

HF Series Low ESR ,Snap-in type 105°C

HF 系列



Features

- Highly reliable capacitors that withstand low ESR & long life
- Load life 6000 hrs at 105°C
- Two or three dimensions with same ratings
- For detail specifications, please refer to Engineering
- RoHS Compliant

Specifications

Item	Performance Characteristics												
Operating Temp. Range	-40~+105°C						-25~+105°C						
Rated Voltage Range	10 to 100 VDC						160 to 400 VDC						
Capacitance Range	560 to 47000 μ F						56 to 1500 μ F						
Capacitance Tolerance	$\pm 20\%$ (120Hz, 20°C)												
Leakage Current	$I_L \leq 3\sqrt{CV}$ (μ A) After 5 minutes with rated working voltage applied												
Dissipation Factor(Tan θ) (max, 120Hz, 20°C)	W.V (μ F / VDC)	10	16	25	35	50	63	80	100	160-250	350-400		
	D.F(%)	55	40	30	25	20	15	15	15	15	15		
Low Temp. Characteristics (Max Impedance Ratio) (120Hz)	W.V (VDC)	10	16	25	35	50	63	80-100	160	200	250	400	
	$Z_{(-25^\circ C)} / Z_{(+25^\circ C)}$	4	4	3	3	2	2	2	4	4	4	4	
	$Z_{(-40^\circ C)} / Z_{(+25^\circ C)}$	15	15	10	8	6	6	5					
Load Life	Test conditions Duration time: 6000hrs Ambient temperature: +105°C Applied voltage: Rated DC working voltage After test requirements at +20°C Capacitance change: $\leq \pm 20\%$ of the initial measured value Dissipation factor: $\leq 200\%$ of the initial specified value Leakage current: \leq the initial specified value												
Shelf Life	Test conditions Duration time: 1000hrs Ambient temperature: +105°C Applied voltage: None After test requirements at +20°C : Same limits as Load life. Pre-treatment for measurements shall be conducted after application of DC working voltage for 30minutes												
Industrial Standard	JIS C-5101-4(IEC 60384-4)												

Multiplier for ripple current vs frequency

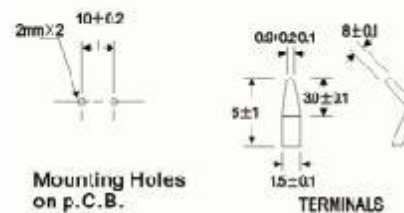
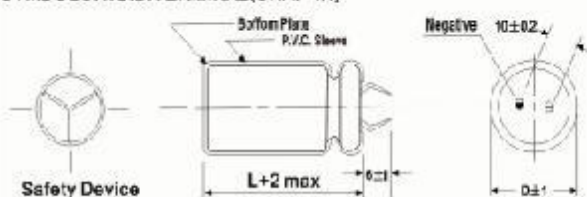
Cap.(μ F)	50(60)	120	1K	10K	100K
≤ 100	0.8	1.0	1.23	1.48	1.53
120-1000	0.8	1.0	1.16	1.35	1.38
> 1000	0.8	1.0	1.11	1.25	1.28

Multiplier for ripple current vs temperature

Temp.(°C)	45	60	85	105
Multiplier	2.10	1.90	1.40	1.00

Diagram of dimensions(cunit:mm)

SYMBOLG:T.C.B.TERMINAL(SNAP-IN)



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● **Case Size**

WV _(SV) Cap (μ F)	10(13)											
	22			25			30			35		
	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR
5600	22*26	1.10	126									
6800	22*26	1.30	126	25*26	1.30	88						
8200	22*26	1.56	126	25*26	1.56	88						
10000	22*31	1.60	98	25*26	1.60	88	30*26	1.60	75			
12000	22*36	1.80	82	25*31	1.80	78	30*26	1.80	75			
15000	22*36	2.10	82	25*31	2.10	68	30*26	2.10	75			
18000	22*36	2.20	82	25*31	2.20	68	30*31	2.20	65			
22000	22*41	2.75	68	25*36	2.75	62	30*31	2.75	48	35*27	2.75	68
27000				25*51	3.05	41	30*41	3.05	30	35*32	3.05	47
33000				25*51	3.40	41	30*41	3.40	30	35*37	3.40	37
39000							30*51	3.60	28	35*41	3.60	31
47000							30*51	4.60	28	35*52	4.60	25

