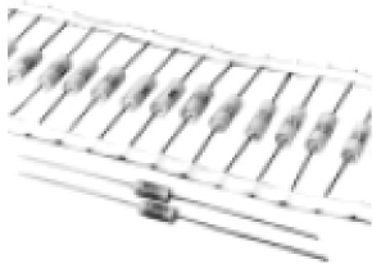


Type 170 Axial Leaded Metallized Polypropylene

High Current / Low ESR, Wrap and Fill Axial Leaded Capacitors



The Type 170 series axial lead metallized polypropylene capacitors are available in bulk or on tape and reel for automatic insertion. The tape wrap and epoxy end fill construction meets UL510 (outer wrap) and UL94V0 (epoxy). Type 170 is non-inductive with low ESR and high current capability for switch-mode power supply applications

Highlights

- Low ESR
- High current
- Available on tape and reel or bulk
- Epoxy end fill meets UL94V-0
- Non inductively wound
- Flame retardant outer wrap meets UL510

Specifications

| | |
|--------------------------------------|--|
| Capacitance Range: | 0.001 μ F to 4.7 μ F |
| Voltage Range: | 160 to 630 Vdc (90 to 250 Vac, 60 Hz) |
| Capacitance Tolerance: | \pm 5%, \pm 10%, \pm 20% |
| Operating Temperature Range: | -55 $^{\circ}$ C to +105 $^{\circ}$ C (derate linearly to 50% rated voltage at 105 $^{\circ}$ C) |
| Dielectric Withstand Voltage: | 1.6 x rated voltage for 2 s @ +25 $^{\circ}$ C \pm 5 $^{\circ}$ C |
| Dissipation Factor (DF): | $\text{tg}\delta \times 10^{-4}$ at +25 $^{\circ}$ C \pm 5 $^{\circ}$ C |

| kHz | C \leq 0.1 μ F | 0.1 μ F < C \leq 1 μ F | C > 1 μ F |
|-----|----------------------|----------------------------------|---------------|
| 1 | \leq 6 | \leq 6 | \leq 6 |
| 10 | \leq 10 | \leq 20 | — |
| 100 | \leq 30 | — | — |

| | |
|---|--|
| Insulation Resistance: | 100,000 M Ω x μ F, 200,000 M Ω Min. |
| Self Inductance: | 1 nH max. per 1 mm lead and body length |
| Life Test: | 1000 hrs @ 85 $^{\circ}$ C 1.25 x Vn |
| Damp Heat Test: | 95% RH @ +40 $^{\circ}$ C for 21 days |
| Soldering: | 260 $^{\circ}$ C \pm 5 $^{\circ}$ C for 10 s \pm 1 s |
| Long Term Storage Stability: | Δ C/C \leq \pm 0.5% after 2 years |
| Maximum Pulse Rise Time dv/dt and Pulse Characteristic (Wo): | |

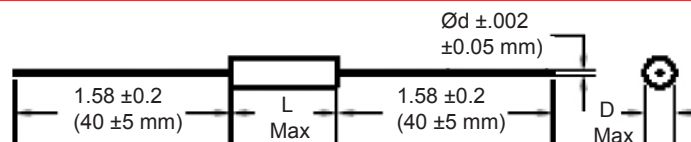
| Vn | L Max | | | | |
|-----|-------|------|------|-----|-----|
| | 11 | 16.5 | 20.5 | 28 | 33 |
| 160 | 5 | 5 | 3 | 2 | 1 |
| 250 | 11 | 10 | 7 | 4 | 2.5 |
| 400 | — | 13.5 | 10 | 6.5 | 4 |
| 630 | — | 20 | 15 | 10 | 6 |

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 (See table dv/dt) with the ratio Vn/V



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

Outline Drawing



Lead Material: tinned copper wire

Type 170 Axial Leaded Metallized Polypropylene

Tape and Reel Specifications

| L Max (Body Length) | | Lead Spacing | | Distance Between Reel Flanges | | Class |
|------------------------|-----------|--------------|------|----------------------------------|----|-------|
| Inches | mm | Inches | mm | Inches | mm | |
| ≤.433 | ≤11 | 2.06 | 52.4 | 3.0 | 75 | 1 |
| .551 - .808 | 14 - 20.5 | 2.50 | 63.6 | 3.4 | 86 | 2 |
| ≥1.03 | ≥26 | 2.87 | 73.0 | 3.7 | 95 | 3 |

