

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
- Plasma Chambers
- Transmitters
- Medical (MRI coils)
- Antenna Tuning

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. 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



Tray
(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 10 ⁵ Megohms min. @ 25°C at 500 VDC 10 ⁴ 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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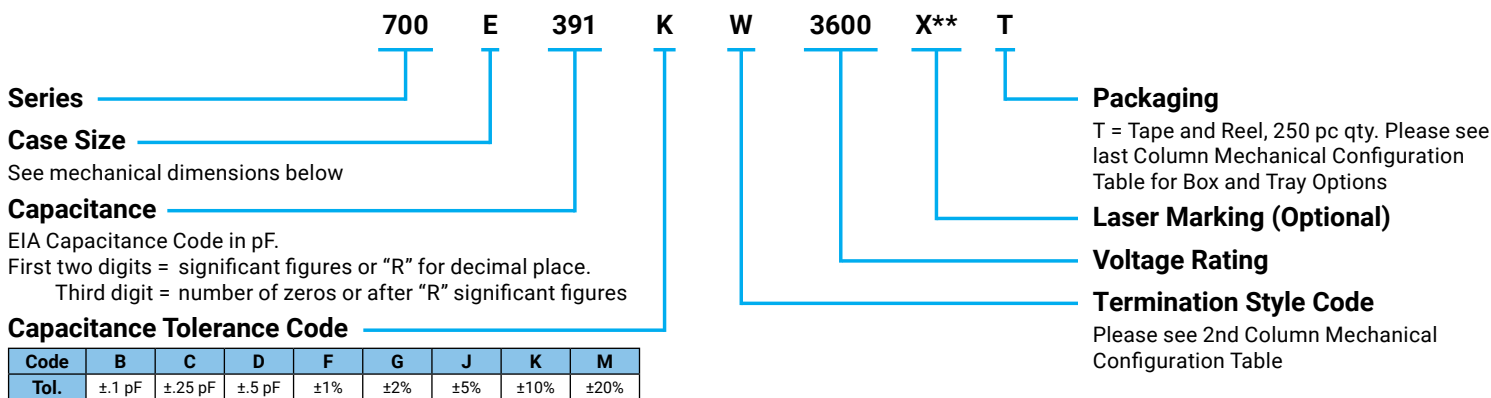


CAPACITANCE VALUES

| Cap. 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 | 3600 | 7200 | 5R1 | 5.1 | B, C, D | 3600 | 7200 | 390 | 39 | F, G, J, K, M | 3600 | 7200 | 271 | 270 | F, G, J, K, M | 3600 | N/A |
| 1R1 | 1.1 | | | | 5R6 | 5.6 | | | | 430 | 4 | | | | 301 | 300 | | | |
| 1R2 | 1.2 | | | | 6R2 | 6.2 | | | | 470 | 47 | | | | 331 | 330 | | | |
| 1R3 | 1.3 | | | | 6R8 | 6.8 | | | | 510 | 51 | | | | 361 | 360 | | | |
| 1R4 | 1.4 | | | | 7R5 | 7.5 | | | | 560 | 56 | | | | 391 | 390 | | | |
| 1R5 | 1.5 | | | | 8R2 | 8.2 | | | | 620 | 62 | | | | 431 | 430 | | | |
| 1R6 | 1.6 | | | | 9R1 | 9.1 | | | | 680 | 68 | | | | 471 | 470 | | | |
| 1R7 | 1.7 | | | | 100 | 10 | | | | 750 | 75 | | | | 511 | 510 | | | |
| 1R8 | 1.8 | | | | 110 | 11 | | | | 820 | 82 | | | | 561 | 560 | | | |
| 1R9 | 1.9 | | | | 120 | 12 | | | | 910 | 91 | | | | 621 | 620 | | | |
| 2R0 | 2.0 | F, G, J, K, M | 3600 | 7200 | 130 | 13 | F, G, J, K, M | 3600 | 7200 | 101 | 100 | F, G, J, K, M | 3600 | 5000 | 681 | 680 | F, G, J, K, M | 1000 | N/A |
| 2R1 | 2.1 | | | | 150 | 15 | | | | 111 | 110 | | | | 751 | 750 | | | |
| 2R2 | 2.2 | | | | 160 | 16 | | | | 121 | 120 | | | | 821 | 820 | | | |
| 2R4 | 2.4 | | | | 180 | 18 | | | | 131 | 130 | | | | 911 | 910 | | | |
| 2R7 | 2.7 | | | | 200 | 20 | | | | 151 | 150 | | | | 102 | 1000 | | | |
| 3R0 | 3.0 | | | | 220 | 22 | | | | 161 | 160 | | | | 112 | 1100 | | | |
| 3R3 | 3.3 | | | | 240 | 24 | | | | 181 | 180 | | | | 122 | 1200 | | | |
| 3R6 | 3.6 | | | | 270 | 27 | | | | 201 | 200 | | | | 152 | 1500 | | | |
| 3R9 | 3.9 | | | | 300 | 30 | | | | 221 | 220 | | | | 182 | 1800 | | | |
| 4R3 | 4.3 | | | | 330 | 33 | | | | 241 | 240 | | | | 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 OPTIONS. • DIFFERENT WORKING VOLTAGES ARE AVAILABLE • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

