产品规格书
PRODOCUT SPECIFICATION

客户名称
CUSTOMER ： _____

产品名称 中高压多层片式陶瓷电容器
PART NAME： **High-Voltage Multi-layer Ceramic Capacitors**

规格
SPECIFICATION: **0402～2225TYPE**

版本
VERSION: _____

日期
DATE OF ISSUE： _____

制 造 MANUFACTURER			客 户 CUSTOMER		
拟制 DESIGN	审核 CHECK	批准 APPROVAL	检验 INSPECTOR	审核 CHECK	批准 APPROVAL

■修订履历 Revision History

版本 Version	日期 Date	修订内容 Revision Content	修订人 Reviser
A0	2024-1-15	新版格式要求重新整理整版内容。 Reorganize the entire content according to the new version format requirements.	褚运凯 Chu Yunkai
A1	2025-1-17	按新版格式要求重新整理整版内容。 Reorganize the entire content according to the new version format requirements.	褚运凯 Chu Yunkai
A2	2025-5-30	规格书更新及规范性能检测要求 Update the product specification and the requirements for performance testing.	褚运凯 Chu Yunkai

注：1.上述所提供之内容为产品规格说明。在产品未变更时，风华保有修改此内容不另行通知之所有权利，任何产品变更将会以 PCN 通知客户。

1.The content provided above is the produce specification, if the product is not changed, FENGHUA reserves all the right to modify this content without prior notice, any product change will be notified to the customer by PCN.

2.产品规格书中，同规格同容量同温度特性可交付的高电压型号规格，可以完全覆盖低压；同规格同容量同电压产品，温度特性 X7R 产品可覆盖 X7S,X7T,X6S,X5R（如 0402B104K101NT 可以覆盖 0402BS104K101NT,0402BT104K101NT, 0402DS104K101NT, 0402X/104K101NT）,规格书中就不再列出详细型号规格。

2.In this product specification, the high voltage model specifications that can be delivered with the same specification and the same capacity and temperature characteristics can completely cover the low voltage; Same specifications, same capacity, same voltage products ,Temperature characteristic X7R products covering X7S,X7T,X6S,X5R(such as 0402B/104K101NT can cover 0402BS104K101NT,0402BT104K101NT,0402DS104K101NT,0402X/104K101NT ） , The specification is no longer listed in this product specification.

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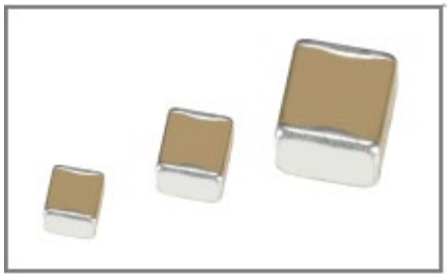


■中高压系列片式陶瓷电容器

High Voltage Series Of Ceramic Chip Capacitors

◆特征 Feature

* 中高压多层片状陶瓷电容器是在多层片状陶瓷电容器的工艺技术、设备基础上，
  通过采用特殊设计制作出来的一种具有良好高压可靠性的产品，该产品适合于表面贴装，适合于多种直流高压线路，可以有效的改善电子线路的性能。
  High voltage MLCC is a kind of special design MLCC that bases on the technology of general MLCC. This kind of MLCC has stable high voltage reliability and suitable to SMT. High voltage MLCC is widely applicable for many direct high voltage circuits in which it can improve the performance of the circuit.
* 叠层独石结构，具有高可靠性能
  There is high reliability on monolithic structure of laminated layers.
* 具有优良的焊接与耐焊性能，适用于回流焊接与波峰焊接
  And its character of excellent soldering ability and soldering resistance ability is suitable for reflow soldering and peak soldering.
* 具有较高的容量且容量性能稳定
  It includes high and stable capacitance
* 执行标准：GB/T 21041-2007　GB/T 21042-2007
  Executive Standard：　GB/T 21041-2007　GB/T 21042-2007

◆应用范围

Application

* 模拟或数字调制解调器
  Analog & Digital Modems
* 局域网/广域网接口界面
  LAN/WAN Interface
* 日光灯启动辉器照明电路
  Lighting Ballast Circuits
* 倍压电器
  Voltage Multipliers
* 直流变送器
  DC-DC Converters
* 背光源驱动电路
  Back-lighting Inverters

◆型号表示法
How To Order

0805	CG	102	K	500	A	T

尺寸规格 Size Code

尺寸规格 Size Code	EIA	长×宽 (L×W) mm
0402	0402	1.00×0.50
0603	0603	1.60×0.80
0805	0805	2.00×1.25
1206	1206	3.20×1.60
1210	1210	3.20×2.50
1808	1808	4.60×2.00
1812	1812	4.60×3.20
2211	2211	5.70×2.80
2220	2220	5.70×5.00
2225	2225	5.70×6.30

标称容量 Nominal Capacitance

表示方式 Express Method	实际值 Actual Value
0R5	0.5
1R0	1.0
102	10×10^2

注：头两位数字为有效数字，第三位数字为 0 的个数；R 为小数点。
Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.

额定电压 Rated Voltage 单位(unit)：V

表示方式 Express Method	实际值 Actual Value
6R3	6.3
500	50×10^0
201	20×10^1

注：头两位数字为有效数字，第三位数字为 0 的个数；R 为小数点。
Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.

包装方式 Package Styles

表示方式 Express Method	包装方式 Package Styles
T	编带 7 寸盘包装 Braided 7 inch disc packing
D	编带 13 寸盘包装 Braided 13 inch disc packing

介质种类 Dielectric Code

介质种类 Dielectric Code	介质材料 Dielectric
B	X7R
CG	C0G

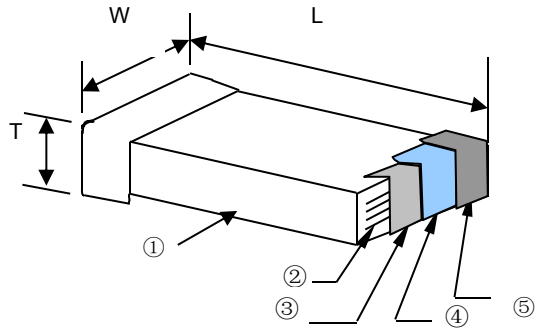
容量误差 Capacitance Tolerance

代码 Code	误差 Tolerance	备注 Note
A	±0.05pF	A、B、C、D 级误差适用于容量≤10pF 的产品。 These Capacitance tolerance A, B, C, D are just applicable the capacitance that equals to or less than 10pF。
B	±0.10pF	
C	±0.25pF	
D	±0.50pF	
F	±1%	
G	±2%	
J	±5%	
K	±10%	
M	±20%	
A	±0.05pF	

端头材料 Terminal Material Styles

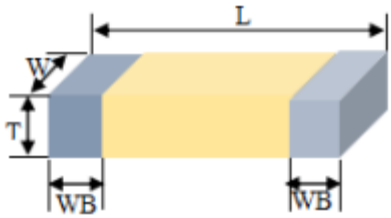
端头类别 Termination Styles	表示方式 Express Method
三层电镀端头 Nickel Barrier Termination	N
柔性端头多层片式陶瓷电容器 MLCC with Flexible Solderable Termination	A

◆产品结构
Product Structure



序号 NO	名称 Name
①	陶瓷介质 Ceramic dielectric
②	内电极 Inner electrode
③	外电极 Substrate electrode
④	镍层 Nickel Layer
⑤	锡层 Tin Layer

◆ 产品尺寸
Product Dimensions



型号 Type		尺寸 Dimensions (mm)				尺寸代码 Size code
英制表示 British	公制表示 Metric	L	W	T	WB	
0402	1005	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.05	CA
0603	1608	1.60±0.10	0.80±0.10	0.80±0.10	0.35±0.20	DA
0805	2012	2.00±0.20	1.25±0.25	0.80±0.20	0.50±0.20	EA
		2.00±0.20	1.25±0.25	1.25±0.25	0.50±0.20	EB
1206	3216	3.20±0.30	1.60±0.30	0.80±0.20	0.60±0.30	FA
				1.25±0.25		FB
				1.60±0.30		FC
1210	3225	3.20±0.30	2.50±0.30	1.25±0.25	0.60±0.30	GA
				1.60±0.30		GB
				2.00±0.30		GC
				2.50±0.30		GD
1808	4620	4.60±0.40	2.000.30	1.60±0.30	0.60±0.30	HA
				2.0±0.30		HB
1812	4632	4.60±0.40	3.20±0.30	1.25±0.25	0.60±0.30	IA
				1.60±0.30		IB
				2.00±0.30		IC
				2.50±0.30		ID
1825	4663	4.60±0.40	6.30±0.50	1.60±0.30	0.60±0.30	JA
				2.00±0.30		JB
				2.50±0.30		JC
2211	5728	5.70±0.40	2.80±0.40	1.60±0.30	0.60±0.30	KA
				2.00±0.30		KB
2220	5750	5.70±0.40	5.00±0.40	1.60±0.30	0.60±0.30	LA
				2.00±0.30		LB
				2.50±0.30		LC
2225	5763	5.70±0.50	6.30±0.50	1.60±0.30	0.60±0.30	MA
				2.00±0.30		MB
				2.50±0.30		MC

备注：1、产品具体厚度“T”查阅本承认书中“容量范围及其电压”。2、可根据客户的特殊要求设计符合客户需求的产品。

Note：1、The specific thickness of the product can read "capacity range and voltage" in this approval sheet.

