

## MLCC 片式多层陶瓷电容器

### MULTILAYER CERAMIC CHIP CAPACITORS

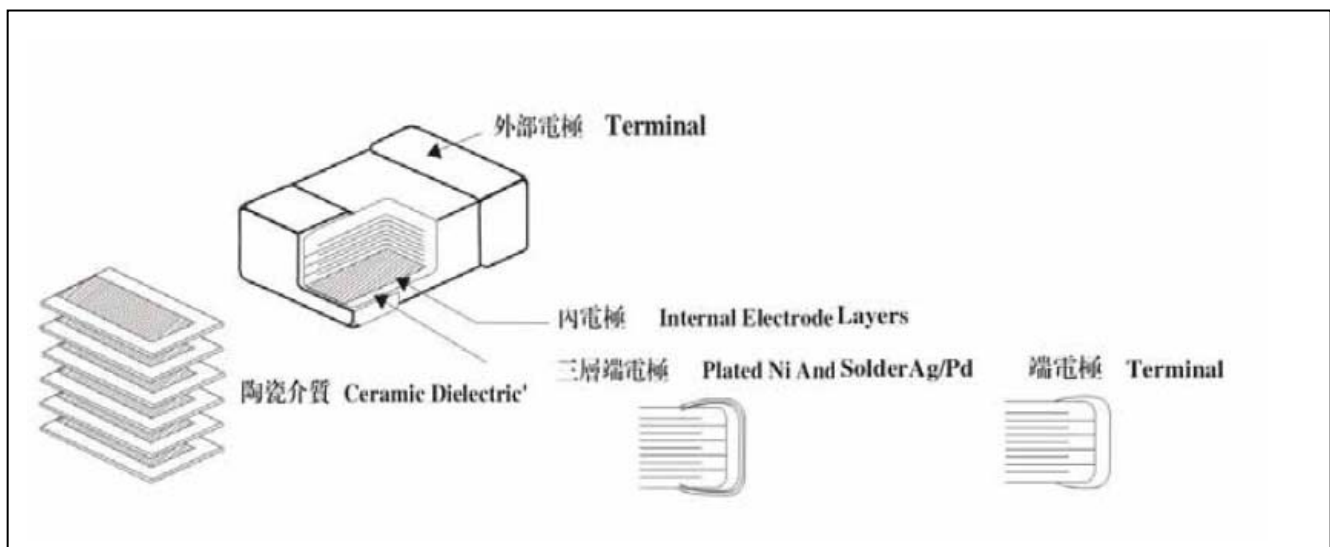
#### 特点：

1. 产品尺寸精度高，便于自动贴片机高效率装配；
2. 端电极三层电极，适合波峰焊和回流焊；
3. 介电体与外表为同种材料，环境条件影响小，高绝缘电阻，高可靠性；
4. 含有从 COG 到 Y5V 各种温度特性介质，适用于通讯、计算机、家用电器和仪器仪表等普通电子设备。
5. HQ产品与常规COG相比，高频COG具有更高Q值以及低ESR，适用于射频RF电路及要求Hi-Q、低ESR、高频率响应的微波电路中。

#### FEATURES

1. Stringent dimensional tolerance allow highly reliable,high speed automatic chip mounting on PCBS;
2. Terminal are plated with ni and solder,suited to flow and reflow soldering.
3. High insulation resistance and high reliability;
4. These capacitors have temperature characteristics ranging form COG to Y5V, applied to general electronic equipment,instrument panel and household electrical appliances.
5. HQ Product Comparing with general COG capacitor, HQ COG capacitor take on higher Q-value and lower ESR, are ideally suited for RF and microwave application requiring high Q, low ESR, and high resonant frequency.

#### 产品结构图 PERFORMANCE CHARACTERISTICS



#### 产品型号代码 ORDERING CODE

常规产品代码：

例 EX: **CB** **0603** **B** **103** **K** **050** **C** **T**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

HQ 产品代码：

例 EX: **CB** **0603** **B** **103** **K** **050** **C** **T** **HQ**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

## MLCC 片式多层陶瓷电容器

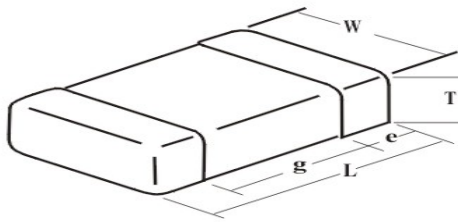
### MULTILAYER CERAMIC CHIP CAPACITORS

#### ① 类别码 TYPE CODE

CB : BDC 国际有限公司片式多层陶瓷电容器代号

The Code of MLCC Form BDC International Co.,Ltd.

#### ② 尺寸码 DIMENSIONS



规格型号		尺寸 (mm)			
英制	公制	L	W	T	E
<b>0201</b>	<b>0603</b>	0.60±0.03	0.30±0.03	0.30±0.03	0.15±0.05
<b>0402</b>	<b>1005</b>	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.10
<b>0603</b>	<b>1608</b>	1.60±0.10	0.80±0.10	0.80±0.10	0.30±0.10
<b>0805</b>	<b>2012</b>	2.00±0.20	1.25±0.20	0.65±0.10 0.85±0.10 1.00±0.10 1.25±0.20	0.50±0.25
<b>1206</b>	<b>3216</b>	3.20±0.30	1.60±0.20	0.80±0.10 1.00±0.10 1.25±0.20	0.50±0.25
<b>1210</b>	<b>3225</b>	3.20±0.30	2.50±0.20	≤2.5	0.50±0.25
<b>1808</b>	<b>4520</b>	4.50±0.40	2.00±0.20	≤2.5	0.50±0.10
<b>1812</b>	<b>4532</b>	4.50±0.40	3.20±0.30	≤2.5	0.50±0.10
<b>2220</b>	<b>5750</b>	5.70±0.50	5.00±0.50	≤2.5	1.00±0.25
<b>2225</b>	<b>5763</b>	5.70±0.50	6.30±0.50	≤2.5	1.00±0.25

## MLCC 片式多层陶瓷电容器

### MULTILAYER CERAMIC CHIP CAPACITORS

#### ③ 温度特性码 TEMPERATURE CHARACTERISTICS

代号 CODE	C	B	F
介质材料 Dielectric Material	COG 或 NPO	X7R/X5R	Y5V
使用温度范围 Temperature Range	-55~125°C/85(X5R)		-30~85°C
温度特性 Temperature Characteristics	0±30PPM/°C	±15%	+22-82%

#### ④ 电容值码 CAPACITANCE

代号 CODE	电容值 Capacitance(PF)	代号 CODE	电容值 Capacitance(PF)
0R5	0.5	102	1000
010	1	103	10000
100	10	104	100000
101	100	105	1000000

#### ⑤ 电容误差码 CAPACI

代号 CODE	容差 CAPACITANCE TOLERANCE	代号 CODE	电容值 CAPACITANCE ( PF )
W	±0.05PF	B	±0.1PF
C	±0.25PF	J	±5%
D	±0.5PF	K	±10%
F	±1%	M	±20%
G	±2%	Z	+80/-20%

MLCC 片式多层陶瓷电容器

MULTILAYER CERAMIC CHIP CAPACITORS

⑥ 额定电压 RATED VOLTAGE

代号 CODE	规格 CHARACTERISTIC	额定电压 RATED VOLTAGE
004	4	4V
006	6.3	6.3V
010	10	10V
016	16	16V
025	25	25V
035	35	35V
050	50	50V
100	100	100V
200	200	200V
250	250	250V
500	500	500V
630	630	630V
102	1000	1000V
202	2000	2000V
302	3000	3000V
402	4000	4000V
502	5000	5000V