^Add class number (1, 2 or 3) to Catalog Part Number to indicate tape and reel

| Diameter | | Quantity per Reel |
|----------------|--------------|-------------------|
| Inches | mm | |
| 0.197 | 5 | 3,000 |
| .236 thru .256 | 6.0 thru 6.5 | 1,200 |
| 0.276 | 7 | 1,100 |
| .315 thru .346 | 8 thru 8.5 | 800 |
| .354 thru .413 | 9 thru 10.5 | 500 |
| .433 thru .512 | 11 thru 13 | 300 |
| .551 thru .571 | 14 thru 14.5 | 200 |
| >0.571 | 14.5 | Not available |

Ratings

| Cap (µF) | Catalog Part Number | Inches (mm) | | | ESR (mΩ) 20 kHz to 100 kHz | IRMS (Amps) | | |
|-------------------------------|------------------------|--------------|--------------|-------------|---|-------------|-------|-------|
| | | D Max | L Max | Ød | | 25 °C | 45 °C | 85 °C |
| 160 Vdc / 90 Vac 60 Hz | | | | | | | | |
| 0.022 | 170223*160AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | Not applicable. These capacitance values are not customarily used in switched-mode power supplies. | | | |
| 0.022 | 170223*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.027 | 170273*160AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.027 | 170273*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.033 | 170333*160AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.033 | 170333*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.039 | 170393*160AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.039 | 170393*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.047 | 170473*160AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.047 | 170473*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.056 | 170563*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.068 | 170683*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.082 | 170823*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.1 | 170104*160BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.12 | 170124*160DB^ | 0.276 (7.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.15 | 170154*160DB^ | 0.276 (7.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.18 | 170184*160EB^ | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.22 | 170224*160EB^ | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.27 | 170274*160EC^ | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.33 | 170334*160EC^ | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.39 | 170394*160HC^ | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.47 | 170474*160HC^ | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | 37 | 8.7 | 3.1 | 1.4 |
| 0.56 | 170564*160GE^ | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | 35 | 3.9 | 3.3 | 1.5 |
| 0.68 | 170684*160GE^ | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | 33 | 4.1 | 3.5 | 1.6 |
| 0.82 | 170824*160JE^ | 0.413 (10.5) | 1.102 (28) | 0.031 (0.8) | 31 | 4.3 | 3.6 | 1.7 |
| 1 | 170105*160JE^ | 0.413 (10.5) | 1.102 (28) | 0.031 (0.8) | 26 | 5.5 | 4.7 | 2.6 |
| 1.5 | 170155*160ME^ | 0.472 (12.0) | 1.102 (28) | 0.031 (0.8) | 20 | 6.1 | 5.1 | 3.1 |
| 2.2 | 170225*160PF^ | 0.531 (13.5) | 1.299 (33) | 0.031 (0.8) | 18 | 6.8 | 5.7 | 3.3 |
| 3.3 | 170335*160TF^ | 0.610 (15.5) | 1.299 (33) | 0.039 (1.0) | 16 | 7.4 | 6.4 | 3.6 |
| 4.7 | 170475*160XF^ | 0.709 (18.0) | 1.299 (33) | 0.039 (1.0) | 15 | 8.1 | 6.8 | 3.9 |