2、We can design according to customer special requirements

◆温度系数/特性 Temperature Coefficient /Characteristics

介质种类 Dielectric	参考温度点 Reference Temperature Point	标称温度系数 Temperature Coefficient	工作温度范围 Operation Temperature Range
C0G	25℃	0±30ppm/℃	-55℃～125℃
X7R	25℃	±15%	-55℃～125℃

◆ 容量范围及电压
Capacitance Range and Voltage

*I 类电容器具体电压对应容量及厚度情况列表

* List of specific voltage corresponding to capacity and thickness of Class I capacitors

材料 Dielectric	C0G								
尺寸 Dimension	0402 (1.0mm*0.5mm)	0603 (1.6mm*0.8mm)			0805 (2.0mm*1.2mm)				
容量/电压 Capacity/ Voltage	100V	100V	200V	250V	100V	200V	250V	500V	1KV
0.5pF									
1pF		DA							
1.2pF		DA							
1.5pF		DA							
1.8pF		DA			EA				
2.0pF		DA			EA				
2.2pF	CA	DA			EA				
2.7pF	CA	DA		DA	EA				
3.0pF	CA	DA		DA	EA				
3.3pF	CA	DA		DA	EA				
3.6pF	CA	DA		DA	EA				
3.9pF	CA	DA		DA	EA				
4.7pF	CA	DA		DA	EA			EA	
5.0pF	CA	DA		DA	EA			EA	
5.6pF	CA	DA		DA	EA			EA	
6.8pF	CA	DA		DA	EA			EA	EA
8.0pF	CA	DA		DA	EA			EA	EA
8.2pF	CA	DA		DA	EA			EA	EA
10pF	CA	DA		DA	EA			EA	EB
12pF	CA	DA		DA	EA		EA	EA	EB
15pF	CA	DA		DA	EA		EA	EA	EB
18pF	CA	DA		DA	EA		EA	EA	EB
22pF	CA	DA		DA	EA		EA	EA	EB
27pF	CA	DA		DA	EA		EA	EA	EB
33pF	CA	DA		DA	EA		EA	EA	EB
39pF	CA	DA		DA	EA		EA	EA	EB
47pF	CA	DA		DA	EA	EA	EA	EA	EB
56pF	CA	DA	DA	DA	EA	EA	EA	EA	EB
68pF	CA	DA	DA	DA	EA	EA	EA	EA	EB
100pF	CA	DA	DA	DA	EA	EA	EA	EA	EB
120pF	CA	DA	DA	DA	EA	EA	EA	EA	EB
150pF	CA	DA	DA	DA	EA	EA	EA	EA	EB
180pF	CA	DA	DA	DA	EA	EA	EA	EB	EB
220pF	CA	DA	DA	DA	EA	EA	EA	EB	EB
270pF	CA	DA	DA	DA	EA	EA	EA	EB	
300pF	CA	DA	DA	DA	EA	EA	EA	EB	
330pF		DA	DA	DA	EA	EA	EA	EB	
390pF		DA	DA		EA	EA	EA	EB	
470pF		DA	DA		EA	EA	EA	EB	
560pF		DA			EA	EA	EA	EB	
680pF		DA			EA	EA	EA	EB	
820pF		DA			EA	EA	EA	EB	
1nF		DA			EA	EA	EA	EB	
1.5nF					EA	EB	EB		
1.8nF					EA	EB	EB		
2.2nF					EA	EB	EB		
2.7nF					EA	EB	EB		
3.3nF					EA	EB	EB		
4.7nF					EA	EB	EB		
10nF									

代码 Code	CA	DA	EA	EB
T	0.50±0.05	0.80±0.10	0.80±0.20	1.25±0.25

材料 Dielectric	C0G							
尺寸 Dimension	1206 (3.2mm*1.6mm)							
容量/电压 Capacity/ Voltage	100V	200V	250V	500V	630V	1KV	2KV	3KV
0.5pF				FB		FB		
1pF				FA		FB		
1.2pF				FA		FB		
1.5pF				FA		FB		
1.8pF				FA		FA		
2.0pF				FA		FB	FB	
2.2pF				FA		FB	FB	
2.7pF				FA		FB	FB	
3.0pF			FA	FA		FB	FB	
3.3pF			FA	FA/FB*		FB	FB	
3.6pF			FA	FA		FB	FB	
3.9pF			FA	FA		FB	FB	
4.7pF			FA	FA		FB	FB	
5.0pF			FA	FA		FB	FB	
5.6pF			FA	FA		FB	FB	
6.8pF			FA	FB		FB	FB	
8.0pF			FA	FB		FB	FB	
8.2pF			FA	FB		FB	FB	
10pF			FA	FA		FB	FB	
12pF			FA	FA/FB*		FB	FB	
15pF			FA	FB		FB	FB	
18pF			FA	FB		FB	FB	
22pF	FA	FA	FA	FB		FA*/FB	FB	
27pF	FA	FA	FA	FB		FB	FB	
33pF	FA	FA	FA	FB		FB	FB	FB/ FC*
39pF	FA	FA	FA	FA		FB	FB	
47pF	FA	FA	FA	FA/FB*		FB	FB	FB/ FC*
56pF	FA	FA	FA	FB		FB	FB	
68pF	FA	FA	FA	FB	FB	FB	FC	
100pF	FA	FA	FA	FB	FB	FB	FC	
120pF	FA	FA	FA	FA	FA	FB	FC	
150pF	FA	FA	FA	FA/FB*	FB	FB	FC	
180pF	FA	FA	FA	FA/FB*	FB	FB	FC	
220pF	FA	FA	FA	FA/FB*	FB	FB	FC	
270pF	FA	FA	FA	FB	FB	FB	FC	
330pF	FA	FA	FA	FB	FB	FB/ FC*	FC	
390pF	FA	FA	FA	FB	FB	FB/ FC*	FC	
470pF	FA	FA	FA	FB	FB	FB		
560pF	FA	FA	FA	FB	FB	FC		
680pF	FA	FA	FA	FB/FC*	FB	FC		
820pF	FA	FA	FA	FC	FB	FC		
1nF	FA	FB	FB	FC	FC	FC		
1.5nF	FA	FB	FB	FC	FC			
1.8nF	FA	FB	FB	FB/FC*	FB/FC*			
2.2nF	FA	FB	FB	FB/FC*	FB/FC*			
2.7nF	FA	FB	FB	FB/FC*	FB/FC*			
3.3nF	FA	FB	FB	FB/FC*	FB/FC*			
4.7nF		FB	FB	FB/FC*	FB/FC*			
5.6nF		FB	FB	FB/FC*	FB/FC*			
10nF								

代码 Code	FA	FB	FC	备注 Note
T	0.80±0.20	1.25±0.25	1.60±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	C0G										
尺寸 Dimension	1210 (3.2mm*2.5mm)						1808 (4.6mm*2.0mm)				
容量/电压 Capacity/ Voltage	100V	200V /250V	500V	630V	1KV	2KV	500V	1KV	2KV	3KV	5KV
2.0pF							HA			HA	
2.2pF							HA			HA	
2.7pF							HA			HA	
3.0pF							HA			HA	HA
3.3pF							HA			HA	HA
3.6pF							HA			HA	HA
3.9pF							HA			HA	HA
4.7pF							HA			HA	HA
5.0pF							HA			HA	HA
5.6pF							HA			HA	HA
6.8pF							HA			HA	HA
8.0pF							HA			HA	HA
8.2pF							HA			HA	HA
10pF		GA	GA			GA	HA			HA	HA
12pF		GA	GA			GA	HA			HA	HA
15pF		GA	GA			GA	HA			HA	HA
18pF		GA	GA			GA	HA			HA	HA
22pF		GA	GA			GA	HA			HA	HA
27pF		GA	GA			GA	HA			HA	HA
33pF		GA	GA			GA	HA	HA		HA	HA
39pF		GA	GA			GA	HA	HA		HA	HA
47pF		GA	GA			GA*/GB	HA	HA		HA	HA
56pF		GA	GA			GA*/GB	HA	HA		HA	HA
68pF		GA	GA		GA	GA*/GB	HA	HA		HA	HA
82pF		GA	GA		GA	GA*/GB	HA	HA		HA	HA*/HB
100pF	GA	GA	GA	GA	GA*/GB	GB	HA	HA	HA	HA	HB
120pF	GA	GA	GA	GA	GB	GB	HA	HA	HA	HA	
150pF	GA	GA	GA	GA	GB	GB	HA	HA	HA	HA	
180pF	GA	GA	GA	GA	GB	GB	HA	HA	HA	HA	
220pF	GA	GA	GA	GA	GC	GB	HA	HA	HA	HA	
270pF	GA	GA	GA	GA	GC	GB	HA	HA	HA	HA	
300pF	GA	GA	GA	GA	GC	GB	HA	HA	HA	HA/HB*	
330pF	GA	GA	GA	GA	GC	GB*/GC	HA	HA	HA	HA	
390pF	GA	GA	GA		GC		HA	HA	HA		
470pF	GA	GA	GA		GB*/GC		HA	HA	HA*/HB		
560pF	GA	GA	GA		GB		HA	HA	HA*/HB		
680pF	GA	GA	GA		GB		HA	HA	HA*/HB		
820pF	GA	GA	GA		GB*/GC		HA	HA	HA*/HB		
1nF	GA	GA	GB		GB*/GC		HA	HA	HB		
1.5nF	GA	GA	GA*/GB		GB*/GC		HA				
1.8nF	GA	GA	GB		GC		HA				
2.2nF	GA	GA	GB		GC		HA	HB			
2.7nF	GA	GA	GA/GC*				HA				
3.3nF	GA	GA	GA				HA				
4.7nF	GA	GA	GA				HA				
5.6nF	GA	GA	GA								
6.8nF	GA			GD	GD						
10nF				GD							
15nF				GD							
18nF				GD							
22nF				GD							

代码 Code	GA	GB	GC	GD	HA	HB	备注 Note
T	1.25±0.25	1.60±0.30	2.00±0.30	2.50±0.30	1.60±0.30	2.00±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	C0G									
尺寸 Dimension	1812 (4.6mm*3.2mm)								1825 (4.6mm*6.3mm)	
容量/电压 Capacity/ Voltage	100V	200V	500V	630V	1KV	2KV	3KV	5KV	1KV	3KV
2.0pF								IB		
2.2pF								IB		
2.7pF								IB		
3.0pF								IB		
3.3pF					IB		IB	IB		
3.6pF					IB		IB	IB		
3.9pF					IB		IB	IB		
4.7pF					IB		IB	IB		
5.0pF					IB		IB	IB		
5.6pF					IB		IB	IB		
6.8pF					IB		IB	IB		
8.0pF					IB		IB	IB		
8.2pF					IB		IB	IB		
10pF					IB		IB	IB		
12pF					IB		IB	IB		
15pF					IB		IB	IB		
18pF					IB		IB	IB		
22pF			IA		IB	IB	IB	IB		
27pF			IA		IB	IB	IB			
33pF			IA		IB	IB	IB			
39pF			IA		IB	IB	IB			
47pF			IA		IB	IB	IB			
56pF	IA		IA		IB	IB	IB			
68pF	IA		IA		IB	IB	IB			
82pF	IA		IA		IB	IB	IB			
100pF	IA		IA		IB	IB	IB			
120pF	IA		IA		IB	IB	IB			
150pF	IA		IA		IB	IB	IB			
180pF	IA		IA		IB	IB	IB			
220pF	IA		IA		IB	IB	IB			JA
270pF	IA		IA		IB	IB	IB*/IC			
330pF	IA		IA		IB	IB	IB*/IC			
390pF	IA		IA		IB	IB	IC			
470pF	IA		IA		IB	IB	IC			
560pF	IA		IA		IB	IB*/IC				
680pF	IA		IA		IB	IB*/IC				
820pF	IA		IA		IB	IB*/IC				
1nF	IA		IA/IB*	IB	IB	ID				
1.5nF	IA*/IB		IB		IB					
1.8nF	IA*/IB		IB		IB*/ID					
2.2nF	IA*/IB		IB		ID					
2.7nF	IA*/IB		IB							
3.3nF	IA*/IB		IB							
3.9nF	IA*/IB		IB							
4.7nF	IA*/IB	IB	IB		ID					
5.6nF	IA*/ID									
6.8nF	IA*/ID									
10nF	IA*/ID								JB	
15nF	IA*/ID									
18nF	IA*/ID									
22nF	ID									
33nF	ID									

