~ 10uF	≤10%
				1uF			≤12.5%
	16V		100pF ~ 1.2nF	100pF ~ 22nF	100pF ~ 220nF	100pF ~ 330nF	≤3.5%
		100pF~1nF	1.5nF ~ 10nF	27nF ~ 100nF	270nF ~ 47nF	470nF ~ 680nF	≤5%
						1uF ~ 2.2uF	≤7%
				220nF	680nF~2.2uF	4.7uF ~ 10uF	≤10%
	25V			100pF ~ 10nF	100pF ~ 39nF	100pF ~ 180nF	≤2.5%
			100pF ~ 470pF	12nF ~ 47nF	47nF ~ 220nF	100pF ~ 330nF	≤3.5%
			560pF ~ 10nF	56nF ~ 100nF	270nF ~ 470nF	470nF ~ 680nF	≤5%
						1uF ~ 2.2uF	≤7%
				120nF~220nF	680nF ~ 4.7uF	4.7uF	≤10%
	50V			100pF ~ 10nF	100pF ~ 39nF	100pF ~ 180nF	≤2.5%
			100pF ~ 470pF	12nF ~ 33nF	47nF ~ 220nF	220nF ~ 470nF	≤3.5%
			560pF ~ 1nF			560nF ~ 680nF	≤5%
				47nF ~ 82nF		1uF	≤7%
				100nF	470nF ~ 1uF	2.2uF, 4.7uF	≤10%
	100V			100pF ~ 10nF	100pF ~ 10nF	100pF ~ 470nF	≤2.5%
							≤3.5%
					12nF ~ 100nF	560nF ~ 1uF	≤5%
							≤10%
	200V			100pF~10nF	220pF ~ 22nF	100pF ~ 100nF	≤2.5%
	250V			100pF~10nF	220pF ~ 22nF	100pF ~ 100nF	≤2.5%
	500V					150pF ~ 22nF	≤2.5%
	630V					150pF ~ 3.3nF	≤2.5%
	1KV					150pF ~ 3.3nF	≤2.5%
	2KV						≤2.5%

材质 Dielectric	电压 Rated Voltage	尺寸 Size					损耗角 DF
		1206	1210	1808	1812	2220	
X7R	≤6.3V	220pF ~ 2.2uF	2.2nF ~ 2.2uF		6.8nF ~ 1uF		≤5%
		4.7uF ~ 22uF	4.7uF ~ 47uF				≤10%
							≤12.5%
	10V	220pF ~ 2.2uF	2.2nF ~ 2.2uF		6.8nF ~ 1uF		≤5%
		4.7uF ~ 22uF	4.7uF ~ 47uF				≤10%
							≤12.5%
	16V	220pF ~ 1uF	2.2nF ~ 1uF		6.8nF ~ 1uF		≤3.5%
		2.2uF	2.2uF				≤5%
		4.7uF ~ 22uF	4.7uF ~ 22uF				≤10%
	25V	220pF ~ 180nF	2.2nF ~1uF		6.8nF ~ 1uF		≤2.5%
		220nF ~ 1uF					≤3.5%
		2.2uF	2.2uF				≤5%
		4.7uF ~ 10uF	4.7uF ~ 22uF				≤10%
	50V	220pF ~ 180nF	2.2nF ~1uF		6.8nF ~ 1uF	470nF,1uF	≤2.5%
		220nF ~ 1uF					≤3.5%
		2.2uF					≤5%
		4.7uF ~ 10uF	2.2uF ~ 10uF				≤10%
	100V	220nF ~ 470nF	2.2nF ~ 680nF		6.8nF ~ 1uF		≤2.5%
		560nF ~ 820nF	1uF ~ 2.2uF				≤3.5%
		1uF ~ 2.2uF					≤5%
			4.7uF				≤10%
	200V	220pF ~ 100nF	2.2nF ~ 220nF		6.8nF ~ 470nF		≤2.5%
	250V	220pF ~ 100nF	2.2nF ~ 220nF		6.8nF ~ 470nF		≤2.5%
	500V	220pF ~ 33nF	3.3nF ~ 100nF		1nF ~ 1uF		≤2.5%
	630V	220pF ~ 33nF	3.3nF ~ 47nF		1nF ~ 100nF	150nF~220nF	≤2.5%
	1KV	220pF ~ 10nF	220pF ~ 22nF	470pF ~ 10nF	1nF ~ 33nF		≤2.5%
	2KV	220pF ~ 1.5nF	220pF ~ 2.2nF	330pF ~ 2.2nF	1nF ~ 6.8nF		≤2.5%

材质 Dielectric	电压 Rated Voltage	尺寸 Size				损耗角 DF
		01005	0201	0402	0603	
X5R	≤4V		100pF~10nF	22nF~100nF	220nF~470nF	≤5%
					680nF~1uF	≤7%
		100pF~220nF	12nF ~1uF	120nF~10uF	2.2uF~47uF	≤10%
						≤15%
			2.2uF ~ 4.7uF	22uF		≤20%
	6.3V		100pF ~ 10nF	22nF ~ 100nF	220nF ~ 470nF	≤5%
					680nF ~ 1uF	≤7%
		100pF~220nF	12nF ~1uF	120nF ~ 10uF	2.2uF ~ 47uF	≤10%
						≤15%
			2.2uF ~ 4.7uF	22uF		≤20%
	10V		100pF ~ 10nF	22nF ~ 100nF	220nF ~ 470nF	≤5%
					680nF ~ 1uF	≤7%
		100pF~10nF	12nF ~1uF	120nF ~ 10uF	2.2uF ~ 22uF	≤10%
			2.2uF			≤20%
	16V		100pF ~ 10nF	22nF ~ 100nF	220nF ~ 470nF	≤5%
					680nF	≤7%
		100pF~1.5nF	12nF ~ 220nF	120nF ~ 4.7uF	1uF ~ 10uF	≤10%
			470nF			≤15%
	25V		100pF ~ 470pF	22nF		≤3.5%
			560pF ~ 10nF	27nF ~ 100nF	220nF ~ 470nF	≤5%
					680nF	≤7%
			22nF ~ 220nF	120nF ~ 2.2uF	1uF ~ 10uF	≤10%
	35V				220nF ~ 470nF	≤5%
					680nF	≤7%
					1uF ~ 10uF	≤10%
	50V		100pF ~ 1nF	22nF		≤3.5%
				27nF ~ 100nF		≤5%
				120nF ~ 1uF	220nF ~ 2.2uF	≤10%

