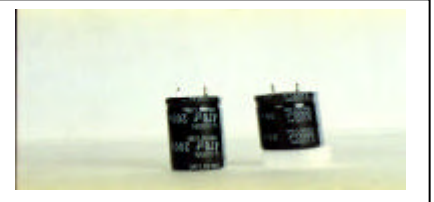


HW Series

Features
 Lifetime: 105 ,2000hrs
 Wide temperature range for TW
 Snap-in terminal
 Large ripple current

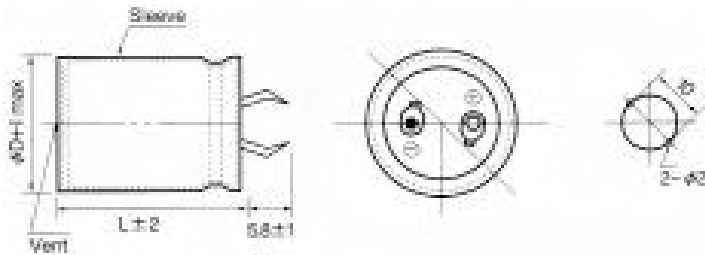
Recommended Applications
 AV(TV, Video, Audio)
 Monitor/Computer
 OA/HA/Communication
 Smoothing circuit
 Adapter
 SMPS



Specifications

Items	Characteristics																
Capacitance Tolerance	± 20% (M) (120Hz, 20)																
Rated Voltage Range (WV)	10~100 VDC								160~450 VDC								
Operating Temperature Range	-40 ~ +105								-25 ~ +105								
Surge Voltage (V) (20)	WV	10	16	25	35	50	63	80	100	160	180	200	250	315	350	400	450
	SV	13	20	32	44	63	79	100	125	200	225	250	300	365	400	450	500
Leakage Current (Max) (20)	I = 0.02CV or 3mA whichever is smaller (After rated voltage applied for 5 minutes)																
	I= Leakage Current (μ A) C= Nominal Capacitance (μ F) V= Rated Voltage (V)																
Dissipation Factor (Max) (tan) (120Hz ,20)	Dissipation Factor(tan) shall not exceed the values showed in the table of standard rating																
Load Life	After applying rated voltage for 2000 hours at 105 , the capacitor shall meet the following requirement.																
	Capacitance Change	Within ± 20% of the initial value															
	Dissipation Factor	Not more than 200% of the specified value															
	Leakage Current	Not more than the specified value															
Shelf Life	After placed at 105 without voltage applied for 1000 hours, the capacitor shall meet the same requirement as load life.																
Applicable standards	Refer to JIS C 5101																

Dimensions (mm)



Multiplier for Ripple Current

Frequency coefficient

Freq. (Hz)	50	60	120	400	1K	2.4K	5K	10K~100K
Coefficient	0.80	0.85	1.00	1.14	1.23	1.30	1.36	1.40

Temperature coefficient

Ambient Temperature ()	40	45	50	55	60	65	70	75	80	85	105
Coefficient	2.73	2.60	2.47	2.33	2.18	2.02	1.85	1.65	1.44	1.18	1.00

Case Size / Max Ripple Current / tan / ESR

CASE SIZE (DxL(mm)) / MAX DISSIPATION FACTOR (tan / 120Hz, 20) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz, 105) / MAX EQUIVALENT SERIES RESISTANCE (ESR() / 120Hz, 20)

WV μ F	10					16							
	DxL				tan	ESR	DxL				tan	ESR	
	RC						RC						
6800							22x25					0.5	0.098
							1.80						
8200							22x30	25x25				0.5	0.081
							2.05	2.05					
10000	22x25				0.5	0.066	22x35	25x30				0.5	0.066
	1.80						2.45	2.45					
12000	22x30	25x25			0.5	0.055	22x40	25x30	30x25			0.5	0.055
	2.05	2.05					2.73	2.60	2.68				
15000	22x35	25x30	30x25		0.5	0.044	22x45	25x35	30x30			0.5	0.044
	2.45	2.45	2.55				2.99	2.90	3.02				
18000	22x40	25x30	30x30		0.5	0.037	22x50	25x40	30x30	35x25		0.5	0.037
	2.94	2.80	3.11				3.43	3.33	3.30	3.37			
22000	22x45	25x35	30x30	35x25	0.5	0.030		25x45	30x35	35x30		0.5	0.030
	3.24	3.15	3.28	3.37				3.70	3.70	3.81			
27000		25x40	30x35	35x30	0.5	0.025			30x40	35x35		0.5	0.025
		3.50	3.67	3.78					4.15	4.27			
33000		25x45	30x40	35x30	0.5	0.020			30x50	35x40		0.5	0.020
		4.00	4.20	4.08					4.65	4.65			
39000		25x50	30x45	35x35	0.5	0.017				35x45		0.5	0.017
		4.45	4.67	4.63						5.25			
47000				35x40	0.5	0.014				35x50		0.5	0.014
				4.90						5.80			
56000				35x45	0.5	0.012							
				5.50									
68000				35x50	0.5	0.010							
				6.05									

