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

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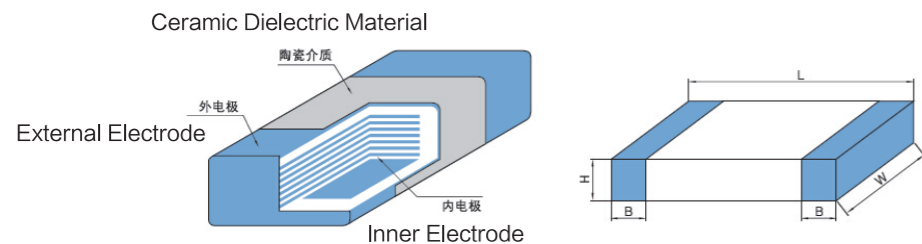
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多层片式陶瓷电容器 Multilayer Chip Ceramic Capacitor

产品特点 Product Features

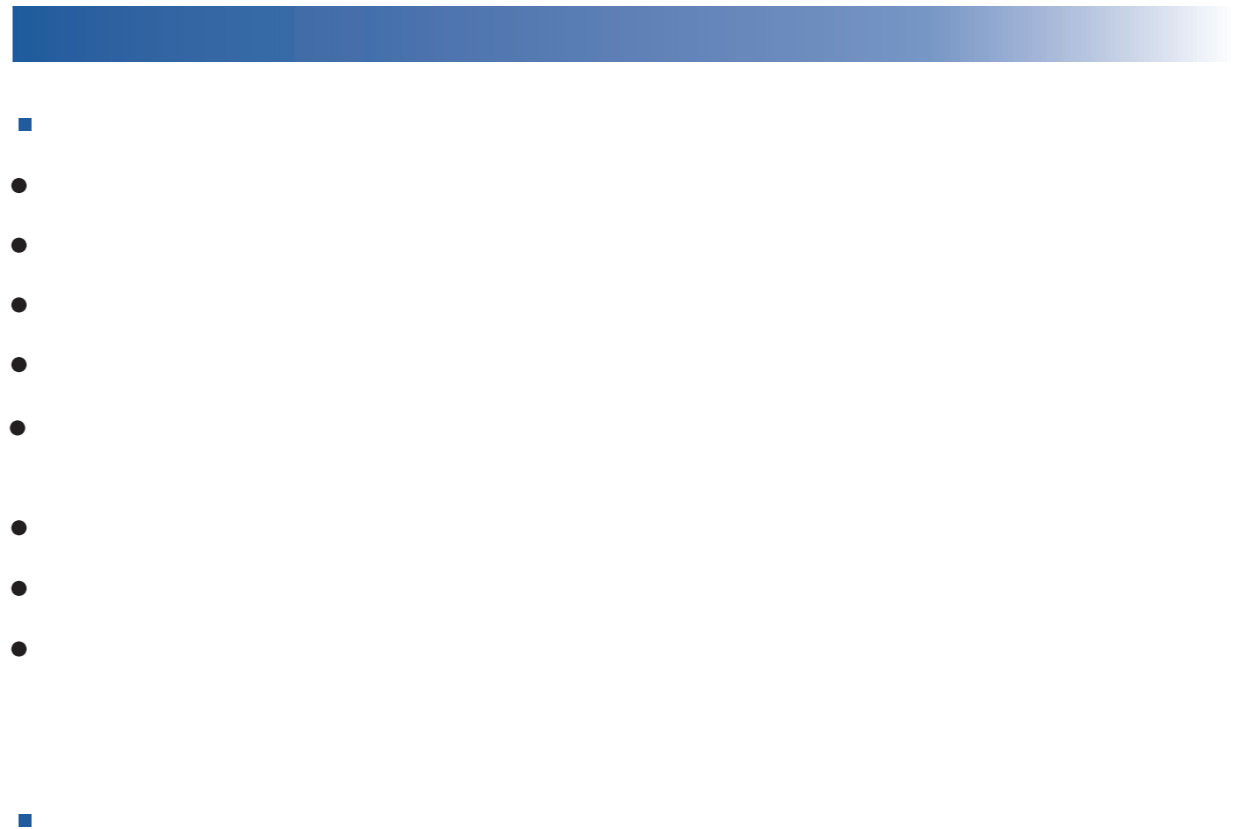
- 产品尺寸精度高，便于自动贴片机高效装配
- 端电极三层电极，适合波峰焊与回流焊；介电体与外表为同种材料，环境条件影响小
- 含有C0G到Y5V各种温度特性介质，适用于计算机、通讯、家用电器和仪器仪表灯普通电子设备
- The precision of product size is high,suitable for auto SMT machines high efficiency assembly.
- External Electrode has 3 layers,suitable for both wave and reflow soldering.
- Consist of all kinds of temperature dielectric material form C0G to Y5V,suitable for computers, communications,home appliances,instruments and other normal electronic equipments.