## MLCC 片式多层陶瓷电容器

### MULTILAYER CERAMIC CHIP CAPACITORS

#### ⑥ 元件厚度 COMPONENTS THICKNESS

代号 CODE	厚度 THICKNESS
P	0.30±0.03mm
A	0.50±0.05mm
B	0.65±0.10mm
C	0.80±0.10mm
D	0.85±0.10mm
E	1.15±0.10mm
F	1.25±0.15mm
G	1.60±0.20mm
H	1.90±0.20mm
I	2.50±0.20mm
J	3.20±0.30mm

#### ⑧ 包装 PACKAGING CODE

代号 CODE	包装 PACKAGING
B	袋散装 BULK PACKAGE IN A BAG
T	编带 TAPE & REEL PACKAGE

#### ⑨ HQ 高频 COG 产品 HQ COG Product

HQ 高频 COG 产品  
HQ COG Product

常规COG 产品介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围	
COG	0201 (0603)	25	0.5PF---100PF	
		6.3	0.5PF---100PF	
	0402 (1005)	10	0.5PF---470PF	
		16	0.5PF---470PF	
		25	0.5PF---470PF	
		50	0.5PF---470PF	
		100	-----	
		250	-----	
		500	-----	
		1000	-----	
		2000	-----	
		3000	-----	
		4000	-----	
		0603 (1608)	4	-----
			6.3	0.5PF---4700PF
			10	0.5PF---4700PF
	16		0.5PF---4700PF	
	25		0.5PF---4700PF	
	50		0.5PF---4700PF	
	100		0.2PF---820PF	
	250		0.5PF---470PF	
	500		-----	
	1000		-----	
	2000		-----	
	3000		-----	
	4000		-----	
	0805 (2012)		4	-----
		6.3	0.5PF---10000PF	
		10	0.5PF---10000PF	
		16	0.5PF---10000PF	
		25	0.5PF---10000PF	
		50	0.5PF---10000PF	
		100	0.5PF---2700PF	
		250	0.5PF---8200PF	
		500	0.5PF---560PF	
		1000	-----	
		2000	-----	
		3000	-----	
		4000	-----	

常规COG产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
COG	1206 (3216)	4	-----
		6.3	0.5PF---33000PF
		10	0.5PF---33000PF
		16	0.5PF---33000PF
		25	0.5PF---33000PF
		50	0.5PF---12000PF
		100	0.5PF---3300PF
		250	0.5PF---2200PF
		500	0.5PF---1000PF
		1000	0.5PF---680PF
		2000	0.5PF---270PF
		3000	-----
		4000	-----
		1210 (3225)	4
	6.3		10PF---10000PF
	10		10PF---10000PF
	16		10PF---10000PF
	25		10PF---10000PF
	50		10PF---8200PF
	100		10PF---4700PF
	250		10PF---3300PF
	500		10PF---2200PF
	1000		10PF---820PF
	2000		10PF---470PF
	3000		-----
	4000		-----
	1808 (4532)		4
		6.3	10PF---10000PF
		10	10PF---10000PF
		16	10PF---10000PF
		25	10PF---10000PF
		50	10PF---6800PF
		100	10PF---4700PF
		250	10PF---3300PF
		500	10PF---1800PF
		1000	10PF---820PF
2000		10PF---470PF	
3000		10PF---330PF	
4000		10PF---150PF	

常规COG产品介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
COG	1812 (4532)	4	-----
		6.3	10PF---10000PF
		10	10PF---10000PF
		16	10PF---10000PF
		25	10PF---10000PF
		50	10PF---1200PF
		100	10PF---10000PF
		250	10PF---5600PF
		500	10PF---3900PF
		1000	10PF---1200PF
		2000	10PF---680PF
		3000	10PF---470PF
		4000	10PF---220PF
		2225 (5763)	4
	6.3		10PF---47000PF
	10		10PF---47000PF
	16		10PF---47000PF
	25		10PF---47000PF
	50		10PF---33000PF
	100		10PF---27000PF
	250		10PF---12000PF
	500		10PF---6800PF
	1000		10PF---2200PF
	2000		10PF---1000PF
	3000		10PF---680PF
	4000		10PF---560PF



常规X7R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X7R	0201 (0603)	4	-----
		6.3	0.5PF~6800PF
		10	-----
		16	0.5PF~1000PF
		25	-----
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		0402 (1005)	4
	6.3		100PF---100000PF
	10		100PF---100000PF
	16		100PF---47000PF
	25		100PF---22000PF
	50		100PF---10000PF
	100		-----
	250		-----
	500		-----
	1000		-----
	2000		-----
	3000		-----
	0603 (1608)	4	-----
		6.3	100PF---4700000PF
		10	100PF---2200000PF
		16	100PF---1000000PF
		25	100PF---1000000PF
		50	100PF---100000PF
		100	100PF---10000PF
		250	100PF---6800PF
		500	-----
		1000	-----
		2000	-----
3000		-----	
4000	-----		

常规X7R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X7R	0805 (2012)	4	-----
		6.3	100PF---22000000PF
		10	100PF---10000000PF
		16	100PF---10000000PF
		25	100PF---2200000PF
		50	100PF---470000PF
		100	100PF---33000PF
		250	150PF---22000PF
		500	150---10000PF
		1000	-----
		2000	-----
		3000	'-----
		4000	-----
		1206 (3216)	4
	6.3		100PF---47000000PF
	10		100PF---22000000PF
	16		100PF---10000000PF
	25		100PF---10000000PF
	50		100PF---470000PF
	100		150PF---120000PF
	250		150PF---47000PF
	500		150PF---22000PF
	1000		150PF---5600PF
	2000		150PF---2200PF
	3000		-----
	4000		-----
	1210 (3225)		4
		6.3	220PF---100000000PF
		10	220PF---47000000PF
		16	220PF---22000000PF
		25	220PF---10000000PF
		50	220PF---1000000PF
		100	150PF---220000PF
		250	150PF---100000PF
		500	150PF---33000PF
		1000	150PF---10000PF
		2000	150PF---6800PF
		3000	-----
		4000	-----

常规X7R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X7R	1808 (4520)	4	-----
		6.3	220PF---10000000PF
		10	220PF---4700000PF
		16	220PF---2200000PF
		25	220PF---2200000PF
		50	220PF---1000000PF
		100	150PF---220000PF
		250	150PF---100000PF
		500	150PF---39000PF
		1000	150PF---10000PF
		2000	150PF---6800PF
		3000	150PF---2200PF
		4000	150PF---1000PF
		1812 (4532)	4
	6.3		470PF---100000000PF
	10		470PF---100000000PF
	16		470PF---22000000PF
	25		470PF---10000000PF
	50		470PF---2200000PF
	100		150PF---330000PF
	250		150PF---150000PF
	500		150PF---100000PF
	1000		150PF---27000PF
	2000		150PF---10000PF
	3000		150PF---2200PF
	4000		150PF---1500PF
	2225 (5763)		4
		6.3	470PF---33000000PF
		10	470PF---22000000PF
		16	470PF---10000000PF
		25	470PF---4700000PF
		50	470PF---3300000PF
		100	150PF---1000000PF
		250	150PF---470000PF
		500	150PF---330000PF
		1000	150PF---56000PF
2000		150PF---27000PF	
3000		150PF---6800PF	
4000		150PF---3300PF	

