



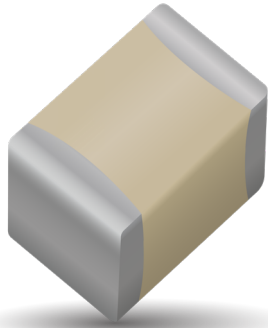
**THE DATASHEET OF**  
**87831-4028**



# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

### 700B Series NPO Porcelain and Ceramic Multilayer Capacitors



#### GENERAL DESCRIPTION

KYOCERA AVX, the industry leader, is announcing new improved ESR/ESL performance for the 700B 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, including RF power. Porcelain and ceramic construction provide a rugged, hermetic package.

#### FUNCTIONAL APPLICATIONS

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

#### CIRCUIT APPLICATIONS

- Timing Power Amplifiers
- Filters
- Oscillators
- RF Power Amplifiers

#### 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. 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 5 lbs. min., 15 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor.

KYOCERA AVX 700B Series Capacitors are designed and manufactured to meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123.

#### FEATURES

- Case B Size (.110" x .110")
- Capacitance Range 0.1 pF to 5100 pF
- 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)



#### ELECTRICAL SPECIFICATIONS

<b>Temperature Coefficient (TCC)</b>	0 ±30 PPM/°C (-55°C to +125°C)
<b>Capacitance Range</b>	0.1 pF to 5100 pF
<b>Operating Temperature</b>	0.1 to 200 pF: from -55°C to +175°C 220 to 5100 pF: from -55°C to +125°C
<b>Quality Factor</b>	Greater than 10,000 (1 pF to 200 pF) @ 1 MHz. Greater than 2000 (220 pF to 1000 pF) @ 1 MHz. Greater than 2000 (1100 pF to 5100 pF) @ 1 KHz.
<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 5100 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 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>Aging Effects</b>	None
<b>Piezoelectric Effects</b>	None
<b>Capacitance Drift</b>	± (0.02% or 0.02 pF), whichever is greater
<b>Retrace</b>	Less than ±(0.02% or 0.02 pF), whichever is greater.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at [www.kyocera-avx.com/disclaimer/](http://www.kyocera-avx.com/disclaimer/) by reference and should be reviewed in full before placing any order.

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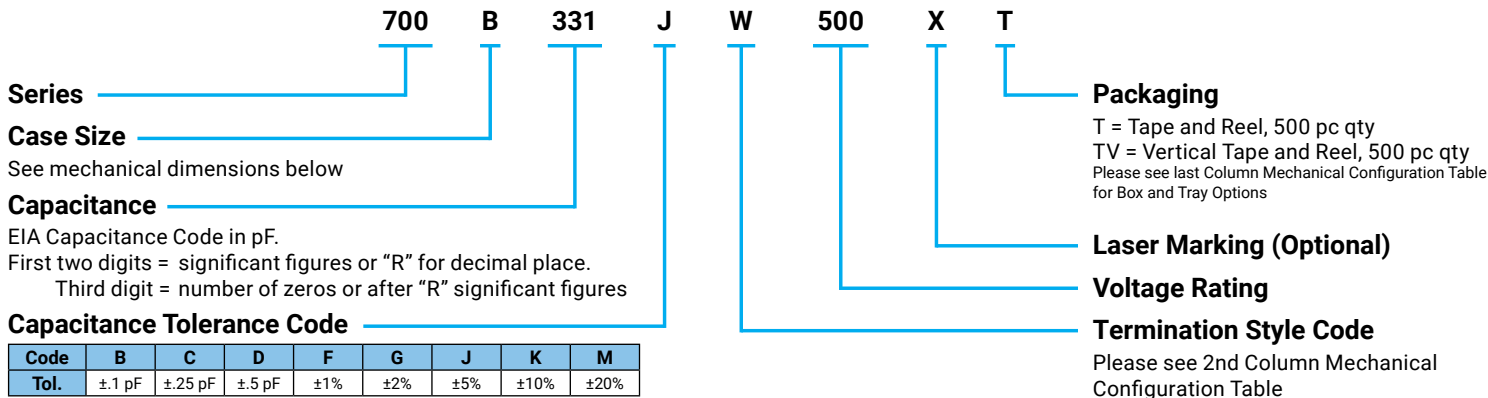