代码 Code	IA	IB	IC	ID	JA	JB	备注 Note
T	1.25±0.25	1.60±0.30	2.00±0.30	2.5±0.30	1.60±0.30	2.00±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	C0G													
尺寸 Dimension	2211 (5.7mm*2.8mm)			2220 (5.7mm*5.0mm)						2225 (5.7mm*6.3mm)				
容量/电压 Capacity/ Voltage	250 V	3K V	5KV	250 V	500 V	1KV	2KV	3KV	5KV	1K V	1.5KV	2KV	2.5K V	3K V
3.3pF														MA
3.6pF														MA
3.9pF														MA
4.7pF														MA
5.0pF														MA
5.6pF														MA
6.8pF														MA
8.0pF														MA
8.2pF														MA
10pF			KA											MA
12pF			KA		LA									MA
15pF			KA		LA								MA	MA
18pF			KA		LA								MA	MA
22pF			KA		LA								MA	MA
27pF			KA		LA								MA	MA
33pF			KA		LA								MA	MA
39pF			KA		LA								MA	MA
47pF			KA*/KB		LA								MA	MA
56pF					LA								MA	MA
68pF					LA								MA	MA
82pF					LA								MA	MA
100pF					LA		LA	LA	LA			MA	MA	MA
120pF					LA		LA	LA	LA/LB*			MA	MA	MA
150pF					LA		LA	LA	LA/LB*			MA	MA	MA
180pF					LA		LA	LA	LA/LB*			MA	MA	MA
220pF		KA			LA		LA*/LB	LA*/LB	LB	MA		MA	MA	MA
270pF					LA		LA*/LB	LA*/LB		MA		MA	MA	MA
330pF					LA		LA*/LB	LA*/LB		MA		MA/MC*		
390pF					LA		LA*/LB	LA*/LB		MA	MA	MA/MC*		
470pF					LA		LA*/LB	LA*/LB		MA	MA	MA/MC*		
560pF					LA		LA*/LB	LA*/LB		MA	MA	MA/MC*		
680pF				LA	LA		LA*/LB	LA*/LB		MA	MA	MA/MC*		
820pF				LA	LA		LB	LB		MA	MA*/MB	MA/MC*		
1nF	KA			LA	LA	LA	LB	LB		MA	MA	MA*/MC		
1.5nF				LA	LA	LA/LC*	LB*/LC	LB*/LC						
1.8nF				LA	LA	LA/LC*	LB*/LC	LB*/LC						
2.2nF				LA	LA	LA/LC*	LC	LC						MC
2.7nF				LA	LA	LA/LC*								MC
3.3nF				LA	LA	LA/LC*								MC
3.9nF				LA	LA	LA/LC*								
4.7nF				LA	LA	LA/LC*								
5.6nF				LA		LA/LC*								
6.8nF				LA		LC								
8.2nF				LA										
10nF				LA										

代码 Code	KA	KB	LA	LB	LC	MA	MB	MC	备注 Note
T	1.60±0.30	2.00±0.30	1.60±0.30	2.00±0.30	2.50±0.30	1.60±0.30	2.00±0.30	2.50±0.30	加“*”为特殊品 Add "*" as special product.

*II 类电容器具体电压对应容量及厚度情况列表

A list of the specific voltage-specific capacitors of Class I capacitors

材料 Dielectric	X7R										
尺寸 Dimension	0402 (1.0mm*0.5mm)	0603 (1.6mm*0.8mm)			0805 (2.0mm*1.2mm)						
容量/电压 Capacity/ Voltage	100V	100V	200V	250V	100V	200V	250V	500V	630V	1000V	2000V
100pF							EA	EA			
120pF							EA	EA			
150pF		DA			EA		EA	EA			
180pF		DA			EA		EA	EA			
220pF	CA	DA	DA		EA	EA	EA	EA			
270pF	CA	DA	DA		EA	EA	EA	EA			
330pF	CA	DA	DA		EA	EA	EA	EA			
390pF	CA	DA	DA		EA	EA	EA	EA			
470pF	CA	DA	DA	DA	EA	EA	EA	EA			
560pF	CA	DA	DA	DA	EA	EA	EA	EA			
680pF	CA	DA	DA	DA	EA	EA	EA	EA			
1nF	CA	DA	DA	DA	EA	EA	EA	EA/EB*	EA	EA	EB
1.5nF	CA	DA	DA	DA	EA	EA	EA	EA/EB*	EA	EA/EB*	
1.8nF	CA	DA	DA	DA	EA	EA	EA	EA/EB*	EA	EA/EB*	
2.2nF	CA	DA	DA	DA	EA	EA	EA	EA/EB*	EA	EB	
2.7nF	CA	DA	DA	DA	EA	EA	EA	EA/EB*	EA/EB*		
3.3nF	CA	DA	DA	DA	EA	EA	EA	EB	EA/EB*		
4.7nF	CA	DA	DA	DA	EA	EA	EA	EA	EA/EB*		
5.6nF	CA	DA	DA	DA	EA	EA	EA	EA	EA/EB*		
10nF	CA	DA	DA	DA	EA	EA/EB*	EA/EB*	EB			
15nF		DA			EA	EA/EB*	EA/EB*				
18nF		DA			EA	EA/EB*	EA/EB*				
22nF		DA			EA	EA/EB*	EA/EB*				
33nF		DA			EB	EB	EB				
39nF		DA			EB						
47nF		DA			EA*/EB						
56nF		DA			EA*/EB						
68nF		DA			EA*/EB						
82nF		DA			EA*/EB						
100nF		DA			EB						
220nF					EB						
330nF					EB						
470nF					EB						
680nF					EB						
1μF					EB						
2.2μF											
3.3μF											
4.7μF											
6.8μF											
10μF											

代码 Code	CA	DA	EA	EB	备注 Note
T	0.50±0.05	0.80±0.10	0.80±0.20	1.25±0.25	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	X7R							
尺寸 Dimension	1206 (3.2mm*1.6mm)							
电压 Voltage	100V	200V	250V	500V	630V	1000V	2000V	2500V
100pF	FA	FA		FA		FB	FB	
120pF	FA	FA		FA		FB	FB	
150pF	FA	FA		FA		FA*/FB	FB	
180pF	FA	FA		FA		FB	FB	
220pF	FA	FA		FA		FA*/FB	FB	
270pF	FA	FA		FA		FB	FB	
330pF	FA	FA		FA		FA*/FB	FB	
390pF	FA	FA		FA		FB	FB	
470pF	FA	FA	FA	FA	FA	FA*/FB	FB	
560pF	FA	FA	FA	FA	FA	FB	FB	
680pF	FA	FA	FA	FA	FA	FA*/FB	FB	
820pF	FA	FA	FA	FA	FA	FA*/FB	FB	
1nF	FA	FA	FA	FA	FA	FA*/FB	FB	FB
1.5nF	FA	FA	FA	FA	FA	FB	FB	
1.8nF	FA	FA	FA	FA	FA	FB	FB	
2.2nF	FA	FA	FA	FA	FA	FB	FB/FC*	
2.7nF	FA	FA	FA	FB	FB	FB	FB	
3.3nF	FA	FA	FA	FB	FB	FB	FB	
4.7nF	FA	FA	FA	FB	FB	FB	FB/FC*	
5.6nF	FA	FA	FA	FB	FB	FB	FB/FC*	
6.8nF	FA	FA	FA	FB	FB	FC	FC	
10nF	FA	FA	FA	FB	FB	FB		
15nF	FA	FA	FA	FB	FB			
18nF	FA	FA	FA	FB	FB			
22nF	FA	FA	FA/FB*	FB	FB			
33nF	FA	FB	FB	FB/FC*	FB/FC*			
47nF	FA	FB	FB	FC	FC			
56nF	FA	FB	FB					
68nF	FA	FB	FB					
100nF	FB	FB/FC*	FB/FC*					
220nF	FB	FC	FC					
330nF	FB/FC*							
470nF	FC							
680nF	FB*/FC							
1μF	FC							
2.2μF	FC							
3.3μF	FC							
4.7μF								
6.8μF								
10μF								

代码 Code	FA	FB	FC	备注 Note
T	0.80±0.20	1.25±0.25	1.60±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	X7R													
尺寸 Dimension	1210 (3.2mm*2.5mm)							1808 (4.6mm*2.0mm)						
电压 Voltage	100V	200V	250V	500V	630V	1KV	2KV	250V	500 V	1K V	2KV	3KV	4KV	5KV
100pF											HA	HA		
120pF											HA	HA		
150pF											HA	HA		HA
180pF											HA	HA		HA
220pF				GA	GA	GA	GA			HA	HA	HA		HA
270pF				GA	GA	GA	GA			HA	HA	HA		HA
330pF				GA	GA	GA	GA			HA	HA	HA		HA
390pF				GA	GA	GA	GA			HA	HA	HA		HA
470pF				GA	GA	GA	GA	HA		HA	HA	HA		HA
560pF				GA	GA	GA	GA	HA		HA	HA	HA		HA
680pF				GA	GA	GA	GA	HA		HA	HA	HA		HA
1nF			GA	GA	GA	GA	GA	HA		HA	HA/HB*	HA/HB*	HA/HB*	HA/HB*
1.5nF			GA	GA	GA	GA	GA	HA		HA	HA	HA/HB*		
1.8nF			GA	GA	GA	GA	GA	HA		HA	HA	HA/HB*		
2.2nF			GA	GA	GA	GA	GA	HA		HA	HA/HB*	HA/HB*		
2.7nF			GA	GA	GA	GA	GA	HA		HA	HA	HA		
3.3nF			GA	GA	GA	GA	GA	HA		HA	HA/HB*	HA/HB*		
4.7nF	GA		GA	GA	GA/ GB*	GA/G B*	GB	HA		HA	HA	HA		
5.6nF	GA		GA	GA	GA	GA	GB			HA	HA			
6.8nF	GA		GA	GA	GA	GA*/ GB	GB			HA	HA			
8.2nF	GA		GA	GA	GA	GA*/ GB	GB			HA	HA			
10nF	GA		GA	GA	GA	GA*/ GB	GB			HA	HA			
15nF	GA		GA	GA	GA	GB				HA				
18nF	GA		GA	GA	GA	GB				HA				
22nF	GA		GA	GA	GA	GB				HA				
33nF	GA		GA	GB	GB/ GC*									
47nF	GA	GA	GA	GB/ GC*	GB/ GC*/ GD*				HA					
56nF	GA		GA	GB	GB									
68nF	GA/ GB*		GA	GB	GB									
82nF	GA		GA	GB	GB									
100nF	GA		GA	GB/ GC*	GB/ GC*									
220nF	GB		GB/ GC*/ GD*											
330nF	GB		GC											
470nF	GB													
680nF	GB													
820nF	GB													
1μF	GB													
2.2μF	GB/ GC*/ GD*													
3.3μF														
4.7μF	GC*/ GD													
6.8μF														

