

# ALUMINUM ELECTROLYTIC CAPACITORS



## RF Series

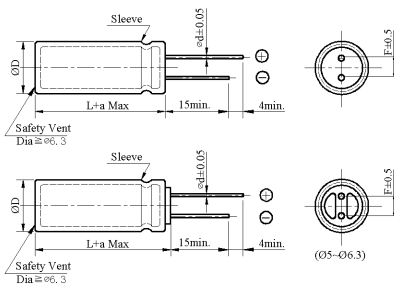
- Miniaturized, Low E.S.R and Low impedance
- Suitable for use in high ripple current capability
- Load life 6,000~12,000 hours at 105°C



### SPECIFICATIONS

Item	Performance Characteristics																				
Category Temperature Range	-55~+105°C																				
Working Voltage Range	6.3 ~ 100Vdc																				
Capacitance Range	6.8 ~ 18,000µF																				
Capacitance Tolerance	±20% (at 25°C and 120Hz)																				
Dissipation Factor (tanδ) (at 25°C, 120Hz)	<table border="1"> <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>tanδ(Max)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.08</td> </tr> </table>	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	tanδ(Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08		
	Rated Voltage (V)	6.3	10	16	25	35	50	63	100												
tanδ(Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08													
The above values should be increased by 0.02 for every additional 1000µF																					
Leakage Current	I=0.01CV or 3µA whichever is greater I : Leakage current (µA) C : Rated capacitance (µF) V : Rated voltage (V) Impress the rated voltage for 2 minutes																				
Low Temperature Characteristics Impedance Ratio(MAX)	<table border="1"> <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(-55°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> <p style="text-align: right;">(at 120Hz)</p>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	Z(-55°C)/Z(+20°C)	4	3	3	3	3	3	3	3		
Rated voltage (V)	6.3	10	16	25	35	50	63	100													
Z(-55°C)/Z(+20°C)	4	3	3	3	3	3	3	3													
Endurance	<p>The following specifications shall be satisfied when the capacitors are restored to 25°C after subjected to DC voltage with the rated ripple current is applied for 6,000~12,000 hours at 105°C</p> <table border="1"> <tr> <td>Capacitance change</td> <td>≡ ±25% of the initial value</td> <td>Size</td> <td>Life time (hours)</td> </tr> <tr> <td>Dissipation factor(tanδ)</td> <td>≡ 200% of the specified value</td> <td>≡ 6.3Φ</td> <td>6,000</td> </tr> <tr> <td>Leakage current</td> <td>≡ specified value</td> <td>8 Φ</td> <td>8,000</td> </tr> <tr> <td></td> <td></td> <td>10 Φ</td> <td>10,000</td> </tr> <tr> <td></td> <td></td> <td>≡ 12.5Φ</td> <td>12,000</td> </tr> </table>	Capacitance change	≡ ±25% of the initial value	Size	Life time (hours)	Dissipation factor(tanδ)	≡ 200% of the specified value	≡ 6.3Φ	6,000	Leakage current	≡ specified value	8 Φ	8,000			10 Φ	10,000			≡ 12.5Φ	12,000
Capacitance change	≡ ±25% of the initial value	Size	Life time (hours)																		
Dissipation factor(tanδ)	≡ 200% of the specified value	≡ 6.3Φ	6,000																		
Leakage current	≡ specified value	8 Φ	8,000																		
		10 Φ	10,000																		
		≡ 12.5Φ	12,000																		
Shelf Life	<p>The following requirements shall be satisfied when the capacitor are restored to 25°C after exposing them for 1,000 hours at 105°C without voltage applied.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>≡ ±25% of the initial value</td> </tr> <tr> <td>Dissipation factor(tanδ)</td> <td>≡ 200% of the specified value</td> </tr> <tr> <td>Leakage current</td> <td>≡ 200% of the specified value</td> </tr> </table>	Capacitance change	≡ ±25% of the initial value	Dissipation factor(tanδ)	≡ 200% of the specified value	Leakage current	≡ 200% of the specified value														
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Dissipation factor(tanδ)	≡ 200% of the specified value																				
Leakage current	≡ 200% of the specified value																				
Others	Conforms to JIS-C-5101-4 (1998), characteristic W																				

