Electronic Concepts
Film Capacitor Innovation Without Limits

5MP1 SERIES

Metallized Polypropylene

Metallized Polypropylene

Metallized Polypropylene and Military Styles CFR13 and CFR14."Hi-Rel" replacement for electrolytics for a broad range of commercial and military switching power supplies.

FEATURES

- Better electrical properties with higher reliability and no "roll-off" capacitance versus electrolytic
- Resonant frequency of 1065KHz
- Ripple current to 30amps
- Capacitance as high as 50µf
- Voltage protection: 200%
- Long term stability, retrace and low dielectric absorption

STANDARD CONFIGURATION

- 5MP12/MIL Style CFR13 Wrap and fill axial leads
- 5MP16/MIL Style CFR14 Wrap and fill lug terminations

Specification Summary

Capacitance Range
1.0µF to 50.0µF. Capacitance is measured at 25°C at/or referenced to a frequency of 1kHz.

Capacitance Tolerance
Standard tolerance is ±10%. Tolerances of ±20% and ±5% are available.

Operating Temperature Range
-55°C to +105°C

Enclosure/ Construction
Mylar tape outer wrap.

Voltage Rating
DC working voltage ratings are from 100VDC to 400VDC

Quality Control
Capacitors are tested 100% for:
o Capacitance tolerance
o Dissipation Factor
o Dielectric withstanding voltage
o Insulation Resistance
o Equivalent Series Resistance (ESR)

Process and inspection data are maintained on file and available on special request.

Environmental

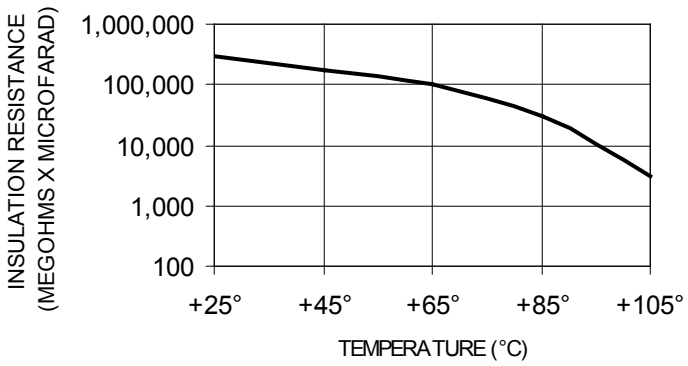
Parameter	Method	Condition
Vibration	204	D
Shock	213	I
Humidity	106	-
Thermal Shock	107	A
Life	108	F
Reference MIL-STD-202		

Characteristics

Insulation Resistance

Temperature(°C)	25	85	105	
Megaohmsx Microfarads	300,000	30,000	3,000	
Insulation Resistance				

INSULATION RESISTANCE VERSUS TEMPERATURE

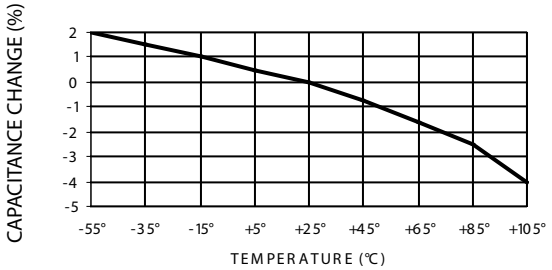


Dilectric Strength
Capacitors shall withstand a DC potential of twice rated voltage for one (1) minute through a limiting resistance of 100 ohms/volt without damage or breakdown.

Capacitance Change

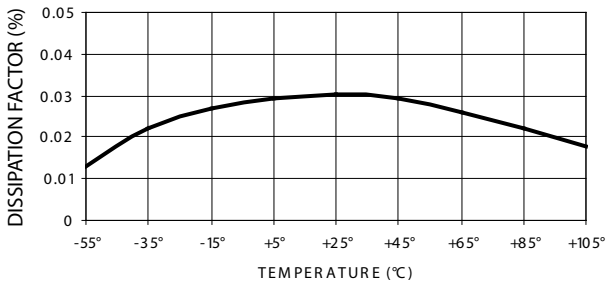
Temperature(°C)	-55	25	105	
PercentageChange (typical)	2.0	0	-4.0	
CapacitanceChange				

CAPACITANCE CHANGE VERSUS TEMPERATURE



Dissipation Factor
When measured at the frequency specified for capacitance measurement, the dissipation factor shall not exceed 0.1%.

