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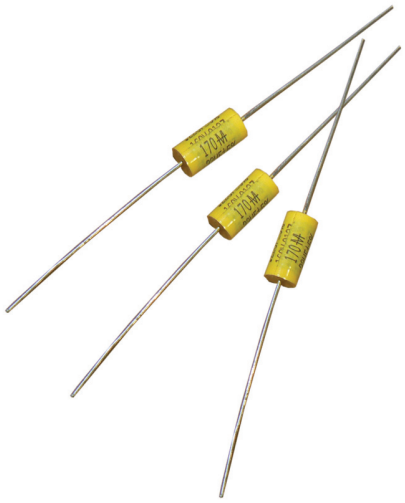
Type 170 Axial Leaded Metallized Polypropylene

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

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Specifications

Capacitance Range: 0.001 µF to 4.7 µF

Voltage Range: 160 to 630 Vdc (90 to 250 Vac, 60 Hz)

Capacitance Tolerance: ±5%, ±10%, ±20%

Operating Temperature Range: –55 ºC to +105 ºC (derate linearly to 50% rated voltage at 105 ºC)

Dielectric Withstand Voltage: 1.6 x rated voltage for 2 s @ +25 ºC ±5 ºC

Dissipation Factor (DF): tgδ x 10^{-4} at +25 ºC ±5 ºC

kHz	C ≤0.1 µF	0.1 µF <C ≤1 µF	C >1 µF
1	≤6	≤6	≤6
10	≤10	≤20	—
100	≤30	—	—

Insulation Resistance: 100,000 MΩ x µF, 200,000 MΩ Min.

Self Inductance: 1 nH max. per 1 mm lead and body length

Life Test: 1000 hrs @ 85 ºC 1.25 x Vn

Damp Heat Test: 95% RH @ +40 ºC for 21 days

Soldering: 260 ºC ±5 ºC for 10 s ±1 s

Long Term Storage Stability: ΔC/C ≤ ±0.5% after 2 years

Maximum Pulse Rise Time dv/dt and Pulse Characteristic (Wo):

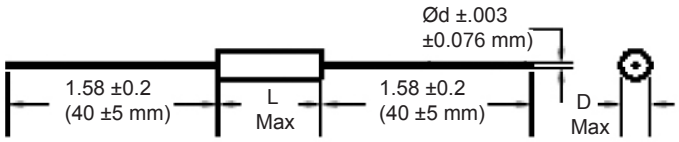
Vn	L Max				
	11	16.5	20.5	28	33
160	5	5	3	2	1
250	11	10	7	4	2.5
400	–	13.5	10	6.5	4
630	–	20	15	10	6

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

RoHS Compliant

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) D Max	L Max	Ød	ESR (mΩ) 20 kHz to 100 kHz	IRMS (Amps) 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) D Max	L Max	Ød	ESR (mΩ) 20 kHz to 100 kHz	IRMS (Amps) 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.

Replacement Part No. with "BB" case size.

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Type 170 Axial Leaded Metallized Polypropylene

Cap (µF)	Catolog Part Number	Inches (mm) D Max	L Max	Ød	ESR (mΩ) 20 kHz to 100 kHz	IRMS (Amps) 25 °C	45 °C	85 °C
400 Vdc / 220 Vac 60 Hz								
0.015	170153*400BB^	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^	0.256 (6.5)	0.65 (16.5)	0.024 (0.6)				
0.022	170223*400CB^	0.256 (6.5)	0.65 (16.5)	0.024 (0.6)				
0.027	170273*400DB^	0.276 (7.0)	0.65 (16.5)	0.024 (0.6)				
0.033	170333*400DB^	0.276 (7.0)	0.65 (16.5)	0.024 (0.6)				
0.039	170393*400EB^	0.315 (8.0)	0.65 (16.5)	0.031 (0.8)				
0.047	170473*400EB^	0.315 (8.0)	0.65 (16.5)	0.031 (0.8)				
0.056	170563*400EC^	0.315 (8.0)	0.807 (20.5)	0.031 (0.8)				
0.068	170683*400EC^	0.315 (8.0)	0.807 (20.5)	0.031 (0.8)				
0.082	170823*400GC^	0.354 (9.0)	0.807 (20.5)	0.031 (0.8)				
0.10	170104*400GC^	0.354 (9.0)	0.807 (20.5)	0.031 (0.8)				
0.12	170124*400FE^	0.335 (8.5)	1.102 (28)	0.031 (0.8)				
0.15	170154*400FE^	0.335 (8.5)	1.102 (28)	0.031 (0.8)				
0.18	170184*400IE^	0.394 (10)	1.102 (28)	0.031 (0.8)				
0.22	170224*400IE^	0.394 (10)	1.102 (28)	0.031 (0.8)				
0.27	170274*400LE^	0.453 (11.5)	1.102 (28)	0.031 (0.8)				
0.33	170334*400LE^	0.453 (11.5)	1.102 (28)	0.031 (0.8)				
0.39	170394*400NE^	0.512 (13.0)	1.102 (28)	0.031 (0.8)				
0.47	170474*400NE^	0.512 (13.0)	1.102 (28)	0.031 (0.8)	32	5.7	5	2.2
0.56	170564*400QF^	0.571 (14.5)	1.299 (33)	0.031 (0.8)	31	5.7	5.3	2.3
0.68	170684*400QF^	0.571 (14.5)	1.299 (33)	0.031 (0.8)	30	5.7	5.5	2.4
0.82	170824*400VF^	0.669 (17)	1.299 (33)	0.039 (1.0)	28	5.7	5.6	2.6
1.0	170105*400VF^	0.669 (17)	1.299 (33)	0.039 (1.0)	27	5.7	5.7	4.3
1.5	170155*400YF^	0.807 (20.5)	1.299 (33)	0.039 (1.0)	25	7	6.7	4.7

