## **RF/Microwave Capacitors**

## **RF/Microwave Multilayer Capacitors (MLC)**

## 700E Series NPO Porcelain High RF Power Multilayer Capacitors





#### **GENERAL DESCRIPTION**

KYOCERA AVX, the industry leader, offers new improved ESR/ESL performance for the 700 E Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications with NPO performance. 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**

- HF/RF Power Amplifiers
- Transmitters
- · Antenna Tuning
- · Plasma Chambers
- · Medical (MRI coils)

### **ENVIRONMENTAL CHARACTERISTICS**

Thermal Shock	Mil-STD-202, Method 107, Condition A
<b>Moisture Resistance</b>	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. 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 10 lbs. min., 25 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.

#### **FEATURES**

- Case E Size (.380" x .380")
- · Capacitance Range 1pF to 2200pF
- Extended WVDC up to 7200 VDC
- Low ESR/ESL
- · High Q
- · High RF Power
- · Ultra-Stable Performance
- · High RF Current/Voltage
- · Available with Encapsulation Option\*
- \* For leaded styles only

#### PACKAGING OPTIONS







Tape & Reel Trav (96 pcs)

#### **ELECTRICAL SPECIFICATIONS**

_	
Temperature Coefficient (TCC)	0 ±30 PPM/°C (-55°C to +125°C)
Capacitance Range	1 pF to 2200 pF
Operating Temperature	-55°C to +125°C (No derating of working voltage).
Quality Factor	Greater than 10,000 (1 pF to 1000 pF) @ 1 MHz. Greater than 10,000 (1100 pF to 2200 pF) @ 1 KHz.
Insulation Resistance (IR)	1 pF to 2200 pF 10⁵ Megohms min. @ 25°C at 500 VDC 10⁴ Megohms min. @ 125°C at 500 VDC
Working Voltage (WVDC)	See Capacitance Values table
Dielectric Withstanding Voltage (DWV)	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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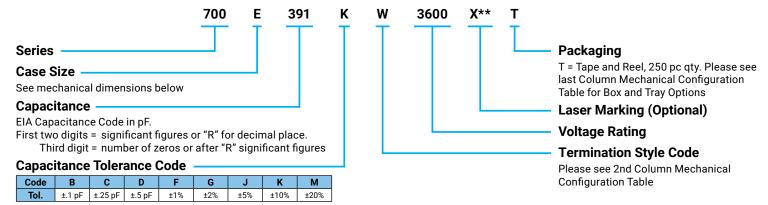


#### CAPACITANCE VALUES

Cap.	Cap.	Tol.	Rat WV		Cap.	Cap.	Tol.	Ra <sup>1</sup>		Cap.	Cap.	Tol.	Rated	ated WVDC CAL		CAP. (pF)	TOL.	RATED	WVDC
Code	(pF)		STD.	EXT.	Code	(pF)		STD.	EXT.	Code	(pF)		STD.	EXT.	CODE	(pr)		STD.	EXT.
1R0	1.0				5R1	5.1				390	39			ш	271	270			
1R1	1.1			E	5R6	5.6		ļų.	430	4			VOTAGE	301	300				
1R2	1.2			AG.	6R2	6.2	D 0		AG	470	47			70/	331	330		3600	
1R3	1.3			77	6R8	6.8	B, C, D		77	510	51			_	361	360			
1R4	1.4			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7R5	7.5			×	560	56			7200	391	390			
1R5	1.5			DEL	8R2	8.2			) H	620	62				431	430			
1R6	1.6			EN	9R1	9.1			EN	680	68			9	471	470			
1R7	1.7			EXTENDED VOLTAGE	100	10			EXTENDED VOLTAGE	750	75			EXTENDED	511	510			
1R8	1.8			H	110	11	11   12   13   3600		<b>B</b>	820	82			Œ	561	560		2500	
1R9	1.9	ВС			120	12				910	91	F, G,		E)	621	620	F, G,		
2R0	2.0	B, C, D	3600	7200	130	13		7200	101	100	J, K,	3600		681	680	J, K,		N/A	
2R1	2.1			7200	150	15			/200	111	110	M		EXT.	751	750	М		
2R2	2.2				160	16				121	120			Û	821	820			
2R4	2.4			GE	180	18	F, G, J, K,		GE	131	130			5000	911	910			
2R7	2.7			T.	200	20	), IX,		ΙŽ	151	150				102	1000			
3R0	3.0			70	220	22			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	161	160			VOLT	112	1100			
3R3	3.3			G	240	24			G	181	180			2	122	1200		1000	
3R6	3.6			ND	270	27			Ž	201	200				152	1500			
3R9	3.9			EXTENDED VOLTAGE	300	30			EXTENDED VOLTAGE	221	220			N/A	182	1800			
4R3	4.3			EX	330	33			Ä	241	240			13/7	222	2200			
4R7	4.7				360	36													

