

# SANYEAR

## 多层片式陶瓷电容器规格书 MULTILAYER CHIP CERAMIC CAPACITOR CATALOG

**深圳市美隆电子有限公司**  
Shenzhen Meilong Electronics Co.,Ltd.

官 方 微 信

• **杭州**  
浙江省杭州市拱墅区登山路428号时代电子市场1B133  
电话：0571-88009133 传真：0571-88009870

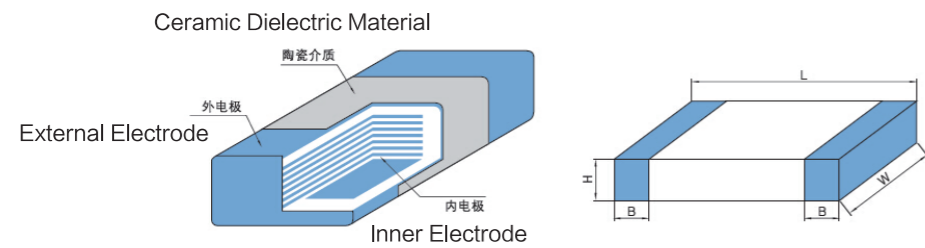
• **香港**  
香港葵涌葵昌道78-84号富都工业大厦3字楼307室  
电话：(00852)-31184938 传真：(00852)-69450797

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

产品特点 Product Features

- 产品尺寸精度高，便于自动贴片机高效装配
- 端电极有三层电极，适合波峰焊与回流焊；介电体与外表为同种材料，环境条件影响小
- 含有C0G到Y5V各种温度特性介质，适用于计算机、通讯、家用电器和仪器仪表灯普通电子设备
- The precision of product size is high,suitable for auto SMT machines high efficiency assembly.
- External Electrode has 3 layers,suitable for both wave and reflow soldering.
- Consist of all kinds of temperature dielectric material form C0G to Y5V,suitable for computers, communications,home appliances,instruments and other normal electronic equipments.

产品结构 Product Construction



产品尺寸 Product Dimensions

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

Blank area for technical specifications or drawing details.

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

产品特点 Product Features

- COG (NPO)：最常用的温度补偿型电容器，属于Ⅰ类介质材料，其性能稳定，温度系数在 $0 \pm 30\text{PPM}/^\circ\text{C}$ 以内，具有好的高频特性。
- X7R：工业中广泛使用的一种温度稳定型电容器，属于Ⅱ类介质材料，具有较高的介电常数，在使用温度（ $-55^\circ\text{C} \sim +125^\circ\text{C}$ ）范围内容值变化率在 $\pm 15\%$ 以内。
- X6S：工业中广泛使用的一种温度稳定型电容器，属于Ⅱ类介质材料，具有较高的介电常数，在使用温度（ $-55^\circ\text{C} \sim +105^\circ\text{C}$ ）范围内容值变化率在 $\pm 22\%$ 以内。
- X5R：工业中广泛使用的一种温度稳定型电容器，属于Ⅱ类介质材料，具有较高的介电常数，在使用温度（ $-55^\circ\text{C} \sim +85^\circ\text{C}$ ）范围内容值变化率在 $\pm 15\%$ 以内。
- Y5V：普通用途的电容器，在使用温度（ $-30^\circ\text{C} \sim +85^\circ\text{C}$ ）范围内容值变化率较大， $+22\%/-82\%$ 以内，具有高介电常数，可以用小的尺寸做大容量的电容。

- COG(NP0): The most normal temperature compensated capacitor,belongs to Class I dielectric material with stable performance,TC  $0 \pm 30\text{ppm}/^\circ\text{C}$ ,high frequency.
- X7R: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is  $\pm 15\%$  for working temperature( $-55^\circ\text{C} \sim +125^\circ\text{C}$ ).
- X6S: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is  $\pm 22\%$  for working temperature( $-55^\circ\text{C} \sim +105^\circ\text{C}$ ).
- X5R: Widely used in industries temperature stable capacitor,belongs to Class II dielectric material with high dielectric constant,and the capacitance changed rate is  $\pm 15\%$  for working temperature( $-55^\circ\text{C} \sim +85^\circ\text{C}$ ).
- Y5V: Y5V dielectric is generally used dielectric material,belongs to Class II dielectric material,it shows a variation of capacitance within  $+22\%/-85\%$  when the temperature is between  $-30^\circ\text{C} \sim +85^\circ\text{C}$ . This kind of dielectric is with very high dielectric constant and suitable for high value capacitors.