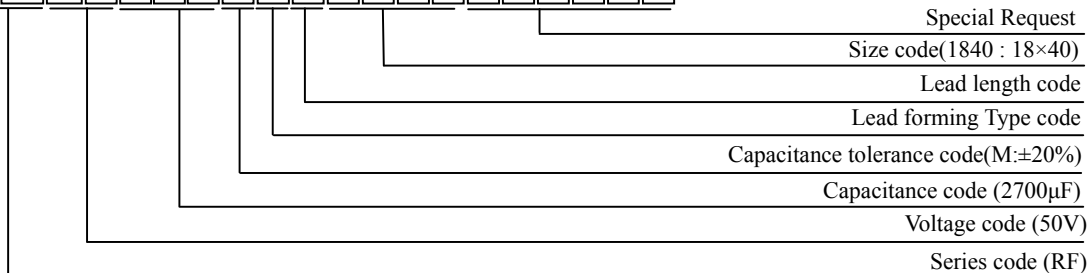
### DIMENSIONS (mm)



ΦD	5	6.3	8	10	12.5 L<35	12.5 L≥35	16	18
ΦD	ΦD + 0.5 Max							
Φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0		7.5	7.5
a	L + 1.5 Max				≧ 35 L+1.5Max ≧ 40 L+2.0 Max		L + 1.5Max	

### PART NUMBER SYSTEM (Example : 50V 2700µF)

R F 1 H 2 7 2 M N N 1 8 4 0





**RF Series**

◆ Case size & Permissible rated ripple current

Nominal capacitance (uF)	6.3V				10V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)
		20°C	-10°C			20°C	-10°C	
100					5×11	0.580	2.300	215
150	5×11	0.570	2.300	210	5×11	0.580	2.300	230
220	6.3×11	0.250	0.900	320	6.3×11	0.220	0.870	340
330	6.3×11	0.210	0.870	340	6.3×11	0.220	0.870	380
470	8×11.5	0.150	0.580	345	8×11.5	0.130	0.520	640
680	8×11.5	0.130	0.520	645	8×15	0.086	0.350	845
					10×12.5	0.080	0.310	865
820	10×12.5	0.080	0.320	865	10×16	0.070	0.280	1015
1000	8×15	0.085	0.350	870	8×20	0.068	0.270	1050
					10×16	0.060	0.240	1215
1200	8×20	0.071	0.260	1050	10×20	0.045	0.180	1410
	10×16	0.062	0.240	1215				
1500	10×20	0.045	0.180	1410	10×25	0.041	0.170	1610
					12.5×16	0.049	0.160	1450
1800	12.5×16	0.048	0.160	1460	12.5×20	0.039	0.150	1710
2200	10×25	0.042	0.170	1650	10×30	0.030	0.120	1920
					12.5×20	0.035	0.120	1910
					16×16	0.042	0.120	1900
2700	10×30	0.030	0.120	1900	18×15	0.042	0.110	2220
	16×15	0.041	0.120	1945				
3300	12.5×20	0.034	0.120	1900	12.5×25	0.026	0.089	2230
3900	12.5×25	0.026	0.088	2240	12.5×30	0.023	0.078	2660
	18×15	0.042	0.110	2210	16×20	0.026	0.078	2540
4700	12.5×30	0.023	0.078	2650	12.5×35	0.020	0.065	2890
5600	12.5×35	0.020	0.065	2890	12.5×40	0.016	0.055	3360
	16×20	0.026	0.077	2540	16×25	0.020	0.060	2940
					18×20	0.025	0.066	2870
6800	12.5×40	0.016	0.055	3350	16×31.5	0.016	0.050	3460
	16×25	0.020	0.060	2940	18×25	0.018	0.049	3150
	18×20	0.025	0.066	2870				
8200	16×31.5	0.016	0.050	3450	16×35.5	0.015	0.044	3610
					18×31.5	0.015	0.040	4180
10000	16×35.5	0.014	0.044	3620	16×40	0.013	0.038	4090
	18×25	0.018	0.049	3150	18×35.5	0.012	0.038	4150
12000	16×40	0.012	0.038	4090	18×40	0.011	0.032	4290
	18×31.5	0.014	0.040	4180				
15000	18×35.5	0.013	0.038	4230				
18000	18×40	0.012	0.032	4290				