## CAPACITANCE VALUES

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	3R3	3.3	B, C, D	500	1500	330	33	F, G, J, K, M	500	1500	1500	331	330	F, G, J, K, M	200														
0R2	0.2				3R6	3.6				360	36					361	360																
0R3	0.3	B, C			EXTENDED VOLTAGE	3R9				3.9	EXTENDED VOLTAGE					390	39				1500	391	390	EXT VOLT	431	430	EXT	471	470				
0R4	0.4					4R3				4.3						430	43					431	430										
0R5	0.5	B, C, D				EXTENDED VOLTAGE				4R7						4.7	EXTENDED VOLTAGE					470	47		500	1000		EXTENDED VOLTAGE	511	510	EXTENDED	511	510
0R6	0.6									5R1						5.1						510	51						511	510			
0R7	0.7									5R6						5.6						560	56						561	560			
0R8	0.8									6R2						6.2						620	62						621	620			
0R9	0.9									B, C, J, K, M						6R8						6.8	680						68	681		680	
1R0	1.0															7R5						7.5	750						75	751		750	
1R1	1.1		B, C, D	EXTENDED VOLTAGE			8R2	8.2	EXTENDED VOLTAGE	820		82	300	1000	EXTENDED	821		820	EXTENDED	821		820											
1R2	1.2						9R1	9.1		910		91				911		910															
1R3	1.3				100		10	101		100	102	1000																					
1R4	1.4				110		11	111		110	112	1100																					
1R5	1.5	120			12	121	120	122		1200																							
1R6	1.6	F, G, J, K, M			130	13	131	130		152	1500																						
1R7	1.7				150	15	151	150		182	1800																						
1R8	1.8				160	16	161	160		222	2200																						
1R9	1.9				180	18	181	180		272	2700																						
2R0	2.0				200	20	201	200		302	3000																						
2R1	2.1		220	22	221	220	332	3300																									
2R2	2.2		240	24	241	240	392	3900																									
2R4	2.4		270	27	271	270	472	4700																									
2R7	2.7		300	30	301	300	512	5100																									
3R0	3.0																																

SPECIAL VALUES, TOLERANCES, DIFFERENT WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.  
Capacitance values in bold type indicate porcelain dielectric. All other capacitance values indicate ceramic dielectric.

## HOW TO ORDER



The above part number refers to a 700B Series (case size B) 330 pF capacitor, J tolerance (±5%), 500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and Tape and Reel packaging.

# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

### 700B Series NPO Porcelain and Ceramic Multilayer Capacitors



#### 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							
700B	W	CDR14BP	B Solder Plate		110+.025-.010 (2.79+0.64-0.25)	.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				
700B	P	CDR14BP	B Pellet		110+.025-.010 (2.79+0.64-0.25)	.110±.015 (2.79±0.38)	.102 (2.59)		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				
700B	T	N/A	B Solderable Nickel Barrier		110+.025-.010 (2.79+0.64-0.25)	.110±.015 (2.79±0.38)	.102 (2.59)		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				
700B	CA	CDR13BP	B Gold Chip		110+.025-.010 (2.79+0.64-0.25)	.110±.015 (2.79±0.38)	.102 (2.59)		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				
700B	MS	CDR21BP	B Microstrip		.135±.015 (3.43±0.38)	.110±.015 (2.79±0.38)	.120 (3.05) max.	N/A	Length (L <sub>L</sub> )	Width (W <sub>L</sub> )	Thickness (T <sub>L</sub> )	Cap Pac, 20 pcs	C20			
700B	AR	CDR22BP	B Axial Ribbon						.250 (6.35) min.	.093±.005 (2.36±0.13)	.004±.001 (.102±.025)	Box, 20 or 100 pcs	B20 or B100			
700B	RR	CDR24BP	B Radial Ribbon		.145±.020 (3.68±0.51)	.110±.015 (2.79±0.38)	.102 (2.59) max.	N/A	.500 (12.7)	#26 AWG., .016 (.406) dia.nominal		Box, 20 or 100 pcs	B20 or B100			
700B	RW	CDR23BP	B Radial Wire									.950 min.			Box, 20 or 100 pcs	B20 or B100
700B	AW	CDR25BP	B Axial Wire													

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.

