

SHELCON LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

SHA SERIES

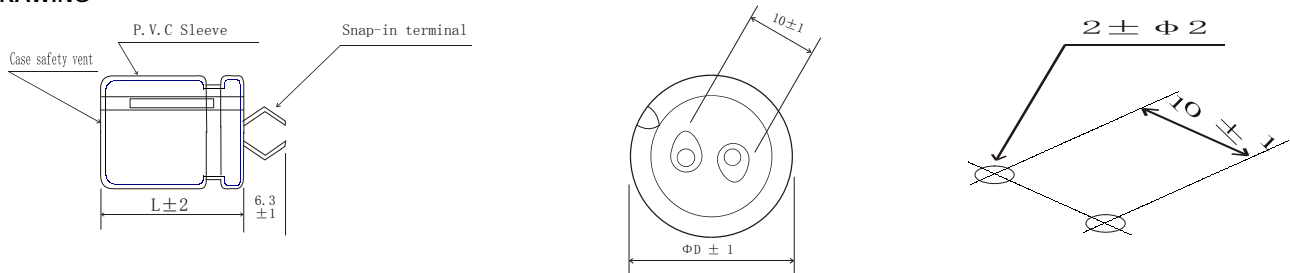
- Endurance with ripple current: 105°C 2000 to 3000 hours
- Non solvent-proof type



◆ SPECIFICATIONS

Item	Characteristics							
Category Temperature Range	-25~+105°C							
Voltage Range	160 ~ 450V.DC							
Nominal Cap. Range	39 ~ 3300 µF							
Capacitance Tolerance	±20%(M)	20°C, 120Hz						
Leakage Current	$I \leq 3 \sqrt{CV}$ I: Leakage Current (µA) C: Nominal Capacitance (µF) V: Rated Voltage (V) (at 20°C after 5 min.)							
Dissipation Factor(tanδ) (at 120Hz,20°C)	<table border="1"> <tr> <td>Rated voltage(V.DC)</td> <td>160 to 400V</td> <td>420 & 450V</td> </tr> <tr> <td>tanδ(max)</td> <td>0.15</td> <td>0.20</td> </tr> </table>		Rated voltage(V.DC)	160 to 400V	420 & 450V	tanδ(max)	0.15	0.20
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Low Temp. Impedance Stability at 120Hz	<table border="1"> <tr> <td>Rated voltage(V.DC)</td> <td>160 to 400V</td> <td>420&450V</td> </tr> <tr> <td>Z - 25°C / Z + 20°C</td> <td>4</td> <td>8</td> </tr> </table>		Rated voltage(V.DC)	160 to 400V	420&450V	Z - 25°C / Z + 20°C	4	8
Rated voltage(V.DC)	160 to 400V	420&450V						
Z - 25°C / Z + 20°C	4	8						
High Temp. Load Test	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to Dc voltage with the rated ripple current is applied for 3000 hours (2000 hours for Φ20X20L products) at 105°C Capacitance change $\leq \pm 20\%$ of the initial measured value tanδ $\leq 200\%$ of the initial specified value Leakage Current \leq the initial specified value							
High Temp. Non-Load Test	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1000 hours at 105°C without voltage applied. Capacitance Change $\leq \pm 15\%$ of the initial measured value tanδ $\leq 150\%$ of the initial specified value Leakage Current \leq the initial specified value							

● DRAWING



● MULTIPLIER FOR RIPPLE CURRENT

(1) Frequency Coefficient

Freq.(Hz)	60(50)	120	500	1K	10K ≤
82~470	0.70	1.00	1.10	1.15	1.20
560~1000	0.75	1.00	1.20	1.25	1.35
1200~4700	0.80	1.00	1.25	1.35	1.40
6800 up	0.85	1.00	1.30	1.40	1.45

