

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

■ TWSS SERIES [Low Voltage, General Purpose]

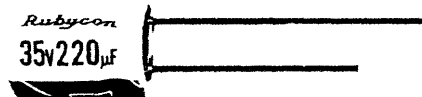
Miniaturized Standard

■ FEATURE

- The compactness will enhance automated insertion operations.
- Minimum life of 2,000 hours at 85°C.
- SSA Series was discontinued and replaced by TWSS series.
- Solvent Proof Type

Rinsing Conditions

Withstands either a 5-minute duration of any one of the immersion, ultrasonic and vapor process employing Freon TE, Freon TES, or Freon TF, or a combination of those processes totaling 5 minutes or less in duration.



■ SPECIFICATION TABLE

1	OPERATING TEMPERATURE RANGE	-40°C to +85°C																																		
2	RATED VOLTAGE RANGE	6.3~100V DC																																		
3	CAPACITANCE TOLERANCE(120Hz)	-20%~+20% (20°C)																																		
4	LEAKAGE CURRENT(μA max) (Apply rated voltage for 2 minutes before test)	I =0.01CV or 3 whichever is greater I =Leakage Current (μA) C=Nominal Capacitance (μF) V=Rated Voltage (V)																																		
5	DISSIPATION FACTOR(max.)at 120Hz	<table><tr><td>RATED VOLTAGE</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr><tr><td>DF(tan δ)</td><td>0.26</td><td>0.22</td><td>0.18</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.12</td><td>0.10</td></tr></table> <p>For capacitors whose capacitance exceeds 1000μF, the value of DF(tan δ) is increased by 0.02 for every addition of 1000μF</p>								RATED VOLTAGE	6.3	10	16	25	35	50	63	100	DF(tan δ)	0.26	0.22	0.18	0.16	0.14	0.12	0.12	0.10									
RATED VOLTAGE	6.3	10	16	25	35	50	63	100																												
DF(tan δ)	0.26	0.22	0.18	0.16	0.14	0.12	0.12	0.10																												
6	LIFE TEST AT 85°C AND RATED VOLTAGE	TEST HOURS	1000hours				2000hours																													
		LEAKAGE CURRENT	Less than the value given in column 4				Less than the value given in column 4																													
		CAPACITANCE CHANGE	Within ±20% of the initial value				Within ±25% of the initial value																													
		DF(tan δ)	Less than 200% of the value given in column 5				Less than 200% of the value given in column 5																													
7	LOW TEMPERATURE STABILITY (Impedance ratio at 120Hz)	<table><tr><td>RATED VOLTAGE(V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr><tr><td>Z(-25°C)/Z(+20°C)</td><td>5</td><td>4</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-40°C)/Z(+20°C)</td><td>12</td><td>10</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td></tr></table>								RATED VOLTAGE(V)	6.3	10	16	25	35	50	63	100	Z(-25°C)/Z(+20°C)	5	4	4	3	2	2	2	2	Z(-40°C)/Z(+20°C)	12	10	8	6	4	3	3	3
RATED VOLTAGE(V)	6.3	10	16	25	35	50	63	100																												
Z(-25°C)/Z(+20°C)	5	4	4	3	2	2	2	2																												
Z(-40°C)/Z(+20°C)	12	10	8	6	4	3	3	3																												
8	OTHERS	Comply with JIS-C-5141 characteristic W																																		

■ RMS RIPPLE CURRENT COEFFICIENT

(1) TEMPERATURE COEFFICIENT

AMBIENT TEMPERATURE(°C)	85	70	50 & under
TEMPERATURE COEFFICIENT	1.00	1.58	2.00

(2) FREQUENCY COEFFICIENT

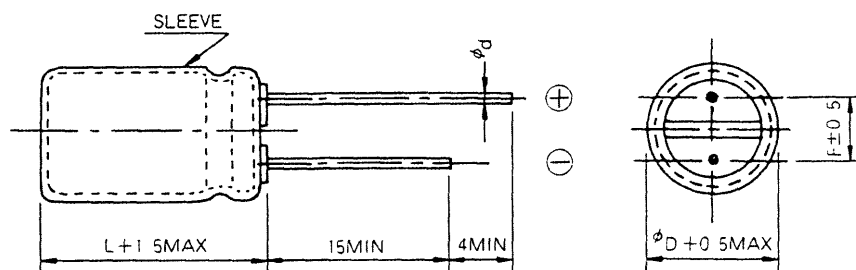
NOMINAL CAPACITANCE(µF) \ FREQUENCY(Hz)	60(50)	120	500	1k	10k & over
<100	0.8	1.0	1.20	1.30	1.50
100~1000	0.8	1.0	1.10	1.15	1.20
>1000	0.8	1.0	1.05	1.10	1.15