DISSIPATION FACTOR VERSUS TEMPERATURE



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ELECTRICAL DATA

EC PART NUMBER	EQUIVALENT MILITARY DESIGNATION	CAP µF	D	L	Lead Dia.	ESR Ohms 20-100 kHz Max	Fres kHz	I PEAK AMPS	dv/dt (V/µs)
5MP12D105_	CFR13ALB105_	1	0.469 ±0.062	0.750	0.032	0.015	1065	407	407
5MP12D205_	CFR13ALB205_	2	0.534 ±0.062	0.938	0.032	0.012	703	528	264
5MP12D305_	CFR13ALB305_	3	0.624 ±0.093	0.938	0.040	0.011	574	790	263
5MP12D505_	CFR13ALB505_	5	0.640 ±0.093	1.250	0.040	0.100	385	828	166
5MP12D106_	CFR13ALB106_	10	0.805 ±0.093	1.500	0.040	0.009	248	1280	128
5MP12D206_	CFR13ALB206_	20	0.875 ±0.125	2.250	0.040	0.008	141	1517	76
5MP12D306_	CFR13ALB306_	30	1.075 ±0.125	2.250	0.040	0.006	115	2277	76
5MP12D506_	Not Available	50	1.375 ±0.125	2.250	0.040	0.004	89	3795	76
5MP12F105_	CFR13ALC105_	1	0.450 ±0.062	1.250	0.032	0.020	861	250	250
5MP12F205_	CFR13ALC205_	2	0.605 ±0.093	1.250	0.032	0.015	609	498	249
5MP12F305_	CFR13ALC305_	3	0.654 ±0.093	1.500	0.040	0.013	452	576	192
5MP12F505_	CFR13ALC505_	5	0.769 ±0.093	1.750	0.040	0.011	323	782	156
5MP12F106_	CFR13ALC106_	10	0.905 ±0.125	2.250	0.040	0.009	200	1139	114
5MP12F206_	CFR13ALC206_	20	1.315 ±0.125	2.250	0.040	0.006	141	2277	114
5MP12J105_	CFR13ALE105_	1	0.620 ±0.093	1.500	0.040	0.019	784	319	319
5MP12J205_	CFR13ALE205_	2	0.802 ±0.093	1.750	0.040	0.015	511	521	260
5MP12J305_	CFR13ALE305_	3	0.961 ±0.125	1.750	0.040	0.012	417	781	260
5MP12J505_	CFR13ALE505_	5	1.067 ±0.125	2.250	0.040	0.010	283	950	190
5MP12J106_	CFR13ALE106_	10	1.543 ±0.125	2.250	0.040	0.006	200	1898	190

Note: The tenth character of the EC part number represents the capacitance tolerance: M=±20%, K=±10%, J=±5%.

