



广东风华高新科技股份有限公司
GUANGDONG FENGHUA ADVANCED TECHNOLOGY HOLDING CO., LTD.

高 Q 电容 (HQ 系列)

概述

●特点:

高 Q 值
低等效串联电阻

●应用:

通讯设备
射频功率放大器
滤波网络
VCO

High Q Caps (HQ SERIES)

SUMMARY

●Features

High Q
Low equivalent series resistance

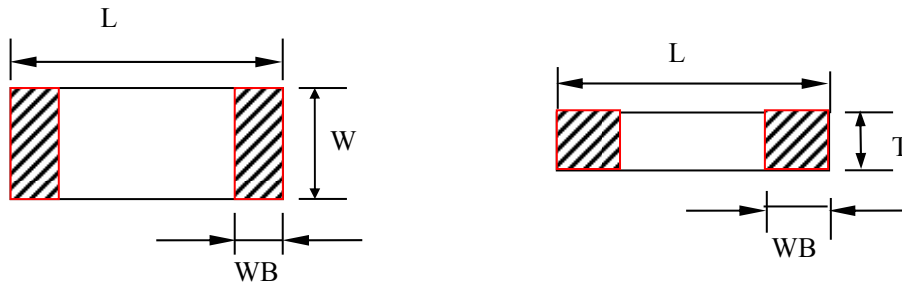
●Applications

Communication devices
RF power amplifier
Filter network
VCO



二、尺寸及结构 DIMENSIONS AND STRUCTURE

※ 尺寸 DIMENSIONS

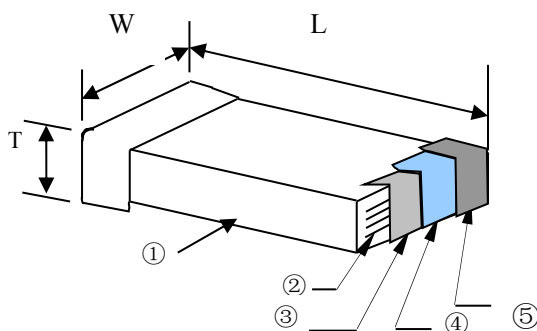


型号 Type		尺寸 Dimensions (mm)			
英制表示 British expression	公制表示 Metric expression	L	W	T	WB
0201	0603	0.60 ± 0.03	0.30 ± 0.03	0.30 ± 0.03	0.15 ± 0.05
0402	1005	1.00 ± 0.05	0.50 ± 0.05	0.50 ± 0.05	0.25 ± 0.10
0603	1608	1.60 ± 0.10	0.80 ± 0.10	0.80 ± 0.10	0.30 ± 0.10
0805	2012	2.00 ± 0.20	1.25 ± 0.20	0.80 ± 0.20 1.25 ± 0.20	0.50 ± 0.20

备注：可根据客户的特殊要求设计符合客户需求的产品。

Note: We can design according to customer special requirements

※ 结构 STRUCTURE



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



三、型号规格表示方法 HOW TO ORDER

0603	HQ	100	J	500	N	T
①	②	③	④	⑤	⑥	⑦

※说明 NOTES:

①尺寸 DIMENSIONS 单位 (unit): inch/ mm

尺寸规格 SizeCode	0201	0402	0603	0805
长×宽 (L×W) inch	0.02×0.01	0.04×0.02	0.06×0.03	0.08×0.05
长×宽 (L×W) mm	0.60×0.30	1.00×0.50	1.60×0.80	2.00×1.25

② 介质种类 DIELECTRIC STYLE

介质种类 (Dielectric Code)	HQ
介质材料 (Dielectric)	COG

③ 标称容量 NOMINAL CAPACITANCE

单位(unit): pF

表示方式 (Express Method)	实际值 (Actual Value)	注：头两位数字为有效数字，第三位数字为 0 的个数；R 为小数点。 Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
R47	0.47	
0R5	0.5	
1R0	1.0	
101	10×10 ¹	
102	10×10 ²	
...	...	



