

# Type CMR , High-Reliability, Mica Capacitors

## High-Reliability Dipped Capacitors/MIL-PRF-39001

Type CMR meets requirement of MIL-PRF-39001, Type CMR high-reliability dipped silvered mica capacitors are ideal for high-grade ground, airborne, and spaceborne devices, such as computers, jetcraft, and missiles.



## Specifications

- Voltage Range:** 50 Vdc to 500 Vdc
- Capacitance Range:** 1 pF to 91,000 pF
- Capacitance Tolerance:**  $\pm 1/2$  pF (D),  $\pm 1\%$  (F),  $\pm 2\%$  (G),  $\pm 5\%$  (J)
- Temperature Range:**  $-55$  °C to  $+125$  °C (O),  $-55$  °C to  $150$  °C (P)  
P temperature range available only for CMR04, CMR05, CMR06, CMR07, CMR08
- Reliability:** Meets Requirements of MIL-PRF-39001  
Established reliability to .01%/1,000 hours failure rate

## Ratings and Dimensions

Cap (pF)	Catalog Part Number	L in (mm)	H in (mm)	T in (mm)	S in (mm)	d in (mm)
<b>50 Vdc</b>						
22	CMR03E220DOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
24	CMR03E240DOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
27	CMR03E270JOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
30	CMR03E300JOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
33	CMR03E330JOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
36	CMR03E360JOYR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
39	CMR03E390JOYR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
43	CMR03E430JOYR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
47	CMR03E470JOYR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
51	CMR03E510JOYR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
56	CMR03E560JOYR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
62	CMR03E620JOYR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
68	CMR03E680JOYR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
75	CMR03E750JOYR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
82	CMR03E820JOYR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
91	CMR03F910JOYR	.270 (6.9)	.200 (5.1)	.130 (3.3)	.120 (3.0)	.016 (.4)
100	CMR03F101JOYR	.270 (6.9)	.200 (5.1)	.130 (3.3)	.120 (3.0)	.016 (.4)
110	CMR03F111JOYR	.270 (6.9)	.200 (5.1)	.130 (3.3)	.120 (3.0)	.016 (.4)
120	CMR03F121JOYR	.270 (6.9)	.200 (5.1)	.130 (3.3)	.120 (3.0)	.016 (.4)
130	CMR03F131JOYR	.270 (6.9)	.210 (5.3)	.130 (3.3)	.120 (3.0)	.016 (.4)

Cap (pF)	Catalog Part Number	L in (mm)	H in (mm)	T in (mm)	S in (mm)	d in (mm)
150	CMR03F151JOYR	.270 (6.9)	.210 (5.3)	.140 (3.6)	.120 (3.0)	.016 (.4)
160	CMR03F161JOYR	.270 (6.9)	.210 (5.3)	.140 (3.6)	.120 (3.0)	.016 (.4)
180	CMR03F181JOYR	.270 (6.9)	.210 (5.3)	.140 (3.6)	.120 (3.0)	.016 (.4)
200	CMR03F201JOYR	.270 (6.9)	.220 (5.6)	.150 (3.8)	.120 (3.0)	.016 (.4)
220	CMR03F221JOYR	.270 (6.9)	.220 (5.6)	.150 (3.8)	.120 (3.0)	.016 (.4)
240	CMR03F241JOYR	.270 (6.9)	.220 (5.6)	.160 (4.1)	.120 (3.0)	.016 (.4)
270	CMR03F271JOYR	.270 (6.9)	.230 (5.8)	.160 (4.1)	.120 (3.0)	.016 (.4)
300	CMR03F301JOYR	.270 (6.9)	.230 (5.8)	.170 (4.3)	.120 (3.0)	.016 (.4)
330	CMR03F331JOYR	.270 (6.9)	.240 (6.1)	.180 (4.6)	.120 (3.0)	.016 (.4)
360	CMR03F361JOYR	.270 (6.9)	.240 (6.1)	.180 (4.6)	.120 (3.0)	.016 (.4)
390	CMR03F391JOYR	.270 (6.9)	.250 (6.4)	.190 (4.8)	.120 (3.0)	.016 (.4)
400	CMR03F401JOYR	.270 (6.9)	.250 (6.4)	.190 (4.8)	.120 (3.0)	.016 (.4)
<b>100 Vdc</b>						
15	CMR03C150DOAR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
18	CMR03C180DOAR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
20	CMR03E200DOAR	.270 (6.9)	.190 (4.8)	.110 (2.8)	.120 (3.0)	.016 (.4)
22	CMR03E220DOAR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
24	CMR03E240DOAR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
27	CMR03E270JOAR	.270 (6.9)	.190 (4.8)	.120 (3.0)	.120 (3.0)	.016 (.4)
30	CMR03E300JOAR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)
33	CMR03E330JOAR	.270 (6.9)	.200 (5.1)	.120 (3.0)	.120 (3.0)	.016 (.4)