代码 Code	GA	GB	GC	GD	HA	HB	备注 Note
T	1.25±0.25	1.60±0.30	2.00±0.30	2.50±0.30	1.60±0.30	2.00±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	X7R									
尺寸 Dimension	1812 (4.6mm*3.2mm)									
电压 Voltage	100V	200V	250V	500V	630V	1KV	2KV	3KV	4KV	5KV
100pF										
120pF										
150pF								IB	IB	
180pF								IB	IB	
220pF							IB	IB	IB	
270pF							IB	IB	IB	
330pF						IB	IB	IB	IB	
390pF						IB	IB	IB	IB	
470pF						IB	IB	IB	IB	
560pF						IB	IB	IB	IB	
680pF			IB			IB	IB	IB	IB	
820pF			IB			IB	IB	IB	IB	
1nF		IB	IB			IB	IB	IB	IB	
1.5nF		IB	IB			IB	IB	IB	IB	
1.8nF		IB	IB			IB	IB	IB	IB	
2.2nF		IB	IB			IB	IB	IB/IC*	IB	IB/IC*
2.7nF		IB	IB			IB	IB	IB	IB	
3.3nF		IB	IB			IB	IB	IB	IB	
4.7nF		IB	IB			IB	IB	IB		
5.6nF		IB	IB			IB	IB	IB/ID*		
6.8nF		IB	IB			IB	IB	IB/ID*		
8.2nF		IB	IB			IB	IB	IB/ID*		
10nF		IB	IB	IB		IB	IB	ID		
12nF		IB	IB	IB		IB	IB			
15nF		IB	IB	IB		IB	IB/ID*			
18nF		IB	IB	IB		IB	ID			
22nF		IB	IB	IB	IB	IB				
33nF		IB	IB	IA	IB	IB				
47nF	IB	IB	IB	IB	IB	IB/IC*				
56nF	IB	IB	IB	IB	IB	IC				
68nF	IB	IB	IB	IB	IB					
82nF	IB	IB	IB	IB	IB					
100nF	IB	IB	IA*/IB	IB	IB/ID*					
120nF	IB	IB	IA	IC	IC					
150nF	IB	IB	IC	IC	IC					
180nF	IB	IB	IB	IC	IC/ID*					
220nF	IB	IB	IB/IC*	IC/ID*	IC/ID*					
330nF	IB	IC	IB*/IC							
470nF	IB	IC	ID							
560nF	IB*/IC	IC	IC							
680nF	IC	IC	IC							
820nF	IC	IC	IC							
1μF	IC	IC	IC							
2.2μF	IC/ID*									
3.3μF										
4.7μF										
6.8μF										
10μF										

代码 Code	IA	IB	IC	ID	备注 Note
T	1.25±0.25	1.60±0.30	2.00±0.30	2.50±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	X7R								
尺寸 Dimension	1825 (4.6mm*6.3mm)							2211 (5.7mm*2.8mm)	
电压 Voltage	200V	250V	500V	630V	1000V	2000V	3000V	3000V	5000V
100pF									
120pF									
150pF									JA
180pF									JA
220pF									JA
270pF									JA
330pF									JA
390pF									JA
470pF									JA
560pF									JA
680pF									JA
820pF									JA
1nF						JA			JA
1.2nF						JA			JA
1.5nF						JA			JA
1.8nF						JA			JA
2.2nF						JA		JA	JA
2.7nF						JA			
3.3nF						JA			
3.9nF						JA			
4.7nF						JA	JA/JB*		
5.6nF						JA			
6.8nF						JA			
8.2nF						JA			
10nF						JA			
12nF						JA			
15nF						JA			
18nF						JA			
22nF						JA			
33nF									
47nF									
56nF									
68nF									
82nF									
100nF	JA		JA	JA	JA				
120nF			JA	JA					
150nF			JA	JA					
220nF			JA						
270nF									
330nF									
470nF									
560nF									
680nF									
8520nF									
1μF		JB/JC*							
1.2μF									
1.5μF									
1.8μF									
2.2μF									
2.7μF									
3.3μF									
4.7μF									
6.8μF									
10μF									

代码 Code	JA	JB	JC	备注 Note
T	1.60±0.30	2.00±0.30	2.50±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric	X7R										
尺寸 Dimension	2220 (5.7mm*5.0mm)										
电压 Voltage	100V	200V	250V	500V	630V	1000V	2000V	2500V	3000V	4000V	5000V
100pF											
120pF											
150pF											
180pF											
220pF											
270pF											
330pF				LA	LA						
390pF				LA	LA						
470pF				LA	LA						
560pF				LA	LA						
680pF				LA	LA						
820pF				LA	LA						
1nF				LA	LA		LA		LA	LA	LA
1.5nF				LA	LA		LA		LA	LA	LA/LB*
1.8nF				LA	LA		LA		LA	LA	LA/LB*
2.2nF		LA	LA	LA	LA		LA		LA/LB*	LA	LB
2.7nF		LA	LA	LA	LA		LA		LA	LA	LB
3.3nF		LA	LA	LA	LA		LA		LA	LA	LB
3.9nF		LA	LA	LA	LA		LA		LA	LA	LB
4.7nF		LA	LA	LA	LA	LA	LA/LB*		LA/LB*	LA	LB
5.6nF		LA	LA	LA	LA	LA	LA		LA	LA	
6.8nF		LA	LA	LA	LA	LA	LA		LA	LA	
8.2nF		LA	LA	LA	LA	LA	LA		LA	LA/LB*	
10nF		LA	LA	LA	LA	LA	LA	LA	LA		
12nF		LA	LA	LA	LA	LA	LA				
15nF		LA	LA	LA	LA	LA	LA				
18nF		LA	LA	LA	LA	LA	LA				
22nF		LA	LA	LA	LA	LA	LA				
33nF		LA	LA	LA	LA	LA	LA				
47nF	LA	LA	LA	LA	LA	LA	LA/LB*				
56nF	LA	LA	LA	LA	LA	LA/LB*					
68nF	LA	LA	LA	LA	LA	LA/LB*					
82nF	LA	LA	LA	LA	LA	LA/LB*					
100nF	LA	LA	LA	LA	LA	LB					
120nF	LA	LA	LA	LA	LA	LB					
150nF	LA	LA	LA	LA	LA	LB					
220nF	LA	LA	LA	LA	LA*/LC	LB					
330nF	LA	LA	LA	LA*/LB	LA*/LB						
470nF	LA	LA	LA	LA*/LB	LA*/LB						
680nF	LA	LA	LA								
820nF	LA	LA	LA								
1μF	LA	LA	LA								
1.2μF	LA	LA	LA								
1.5μF	LA	LA	LA								
1.8μF	LA	LA	LA								
2.2μF	LA*/LB	LA*/LB	LA*/LB								
3.3μF	LB										
4.7μF	LB										
6.8μF											
10μF											

代码 Code	LA	LB	LC	备注 Note
T	1.60±0.30	2.00±0.30	2.50±0.30	加“*”为特殊品 Add "*" as special product.

材料 Dielectric		X7R									
尺寸 Dimension		2225 (5.7mm*6.3mm)									
电压 Voltage	100V	200V	250V	500V	630V	1000V	1500V	2000V	3000V	4000V	5000V
100pF											
120pF											
150pF									MA		
180pF									MA		
220pF						MA			MA		
270pF						MA			MA		
330pF						MA			MA		
390pF						MA			MA		
470pF						MA			MA		
560pF						MA			MA		
680pF						MA			MA		
820pF						MA			MA		
1nF			MA			MA			MA		
1.2nF			MA			MA			MA		
1.5nF			MA			MA			MA		MA
1.8nF			MA			MA			MA		
2.2nF			MA			MA		MA	MA	MA	
2.7nF			MA			MA		MA	MA		
3.3nF			MA	MA	MA	MA		MA	MA		
3.9nF			MA	MA	MA	MA		MA	MA		
4.7nF			MA	MA	MA	MA		MA	MA		
5.6nF			MA	MA	MA	MA		MA	MA		
6.8nF			MA	MA	MA	MA		MA	MA		
8.2nF			MA	MA	MA	MA		MA	MA		
10nF			MA	MA	MA	MA		MA	MA		
12nF			MA	MA	MA	MA		MA	MA		
15nF			MA	MA	MA	MA		MA	MA		
18nF			MA	MA	MA	MA		MA			
22nF			MA	MA	MA	MA		MA			
33nF			MA	MA	MA	MA		MA/MB*			
47nF			MA	MA	MA	MA		MA			
56nF			MA	MA	MA	MA		MA/MB*			
68nF			MA	MA	MA	MA		MA/MB*			
82nF			MA	MA	MA	MA		MA/MB*			
100nF	MA		MA	MA	MA	MA*/MB	MB				
120nF	MA		MA	MA	MA	MB					
150nF	MA		MA	MA	MA						
220nF	MA		MA	MA	MA						
330nF	MA		MA	MA	MA						
470nF	MA	MA	MA	MA	MA						
680nF	MA		MA	MB	MB						
820nF	MA		MA	MB/MC*	MB/MC*						
1μF	MA		MA*/MB	MC	MC						
1.2μF	MA		MA*/MB								
1.5μF	MA		MA*/MB								
1.8μF	MA		MA*/MB								
2.2μF	MB		MB								
3.3μF											
4.7μF											
6.8μF											
10μF											

代码 Code	MA	MB	MC	备注 Note
T	1.60±0.30	2.00±0.30	2.50±0.30	加“*”为特殊品 Add "*" as special product.

◆中高压电容器介质耐电强度的测试方法：

Measurement method of dielectric withstanding voltage for high voltage MLCC

额定电压范围 Rated voltage range	耐电性能的测试方法 Measuring Method
Vr=100V	施加额定电压的 250%, 5 秒，最大电流不超过 50mA Force 200%Rated voltage for 5 second. Max..current should not exceed 50 mA.
100V＜Vr＜500V	施加额定电压的 200%, 5 秒，最大电流不超过 50mA Force 200%Rated voltage for 5 second. Max..current should not exceed 50 mA.
500V≤Vr≤1000V	施加额定电压的 150%, 5 秒，最大电流不超过 50mA Force 150%Rated voltage for 5 second. Max..current should not exceed 50 mA.
1000V＜Vr≤2000V	施加额定电压的 120%, 5 秒，最大电流不超过 50mA Force 120%Rated voltage for 5 seconds. Max..current should not exceed 50 mA.
2000V＜Vr≤5000V	施加额定电压的 120%, 5 秒，最大电流不超过 10mA Force 120%Rated voltage for 5 seconds. Max..current should not exceed 10 mA.

◆ 可靠性测试

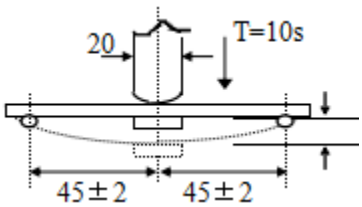
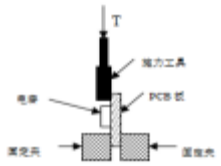
Reliability Test

二类介质规格测容量前需去老化处理：测试温度：25℃±3℃，测试湿度：＜70%RH. 电容器在 150℃热处理 1 小时，放置 48h 后进行测量。

.The second type of medium specification needs to be aged before measuring the capacity: test temperature: 25℃±3℃, test humidity: < 70%RH. The capacitors were heat treated at 150℃ for 1 hour and measured after 48 hours of placement.

