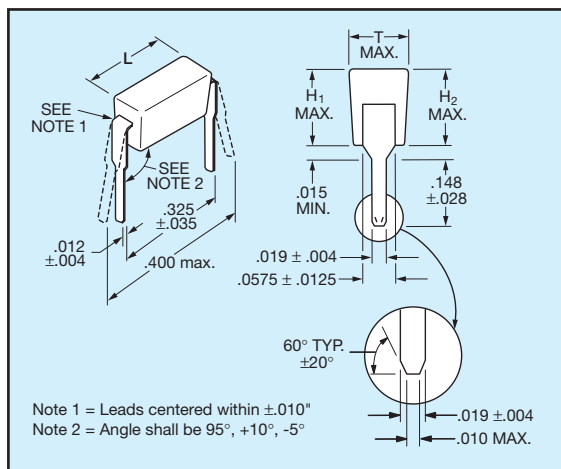




AVX MD series is a Molded 2 Pin DIP capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50 and 100Vdc.



Check for up-to-date CV Tables at  
<http://www.avx.com/docs/catalogs/dipguard.pdf>

## HOW TO ORDER

**MD01**

### AVX Style

MD01  
CKR22\*  
CKS22\*\*  
MD02  
CKR23\*  
CKS23\*  
MD03  
CKR24\*  
CKS24\*\*

**5**

### Voltage

Y = 16V  
5 = 50V  
1 = 100V

**E**

### Temperature Coefficient

A = C0G (NP0)  
C = X7R  
E = Z5U

**104**

### Capacitance

First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104.

**M**

### Capacitance Tolerance

C0G (NP0): F = ±1% J = ±5% K = ±10%  
X7R: J = ±5% K = ±10% M = ±20%  
Z5U: M = ±20% Z = +80% -20%

**A**

### Failure Rate

A = Not Applicable

**B**

### Assembly Method

A = Hand Assembled  
B = Automated Assembly

## C0G (NP0)

| EIA Characteristic |              | C0G (NP0)      |  |
|--------------------|--------------|----------------|--|
| AVX Style          |              | MD01           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 10                 | MD015A100KAB |                |  |
| 15                 | MD015A150KAB |                |  |
| 22                 | MD015A220KAB |                |  |
| 33                 | MD015A330KAB |                |  |
| 47                 | MD015A470KAB |                |  |
| 68                 | MD015A680KAB |                |  |
| 100                | MD015A101KAB |                |  |
| 150                | MD015A151KAB |                |  |
| 220                | MD015A221KAB |                |  |
| 330                | MD015A331KAB |                |  |
| 470                | MD015A471KAB |                |  |
| 680                | MD015A681KAB |                |  |
| 1000               | MD015A102KAB |                |  |
| 1500               | MD015A152KAB |                |  |
| 2200               | MD015A222KAB |                |  |
| 3300               | MD015A332KAB |                |  |
| AVX Style          |              | MD02           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 4700               | MD025A472KAB |                |  |
| 6800               | MD025A682KAB |                |  |
| 10000              | MD025A103KAB |                |  |

For other voltages and tolerances see Part No. Codes.

## X7R

| EIA Characteristic |              | X7R            |  |
|--------------------|--------------|----------------|--|
| AVX Style          |              | MD01           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 220                | MD015C221KAB |                |  |
| 330                | MD015C331KAB |                |  |
| 470                | MD015C471KAB |                |  |
| 680                | MD015C681KAB |                |  |
| 1000               | MD015C102KAB |                |  |
| 1500               | MD015C152KAB |                |  |
| 2200               | MD015C222KAB |                |  |
| 3300               | MD015C332KAB |                |  |
| 4700               | MD015C472KAB |                |  |
| 6800               | MD015C682KAB |                |  |
| 10,000             | MD011C103KAB |                |  |
| 15,000             | MD015C153KAB |                |  |
| 22,000             | MD015C223KAB |                |  |
| 33,000             | MD015C333KAB |                |  |
| 47,000             | MD015C473KAB |                |  |
| 68,000             | MD015C683KAB |                |  |
| 100,000            | MD015C104KAB |                |  |
| AVX Style          |              | MD02           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 150,000            | MD025C154KAB |                |  |
| 220,000            | MD025C224KAB |                |  |
| AVX Style          |              | MD03           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 330,000            | MD035C334KAA |                |  |
| 470,000            | MD035C474KAA |                |  |
| 680,000            | MD035C684KAA |                |  |
| 1,000,000          | MD035C105KAA |                |  |

For other voltages and tolerances see Part No. Codes.