常规X5R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X5R	0201 (0603)	4	-----
		6.3	-----
		10	-----
		16	-----
		25	-----
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		0402 (1005)	4
	6.3		150000PF---1000000PF
	10		100000PF---220000PF
	16		68000PF---220000PF
	25		47000PF---100000PF
	50		-----
	100		-----
	250		-----
	500		-----
	1000		-----
	2000		-----
	3000		-----
	0603 (1608)	4	-----
		6.3	1000000PF
		10	1500000PF---10000000PF
		16	330000PF---4700000PF
		25	330000PF---2200000PF
		50	220000PF---1000000PF
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
3000		-----	
4000		-----	

常规X5R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X5R	0805 (2012)	4	-----
		6.3	4700000PF---22000000PF
		10	2200000PF---10000000PF
		16	3300000PF, 4700000PF
		25	2200000PF
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		1206 (3216)	4
	6.3		10000000P---47000000PF
	10		10000000PF
	16		10000000PF
	25		4700000PF, 10000000PF
	50		-----
	100		-----
	250		-----
	500		-----
	1000		-----
	2000		-----
	3000		-----
	4000	-----	
	1210 (3225)	4	-----
		6.3	33000000PF---100000000PF
		10	22000000PF
		16	15000000PF, 22000000PF
		25	10000000PF
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
2000	-----		
3000	-----		
4000	-----		

常规X5R产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
X5R	1808 (4520)	4	-----
		6.3	-----
		10	-----
		16	-----
		25	-----
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		1812 (4532)	4
	6.3		10000000PF
	10		33000000PF, 47000000PF
	16		33000000PF
	25		22000000PF
	50		4700000PF
	100		-----
	250		-----
	500		-----
	1000		-----
	2000		-----
	3000		-----
	2225 (5763)	4	-----
		6.3	10000000PF
		10	68000000PF
		16	33000000PF, 47000000PF
		25	-----
		50	-----
		100	-----
		250	-----
		500	-----
		1000	-----
	2000	-----	
3000	-----		
4000	-----		

常规Y5V产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
Y5V	0402 (1005)	4	-----
		6.3	-----
		10	22000PF-470000PF
		16	10000PF-220000PF
		25	4700PF-100000PF
		50	1000PF-10000PF
		100	-----
		250	-----
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		0603 (1608)	4
	6.3		1000PF---4700000PF
	10		1000PF---2200000PF
	16		1000PF---2200000PF
	25		1000PF---1000000PF
	50		1000PF---470000PF
	100		2200PF---68000PF
	250		-----
	500		-----
	1000		-----
	2000		-----
	3000		-----
	4000		-----
	0805 (2012)		4
		6.3	1000PF---10000000PF
		10	1000PF---10000000PF
		16	1000PF---2200000PF
		25	1000PF---1000000PF
		50	1000PF---1000000PF
		100	10000PF---100000PF
		250	10000PF---56000PF
		500	-----
		1000	-----
2000		-----	
3000		-----	
4000		-----	

常规Y5V产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围
Y5V	1206 (3216)	4	-----
		6.3	1000PF---47000000PF
		10	1000PF---22000000PF
		16	1000PF---10000000PF
		25	1000PF---10000000PF
		50	1000PF---2200000PF
		100	1000PF---330000PF
		250	1000PF---150000PF
		500	-----
		1000	-----
		2000	-----
		3000	-----
		4000	-----
		1206 (3216)	4
	6.3		4700PF---47000000PF
	10		4700PF---47000000PF
	16		4700PF---10000000PF
	25		4700PF---10000000PF
	50		4700PF---1500000PF
	100		10000PF---820000PF
	250		10000PF---390000PF
	500		-----
	1000		-----
	2000		-----
	3000		-----
	4000		-----
	1808 (4520)		4
		6.3	4700PF---33000000PF
		10	4700PF---22000000PF
		16	4700PF---22000000PF
		25	4700PF---10000000PF
		50	4700PF---2200000PF
		100	10000PF---820000PF
		250	10000PF---390000PF
		500	-----
		1000	-----
2000		-----	
3000		-----	
4000		-----	



常规Y5V产品 介质电容器容值范围

材质类型	尺寸	耐压值 (V)	电容量范围	
Y5V	1812 (4532)	4	-----	
		6.3	10000PF---33000000PF	
		10	10000PF---22000000PF	
		16	10000PF---22000000PF	
		25	10000PF---10000000PF	
		50	10000PF---1000000PF	
		100	10000PF---1000000PF	
		250	10000PF---470000PF	
		500	-----	
		1000	-----	
		2000	-----	
		3000	-----	
		4000	-----	
		2225 (5763)	4	-----
	6.3		10000PF---47000000PF	
	10		10000PF---33000000PF	
	16		10000PF---22000000PF	
	25		10000PF---10000000PF	
	50		10000PF---10000000PF	
	100		10000PF---15000000PF	
	250		10000PF---680000PF	
	500		-----	
	1000		-----	
	2000		-----	
	3000		-----	
	4000		-----	

HQ COG 产品 容量范围表

尺寸	0402	0603	0805	1206
Cp VDC	50V	50 V	50 V	50V
0R2	A	C	B	B
0R5	A	C	B	B
1R0	A	C	B	B
2R0	A	C	B	B
3R0	A	C	B	B
4R0	A	C	B	B
5R0	A	C	B	B
6R0	A	C	B	B
7R0	A	C	B	B
8R0	A	C	B	B
9R0	A	C	B	B
100	A	C	B	B
120	A	C	B	B
150	A	C	B	B
180	A	C	B	B
200		C	B	B
220		C	B	B
270		C	B	B
300		C	B	B
330		C	B	B
390		C	B	B
470		C	B	B
560		C	B	B/D
680		C	B/D	B/D
820		C	B/D	B/D
101		C	B/D	B/D
厚度: A:0.50±0.05mm    B:0.60±0.10mm    C:0.80±0.10mm    D:0.85±0.10mm				

## MLCC 片式多层陶瓷电容器

### MULTILAYER CERAMICCHIP CAPACITORS

**\* 特点:**

- 1.产品尺寸精度高，便于自动贴片机高效率装配;
- 2.端电极为三层电极，适合波峰焊和回流焊;
- 3.介电体与外表为同种材料，环境条件影响小，高绝缘电阻，高可靠性;
- 4.含有从 COG 到 Y5V 各种温度特性，使用与通讯，计算机，家用电器，和仪表仪器等普通电子设备。

### 可靠性测试 RELIABILITY TEST

项目 Item	技术规格 Technical Specification		测试方法		
			Test Method and Remarks		
容量 Capacitance	I 类 Class I	应符合指定的误差别 Shoule be within the specified tolerance.	标称容量 Capacitance	测试频率 Measuring Frequency	测试电压 Measuring Voltage
			≤1000pF	1MHz±10%	1.0±0.2Vrms
			>1000pF	1KHz±10%	
	II 类 Class II	应符合指定的误差别 Shoule be within the specified tolerance.	C≤10uF: 测试频率: 1KHz±10% 测试电压: 1.0±0.2Vrms Test Frequency:1KHz±10% Test Voltage:1.0±0.2Vrms  C>10uF: X7R、Y5V、X5R:测试频率: 120±24Hz 测试电压: 0.5±0.1Vrms Test Frequency:120±24Hz Test Voltage:5±0.1Vrms		