④ 容量误差 CAPACITANCE TOLERANCE

代码 (Code)	A	B	C	D	F	G	J	K	M	S	Z
误差 (Tolerance)	± 0.05pF	± 0.10pF	± 0.25pF	± 0.5pF	± 1.0%	± 2.0%	± 5.0%	±10%	±20%	+50% -20%	+80% -20%

备注：A、B、C、D级误差适用于容量≤10pF的产品。

Note: These capacitance tolerance A, B, C, D are just applicable the capacitance that equals to or less than 10pF.

⑤ 额定电压 RATED VOLTAGE

单位(unit): V

表示方式 (Express Method)	实际值 (Actual Value)	注：头两位数字为有效数字，第三位数字为0的个数； R为小数点。 Note: the first two digits are significant; third digit denotes number of zeros; R=decimal point.
500	50×10^0	
501	50×10^1	
...	...	

⑥ 端头材料 TERMINAL MATERIAL STYLES

端头类别 (Termination Styles)	表示方式 (Express Method)
三层电镀端头 (Nickel Barrier Termination)	N

⑦ 包装方式 PACKAGE STYLES

B	T
散包装 (Bulk Bag)	编带包装 (Taping Package)

四、温度系数/特性 Temperature Coefficient /Characteristics

介质种类 Dielectric	参考温度点 Reference Temperature Point	标称温度系数 Temperature Coefficient	工作温度范围 Operation Temperature Range
C0G	20°C	0±30ppm/°C	-55°C ~ 125°C



五、电容量范围（注：■和■表示可生产的容值）

项目	0201	
材料	COG	
电容量		
工作电压	25V	50V
0.1pF	■	■
0.2pF	■	■
0.3pF	■	■
0.4pF	■	■
0.5pF	■	■
0.6 pF	■	■
0.7pF	■	■
1.0pF	■	■
1.2pF	■	■
1.5pF	■	■
1.8pF	■	■
2.0pF	■	■
2.2pF	■	■
3.3pF	■	■
3.9pF	■	■
4.7pF	■	■
5.6pF	■	■
6.8pF	■	■
8.2pF	■	■
9.0pF	■	■
10pF	■	■
12pF	■	■
15pF	■	■
18pF	■	■
20pF	■	■
22pF	■	■



项目	0402	
材料	COG	
电容量		
工作电压	25V	50V
0.5pF		
0.6pF		
0.7pF		
0.8pF		
0.9pF		
1.0pF		
1.2pF		
1.5pF		
1.8pF		
2.2pF		
2.7pF		
3.3pF		
3.9pF		
4.7pF		
5.6pF		
6.8pF		
8.2pF		
10pF		
12pF		
15pF		
18pF		
22pF		
27pF		
33pF		
39pF		
47pF		
56pF		
68pF		
82pF		
100pF		
120pF		
150pF		
180pF		



项目	0603			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
0.5pF				
0.6pF				
0.7pF				
0.8pF				
0.9pF				
1.0pF				
1.2pF				
1.5pF				
1.8pF				
2.2pF				
2.7pF				
3.3pF				
3.9pF				
4.7pF				
5.6pF				
6.8pF				
8.2pF				
10pF				
12pF				
15pF				
18pF				
22pF				
27pF				
33pF				
39pF				
47pF				



项目	0603			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
56pF				
68pF				
82pF				
100pF				
120pF				
150pF				
180pF				
220pF				
270pF				
330pF				
390pF				
470pF				
560pF				
680pF				



项目	0805			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
0.5pF				
0.6pF				
0.7pF				
0.8pF				
0.9pF				
1.0pF				
1.2pF				
1.5pF				
1.8pF				
2.2pF				
2.7pF				
3.3pF				
3.9pF				
4.7pF				
5.6pF				
6.8pF				
8.2pF				
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27pF				
33pF				
39pF				
47pF				



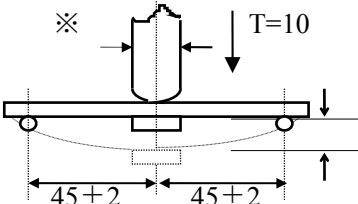
项目	0805			
材料	COG			
电容量				
工作电压	25V	50V	100V	200/250V
56pF				
68pF				
82pF				
100pF				
120pF				
150pF				
180pF				
220pF				
270pF				
330pF				
390pF				
470pF				
560pF				
680pF				
820pF				
1000pF				
1200pF				
1500pF				



