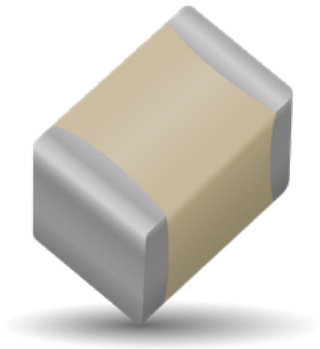
RF/Microwave Capacitors

RF/Microwave Multilayer Capacitors (MLC)

100B Series Porcelain Superchip® Multilayer Capacitors



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 85ºC 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.

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)

PACKAGING OPTIONS

Tape & Reel

Vertical Orientation Tape & Reel

Cap Pac® (100 pcs)

RoHS COMPLIANT

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	-55ºC to +125ºC*
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.

CAPACITANCE VALUES

Cap. Code	Cap. (pF)	Tol.	Rated WVDC STD.	Rated WVDC EXT.	Cap. Code	Cap. (pF)	Tol.	Rated WVDC STD.	Rated WVDC EXT.	Cap. Code	Cap. (pF)	Tol.	Rated WVDC STD.	Rated WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.
0R1	0.1	B	500	EXTENDED VOLTAGE 1500	2R4	2.4	B, C, D	500	EXTENDED VOLTAGE 1500	200	20	F, G, J, K, M	500	VOLTAGE 1500	151	150	F, G, J, K, M	300	EXT. 1000 VOLT.
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		200	EXT. 600 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			
1R2	1.2				6R8	6.8	B, C, J, K, M			560	56				431	430			
1R3	1.3				7R5	7.5				620	62				471	470			EXT.
1R4	1.4				8R2	8.2				680	68				511	510		100	
1R5	1.5				9R1	9.1				750	75				561	560			
1R6	1.6				100	10	F, G, J, K, M			820	82				621	620			
1R7	1.7				110	11				910	91				681	680		300	
1R8	1.8				120	12				101	100				751	750			
1R9	1.9				130	13				111	110		300		821	820		50	
2R0	2.0				150	15				121	120				911	910			
2R1	2.1				160	16				131	130			1000	102	1000			VOLT
2R2	2.2				180	18													

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

100 B 910 J W 500 X T

Series

Case Size
See mechanical dimensions below

Capacitance
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.

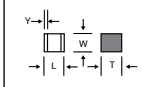
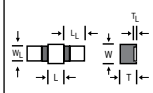
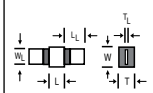
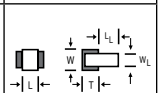
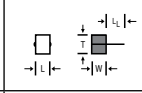
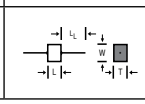
Laser Marking (Optional)

Voltage Rating

Termination Style Code
Please see 2nd Column
Mechanical Configuration Table

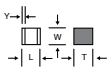
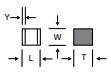
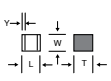
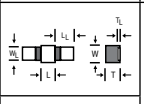
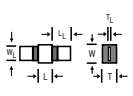
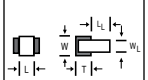
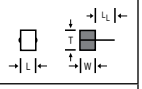
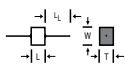
The above part number refers to a 100 B Series (case size B) 91 pF capacitor,
J tolerance (±5%), 500 WVDC, with W termination (Tin /Lead, Solder Plated over Nickel Barrier), laser marking and Tape and Reel packaging.

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	B Solder Plate		.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	P	CDR14BG	B Pellet		.110+ .035 - .01 (2.79 + 0.89-0.25)	.110 ±.015 (2.79 ±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
100B	T	N/A	B Solderable Nickel		.110+ .035 - .01 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±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
100B	CA	CDR13BG	B Gold Chip		.110+.020 - .010 (2.79 + 0.51-0.25)	.110 ±.015 (2.79 ±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
100B	MS	CDR21BG	B 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	AR	CDR22BG	B Axial Ribbon				.102 (2.59) max.		.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	B Radial Ribbon									Box, 20 or 100 pcs	B20 or B100
100B	RW	CDR23BG	B Radial Wire		.145 ±.020 (3.68 ±0.51)				.500 (12.7)	#26 AWG., .016 (.406) dia. nominal		Box, 20 or 100 pcs	B20 or B100
100B	AW	CDR25BG	B Axial Wire									Box, 20 or 100 pcs	B20 or B100

