

Type 168/185 Metallized Polyester Radial Lead Capacitors

Radial Box Metallized Polyester Capacitors for Automatic Insertion



The Type 168/185 series radial lead metallized polyester box capacitors are available in bulk (Type 168) or on ammo pack or tape and reel (Type 185). These capacitors are constructed in rugged rectangular plastic cases and all come with 5.0 mm (0.197") lead spacing. They are good for general purpose applications such as bypass, decoupling, energy storage/discharge and arc suppression.

Highlights

- Case and epoxy fill meets UL94V-0
- 5.0 mm (0.197") lead spacing
- Bulk, tape and reel or ammo pack
- Non-inductively wound
- Non-polar
- Low leakage
- Lead material: Tinned copper wire

Specifications

RoHS Compliant

Capacitance Range: 0.001 μF to 1.0 μF

Voltage Range: 50 Vdc to 400 Vdc (30 Vac to 200 Vac, 60 Hz)

Capacitance Tolerance: $\pm 5\%$, $\pm 10\%$, $\pm 20\%$

Operating Temperature Range: $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$ (with 50% Vdc derating $>85\text{ }^{\circ}\text{C}$)

Dielectric Withstand Voltage: 1.6 x rated voltage for 2 sec @ $+25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$

Dissipation Factor (DF): $\tan\delta \times 10^{-4}$ at $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$

| kHz | C $\leq 0.1\ \mu\text{F}$ | C $> 0.1\ \mu\text{F}$ |
|-----|---------------------------|------------------------|
| 1 | ≤ 100 | ≤ 100 |
| 10 | ≤ 150 | ≤ 150 |
| 100 | ≤ 300 | |

Total Self Inductance (L): Approximately 7 nH

Long Term Stability (after two years): Capacitance change $\Delta\text{C}/\text{C} \leq \pm 3\%$ under standard environmental conditions

Maximum Pulse Rise Time (dv/dt):

| Vn | V/ μs |
|-----|------------------|
| 50 | 250 |
| 63 | 250 |
| 100 | 300 |
| 250 | 400 |
| 400 | 600 |

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value with the ratio Vn/V.

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Capacitor Outline Drawing



Test Method and Performance

| Insulation Resistance | |
|------------------------|--|
| Test Conditions | Temperature: 25 °C ±5 °C Voltage Charge Time: 1 minute Voltage Charge: 10 Vdc for Vn < 100 Vdc 100 Vdc for Vn ≥ 100 Vdc |
| Performance | For Vn > 100 Vdc: C ≤ 0.33 μF, ≥15,000 MΩ C > 0.33 μF, ≥ 5,000 S For Vn ≤ 100 Vdc: C ≤ 0.33 μF, 30,000 MΩ C > 0.33 μF, ≥ 10,000 S |
| Damp Heat Test | |
| Test Conditions | Temperature: +40 °C Relative Humidity: 95% Test Duration: 21 days |
| Performance | Capacitance Change ΔC/C: ±5% DF Change Δtgδ: ≤ 0.005 (10 KHz) Insulation Resistance: ≥ 50% of limit value |
| Life Test | |
| Test Conditions | REF Temperature: +85 °C Test Duration: 2000 hrs Voltage Applied: 1.25 x Vn |
| Performance | Capacitance Change ΔC/C: ≤ ±2% DF Change Δtgδ: ≤ 30 x 10 ⁻⁴ at 10 kHz Insulation Resistance: ≥ 50% of limit value |

Soldering

| | |
|------------------------|---|
| Test Conditions | Soldering Temperature: 260 °C ±5 °C Soldering Duration: 10 sec ±1 sec |
| Performance | Capacitance Change ΔC/C: ≤ ±2% DF Change Δtgδ: ≤ 30 x 10 ⁻⁴ at 10 kHz Insulation Resistance: ≥ limit value |

