MULTILAYER CERAMIC CHIP CAPACITORS - **ULTRA-LOW ESR & HI-Q NPO**

RoHs Compliant

DESCRIPTION: CHIP SERIES (MA-Q TYPE)

The Pro-Cap Electronics MA-Q Series Ultra-Low ESR Capacitors are ideally suited for applications such as base station products, high Q Frequency sources, portable wireless systems, and RF integrated circuits. The unique combination of characteristics, performance, and high working voltage allows the MA-Q Series to exceed the dielectric RF performance of any other series capacitors and to meet or exceed EIA-198, MIL-PRF-55681 and MIL-PRF-123 requirements.

SELECTION OF CERAMIC CHIP CAPACITOR

1. DIELECTRIC TYPE
   The choice of dielectric is determined by the required capacitance-temperature stability. We offer CG.

2. CAPACITANCE AND TOLERANCE
   Capacitance and its tolerance are determined by circuit requirement and cost consideration.

3. RATED VOLTAGE
   Rated voltage is determined by circuit requirement.

4. SIZE
   Size is determined by the circuit design and cost consideration.

5. PACKAGING
   Specify the packaging of Capacitors as TAPE & REEL.

6. NON-STANDARD REQUIREMENTS
   Specify any non-standard requirements which are not stated in the catalogue.

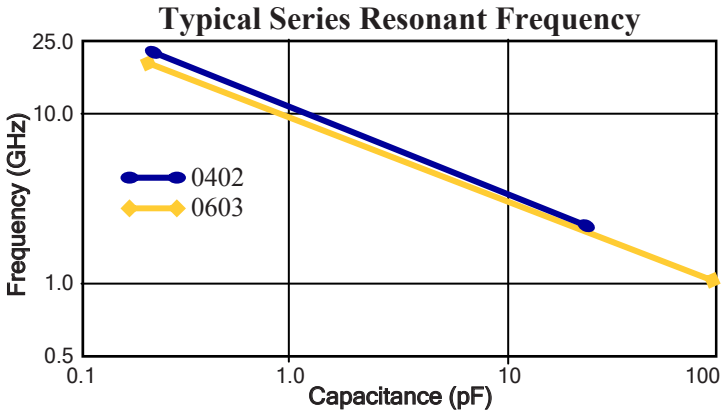
Dielectric	CG
NPO	• Ultra-Low ESR • High Self Resonance Frequencies • High Working Voltage • Ultra Hi-Q NPO Dielectric

ENVIRONMENTAL CHARACTERISTICS

	Specification	Test Parameters
Solderability:	Solder coverage: 90% of metalized areas No termination degradation	Preheat chip to 120°C-150°C for 60 secs, dip terminals in rosin flux then dip in Sn62 solder @ 240°±5°C for ±1 sec
Resistance to Soldering Heat:	No mechanical damage. Capacitance change: ±2.5% or 0.25pF Q>500 I.R. >10G Ohms Breakdown Voltage: 2.5 x WVDC	Preheat device to 80°-100°C for 60 secs; followed by 150°-180°C for 60 secs.
Terminal Adhesion:	Termination should not pull off. Ceramic should remain undamaged.	Linear pull force exerted on axial leads soldered to each terminal. (2lbs for 0402; 2lbs for 0603)
PCB Deflection:	No mechanical damage. Capacitance change: 2% or 0.5pF Max	Glass epoxy PCB; 0.5 mm deflection.
Life Test:	No mechanical damage. Capacitance change: ±3.0% or 0.3pF Q>500 I.R. >1G Ohms Breakdown Voltage: 2.5 x WVDC	Applied voltage: 200% rated voltage, 50mA max. Temperature: 125°±3°C Test time: 1000 +48 hours, -0 hours.
Thermal Cycle:	No mechanical damage. Capacitance change: ±2.5% or 0.25pF Q>2000 I.R. >10G Ohms Breakdown Voltage: 2.5 x WVDC	5 cycles of: 30±3 min. @ -55°+0/-3°C, 2-3 min. @ 25°C, 30±3 min. @ +125°C=3/-0°C, 2-3 mins. @ 25°C Measure after 24±2 hour cooling period.
Humidity, Steady State:	No mechanical damage. Capacitance change: ±5.0% or 0.5pF max. Q>300 I.R. = 1G Ohms Breakdown Voltage: 2.5 x WVDC	Relative humidity: 90-95% Temperature: 40°±2°C Test time: 500 + 12/-0 hours. Measure time after 24±2 hour cooling period.
Humidity, Low Voltage:	No mechanical damage. Capacitance change: ±5.0% or 0.5pF max. Q>300 I.R. = 1G Ohms min. Breakdown Voltage: 2.5 x WVDC	Applied voltage: 1.5 VDC, 50 mA max Relative humidity: 85±2%; Temperature: 40°±2°C Test time: 240 + 12/-0 hours. Measure after 24±2 hour cooling period.
Vibration:	No mechanical damage. Capacitance change: ±2.5% or 0.25pF max. Q>1000 I.R. = 10G Ohms Breakdown Voltage: 2.5 x WVDC	Cycle performed for 2 hours in each of three perpendicular directions. Frequency range 10Hz to 55 Hz to 10 Hz traversed in 1 min Harmonic motion amplitude: 1.5mm.

