

Aluminum Capacitors + 105 °C, Miniature, Radial Lead

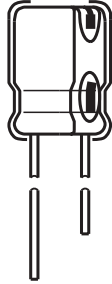


Fig.1 Component outline

FEATURES

- Original SMPS output capacitors
- Minimal ESR change
- High ripple current capability



QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case size Ø D x L in mm	0.394" x 0.472" [10.0 x 12.0] to 0.709" x 1.575" [18.0 x 40.0]
Operating temperature	- 55 °C to + 105 °C
Rated capacitance range, C _R	4.7 µF to 3300 µF
Tolerance on C _R	- 10 %, + 50 %
Rated voltage range, U _R	6.3 WVDC to 250 WVDC
Termination	2 and 3 radial leads and axial mount.
Life validation test at 105 °C	4000 hours (> 0.394" [10.0] diameter); 3000 hours (> 0.394" [10.0] diameter); Δ CAP ≤ 20 % from individual measurement. Δ ESR ≤ 1.15 x initial specified limit. Δ DCL ≤ 3 x initial specified limit.
Shelf life at 105 °C	500 hours: Δ CAP ≤ 10 % from initial measurement. Δ ESR ≤ 1.15 x initial specified limit. Δ DCL ≤ 2 x initial specified limit, (6.3 WVDC to 100 WVDC); ≤ 3 x initial specified limit, (150 WVDC to 250 WVDC).
DC leakage current at 25 °C	6.3 WVDC to 100 WVDC I = 0.03 √CV 150 WVDC to 250 WVDC I = 0.01 CV I in µA, C in µF, V in Volts

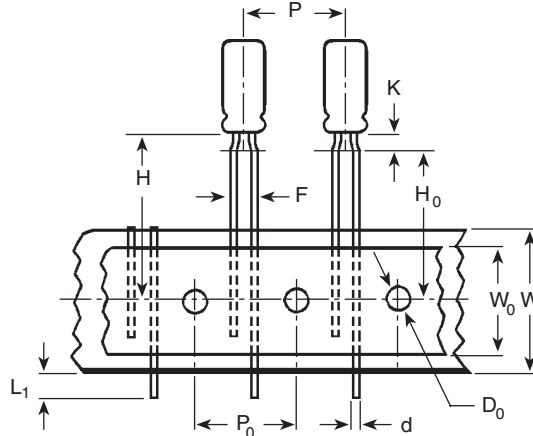
RIPPLE CURRENT MULTIPLIERS				
TEMPERATURE				
Ambient Temperature	Multipliers			
+ 105 °C	0.5			
+ 85 °C	1.0			
≤ + 75 °C	1.25			
FREQUENCY (Hz)				
WVDC	50 - 60	100 - 120	300 - 400	1K to 19K
0 - 75	0.60	0.70	0.75	0.80
76 - 100	0.40	0.55	0.70	0.80
101 - 250	0.25	0.35	0.45	0.65

LOW TEMPERATURE PERFORMANCE				
CAPACITANCE RATIO C - 55 °C / + 25 °C MINIMUM AT 120 Hz				
Maximum Capacitance Change	Voltage	Multiplier		
	6.3 V - 100 V	0.75		
150 v - 250 V	0.70			
Maximum Impedance Change	Voltage	Multiplier		
	6.3 V - 100 V	2.5		
150 v - 250 V	2.0			
ESL (TYPICAL VALUES AT 1 MHz TO 10 MHz)				
Nominal diameter	0.394	0.512	0.630	0.709
Typical ESL (nH)	4.0	7.0	10.0	12.0

