

# SANYEAR

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

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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 <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												
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1R8												
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3R9												
4R7												
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152												
182												
222												
272												
332												
392												
472												
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153												
183												
223												
273												
333												
473												
563												
104												



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背景色代表：可生产型号

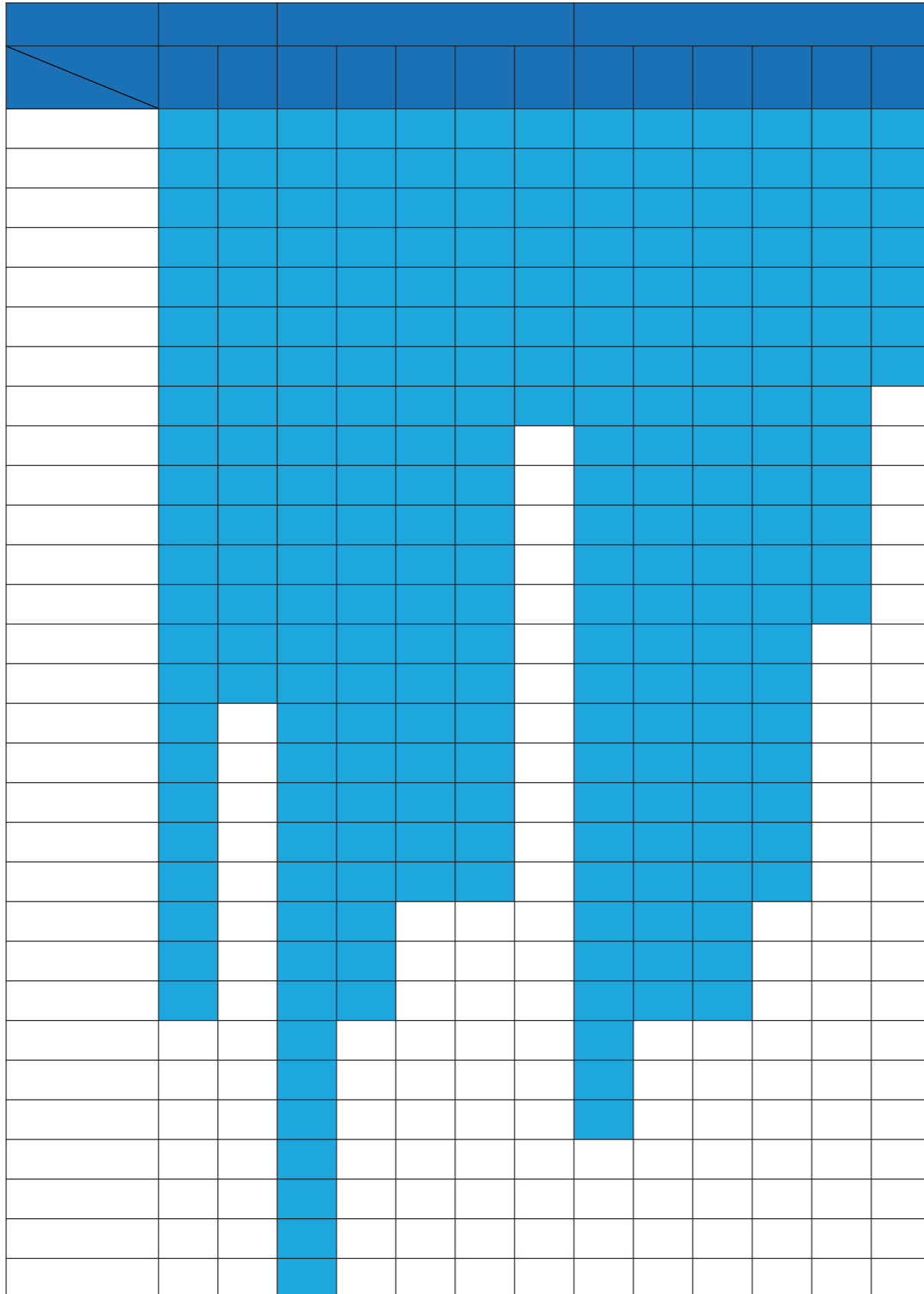
材质	X6S																													
	01005			0201			0402			0603			0805			1206			1210			1812			2220					
尺寸	4	6.3	10	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50	
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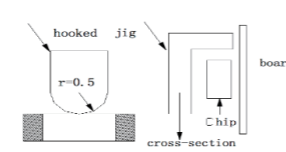


