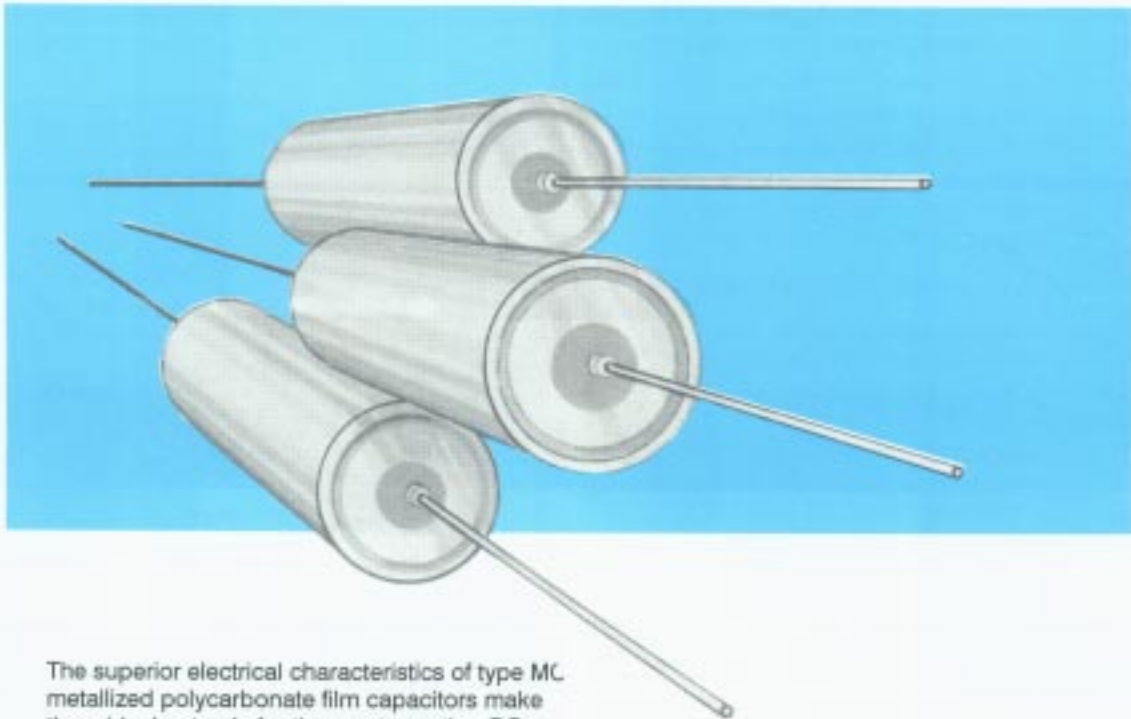


Capacitors

Metallized Polycarbonate Capacitors

(HERMETICALLY SEALED) TYPE MC



The superior electrical characteristics of type MC metallized polycarbonate film capacitors make them ideal not only for the most exacting DC requirements, but also for square-wave voltage applications such as silicon-controlled inverters, converters, and rectifiers.

Outstanding electrical characteristics of type MC capacitors are achieved as a result of Electronic Concepts skilled engineering and many years of experience in the manufacture of high-quality metallized capacitors.

Additional advantages are:

High volumetric efficiency which results in small, lightweight units. This is particularly important to designers of equipment where space is at a premium.

Self-healing properties assuring greater operational reliability.

Low loss characteristics and high current carrying capabilities make these capacitors especially suitable for specialized AC and RF applications.

Applications for these capacitors include tuned circuits, analog computer reference capacitors, and precision timing and integrating circuits.

ELECTRONIC CONCEPTS INC.



Specifications

Dimensional Data

OPERATING TEMPERATURE RANGE

-55°C to +125°C without derating.

CAPACITANCE RANGE

.001μF to 100μF.

CAPACITANCE TOLERANCE

Standard Tolerance is ±10%. Tolerances of ±20%, ±5%, ±2% and ±1% are available.

Note: Capacitance shall be measured at 25°C, and at or referred to a frequency of 1KHz for values of 1μF or less; and at or referred to a frequency of 120 Hz for values above 1μF.

VOLTAGE RATING

DC Working Voltages of 50V, 75V, 100V, 150V, 200V, 300V, and 400V are standard.

