Aluminum Capacitors
4-Terminal, Tubular, Axial Lead



FEATURES

- 4-terminal construction
- Very low impedance
- Inductance limit 2 nH
- Wide temperature range
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free Available

QUICK REFERENCE DATA	
DESCRIPTION	**VALUE**
Nominal case size Ø D x L in mm	19.050 x 41.275 to 25.400 x 92.075
Operating temperature	-55 °C to +105 °C
Rated capacitance range, C_R	47 µF to 22 000 µF
Tolerance on C_R	-10 %, +50 %
Rated voltage range, U_R	5 WV_{DC} to 200 WV_{DC}
Termination	4-terminal
Life validation test 2000 h at 105 °C	ΔCAP < 15 % from initial measurement. ΔESR < 1.5 x initial specified limit. ΔDCL < initial specified limit.
Shelf life 500 h at 105 °C	ΔCAP < 10 % from initial measurement. ΔESR < 1.2 x initial specified limit. ΔDCL < 2.0 x initial specified limit.
DC leakage current (after 5 min charge)	$I = k\sqrt{CV}$ k = 0.5 at +25 °C k = 3.0 at +105 °C I in µA, C in µF, V in Volts

LOW TEMPERATURE PERFORMANCE	
CAPACITANCE RATIO $C^{-55\ °C}$ / $C^{+25\ °C}$ MINIMUM AT 120 Hz	
RATED VOLTAGE WV_{DC}	**CAPACITANCE REMAINING**
5 to 50	75 %
51 and up	80 %
ESR RATIO $ESR^{-55\ °C}$ / $ESR^{+25\ °C}$ MAXIMUM AT 120 Hz	
RATED VOLTAGE WV_{DC}	**MULTIPLIER**
5 to 50	12
51 and up	18

DIMENSIONS in millimeters

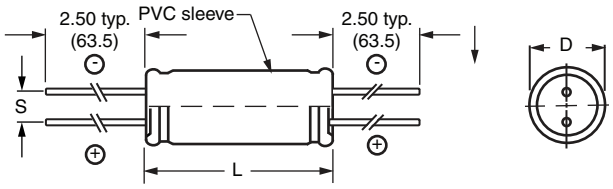
CASE CODE	BARE CASE		OUTER INSULATION WITH POLYMER COATED END SEALS		LEAD SPACING
	D	L	D	L (max.)	S
GJ	19.050 ± 0.787	41.275 ± 1.575	20.625 ± 0.787	46.812	6.350 ± 0.381
GL	19.050 ± 0.787	53.975 ± 1.575	20.625 ± 0.787	59.512	6.350 ± 0.381
GP	19.050 ± 0.787	66.675 ± 1.575	20.625 ± 0.787	72.212	6.350 ± 0.381
GS	19.050 ± 0.787	79.375 ± 1.575	20.625 ± 0.787	84.912	6.350 ± 0.381
GT	19.050 ± 0.787	92.075 ± 1.575	20.625 ± 0.787	97.612	6.350 ± 0.381
HJ	22.225 ± 0.787	28.575 ± 1.575	23.800 ± 0.787	34.112	7.620 ± 0.381
HL	22.225 ± 0.787	53.975 ± 1.575	23.800 ± 0.787	59.512	7.620 ± 0.381
HP	22.225 ± 0.787	66.675 ± 1.575	23.800 ± 0.787	72.212	7.620 ± 0.381
HS	22.225 ± 0.787	92.075 ± 1.575	23.800 ± 0.787	97.612	7.620 ± 0.381
HT	22.225 ± 0.787	79.375 ± 1.575	23.800 ± 0.787	84.912	7.620 ± 0.381
JJ	25.400 ± 0.787	41.275 ± 1.575	26.975 ± 0.787	46.812	10.160 ± 0.381
JL	25.400 ± 0.787	53.975 ± 1.575	26.975 ± 0.787	59.512	10.160 ± 0.381
JP	25.400 ± 0.787	66.675 ± 1.575	26.975 ± 0.787	72.212	10.160 ± 0.381
JS	25.400 ± 0.787	79.375 ± 1.575	26.975 ± 0.787	84.912	10.160 ± 0.381
JT	25.400 ± 0.787	92.075 ± 1.575	26.975 ± 0.787	97.612	10.160 ± 0.381

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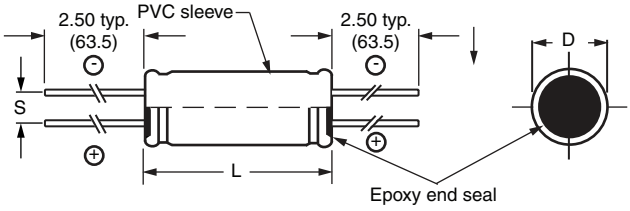
DIMENSIONS AND AVAILABLE FORMS

Styles 1 and 2



Lead diameter
No.18 AWG (0.040" [1.016 mm] Dia.)

