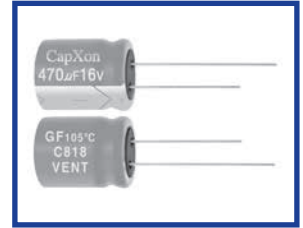


## GF Series Low Impedance

### Features

- ◆ Used in mother board, computer peripheral, etc.
- ◆ Endurance 3000 ~ 5000 Hrs at 105 °C
- ◆ Safety vent construction design.
- ◆ RoHS Compliant



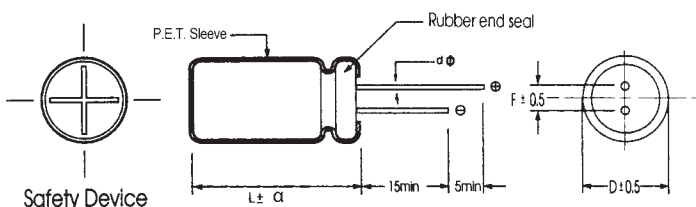
### Specifications

Item	Performance Characteristics																												
Operating Temperature Range	-55 to +105°C																												
Rated Voltage Range	6.3 to 100 VDC																												
Capacitance Range	4.7 to 6800 µF																												
Capacitance Tolerance	±20% (120Hz, +20°C)																												
Leakage Current (+20°C, max.)	I ≤ 0.01 CV or 3 (µA) After 2 minutes whichever is greater measured with rated working voltage applied.																												
Dissipation Factor (tan δ, at 20°C, 120Hz)	<table border="1"> <tr> <th>Working Voltage (VDC)</th> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <th>D.F. (%)max</th> <td>16</td> <td>14</td> <td>12</td> <td>10</td> <td>9</td> <td>8</td> <td>8</td> <td>8</td> </tr> </table>		Working Voltage (VDC)	6.3	10	16	25	35	50	63	100	D.F. (%)max	16	14	12	10	9	8	8	8									
	Working Voltage (VDC)	6.3	10	16	25	35	50	63	100																				
D.F. (%)max	16	14	12	10	9	8	8	8																					
For capacitance > 1000 µF, add 2% per another 1000 µF.																													
Low Temperature Characteristics (at 120Hz)	Impedance ratio max																												
	<table border="1"> <tr> <th>Working Voltage</th> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <th>Z(-25°C) / Z(20°C)</th> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <th>Z(-40°C) / Z(20°C)</th> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>		Working Voltage	6.3	10	16	25	35	50	63	100	Z(-25°C) / Z(20°C)	4	3	3	3	3	3	2	2	Z(-40°C) / Z(20°C)	8	6	4	3	3	3	3	3
	Working Voltage	6.3	10	16	25	35	50	63	100																				
Z(-25°C) / Z(20°C)	4	3	3	3	3	3	2	2																					
Z(-40°C) / Z(20°C)	8	6	4	3	3	3	3	3																					
For Capacitance > 1000 µF, add 0.5 per another 1000 µF for -25°C / +20°C add 1 per another 1000 µF for -40°C / +20°C																													
Endurance	Test conditions Duration time : as right Ambient temperature : +105°C Applied voltage : Rated DC working voltage	<table border="1"> <tr> <th>D φ</th> <th>Life hours</th> </tr> <tr> <td>5 - 6.3 φ</td> <td>3000</td> </tr> <tr> <td>8 φ</td> <td>4000</td> </tr> <tr> <td>≥ 10 φ</td> <td>5000</td> </tr> </table>	D φ	Life hours	5 - 6.3 φ	3000	8 φ	4000	≥ 10 φ	5000																			
	D φ	Life hours																											
5 - 6.3 φ	3000																												
8 φ	4000																												
≥ 10 φ	5000																												
After test requirement at +20°C Capacitance change : ≤ ±20% of the initial measured value Dissipation factor : ≤ 200% of the initial specified value Leakage current : ≤ The initial specified value																													
Shelf Life	Test conditions Duration time : 1000Hrs Ambient temperature : +105°C Applied voltage : None																												
	After test requirement at +20°C: Same limits as Endurance. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.																												

### Multiplier for Ripple Current vs. Frequency

CAP (µF) \ Frequency (Hz)	50(60)	120	400	1K	10K	50K-100K
CAP ≤ 10	0.47	0.59	0.76	0.85	0.97	1.0
10 < CAP ≤ 100	0.52	0.62	0.80	0.89	0.97	1.0
100 < CAP ≤ 1000	0.58	0.72	0.84	0.90	0.98	1.0
1000 < CAP	0.63	0.78	0.87	0.91	0.98	1.0

### Diagram of Dimensions: (unit: mm)



D φ	5	6.3	8	10	13	16	18
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5
d φ	0.5		L < 20 0.5	L ≥ 20 0.6	0.6		0.8
	α		D = 18 L < 35.5    L ≥ 35.5		D > 18		
		D < 18	1.5	2.0	2.0		