REB M88-03(TWSS)

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

■ DIMENSIONS

UNIT : mm



ϕ_D	5	6.3	8	10	12.5	16	18
ϕ_d	0.5	0.5	0.6	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	7.5

■ STANDARD CASE SIZE

($\phi_D \times L$ mm)

RATED VOLTAGE(V.DC) NOMINAL CAPACITANCE(μ F)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63 (1J)	100 (2A)
0.47						5 × 11		5 × 11
1						5 × 11		5 × 11
2.2						5 × 11		5 × 11
3.3						5 × 11		5 × 11
4.7						5 × 11		5 × 11
10						5 × 11	5 × 11	6.3 × 11
22						5 × 11	6.3 × 11	8 × 11
33				5 × 11	5 × 11	6.3 × 11	6.3 × 11	10 × 12.5
47			5 × 11	5 × 11	6.3 × 11	6.3 × 11	8 × 11	10 × 16
100	5 × 11	5 × 11	6.3 × 11	6.3 × 11	8 × 11	8 × 12.5	10 × 12.5	12.5 × 20
220	6.3 × 11	6.3 × 11	8 × 11	8 × 12.5	10 × 12.5	10 × 16	10 × 20	16 × 25
330	6.3 × 11	8 × 11	8 × 12.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20	16 × 25
470	8 × 11	8 × 12.5	10 × 12.5	10 × 16	10 × 20	12.5 × 20	12.5 × 25	16 × 31.5
1000	10 × 12.5	10 × 16	10 × 20	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	
2200	12.5 × 20	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	18 × 35.5		
3300	12.5 × 20	12.5 × 25	16 × 25	16 × 31.5	18 × 35.5			
4700	16 × 25	16 × 25	16 × 31.5	18 × 35.5				
6800	16 × 25	16 × 31.5	18 × 35.5					
10000	16 × 31.5	18 × 35.5						

MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

■ LIST OF STANDARD PRODUCTS

RATED VOLTAGE (SURGE VOLTAGE) (V DC)	NOMINAL CAPACITANCE (μF)	PART NUMBER	DF (tan δ) at 120Hz 20 C	ESR (ΩMAX) at 120Hz 20 C	LEAKAGE CURRENT (μA MAX)	RIPPLE CURRENT (mA MAX) at 120Hz 85 C	DIMENSIONS(mm)			
							φD	L	F	φd
6.3 (8)	100	6.3 TWSS 100	0.26	3.45	6.3	130	5	11	2.0	0.5
	220	6.3 TWSS 220	0.26	1.57	13.3	220	6.3	11	2.5	0.5
	330	6.3 TWSS 330	0.26	1.04	20.7	280	6.3	11	2.5	0.5
	470	6.3 TWSS 470	0.26	0.73	29.6	360	8	11	3.5	0.6
	1000	6.3 TWSS 1000	0.26	0.34	63.0	590	10	12.5	5.0	0.6
	2200	6.3 TWSS 2200	0.28	0.17	133	920	12.5	20	5.0	0.6
	3300	6.3 TWSS 3300	0.30	0.12	207	1100	12.5	20	5.0	0.6
	4700	6.3 TWSS 4700	0.32	0.09	296	1400	16	25	7.5	0.8
	6800	6.3 TWSS 6800	0.36	0.07	423	1600	16	25	7.5	0.8
	10000	6.3 TWSS 10000	0.44	0.06	630	1900	16	31.5	7.5	0.8
10 (13)	100	10 TWSS 100 228-436	0.22	2.92	10.0	140	5	11	2.0	0.5
	220	10 TWSS 220	0.22	1.33	20.0	230	6.3	11	2.5	0.5
	330	10 TWSS 330	0.22	0.88	33.0	310	8	11	3.5	0.6
	470	10 TWSS 470	0.22	0.62	47.0	400	8	12.5	3.5	0.6
	1000	10 TWSS 1000 228-448	0.22	0.29	100	660	10	16	5.0	0.6
	2200	10 TWSS 2200 228-450	0.24	0.14	200	1050	12.5	20	5.0	0.6
	3300	10 TWSS 3300	0.26	0.10	330	1300	12.5	25	5.0	0.6
	4700	10 TWSS 4700	0.28	0.08	470	1550	16	25	7.5	0.8
	6800	10 TWSS 6800	0.32	0.06	680	1900	16	31.5	7.5	0.8
	10000	10 TWSS 10000	0.40	0.05	1000	2500	18	35.5	7.5	0.8
16 (20)	47	16 TWSS 47 228-497	0.18	5.08	7.5	110	5	11	2.0	0.5
	100	16 TWSS 100 228-503	0.18	2.39	16.0	175	6.3	11	2.5	0.5
	220	16 TWSS 220 228-515	0.18	1.09	35.2	280	8	11	3.5	0.6
	330	16 TWSS 330 228-527	0.18	0.72	52.8	360	8	12.5	3.5	0.6
	470	16 TWSS 470 228-539	0.18	0.51	75.2	460	10	12.5	5.0	0.6
	1000	16 TWSS 1000 228-540	0.18	0.24	160	760	10	20	5.0	0.6
	2200	16 TWSS 2200 228-552	0.20	0.12	352	1200	12.5	25	5.0	0.6
	3300	16 TWSS 3300	0.22	0.09	528	1450	16	25	7.5	0.8
	4700	16 TWSS 4700	0.24	0.07	752	1700	16	31.5	7.5	0.8
	6800	16 TWSS 6800	0.28	0.05	1023	2000	18	35.5	7.5	0.8
25 (32)	33	25 TWSS 33 228-564	0.16	6.43	3.2	98	5	11	2.0	0.5
	47	25 TWSS 47	0.16	4.52	11.7	120	5	11	2.0	0.5
	100	25 TWSS 100 228-576	0.16	2.12	25.0	185	6.3	11	2.5	0.5
	220	25 TWSS 220 228-588	0.16	0.96	55.0	310	8	12.5	3.5	0.6
	330	25 TWSS 330	0.16	0.64	82.5	410	10	12.5	5.0	0.6
	470	25 TWSS 470	0.16	0.45	117	530	10	16	5.0	0.6
	1000	25 TWSS 1000 228-590	0.16	0.21	250	900	12.5	20	5.0	0.6
	2200	25 TWSS 2200	0.18	0.11	550	1350	16	25	7.5	0.8
	3300	25 TWSS 3300	0.20	0.08	825	1600	16	31.5	7.5	0.8
	4700	25 TWSS 4700	0.22	0.06	1175	2000	18	35.5	7.5	0.8

B M88-03(TWSS)

