

RF/Microwave Capacitors

RF/Microwave Multilayer Capacitors (MLC)

100B Series Porcelain Superchip® Multilayer Capacitors



FEATURES

- Case B Size (.110" x .110")
- Capacitance Range 0.1pF to 1000pF
- Extended WVDC up to 1500 VDC
- Low ESR/ESL
- High Q
- Low Noise
- Ultra-Stable Performance
- High Self-Resonance
- Established Reliability (QPL)

GENERAL DESCRIPTION

KYOCERA AVX, the industry leader, offers new improved ESR/ESL performance for the 100 B Series RF/Microwave Capacitors. This Series is now available with extended operating temperatures up to 175°C. High Density porcelain construction provides a rugged, hermetic package.

FUNCTIONAL APPLICATIONS

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

CIRCUIT APPLICATIONS

- UHF/Microwave RF Power Amplifiers
- Oscillators
- Low Noise Amplifiers
- Filter Networks
- Timing Circuits

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. 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
Termination Styles	Available in various surface mount and leaded styles. See Mechanical Configurations
Terminal Strength	Terminations for chips and pellets withstand a pull of 5 lbs. min., 15 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor.

PACKAGING OPTIONS



Tape & Reel



Vertical Orientation Tape & Reel



Cap Pac® (100 pcs)



ELECTRICAL SPECIFICATIONS

Temperature Coefficient (TCC)	+90 ±20 PPM/°C (-55°C to +125°C) +90 ±30 PPM/°C (+125°C to +175°C)
Capacitance Range	0.1pF to 1000pF
Operating Temperature	-55°C to +125°C*
Quality Factor	greater than 10,000 at 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 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
Aging Effects	None
Piezoelectric Effects	None
Capacitance Drift	± (0.02% or 0.02 pF), whichever is greater
Retrace	Less than ±(0.02% or 0.02 pF), whichever is greater.

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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.	STD.	EXT.
0R1	0.1	B	500	1500	2R4	2.4	B, C, D	500	1500	200	20	F, G, J, K, M	500	1500	151	150	F, G, J, K, M	300	EXT.		
0R2	0.2				2R7	2.7				220	22				161	160					
0R3	0.3	B, C			EXTENDED VOLTAGE	3R0				3.0	240				24	181				180	1000
0R4	0.4					3R3				3.3	270				27	201				200	
0R5	0.5	B, C, D			EXTENDED VOLTAGE	3R6				3.6	300				30	221				220	VOLT.
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		6R2	6.2		510	51	391	390	200	600										
1R2	1.2		6R8	6.8		560	56	431	430												
1R3	1.3		B, C, D	EXTENDED VOLTAGE		7R5	7.5	620	62	471	470	VOLT.									
1R4	1.4					8R2	8.2	680	68	511	510										
1R5	1.5	9R1			9.1	750	75	561	560												
1R6	1.6	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	100	300										
2R1	2.1	160			16	131	130	102	1000												
2R2	2.2	180			18					50	VOLT										

VRMS = 0.707 X WVDC

• SPECIAL VALUES, TOLERANCES, DIFFERENT WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY. NOTE: EXTENDED WVDC DOES NOT APPLY TO CDR PRODUCTS.

HOW TO ORDER

Series 100 **Case Size** B **Capacitance** 910 **Termination Style Code** J **Voltage Rating** W **Rated WVDC** 500 **Termination Style Code** 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.	±1 pF	±25 pF	±5 pF	±1%	±2%	±5%	±10%	±20%

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

Laser Marking (Optional)