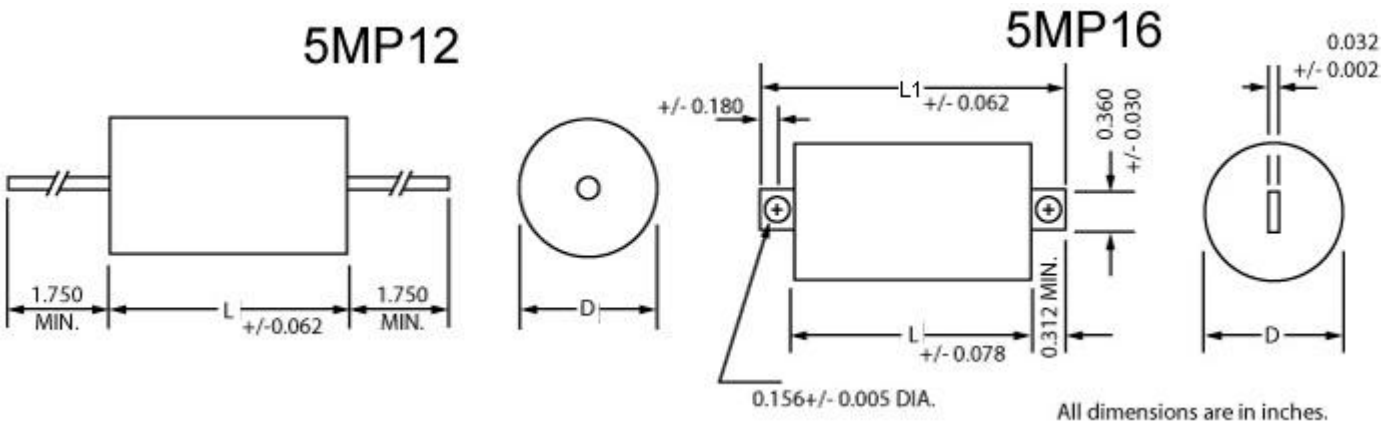
EC PART NUMBER	EQUIVALENT MILITARY DESIGNATION	CAP µF	D	L	L1	ESR Ohms 20-100 kHz Max	Fres kHz	I PEAK AMPS	dv/dt (V/µs)
5MP16D105_	CFR14LLB105_	1	0.469 ±0.062	0.922	1.640	0.015	949	407	407
5MP16D205_	CFR14LLB205_	2	0.534 ±0.062	1.110	1.828	0.012	617	528	264
5MP16D305_	CFR14LLB305_	3	0.624 ±0.093	1.110	1.828	0.011	504	790	263
5MP16D505_	CFR14LLB505_	5	0.640 ±0.093	1.422	2.140	0.100	347	828	166
5MP16D106_	CFR14LLB106_	10	0.805 ±0.093	1.672	2.390	0.009	227	1280	128
5MP16D206_	CFR14LLB206_	20	0.875 ±0.125	2.422	3.140	0.008	133	1517	76
5MP16D306_	CFR14LLB306_	30	1.075 ±0.125	2.422	3.140	0.006	108	2277	76
5MP16D506_	Not Available	50	1.375 ±0.125	2.422	3.140	0.004	84	3795	76
5MP16F105_	CFR14LLC105_	1	0.450 ±0.062	1.422	2.140	0.020	776	250	250
5MP16F205_	CFR14LLC205_	2	0.605 ±0.093	1.422	2.140	0.015	548	498	249
5MP16F305_	CFR14LLC305_	3	0.654 ±0.093	1.672	2.390	0.013	414	576	192
5MP16F505_	CFR14LLC505_	5	0.769 ±0.093	1.922	2.640	0.011	299	782	156
5MP16F106_	CFR14LLC106_	10	0.905 ±0.125	2.422	3.140	0.009	188	1139	114
5MP16F206_	CFR14LLC206_	20	1.315 ±0.125	2.422	3.140	0.006	133	2277	114
5MP16J105_	CFR14LLE105_	1	0.620 ±0.093	1.672	2.390	0.019	716	319	319
5MP16J205_	CFR14LLE205_	2	0.802 ±0.093	1.922	2.640	0.015	472	521	260
5MP16J305_	CFR14LLE305_	3	0.961 ±0.125	1.922	2.640	0.012	386	781	260
5MP16J505_	CFR14LLE505_	5	1.067 ±0.125	2.422	3.140	0.010	265	950	190
5MP16J106_	CFR14LLE106_	10	1.543 ±0.125	2.422	3.140	0.006	188	1898	190

Note: The tenth character of the EC part number represents the capacitance tolerance: M=±20%, K=±10%, J=±5%.