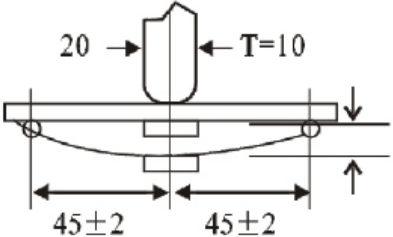
**MLCC 片式多层陶瓷电容器      MULTILAYER CERAMIC CHIP CAPACITORS**

项目 Item	技术规格 Technical Specification			测试方法 Test Method Remarks					
<b>损耗角正切 (DF, <math>\tan \delta</math>) Dissipation Factor</b>	I 类 Class I	DF $\leq 0.15\%$ HQ COG 产品: Q $\geq 4000$			标称容量 Capacitance		测试频率 Measuring Frequency	测试电压 Measuring Voltage	
					$\leq 1000\text{pF}$		1MHz $\pm 10\%$	1.0 $\pm 0.2V_{rma}$	
					$> 1000\text{pF}$		1KHz		
	II 类 Class II	X5R X7R	50V	25V	16V	10V	6.3V	C $\leq 10\mu\text{F}$ 测试频率: 1KHz $\pm 10\%$ 测试电压: 1.0 $\pm 0.2V_{rma}$ Test Frequency: 1KHz $\pm 10\%$ Test Voltage: 1.0 $\pm 0.2V_{rma}$	
			$\leq 2.5\%$	$\leq 2.5\%$	$\leq 3.5\%$	$\leq 5.0\%$	$\leq 5.0\%$ (C $< 33\mu\text{F}$ ) $\leq 10.0\%$ (C $\geq 33\mu\text{F}$ )		
	Y5V	C $\geq 25V$		16V	10V	6.3V	C $> 10\mu\text{F}$ X5R、X7R、Y5V 测试频率: 120 $\pm 24\text{Hz}$ 测试电压: 0.5 $\pm 0.1V_{rma}$ Test Frequency: 120 $\pm 24\text{Hz}$ Test Voltage: 0.5 $\pm 0.1V_{rma}$		
	$\leq 7.0\%$ (C $< 1.0\mu\text{F}$ ) $\leq 9.0\%$ (C $\geq 1.0\mu\text{F}$ )	$\leq 12.5\%$ (C $< 4.7\mu\text{F}$ ) $\leq 18.0\%$ (C $\geq 4.7\mu\text{F}$ )	$\leq 12.5\%$ (C $< 4.7\mu\text{F}$ ) $\leq 18.0\%$ (C $\geq 4.7\mu\text{F}$ )	$\leq 12.5\%$ (C $< 4.7\mu\text{F}$ ) $\leq 18.0\%$ (C $\geq 4.7\mu\text{F}$ )					
<b>绝缘电阻 (IR) Insulation Resistance</b>	I 类 Class I	C $\leq 10\text{nF}$ , Ri $\geq 50000M\Omega$ C $> 10\text{nF}$ , Ri $\geq 100S$			测试电压: 额定电压 测试时间: 60 $\pm 5$ 秒 测试湿度: $\leq 75\%$ 测试温度: 25 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 测试充放电电流 $\leq 50\text{mA}$ Measuring Voltage: Rated Voltage Duration: 60 $\pm 5\text{s}$ Test Humidity: $\leq 75\%$ Test Temperature: 25 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Test Current: $\leq 50\text{mA}$				
	II 类 Class II	X5R X7R	C $\leq 25\text{nF}$ , Ri $\geq 10000M\Omega$ C $> 25\text{nF}$ , Ri * C <sub>r</sub> $\geq 100S$						
		Y5V	C $\leq 25\text{nF}$ , Ri $\geq 5000M\Omega$ C $> 25\text{nF}$ , Ri * C <sub>r</sub> $\geq 100S$						

**MLCC 片式多层陶瓷电容器      MULTILAYER CERAMIC CHIP CAPACITORS**

项目 Item	技术规格 Technical Specification	测试方法 Test Method and Remarks																												
<b>介质耐电强度</b> (DWV) Dielectric Withstanding Voltage	不应有介质被击穿或损伤 No breakdown or damage.	低压产品测量电压 ( $U_r \leq 50V$ ) : I 类: 300%额定电压    II 类: 250%额定电压 中高压产品测试电压 ( $U_r \geq 100V$ ) : $U_r < 200V$ : 250%额定电压 $200V \leq U_r \leq 1000V$ : 150%额定电压 $U_r > 1000V$ : 120%额定电压 时间: 1-5 秒 充/放电电流: 不应超过 50mA Low $U_r$ Measuring Voltage ( $U_r \leq 50V$ ) : Class I: 300% Rated voltage Class II: 250% Rated Voltage High $U_r$ Measuring Voltage ( $U_r \geq 100V$ ) $U_r < 200V$ : 250% Rated voltage $200V \leq U_r \leq 1000V$ : 150% Rated voltage $U_r > 1000V$ : 120% Rated voltage Duration: 1-5s Charge/Discharge Current: 50mA max. (This method excludes high-voltage MLCC)																												
<b>可焊性</b> Solderability	上锡率应大于 95% 外观: 无可见损伤 At least 95% of the terminal electrode is covered by new solder. Visual Appearance: No visible damage.	将电容在 80~120°C 的温度下预热 10~30s Preheating conditions: 80 to 120°C; 10~30s <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 50%;">有铅焊料: (Sn/Pb: 63/37)</td> <td style="width: 50%;">无铅焊料:</td> </tr> <tr> <td>浸锡温度 235±5°C</td> <td>浸锡温度: 245±5°C</td> </tr> <tr> <td>浸锡时间 2±0.5s</td> <td>浸锡时间 2±0.5s</td> </tr> <tr> <td>Solder Temperature: 235±5°C</td> <td>Solder Temperature: 235±5°C</td> </tr> <tr> <td>Duration: 2±0.5s</td> <td>Duration: 2±0.5s</td> </tr> </table>			有铅焊料: (Sn/Pb: 63/37)	无铅焊料:	浸锡温度 235±5°C	浸锡温度: 245±5°C	浸锡时间 2±0.5s	浸锡时间 2±0.5s	Solder Temperature: 235±5°C	Solder Temperature: 235±5°C	Duration: 2±0.5s	Duration: 2±0.5s																
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<b>耐焊接热</b> Resistanceto Soldering Heat	<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 10%;">项目 Item</td> <td style="width: 20%;">NPO 至 SL NPO to SL</td> <td style="width: 10%;">X7R X5R</td> <td style="width: 10%;">Y5V</td> </tr> <tr> <td><math>\Delta</math> C/C</td> <td><math>\leq \pm 0.5\%</math> 或 <math>\pm</math> 0.5PF, 取较大值 <math>\leq \pm 0.5\%</math> or <math>\pm</math> 0.5PF, whichever is larger</td> <td><math>\pm</math> 10%</td> <td><math>\pm</math> 20%</td> </tr> </table> DF      同初始标准 Same to initial value. IR      同初始标准 Same to initial value.	项目 Item	NPO 至 SL NPO to SL	X7R X5R	Y5V	$\Delta$ C/C	$\leq \pm 0.5\%$ 或 $\pm$ 0.5PF, 取较大值 $\leq \pm 0.5\%$ or $\pm$ 0.5PF, whichever is larger	$\pm$ 10%	$\pm$ 20%	<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 20%;">预热阶段</td> <td style="width: 40%;">温度°C</td> <td style="width: 40%;">时间</td> </tr> <tr> <td>1</td> <td>80-100°C</td> <td>1 分钟</td> </tr> <tr> <td>2</td> <td>150-180°C</td> <td>1 分钟</td> </tr> </table> 浸锡温度: 270±5°C 浸锡时间: 10±1Sec 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 <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 20%;">SETUP</td> <td style="width: 40%;">TEMP°C</td> <td style="width: 40%;">TIME</td> </tr> <tr> <td>1</td> <td>80-100°C</td> <td>1Min</td> </tr> <tr> <td>2</td> <td>150-180°C</td> <td>1Min</td> </tr> </table> Solder Temperature: 270±5°C Duration: 10±1Sec Clean the capacitor with solvent and examine it with a 10X(min) microscope. Recovery: 24±2h Recovery condition: Room temperature.			预热阶段	温度°C	时间	1	80-100°C	1 分钟	2	150-180°C	1 分钟	SETUP	TEMP°C	TIME	1	80-100°C	1Min	2	150-180°C	1Min
项目 Item	NPO 至 SL NPO to SL	X7R X5R	Y5V																											
$\Delta$ C/C	$\leq \pm 0.5\%$ 或 $\pm$ 0.5PF, 取较大值 $\leq \pm 0.5\%$ or $\pm$ 0.5PF, whichever is larger	$\pm$ 10%	$\pm$ 20%																											
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2	150-180°C	1Min																												
	外观: 无可见损伤 上锡率: $\geq 95\%$ Appearance: No visible damage, At least 95% of the terminal electrode is covered by new solder																													

