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

RoHs Compliant

HEADER

HOW TO ORDER

MA 0805 CG 101 J 500 PR Q

PRO-CAP TYPE:

SIZE CODE:

0201	0402	0603	0805

DIELECTRIC CODE:

CODE	DIELECTRIC
CG	NPO

CAPACITANCE CODE:

Capacitance expressed in pico farads (pF).
First two digits are significant figures.
Third digit denotes the number of zeros.
Use R for decimal point for values less then 10pF.
A few examples are shown with codes.

(nF)	CAPACITANCE (pF)	CODE
	0.1 pF	0R1
	4.7 pF	4R7
	10 pF	100
0.22 nF	220 pF	221

TOLERANCE CODE:

CODE	TOLERANCE	CODE	TOLERANCE	CODE	TOLERANCE
P	± 0.03pF	F	± 1%	M	± 20%
A	± 0.05pF	G	± 2%		
B	± 0.10pF	J	± 5%		
C	± 0.25pF	K	± 10%		

RATED VOLTAGE CODE:

2 significant digits + number of zeros.

CODE	VOLTAGE
250	25V DC
500	50V DC
201	200V DC
251	250V DC

PACKAGING CODE:

CODE	PACKAGING
PR	Tape and Reel 7” Reel, Cardboard Tape

SPECIAL CAPACITOR TYPE CODE:

CODE	TYPE
Q	Ultra-Low ESR & HI-Q

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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.

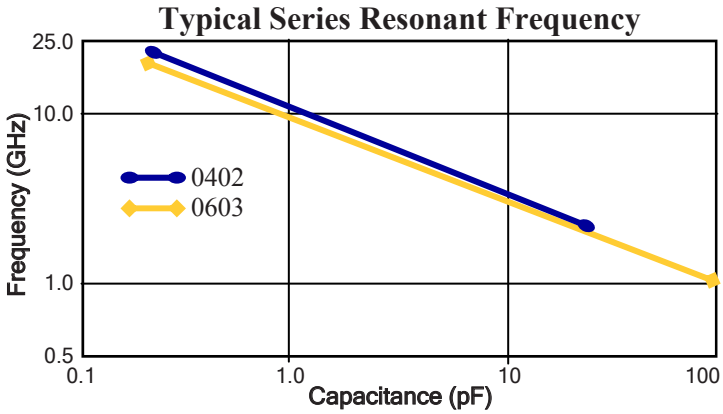
Dielectric	CG
NPO	• Ultra-Low ESR • High Self Resonance Frequencies • High Working Voltage • Ultra Hi-Q NPO Dielectric

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.

