

FHS SERIES

ALUMINUM ELECTROLYTIC CAPACITORS

85°C, Standard, PCB mounting

Features

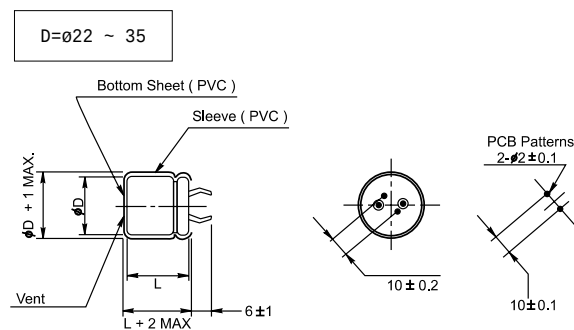
- 85°C Standard, snap-in terminal
- Ideal for switching power supplies
- Low ESR, Low Dissipation
- High and stable quality
- Load life of 2000 hours at 85°C



Specifications

Item	Performance Characteristics					
Operating temperature range	16V ~ 250V : -40°C ~ +85°C 315 ~ 450V : -25°C ~ +85°C					
Rated working voltage range	16V ~ 450V					
Nominal capacitance range	47μF ~ 47000μF, ±20%(at 20°C, 120Hz)					
D.C Leakage current(at 20°C)	The following specifications shall be satisfied when the rated voltage is applied for the required time. I ≤ 0.02CV or 2mA(3 min), whichever is less. Where I=Leakage current(μA) C=Nominal capacitance(μF) V=Rated voltage(V)					
Tan δ(max., at 20°C, 120Hz)	W.V(V)	16~25	35~50	63~100	160~250	315~450
	47~2200μF	—	0.20	0.15	0.10	0.20
	2700~6800μF	0.30	0.25	0.20	—	—
	8200V	0.35	0.30	0.25	—	—
	10000~33000μF	0.50	0.40	0.30	—	—
	39000~47000μF			—		
Characteristics at low temperature(max.) (impedance ratio at 120Hz)	W.V(V)	16	25~100	160~250	315~450	
	Z-25°C/Z20°C	4	3	3	6	
		8	6	6	—	
Load life	After applying rated working voltage for 2000 hours at +85°C and then being stabilized at +20°C, capacitors shall meet following limits.					
	Capacitance change		Within ±20% of initial measured value			
	Tanδ		≤ 200% of initial specified value			
	Leakage current		≤ Initial specified value			
Shelf life	After storage for 1000 hours at +85°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet following limits.					
	Capacitance change		Within ±20% of initial measured value			
	Tanδ		≤ 150% of initial specified value			
	Leakage current		≤ 200% of initial specified value			

Case sizes and Dimensions



Ripple current coefficient

Frequency

W.V	Freq(Hz)					
	50	120	500	1K	10K	100K
16~100V	0.9	1	1.10	1.15	1.25	1.25
160~250V	0.8	1	1.25	1.40	1.45	1.50
315~450V	0.8	1	1.20	1.25	1.35	1.40

Temperature

Temperature Factor	≤ 45°C	60°C	70°C	85°C
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STANDARD RATINGS OF FHS SERIES

