

**INCH-POUND**  
 MIL-PRF-19978/10B  
 W/Amendment 1  
25 March 2004  
SUPERSEDEDING  
 MIL-PRF-19978/10B  
 6 September 2002

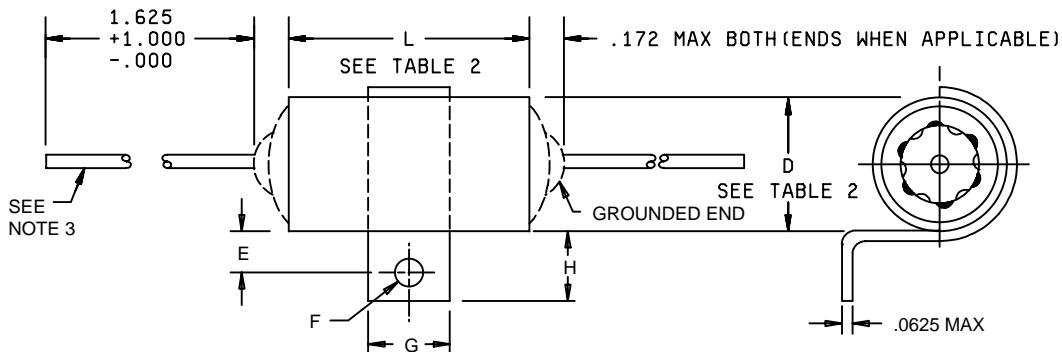
## PERFORMANCE SPECIFICATION SHEET

**CAPACITORS, FIXED, PLASTIC (OR PAPER-PLASTIC) DIELECTRIC, AXIAL-WIRE  
 TERMINAL, TANGENTIAL RETAINER, TUBULAR (UNINSULATED)  
 (HERMETICALLY SEALED IN METAL CASES),  
 ESTABLISHED RELIABILITY, STYLE CQR12**

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.

**FAILURE RATE LEVEL "L" IS INACTIVE FOR  
 NEW DESIGN AFTER 14 SEPTEMBER 1983.**



Inches	mm	Inches	mm	Inches	mm	Inches	mm
.001	.03	.062	1.57	.235	5.97	.562	14.27
.004	.10	.0625	1.59	.250	6.35	1.000	25.40
.005	.13	.144	3.66	.312	7.92	1.625	41.38
.025	.64	.156	3.96	.400	10.16		
.031	.79	.172	4.37	.438	11.13		
.032	.81	.188	4.78	.500	12.70		

Case dimension D	H ± .062	G ± .062	E ± .031	F ± .005
Less than .500	.312	.250	.188	.144
.500 and up	.438	.500	.250	.156

### NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only.
- Leads shall be of tinned solid wire, .025(No. 22 AWG) for cases .235 and .312 in diameter; and .032(No. 20 AWG) for cases .400 diameter and above. Tolerance on all lead wire diameters shall be +.004, -.001.

FIGURE 1. Style CQR12 capacitors.

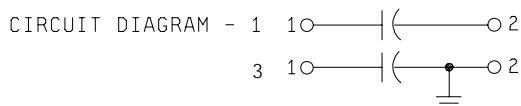
REQUIREMENTS:

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: -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.

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.

Solderability: In accordance with MIL-PRF-19978.

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TABLE I. Terminal-to-terminal insulation resistance.

Capacitance rating <u>Characteristic K</u>	Minimum insulation resistance
0 to 0.6 microfarad	<u>At 25°C</u> 25,000 megohms
Greater than 0.6 microfarad	15,000 megohm-microfarads <u>1/</u>
0 to 0.08 microfarad	<u>At 125°C</u> 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 CQR12 capacitors.