(2) Temperature Coefficient

Ambient Temperature(°C)	40	60	70	85	105
Coefficient	2.40	2.10	1.78	1.65	1.00

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■ Standard Ratings

Cap.(μ F)	WV(Vdc) Φ D	160					180				
		20	22	25	30	35	20	22	25	30	35
150							20X20 0.62				
180		20X20 0.68					20X25 0.77	22X20 0.80			
220		20X25 0.85	22X20 0.81				20X25 1.00		25X20 0.90		
270		20X25 1.10		25X20 0.98			20X30 1.10	22X25 1.00	25X20 0.95		
330		20X30 1.20	22X25 1.20	25X20 1.02			20X30 1.20	22X25 1.20	25X25 1.16	30X20 1.15	
390		20X30 1.30	22X25 1.30	25X25 1.26	30X20 1.25		20X35 1.3	22X30 1.35	25X25 1.35	30X20 1.20	
470		20X35 1.34	22X30 1.55	25X25 1.55	30X20 1.30		20X40 1.4	22X35 1.50	25X30 1.50	30X25 1.50	35X20 1.36
560		20X40 1.50	22X35 1.67	25X30 1.67	30X25 1.67	35X20 1.46	20X45 1.55	22X40 1.67	25X30 1.67	30X25 1.67	35X20 1.43
680		20X45 1.70	22X40 1.82	25X30 1.82	30X25 1.82	35X20 1.51	20X50 1.75	22X45 1.78	25X35 1.78	30X30 1.78	35X25 1.83
820			22X45 2.04	25X35 2.04	30X30 2.04	35X25 2.04		22X50 2.04	25X40 2.04	30X30 2.04	35X25 2.04
1000			22X50 2.25	25X40 2.25	30X30 2.25	35X25 2.25			25X45 2.30	30X35 2.30	35X30 2.30
1200				25X45 2.49	30X35 2.49	35X30 2.49			25X50 2.55	30X40 2.55	35X30 2.55
1500				25X60 2.97	30X40 2.84	35X30 2.84				30X45 2.90	35X35 2.90
1800					30X45 3.32	35X35 3.00				30X60 3.49	35X40 3.30
2200					30X60 3.86	35X45 3.50					35X50 3.65
2700						35X50 4.00					35X60 4.19
3300						35X60 4.63	← Upper: Case Size Φ DxL (mm) ← Lower: Rated Ripple Current(Arms)(105°C 120Hz)				

Cap.(μ F)	WV(Vdc) Φ D	200					220				
		20	22	25	30	35	20	22	25	30	35
120		20X20 0.56					20X20 0.56				
150		20X25 0.71	22X20 0.73				20X25 0.73	22X20 0.67			
180		20X25 0.77	22X20 0.80				20X25 0.90		25X20 0.76		
220		20X25 1.00		25X20 0.85			20X30 1.00	22X25 1.00	25X20 0.84		
270		20X30 1.10	22X25 1.10	25X20	30X20 1.05		20X35 1.15	22X30 1.15	25X25 1.08	30X20 0.98	
330		20X35 1.2	22X30 1.25		30X20 1.10		20X40 1.25	22X35 1.25	25X25 1.25		35X20 1.13
390		20X40 1.31	22X30 1.35	25X25 1.25		35X20 1.30	20X45 1.40	22X35 1.40	25X30 1.40	30X25 1.36	35X20 1.23
470		20X45 1.45	22X35 1.5	25X25 1.35	30X25 1.50	35X20 1.41	20X50 1.51	22X40 1.51	25X35 1.54	30X25 1.50	
560		20X50 1.58	22X40 1.67	25X30 1.50	30X25 1.67			22X45 1.70	25X40 1.72	30X30 1.70	35X25 1.71
680			22X45 1.78	25X30 1.67	30X30 1.78	35X25 1.78			25X45 1.94	30X35 1.93	35X25 1.89
820				25X35 1.78	30X30 2.04	35X25 2.04			25X50 2.18	30X40 2.19	35X30 2.16
1000				25X40 2.04	30X35 2.3	35X30 2.30			25X60 2.54	30X45 2.50	35X35 2.44
1200				25X50 2.30	30X40 2.65	35X35 2.65				30X50 2.81	35X40 2.79
1500				25X60 2.66	30X50 3.08	35X40 3.08				30X60 3.30	35X45 3.22
1800					30X60 3.49	35X45 3.48					35X50 3.63
2200						35X50 3.78	← Upper: Case Size Φ DxL (mm) ← Lower: Rated Ripple Current(Arms)(105°C 120Hz)				35X60 4.23

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Standard Ratings

Cap.(μF)	WV(Vdc)		250					315				
	ΦD		20	22	25	30	35	20	22	25	30	35
56								20X20 0.38				
68								20X25 0.47	22X20 0.45			
82								20X25 0.64	22X20 0.47			
100		20X20 0.51						20X30 0.69	22X25 0.61	25 X20 0.56		
120		20X25 0.58	22X20 0.60					20X30 0.75	22X25 0.75	25 X20 0.62	30X20 0.65	
150		20X25 0.79		25 X20 0.74				20X35 0.82	22X30 0.82	25 X25 0.82	30X20 0.70	
180		20X30 0.90	22X25 0.78	25 X20 0.75				20X40 0.90	22X35 0.92	25 X25 0.92	30X25 0.90	35X20 0.76
220		20X30 1.00	22X25 1.00	25 X25 0.95	30X20 0.95			20X50 1.00	22X40 1.04	25 X30 1.04	30X25 1.04	35X20 0.85
270		20X35 1.10	22X30 1.18	25 X25 1.18	30X20 1.00				22X45 1.16	25 X35 1.16	30X25 1.16	35X20 0.90
330		20X40 1.20	22X35 1.30	25 X30 1.30	30X25 1.30	35X20 1.16			22X50 1.33	25 X40 1.33	30X30 1.33	35X25 1.15
390		20X50 1.45	22X40 1.49	25 X35 1.49	30X25 1.49					25 X45 1.47	30X35 1.47	35X25 1.33
470			22X45 1.65	25 X35 1.65	30X30 1.65	35X25 1.65				25 X50 1.70	30X40 1.70	35X30 1.47
560			22X50 1.67	25 X40 1.8	30X30 1.80	35X25 1.80					30X45 2.05	35X30 1.70
680				25 X50 2.00	30X35 2.00	35X30 2.00					30X50 2.17	35X35 2.05
820				25 X60 2.20	30X40 2.30	35X35 2.30						35X40 2.17
1000					30X50 2.47	35X40 2.47						35X45 2.20
1200					30X60 2.85	35X45 2.60						35X60 2.55
1500						35X50 3.00						
1800						35X60 3.42						