Cap(μF)	W.V	16(IC)				25(IE)				35(IV)				50(IH)			
		22 ̸	25 ̸	30 ̸	35 ̸	22 ̸	25 ̸	30 ̸	35 ̸	22 ̸	25 ̸	30 ̸	35 ̸	22 ̸	25 ̸	30 ̸	35 ̸
2200														22x2 5			
2700														1.90 25x2 22x3 5			
3300										22x2 5				0 2.10 2.10 25x2			
3900										2.20 25x2 22x3 5				22x3 5 30x2 0 2.25 5			
4700						22x2 5				0 2.25 2.25 25x2				2.25 25x3 2.50 22x3 0 30x2			
5600						2.20 25x2 22x3 5				22x3 5 30x2 0 2.35 5				5 2.50 5 2.50 25x3 2.65			
6800						0 2.40 2.40 25x2				2.35 25x3 2.55 22x3 0 30x2				22x4 5 30x3 35x30 0 2.65 0 3.30			
8200	22x2 5					22x3 5 30x2 5 2.55 5				5 2.50 5 2.55 25x3 2.80				2.65 25x4 3.00 35x30 22x4 0 30x3 3.80			
10000	2.50 25x2 22x3 5					2.55 25x3 2.80 22x4 0 30x2				22x4 5 30x3 0 2.82 0				5 3.00 5 35x35 2.95 25x4 3.30 4.20			
12000	0 2.65 2.65 25x2					0 2.70 5 2.80 25x3 3.10				2.80 25x4 3.10 35x3 22x4 0 30x3 0				22x5 5 30x4 35x40 0 3.30 0 4.80			
15000	22x3 5 30x2 5 3.10 5					22x4 5 30x3 35x3 0 3.10 0 0				5 3.10 0 4.00 3.04 25x4 3.65 35x3				3.30 25x5 3.80 35x45 0 30x4 5.20			
18000	3.10 25x3 3.55 22x4 0 30x3					3.10 25x4 3.65 4.00 22x4 0 30x3 35x3				22x5 0 30x3 5 0 3.65 5 4.45				3.80 5 35x50 4.20 6.10			
22000	0 3.38 3.55 25x3 4.10					5 3.65 5 5 3.57 25x4 4.00 4.45				3.65 25x4 4.10 35x4 5 30x4 0				30x5 0			
27000	22x4 5 30x3 35x3 5 4.10 0 0					22x5 5 30x4 35x4 0 4.00 0 0				4.00 0 5.20 4.45 35x4				4.80			
33000	4.10 25x4 4.35 4.70 22x5 0 30x3 35x3					3.88 25x5 4.45 5.20 0 30x4 35x4				30x4 5 5 6.10							
39000	0 4.35 5 5 4.50 25x4 4.60 5.25					4.45 5 0 5.20 6.10				5.20 35x5 0							
47000	5 30x4 35x3 0 5					30x5 0				6.40							

Cap(μF)	W.V	63(IJ)				80(IK)				100(2A)			
		22 ̸	25 ̸	30 ̸	35 ̸	22 ̸	25 ̸	30 ̸	35 ̸	22 ̸	25 ̸	30 ̸	35 ̸
820										22x2 5			
1000						22x2 5				1.50 25x2 22x3 5			
1200						1.50 25x2 22x3 5				0 1.70 30x2 1.70 25x2 5			
1500	22x2 5					0 1.65 1.65 25x2				22x3 5 1.85 5 1.80 30x2			
1800	1.70 25x2 22x3 5					22x3 5 30x2 0 1.80 5				1.85 25x3 5 22x4 0 2.30			
2200	0 1.90 1.90 25x2					1.80 25x3 2.20 22x3 0 30x2				0 2.20 30x3 2.30 25x4 0			
2700	22x3 5 30x2 0 2.20 5					5 2.20 5 2.20 25x3 2.50				22x4 0 2.50 35x3 5 2.50 30x3 0			
3300	2.20 25x3 2.40 22x3 0 30x2					22x4 5 30x3 35x3 0 2.50 0 0				2.50 25x4 0 3.10 22x5 5 2.80 35x3			
3900	5 2.40 5 2.40 25x3 2.70					2.50 25x4 2.70 3.00 22x4 0 30x3 35x3				0 2.80 30x3 5 3.40 2.80 25x5 5			
4700	22x4 5 30x3 0 2.70 0					5 2.70 5 0 2.60 25x4 3.00 3.20				0 3.10 35x4 3.20 30x4 0			
5600	2.70 25x4 2.90 35x3 22x4 0 30x3 0					22x5 5 30x4 35x3 0 3.00 0 5				0 3.40 35x4 30x5 5			
6800	5 2.90 0 3.40 2.90 25x4 3.10 35x3					2.90 25x5 3.20 3.50 0 30x4 35x4				0 4.00 3.80 35x5			
8200	22x5 5 30x4 5 0 3.10 0 3.90					3.20 5 0 3.50 3.90							
10000	3.04 25x5 3.40 35x3 0 30x4 5					30x5 35x4 0 5							4.30
12000	3.40 5 4.40 3.90 35x4					3.90 4.30 35x5							