六、可靠性测试 Reliability Test

项目 Item	技术规格 Technical Specification	测试方法 Test Method and Remarks
容量 Capacitance	应符合指定的误差级别 Should be within the specified tolerance.	测试温度: 25°C ± 3°C Test Temperature: 25°C ± 3°C C ≤ 1000pF: 测试频率: 1MHZ ± 10% 测试电压: 1.0 ± 0.2Vrms Test Frequency: 1MHZ ± 10% Test Voltage: 1.0 ± 0.2Vrms C > 1000pF: 测试频率: 1KHZ ± 10% 测试电压: 1.0 ± 0.2Vrms Test Frequency: 1KHZ ± 10% Test Voltage: 1.0 ± 0.2Vrms
Q	C ≥ 30pF, Q ≥ 1000 C ≤ 30pF, Q ≥ 400+20C	测试频率: 1MHZ ± 10% 测试电压: 1.0 ± 0.2Vrms Test Frequency: 1MHZ ± 10% Test Voltage: 1.0 ± 0.2Vrms
绝缘电阻 (IR) Insulation Resistance	≥ 10,000MΩ	测试电压: 额定电压 测试时间: 60 ± 5 秒 测试湿度: ≤ 75% 测试温度: 25°C ± 3°C 测试充放电电流: ≤ 50mA Measuring Voltage: Rated Voltage Duration: 60 ± 5s Test Humidity: ≤ 75% Test Temperature: 25°C ± 3°C Test Current: ≤ 50mA
介质耐电强度 (DWV) Dielectric Withstanding Voltage	不应有介质被击穿或损伤 No breakdown or damage.	测量电压: 额定电压 < 100V, 300%额定电压 100V ≤ 额定电压 ≤ 500V, 250%额定电压 时间: 1~5 秒 充/放电电流: 不应超过 50mA Measuring Voltage: Rated voltage < 100V, 300% Rated voltage 100V ≤ Rated voltage ≤ 500V, 250% Rated voltage Duration: 1~5s Charge/ Discharge Current: 50mA max.



项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks	
可焊性 Solderability	上锡率应大于 95% 外观: 无可见损伤。 At least 95% of the terminal electrode is covered by new solder. Visual Appearance: No visible damage.		将电容在 80~120℃ 的温度下预热 10~30 秒。 Preheating conditions: 80 to 120℃; 10~30s.	
			有铅焊料: (Sn/Pb: 63/37) 浸锡温度: 235±5℃ 浸锡时间: 2±0.5s Solder Temperature: 235±5℃ Duration: 2±0.5s	无铅焊料: 浸锡温度: 245±5℃ 浸锡时间: 2±0.5s Solder Temperature: 245±5℃ Duration: 2±0.5s
耐焊接热 Resistance to Soldering Heat	Δ C/C	在±0.5%或±0.5pF 范围内, 取较大值 Within ±0.5% or ±0.5pF, whichever is larger	将电容在 100~200℃ 的温度下预热 10±2 分钟。 浸锡温度: 265±5℃ 浸锡时间: 10±1s 然后取出溶剂清洗干净, 在 10 倍以上的显微镜底下观察。 放置时间: 24±2 小时 放置条件: 室温 Preheating conditions: 100 to 200℃; 10±2min. Solder Temperature: 265±5℃ Duration: 10±1s Clean the capacitor with solvent and examine it with a 10X(min.) microscope. Recovery Time: 24±2h Recovery condition: Room temperature	
	Q	同初始标准 Same to initial value.		
	IR	同初始标准 Same to initial value.		
	外观: 无可见损伤 上锡率: ≥95% Appearance: No visible damage. At least 95% of the terminal electrode is covered by new solder.			
抗弯曲强度 Resistance to Flexure of Substrate (Bending Strength)	外观: 无可见损伤。 Appearance: No visible damage.		试验基板: Al ₂ O ₃ 或 PCB 弯曲深度: 1mm 施压速度: 0.5mm/sec. 单位: mm 应在弯曲状态下进行测量。	
	Δ C/C	在±0.5%或±0.5pF 范围内, 取较大值 Within ±0.5% or ±0.5pF, whichever is larger	 Test Board: Al ₂ O ₃ or PCB Warp: 1mm Speed: 0.5mm/sec. Unit: mm The measurement should be made with the board in the bending position.	



