

# ALUMINUM ELECTROLYTIC CAPACITORS

**PA** Miniature Sized, Low Impedance,  
High Reliability For Switching Power Supplies  
series



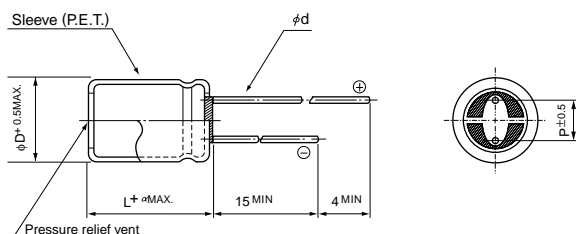
- Lower impedance than PW series.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2002/95/EC).



## Specifications

Item	Performance Characteristics						
Category Temperature Range	-55 to +105°C						
Rated Voltage Range	6.3 to 35V						
Rated Capacitance Range	180 to 10000μF						
Capacitance Tolerance	±20% at 120Hz, 20°C						
Leakage Current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.						
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35	120Hz 20°C
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	
For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.							
Stability at Low Temperature	Rated voltage (V)	6.3	10	16	25	35	120Hz
	Impedance ratio ZT / Z20 (MAX.) Z-55°C / Z+20°C	3	3	3	3	3	
Endurance	The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 5000 hours (3000 hours for φD=8, 4000 hours for φD=10) at 105°C, the peak voltage shall not exceed the rated voltage.						
	Capacitance change	Within ±20% of the initial capacitance value (6.3V, 10V : ±30%)					
	tan δ	200% or less than the initial specified value (6.3V, 10V : 300%)					
Shelf Life	After storing the capacitors under no load at 105°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.						
	Leakage current	Less than or equal to the initial specified value					
Marking	Printed with white color letter on dark brown sleeve.						

## Radial Lead Type

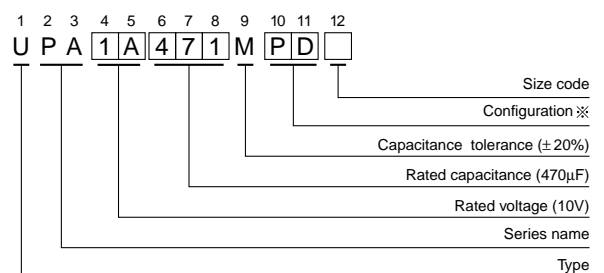


α	(L < 20)	1.5
	(L ≥ 20)	2.0

	(mm)				
φD	8	10	12.5	16	18
P	3.5	5.0	5.0	7.5	7.5
φd	0.6	0.6	*0.6	0.8	0.8

※: In case L > 25 for the φ12.5 dia. unit, lead dia. φd = 0.8mm.

## Type numbering system (Example : 10V 470μF)



※ Configuration

φD	Pb-free leadwire Pb-free PET sleeve
8-10	PD
12.5 to 18	HD

## Frequency coefficient of rated ripple current

Cap. (μF)	Frequency				
	50Hz	120Hz	300Hz	1kHz	10kHz or more
180 to 330	0.55	0.65	0.75	0.85	1.00
390 to 1000	0.70	0.75	0.80	0.90	1.00
1200 to 10000	0.80	0.85	0.90	0.95	1.00

- 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.



