

RF/Microwave Capacitors

RF/Microwave Multilayer Capacitors (MLC)

700A Series NP0 Porcelain and Ceramic Multilayer Capacitors



FEATURES

- Case A Size (.055" x .055")
- Low ESR / ESL
- High Q
- Low Noise
- Capacitance Range 0.1 pF to 1000 pF
- Extended WVDC up to 250 VDC
- Zero TCC
- High Self-Resonance
- Established Reliability (QPL)

GENERAL DESCRIPTION

KYOCERA AVX, the industry leader, offers new improved ESR/ESL performance for the 700 A Series RF/Microwave Capacitors. The superior high self-resonance and zero TCC characteristic of this Series provide excellent performance over a broad range of RF and microwave applications requiring minimum drift. High density porcelain and ceramic constructions provide a rugged, hermetic package.

Typical functional applications: Bypass, Coupling, Tuning and DC Blocking.

Typical circuit applications: Filters, Oscillators and Timing

PACKAGING OPTIONS



ELECTRICAL SPECIFICATIONS

| | |
|--|---|
| Temperature Coefficient (TCC) | 0 ± 30 PPM/°C |
| Capacitance Range | 0.1 pF to 1000 pF |
| Operating Temperature | -55°C to +125°C* |
| Quality Factor | Greater than 10,000 (0.1 pF to 100 pF) @ 1 MHz. Greater than 2000 (110 pF to 1000 pF) @ 1 MHz. |
| Insulation Resistance (IR) | 0.1 pF to 470 pF 10 ⁶ Megohms min. @ 25°C at rated WVDC 10 ⁵ Megohms min. @ 125°C at rated WVDC 510 pF to 1000 pF 10 ⁵ Megohms min. @ 25°C at rated WVDC 10 ⁴ Megohms min. @ 125°C at rated WVDC |
| Working Voltage (WVDC) | See Capacitance Values table |
| Dielectric Withstanding Voltage (DWV) | 250% of rated WVDC for 5 seconds |
| Aging Effects | None |
| Piezoelectric Effects | None |
| Capacitance Drift | ± (0.02% or 0.02 pF), whichever is greater |

ENVIRONMENTAL CHARACTERISTICS

| | |
|-----------------------------|--|
| Thermal Shock | Mil-STD-202, Method 107, Condition A |
| Moisture Resistance | Mil-STD-202, Method 106 |
| Low Voltage Humidity | Mil-STD-202, Method 103, condition A, with 1.5 VDC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours |
| Life Test | MIL-STD-202, Method 108, for 2000 hours, at 125°C. 200% WVDC applied. |
| Solderability | Mil-STD-202, Method 208 |
| Terminal Strength | Terminations for chips and pellets withstand a pull of 5 lbs. min., 10 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. |