# Type CMR , High-Reliability, Mica Capacitors

Cap (pF)	Catalog Part Number	L in (mm)	H in (mm)	T in (mm)	S in (mm)	d in (mm)	Cap (pF)	Catalog Part Number	L in (mm)	H in (mm)	T in (mm)	S in (mm)	d in (mm)
27	CMR05E270.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	360	CMR05F361.JODR	.470 (11.9)	.400 (10.2)	.220 (5.6)	.225 (5.7)	.025 (.6)
30	CMR04E300.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	390	CMR05F391.JODR	.470 (11.9)	.400 (10.2)	.220 (5.6)	.225 (5.7)	.025 (.6)
30	CMR05E300.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	430	CMR06F431.JODR	.640 (16.3)	.510 (13.0)	.200 (5.1)	.350 (8.9)	.032 (.8)
33	CMR04E330.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	470	CMR06F471.JODR	.640 (16.3)	.510 (13.0)	.200 (5.1)	.350 (8.9)	.032 (.8)
33	CMR05E330.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	510	CMR06F511.JODR	.650 (16.5)	.510 (13.0)	.200 (5.1)	.350 (8.9)	.032 (.8)
36	CMR04E360.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	560	CMR06F561.JODR	.650 (16.5)	.510 (13.0)	.200 (5.1)	.350 (8.9)	.032 (.8)
36	CMR05E360.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	620	CMR06F621.JODR	.650 (16.5)	.510 (13.0)	.200 (5.1)	.350 (8.9)	.032 (.8)
39	CMR04E390.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	680	CMR06F681.JODR	.650 (16.5)	.510 (13.0)	.210 (5.3)	.350 (8.9)	.032 (.8)
39	CMR05E390.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	750	CMR06F751.JODR	.650 (16.5)	.510 (13.0)	.210 (5.3)	.350 (8.9)	.032 (.8)
43	CMR04E430.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	820	CMR06F821.JODR	.650 (16.5)	.510 (13.0)	.210 (5.3)	.350 (8.9)	.032 (.8)
43	CMR05E430.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	1000	CMR06F102.JODR	.650 (16.5)	.520 (13.2)	.220 (5.6)	.350 (8.9)	.032 (.8)
47	CMR04E470.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	1100	CMR06F112.JODR	.650 (16.5)	.520 (13.2)	.220 (5.6)	.350 (8.9)	.032 (.8)
47	CMR05E470.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	1200	CMR06F122.JODR	.660 (16.8)	.520 (13.2)	.220 (5.6)	.350 (8.9)	.032 (.8)
51	CMR04E510.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	1300	CMR06F132.JODR	.660 (16.8)	.520 (13.2)	.220 (5.6)	.350 (8.9)	.032 (.8)
51	CMR05E510.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	1500	CMR06F152.JODR	.660 (16.8)	.520 (13.2)	.230 (5.8)	.350 (8.9)	.032 (.8)
56	CMR04E560.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	1600	CMR06F162.JODR	.660 (16.8)	.530 (13.5)	.230 (5.8)	.350 (8.9)	.032 (.8)
56	CMR05E560.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	1800	CMR06F182.JODR	.670 (17.0)	.530 (13.5)	.240 (6.1)	.350 (8.9)	.032 (.8)
