

Military Glass Capacitors



Glass/Glass-K Capacitors

GLASS CAPACITOR MIL-PRF-23269 ESTABLISHED RELIABILITY

M AND S FAILURE RATE LEVEL

100V, 300V, 500V

Style CYR10, CYR15, CYR20, CYR30
CYR51, CYR52, CYR53

Slash Sheets

/01, 3001-3126, 7001-7126
/02, 3001-3057, 7001-7057
/03, 3001-3072, 7001-7057
/04, 3001-3036, 7001-7021
/10, 3001-3150, 3201-3218, 3301-3327

MIL-PRF-11272

300V, 500V

Style CY10, CY15, CY20, CY30, CY06, CY07, CY08

Slash Sheets /01, /02, /03, /04, /13, /14, /15

GLASS-K CAPACITOR MIL-PRF-11015

50V

Style CK31, CK32

Slash Sheet /25

MIL-PRF-39014

50V

Style CKR31, CKR32

Slash Sheet /21

Glass dielectric capacitors have been the capacitors of choice for extreme long-term stability and reliability for almost fifty years. They are available in glass or glass composition, and are covered by MIL-PRF-11272 and MIL-PRF-23269 or MIL-PRF-11015 and MIL-PRF-39014, respectively.

- **CY Series Glass Dielectric capacitors**, available in both axial and radial configurations, offer the industry's highest performance and maximum stability for aerospace, military and satellite applications which require "S" level reliability, radiation hardness and operating temperatures up to +200°C. Capacitance values range from 0.5 pF to 10,000 pF with tolerances to ±0.5%. Rated voltage is from 50 to 2,000 VDC, with a temperature coefficient of 140±25 ppm/°C. Operating temperature range is -75°C to +200°C.

- **CK Series Glass-K capacitors**, available in axial configurations, offer low noise and low dielectric absorption rate (<0.1%), for digital systems and sensor applications where low loss and stability are required. The Glass-K technology features "M" level reliability, radiation resistance and operating temperatures up to +200°C. Capacitance values range from 270 pF to 100,000 pF (0.1 µF) with tolerances to ±5%. Rated voltage is from 25 to 50 VDC, with three temperature characteristics: +2, -10%; +2, -15% and +20, -45%. Operating temperature range is -75°C to +200°C.

CAPACITORS – MILITARY SPECIFICATION CROSS-REFERENCE

| Military Specification | Military Part No. | AVX Part No. | Military Specification | Military Part No. | AVX Part No. |
|--|-------------------|--------------|---|-------------------|--------------|
| MIL-PRF-11015 (Ceramic Capacitors) | CK31 | CK31 | MIL-PRF-39014 (Established Reliability) (Ceramic Capacitors) | CKR31 | CKR31 |
| | CK32 | CK32 | | CKR32 | CKR32 |
| MIL-PRF-11272 (Glass Capacitors) | CY06 | CY06 | MIL-PRF-23269 (Established Reliability) | CYR10 | CYR10 |
| | CY07 | CY07 | | CYR15 | CYR15 |
| | CY08 | CY08 | | CYR20 | CYR20 |
| | CY10 | CY10 | | CYR30 | CYR30 |
| | CY15 | CY15 | | CYR51 | CYR51 |
| | CY20 | CY20 | | CYR52 | CYR52 |
| | CY30 | CY30 | | CYR53 | CYR53 |

Military Glass Capacitors

MIL-PRF-11272/01, /02, /03, /04
CY10, 15, 20, 30



APPLICATIONS

These extremely stable glass capacitors, AVX style CY, meet or exceed all requirements of MIL-PRF-11272. With glass dielectric, fused monolithic construction, and true glass-to-metal seals at the leads, they have very low losses and are virtually immune to severe environmental stresses.

PERFORMANCE CHARACTERISTICS

Tolerance: Available tolerances for each value of capacitance are shown in the ordering information table. For codes, refer to the Part Numbers paragraph.

Temperature Coefficient: $+140 \pm 25$ ppm/°C at 100 kHz. TC will track and retrace to within ± 5 ppm. Capacitance drift is less than 0.1% or 0.1 pF, whichever is greater.

Voltage Coefficient: Zero.

Losses: Extremely low, and remain relatively low at elevated temperatures. Dissipation factor is not more than 0.001 at 1.0 kHz and 25°C.

Life: After 2,000 hours at 125°C with 150% of rated voltage applied, capacitance change is less than 0.5% or 0.5 pF, whichever is greater.