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

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

Cap (µF)	Catolog Part Number	Inches (mm) D Max	L Max	Ød	ESR (mΩ) 20 kHz to 100 kHz	IRMS (Amps) 25 °C	45 °C	85 °C
630 Vdc / 250 Vac 60 Hz								
0.001	170102*630BB^	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^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0015	170152*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0018	170182*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0022	170222*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0027	170272*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0033	170332*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0039	170392*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0047	170472*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0056	170562*630BB^	0.236 (6.0)	0.65 (16.5)	0.024 (0.6)				
0.0068	170682*630CB^	0.256 (6.5)	0.65 (16.5)	0.024 (0.6)				
0.0082	170822*630CB^	0.256 (6.5)	0.65 (16.5)	0.024 (0.6)				
0.010	170103*630CB^	0.256 (6.5)	0.65 (16.5)	0.024 (0.6)				
0.012	170123*630EB^	0.315 (8.0)	0.65 (16.5)	0.031 (0.8)				
0.015	170153*630EB^	0.315 (8.0)	0.65 (16.5)	0.031 (0.8)				
0.018	170183*630FB^	0.335 (8.5)	0.65 (16.5)	0.031 (0.8)				
0.022	170223*630FB^	0.335 (8.5)	0.65 (16.5)	0.031 (0.8)				
0.027	170273*630FC^	0.315 (8.0)	0.807 (20.5)	0.031 (0.8)				
0.033	170333*630FC^	0.315 (8.0)	0.807 (20.5)	0.031 (0.8)				
0.039	170393*630HC^	0.374 (9.5)	0.807 (20.5)	0.031 (0.8)				
0.047	170473*630HC^	0.374 (9.5)	0.807 (20.5)	0.031 (0.8)				
0.056	170563*630GE^	0.354 (9.0)	1.102 (28)	0.031 (0.8)				
0.068	170683*630GE^	0.354 (9.0)	1.102 (28)	0.031 (0.8)				
0.082	170823*630IE^	0.394 (10)	1.102 (28)	0.031 (0.8)				
0.100	170104*630IE^	0.394 (10)	1.102 (28)	0.031 (0.8)				
0.120	170124*630ME^	0.472 (12.0)	1.102 (28)	0.031 (0.8)				
0.150	170154*630ME^	0.472 (12.0)	1.102 (28)	0.031 (0.8)				
0.180	170184*630NF^	0.512 (13.0)	1.299 (33)	0.031 (0.8)				
0.220	170224*630NF^	0.512 (13.0)	1.299 (33)	0.031 (0.8)				
0.270	170274*630TF^	0.610 (15.5)	1.299 (33)	0.031 (0.8)				
0.330	170334*630TF^	0.610 (15.5)	1.299 (33)	0.031 (0.8)				
0.390	170394*630XF^	0.709 (18.0)	1.299 (33)	0.039 (1.0)				
0.470	170474*630XF^	0.709 (18.0)	1.299 (33)	0.039 (1.0)	28	6.8	5.8	2.6
0.560	170564*630ZF^	0.827 (21.0)	1.299 (33)	0.039 (1.0)	26	7.4	6.3	2.8
0.680	170684*630ZF^	0.827 (21.0)	1.299 (33)	0.039 (1.0)	25	7.8	6.8	2.9

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