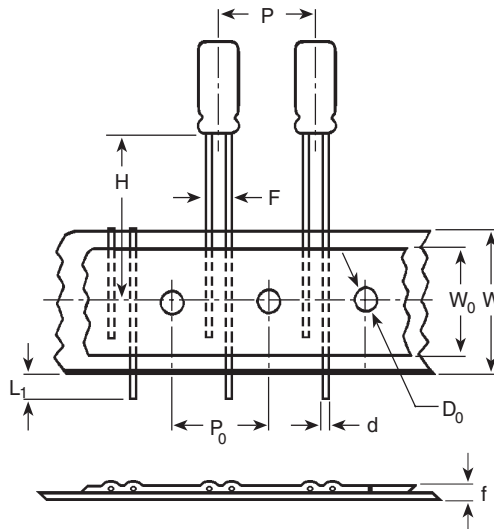
DIMENSIONS in inches [millimeters]										
CASE CODE	NOMINAL		STYLES 2 AND 4		STYLES 3 AND 5		LEAD SPACING		LEAD DIAMETER	
	D	L	D (max.)	L (max.)	D (max.)	L (max.)	S ± 0.024 [0.60]	T ± 0.020 [0.50]	Nominal	AWG
CC	0.394 [10.0]	0.512 [13.0]	0.413 [10.5]	0.563 [14.3]	0.413 [10.5]	0.630 [16.0]	0.197 [5.0]	N/A	0.025 [0.63]	22
CD	0.394 [10.0]	0.630 [16.0]	0.413 [10.5]	0.669 [17.0]	0.413 [10.5]	0.740 [18.8]	0.197 [5.0]	N/A	0.025 [0.63]	22
CG	0.394 [10.0]	0.787 [20.0]	0.413 [10.5]	0.846 [21.5]	0.413 [10.5]	0.906 [23.0]	0.197 [5.0]	N/A	0.025 [0.63]	22
DG	0.492 [12.5]	0.787 [20.0]	0.512 [13.0]	0.846 [21.5]	0.512 [13.0]	0.906 [23.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DK	0.492 [12.5]	0.984 [25.0]	0.512 [13.0]	1.043 [26.5]	0.512 [13.0]	1.142 [29.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DM	0.492 [12.5]	1.043 [26.5]	0.512 [13.0]	1.102 [28.0]	0.512 [13.0]	1.161 [29.5]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DT	0.492 [12.5]	1.319 [33.5]	0.512 [13.0]	1.346 [34.2]	0.512 [13.0]	1.417 [36.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DS	0.492 [12.5]	1.673 [42.5]	0.512 [13.0]	1.720 [43.7]	0.512 [13.0]	1.791 [45.5]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
EK	0.630 [16.0]	0.984 [25.0]	0.650 [16.5]	1.031 [26.2]	0.650 [16.5]	1.098 [27.9]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
EN	0.630 [16.0]	1.260 [32.0]	0.650 [16.5]	1.319 [33.5]	0.650 [16.5]	1.417 [36.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
ER	0.630 [16.0]	1.417 [36.0]	0.650 [16.5]	1.476 [37.5]	0.650 [16.5]	1.575 [40.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20

DIMENSIONS in inches [millimeters]										
CASE CODE	NOMINAL		STYLES 2 AND 4		STYLES 3 AND 5		LEAD SPACING		LEAD DIAMETER	
	D	L	D (max.)	L (max.)	D (max.)	L (max.)	S ± 0.024 [0.60]	T ± 0.020 [0.50]	Nominal	AWG
EU	0.630 [16.0]	1.575 [40.0]	0.650 [16.5]	1.642 [41.7]	0.650 [16.5]	1.669 [42.4]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
FR	0.709 [18.0]	1.417 [36.0]	0.728 [18.5]	1.476 [37.5]	0.728 [18.5]	1.575 [40.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
FV	0.709 [18.0]	1.575 [40.0]	0.728 [18.5]	1.653 [42.0]	0.728 [18.5]	1.693 [43.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20

TAPE AND REEL, SPECIFICATIONS TO EIA-468D in inches [millimeters]

Formed Leads


DIMENSIONS in inches [millimeters] AND PACKAGING QUANTITIES		
CASE SIZE	F LEAD SPACING	STD. QTY/REEL
0.236 x 0.453 [6.0 x 11.0]	0.197 [5.0]	800
0.315 x 0.472 [8.0 x 12.0]	0.197 [5.0]	700

Unformed (Straight) Leads


DIMENSIONS in inches [millimeters] AND PACKAGING QUANTITIES		
CASE SIZE	F LEAD SPACING	STD. QTY/REEL
0.236 x 0.453 [6.0 x 11.0]	0.098 [2.5]	800
0.315 x 0.472 [8.0 x 12.0]	0.140 [3.5] ⁽¹⁾	700
0.394 x 0.512 [10.0 x 13.0]	0.197 [5.0]	500
0.394 x 0.630 [10.0 x 16.0]	0.197 [5.0]	500
0.394 x 0.787 [10.0 x 20.0]	0.197 [5.0]	500

Note ⁽¹⁾ Available as special order.

