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: ±5%, ±10%, ±20%

Operating Temperature Range: –55 ºC to +125 ºC (with 50% Vdc derating >85 ºC)

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

Dissipation Factor (DF): $\tan\delta \times 10^{-4}$ at 25 ºC ±5 ºC

kHz	C ≤0.1 µF	C > 0.1 µF
1	≤100	≤100
10	≤150	≤150
100	≤300	

Total Self Inductance (L): Approximately 7 nH

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

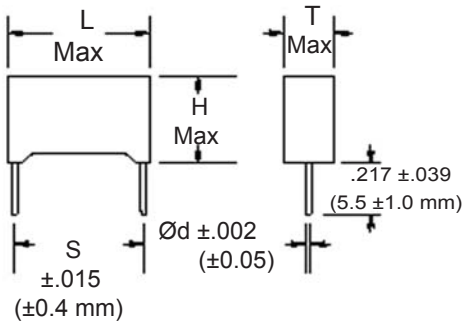
Maximum Pulse Rise Time (dv/dt):

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.

Type 168/185 Metallized Polyester Radial Lead Capacitors

Capacitor Outline Drawing



Lead length shown is as supplied on the 168 Series

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

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

Ratings

RoHS Compliant

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

* 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

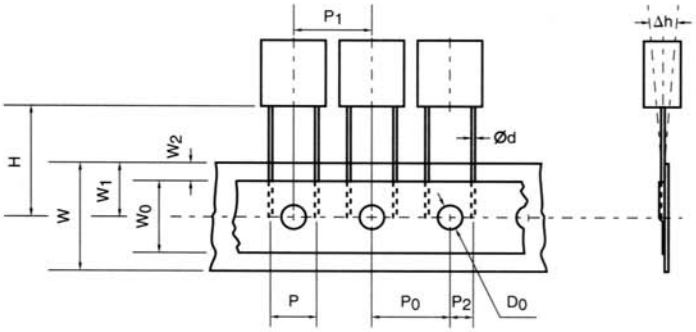
Catalog Part Number	Tape & Reel Ammo Pack	Cap (µF)	Inches					Millimeters				
			L	T	H	S	Ød	L	T	H	S	Ød
100 Vdc / 63 Vac												
168102*100A-F	185102*100#A>-F	0.0010	0.283	0.098	0.256	0.197	0.020	7.2	2.5	6.5	5.0	0.5
168152*100A-F	185152*100#A>-F	0.0015	0.283	0.098	0.256	0.197	0.020	7.2	2.5	6.5	5.0	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 = ±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 specification)

Type 168/185 Metallized Polyester Radial Lead Capacitors

Tape Specification - 5.0 mm Lead Spacing

Standard EIA-468-B



Reel Packing

Ammo Box Packing

Item	Code	Millimeters	Inches
Lead-to-Lead Distance	P	$5.0^{+0.6\ -0.2}$	$.197^{+.024\ -.040}$
Feed Hole Pitch	P_0	$12.7^{\pm0.3}$	$.5^{\pm.012}$
Pitch of Component	P_1	$12.7^{\pm1.0}$	$.5^{\pm.039}$
Hole Center to Lead	P_2	$3.85^{\pm0.7}$	$.152^{\pm.028}$
Feed Hole Center to Component Center	P_3	$6.35^{\pm1.3}$	$.250^{\pm.051}$
Component Alignment, F-R	Δh	$0^{\pm2.0}$	$0^{\pm.079}$
Tape Width	W	$18^{+1.0\ -0.1}$	$.709^{+.039\ -.004}$
Hold-down Tape Width	W_0	6.0 min	.236 min
Hole Position	W_1	$9.0^{+0.75\ -0.05}$	$.355^{+.030\ -.001}$
Hold-down Tape Position	W_2	3.0 Max	.118 Max
Height of Component from Tape Center	H	>	>
Feed Hole Diameter	D_0	$4.0^{\pm0.3}$	$.157^{\pm.012}$

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	H Dimensions	
Code	Millimeters	Inches
A	$16.5^{\pm0.75}$	$.679^{\pm0.030}$
B	$18.5^{\pm0.75}$	$.728^{\pm0.030}$

Part Numbering System for Auto Insertion

168/185	104	K	100	R	H	B	–F
				Packaging Type	Internal	*Tooling	RoHS
Series	Capacitance	Tolerance	Voltage	(#)	Code	Code (>)	Compliant 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.