**MLCC 片式多层陶瓷电容器 MULTILAYER CERAMIC CHIP CAPACITORS**

项目 Item	技术规格 Technical Specification	测试方法 Test Method and Remarks																														
<b>抗弯曲强度</b> Resistance to Flexure of Substrate (Bending Strength)	外观: 无可见损伤 Appearance: No visible damage.  $\Delta C/C \leq \pm 12.5\%$	实验基板: A1203 或 PCB 弯曲深度: 1mm 施压速度: 0.5mm/see. 单位: mm 应在弯曲状态下进行测量。  Test Board: A1203 or PCB Warp: 1mm Speed: 0.5mm/ee. Unit: mm The measurement should be made with the board in the bending position																														
<b>端头结合强度</b> Termination Adhesion	外观: 无可见损伤 Appearance: No visible damage.	施加的力: 5N 时间: 10±1S Applied Force: 5N Duration: 10±1S																														
<b>温度循环</b> Temperature Cycle	I 类: $\leq \pm 1\%$ 或 1pF, 取两者中最大者 II 类: X5R, X7R: $\leq \pm 10\%$ Y5V: $\leq \pm 20\%$ Class I: $\leq \pm 1\%$ or 1pF, whichever is larger. Class II: X5R, X7R: $\leq \pm 10\%$ Y5V: $\leq \pm 20\%$	预热处理※ (2 类): 上限类别温度预热 1 小时 恢复: 24±1h 初始测量 循环次数: 5 次, 一个循环分以下 4 步 <table border="1" data-bbox="730 1366 1476 1585"> <thead> <tr> <th>阶段</th> <th>温度 (°C)</th> <th>时间 (分钟)</th> </tr> </thead> <tbody> <tr> <td>第 1 步</td> <td>下限温度</td> <td>30</td> </tr> <tr> <td>第 2 步</td> <td>常温 (±20)</td> <td>2~3</td> </tr> <tr> <td>第 3 步</td> <td>上限温度</td> <td>30</td> </tr> <tr> <td>第 4 步</td> <td>常温 (±20)</td> <td>2~3</td> </tr> </tbody> </table> 实验后放置 (恢复) 时间: 24±1h Preheating conditions: up-category temperature, 1h Recovery time: 24±1h Measurement Initial Cycling Times: 5 times, 1 cycle, 4 steps: <table border="1" data-bbox="730 1792 1516 2011"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Low-category temp.</td> <td>30</td> </tr> <tr> <td>2</td> <td>Normal temp. (±20)</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>Up-category temp.</td> <td>30</td> </tr> <tr> <td>4</td> <td>Normal temp. (±20)</td> <td>2~3</td> </tr> </tbody> </table> Recovery time after test: 24±2h	阶段	温度 (°C)	时间 (分钟)	第 1 步	下限温度	30	第 2 步	常温 (±20)	2~3	第 3 步	上限温度	30	第 4 步	常温 (±20)	2~3	Step	Temperature (°C)	Time (min.)	1	Low-category temp.	30	2	Normal temp. (±20)	2~3	3	Up-category temp.	30	4	Normal temp. (±20)	2~3
阶段	温度 (°C)	时间 (分钟)																														
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第 3 步	上限温度	30																														
第 4 步	常温 (±20)	2~3																														
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1	Low-category temp.	30																														
2	Normal temp. (±20)	2~3																														
3	Up-category temp.	30																														
4	Normal temp. (±20)	2~3																														

**MLCC 片式多层陶瓷电容器      MULTILAYER CERAMIC CHIP CAPACITORS**

项目 Item	技术规格 Technical Specification	测试方法 Test Method and Remarks	
<b>潮湿实验 Moisture Resistance</b>	$\Delta C/C$	I 类: $\leq \pm 2\%$ 或 $\pm 1pF$ , 取两者之中较大者 II 类: X5R, X7R: $\leq \pm 10\%$ Y5V: $\leq \pm 30\%$ Class I: $\leq 2\%$ 或 $\pm 1pF$ whichever is larger. Class II: X5R, X7R: $\leq \pm 10\%$ Y5V: $\leq \pm 30\%$	温度: $40 \pm 2^\circ C$ 湿度: 90~95%RH 时间: 500 小时 放置条件: 室温 放置时间: 24 小时 (I 类); 48 小时 (II 类) Temperature: $40 \pm 2^\circ C$ Humidity: 90~95%RH Duration: 500h Recovery conditions: Room Temperature Recovery Time: 24h (Class1) or 48h (Class2)
	DF	$\geq 2$ 倍初始标准 Not more than twice of initial value.	
	IR	I 类: $R_i \leq 2500M\Omega$ 或 $R_i \cdot C_R \geq 25S$ 取两者之中较小者 Class I 类: $R_i \leq 2500M\Omega$ 或 $R_i \cdot C_R \geq 25S$ whichever is smaller. II 类: $R_i \leq 1000M\Omega$ 或 $R_i \cdot C_R \geq 25S$ 取两者之中较小者 Class II 类: $R_i \leq 1000M\Omega$ 或 $R_i \cdot C_R \geq 25S$ whichever is smaller.	
	外观: 无损伤 Appearance: No visible damage.		
<b>低压产品寿命 实验 Life Test</b>	$\Delta C/C$	I 类: $\leq \pm 2\%$ 或 $\pm 1pF$ , 取两者之中较大者 II 类: X5R, X7R: $\leq \pm 20\%$ Y5V: $\leq \pm 30\%$ Class I: $\leq 2\%$ 或 $\pm 1pF$ whichever is larger. Class II: X5R, X7R: $\leq \pm 20\%$ Y5V: $\leq \pm 30\%$	低压产品 ( $> 100V$ ); 电压: 2 倍额定工作电压 时间: 1000 小时 充电电流: 不应超过 50mA 放置条件: 室温 放置时间: 24 小时 (I 类), 或 48 小时 (II 类) Low-Voltage ( $< 100V$ ); Applied Voltage: $1.5 \times$ Rated Voltage Duration: 1000h Charge/Discharge Current: 50mA max. Recovery Conditions: Room Temperature Recovery Time: 24h (Class 1), or 48h (Class2)
	DF	$\geq 2$ 倍初始标准 Not more than twice of initial value.	
	IR	I 类: $R_i \leq 4000M\Omega$ 或 $R_i \cdot C_R \geq 40S$ 取两者之中较小者 Class I 类: $R_i \leq 4000M\Omega$ 或 $R_i \cdot C_R \geq 40S$ whichever is smaller. II 类: $R_i \leq 2000M\Omega$ 或 $R_i \cdot C_R \geq 50S$ 取两者之中较小者 Class II 类: $R_i \geq 2000M\Omega$ 或 $R_i \cdot C_R \geq 50S$ whichever is smaller.	
	外观: 无损伤 Appearance: No visible damage.		