材质 Dielectric	电压 Rated Voltage	尺寸 Size			损耗角 DF
		0805	1206	1210	
X5R	≤6.3V	470nF ~ 680nF	1uF ~ 4.7uF	1uF ~ 10uF	≤5%
		1uF ~ 2.2uF			≤7%
		4.7uF ~ 47uF	10uF ~ 100uF	22uF ~ 220uF	≤10%
	10V	470nF ~ 680nF	1uF ~ 4.7uF	1uF ~ 4.7uF	≤5%
		1uF ~ 2.2uF			≤7%
		4.7uF ~ 47uF	10uF ~ 100uF	10uF ~ 100uF	≤10%
	16V	470nF ~ 680nF	1uF ~ 4.7uF	1uF ~ 4.7uF	≤5%
		1uF ~ 2.2uF			≤7%
		4.7uF ~ 22uF	10uF ~ 22uF	10uF ~ 100uF	≤10%
	25V		1uF ~ 2.2uF	1uF ~ 4.7uF	≤3.5%
		470nF ~ 680nF	4.7uF	10uF	≤5%
		1uF ~ 2.2uF			≤7%
		4.7uF ~ 22uF	10uF ~ 22uF	22uF	≤10%
	35V				≤3.5%
		470nF ~ 680nF			≤5%
		1uF ~ 2.2uF			≤7%
		4.7uF ~ 22uF			≤10%
	50V	470nF ~ 4.7uF	1uF ~ 10uF	1uF ~ 10uF	≤10%

※IR 规格表（X7R/X5R） IR specification table(X7R/X5R)

材质 Dielectric	电压 Rated Voltage	尺寸 Size					绝缘阻抗 IR
		01005	0201	0402	0603	0805	
X7R	≤6.3V	100pF~390pF	100pF ~ 10nF	100pF ~ 220nF	100pF ~ 470nF	220pF ~ 2.2uF	≥10,000MΩ or RC≥500Ω·F
			100nF		560nF ~ 4.7uF	4.7uF ~ 10uF	RC≥100Ω·F
				470nF ~ 1uF			RC≥50Ω·F
	10V	100pF~390pF	100pF ~ 10nF	100pF ~ 100nF	100pF ~ 470nF	220pF ~ 2.2uF	≥10,000MΩ or RC≥500Ω·F
					560nF ~ 4.7uF	4.7uF ~ 10uF	RC≥100Ω·F
				220nF ~ 1uF			RC≥50Ω·F
	16V	100pF~390pF	100pF ~ 10nF	100pF ~ 100nF	100pF ~ 470nF	220pF ~ 2.2uF	10,000MΩ or 500Ω·F
					560nF ~ 4.7uF	4.7uF ~ 10uF	RC≥100Ω·F
				220nF			RC≥50Ω·F
	25V		100pF ~ 10nF	100pF ~ 100nF	100pF ~ 220nF	220pF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
					270nF ~ 1uF	2.2uF ~ 4.7uF	RC≥100Ω·F
				220nF			RC≥50Ω·F
	50V		100pF ~ 1nF	100pF ~ 82nF	100pF ~ 220nF	220pF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
				100nF	270nF ~ 1uF	2.2uF	RC≥100Ω·F
	100V			100pF ~ 10nF	100pF ~ 100nF	220pF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
	200V			100pF ~ 10nF	220pF ~ 22nF	220pF ~ 100nF	≥10,000MΩ or RC≥500Ω·F
	250V			100pF ~ 10nF	220pF ~ 22nF	220pF ~ 100nF	≥10,000MΩ or RC≥500Ω·F
	500V					150pF ~ 3.3nF	≥10,000MΩ or RC≥500Ω·F
						3.9nF ~ 22nF	RC≥100Ω·F
	630V					150pF ~ 3.3nF	≥10,000MΩ or RC≥500Ω·F
	1KV					150pF ~ 3.3nF	≥10,000MΩ or RC≥500Ω·F