Voltage Rating

Termination Style Code
Please see 2nd Column Mechanical Configuration Table

The above part number refers to a 100 B Series (case size B) 91 pF capacitor, J tolerance (±5%), 500 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 W/T is a Termination Surface	Body Dimensions inches (mm)			Lead and Termination Dimensions and Material			Pkg Type	Pkg Code		
					Length (L)	Width (W)	Thickness (T)	Overlap (Y)	Materials					
100B	W	CDR14BG	Solder Plate		.110+ .020 - .01 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±.038)	.102 (2.59) max.	.015 (0.38) ±.010 (0.25)	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		
100B	P	CDR14BG	Pellet		.110+ .035 - .01 (2.79 + 0.89-0.25)	.110 ±.015 (2.79 ±.038)			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		
100B	T	N/A	Solderable Nickel		.110+ .035 - .01 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±.038)			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		
100B	CA	CDR13BG	Gold Chip		.110+.020 - .010 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±.038)			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		
100B	MS	CDR21BG	Microstrip		.135 ±.015 (3.43 ±.038)	.110 ±.015 (2.79 ±.038)	.120 (3.05) max.	N/A	Length (L _L)	Width (W _L)	Thickness (T _L)	Cap Pac, 20 pcs	C20	
100B	AR	CDR22BG	Axial Ribbon				.250 (6.35) min.		.093±.005 (2.36 ±0.13)	.004 ± .001 (.102±.025)	Box, 20 or 100 pcs		B20 or B100	
100B	RR	CDR24BG	Radial Ribbon				.145 ±.020 (3.68 ±0.51)		.102 (2.59) max.	#26 AWG, .016 (.406) dia. nominal		Box, 20 or 100 pcs		B20 or B100
100B	RW	CDR23BG	Radial Wire							Box, 20 or 100 pcs		B20 or B100		
100B	AW	CDR25BG	Axial Wire		Box, 20 or 100 pcs		B20 or B100							

Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

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NON-MAGNETIC MECHANICAL CONFIGURATION

Series & Case Size	Term. Code	MIL-PRF-55681	Case Size & Type	Outline W/T is a Termination Surface	Body Dimensions inches (mm)			Lead and Termination Dimensions and Material			Pkg Type	Pkg Code	
					Length (L)	Width (W)	Thickness (T)	Overlap (Y)	Materials				
100B	WN	Meets Requirements	Non-Mag		.110+ .020 - .01 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±0.38)	.102 (2.59) max.	.015 (0.38) ±.010 (0.25)	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	
100B	PN	Meets Requirements	Solderable Nickel		.110+ .035 - .01 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±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	
100B	TN	Meets Requirements	Non-Mag Solderable Barrier		.110+.020 - .010 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±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	
100B	MN	Meets Requirements	Microstrip		.135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L _L)	Width (W _L)	Thickness (T _L)	Cap Pac, 20 pcs	C20
100B	AN	Meets Requirements	Axial Ribbon						.250 (6.35) (6.35) min.	.093±.005 (2.36 ±0.13)	.004 ± .001 (.102±.025)	Box, 20 or 100 pcs	B20 or B100
100B	FN	Meets Requirements	Radial Ribbon						.145 ±.020 (3.68 ±0.51)	.102 (2.59) max.	N/A	.500 (12.7)	#26 AWG., .016 (.406) dia. nominal
100B	RN	Meets Requirements	Radial Wire		Box, 20 or 100 pcs	B20 or B100							
100B	BN	Meets Requirements	Axial Wire								Box, 20 or 100 pcs	B20 or B100	

Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.

SUGGESTED MOUNTING PAD DIMENSIONS

Horizontal
Electrode Orientation

Vertical
Electrode Orientation

Case B Vertical Mount

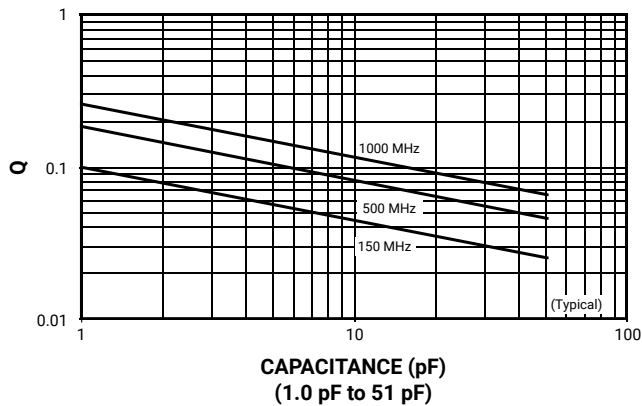
Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
0.1 pF	Normal	.065	.050	.075	.175
	High Density	.045	.030	.075	.135
0.2 pF	Normal	.090	.050	.075	.175
	High Density	.070	.030	.075	.135
0.3 to 510 pF	Normal	.110	.050	.075	.175
	High Density	.090	.030	.075	.135
> 510 pF	Normal	.120	.050	.075	.175
	High Density	.100	.030	.075	.135