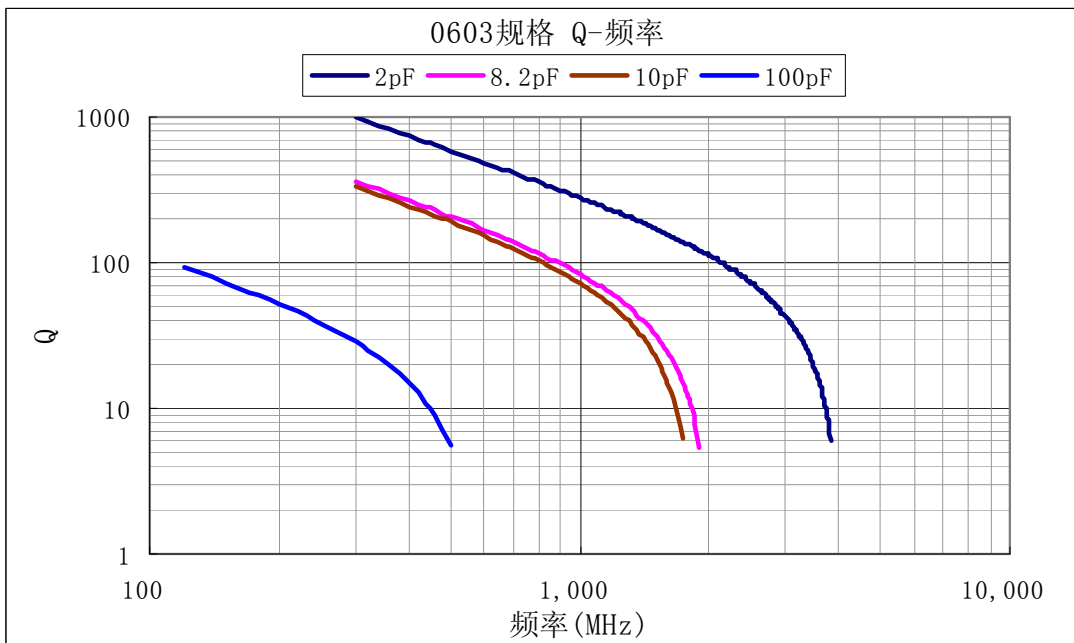
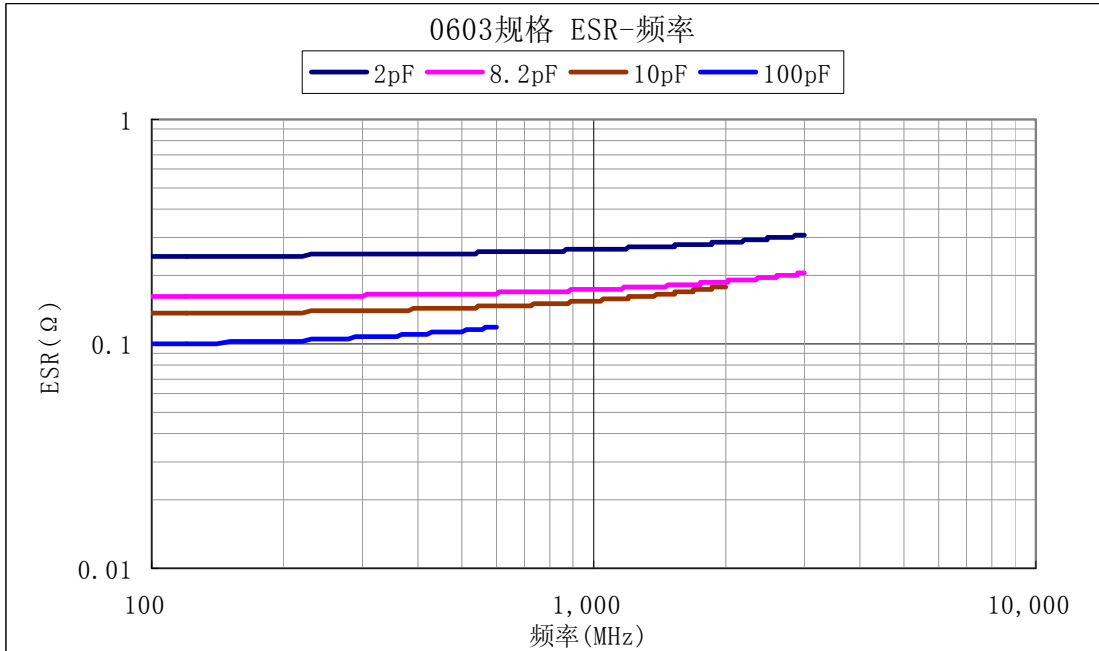
项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks																														
端头结合强度 Termination Adhesion	外观无可见损伤 No visible damage.		施加的力: 5N 时间: 10±1S Applied Force: 5N Duration: 10±1S																														
温度循环 Temperature Cycle	Δ C/C	在±1%或±1pF范围内, 取两者中最大者 Δ C/C: Within ±1% or ±1pF, whichever is larger.	初始测量 循环次数: 5次, 一个循环分以下4步: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>阶段</th> <th>温度(°C)</th> <th>时间(分钟)</th> </tr> </thead> <tbody> <tr> <td>第1步</td> <td>下限温度</td> <td>30</td> </tr> <tr> <td>第2步</td> <td>常温(+20)</td> <td>2~3</td> </tr> <tr> <td>第3步</td> <td>上限温度</td> <td>30</td> </tr> <tr> <td>第4步</td> <td>常温(+20)</td> <td>2~3</td> </tr> </tbody> </table> 试验后放置(恢复)时间: 24±2h Preheating conditions: up-category temperature, 1h Recovery time: 24±1h Initial Measurement Cycling Times: 5 times, 1 cycle, 4 steps: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Low- category temp.</td> <td>30</td> </tr> <tr> <td>2</td> <td>Normal temp. (+20)</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>Up- category temp.