

# 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



Tape & Reel



Vertical  
Orientation  
Tape & Reel



Cap-Pak®  
(100 pcs)



#### ELECTRICAL SPECIFICATIONS

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

#### ENVIRONMENTAL CHARACTERISTICS

<b>Thermal Shock</b>	Mil-STD-202, Method 107, Condition A
<b>Moisture Resistance</b>	Mil-STD-202, Method 106
<b>Low Voltage Humidity</b>	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
<b>Life Test</b>	MIL-STD-202, Method 108, for 2000 hours, at 125°C. 200% WVDC applied.
<b>Solderability</b>	Mil-STD-202, Method 208
<b>Terminal Strength</b>	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	<b>0.1</b>	B	150	250	<b>2R4</b>	<b>2.4</b>	B, C, D	150	250	<b>200</b>	<b>20</b>	F, G, J, K, M	150	VOLTAGE	151	150	F, G, J, K, M	150	N/A
0R2	<b>0.2</b>				<b>2R7</b>	<b>2.7</b>				<b>220</b>	<b>22</b>				161	160			
0R3	<b>0.3</b>	B, C			<b>3R0</b>	<b>3.0</b>				<b>240</b>	<b>24</b>				181	180			
0R4	<b>0.4</b>				<b>3R3</b>	<b>3.3</b>				<b>270</b>	<b>27</b>				201	200			
0R5	<b>0.5</b>	B, C, D			<b>3R6</b>	<b>3.6</b>				<b>300</b>	<b>30</b>				221	220			
0R6	<b>0.6</b>				<b>3R9</b>	<b>3.9</b>				<b>330</b>	<b>33</b>				241	240			
0R7	<b>0.7</b>				<b>4R3</b>	<b>4.3</b>				<b>360</b>	<b>36</b>				271	270			
0R8	<b>0.8</b>				<b>4R7</b>	<b>4.7</b>				<b>390</b>	<b>39</b>				301	300			
0R9	<b>0.9</b>				<b>5R1</b>	<b>5.1</b>				<b>430</b>	<b>43</b>				331	330			
1R0	<b>1.0</b>				<b>5R6</b>	<b>5.6</b>				<b>470</b>	<b>47</b>				361	360			
1R1	<b>1.1</b>		B, C, D	<b>6R2</b>	<b>6.2</b>	<b>510</b>	<b>51</b>	391	390										
1R2	<b>1.2</b>			<b>6R8</b>	<b>6.8</b>	<b>560</b>	<b>56</b>	431	430										
1R3	<b>1.3</b>			B, C, J, K, M	<b>7R5</b>	<b>7.5</b>	<b>620</b>	<b>62</b>	471	470									
1R4	<b>1.4</b>				<b>8R2</b>	<b>8.2</b>	<b>680</b>	<b>68</b>	511	510									
1R5	<b>1.5</b>	<b>9R1</b>			<b>9.1</b>	<b>750</b>	<b>75</b>	561	560										
1R6	<b>1.6</b>	F, G, J, K, M			<b>100</b>	<b>10</b>	<b>820</b>	<b>82</b>	621	620									
1R7	<b>1.7</b>				<b>110</b>	<b>11</b>	<b>910</b>	<b>91</b>	681	680									
1R8	<b>1.8</b>				<b>120</b>	<b>12</b>	<b>101</b>	<b>100</b>	751	750									
1R9	<b>1.9</b>				<b>130</b>	<b>13</b>	111	110	821	820									
2R0	<b>2.0</b>				<b>150</b>	<b>15</b>	121	120	911	910									
2R1	<b>2.1</b>		<b>160</b>		<b>16</b>	131	130	102	1000										
2R2	<b>2.2</b>		<b>180</b>		<b>18</b>														

$v_{rms} = 0.707 \times WVDC$

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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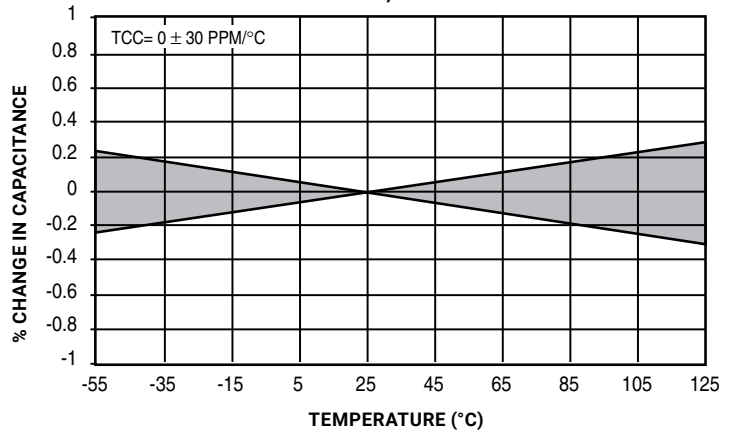


