

RF/Microwave Capacitors

RF/Microwave Multilayer Capacitors (MLC)

100C Series Porcelain Superchip® Multilayer Capacitors



GENERAL DESCRIPTION

KYOCERA AVX, the industry leader, offers new improved ESR/ESL performance for the 100C Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications. 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

- VHF/UHF RF Power Amplifiers
- Plasma Chambers
- Antenna Tuning
- Medical (MRI coils)

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 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min. |
| 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 10 lbs. min., 20 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211. |

FEATURES

- Case C Size (.250" x .250")
- Capacitance Range 1pF to 2700pF
- Extended WVDC up to 3600 VDC
- Low ESR/ESL
- High Q
- Low Noise
- Ultra-Stable Performance
- High Self-Resonance
- Established Reliability (QPL)

PACKAGING OPTIONS



Tape & Reel



Tray
(180 pcs)



ELECTRICAL SPECIFICATIONS

| | |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Coefficient (TCC) | +90 ±30 PPM/°C (-55°C to +125°C) |
| Insulation Resistance (IR) | 1 pF to 2700 pF: 10 ⁵ Megohms min. @ +25°C at rated WVDC. 10 ⁴ Megohms min. @ +125°C at rated WVDC. Max. test voltage is 500 VDC. |
| 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 |
| Retrace | Less than ±(0.02% or 0.02 pF), whichever is greater. |
| Aging Effects | None |
| Piezoelectric Effects | None |
| Capacitance Drift | ±(0.02% or 0.02 pF), whichever is greater. |
| Operating Temperature Range | From -55°C to +125°C (No derating of working voltage) |

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| 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 | 2500 | 3600 | 5R1 | 5.1 | B, C, D | 2500 | 3600 | 390 | 39 | F, G, J, K, M | 2500 | 3600 | 301 | 300 | F, G, J, K, M | 1500 | 2000 |
| 1R1 | 1.1 | | | | 5R6 | 5.6 | | | | 430 | 43 | | | | 331 | 330 | | | |
| 1R2 | 1.2 | | | | 6R2 | 6.2 | | | | 470 | 47 | | | | 361 | 360 | | | |
| 1R3 | 1.3 | | | | 6R8 | 6.8 | | | | 510 | 51 | | | | 391 | 390 | | | |
| 1R4 | 1.4 | | | | 7R5 | 7.5 | | | | 560 | 56 | | | | 431 | 430 | | | |
| 1R5 | 1.5 | | | | 8R2 | 8.2 | | | | 620 | 62 | | | | 471 | 470 | | | |
| 1R6 | 1.6 | | | | 9R1 | 9.1 | | | | 680 | 68 | | | | 511 | 510 | | | |
| 1R7 | 1.7 | | | | 100 | 10 | | | | 750 | 75 | | | | 561 | 560 | | | |
| 1R8 | 1.8 | | | | 110 | 11 | | | | 820 | 82 | | | | 621 | 620 | | | |
| 1R9 | 1.9 | | | | 120 | 12 | | | | 910 | 91 | | | | 681 | 680 | | | |
| 2R0 | 2.0 | B, C, D | 2500 | 3600 | 130 | 13 | F, G, J, K, M | 2500 | 3600 | 101 | 100 | F, G, J, K, M | 2500 | 3000 | 751 | 750 | F, G, J, K, M | 1000 | 1500 |
| 2R1 | 2.1 | | | | 150 | 15 | | | | 111 | 110 | | | | 821 | 820 | | | |
| 2R2 | 2.2 | | | | 160 | 16 | | | | 121 | 120 | | | | 911 | 910 | | | |
| 2R4 | 2.4 | | | | 180 | 18 | | | | 131 | 130 | | | | 102 | 1000 | | | |
| 2R7 | 2.7 | | | | 200 | 20 | | | | 151 | 150 | | | | 112 | 1100 | | | |
| 3R0 | 3.0 | | | | 220 | 22 | | | | 161 | 160 | | | | 122 | 1200 | | | |
| 3R3 | 3.3 | | | | 240 | 24 | | | | 181 | 180 | | | | 152 | 1500 | | | |
| 3R6 | 3.6 | | | | 270 | 27 | | | | 201 | 200 | | | | 182 | 1800 | | | |
| 3R9 | 3.9 | | | | 300 | 30 | | | | 221 | 220 | | | | 222 | 2200 | | | |
| 4R3 | 4.3 | | | | 330 | 33 | | | | 241 | 240 | | | | 242 | 2400 | | | |
| 4R7 | 4.7 | 360 | 36 | 271 | 270 | 272 | 2700 | | | | | | | | | | | | |

VRMS = 0.707 x WVDC

• SPECIAL VALUES, TOLERANCES, HIGHER WVDC AND MATCHING AVAILABLE. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

HOW TO ORDER



The above part number refers to a 100 C Series (case size C) 10 pF capacitor, J tolerance (±5%), 2500 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and 500 pc T&R packaging.