</td> <td>30</td> </tr> <tr> <td>4</td> <td>Normal temp. (+20)</td> <td>2~3</td> </tr> </tbody> </table> Recovery time after test: 24±2h	阶段	温度(°C)	时间(分钟)	第1步	下限温度	30	第2步	常温(+20)	2~3	第3步	上限温度	30	第4步	常温(+20)	2~3	Step	Temperature (°C)	Time (min.)	1	Low- category temp.	30	2	Normal temp. (+20)	2~3	3	Up- category temp.	30	4	Normal temp. (+20)	2~3
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IR	同初始标准 Same to initial value.																																
DWV	同初始标准 Same to initial value.																																
潮湿试验 Moisture Resistance	Δ C/C	在±2%或±1pF范围内, 取两者中最大者 Within ±2% or ±1pF, whichever is larger.	温度: 40±2°C 湿度: 90~95%RH 时间: 500小时 放置条件: 室温 放置时间: 48小时 Temperature: 40±2°C Humidity: 90~95%RH Duration: 500h Recovery conditions: Room temperature Recovery Time: 48h																														
	Q	C≥30pF, Q≥350 10pF≤C≤30pF, Q≥275+5C/2 C≥10pF, Q≥200+10C																															
	IR	Ri≥2500MΩ 或 Ri·CR≥25S 取两者之中较小者。 Ri≥2500MΩ 或 Ri·CR≥25S whichever is smaller.																															
	外观: 无损伤 Appearance: No visible damage.																																

