MNR 03

RF/Microwave COG (NPO) Multilayer Capacitors

Features

- Capacitance Range: 0.1pF to 100pF
- High Q Low ESR/ESL
- High Power
- Ultra Stable Performance
- High Self-Resonance
- Operating Voltages
  - DC Voltage: 250Vdc

Applications

Typical Functional Applications: Bypass, Coupling, Tuning, Feedback, Impedance Matching and DC Blocking. Devices such as RF oscillators and precision timing circuits requiring a predictable temperature coefficient are examples of devices utilizing these capacitors.

AFM Part Number Code

M	N	R	03	W	101	J	G	C	B	B
Product Series: M: High Frequency	**Dielectrics:** N: NPO	**Product Type:** R: Chip	**Chip Size:** 03: 0603	**Termination Code:** C: Pd/Ag Term T: Ag Term, Ni/100% Sn Plated (Pb Free) W: Ag Term, Ni Barrier, 90/10 Sn/Pb Plated	**Capacitance Code:** 1st two digits are significant: Third digit denotes number of zero(s); R=Decimal point 2R0=2.0pF 101=100pF	**Tolerance:** B: ± 0.1pF C: ± 0.25pF D: ±0.5pF F: ±1% G: ±2% J: ±5% K: ±10% M: ±20%	**Voltage:** D: 100 Vdc G: 250 Vdc	**Test Code:** C: Commercial Test S: Special (Customer Defined) M: Hi-Rel	**Marking:** B: Not Marked	**Packaging:** B: Bulk T: Tape & Reel W: Waffle Pack

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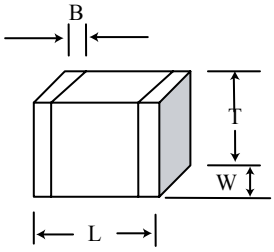
Chip Dimensions

Length	.063 ±.006in (1.60±0.15mm)
Width	.032±.006in (0.81±0.15mm)
Thickness	.030....+.005~-.003in (0.76....+0.13~-0.08mm)
Band	.015in (0.38mm)



Standard Capacitance Values

CAP CODE	CAP (pF)	TOL	RATED WVdc	CAP-CODE	CAP (pF)	TOL	RATED WVdc	CAP CODE	CAP (pF)	TOL	RATED WVdc	CAP CODE	CAP (pF)	TOL	RATED WVdc
0R1	0.1			1R7	1.7			6R2	6.2	A,B,C,D		270	27		
0R2	0.2			1R8	1.8			6R8	6.8			300	30		
0R3	0.3			1R9	1.9			7R5	7.5	B, C, J, K,		330	33		
0R4	0.4			2R0	2.0			8R2	8.2			360	36		
0R5	0.5			2R1	2.1			9R1	9.1			390	39		
0R6	0.6			2R2	2.2			100	10			430	43		
0R7	0.7			2R4	2.4			110	11			470	47		
0R8	0.8	A, B, C, D	250	2R7	2.7	A, B, C, D	250	120	12		250	510	51	F, G, J, K, M	250
0R9	0.9			3R0	3.0			130	13			560	56		
1R0	1.0			3R3	3.3			150	15	F, G, J, K, M		620	62		
1R1	1.1			3R6	3.6			160	16			680	68		
1R2	1.2			3R9	3.9			180	18			750	75		
1R3	1.3			4R3	4.3			200	20			820	82		
1R4	1.4			4R7	4.7			220	22			910	91		
1R5	1.5			5R1	5.1			240	24			101	100		
1R6	1.6			5R6	5.6										

Specification and Performance

Piezoelectric and Aging Effect:	None
Temperature Range:	-55°C to +125°C
Temperature Coefficient of Capacitance:	0±30ppm/°C
Quality Factor (Q) :	2,000 min.
Insulation Resistance (IR, at Rated Voltage):	10^5MΩ min. at +25°C at rated WVDC 10^4MΩ min. at +125°C at rated WVDC
Dielectric Withstand Voltage (DWV):	250% of rated WVDC for 5 secs
Capacitance Drift:	±0.02% or ±0.02pF, whichever is greater

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Environmental Tests

MNR03 Series Capacitors are designed and manufactured to meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123.