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MECHANICAL CONFIGURATIONS

| ATC SERIES & CASE SIZE | ATC TERM. CODE | CASE SIZE & TYPE | OUTLINES W/T IS A TERMINATION SURFACE | BODY DIMENSIONS INCHES (MM) | | | LEAD AND TERMINATION DIMENSIONS AND MATERIALS | | Pkg. Type | Pkg Code | |
|------------------------|----------------|---------------------------|---------------------------------------|-------------------------------------|-----------------------------|---------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------|
| | | | | LENGTH (L) | WIDTH (W) | THICKNESS (T) | OVERLAP (Y) | MATERIALS | | | |
| 100C | W | Solder Plate | | .230+.020 -.010 (5.84+0.51-0.25) | .250 ±0.015 (6.35 ±0.38) | | .040 (1.02) max. | Tin/Lead, Solder Plated over Nickel Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 | |
| 100C | P | Pellet | | .230+.025 -.010 (5.84+0.64-0.25) | | | | Heavy Tin/Lead Coated, over Nickel Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 | |
| 100C | T | Solderable Nickel Barrier | | .230+.020 -.010 (5.84+0.51-0.25) | | | | RoHS Compliant Tin Plated over Nickel Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 | |
| 100C | MS | Microstrip | | | | | .145(3.68) max. for capacitance values ≤680pF | N/A | High Purity Silver Leads $L_L = .500$ (12.7) min. $W_L = .240 \pm .005$ (6.10 ± 0.127) $T_L = .004 \pm .001$ (.102 ± 0.025) Leads are Attached with High Temperature Solder. | Tray, 24 or 60 pcs | J24 or J60 |
| 100C | AR | Axial Ribbon | | | | | .165(4.19) max. for capacitance values >680pF | | | Box, 24 pcs | B24 |
| 100C | AW | Axial Wire | | .245 ±0.025 (6.22 ±0.64) | | | | | Silver-plated Copper Leads $L_L = 2.25$ (57.15) min. Dia. = .032 ±0.002 (0.81 ±0.05) | Box, 21 pcs | B21 |
| 100C | VA | Vertical Axial Ribbon | | | | | | | Silver Leads $L_L = .500$ (12.7) min. $W_L = **$ See below $T_L = .004 \pm .001$ (.102 ± 0.025) | Box, 24 pcs | B24 |
| 100C | RW | Radial Wire | | | | | Silver-plated Copper Leads $L_L = 1.0$ (25.4) min. Dia. = .032 ±0.002 (0.81 ±0.05) | Tray, 16 pcs | J16 | | |

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NON-MAGNETIC MECHANICAL CONFIGURATIONS

| ATC SERIES & CASE SIZE | ATC TERM. CODE | CASE SIZE & TYPE | OUTLINES W/T IS A TERMINATION SURFACE | BODY DIMENSIONS INCHES (MM) | | | LEAD AND TERMINATION DIMENSIONS AND MATERIALS | | Pkg. Type | Pkg Code |
|------------------------|----------------|-----------------------------------|---------------------------------------|-------------------------------------|----------------------------|--------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------|
| | | | | LENGTH (L) | WIDTH (W) | THICKNESS (T) | OVERLAP (Y) | MATERIALS | | |
| 100C | WN | Non-Mag Solder Plate | | .230±.025 -.010 (5.84±0.64-0.25) | .250 ±.015 (6.35 ±0.38) | .145(3.68) max. for capacitance values ≤680pF | .040 (1.02) max. | Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 |
| 100C | PN | Non-Mag Pellet | | .230±.035-.010 (5.84±0.89-0.25) | | | | Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 |
| 100C | TN | Non-Mag Solderable Nickel Barrier | | .230±.025 -.010 (5.84±0.64-0.25) | | | | RoHS Compliant Tin Plated over Non-Magnetic Barrier Termination | T&R, 250 or 500 pcs Tray, 36 or 180 pcs | T250 or T J36 or J180 |
| 100C | MN | Non-Mag Microstrip | | .245 ±.025 (6.22 ±0.64) | | | | High Purity Silver Leads L _L = .500 (12.7) min. W _L = .240 ±.005 (6.10 ±.127) T _L = .004 ±.001 (.102 ±.025) Leads are Attached with High Temperature Solder. | Tray, 24 or 60 pcs | J24 or J60 |

SUGGESTED MOUNTING PAD DIMENSIONS

Horizontal Electrode Orientation

Vertical Electrode Orientation

Case C Vertical Mount

| Cap Value | Pad Size | A Min. | B Min. | C Min. | D Min. |
|-----------|--------------|--------|--------|--------|--------|
| < 680 pF | Normal | .150 | .050 | .200 | .300 |
| | High Density | .130 | .030 | .200 | .260 |
| > 680 pF | Normal | .185 | .050 | .200 | .300 |
| | High Density | .165 | .030 | .200 | .260 |

Horizontal Mount

| All Values | Pad Size | A Min. | B Min. | C Min. | D Min. |
|------------|--------------|--------|--------|--------|--------|
| All Values | Normal | .280 | .050 | .200 | .300 |
| | High Density | .260 | .030 | .200 | .260 |