DIELECTRIC STRENGTH

Capacitors shall withstand a DC potential of 200% rated voltage for two (2) minutes without damage or breakdown. When the capacitor section is insulated from the case, the capacitors shall withstand a DC potential of 200% rated voltage applied between the case and the terminals. Test voltage must be applied and discharged through a resistance of 1 OHM per volt, minimum, and at 25°C.

DISSIPATION FACTOR

When measured at the frequency specified for capacitance measurements, the dissipation factor shall not exceed 0.3% from +25°C, to +125°C.

INSULATION RESISTANCE

When measured at the applicable test temperature, and rated voltage, the insulation resistance shall equal or exceed the following values:

Megohm x Microfarads	25°C	85°C	125°C
	100,000	7,000	700

Except the insulation resistance in megohms need not exceed

} 200,000	70,000	7,000

CAPACITANCE CHANGE

The Capacitance change vs. temperature for Type MC Capacitors shall not exceed the following:

Temperature Degrees C.	-55	+25	+85	+125
Percent Change	±1.5	0	±0.3	±0.8

The measurement at each temperature shall be recorded when two successive readings taken at 5-minute intervals indicate no change in capacitance.

50VDCW

75VDCW

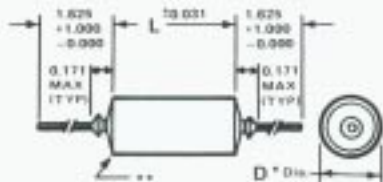
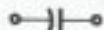
100VDCW