# RF Series

## ◆ Case size & Permissible rated ripple current

Nominal capacitance (uF)	16V				25V			
	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ωmax/100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)
		20°C	-10°C			20°C	-10°C	
10	5×11	1.100	3.020	96	5×11	1.100	3.020	100
22	5×11	0.750	2.800	120	5×11	0.700	2.800	140
47	5×11	0.600	2.600	100	5×11	0.570	2.300	205
56	5×11	0.570	2.300	220	5×11	0.570	2.300	240
100	5×11	0.350	0.760	260	6.3×11	0.210	0.870	340
	6.3×11	0.210	0.820	310				
120	6.3×11	0.210	0.870	340	6.3×11	0.210	0.870	360
220	6.3×11	0.150	0.650	450	8×11.5	0.120	0.520	650
	8×11.5	0.190	0.850	650				
330	8×11.5	0.120	0.520	760	8×15	0.087	0.350	850
					10×12.5	0.081	0.320	870
470	8×15	0.086	0.350	840	8×20	0.070	0.270	1050
	10×12.5	0.080	0.320	865	10×16	0.060	0.240	1210
680	8×20	0.069	0.270	1060	10×20	0.045	0.180	1410
	10×16	0.060	0.240	1210	12.5×16	0.049	0.160	1460
820	10×20	0.052	0.220	1310	10×25	0.041	0.170	1660
1000	10×20	0.045	0.180	1410	10×30	0.030	0.120	1920
	12.5×16	0.050	0.160	1450	12.5×20	0.034	0.120	1910
					16×16	0.042	0.120	1940
1200	10×25	0.043	0.170	1650	18×15	0.043	0.110	2220
1500	10×30	0.030	0.120	1920	12.5×25	0.026	0.089	2240
	12.5×20	0.035	0.120	1910				
	16×16	0.042	0.120	1940				
1800	12.5×25	0.028	0.095	2140	12.5×30	0.024	0.078	2660
					16×20	0.026	0.078	2540
2200	12.5×25	0.026	0.089	2240	12.5×35	0.020	0.065	2890
	18×15	0.042	0.110	2220	18×20	0.025	0.066	2870
2700	12.5×30	0.023	0.077	2650	12.5×40	0.016	0.056	3360
	16×20	0.026	0.078	2540	16×25	0.021	0.060	2940
3300	12.5×35	0.020	0.066	2890	16×30	0.016	0.050	3460
					18×25	0.018	0.048	3150
3900	12.5×40	0.016	0.056	3350	16×35.5	0.014	0.043	3620
	16×25	0.021	0.060	2930	18×31.5	0.015	0.040	4180
	16×20	0.025	0.067	2860				
4700	16×31.5	0.016	0.050	3450	16×40	0.012	0.038	4090
	18×25	0.018	0.049	3150	18×35.5	0.013	0.038	4230
5600	16×35.5	0.015	0.044	3620	18×40	0.011	0.032	4290
	18×31.5	0.015	0.040	4180				
6800	16×40	0.012	0.038	4080				
8200	18×35.5	0.014	0.038	4230				
18000	18×40	0.011	0.032	4290				

