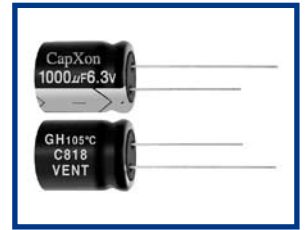


## GH Series

### Features

- ◆ Low impedance
- ◆ High temperature, Long life 3,000 to 10,000 hours at 105°C
- ◆ For detail specifications, please refer to Engineering Bulletin NO. 170.



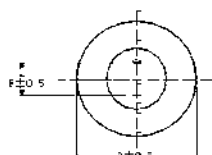
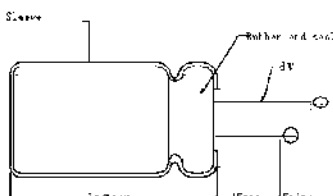
### Specifications

Item	Performance Characteristics																												
Operating Temperature Range	-55 to +105°C																												
Rated Voltage Range	6.3 to 50 VDC																												
Capacitance Range	0.47 to 6800 µ F																												
Capacitance Tolerance	±20%(120Hz,+20°C)																												
Leakage Current (+20°C,max.)	$I \leq 0.01 CV$ or 3 (µ A) (After 2 minute with rated working voltage applied.)																												
Dissipation Factor (tan δ , at 20°C , 120Hz)	<table border="1"> <tr> <td>Working Voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>D.F.(%)max.</td> <td>22</td> <td>19</td> <td>16</td> <td>14</td> <td>12</td> <td>10</td> </tr> </table>	Working Voltage(VDC)	6.3	10	16	25	35	50	D.F.(%)max.	22	19	16	14	12	10														
	Working Voltage(VDC)	6.3	10	16	25	35	50																						
D.F.(%)max.	22	19	16	14	12	10																							
For capacitance > 1000 µ F,add 2% per another 1000 µ F.																													
Low Temperature Characteristics (at 120Hz)	Impedance ratio max																												
	<table border="1"> <tr> <td>Rated voltage(VDC)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>1.5</td> <td>1.5</td> </tr> <tr> <td>Z-40°C / Z+20°C</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-55°C / Z+20°C</td> <td>8</td> <td>6</td> <td>5</td> <td>5</td> <td>4</td> <td>4</td> </tr> </table>	Rated voltage(VDC)	6.3	10	16	25	35	50	Z-25°C / Z+20°C	4	3	2	2	1.5	1.5	Z-40°C / Z+20°C	6	4	3	3	2	2	Z-55°C / Z+20°C	8	6	5	5	4	4
	Rated voltage(VDC)	6.3	10	16	25	35	50																						
	Z-25°C / Z+20°C	4	3	2	2	1.5	1.5																						
Z-40°C / Z+20°C	6	4	3	3	2	2																							
Z-55°C / Z+20°C	8	6	5	5	4	4																							
For Capacitance > 1000 µ F, add 0.5 per another 1000 µ F for -25°C/+20°C add 1 per another 1000 µ F for -40°C/+20°C add 1.5 per another 1000 µ F for -55°C/+20°C																													
Load Life	Test condition Duration time:																												
	<table border="1"> <tr> <td>D φ</td> <td>5-6.3 φ</td> <td>8-12 φ</td> <td>≥13 φ</td> </tr> <tr> <td>+105°C Life hours</td> <td>4000 hours</td> <td>7000 hours</td> <td>10000 hours</td> </tr> </table>	D φ	5-6.3 φ	8-12 φ	≥13 φ	+105°C Life hours	4000 hours	7000 hours	10000 hours																				
	D φ	5-6.3 φ	8-12 φ	≥13 φ																									
	+105°C Life hours	4000 hours	7000 hours	10000 hours																									
* down size load life																													
<table border="1"> <tr> <td>D φ</td> <td>5-6.3 φ</td> <td>8 φ</td> <td>10-12.5 φ</td> <td>≥13 φ</td> </tr> <tr> <td>+105°C</td> <td>3000 hours</td> <td>4000 hours</td> <td>6000 hours</td> <td>7000 hours</td> </tr> </table>	D φ	5-6.3 φ	8 φ	10-12.5 φ	≥13 φ	+105°C	3000 hours	4000 hours	6000 hours	7000 hours																			
D φ	5-6.3 φ	8 φ	10-12.5 φ	≥13 φ																									
+105°C	3000 hours	4000 hours	6000 hours	7000 hours																									
Ambient temperature :+105°C Applied voltage :Rated DC working voltage After test requirement at +20°C Capacitance change :≤ ±25% of the initial measured value Dissipation factor :≤200% of the initial specified value Leakage current :≤The initial specified value																													
Shelf Life	Test condition Duration time :1000 Hrs Ambient temperature :+105°C Applied voltage :None After test requirement at +20°C:Same limits as Load life. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes.																												