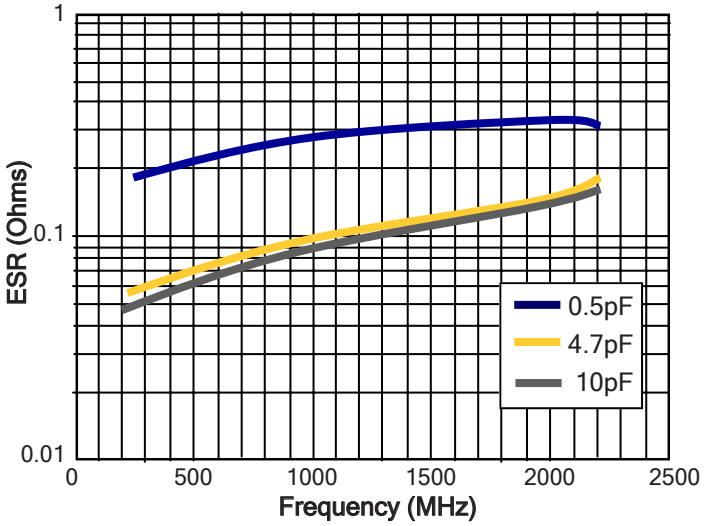
DIELECTRIC CHARACTERISTICS

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

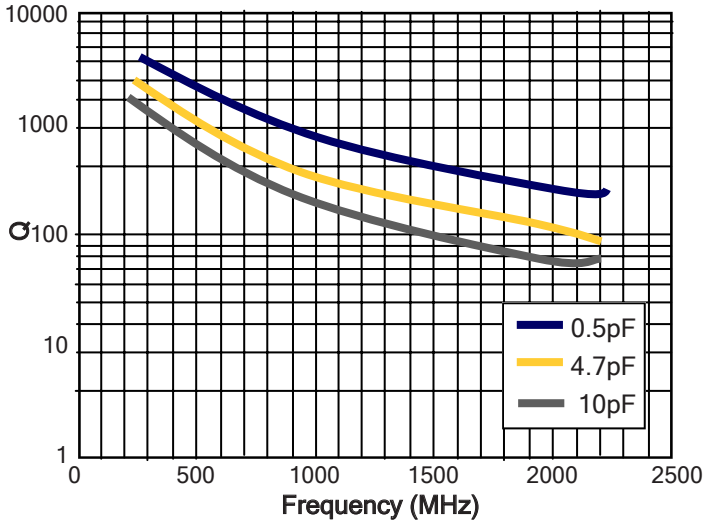


RF CHARACTERISTICS VERSUS FREQUENCY

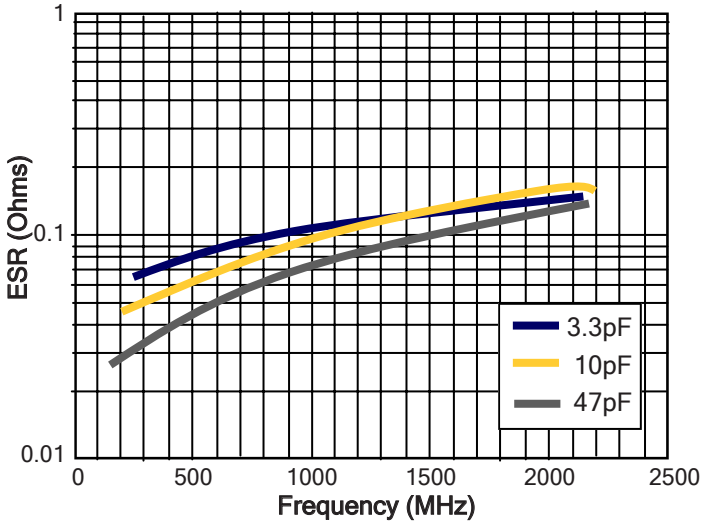
0402: Equivalent Series Resistance



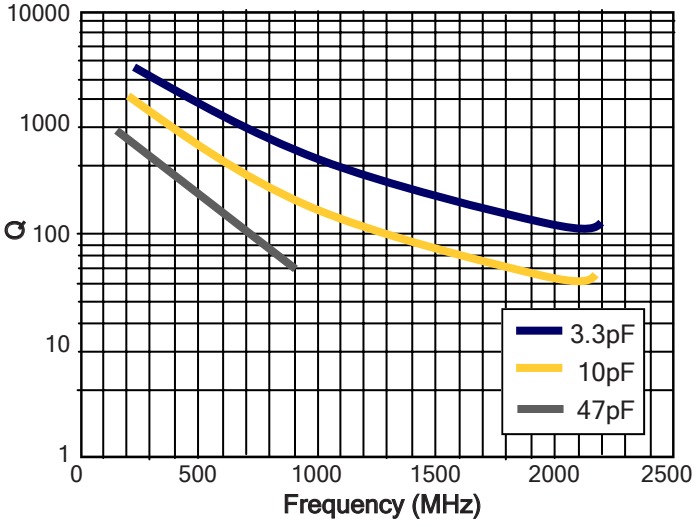
0402: Dissipation Factor (Q)



0603: Equivalent Series Resistance

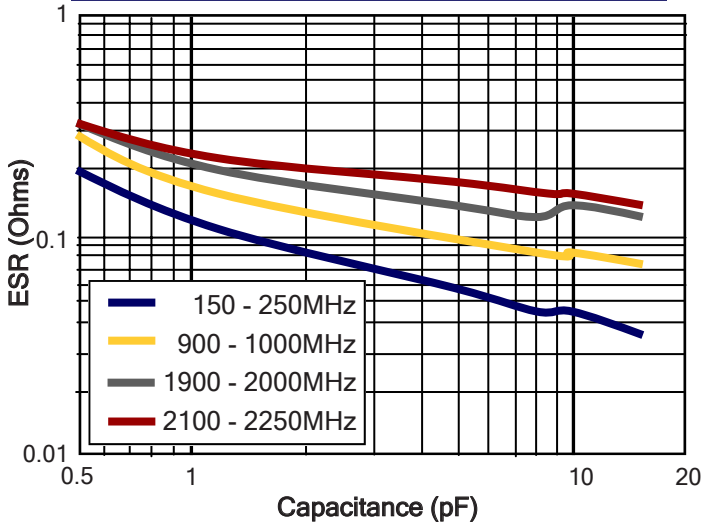


0603: Dissipation Factor (Q)

