

# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

### 100C Series Porcelain Superchip® Multilayer Capacitors



#### GENERAL DESCRIPTION

KYOCERA AVX, the industry leader, offers new improved ESR/ESL performance for the 100C Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications. High density Porcelain construction provides a rugged, hermetic package.

KYOCERA AVX offers an encapsulation option for applications requiring extended protection against arc-over and corona.

#### FUNCTIONAL APPLICATIONS

- Bypass
- Impedance Matching
- Coupling
- DC Blocking
- Tuning

#### CIRCUIT APPLICATIONS

- VHF/UHF RF Power Amplifiers
- Plasma Chambers
- Antenna Tuning
- Medical (MRI coils)

#### 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 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.
<b>Life Test</b>	MIL-STD-202, Method 108, for 2000 hours, at 125°C. Voltage applied. 200% of WVDC for capacitors rated at 500 volts DC or less. 120% of WVDC for capacitors rated at 1250 volts DC or less. 100% of WVDC for capacitors rated above 1250 volts DC.
<b>Termination Styles</b>	Available in various surface mount and leaded styles. See Mechanical Configurations
<b>Terminal Strength</b>	Terminations for chips and pellets withstand a pull of 10 lbs. min., 20 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.

#### FEATURES

- Case C Size (.250" x .250")
- Capacitance Range 1pF to 2700pF
- Extended WVDC up to 3600 VDC
- Low ESR/ESL
- High Q
- Low Noise
- Ultra-Stable Performance
- High Self-Resonance
- Established Reliability (QPL)

#### PACKAGING OPTIONS



Tape & Reel



Tray  
(180 pcs)



#### ELECTRICAL SPECIFICATIONS

<b>Temperature Coefficient (TCC)</b>	+90 ±30 PPM/°C (-55°C to +125°C)
<b>Insulation Resistance (IR)</b>	1 pF to 2700 pF: 10 <sup>5</sup> Megohms min. @ +25°C at rated WVDC. 10 <sup>4</sup> Megohms min. @ +125°C at rated WVDC. Max. test voltage is 500 VDC.
<b>Working Voltage (WVDC)</b>	See Capacitance Values Table
<b>Dielectric Withstanding Voltage (DWV)</b>	250% of WVDC for capacitors rated at 500 volts DC or less for 5 seconds. 150% of WVDC for capacitors rated at 1250 volts DC or less for 5 seconds. 120% of WVDC for capacitors rated above 1250 Volts DC for 5 seconds
<b>Retrace</b>	Less than ±(0.02% or 0.02 pF), whichever is greater.
<b>Aging Effects</b>	None
<b>Piezoelectric Effects</b>	None
<b>Capacitance Drift</b>	±(0.02% or 0.02 pF), whichever is greater.
<b>Operating Temperature Range</b>	From -55°C to +125°C (No derating of working voltage)

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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.
1R0	1.0	B, C, D	2500	3600	5R1	5.1	B, C, D	2500	3600	390	39	F, G, J, K, M	2500	3600	301	300	F, G, J, K, M	1500	2000
1R1	1.1				5R6	5.6				430	43				331	330			
1R2	1.2				6R2	6.2				470	47				361	360			
1R3	1.3				6R8	6.8				510	51				391	390			
1R4	1.4				7R5	7.5				560	56				431	430			
1R5	1.5				8R2	8.2				620	62				471	470			
1R6	1.6				9R1	9.1				680	68				511	510			
1R7	1.7				100	10				750	75				561	560			
1R8	1.8				110	11				820	82				621	620			
1R9	1.9				120	12				910	91				681	680			
2R0	2.0	B, C, D	2500	3600	130	13	F, G, J, K, M	2500	3600	101	100	F, G, J, K, M	2500	3000	751	750	F, G, J, K, M	1000	1500
2R1	2.1				150	15				111	110				821	820			
2R2	2.2				160	16				121	120				911	910			
2R4	2.4				180	18				131	130				102	1000			
2R7	2.7				200	20				151	150				112	1100			
3R0	3.0				220	22				161	160				122	1200			
3R3	3.3				240	24				181	180				152	1500			
3R6	3.6				270	27				201	200				182	1800			
3R9	3.9				300	30				221	220				222	2200			
4R3	4.3				330	33				241	240				242	2400			
4R7	4.7	360	36	271	270	272	2700												

VRMS = 0.707 x WVDC

• SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

## HOW TO ORDER

Series **100** Case Size **C** Capacitance **100** Tolerance **J** Termination **W** WVDC **2500** Laser Marking **X** Packaging **T**

See mechanical dimensions below

EIA Capacitance Code in pF.  
First two digits = significant figures or "R" for decimal place.  
Third digit = number of zeros or after "R" significant figures

**Capacitance Tolerance Code**

Code	B	C	D	F	G	J	K	M
Tol.	±0.1 pF	±0.25 pF	±0.5 pF	±1%	±2%	±5%	±10%	±20%

**Packaging**  
T = Tape and Reel, 500 pc. qty.  
Please see last column of mechanical configuration table for other options.