产品结构 Product Construction



产品尺寸 Product Dimensions

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



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

产品规格型号 Part Number

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

Ceramic Dielectric Material

External Electrode

Inner Electrode

| 尺寸 Size | MLCC尺寸规格 (单位: mm) | | | |
|------------|-------------------|---|---------|---------|
| | L | W | H (max) | B (max) |
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■ 产品容值范围 Product Capacitance Range

背景色代表：可生产型号

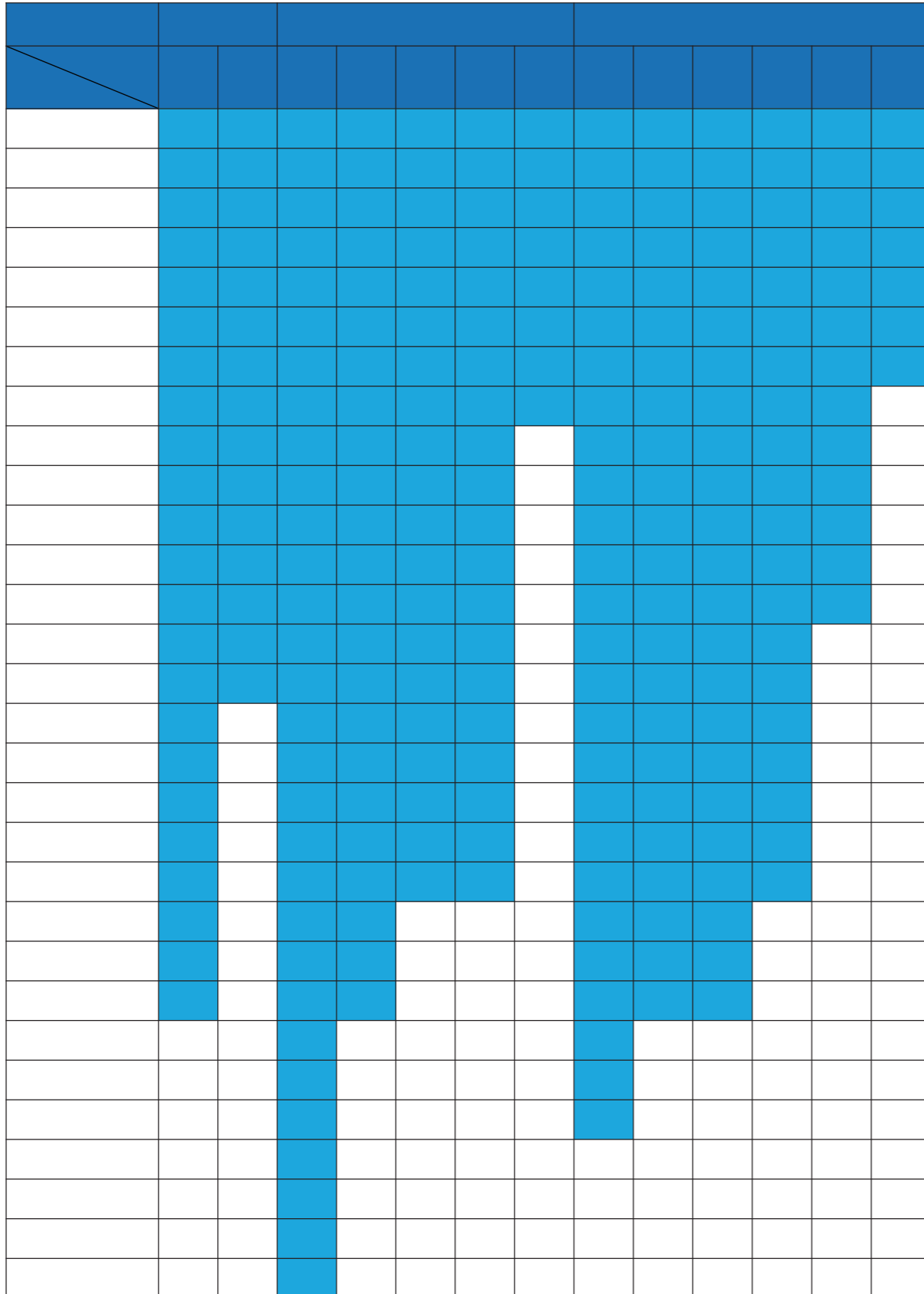
| 材质 | COG | | | | | | | | | | | |
|------|-----------------|------|----|------|------|------|------|------|------|------|------|------|
| | 01005 | 0201 | | 0402 | 0603 | 0805 | 1206 | 1210 | 1808 | 1812 | 2220 | 2225 |
| 尺寸 | V _{DC} | 6.3 | 16 | 10 | 10 | 10 | 16 | 16 | 16 | 16 | 16 | 16 |
| | C _p | 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_{DC} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | 6.3 10 | 16 | 25 | 50 | |
| C_p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 123 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 153 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 183 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 223 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 273 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 333 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 393 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 473 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 563 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 823 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 104 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 124 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 184 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 224 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 274 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 334 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 394 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 474 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 564 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 684 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 824 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 105 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 225 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 275 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 335 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 395 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 475 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 565 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 106 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 226 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 476 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 107 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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