<table>
<tr><td>项目
Item</td><td colspan="2">技术规格
Technical Specification</td><td colspan="3">测 试 方 法
Test Method and Remarks</td></tr>
<tr><td rowspan="4">容量
Capacitance</td><td rowspan="3">Ⅰ类
ClassⅠ</td><td rowspan="3">应符合指定的误差级别
Should be within the specified tolerance.</td><td>标称容量
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>＞1000 pF</td><td>1KHz±10%</td></tr>
<tr><td>Ⅱ类
ClassⅡ</td><td>应符合指定的误差级别
Should be within the specified tolerance.</td><td colspan="3">测试温度： 25℃±3℃
测试频率：1KHz±10%
测试电压：1.0±0.2Vrms
Test Temperature: 25℃±3℃
Test Frequency: 1KHz±10%
Test Voltage: 1.0±0.2Vrms</td></tr>
<tr><td rowspan="5">损耗角正切
(DF, tanδ)
Dissipation Factor</td><td rowspan="3">Ⅰ类
ClassⅠ</td><td>DF</td><td>标称容量
Capacitance</td><td>测试频率
Measuring Frequency</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td>≤1/（400+20C）</td><td>C＜30 pF</td><td rowspan="2">1MHz±10%
（C＞1000 pF，1KHz±10%）</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td>≤0.1%</td><td>C≥30pF</td></tr>
<tr><td rowspan="2">Ⅱ类
ClassⅡ</td><td>DF</td><td>标称容量
Capacitance</td><td>测试频率
Measuring Frequency</td><td>测试电压
Measuring Voltage</td></tr>
<tr><td>≤250×10^{-4}</td><td>C＜1 uF</td><td rowspan="2">1KHz±10%</td><td rowspan="2">1.0±0.2Vrms</td></tr>
<tr><td>≤750×10^{-4}</td><td>1 uF≤C≤4.7 uF</td></tr>
<tr><td rowspan="3">绝缘电阻
(IR)
Insulation Resistance</td><td>Ⅰ类
ClassⅠ</td><td>C≤10 nF, Ri≥50000MΩ
C＞10 nF, Ri•C_R≥500S</td><td colspan="3" rowspan="2">测试电压:额定电压（最高 500V）
测试时间：60±5 秒
测试湿度：≤75%
测试温度： 25℃±3℃
测试充放电电流：≤50mA
Measuring Voltage: Rated Voltage（Max 500V）
Duration: 60±5s
Test Humidity: ≤75%
Test Temprature: 25℃±3℃
Test Current: ≤50mA</td></tr>
<tr><td>Ⅱ类
ClassⅡ</td><td>C≤25nF，Ri≥10000MΩ
C＞25nF，Ri•C_R＞100S</td></tr>
<tr><td colspan="2"></td><td colspan="3">无铅焊料：
浸锡温度：245±5℃
浸锡时间：2±0.5s
Lead-free soldering
Solder Temperature: 245±5℃
Duration: 2±0.5s</td></tr>
</table>

<table>
<tr><th>项目
Item</th><th>技术规格
Technical Specification</th><th>测 试 方 法
Test Method and Remarks</th></tr>
<tr><td>可焊性
Solderability</td><td>上锡率应大于 95%
At least 95% of the terminal electrode is covered by new solder.
外观：无可见损伤.
Visual Appearance: No visible damage.</td><td>将电容在 80~120℃的温度下预热 10~30 秒.
Preheating conditions:80 to 120℃; 10~30s.</td></tr>
<tr><td>耐焊接热
Resistance to Soldering Heat</td><td>
<table>
<tr><th>项目
Item</th><th>Ⅰ类</th><th>Ⅱ类</th></tr>
<tr><td>ΔC/C</td><td>≤±2.5%或±0.25pF,取较大值
≤±2.5% or ±0.25pF, whichever is larger</td><td>±15%</td></tr>
<tr><td>DF</td><td colspan="2">同初始标准
Same to initial value.</td></tr>
<tr><td>IR</td><td colspan="2">同初始标准
Same to initial value.</td></tr>
<tr><td colspan="3">外观：无可见损伤 上锡率：≥95%
Appearance： No visible damage.At least 95% of the terminal electrode is covered by new solder.</td></tr>
</table>
</td><td>将电容在 100~200℃的温度下预热 60-120 秒.
浸锡温度：265±5℃
浸锡时间：10±1s
然后取出溶剂清洗干净,在 10 倍以上的显微镜底下观察.
放置时间：24±2 小时 放置条件：室温
Preheating conditions: 100 to 200℃; 60-120s.
Solder Temperature: 265±5℃
Duration: 10±1s
Clean the capacitor with solvent and examine it with a 10X(min.) microscope.
Recovery Time: 24±2h
Recovery condition: Room temperature</td></tr>
<tr><td>抗弯曲强度
Resistance to Flexure of Substrate (Bending Strength)</td><td>外观：无可见损伤.
Appearance: No visible damage.

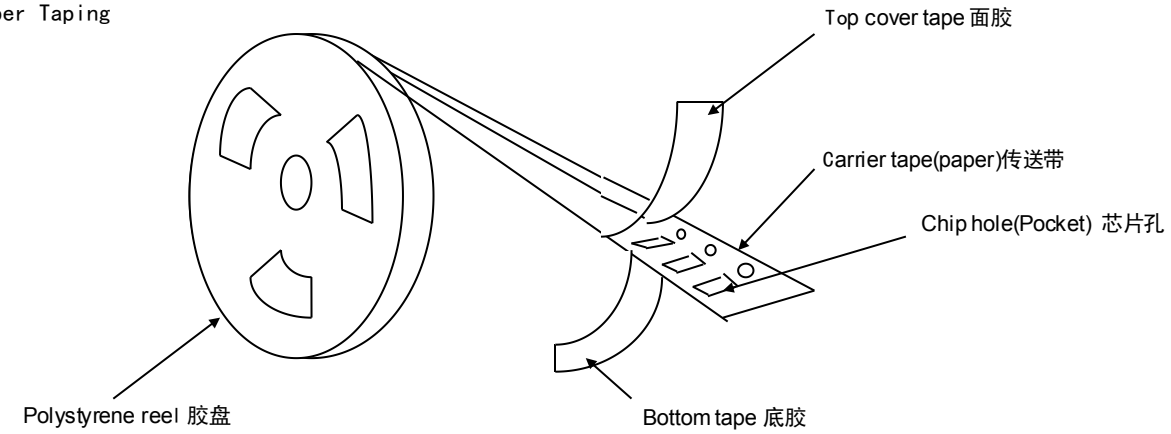
ΔC/C:
Ⅰ类：≤±5%或±0.5pF，取两者中最大者
Ⅱ类：：≤±10%
Class Ⅰ: ≤±5% or ±0.5pF,whichever is larger.
Class Ⅱ: : ≤±10%</td><td>试验基板：PCB 弯曲深度：1mm
施压速度：1mm/sec.
应在弯曲状态下进行测量。
Test Board: PCB
Speed: 1mm/sec. Unit: mm
The measurement should be made with the board in the bending position.
 
</td></tr>
<tr><td>温度循环
Temperature Cycle</td><td>
<table>
<tr><th>项目
Item</th><th>C0G</th><th>X7R</th></tr>
<tr><td>ΔC/C</td><td>≤±1%或±1PF，取较大值
≤±1% or ±1pF，whichever is larger</td><td>-15% ~+15%</td></tr>
</table>
外观无可见损伤
No visible damage.</td><td>Recovery time: 24±1h
初始测量 Initial Measurement
循环次数：5 次，一个循环分以下 4 步：
Cycling Times: 5 times, 1 cycle, 4 steps:
<table>
<tr><th>阶段
Step</th><th>温度（Temperature）</th><th>时间 (Time)</th></tr>
<tr><td>1</td><td>下限温度(Low- category temp.):
(C0GX7R:-55℃)</td><td>30min</td></tr>
<tr><td>2</td><td>常温(Normal temp.) : +20℃</td><td>2～3min</td></tr>
<tr><td>3</td><td>上限温度(Up- category temp.)
(C0G/X7R: +125℃)</td><td>30min</td></tr>
<tr><td>4</td><td>常温(Normal temp.) : +20℃</td><td>2～3min</td></tr>
</table>
试验后放置（恢复）时间：24±2h
Recovery time after test: 24±2h</td></tr>
<tr><td>端头结合强度
Termination Adhesion</td><td>外观无可见损伤
No visible damage.</td><td>如图所示：慢慢施加一个 T 的力到电容侧面瓷体上，并保持 60+1 秒。
As shown in the picture , Slowly apply a T force to the porcelain body on the side of the capacitor and hold for 60+1 seconds.
<table>
<tr><th>规 格
Specification</th><th>施加力 T
Apply force T</th></tr>
<tr><td>≤0402</td><td>2N</td></tr>
<tr><td>≥0603</td><td>5N</td></tr>
</table>

</td></tr>
</table>

<table>
<tr><th>项目
Item</th><th>技术规格
Technical Specification</th><th>测 试 方 法
Test Method and Remarks</th></tr>
<tr><td>耐湿负荷
Humidity load</td><td>
<table>
<tr><td rowspan="2">ΔC/C</td><td>Ⅰ类</td><td>±7.5%或±0.75pF, 取两者之中较大者
±7.5% or ±0.75pF, whichever is larger.</td></tr>
<tr><td>Ⅱ类</td><td>-12.5% ~ +12.5%</td></tr>
<tr><td>DF</td><td colspan="2">≤2 倍初始标准
Not more than twice of initial value.</td></tr>
<tr><td rowspan="2">IR</td><td>Ⅰ类</td><td>Ri≥5000MΩ或 Ri•C≥50S 取两者之中较小者.
Ri≥5000MΩ or Ri•C_R≥50S whichever is smaller.</td></tr>
<tr><td>Ⅱ类</td><td>Ri≥1000MΩ或 Ri•C≥10S 取两者之中较小者.
Ri≥1000MΩ or Ri•C_R≥10S whichever is smaller.</td></tr>
<tr><td colspan="3">外观：无损伤
Appearance: No visible damage.</td></tr>
</table>
</td><td>温度：40±2℃
湿度：90~95%RH
电压：额定电压 Ur≤1000V 时，按 Ur 测试；
额定电压 Ur＞1000V 时，最高按 1000V 测试
时间：500 小时
放置时间：24±2h 小时；
Ⅱ类：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF 产品试验后需在 150℃温度下保持 1h ，再放置 24±2h 后测试电性能.
Temperature: 40±2℃
Humidity: 90~95%RH
Voltage: Rated Voltage（Umax≤1000V）
Duration: 500h
Recovery Time: 24h±2h
Class 2：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF product need to keep in 150℃、1h after the test，and measurement to be made after being kept at room temperature for 24±2h.</td></tr>
<tr><td>寿命试验
Life Test</td><td>
<table>
<tr><td rowspan="2">ΔC/C</td><td>Ⅰ类</td><td>≤±3%或±0.3pF, 取两者之中较大者
≤±3% or ±0.3pF, whichever is larger.</td></tr>
<tr><td>Ⅱ类</td><td>-20% ~ +20%</td></tr>
<tr><td>DF</td><td colspan="2">≤2 倍初始标准
Not more than twice of initial value.</td></tr>
<tr><td rowspan="2">IR</td><td>Ⅰ类</td><td>Ri≥4000MΩ或 Ri•C≥40S 取两者之中较小者
Ri≥4000MΩ or Ri•C_R≥40S whichever is smaller.</td></tr>
<tr><td>Ⅱ类</td><td>Ri≥2000MΩ或 Ri•C≥50S 取两者之中较小者.
Ri≥2000MΩ or Ri•C_R≥50S whichever is smaller.</td></tr>
<tr><td colspan="3">外观：无损伤
Appearance: No visible damage.</td></tr>
</table>
</td><td>电压：
100V≤额定电压≤200V：1.5Ur
200V＜额定电压＜500V：1.3Ur
500V≤额定电压： 1.2Ur
时间：1000 小时
温度：125℃
充电电流：不应超过 50mA
放置时间：24±2h 小时；
Ⅱ类：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF 产品试验后需在 150℃温度下保持 1h ，再放置 24±2h 后测试电性能.
Applied Voltage:
100V≤Rated Voltage≤200V：1.5 Multiple
200V＜Rated Voltage＜500V：1.3 Multiple
500V≤Rated Voltage： 1.2 Multiple
Duration: 1000h
Temperature：125℃（C0G、X7R）
Charge/Discharge Current:50mA max.
Recovery Time: 24h±2h
Class 2：0201≥47nF、0402≥33nF、0603≥1μF、0805≥4.7μF、1206≥10μF product need to keep in 150℃、1h after the test，and measurement to be made after being kept at room temperature for 24±2h.</td></tr>
</table>