Cap. in μF	Cat. No. for ±10% Cap. Tol.	Case Size in Inches		Lead Dia. (AWG)	Cat. No. for ±10% Cap. Tol.	Case Size in Inches		Lead Dia. (AWG)	Cat. No. for ±10% Cap. Tol.	Case Size in Inches		Lead Dia. (AWG)
		D	L			D	L			D	L	
.01					MC52C103K	.174	.531	.24	MC52D103K	.174	.625	.24
.012					MC52C123K	.174	.531	.24	MC52D123K	.174	.625	.24
.015					MC52C153K	.174	.531	.24	MC52D153K	.174	.625	.24
.018					MC52C183K	.174	.531	.24	MC52D183K	.174	.625	.24
.022					MC52C223K	.174	.531	.24	MC52D223K	.174	.625	.24
.027					MC52C273K	.174	.531	.24	MC52D273K	.174	.625	.24
.033					MC52C333K	.174	.531	.24	MC52D333K	.174	.625	.24
.039					MC52C393K	.174	.625	.24	MC52D393K	.174	.625	.24
.047	MC52B473K	.174	.531	.24	MC52C473K	.174	.625	.24	MC52D473K	.193	.625	.24
.056	MC52B563K	.174	.531	.24	MC52C563K	.174	.625	.24	MC52D563K	.193	.625	.24
.068	MC52B683K	.174	.625	.24	MC52C683K	.174	.625	.24	MC52D683K	.235	.625	.22
.080	MC52B803K	.174	.625	.24	MC52C803K	.193	.625	.24	MC52D803K	.235	.625	.22
.10	MC52B104K	.174	.625	.24	MC52C104K	.193	.625	.24	MC52D104K	.235	.688	.22
.12	MC52B124K	.174	.625	.24	MC52C124K	.235	.625	.22	MC52D124K	.235	.688	.22
.15	MC52B154K	.193	.625	.24	MC52C154K	.235	.625	.22	MC52D154K	.312	.625	.22
.18	MC52B184K	.193	.625	.24	MC52C184K	.312	.625	.22	MC52D184K	.312	.625	.22
.22	MC52B224K	.235	.625	.22	MC52C224K	.312	.625	.22	MC52D224K	.312	.688	.22
.27	MC52B274K	.235	.625	.22	MC52C274K	.312	.625	.22	MC52D274K	.312	.688	.22
.33	MC52B334K	.312	.625	.22	MC52C334K	.312	.625	.22	MC52D334K	.312	.812	.22
.39	MC52B394K	.312	.625	.22	MC52C394K	.312	.843	.22	MC52D394K	.312	.812	.22
.47	MC52B474K	.312	.625	.22	MC52C474K	.312	.843	.22	MC52D474K	.400	.688	.20
.56	MC52B564K	.312	.625	.22	MC52C564K	.312	.843	.22	MC52D564K	.400	.812	.20
.68	MC52B684K	.312	.843	.22	MC52C684K	.312	.843	.22	MC52D684K	.400	.812	.20
.82	MC52B824K	.312	.843	.22	MC52C824K	.400	.843	.20	MC52D824K	.400	.938	.20
1.0	MC52B105K	.312	.843	.22	MC52C105K	.400	.843	.20	MC52D105K	.400	.938	.20
1.2	MC52B125K	.400	.843	.20	MC52C125K	.400	1.125	.20	MC52D125K	.500	.938	.20
1.5	MC52B155K	.400	.843	.20	MC52C155K	.400	1.125	.20	MC52D155K	.500	.938	.20
1.8	MC52B185K	.400	.843	.20	MC52C185K	.400	1.125	.20	MC52D185K	.500	1.125	.20
2.0	MC52B205K	.400	.843	.20	MC52C205K	.500	1.125	.20	MC52D205K	.500	1.125	.20
2.2	MC52B225K	.400	1.125	.20	MC52C225K	.500	1.125	.20	MC52D225K	.500	1.125	.20
2.7	MC52B275K	.400	1.125	.20	MC52C275K	.500	1.125	.20	MC52D275K	.562	1.312	.20
3.0	MC52B305K	.400	1.125	.20	MC52C305K	.500	1.125	.20	MC52D305K	.562	1.312	.20
3.3	MC52B335K	.400	1.125	.20	MC52C335K	.562	1.125	.20	MC52D335K	.562	1.312	.20
3.9	MC52B395K	.500	1.125	.20	MC52C395K	.562	1.125	.20	MC52D395K	.562	1.562	.20
4.7	MC52B475K	.500	1.125	.20	MC52C475K	.562	1.312	.20	MC52D475K	.670	1.312	.20
5.0	MC52B505K	.500	1.125	.20	MC52C505K	.562	1.312	.20	MC52D505K	.670	1.312	.20
5.6	MC52B565K	.500	1.125	.20	MC52C565K	.670	1.312	.20	MC52D565K	.670	1.312	.20
6.8	MC52B685K	.562	1.125	.20	MC52C685K	.670	1.312	.20	MC52D685K	.670	1.562	.20
8.2	MC52B825K	.562	1.321	.20	MC52C825K	.670	1.625	.20	MC52D825K	.670	1.612	.20
10.0	MC52B106K	.670	1.321	.20	MC52C106K	.670	1.625	.20	MC52D106K	.750	1.612	.20
12.0	MC52B126K	.670	1.321	.20	MC52C126K	.670	1.875	.20	MC52D126K	.750	1.612	.20
15.0	MC52B156K	.750	1.375	.20	MC52C156K	.750	1.875	.20	MC52D156K	1.000	1.875	.20
18.0	MC52B186K	.750	1.375	.20	MC52C186K	.750	2.125	.20	MC52D186K	1.000	1.875	.20
20.0	MC52B206K	.750	1.625	.20	MC52C206K	.750	2.625	.20	MC52D206K	1.000	1.875	.20
22.0	MC52B226K	.750	1.625	.20	MC52C226K	.750	2.625	.20	MC52D226K	1.000	1.875	.20
25.0	MC52B256K	1.000	1.375	.20	MC52C256K	1.000	1.875	.20	MC52D256K	1.000	2.125	.20
27.0	MC52B276K	1.000	1.375	.20	MC52C276K	1.000	1.875	.20	MC52D276K	1.000	2.125	.20
30.0	MC52B306K	1.000	1.375	.20	MC52C306K	1.000	2.125	.20	MC52D306K	1.000	2.375	.20
33.0	MC52B336K	1.000	1.375	.20	MC52C336K	1.000	2.125	.20	MC52D336K	1.000	2.625	.18
39.0	MC52B396K	1.000	1.625	.20	MC52C396K	1.000	2.625	.18	MC52D396K	1.000	2.675	.18
47.0	MC52B476K	1.000	1.875	.20	MC52C476K	1.000	2.875	.18	MC52D476K	1.125	2.937	.18
50.0	MC52B506K	1.000	1.875	.20	MC52C506K	1.125	2.937	.18	MC52D506K	1.250	2.937	.18
56.0	MC52B566K	1.000	1.875	.20	MC52C566K	1.125	2.937	.18	MC52D566K	1.250	2.937	.18
68.0	MC52B686K	1.000	2.125	.20	MC52C686K	1.250	2.937	.18	MC52D686K	1.390	2.937	.18
75.0	MC52B756K	1.000	2.375	.20	MC52C756K	1.250	2.937	.18	MC52D756K	1.390	2.937	.18
82.0	MC52B826K	1.000	2.625	.18	MC52C826K	1.250	3.187	.18	MC52D826K	1.390	3.187	.18
90.0	MC52B906K	1.000	2.875	.18	MC52C906K	1.390	2.937	.18	MC52D906K	1.390	3.187	.18
100.0	MC52B107K	1.000	3.187	.18	MC52C107K	1.390	3.187	.18	MC52D107K	1.500	3.187	.18