Styles 5 and 7



PART NUMBER INFORMATION

604D	272	F	005	GJ	2
TYPE	CAPACITANCE	CAPACITANCE TOLERANCE	DC VOLTAGE RATING	CASE CODE	CASE STYLE
Identifies the series name.	Expressed in µF. The first two digits are significant figures. The third is the number of zeros.	F = -10 % / +50 % (std.)	Expressed in volts. The letter "R" signifies a decimal point (i.e. 7R5 = 7.5 V).	See table Dimensions	1 = PVC sleeve 2 = polyester sleeve (std.) 5 = polyester sleeve with epoxy end seal (required for exposure to halogenated cleaning solvents) 7 = PVC sleeve with epoxy end seal (required for exposure to halogenated cleaning solvents)

ORDERING EXAMPLE [1]

Electrolytic capacitor 604D series: 604D272F005GJ2

Note

[1] For lead (Pb)-free / RoHS compliant products add suffix "E3" to part number. Example: 604D272F005GJ2E3

ELECTRICAL DATA AND ORDERING INFORMATION

CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L (mm)	MAX. ESR AT 100 kHz / 25 °C (Ω)	MAX. Z AT 100 kHz / 25 °C (Ω)	MAX. RIPPLE CURRENT AT 100 kHz / 85 °C (A)
5 WV_{DC} AT +85 °C, SURGE = 7 V					
2700	604D272F005GJ2	19.05 x 41.28	0.146	0.110	1.50
3300	604D332F005GL2	19.05 x 53.98	0.106	0.080	1.80
4700	604D472F005GP2	19.05 x 66.68	0.080	0.060	2.50
6800	604D682F005GS2	19.05 x 79.38	0.062	0.047	3.10
3900	604D392F005HJ2	22.23 x 41.28	0.095	0.071	1.90
5600	604D562F005HL2	22.23 x 53.98	0.070	0.053	2.50
6800	604D682F005HP2	22.23 x 66.68	0.052	0.039	3.20
10 000	604D103F005HS2	22.23 x 79.38	0.040	0.030	4.00
8200	604D822F005JL2	25.04 x 53.98	0.049	0.037	3.50
15 000	604D153F005JP2	25.04 x 66.68	0.035	0.026	4.60
18 000	604D183F005JS2	25.04 x 79.38	0.027	0.020	5.60
22 000	604D223F005JT2	25.04 x 92.08	0.022	0.017	7.00