产品规格型号 Part Number

| C                        | 0603                                                                                  | X7R                                      | 102                                                        | K                                                                                                                                                                                                          | 500                                                                         | N                                                | T                               |
|--------------------------|---------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|
| 产品类型<br>Product Type     | 尺寸<br>Size                                                                            | 温度系数<br>温度特性<br>T.C.                     | 电容值<br>Capacitance                                         | 允许偏差<br>Tolerance                                                                                                                                                                                          | 额定电压<br>Rate Voltage                                                        | 端头类型<br>Terminal Type                            | 包装<br>Packaging                 |
| 多层式<br>陶瓷电<br>容器<br>MLCC | 01005<br>0201<br>0402<br>0603<br>0805<br>1206<br>1210<br>1808<br>1812<br>2220<br>2225 | COG<br>(NPO)<br>X7R<br>X6S<br>X5R<br>Y5V | 1R5=1.5pF<br>100=10pF<br>222=2.2NF<br>105=1uF<br>475=4.7uF | A= $\pm 0.05\text{pF}$<br>B= $\pm 0.1\text{pF}$<br>C= $\pm 0.25\text{pF}$<br>D= $\pm 0.5\text{pF}$<br>F= $\pm 1\%$<br>G= $\pm 2\%$<br>J= $\pm 5\%$<br>K= $\pm 10\%$<br>M= $\pm 20\%$<br>Z= $+80\%$<br>-20% | 4R0=4V<br>6R3=6.3V<br>250=25V<br>500=50V<br>101=100V<br>251=250V<br>102=1KV | N:银<br>(或铜)<br>/镍/锡<br>N=Ag<br>(or Cu)<br>/Ni/Sn | T=编带<br>Taping<br>B=袋散装<br>Bulk |

Ceramic Dielectric Material

External Electrode

Inner Electrode

| 尺寸<br>Size | MLCC尺寸规格 (单位: mm) |   |         |         |
|------------|-------------------|---|---------|---------|
|            | L                 | W | H (max) | B (max) |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |
|            |                   |   |         |         |