■ 技术指标和实验方法 Specifications and Test Method



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 : $C_p \leq 1000\text{pF}$ $1\text{MHz} \pm 10\%$ , $1.0 \pm 0.1\text{Vrms}$ $C_p > 1000\text{pF}$ $1\text{KHz} \pm 10\%$ , $1.0 \pm 0.1\text{Vrms}$  Class II: $C_p < 10 \mu\text{F}$ $1\text{KHz} \pm 10\%$ , $1.0 \pm 0.1\text{Vrms}$ $C_p \geq 10 \mu\text{F}$ $120 \pm 24\text{Hz}$ , $1.0 \pm 0.1\text{Vrms}$
4	损耗(Q/DF) Dissipation Factor	C0G $C_p < 30\text{pF}$ , $Q \geq 400 + 20C_p$ $C_p \geq 30\text{pF}$ , $Q \geq 1000$	
		X7R X6S X5R <ul style="list-style-type: none"> <li>■ <math>U_R \geq 100\text{V}</math> <math>DF \leq 7.5\%</math></li> <li>■ <math>25\text{V} \leq U_R \leq 50\text{V}</math>, <math>DF \leq 3.5\%</math>  <math>DF \leq 10\%</math> 0201 <math>\geq 104</math>, 0402 <math>\geq 333</math>  0603 <math>\geq 104</math>, 0805 <math>\geq 684</math>  1206 <math>\geq 225</math>, 1210 <math>\geq 475</math>  <math>DF \leq 12.5\%</math> 0402 <math>\geq 474</math></li> <li>■ <math>U_R \leq 16\text{V}</math>, <math>DF \leq 5.0\%</math>  <math>DF \leq 10\%</math>, 0201 <math>\geq 104</math>, 0402 <math>\geq 563</math>  0603 <math>\geq 564</math>, 0805 <math>\geq 105</math>  1206 <math>\geq 475</math>, 1210 <math>\geq 106</math></li> <li>■ <math>U_R \leq 10\text{V}</math>, <math>DF \leq 7.0\%</math>  <math>DF \leq 10\%</math> 01005, 0201 <math>\geq 123</math>  0402 <math>\geq 224</math>, 0603 <math>\geq 334</math>  0805 <math>\geq 225</math>, 1206 <math>\geq 225</math>  1210 <math>\geq 226</math>  <math>DF \leq 15\%</math>, 0201 <math>\geq 104</math>, 0402 <math>\geq 105</math></li> <li>■ <math>U_R = 6.3\text{V}</math>, <math>DF \leq 10\%</math>  <math>DF \leq 15\%</math>, 0201 <math>\geq 104</math>, 0402 <math>\geq 105</math>  0603 <math>\geq 106</math>, 0805 <math>\geq 475</math>  1206 <math>\geq 476</math>, 1210 <math>\geq 107</math>  <math>DF \leq 20\%</math>, 0402 <math>\geq 225</math></li> <li>■ <math>U_R = 4\text{V}</math>, <math>DF \leq 15\%</math></li> </ul>	
		Y5V <ul style="list-style-type: none"> <li>■ <math>U_R \geq 50\text{V}</math>, <math>DF \leq 12.5\%</math></li> <li>■ <math>U_R = 25\text{V}</math>, <math>DF \leq 7.0\%</math>  <math>DF \leq 9\%</math>, 0402 <math>\geq 683</math>, 0603 <math>\geq 474</math>  0805 <math>\geq 105</math>, 1206 <math>\geq 475</math>  1210 <math>\geq 106</math></li> <li>■ <math>U_R = 16\text{V}</math>, <math>DF \leq 15\%</math></li> <li>■ <math>U_R = 10\text{V}</math>, <math>DF \leq 20\%</math></li> <li>■ <math>U_R \leq 6.3\text{V}</math>, <math>DF \leq 20\%</math></li> </ul>	
高Q $C_p > 30\text{pF}$ $Q \geq 1000$ $1\text{pF} < C_p \leq 30\text{pF}$ $Q \geq 400 + 20C_p$ $C_p \leq 1\text{pF}$ $Q \geq 300$			
5	绝缘电阻(IR) Insulation Resistance	C0G $R_i \geq 10\text{G}\Omega$ 或 $500\Omega \cdot \text{F}$ , 取最小值  $R_i \geq 10\text{G}\Omega$ 或 $500\Omega \cdot \text{F}$ , whichever is smaller	施加电压: $U_R \leq 400\text{V}$ $U_{\text{测}} = U_R$ $U_R > 400\text{V}$ $U_{\text{测}} = 400\text{V}$ 充电时间: $60 \pm 5$ 秒 To apply voltage: $U_R \leq 400\text{V}$ $U_{\text{测}} = U_R$ $U_R > 400\text{V}$ $U_{\text{测}} = 400\text{V}$ Charge time: $60 \pm 5$ sec