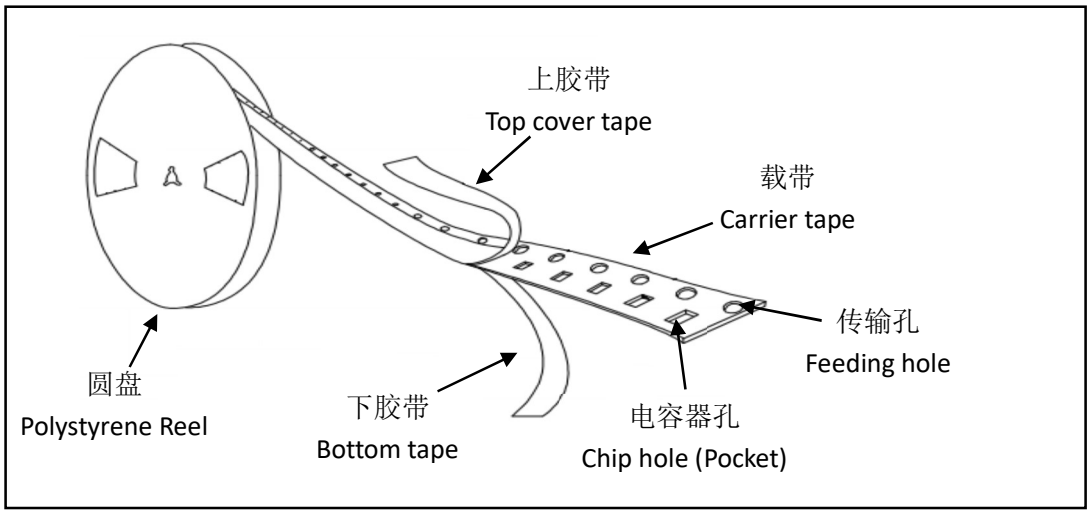
材质 Dielectric	电压 Rated Voltage	尺寸 Size					绝缘阻抗 IR
		1206	1210	1808	1812	2220	
X7R	≤6.3V	220pF ~ 2.2uF	2.2nF ~ 4.7uF		6.8nF ~ 1uF		≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 47uF	10uF ~ 47uF				RC≥100Ω·F
	10V	220pF ~ 2.2uF	2.2nF ~ 4.7uF		6.8nF ~ 1uF		≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 47uF	10uF ~ 47uF				RC≥100Ω·F
	16V	220pF ~ 2.2uF	2.2nF ~ 4.7uF		6.8nF ~ 1uF		10,000MΩ or 500Ω·F
		4.7uF ~ 22uF	10uF ~ 22uF				RC≥100Ω·F
	25V	220pF ~ 2.2uF	2.2nF ~ 2.2uF		6.8nF ~ 1uF		≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 10uF	4.7uF ~ 10uF				RC≥100Ω·F
	50V	220pF ~ 2.2uF	2.2nF ~ 1uF		6.8nF ~ 330nF	470nF	≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 10uF	2.2uF ~ 10uF		470nF ~ 1uF	1uF	RC≥100Ω·F
	100V	220pF ~ 100nF	2.2nF ~ 56nF		6.8nF ~ 330nF		≥10,000MΩ or RC≥500Ω·F
		120nF ~ 2.2uF	68nF ~ 2.2uF		470nF ~ 1uF		RC≥100Ω·F
	200V	220pF ~ 22nF	2.2nF ~ 33nF		6.8nF ~ 120nF		≥10,000MΩ or RC≥500Ω·F
		27nF ~ 100nF	39nF ~ 220nF		150nF ~ 470nF		RC≥100Ω·F
	250V	220pF ~ 22nF	2.2nF ~ 33nF		6.8nF ~ 120nF		≥10,000MΩ or RC≥500Ω·F
		27nF ~ 100nF	39nF ~ 220nF		150nF ~ 470nF		RC≥100Ω·F
	500V	220pF ~ 10nF	3.3nF ~ 10nF		1nF ~ 22nF		≥10,000MΩ or RC≥500Ω·F
		12nF ~ 33nF	12nF ~ 100nF		27nF ~ 1uF	150nF ~ 220nF	RC≥100Ω·F
	630V	220pF ~ 10nF	3.3nF ~ 10nF		1nF ~ 22nF		≥10,000MΩ or RC≥500Ω·F
		12nF ~ 33nF	12nF ~ 47nF		27nF ~ 100nF	150nF ~ 220nF	RC≥100Ω·F
	1KV	220pF ~ 10nF	220pF ~ 10nF	470pF ~ 15nF	1nF ~22nF		≥10,000MΩ or RC≥500Ω·F
			12nF ~ 22nF	18nF	27nF ~ 33nF		RC≥100Ω·F
	2KV	220pF ~ 1.5nF	220pF ~ 2.2nF	330pF ~ 2.2nF	1nF ~ 6.8nF		≥10,000MΩ or RC≥500Ω·F

材质 Dielectric	电压 Rated Voltage	尺寸 Size				绝缘阻抗 IR
		01005	0201	0402	0603	
X5R	≤4V	100pF ~ 10nF	100pF ~ 82nF	22nF ~ 470nF	220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
			100nF ~ 1uF	560nF ~ 4.7nF	2.2uF ~ 4.7uF	RC≥100Ω·F
		>10nF		10uF	10uF ~ 22uF	RC≥50Ω·F
			2.2uF ~ 4.7uF	22uF	47uF	RC≥20Ω·F
	6.3V	100pF ~ 10nF	100pF ~ 82nF	22nF ~ 470nF	220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
			100nF ~ 1uF	560nF ~ 4.7uF	2.2uF ~ 4.7uF	RC≥100Ω·F
		>10nF		10uF	10uF ~ 22uF	RC≥50Ω·F
			2.2uF ~ 4.7uF	22uF	47uF	RC≥20Ω·F
	10V	100pF~10nF	100pF ~ 82nF	22nF ~ 470nF	220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
			100nF ~ 470nF	560nF ~ 4.7uF	2.2uF ~ 4.7uF	RC≥100Ω·F
		>10nF	560nF ~ 2.2uF	10uF	10uF ~ 22uF	RC≥50Ω·F
	16V	100pF ~ 1.5nF	100pF ~ 10nF	22nF ~ 150nF	220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
			22nF~470nF,		2.2uF ~ 4.7uF	RC≥100Ω·F
				220nF ~ 4.7uF	10uF	RC≥50Ω·F
	25V		100pF ~ 10nF	22nF ~ 150nF	220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
			22nF~100nF		2.2uF ~ 4.7uF	RC≥100Ω·F
			220nF	220nF ~ 2.2uF	10uF	RC≥50Ω·F
	35V				220nF ~ 1uF	≥10,000MΩ or RC≥500Ω·F
					2.2uF ~ 4.7uF	RC≥100Ω·F
					10uF	RC≥50Ω·F
	50V		100pF ~ 1nF	22nF ~ 100nF		≥10,000MΩ or RC≥500Ω·F
					220nF ~ 2.2uF	RC≥100Ω·F
				150nF ~ 1uF		RC≥50Ω·F