The catalog numbers and dimensions shown are for Type MC52 capacitors, which employ circuit 2 design and having a capacitance tolerance of ±10%. For circuit 4 design, change the fourth character of the catalog number to "4", and deduct 0.062" from the "L" dimension.

For units with plastic insulating sleeves, change the third character of the catalog number to "6". Add 0.020" to "D" dimension and 0.031" to "L". The dimensional tolerances will then become ±0.020" for "D", and ±0.031" for "L". To specify units having capacitance tolerance other than ±10%, change the last character of the catalog number from "K" to the appropriate letter for the tolerance desired, (J=±5%, G=±2%, F=±1%).

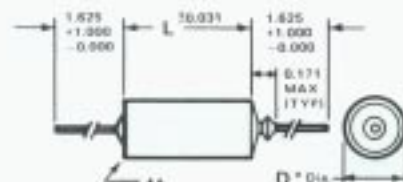
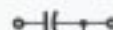
CIRCUIT 2



* Tolerance on Dia. is $\pm 0.015''$ on Units with Dia. of 1.000 or Smaller; Tolerance on Larger Dia. Units is $\pm 0.020''$.

** 0.062" Radius Allowed when Dia. Exceeds 1.000".

CIRCUIT 4



150 VDCW

200 VDCW

300 VDCW

400 VDCW

150 VDCW			200 VDCW			300 VDCW			400 VDCW		
Cat. No. for ±10% Cap. Tol.	Case Size in Inches D L	Lead Dia. (AWG)	Cat. No. for ±10% Cap. Tol.	Case Size in Inches D L	Lead Dia. (AWG)	Cat. No. for ±10% Cap. Tol.	Case Size in Inches D L	Lead Dia. (AWG)	Cat. No. for ±10% Cap. Tol.	Case Size in Inches D L	Lead Dia. (AWG)
MC52E103K	.174 .625 24		MC52F103K	.174 .625 24		MC52H103K	.193 .688 24		MC52J103K	.235 .688 22	
MC52E123K	.174 .625 24		MC52F123K	.174 .625 24		MC52H123K	.235 .688 22		MC52J123K	.235 .812 22	
MC52E153K	.174 .625 24		MC52F153K	.174 .625 24		MC52H153K	.235 .688 22		MC52J153K	.235 .812 22	
MC52E183K	.174 .625 24		MC52F183K	.193 .625 24		MC52H183K	.235 .812 22		MC52J183K	.235 .812 22	
MC52E223K	.174 .625 24		MC52F223K	.193 .625 24		MC52H223K	.235 .812 22		MC52J223K	.312 .688 22	
MC52E273K	.193 .625 24		MC52F273K	.235 .625 22		MC52H273K	.312 .688 22		MC52J273K	.312 .812 22	
MC52E333K	.193 .688 24		MC52F333K	.235 .625 22		MC52H333K	.312 .688 22		MC52J333K	.312 .812 22	
MC52E393K	.193 .688 24		MC52F393K	.235 .688 22		MC52H393K	.312 .812 22		MC52J393K	.312 .938 22	
MC52E473K	.235 .625 22		MC52F473K	.235 .688 22		MC52H473K	.312 .812 22		MC52J473K	.400 .812 20	
MC52E563K	.235 .688 22		MC52F563K	.312 .625 22		MC52H563K	.312 .938 22		MC52J563K	.400 .812 20	
MC52E683K	.235 .688 22		MC52F683K	.312 .625 22		MC52H683K	.312 .938 22		MC52J683K	.400 .938 20	
MC52E823K	.312 .625 22		MC52F823K	.312 .888 22		MC52H823K	.400 .812 20		MC52J823K	.400 .938 20	
MC52E104K	.312 .688 22		MC52F104K	.312 .688 22		MC52H104K	.400 .938 20		MC52J104K	.400 1.125 20	
MC52E124K	.312 .688 22		MC52F124K	.312 .812 22		MC52H124K	.400 .938 20		MC52J124K	.400 1.312 20	
MC52E154K	.312 .812 22		MC52F154K	.312 .812 22		MC52H154K	.400 1.125 20		MC52J154K	.400 1.312 20	
MC52E184K	.312 .812 22		MC52F184K	.400 .688 20		MC52H184K	.400 1.312 20		MC52J184K	.562 1.125 20	