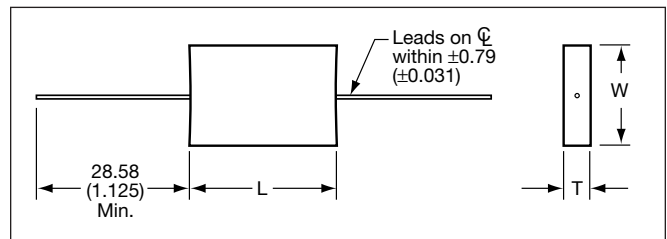
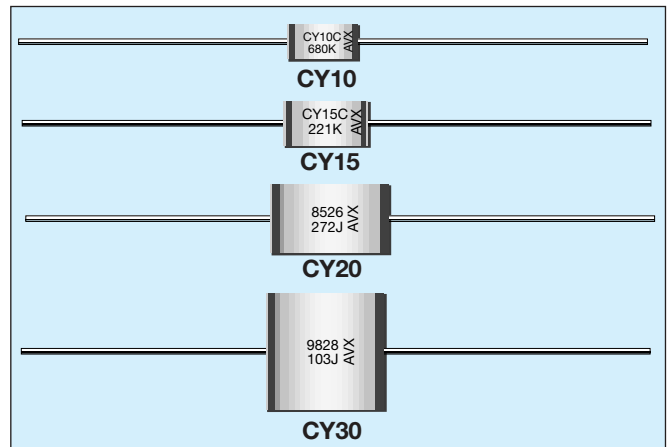
Insulation Resistance: Greater than 100,000 megohms at 25°C; greater than 10,000 megohms at 125°C.

Voltage/Temperature Rating: Voltage ratings are shown in the ordering information table. The operating temperature range is -55°C to +125°C with no derating required.

Moisture Resistance: Meets or exceeds all requirements of MIL-PRF-11272 and MIL-STD-202, Method 106.

Radiation Resistance: The unique materials and construction techniques involved with glass capacitors make them ideal for use in radiation environments. After a total dose of nearly 10^8 rads (H_2O) glass capacitors exhibit only a minor change in capacitance (.5%) and an 8% change in dissipation factor. Furthermore, glass capacitors can operate in fast neutron flux environments of 10^{15} N $cm^{-2}sec^{-1}$ and experience little or no damage in component parameters.

Additional performance details are given in the AVX "Performance Characteristics of Multilayer Glass Dielectric Capacitors" technical paper.



DIMENSIONS:

millimeters (inches)

| Case Size | L | W | T | Lead Dia. +0.1 (+0.004) -0.03 (-0.001) | Weight (Grams) |
|-----------|---------------------------------|---------------------------------|--------------------------------|--|-------------------|
| CY10 | 8.74 ± 1.19 (0.344 ± 0.047) | 4.37 ± .79 (0.172 ± 0.031) | 1.98 ± .79 (0.078 ± 0.031) | .51 (0.020) | 25 – 50 |
| CY15 | 11.91 ± 1.19 (0.469 ± 0.047) | 6.76 ± .79 (0.266 ± 0.031) | 2.77 ± 1.19 (0.109 ± 0.047) | .51 (0.020) | 75 – 1.25 |
| CY20 | 18.64 ± 1.57 (0.734 ± 0.062) | 10.72 ± 1.19 (0.422 ± 0.047) | 3.58 ± 1.19 (0.141 ± 0.047) | .63 (0.025) | 2.50 – 4.00 |
| CY30 | 19.46 ± 1.57 (0.766 ± 0.062) | 19.05 ± 1.98 (0.750 ± 0.078) | 3.58 ± 1.19 (0.141 ± 0.047) | .63 (0.025) | 5.00 – 7.00 |

Note: Standard leads are solder-coated Dumet.

Military Glass Capacitors

MIL-PRF-11272/01, /02, /03, /04
CY10, 15, 20, 30



HOW TO ORDER

Military Type Designation: Styles CY10, CY15, CY20, CY30

Dash Number Option: MIL-PRF-11272/01, 02, 03, 04 (Add Appropriate Dash Number)

CY
|
Style
Glass Capacitor

10
|
Case Size
10
15
20
30

C
|
Operating
Temperature Range
-55°C to +125°C

101
|
Capacitance Code
Capacitance Code is expressed in picofarads (pF). The first two digits represent significant figures and the third digit specifies the number of zeros to follow; i.e. 101 indicates 100 pF. For values below 10 pF, R = decimal point; i.e. 1R5 indicates 1.5 pF.