| NO | 项目 Item | 技术指标 Specification | 实验方法 Test Method | |
|----|---|--|--|--|
| 1 | 外观 Appearance | 无异常 No abnormalities | 通过显微镜视觉检测 (X10) On microscope | |
| 2 | 尺寸 Dimension | 在要求的范围内 Within the specified dimensions | 采用精度不低于0.01mm千分尺 Using calipers on micrometer with tolerance no less than 0.01mm | |
| 3 | 容量(c) Capacitance | 在要求的范围内 Within the specified dimensions | Class I : Cp ≤ 1000pF 1MHz ± 10%, 1.0 ± 0.1Vrms Cp > 1000pF 1KHz ± 10%, 1.0 ± 0.1Vrms Class II: Cp < 10 μF 1KHz ± 10%, 1.0 ± 0.1Vrms Cp ≥ 10 μF 120 ± 24Hz, 1.0 ± 0.1Vrms | |
| 4 | 损耗(Q/DF) Dissipation Factor | C0G | | Cp < 30pF, Q ≥ 400+20Cp Cp ≥ 30pF, Q ≥ 1000 |
| | | X7R X6S X5R | | ■ UR ≥ 100V, DF ≤ 7.5% ■ 25V ≤ UR ≤ 50V, DF ≤ 3.5% DF ≤ 10%, 0201 ≥ 104, 0402 ≥ 333 0603 ≥ 104, 0805 ≥ 684 1206 ≥ 225, 1210 ≥ 475 DF ≤ 12.5% 0402 ≥ 474 ■ UR ≤ 16V, DF ≤ 5.0% DF ≤ 10%, 0201 ≥ 104, 0402 ≥ 563 0603 ≥ 564, 0805 ≥ 105 1206 ≥ 475, 1210 ≥ 106 ■ UR ≤ 10V, DF ≤ 7.0% DF ≤ 10% 01005, 0201 ≥ 123 0402 ≥ 224, 0603 ≥ 334 0805 ≥ 225, 1206 ≥ 225 1210 ≥ 226 DF ≤ 15%, 0201 ≥ 104, 0402 ≥ 105 ■ UR = 6.3V, DF ≤ 10% DF ≤ 15%, 0201 ≥ 104, 0402 ≥ 105 0603 ≥ 106, 0805 ≥ 475 1206 ≥ 476, 1210 ≥ 107 DF ≤ 20%, 0402 ≥ 225 ■ UR = 4V, DF ≤ 15% |
| | | Y5V | | ■ UR ≥ 50V, DF ≤ 12.5% ■ UR = 25V, DF ≤ 7.0% DF ≤ 9%, 0402 ≥ 683, 0603 ≥ 474 0805 ≥ 105, 1206 ≥ 475 1210 ≥ 106 ■ UR = 16V, DF ≤ 15% ■ UR = 10V, DF ≤ 20% ■ UR ≤ 6.3V, DF ≤ 20% |
| 高Q | Cp > 30pF Q ≥ 1000 1pF < Cp ≤ 30pF Q ≥ 400+20Cp Cp ≤ 1pF Q ≥ 300 | | | |
| 5 | 绝缘电阻(IR) Insulation Resistance | C0G | 施加电压: UR ≤ 400V UR测=UR UR > 400V UR测=400V 充电时间: 60 ± 5秒 To apply voltage: UR ≤ 400V UR测=UR UR > 400V UR测=400V Charge time: 60 ± 5sec | |