DIMENSIONS in inches [millimeters]					
ITEM	CASE SIZE (Diameter x Length)				
	0.236 x 0.433 [6.0 x 11.0]	0.315 x 0.472 [8.0 x 12.0]	0.394 x 0.512 [10.0 x 13.0]	0.394 x 0.630 [10.0 x 16.0]	0.394 x 0.787 [10.0 x 20.0]
d - Lead-wire diameter	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]
P - Pitch of component	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]
P ₀ - Feed hole pitch	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]
F - Lead-to-lead distance	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]
K - Clinch height	0.098 [2.5]	0.157 [4.0]	N/A	N/A	N/A
H - Height of component from tape center	0.728 [18.5]	0.787 [20.0]	0.906 [23.0]	0.906 [23.0]	0.906 [23.0]
H ₀ - Lead-wire clinch height	0.630 [16.0]	0.630 [16.0]	N/A	N/A	N/A
W - Tape width	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]
W ₀ - Hold down tape width	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]
D ₀ - Feed hole diameter	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]
f - Total tape thickness	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]
L ₁ -Maximum lead protrusion	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]

Note

Positive leader is standard. Negative leader is available by special order.

ORDERING EXAMPLE

Electrolytic capacitor 672D series: 672D 336 F 100 DM 5 D

DESCRIPTION	
CODE	EXPLANATION
672D	product type
336	capacitance value (33 μF)
F	tolerance (F = - 10 %/+ 50 %)
100	voltage rating at 105 °C (100 = 100 V)
DM	can size (see dimensions table)
5	sleeve and sealing (5 = polyester sleeve w/epoxy end seal)
D	packaging (D = bulk; straight leads)

STANDARD RATINGS in inches [millimeters]						
CAPACITANCE (μF)	PART NUMBER	NOMINAL CASE SIZE D x L	Max. ESR AT + 25 °C (mΩ)		Max. RIPPLE AT + 85 °C (A) 20 kHz - 100 kHz	Max. IMPEDANCE AT + 25 °C (mΩ) 100 Hz
			120 Hz	20 kHz		
6.3 WVDC AT 105 °C, SURGE = 9 V						
150.0	672D157F6RCD5D	0.394 x 0.630 [10.0 x 16.0]	1.10	0.70	0.50	0.60
220.0	672D227F6RCG5D	0.394 x 0.787 [10.0 x 20.0]	0.75	0.40	0.70	0.33
1000.0	672D108F6REK5D	0.630 x 0.984 [16.0 x 25.0]	0.16	0.09	2.05	0.085
1500.0	672D158F6RET5D	0.630 x 1.319 [16.0 x 33.5]	0.105	0.06	2.90	0.055
3300.0	672D338F6RFV5D	0.709 x 1.575 [18.0 x 40.0]	0.075	0.045	3.40	0.045
12 WVDC AT 105 °C, SURGE = 16 V						
100.0	672D107F012CC5D	0.394 x 0.512 [10.0 x 13.0]	1.60	0.90	0.40	0.70
470.0	672D477F012CM5D	0.492 x 1.043 [12.5 x 26.5]	0.31	0.16	1.35	0.12
1000.0	672D108F012DS5D	0.492 x 1.673 [12.5 x 42.5]	0.15	0.08	2.35	0.06
2200.0	672D228F012FV5D	0.709 x 1.575 [18.0 x 40.0]	0.08	0.05	3.30	0.05
15 WVDC AT 105 °C, SURGE = 20 V						
100.0	672D107F015CD5D	0.394 x 0.630 [10.0 x 16.0]	1.35	0.70	0.50	0.50
470.0	672D477F015DT5D	0.492 x 1.319 [12.5 x 35.5]	0.25	0.12	1.75	0.11
1000.0	672D108F015ET5D	0.630 x 1.319 [16.0 x 33.5]	0.12	0.06	2.90	0.055
20 WVDC AT 105 °C, SURGE = 30 V						
100.0	672D107F020CG5D	0.394 x 0.787 [10.0 x 20.0]	1.25	0.40	0.70	0.35
470.0	672D477F020EK5D	0.630 x 0.984 [16.0 x 25.0]	0.24	0.09	2.00	0.085
1000.0	672D158F020FV5D	0.709 x 1.575 [18.0 x 40.0]	0.09	0.05	3.25	0.05



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+ 105 °C, Miniature, Radial Lead