VRMS = 0.707 X WVDC
• SPECIAL VALUES, TOLERANCES, MATCHING, AND CAPACITOR ASSEMBLIES ARE AVAILABLE. • KYOCERA AVX'S CUSTOM POWER CAPACITOR ASSEMBLY CATALOG, LISTS **ASSEMBLY** 

#### **HOW TO ORDER**



The above part number refers to a 700 E Series (case size E) 390 pF capacitor, K tolerance (±10%), 3600 WVDC, with W termination (Tin /Lead, Solder Plated over Nickel Barrier), laser marking and Tape and Reel Packaging.

OPTIONS. • DIFFERENT WORKING VOLTAGES ARE AVAILABLE • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

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### **MECHANICAL CONFIGURATION**

Series	8 Case Size		Outline W/T is a Termination		Dimensions ches (mm)			ead and Termination nensions and Material	Dien Tune	Pkg
Size	Code	& Type	Surface	Length (L)	Width (W)	Thickness (T)	Overlap (Y)	Materials	Pkg Type	Code
700E	W	E Solder Plate	Y→    ←	.380+.015010 (9.65+0.38-0.25)				Tin/Lead, Solder Plated over Nickel Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	Р	E Pellet	Y→   ←	.380+.040010 (9.65+1.02-0.25)	.380 ±.010 (9.65 ±0.25)		.040 (1.02) max.	Heavy Tin/Lead Coated, over Nickel Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	Т	E Solderable Nickel Barrier	Y→   ←	.380+.015010 (9.65+0.38-0.25)				RoHS Compliant Tin Plated over Nickel Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	MS	E Microstrip	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.380+.035010 (9.65+0.89-0.25)		170 (4.32) max.		$\begin{array}{c} \text{High Purity} \\ \text{Silver Leads} \\ \text{L}_{\text{L}} = .750 \ (19.05) \ \text{min} \\ \text{W}_{\text{L}} = .350 \pm .010 \ (8.89 \pm 0.25) \\ \text{T}_{\text{L}} = .010 \pm .005 \ (0.25 \pm 0.13) \\ \text{Leads are Attached with} \\ \text{High Temperature Solder.} \end{array}$	Tray, 16 or 32 pcs	J16 J32
700E	AR	E Axial Ribbon	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						Tray, 16 or 32 pcs	J16 J32
700E	AW	E Axial Wire	→ Lt   ← ↓ w • ↑				IN/A	Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L <sub>L</sub> = 2.25 (57.2) min.	Box, 20 pcs	B20
700E	RW	E Radial Wire	→ Lt   ← ↓ w + + + + + + + + + + + + + + + + + +					Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L <sub>L</sub> = 1.0 (25.4) min.	Tray, 16 or 64 pcs	J16 J64

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.

