

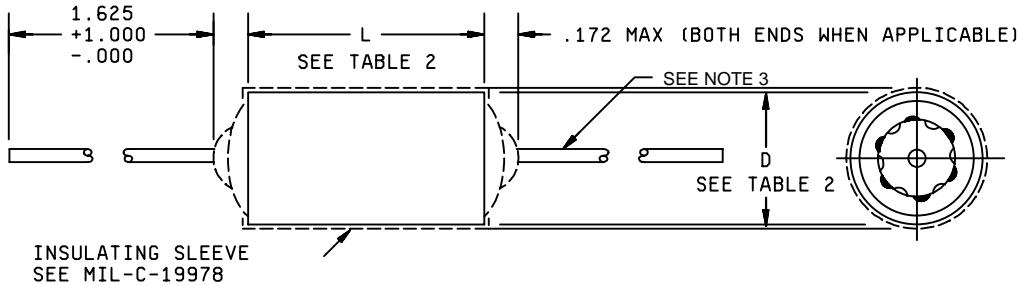
INCH-POUND
MIL-PRF-19978/8A
27 May 1999
SUPERSEDING
MIL-C-19978/8
20 October 1972

PERFORMANCE SPECIFICATION SHEET

CAPACITORS, FIXED, PLASTIC DIELECTRIC, AXIAL-WIRE TERMINAL, TUBULAR (INSULATED) (HERMETICALLY SEALED IN METAL CASES), ESTABLISHED RELIABILITY, STYLE CQR07

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

The complete requirements for procuring the capacitors described herein
shall consist of this specification and MIL-PRF-19978.



Inches	mm	Inches	mm
.001	.03	.235	5.97
.004	.10	.312	7.92
.020	.51	.400	10.16
.025	.64	.562	14.27
.032	.81	1.000	25.40
.172	4.37	1.562	39.67
.175	4.45	1.625	41.28
.195	4.95		

NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only.
- Leads shall be tinned solid wire, .020 (No. 24 AWG) for cases .175 and .195 in diameter; .025 (No. 22 AWG) for cases .235 through .312 diameter; and .032 (No. 20 AWG) for cases .400 diameter and above. Tolerance on all lead wire diameters shall be +.004, -.001.
- Capacitors with dimension L of 1.562 or D of .562 and larger, are not intended to be supported by their leads. These capacitors shall be supported with a supplementary means of mounting, such as a wrap-around band. The supporting device will not be supplied with the capacitor.
- Lead length may be a minimum of 1-inch long for use in tape and reel packaging when specified in the ordering data.

FIGURE 1. Style CQR07 capacitors.

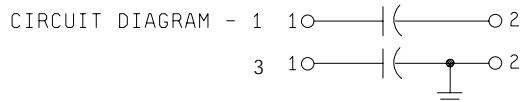
REQUIREMENTS:

Design and construction:

Dimensions and configuration - See figure 1 and table II.

Case material - Nonmagnetic (end seal may be of magnetic material).

Terminals - Axial-wire lead (see figure 1).



Rated voltage - See table II.

Rated temperature - -55° to +125°C.

Capacitance (Cap.) (nom) - See table II.

Capacitance tolerance - See table II.

Dissipation factor (DF) (max) - 0.15 percent.

Failure rate level - In accordance with MIL-PRF-19978.

Reliability - In accordance with MIL-PRF-19978.

Burn-in: In accordance with MIL-PRF-19978.

Radiographic inspection: In accordance with MIL-PRF-19978.

Seal: Method 112 of MIL-STD-202, test condition letter A.

Dielectric withstanding voltage (DWV):

Sleeving - In accordance with MIL-PRF-19978.

Barometric pressure: In accordance with MIL-PRF-19978.

Test points:

Circuit diagram 1 - Between terminals and case.

Circuit diagram 3 - Between ungrounded terminal and case.

Insulation resistance (IR):

Sleeving - In accordance with MIL-PRF-19978.

Terminal to terminal - See table I.

TABLE I. Terminal-to-terminal insulation resistance.

Capacitance rating <u>Characteristic Q</u>	Minimum insulation resistance
0 to 0.5 microfarad	<u>At 25°C</u> 150,000 megohms
Greater than 0.5 microfarad	75,000 megohm-microfarads <u>1/</u>
0 to 0.1 microfarad	<u>At 125°C</u> 5,000 megohms
Greater than 0.1 microfarad	500 megohm-microfarads <u>1/</u>

1/ Product obtained by multiplying the capacitance in microfarads by the insulation resistance in megohms.

