

PERFORMANCE SPECIFICATION SHEET

CAPACITOR, FIXED, ELECTROLYTIC (SOLID ELECTROLYTE), TANTALUM
(POLARIZED, SINTERED SLUG), ESTABLISHED RELIABILITY,
STYLE CSR09

FAILURE RATE LEVELS "M", "P", AND "R" ARE INACTIVE
FOR NEW DESIGN AFTER 2 FEBRUARY 1984.

FAILURE RATE LEVEL "S" IS INACTIVE
FOR NEW DESIGN AFTER 15 AUGUST 1984.

This specification sheet is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein
shall consist of this specification sheet and [MIL-PRF-39003](#).

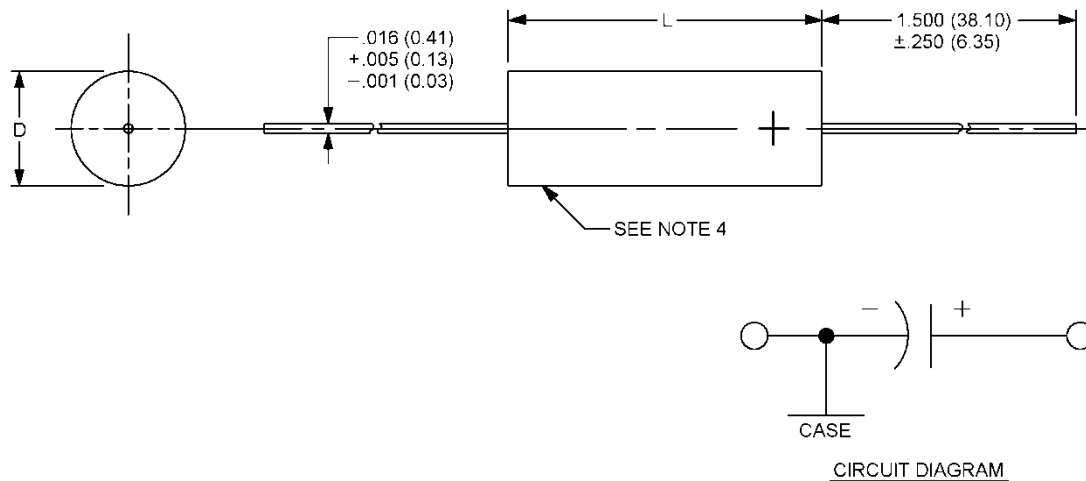


FIGURE 1. Dimensions and configuration.



Case size	Dimensions					
	L			D		
	Min	Nom	Max	Min	Nom	Max
A1	.235 (5.97)	.250 (6.35)	.281 (7.14)	.081 (2.06)	.090 (2.29)	.099 (2.51)
B1	.375 (9.52)	.390 (9.91)	.405 (10.29)	.128 (3.25)	.138 (3.51)	.148 (3.76)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents (in parentheses) are in millimeters and are given for general information only.
3. These capacitors are not intended to be mounted by their leads.
4. The case insulation shall extend .015 inch (0.38 mm) minimum beyond each end. However, when a shrink-fitted insulation is used, it shall lap over the ends of the capacitor body.
5. Lead length may be a minimum of 1 inch long for use in tape and reel automatic insertion equipment, when specified.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS

Dimensions and configuration: See [figure 1](#).

Case type: Tubular, insulated.

Material: Metal (alloy unspecified).

Type of seal: Hermetic.

Leads (gold-plated leads optional; see [MIL-PRF-39003](#) acquisition requirements):

Anode lead: Nickel-iron-alloy.

Cathode lead: Nickel-iron-alloy or nickel.

DC rated voltage: See [table I](#). Above +85°C voltage derating is required (see [MIL-PRF-39003](#)).

DC leakage (DCL): See [table I](#).

Capacitance (Cap.) (nom): See [table I](#).

Cap. tolerance: 5 or 10 percent, see [table I](#).

Dissipation factor (DF): See [table I](#).

Operating temperature: -55°C to +125°C.

Failure rate level: See [table I](#).

MIL-PRF-39003/2K

TABLE I. Style CSR09 characteristics and dash numbers.

