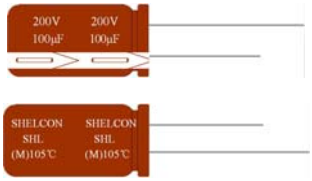
SHL SERIES



- 105℃, High Frequency, Low Impedance.
- 105℃, 3000~5000 hours guaranteed.

■ SPECIFICATIONS

Item	Characteristics		
Operating Temperature Range	-55 ~ + 105℃	- 40 ~ + 105℃	- 25 ~ + 105℃
Voltage Range	6.3 ~ 100V.DC	160 ~ 400V.DC	450V.DC
Nominal Cap. Range	0.47 ~ 10000 μF	3.3 ~ 220 μF	2.2 ~ 33 μF
Capacitance Tolerance	- 20% ~ + 20% (at 20℃, 120Hz)		

Leakage Current

WV	6.3 ~ 100 V.DC	160 ~ 450 V.DC		
LC	I= 0.01CV or 3(μA) whichever is greater.(after 2 min.)	Time / CV	1 Min.	5 Min.
	I= 0.03CV or 4(μA) whichever is greater.(after 1 min.)	CV≦1000	I=0.1CV+40μA Max	I=0.03CV+15μA Max
		CV > 1000	I=0.04CV+100μA Max	I=0.02CV+25μA Max

where,I: Max Leakage Current(μA), C: Nominal Capacitance(μF), V: Rated Voltage(V) (at 20℃)

Dissipation Factor (tanδ) (at 120Hz,+20℃)

WV	6.3	10	16	25	35	50	63	100	160~250	400	450
tanδ	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.2	0.24	0.24

0.02 is added to every 1000μF increase over 1000μF.

Low Temp. Impedance Stability at 120Hz

Rated voltage (V.DC)		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450
Impedance ratio	Z-25℃/Z+20℃	4	3	2	2					3			5	6	
	Z-40℃/Z+20℃	8	6	6	3					6		-	6	-	

Impedance (Ω) See case size table

High Temp. Load Test

After application of DC rated working voltage at +105℃, the capacitor shall meet the following limits.

Time	6.3 ~ 100 V.DC	Φ5、Φ6.3: 3000 hours; Φ8、Φ10: 4000 hours;ΦD≧Φ13: 5000 hours
	160~ 450 V.DC	4000 hours;

Capacitance change …≦ ± 20% of the initial measured value
Tanδ …≦ 200% of the initial specified value
DC leakage current …≦ the initial specified value

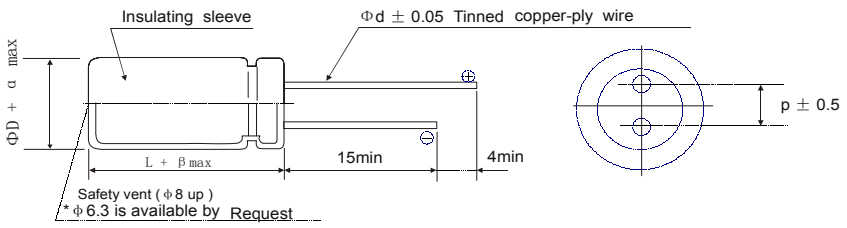
High Temp. Non-Load Test

After storage for 1000 hours at 105℃ with no voltage applied, voltage treatment of JIS-C-5102 article 4-4 is to be given and then measurement shall be made, the capacitor shall meet the following limits.

WV(D.C.)	6.3 ~ 100 V.DC	160 ~ 450 V.DC
Capacitance change	≦ ± 20% of the initial measured value	≦ ± 20% of the initial measured value
Tanδ	≦ 200% of the initial specified value	≦ 200% of the initial specified value
DC leakage current	≦ the initial specified value	≦ 500% of the initial specified value

Note: Some cleaning solvents may adversely affect the capacitors. Consult us about the suitable type of cleaning solvents to be used.

● DRAWING



Unit:(mm)

ΦD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Φd	0.5			0.6		0.8	
β	1.5						
α	0.5						

▼ MULTIPLIER FOR RIPPLE CURRENT

(1) Frequeny coefficient

Freq.(HZ) / Cap(μF)	60(50)	120	1K	10K	100K
0.47~ 47	0.40	0.50	0.70	0.85	1.00
100 ~ 470	0.60	0.65	0.80	0.90	1.00
1000 ~10000	0.65	0.70	0.90	0.95	1.00

(2) Temperature coefficient

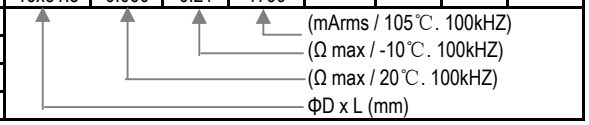
Ambient Temperature(℃)	40	60	85	105
Coefficient	2.20	2.00	1.65	1.00

