

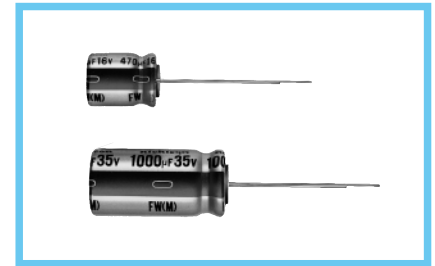
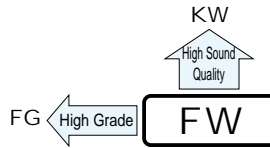
# ALUMINUM ELECTROLYTIC CAPACITORS



**FW** Standard, For Audio Equipment  
series



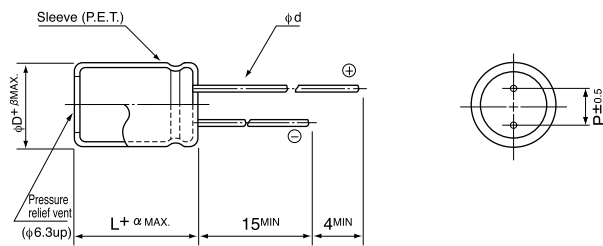
- Adapted to the RoHS directive (2002/95/EC).



## Specifications

Item	Performance Characteristics																													
Category Temperature Range	-40 ~ +85°C																													
Rated Voltage Range	6.3 ~ 100V																													
Rated Capacitance Range	0.1 ~ 33000µF																													
Capacitance Tolerance	±20% at 120Hz, 20°C																													
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03 CV or 4 (µA), whichever is greater. After 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV or 3 (µA), whichever is greater.																													
tan δ	<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>tan δ (MAX.)</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </table> <p>Measurement frequency : 120Hz, Temperature : 20°C For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF.</p>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	tan δ (MAX.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08											
Rated voltage (V)	6.3	10	16	25	35	50	63	100																						
tan δ (MAX.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08																						
Stability at Low Temperature	<table border="1"> <tr> <td colspan="2">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 rowspan="2">Impedance ratio ZT / Z20 (MAX.)</td> <td>Z-25°C / Z+20°C</td> <td>5</td> <td>4</td> <td>3</td> <td>2</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>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> <p>Measurement frequency : 120Hz</p>	Rated voltage (V)		6.3	10	16	25	35	50	63	100	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	5	4	3	2	2	2	2	2	Z-40°C / Z+20°C	12	10	8	5	4	3	3	3
Rated voltage (V)		6.3	10	16	25	35	50	63	100																					
Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	5	4	3	2	2	2	2	2																					
	Z-40°C / Z+20°C	12	10	8	5	4	3	3	3																					
Endurance	<p>After 2000 hours' application of voltage at 85°C, capacitors meet the characteristic requirements listed at right.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance change	Within ±20% of initial value	tan δ	200% or less of initial specified value	Leakage current	Initial specified value or less																							
Capacitance change	Within ±20% of initial value																													
tan δ	200% or less of initial specified value																													
Leakage current	Initial specified value or less																													
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the specified value for endurance characteristics listed above.																													
Marking	Printed with black color letter on Gold sleeve.																													

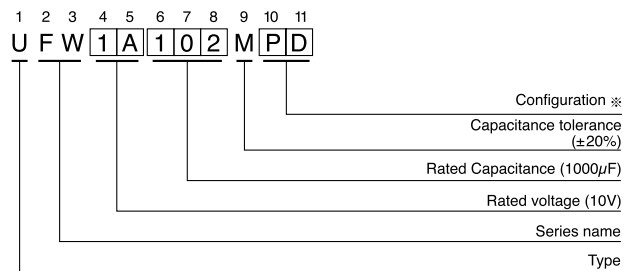
## Radial Lead Type



	(mm)									
φD	5	6.3	8	10	12.5	16	18	20	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	10	12.5
φd	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0	1.0
β	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0

α	(φD < 20) 1.5
	(φD ≥ 20) 2.0

## Type numbering system (Example : 10V 1000µF)



※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve
5	DD
6.3	ED
8 - 10	PD
12.5 ~ 18	HD
20 ~ 25	RD

- Please refer to page 21 about the end seal configuration.

Please refer to page 21, 22, 23 about the formed or taped product spec.  
Please refer to page 3 for the minimum order quantity.

Dimension table in next page.

# ALUMINUM ELECTROLYTIC CAPACITORS

**FW** series

■ Dimensions

Cap.(μF)	Code	V		6.3		10		16		25		35		50		63		100		
		0J	1A	1C	1E	1V	1H	1J	2A	2B	2C	2D	2E	2F	2G	2H	2I	2J	2K	2L
0.1	0R1													5×11	1.1				5×11	2.1
0.22	R22													5×11	2.4				5×11	4.7
0.33	R33													5×11	3.5				5×11	7.0
0.47	R47													5×11	5.0				5×11	10
1	010													5×11	10				5×11	21
2.2	2R2													5×11	23				5×11	30
3.3	3R3													5×11	35				5×11	40
4.7	4R7													5×11	40				5×11	45
10	100													5×11	65	5×11	70	6.3×11	75	
22	220													5×11	95	5×11	100	6.3×11	120	
33	330									5×11	105	5×11	120	6.3×11	140	8×11.5	160			
47	470							5×11	115	5×11	120	6.3×11	150	6.3×11	165	10×12.5	210			
100	101			5×11	145	5×11	155	6.3×11	185	6.3×11	200	8×11.5	250	10×12.5	300	10×20	350			
220	221			6.3×11	230	6.3×11	250	8×11.5	320	10×12.5	370	10×12.5	410	10×16	470	12.5×25	600			
330	331	6.3×11	265	6.3×11	270	8×11.5	360	10×12.5	420	10×12.5	470	10×16	570	10×20	650	12.5×25	750			
470	471	6.3×11	310	6.3×11	330	8×11.5	420	10×12.5	530	10×16	630	12.5×20	760	12.5×20	880	16×25	1000			
1000	102	8×11.5	530	10×12.5	630	10×16	770	10×20	950	12.5×20	1100	12.5×25	1300	16×25	1300	18×40	1370			
2200	222	10×20	980	10×20	1050	12.5×20	1250	12.5×25	1550	16×25	1800	16×35.5	2090	18×35.5	2200	22×50	2400			
3300	332	10×20	1170	12.5×20	1420	12.5×25	1700	16×25	1950	16×35.5	2220	18×35.5	2360	20×40	2700	25×50	2900			
4700	472	12.5×20	1350	12.5×25	1800	16×25	2100	16×31.5	2360	18×35.5	2490	20×40	2900	22×50	3400					
6800	682	12.5×25	1600	16×25	2150	16×35.5	2500	18×35.5	2590	20×40	3000	22×50	3500	25×50	3500					
10000	103	16×25	2000	16×35.5	2500	18×35.5	2640	20×40	3000	22×50	3700	25×50	4000							
15000	153	16×35.5	2550	18×35.5	2720	20×40	3400	22×50	3800	25×50	4300									
22000	223	18×40	3200	20×40	3700	22×50	4200	25×50	4500											
33000	333	22×50	3900	22×50	4500	25×50	4800													

Rated Ripple (mA<sub>rms</sub>) at 85°C 120Hz

● Frequency coefficient of rated ripple current

Cap.(μF)	Frequency	50Hz	120Hz	300Hz	1kHz	10kHz ~
~ 47		0.75	1.00	1.35	1.57	2.00
100 ~ 470		0.80	1.00	1.23	1.34	1.50
1000 ~ 33000		0.85	1.00	1.10	1.13	1.15