Vibration, high frequency: Method 204 of MIL-STD-202, test condition B, with the following exception:

Direction and duration of motion - 4 hours in each of two mutually perpendicular direction (total of 8 hours), one parallel and the other perpendicular to the cylindrical axis.

Salt spray: In accordance with MIL-PRF-19978.

Immersion:

DWV:

Sleeving - In accordance with MIL-PRF-19978.

IR:

Sleeving - In accordance with MIL-PRF-19978.

Solderability: In accordance with MIL-PRF-19978.

Terminal strength: Method 211 of MIL-STD-202, test condition letter D.

Moisture resistance:

DWV:

Sleeving - In accordance with MIL-PRF-19978.

IR:

Sleeving - In accordance with MIL-PRF-19978.

Dielectric absorption (not applicable to values of 0.01 μ F or less) (max): 0.04 percent.

Stability at low and high temperatures:

Low temperature:

Test temperature - -55°C +0°C, -5°C.

Capacitance change (max) - \pm 2.5 percent.

High temperature:

Test temperature - +125°C +0°C, -5°C.

Capacitance change (max) - +1 percent, -4 percent.

Life:

Capacitance change (max) - +2 percent, -1 percent.

Resistance to soldering heat: In accordance with MIL-PRF-19978.

TABLE II. STYLES CQR07 capacitors.

Part number <u>1/</u>	DC voltage rating (Volts)	Capacitance rating (μF)	Capacitance tolerance	Failure rate level	Dimensions <u>2/</u>			
					Circuit 1		Circuit 2	
					L $\pm .031$	D +.015, -.005	L $\pm .031$	D +.015, -.005
CQR07A-QA392-3-	50	.0039	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QA472-3-	50	.0047	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QA562-3-	50	.0056	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QA682-3-	50	.0068	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QA393-3-	50	.039	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QA473-3-	50	.047	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QA563-3-	50	.056	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QA683-3-	50	.068	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QA823-3-	50	.082	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QA104-3-	50	.1	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QA124-3-	50	.12	J, K	M, P, R, S	1.375	.400	1.312	.400
CQR07A-QA154-3-	50	.15	J, K	M, P, R, S	1.375	.400	1.312	.400
CQR07A-QA184-3-	50	.18	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QA224-3-	50	.22	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QA274-3-	50	.27	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QA334-3-	50	.33	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QA394-3-	50	.39	J, K	M, P, R, S	1.875	.562	1.812	.562
CQR07A-QA474-3-	50	.47	J, K	M, P, R, S	1.875	.562	1.812	.562
CQR07A-QA564-3-	50	.56	J, K	M, P, R, S	1.875	.670	1.812	.670
CQR07A-QA684-3-	50	.68	J, K	M, P, R, S	1.875	.670	1.812	.670
CQR07A-QA824-3-	50	.82	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QA105-3-	50	1.0	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QB222-3-	100	.0022	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QB272-3-	100	.0027	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QB332-3-	100	.0033	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QB392-3-	100	.0039	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QB472-3-	100	.0047	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QB562-3-	100	.0056	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QB682-3-	100	.0068	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QB822-3-	100	.0082	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QB103-3-	100	.01	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QB183-3-	100	.018	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QB223-3-	100	.022	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QB273-3-	100	.027	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QB333-3-	100	.033	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QB393-3-	100	.039	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QB473-3-	100	.047	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QB563-3-	100	.056	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QB683-3-	100	.068	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QB823-3-	100	.082	J, K	M, P, R, S	1.125	.400	1.062	.400

See footnotes at end of table

TABLE II. STYLES CQR07 capacitors - Continued.