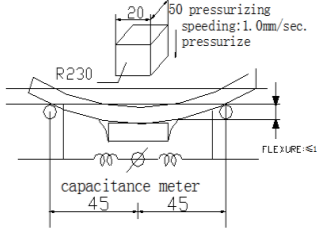
■ 技术指标和实验方法 Specifications and Test Method

| NO | 项目 Item | 技术指标 Specification | 实验方法 Test Method | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|--|---|------------------------|-----------------------|---|---|---|---|---------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|---------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|
| 5 | 绝缘电阻(IR) Insulation Resistance | <p>$R_i \geq 4G\Omega$ 或 $100\Omega \cdot F$ (以下范围为 $50\Omega \cdot F$) 取较小值</p> <p>$R_i \geq 4G\Omega$ or $100\Omega \cdot F$ (50 $\Omega \cdot F$ of below range), whichever is smaller</p> <p>以下范围below range: ■50V: 0402\geq104;0603\geq225; 0805\geq106;1206\geq106 ■25V: 0201\geq104;0402\geq224; 0603\geq106;0805\geq106; 1206\geq226;01005(X6S/ X5R) ■16V: 0603\geq106; 01005 (X6S/X5R) ■10V: 0201$>$104; 0603\geq106; 0805\geq476; 01005(X6S/ X5R) ■6.3V: 0201\geq104;0603 \geq475;1206\geq106;0100(X6SX5R) ■4V: 0603\geq226;0805\geq 476; 1206\geq107; 01005 (X6SX5R)</p> | <p>施加电压: $U_R \leq 400V$ $U_{测} = U_R$ $U_R > 400V$ $U_{测} = 400V$</p> <p>充电时间: 60 ± 5秒</p> <p>To apply voltage: $U_R \leq 400V$ $U_{测} = U_R$ $U_R > 400V$ $U_{测} = 400V$</p> <p>Charge time: 60 ± 5sec</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 耐电压 Dielectric Strength | <p>C0G X7R X6S X5R Y5V</p> <p>无介质击穿和材料裂缝 No dielectric breakdown or mechanical breakdown</p> | <p>施加电压: $U_R < 100V$: 250% $100V \leq U_R < 1000V$: 150% $U_R \geq 1000V$: 120%</p> <p>测试时间: 60 ± 5秒, 最大电流: 不超过50mA</p> <p>To apply voltage: $U_R < 100V$: 250%; $100V \leq U_R < 1000V$: 150%; $U_R \geq 1000V$: 120%</p> <p>Test time: 60 ± 5sec, Max current: should not exceed 50mA</p> | | | | | | | | | | | | | | | | | | | | | | | | |
| *7 | 电容量温度系数或温度特性 Capatiance Temperature Coefficient Or Temperature Characteristics | <p>C0G X7R X6S X5R Y5V</p> <p>温度系数 $\leq 0 \pm 30ppm/^\circ C$ Temperature coefficient within $0 \pm 30ppm/^\circ C$</p> <p>容量变化 $\leq \pm 15\%$ Capacitance change within $\pm 15\%$</p> <p>容量变化 $\leq +22\% \sim -82\%$ Capacitance change within $+22\% \sim -82\%$</p> | <p>按系列温度顺序测试电容量 Measure capacitance under follow table list</p> <table border="1"> <thead> <tr> <th>步骤Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>C0G/X7R</td> <td>25\pm2$^\circ C$</td> <td>-55\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> <td>125\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> </tr> <tr> <td>X6S/X5R</td> <td>25\pm2$^\circ C$</td> <td>-55\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> <td>85\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> </tr> <tr> <td>Y5V</td> <td>25\pm2$^\circ C$</td> <td>-30\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> <td>85\pm3$^\circ C$</td> <td>25\pm2$^\circ C$</td> </tr> </tbody> </table> <p>PS:C0G预先干燥: 16-24小时. C0G Preliminary Drying for 16-24hr. ▶$C = [(C_i - C_1) / (C_1 \cdot \Delta T)] \cdot 10^6$ 或 (or) ▶$C = (C_i - C_1) / C_1 \cdot 100\%$ C_i: 1-5温度下的容值 Capacitance value at 1-5 temperature ▶T: 温度变化量 (Temperature variation) ▶$T = T_i - T_1$</p> | 步骤Step | 1 | 2 | 3 | 4 | 5 | C0G/X7R | 25 \pm 2 $^\circ C$ | -55 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 125 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | X6S/X5R | 25 \pm 2 $^\circ C$ | -55 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 85 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | Y5V | 25 \pm 2 $^\circ C$ | -30 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 85 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ |
| 步骤Step | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | | | | | | | | | |
| C0G/X7R | 25 \pm 2 $^\circ C$ | -55 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 125 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | | | | | | | | | | | | | | | | | | | | | | |
| X6S/X5R | 25 \pm 2 $^\circ C$ | -55 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 85 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | | | | | | | | | | | | | | | | | | | | | | |
| Y5V | 25 \pm 2 $^\circ C$ | -30 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | 85 \pm 3 $^\circ C$ | 25 \pm 2 $^\circ C$ | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 附着力 Adhesion | <p>C0G X7R X6S X5R</p> <p>无明显的损伤或端电极脱落 No remarkable damage or removal of the terminations.</p> | <p>施加压力: 5N(0201:2N; 01005:1N) 时间: 10 ± 1秒 Pressurizing force: 5N(0201:2N; 01005:1N) time: 10 ± 1sec</p> | | | | | | | | | | | | | | | | | | | | | | | | |