## RF Series

### ◆ Case size & Permissible rated ripple current

Nominal capacitance (uF)	35V				50V			
	Case size ΦD×L (mm)	Impedance (Ω <sub>max</sub> /100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ω <sub>max</sub> /100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)
		20°C	-10°C			20°C	-10°C	
10	5×11	0.700	2.500	120	5×11	1.300	2.800	135
22	5×11	0.600	1.900	165	5×11	0.700	2.500	180
33	5×11	0.560	2.300	220	6.3×11	0.600	1.900	205
47	6.3×11	0.350	1.400	280	6.3×11	0.380	1.500	220
56	6.3×11	0.210	0.860	340	8×11.5	0.300	1.200	300
100	8×11.5	0.150	0.560	510	8×11.5	0.160	0.670	560
150	8×11.5	0.130	0.520	650	8×15	0.120	0.480	740
220	8×15	0.086	0.350	850	10×16	0.083	0.340	1050
330	10×16	0.060	0.240	1210	10×25	0.053	0.220	1450
470	10×20	0.045	0.180	1410	12.5×20	0.044	0.150	1670
560	10×25	0.041	0.160	1650	12.5×25	0.033	0.110	1950
680	10×30	0.030	0.120	1920	12.5×30	0.030	0.100	2320
820	12.5×25	0.029	0.095	2050	12.5×35	0.023	0.081	2520
1000	12.5×25	0.028	0.088	2230	16×25	0.025	0.075	2555
1200	12.5×30	0.023	0.078	2660	16×31.5	0.021	0.066	3020
1500	12.5×35	0.020	0.065	2880	16×35.5	0.018	0.056	3150
2200	16×31.5	0.016	0.056	3350	18×35.5	0.017	0.046	3690
2700	16×35.5	0.015	0.044	3620	18×40	0.014	0.038	3810
3300	16×40	0.013	0.038	4090				
3900	18×40	0.012	0.033	4290				

Nominal capacitance (uF)	63V				100V			
	Case size ΦD×L (mm)	Impedance (Ω <sub>max</sub> /100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)	Case size ΦD×L (mm)	Impedance (Ω <sub>max</sub> /100kHz)		Max. Rated ripple current @105°C 100kHz (mA rms)
		20°C	-10°C			20°C	-10°C	
6.8					5×11	2.200	9.200	56
15	5×11	2.200	9.200	56	6.3×11	1.200	5.000	120
33	6.3×11	1.200	5.000	120	8×15	0.580	3.200	160
47	8×11.5	0.680	3.100	190	10×12	0.430	1.800	290
68	8×11.5	0.600	2.900	245	10×16	0.300	1.500	350
100	10×16	0.350	1.800	320	10×25	0.200	0.840	535
120	10×16	0.300	1.500	355	10×30	0.150	0.710	665
180	10×20	0.200	0.940	470	12.5×25	0.120	0.450	790
220	10×25	0.200	0.840	535	12.5×30	0.100	0.420	905
330	12.5×25	0.120	0.450	790	12.5×40	0.070	0.300	1190
470	12.5×30	0.100	0.420	910	16×35.5	0.045	0.170	1790
560	12.5×35	0.082	0.350	1050	16×40	0.040	0.150	2030
680	12.5×40	0.070	0.300	1190	18×35.5	0.040	0.150	1790
820	16×31.5	0.053	0.200	1580	18×40	0.036	0.130	2340
1000	16×35.5	0.045	0.170	1790				
1200	16×40	0.040	0.150	2020				
1500	18×40	0.035	0.130	2340				

### ◆ RIPPLE CURRENT MULTIPLIERS

#### Frequency Multipliers

Vdc	Cap(uF)	Frequency (Hz)			
		120	1K	10K	100K
6.3 ~ 100	6.8 ~ 68	0.30	0.55	0.80	1.00
	82 ~ 220	0.40	0.60	0.85	1.00
	330 ~ 820	0.50	0.65	0.90	1.00
	1000 ~ 18000	0.60	0.70	0.95	1.00