62	CMR04E620.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	2000	CMR06F202.JODR	.670 (17.0)	.530 (13.5)	.240 (6.1)	.350 (8.9)	.032 (.8)
62	CMR05E620.JODR	.450 (11.4)	.360 (9.1)	.170 (4.3)	.225 (5.7)	.025 (.6)	2200	CMR06F222.JODR	.670 (17.0)	.530 (13.5)	.250 (6.4)	.350 (8.9)	.032 (.8)
68	CMR04E680.JODR	.370 (9.4)	.340 (8.6)	.190 (4.8)	.150 (3.8)	.016 (.4)	2400	CMR06F242.JODR	.670 (17.0)	.540 (13.7)	.260 (6.6)	.350 (8.9)	.032 (.8)
68	CMR05E680.JODR	.450 (11.4)	.360 (9.1)	.180 (4.6)	.225 (5.7)	.025 (.6)	2700	CMR06F272.JODR	.680 (17.3)	.540 (13.7)	.270 (6.9)	.350 (8.9)	.032 (.8)
75	CMR04E750.JODR	.370 (9.4)	.340 (8.6)	.200 (5.1)	.150 (3.8)	.016 (.4)	3000	CMR06F302.JODR	.680 (17.3)	.550 (14.0)	.280 (7.1)	.350 (8.9)	.032 (.8)
75	CMR05E750.JODR	.450 (11.4)	.360 (9.1)	.180 (4.6)	.225 (5.7)	.025 (.6)	3300	CMR06F332.JODR	.680 (17.3)	.550 (14.0)	.290 (7.4)	.350 (8.9)	.032 (.8)
82	CMR04E820.JODR	.370 (9.4)	.350 (8.9)	.200 (5.1)	.150 (3.8)	.016 (.4)	3600	CMR06F362.JODR	.680 (17.3)	.560 (14.2)	.300 (7.6)	.350 (8.9)	.032 (.8)
82	CMR05E820.JODR	.450 (11.4)	.360 (9.1)	.180 (4.6)	.225 (5.7)	.025 (.6)	3900	CMR06F392.JODR	.690 (17.5)	.560 (14.2)	.310 (7.9)	.350 (8.9)	.032 (.8)
91	CMR04F910.JODR	.370 (9.4)	.350 (8.9)	.200 (5.1)	.150 (3.8)	.016 (.4)	4300	CMR06F432.JODR	.690 (17.5)	.570 (14.5)	.330 (8.4)	.350 (8.9)	.032 (.8)
91	CMR05F910.JODR	.460 (11.7)	.360 (9.1)	.180 (4.6)	.225 (5.7)	.025 (.6)	4700	CMR06F472.JODR	.700 (17.8)	.580 (14.7)	.350 (8.9)	.350 (8.9)	.032 (.8)
100	CMR04F101.JODR	.370 (9.4)	.350 (8.9)	.200 (5.1)	.150 (3.8)	.016 (.4)	5100	CMR07F512.JODR	.780 (19.8)	.860 (21.8)	.280 (7.1)	.425 (10.8)	.040 (1.0)
100	CMR05F101.JODR	.460 (11.7)	.360 (9.1)	.180 (4.6)	.225 (5.7)	.025 (.6)	5600	CMR07F562.JODR	.780 (19.8)	.870 (22.1)	.290 (7.4)	.425 (10.8)	.040 (1.0)
110	CMR04F111.JODR	.380 (9.7)	.350 (8.9)	.200 (5.1)	.150 (3.8)	.016 (.4)	6200	CMR07F622.JODR	.780 (19.8)	.870 (22.1)	.290 (7.4)	.425 (10.8)	.040 (1.0)
110	CMR05F111.JODR	.460 (11.7)	.370 (9.4)	.180 (4.6)	.225 (5.7)	.025 (.6)	6800	CMR07F682.JODR	.780 (19.8)	.870 (22.1)	.300 (7.6)	.425 (10.8)	.040 (1.0)
120	CMR04F121.JODR	.380 (9.7)	.350 (8.9)	.200 (5.1)	.150 (3.8)	.016 (.4)	7500	CMR07F752.JODR	.790 (20.1)	.880 (22.4)	.310 (7.9)	.425 (10.8)	.040 (1.0)
120	CMR05F121.JODR	.460 (11.7)	.370 (9.4)	.180 (4.6)	.225 (5.7)	.025 (.6)	8200	CMR07F822.JODR	.790 (20.1)	.880 (22.4)	.320 (8.1)	.425 (10.8)	.040 (1.0)
130	CMR04F131.JODR	.380 (9.7)	.360 (9.1)	.200 (5.1)	.150 (3.8)	.016 (.4)	9100	CMR07F912.JODR	.790 (20.1)	.880 (22.4)	.330 (8.4)	.425 (10.8)	.040 (1.0)