**■ MLCC 片式多层陶瓷电容器      MULTILAYER CERAMIC CHIP CAPACITORS**

项目 Item	技术规格 Technical Specification		测试方法 Method and Remarks	Test
中高压产品 寿命实验 Middle δ high voltage Life Test	ΔC/C	I 类: $\leq \pm 2\%$ 或 $\pm 1pF$ , 取两者之中较大者 II 类: X5R, X7R: $\leq \pm 20\%$ Y5V: $\leq \pm 30\%$ Class I: $\leq 2\%$ 或 $\pm 1pF$ whichever is larger. Class II: X5R, X7R: $\leq \pm 20\%$ Y5V: $\leq \pm 30\%$	中高压产品: $\leq$ 额定电压 $< 500V$ : 2 倍工作电压 $500V \leq$ 额定电压 $\leq 1000V$ : 1.5 倍工作电压 额定电压 $> 1000V$ : 1.2 倍工作电压 时间: 100 小时 充电电流: 不应超过 50mA 温度: 125°C (NPO X7R); 85°C (Y5V) 放置条件: 室温 放置时间: 24 小时 (I 类), 或 48 小时 (II 类) Applied voltage: $100V \leq$ Rated Voltage $< 500V$ : 2Multiple $500V \leq$ Rated Voltage $\leq 1000V$ : 1.5Multiple $> 1000V$ Rated Voltage: 1.2 Multiple Duration: 100h Charge/Discharge Current: 50mA max. Temperature: 125°C (NPO X7R); 85°C (Y5V) Recovery Conditions: Room Temperature Recovery Time : 24h (Class I), or 48h (Class2)	100V
	DF	$\geq 2$ 倍初始标准 Not more than twice of initial value.		
	IR	I 类: $R_i \geq 4000\Omega$ 或 $R_i * CR \geq 40S$ 取两者之中较小者 Class I 类: $R_i \geq 4000\Omega$ 或 $R_i * CR \geq 40S$ whichever is smaller. II 类: $R_i \geq 2000\Omega$ 或 $R_i * CR \geq 50S$ 取两者之中较小者 Class II 类: $R_i \leq 2000\Omega$ 或 $R_i * CR \geq 50S$ whichever is smaller.		
	外观: 无损伤 Appearance: No visible damage.			

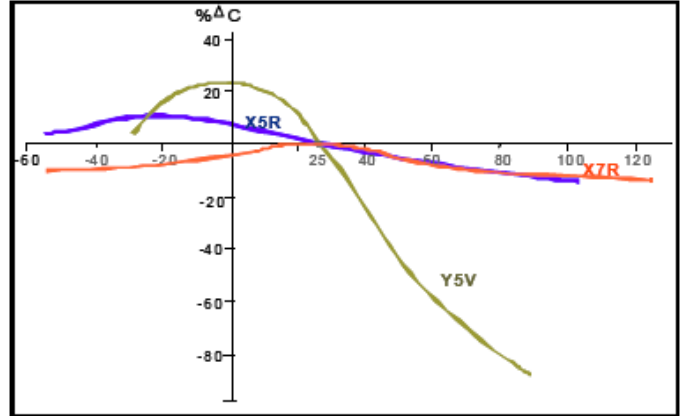
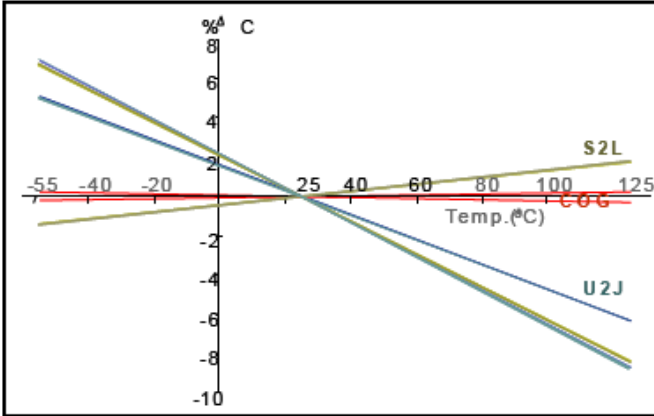


**MLCC 片式多层陶瓷电容器 MULTILAYER CERAMIC CHIP CAPACITORS**

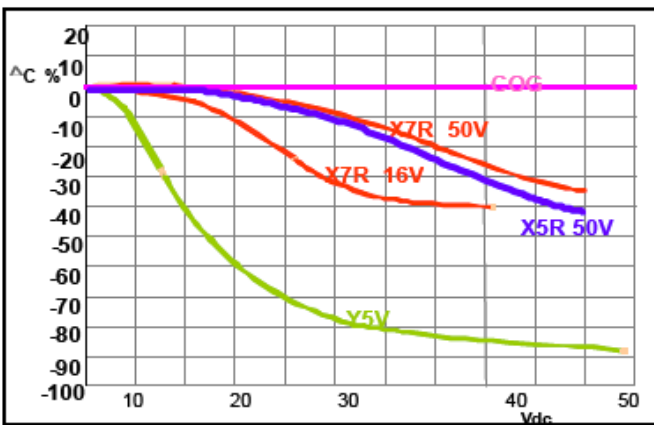
● 电性能曲线描述

● ELECTRICAL CHARACTERISTICS

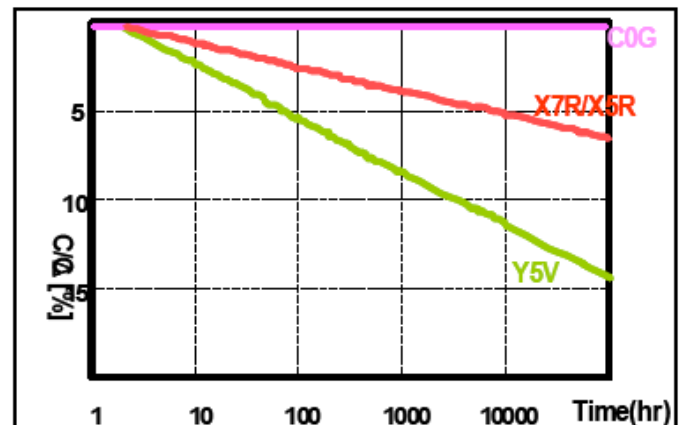
▶ CAPACITANCE - TEMPERATURE CHARACTERISTICS