Part number <u>1/</u>	DC voltage rating	Capacitance rating	Capacitance tolerance	Failure rate level	Case dimensions			
					Circuit 1		Circuit 3	
					L ± .031	D + .015, - .005	L ± .031	D + .015, - .005
CQR12A-KC392-3-200	.0039	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KC472-3-200	.0047	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KC562-3-200	.0056	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KC682-3-200	.0068	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KC183-3-200	.018	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KC223-3-200	.022	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KC273-3-200	.027	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KC333-3-200	.033	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KC393-3-200	.039	G, J, K	L, M, P, R, S	.875	.400	.812	.400	
CQR12A-KC473-3-200	.047	G, J, K	L, M, P, R, S	.875	.400	.812	.400	
CQR12A-KC563-3-200	.056	G, J, K	L, M, P, R, S	.875	.400	.812	.400	
CQR12A-KC683-3-200	.068	G, J, K	L, M, P, R, S	.875	.400	.812	.400	
CQR12A-KC823-3-200	.082	G, J, K	L, M, P, R, S	1.125	.400	1.062	.400	
CQR12A-KC104-3-200	.10	G, J, K	L, M, P, R, S	1.125	.400	1.062	.400	
CQR12A-KC124-3-200	.12	G, J, K	L, M, P, R, S	1.375	.400	1.312	.400	
CQR12A-KC154-3-200	.15	G, J, K	L, M, P, R, S	1.375	.400	1.312	.400	
CQR12A-KC184-3-200	.18	G, J, K	L, M, P, R, S	1.125	.562	1.062	.562	
CQR12A-KC224-3-200	.22	G, J, K	L, M, P, R, S	1.125	.562	1.062	.562	
CQR12A-KC274-3-200	.27	G, J, K	L, M, P, R, S	1.375	.562	1.312	.562	
CQR12A-KC334-3-200	.33	G, J, K	L, M, P, R, S	1.375	.562	1.312	.562	
CQR12A-KC394-3-200	.39	G, J, K	L, M, P, R, S	1.625	.562	1.562	.562	
CQR12A-KC474-3-200	.47	G, J, K	L, M, P, R, S	1.625	.562	1.562	.562	
CQR12A-KC564-3-200	.56	G, J, K	L, M, P, R, S	1.625	.670	1.562	.670	
CQR12A-KC684-3-200	.68	G, J, K	L, M, P, R, S	1.625	.670	1.562	.670	
CQR12A-KC824-3-200	.82	G, J, K	L, M, P, R, S	2.125	.750	2.062	.750	
CQR12A-KC105-3-200	1.000	G, J, K	L, M, P, R, S	2.125	.750	2.062	.750	
CQR12A-KE272-3-400	.0027	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KE332-3-400	.0033	G, J, K	L, M, P, R, S	.750	.235	.688	.235	
CQR12A-KE123-3-400	.012	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KE153-3-400	.015	G, J, K	L, M, P, R, S	.875	.312	.812	.312	
CQR12A-KE273-3-400	.027	G, J, K	L, M, P, R, S	.875	.400	.812	.400	
CQR12A-KE333-3-400	.033	G, J, K	L, M, P, R, S	.875	.400	.812	.400	

See footnote at end of table.

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TABLE II. STYLE CQR12 capacitors - Continued.

Part number 1/	DC voltage rating	Capacitance rating	Capacitance tolerance	Failure rate level	Case dimensions			
					Circuit 1		Circuit 3	
					L ± .031	D + .015, -.005	L ± .031	D + .015, -.005
CQR12A-KE393-3-	400	.039	G, J, K	L, M, P, R, S	1.125	.400	1.062	.400
CQR12A-KE473-3-	400	.047	G, J, K	L, M, P, R, S	1.125	.400	1.062	.400
CQR12A-KE563-3-	400	.056	G, J, K	L, M, P, R, S	1.375	.400	1.312	.400
CQR12A-KE683-3-	400	.068	G, J, K	L, M, P, R, S	1.375	.400	1.312	.400
CQR12A-KE823-3-	400	.082	G, J, K	L, M, P, R, S	1.125	.562	1.062	.562
CQR12A-KE104-3-	400	.10	G, J, K	L, M, P, R, S	1.125	.562	1.062	.562
CQR12A-KE124-3-	400	.12	G, J, K	L, M, P, R, S	1.375	.562	1.312	.562
CQR12A-KE154-3-	400	.15	G, J, K	L, M, P, R, S	1.375	.562	1.312	.562
CQR12A-KE184-3-	400	.18	G, J, K	L, M, P, R, S	1.625	.562	1.562	.562
CQR12A-KE224-3-	400	.22	G, J, K	L, M, P, R, S	1.625	.562	1.562	.562
CQR12A-KE274-3-	400	.27	G, J, K	L, M, P, R, S	1.625	.670	1.562	.670
CQR12A-KE334-3-	400	.33	G, J, K	L, M, P, R, S	1.625	.670	1.562	.670
CQR12A-KE394-3-	400	.39	G, J, K	L, M, P, R, S	2.125	.750	2.062	.750
CQR12A-KE474-3-	400	.47	G, J, K	L, M, P, R, S	2.125	.750	2.062	.750
CQR12A-KF102-3-	600	.0010	G, J, K	M, P, R, S	.750	.235	.688	.235
CQR12A-KF122-3-	600	.0012	G, J, K	M, P, R, S	.750	.235	.688	.235
CQR12A-KF152-3-	600	.0015	G, J, K	M, P, R, S	.750	.235	.688	.235
CQR12A-KF182-3-	600	.0018	G, J, K	M, P, R, S	.750	.235	.688	.235
CQR12A-KF222-3-	600	.0022	G, J, K	M, P, R, S	.750	.235	.688	.235
CQR12A-KF272-3-	600	.0027	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF332-3-	600	.0033	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF392-3-	600	.0039	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF472-3-	600	.0047	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF562-3-	600	.0056	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF682-3-	600	.0068	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF822-3-	600	.0082	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF103-3-	600	.010	G, J, K	M, P, R, S	.875	.312	.812	.312
CQR12A-KF123-3-	600	.012	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KF153-3-	600	.015	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KF183-3-	600	.018	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KF223-3-	600	.022	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KF273-3-	600	.027	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR12A-KF333-3-	600	.033	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR12A-KF393-3-	600	.039	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR12A-KF473-3-	600	.047	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR12A-KF563-3-	600	.056	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR12A-KF683-3-	600	.068	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR12A-KF823-3-	600	.082	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR12A-KF104-3-	600	.10	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR12A-KF124-3-	600	.12	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR12A-KF154-3-	600	.15	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR12A-KF184-3-	600	.18	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR12A-KF224-3-	600	.22	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR12A-KF274-3-	600	.27	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR12A-KF334-3-	600	.33	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR12A-KF394-3-	600	.39	G, J, K	M, P, R, S	2.375	.750	2.312	.750
CQR12A-KF474-3-	600	.47	G, J, K	M, P, R, S	2.375	.750	2.312	.750