◆ 包装
Package

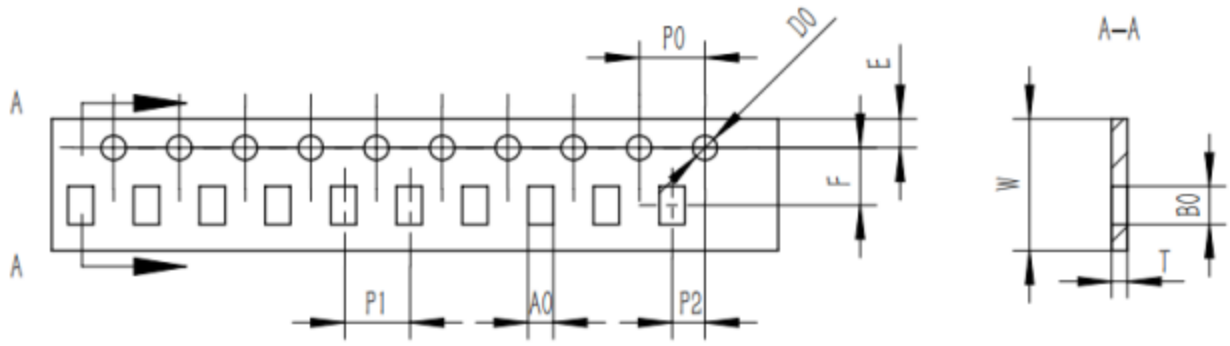
＊ 纸带卷盘结构

Paper Taping



* 0402 纸带编带尺寸大小

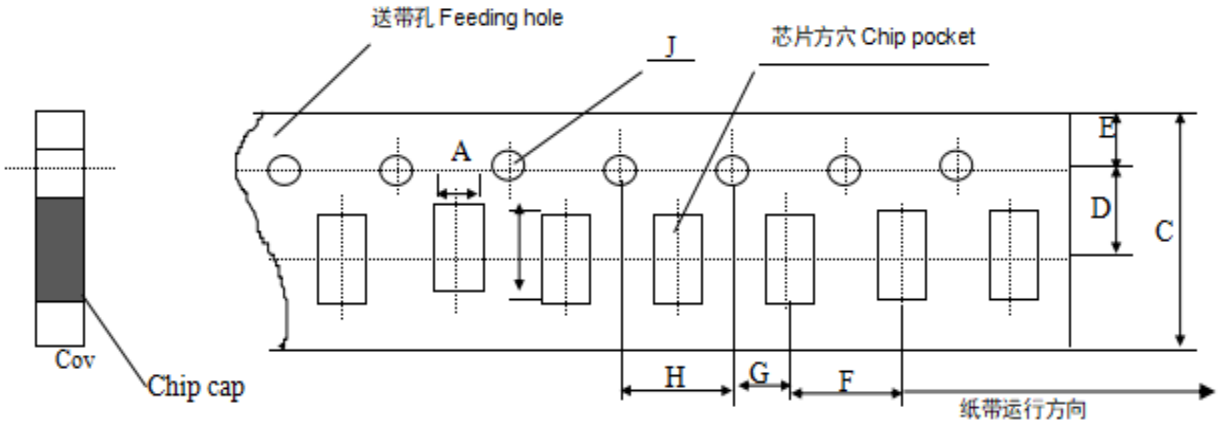
Dimensions of paper taping for 0402 type



代号 Code	A0	B0	W	F	E	P1	P2	P0	D0	T
0402	0.65 ±0.10	1.15 ±0.10	8.00 ±0.10	3.50 ±0.05	1.75 ±0.10	2.00 ±0.05	2.00 ±0.05	4.00 ±0.10	1.50 -0/+0.10	0.80 Below

* 适合‘0402，0603，0805，1206’常规尺寸产品的纸带尺寸

Dimensions of paper taping for 0402，0603，0805，1206 types.



代号Code / 纸带规格	A	B	C	D*	E	F	G*	H	J	T
0402	0.59±0.03	1.12±0.03	8±0.1	/	1.75±0.1	2±0.05	/	4±0.1	1.55±0.05	0.60±0.03
0402	0.60±0.03	1.15±0.03	8±0.1	/	1.75±0.1	2±0.05	/	4±0.1	1.55±0.05	0.60±0.03
0402	0.65±0.03	1.15±0.03	8±0.1	/	1.75±0.1	2±0.05	/	4±0.1	1.55±0.05	0.60±0.03
0402	0.66±0.03	1.18±0.03	8±0.1	/	1.75±0.1	2±0.05	/	4±0.1	1.55±0.05	0.65±0.03
0603	0.95±0.05	1.9±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.95±0.03
0603	1.05±0.05	1.85±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.98±0.03
0603	1.10±0.05	1.90±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	1.05±0.03

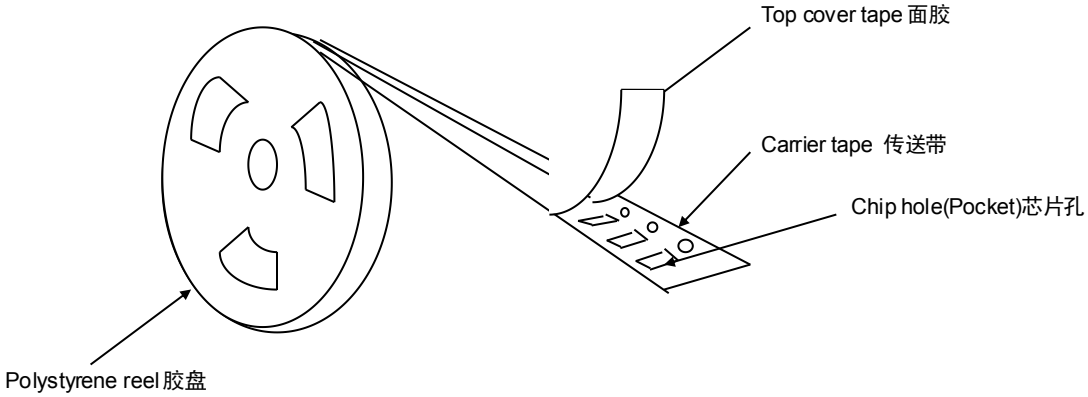
代号Code / 纸带规格	A	B	C	D*	E	F	G*	H	J	T
0805	1.55±0.05	2.3±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.75±0.03
0805	1.55±0.05	2.3±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.95±0.03
0603	1.10±0.05	1.90±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	1.05±0.03
0805	1.55±0.05	2.3±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.75±0.03
0805	1.55±0.05	2.3±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.95±0.03
0805	1.55±0.05	2.3±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.98±0.03
1206	1.85±0.05	3.45±0.05	8±0.1	/	1.75±0.1	4±0.05	/	4±0.1	1.55±0.05	0.95±0.03

注意：*表示此处对尺寸的要求非常精确。

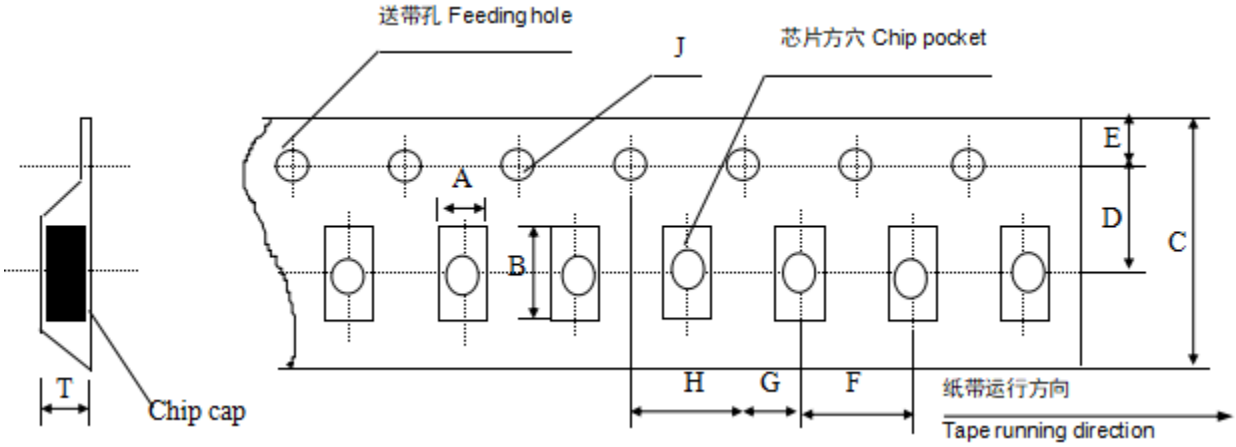
Note: The place with "*" means where needs exactly dimensions.