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STANDARD RATINGS in inches [millimeters]						
CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L	Max. ESR AT + 25 °C (mΩ)		Max. RIPPLE AT + 85 °C (A) 20 kHz - 100 kHz	Max. IMPEDANCE AT + 25 °C (mΩ) 100 Hz
			120 Hz	20 kHz		
25 WVDC AT 105 °C, SURGE = 35 V						
47.0	672D476F025CC5D	0.394 x 0.512 [10.0 x 13.0]	2.35	0.90	0.40	0.85
330.0	672D337F025DT5D	0.492 x 1.319 [12.5 x 33.5]	0.29	0.12	1.75	0.10
470.0	672D477F025DS5D	0.492 x 1.673 [12.5 x 42.5]	0.22	0.08	2.35	0.07
1200.0	672D128F025FV5D	0.709 x 1.575 [18.0 x 40.0]	0.10	0.05	3.20	0.055
40 WVDC AT 105 °C, SURGE = 55 V						
220.0	672D227F040EK5D	0.630 x 0.984 [16.0 x 25.0]	0.48	0.14	1.65	0.12
330.0	672D337F040ET5D	0.630 x 1.319 [16.0 x 33.5]	0.32	0.12	2.25	0.08
50 WVDC AT 105 °C, SURGE = 75 V						
100.0	672D107F050DT5D	0.492 x 1.319 [12.5 x 33.5]	0.80	0.26	1.15	0.22
150.0	672D157F050EK5D	0.630 x 0.984 [16.0 x 25.0]	0.55	0.22	1.30	0.18
220.0	672D277F050ET5D	0.630 x 1.319 [16.0 x 33.5]	0.40	0.15	1.85	0.12
470.0	672D477F050FV5D	0.709 x 1.575 [18.0 x 40.0]	0.25	0.09	2.40	0.095
60 WVDC AT 105 °C, SURGE = 85 V						
15.0	672D156F060CD5D	0.394 x 0.512 [10.0 x 13.0]	7.00	2.00	0.28	1.70
22.0	672D226F060CG5D	0.394 x 0.787 [10.0 x 20.0]	4.60	1.20	0.40	1.00
100.0	672D107F060EK5D	0.630 x 0.984 [16.0 x 25.0]	0.90	0.28	1.20	0.24
150.0	672D157F060ET5D	0.630 x 1.319 [16.0 x 33.5]	0.60	0.18	1.65	0.15
75 WVDC AT 105 °C, SURGE = 100 V						
12.0	672D126F075CD5D	0.394 x 0.512 [10.0 x 13.0]	8.50	2.20	0.26	1.75
120.0	672D127F075ET5D	0.630 x 1.319 [16.0 x 33.5]	0.68	0.18	1.50	0.16
100 WVDC AT 105 °C, SURGE = 125 V						
10.0	672D106F100CD5D	0.394 x 0.630 [10.0 x 16.0]	10.00	2.30	0.26	1.80
33.0	672D336F100DM5D	0.492 x 1.043 [12.5 x 26.5]	2.55	0.55	0.72	0.39
120.0	672D127F100ET5D	0.630 x 1.319 [16.0 x 33.5]	0.68	0.19	1.50	0.17
200 WVDC AT 105 °C, SURGE = 250 V						
4.7	672D475F200CG5D	0.394 x 0.787 [10.0 x 20.0]	22.50	1.95	0.31	1.75
15.0	672D156F200DT5D	0.492 x 1.319 [12.5 x 33.5]	7.00	0.58	0.76	0.55
47.0	672D476F200FV5D	0.709 x 1.575 [18.0 x 40.0]	2.30	0.18	1.90	0.165
250 WVDC AT 105 °C, SURGE = 300 V						
10.0	672D106F250DT5D	0.492 x 1.319 [12.5 x 33.5]	12.00	1.50	0.48	1.60

ORIGINAL RATINGS		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
6.3 WVDC AT 105 °C, SURGE = 9 V		
150.0	CD	672D157H6R3CD5C
220.0	CG	672D227H6R3CG5C
680.0	DM	672D687H6R3DM5C
1000.0	EK	672D108H6R3EK5C
1200.0	DS	672D158H6R3ET5C
3300.0	FV	672D338H6R3FV5C
7.5 WVDC AT 105 °C, SURGE = 10 V		
100.0	CC	672D107H7R5CC5C
150.0	CD	672D157H7R5CD5C
680.0	DT	672D687H7R5DT5C
1000.0	ET	672D108H7R5ET5C
2700.0	FV	672D278H7R5FV5C

Notes

(1) Capacitance Tolerance Code H, - 10 %, + 100 %; Lead Code C, cut leads. C Lead = Negative Lead: 0.281" [7.1 mm], ± 0.062" [1.6 mm]; Positive Lead: 0.375" [9.5 mm], ± 0.062" [1.6 mm]. D Lead = 1.0" [25.4 mm] minimum.