DC rated voltage	Capaci- tance (nom)	Capaci- tance tolerance	DC leakage at			Dissipation factor at			Case size	Dash number M39003/02- 1/ Failure rate level for percent per 1000 hours							
			+25°C	+85°C	+125°C	-55°C	+25°C	+85°C +125°C		M (1.0)	P (0.1)	R (0.01)	S (0.001)	G (1.0)	B (0.1)	C (0.01)	D (0.001)
6	2.7	5	0.6	6	8	8	6	6	A1	1001-	1061-	1121-	1181-	5001-	2001-	3001-	4001-
6	2.7	10	0.6	6	8	8	6	6	A1	0001-	0061-	0121-	0181-	5002-	2002-	3002-	4002-
6	18	5	1.4	21.6	36.7	8	6	6	B1	1002-	1062-	1122-	1182-	5003-	2003-	3003-	4003-
6	18	10	1.4	21.6	36.7	8	6	6	B1	0002-	0062-	0122-	0182-	5004-	2004-	3004-	4004-
10	1.8	5	0.6	6	8	8	6	6	A1	1007-	1067-	1127-	1187-	5005-	2005-	3005-	4005-
10	1.8	10	0.6	6	8	8	6	6	A1	0007-	0067-	0127-	0187-	5006-	2006-	3006-	4006-
10	2.2	5	0.6	6	8	8	6	6	A1	1008-	1068-	1128-	1188-	5007-	2007-	3007-	4007-
10	2.2	10	0.6	6	8	8	6	6	A1	0008-	0068-	0128-	0188-	5008-	2008-	3008-	4008-
10	10	5	2.5	20	34	8	6	6	B1	1009-	1069-	1129-	1189-	5009-	2009-	3009-	4009-
10	10	10	2.5	20	34	8	6	6	B1	0009-	0069-	0129-	0189-	5010-	2010-	3010-	4010-
10	12	5	2.5	24	40.8	8	6	6	B1	1010-	1070-	1130-	1190-	5011-	2011-	3011-	4011-
10	12	10	2.5	24	40.8	8	6	6	B1	0010-	0070-	0130-	0190-	5012-	2012-	3012-	4012-
10	15	5	2.5	30	51	8	6	6	B1	1011-	1071-	1131-	1191-	5013-	2013-	3013-	4013-
10	15	10	2.5	30	51	8	6	6	B1	0011-	0071-	0131-	0191-	5014-	2014-	3014-	4014-
15	1	5	0.6	6	8	8	6	6	A1	1012-	1072-	1132-	1192-	5015-	2015-	3015-	4015-
15	1	10	0.6	6	8	8	6	6	A1	0012-	0072-	0132-	0192-	5016-	2016-	3016-	4016-
15	1.2	5	0.6	6	8	8	6	6	A1	1013-	1073-	1133-	1193-	5017-	2017-	3017-	4017-
15	1.2	10	0.6	6	8	8	6	6	A1	0013-	0073-	0133-	0193-	5018-	2018-	3018-	4018-
15	1.5	5	0.6	6	8	8	6	6	A1	1014-	1074-	1134-	1194-	5019-	2019-	3019-	4019-
15	1.5	10	0.6	6	8	8	6	6	A1	0014-	0074-	0134-	0194-	5020-	2020-	3020-	4020-
15	8.2	5	1.8	24.6	42	8	6	6	B1	1015-	1075-	1135-	1195-	5021-	2021-	3021-	4021-
15	8.2	10	1.8	24.6	42	8	6	6	B1	0015-	0075-	0135-	0195-	5022-	2022-	3022-	4022-
20	0.56	5	0.6	6	8	4	3	4	A1	1016-	1076-	1136-	1196-	5023-	2023-	3023-	4023-
20	0.56	10	0.6	6	8	4	3	4	A1	0016-	0076-	0136-	0196-	5024-	2024-	3024-	4024-
20	0.68	5	0.6	6	8	4	3	4	A1	1017-	1077-	1137-	1197-	5025-	2025-	3025-	4025-