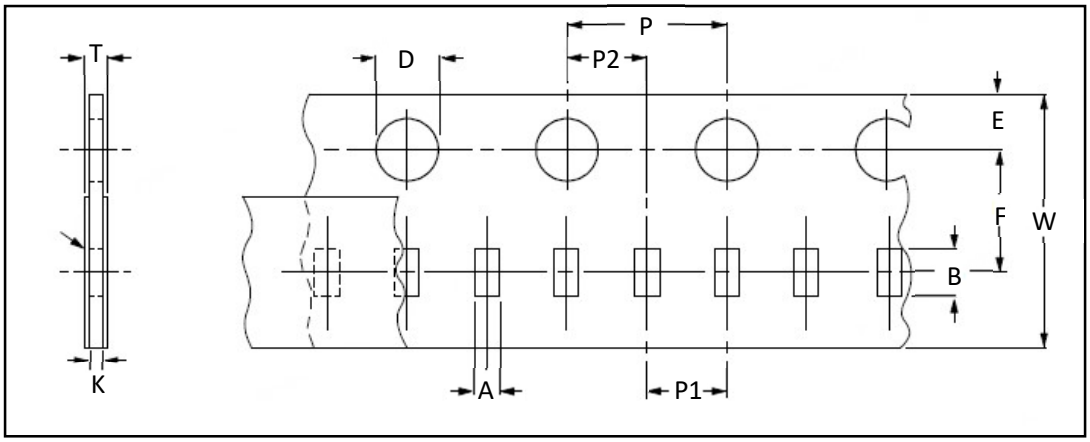
材质 Dielectric	电压 Rated Voltage	尺寸 Size			绝缘阻抗 IR
		0805	1206	1210	
X5R	≤6.3V	470nF ~ 4.7uF	1uF ~4.7uF	1uF ~4.7uF	≥10,000MΩ or RC≥500Ω·F
		10uF	4.7uF ~ 47uF	10uF ~ 220uF	RC≥100Ω·F
		22uF ~ 47uF	100uF		RC≥50Ω·F
	10V	470nF ~ 2.2uF	1uF ~2.2uF	1uF ~ 4.7uF	≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 22uF	4.7uF ~ 47uF	10uF ~ 100uF	RC≥100Ω·F
		47uF	100uF		RC≥50Ω·F
	16V	470nF ~ 2.2uF	1uF ~ 2.2uF	1uF ~ 4.7uF	≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 22uF	4.7uF ~ 10uF	10uF ~ 100uF	RC≥100Ω·F
			22uF, 47uF		RC≥50Ω·F
	25V	470nF ~ 2.2uF	1uF ~ 2.2uF	1uF ~ 2.2uF	≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 22uF	4.7uF	4.7uF ~ 22uF	RC≥100Ω·F
			10uF ~ 47uF		RC≥50Ω·F
	35V	470nF ~ 2.2uF			≥10,000MΩ or RC≥500Ω·F
		4.7uF ~ 22uF			RC≥100Ω·F
	50V	470nF ~ 2.2uF	1uF ~ 2.2uF	1uF ~ 2.2uF	≥10,000MΩ or RC≥500Ω·F
		4.7uF	4.7uF	4.7uF ~ 10uF	RC≥100Ω·F
			10uF		RC≥50Ω·F

五、包装 Package

5.1 纸带圆盘结构 Paper Taping



纸带结构 Structure of paper tape.

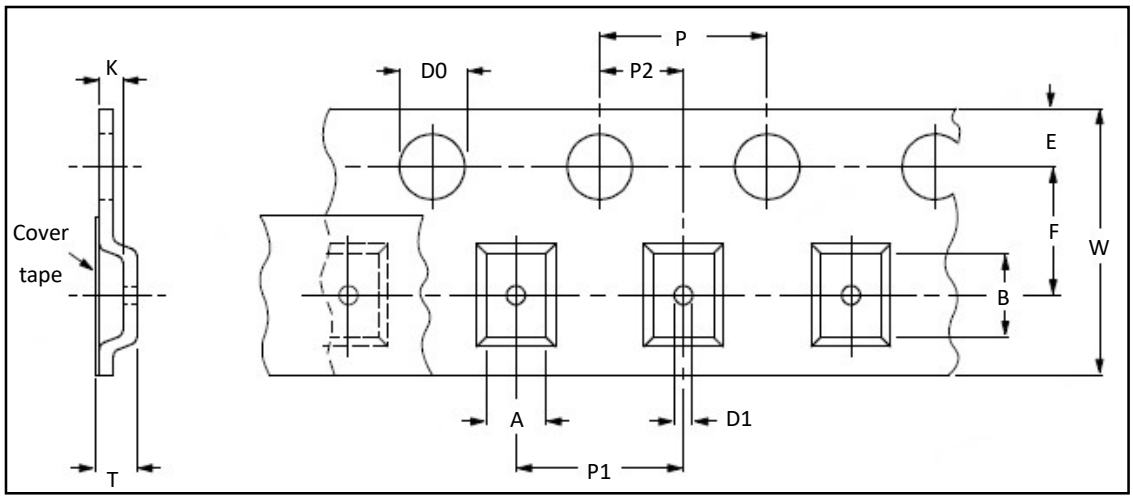


适合纸带的常规尺寸有“01005，0201, 0402, 0603, 0805, 1206,1210,1808,1812,2220”,规格如下：

Dimension of paper taping for “01005，0201, 0402, 0603, 0805, 1206,1210,1808,1812,2220”

