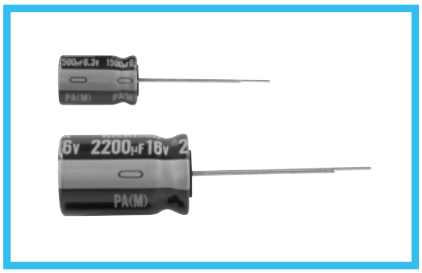
ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

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

Smaller | Low Impedance | Long Life | Anti-Solvent Feature



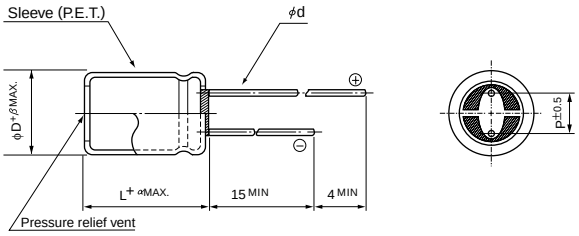
- Lower impedance than PW series.
- Smaller case size and high ripple current.
- Compliant to the RoHS directive (2002/95/EC).

PA ← Low Impedance — PW

■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%)						
	Leakage current: Less than or equal to the initial specified value						
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.						
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
β	0.5	0.5	0.5	0.5	0.5

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

• Please refer to page 20 about the end seal configulation.

Type numbering system (Example : 10V 470μF)

1	2	3	4	5	6	7	8	9	10	11	12
U	P	A	1	A	4	7	1	M	P	D	

Size code
Configuration※
Capacitance tolerance (±20%)
Rated capacitance (470μF)
Rated voltage (10V)
Series name
Type

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

●Dimension table in next page.

PA series

Standard Ratings

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

V (Code) / Item / Cap.(μF) / Code	25 (1E) Case size φD × L (mm)	25 (1E) Impedance (Ω) MAX. 20°C / 100kHz	25 (1E) Impedance (Ω) MAX. −10°C / 100kHz	25 (1E) Rated ripple (mArms) 105°C / 100kHz	35 (1V) Case size φD × L (mm)	35 (1V) Impedance (Ω) MAX. 20°C / 100kHz	35 (1V) Impedance (Ω) MAX. −10°C / 100kHz	35 (1V) Rated ripple (mArms) 105°C / 100kHz
180 / 181					8 × 11.5	0.090	0.180	630
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 × 20	0.035	0.070	1490
	▲10 × 16	0.049	0.098	1240				
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 × 20	0.029	0.058	1890
	●12.5 × 20	0.029	0.058	1890				
1200 / 122	12.5 × 20	0.029	0.058	1890	12.5 × 25	0.022	0.044	2280
1500 / 152					12.5 × 31.5	0.018	0.036	2720
					▲16 × 20	0.026	0.052	2330
1800 / 182	12.5 × 25	0.022	0.044	2280	12.5 × 35.5	0.016	0.032	2940
					▲16 × 20	0.026	0.052	2330
2200 / 222	12.5 × 31.5	0.018	0.036	2720	16 × 25	0.019	0.038	2760
	▲16 × 20	0.026	0.052	2330	▲18 × 20	0.025	0.050	2640
2700 / 272	12.5 × 35.5	0.016	0.032	2940	16 × 31.5	0.017	0.035	2810
					▲18 × 25	0.018	0.036	2850
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.