EC PART NUMBER	EQUIVALENT MILITARY DESIGNATION	MAXIMUM RIPPLE CURRENT (AMPS RMS) 20-100 kHz						
		CASE TEMPERATURE						
		25°C	35°C	45°C	55°C	65°C	75°C	85°C
5MP12D105_	CFR13ALB105_	9.2	8.5	7.8	7.0	6.0	4.9	4.5
5MP12D205_	CFR13ALB205_	10.8	10.0	9.1	8.2	7.0	5.8	5.3
5MP12D305_	CFR13ALB305_	12.1	11.2	10.3	9.2	8.0	6.5	5.9
5MP12D505_	CFR13ALB505_	13.8	12.7	11.6	10.4	9.0	7.4	6.7
5MP12D106_	CFR13ALB106_	15.0	15.0	14.2	12.7	11.0	9.0	8.2
5MP12D206_	CFR13ALB206_	15.0	15.0	15.0	15.0	13.6	11.1	10.0
5MP12D306_	CFR13ALB306_	15.0	15.0	15.0	15.0	15.0	12.4	11.4
5MP12D506_	Not Available	15.0	15.0	15.0	15.0	15.0	13.6	12.4
5MP12F105_	CFR13ALC105_	7.3	7.3	7.3	7.3	7.2	5.9	5.4
5MP12F205_	CFR13ALC205_	12.0	12.0	11.3	10.1	8.7	7.1	6.5
5MP12F305_	CFR13ALC305_	15.0	13.8	12.6	11.3	9.8	8.0	7.3
5MP12F505_	CFR13ALC505_	15.0	15.0	14.7	13.1	11.4	9.3	8.5
5MP12F106_	CFR13ALC106_	15.0	15.0	15.0	15.0	13.8	11.3	10.3
5MP12F206_	CFR13ALC206_	15.0	15.0	15.0	15.0	15.0	14.1	12.8
5MP12J105_	CFR13ALE105_	9.5	9.5	9.5	9.5	9.5	7.8	7.1
5MP12J205_	CFR13ALE205_	15.0	15.0	15.0	13.4	11.6	9.5	8.7
5MP12J305_	CFR13ALE305_	15.0	15.0	15.0	15.0	13.1	10.7	9.8
5MP12J505_	CFR13ALE505_	15.0	15.0	15.0	15.0	15.0	12.5	11.4
5MP12J106_	CFR13ALE106_	15.0	15.0	15.0	15.0	15.0	15.0	14.1
5MP16D105_	CFR14LLB105_	10.3	9.5	8.7	7.8	6.7	5.5	5.0
5MP16D205_	CFR14LLB205_	12.0	11.0	10.0	8.9	7.8	6.3	5.8
5MP16D305_	CFR14LLB305_	13.3	12.3	11.2	10.0	8.7	7.1	6.5
5MP16D505_	CFR14LLB505_	14.8	13.7	12.5	11.2	9.7	7.9	7.2
5MP16D106_	CFR14LLB106_	17.8	16.5	15.0	13.5	11.7	9.5	8.7
5MP16D206_	CFR14LLB206_	21.6	20.0	18.3	16.4	14.2	11.6	10.6
5MP16D306_	CFR14LLB306_	24.3	22.5	20.5	18.4	15.9	13.0	11.9
5MP16D506_	Not Available	29.6	27.3	25.5	23.6	20.6	20.0	19.7
5MP16F105_	CFR14LLC105_	7.3	7.3	7.3	7.3	7.3	6.4	5.8
5MP16F205_	CFR14LLC205_	14.3	13.3	12.1	10.8	9.4	7.7	7.0
5MP16F305_	CFR14LLC305_	15.9	14.7	13.5	12.0	10.4	8.5	7.8
5MP16F505_	CFR14LLC505_	18.3	17.0	15.5	13.9	12.0	9.8	8.9
5MP16F106_	CFR14LLC106_	22.4	20.7	18.9	16.9	14.6	12.0	10.9
5MP16F206_	CFR14LLC206_	27.4	25.4	23.2	20.7	17.9	14.7	13.4
5MP16J105_	CFR14LLE105_	9.5	9.5	9.5	9.5	9.5	8.3	7.5
5MP16J205_	CFR14LLE205_	15.0	15.0	15.0	14.2	12.3	10.0	9.1
5MP16J305_	CFR14LLE305_	21.1	19.5	17.8	15.9	13.8	11.3	10.3
5MP16J505_	CFR14LLE505_	24.4	22.6	20.6	18.5	16.0	13.1	11.9
5MP16J106_	CFR14LLE106_	30.0	27.8	25.4	22.7	19.7	16.1	14.7

Note: The tenth character of the EC part number represents the capacitance tolerance: M=±20%, K=±10%, J=±5%

MECHANICAL DATA



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ADDITIONAL INFORMATION

These metallized polypropylene capacitors are manufactured by using special techniques in order to achieve the optimum characteristics for high current, high capacitance, low ESR applications. For Filter designs where capacitance of 50µF or less is suitable for the circuit, type 5MP affords the opportunity to utilize capacitors with ESR's orders of magnitude better than those of electrolytics, thus providing the opportunity to improve general system design. These unique capacitors also exhibit none of the "roll-off" of capacitance with frequency often associated with electrolytics.

In addition to the features which make type 5MP particularly suitable for switching applications, they are also characterized by low losses. Other advantages of polypropylene are long term stability, retrace, low dielectric absorption, and high insulation resistance.

HOW TO ORDER

TYPE Metallized Polypropylene →	5MP1
STYLE / VOLTAGE AC high power / D=100VDC; F=200VDC; J=400VDC →	2 D
CAPACITANCE IN PICOFARADS The first two digits are significant, the third represents the number of zeros (e.g. 475=4700000pF) →	105
TOLERANCE Standard tolerance is ±10%. Tolerances of ±20% and ±5% are available. →	K

Marking and Date Code
All capacitors are marked with company initials "EC", corporate logo or EC trademark—in addition to type 5MP1, capacitance, tolerance, rated DC working voltage and date code. The first two digits of the date code represent the year, the second two digits the week, i.e., 0952 is the 52nd week of 2009, 0902 is the second week of 2009.

Quality Assurance
Major emphasis is placed on quality assurance. EC is an ISO 9001-2000 and AS9100:2004 Certified Company. Raw material inspection and the use of SPC manufacturing procedures assure the highest quality standards. Procedures are fully described in the EC Quality Control Manual. Electronic Concepts will continue to advance the state-of-the-art by utilizing leading edge technology, compact capacitor designs and establishing reliability procedures.

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