## Standard Ratings

Cap. (μF) / Code		V (Code) / Item	6.3 (0J)				10 (1A)				16 (1C)			
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz
				20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz	
330	331													
390	391													
470	471						8 × 11.5	0.090	0.180	630				
560	561		8 × 11.5	0.090	0.180	630	8 × 11.5	0.090	0.180	630				
680	681		8 × 11.5	0.090	0.180	630								
820	821						8 × 15	0.062	0.124	860				
							▲10 × 12.5	0.063	0.126	900				
							8 × 20	0.044	0.088	1220				
							▲10 × 12.5	0.063	0.126	900				
							●10 × 16	0.049	0.098	1240				
1000	102		8 × 15	0.062	0.124	860	8 × 20	0.044	0.088	1220				
			▲10 × 12.5	0.063	0.126	900	▲10 × 12.5	0.063	0.126	900				
			10 × 12.5	0.063	0.126	900	●10 × 16	0.049	0.098	1240				
			●10 × 16	0.049	0.098	1240	▲10 × 16	0.049	0.098	1240				
1200	122		10 × 12.5	0.063	0.126	900	8 × 20	0.044	0.088	1220				
			●10 × 16	0.049	0.098	1240	▲10 × 16	0.049	0.098	1240				
1500	152		8 × 20	0.044	0.088	1220								
			▲10 × 16	0.049	0.098	1240	10 × 20	0.035	0.070	1490				
			●10 × 20	0.035	0.070	1490								
1800	182						10 × 20	0.035	0.070	1490				
							▲10 × 25	0.033	0.066	1680				
2200	222		10 × 20	0.035	0.070	1490	10 × 25	0.033	0.066	1680				
			●10 × 25	0.033	0.066	1680	●12.5 × 20	0.029	0.058	1890				
2700	272		10 × 25	0.033	0.066	1680	12.5 × 20	0.029	0.058	1890				
3300	332		12.5 × 20	0.029	0.058	1890	12.5 × 25	0.022	0.044	2280				
3900	392		12.5 × 25	0.022	0.044	2280	12.5 × 25	0.022	0.044	2280				
4700	472		12.5 × 25	0.022	0.044	2280	12.5 × 31.5	0.018	0.036	2720				
							▲16 × 20	0.026	0.052	2330				
5600	562		12.5 × 31.5	0.018	0.036	2720	12.5 × 35.5	0.016	0.032	2940				
			▲16 × 20	0.026	0.052	2330								
6800	682		12.5 × 35.5	0.016	0.032	2940	16 × 25	0.019	0.038	2760				
8200	822		16 × 25	0.019	0.038	2760	16 × 31.5	0.017	0.034	2810				
			▲18 × 20	0.025	0.050	2640	▲18 × 25	0.018	0.036	2850				
10000	103		16 × 31.5	0.017	0.034	2810								
			▲18 × 25	0.018	0.036	2850								

Cap. (μF) / Code		V (Code) / Item	25 (1E)				35 (1V)						
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz	Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms) 105°C / 100kHz			
				20°C / 100kHz	-10°C / 100kHz			20°C / 100kHz	-10°C / 100kHz				
180	181												
270	271		8 × 11.5	0.090	0.180	630	8 × 15	0.062	0.124	860			
							▲10 × 12.5	0.063	0.126	900			
330	331		8 × 11.5	0.090	0.180	630							
390	391		8 × 15	0.062	0.124	860	8 × 20	0.044	0.088	1220			
							▲10 × 16	0.049	0.098	1240			
470	471		8 × 15	0.062	0.124	860							
			▲10 × 12.5	0.063	0.126	900							
560	561		8 × 20	0.044	0.088	1220							
			▲10 × 16	0.049	0.098	1240	10 × 20	0.035	0.070	1490			
680	681		10 × 16	0.049	0.098	1240	10 × 25	0.033	0.066	1680			
820	821		10 × 20	0.035	0.070	1490	12.5 × 20	0.029	0.058	1890			
1000	102		10 × 25	0.033	0.066	1680	12.5 × 25	0.022	0.044	2280			
			●12.5 × 20	0.029	0.058	1890	12.5 × 31.5	0.018	0.036	2720			
1200	122		12.5 × 20	0.029	0.058	1890	▲16 × 20	0.026	0.052	2330			
1500	152						12.5 × 35.5	0.016	0.032	2940			
							▲16 × 20	0.026	0.052	2330			
1800	182		12.5 × 25	0.022	0.044	2280	16 × 25	0.019	0.038	2760			
							▲18 × 20	0.025	0.050	2640			
2200	222		12.5 × 31.5	0.018	0.036	2720	16 × 31.5	0.017	0.034	2810			
			▲16 × 20	0.026	0.052	2330	▲18 × 25	0.018	0.036	2850			
2700	272		12.5 × 35.5	0.016	0.032	2940							
3300	332		16 × 25	0.019	0.038	2760	18 × 31.5	0.016	0.032	2910			
			▲18 × 20	0.025	0.050	2640							
4700	472		18 × 25	0.018	0.036	2850							

- ▲ : In this case, [6] will be put at 12th digit of type numbering system.
- : In this case, [3] will be put at 12th digit of type numbering system.