WV μ F	25					35							
	DxL				tan	ESR	DxL				tan	ESR	
	RC						RC						
2700							22x25					0.35	0.172
							1.45						
3300							22x30					0.35	0.141
							1.60						
3900	22x25				0.4	0.136	22x30					0.35	0.119
	1.50						1.80						
4700	22x30				0.4	0.113	22x35	25x25				0.35	0.099
	1.80						2.23	2.10					
5600	22x30	25x25			0.4	0.095	22x40	25x30	30x25			0.35	0.083
	1.95	1.95					2.41	2.30	2.37				
6800	22x35	25x30			0.4	0.078	22x45	25x35	30x30			0.35	0.068
	2.20	2.20					2.68	2.60	2.70				
8200	22x40	25x35	30x25		0.4	0.065	22x50	25x40	30x30	35x25		0.35	0.057
	2.47	2.50	2.45				3.02	2.93	2.90	2.96			
10000	22x45	25x40	30x30		0.4	0.053		25x45	30x35	35x30		0.35	0.046
	2.75	2.80	2.75					3.20	3.20	3.30			
12000	22x50	25x45	30x35	35x25	0.4	0.044		25x50	30x40	35x30		0.35	0.039
	3.13	3.22	3.19	3.10				3.64	3.67	3.60			
15000		25x50	30x40	35x30	0.4	0.035			30x45	35x35		0.35	0.031
		3.43	3.47	3.40					4.04	4.00			
18000			30x45	35x35	0.4	0.029				35x40		0.35	0.026
			3.94	3.90						4.60			
22000			30x50	35x40	0.4	0.024				35x50		0.35	0.021
			4.30	4.30						5.10			
27000				35x45	0.4	0.020							
				4.85									

Case Size / Max Ripple Current / tan / ESR

CASE SIZE (DxL(mm)) / MAX DISSIPATION FACTOR (tan / 120Hz,20) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105) / MAX EQUIVALENT SERIES RESISTANCE (ESR() / 120Hz,20)

WV	50						63						
SPEC μ F	DxL			tan	ESR	DxL			tan	ESR			
	RC					RC							
1200						22x25 1.25				0.25	0.276		
1500	22x25 1.25				0.30	0.265	22x30 1.45	25x25 1.45			0.25	0.221	
1800	22x30 1.45				0.30	0.221	22x35 1.60	25x30 1.60			0.25	0.184	
2200	22x30 1.60	25x25 1.60			0.30	0.181	22x40 1.89	25x30 1.80	30x25 1.85			0.25	0.151
2700	22x35 1.80	25x30 1.80			0.30	0.147	22x45 2.06	25x35 2.00	30x30 2.08			0.25	0.123
3300	22x40 2.05	25x30 1.95	30x25 2.01		0.30	0.121		25x40 2.32	30x30 2.30	35x25 2.35	0.25	0.101	
3900	22x45 2.27	25x35 2.20	30x30 2.29		0.30	0.102		25x45 2.55	30x35 2.55	35x30 2.63	0.25	0.085	
4700	22x50 2.50	25x40 2.42	30x30 2.40	35x25 2.45	0.30	0.085		25x50 2.83	30x40 2.86	35x30 2.80	0.25	0.071	
5600		25x45 2.70	30x35 2.70	35x30 2.78	0.30	0.071			30x45 3.18	35x35 3.15	0.25	0.059	
6800			30x40 3.06	35x30 3.00	0.30	0.059			30x50 3.50	35x40 3.50	0.25	0.048	
8200			30x45 3.38	35x35 3.35	0.30	0.049				35x45 3.90	0.25	0.040	
10000				35x40 3.70	0.30	0.040							
12000				35x50 4.20	0.30	0.033							

