

WS
Upgrade

Screw Terminal Type, Standard Series

- Standard at 85°C
- UPS
- High Professional Inverters and Power Supplies
- Complied to the RoHS directive

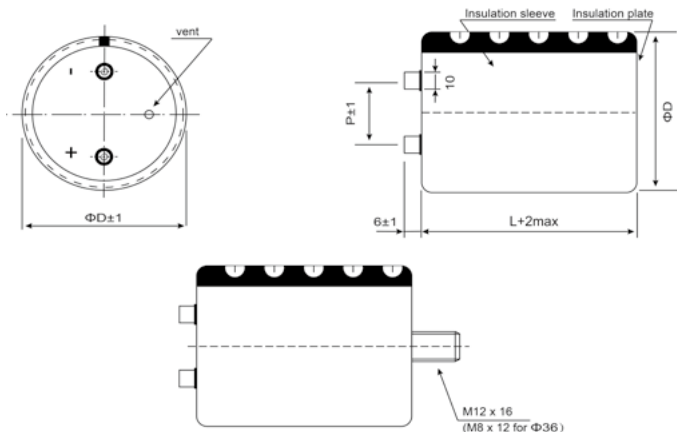
Items	Performance characteristics
Operating temperature range	-40 ~ +85°C (10V~250V); -25 ~ +85°C (350V~650V);
Leakage current max.	I=0.01CV or 5mA whichever is smaller (after 5 minutes)
Capacitance tolerance	±20% at 120Hz, 20°C
Dissipation factor max. (at 120Hz, 20°C)	Less than values shown in the standard ratings

	Useful Life		Load Life	Endurance Test	Shelf Life
	>4000h	>65000h	2000h	2000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ±30% of initial value		Within ±20% of initial value	Within ±10% of initial value	Within ±20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 130% of specified value	Not more than 200% of specified value
Condition:					
Applied Voltage	U _R	U _R	U _R	U _R	U _R =0
Applied Current	I _R	1.2×I _R	I _R	I _R =0	I _R =0
Applied Temperature	85°C	40°C	85°C	85°C	85°C

After test
 U_R to be applied
 for 60min>24h
 before measurement

DRAWING

Unit: mm



ΦD/mm	36	51	64	77	90	101
P/mm	12.7	22.0	28.2	31.4	31.4	41.5

- *Hex head screw M5×10 and M6×12 are standard screws. Longer screws are available on request.
- *Max tightening torque for screw terminal M5:3Nm, M6:4Nm. Max torque for bolt mounting M12:12.5Nm.
- *Screws, Bracket and cap nut will be delivered separately if necessary.

Ripple Current Coefficient

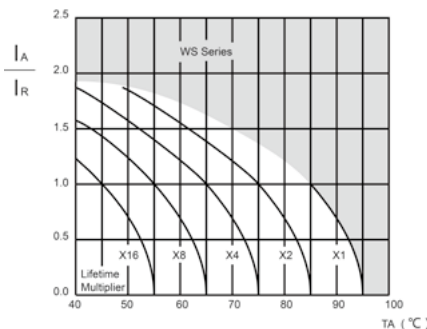
Frequency(Hz)	50/60	120	300	1k	>10k
WV					
10~50	0.95	1.00	1.04	1.10	1.15
63~100	0.95	1.00	1.06	1.16	1.30
160~500	0.80	1.00	1.10	1.25	1.50
600,630	0.80	1.00	1.10	1.30	1.40

Ambient Temp(°C)	40	60	70	85
WV				
10~500	2.70	2.00	1.70	1.00
600,630	1.89	1.67	1.41	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g.lower operating voltage, Rms ripple current or ambient temperature)and by appropriate cooling measures.

It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life .

Lifetime Diagram



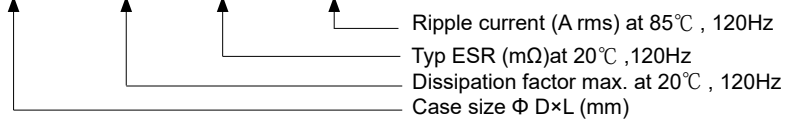
I_A=actual ripple current at 120Hz,
 I_R=rated ripple current at 120Hz,85°C
 Multiplier of Useful Life as a function of ambient temperature and ripple current load.