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Cap(μF)	W.V															
	160(2C)				180(2S)				200(2D)				250(2E)			
	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø
180													22x25 1.00			
220									22x25 1.15				22x30 1.25	25x25 1.25		
270					22x25 1.30				22x30 1.35	25x25 1.35			22x35 1.40	25x30 1.45	30x25 1.40	
330	22x25 1.43				22x30 1.45	25x25 1.45			22x30 1.50	25x25 1.50			22x40 1.50	25x30 1.45	30x25 1.50	
390	22x30 1.55	25x25 1.55			22x35 1.60	25x25 1.60			22x35 1.70	25x30 1.75	30x25 1.70		22x45 1.80	25x35 1.80	30x30 1.80	
470	22x30 1.95	25x25 1.95			22x35 1.98	25x30 1.98	30x25 1.98		22x40 2.05	25x35 2.05	30x25 2.05		22x50 2.10	25x40 2.10	30x30 2.10	
560	22x35 2.01	25x30 2.01	30x25 2.01		22x40 2.05	25x35 2.05	30x25 2.05		22x45 2.10	25x35 2.10	30x30 2.10			25x45 2.20	30x35 2.20	35x30 2.20
680	22x40 2.22	25x35 2.22	30x30 2.22		22x50 2.30	25x40 2.30	30x30 2.30			25x40 2.40	30x30 2.40			25x50 2.50	30x40 2.50	35x30 2.50
820	22x50 2.60	25x40 2.60	30x30 2.60			25x45 2.65	30x35 2.65	35x30 2.65		25x50 2.70	30x40 2.75	35x30 2.70			30x45 2.80	35x35 2.80
1000		25x45 3.02	30x35 3.02	35x30 3.02		25x50 3.05	30x40 3.05	35x35 3.05			30x45 3.15	35x35 3.10			30x50 3.25	35x40 3.25
1200		25x50 3.29	30x40 3.29	35x35 3.29			30x45 3.35	35x35 3.30			30x50 3.40	35x40 3.40				35x50 3.50
1500			30x45 3.80	35x40 3.80			30x50 3.90	35x40 3.95				35x50 4.10				
1800			30x50 4.27	35x40 4.27				35x50 4.30								
2200				35x50 4.50												

Cap(μF)	315(2F)				350(2V)				400(2G)				450(2W)			
	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø	22ø	25ø	30ø	35ø
47													22x25 0.45			
56									22x25 0.50				22x25 0.50			
68									22x25 0.60				22x30 0.60	25x25 0.60		
82					22x25 0.65				22x30 0.65	25x25 0.65			22x30 0.65	25x25 0.65		
100	22x25 0.65				22x30 0.68	25x25 0.68			22x30 0.75	25x25 0.75			22x35 0.75	25x30 0.75	30x25 0.75	
120	22x30 0.75	25x25 0.75			22x30 0.85	25x25 0.85			22x35 0.90	25x30 0.92	30x25 0.92		22x40 0.92	25x35 0.92	30x25 0.92	
150	22x35 0.85	25x25 0.85			22x35 1.00	25x30 1.00	30x25 1.00		22x40 1.05	25x30 1.07	30x25 1.05		22x50 1.10	25x40 1.10	30x30 1.10	
180	22x35 1.00	25x30 1.00	30x25 1.05		22x40 1.10	25x35 1.10	30x25 1.10		22x45 1.20	25x35 1.20	30x30 1.20			25x45 1.20	30x35 1.20	35x30 1.20
220	22x40 1.20	25x35 1.15	30x25 1.15		22x45 1.30	25x40 1.30	30x30 1.30		22x50 1.35	25x40 1.35	30x35 1.35	35x30 1.35		25x50 1.40	30x40 1.40	35x30 1.40
270	22x45 1.30	25x40 1.32	30x30 1.30			25x45 1.53	30x35 1.50	35x30 1.50		25x45 1.60	30x40 1.62	35x30 1.60			30x45 1.65	35x35 1.65
330	22x50 1.50	25x45 1.55	30x35 1.55	35x30 1.55		25x50 1.70	30x40 1.70	35x30 1.70			30x45 1.85	35x35 1.85			30x50 1.90	35x40 1.90
390		25x50 1.70	30x40 1.70	35x35 1.70			30x45 1.90	35x35 1.90			30x50 2.08	35x40 2.08				35x45 2.10
470			30x45 1.90	35x35 1.90			30x50 2.20	35x40 2.20				35x45 2.38				35x50 2.50
560			30x50 2.20	35x40 2.20				35x45 2.50				35x50 2.65				
680				35x45 2.50				35x50 2.90								
820				35x50 2.80												

Max. permissible ripple current [A(rms)] at
85°C, 120Hz]

FHS SERIES

PERFORMANCE CURVES

— 80V 2200 μ F
 - · - · 200V 680 μ F
 - - - 400V 390 μ F