■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

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







■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

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

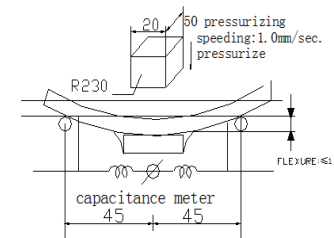




■ 技术指标和实验方法 Specifications and Test Method

| NO      | 项目 Item                                                                           | 技术指标 Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 实验方法 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                        |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
|---------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------|---|---|---|---|---------|------------------------|-------------------------|------------------------|-------------------------|------------------------|---------|------------------------|-------------------------|------------------------|------------------------|------------------------|-----|------------------------|-------------------------|------------------------|------------------------|------------------------|
| 5       | 绝缘电阻(IR)<br>Insulation Resistance                                                 | <p><math>Ri \geq 4G\Omega</math> 或 <math>100\Omega \cdot F</math> (以下范围为 <math>50\Omega \cdot F</math>) 取较小值</p> <p><math>Ri \geq 4 G\Omega</math> or <math>100\Omega.F</math> (<math>50\Omega \cdot F</math> of below range), whichever is smaller</p> <p>以下范围below range:<br/>                     ■50V: 0402<math>\geq</math>104;0603<math>\geq</math>225;<br/>                     0805<math>\geq</math>106;1206<math>\geq</math>106<br/>                     ■25V: 0201<math>\geq</math>104;0402<math>\geq</math>224;<br/>                     0603<math>\geq</math>106;0805<math>\geq</math>106;<br/>                     1206<math>\geq</math>226;01005(X6S/<br/>                     X5R) ■16V: 0603<math>\geq</math>106; 01005<br/>                     (X6S/X5R) ■10V: 0201<math>&gt;</math>104;<br/>                     0603<math>\geq</math>106;<br/>                     0805<math>\geq</math>476; 01005(X6S/<br/>                     X5R) ■6.3V: 0201<math>\geq</math>104;0603<br/> <math>\geq</math>475;1206<math>\geq</math>106;0100(X6SX5R)<br/>                     ■4V: 0603<math>\geq</math>226;0805<math>\geq</math><br/>                     476;<br/>                     1206<math>\geq</math>107; 01005<br/>                     (X6SX5R)</p> | <p>施加电压: <math>U_R \leq 400V</math> <math>U_{测} = U_R</math><br/> <math>U_R &gt; 400V</math> <math>U_{测} = 400V</math><br/>                     充电时间: 60<math>\pm</math>5秒</p> <p>To apply voltage: <math>U_R \leq 400V</math> <math>U_{测} = U_R</math><br/> <math>U_R &gt; 400V</math> <math>U_{测} = 400V</math><br/>                     Charge time: 60<math>\pm</math>5sec</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                        |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| 6       | 耐电压<br>Dielectric Strength                                                        | <p>C0G<br/>X7R<br/>X6S<br/>X5R<br/>Y5V</p> <p>无介质击穿和材料裂缝<br/>No dielectric breakdown or mechanical breakdown</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>施加电压: <math>U_R &lt; 100V</math>: 250%<br/> <math>100V \leq U_R &lt; 1000V</math>: 150%<br/> <math>U_R \geq 1000V</math>: 120%</p> <p>测试时间: 60<math>\pm</math>5秒,<br/>                     最大电流: 不超过50mA</p> <p>To apply voltage: <math>U_R &lt; 100V</math>: 250%;<br/> <math>100V \leq U_R &lt; 1000V</math>: 150%;<br/> <math>U_R \geq 1000V</math>: 120%</p> <p>Test time: 60<math>\pm</math>5sec,<br/>                     Max current: should not exceed 50mA</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                        |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| *7      | 电容量温度系数或温度特性<br>Capatiance Temperature Coefficient Or Temperature Characteristics | <p>C0G<br/>X7R<br/>X6S<br/>X5R<br/>Y5V</p> <p>温度系数<math>\leq 0 \pm 30ppm/^{\circ}C</math><br/>Temperature coefficient within <math>0 \pm 30ppm/^{\circ}C</math></p> <p>容量变化<math>\leq \pm 15\%</math><br/>Capacitance change within <math>\pm 15\%</math></p> <p>容量变化<math>\leq +22\% \sim -82\%</math><br/>Capacitance change within <math>+22\% \sim -82\%</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>按系列温度顺序测试电容量<br/>Measure capacitance under follow table list</p> <table border="1"> <thead> <tr> <th>步骤Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>C0G/X7R</td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>-55<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>125<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> </tr> <tr> <td>X6S/X5R</td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>-55<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>85<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> </tr> <tr> <td>Y5V</td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>-30<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> <td>85<math>\pm</math>3<math>^{\circ}C</math></td> <td>25<math>\pm</math>2<math>^{\circ}C</math></td> </tr> </tbody> </table> <p>PS: C0G预先干燥: 16-24小时.<br/>                     C0G Preliminary Drying for 16-24hr.<br/>                     ▶ <math>C = [(C_i - C_1) / (C_1 * T)] * 10^6</math> 或 (or)<br/>                     ▶ <math>C = (C_i - C_1) / C_1 * 100\%</math><br/> <math>C_i</math>: 1-5温度下的容值<br/>                     Capacitance value at 1-5 temperature<br/>                     ▶ T: 温度变化量 (Temperature variation)<br/>                     ▶ <math>T = T_i - T_1</math></p> | 步骤Step                  | 1                      | 2 | 3 | 4 | 5 | C0G/X7R | 25 $\pm$ 2 $^{\circ}C$ | -55 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ | 125 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ | X6S/X5R | 25 $\pm$ 2 $^{\circ}C$ | -55 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ | 85 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ | Y5V | 25 $\pm$ 2 $^{\circ}C$ | -30 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ | 85 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ |
| 步骤Step  | 1                                                                                 | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4                       | 5                      |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| C0G/X7R | 25 $\pm$ 2 $^{\circ}C$                                                            | -55 $\pm$ 3 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 25 $\pm$ 2 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 125 $\pm$ 3 $^{\circ}C$ | 25 $\pm$ 2 $^{\circ}C$ |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| X6S/X5R | 25 $\pm$ 2 $^{\circ}C$                                                            | -55 $\pm$ 3 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 25 $\pm$ 2 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 85 $\pm$ 3 $^{\circ}C$  | 25 $\pm$ 2 $^{\circ}C$ |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| Y5V     | 25 $\pm$ 2 $^{\circ}C$                                                            | -30 $\pm$ 3 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 25 $\pm$ 2 $^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 85 $\pm$ 3 $^{\circ}C$  | 25 $\pm$ 2 $^{\circ}C$ |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |
| 8       | 附着力<br>Adhesion                                                                   | <p>C0G<br/>X7R<br/>X6S<br/>X5R</p> <p>无明显的损伤或端电极脱落<br/>No remarkable damage or removal of the terminations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>施加压力: 5N(0201:2N; 01005:1N)<br/>                     时间: 10<math>\pm</math>1秒<br/>                     Pressurizing force: 5N(0201:2N; 01005:1N)<br/>                     time: 10<math>\pm</math>1sec</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |                        |   |   |   |   |         |                        |                         |                        |                         |                        |         |                        |                         |                        |                        |                        |     |                        |                         |                        |                        |                        |