J
|
Capacitance Tolerance
C = ±.25 pF
D = ±.50 pF
F = ±1%
G = ±2%
J = ±5%
K = ±10%
M = ±20%

MARKING

CY10C
101J

AVX
|
AVX Corporation
CY = Glass Capacitor
10 = Case Size
C = Operating Temperature Range
101 = Capacitance, Coded in pF
J = Tolerance

MILITARY PART NUMBER IDENTIFICATION (Standard Values)

| Military Type Designation | Cap. (pF) | Cap. Tol. | WVDC |
|---------------------------|-----------|---------------|------|
| CY10 | | | |
| CY10C0R5_ | 0.5 | C | 500 |
| CY10C1R0_ | 1.0 | C, D | 500 |
| CY10C1R5_ | 1.5 | C, D | 500 |
| CY10C2R2_ | 2.2 | C, D | 500 |
| CY10C2R7_ | 2.7 | C, D | 500 |
| CY10C3R0_ | 3.0 | C, D | 500 |
| CY10C3R3_ | 3.3 | C, D | 500 |
| CY10C3R6_ | 3.6 | C, D | 500 |
| CY10C3R9_ | 3.9 | C, D | 500 |
| CY10C4R3_ | 4.3 | C, D | 500 |
| CY10C4R7_ | 4.7 | C, K | 500 |
| CY10C5R1_ | 5.1 | C, J, K | 500 |
| CY10C5R6_ | 5.6 | C, J, K | 500 |
| CY10C6R2_ | 6.2 | C, J, K | 500 |
| CY10C6R8_ | 6.8 | C, J, K | 500 |
| CY10C7R5_ | 7.5 | C, J, K | 500 |
| CY10C8R2_ | 8.2 | C, J, K | 500 |
| CY10C9R1_ | 9.1 | C, J, K | 500 |
| CY10C100_ | 10 | C, J, K, M | 500 |
| CY10C110_ | 11 | C, J, K, M | 500 |
| CY10C120_ | 12 | C, J, K, M | 500 |
| CY10C130_ | 13 | C, G, J, K, M | 500 |
| CY10C150_ | 15 | C, G, J, K, M | 500 |
| CY10C160_ | 16 | C, G, J, K, M | 500 |
| CY10C180_ | 18 | C, G, J, K, M | 500 |
| CY10C200_ | 20 | C, G, J, K, M | 500 |
| CY10C220_ | 22 | C, G, J, K, M | 500 |
| CY10C240_ | 24 | C, G, J, K, M | 500 |
| CY10C270_ | 27 | F, G, J, K, M | 500 |
| CY10C300_ | 30 | F, G, J, K, M | 500 |
| CY10C330_ | 33 | F, G, J, K, M | 500 |
| CY10C360_ | 36 | F, G, J, K, M | 500 |
| CY10C390_ | 39 | F, G, J, K, M | 500 |
| CY10C430_ | 43 | F, G, J, K, M | 500 |
| CY10C470_ | 47 | F, G, J, K, M | 500 |
| CY10C510_ | 51 | F, G, J, K, M | 500 |
| CY10C560_ | 56 | F, G, J, K, M | 500 |
| CY10C620_ | 62 | F, G, J, K, M | 500 |
| CY10C680_ | 68 | F, G, J, K, M | 500 |
| CY10C750_ | 75 | F, G, J, K, M | 500 |
| CY10C820_ | 82 | F, G, J, K, M | 500 |
| CY10C910_ | 91 | F, G, J, K, M | 500 |
| CY10C101_ | 100 | F, G, J, K, M | 500 |
| CY10C111_ | 110 | F, G, J, K, M | 500 |
| CY10C121_ | 120 | F, G, J, K, M | 500 |
| CY10C131_ | 130 | F, G, J, K, M | 500 |
| CY10C151_ | 150 | F, G, J, K, M | 500 |
| CY10C161_ | 160 | F, G, J, K, M | 500 |
| CY10C181_ | 180 | F, G, J, K, M | 500 |
| CY10C201_ | 200 | F, G, J, K, M | 500 |
| CY10C221_ | 220 | F, G, J, K, M | 300 |
| CY10C241_ | 240 | F, G, J, K, M | 300 |
| CY10C271_ | 270 | F, G, J, K, M | 300 |
| CY10C301_ | 300 | F, G, J, K, M | 300 |

—Add letter for tolerance code above lines.