HOW TO ORDER



**Optional
 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.

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MECHANICAL CONFIGURATION

| Series & Case Size | Term. Code | 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 | | | |
| 700E | W | Solder Plate | | .380+.015-.010 (9.65±0.38-0.25) | | 170 (4.32) max. | .040 (1.02) max. | Tin/Lead, Solder Plated over Nickel Barrier Termination | T&R, 250 pcs Tray, 96 pcs | T J96 | |
| 700E | P | Pellet | | | | | | .380+.040-.010 (9.65±1.02-0.25) | Heavy Tin/Lead Coated, over Nickel Barrier Termination | T&R, 250 pcs Tray, 96 pcs | T J96 |
| 700E | T | Solderable Nickel Barrier | | | | | | .380+.015-.010 (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 | Microstrip | | .380±.010 (9.65±0.25) | | 170 (4.32) max. | N/A | High Purity Silver Leads $L_L = .750 (19.05) \text{ min}$ $W_L = .350 \pm .010 (8.89 \pm 0.25)$ $T_L = .010 \pm .005 (0.25 \pm 0.13)$ Leads are Attached with High Temperature Solder. | Tray, 16 or 32 pcs | J16 J32 | |
| 700E | AR | Axial Ribbon | | | | | | .380+.035-.010 (9.65±0.89-0.25) | Leads are Attached with High Temperature Solder. | Tray, 16 or 32 pcs | J16 J32 |
| 700E | AW | Axial Wire | | | | | | | Silver-plated Copper Leads Dia. = $.032 \pm .002 (.813 \pm .051)$ $L_L = 2.25 (57.2) \text{ min.}$ | Box, 20 pcs | B20 |
| 700E | RW | Radial Wire | | | | | | Silver-plated Copper Leads Dia. = $.032 \pm .002 (.813 \pm .051)$ $L_L = 1.0 (25.4) \text{ min.}$ | 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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|--------------------|------------|----------------------------|---|------------------------------------|-----------|------------------|--|--|---------------------------|----------|
| | | | | Length (L) | Width (W) | Thickness (T) | Overlap (Y) | Materials | | |
| 700E | WN | Non-Mag Solder Plate | | .380+.015-.010 (9.65+0.38-0.25) | | | .040 (1.02) max. | Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination | T&R, 250 pcs Tray, 96 pcs | T J96 |
| 700E | PN | Non-Mag Pellet | | .380+.040-.010 (9.65+1.02-0.25) | | | | Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination | T&R, 250 pcs Tray, 96 pcs | T J96 |
| 700E | TN | Non-Mag Solderable Barrier | | .380+.015-.010 (9.65+0.38-0.25) | | | | RoHS Compliant Tin Plated over Non-Magnetic Barrier Termination | T&R, 250 pcs Tray, 96 pcs | T J96 |
| 700E | MN | Non-Mag Microstrip | | .380±.010 (9.65±0.25) | | .170 (4.32) max. | N/A | High Purity Silver Leads $L_L = .750$ (19.05) min $W_L = .350 \pm .010$ (8.89 ± 0.25) $T_L = .010 \pm .005$ (0.25 ± 0.13) Leads are Attached with High Temperature Solder. | Tray, 16 or 32 pcs | J16 J32 |
| 700E | AN | Non-Mag Axial Ribbon | | | | | | .380+.035-.010 (9.65+0.89-0.25) | Tray, 16 or 32 pcs | J16 J32 |
| 700E | BN | Non-Mag Axial Wire | | | | | | Silver-plated Copper Leads Dia. = .032 ± .002 (.813 ± .051) $L_L = 2.25$ (57.2) min. | Box, 20 pcs | B20 |
| 700E | RN | Non-Mag Radial Wire | | | | | | Silver-plated Copper Leads Dia. = .032 ± .002 (.813 ± .051) $L_L = 1.0$ (25.4) min. | Tray, 16 or 64 pcs | J16 J64 |

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SUGGESTED MOUNTING PAD DIMENSIONS

Horizontal
Electrode Orientation

Vertical
Electrode Orientation

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

Dimensions are in inches.

PERFORMANCE DATA