尺寸 size	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P (mm)	P1 (mm)	P2 (mm)	øD (mm)	K (mm)	T (mm)
01005	0.24 ±0.03	0.45 ±0.03	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	2.00 ±0.05	2.00 ±0.05	1.50 +0.1/-0	0.24 ±0.03	0.36 ±0.1
0201	0.39 ±0.06	0.70 ±0.06	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	2.00 ±0.05	2.00 ±0.05	1.50 +0.1/-0	0.38 ±0.05	(0.47/0.55) ±0.10
0402	0.70 ±0.15	1.16 ±0.12	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	2.00 ±0.05	2.00 ±0.05	1.50 +0.1/-0	0.60/0.75 ±0.10	0.70/0.85 ±0.10
0603	1.05 ±0.14	1.86 ±0.13	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.50 +0.1/-0	0.75/0.95/1.05 ±0.10	0.85/1.05/1.15 ±0.10
0805	1.50 ±0.15	2.26 ±0.20	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.50 +0.1/-0	0.75/0.95/1.05 ±0.10	0.85/1.05/1.15 ±0.10
1206	1.90 ±0.15	3.50 ±0.20	8.00 ±0.20	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.50 +0.1/-0	0.75/0.95 ±0.10	0.85/1.05 ±0.10

5.2 塑胶带尺寸结构 Structure of plastic tape

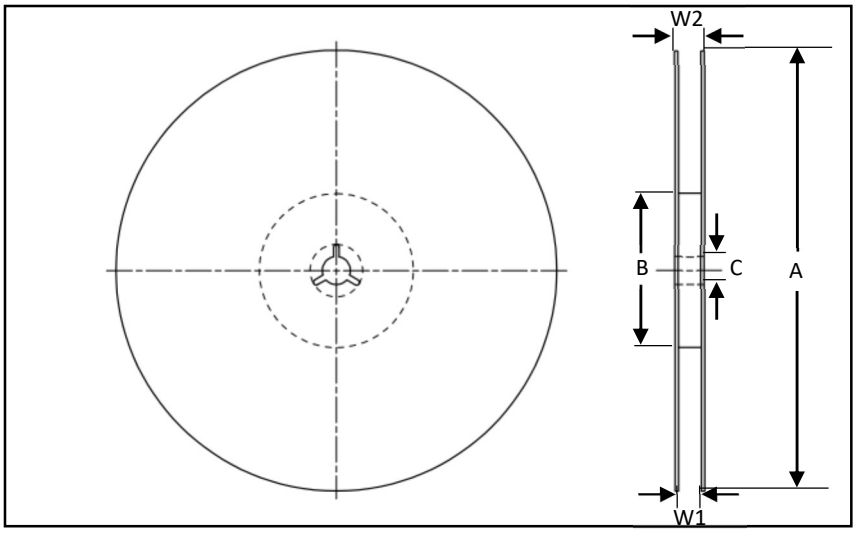


塑胶带适合 0805, 1206 型产品，规格参考下表

Plastic tape is suitable for 0805, 1206 type products, the specification refer to below table

尺寸 size	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	øD0 (mm)	øD1 (mm)	P (mm)	P1 (mm)	P2 (mm)	K (mm)	T (mm)
01005	0.23 ±0.02	0.43 ±0.02	4.00 ±0.05	0.90 ±0.05	1.80 ±0.02	0.80 ±0.04	/	2.00 ±0.04	1.00 ±0.02	1.00 ±0.02	0.25~ 0.35	0.5max
0805	1.29~ 1.65	2.09~ 2.60	8.10 ±0.20	1.75 ±0.10	3.50 ±0.05	1.50 +0.1/-0	1.0 +0.1/-0	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.25~ 1.62	1.30~ 1.67
1206	1.65~ 2.12	3.30~ 3.75	8.10 ±0.20	1.75 ±0.10	3.50 ±0.05	1.50 +0.1/-0	1.0 +0.1/-0	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.22~ 2.15	1.27~ 2.20
1210	2.55~ 3.02	3.31~ 3.88	8.10 ±0.20	1.75 ±0.10	3.50 ±0.05	1.50 +0.1/-0	1.0 +0.1/-0	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.97~ 2.92	1.02~ 2.97
1808	2.05~ 2.55	4.80~ 5.45	12.1 ±0.20	1.75 ±0.10	5.5 ±0.05	1.50 +0.1/-0	1.50 +0.1/-0	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	1.30~ 2.45	1.35~ 2.50
1812	3.35~ 3.75	4.70~ 5.33	12.1 ±0.20	1.75 ±0.10	5.5 ±0.05	1.50 +0.1/-0	1.50 +0.1/-0	4.00 ±0.10	8.00 ±0.10	2.00 ±0.05	0.70~ 2.40	0.75~ 2.45
2220	5.12~ 5.32	5.84~ 6.04	12.1 ±0.20	1.75 ±0.10	5.5 ±0.05	1.50 +0.1/-0	1.50 +0.1/-0	4.00 ±0.10	8.00 ±0.10	2.00 ±0.05	1.28~ 1.48	1.33~ 1.53