### Multiplier for Ripple Current vs. Frequency

CAP(µ F)\Frequency(Hz)	120	400	1K	10K	100K
CAP≤10	0.40	0.52	0.60	0.92	1
10<CAP≤100	0.67	0.80	0.83	0.94	1
100<CAP≤1000	0.75	0.84	0.88	0.95	1
1000<CAP	0.82	0.87	0.92	0.95	1

### 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	D = 18		D > 18
		L < 35.5	L ≥ 35.5	
	1.5	1.5	2.0	2.0

## Case Size

φ DxDL(mm)

Cap(μF) \ WV(SV)	6.3(8)			10(13)			16(20)		
	Size	Ripple	Impedance	Size	Ripple	Impedance	Size	Ripple	Impedance
10							5X11	30	3.9
15							5X11	60	3.32
22				5X11	55	3.08	5X11	60	2.64
27				5X11	60	2.67	5X11	110	2.37
33				5X11	60	2.33	5X11	120	2
39				5X11	100	2.02	5X11	140	1.61
47				5X11	110	1.71	5X11	155	1.35
56				5X11	120	1.47	5X11	175	1.24
68				5X11	135	1.3	5X11	190	1.18
82	5X11	165	1.63	5X11	160	1.15	6.3X11	220	1.03
100	5X11	175	1.45	5X11	185	1.02	6.3X11	220	0.86
				6.3X11	200	1.02	5X11*	190	1.1
120	5X11	185	1.28	5X11*	205	1.02	6.3X11	260	0.66
				6.3X11	215	1.02			
150	6.3X11	200	1.16	6.3X11	235	0.95	6.3X11*	280	0.58
							6.3X15	330	0.58
180	6.3X11	235	1.04	6.3X11	265	0.68	6.3X15	350	0.56
							8X11.5	355	0.54
220	6.3X11	315	0.89	6.3X11*	305	0.60	6.3X15	420	0.52
				6.3X15	325	0.58	8X11.5	450	0.46
270	6.3X11	330	0.77	6.3X15	345	0.56	6.3X15*	450	0.42
				8X11.5	350	0.53	8X11.5	485	0.38
330	6.3X11*	315	0.77	6.3X15	385	0.47	8X11.5*	490	0.37
	6.3X15	355	0.68	8X11.5	410	0.45	8X16	515	0.35
390	8X11.5	370	0.68				6.3X15*	490	0.14
	6.3X15*	385	0.58	6.3X15*	380	0.42	8X11.5*	510	0.33
470	8X11.5	400	0.52	8X11.5	430	0.42	8X16	545	0.33
							10X12.5	540	0.33
560	6.3X15	420	0.41	6.3X15*	400	0.37	8X16*	705	0.29
	8X11.5	445	0.38	8X11.5	460	0.30	8X20	750	0.28
680	10X12.5	470	0.38				10X12.5	735	0.28
	8X11.5*	475	0.36	8X11.5*	490	0.28	8X16*	720	0.26
820	8X16	500	0.36	8X16	530	0.25	8X20	780	0.24
	10X12.5	510	0.36	10X12.5	530	0.25	10X12.5*	735	0.24
1000							10X16	800	0.20