# RF/Microwave Capacitors

## RF/Microwave Multilayer Capacitors (MLC)

### 700B Series NPO Porcelain and Ceramic Multilayer Capacitors



#### 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						
700B	WN	Meets Requirements	B Non-Mag Solder Plate		.110 +.020 -.010 (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 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		
700B	PN	Meets Requirements	B Non-Mag Pellet		.110 +.035 -.010 (2.79 +0.89 -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		
700B	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		
700B	MN	Meets Requirements	B Non-Mag Microstrip		.135 ±.015 (3.43 ±0.38)	.110 ±.015 (2.79 ±0.38)	.120 (3.05) max.	N/A	Length (L)	Width (W.)	Thickness (T.)	Cap Pac, 20 pcs	C20		
700B	AN	Meets Requirements	B Non-Mag Axial Ribbon						.250 (6.35) min.	.093 ± .005 (2.36 ± 0.13)	.004 ± .001 (.102 ± .025)	Box, 20 or 100 pcs	B20 or B100		
700B	FN	Meets Requirements	B Non-Mag Radial Ribbon						.145 ±.020 (3.68 ±0.51)	.102 (2.59) max.	N/A	.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal		Box, 20 or 100 pcs
700B	RN	Meets Requirements	B Non-Mag Axial Wire		.950 min.	N/A	.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal					Box, 20 or 100 pcs	B20 or B100	
700B	BN	Meets Requirements	B Non-Mag Radial Wire					.950 min.					N/A	.500 (12.7) min.	#26 AWG., .016 (.406) dia. nominal

\*Capacitors with values greater than 200 pF contain a trace magnetic element that may exhibit weak magnetic properties.

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

**SUGGESTED MOUNTING PAD DIMENSIONS**

Horizontal  
Electrode Orientation

Vertical  
Electrode Orientation

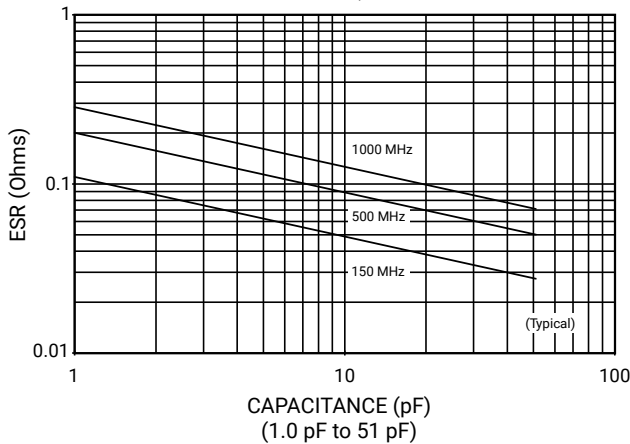
Case B Vertical Mount					
Cap Value	Pad Size	A Min.	B Min.	C Min.	D Min.
0.1 pF	Normal	.065	.050	.075	.175
	High Density	.045	.030	.075	.135
0.2 pF	Normal	.090	.050	.075	.175
	High Density	.070	.030	.075	.135
0.3 to 510 pF	Normal	.110	.050	.075	.175
	High Density	.090	.030	.075	.135
> 510 pF	Normal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

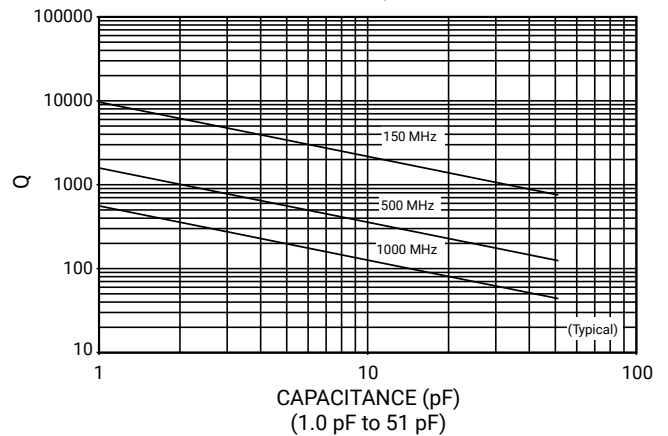
Horizontal Mount					
All Values	Pad Size	A Min.	B Min.	C Min.	D Min.
All Values	Normal	.130	.050	.075	.175
	High Density	.110	.030	.075	.135