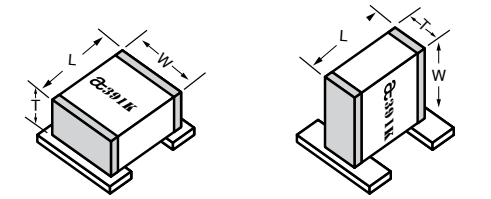
Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory.
All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

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	B 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	B 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	B 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	B 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	B Axial Ribbon				.102 (2.59) max.		.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	B Radial Ribbon									Box, 20 or 100 pcs	B20 or B100
100B	RN	Meets Requirements	B Radial Wire		.145 ±.020 (3.68 ±0.51)			.500 (12.7)	#26 AWG., .016 (.406) dia. nominal			Box, 20 or 100 pcs	B20 or B100
100B	BN	Meets Requirements	B Axial Wire									Box, 20 or 100 pcs	B20 or B100

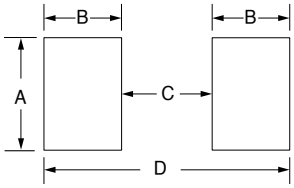
Additional lead styles available: Narrow Microstrip (NM), Narrow Axial Ribbon (NA) and Vertical Narrow Microstrip (H). Other lead lengths are available; consult factory.
All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

SUGGESTED MOUNTING PAD DIMENSIONS



Horizontal Electrode Orientation

Vertical Electrode Orientation



Case B Vertical Mount

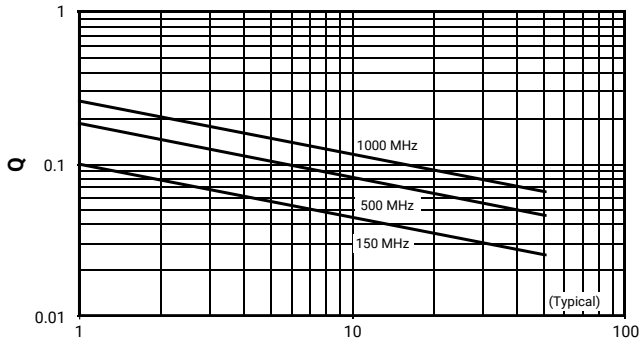
Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
0.1 pF	Normal	.065	.050	.075	.175
	High Density	.045	.030	.075	.135
0.2 pF	Normal	.090	.050	.075	.175
	High Density	.070	.030	.075	.135
0.3 to 510 pF	Normal	.110	.050	.075	.175
	High Density	.090	.030	.075	.135
> 510 pF	Normal	.120	.050	.075	.175
	High Density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

Horizontal Mount

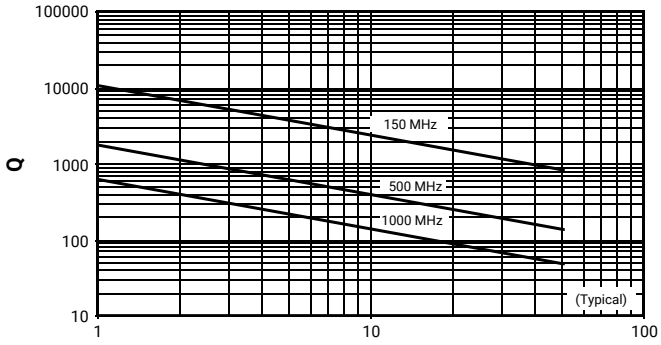
All Values	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