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CAPACITANCE (µF)	PART NUMBER	NOMINAL CASE SIZE D x L (mm)	MAX. ESR AT 100 kHz / 25 °C (Ω)	MAX. Z AT 100 kHz / 25 °C (Ω)	MAX. RIPPLE CURRENT AT 100 kHz / 85 °C (A)
7.5 WV_{DC} AT +85 °C, SURGE = 10 V					
2200	604D222F7R5GJ2	19.05 x 41.28	0.175	0.130	1.40
3900	604D392F7R5GP2	19.05 x 66.68	0.093	0.070	2.40
5600	604D562F7R5GS2	19.05 x 79.38	0.070	0.053	3.00
3300	604D332F7R5HJ2	22.23 x 41.28	0.117	0.087	1.80
4700	604D472F7R5HL2	22.23 x 53.98	0.080	0.059	2.40
6200	604D622F7R5HP2	22.23 x 66.68	0.061	0.046	3.10
8200	604D822F7R5HS2	22.23 x 79.38	0.047	0.035	3.80
5600	604D562F7R5JJ2	25.04 x 41.28	0.073	0.055	2.40
6800	604D682F7R5JL2	25.04 x 53.98	0.057	0.043	3.30
12 000	604D123F7R5JP2	25.04 x 66.68	0.039	0.029	4.40
15 000	604D153F7R5JS2	25.04 x 79.38	0.032	0.024	5.30
18 000	604D183F7R5JT2	25.04 x 92.08	0.025	0.019	6.60
10 WV_{DC} AT +85 °C, SURGE = 15 V					
1800	604D182F010GJ2	19.05 x 41.28	0.195	0.144	1.30
2700	604D272F010GL2	19.05 x 53.98	0.144	0.107	1.70
3300	604D332F010GP2	19.05 x 66.68	0.110	0.082	2.20
4700	604D472F010GS2	19.05 x 79.38	0.081	0.060	2.80
2700	604D272F010HJ2	22.23 x 41.28	0.127	0.094	1.70
3900	604D392F010HL2	22.23 x 53.98	0.092	0.068	2.20
5600	604D562F010HP2	22.23 x 66.68	0.069	0.051	2.90
6800	604D682F010HS2	22.23 x 79.38	0.053	0.039	3.60
5600	604D562F010JL2	25.04 x 53.98	0.065	0.048	3.20
8200	604D822F010JP2	25.04 x 66.68	0.044	0.033	4.10
10 000	604D103F010JS2	25.04 x 79.38	0.034	0.025	5.00
15 000	604D153F010JT2	25.04 x 92.08	0.028	0.021	6.20
16 WV_{DC} AT +85 °C, SURGE = 20 V					
1500	604D152F016GJ2	19.05 x 41.28	0.207	0.149	1.20
2200	604D222F016GL2	19.05 x 53.98	0.153	0.110	1.60
3900	604D392F016GS2	19.05 x 79.38	0.085	0.061	2.60
2200	604D223F016HJ2	22.23 x 41.28	0.138	0.100	1.60
3300	604D332F016HL2	22.23 x 53.98	0.107	0.077	2.00
5600	604D562F016HS2	22.23 x 79.38	0.056	0.041	3.30
8200	604D822F016HT2	22.23 x 92.08	0.046	0.033	4.10
4700	604D472F016JL2	25.04 x 53.98	0.069	0.050	2.90
6800	604D682F016JP2	25.04 x 66.68	0.048	0.035	3.90
10 000	604D103F016JS2	25.04 x 79.38	0.036	0.026	4.70
20 WV_{DC} AT +85 °C, SURGE = 25 V					
1200	604D122F020GJ2	19.05 x 41.28	0.240	0.170	1.20
2200	604D222F020GP2	19.05 x 66.68	0.132	0.092	2.00
3300	604D332F020GS2	19.05 x 79.38	0.100	0.070	2.50
1800	604D182F020HJ2	22.23 x 41.28	0.160	0.110	1.50
2700	604D272F020HL2	22.23 x 53.98	0.120	0.084	1.90
3900	604D392F020HP2	22.23 x 66.68	0.085	0.060	2.60
5600	604D562F020HS2	22.23 x 79.38	0.064	0.045	3.80
4700	604D472F020JL2	25.04 x 53.98	0.078	0.055	2.70
6800	604D682F020JP2	25.04 x 66.68	0.055	0.039	3.50
8200	604D822F020JS2	25.04 x 79.38	0.042	0.030	4.50
10 000	604D103F020JT2	25.04 x 92.08	0.034	0.024	5.50