MC52E224K	.312 .812 22		MC52F224K	.400 .812 20		MC52H224K	.400 1.312 20		MC52J224K	.562 1.125 20	
MC52E274K	.400 .812 20		MC52F274K	.400 .812 20		MC52H274K	.562 1.125 20		MC52J274K	.562 1.312 20	
MC52E334K	.400 .812 20		MC52F334K	.400 .938 20		MC52H334K	.562 1.125 20		MC52J334K	.562 1.562 20	
MC52E394K	.400 .812 20		MC52F394K	.400 .938 20		MC52H394K	.562 1.125 20		MC52J394K	.562 1.562 20	
MC52E474K	.400 .938 20		MC52F474K	.400 1.125 20		MC52H474K	.562 1.562 20		MC52J474K	.562 1.812 20	
MC52E564K	.400 1.125 20		MC52F564K	.400 1.312 20		MC52H564K	.562 1.562 20		MC52J564K	.670 1.562 20	
MC52E684K	.400 1.125 20		MC52F684K	.500 1.125 20		MC52H684K	.670 1.312 20		MC52J684K	.670 1.812 20	
MC52E824K	.500 .938 20		MC52F824K	.500 1.125 20		MC52H824K	.670 1.562 20		MC52J824K	.750 1.812 20	
MC52E105K	.500 1.125 20		MC52F105K	.562 1.125 20		MC52H105K	.670 1.812 20		MC52J105K	.750 2.062 20	
MC52E125K	.500 1.125 20		MC52F125K	.562 1.312 20		MC52H125K	.670 1.812 20		MC52J125K	1.000 1.812 20	
MC52E155K	.500 1.312 20		MC52F155K	.562 1.312 20		MC52H155K	.750 2.062 20		MC52J155K	1.000 1.812 20	
MC52E185K	.562 1.312 20		MC52F185K	.562 1.812 20		MC52H185K	.750 2.062 20		MC52J185K	1.000 2.062 20	
MC52E205K	.562 1.312 20		MC52F205K	.562 1.812 20		MC52H205K	.750 2.062 20		MC52J205K	1.000 2.062 20	
MC52E225K	.562 1.562 20		MC52F225K	.562 1.812 20		MC52H225K	1.000 1.812 20		MC52J225K	1.000 2.312 20	
MC52E275K	.562 1.812 20		MC52F275K	.670 1.562 20		MC52H275K	1.000 1.812 20		MC52J275K	1.000 2.562 20	
MC52E305K	.562 1.812 20		MC52F305K	.750 1.562 20		MC52H305K	1.000 2.062 20		MC52J305K	1.000 2.687 18	
MC52E335K	.562 1.812 20		MC52F335K	.750 1.812 20		MC52H335K	1.000 2.312 20				
MC52E395K	.670 1.812 20		MC52F395K	.750 1.812 20		MC52H395K	1.000 2.562 20				
MC52E475K	.670 1.812 20		MC52F475K	.750 2.062 20							
MC52E505K	.750 1.562 20		MC52F505K	.750 2.062 20							
MC52E565K	.750 1.812 20		MC52F565K	.750 2.312 20							
MC52E685K	.750 2.062 20		MC52F685K	1.000 1.812 20							
MC52E825K	.750 2.312 20		MC52F825K	1.000 2.062 20							
MC52E106K	.750 2.625 20		MC52F106K	1.000 2.312 20							
MC52E126K	1.000 1.875 20		MC52F126K	1.000 2.563 18							
MC52E156K	1.000 2.125 20		MC52F156K	1.125 2.687 18							
MC52E186K	1.000 2.625 18		MC52F186K	1.250 2.687 18							
MC52E206K	1.000 2.875 18		MC52F206K	1.250 2.687 18							
MC52E226K	1.125 2.937 18		MC52F226K	1.250 2.937 18							
MC52E256K	1.250 2.687 18		MC52F256K	1.390 2.937 18							
MC52E276K	1.250 2.687 18		MC52F276K	1.390 2.937 18							
MC52E306K	1.250 2.937 18		MC52F306K	1.390 3.187 18							
MC52E336K	1.250 2.937 18		MC52F336K	1.390 3.187 18							
MC52E396K	1.390 2.937 18		MC52F396K	1.500 3.187 18							
MC52E476K	1.500 2.937 18										
MC52E506K	1.500 3.187 18										
MC52E566K	1.500 3.187 18										