WV _(SV) Cap (μ F)	16(20)											
	22			25			30			35		
	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR
5600	22*26	1.40	126									
6800	22*31	1.60	98	25*26	1.60	88						
8200	22*36	1.80	82	25*31	1.80	75						
10000	22*41	2.10	68	25*31	2.10	68	30*26	2.10	75			
12000	22*41	2.40	68	25*36	2.40	52	30*26	2.40	75			
15000	22*51	2.70	53	25*41	2.70	52	30*31	2.70	48			
18000				25*51	3.05	41	30*36	3.05	36	35*32	3.05	47
22000				25*51	3.40	41	30*41	3.40	30	35*47	3.40	37
27000							30*51	4.02	28	35*42	4.02	31
33000							30*51	4.32	28	35*42	4.32	31
39000										35*52	4.95	25

WV _(SV) Cap (μ F)	25(32)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
3900	22*26	1.30	126									
4700	22*31	1.50	98	25*26	1.50	88						
5600	22*36	1.60	82	25*26	1.60	88						
6800	22*41	1.87	68	25*31	1.87	68	30*26	1.87	75			
8200	22*46	2.20	62	25*36	2.20	62	30*31	2.20	48	35*27	2.20	68
10000	22*51	2.35	41	25*41	2.35	52	30*36	2.35	36	35*32	2.35	60
12000				25*51	2.70	41	30*36	2.70	36	35*32	2.70	47
15000							30*41	3.15	30	35*37	3.15	37
18000							30*51	3.60	28	35*42	3.60	31
22000										35*47	3.90	29
27000										35*52	4.60	25

Ripple Current (A, rms) at 105°C, 120Hz
Max ESR (m Ω) at 20°C 30KHz

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Case Size

Cap (μ F)	WV(SV) 35(44)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
2200	22*26	1.10	126									
2700	22*26	1.29	126									
3300	22*31	1.40	98	25*26	1.40	88						
3900	22*36	1.55	82	25*31	1.55	68						
4700	22*41	1.75	68	25*31	1.75	68	30*26	1.75	75			
5600	22*46	1.95	62	25*36	1.95	62	30*31	1.95	48	35*27	1.95	68
6800	22*51	2.20	53	25*41	2.20	52	30*36	2.20	36	35*32	2.20	60
8200				25*51	2.50	41	30*36	2.50	36	35*32	2.50	47
10000							30*41	2.80	30	35*37	2.80	37
12000							30*51	3.30	28	35*42	3.30	31
15000										35*52	4.25	25

Cap (μ F)	WV(SV) 50(63)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
1500	22*26	1.00	126									
1800	22*31	1.10	98	25*26	1.10	88						
2200	22*36	1.30	82	25*26	1.30	88						
2700	22*41	1.45	68	25*31	1.45	68	30*26	1.45	75			
3300	22*41	1.70	68	25*36	1.70	62	30*31	1.70	48			
3900	22*51	1.90	53	25*41	1.90	52	30*36	1.90	36			
4700				25*41	2.10	52	30*36	2.10	36	35*32	2.10	47
5600				25*51	2.36	41	30*41	2.36	30	35*37	2.36	37
6800							30*51	2.70	28	35*42	2.70	31
8200							30*51	3.16	28	35*42	3.16	31
10000										35*52	3.50	25

Cap (μ F)	WV(SV) 63(72)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
1000	22*26	1.00	126									
1200	22*26	1.15	126	25*26	1.15	88						
1500	22*36	1.30	82	25*31	1.30	68						
1800	22*41	1.45	68	25*31	1.45	68	30*26	1.45	75			
2200	22*46	1.65	62	25*36	1.65	62	30*31	1.65	48	35*27	1.65	68
2700	22*51	1.90	53	25*41	1.90	52	30*36	1.90	36	35*32	1.90	60
3300				25*51	2.15	41	30*36	2.15	36	35*32	2.15	47
3900							30*41	2.40	30	35*37	2.40	37
4700							30*51	2.70	28	35*42	2.70	31
5600							30*51	3.10	28	35*42	3.10	31
6800										35*52	3.50	25

Ripple Current (A, rms) at 105°C, 120Hz
Max ESR (m Ω) at 20°C, 30KHz

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● **Case Size**

WV(sv) Cap (μF)	80(92)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
680	22*26	0.95	148									
820	22*31	1.00	118									
1000	22*36	1.20	98	25*26	1.20	115						
1200	22*41	1.40	78	25*31	1.40	80						
1500	22*46	1.60	48	25*36	1.60	65	30*26	1.60	82			
1800	22*51	1.80	58	25*41	1.80	62	30*31	1.80	58	35*27	1.80	68
2200				25*51	2.05	43	30*36	2.05	52	35*32	2.05	48
2700							30*41	2.35	41	35*37	2.35	42
3300							30*51	2.70	28	35*42	2.70	28
3900										35*47	2.80	26
4700										35*52	3.40	22