WV	80						100						
SPEC μ F	DxL			tan	ESR	DxL			tan	ESR			
	RC					RC							
560						22x25 1.20				0.2	0.474		
680						22x30 1.35				0.2	0.390		
820	22x25 1.20				0.2	0.324	22x30 1.50	25x25 1.50			0.2	0.324	
1000	22x30 1.35				0.2	0.265	22x35 1.70	25x30 1.70			0.2	0.265	
1200	22x35 1.59	25x25 1.50			0.2	0.221	22x40 1.97	25x35 1.99	30x25 1.95			0.2	0.221
1500	22x40 1.78	25x30 1.70	30x25 1.75		0.2	0.177	22x45 2.15	25x40 2.19	30x30 2.15	35x25 2.21	0.2	0.177	
1800	22x45 2.01	25x35 1.95	30x30 2.03		0.2	0.147		25x45 2.45	30x35 2.45	35x30 2.52	0.2	0.147	
2200		25x40 2.17	30x30 2.15	35x25 2.19	0.2	0.121		25x50 2.75	30x40 2.75	35x35 2.86	0.2	0.121	
2700		25x45 2.45	30x35 2.45	35x30 2.52	0.2	0.098			30x45 3.08	35x35 3.05	0.2	0.098	
3300			30x40 2.75	35x35 2.83	0.2	0.080			30x50 3.45	35x40 3.45	0.2	0.080	
3900			30x45 3.13	35x35 3.10	0.2	0.068				35x45 3.90	0.2	0.068	
4700				35x40 3.40	0.2	0.056				35x50 4.30	0.2	0.056	
5600				35x50 3.80	0.2	0.047							

Case Size / Max Ripple Current / tan / ESR

CASE SIZE (DxL(mm)) / MAX DISSIPATION FACTOR (tan@ 120Hz,20) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105) / MAX EQUIVALENT SERIES RESISTANCE (ESR() / 120Hz,20)

WV μF	160					180						
	DxL				tan	ESR	DxL				tan	ESR
	RC						RC					
270	22x25				0.15	0.737	22x25				0.15	0.737
	0.85						0.85					
330	22x30				0.15	0.603	22x30				0.15	0.603
	1.00						1.10					
390	22x30	25x25			0.15	0.510	22x35	25x25			0.15	0.510
	1.15	1.15					1.32	1.25				
470	22x35	25x30			0.15	0.423	22x40	25x30			0.15	0.423
	1.30	1.30					1.47	1.40				
560	22x40	25x30	30x25		0.15	0.355	22x45	25x35	30x25		0.15	0.355
	1.57	1.50	1.54				1.70	1.63	1.60			
680	22x45	25x35	30x30		0.15	0.293	22x50	25x40	30x30	35x25	0.15	0.293
	1.75	1.70	1.77				1.87	1.82	1.80	1.84		
820	22x50	25x40	30x30	35x25	0.15	0.243		25x45	30x35	35x30	0.15	0.243
	2.03	1.97	1.95	1.99				2.05	2.05	2.11		
1000		25x45	30x35	35x30	0.15	0.199		25x50	30x40	35x30	0.15	0.199
		2.15	2.15	2.21				2.27	2.29	2.25		
1200			30x40	35x35	0.15	0.166			30x45	35x35	0.15	0.166
			2.45	2.52					2.57	2.55		
1500			30x50	35x40	0.15	0.133				35x40	0.15	0.133
			2.75	2.75						2.85		
1800				35x45	0.15	0.111				35x50	0.15	0.111
				3.00						3.10		
2200				35x50	0.15	0.090						
				3.50								

WV μF	200					250						
	DxL				tan	ESR	DxL				tan	ESR
	RC						RC					
150							22x25				0.15	1.33
							0.75					
180							22x30				0.15	1.11
							0.85					
220	22x25				0.15	0.905	22x30	25x25			0.15	0.905
	0.85						1.00	1.00				
270	22x30				0.15	0.737	22x35	25x25			0.15	0.737
	1.00						1.22	1.15				
330	22x30	25x25			0.15	0.603	22x40	25x30			0.15	0.603
	1.15	1.15					1.36	1.30				
390	22x35	25x30			0.15	0.510	22x45	25x35	30x25	35x25	0.15	0.510
	1.30	1.30					1.54	1.48	1.45	1.59		
470	22x40	25x35	30x25		0.15	0.423	22x50	25x40	30x30	35x30	0.15	0.423
	1.52	1.54	1.49				1.78	1.75	1.72	1.88		
560	22x45	25x35	30x30		0.15	0.355		25x40	30x35	35x30	0.15	0.355
	1.70	1.65	1.72					1.80	1.89	1.94		
680		25x45	30x35	35x30	0.15	0.293		25x50	30x40	35x35	0.15	0.293
		1.97	1.97	2.02				2.10	2.10	2.18		
820		25x50	30x35	35x30	0.15	0.243			30x45	35x40	0.15	0.243
		2.20	2.10	2.16					2.30	2.39		
1000			30x45	35x35	0.15	0.199			30x50	35x45	0.15	0.199
			2.32	2.30					2.55	2.65		
1200			30x50	35x40	0.15	0.166				35x50	0.15	0.166
			2.75	2.75						2.90		
1500				35x45	0.15	0.133						
				2.90								