■ 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><math>R_i \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>R_i \geq 4 G\Omega</math> or <math>100\Omega \cdot F</math> (50 <math>\Omega \cdot F</math> of below range), whichever is smaller</p> <p>以下范围below range:                      ■50V: 0402<math>\geq</math>104;0603<math>\geq</math>225;                      0805<math>\geq</math>106;1206<math>\geq</math>106                      ■25V: 0201<math>\geq</math>104;0402<math>\geq</math>224;                      0603<math>\geq</math>106;0805<math>\geq</math>106;                      1206<math>\geq</math>226;01005(X6S/                      X5R)■16V: 0603<math>\geq</math>106; 01005                      (X6S/X5R)■10V: 0201<math>&gt;</math>104;                      0603<math>\geq</math>106;                      0805<math>\geq</math>476; 01005(X6S/                      X5R)■6.3V: 0201<math>\geq</math>104;0603  <math>\geq</math>475;1206<math>\geq</math>106;0100(X6SX5R)                      ■4V: 0603<math>\geq</math>226;0805<math>\geq</math>                      476;                      1206<math>\geq</math>107; 01005                      (X6SX5R)</p>	<p>施加电压: <math>U_R \leq 400V</math> <math>U_{测}=U_R</math>  <math>U_R &gt; 400V</math> <math>U_{测}=400V</math>                      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>  <math>U_R &gt; 400V</math> <math>U_{测}=400V</math>                      Charge time: 60<math>\pm</math>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: <math>U_R &lt; 100V</math>: 250%  <math>100V \leq U_R &lt; 1000V</math>: 150%  <math>U_R \geq 1000V</math>: 120%</p> <p>测试时间: 60<math>\pm</math>5秒,                      最大电流: 不超过50mA</p> <p>To apply voltage: <math>U_R &lt; 100V</math>: 250%;  <math>100V \leq U_R &lt; 1000V</math>: 150%;  <math>U_R \geq 1000V</math>: 120%</p> <p>Test time: 60<math>\pm</math>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</p> <p>温度系数<math>\leq 0 \pm 30ppm/^{\circ}C</math> Temperature coefficient within <math>0 \pm 30ppm/^{\circ}C</math></p> <p>X7R X6S X5R</p> <p>容量变化<math>\leq \pm 15\%</math> Capacitance change within <math>\pm 15\%</math></p> <p>Y5V</p> <p>容量变化<math>\leq +22\% \sim -82\%</math> Capacitance change within <math>+22\% \sim -82\%</math></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<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.                      C0G Preliminary Drying for 16-24hr.                      ▶<math>C = [(C_i - C_1) / (C_1 * T)] * 10^6</math>或(or)                      ▶<math>C = (C_i - C_1) / C_1 * 100\%</math>  <math>C_i</math>: 1-5温度下的容值                      Capacitance value at 1-5 temperature                      ▶T: 温度变化量(Temperature variation)                      ▶<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																						
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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<math>\pm</math>1秒                      Pressurizing force: 5N(0201:2N; 01005:1N)                      time: 10<math>\pm</math>1sec</p> 																								




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 <sub>R</sub> < 100V 150% 100V ≤ U <sub>R</sub> < 1000V 120% U <sub>R</sub> ≥ 1000V 100% 测试时间: 1000小时  Test temperature:Max.Operating Temp. ±3℃ Voltage: U <sub>R</sub> < 100V 150% 100V ≤ U <sub>R</sub> < 1000V 120% U <sub>R</sub> ≥ 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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[NMC0805X7R224K16TRPLPF](#) [NMC0805X7R224K25TRPF](#) [NMC1206X7R102K50TRPF](#) [NMC1206X7R475K10TRPLPF](#) [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](#) [CGA2B2C0G1H680J](#) [CGA2B2C0G1H6R8D](#)