WS Series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV(SV) μF	10 (13)				16 (20)				25 (32)			
	15000									36×53	0.50	22
18000									36×53	0.50	18	4.1
22000					36×53	0.60	22	4.1	36×53	0.50	16	4.5
27000					36×53	0.60	19	4.5	36×65	0.50	13	5.0
33000	36×53	0.80	21	4.3	36×53	0.60	16	5.0	36×83	0.50	11	5.9
39000	36×53	0.80	18	4.7	36×65	0.60	13	5.9	36×83	0.50	9	6.7
47000	36×65	0.80	15	5.2	36×83	0.60	11	6.4	36×100	0.50	8	7.7
56000	36×83	0.80	13	6.1	36×83	0.60	10	7.3	36×100	0.60	7	7.9
68000	36×83	0.80	10	6.7	36×100	0.60	8	8.4	36×121	0.60	6	9.1
82000	36×100	0.80	9	7.7	36×100	0.80	7	8.3	36×121	0.60	5	10.4
100000	36×100	0.80	8	8.8	36×121	0.80	6	9.5	51×96	0.80	4	10.3
120000	36×121	0.80	7	10.0	36×121	0.80	5	10.9	51×115	0.80	4	11.7
150000	36×121	1.00	7	10.8	51×96	1.00	4	11.3	51×130	0.80	3	14.1
180000	51×96	1.00	6	12.0	51×115	1.00	3	12.8	64×96	0.80	3	15.7
220000	51×121	1.50	5	11.2	51×130	1.00	3	15.3	64×115	1.00	3	16.1
270000	51×121	1.50	4	12.8	64×96	1.00	3	17.6	64×130	1.00	3	18.6
330000	64×96	1.50	4	15.3	64×115	1.50	3	16.8	64×155	1.00	2	21.9
390000	64×115	1.50	3	17.3	64×130	1.50	3	18.3	77×115	1.20	2	22.0
470000	64×130	2.00	3	16.7	77×115	1.50	2	21.3	77×155	1.20	2	25.6
560000	77×115	2.00	3	19.0	77×130	1.50	2	23.6	90×131	1.20	2	27.9
680000	77×130	2.00	3	21.7	77×155	1.50	2	27.6	90×157	1.20	2	32.5
820000	77×155	2.00	2	24.7	90×157	2.00	2	27.1				

WV(SV) μF	35 (44)				50 (63)				63 (79)			
	3900									36×53	0.25	47
4700									36×53	0.25	39	3.0
5600					36×53	0.30	46	3.0	36×53	0.25	38	3.3
6800					36×53	0.30	38	3.3	36×65	0.25	32	3.6
8200					36×53	0.30	31	3.6	36×83	0.25	26	4.3
10000	36×53	0.40	24	3.4	36×65	0.30	26	4.0	36×83	0.25	23	4.9
12000	36×53	0.40	20	3.7	36×83	0.30	22	4.7	36×100	0.25	18	5.6
15000	36×65	0.40	17	4.2	36×83	0.30	15	5.5	36×100	0.30	16	5.9
18000	36×83	0.40	14	4.9	36×100	0.30	12	6.2	36×121	0.30	15	6.7
22000	36×83	0.40	12	5.7	36×121	0.40	11	6.3	36×121	0.30	13	7.8
27000	36×100	0.40	9	6.3	36×121	0.40	10	7.1	51×96	0.40	12	7.4
33000	36×100	0.40	9	7.2	51×96	0.40	9	8.2	51×96	0.40	8	8.4
39000	36×121	0.50	8	7.3	51×96	0.50	8	8.1	51×115	0.40	7	9.5
47000	51×96	0.50	8	8.7	51×115	0.50	8	9.3	51×130	0.40	6	11.3
56000	51×96	0.60	8	8.6	64×96	0.50	6	10.5	64×115	0.40	6	12.8
68000	51×115	0.60	6	9.8	64×96	0.50	5	12.0	64×121	0.50	5	12.7
82000	64×96	0.60	5	11.6	64×115	0.50	4	13.7	64×130	0.50	4	14.5
100000	64×115	0.60	4	13.3	77×115	0.60	4	14.7	77×115	0.50	4	16.7
120000	64×121	0.60	4	14.8	77×115	0.60	3	16.7	77×130	0.50	3	18.9
150000	64×130	0.80	4	14.9	77×130	0.60	3	19.3	77×155	0.50	2	22.4
180000	77×115	0.80	3	17.0	77×155	0.60	3	21.9	90×131	0.60	2	22.4
220000	77×130	0.80	3	20.0	90×131	0.60	2	21.4	90×157	0.60	2	26.2
270000	77×155	1.00	3	20.3	90×157	0.60	2	24.6				
330000	90×131	1.00	2	23.5								
390000	90×157	1.00	2	26.4								
470000	90×157	1.00	2	29.6								