## Case Size

WV	6.3				10				$\phi$ DxL(mm)
	Size	Ripple	Impedance		Size	Ripple	Impedance		
			+20°C	-10°C			+20°C	-10°C	
68					5x11	190	0.70	2.065	
82					5x11	210	0.50	1.475	
100	5x11	200	0.40	1.240	5x11	242	0.31	0.915	
120	5x11	210	0.38	1.178	5x11	261	0.28	0.826	
150	5x11	225	0.35	1.085	6.3x11	300	0.26	0.767	
180	6.3x11	300	0.32	0.992	6.3x11	350	0.22	0.649	
220	6.3x11	360	0.25	0.775	6.3x11	390	0.18	0.531	
270	6.3x11	377	0.24	0.744	6.3x15	460	0.16	0.472	
330	6.3x11	395	0.20	0.465	8x11.5	540	0.11	0.325	
390	8x11.5	576	0.14	0.434	8x11.5	620	0.095	0.280	
470	8x11.5	600	0.095	0.294	8x11.5	750	0.075	0.221	
560	8x16	720	0.087	0.270	8x16	870	0.072	0.212	
680	8x16	800	0.080	0.248	8x20	1010	0.068	0.201	
	10x16	814	0.084	0.260					
820	8x20	970	0.070	0.217	8x20	1030	0.065	0.192	
1000	10x12.5	1000	0.055	0.168	8x20	1220	0.050	0.148	
					10x16	1400	0.042	0.124	
					10x20	1560	0.035	0.095	
1200	8x20	1150	0.048	0.146					
	10x16	1180	0.050	0.152					
1500	10x20	1400	0.045	0.137	10x20	1670	0.032	0.086	
	10x25	1560	0.043	0.131					
1800	10x20	1500	0.041	0.125	10x25	2000	0.028	0.076	
2200	10x25	1720	0.037	0.113	13x20	2370	0.025	0.065	
	13x20	1890	0.039	0.119					
2700	13x20	2080	0.034	0.095	13x20	2400	0.023	0.060	
3300	13x20	2290	0.026	0.073	13x25	2720	0.021	0.055	
3900	10x30	2450	0.024	0.067	13x30	3000	0.020	0.052	
	13x25	2670	0.022	0.062					
4700	13x30	3200	0.021	0.059	13x35	3450	0.019	0.049	
5600	13x35	3270	0.020	0.056	16x31.5	3460	0.018	0.047	
6800	16x31.5	3490	0.018	0.050	16x31.5	3630	0.016	0.042	

Ripple Current ( mA, rms ) at 105°C 100KHz

Max Impedance ( $\Omega$ ) at 20°C 100KHz

φ pDxL(mm)

WV Cap(μF)	16				25			
	Size	Ripple	Impedance		Size	Ripple	Impedance	
			+20°C	-10°C			+20°C	-10°C
39					5x11	210	0.42	1.218
47	5x11	200	0.40	1.16	5x11	240	0.35	1.015
56	5x11	220	0.38	1.10	5x11	256	0.31	0.899
68	5x11	230	0.35	1.02	6.3x11	300	0.28	0.812
82	5x11	260	0.31	0.90	6.3x11	350	0.24	0.696
100	6.3x11	360	0.25	0.73	6.3x11	410	0.15	0.435
120	6.3x11	365	0.23	0.67	6.3x15	490	0.13	0.377
150	6.3x11	385	0.21	0.61	8x11.5	540	0.11	0.319
180	8x11.5	520	0.19	0.55	8x11.5	620	0.098	0.2842
220	8x11.5	575	0.14	0.41	8x11.5	750	0.075	0.218
270	8x11.5	600	0.12	0.35	8x16	850	0.063	0.183
330	8x11.5	740	0.08	0.23	8x16	990	0.056	0.1624
					10x12.5	1010	0.054	0.1566
390	8x16	790	0.075	0.22	10x12.5	1050	0.051	0.1479
470	8x16	990	0.062	0.18	8x20	1260	0.045	0.1305
	10x12.5	1000	0.058	0.17	10x16	1415	0.042	0.1218
560	8x20	1070	0.057	0.17	10x20	1450	0.040	0.116
680	8x20	1120	0.055	0.16	10x20	1570	0.035	0.1015
	10x16	1280	0.052	0.15				
820	10x20	1400	0.048	0.14	10x25	1910	0.032	0.093
1000	10x20	1840	0.035	0.09	13x20	2340	0.025	0.055
1200	10x25	1920	0.032	0.08	13x20	2390	0.025	0.055
1500	10x25	2050	0.030	0.08	13x25	2710	0.023	0.0506
	13x20	2200	0.029	0.07				
1800	13x20	2380	0.026	0.07	13x30	3150	0.021	0.0462
2200	13x25	2750	0.022	0.06	13x35	3420	0.018	0.0396
2700	13x25	3000	0.022	0.06	16x31.5	3480	0.018	0.0396
3300	13x35	3490	0.018	0.05	16x31.5	3600	0.018	0.0396
3900	16x25	3520	0.018	0.05				
4700	16x31.5	3770	0.017	0.04				

Ripple Current ( mA, rms ) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

φ DxD(mm)