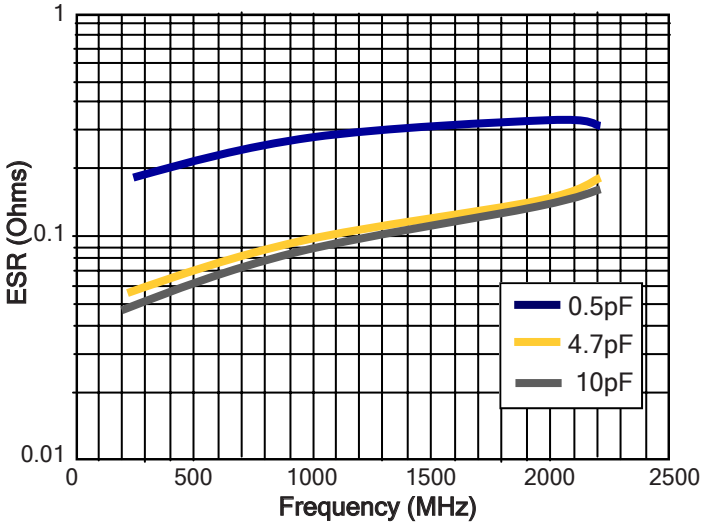
DIELECTRIC CHARACTERISTICS

Temperature Coefficient	0 ± 30ppm / °C, -55 to 125°C
Quality Factor:	
Insulation Resistance:	> 10G @ 25°C, WVDC; 125°C IR is 10% of 25 rating
Dielectric Strength:	2.5 x WVDC min, 25°C, 50 mA max
Test Parameters:	1MHz ± 50kHz 1.0 ± 0.2, VRMS, 25°C
Available Capacitance:	0201 Size: 0.2 - 20pF 0402 Size: 0.2 - 33pF 0603 Size: 0.2 - 100pF 0805 Size: 0.3 - 220pF