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LIST OF STANDARD PRODUCTS

RATED VOLTAGE (SURGE VOLTAGE) (V DC)	NOMINAL CAPACITANCE (μ F)	PART NUMBER	DF (tan δ) at 120Hz 20°C	ESR (Ω MAX) at 120Hz 20°C	LEAKAGE CURRENT (μ A MAX)	RIPPLE CURRENT (mA MAX) at 120Hz 85°C	DIMENSIONS(mm)			
							ϕ D	L	F	ϕ d
35 (44)	33	35 TWSS 33 228-631	0.14	5.63	1.5	110	5	11	2.0	0.5
	47	35 TWSS 47 228-643	0.14	3.95	0.4	130	6.3	11	2.5	0.5
	100	35 TWSS 100 228-655	0.14	1.86	0.1	210	8	11	3.5	0.6
	220	35 TWSS 220 228-667	0.14	0.84	0.01	370	10	12.5	5.0	0.6
	330	35 TWSS 330 228-679	0.14	0.56	0.01	480	10	16	5.0	0.6
	470	35 TWSS 470 228-680	0.14	0.40	0.01	600	10	20	5.0	0.6
	1000	35 TWSS 1000 228-692	0.14	0.19	0.01	1000	12.5	25	5.0	0.6
	2200	35 TWSS 2200 228-704	0.16	0.10	0.01	1400	16	31.5	7.5	0.8
	3300	35 TWSS 3300	0.18	0.07	0.01	1700	18	35.5	7.5	0.8
50 (63)	0.47	50 TWSS 0R47	0.12	339	3.0	7	5	11	2.0	0.5
	1	50 TWSS 1	0.12	159	3.0	12	5	11	2.0	0.5
	2.2	50 TWSS 2R2	0.12	72.3	3.0	21	5	11	2.0	0.5
	3.3	50 TWSS 3R3	0.12	48.2	3.0	28	5	11	2.0	0.5
	4.7	50 TWSS 4R7	0.12	33.9	3.0	35	5	11	2.0	0.5
	10	50 TWSS 10	0.12	15.9	5.0	60	5	11	2.0	0.5
	22	50 TWSS 22	0.12	7.23	11.0	95	5	11	2.0	0.5
	33	50 TWSS 33	0.12	4.82	16.5	120	6.3	11	2.5	0.5
	47	50 TWSS 47	0.12	3.39	23.5	145	6.3	11	2.5	0.5
	100	50 TWSS 100	0.12	1.59	50.0	250	8	12.5	3.5	0.6
	220	50 TWSS 220	0.12	0.72	110	420	10	16	5.0	0.6
	330	50 TWSS 330	0.12	0.48	165	540	10	20	5.0	0.6
	470	50 TWSS 470	0.12	0.34	235	730	12.5	20	5.0	0.6
	1000	50 TWSS 1000	0.12	0.16	500	1100	16	25	7.5	0.8
	2200	50 TWSS 2200	0.14	0.08	1100	1800	18	35.5	7.5	0.8
63 (79)	10	63 TWSS 10 228-758	0.12	15.9	5.3	65	5	11	2.0	0.5
	22	63 TWSS 22 228-760	0.12	7.23	13.3	110	6.3	11	2.5	0.5
	33	63 TWSS 33 228-771	0.12	4.82	20.7	140	6.3	11	2.5	0.5
	47	63 TWSS 47 228-783	0.12	3.39	29.6	190	8	11	3.5	0.6
	100	63 TWSS 100 228-795	0.12	1.59	63.0	300	10	12.5	5.0	0.6
	220	63 TWSS 220 228-801	0.12	0.72	138	490	10	20	5.0	0.6
	330	63 TWSS 330 228-813	0.12	0.48	207	680	12.5	20	5.0	0.6
	470	63 TWSS 470 228-825	0.12	0.34	296	880	12.5	25	5.0	0.6
	1000	63 TWSS 1000	0.12	0.16	630	1300	16	31.5	7.5	0.8
100 (125)	0.47	100 TWSS 0R47 228-837	0.10	282	3.0	8	5	11	2.0	0.5
	1	100 TWSS 1 228-849	0.10	133	3.0	15	5	11	2.0	0.5
	2.2	100 TWSS 2R2 228-850	0.10	60.3	3.0	25	5	11	2.0	0.5
	3.3	100 TWSS 3R3 228-862	0.10	40.2	3.3	35	5	11	2.0	0.5
	4.7	100 TWSS 4R7 228-874	0.10	28.2	4.7	45	5	11	2.0	0.5
	10	100 TWSS 10 228-886	0.10	13.3	10.0	75	6.3	11	2.5	0.5
	22	100 TWSS 22 228-898	0.10	6.03	22.0	130	8	11	3.5	0.6
	33	100 TWSS 33 228-904	0.10	4.02	33.0	170	10	12.5	5.0	0.6
	47	100 TWSS 47 228-916	0.10	2.82	47.0	230	10	16	5.0	0.6
	100	100 TWSS 100 228-928	0.10	1.33	100	380	12.5	20	5.0	0.6
	220	100 TWSS 220	0.10	0.60	220	610	16	25	7.5	0.8
	330	100 TWSS 330	0.10	0.40	330	760	16	25	7.5	0.8
	470	100 TWSS 470	0.10	0.28	470	950	16	31.5	7.5	0.8