| Military Type Designation | Cap. (pF) | Cap. Tol. | WVDC |
|---------------------------|-----------|---------------|------|
| CY15 | | | |
| CY15C221_ | 220 | F, G, J, K, M | 500 |
| CY15C241_ | 240 | F, G, J, K, M | 500 |
| CY15C271_ | 270 | F, G, J, K, M | 500 |
| CY15C301_ | 300 | F, G, J, K, M | 500 |
| CY15C331_ | 330 | F, G, J, K, M | 500 |
| CY15C361_ | 360 | F, G, J, K, M | 500 |
| CY15C391_ | 390 | F, G, J, K, M | 500 |
| CY15C431_ | 430 | F, G, J, K, M | 500 |
| CY15C471_ | 470 | F, G, J, K, M | 500 |
| CY15C511_ | 510 | F, G, J, K, M | 500 |
| CY15C561_ | 560 | F, G, J, K, M | 300 |
| CY15C621_ | 620 | F, G, J, K, M | 300 |
| CY15C681_ | 680 | F, G, J, K, M | 300 |
| CY15C751_ | 750 | F, G, J, K, M | 300 |
| CY15C821_ | 820 | F, G, J, K, M | 300 |
| CY15C911_ | 910 | F, G, J, K, M | 300 |
| CY15C102_ | 1,000 | F, G, J, K, M | 300 |
| CY15C112_ | 1,100 | F, G, J, K, M | 300 |
| CY15C122_ | 1,200 | F, G, J, K, M | 300 |
| CY20 | | | |
| CY20C561_ | 560 | F, G, J, K, M | 500 |
| CY20C621_ | 620 | F, G, J, K, M | 500 |
| CY20C681_ | 680 | F, G, J, K, M | 500 |
| CY20C751_ | 750 | F, G, J, K, M | 500 |
| CY20C821_ | 820 | F, G, J, K, M | 500 |
| CY20C911_ | 910 | F, G, J, K, M | 500 |
| CY20C102_ | 1,000 | F, G, J, K, M | 500 |
| CY20C112_ | 1,100 | F, G, J, K, M | 500 |
| CY20C122_ | 1,200 | F, G, J, K, M | 500 |
| CY20C132_ | 1,300 | F, G, J, K, M | 500 |
| CY20C152_ | 1,500 | F, G, J, K, M | 500 |
| CY20C162_ | 1,600 | F, G, J, K, M | 500 |
| CY20C182_ | 1,800 | F, G, J, K, M | 500 |
| CY20C202_ | 2,000 | F, G, J, K, M | 500 |
| CY20C222_ | 2,200 | F, G, J, K, M | 500 |
| CY20C242_ | 2,400 | F, G, J, K, M | 500 |
| CY20C272_ | 2,700 | F, G, J, K, M | 500 |
| CY20C302_ | 3,000 | F, G, J, K, M | 500 |
| CY20C332_ | 3,300 | F, G, J, K, M | 500 |
| CY20C362_ | 3,600 | F, G, J, K, M | 300 |
| CY20C392_ | 3,900 | F, G, J, K, M | 300 |
| CY20C432_ | 4,300 | F, G, J, K, M | 300 |
| CY20C472_ | 4,700 | F, G, J, K, M | 300 |
| CY20C512_ | 5,100 | F, G, J, K, M | 300 |

—Add letter for tolerance code above lines.

| Military Type Designation | Cap. (pF) | Cap. Tol. | WVDC |
|---------------------------|-----------|---------------|------|
| CY30 | | | |
| CY30C362_ | 3,600 | F, G, J, K, M | 500 |
| CY30C392_ | 3,900 | F, G, J, K, M | 500 |
| CY30C432_ | 4,300 | F, G, J, K, M | 500 |
| CY30C472_ | 4,700 | F, G, J, K, M | 500 |
| CY30C512_ | 5,100 | F, G, J, K, M | 500 |
| CY30C562_ | 5,600 | F, G, J, K, M | 500 |
| CY30C622_ | 6,200 | F, G, J, K, M | 500 |
| CY30C682_ | 6,800 | F, G, J, K, M | 300 |
| CY30C752_ | 7,500 | F, G, J, K, M | 300 |
| CY30C822_ | 8,200 | F, G, J, K, M | 300 |
| CY30C912_ | 9,100 | F, G, J, K, M | 300 |
| CY30C103_ | 10,000 | F, G, J, K, M | 300 |

—Add letter for tolerance code above lines.