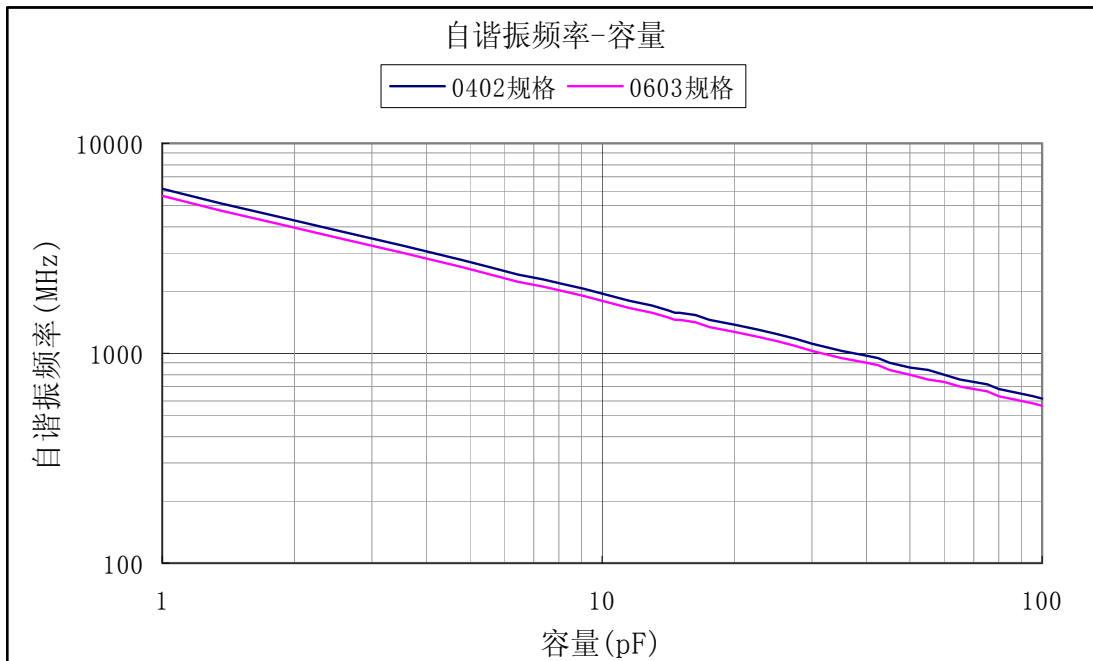
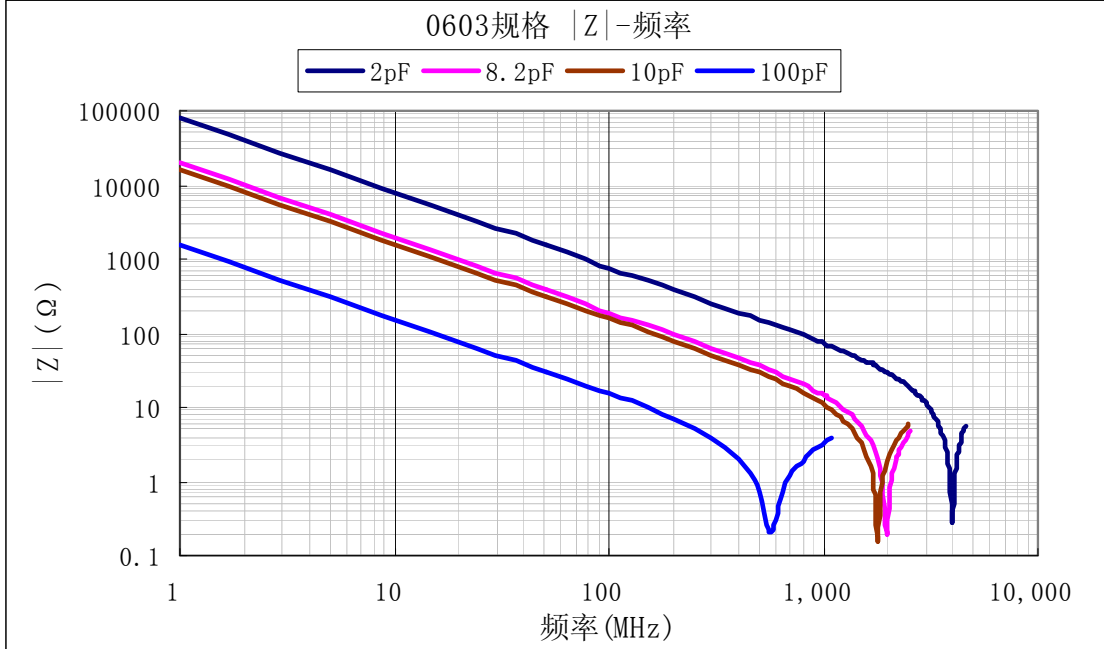