SHL SERIES

■ STANDARD RATINGS

WV(Vdc) / Parameter / Cap (μF)	6.3				10				16				25			
	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current
4.7													5x11	3.0	9.0	100
10									5x11	2.0	6.0	124	5x11	2.0	6.0	124
22					5x11	1.3	3.9	154	5x11	1.3	3.9	154	5x11	1.3	3.9	154
33	5x11	1.3	3.9	154	5x11	1.3	3.9	154	5x11	1.3	3.9	154	5x11	1.3	3.9	154
47	5x11	1.3	3.9	154	5x11	1.3	3.9	154	5x11	1.3	3.9	154	5x11	1.3	3.9	154
100	5x11	1.3	3.9	154	5x11	1.3	3.9	154	6.3x11	0.6	1.8	260	6.3x11	0.60	1.8	260
220	6.3x11	0.60	1.8	260	6.3x11	0.6	1.8	260	8x11.5	0.33	0.99	400	8x11.5	0.33	0.99	400
330	6.3x11	0.60	1.8	260	8x11.5	0.33	0.99	400	8x11.5	0.33	0.99	400	10x12.5	0.25	0.75	510
470	8x11.5	0.33	0.99	400	8x11.5	0.33	0.99	400	10x12.5	0.25	0.75	510	10x16	0.19	0.57	635
1000	10x12.5	0.25	0.75	510	10x16	0.19	0.57	635	10x20	0.14	0.42	860	13x20	0.085	0.26	1120
2200	13x20	0.085	0.26	1120	13x20	0.085	0.26	1120	13x25	0.070	0.21	1320	16x25	0.60	0.18	1570
3300	13x20	0.085	0.26	1120	13x25	0.070	0.21	1320	16x25	0.060	0.18	1570	16x31.5	0.048	0.14	1810
4700	16x25	0.060	0.18	1570	16x25	0.060	0.18	1570	16x31.5	0.048	0.14	1810	18x35.5	0.037	0.11	2240
6800	16x25	0.060	0.18	1570	16x31.5	0.048	0.14	1810	18x35.5	0.037	0.11	2240	18x40	0.034	0.10	2460
10000	16x31.5	0.048	0.14	1810	18x35.5	0.037	0.11	2240	18x40	0.034	0.10	2460				

WV(Vdc) / Parameter / Cap (μF)	35				50				63				100			
	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current	ΦDxL	Impedance		Ripple Current
0.47					5x11	7.0	21.0	66					5x11	10.0	35.0	55
1.0					5x11	5.0	15.0	78					5x11	7.0	25.0	66
2.2					5x11	4.0	12.0	88					5x11	6.0	21.0	72
3.3					5x11	3.5	11.0	94					5x11	5.0	18.0	78
4.7	5x11	3.0	9.0	100	5x11	3.0	9.0	100	5x11	4.0	14.0	88	5x11	4.0	14.0	88
10	5x11	2.0	6.0	124	5x11	2.0	6.0	124	5x11	2.5	8.8	124	6.3x11	1.2	4.2	180
22	5x11	1.3	3.9	154	5x11	2.0	3.9	154	6.3x11	1.2	4.2	180	8x11.5	0.66	2.3	282
33	5x11	1.3	3.9	154	6.3x11	1.5	1.8	260	6.3x11	1.2	4.2	180	10x12.5	0.50	1.8	380
47	6.3x11	0.60	1.8	260	6.3x11	1.2	1.8	260	8x11.5	0.56	2.0	305	10x16	0.32	1.1	500
100	8x11.5	0.33	0.99	400	8x11.5	1.1	0.99	400	10x12.5	0.50	1.8	380	13x20	0.16	0.56	890
220	10x12.5	0.25	0.75	510	10x16	0.7	0.57	635	10x20	0.27	0.95	620	16x25	0.090	0.32	1440
330	10x16	0.19	0.57	635	10x20	0.5	0.42	860	13x20	0.16	0.56	890	16x25	0.090	0.32	1440
470	10x20	0.14	0.42	860	13x20	0.085	0.26	1120	13x25	0.14	0.49	1040	16x31.5	0.060	0.21	1790
1000	13x25	0.070	0.21	1320	16x25	0.060	0.18	1570	16x31.5	0.060	0.21	1790				
2200	16x31.5	0.048	0.14	1810	18x35.5	0.037	0.11	2240								
3300	18x35.5	0.037	0.11	2240												
4700	18x40	0.034	0.10	2460												



WV(Vdc) / Parameter / Cap (μF)	160			200			250		
	ΦDxL	Impedance Ω 20℃,100KHz	Ripple Current	ΦDxL	Impedance Ω 20℃,100KHz	Ripple Current	ΦDxL	Impedance Ω 20℃,100KHz	Ripple Current
4.7							10x16	3.5	165
10	10x16	1.5	250	10x16	1.5	250	10x20	2.8	230
22	10x20	1.1	350	10x20	1.1	350	13x25	1.2	360
33	13x20	0.71	440	13x20	0.71	440	13x25	1.2	360
47	13x25	0.46	600	13x25	0.46	600	16x25	0.60	570
100	16x25	0.24	910	16x31.5	0.17	1160	18x35.5	0.30	935
220	18x35.5	0.14	1370	18x35.5	0.14	1370	18x40	0.27	1000

WV(Vdc) / Parameter / Cap (μF)	400			450		
	ΦDxL	Impedance Ω 20℃,100KHz	Ripple Current	ΦDxL	Impedance Ω 20℃,100KHz	Ripple Current
2.2				10x16	7.9	110
3.3	10x20	2.9	195	10x20	6.2	135
4.7	10x25	2.3	220	13x20	3.7	190
10	13x25	1.5	360	13x25	2.6	250
22	16x25	1.3	570	16x31.5	1.0	480
33	16x25	1.2	700	18x35.5	0.62	650
47	18x31.5	0.5	860			