20	0.68	10	0.6	6	8	4	3	4	A1	0017-	0077-	0137-	0197-	5026-	2026-	3026-	4026-
20	0.82	5	0.6	6	8	4	3	4	A1	1018-	1078-	1138-	1198-	5027-	2027-	3027-	4027-
20	0.82	10	0.6	6	8	4	3	4	A1	0018-	0078-	0138-	0198-	5028-	2028-	3028-	4028-
20	1	5	0.6	6	8	4	3	4	A1	1019-	1079-	1139-	1199-	5029-	2029-	3029-	4029-
20	1	10	0.6	6	8	4	3	4	A1	0019-	0079-	0139-	0199-	5030-	2030-	3030-	4030-
20	3.3	5	1	13.2	22.4	4	3	4	B1	1020-	1080-	1140-	1200-	5031-	2031-	3031-	4031-
20	3.3	10	1	13.2	22.4	4	3	4	B1	0020-	0080-	0140-	0200-	5032-	2032-	3032-	4032-
20	3.9	5	2	15.6	26.5	4	3	4	B1	1021-	1081-	1141-	1201-	5033-	2033-	3033-	4033-
20	3.9	10	2	15.6	26.5	4	3	4	B1	0021-	0081-	0141-	0201-	5034-	2034-	3034-	4034-
20	4.7	5	2	18.8	32	4	3	4	B1	1022-	1082-	1142-	1202-	5035-	2035-	3035-	4035-
20	4.7	10	2	18.8	32	4	3	4	B1	0022-	0082-	0142-	0202-	5036-	2036-	3036-	4036-
20	5.6	5	2	22.4	38.1	4	3	4	B1	1023-	1083-	1143-	1203-	5037-	2037-	3037-	4037-
20	5.6	10	2	22.4	38.1	4	3	4	B1	0023-	0083-	0143-	0203-	5038-	2038-	3038-	4038-
20	6.8	5	2	27.2	46.2	4	3	4	B1	1024-	1084-	1144-	1204-	5039-	2039-	3039-	4039-
20	6.8	10	2	27.2	46.2	4	3	4	B1	0024-	0084-	0144-	0204-	5040-	2040-	3040-	4040-
35	0.33	5	0.6	6	8	4	3	4	A1	1025-	1085-	1145-	1205-	5041-	2041-	3041-	4041-
35	0.33	10	0.6	6	8	4	3	4	A1	0025-	0085-	0145-	0205-	5042-	2042-	3042-	4042-
35	0.39	5	0.6	6	8	4	3	4	A1	1026-	1086-	1146-	1206-	5043-	2043-	3043-	4043-
35	0.39	10	0.6	6	8	4	3	4	A1	0026-	0086-	0146-	0206-	5044-	2044-	3044-	4044-
35	0.47	5	0.6	6	8	4	3	4	A1	1027-	1087-	1147-	1207-	5045-	2045-	3045-	4045-
35	0.47	10	0.6	6	8	4	3	4	A1	0027-	0087-	0147-	0207-	5046-	2046-	3046-	4046-
35	2.2	5	1.4	15.4	26.2	4	3	4	B1	1028-	1088-	1148-	1208-	5047-	2047-	3047-	4047-
35	2.2	10	1.4	15.4	26.2	4	3	4	B1	0028-	0088-	0148-	0208-	5048-	2048-	3048-	4048-
35	2.7	5	1.4	18.9	32.1	4	3	4	B1	1029-	1089-	1149-	1209-	5049-	2049-	3049-	4049-
35	2.7	10	1.4	18.9	32.1	4	3	4	B1	0029-	0089-	0149-	0209-	5050-	2050-	3050-	4050-
50	0.22	5	0.6	6	8	4	3	4	A1	1030-	1090-	1150-	1210-	5051-	2051-	3051-	4051-
50	0.22	10	0.6	6	8	4	3	4	A1	0030-	0090-	0150-	0210-	5052-	2052-	3052-	4052-
50	0.27	5	0.6	6	8	4	3	4	A1	1031-	1091-	1151-	1211-	5053-	2053-	3053-	4053-
50	0.27	10	0.6	6	8	4	3	4	A1	0031-	0091-	0151-	0211-	5054-	2054-	3054-	4054-