项目 Item	技术规格 Technical Specification		测试方法 Test Method and Remarks
寿命试验 Life Test	Δ C/C	在 $\pm 2\%$ 或 $\pm 1\text{pF}$ 范围内, 取两者中最大者 Within $\pm 2\%$ or $\pm 1\text{pF}$, whichever is larger.	低压产品 ($<100\text{V}$) 电压: 1.5 倍额定工作电压 时间: 1000 小时 温度: 125°C
	Q	$C \geq 30\text{pF}$, $Q \geq 350$ $10\text{pF} \leq C \leq 30\text{pF}$, $Q \geq 275+5C/2$ $C \geq 10\text{pF}$, $Q \geq 200+10C$	充电电流: 不应超过 50mA 放置条件: 室温 放置时间: 24 小时
	IR	$R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ 取两者之中较小者. $R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ whichever is smaller.	Low-Voltage ($<100\text{V}$) Applied Voltage: $1.5 \times \text{Rated Voltage}$ Duration: 1000h Temperature: 125°C Charge/ Discharge Current: 50mA max.
	外观: 无损伤 Visual Appearance: No visible damage.		Recovery Conditions: Room Temperature Recovery Time: 24h
中高压产品 寿命试验 Middle & high voltage Life Test	Δ C/C	在 $\pm 2\%$ 或 $\pm 1\text{pF}$ 范围内, 取两者中最大者 Within $\pm 2\%$ or $\pm 1\text{pF}$, whichever is larger.	中高压产品: $100\text{V} \leq \text{额定电压} < 500\text{V}$: 2 倍工作电压 $500\text{V} \leq \text{额定电压} \leq 1000\text{V}$: 1.5 倍工作电压 额定电压 $> 1000\text{V}$: 1.2 倍工作电压
	Q	$C \geq 30\text{pF}$, $Q \geq 350$ $10\text{pF} \leq C \leq 30\text{pF}$, $Q \geq 275+5C/2$ $C \geq 10\text{pF}$, $Q \geq 200+10C$	时间: 1000 小时 充电电流: 不应超过 50mA 温度: 125°C
	IR	$R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ 取两者之中较小者. $R_i \geq 4000\text{M}\Omega$ 或 $R_i \cdot C_R \geq 40\text{S}$ whichever is smaller.	放置条件: 室温 放置时间: 24 小时 Applied Voltage: $100\text{V} \leq \text{Rated Voltage} < 500\text{V}$: 2 Multiple $500\text{V} \leq \text{Rated Voltage} \leq 1000\text{V}$: 1.5 Multiple $> 1000\text{V}$ Rated Voltage: 1.2 Multiple
	外观: 无损伤 Visual Appearance: No visible damage.		Duration: 1000h Charge/ Discharge Current: 50mA max. Temperature: 125°C Recovery Conditions: Room Temperature Recovery Time: 24h



七、典型特性曲线





X-ON Electronics

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[NIN-FC2R7JTRF](#) [NMC0201X5R474K4TRPF](#) [NMC0402NPO220J50TRPF](#) [NMC0402X5R105K6.3TRPF](#) [NMC0402X5R224K6.3TRPF](#)
[NMC0402X7R103J25TRPF](#) [NMC0402X7R153K16TRPF](#) [NMC0603NPO1R8C50TRPF](#) [NMC0603NPO201J50TRPF](#)
[NMC0603NPO330G50TRPF](#) [NMC0603X5R475M6.3TRPF](#) [NMC0805NPO270J50TRPF](#) [NMC0805NPO820J50TRPF](#)
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[L0603NPO2R2B50TRPF](#) [NMC-P0805NPO221J500TRPLPF](#) [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](#)