* 塑胶卷盘结构

Embossed taping



* 塑胶带尺寸结构(适合'0805~1812' 型产品)



Dimensions of embossed taping for 0805~1812 type

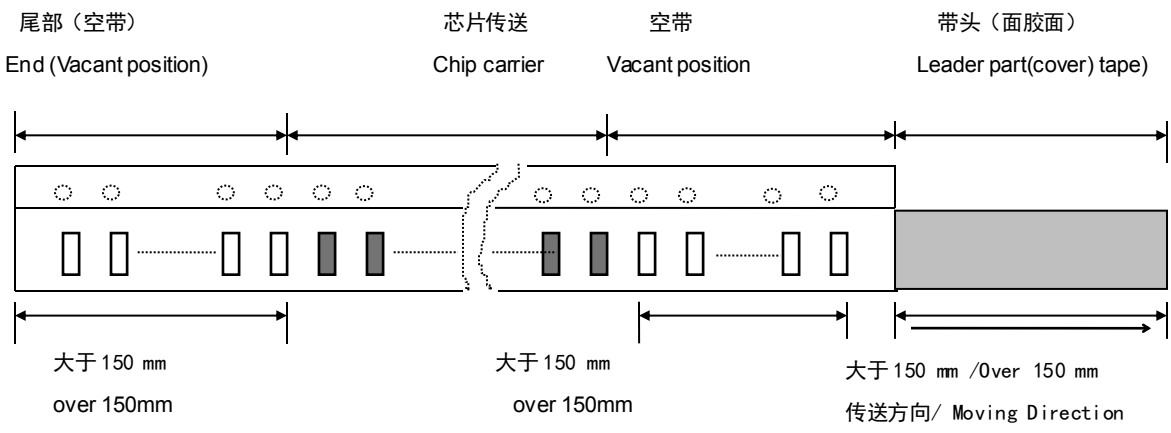
备注：*表示此处对尺寸的要求非常精确。

Note：The place with "*" means where needs exactly dimensions

代号 Code	A	B	C	D*	E	F	G*	H	J	T
0805	1.50 ±0.10	2.34 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.22 + 0.1-0.03
0805	1.40 + 0.10-0.05	2.25 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.35 + 0.1-0.03
0805	1.55 ±0.10	2.28 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.45 + 0.1-0.03
0805	1.55 + 0.10-0.03	2.35 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.55 + 0.1-0.03
1206	1.77 + 0.10-0.03	3.40 + 0.10-0.05	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.04 + 0.1-0.03
1206	1.88 ±0.10	3.50 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.27 + 0.1-0.03
1206	1.85 ±0.10	3.50 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.35 + 0.1-0.03
1206	1.88 ±0.10	3.53 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.80 + 0.1-0.03
1206	2.00 + 0.10-0.03	3.55 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.95 + 0.1-0.03
1210	2.76 ±0.10	3.42 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.55 + 0.1-0.03
1210	2.85 ±0.10	3.56 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.80 + 0.1-0.05
1210	2.80 ±0.10	3.60 ±0.10	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.30 + 0.1-0.03
1210	2.65 + 0.10-0.03	3.45 + 0.10-0.03	8.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.65 + 0.1-0.03
1808	2.20 + 0.10-0.03	4.95±0.10	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.80 + 0.1-0.03
1808	2.30 + 0.10-0.03	5.16±0.10	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.30 + 0.1-0.03
1812	3.66 ±0.10	4.95±0.10	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	1.85±0.1
1812	3.60 ±0.10	5.10 ±0.10	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.80±0.1
2220	5.70 ±0.10	6.20 ±0.10	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.0 + 0.15-0.03
2225	6.30 + 0.10-0.03	6.80 + 0.10-0.03	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.0 + 0.10-0.03
2225	6.20 + 0.10-0.03	6.70 + 0.10-0.03	12.00 + 0.10-0.03	/	1.75 ±0.10	/	/	/	/	2.4 + 0.10-0.03

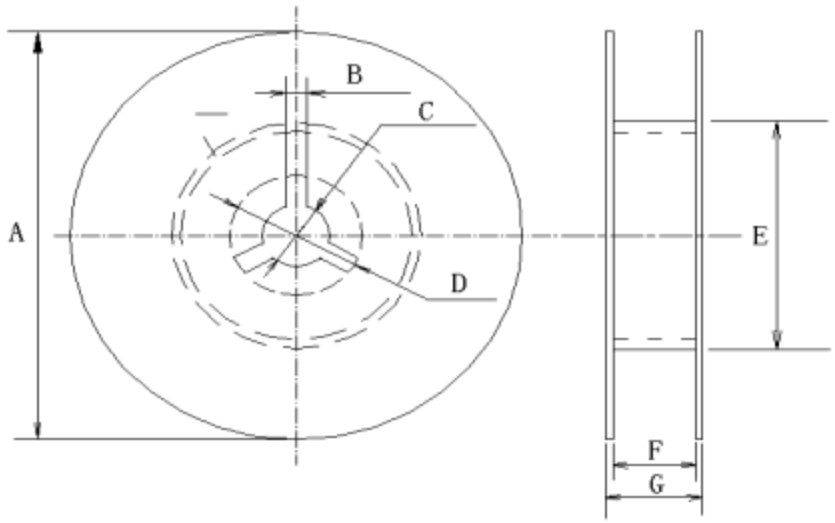
* 传送带的前后结构

Structure of leader part and end part of the carrier paper



* 卷盘尺寸

Reel dimensions (unit: mm)



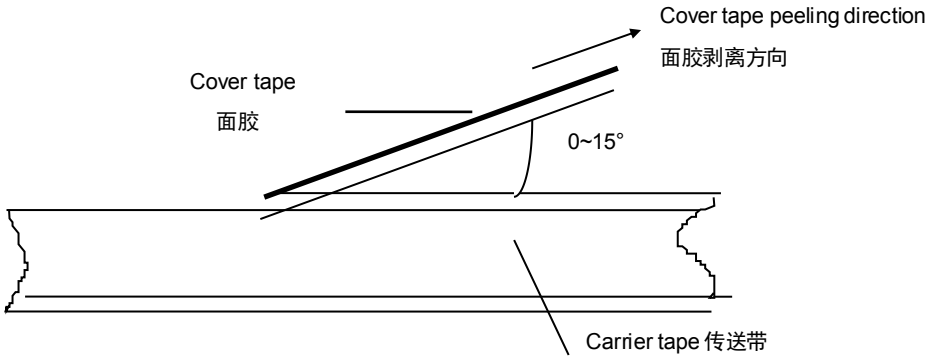
卷盘型号	A	B	C	D	E	F	G
7′REEL	φ178±2.0	3.0	φ13±0.5	φ21±0.8	φ50 或更大 φ50 or more	10.0±1.5	12max
13′REEL	Φ330±2.0	3.0	φ13±0.5	φ21±0.8	92-100	10.0±1.5	12max

* 关于卷带的说明：面胶剥离强度

Taping specification：top tape peeling strength

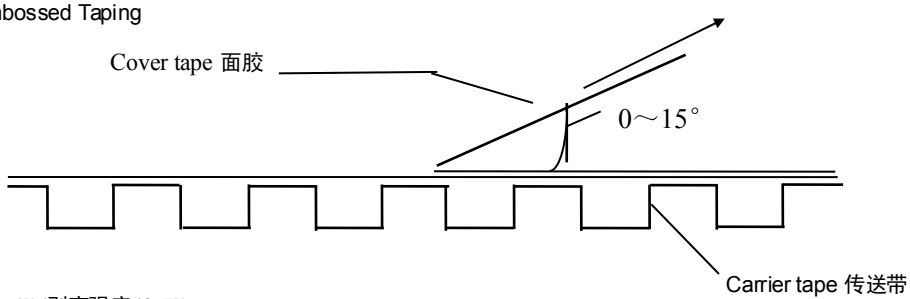
* 纸带 Paper Tapin

*



Cover tape peeling direction 面胶剥离方向

塑料胶盘 Embossed Taping



标准：0.1N<剥离强度<0.7N

Standard: 0.1N < peeling strength < 0.7N

在剥离时，纸带不能有纸碎，也不能粘在底、面胶上。

No paper dirty remains on the scotch when peeling, and sticks to top and bottom tape.

* 包装数量

Packing Quantity

尺寸代码 SizeCode	厚度（T） Thickness	7 寸纸带卷盘（PT）	7 寸胶带卷盘（ET）	13 寸纸带卷盘(PT)	13 寸胶带卷盘(ET)
0402	0.50±0.05	10000	——	50000	——
0603	0.80±0.10	4000	——	15000	——
0805	0.80±0.20	4000	——	15000	——
	1.25±0.25	——	T≤1.35mm 3000 T＞1.35mm 2000	——	10000
1206	0.80±0.20	4000	——	15000	——
	1.25±0.25	——	T≤1.35mm 3000 T＞1.35mm 2000	——	10000
	1.60±0.30	——	2000	——	8000
1210	1.25±0.25	——	2000	——	8000
	1.60±0.30	——	2000	——	8000
	2.00±0.30	——	2000/1000	——	8000
	2.50±0.30	——	1000	——	8000
1808	1.60±0.30	——	2000	——	8000
	2.00±0.30	——	2000	——	8000
1812	1.25±0.25	——	1000	——	3000
	1.60±0.30	——	T≤1.85mm 1000 T＞1.85mm 500	——	3000
	2.00±0.30	——	500	——	3000
	2.50±0.30	——	500	——	——
1825	1.60±0.30	——	500	——	——
	2.00±0.30	——	500	——	——
	2.50±0.30	——	500	——	——
2211	1.60±0.30	——	500	——	——
	2.00±0.30	——	500	——	——
2220	1.60±0.30	——	500	——	——
	2.00±0.30	——	500	——	——
	2.50±0.30	——	500	——	——
2225	1.60±0.30	——	500	——	——
	2.00±0.30	——	500	——	——
	2.50±0.30	——	500	——	——

注意：包装的形式和数量可根据客户的要求来定。

Note：We can choose packing style and quantity can be according to the customer's requirement.