**Laser Marking (Optional)**

**WVDC**

**Termination Style Code**  
Please see 2nd Column Mechanical Configuration Table

The above part number refers to a 100 C Series (case size C) 10 pF capacitor, J tolerance (±5%), 2500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and 500 pc T&R packaging.

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#### MECHANICAL CONFIGURATIONS

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS INCHES (MM)			LEAD AND TERMINATION DIMENSIONS AND MATERIALS		Pkg. Type	Pkg Code	
				LENGTH (L)	WIDTH (W)	THICKNESS (T)	OVERLAP (Y)	MATERIALS			
100C	W	Solder Plate		.230+.020 -.010 (5.84+0.51-0.25)	.250 ±0.015 (6.35 ±0.38)		.040 (1.02) max.	Tin/Lead, Solder Plated over Nickel Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180	
100C	P	Pellet		.230+.025 -.010 (5.84+0.64-0.25)				Heavy Tin/Lead Coated, over Nickel Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180	
100C	T	Solderable Nickel Barrier		.230+.020 -.010 (5.84+0.51-0.25)				<b>RoHS Compliant</b> Tin Plated over Nickel Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180	
100C	MS	Microstrip		.245 ±0.025 (6.22 ±0.64)			.145(3.68) max. for capacitance values ≤680pF	N/A	High Purity Silver Leads $L_L = .500$ (12.7) min. $W_L = .240 \pm .005$ (6.10 ± 0.127) $T_L = .004 \pm .001$ (.102 ± 0.025) Leads are Attached with High Temperature Solder.	Tray, 24 or 60 pcs	J24 or J60
100C	AR	Axial Ribbon					.165(4.19) max. for capacitance values >680pF		Box, 24 pcs	B24	
100C	AW	Axial Wire					Silver-plated Copper Leads $L_L = 2.25$ (57.15) min. Dia. = .032 ± 0.002 (0.81 ± 0.05)	Box, 21 pcs	B21		
100C	VA	Vertical Axial Ribbon		Silver Leads $L_L = .500$ (12.7) min. $W_L = **$ See below $T_L = .004 \pm .001$ (.102 ± 0.025)			Box, 24 pcs	B24			
100C	RW	Radial Wire		Silver-plated Copper Leads $L_L = 1.0$ (25.4) min. Dia. = .032 ± 0.002 (0.81 ± 0.05)	Tray, 16 pcs	J16					

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## NON-MAGNETIC MECHANICAL CONFIGURATIONS

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS INCHES (MM)			LEAD AND TERMINATION DIMENSIONS AND MATERIALS		Pkg. Type	Pkg Code
				LENGTH (L)	WIDTH (W)	THICKNESS (T)	OVERLAP (Y)	MATERIALS		
100C	WN	Non-Mag Solder Plate		.230±.025-.010 (5.84±0.64-0.25)	.250 ±.015 (6.35 ±0.38)	.145(3.68) max. for capacitance values ≤680pF  .165(4.19) max. for capacitance values >680pF	.040 (1.02) max.	Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180
100C	PN	Non-Mag Pellet		.230±.035-.010 (5.84±0.89-0.25)				Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180
100C	TN	Non-Mag Solderable Nickel Barrier		.230±.025-.010 (5.84±0.64-0.25)				<b>RoHS Compliant</b> Tin Plated over Non-Magnetic Barrier Termination	T&R, 250 or 500 pcs Tray, 36 or 180 pcs	T250 or T J36 or J180
100C	MN	Non-Mag Microstrip		.245 ±.025 (6.22 ±0.64)				High Purity Silver Leads L <sub>L</sub> = .500 (12.7) min. W <sub>L</sub> = .240 ±.005 (6.10 ±.127) T <sub>L</sub> = .004 ±.001 (.102 ±.025) Leads are Attached with High Temperature Solder.	Tray, 24 or 60 pcs	J24 or J60

## SUGGESTED MOUNTING PAD DIMENSIONS

Horizontal Electrode Orientation

Vertical Electrode Orientation

**Case C Vertical Mount**

Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
< 680 pF	Normal	.150	.050	.200	.300
	High Density	.130	.030	.200	.260
> 680 pF	Normal	.185	.050	.200	.300
	High Density	.165	.030	.200	.260

**Horizontal Mount**

All Values	Pad Size	A Min.	B Min.	C Min.	D Min.
All Values	Normal	.280	.050	.200	.300
	High Density	.260	.030	.200	.260