Case Size / Max Ripple Current / tan / ESR

CASE SIZE (DxL(mm)) / MAX DISSIPATION FACTOR (tan@ 120Hz,20) / MAX PERMISSIBLE RIPPLE CURRENT (RC(Arms) / 120Hz,105) / MAX EQUIVALENT SERIES RESISTANCE (ESR() / 120Hz,20)

WV	315					350						
SPEC μF	DxL			tan	ESR	DxL			tan	ESR		
	RC					RC						
82	22x25 0.55				0.15	2.43	22x25 0.60				0.15	2.43
100	22x30 0.65				0.15	1.99	22x30 0.70	25x25 0.70			0.15	1.99
120	22x30 0.75	25x25 0.75			0.15	1.66	22x35 0.80	25x30 0.80			0.15	1.66
150	22x35 0.80	25x30 0.80			0.15	1.33	22x40 0.86	25x35 0.87	30x25 0.85		0.15	1.33
180	22x40 1.01	25x35 1.02	30x25 1.00		0.15	1.11	22x45 1.05	25x40 1.07	30x30 1.05		0.15	1.11
220	22x45 1.10	25x40 1.12	30x30 1.10		0.15	0.905	22x50 1.16	25x45 1.20	30x35 1.18	35x25 1.15	0.15	0.905
270		25x45 1.25	30x35 1.25		0.15	0.737		25x50 1.31	30x40 1.33	35x30 1.30	0.15	0.737
330		25x50 1.53	30x40 1.53	35x30 1.50	0.15	0.603			30x45 1.46	35x35 1.45	0.15	0.603
390			30x45 1.71	35x30 1.60	0.15	0.510			30x50 1.65	35x40 1.65	0.15	0.510
470			30x50 1.85	35x35 1.75	0.15	0.423				35x45 1.85	0.15	0.423
560				35x40 2.00	0.15	0.355				35x50 2.10	0.15	0.355
680				35x45 2.20	0.15	0.293						

WV	400					450						
SPEC μF	DxL			tan	ESR	DxL			tan	ESR		
	RC					RC						
56							22x25 0.55				0.2	4.74
68	22x25 0.55				0.15	2.93	22x30 0.65				0.2	3.90
82	22x30 0.65	25x25 0.65			0.15	2.43	22x35 0.80	25x25 0.75			0.2	3.24
100	22x35 0.79	25x25 0.75			0.15	1.99	22x40 0.89	25x30 0.85			0.2	2.65
120	22x40 0.89	25x30 0.85	30x25 0.87		0.15	1.66	22x45 0.95	25x35 0.92	30x25 0.90		0.2	2.21
150	22x45 0.93	25x35 0.90	30x30 0.94	35x25 0.96	0.15	1.33	22x50 1.14	25x40 1.11	30x30 1.10		0.2	1.77
180	22x50 1.14	25x40 1.11	30x30 1.10	35x25 1.12	0.15	1.11		25x45 1.25	30x35 1.24	35x25 1.20	0.2	1.47
220		25x45 1.20	30x35 1.20	35x30 1.24	0.15	0.905		25x50 1.36	30x40 1.38	35x30 1.35	0.2	1.20
270		25x50 1.36	30x40 1.38	35x30 1.35	0.15	0.737			30x45 1.51	35x35 1.50	0.2	0.982
330			30x45 1.51	35x35 1.50	0.15	0.603			30x50 1.70	35x40 1.70	0.2	0.804
390			30x50 1.70	35x40 1.70	0.15	0.510				35x45 1.90	0.2	0.680
470				35x45 1.90	0.15	0.423				35x50 2.10	0.2	0.564