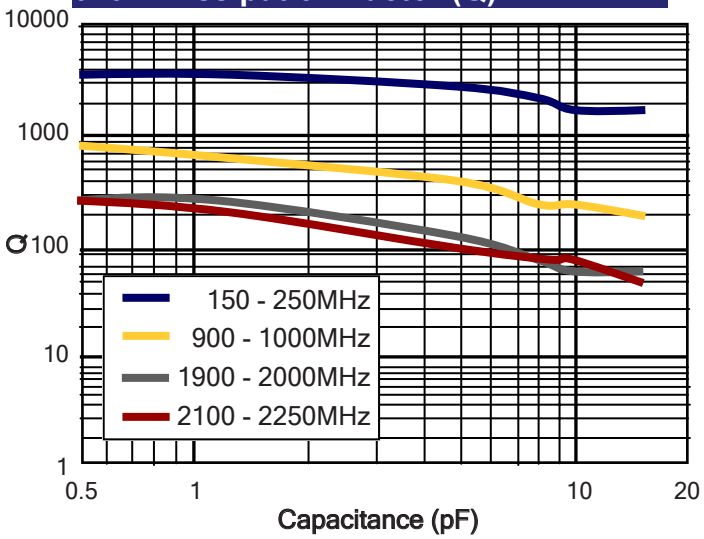


RF CHARACTERISTICS VERSUS CAPACITANCE

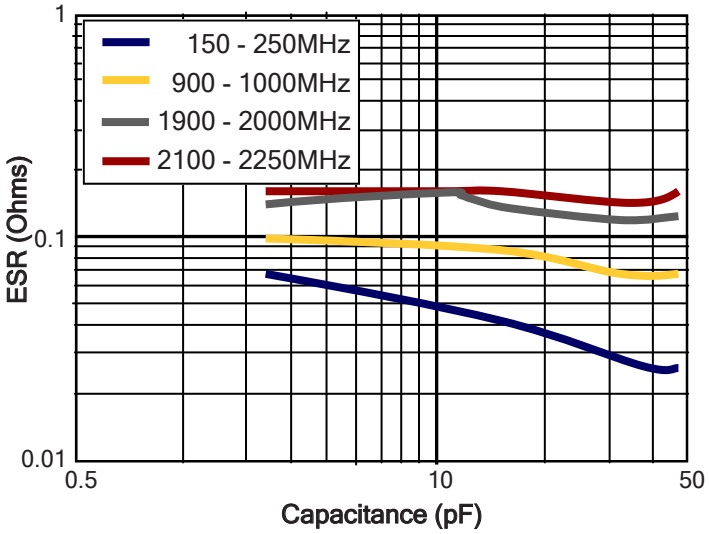
0402: Equivalent Series Resistance



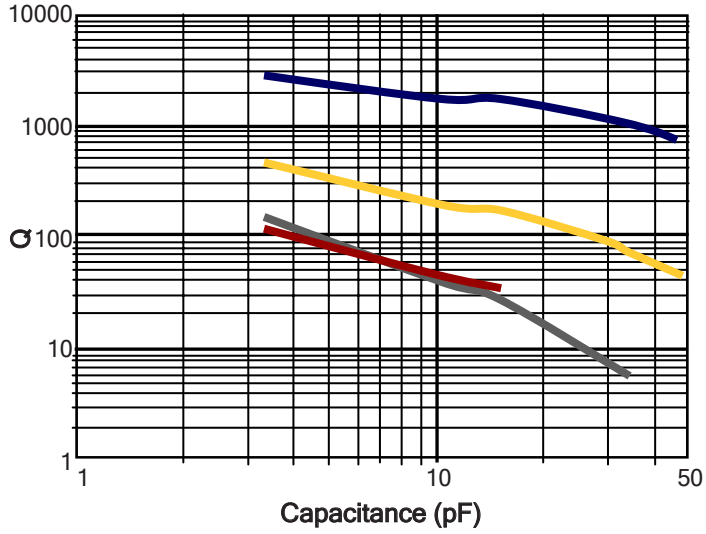
0402: Dissipation Factor (Q)



0603: Equivalent Series Resistance



0603: Dissipation Factor (Q)



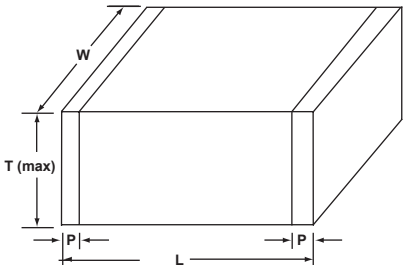
PRO-CAP Electronics

MA-Q Series

RoHs Compliant

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

SIZE	0201	0402	0603	0805
(L) Length mm	0.51 ± 0.10	1.02 ± 0.10	1.50 ± 0.15	2.03 ± 0.20
(W) Width mm	0.25 ± 0.10	0.51 ± 0.10	0.81 ± 0.15	1.27 ± 0.20
(T) Thickness mm	0.51 ± 0.08	0.51 ± 0.10	0.889 max	1.02 ± 0.15
(P) Termination mm	0.076 ± 0.03	0.25 ± 0.15	0.357 ± 0.15	0.51 ± 0.25



Capacitance	CODE	0201	0402	0603	0805
CAP 0.1	0R1				
(pF) 0.2	0R2				
0.3	0R3				
0.4	0R4				
0.5	0R5				
0.6	0R6				
0.7	0R7				
0.8	0R8				
0.9	0R9				
1.0	1R0				
1.1	1R1				
1.2	1R2				
1.3	1R3				
1.5	1R5				
1.8	1R8				
2.0	2R0				
2.2	2R2				
2.4	2R4				
2.7	2R7				
3.0	3R0				
3.3	3R3				
3.6	3R6				
3.9	3R9				
4.3	4R3				
4.7	4R7				
5.1	5R1				
5.6	5R6				
6.2	6R2				
6.8	6R8				
7.5	7R5				
8.2	8R2				
9.1	9R1				
10	100				
11	110				
12	120				
13	130				
15	150				
16	160				
18	180				
20	200				
22	220				
24	240				
27	270				
30	300				
33	330				
36	360				
39	390				
43	430				
47	470				
56	560				
68	680				
82	820				
100	101				
120	121				
150	151				
180	181				
220	221				

For additional capacitance values and working voltages, please contact us.