| Cap (µF) | Catalog Part Number | Inches (mm) | | | ESR (mΩ) 20 kHz to 100 kHz | IRMS (Amps) | | |
|--------------------------------|------------------------|--------------|--------------|-------------|---|-------------|-------|-------|
| | | D Max | L Max | Ød | | 25 °C | 45 °C | 85 °C |
| 250 Vdc / 200 Vac 60 Hz | | | | | | | | |
| 0.01 | 170103*250AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | Not applicable. These capacitance values are not customarily used in switched-mode power supplies. | | | |
| 0.01 | 170103*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.012 | 170123*250AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.012 | 170123*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.015 | 170153*250AA^ | 0.197 (5.0) | 0.433 (11.0) | 0.02 (0.5) | | | | |
| 0.015 | 170153*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.02 (0.5) | | | | |
| 0.018 | 170183*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.022 | 170223*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.027 | 170273*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.033 | 170333*250BB^ | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.039 | 170393*250CB^ | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.047 | 170473*250CB^ | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.056 | 170563*250EB^ | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.068 | 170683*250EB^ | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.082 | 170823*250FB^ | 0.335 (8.5) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.1 | 170104*250FB^ | 0.335 (8.5) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.12 | 170124*250FC^ | 0.335 (8.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.15 | 170154*250FC^ | 0.335 (8.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.18 | 170184*250HC^ | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.22 | 170224*250HC^ | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.27 | 170274*250GE^ | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.33 | 170334*250GE^ | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.39 | 170394*250JE^ | 0.413 (10.5) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.47 | 170474*250JE^ | 0.413 (10.5) | 1.102 (28) | 0.031 (0.8) | 35 | 3.8 | 3.6 | 1.7 |
| 0.56 | 170564*250ME^ | 0.472 (12.0) | 1.102 (28) | 0.031 (0.8) | 33 | 3.9 | 3.7 | 1.8 |
| 0.68 | 170684*250ME^ | 0.472 (12.0) | 1.102 (28) | 0.031 (0.8) | 32 | 4 | 3.8 | 1.9 |
| 0.82 | 170824*250NF^ | 0.512 (13.0) | 1.299 (33) | 0.031 (0.8) | 31 | 4.2 | 4 | 2 |
| 1 | 170105*250NF^ | 0.512 (13.0) | 1.299 (33) | 0.031 (0.8) | 28 | 4.4 | 4.4 | 3.2 |
| 1.5 | 170155*250TF^ | 0.610 (15.5) | 1.299 (33) | 0.031 (0.8) | 26 | 5.1 | 4.9 | 3.5 |
| 2.2 | 170225*250XF^ | 0.709 (18.0) | 1.299 (33) | 0.039 (1.0) | 20 | 8.4 | 7 | 4.1 |
| 3.3 | 170335*250ZF^ | 0.827 (21.0) | 1.299 (33) | 0.039 (1.0) | 18 | 9 | 7.8 | 4.5 |

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

^If ordering tape and reel, insert 1, 2, or 3.

See tape & reel specifications to determine which class applies.

Part Number highlighted in yellow, available until stock is depleted. Replacement Part No. with "BB" case size.

Type 170 Axial Leaded Metallized Polypropylene

| Cap (µF) | Catalog Part Number | Inches (mm) | | | ESR (mΩ) 20 kHz to 100 kHz | IRMS (Amps) | | | |
|--------------------------------|---------------------------|--------------|--------------|-------------|--|-------------|-------|-------|-----|
| | | D Max | L Max | Ød | | 25 °C | 45 °C | 85 °C | |
| 400 Vdc / 220 Vac 60 Hz | | | | | | | | | |
| 0.015 | 170153*400BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | Not applicable. These capacitance values are not customarily used in switched-mode power supplies | | | | |
| 0.018 | 170183*400CB ^A | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | | |
| 0.022 | 170223*400CB ^A | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | | |
| 0.027 | 170273*400DB ^A | 0.276 (7.0) | 0.65 (16.5) | 0.024 (0.6) | | | | | |
| 0.033 | 170333*400DB ^A | 0.276 (7.0) | 0.65 (16.5) | 0.024 (0.6) | | | | | |
| 0.039 | 170393*400EB ^A | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | | |
| 0.047 | 170473*400EB ^A | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | | |
| 0.056 | 170563*400EC ^A | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | | |
| 0.068 | 170683*400EC ^A | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | | |
| 0.082 | 170823*400GC ^A | 0.354 (9.0) | 0.807 (20.5) | 0.031 (0.8) | | | | | |
| 0.10 | 170104*400GC ^A | 0.354 (9.0) | 0.807 (20.5) | 0.031 (0.8) | | | | | |
| 0.12 | 170124*400FE ^A | 0.335 (8.5) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.15 | 170154*400FE ^A | 0.335 (8.5) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.18 | 170184*400IE ^A | 0.394 (10) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.22 | 170224*400IE ^A | 0.394 (10) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.27 | 170274*400LE ^A | 0.453 (11.5) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.33 | 170334*400LE ^A | 0.453 (11.5) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.39 | 170394*400NE ^A | 0.512 (13.0) | 1.102 (28) | 0.031 (0.8) | | | | | |
| 0.47 | 170474*400NE ^A | 0.512 (13.0) | 1.102 (28) | 0.031 (0.8) | | 32 | 5.7 | 5 | 2.2 |
| 0.56 | 170564*400QF ^A | 0.571 (14.5) | 1.299 (33) | 0.031 (0.8) | | 31 | 5.7 | 5.3 | 2.3 |
| 0.68 | 170684*400QF ^A | 0.571 (14.5) | 1.299 (33) | 0.031 (0.8) | 30 | 5.7 | 5.5 | 2.4 | |
| 0.82 | 170824*400VF ^A | 0.669 (17) | 1.299 (33) | 0.039 (1.0) | 28 | 5.7 | 5.6 | 2.6 | |
| 1.0 | 170105*400VF ^A | 0.669 (17) | 1.299 (33) | 0.039 (1.0) | 27 | 5.7 | 5.7 | 4.3 | |
| 1.5 | 170155*400YF ^A | 0.807 (20.5) | 1.299 (33) | 0.039 (1.0) | 25 | 7 | 6.7 | 4.7 | |