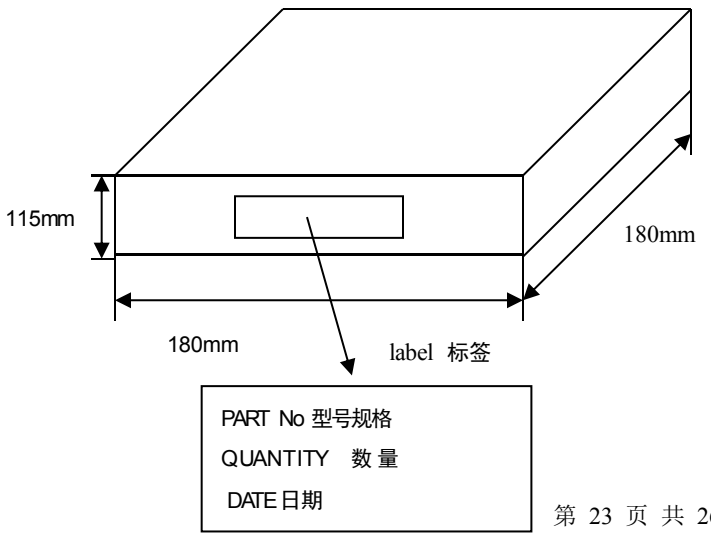
*** 外包装**

Outer packing

小包装 The first package

Quantity: 10 reels

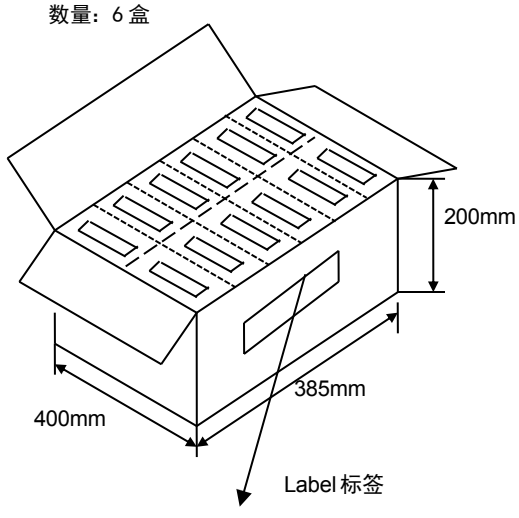
数量： 10 卷



大包装 The second package

Quantity: 6 cases

数量：6 盒



Production name 产品名称
Quantity 数量
Weight 重量

◆储存方法
Storage Methods

* 确保芯片可焊性良好的贮存期限为 12 个月(在包装好已交付的情况下)。
  The guaranteed period for solderability is 12 months (Under deliver package condition).
* 储存条件 Storage conditions：
  储存温度/Temperature 5~40℃ 储存相对湿度/Relative Humidity 20~70%

◆使用前的注意事项
Precautions For Use

多层片式瓷介电容器(MLCC)在短路或开路的电路中都有可能失效, 在超出本承认书或相关说明书中所述使用频率的恶劣工作环境, 或外界机械力超压作用下, 电容芯片都有可能着火、燃烧甚至爆炸, 所以在使用的时候, 首先应考虑按本承认书的有关说明来进行, 如有不明之处, 请联系我们技术部、品管部或生产部.

The Multi-layer Ceramic Capacitors (MLCC) may fail in a short circuit modern in an open circuit mode when subjected to severe conditions of electrical environment and / or mechanical stress beyond the specified “rating” and specified “conditions” in the specification, which will result in burn out, flaming or glowing in the worst case. Following “precautions for “safety” and Application Notes shall be taken in your major consideration. If you have a question about the precautions for handling, please contact our engineering section or factory.

* 焊接的条件与相关图表
  Soldering Profile

为避免因温度的突然变化而引起的芯片开裂或局部爆炸的现象发生, 请按有关温度曲线图表来进行. (请参考附页中的图表)

To avoid the crack problem by sudden temperature change, follow the temperature profile in the adjacent graph (refer to the graph in the enclosure page).

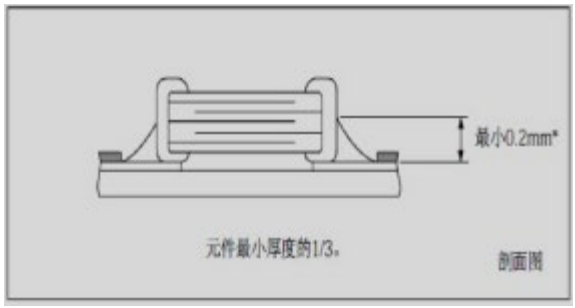
* 手工焊接
  Manual Soldering

手工焊接很容易因为芯片局部受热不均而引起瓷体微裂或局部爆炸的现象, 在焊接时, 如果操作者不小心, 会使烙铁头直接同电容芯片的瓷体部分接触, 这样很容易使电容芯片因热冲击而受损或出现其他意外. 因此, 使用电烙铁手工焊接时应仔细操作, 并对电烙铁的尖端的选择和尖端温度控制应多加小心.

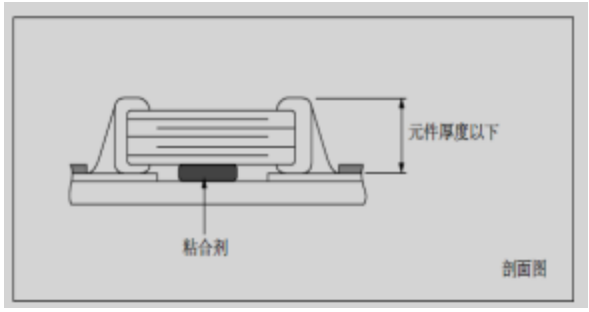
Manual soldering can pose a great risk of creating thermal cracks in capacitors. The hot soldering iron tip comes into direct contact with the end terminations, and operator’s careless may cause the tip of the soldering iron to come into direct contact with the ceramic body of the capacitor. Therefore the soldering iron must be handled carefully, and pay much attention to the selection of the soldering iron tip and temperature contact of the tip.

* 推荐焊料用量
  Recommended Soldering amounts

回流焊接的最佳焊料用量
The optimal solder fillet amounts for re-flow soldering

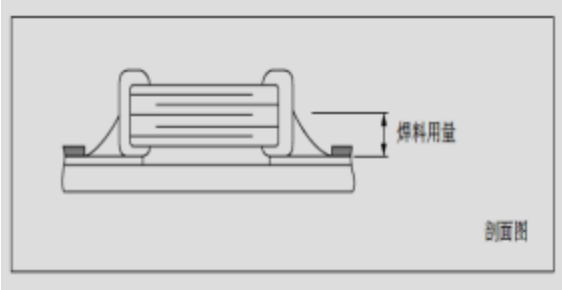


波峰焊接的最佳焊料用量
The optimal solder fillet amounts for wave soldering



使用烙铁返修时的最佳焊料量

The optimal solder fillet amounts for reworking by using soldering iron



* 推荐焊接方式

Recommended Soldering Method

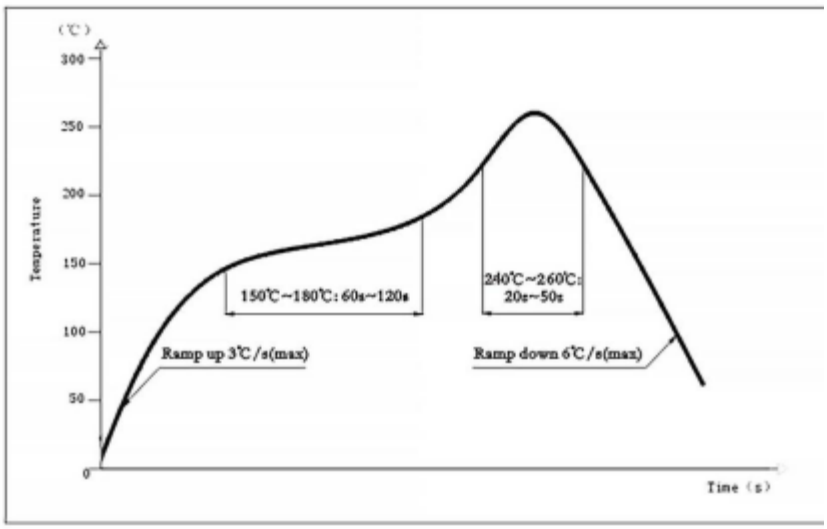
规格尺寸 Size	温度特性 Temperature Characteristics	容量范围 Capacitance	焊接方式 Soldering Method
0402	X7R	/	R
0603	C0G	/	R/W
	X7R	C≥1uf	R
		C＜1uf	R/W
0805	C0G	/	R/W
	X7R	C≥4.7uf	R
		C＜4.7uf	R/W
1206	C0G	/	R/W
	X7R	C≥10uf	R
		C＜10uf	R/W
≥1210	C0G	/	R
	X7R	/	R

焊接方式 Soldering method： R—回流焊 Reflow Solering W—波峰焊 Wave Soldering

◆ 推荐焊接温度曲线图

The temperature profile for soldering

* 回流焊接（Re-flow soldering）

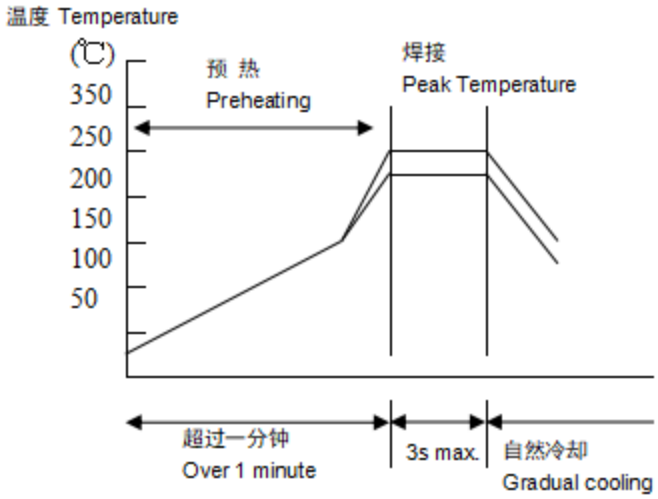


在预热时，请将焊接温度与芯片表面温度之间的温差维持在 T≤150℃。

While in preheating,please keep the temperature difference between soldering temperature and surface temperature of chips as: T≤150℃.

* 波峰焊接

（Wave soldering）



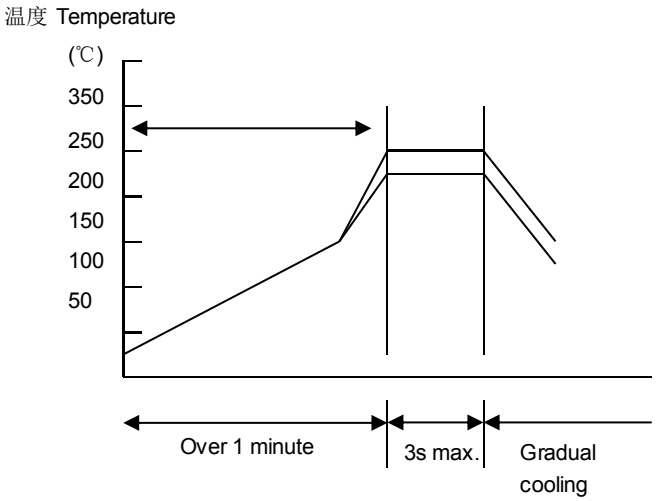
	无铅焊接 Lead-free soldering
尖峰温度 Peak temperature	240℃～270℃

在预热时，请将焊接温度与芯片表面温度之间的温差维持在 T≤150℃。

While in preheating,please keep the temperature difference between soldering temperature and surface temperature of chips as: T≤150℃.

* 手工焊接

Hand soldering



条件 Conditions:

预热 Preheating	烙铁头温度 Temperature of soldering iron head	烙铁功率 Power of soldering iron	烙铁头直径 Diameter of soldering iron head	焊接时间 Soldering time	锡膏量 Solder paste amount	限制条件 Restricted conditions
△≤130℃	最高 350℃ Highest temperature:350℃	最大 20W 20W at the highest	建议 1mm 1mm recommended	最长 3s 3s at the longest	≤1/2 芯片厚度 ≤1/2 chip thickness	请勿使用烙铁头直接接触陶瓷元件 Please avoid the derect contact between soldering iron head and ceramic components

* 备注：产品规格书仅供设计选型参考用，不作为交货依据。

Note:The product specification is for design and selection reference only and shall not serve as a basis for delivery.