WV(sv) Cap (μF)	100(125)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
560	22*31	0.95	118	25*26	0.95	115						
680	22*36	1.10	98	25*31	1.10	80						
820	22*41	1.40	78	25*31	1.40	80	30*26	1.40	82			
1000	22*46	1.40	75	25*36	1.40	65	30*31	1.40	58	35*27	1.40	68
1200	22*51	1.60	58	25*41	1.60	62	30*36	1.60	52	35*32	1.60	65
1500				25*51	1.85	43	30*41	1.85	41	35*32	1.85	48
1800							30*46	2.05	37	35*37	2.05	42
2200							30*51	2.40	28	35*42	2.40	28
2700										35*52	2.80	22

WV(sv) Cap (μF)	160(200)											
	22			25			30			35		
	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
270	22*31	0.60	565									
330	22*36	0.80	455	25*26	0.80	525						
390	22*36	0.85	455	25*31	0.85	415						
470	22*46	1.10	380	25*36	1.10	365	30*31	1.10	315			
560	22*46	1.16	380	25*36	1.16	300	30*31	1.16	315			
680				25*46	1.30	280	30*36	1.30	262			
820				25*46	1.43	280	30*41	1.43	345	35*32	1.43	255
1000							30*46	1.69	300	35*37	1.69	205
1200										35*47	1.95	165
1500										35*52	2.40	145

Ripple Current (A, rms) at 105°C, 120Hz
Max ESR (mΩ) at 20°C 30KHz

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WV _(SV)	200(250)											
	22			25			30			35		
	Cap (μF)	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
180	22*26	0.57	645									
220	22*31	0.65	565									
270	22*36	0.78	455	25*26	0.78	525						
330	22*41	0.90	405	25*31	0.90	415						
390	22*41	0.98	405	25*36	0.98	405	30*26	0.98	405			
470	22*41	1.15	405	25*36	1.15	405	30*26	1.15	405			
560	22*46	1.30	345	25*36	1.30	365	30*26	1.30	405			
680	22*51	1.45	315	25*41	1.45	300	30*31	1.45	315	35*27	1.45	345
820				25*46	1.60	300	30*36	1.60	362	35*37	1.60	285
1000				25*56	1.90	235	30*46	1.90	300	35*37	1.90	205
1200							30*51	2.10	173	35*42	2.10	175

WV _(SV)	250(300)												
	22			25			30			35			
	Cap (μF)	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
150	22*26	0.52	645										
180	22*31	0.64	565	25*26	0.64	525							
220	22*36	0.75	455	25*31	0.75	415							
270	22*41	0.85	405	25*31	0.85	415	30*26	0.85	405				
330	22*46	1.00	380	25*36	1.00	365	30*31	1.00	315	35*27	1.00	345	
390	22*51	1.10	315	25*41	1.10	300	30*36	1.10	262				
470				25*51	1.20	235	30*36	1.20	262	35*32	1.20	255	
560							30*41	1.35	345	35*37	1.35	205	
680							30*51	1.55	173	35*42	1.55	175	
820							30*56	1.70	300				
1000										35*52	2.00	145	

WV _(SV)	350(400)												
	22			25			30			35			
	Cap (μF)	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR	Size	Rippl	ESR
68	22*26	0.34	795										
82	22*31	0.40	705										
100	22*36	0.50	565	25*26	0.50	655							
120	22*41	0.56	505	25*31	0.56	525	30*26	0.56	495				
150	22*46	0.63	460	25*36	0.63	435	30*31	0.63	395				
180	22*51	0.70	385	25*41	0.70	375	30*31	0.70	395				
220				25*51	0.82	305	30*36	0.82	325	35*32	0.82	310	
270							30*41	0.90	285	35*37	0.90	250	
330							30*51	1.10	215	35*42	1.10	225	
390										35*47	1.20	210	
470										35*52	1.30	175	

Ripple Current (A, rms) at 105°C, 120Hz

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WV _(SV) Cap (μ F)	400 (450)											
	22			25			30			35		
	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR	Size	Ripple	ESR
56	22*26	0.32	795									
68	22*31	0.40	705	25*26	0.40	656						
82	22*36	0.45	565	25*31	0.45	525						
100	22*41	0.50	505	25*31	0.50	525	30*26	0.50	495			
120	22*41	0.55	505	25*36	0.55	435	30*31	0.55	395			
150	22*51	0.65	385	25*41	0.65	375	30*36	0.65	325			
180				25*46	0.75	350	30*36	0.75	325	35*32	0.75	310
220				25*51	0.85	305	30*41	0.85	285	35*37	0.85	250
270							30*51	1.05	215	35*42	1.05	225
330										35*47	1.10	210
390										35*52	1.20	175

Ripple Current (A, rms) at 105°C, 120Hz:

Max ESR (m Ω) at 20°C 30KHz:

- For special designing requirement, please contact us.