Item	Specifications	Method
Terminal Adhesion	Termination should not pull off, ceramic should remain undamaged.	Linear pull force exerted on axial leads soldered to each terminal 2.0lbs.
Resistance to soldering heat	No mechanical damge Capacitance change: -1.0%~+2.0% Q>500 I.R.>10G Ohms Breakdown voltage: 2.5 x WVDC	Preheat device to 150°C-180°C for 60 sec. Dip in 260°C±5°C solder for 10±1 sec. Measure after 24±2 hour cooling period
Thermal Shock		MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and +125°C) stay 30 minutes, the time of removing shall be not more than 3 minutes. Perform the five cycles.
Humidity (steady state)	No mechanical damge Capacitance change: ±0.5% or 0.5pF max. Q>300 I.R.>1G Ohms Breakdown voltage: 2.5 x WVDC	MIL-STD-202, Method 106
Low Voltage Humidity	No mechanical damge Capacitance change: ±0.3% or 0.3pF max. Q>300 I.R.>1G Ohms Breakdown voltage: 2.5 x WVDC	MIL-STD-202, Method 103, Condition A, with 1.5 volts D.C. applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.
Life	No mechanical damge Capacitance change: ±2.0% or 0.5pF max. Q>500 I.R.>1G Ohms Breakdown voltage: 2.5 x WVDC	MIL-STD-202, Method 108, for 1000 hours, at 125°C. 200% Rated Voltage D.C. applied.

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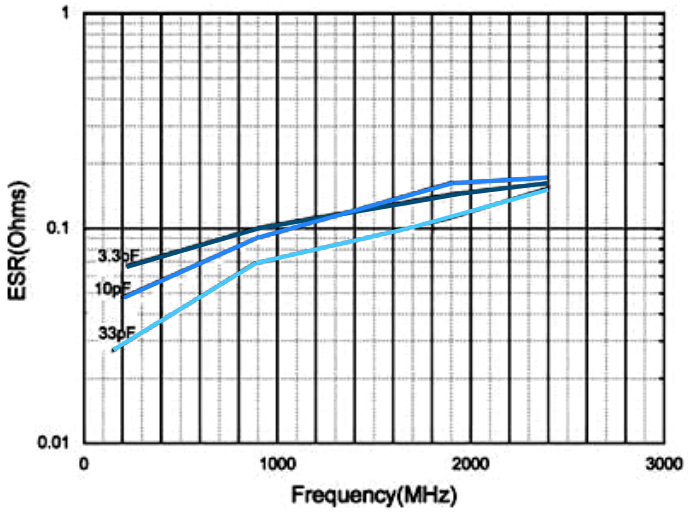
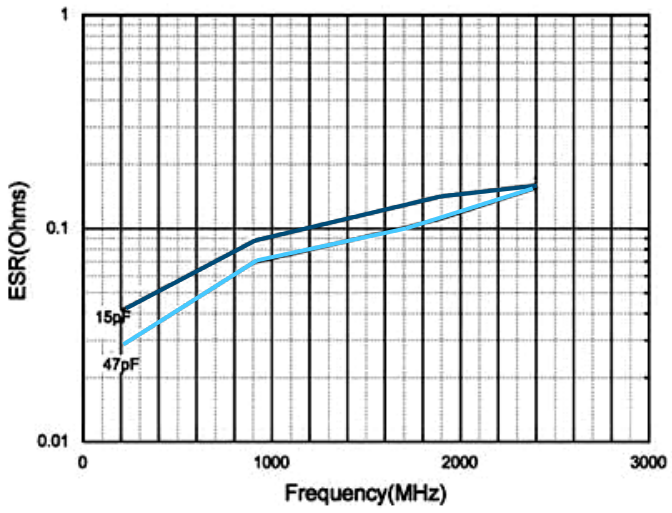
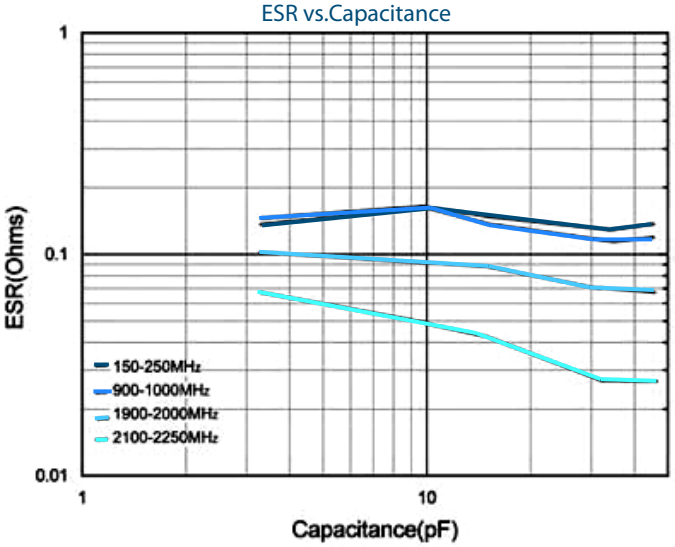
ESR vs. Frequency