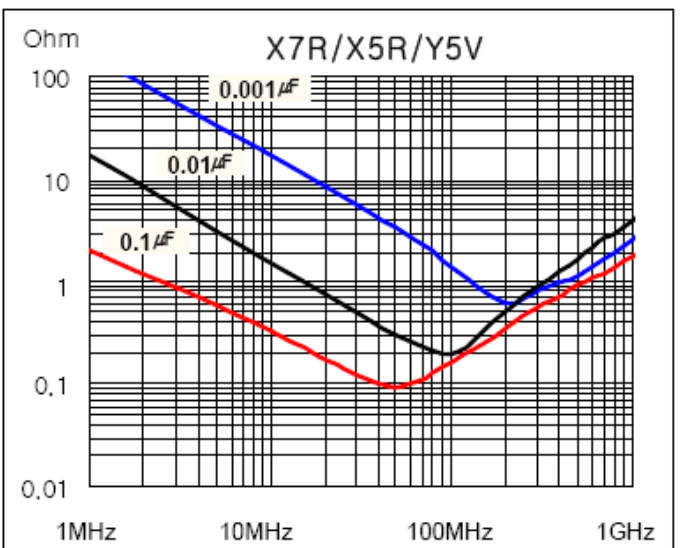
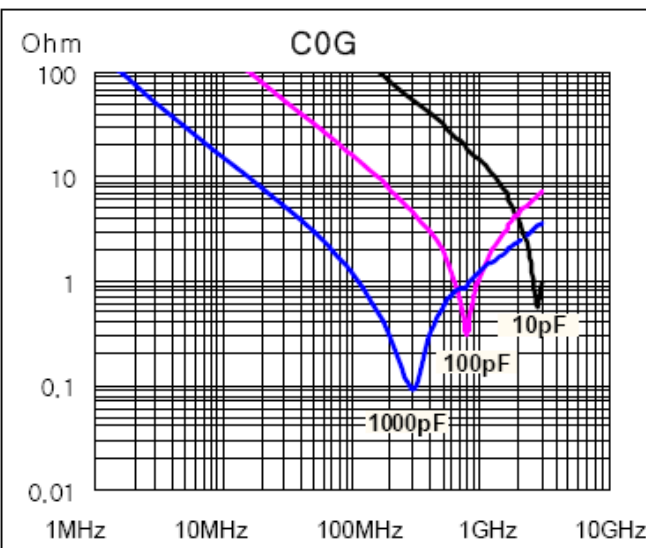
▶ CAPACITANCE - DC VOLTAGE CHARACTERISTICS



▶ CAPACITANCE CHANGE - AGING



▶ IMPEDANCE - FREQUENCY CHARACTERISTICS



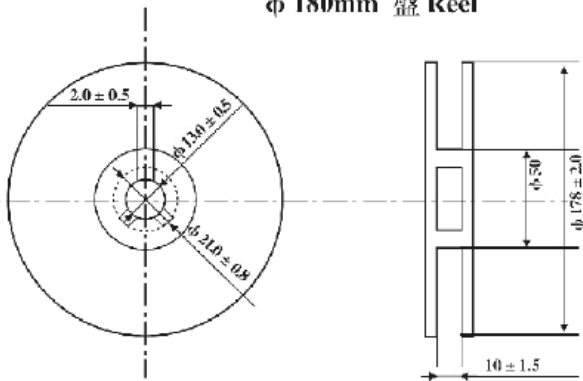
**MLCC 片式多层陶瓷电容器 MULTILAYER CERAMIC CHIP CAPACITORS**

**产品包装 PACKAGING**

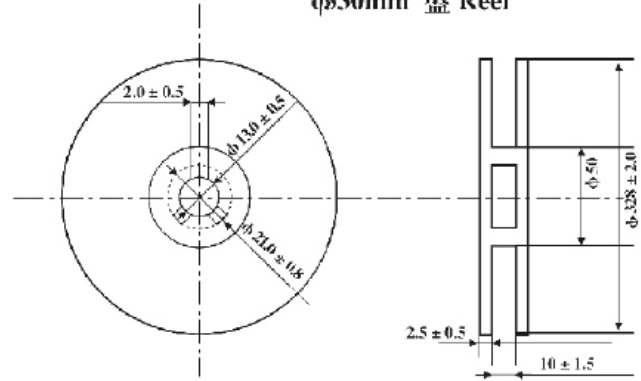
**编带盘包装 Tape & Reel Package**

**A. 编带盘尺寸 Dimension of Reel**

**φ180mm 盘 Reel**

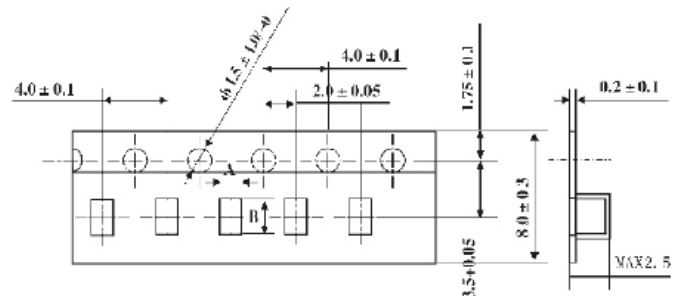
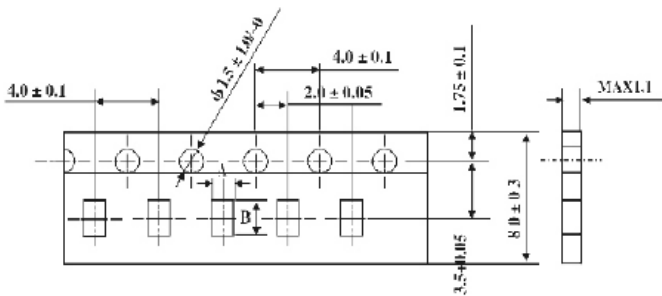
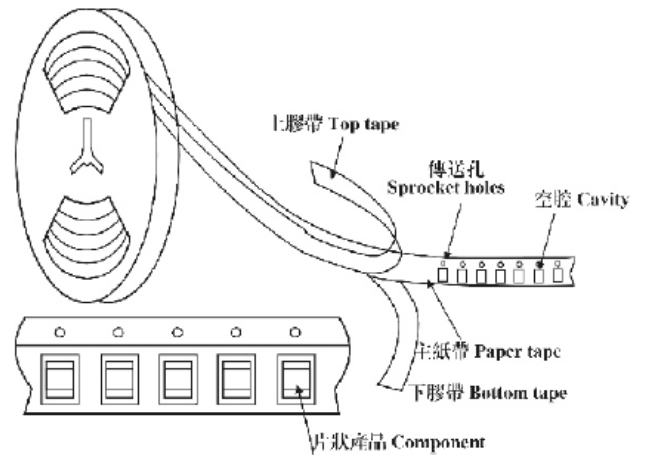
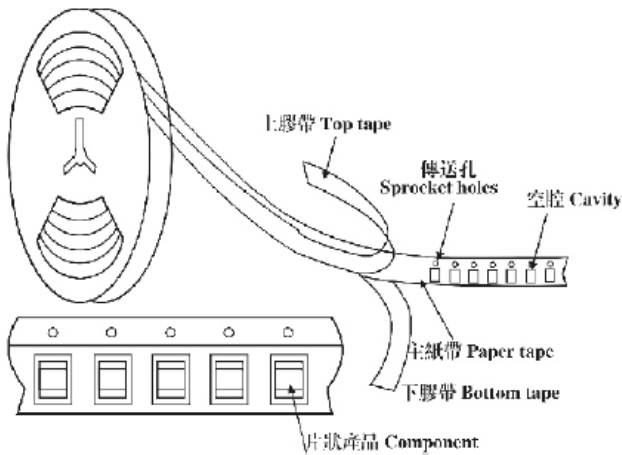