**PERFORMANCE DATA**

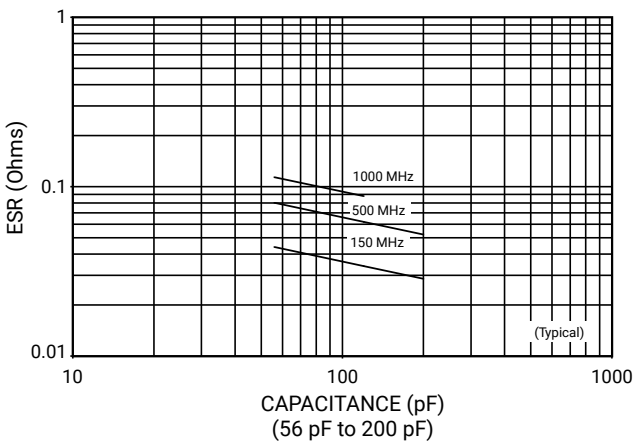
**ESR VS. CAPACITANCE  
 SERIES 700, CASE B**



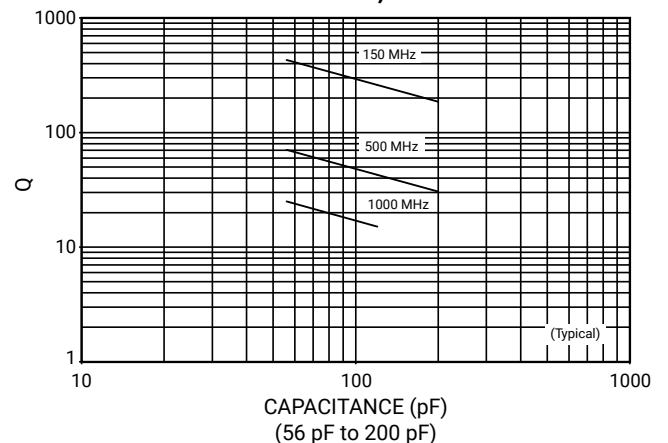
**Q VS. CAPACITANCE  
 SERIES 700, CASE B**



