



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 (2011/65/EU).

PA

Low
Impedance

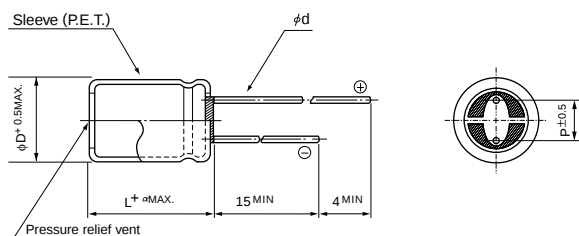
PW



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	
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

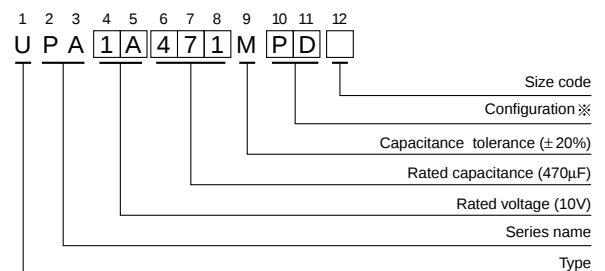


α	(L < 20) 1.5
	(L ≥ 20) 2.0

	8	10	12.5	16	18
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

V (Code) Item Cap. (μF) Code		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									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 ▲10 × 12.5	0.062 0.063	0.124 0.126	860 900
820	821					8 × 15 ▲10 × 12.5	0.062 0.063	0.124 0.126	860 900	8 × 20 ▲10 × 16	0.044 0.049	0.088 0.098	1220 1240
1000	102	8 × 15 ▲10 × 12.5	0.062 0.063	0.124 0.126	860 900	8 × 20 ▲10 × 12.5 ●10 × 16	0.044 0.063 0.049	0.088 0.126 0.098	1220 900 1240	10 × 16 ●10 × 20	0.049 0.035	0.098 0.070	1240 1490
1200	122	10 × 12.5 ●10 × 16	0.063 0.049	0.126 0.098	900 1240	8 × 20 ▲10 × 16	0.044 0.049	0.088 0.098	1220 1240	10 × 20	0.035	0.070	1490
1500	152	8 × 20 ▲10 × 16 ●10 × 20	0.044 0.049 0.035	0.088 0.098 0.070	1220 1240 1490	10 × 20	0.035	0.070	1490	10 × 25	0.033	0.066	1680
1800	182					10 × 20 ▲10 × 25	0.035 0.033	0.070 0.066	1490 1680				
2200	222	10 × 20 ●10 × 25	0.035 0.033	0.070 0.066	1490 1680	10 × 25 ●12.5 × 20	0.033 0.029	0.066 0.058	1680 1890	12.5 × 20 ●12.5 × 25	0.029 0.022	0.058 0.044	1890 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 ▲16 × 20	0.018 0.026	0.036 0.052	2720 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 ▲16 × 20	0.018 0.026	0.036 0.052	2720 2330	16 × 25 ▲18 × 20	0.019 0.025	0.038 0.050	2760 2640
5600	562	12.5 × 31.5 ▲16 × 20	0.018 0.026	0.036 0.052	2720 2330	12.5 × 35.5	0.016	0.032	2940	16 × 31.5 ▲18 × 25	0.017 0.018	0.035 0.036	2810 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 ▲18 × 20	0.019 0.025	0.038 0.050	2760 2640	16 × 31.5 ▲18 × 25	0.017 0.018	0.034 0.036	2810 2850				
10000	103	16 × 31.5 ▲18 × 25	0.017 0.018	0.034 0.036	2810 2850								

V (Code) Item Cap. (μF) Code		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					8 × 11.5	0.090	0.180	630
270	271	8 × 11.5	0.090	0.180	630	8 × 15 ▲10 × 12.5	0.062 0.063	0.124 0.126	860 900
330	331	8 × 11.5	0.090	0.180	630				
390	391	8 × 15	0.062	0.124	860	8 × 20 ▲10 × 16	0.044 0.049	0.088 0.098	1220 1240
470	471	8 × 15 ▲10 × 12.5	0.062 0.063	0.124 0.126	860 900				
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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 ●12.5 × 20	0.033 0.029	0.066 0.058	1680 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
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3300	332	16 × 25 ▲18 × 20	0.019 0.025	0.038 0.050	2760 2640	18 × 31.5	0.016	0.032	2910
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.