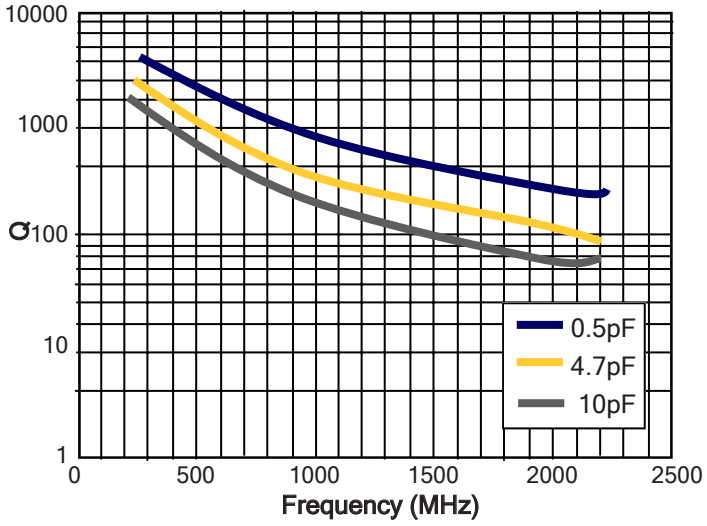


RF CHARACTERISTICS VERSUS FREQUENCY

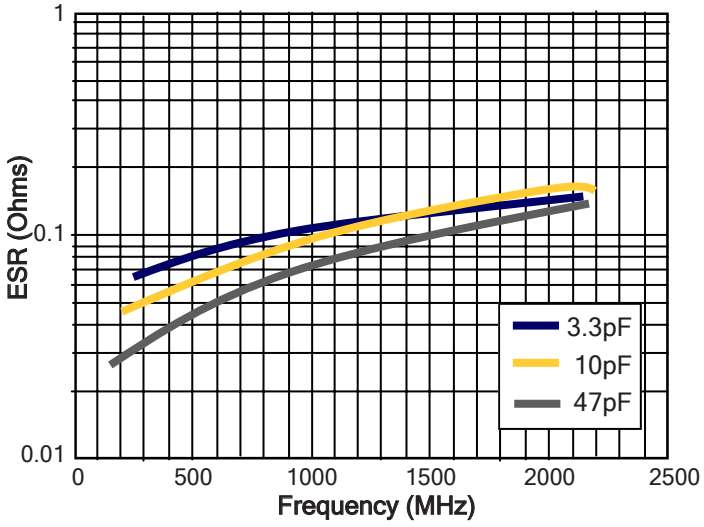
0402: Equivalent Series Resistance



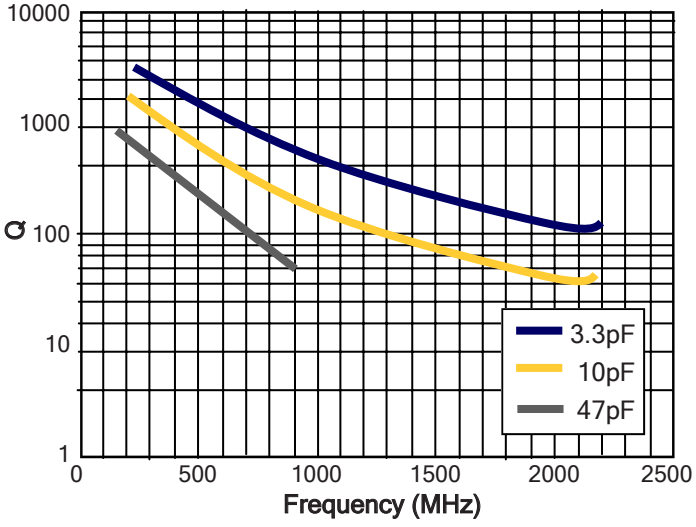
0402: Dissipation Factor (Q)



0603: Equivalent Series Resistance

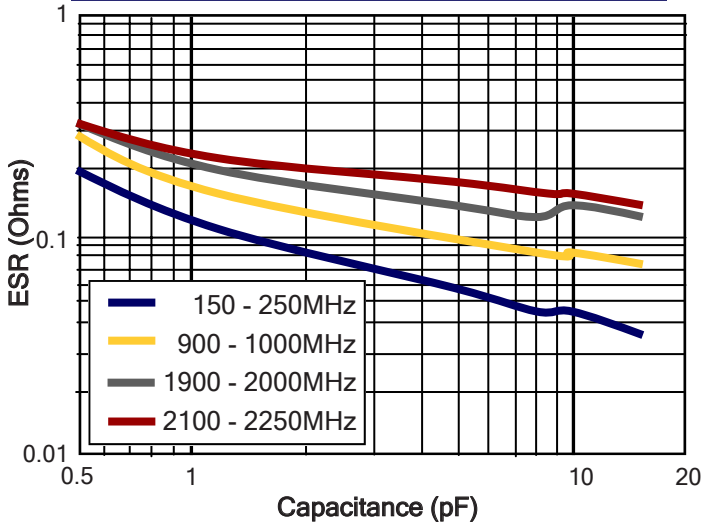


0603: Dissipation Factor (Q)



RF CHARACTERISTICS VERSUS CAPACITANCE

0402: Equivalent Series Resistance



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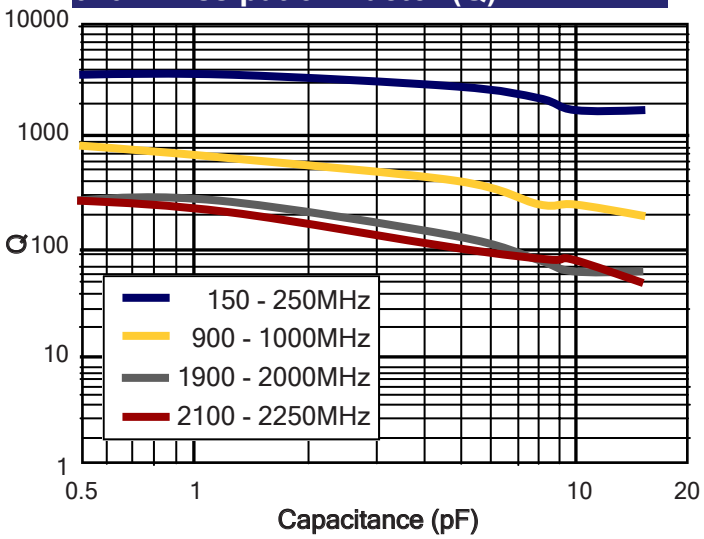
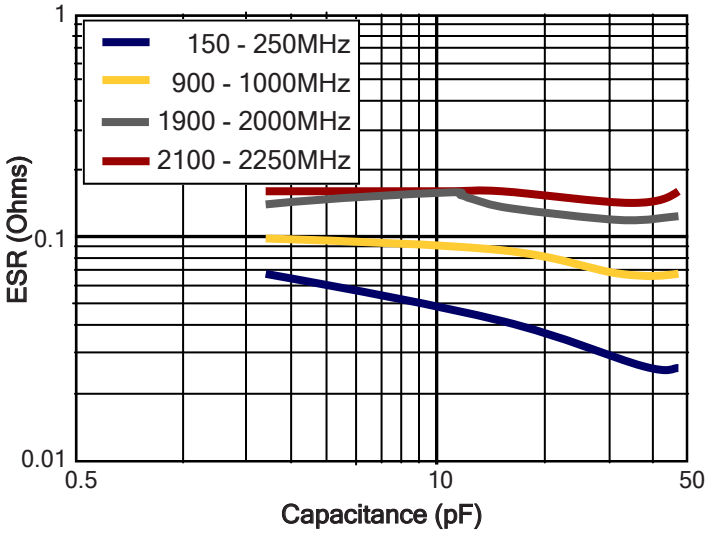


0603: Equivalent Series Resistance



0603: Dissipation Factor (Q)