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

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

| NO | 项目 Item | 技术指标 Specification | | 实验方法 Test Method |
|-----|--------------------------|--------------------|--|---|
| | | 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 No remarkable visual damage | 测试温度: 40±2℃ 相对湿度: 90~95%RH 测试电压: 额定电压 (最大500V) 测试时间: 500±12hrs Test temperature:40±2℃ Humidity:90~95% RH Voltage:100% of the rated voltage(max:500V) Testing time:500±12hrs |
| | | 容量变化 Cap change | C0G: ±7.5%或±0.75pF,取较大值 X7R/X6S/X5R: ±25% Y5V: ±30%或-40%~+30% C0G:within ±7.5% or ±0.75pF, whichever is larger X7R/X6S/X5R: within ±25% Y5V:within ±30%或-40%~+30% | |
| | | DF | 初始值的2倍以下 Not more than 2 times of initial value | |
| | | IR | Ri > 500MΩ或25Ω·F(☆为5Ω·F), 取较小值 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 No remarkable visual damage | 温度测试: 上限类别温度±3℃ 测试电压: U _R < 100V 150% 100V ≤ U _R < 1000V 120% U _R ≥ 1000V 100% 测试时间: 1000小时 Test temperature:Max.Operating Temp. ±3℃ Voltage: U _R < 100V 150% 100V ≤ U _R < 1000V 120% U _R ≥ 1000V 100% Testing time: 1000hrs |
| | | 容量变化 Cap change | C0G: ±3%或±0.5pF,取较大值 X7R/X6S/X5R: ±25% Y5V: ±30%或-40%~+30% C0G:within ±3% or ±0.5pF, whichever is larger X7R/X6S/X5R: within ±25% Y5V:within ±30%或-40%~+30% | |
| | | DF | 初始值的2倍以下 Not more than 2 times of initial value | |
| | | IR | Ri > 1GΩ或50Ω·F(☆为10Ω·F), 取较小值 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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[NMC0402X7R103J25TRPF](#) [NMC0402X7R153K16TRPF](#) [NMC0603NPO1R8C50TRPF](#) [NMC0603NPO201J50TRPF](#)
[NMC0603NPO330G50TRPF](#) [NMC0603X5R475M6.3TRPF](#) [NMC0805NPO270J50TRPF](#) [NMC0805NPO820J50TRPF](#)
[NMC0805X7R224K16TRPLPF](#) [NMC0805X7R224K25TRPF](#) [NMC1206X7R102K50TRPF](#) [NMC1206X7R106K10TRPLPF](#)
[NMC1206X7R475K10TRPLPF](#) [NMC-H0805X7R472K250TRPF](#) [NMC-L0402NPO7R0C50TRPF](#) [NMC-L0603NPO2R2B50TRPF](#) [NMC-](#)
[Q0402NPO8R2D200TRPF](#) [C1206C101J1GAC](#) [C1608C0G2A221J](#) [C1608X7R1E334K](#) [C2012C0G2A472J](#) [2220J2K00562KXT](#)
[1812J2K00332KXT](#) [CDR31BX103AKWR](#) [CDR33BX104AKUR](#) [CDR33BX683AKUS](#) [CGA2B2C0G1H010C](#) [CGA2B2C0G1H040C](#)
[CGA2B2C0G1H050C](#) [CGA2B2C0G1H060D](#) [CGA2B2C0G1H070D](#) [CGA2B2C0G1H120J](#) [CGA2B2C0G1H151J](#)
[CGA2B2C0G1H181JT0Y0F](#) [CGA2B2C0G1H1R5C](#) [CGA2B2C0G1H2R2C](#) [CGA2B2C0G1H390J](#) [CGA2B2C0G1H391J](#)
[CGA2B2C0G1H3R3C](#)