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CAPACITANCE VALUES

| Cap. Code | Cap. (pF) | Tol. | Rated WVDC | | Cap. Code | Cap. (pF) | Tol. | Rated WVDC | | Cap. Code | Cap. (pF) | Tol. | Rated WVDC | | Cap. Code | Cap. (pF) | Tol. | Rated WVDC | |
|-----------|------------|---------------|------------|---------------|-----------|-----------|---------|------------|------|-----------|-----------|---------------|------------|---------|-----------|-----------|---------------|------------|------|
| | | | STD. | EXT. | | | | STD. | EXT. | | | | STD. | EXT. | | | | STD. | EXT. |
| 0R1 | 0.1 | B | 150 | 250 | 2R4 | 2.4 | B, C, D | 150 | 250 | 200 | 20 | F, G, J, K, M | 150 | VOLTAGE | 151 | 150 | F, G, J, K, M | 150 | N/A |
| 0R2 | 0.2 | | | | 2R7 | 2.7 | | | | 220 | 22 | | | | 161 | 160 | | | |
| 0R3 | 0.3 | B, C | | | 3R0 | 3.0 | | | | 240 | 24 | | | | 181 | 180 | | | |
| 0R4 | 0.4 | | | | 3R3 | 3.3 | | | | 270 | 27 | | | | 201 | 200 | | | |
| 0R5 | 0.5 | B, C, D | | | 3R6 | 3.6 | | | | 300 | 30 | | | | 221 | 220 | | | |
| 0R6 | 0.6 | | | | 3R9 | 3.9 | | | | 330 | 33 | | | | 241 | 240 | | | |
| 0R7 | 0.7 | | | | 4R3 | 4.3 | | | | 360 | 36 | | | | 271 | 270 | | | |
| 0R8 | 0.8 | | | | 4R7 | 4.7 | | | | 390 | 39 | | | | 301 | 300 | | | |
| 0R9 | 0.9 | | | | 5R1 | 5.1 | | | | 430 | 43 | | | | 331 | 330 | | | |
| 1R0 | 1.0 | | | | 5R6 | 5.6 | | | | 470 | 47 | | | | 361 | 360 | | | |
| 1R1 | 1.1 | | B, C, D | 6R2 | 6.2 | 510 | 51 | 391 | 390 | | | | | | | | | | |
| 1R2 | 1.2 | | | 6R8 | 6.8 | 560 | 56 | 431 | 430 | | | | | | | | | | |
| 1R3 | 1.3 | | | B, C, J, K, M | 7R5 | 7.5 | 620 | 62 | 471 | 470 | | | | | | | | | |
| 1R4 | 1.4 | | | | 8R2 | 8.2 | 680 | 68 | 511 | 510 | | | | | | | | | |
| 1R5 | 1.5 | 9R1 | | | 9.1 | 750 | 75 | 561 | 560 | | | | | | | | | | |
| 1R6 | 1.6 | F, G, J, K, M | | | 100 | 10 | 820 | 82 | 621 | 620 | | | | | | | | | |
| 1R7 | 1.7 | | | | 110 | 11 | 910 | 91 | 681 | 680 | | | | | | | | | |
| 1R8 | 1.8 | | | | 120 | 12 | 101 | 100 | 751 | 750 | | | | | | | | | |
| 1R9 | 1.9 | | | | 130 | 13 | 111 | 110 | 821 | 820 | | | | | | | | | |
| 2R0 | 2.0 | | | | 150 | 15 | 121 | 120 | 911 | 910 | | | | | | | | | |
| 2R1 | 2.1 | | 160 | | 16 | 131 | 130 | 102 | 1000 | | | | | | | | | | |
| 2R2 | 2.2 | | 180 | | 18 | | | | | | | | | | | | | | |

$v_{rms} = 0.707 \times WVDC$

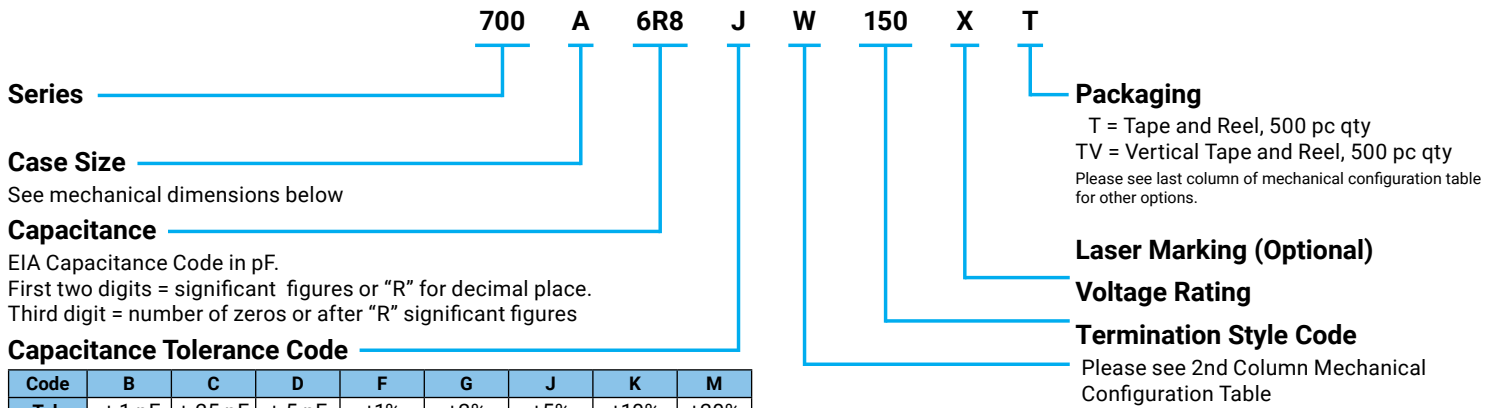
Special values, tolerances, higher WVDC and matching available. Please consult factory.

note: extended wvdc does not apply to cdr products.