## Z5U

| EIA Characteristic |              | Z5U            |  |
|--------------------|--------------|----------------|--|
| AVX Style          |              | MD01           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 10,000             | MD015E103ZAB |                |  |
| 15,000             | MD015E153ZAB |                |  |
| 22,000             | MD015E223ZAB |                |  |
| 33,000             | MD015E333ZAB |                |  |
| 47,000             | MD015E473ZAB |                |  |
| 68,000             | MD015E683ZAB |                |  |
| 100,000            | MD015E104ZAB |                |  |
| 150,000            | MD015E154ZAB |                |  |
| 220,000            | MD015E224ZAB |                |  |
| 330,000            | MD015E334ZAB |                |  |
| AVX Style          |              | MD02           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 470,000            | MD025E474ZAB |                |  |
| AVX Style          |              | MD03           |  |
| Cap. in pF*        |              | WVDC<br>100 50 |  |
| 680,000            | MD035E684ZAA |                |  |
| 1,000,000          | MD035E105ZAA |                |  |

For other voltages and tolerances see Part No. Codes.

\*Other capacitance values available upon special request.

■ = Industry preferred values

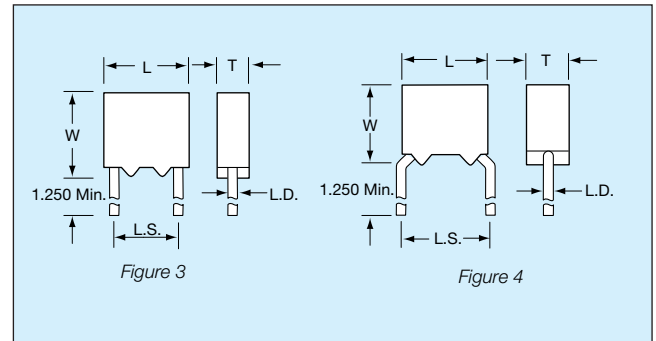
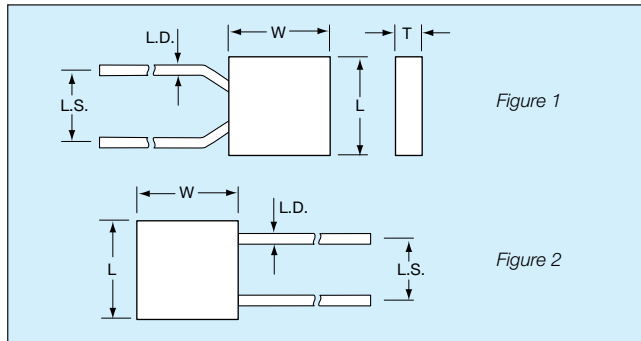
# CKR Series

## Molded Ceramic Capacitors



The CKR series of multilayer ceramic capacitors are molded radial and molded axial leaded devices. They provide a rugged construction and are designed specifically for military

applications. Terminations are Tin/Lead for improved solderability. Available to military specifications MIL-PRF-39014, MIL-PRF-20 and MIL-C-11014.



## HOW TO ORDER

**Military Type Designation: Styles CKR04, CKR05, CKR06, CKR08, CKR11, CKR12, CKR14, CKR15, CKR16**

**Dash Number Option: MIL-PRF-39014/01 (Appropriate Dash Number)**

### CKR05

#### Style

CK = General purpose, ceramic dielectric, fixed capacitors  
R = Established Reliability Parts  
05 = Remaining two numbers identify shape and dimension  
11 = Remaining two numbers identify shape and dimension

### BX

#### Voltage-Temperature Limits

First letter identifies temperature range.  
B = -55°C to +125°C  
Second letter identifies voltage-temperature coefficient.

| Capacitance Change with Reference to 25°C |            |               |
|-------------------------------------------|------------|---------------|
| Second Letter                             | No Voltage | Rated Voltage |
| X                                         | +15, -15%  | +15, -25%     |
| R<br>Axial Only                           | +15, -15%  | +15, -40%     |

### 104

#### Capacitance

First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

### K

#### Capacitance Tolerance

K = ±10%  
M = ±20%

### S

#### Military Failure Rate

M = 1% per 1000 hours  
P = 0.1% per 1000 hours  
R = 0.01% per 1000 hours  
S = 0.001% per 1000 hours

Note:

AVX reserves the right to substitute a lower failure rate part per MIL-PRF-39014. Substitutability for failure rate levels shall be as follows:

| Failure Rate Level | Will Replace Failure Rate Level |
|--------------------|---------------------------------|
| S (STD) (X-ray)    | R, P, M, L                      |
| R (STD) (No X-ray) | P, M, L                         |
| P                  | M, L                            |
| M                  | L                               |

### (V)

#### Standoff Option

To order standoff option, place "V" at the end of the part number.  
Example: CKR05BX104KSV

## PACKAGING REQUIREMENTS

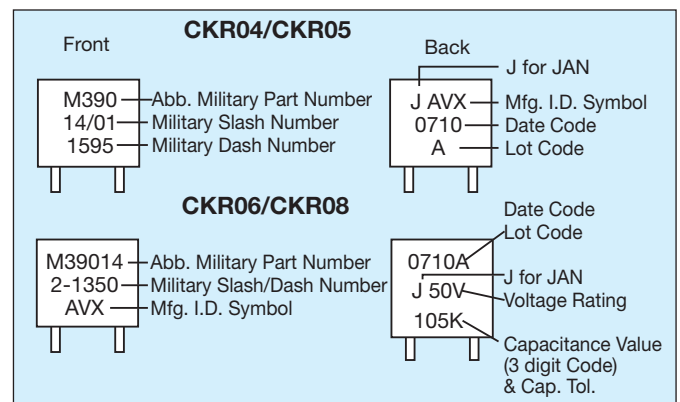
Packaging: 100 Pcs/bag; Radial Tape and Reel Packaging available upon request (2500 pcs./reel).