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

| NO              |                                         |        | 项目 Item                                                                                                                                                                     |                                         |         | 技术指标 Specification                                                                                                                                                        |  |  | 实验方法 Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
|-----------------|-----------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|---------|----------------|---------|---|-----------------------------------------|-------|---|-----|--------|---|-----------------------------------------|-------|---|-----|--------|
|                 |                                         |        |                                                                                                                                                                             |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 9               |                                         |        | 可焊性 Solderability                                                                                                                                                           |                                         |         | C0G X7R X6S X5R Y5V<br>端电极挂锡面积小于95%<br>95%min.coverage of both terminal electrodes                                                                                        |  |  | 锡炉温度: 245 ± 5℃<br>浸入时间: 2 ± 1秒<br>Solder temperature:245 ± 5℃<br>Dipping time: 2 ± 1sec.                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 10              |                                         |        | 外观 Appearance                                                                                                                                                               |                                         |         | 无明显可见损伤<br>No remarkable visual damage                                                                                                                                    |  |  | 将电容安在测试夹具上, 按图所示方向以1.0mm/s的速率施加压力, 弯曲1mm.<br><br>Solder the capacitor on testing substrate and putt on testing stand.<br>The middle part of substrateshall successively be pressurized by pressuringrod at a rated of about 1.0mm/sec. Until the deflection become means of the 1.0mm.<br><br>                                                                                                          |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
|                 |                                         |        | 弯曲强度 Bending                                                                                                                                                                |                                         |         | C0G: ± 5%或 ± 0.5pF, 取较大值<br>X7R/X6S/X5R: ± 12.5%<br>Y5V: ± 30%<br><br>C0G:within ± 5% or ± 0.5pF, whichever is larger<br>X7R/X6S/X5R: within ± 12.5%<br>Y5V: within ± 30% |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| *11             |                                         |        | 外观 Appearance                                                                                                                                                               |                                         |         | 无明显可见损伤<br>No remarkable visual damage                                                                                                                                    |  |  | 预热: 120~150℃ 60秒<br>焊接温度: 270 ± 5%℃<br>浸入时间: 10 ± 1秒<br><br>Preheating:120~150℃ 60sec<br>Soldering temperature :270 ± 5℃<br>Dipping time:10 ± 1seconds                                                                                                                                                                                                                                                                                                                                     |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
|                 |                                         |        | 容量变化 Cap change                                                                                                                                                             |                                         |         | C0G: ± 2.5%或 ± 0.5pF, 取较大值<br>X7R/X6S/X5R: ± 15%<br>Y5V: ± 30%<br><br>C0G:within ± 2.5% or ± 0.5pF, whichever is larger<br>X7R/X6S/X5R: within ± 15%<br>Y5V: within ± 30% |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
|                 |                                         |        | DF/IR                                                                                                                                                                       |                                         |         | 满足产品初始值得要求<br>Meets initial standard damage                                                                                                                               |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| *12             |                                         |        | 外观 Appearance                                                                                                                                                               |                                         |         | 无明显可见损伤<br>No remarkable visual damage                                                                                                                                    |  |  | 按下列步骤进行5次循环:<br>To perform 5cycles of the stated environment<br><br><table border="1"> <thead> <tr> <th>步骤 Step</th> <th>温度 Temperature</th> <th>时间 Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>下限温度+0/-3℃<br/>Min.operating Temp.+0/-3℃</td> <td>30min</td> </tr> <tr> <td>2</td> <td>25℃</td> <td>2~3min</td> </tr> <tr> <td>3</td> <td>上限温度+3/-0℃<br/>Min.operating Temp.+3/-0℃</td> <td>30min</td> </tr> <tr> <td>4</td> <td>25℃</td> <td>2~3min</td> </tr> </tbody> </table> |  |  | 步骤 Step | 温度 Temperature | 时间 Time | 1 | 下限温度+0/-3℃<br>Min.operating Temp.+0/-3℃ | 30min | 2 | 25℃ | 2~3min | 3 | 上限温度+3/-0℃<br>Min.operating Temp.+3/-0℃ | 30min | 4 | 25℃ | 2~3min |
|                 |                                         |        | 步骤 Step                                                                                                                                                                     | 温度 Temperature                          | 时间 Time |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
|                 |                                         |        | 1                                                                                                                                                                           | 下限温度+0/-3℃<br>Min.operating Temp.+0/-3℃ | 30min   |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 2               | 25℃                                     | 2~3min |                                                                                                                                                                             |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 3               | 上限温度+3/-0℃<br>Min.operating Temp.+3/-0℃ | 30min  |                                                                                                                                                                             |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 4               | 25℃                                     | 2~3min |                                                                                                                                                                             |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| 容量变化 Cap change |                                         |        | C0G: ± 2.5%或 ± 0.25pF, 取较大值<br>X7R/X6S/X5R: ± 15%<br>Y5V: ± 30%<br><br>C0G:within ± 2.5% or ± 0.25pF, whichever is larger<br>X7R/X6S/X5R: within ± 15%<br>Y5V: within ± 30% |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |
| DF/IR           |                                         |        | 满足产品初始值得要求<br>Meets initial standard damage                                                                                                                                 |                                         |         |                                                                                                                                                                           |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |         |                |         |   |                                         |       |   |     |        |   |                                         |       |   |     |        |

