

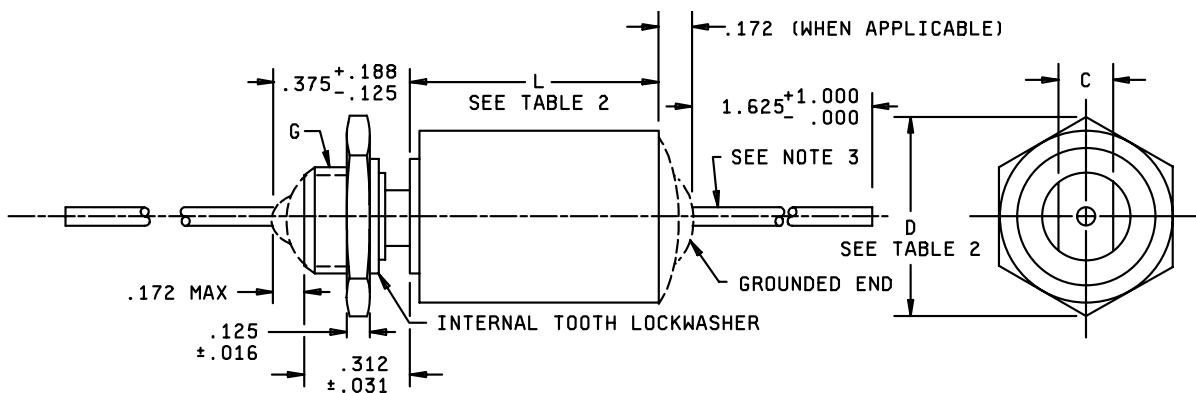
INCH-POUND
MIL-PRF-19978/11B
6 September 2002
SUPERSEDING
MIL-PRF-19978/11A
27 May 1999

PERFORMANCE SPECIFICATION SHEET

CAPACITORS, FIXED, PLASTIC (OR PAPER-PLASTIC) DIELECTRIC, AXIAL-WIRE
THREADED-STUD RETAINER, TUBULAR (UNINSULATED)
(HERMETICALLY SEALED IN METAL CASES),
ESTABLISHED RELIABILITY, STYLE CQR13

This specification 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 and MIL-PRF-19978.



Inches	mm	Inches	mm	Inches	mm
.001	.03	.125	3.18	.437	11.10
.004	.10	.172	4.37	.562	14.27
.005	.13	.188	4.78	.670	17.02
.016	.41	.250	6.35	.750	19.05
.031	.79	.312	7.92	1.000	25.40
.032	.81	.375	9.53	1.625	41.38

Case dimension D	C ± .005	G
.562 or less	.250	5/16-24UNF-2A
.670	.375	7/16-28UNEF-2A
.750 and up	.437	1/2-28UNEF-2A

NOTES:

- TEC.

 1. Dimensions are in inches.
 2. Metric equivalents are given for general information only.
 3. Leads shall be of tinned solidwire, .032 +.004, -.001(No. 20 AWG).
 4. Mounting nuts and lockwashers shall be supplied.

FIGURE 1. Style CQR13 capacitors.

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figure 1 and table II.

Case material: Nonmagnetic (screwneck and end seal may be of magnetic material).

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



Rated voltage: See table II.

Rated temperature: -65° to +125°C.

Capacitance (cap.) (nom): See table II.

Capacitance tolerance: See table II.

Dissipation factor (DF) (max): 1.0 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.

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):

Terminal to terminal: See table I.

Terminal to case: Greater than 10,000 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 directions (total of 8 hours), one parallel and the other perpendicular to the cylindrical axis.

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

TABLE I. Terminal-to-terminal insulation resistance.

Capacitance rating	Minimum insulation resistance
<u>Characteristic K</u>	<u>At 25°C</u>
0 to 0.6 microfarad	25,000 megohms
Greater than 0.6 microfarad	15,000 megohm-microfarads <u>1/</u>
<u>At 125°C</u>	
0 to 0.08 microfarad	250 megohms
Greater than 0.08 microfarad	20 megohm-microfarads <u>1/</u>

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

TABLE II. STYLE CQR13 capacitors.