Ratings

| Catalog Part Number | Tape & Reel Ammo Pack | Cap (μF) | Inches | | | | | Millimeters | | | | |
|------------------------|-----------------------|----------|--------|-------|-------|-------|-------|-------------|-----|------|-----|-----|
| | | | L | T | H | S | Ød | L | T | H | S | Ød |
| 50 Vdc / 30 Vac | | | | | | | | | | | | |
| 168104*50A-F | 185104*50#A>-F | 0.10 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168154*50A-F | 185154*50#A>-F | 0.15 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168224*50C-F | 185224*50#C>-F | 0.22 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168334*50C-F | 185334*50#C>-F | 0.33 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168474*50H-F | 185474*50#H>-F | 0.47 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168684*50F-F | 185684*50#F>-F | 0.68 | 0.283 | 0.236 | 0.433 | 0.197 | 0.024 | 7.2 | 6.0 | 11.0 | 5.0 | 0.6 |
| 168824*50G-F | 185824*50#G>-F | 0.82 | 0.283 | 0.236 | 0.433 | 0.197 | 0.024 | 7.2 | 6.0 | 11.0 | 5.0 | 0.6 |
| 168105*50G-F | 185105*50#G>-F | 1.00 | 0.283 | 0.236 | 0.433 | 0.197 | 0.024 | 7.2 | 6.0 | 11.0 | 5.0 | 0.6 |
| 63 Vdc / 40 Vac | | | | | | | | | | | | |
| 168473*63A-F | 185473*63#A>-F | 0.047 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168563*63A-F | 185563*63#A>-F | 0.056 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168683*63A-F | 185683*63#A>-F | 0.068 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168823*63A-F | 185823*63#A>-F | 0.082 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168104*63A-F | 185104*63#A>-F | 0.10 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168154*63C-F | 185154*63#C>-F | 0.15 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168184*63C-F | 185184*63#C>-F | 0.18 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168224*63C-F | 185224*63#C>-F | 0.22 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168274*63C-F | 185274*63#C>-F | 0.27 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168334*63H-F | 185334*63#H>-F | 0.33 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168474*63H-F | 185474*63#H>-F | 0.47 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168684*63F-F | 185684*63#F>-F | 0.68 | 0.283 | 0.177 | 0.374 | 0.197 | 0.024 | 7.2 | 4.5 | 9.5 | 5.0 | 0.6 |
| 168105*63G-F | 185105*63#G>-F | 1.00 | 0.283 | 0.236 | 0.433 | 0.197 | 0.024 | 7.2 | 6.0 | 11.0 | 5.0 | 0.6 |

RoHS Compliant

* Indicates capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Indicates packaging type: R = Tape and Reel, A = Ammo Pack

> Indicates tooling code: A = 16.5 mm, B = 18.5 mm (See H dimension in taping specifications)

Type 168/185 Metallized Polyester Radial Lead Capacitors

RoHS
Compliant

| Catalog Part Number | Tape & Reel Ammo Pack | Cap (μ F) | Inches | | | | | Millimeters | | | | |
|--------------------------|--------------------------|-------------------|--------|-------|-------|-------|-----------------|-------------|-----|------|-----|-----------------|
| | | | L | T | H | S | \varnothing d | L | T | H | S | \varnothing d |
| 100 Vdc / 63 Vac | | | | | | | | | | | | |
| 168102*100A-F | 185102*100#A>-F | 0.0010 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168152*100A-F | 185152*100#A>-F | 0.0015 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168222*100A-F | 185222*100#A>-F | 0.0022 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168272*100A-F | 185272*100#A>-F | 0.0027 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168332*100A-F | 185332*100#A>-F | 0.0033 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168392*100A-F | 185392*100#A>-F | 0.0039 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168472*100A-F | 185472*100#A>-F | 0.0047 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168562*100A-F | 185562*100#A>-F | 0.0056 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168682*100A-F | 185682*100#A>-F | 0.0068 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168822*100A-F | 185822*100#A>-F | 0.0082 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168103*100A-F | 185103*100#A>-F | 0.010 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168153*100A-F | 185153*100#A>-F | 0.015 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168183*100A-F | 185183*100#A>-F | 0.018 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168223*100A-F | 185223*100#A>-F | 0.022 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168273*100A-F | 185273*100#A>-F | 0.027 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168333*100C-F | 185333*100#C>-F | 0.033 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168393*100C-F | 185393*100#C>-F | 0.039 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168473*100C-F | 185473*100#C>-F | 0.047 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168683*100H-F | 185683*100#H>-F | 0.068 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168104*100H-F | 185104*100#H>-F | 0.10 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168154*100F-F | 185154*100#F>-F | 0.15 | 0.283 | 0.177 | 0.374 | 0.197 | 0.024 | 7.2 | 4.5 | 9.5 | 5.0 | 0.6 |
| 168224*100G-F | 185224*100#G>-F | 0.22 | 0.283 | 0.197 | 0.394 | 0.197 | 0.024 | 7.2 | 5.0 | 10.0 | 5.0 | 0.6 |
| 250 Vdc / 160 Vac | | | | | | | | | | | | |
| 168332*250A-F | 185332*250#A>-F | 0.0033 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168472*250A-F | 185472*250#A>-F | 0.0047 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168682*250A-F | 185682*250#A>-F | 0.0068 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168103*250A-F | 185103*250#A>-F | 0.010 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168153*250A-F | 185153*250#A>-F | 0.015 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168223*250C-F | 185223*250#C>-F | 0.022 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168333*250C-F | 185333*250#C>-F | 0.033 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168473*250F-F | 185473*250#F>-F | 0.047 | 0.283 | 0.177 | 0.374 | 0.197 | 0.024 | 7.2 | 4.5 | 9.5 | 5.0 | 0.6 |
| 168683*250F-F | 185683*250#F>-F | 0.068 | 0.283 | 0.177 | 0.374 | 0.197 | 0.024 | 7.2 | 4.5 | 9.5 | 5.0 | 0.6 |
| 168104*250G-F | 185104*250#G>-F | 0.100 | 0.283 | 0.197 | 0.394 | 0.197 | 0.024 | 7.2 | 5.0 | 10 | 5.0 | 0.6 |
| 400 Vdc / 200 Vac | | | | | | | | | | | | |
| 168102*400A-F | 185102*400#A>-F | 0.001 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168152*400A-F | 185152*400#A>-F | 0.0015 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168222*400A-F | 185222*400#A>-F | 0.0022 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168332*400C-F | 185332*400#C>-F | 0.0033 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168472*400C-F | 185472*400#C>-F | 0.0047 | 0.283 | 0.098 | 0.256 | 0.197 | 0.020 | 7.2 | 2.5 | 6.5 | 5.0 | 0.5 |
| 168682*400C-F | 185682*400#C>-F | 0.0068 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168103*400F-F | 185103*400#F>-F | 0.010 | 0.283 | 0.138 | 0.295 | 0.197 | 0.020 | 7.2 | 3.5 | 7.5 | 5.0 | 0.5 |
| 168153*400F-F | 185153*400#F>-F | 0.015 | 0.283 | 0.177 | 0.374 | 0.197 | 0.024 | 7.2 | 4.5 | 9.5 | 5.0 | 0.6 |
| 168223*400G-F | 185223*400#G>-F | 0.022 | 0.283 | 0.197 | 0.394 | 0.197 | 0.024 | 7.2 | 5.0 | 10 | 5.0 | 0.6 |