	8X11.5*	485	0.33	8X16	550	0.21	8X20*	800	0.20
1200	8X16	515	0.33	8X20	570	0.20	10X16	870	0.18
	10X12.5	535	0.33	10X12.5	570	0.20			
1500	8X11.5*	555	0.25	8X16*	610	0.20	8X20*	920	0.17
	10X12.5	600	0.25	8X20	690	0.18	10X16*	1045	0.15
1800				10X12.5*	730	0.16	10X20	1100	0.15
				10X16	780	0.16			
2200	8X16	575	0.22	8X16*	850	0.16	10X16*	1170	0.14
	8X20	630	0.22	8X20	935	0.14	10X20	1230	0.12
2700	10X12.5	590	0.22	10X12.5*	860	0.14			
				10X16	950	0.13			
3300	8X20	700	0.18	8X20*	1040	0.13	10X20*	1250	0.13
	10X16	740	0.18	10X16*	1060	0.13	10X25	1315	0.11
3900				10X20	1140	0.12			
	8X20	880	0.15	10X20	1280	0.106	10X25*	1350	0.096
4700	10X16	940	0.12				13X20	1440	0.095
	10X20	980	0.12						
5600	8X25*	1025	0.11	10X25	1375	0.102	10X30*	1480	0.097
	10X20	1090	0.11	13X20	1420	0.098	13X20*	1545	0.094
6800							13X25	1630	0.090
	10X20	1125	0.1	10X25*	1480	0.095	13X20*	1735	0.09
8200	10X25	1135	0.1	10X30	1550	0.093	13X25	1950	0.085
				13X20	1560	0.093			
10000	10X25	1240	0.09	10X30	1730	0.084	13X25*	2030	0.076
	10X30	1300	0.09	13X20*	1690	0.084	13X30	2080	0.072
12000	13X20	1260	0.09	13X25	1770	0.084	16X25	2120	0.072
	10X30	1350	0.085	10X30*	1860	0.070	13X30*	2135	0.068
15000	13X20	1320	0.085	13X25*	1890	0.070	13X35	2190	0.066
				16X25	1930	0.070	16X25*	2250	0.064
18000	13X25	1550	0.08	13X25*	1920	0.065	13X35*	2220	0.05
				13X30	1980	0.065	16X25*	2280	0.06
22000				16X25	2120	0.065	16X31.5	2380	0.058
	13X25	1615	0.075	13X30*	2070	0.065	16X31.5	2405	0.05
27000	13X30	1660	0.07	13X35	2140	0.060	18X25*	2370	0.055
				16X25*	2195	0.057			
33000	13X30	1650	0.068	13X35*	2200	0.054	18X31.5*	2570	0.048
	16X25	1830	0.068	16X31.5	2280	0.050	18X35.5	2640	0.045
39000	13X30*	2100	0.063	16X31.5	2470	0.046	18X35.5*	2710	0.040
	16X25	2265	0.063						

\* is down size

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

Max Impedance(Ω) at 20°C 100KHz

φ DxL(mm)