Part number <u>1/</u>	DC voltage rating (Volts)	Capacitance rating (μF)	Capacitance tolerance	Failure rate level	Dimensions <u>2/</u>			
					Circuit 1		Circuit 2	
					L $\pm .031$	D $+.015, -.005$	L $\pm .031$	D $+.015, -.005$
CQR07A-QB104-3-	100	.1	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QB124-3-	100	.12	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QB154-3-	100	.15	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QB184-3-	100	.18	J, K	M, P, R, S	1.625	.562	1.562	.562
CQR07A-QB224-3-	100	.22	J, K	M, P, R, S	1.625	.562	1.562	.562
CQR07A-QB274-3-	100	.27	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QB334-3-	100	.33	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QB394-3-	100	.39	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QB474-3-	100	.47	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QB564-3-	100	.56	J, K	M, P, R, S	2.375	.750	2.312	.750
CQR07A-QB684-3-	100	.68	J, K	M, P, R, S	2.375	.750	2.312	.750
CQR07A-QB824-3-	100	.82	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QB105-3-	100	1.0	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QC102-3-	200	.001	J, K	M, P, R, S	.750	.175	.688	.175
CQR07A-QC122-3-	200	.0012	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QC152-3-	200	.0015	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QC182-3-	200	.0018	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QC222-3-	200	.0022	J, K	M, P, R, S	.750	.195	.688	.195
CQR07A-QC272-3-	200	.0027	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QC332-3-	200	.0033	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QC822-3-	200	.082	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QC103-3-	200	.01	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QC123-3-	200	.012	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QC153-3-	200	.015	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QC183-3-	200	.018	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QC223-3-	200	.022	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QC273-3-	200	.027	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QC333-3-	200	.033	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QC393-3-	200	.039	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QC473-3-	200	.047	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QC563-3-	200	.056	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QC683-3-	200	.068	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QC823-3-	200	.082	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QC104-3-	200	.1	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QC124-3-	200	.12	J, K	M, P, R, S	1.875	.562	1.812	.562
CQR07A-QC154-3-	200	.15	J, K	M, P, R, S	1.875	.562	1.812	.562
CQR07A-QC184-3-	200	.18	J, K	M, P, R, S	1.875	.670	1.812	.670
CQR07A-QC224-3-	200	.22	J, K	M, P, R, S	1.875	.670	1.812	.670
CQR07A-QC274-3-	200	.27	J, K	M, P, R, S	2.125	.750	2.062	.750
CQR07A-QC334-3-	200	.33	J, K	M, P, R, S	2.125	.750	2.062	.750
CQR07A-QC394-3-	200	.39	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QC474-3-	200	.47	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QC564-3-	200	.56	J, K	M, P, R, S	2.125	1.000	2.062	1.000
CQR07A-QC684-3-	200	.68	J, K	M, P, R, S	2.125	1.000	2.062	1.000
CQR07A-QE122-3-	400	.0012	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QE152-3-	400	.0015	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QE392-3-	400	.0039	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QE472-3-	400	.0047	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QE562-3-	400	.0056	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QE682-3-	400	.0068	J, K	M, P, R, S	.875	.312	.812	.312

See footnotes at end of table

TABLE II. STYLES CQR07 capacitors - Continued.