See footnote at end of table.

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TABLE I. Style CSR09 characteristics and dash numbers - Continued.

DC rated voltage	Capaci- tance (nom)	Capaci- tance tolerance	DC leakage at			Dissipation factor at			Case size	Dash number M39003/02- ^{1/} Failure rate level for percent per 1000 hours							
			+25°C	+85°C	+125°C	-55°C	+25°C	+85°C +125°C		M (1.0)	P (0.1)	R (0.01)	S (0.001)	G (1.0)	B (0.1)	C (0.01)	D (0.001)
50	1.5	5	1.4	15	25.5	4	3	4	B1	1032-	1092-	1152-	1212-	5055-	2055-	3055-	4055-
50	1.5	10	1.4	15	25.5	4	3	4	B1	0032-	0092-	0152-	0212-	5056-	2056-	3056-	4056-
50	1.8	5	1.4	18	30.6	4	3	4	B1	1033-	1093-	1153-	1213-	5057-	2057-	3057-	4057-
50	1.8	10	1.4	18	30.6	4	3	4	B1	0033-	0093-	0153-	0213-	5058-	2058-	3058-	4058-
75	0.047	5	0.6	6	8	4	3	4	A1	1034-	1094-	1154-	1214-	5059-	2059-	3059-	4059-
75	0.047	10	0.6	6	8	4	3	4	A1	0034-	0094-	0154-	0214-	5060-	2060-	3060-	4060-
75	0.056	5	0.6	6	8	4	3	4	A1	1035-	1095-	1155-	1215-	5061-	2061-	3061-	4061-
75	0.056	10	0.6	6	8	4	3	4	A1	0035-	0095-	0155-	0215-	5062-	2062-	3062-	4062-
75	0.068	5	0.6	6	8	4	3	4	A1	1036-	1096-	1156-	1216-	5063-	2063-	3063-	4063-
75	0.068	10	0.6	6	8	4	3	4	A1	0036-	0096-	0156-	0216-	5064-	2064-	3064-	4064-
75	0.082	5	0.6	6	8	4	3	4	A1	1037-	1097-	1157-	1217-	5065-	2065-	3065-	4065-
75	0.082	10	0.6	6	8	4	3	4	A1	0037-	0097-	0157-	0217-	5066-	2066-	3066-	4066-
75	0.1	5	0.6	6	8	4	3	4	A1	1038-	1098-	1158-	1218-	5067-	2067-	3067-	4067-
75	0.1	10	0.6	6	8	4	3	4	A1	0038-	0098-	0158-	0218-	5068-	2068-	3068-	4068-
75	0.12	5	0.6	6	8	4	3	4	A1	1039-	1099-	1159-	1219-	5069-	2069-	3069-	4069-
75	0.12	10	0.6	6	8	4	3	4	A1	0039-	0099-	0159-	0219-	5070-	2070-	3070-	4070-
75	0.15	5	0.6	6	8	4	3	4	A1	1040-	1100-	1160-	1220-	5071-	2071-	3071-	4071-
75	0.15	10	0.6	6	8	4	3	4	A1	0040-	0100-	0160-	0220-	5072-	2072-	3072-	4072-
75	0.18	5	0.6	6	8	4	3	4	A1	1041-	1101-	1161-	1221-	5073-	2073-	3073-	4073-
75	0.18	10	0.6	6	8	4	3	4	A1	0041-	0101-	0161-	0221-	5074-	2074-	3074-	4074-
75	0.22	5	0.6	6	8	4	3	4	B1	1042-	1102-	1162-	1222-	5075-	2075-	3075-	4075-
75	0.22	10	0.6	6	8	4	3	4	B1	0042-	0102-	0162-	0222-	5076-	2076-	3076-	4076-
75	0.27	5	0.6	6	8	4	3	4	B1	1043-	1103-	1163-	1223-	5077-	2077-	3077-	4077-
75	0.27	10	0.6	6	8	4	3	4	B1	0043-	0103-	0163-	0223-	5078-	2078-	3078-	4078-
75	0.33	5	0.6	6	8.4	4	3	4	B1	1044-	1104-	1164-	1224-	5079-	2079-	3079-	4079-
75	0.33	10	0.6	6	8.4	4	3	4	B1	0044-	0104-	0164-	0224-	5080-	2080-	3080-	4080-
75	0.39	5	0.6	6	9.9	4	3	4	B1	1045-	1105-	1165-	1225-	5081-	2081-	3081-	4081-
75	0.39	10	0.6	6	9.9	4	3	4	B1	0045-	0105-	0165-	0225-	5082-	2082-	3082-	4082-
75	0.47	5	0.6	7	12	4	3	4	B1	1046-	1106-	1166-	1226-	5083-	2083-	3083-	4083-
75	0.47	10	0.6	7	12	4	3	4	B1	0046-	0106-	0166-	0226-	5084-	2084-	3084-	4084-
75	0.56	5	0.6	8.4	14.3	4	3	4	B1	1047-	1107-	1167-	1227-	5085-	2085-	3085-	4085-
75	0.56	10	0.6	8.4	14.3	4	3	4	B1	0047-	0107-	0167-	0227-	5086-	2086-	3086-	4086-
75	0.68	5	0.6	10.2	17.3	4	3	4	B1	1048-	1108-	1168-	1228-	5087-	2087-	3087-	4087-
75	0.68	10	0.6	10.2	17.3	4	3	4	B1	0048-	0108-	0168-	0228-	5088-	2088-	3088-	4088-
75	0.82	5	0.7	12.3	20.9	4	3	4	B1	1049-	1109-	1169-	1229-	5089-	2089-	3089-	4089-
75	0.82	10	0.7	12.3	20.9	4	3	4	B1	0049-	0109-	0169-	0229-	5090-	2090-	3090-	4090-
75	1	5	0.9	15	25.5	4	3	4	B1	1050-	1110-	1170-	1230-	5091-	2091-	3091-	4091-
75	1	10	0.9	15	25.5	4	3	4	B1	0050-	0110-	0170-	0230-	5092-	2092-	3092-	4092-
75	1.2	5	0.9	18	30.6	4	3	4	B1	1051-	1111-	1171-	1231-	5093-	2093-	3093-	4093-
75	1.2	10	0.9	18	30.6	4	3	4	B1	0051-	0111-	0171-	0231-	5094-	2094-	3094-	4094-