Horizontal Mount

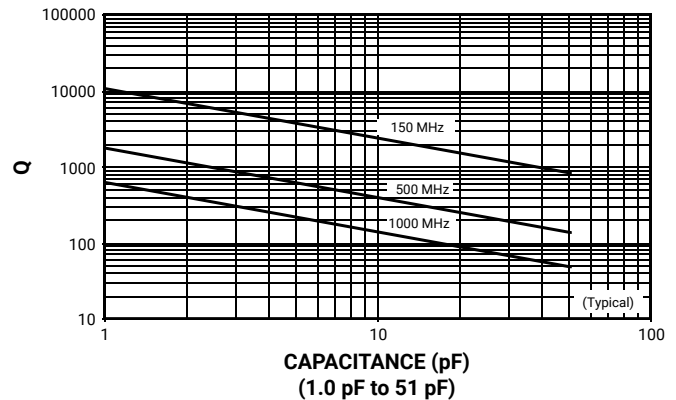
All Values	Pad Size	A Min.	B Min.	C Min.	D Min.
All Values	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

PERFORMANCE DATA

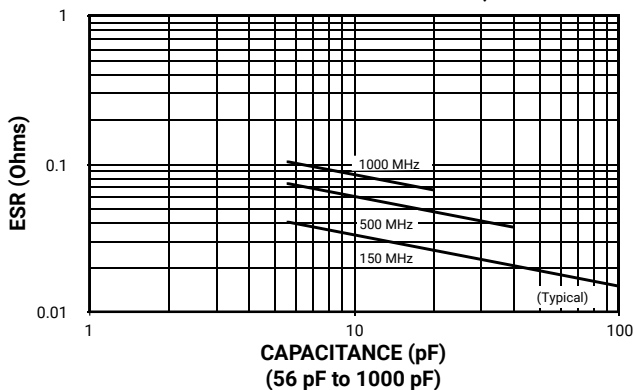
ESR VS. CAPACITANCE SERIES 100, CASE B



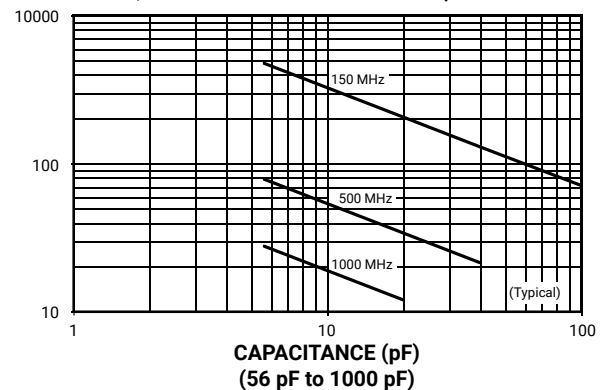
Q VS. CAPACITANCE SERIES 100, CASE B



ESR VS. CAPACITANCE SERIES 100, CASE B



Q VS. CAPACITANCE SERIES 100, CASE B



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PERFORMANCE DATA

SERIES RESONANCE VS. CAPACITANCE
SERIES 100, CASE B



CAPACITANCE CHANGE VS. TEMPERATURE
SERIES 100, CASE B



CURRENT RATING VS. CAPACITANCE
SERIES 100, CASE B



CURRENT RATING VS. CAPACITANCE
SERIES 100, CASE B