| Cap (µF) | Catalog Part Number | Inches (mm) | | | ESR (mΩ) 20 kHz to 100 kHz | IRMS (Amps) | | |
|--------------------------------|---------------------------|--------------|--------------|-------------|--|-------------|-------|-------|
| | | D Max | L Max | Ød | | 25 °C | 45 °C | 85 °C |
| 630 Vdc / 250 Vac 60 Hz | | | | | | | | |
| 0.001 | 170102*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | Not Applicable. These capacitance values are not customarily used in switched-mode power supplies | | | |
| 0.0012 | 170122*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0015 | 170152*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0018 | 170182*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0022 | 170222*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0027 | 170272*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0033 | 170332*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0039 | 170392*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0047 | 170472*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0056 | 170562*630BB ^A | 0.236 (6.0) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0068 | 170682*630CB ^A | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.0082 | 170822*630CB ^A | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.010 | 170103*630CB ^A | 0.256 (6.5) | 0.65 (16.5) | 0.024 (0.6) | | | | |
| 0.012 | 170123*630EB ^A | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.015 | 170153*630EB ^A | 0.315 (8.0) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.018 | 170183*630FB ^A | 0.335 (8.5) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.022 | 170223*630FB ^A | 0.335 (8.5) | 0.65 (16.5) | 0.031 (0.8) | | | | |
| 0.027 | 170273*630FC ^A | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.033 | 170333*630FC ^A | 0.315 (8.0) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.039 | 170393*630HC ^A | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.047 | 170473*630HC ^A | 0.374 (9.5) | 0.807 (20.5) | 0.031 (0.8) | | | | |
| 0.056 | 170563*630GE ^A | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.068 | 170683*630GE ^A | 0.354 (9.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.082 | 170823*630IE ^A | 0.394 (10) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.100 | 170104*630IE ^A | 0.394 (10) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.120 | 170124*630ME ^A | 0.472 (12.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.150 | 170154*630ME ^A | 0.472 (12.0) | 1.102 (28) | 0.031 (0.8) | | | | |
| 0.180 | 170184*630NF ^A | 0.512 (13.0) | 1.299 (33) | 0.031 (0.8) | | | | |
| 0.220 | 170224*630NF ^A | 0.512 (13.0) | 1.299 (33) | 0.031 (0.8) | | | | |
| 0.270 | 170274*630TF ^A | 0.610 (15.5) | 1.299 (33) | 0.031 (0.8) | | | | |
| 0.330 | 170334*630TF ^A | 0.610 (15.5) | 1.299 (33) | 0.031 (0.8) | | | | |
| 0.390 | 170394*630XF ^A | 0.709 (18.0) | 1.299 (33) | 0.039 (1.0) | | | | |
| 0.470 | 170474*630XF ^A | 0.709 (18.0) | 1.299 (33) | 0.039 (1.0) | 28 | 6.8 | 5.8 | 2.6 |
| 0.560 | 170564*630ZF ^A | 0.827 (21.0) | 1.299 (33) | 0.039 (1.0) | 26 | 7.4 | 6.3 | 2.8 |
| 0.680 | 170684*630ZF ^A | 0.827 (21.0) | 1.299 (33) | 0.039 (1.0) | 25 | 7.8 | 6.8 | 2.9 |

* Indicates Tolerance J = ±5%, K = ±10%, M = ±20%

^AIf ordering Tape & Reel, see specification to determine which class (1, 2, or 3) applies