Capacitance values in bold type indicate porcelain dielectric. All other capacitance values indicate ceramic dielectric.

All 700 A Capacitors are available laser marked with KYOCERA AVX identification, capacitance code and tolerance.

HOW TO ORDER



The above part number refers to a 700A Series (case size A) 6.8 pF capacitor, J tolerance (+/-5%), 150 WVDC, with W termination, (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and Tape and Reel Packaging.

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MECHANICAL CONFIGURATION

| Series & Case Size | Term. Code | MIL-PRF-55681 | Case Size & Type | Outline ES W/T is a Termination Surface | Body Dimensions inches (mm) | | | Lead and Termination Dimensions and Material | | | |
|--------------------|------------|---------------|-----------------------------|---|------------------------------------|----------------------------|------------------------|--|--|---|--------------------------|
| | | | | | Length (L) | Width (W) | Thickness (T) | Overlap (Y) | Materials | Pkg Type | Pkg Code |
| 700A | W | CDR12BP | A Solder Plate | | .055+.015-.010 (1.40+0.38-0.25) | .055 ±.015 (1.40 ±0.38) | .057 (1.45) max. | .010+.010-.005 (0.25+0.25-.013) | Tin/ Lead, Solder Plated over Nickel Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |
| 700A | P | CDR12BP | A Pellet | | .055+.025-.010 (1.40+0.64-0.25) | .055 ±.015 (1.40 ±0.38) | | | Heavy Tin/ Lead Coated, over Nickel Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |
| 700A | T | N/A | A Solderable Nickel Barrier | | .055+.015-.010 (1.40+0.38-0.25) | .055 ±.015 (1.40 ±0.38) | | | RoHS Compliant Tin Plated over Nickel Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |
| 700A | CA | CDR11BP | A Gold Chip | | .055+.015-.010 (1.40+0.38-0.25) | .055 ±.015 (1.40 ±0.38) | | | RoHS Compliant Gold Plated over Nickel Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |

NON-MAGNETIC CONFIGURATION

| Series & Case Size | Term. Code | MIL-PRF-55681 | Case Size & Type | Non-Magnetic Configuration | Body Dimensions inches (mm) | | | Lead and Termination Dimensions and Material | | | |
|--------------------|------------|--------------------|------------------------------|----------------------------|------------------------------------|----------------------------|------------------------|--|---|---|--------------------------|
| | | | | | Length (L) | Width (W) | Thickness (T) | Overlap (Y) | Materials | Pkg Type | Pkg Code |
| 700A | WN | Meets Requirements | A Non-Mag Solder Plate | | .055+.025-.010 (1.40+0.64-0.25) | .055 ±.015 (1.40 ±0.38) | .057 (1.45) max. | .010+.010-.005 (0.25+0.25-.013) | Tin/ Lead, Solder Plated over Non-Magnetic Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |
| 700A | PN | Meets Requirements | A Non-Mag Pellet | | .055+.025-.010 (1.40+0.64-0.25) | .055 ±.015 (1.40 ±0.38) | | | Heavy Tin/ Lead Coated, over Non-Magnetic Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |
| 700A | TN | Meets Requirements | A Non-Mag Solderable Barrier | | .055+.015-.010 (1.40+0.38-0.25) | .055 ±.015 (1.40 ±0.38) | | | RoHS Compliant Tin Plated over Non-Magnetic Barrier Termination | T&R, 1000 or 500 pcs Vertical T&R, 1000 or 500 pcs Cap Pac, 100 pcs | T1K or T TV1K or TV C100 |

*Capacitors with values greater than 100 pF contain a trace magnetic element that may exhibit weak magnetic properties.