See footnote at end of table.

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TABLE II. STYLE CQR12 capacitors - Continued.

Part number <sup>1/</sup>	DC voltage rating	Capacitance rating	Capacitance tolerance	Failure rate level	Case dimensions			
					Circuit 1		Circuit 3	
					L ± .031	D + .015, -.005	L ± .031	D + .015, -.005
CQR12A-KG102-3-	1000	.0010	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG122-3-	1000	.0012	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG152-3-	1000	.0015	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG182-3-	1000	.0018	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG222-3-	1000	.0022	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG272-3-	1000	.0027	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG332-3-	1000	.0033	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG392-3-	1000	.0039	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG472-3-	1000	.0047	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG562-3-	1000	.0056	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG682-3-	1000	.0068	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG822-3-	1000	.0082	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG103-3-	1000	.010	G, J, K	M, P, R, S	.875	.400	.812	.400
CQR12A-KG123-3-	1000	.012	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR12A-KG153-3-	1000	.015	G, J, K	M, P, R, S	1.125	.400	1.062	.400
CQR12A-KG183-3-	1000	.018	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR12A-KG223-3-	1000	.022	G, J, K	M, P, R, S	1.375	.400	1.312	.400
CQR12A-KG273-3-	1000	.027	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR12A-KG333-3-	1000	.033	G, J, K	M, P, R, S	1.125	.562	1.062	.562
CQR12A-KG393-3-	1000	.039	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR12A-KG473-3-	1000	.047	G, J, K	M, P, R, S	1.375	.562	1.312	.562
CQR12A-KG563-3-	1000	.056	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR12A-KG683-3-	1000	.068	G, J, K	M, P, R, S	1.625	.562	1.562	.562
CQR12A-KG823-3-	1000	.082	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR12A-KG104-3-	1000	.10	G, J, K	M, P, R, S	1.625	.670	1.562	.670
CQR12A-KG124-3-	1000	.12	G, J, K	M, P, R, S	1.875	.670	1.812	.670
CQR12A-KG154-3-	1000	.15	G, J, K	M, P, R, S	1.875	.670	1.812	.670
CQR12A-KG184-3-	1000	.18	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR12A-KG224-3-	1000	.22	G, J, K	M, P, R, S	2.125	.750	2.062	.750
CQR12A-KG274-3-	1000	.27	G, J, K	M, P, R, S	2.125	1.0	2.062	1.000
CQR12A-KG334-3-	1000	.33	G, J, K	M, P, R, S	2.125	1.0	2.062	1.000
CQR12A-KG394-3-	1000	.39	G, J, K	M, P, R, S	2.375	1.0	2.312	1.000
CQR12A-KG474-3-	1000	.47	G, J, K	M, P, R, S	2.375	1.0	2.312	1.000

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

TABLE III. Millimeter equivalents of decimal inches.

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

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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):  $\pm 5$  percent of initial measured value.

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

- \* Referenced documents: In addition to MIL-PRF-19978, this document references MIL-STD-202.

Amendment notations: The margins of this specification are marked with asterisks to indicate modifications generated by this amendment. 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 - 11

Preparing activity:  
DLA - CC  
(Project 5910-2247)

Review activities:  
Navy - MC  
Air Force - 19, 99

- \* NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).