^{1/} Dash number shall include a letter that indicates user preference for surge current/high temperature solder or the dash will be deleted.

Stability at low and high temperatures: In accordance with [MIL-PRF-39003](#).

Step 1 (+25°C):

DCL: See [table I](#).

Capacitance: Within tolerance of [table I](#) value.

DF: See [table I](#).

Step 2 (-55°C):

Capacitance: Shall not change more than ± 8 percent of step 1 measured value.

DF: See [table I](#).

Step 3 (+25°C):

DCL: See [table I](#).

Capacitance: Shall not change more than ± 2 percent of step 1 measured value.

DF: See [table I](#).

Step 4 (+85°C):

DCL: See [table I](#).

Capacitance: Shall not change more than ± 8 percent of step 1 measured value (6, 10, and 15 volt units).

Capacitance: Shall not change more than ± 6 percent of step 1 measured value (20 volts and higher).

DF: See [table I](#).

Step 5 (+125°C):

DCL: See [table I](#).

Capacitance: Shall not change more than ± 12 percent of step 1 measured value.

DF: See [table I](#).

Step 6 (+25°C):

DCL: See [table I](#).

Capacitance: Shall not change more than ± 2 percent of step 1 measured value.

DF: See [table I](#).

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Surge voltage: In accordance with [MIL-PRF-39003](#).

DCL: See [table I](#).

Capacitance: Shall not change more than ± 2 percent from initial measured value.

DF: See [table I](#).

Life: [MIL-STD-202-108](#).

240, 1,000, and 2,000 hours.

At +25°C (as applicable).

DCL: See [table I](#).

Capacitance: Not greater than ± 5 percent of initial measured value.

DF: See [table I](#).

At +85°C:

DCL: See [table I](#).

At +125°C:

DCL: See [table I](#).

4,000, 6,000, 8,000, and 10,000 hours (exponential only):

At +25°C (as applicable):

DCL: 200 percent of initial limit.

Capacitance: Not greater than ± 10 percent of initial measured value.

DF: See [table I](#).

At +85°C:

DCL: 200 percent of initial limit.

At +125°C:

DCL: 200 percent of initial limit.

Marking: In accordance with [MIL-PRF-39003](#).

Part or Identifying Number (PIN): M39003/02-(dash number from [table I](#)).

Substitutability data: Substitutability for failure rate levels and capacitance tolerances shall be in accordance with [MIL-PRF-39003](#).

Reference documents. In addition to [MIL-PRF-39003](#), this specification sheet references the following documents:

[MIL-STD-202-108](#)

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where modifications from this revision were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodians:

Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity
DLA - CC

(Project 5910-2022-015)

Review activities

Navy - AS, MC, OS, SH
Air Force - 19

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.