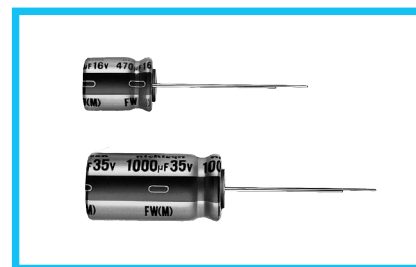
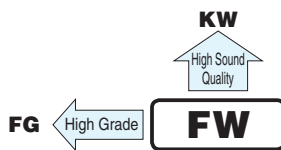


# ALUMINUM ELECTROLYTIC CAPACITORS

**FW** series Standard, For Audio Equipment



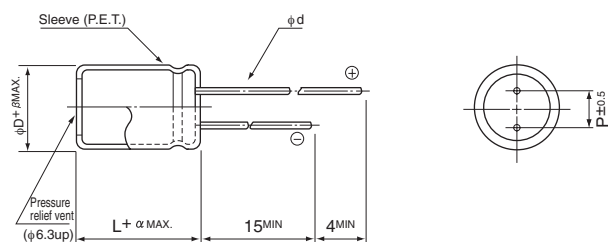
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

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

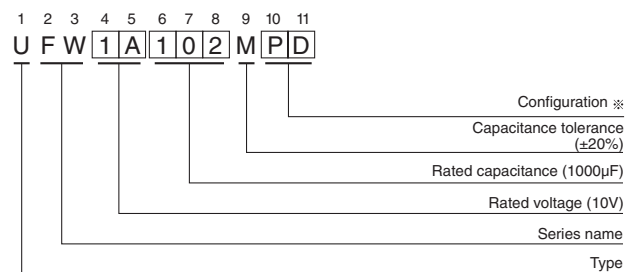
## Radial Lead Type



	(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 to 18	HD
20 to 25	RD

- Please refer to page 20 about the end seal configuration.

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

● Dimension table in next page.

## ■ Dimensions

Cap.(μF)	Code	V		6.3		10		16		25		35		50		63		100		
		OJ	1A	1C	1E	1V	1H	1J	2A											
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												Case size φD × L (mm)	Rated ripple

Rated ripple current (mArms) at 85°C 120Hz

## ● Frequency coefficient of rated ripple current

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

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