ORIGINAL RATINGS		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
12 WVDC AT 105 °C, SURGE = 16 V		
100.0	CC	672D107H012CC5C
150.0	CG	672D157H012CG5C
470.0	DM	672D477H012DM5C
680.0	DT	672D687H012DT5C
1000.0	DS	672D108H012DS5C
2200.0	FV	672D228H012FV5C
15 WVDC AT 105 °C, SURGE = 20 V		
100.0	CD	672D107H015CD5C
150.0	CG	672D157H015CG5C
470.0	DT	672D477H015DT5C
680.0	EK	672D687H015EK5C
820.0	DS	672D827H015DS5C
1000.0 ⁽¹⁾	ET	672D108H015ET5C
1800.0	FV	672D188H015FV5C
20 WVDC AT 105 °C, SURGE = 30 V		
68.0	CD	672D868H020CD5C
100.0	CG	672D107H020CG5C
330.0	DM	672D337H020DM5C
470.0	EK	672D477H020EK5C
560.0	DS	672D567H020DS5C
680.0	ET	672D687H020ET5C
1500.0	FV	672D158H020FV5C
25 WVDC AT 105 °C, SURGE = 35 V		
47.0	CC	672D476H025CC5C
68.0	CD	672D686H025CD5C
330.0	DT	672D337H025DT5C
470.0	DS	672D477H025DS5C
680.0	EU	672D687H025EU5C
1200.0	FV	672D128H025FV5C
40 WVDC AT 105 °C, SURGE = 55 V		
47.0	CD	672D476H040CD5C
220.0	EK	672D227H040EK5C
330.0	ET	672D337H040ET5C
390.0	DS	672D397H040DS5C
820.0	FV	672D827H040FV5C
50 WVDC AT 105 °C, SURGE = 75 V		
22.0	CD	672D226H050CD5C
100.0	DT	672D107H050DT5C
150.0	EK	672D157H050EK5C
180.0	DS	672D187H050DS5C
220.0	ET	672D227H050ET5C
470.0	FV	672D477H050FV5C
60 WVDC AT 105 °C, SURGE = 85 V		
15.0	CD	672D156H060CD5C
22.0	CG	672D226H060CG5C
68.0 ⁽¹⁾	DM	672D686H060DM5C
100.0	EK	672D107H060EK5C
120.0	DS	672D127H060DS5C
150.0	ET	672D157H060ET5C
390.0	FV	672D397H060FV5C

Notes

⁽¹⁾ Capacitance Tolerance Code H, - 10 %, + 100 %; Lead Code C, cut leads. C Lead = Negative Lead: 0.281" [7.1 mm], ± 0.062" [1.6 mm]; Positive Lead: 0.375" [9.5 mm], ± 0.062" [1.6 mm]. D Lead = 1.0" [25.4 mm] minimum.

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ORIGINAL RATINGS		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
75 WVDC AT 105 °C, SURGE = 100 V		
12.0	CD	672D126H075CD5C
18.0	CG	672D186H075CG5C
82.0	EK	672D826H075EK5C
120.0	ET	672D127H075ET5C
270.0	FV	672D277H075FV5C
100 WVDC AT 105 °C, SURGE = 125 V		
8.2	CC	672D825H100CC5C
10.0	CD	672D106H100CD5C
33.0	DM	672D336H100DM5C
68.0	EK	672D686H100EK5C
120.0	ET	672D127H100ET5C
180.0	FV	672D187H100FV5C
150 WVDC AT 105 °C, SURGE = 200 V		
6.8	CG	672D685H150CG5C
22.0	DT	672D226H150DT5C
39.0	ET	672D396H150ET5C
68.0	FV	672D686H150FV5C
200 WVDC AT 105 °C, SURGE = 250 V		
4.7	CG	672D475H200CG5C
15.0	DT	672D156H200DT5C
27.0	ET	672D276H200ET5C
47.0	FV	672D476H200FV5C
250 WVDC AT 105 °C, SURGE = 300 V		
8.2	DM	672D825H250DM5C
10.0	DT	672D106H250DT5C
22.0	ET	672D226H250ET5C
39.0	FV	672D396H250FV5C

Notes

⁽¹⁾ Capacitance Tolerance Code H, - 10 %, + 100 %; Lead Code C, cut leads. C Lead = Negative Lead: 0.281" [7.1 mm], ± 0.062" [1.6 mm]; Positive Lead: 0.375" [9.5 mm], ± 0.062" [1.6 mm]. D Lead = 1.0" [25.4 mm] minimum.



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