5.3 卷盘尺寸 Reel dimension

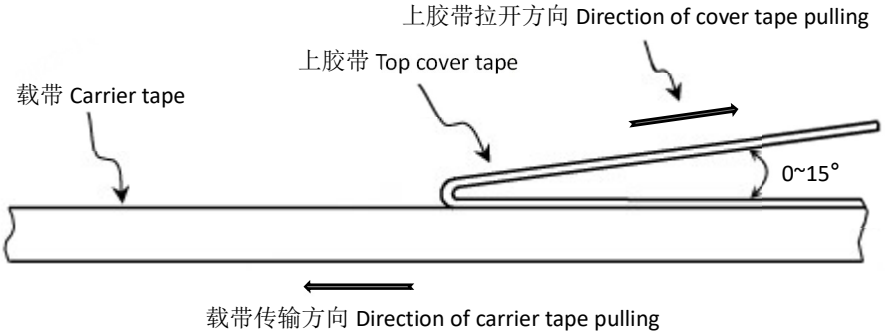


卷盘宽度 Tape Width	A (㎜)	B (mm)	C (mm)	W1 (mm)	W2 (mm)
4(7' Reel)	ø178±2.0	60±1.0	ø13±0.5	4.2±0.75	7.95max
8(7' Reel)	ø178±2.0	60±1.0	ø13±0.5	10±1.5	14.4 max
8(13' Reel)	ø330±2.0	100±1.0	ø13±0.5	10±1.5	14.4 max
12(7' Reel)	ø178±2.0	60±1.0	ø13±0.5	13.4±1.5	18.4 max

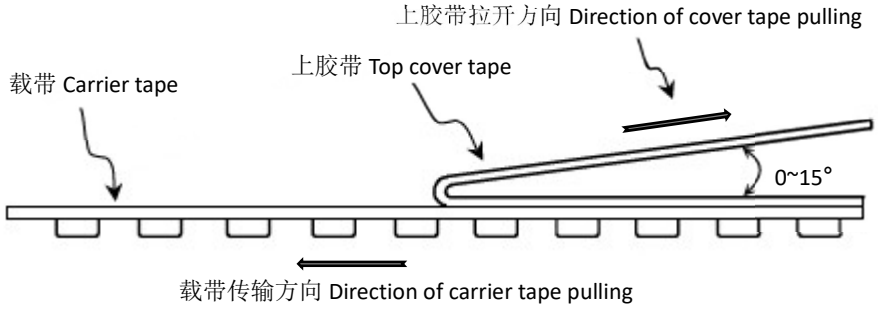
5.4 卷带规格 Taping performance specification

上胶带剥离强度 The top cover tape peeling strength

a)纸带 Paper Tape



b)塑胶带 Plastic Tape



标准： 1）0.1N < 剥离力 <1N (上胶带)

2）剥离速度：300±10mm/min

3）剥离时，电容器不能粘在上胶带上。

Standard: 1) 0.1N < Peeling strength < 0.7N (top cover tape)

2) Speed of peeling off: 300mm/min

3) Component shall not stick to top cover tape when peeling.

5.5 包装数量 Packing Quantity （单位 unit：pcs）

尺寸 Size	厚度(mm) Thickness	料带宽度 (mm) Tape Width	Ø180mm / 7 inch		Ø330m / 13 inch	
			纸带 Paper	塑胶带 Plastic	纸带 Paper	塑胶带 plastic
01005	0.2±0.02	4	---	40,000	---	---
	0.2±0.02	8	20,000	---	100,000	---
0201	0.3±0.03/0.05/0.09	8	15,000	---	50,000	---
0402	0.5±0.05/0.1	8	10,000	---	50,000	---
0402	0.5±0.15/0.2	8	10,000	---	50,000	---
0603	0.8±0.1/0.15/0.2	8	4,000	---	15,000	---
0805	0.6±0.1	8	4,000	---	20,000	---
	0.85±0.1	8	4,000	---	15,000	---
	1.25±0.2	8	---	3,000	---	10,000
1206	0.6±0.1	8	4,000	---	20,000	---
	0.85±0.1	8	4,000	---	15,000	---
	1.0/1.15±0.1	8	---	3,000	---	10,000
	1.25±0.2	8	---	3,000	---	10,000
	1.6±0.2/0.3	8	---	2,000	---	8,000
1210	0.85±0.1	8	4000	--	10000	--
	1.25±0.2	8	---	3000	--	--
	1.6±0.2	8	---	2000	--	--
	1.9±0.2	8	---	2000	--	--
	2.0±0.2	8	---	2000 1000	--	--
	2.5±0.2/0.3	8	---	1000 500	--	--
1808	1.25±0.2	12	---	3000	--	--
	1.35±0.15	12	---	2000	--	--
	1.6±0.2	12	---	2000	--	--
	2.0±0.2	12	---	2000	--	--
1812	0.6/0.85±0.1	12	---	2000	--	--
	1.25±0.2	12	---	1000	--	--
	1.6±0.2	12	---	1000	--	--
2220	2.0±0.2	12	---	1000	--	--

六、储存方法及要求 Storage method and requirement

6.1 确保电容器储存在 5~40℃的温度，20%~70%RH.的湿度环境中；

The MLCC chips must be stored in an ambient temperature of 5 to 40℃ with a relative humidity of 20 to 70% RH.

6.2 大气中的腐蚀气体可能导致可靠性下降，如终端电极的焊锡性差。不要将电容器储存在容易接触腐蚀性气体（如硫化氢、二氧化硫、氯氨等）的地方。

Corrosive gasses in the air or atmosphere may result in deterioration of the reliability, such as poor solderability of the terminal electrodes. Do not store capacitors in an atmosphere of corrosive gas (such as hydrogen sulfide, sulfur dioxide, chlorine, ammonia gas etc.)