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SUGGESTED MOUNTING PAD DIMENSIONS

Horizontal Electrode Orientation

Vertical Electrode Orientation

| Case A | | | | | |
|------------------|--------------|--------|--------|--------|--------|
| Mount Type | Pad Size | A Min. | B Min. | C Min. | D Min. |
| Vertical Mount | Normal | .070 | .050 | .030 | .130 |
| | High Density | .050 | .030 | .030 | .090 |
| Horizontal Mount | Normal | .080 | .050 | .030 | .130 |
| | High Density | .060 | .030 | .030 | .090 |

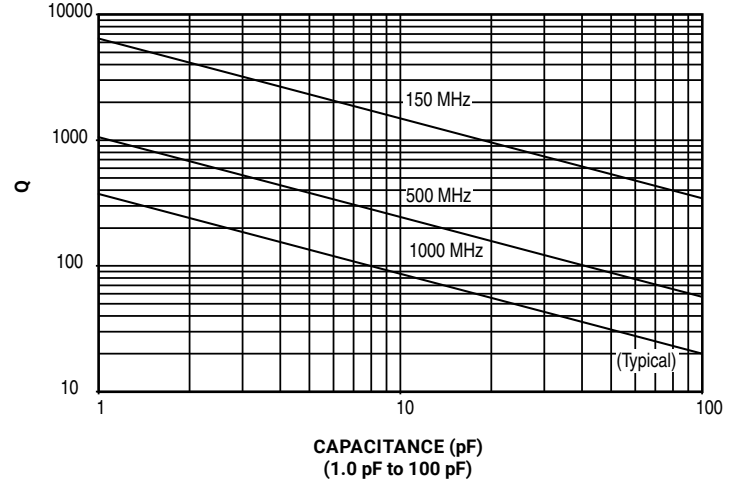
Dimensions are in inches.

PERFORMANCE DATA

ESR VS. CAPACITANCE
SERIES 700, CASE A



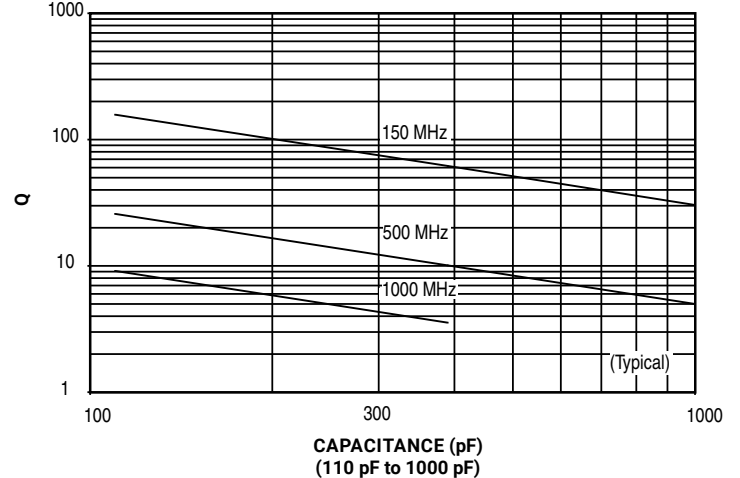
Q VS. CAPACITANCE
SERIES 700, CASE A



ESR VS. CAPACITANCE
SERIES 700, CASE A



Q VS. CAPACITANCE
SERIES 700, CASE A



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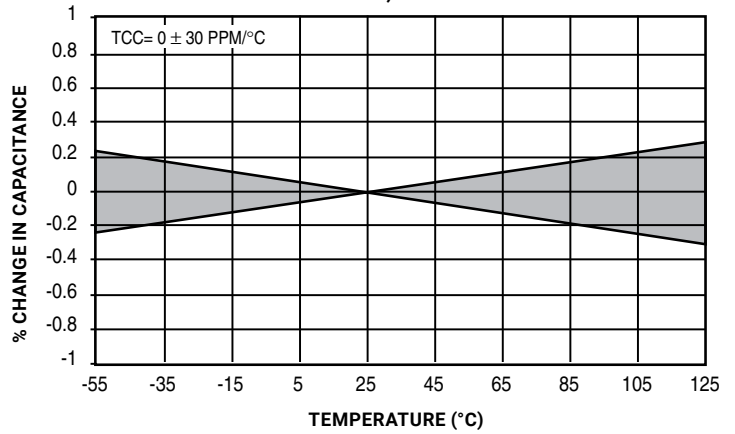