130	CMR05F131.JODR	.460 (11.7)	.370 (9.4)	.180 (4.6)	.225 (5.7)	.025 (.6)	10000	CMR07F103.JODR	.800 (20.3)	.890 (22.6)	.340 (8.6)	.425 (10.8)	.040 (1.0)
150	CMR04F151.JODR	.380 (9.7)	.360 (9.1)	.210 (5.3)	.150 (3.8)	.016 (.4)	11000	CMR07F113.JODR	.800 (20.3)	.890 (22.6)	.350 (8.9)	.425 (10.8)	.040 (1.0)
150	CMR05F151.JODR	.460 (11.7)	.370 (9.4)	.190 (4.8)	.225 (5.7)	.025 (.6)	12000	CMR07F123.JODR	.800 (20.3)	.890 (22.6)	.360 (9.1)	.425 (10.8)	.040 (1.0)
160	CMR04F161.JODR	.380 (9.7)	.360 (9.1)	.210 (5.3)	.150 (3.8)	.016 (.4)	13000	CMR07F133.JODR	.810 (20.6)	.890 (22.6)	.370 (9.4)	.425 (10.8)	.040 (1.0)
160	CMR05F161.JODR	.460 (11.7)	.370 (9.4)	.190 (4.8)	.225 (5.7)	.025 (.6)	15000	CMR07F153.JODR	.810 (20.6)	.900 (22.9)	.390 (9.9)	.425 (10.8)	.040 (1.0)
180	CMR04F181.JODR	.380 (9.7)	.370 (9.4)	.210 (5.3)	.150 (3.8)	.016 (.4)	16000	CMR07F163.JODR	.820 (20.8)	.900 (22.9)	.410 (10.4)	.425 (10.8)	.040 (1.0)
180	CMR05F181.JODR	.460 (11.7)	.370 (9.4)	.190 (4.8)	.225 (5.7)	.025 (.6)	18000	CMR07F183.JODR	.820 (20.8)	.910 (23.1)	.430 (10.9)	.425 (10.8)	.040 (1.0)
200	CMR04F201.JODR	.390 (9.9)	.380 (9.7)	.220 (5.6)	.150 (3.8)	.016 (.4)	22000	CMR08F223.JODR	1.42 (36.1)	.880 (22.4)	.310 (7.9)	1.05 (26.7)	.040 (1.02)
200	CMR05F201.JODR	.460 (11.7)	.380 (9.7)	.190 (4.8)	.225 (5.7)	.025 (.6)	24000	CMR08F243.JODR	1.43 (36.3)	.880 (22.4)	.320 (8.1)	1.05 (26.7)	.040 (1.02)
220	CMR04F221.JODR	.390 (9.9)	.380 (9.7)	.220 (5.6)	.150 (3.8)	.016 (.4)	27000	CMR08F273.JODR	1.43 (36.3)	.880 (22.4)	.330 (8.4)	1.05 (26.7)	.040 (1.02)
220	CMR05F221.JODR	.460 (11.7)	.380 (9.7)	.200 (5.1)	.225 (5.7)	.025 (.6)	30000	CMR08F303.JODR	1.44 (36.6)	.890 (22.6)	.350 (8.9)	1.05 (26.7)	.040 (1.02)
240	CMR04F241.JODR	.390 (9.9)	.380 (9.7)	.220 (5.6)	.150 (3.8)	.016 (.4)	33000	CMR08F333.JODR	1.44 (36.6)	.890 (22.6)	.360 (9.1)	1.05 (26.7)	.040 (1.02)
240	CMR05F241.JODR	.460 (11.7)	.380 (9.7)	.200 (5.1)	.225 (5.7)	.025 (.6)	36000	CMR08F363.JODR	1.45 (36.8)	.900 (22.9)	.380 (9.7)	1.05 (26.7)	.040 (1.02)
270	CMR05F271.JODR	.470 (11.9)	.390 (9.9)	.210 (5.3)	.225 (5.7)	.025 (.6)	39000	CMR08F393.JODR	1.45 (36.8)	.900 (22.9)	.400 (10.2)	1.05 (26.7)	.040 (1.02)
300	CMR05F301.JODR	.470 (11.9)	.390 (9.9)	.210 (5.3)	.225 (5.7)	.025 (.6)	43000	CMR08F433.JODR	1.46 (37.1)	.910 (23.1)	.420 (10.7)	1.05 (26.7)	.040 (1.02)
330	CMR05F331.JODR	.470 (11.9)	.390 (9.9)	.210 (5.3)	.225 (5.7)	.025 (.6)	47000	CMR08F473.JODR	1.47 (37.3)	.910 (23.1)	.450 (11.4)	1.05 (26.7)	.040 (1.02)
							51000	CMR08F513.JODR	1.48 (37.6)	.920 (23.3)	.470 (11.9)	1.05 (26.7)	.040 (1.02)