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25 WV_{DC} AT +85 °C, SURGE = 30 V					
1000	604D102F025GJ2	19.05 x 41.28	0.320	0.224	1.05
1200	604D122F025GL2	19.05 x 53.98	0.240	0.168	1.40
1800	604D182F025GP2	19.05 x 66.68	0.180	0.126	1.75
2200	604D222F025HL2	22.23 x 53.98	0.145	0.102	1.90
3300	604D332F025HP2	22.23 x 66.68	0.108	0.072	3.00
2700	604D272F025JL2	25.04 x 53.98	0.116	0.081	2.40
4700	604D472F025JP2	25.04 x 66.68	0.080	0.056	3.25
6800	604D682F025JS2	25.04 x 79.38	0.062	0.043	4.00
8200	604D822F025JT2	25.04 x 92.08	0.051	0.036	4.65
30 WV_{DC} AT +85 °C, SURGE = 40 V					
820	604D821F030GJ2	19.05 x 41.28	0.380	0.262	1.00
1000	604D102F030GL2	19.05 x 53.98	0.295	0.204	1.25
1500	604D152F030GP2	19.05 x 66.68	0.204	0.141	1.70
1800	604D182F030HL2	22.23 x 53.98	0.165	0.114	1.75
2700	604D272F030HP2	22.23 x 66.68	0.120	0.083	2.35
3900	604D392F030HS2	22.23 x 79.38	0.088	0.061	2.90
2200	604D222F030JL2	25.04 x 53.98	0.133	0.092	2.25
3300	604D332F030JP2	25.04 x 66.68	0.095	0.056	3.00
4700	604D472F030JS2	25.04 x 79.38	0.074	0.051	3.60
5600	604D562F030JT2	25.04 x 92.08	0.059	0.041	4.40
40 WV_{DC} AT +85 °C, SURGE = 50 V					
680	604D681F040GJ2	19.05 x 41.28	0.480	0.322	0.90
820	604D821F040GL2	19.05 x 53.98	0.380	0.255	1.15
1000	604D102F040HJ2	22.23 x 41.28	0.295	0.197	1.20
1500	604D152F040HL2	22.23 x 53.98	0.220	0.147	1.55
2200	604D222F040HP2	22.23 x 66.68	0.155	0.104	2.15
3300	604D332F040HS2	22.23 x 79.38	0.115	0.077	2.60
1800	604D182F040JL2	25.04 x 53.98	0.175	0.117	2.05
3900	604D392F040JS2	25.04 x 79.38	0.091	0.061	3.40
4700	604D472F040JT2	25.04 x 92.08	0.074	0.050	4.10
50 WV_{DC} AT +85 °C, SURGE = 75 V					
470	604D471F050GJ2	19.05 x 41.28	0.430	0.280	0.93
560	604D561F050GL2	19.05 x 53.98	0.325	0.212	1.15
680	604D681F050HJ2	22.23 x 41.28	0.245	0.160	1.25
820	604D821F050HL2	22.23 x 53.98	0.185	0.120	1.60
1200	604D122F050HP2	22.23 x 66.68	0.130	0.085	2.15
1000	604D102F050JL2	25.04 x 53.98	0.150	0.098	2.10
1500	604D152F050JP2	25.04 x 66.68	0.108	0.070	2.80
2200	604D222F050JS2	25.04 x 79.38	0.081	0.053	3.40
3300	604D332F050JT2	25.04 x 92.08	0.065	0.042	4.25

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75 WV_{DC} AT +85 °C, SURGE = 100 V					
220	604D221F075GJ2	19.05 x 41.28	0.650	0.384	0.78
270	604D271F075GL2	19.05 x 53.98	0.500	0.295	1.00
390	604D391F075HJ2	22.23 x 41.28	0.370	0.218	1.10
560	604D561F075HL2	22.23 x 53.98	0.290	0.171	1.40
820	604D821F075HP2	22.23 x 66.68	0.200	0.118	1.95
1000	604D102F075HS2	22.23 x 79.38	0.153	0.090	2.25
680	604D681F075JL2	25.04 x 53.98	0.230	0.136	1.85
1500	604D152F075JS2	25.04 x 79.38	0.130	0.077	2.95
1800	604D182F075JT2	25.04 x 92.08	0.100	0.059	3.55
100 WV_{DC} AT +85 °C, SURGE = 125 V					
150	604D151F100GJ2	19.05 x 41.28	1.000	0.530	0.70
180	604D181F100GL2	19.05 x 53.98	0.765	0.405	0.90
270	604D271F100HJ2	22.23 x 41.28	0.565	0.300	0.93
390	604D391F100HL2	22.23 x 53.98	0.435	0.230	1.20
560	604D561F100HP2	22.23 x 66.68	0.300	0.159	1.60
470	604D471F100JL2	25.04 x 53.98	0.340	0.180	1.55
820	604D821F100JP2	25.04 x 66.68	0.235	0.125	2.10
1000	604D102F100JS2	25.04 x 79.38	0.185	0.098	2.65
1200	604D122F100JT2	25.04 x 92.08	0.150	0.080	3.15
200 WV_{DC} AT +85 °C, SURGE = 250 V					
47	604D470F200GJ2	19.05 x 41.28	2.600	0.780	0.60
82	604D820F200GJ2	19.05 x 41.28	1.530	0.460	0.75
120	604D121F200HL2	22.23 x 53.98	1.300	0.390	0.95
180	604D181F200HP2	22.23 x 66.68	0.865	0.259	1.25
270	604D271F200HT2	22.23 x 92.08	0.520	0.156	1.90
220	604D221F200JP2	25.04 x 66.68	0.650	0.195	1.67
390	604D391F200JT2	25.04 x 92.08	0.405	0.122	2.50

Statements about product lifetime are based on calculations and internal testing. They should only be interpreted as estimations. Also due to external factors, the lifetime in the field application may deviate from the calculated lifetime. In general, nothing stated herein shall be construed as a guarantee of durability.

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