**ESR VS. CAPACITANCE  
 SERIES 700, CASE B**

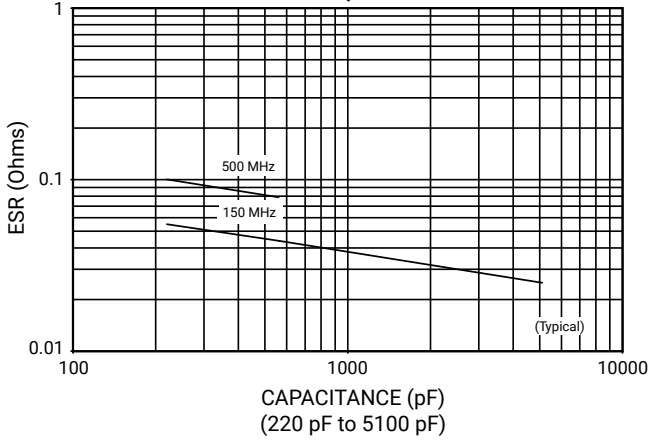


**Q VS. CAPACITANCE  
 SERIES 700, CASE B**

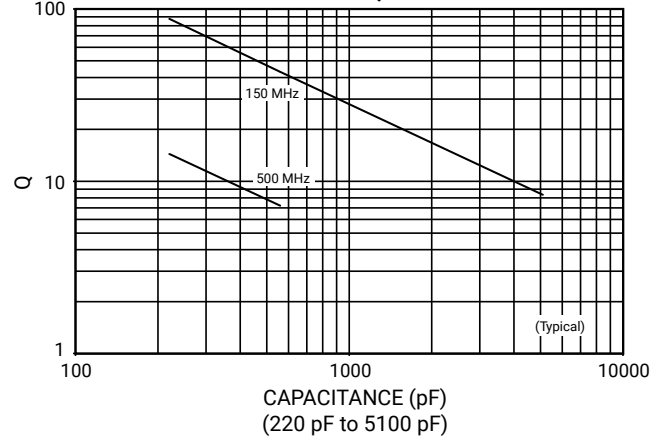


**PERFORMANCE DATA**

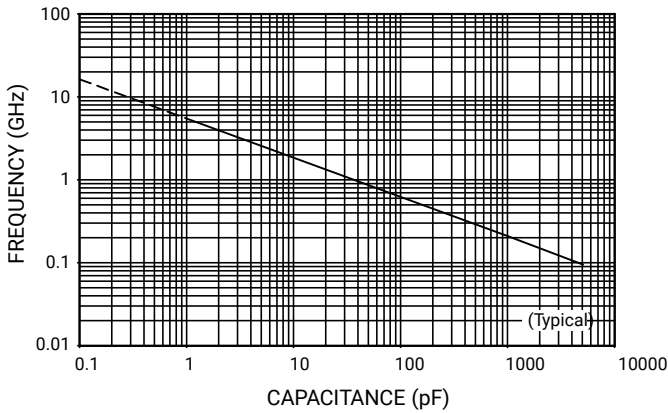
**ESR VS. CAPACITANCE**  
**SERIES 700, CASE B**



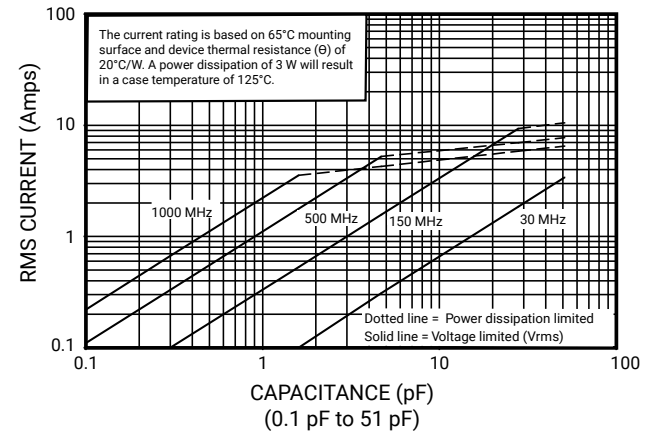
**Q VS. CAPACITANCE**  
**SERIES 700, CASE B**



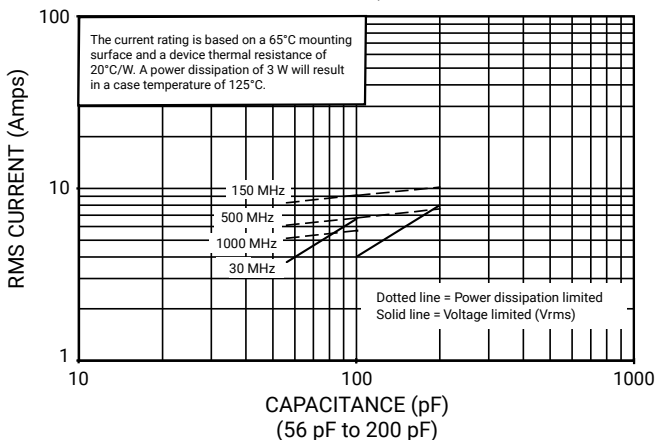
**SERIES RESONANCE VS. CAPACITANCE**  
**SERIES 700, CASE B**



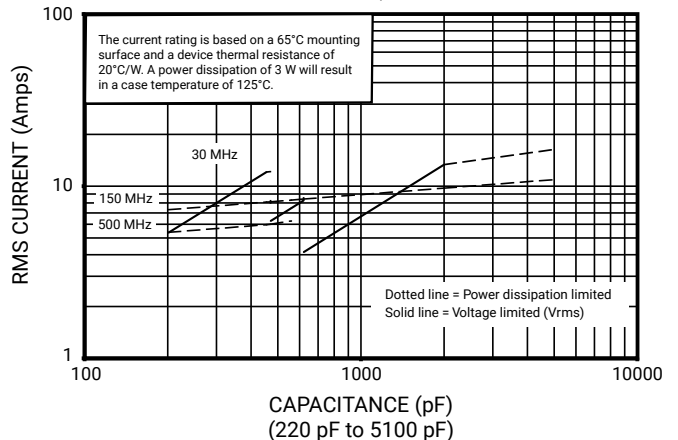
**CURRENT RATING VS. CAPACITANCE**  
**SERIES 700, CASE B**