Part number <u>1/</u>	DC voltage rating	Capacitance rating	Capacitance Tolerance	Failure rate levels	Case dimensions			
					Circuit 1		Circuit 3	
					L ± .031	D + .015, - .005	L ± .031	D + .015, - .005
CQR13A-KC392-3-	200	.0039	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KC472-3-	200	.0047	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KC562-3-	200	.0056	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KC682-3-	200	.0068	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KC183-3-	200	.018	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC223-3-	200	.022	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC273-3-	200	.027	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC333-3-	200	.033	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC393-3-	200	.039	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC473-3-	200	.047	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC563-3-	200	.056	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC683-3-	200	.068	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KC823-3-	200	.082	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KC104-3-	200	.10	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KC124-3-	200	.12	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR13A-KC154-3-	200	.15	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR13A-KC184-3-	200	.18	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KC224-3-	200	.22	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KC274-3-	200	.27	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KC334-3-	200	.33	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KC394-3-	200	.39	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KC474-3-	200	.47	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KC564-3-	200	.56	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KC684-3-	200	.68	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KC824-3-	200	.82	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KC105-3-	200	1.000	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KE272-3-	400	.0027	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KE332-3-	400	.0033	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KE123-3-	400	.012	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KE153-3-	400	.015	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KE273-3-	400	.027	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KE333-3-	400	.033	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KE393-3-	400	.039	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KE473-3-	400	.047	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KE563-3-	400	.056	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR13A-KE683-3-	400	.068	G, J, K	M, P, R, S	1.375	.400	1.312	.400

See footnote at end of table.

* TABLE II. STYLE CQR13 capacitors - Continued.

Part number <u>1/</u>	DC voltage rating	Capacitance rating	Capacitance tolerance	Failure rate levels	Case dimensions			
					Circuit 1		Circuit 3	
					L ±.031	D +.015, -.005	L ±.031	D +.015, -.005
CQR13A-KE823-3-	400	.082	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KE104-3-	400	.10	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KE124-3-	400	.12	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KE154-3-	400	.15	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KE184-3-	400	.18	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KE224-3-	400	.22	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KE274-3-	400	.27	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KE334-3-	400	.33	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KE394-3-	400	.39	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KE474-3-	400	.47	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KF102-3-	600	.0010	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KF122-3-	600	.0012	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KF152-3-	600	.0015	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KF182-3-	600	.0018	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KF222-3-	600	.0022	G, J, K	M, P, R, S	.750	.400	.688	.400
CQR13A-KF272-3-	600	.0027	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF332-3-	600	.0033	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF392-3-	600	.0039	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF472-3-	600	.0047	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF562-3-	600	.0056	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF682-3-	600	.0068	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF822-3-	600	.0082	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF103-3-	600	.010	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF123-3-	600	.012	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF153-3-	600	.015	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF183-3-	600	.018	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF223-3-	600	.022	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR13A-KF273-3-	600	.027	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KF333-3-	600	.033	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR13A-KF393-3-	600	.039	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR13A-KF473-3-	600	.047	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR13A-KF563-3-	600	.056	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KF683-3-	600	.068	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR13A-KF823-3-	600	.082	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KF104-3-	600	.10	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR13A-KF124-3-	600	.12	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KF154-3-	600	.15	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR13A-KF184-3-	600	.18	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KF224-3-	600	.22	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR13A-KF274-3-	600	.27	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KF334-3-	600	.33	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KF394-3-	600	.39	G, J, K	M, P, R, S	2.375	.750	2.312	.750
CQR13A-KF474-3-	600	.47	G, J, K	M, P, R, S	2.375	.750	2.312	.750
CQR13A-KG184-3-	1000	.18	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KG224-3-	1000	.22	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR13A-KG274-3-	1000	.27	G, J, K	M, P, R, S	2.125	1.0	2.062	1.000
CQR13A-KG334-3-	1000	.33	G, J, K	M, P, R, S	2.125	1.0	2.062	1.000
CQR13A-KG394-3-	1000	.39	G, J, K	M, P, R, S	2.375	1.0	2.312	1.000
CQR13A-KG474-3-	1000	.47	G, J, K	M, P, R, S	2.375	1.0	2.312	1.000

1/ Complete part number shall include additional symbols to indicate circuit, capacitance tolerance, and failure rate level, as applicable.

Solderability: In accordance with MIL-PRF-19978.

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

Stability at low and high temperatures:

Low temperature:

Test temperature: -65°C +0°C, -5°C.

Capacitance change (max): -10 percent.

High temperature:

Test temperature: +125°C +5°C, -0°C.

Capacitance change (max): +10 percent.

Life:

Capacitance change (max): ±5 percent of initial measured value.

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

TABLE III. Millimeter equivalents of inches.

Inches	mm	Inches	mm	Inches	mm
0.005	0.13	0.688	17.48	1.312	33.32
0.015	0.38	0.750	19.05	1.375	34.93
0.031	0.79	0.812	20.62	1.562	39.67
0.235	5.97	0.833	21.16	1.625	41.28
0.312	7.92	0.875	22.23	2.062	52.37
0.400	10.16	1.000	25.40	2.125	53.98
0.562	14.27	1.062	26.97	2.312	58.72
0.670	17.02	1.125	28.58	2.375	60.33

Changes from previous issue: The margins of this specification are marked with asterisks to indicate where changes from the previous issue 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 and relationship to the last previous issue.

Custodians:

Army - CR
Navy - EC
Air Force - 11

Preparing activity:

DLA - CC

(Project 5910-2193)

Review activities:

Navy - MC
Air Force - 19, 99