| NO  | 项目 Item                  | 技术指标 Specification |                                                                                                                                                                                  | 实验方法 Test Method                                                                                                                                                                                                                                                                                                          |
|-----|--------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                          | 外观 Appearance      | 容量变化 Cap change                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                           |
| *13 | 耐湿负荷 Damp heat with load | 外观 Appearance      | 无明显可见损伤<br>No remarkable visual damage                                                                                                                                           | 测试温度: 40±2℃<br>相对湿度: 90~95%RH<br>测试电压: 额定电压 (最大500V)<br>测试时间: 500±12hrs<br>Test temperature:40±2℃<br>Humidity:90~95% RH<br>Voltage:100% of the rated voltage(max:500V)<br>Testing time:500±12hrs                                                                                                                          |
|     |                          | 容量变化 Cap change    | C0G: ±7.5%或±0.75pF,取较大值<br>X7R/X6S/X5R: ±25%<br>Y5V: ±30%或-40%~+30%<br>C0G:within ±7.5% or ±0.75pF, whichever is larger<br>X7R/X6S/X5R: within ±25%<br>Y5V:within ±30%或-40%~+30% |                                                                                                                                                                                                                                                                                                                           |
|     |                          | DF                 | 初始值的2倍以下<br>Not more than 2 times of initial value                                                                                                                               |                                                                                                                                                                                                                                                                                                                           |
|     |                          | IR                 | Ri > 500MΩ或25Ω·F(☆为5Ω·F), 取较小值<br>Ri > 500MΩ或25Ω·F(5Ω·F of ☆), whichever is smaller                                                                                              |                                                                                                                                                                                                                                                                                                                           |
| *14 | 耐久性 Life Test            | 外观 Appearance      | 无明显可见损伤<br>No remarkable visual damage                                                                                                                                           | 温度测试: 上限类别温度±3℃<br>测试电压: U <sub>R</sub> < 100V 150%<br>100V ≤ U <sub>R</sub> < 1000V 120%<br>U <sub>R</sub> ≥ 1000V 100%<br>测试时间: 1000小时<br>Test temperature:Max.Operating Temp. ±3℃<br>Voltage: U <sub>R</sub> < 100V 150%<br>100V ≤ U <sub>R</sub> < 1000V 120%<br>U <sub>R</sub> ≥ 1000V 100%<br>Testing time: 1000hrs |
|     |                          | 容量变化 Cap change    | C0G: ±3%或±0.5pF,取较大值<br>X7R/X6S/X5R: ±25%<br>Y5V: ±30%或-40%~+30%<br>C0G:within ±3% or ±0.5pF, whichever is larger<br>X7R/X6S/X5R: within ±25%<br>Y5V:within ±30%或-40%~+30%       |                                                                                                                                                                                                                                                                                                                           |
|     |                          | DF                 | 初始值的2倍以下<br>Not more than 2 times of initial value                                                                                                                               |                                                                                                                                                                                                                                                                                                                           |
|     |                          | IR                 | Ri > 1GΩ或50Ω·F(☆为10Ω·F), 取较小值<br>Ri > 1GΩ或50Ω·F(10Ω·F of ☆), whichever is smaller                                                                                                |                                                                                                                                                                                                                                                                                                                           |

注:

\*A.3.7.11.12.13.14项需对II类电容器做预处理(将电容器在160℃下热处理1小时),然后在标准大气条件下恢复48±4小时,再测量初始值;

B.3.11.12.13.14项实验后在室温下放置24±2(C0G)或48±4(X7R、X6S、X5R、Y5V)小时以后再测量;

C.3.11.12.13.14项电性能测量的环境条件,温度:25℃±2℃ 相对湿度:25%~80%RH。

☆ ■ 100V:X7R

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

■ 25V:0201≥104;0402≥224 0603≥225; 0805≥225;1206≥106;1210≥106;01005(X6S/X5R)

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

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

■ ≤6.3V Class II; 01005(X6S/X5R)

Note:

A.3.7.11.12.13.14Item need to do the pretreatment of class II type capacitor(Perform a heat treatment at 160℃ for 1 hour),

Then recovery the capacitor at standard pressure conditions for 48±4 hours,Perform the initial measurement

B.3.11.12.13.14Item end of experiment Measurement to be made after being kept at room temperature for 24±2(C0G) or

48±4(X7R、X6S、X5R、Y5V)hrs.

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

25%~80%RH

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