**φ330mm 盘 Reel**



**B. 纸带 Paper Tape**

**C. 塑料带 Embossed Tape**



**MLCC 片式多层陶瓷电容器 MULTILAYER CERAMIC CHIP CAPACITORS**

电容器包装 PACKAGE OF CAPACITORS

型号 Type	A	B
0402	0.65 + 0.1	1.15 + 0.1
0603	1.05 + 0.1	1.85 + 0.1
0805(T<1.0mm)	1.55 + 0.15	2.3 + 0.15
1206(T<1.0mm)	2.0 + 0.2	3.6 + 0.2

型号 Type	A	B
0805(T=1.25mm)	1.45 ± 0.2	2.25 ± 0.2
1206(T>1mm)	1.9 ± 0.2	3.5 ± 0.2

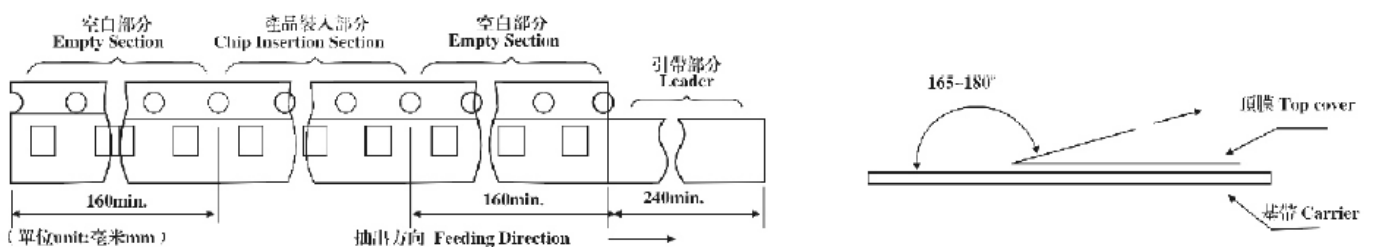
D. 包装要求

- 包装电容器的编带是顺时针卷绕的，由上往下的方向拉出编带时，传送孔处于编带的右侧。
- 在编带的前端，至少留出 5 个间距的引出带。
- 在编带时，必须按下图留出引带部分或空白部分。
- 在盘带的安装中的产品装错的数量每盘必须小 6：表示数量的 0.1% 或 1 个为限，不连续发生错误。
- 上胶带和下胶带不应超出编带的边缘，不能挡住传送孔。
- 传送孔的累计误差为 10 个间距：0.3 毫米以内。
- 上胶带的剥离力应在 0.1 至 0.6 牛顿以内，其方向如右下图 1 所示。

Taping Method

- Tapes for capacitors are wound clockwise. The sprocket holes are to the right as the tape is pulled toward the user.
- The top tape and base tape are not attached at the end of the tape for a minimum of 5 pitches.
- Part of the leader and part of the empty tape shall be attached to the end of the tape as following illustration
- Number of missing capacitors is less than 0.1% of the total number quoted per reel or lpc, whichever is greater, and are not continuous.
- The top tape and bottom tape shall not protrude beyond the edges of the tape and shall not cover sprocket below.
- Cumulative tolerance of sprocket holes, 10 pitches: ±0.3mm.
- Peeling off force: 0.1 to 0.6n in the direction shown down.

图示 1:



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### 注意事项:

#### 1. 环保 Environment protection

我司产品是环保产品，完全符合符合 ROHS 指令，不含（包括含量在限度范围内）有 ROHS 指令禁止的镉、汞、铅 6+、铅、多溴联苯、多溴联苯醚六种有害物质。

The products of BDC are environment friendly products, accord with ROHS instruction totally. The product without any harm materials including Cd, Pb, Hg, Cr6+, PBB, PBDE which ROHS has forbidden.

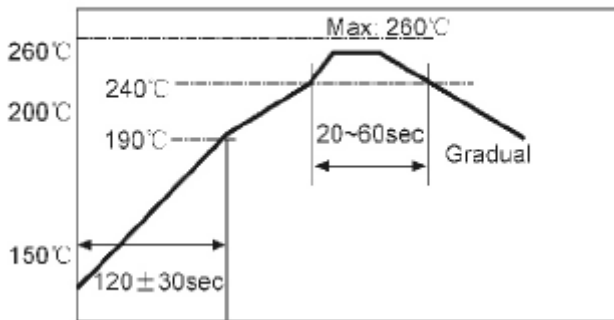
#### 2. 存储 Store

环境温度应保持在 5~40℃，湿度在 20~70% 在 RH 范围内。避免放置于高温、高湿或暴露于充满硫磺或氯气的环境下，否则会引起外部电极氧化或硫化，从而降低可焊性。产品应放在购买 3 个月内使用。若超过 3 个月，使用前应检查可焊性。

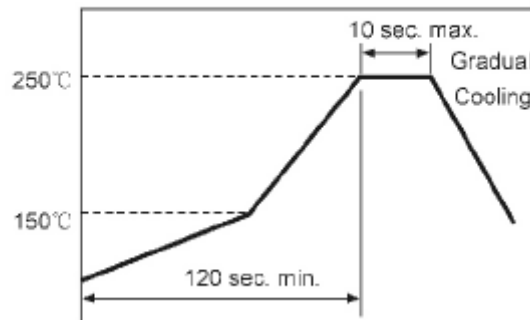
The temperature of environment should keep on 5~40℃, humidity should main within 20%-70%RH. The high temperature, high humidity or full of sulfur or chlorine environment should avoid, if no avoid, the external terminal will be oxidation or sulfuration. The product should be used within three months after purchases. If the time over three months should test to check the solder capacity.

#### 3. 焊接（建设曲线） Solder (advice curve)

REFLOW SOLDERING PROFILE (LEAD FREE)



WAVE SOLDERING PROFILE



#### 4. 检验与分析

在检测时，尽量避免用力推压试棒，是路板弯曲；在分析时，要避免电路板发生弯曲；在超声波清洗时，避免输出功率过大，引起电路板共振等现象，以至发生元件破裂或焊锡断裂；电烙铁检修时，勿使电烙铁头直接接触电容器，且电烙铁功率 max 30W，烙铁头直径 MAXmm，最大温度应小于 300℃。（建议：280℃，25W，1mm）

You should take careful to avoid making circuit bend during you pressure testing stick to check product, and also during you analyses time. The ultrasonic cleaning process should avoid output power over the requirement; if so, it will be cause circuit syntonny to make components break or solder break; when need to use power searing-iron repair, do not making searing-iron touch chip capacitor. Searing-iron max power is 30W, the tip of searing-iron max diameter is 1mm, The max temperature should less 300℃. (Advice: 280℃, 25W, 1mm)