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## Specifications

**Capacitance** is within tolerance when measured at these frequencies:

- 1 - 1000 pF @ 1 MHz
- > 1000 pF @ 1 Khz

**Dissipation Factor** limits are below. Measure dissipation factor at 1 MHz when the capacitance is 1 pF to 1000 pF, and at 1 kHz when the capacitance is greater than 1000 pF. Dissipation factor is equal to  $DF = 2\pi fRC$ , where  $f$  is the test frequency,  $R$  is the equivalent series resistance, and  $C$  is the capacitance. For other capacitance values, see Figure 1.

Capacitance	Dissipation Factor
100-1000 pF	0.00075 max at 1 MHz
1100-3300 pF	0.0014 max at 1 kHz
3600-9100 pF	0.0013 max at 1 kHz
10,000 pF	0.0012 max at 1 kHz

**Quality Factor (Q)** is the reciprocal of dissipation factor.

**Insulation Resistance** for capacitance up to 10,000 pF is greater than 100 G. at 25 °C, greater than 10 G. at 125 °C, and greater than 5 G. at 150 °C. For other capacitance values and temperatures, see Figure 2.

**Withstanding Voltage** is two times the rated voltage, and can be applied up to 5 seconds without damage.

**Temperature Coefficient and Capacitance Drift** measure the capacitors'

capacitance at 25 °C, -55 °C, 25 °C, 125 °C (or 150 °C) and at 25 °C after stabilizing at each temperature. The capacitance will meet the limits of the Characteristic table shown in Ordering Information.

**Failure Rate:** Type CMR capacitors have specified failure rate levels ranging from 0.01% to 1.0% per 1000 hours. The failure rate level is established at 90% confidence level and is referred to operational life at full rated voltage at maximum rated temperature.

**High Voltage Stabilization:** We subject capacitors with Failure Levels M, P, and R to a burn-in at twice rated voltage, at rated temperature, for a minimum of 48 hours. Capacitors that show damage, arcing, breakdown, or low IR are removed. We reject the lot if more than 8% of the capacitors fail.

**Solderability:** After an 8-hour steam aging, coat leads with a rosin flux (R) and immerse in molten 245 °C  $\pm$  5 °C 60/40 tin/lead solder. Solder coverage will be no less than 95% when examined at 10X magnification.