WV(SV) Cap(μF)	25(32)			35(44)			50(63)			
	Size	Ripple	Impedance	Size	Ripple	Impedance	Size	Ripple	Impedance	
0.47							5X11	10	7.23	
1							5X11	20	4.31	
2.2							5X11	30	3.6	
3.3							5X11	40	3.5	
4.7							5X11	55	3.3	
5.6							5X11	80	3.2	
6.8							5X11	80	3.0	
8.2							5X11	90	2.8	
10	5X11	55	3.01	5X11	70	2.65	5X11	100	2.6	
15	5X11	100	2.64	5X11	120	2.29	5X11	125	1.87	
22	5X11	120	2.3	5X11	135	1.9	5X11*	135	1.6	
							6.3X11	140	1.27	
27	5X11	130	2.03	5X11*	145	1.58	6.3X11	160	1.02	
					6.3X11	165	1.42			
33	5X11	145	1.72	5X11*	185	1.25	6.3X11*	235	0.87	
					6.3X11	200	1.25	6.3X15	247	0.85
39	5X11	145	1.5	6.3X11	210	1.1	6.3X11*	255	0.72	
							6.3X15	275	0.7	
47	5X11	185	1.37	6.3X11	220	0.92	6.3X15	290	0.55	
	6.3X11	200	1.28				8X11.5	305	0.55	
56	5X11	220	1.25	6.3X11*	235	0.75	8X11.5	315	0.47	
					6.3X15	255	0.68			
68	6.3X11	250	0.97	6.3X11*	260	0.62	8X11.5	350	0.36	
					6.3X15	290	0.55			
82	6.3X11	260	0.79	6.3X15	295	0.51	6.3X15*	385	0.35	
					8X11.5	320	0.47	8X11.5*	410	0.32
100	6.3X11	300	0.68	6.3X15*	315	0.47	8X16	440	0.28	
	8X11.5	430	0.54	8X11.5	345	0.45	8X11.5*	450	0.28	
120	6.3X11	335	0.58	8X11.5*	455	0.42	8X16	480	0.25	
	6.3X15	385	0.56	8X16	510	0.38	8X16	525	0.21	
150	6.3X15	425	0.54	8X16	595	0.35	8X16*	580	0.21	
	8X11.5	440	0.52	10X12.5	600	0.35	8X20	630	0.18	
180							10X16	650	0.18	
	6.3X15	455	0.51	8X16	660	0.32	8X20*	720	0.18	
220	8X11.5	460	0.46	10X12.5	670	0.32	10X16	760	0.16	
	8X11.5	515	0.42	8X16*	720	0.26	10X16*	880	0.15	
270	8X16	535	0.4	8X20	780	0.24	10X20	935	0.15	
					10X12.5*	740	0.24			
330	8X11.5*	625	0.34	8X20*	880	0.22	10X20*	1010	0.1	
	8X16	630	0.32	10X12.5*	820	0.24	10X25	1070	0.1	
470	10X12.5	680	0.32	10X16	890	0.21				
	8X16	800	0.25	8X20*	950	0.16	10X25*	1170	0.084	
560	10X12.5	770	0.24	10X16*	980	0.15	13X20	1250	0.082	
	8X20	880	0.23	10X20*	1085	0.11	13X20*	1480	0.078	
680	10X12.5*	850	0.21	10X25	1165	0.10	13X25	1550	0.078	
	10X16	900	0.21	13X20	1165	0.10				
820	8X20*	1020	0.17	10X25*	1310	0.096	13X20*	1745	0.075	
	10X16	1050	0.15	13X20	1320	0.096	13X25	1810	0.070	
1000	10X20	1225	0.11	10X25*	1400	0.084	13X25*	1920	0.057	
					13X20	1410	0.082	16X25	1980	0.057
1200	10X20*	1390	0.11	13X20*	1515	0.068	13X30*	2010	0.052	
	10X25	1420	0.1	13X25	1620	0.062	16X31.5	2070	0.052	
1500	10X25*	1510	0.093	10X30*	1780	0.060	16X25*	2230	0.050	
	13X20	1560	0.090	13X25*	1820	0.060	16X31.5	2280	0.048	
1800					13X30	1900	0.058			
	13X20	1690	0.082	13X25*	1910	0.052	16X31.5*	2460	0.045	
2200					16X25	2140	0.05	16X35.5	2540	0.042
	13X20*	1770	0.067	13X35*	2350	0.048	16X35.5*	2680	0.038	
2700	13X25	1825	0.065	16X31.5	2440	0.048				
	13X30	1925	0.058	13X35*	2480	0.045				
3300	16X25	1950	0.058	16X31.5	2510	0.045				
	13X30*	2160	0.052	16X31.5*	2690	0.036				
3300	16X25	2260	0.050	18X25*	2610	0.036				
	13X35	2375	0.050	18X31.5*	2780	0.032				
3300	16X31.5	2465	0.046							
	16X31.5*	2670	0.038							
3300	16X35.5	2740	0.036							
	18X25*	2630	0.041							

"\*" is down size

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

Max Impedance(Ω)at 20°C 100KHz