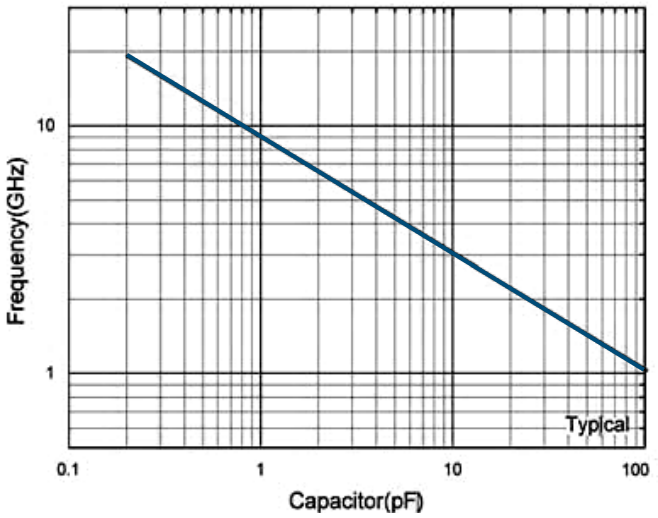
ESR vs. Frequency



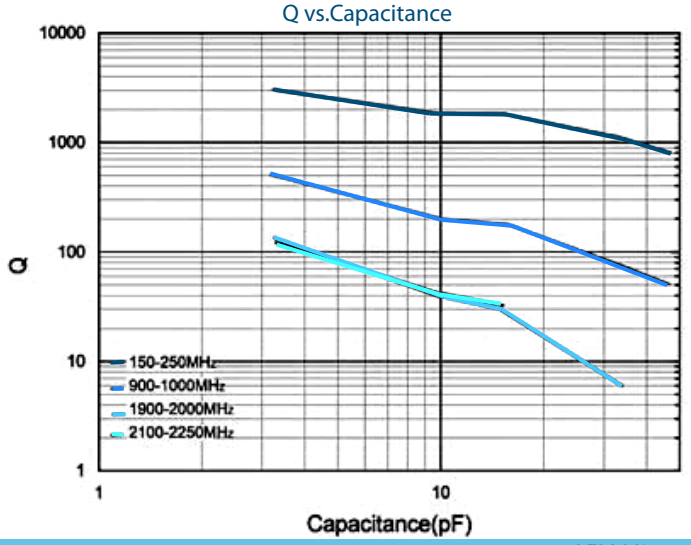
ESR vs.Capacitance



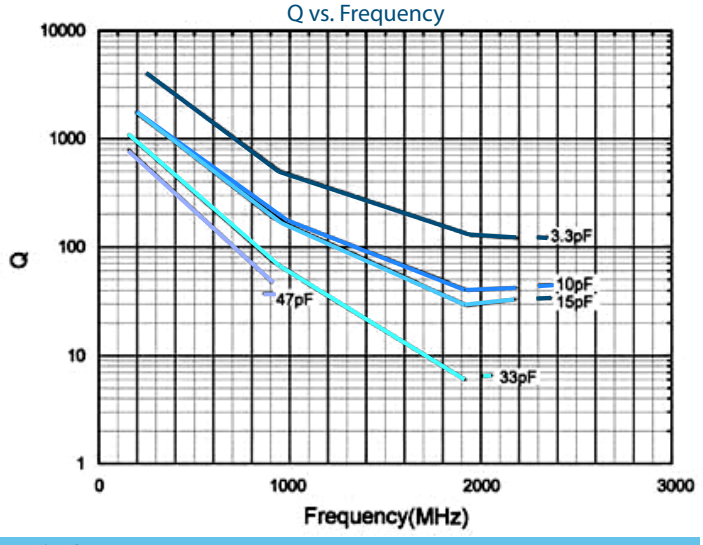
Resonance vs.Capacitance



Q vs.Capacitance



Q vs. Frequency



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