**Life Test:** Subject the capacitors to maximum operating temperature (+125 °C or +150 °C) with 1.5 times rated voltage applied for 10,000 hours. Take readings and make visual observations every 2000 hours.

There will be no visual damage and the capacitors will meet the after-test limits on the following page.

**Resistance to Solvents:** Subject the capacitors to three cycles of 3 minute immersion in solvent, 10 strokes with bristle brush and, where applicable, ½ minute in vapor, per MIL-STD-202, Method 215. Repeat the three cycles for three solvent mixtures: Isopropyl alcohol mixture (Solvent 1), azeotrope mixture (Solvent 3), and water/propylene-glycol mixture (Solvent 4). The marking will not rub off or smear and there will be no visible damage to the capacitor body. Refer to MIL-STD-202 for details.

**Resistance to Soldering Heat:** Capacitors will meet the requirements of MIL-STD-202, Method 210 Test Condition G. Immerse capacitor leads to within .250 inches (6.4 mm) of the body in molten tin/lead solder (260 °C  $\pm$  5 °C) for 10  $\pm$  2 seconds. Allow to cool. Capacitors will meet the after-test limits on the following page.

**Marking** of capacitors conforms to method I of MIL-STD-1285, and includes the type designation, "JAN," brand, trademark, source code, date code, rated voltage, capacitance, capacitance tolerance, and the highest rated temperature. Small capacitors are marked with the letter "J".



Figure 1. DF vs. Capacitance



Figure 2. IR vs. Capacitance

# Type CMR , High-Reliability, Mica Capacitors

**Moisture Resistance:** Capacitors will meet the requirements of MIL-STD-202, Method 106F as outlined here and diagrammed on the right. Apply 100 V or the rated voltage (whichever is less) to half of the capacitors. Don't apply voltage to the other half. Refer to MIL-STD-202 for details.

1. Dry capacitors for 24 hours in a  $50 \pm 2^\circ\text{C}$  oven and then allow to stabilize at room temperature.
2. Subject the capacitors to 20 24-hour continuous cycles with relative humidity and temperature as shown.
3. 4 to 24 hours after completion of the last cycle the capacitors will show no visual damage and will meet the after-test limits below.



## After-Test Limits

Test	Withstand Voltage	Insulation Resistance	Capacitance Change (whichever is greater)	DF	Q
Moisture Resistance	IL	30 GΩ	NV±1% or ±1 pF	150% IL	2/3xIL
Life Test	IL	IL	NV±1% or ±1 pF	150% IL	2/3xIL
Solder Heat	IL	IL	IV±5% or ±5pF	IL	IL

IL=Initial Limit NV=Nominal Value IV=Initial Value

## Ordering Information

Order by complete part number, as below.  
For other options, write your requirements on your quote request.

## Part Numbering System

<b>CMR05</b>	<b>C</b>	<b>100</b>	<b>J</b>	<b>P</b>	<b>D</b>	<b>R</b>
<b>CDE Type</b>		<b>Capacitance</b>	<b>Capacitance Tolerance</b>	<b>Temperature Range</b>	<b>Voltage</b>	<b>Failure Rate</b>
122 = 1200pF		1R0 = 1.0pF 361 = 360pF F = ±1%	D = ±.5 pf G = ±2% J = ±5%	O = -55 °C to +125 °C P = -55 °C to +150 °C* C = 300 Vdc	Y = 50 Vdc A = 100 Vdc P = .1%/1000 hrs. D = 500 Vdc	M = 1.0%/1000 hrs. R = .01%/1000 hrs.
<b>Characteristic</b>						

	Temp. Coeff. ppm/°C	Capacitance Drift	Standard Cap. Range
<b>C</b>	-200 to +200	±(0.5% +0.1pF)	1 – 18 pF
<b>E</b>	-20 to +100	±(0.1% +0.1pF)	20 – 82 pF
<b>F</b>	-200 to + 70	±(0.05% +0.1pF)	91 pF and up

\*P temperature range available for CMR04, CMR05, CMR06, CMR07, CMR08

## Type CMR , High-Reliability, Mica Capacitors

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- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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