WS Series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV(SV) μF	80 (100)				100 (125)				160 (200)			
	1800					36×53	0.25	48	1.9			
2200					36×53	0.25	44	2.1				
2700					36×53	0.25	39	2.3				
3300	36×53	0.25	54	2.5	36×65	0.25	35	2.6	36×121	0.25	31	5.2
3900	36×53	0.25	46	2.8	36×83	0.25	28	3.0				
4700	36×65	0.25	38	3.0	36×83	0.25	26	3.5	51×75	0.25	21	5.9
5600	36×83	0.25	32	3.6	36×100	0.25	23	3.9	51×96	0.25	19	7.0
6800	36×83	0.25	26	3.9	36×100	0.25	22	4.5	51×96	0.25	16	7.8
8200	36×83	0.25	22	4.5	36×121	0.25	20	5.1				
10000	36×100	0.25	17	5.2	36×121	0.25	19	5.9	64×96	0.25	13	10.4
12000	36×100	0.25	15	5.9	51×75	0.25	16	6.4	51×120	0.25	10	11.3
15000	36×121	0.25	12	6.8	51×96	0.25	12	7.0	64×130	0.25	9	14.3
18000	36×121	0.25	10	7.8	51×115	0.25	10	8.3	64×130	0.25	8	15.6
22000	51×96	0.30	10	8.0	51×130	0.25	8	10.0	77×130	0.25	6	18.3
27000	51×96	0.30	8	9.2	64×115	0.25	7	11.5				
33000	51×115	0.30	7	10.5	64×130	0.25	6	11.9	90×131	0.25	4	23.8
39000	51×130	0.30	6	12.0	77×115	0.25	5	13.4	90×157	0.25	2	27.9
47000	64×115	0.30	5	13.6	77×130	0.35	5	14.2				
56000	64×130	0.40	4	13.4	77×155	0.35	4	16.0				
68000	77×115	0.40	4	15.4	90×131	0.35	3	18.8				
82000	77×130	0.40	4	17.5	90×157	0.35	3	20.5				
100000	77×155	0.40	3	20.5	90×171	0.35	3	24.0				
120000	90×131	0.40	2	22.4								
150000	90×157	0.40	2	26.5								

WV(SV) μF	200 (250)				250 (300)				350 (400)			
	470									36×83	0.20	228
680									36×83	0.20	152	2.6
1000									36×100	0.20	104	3.4
1500					36×100	0.25	49	3.2	51×75	0.20	72	4.3
1800									51×96	0.20	58	5.1
2200	36×100	0.25	38	3.9	51×75	0.25	33	4.0	51×96	0.20	48	5.7
2700									51×130	0.20	39	7.1
3300	51×75	0.25	24	4.9	51×96	0.25	23	5.4	51×130	0.20	32	7.9
3900									64×115	0.20	28	9.0
4700	51×96	0.25	20	6.4	64×96	0.25	17	7.1	64×130	0.20	25	10.3
5600	51×115	0.25	18	7.6					77×115	0.20	22	11.4
6800	51×130	0.25	14	8.8	64×115	0.25	12	9.1	77×130	0.20	17	13.1
8200	64×96	0.25	11	9.4	64×115	0.25	11	10.0	77×155	0.20	14	15.4
10000	64×96	0.25	9	10.4	64×130	0.25	11	11.7	90×157	0.20	12	18.1
12000									90×157	0.20	10	20.0
15000	77×96	0.25	7	14.4	77×130	0.25	7	15.1	90×196	0.20	8	24.5
18000	77×130	0.25	6	16.5	77×155	0.25	6	17.7	90×236	0.20	6	28.8
22000	77×155	0.25	4	19.6	90×157	0.25	3	20.9				
33000	90×157	0.25	3	25.3								