## SIZE SPECIFICATIONS

Dimensions: Millimeters (Inches)

| Per Mil Spec         | Case Size               |                         |                         |                         |                        |
|----------------------|-------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| MIL-PRF-39014        | Length (L)              | Width (W)               | Thickness (T)           | Lead Spacing (L.S.)     | Lead Diameter (L.D.)   |
| CKR04<br>(Fig. 2)    | 4.83±.25<br>(.190±.010) | 4.83±.25<br>(.190±.010) | 2.29±.25<br>(.090±.010) | 2.54±.38<br>(.100±.015) | .64±.05<br>(.025±.002) |
| CKR05<br>(Fig. 1, 4) | 4.83±.25<br>(.190±.010) | 4.83±.25<br>(.190±.010) | 2.29±.25<br>(.090±.010) | 5.08±.38<br>(.200±.015) | .64±.05<br>(.025±.002) |
| CKR06<br>(Fig. 2, 3) | 7.37±.25<br>(.290±.010) | 7.37±.25<br>(.290±.010) | 2.29±.25<br>(.090±.010) | 5.08±.38<br>(.200±.015) | .64±.05<br>(.025±.002) |
| CKR08<br>(Fig. 2)    | 7.37±.25<br>(.290±.010) | 7.37±.25<br>(.290±.010) | 3.68±.38<br>(.145±.015) | 5.08±.38<br>(.200±.015) | .64±.05<br>(.025±.002) |

## MARKING RADIAL LEAD



## HOW TO ORDER

**Military Type Designation: Capacitors, Fixed, Ceramic Dielectric, (Temperature Stable and General Purpose), High Reliability**

|                        |                           |                           |                                                                                  |                                     |                         |                                                                                                                                       |                                                                                                                                                     |
|------------------------|---------------------------|---------------------------|----------------------------------------------------------------------------------|-------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>M123</b>            | <b>A</b>                  | <b>01</b>                 | <b>BX</b>                                                                        | <b>B</b>                            | <b>103</b>              | <b>K</b>                                                                                                                              | <b>C</b>                                                                                                                                            |
| <b>Mil-Spec Number</b> | <b>Modification Spec.</b> | <b>Slash Sheet Number</b> | <b>Temperature Characteristic</b>                                                | <b>Voltage</b><br>B = 50<br>C = 100 | <b>Capacitance Code</b> | <b>Capacitance Tolerance</b><br>C = $\pm 0.25\text{pF}$<br>D = $\pm 0.5\text{pF}$<br>F = $\pm 1\%$<br>J = $\pm 5\%$<br>K = $\pm 10\%$ | <b>Termination</b><br>C = Copper, solder coated (type C-4 or C-5 of MIL-STD-1276)<br>W = Copper clad steel, solder coated, 60 micro inches minimum. |
|                        |                           |                           | Capacitance change with reference to 25°C over temperature range -55°C to +125°C |                                     |                         |                                                                                                                                       |                                                                                                                                                     |
|                        |                           |                           | Symbol                                                                           | Without Voltage                     | With Rated DC Voltage   |                                                                                                                                       |                                                                                                                                                     |
|                        |                           |                           | BP                                                                               | 0 $\pm$ 30 ppm/°C                   | 0 $\pm$ 30 ppm/°C       |                                                                                                                                       |                                                                                                                                                     |
|                        |                           |                           | BX                                                                               | $\pm 15$ , -15%                     | $\pm 15$ , -25%         |                                                                                                                                       |                                                                                                                                                     |

## CROSS REFERENCE MIL-SPEC TEST REQUIREMENTS

| TEST DESCRIPTION                                        | MIL-PRF-123                                               | MIL-PRF-39014 | MIL-PRF-20 | MIL-PRF-55681 |
|---------------------------------------------------------|-----------------------------------------------------------|---------------|------------|---------------|
| NDT (Non-Destructive Test)                              | 100% Ultrasonic Scan or Neutron-Radiography               | No            | No         | No            |
| Pre-Cap Visual (Pre-Encapsulation Visual Examination)   | 100%                                                      | No            | No         | No            |
| D.P.A. (Destructive Physical Analysis)                  | Lot by Lot—Pre-Termination<br>Lot by Lot—Finished Product | No            | No         | No            |
| Pre-Cap Terminal Strength (Pre-Encapsulation Pull Test) | Lot by Lot                                                | No            | No         | No            |
| Life Test (Lot by Lot)                                  | Lot by Lot—1000 Hours                                     | No            | No         | No            |
| Low Voltage Humidity                                    | Lot by Lot                                                | No            | No         | No            |
| Thermal Shock 100 Cycles                                | Lot by Lot                                                | No            | No         | No            |