A-C Voltage Rating:

(-55 C to +105 C Ambient)

D-C Voltage Rating		Equivalent VAC RMS Ratings at				
		400 Hz	800 Hz	1200 Hz	1600 Hz	2000 Hz
50	(0.33 μ F thru 5.6 μ F)	30	25	20	15	12
	(6.8 μ F thru 12.0 μ F)	25	20	15	12	10
	(15.0 μ F thru 40.0 μ F)	20	15	12	10	8
	(47.0 μ F thru 100.0 μ F)	10	8	6	5	4
75	(0.18 μ F thru 5.6 μ F)	50	35	30	25	20
	(6.8 μ F thru 12.0 μ F)	40	30	25	20	15
	(15.0 μ F thru 39.0 μ F)	30	20	18	15	12
	(47.0 μ F thru 100.0 μ F)	15	10	8	6	5
100	(0.15 μ F thru 5.6 μ F)	65	45	40	35	30
	(6.0 μ F thru 12.0 μ F)	45	35	30	25	20
	(15.0 μ F thru 39.0 μ F)	35	25	20	15	12
	(47.0 μ F thru 100.0 μ F)	18	12	8	6	5
150	(.10 μ F thru 3.3 μ F)	90	65	55	45	40
	(3.9 μ F thru 5.6 μ F)	80	55	45	40	35
	(6.8 μ F thru 12.0 μ F)	55	40	35	30	25
	(15.0 μ F thru 39.0 μ F)	45	30	20	15	12
	(47.0 μ F thru 100.0 μ F)	25	18	12	10	8
200	(.10 μ F thru 2.0 μ F)	120	95	80	70	60
	(2.2 μ F thru 5.6 μ F)	95	75	65	55	50
	(6.0 μ F thru 12.0 μ F)	65	45	35	30	25
	(15.0 μ F thru 39.0 μ F)	50	30	20	15	12
300	(.10 μ F thru 1.5 μ F)	200	140	115	100	90
	(1.8 μ F thru 3.9 μ F)	160	110	90	80	70
400	(.10 μ F thru 1.0 μ F)	240	170	140	120	110
	(1.2 μ F thru 2.7 μ F)	190	135	110	95	90

When ordering type MC capacitors the complete Electronic Concepts catalog number should always be used.

Catalog Numbering System

MC 5 2 B 104 K

Capacitance Tolerance: M=±20%, K=±10%, J=±5%, G=±2%, F=±1%.

Capacitance: Expressed in picofarads, the first two digits are significant figures. The third is the number of zeros. (e.g., 104 equals 100,000pF).

D.C. Voltage Rating: B=50, C=75, D=100, E=150, F=200, H=300, J=400.

Terminals: 2=Two, axial solid wire leads, section insulated from case, 4=two axial solid wire leads, section grounded to case.

Style: 5=Metal tube, hermetically sealed round; without insulating sleeve. 6=Metal tube, hermetically sealed round; with clear plastic insulating sleeve.

Type: Electronic Concepts' basic type - MC Metallized Polycarbonate dielectric for -55°C to +125°C operation.

Performance Characteristics

INTERNAL CONSTRUCTION

Extended foil winding (non-inductive) metalized polycarbonate

ENCLOSURE

Hermetically sealed in metal tubes with glass-to-metal solder-sealed terminals.

TERMINALS

Terminal leads are solid wire of tinned copper or tinned copper clad steel.