PERFORMANCE DATA

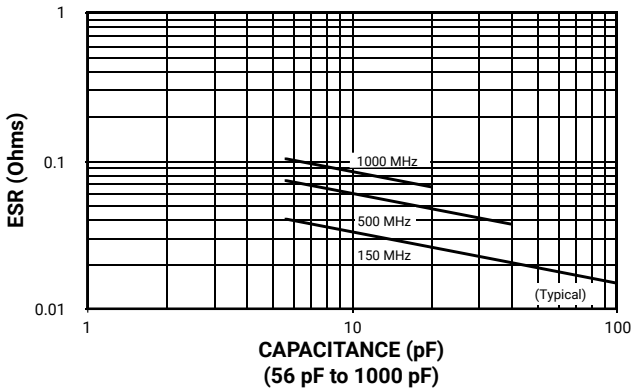
ESR VS. CAPACITANCE SERIES 100, CASE B



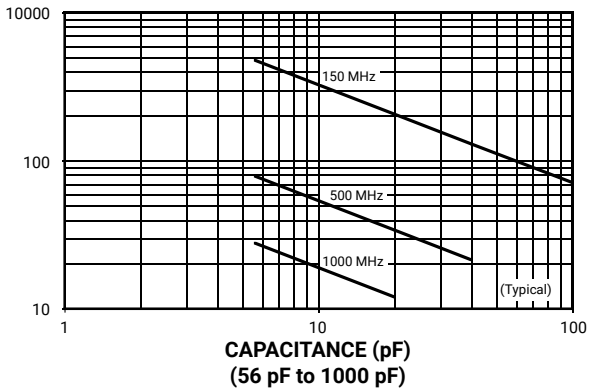
Q VS. CAPACITANCE SERIES 100, CASE B



ESR VS. CAPACITANCE SERIES 100, CASE B

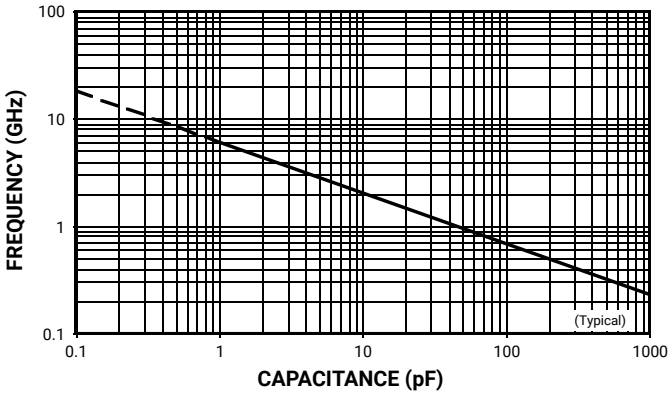


Q VS. CAPACITANCE SERIES 100, CASE B

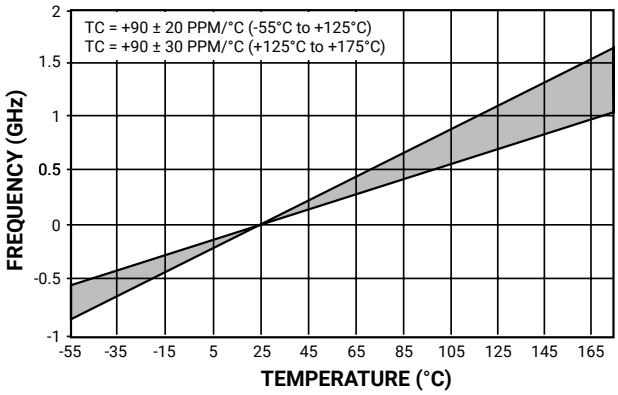


PERFORMANCE DATA

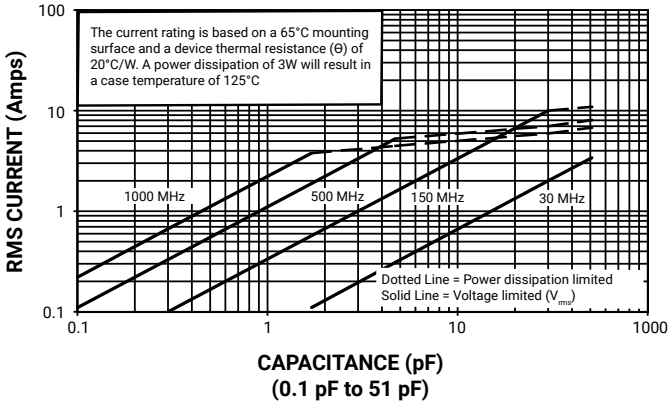
SERIES RESONANCE VS. CAPACITANCE
SERIES 100, CASE B



CAPACITANCE CHANGE VS. TEMPERATURE
SERIES 100, CASE B



CURRENT RATING VS. CAPACITANCE
SERIES 100, CASE B



CURRENT RATING VS. CAPACITANCE
SERIES 100, CASE B