Upper: Case Size ΦDxL (mm)
Lower: Rated Ripple Current(Arms)(105°C 120Hz)

Cap.(μF)	WV(Vdc)		350					400				
	ΦD		20	22	25	30	35	20	22	25	30	35
39								20X20 0.32				
47		20X20 0.35						20X25 0.39	22X20 0.37			
56		20X25 0.43	22X20 0.41					20X25 0.51		25 X20 0.42		
68		20X25 0.47		25 X20 0.46				20X30 0.56	22X25 0.50	25 X20 0.46		
82		20X30 0.54	22X25 0.55	25 X20 0.51				20X30 0.64	22X25 0.64		30X20 0.55	
100		20X30 0.60	22X25 0.69			30X20 0.60		20X35 0.7	22X30 0.70	25 X25 0.70	30X20 0.60	
120		20X35 0.68	22X30 0.75	25 X25 0.75	30X20 0.65			20X40 0.75	22X35 0.75	25 X25 0.75	30X25 0.73	35X20 0.75
150		20X40 0.78	22X35 0.82	25 X30 0.83	30X25 0.82	35X20 0.76		20X45 0.83	22X40 0.88	25 X30 0.88	30X25 0.88	35X20 0.80
180		20X45 0.87	22X40 0.92	25 X30 0.92	30X25 0.90				22X45 0.98	25 X35 0.98	30X30 0.98	35X25 0.98
220		20X50 1.00	22X45 1.05	25 X35 1.04	30X30 1.02	35X25 1.04			22X50 1.10	25 X40 1.10	30X30 1.10	35X25 1.10
270			22X50 1.16	25 X40 1.18	30X30 1.17	35X25 1.20				25 X45 1.22	30X35 1.22	35X30 1.22
330				25 X45 1.29	30X35 1.34	35X30 1.22				25 X50 1.44	30X40 1.44	35X30 1.44
390				25 X50 1.51	30X40 1.51	35X35 1.47				25 X60 1.51	30X45 1.60	35X35 1.60
470				25 X60 1.66	30X45 1.65	35X35 1.69					30X50 1.90	35X40 1.90
560					30X50 1.85	35X40 1.90					30X60 2.10	35X45 2.12
680					30X60 2.15	35X50 1.99						35X60 2.27
820						35X60 2.31						

Upper: Case Size ΦDxL (mm)
Lower: Rated Ripple Current(Arms)(105°C 120Hz)

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■ Standard Ratings

Cap.(μ F)	WV(Vdc) Φ D	420					450				
		20	22	25	30	35	20	22	25	30	35
39	20X20 0.32						20X25 0.34				
47	20X25 0.39	22X20 0.37					20X25 0.39				
56	20X25 0.51		25 X20 0.42				20X30 0.51	22X25 0.4			
68	20X30 0.56	22X25 0.5	25 X20 0.46				20X35 0.56	22X30 0.53	25 X25 0.50		
82	20X35 0.64	22X25 0.64	25 X25 0.58	30X20 0.53			20X35 0.64	22X30 0.64	25 X25 0.64		
100	20X35 0.70	22X30 0.7	25 X25 0.7	30X20 0.59			20X45 0.69	22X35 0.69	25 X30 0.69	30X25 0.64	
120	20X40 0.75	22X35 0.75	25 X30 0.75	30X25 0.73	35X20 0.67		20X50 0.75	22X40 0.80	25 X30 0.8	30X25 0.80	35X25 0.73
150	20X50 0.88	22X40 0.88	25 X35 0.88	30X25 0.88				22X45 0.88	25 X35 0.88	30X30 0.88	35X25 0.75
180		22X45 0.95	25 X35 0.95	30X30 0.95	35X25 0.94			22X50 1	25 X40 1	30X30 1	
220		22X50 1.1	25 X45 1.1	30X35 1.10	35X25 1.1				25 X45 1.12	30X35 1.12	35X30 1.12
270			25 X50 1.22	30X40 1.22	35X30 1.22				25 X60 1.18	30X40 1.28	35X35 1.28
330			25 X60 1.41	30X45 1.45	35X35 1.45					30X50 1.45	35X40 1.45
390				30X50 1.55	35X40 1.55					30X60 1.51	35X40 1.55
470				30X60 1.79	35X45 1.90						35X50 1.85
560					35X50 2.15						35X60 1.91
680					35X60 2.27	← Upper: Case Size Φ DxL (mm) ← Lower: Rated Ripple Current(Arms)(105°C 120Hz)					