TERMINAL STRENGTH

There shall be no permanent damage to the terminals or seal when tested in accordance with method 211 of MIL-STD-202.

The following test conditions shall apply:

Test Condition "A"

Capacitors shall be clamped by one terminal and a pull test load of 5 pounds shall be applied to the other terminal.

Test Condition "C" - 5 Pounds.

SOLDERABILITY

Capacitors shall be tested in accordance with method 208 of MIL-STD-202 and shall conform to the solid-wire termination criteria thereof.

The following details shall apply:

- A. Number of terminations of each capacitor to be tested - 2.
- B. Depth of immersion in flux and solder - both terminals shall be immersed to within 0.125 inch of the capacitor body.

SEAL

When capacitors are tested in accordance with method 112 of MIL-STD-202 there shall be no repetitive bubbling.

The following details shall apply:

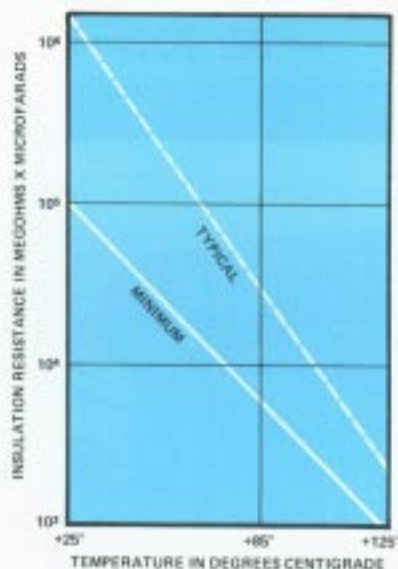
- A. Test-condition letter - D.
- B. Measurements after test - Not applicable.

ENVIRONMENTAL

Type MC capacitors shall meet or exceed the requirements of MIL-C-83421 for all the following:

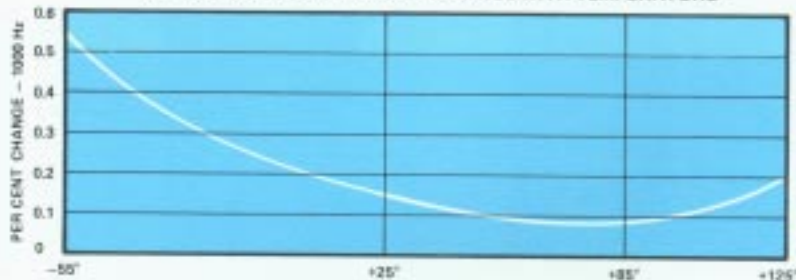
Thermal Aging	(Para. 3.7)
Thermal Shock	(Para. 3.8)
Vibration	(Para. 3.15)
Immersion	(Para. 3.17)
Shock	(Para. 3.19)
Moisture Resistance	(Para. 3.20)
Life	(Para. 3.27)

INSULATION RESISTANCE VS. TEMPERATURE

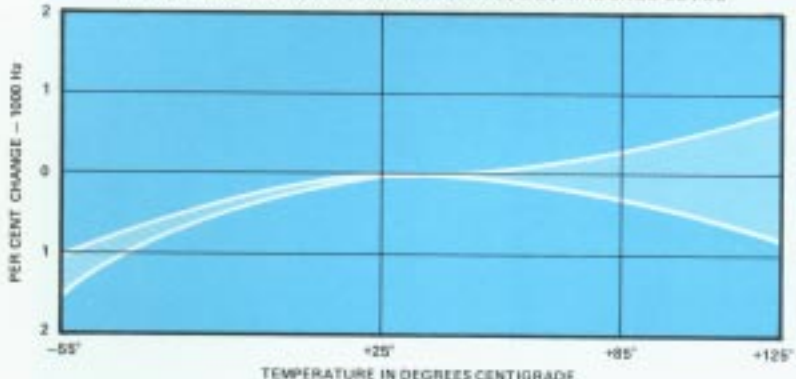


ELECTRICAL CHARACTERISTICS VS TEMPERATURE

TYPICAL DISSIPATION FACTOR CHANGE WITH TEMPERATURE



CAPACITANCE CHANGE ENVELOPE FOR 95% CONFIDENCE LEVEL



In the construction of the components described, the full intent of the specification will be met. Electronic Concepts, Inc., however, reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the design of its products. Components made under military approvals will be in accordance with the approval requirements.

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