PERFORMANCE DATA

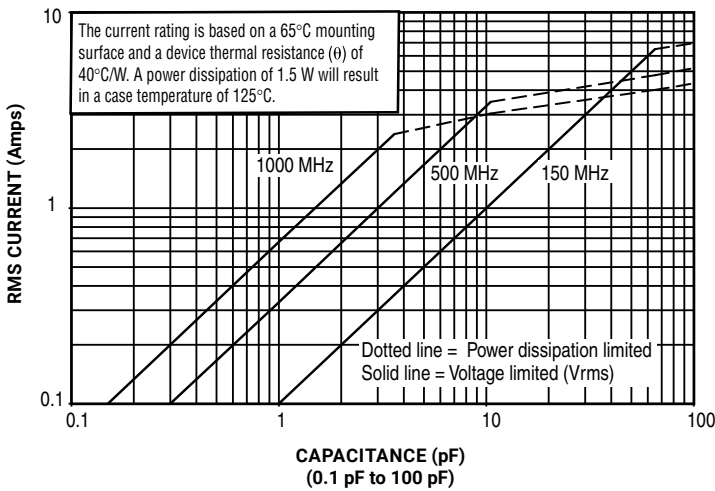
SERIES RESONANCE VS. CAPACITANCE
SERIES 700, CASE A



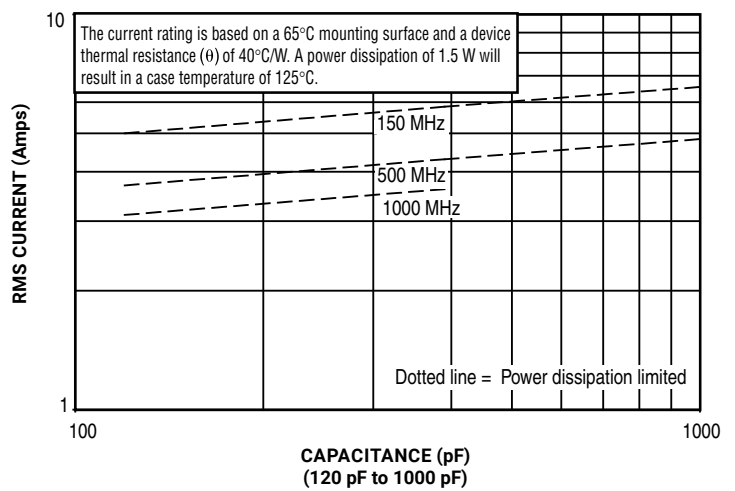
CAPACITANCE CHANGE VS. TEMPERATURE
SERIES 700, CASE A



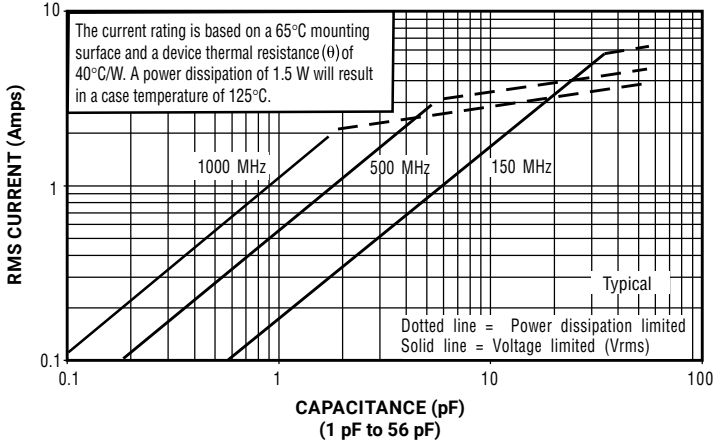
CURRENT RATING VS. CAPACITANCE
SERIES 700, CASE A



CURRENT RATING VS. CAPACITANCE
SERIES 700, CASE A



CURRENT RATING VS. CAPACITANCE
SERIES 700, CASE A, EXTENDED VOLTAGE



CURRENT RATING VS. CAPACITANCE
SERIES 700, CASE A, EXTENDED VOLTAGE