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#### **MECHANICAL CONFIGURATION**

& Case Size W/T is a		Outline W/T is a Termination		Body Dimensions inches (mm)			ead and Termination nensions and Material	Disa Tura	Pkg	
Size	Code	& Type	Surface	Length (L)	Width (W)	Thickness (T)	Overlap (Y)	Materials	Pkg Type	Code
700E	WN	E Non-Mag Solder Plate	$\begin{array}{c c}  & \downarrow \\  & \underline{\qquad} \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\$	.380+.015010 (9.65+0.38-0.25)				Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	PN	E Non-Mag Pellet	$\begin{array}{c c}  & \downarrow \\  & \downarrow \\  & w \\  & \downarrow \\ $	.380+.040010 (9.65+1.02-0.25)			.040 (1.02) max.	Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	TN	E Non-Mag Solderable Barrier	$\begin{array}{c c}  & \downarrow \\  & \underline{\qquad} \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  & \underline{\qquad} \\  & \downarrow \\  & \underline{\qquad} \\  &$	.380+.015010 (9.65+0.38-0.25)				<b>RoHS Compliant</b> Tin Plated over Non-Magnetic Barrier Termination	T&R, 250 pcs Tray, 96 pcs	T J96
700E	MN	E Non-Mag Microstrip	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		.380 ±.010 (9.65 ±0.25)	.170 (4.32) max.		$High \ Purity \\ Silver \ Leads \\ L_{\tiny L} = .750 \ (19.05) \ min \\ W_{\tiny L} = .350 \pm .010 \ (8.89 \pm 0.25) \\ T_{\tiny L} = .010 \pm .005 \ (0.25 \pm 0.13) \\ Leads \ are \ Attached \ with \\ High \ Temperature \ Solder.$	Tray, 16 or 32 pcs	J16 J32
700E	AN	E Non-Mag Axial Ribbon	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	.380+.035010			N/A		Tray, 16 or 32 pcs	J16 J32
700E	BN	E Non-Mag Axial Wire	→ L	(9.65+0.89-0.25)			N/A	Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L <sub>L</sub> = 2.25 (57.2) min.	Box, 20 pcs	B20
700E	RN	E Non-Mag Radial Wire	→ L ← → W ←					Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L <sub>L</sub> = 1.0 (25.4) min.	Tray, 16 or 64 pcs	J16 J64

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are RoHS compliant.

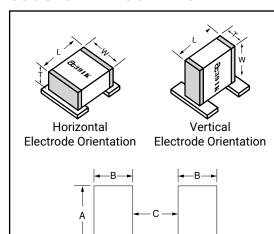
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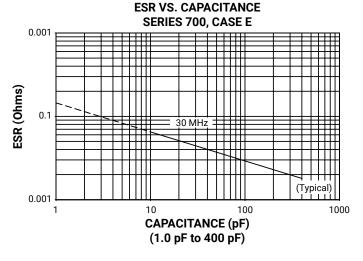
### SUGGESTED MOUNTING PAD DIMENSIONS

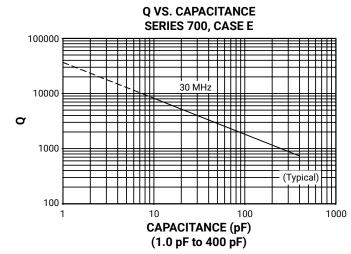


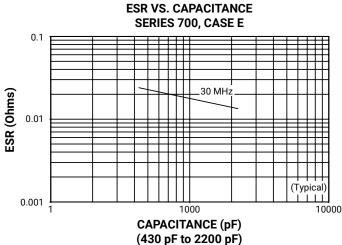
Mount Type	Case E									
Mount Type	Pad Size	A Min.	B Min.	C Min.	D Min.					
Vertical Mount	Normal	.185	.050	.325	.425					
vertical Mount	High Density	.165	.030	.325	.385					
Horizontal Mount	Normal	.405	.050	.325	.425					
HOHZOHILAH MOUHL	High Density	.383	.030	.325	.385					

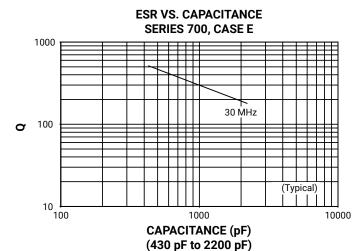
Dimensions are in inches.

#### PERFORMANCE DATA









KYDEERa
The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.