Ripple current (A rms) at 85°C , 120Hz
 Typ ESR (mΩ)at 20°C , 120Hz
 Dissipation factor max. at 20°C , 120Hz
 Case size Φ D×L (mm)

WS Series

● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV(SV) μF	400 (450)				450 (500)				500 (550)			
	470	36×83	0.20	178	2.2	36×83	0.20	200	2.2			
680	36×100	0.20	119	2.8	36×100	0.20	140	2.8				
820					51×75	0.20	96	3.2				
1000	51×75	0.20	82	3.5	51×75	0.20	82	3.5	51×115	0.25	85	4.6
1200	51×75	0.20	68	3.8	51×96	0.20	72	4.2				
1500	51×96	0.20	58	4.7	51×115	0.20	58	5.1	64×96	0.25	60	5.7
1800	51×96	0.20	47	5.2	51×130	0.20	46	5.9				
2200	51×120	0.20	35	6.4	64×96	0.20	33	6.3	64×130	0.25	41	6.9
2700	64×96	0.20	33	7.0	64×115	0.20	32	7.5	77×115	0.25	36	8.1
3300	64×115	0.20	31	8.2	64×130	0.20	30	8.7	77×130	0.25	32	9.6
3900	64×130	0.20	25	9.4	77×115	0.20	29	9.5	77×130	0.25	30	10.8
4700	77×115	0.20	24	10.4	77×130	0.20	24	10.9	77×155	0.25	27	12.1
5600	77×130	0.20	19	11.9	77×155	0.20	16	12.8	90×157	0.25	21	13.8
6800	77×155	0.20	16	14.1	90×157	0.20	14	15.0	90×171	0.25	18	15.8
8200	90×157	0.20	14	16.4	90×157	0.20	12	16.5	77×220	0.25	14	17.2
10000	90×157	0.20	11	18.3	90×196	0.20	10	20.0	90×236	0.25	10	22.1
12000	90×196	0.20	10	21.8	90×236	0.20	8	23.6				
15000	90×236	0.20	8	26.3								

↑ Ripple current (A rms) at 85°C , 120Hz
 ↑ Typ ESR (mΩ)at 20°C ,120Hz
 ↑ Dissipation factor max. at 20°C , 120Hz
 ↑ Case size Φ D×L (mm)

WV(SV) μF	600 (650)					650 (700)				
	1000						64×130	0.25	300	150
1200	64×96	0.25	242	121	7.7	77×115	0.25	266	133	6.7
1500	64×115	0.25	224	112	9.3	77×130	0.25	212	106	8.1
1800	77×96	0.25	194	97	10.1	77×155	0.25	176	88	9.8
2200	77×115	0.25	162	81	12.0	90×131	0.25	144	72	10.7
2700	77×130	0.25	132	66	14.0	90×157	0.25	128	64	12.8
3300	77×155	0.25	88	44	16.4	90×171	0.25	106	53	14.7
	90×131	0.25	88	44	16.4					
3900	90×131	0.25	74	37	17.8	90×196	0.25	94	47	17.9
4700	90×157	0.25	62	31	21.0	90×196	0.25	78	39	21.6
5600	90×196	0.25	56	28	24.5	101×220	0.25	70	35	24.9

↑ Ripple current (A rms) at 85°C , 120Hz
 ↑ Typ ESR (mΩ) at 20°C ,120Hz
 ↑ Max.ESR (mΩ) at 20°C 120Hz
 ↑ Dissipation factor max. at 20°C , 120Hz
 ↑ Case size Φ D×L (mm)