Part number <u>1/</u>	DC voltage rating (Volts)	Capacitance rating (μF)	Capacitance tolerance	Failure rate level	Dimensions <u>2/</u>			
					Circuit 1		Circuit 2	
					L $\pm .031$	D $+0.015, -0.005$	L $\pm .031$	D $+0.015, -0.005$
CQR07A-QE822-3-	400	.082	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QE103-3-	400	.01	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QE123-3-	400	.012	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QE153-3-	400	.015	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QE183-3-	400	.018	J, K	M, P, R, S	1.375	.400	1.312	.400
CQR07A-QE223-3-	400	.022	J, K	M, P, R, S	1.375	.400	1.312	.400
CQR07A-QE273-3-	400	.027	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QE333-3-	400	.033	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QE393-3-	400	.039	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QE473-3-	400	.047	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QE563-3-	400	.056	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QE683-3-	400	.068	J, K°	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QE823-3-	400	.082	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QE104-3-	400	.1	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QE124-3-	400	.12	J, K	M, P, R, S	2.125	.750	2.062	.750
CQR07A-QE154-3-	400	.15	J, K	M, P, R, S	2.125	.750	2.062	.750
CQR07A-QE184-3-	400	.18	J, K	M, P, R, S	2.625	.750	2.562	.750
CQR07A-QE224-3-	400	.22	J, K	M, P, R, S	2.625	.750	2.562	.750
CQR07A-QE274-3-	400	.27	J, K	M, P, R, S	2.125	1.000	2.062	1.000
CQR07A-QE334-3-	400	.33	J, K	M, P, R, S	2.125	1.000	2.062	1.000
CQR07A-QE394-3-	400	.39	J, K	M, P, R, S	2.625	1.000	2.562	1.000
CQR07A-QE474-3-	400	.47	J, K	M, P, R, S	2.625	1.000	2.562	1.000
CQR07A-QF102-3-	600	.001	J, K	M, P, R, S	.750	.235	.688	.235
CQR07A-QF122-3-	600	.0012	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF152-3-	600	.0015	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF182-3-	600	.0018	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF222-3-	600	.0022	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF272-3-	600	.0027	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF332-3-	600	.0033	J, K	M, P, R, S	.875	.312	.812	.312
CQR07A-QF392-3-	600	.0039	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QF472-3-	600	.0047	J, K	M, P, R, S	.875	.400	.812	.400
CQR07A-QF562-3-	600	.0056	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QF682-3-	600	.0068	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QF822-3-	600	.0082	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QF103-3-	600	.01	J, K	M, P, R, S	1.125	.400	1.062	.400
CQR07A-QF123-3-	600	.012	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QF153-3-	600	.015	J, K	M, P, R, S	1.125	.500	1.062	.500
CQR07A-QF183-3-	600	.018	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QF223-3-	600	.022	J, K	M, P, R, S	1.125	.562	1.062	.562
CQR07A-QF273-3-	600	.027	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QF333-3-	600	.033	J, K	M, P, R, S	1.375	.562	1.312	.562
CQR07A-QF393-3-	600	.039	J, K	M, P, R, S	1.625	.562	1.562	.562
CQR07A-QF473-3-	600	.047	J, K	M, P, R, S	1.625	.562	1.562	.562
CQR07A-QF563-3-	600	.056	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QF683-3-	600	.068	J, K	M, P, R, S	1.625	.670	1.562	.670
CQR07A-QF823-3-	600	.082	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QF104-3-	600	.1	J, K	M, P, R, S	1.875	.750	1.812	.750
CQR07A-QF124-3-	600	.12	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QF154-3-	600	.15	J, K	M, P, R, S	1.875	1.000	1.812	1.000
CQR07A-QF184-3-	600	.18	J, K	M, P, R, S	2.625	1.000	2.562	1.000

See footnotes at end of table

TABLE II. STYLES CQR07 capacitors - Continued.

Part number <u>1/</u>	DC voltage rating (Volts)	Capacitance rating (μF)	Capacitance tolerance	Failure rate level	Dimensions <u>2/</u>			
					Circuit 1		Circuit 2	
					L $\pm .031$	D +.015, -.005	L $\pm .031$	D +.015, -.005
CQR07A-QF224-3-	600	.22	J, K	M, P, R, S	2.625	1.000	2.562	1.000

- 1/ Complete part number shall include additional symbols to indicate circuit symbol, capacitance tolerance and failure rate level, as applicable.
2/ Dimensions are for basic case; sleeving shall extend 0.016 inch minimum and 0.062 inch maximum, beyond each end of the capacitor body; however, if a shrink-fitted insulation is used for the sleeving, it shall lap over the ends of the capacitor body. Add 0.047 inch maximum to the nominal for capacitance diameter.

TABLE III. Multimeter equivalent of decimal inches.

Inches	mm	Inches	mm
0.005	0.13	0.812	20.62
0.015	0.38	0.875	22.23
0.016	0.41	1.000	25.40
0.031	0.79	1.062	26.97
0.047	1.19	1.125	28.58
0.062	1.57	1.312	33.32
0.175	4.45	1.375	34.93
0.188	4.78	1.562	39.67
0.195	4.95	1.625	41.28
0.235	5.97	1.812	46.02
0.312	7.92	1.875	47.63
0.400	10.16	2.062	52.37
0.500	12.70	2.125	53.98
0.562	14.27	2.312	58.72
0.670	17.02	2.375	60.33
0.688	17.48	2.562	65.07
0.750	19.05	2.625	66.68

Custodians:

Army - CR
 Navy - EC
 Air Force - 11
 DLA - CC

Preparing activity:
 DLA - CC

(Project 5910-2016-05)

Review activities:

Navy - MC
 Air Force - 19, 99