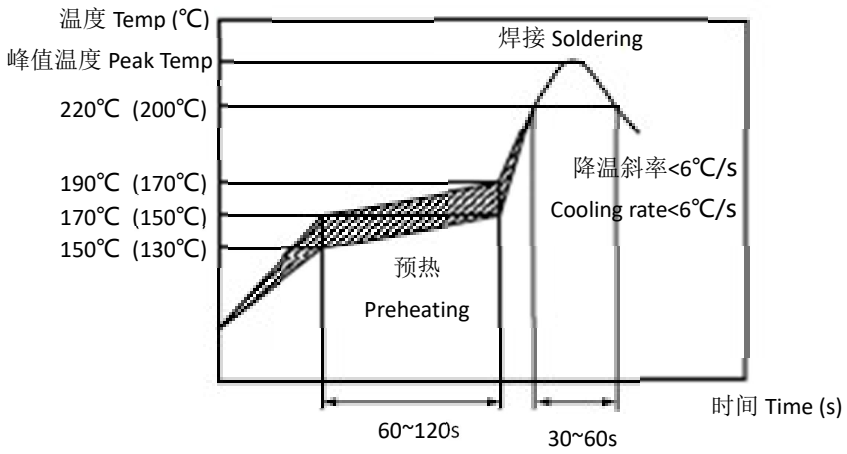
6.3 高温和潮湿的环境会加速电容器的端子氧化，从而影响焊锡性，还会降低卷带和包装的性能，因此贴片电容应在 24 个月内使用。当电容器储存时间超过 24 个月，在使用前需要确认电容器焊锡性。

High temperature and humidity environment may affect a capacitor's solder ability because they accelerate the solder layer of termination oxidization. They deteriorate performance of taping and packaging too. Therefore MLCC chips shall be used within 24 months. When MLCC chips are stored for a longer time period than 24 month, must confirm the solder ability of the chips prior to use.

七、注意事项 Cautions

7.1 焊接的方式和条件 Soldering method and condition

a)回流焊 Reflow soldering



*温度说明：括号（）前为建议的无铅焊锡温度，括号（）内为建议的有铅焊锡温度。

*Temperature specification: The recommended lead-free solder temperature is in front of parentheses ( ) and the recommended leaded solder temperature is in parentheses ( )

焊锡类别 Solder type	有铅焊锡 Pb-Sn soldering	无铅焊锡 Lead-free soldering
峰值温度 Peak temperature	230~250℃	240~260℃
气体 Atmosphere	空气 Air	空气或氮气 Air or N_2

有铅焊锡(Pb-Sn solder): Sn-37Pb

无铅焊锡(Lead-free solder): Sn-3.0Ag-0.5Cu

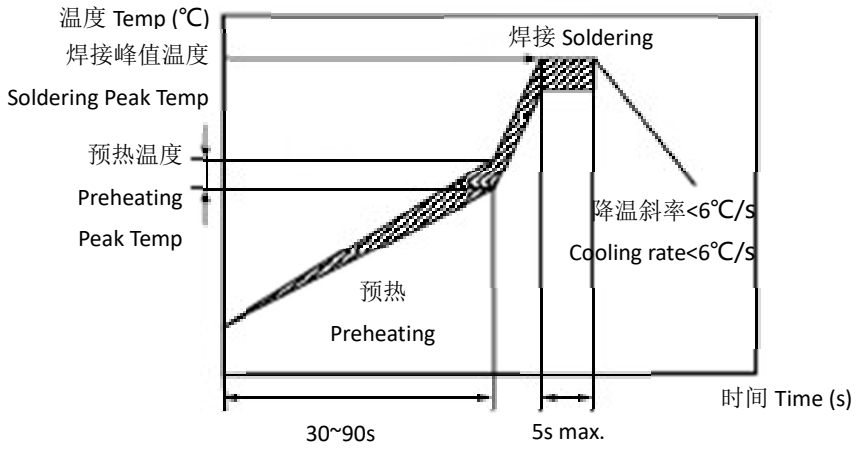
当电容器焊接的温度低于焊锡推荐的峰值温度时，可能会发生以下质量问题。考虑诸如周边组件的放置和回流温度设定的因素，以防止电容器的回流温度下降到规定的峰值温度以下。一定要事先评估焊接情况，并确认没有发生下列问题：

- 焊锡润湿性下降
- 焊锡粘结强度下降
- 焊锡孔洞
- 可能发生电容器在线路板上立碑或偏移

When a chip is mounted at a temperature lower than the peak reflow temperature, the following quality problems can occur. Consider factor such as the placement of dropping below the peak temperature specified. Be sure to evaluate the mounting situation beforehand and verify that none of the follow problems occur.

- Drop in solder wettability
- Drop in bonding strength
- Solder voids
- Possible occurrence of tombstone or shifting issue on the land patterns of PCB

b)波峰焊 Wave soldering



焊锡类别 Solder type	有铅焊锡 Pb-Sn soldering	无铅焊锡 Lead-free soldering
预热峰值温度 Preheating Peak temperature	90~110℃	100~120℃
焊接峰值温度 Soldering Peak temperature	240~250℃	250~260℃
气体 Atmosphere	空气 Air	空气或氮气 Air or N_2