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

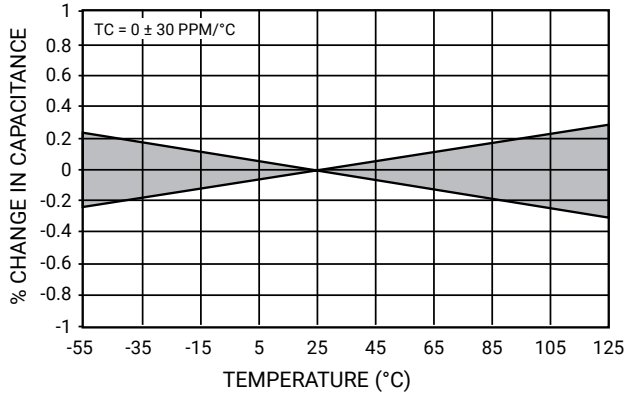


**CURRENT RATING VS. CAPACITANCE**  
**SERIES 700, CASE B**

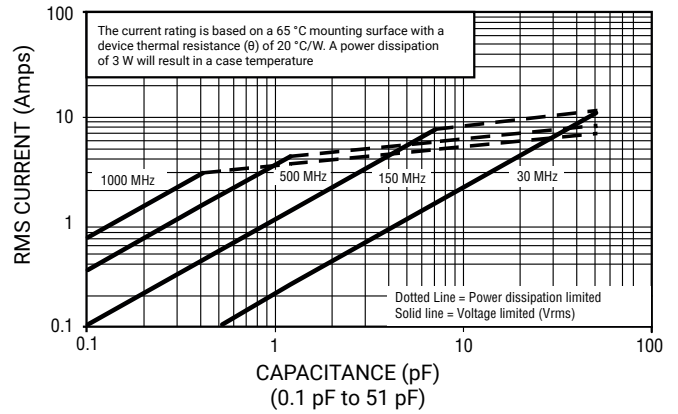


**PERFORMANCE DATA**

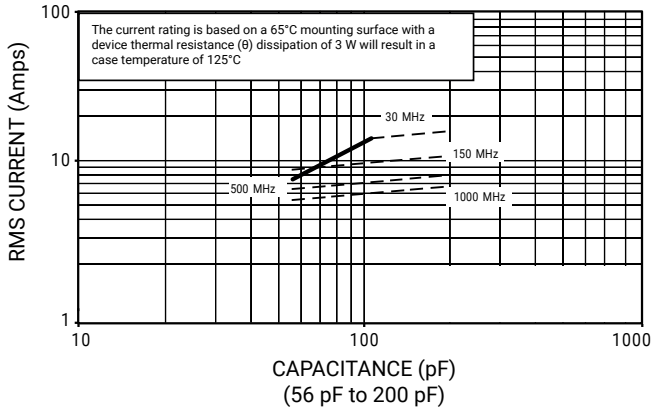
**CURRENT CHANGE VS. TEMPERATURE**  
**SERIES 700, CASE B**



**CURRENT RATING VS. CAPACITANCE**  
**SERIES 700, CASE B, EXTENDED VOLTAGE**



**CURRENT RATING VS. CAPACITANCE**  
**SERIES 700, CASE B, EXTENDED VOLTAGE**



**RF/Microwave Capacitors**  
**RF/Microwave Multilayer Capacitors (MLC)**  
**700B Series NPO Porcelain and Ceramic Multilayer Capacitors**



**SAMPLE KITS**

Kit #	RoHS Compliant	Item Number	Description	Cap. Value Range (pF)	Cap Value (pF)	Tol.	Price
Kit 11	-	DK0011	700B Porcelain and Ceramic 16 different values, 15 pcs. min. per value	1.0 to 10	1.0, 1.2, 1.5, 1.8, 2.0, 2.2, 2.4, 2.7, 3.0, 3.3.....	±0.1	\$165.00
Kit 11T		DK0011T			3.9, 4.7, 5.6, 6.8, 8.2 3.9, 4.7, 5.6, 6.8, 8.2 .....	±0.25	
Kit 12	-	DK0012	700B Porcelain and Ceramic 16 different values, 15 pcs. min. per value	10 to 100	10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 47, 56, 68, 82, 100 .....	±5%	\$165.00
Kit 12T		DK0012T					
Kit 13	-	DK0013	700B Porcelain and Ceramic 16 different values, 15 pcs. min. per value	100 to 1000	100, 120, 150, 180, 200, 220, 240, 270, 300, 330, 390, 470 .....	± 5%	\$165.00
Kit 13T		DK0013T			560, 680, 820, 1000.....	±10%	

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 [Molex, LLC Information](#)

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-  Alternative Solution
-  Excess Inventory Management