WV Cap(μF)	35				50			
	Size	Ripple	Impedance		Size	Ripple	Impedance	
			+20°C	-10°C			+20°C	-10°C
22					5x11	220	0.35	1.015
27					6.3x11	265	0.34	0.986
33	5x11	230	0.32	0.934	6.3x11	280	0.32	0.928
39	6.3x11	277	0.31	0.905	6.3x11	300	0.28	0.812
47	6.3x11	340	0.20	0.584	8x11.5	360	0.20	0.580
56	6.3x11	375	0.20	0.584	8x11.5	385	0.19	0.551
68	6.3x11	400	0.19	0.555	8x11.5	400	0.17	0.493
82	8x11.5	480	0.17	0.496	8x11.5	550	0.12	0.348
100	8x11.5	560	0.15	0.438	8x11.5	730	0.075	0.2175
120	8x11.5	585	0.13	0.38	8x16	770	0.073	0.2117
150	8x11.5	680	0.11	0.321	10x12.5	790	0.072	0.2088
180	8x16	810	0.098	0.286	10x12.5	870	0.068	0.1972
220	8x16	1000	0.056	0.164	8x20	1060	0.055	0.1595
270	10x12.5	1060	0.052	0.152	10x16	1090	0.055	0.1595
330	10x16	1190	0.050	0.146	10x16	1385	0.045	0.1305
390	8x20	1210	0.041	0.12	10x20	1500	0.043	0.1247
470	10x16	1400	0.038	0.111	10x25	1850	0.032	0.0928
560	10x20	1550	0.035	0.102				
680	10x20	1850	0.034	0.064	13x20	1910	0.031	0.0899
820	10x25	2040	0.031	0.064	13x20	2000	0.030	0.0870
1000	13x20	2260	0.029	0.061	13x20	2150	0.028	0.0812
1200	13x25	2630	0.021	0.053	13x25	2490	0.026	0.0754
1500					13x30	2770	0.025	0.0725
1800	13x25	2780	0.019	0.048	16x25	2960	0.024	0.0696
2200	13x30	2950	0.019	0.048	16x25	3000	0.020	0.0580
2700	16x25	3150	0.018	0.045				
	13x35	3350	0.018	0.045				
	16x31.5	3600	0.017	0.043				
	16x31.5	3670	0.016	0.04				
	16x35.5	3750	0.015	0.038				
	18x31.5	3850	0.014	0.035				

Ripple Current ( mA, rms ) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

φ DxL(mm)

WV Cap(μF)	63				100			
	Size	Ripple	Impedance		Size	Ripple	Impedance	
			+20°C	-10°C			+20°C	-10°C
4.7					5x11	105	1.60	4.64
5.6					5x11	116	1.49	4.321
6.8					5x11	120	1.45	4.205
10	5x11	135	0.95	2.755	6.3x11	170	0.70	2.03
15	6.3x11	168	0.85	2.465	8x11.5	255	0.61	1.769
18	6.3x11	170	0.82	2.378	8x11.5	270	0.56	1.624
22	6.3x11	250	0.75	2.175	8x11.5	320	0.48	1.392
27	6.3x11	260	0.55	1.595	8x11.5	340	0.39	1.131
33	6.3x11	270	0.38	1.102	8x16	400	0.31	0.899
39	8x11.5	320	0.35	1.015	8x16	425	0.29	0.841
					10x12.5	440	0.27	0.783
47	8x11.5	400	0.22	0.638	10x12.5	450	0.25	0.725
56	8x11.5	420	0.22	0.638	10x16	540	0.21	0.609
68	10x12.5	500	0.20	0.58	10x20	630	0.18	0.522
82	8x16	540	0.17	0.493	10x20	720	0.15	0.435
	10x12.5	570	0.16	0.464				
100	10x12.5	720	0.14	0.406	10x25	890	0.12	0.348
120	8x20	790	0.14	0.406	10x25	900	0.12	0.348
	10x16	835	0.13	0.377	13x20	980	0.11	0.319
150	10x16	900	0.11	0.319	13x20	1100	0.095	0.276
180	10x20	1200	0.095	0.276	13x25	1250	0.078	0.226
220	10x25	1315	0.075	0.218	13x30	1420	0.065	0.189
					16x21	1270	0.075	0.218
270	13x20	1400	0.071	0.206	13x35	1630	0.057	0.165
					16x25	1570	0.058	0.168
330	10x30	1750	0.047	0.136	13x40	1650	0.045	0.131
	13x25	1870	0.045	0.131				
390	13x25	1920	0.044	0.128	16x31.5	1850	0.043	0.125
470	13x30	2225	0.041	0.119	16x35.5	1900	0.032	0.093
	16x21	1970	0.043	0.125	18x31.5	1700	0.038	0.095
560	16x25	2350	0.039	0.098	16x41	2170	0.032	0.08
					18x31.5	2100	0.031	0.078
680	16x31.5	2600	0.035	0.088	18x35.5	2400	0.029	0.073
820	16x31.5	2650	0.031	0.078				
1000	16x35.5	2780	0.026	0.065				
	18x31.5	3230	0.028	0.070				

Ripple Current ( mA, rms ) at 105°C 100KHz

Max Impedance (Ω) at 20°C 100KHz

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