#### PERFORMANCE DATA

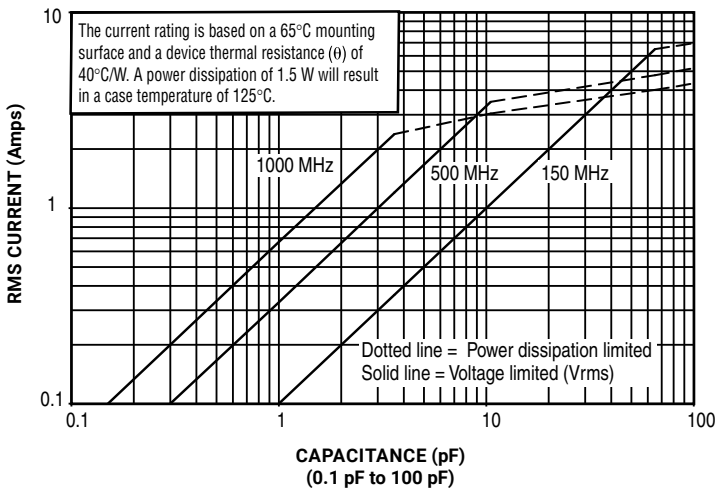
**SERIES RESONANCE VS. CAPACITANCE**  
SERIES 700, CASE A



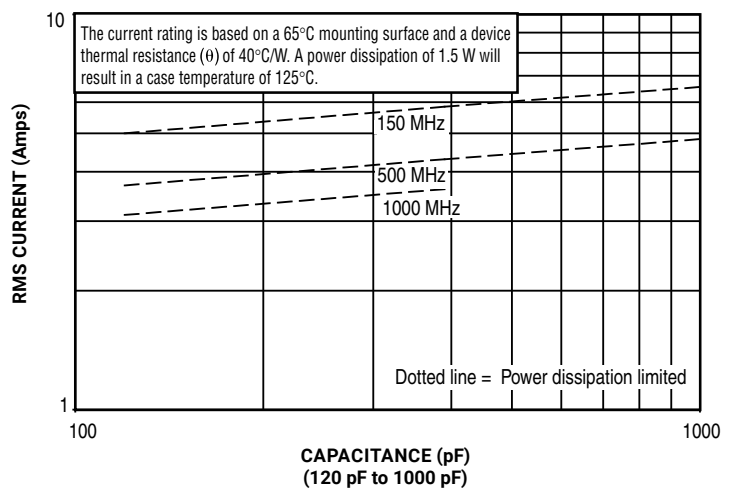
**CAPACITANCE CHANGE VS. TEMPERATURE**  
SERIES 700, CASE A



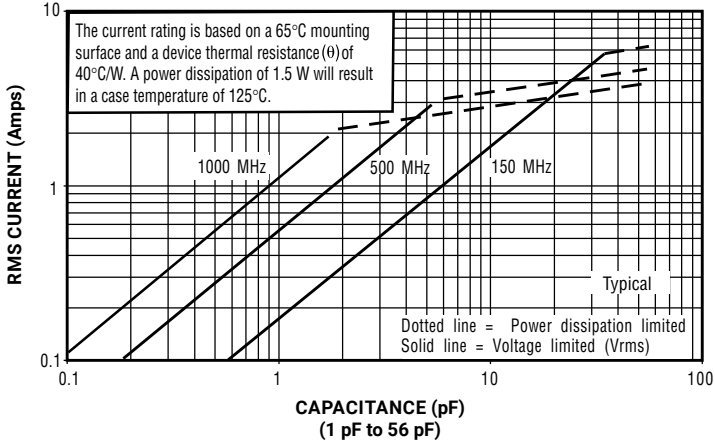
**CURRENT RATING VS. CAPACITANCE**  
SERIES 700, CASE A



**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

