

RF/Microwave Capacitors

RF/Microwave Multilayer Capacitors (MLC)

100C Series Porcelain Superchip® Multilayer Capacitors



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)

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. |

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

Series **100** Case Size **C** Capacitance **100** Tolerance **J** Termination **W** WVDC **2500** Laser Marking **X** Packaging **T**

See mechanical dimensions below

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. | ±0.1 pF | ±0.25 pF | ±0.5 pF | ±1% | ±2% | ±5% | ±10% | ±20% |

Packaging
T = Tape and Reel, 500 pc. qty.
Please see last column of mechanical configuration table for other options.

Laser Marking (Optional)

WVDC

Termination Style Code
Please see 2nd Column Mechanical Configuration Table

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) | .145(3.68) max. for capacitance values ≤680pF | .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 | | .245 ±0.025 (6.22 ±0.64) | | | .165(4.19) 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 | | | | | | | Box, 24 pcs | B24 | |
| 100C | AW | Axial Wire | | | | | | | Box, 21 pcs | B21 | |
| 100C | VA | Vertical Axial Ribbon | | Box, 24 pcs | | | B24 | | | | |
| 100C | RW | Radial Wire | | 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 .165(4.19) 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 |