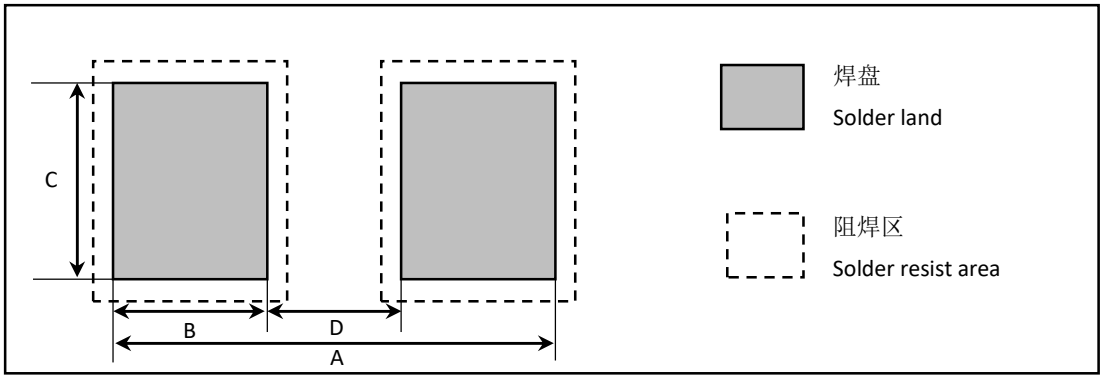
有铅焊锡(Pb-Sn solder): Sn-37Pb

无铅焊锡(Lead-free solder): Sn-3.0Ag-0.5Cu

c) 焊接方式建议 Suggestion for soldering method

焊接方式 Method	01005	0201	0402	0603	0805	1206	1210	1808	1812	2220
Reflow	All	All	>100nF	>1uF	>2.2uF	>4.7uF	All	All	All	All
Reflow/Wave			≤100nF	≤1uF	≤2.2uF	≤4.7uF				

d) 推荐焊接焊盘的尺寸规格 Suggest dimension of solder land



尺寸 Dimension	A (mm)	B (mm)	C (mm)	D (mm)
01005	0.48±0.08	0.15±0.03	0.22±0.15	0.18±0.02
0201	0.8±0.20	0.28±0.07	0.3±0.10	0.25±0.05
0402	1.5±0.15	0.5±0.15	0.5±0.15	0.5±0.15
0603[a]	2.3±0.15	0.8±0.15	0.9±0.15	0.7±0.15
0603[b]	2.3±0.25	0.9±0.25	0.9±0.25	0.5±0.25
0805	2.8±0.25	0.95±0.25	1.4±0.25	0.9±0.25
1206	4.0±0.25	1.0±0.25	1.8±0.25	2.0±0.25
1210	4.0±0.25	1.0±0.25	2.7±0.25	2.0±0.25
1808	5.4±0.25	1.05±0.25	2.3±0.25	3.3±0.25
1812	5.4±0.25	1.05±0.25	3.5±0.25	3.3±0.25
2220	6.6±0.25	1.05±0.25	5.3±0.25	4.5±0.25

7.2 焊接维修 Solder repairing

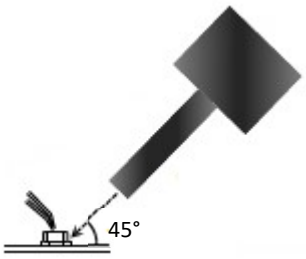
a)热风枪返工 Soldering repair by spot heater

如果热风枪的吹气口离电容器太近，可能会由于热应力的影响在电容中产生裂纹，以下是避免这种情况发生的建议。

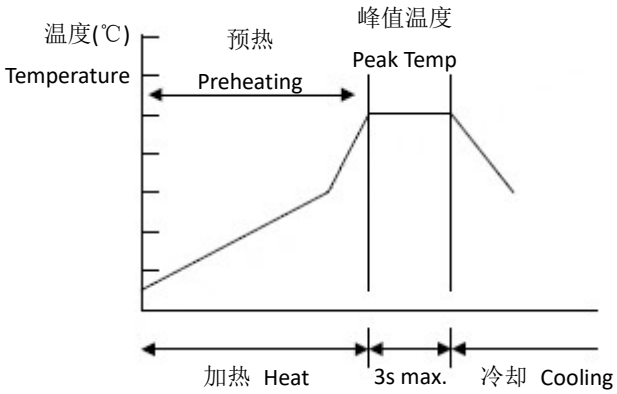
- 电容器和吹气口之间保持 5mm 以上的距离
- 热风枪的加热器温度应低于 400℃
- 吹气气流应设置的尽可能小
- 吹热风的时间建议为 10s 或者更少
- 喷嘴与电容器之间的角度建议为 45°，避免局部加热

If the lower nozzle of a spot heater is too close to a capacitor, the crack in the capacitor may occur because of heat stress. Below are recommendations for avoiding such an occurrence

- The distance between the capacitor and the spot heater nozzle shall be more than 5mm
- The blower temperature of the spot heater shall be lower than 400℃
- The airflow shall be set as slight as possible
- Duration of blowing hot air is recommended to be 10s or less
- The angle between the capacitor and nozzle is recommended to be 45° in order to avoid partial area heating too much



b) 烙铁返工 Soldering repair by solder iron



烙铁头温度 Temperature of solder iron tip	焊接时间 Soldering time	限制条件 Restricted conditions
最高 350℃ 350℃ max.	不大于 3s 3s max.	请勿使用烙铁头直接接触陶瓷本体 Do not directly contact the ceramic body of chip by soldering tip

八、版本 Version history

版本号 Version	日期 Date	变更描述 Version Change Description
Version 1	2023/01/01	新版本发行 New version issue
Version 2	2024/07/02	增加 01005、008004、1210、1808、1812、2220 尺寸 Add 01005/008004/1210/1808/1812/2220 size
Version 3	2025/02/12	增加焊盘尺寸 Add solder land dimension
Version 4	2025/03/10	增加 X5R 4V 系列产品 Add X5R 4V series products
Version 5	2025/06/03	增加 0805/X7R/50V/220nF~1uF 厚度 0.85mm 的产品规格 Add thickness 0.85mm for 0805/X7R/50V/220nF~1uF series.
Version 6	2025/09/24	增加 0402/X7R/200V,250V/100pF~10nF 产品规格 Add 0402/X7R/200V,250V/100pF~10nF series products data.
Version 7	2025/11/10	增加 1206/X7R/50V/10uF 产品规格 Add 1206/X7R/50V/10uF product data
Version 8	2026/1/6	修订规格型号编码，定义第 8 码为厚度代码 Revise part code and define the 8th digit as thickness code.