* Indicates capacitance tolerance: J = \pm 5%, K = \pm 10%, M = \pm 20%

Indicates packaging type: R = Tape and Reel, A = Ammo Pack

> Indicates tooling code: A = 16.5 mm, B = 18.5 mm (See H dimension in taping specification)

Type 168/185 Metallized Polyester Radial Lead Capacitors

Tape Specification - 5.0 mm Lead Spacing

Standard EIA-468-B



| Item | Code | Millimeters | Inches |
|--------------------------------------|----------------|----------------------------|------------------------------|
| Lead-to-Lead Distance | P | 5.0 ^{+0.6} -0.2 | .197 ^{+0.024} -.040 |
| Feed Hole Pitch | P ₀ | 12.7 ^{±0.3} | .5 ^{±0.12} |
| Pitch of Component | P ₁ | 12.7 ^{±1.0} | .5 ^{±0.39} |
| Hole Center to Lead | P ₂ | 2.54 ^{±0.7} | .100 ^{±0.28} |
| Feed Hole Center to Component Center | P ₃ | 6.35 ^{±1.3} | .250 ^{±0.51} |
| Component Alignment, F-R | Δh | 0 ^{±2.0} | 0 ^{±0.79} |
| Tape Width | W | 18 ^{+1.0} -0.1 | .709 ^{+0.039} -.004 |
| Hold-down Tape Width | W ₀ | 6.0 min | .236 min |
| Hole Position | W ₁ | 9.0 ^{+0.75} -0.05 | .355 ^{+0.030} -.001 |
| Hold-down Tape Position | W ₂ | 3.0 Max | .118 Max |
| Height of Component from Tape Center | H | > | > |
| Feed Hole Diameter | D ₀ | 4.0 ^{±0.3} | .157 ^{±0.12} |

| Case Thickness T | Quantity Reeled | Quantity Ammo Pack |
|------------------|-----------------|--------------------|
| 2.5 | 2500 | 2000 |
| 3.5 | 1800 | 1500 |
| 4.5 | 1400 | 1300 |
| 5 | 1200 | 1000 |
| 6 | 1000 | 800 |

> The H dimension depends on the insertion equipment used. Specify the proper tooling code as indicated below.

| Tooling Code | H Dimensions | |
|--------------|-----------------------|------------------------|
| | Millimeters | Inches |
| A | 16.5 ^{±0.75} | .679 ^{±0.030} |
| B | 18.5 ^{±0.75} | .728 ^{±0.030} |

Part Numbering System for Auto Insertion

| 168/185 | 104 | K | 100 | R | H | B | -F |
|---------|---------------|-----------|---------------|--------------------|---------------|-------------------|------------------|
| Series | Capacitance | Tolerance | Voltage | Packaging Type (#) | Internal Code | *Tooling Code (>) | RoHS Designation |
| 185 | 102 = .001 μF | J = ±5% | 50 = 50 Vdc | A = Ammo | Letter | A | |
| | 103 = .01 μF | K = ±10% | 63 = 63 Vdc | R = Tape & Reel | | B | |
| | 104 = .1 μF | M = ±20% | 100 = 100 Vdc | | | | |
| | 105 = 1.0 μF | | 250 = 250 Vdc | | | | |
| | | | 400 = 400 Vdc | | | | |

* Tooling code (>) depends on the users insertion equipment requirements. See table for available options.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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