

PW Low Impedance, High Reliability
For Switching Power Supplies
series



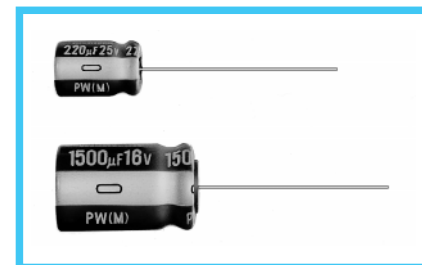
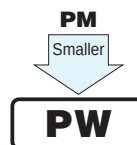
Smaller

Low Impedance

Long Life

Anti-Solvent
Feature
(Through
100V only)

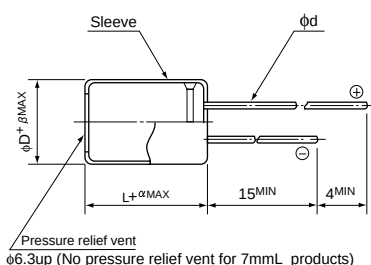
- Smaller case size and lower impedance than PM series.
- Low impedance and high reliability withstanding 5000 hour load life at +105°C (3000/2000 hours for smaller case sizes as specified below).
- Capacitance ranges available based on the numerical values in E12 series under JIS.



Specifications

Item	Performance Characteristics												
Category Temperature Range	- 55 ~ +105°C (6.3 ~ 100V), - 40 ~ + 105°C (160 ~ 400V), - 25 ~ +105°C (450V)												
Rated Voltage Range	6.3 ~ 450V												
Rated Capacitance Range	0.47 ~ 15000μF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	Rated voltage (V)	6.3 ~ 100						160 ~ 450					
	Leakage current	After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater.						CV ≤ 1000: I = 0.1CV+40 (μA)max. (1 minute's) CV > 1000: I = 0.04CV+100 (μA)max. (1 minute's)					
tan δ	For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz, Temperature : 20°C												
	Rated voltage (V)	6.3	10	16	25	35	50	63	100	160 ~ 250	315 ~ 350	400 ~ 450	
	tan δ (MAX.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20	0.25	
Stability at Low Temperature	120Hz												
	Rated voltage (V)		6.3 · 10	16 · 25	35 · 50	63 · 100	160 · 200	250	315 · 350	400	450		
	Impedance ratio	Z - 55°C/Z+20°C	3	3	3	3	—	—	—	—	—		
		Z - 40°C/Z+20°C	—	—	—	—	4	6	8	10	—		
Z - 25°C/Z+20°C		—	—	—	—	3	3	4	6	15			
Endurance	After an application of D.C. bias voltage plus the rated ripple current for 5000 hours (2000 hours for D = 4, 5 and 6.3, 3000 hours for D = 8 and 10) at 105°C the peak voltage shall not exceed the rated D.C.voltage, capacitors meet the characteristic requirements listed at right.												
	Capacitance change		Within ±20% of initial value										
	tan δ		200% or less of initial specified value										
Shelf Life	Leakage current		Initial specified value or less										
Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for endurance characteristics listed above.												
Marking	Printed with white color letter on dark brown sleeve.												

Radial Lead Type



α	(L=7)	1.0												
	(L<20)	1.5												
	(L≥20)	2.0												
			ΦD	4	5	6.3	8	10	12.5	16	18	20	22	25
			P	1.5	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	10.0	12.5
			φd	0.45	0.5	0.5	0.6	0.6	0.6	0.8	0.8	1.0	1.0	1.0
						(0.45)	(0.45)			※0.8				
			β	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0

※: Applied to L>25 products
(): Applied to 7mmL products

Type numbering system (Example : 10V 680µF)

1	2	3	4	5	6	7	8	9	10	11	12	
U	P	W	1	A	6	8	1	M	P	H		
											Size code	
											Configuration	
											Capacitance tolerance(±20%)	
											Rated Capacitance(680μF)	
											Rated voltage(10V)	
											Series name	
											Type	
											φD	Code
											7L	DH
											4 · 5	DH
											6.3	EH
											8 · 10	PH
											12.5-18	HH
											20-25	RH

- The PET sleeve product is also available upon request.
In this case, **T** will be put at 11th digit of type numbering system.

Frequency coefficient of rated ripple current

V	Cap. (µF)	Frequency				
		50Hz	120Hz	300Hz	1kHz	10kHz ~
6.3 ~ 100	~ 56	0.20	0.30	0.50	0.80	1.00
	68 ~ 330	0.55	0.65	0.75	0.85	1.00
	390 ~ 1000	0.70	0.75	0.80	0.90	1.00
	1200 ~ 15000	0.80	0.85	0.90	0.95	1.00
160 ~ 450	0.47 ~ 220	0.80	1.00	1.25	1.40	1.60
	330 ~ 470	0.90	1.00	1.10	1.13	1.15

Please refer to page 18, 19, 20 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.

■ Dimension table in next page.

■ Standard ratings

V (Code)		6.3 (0J)				10 (1A)			
Cap. (μF)	Item Code	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	—10°C / 100kHz			20°C / 100kHz	—10°C / 100kHz	
22	220	5×11	0.60	1.20	180	5×11 ▲ 4×7	0.60 2.00	1.20 5.00	180 65
27	270	4×7	2.00	5.00	65				
33	330	5×11 ▲ 5×7	0.60 0.95	1.20 2.40	180 120	5×11 ▲ 5×7	0.60 0.95	1.20 2.40	180 120
39	390					5×7	0.95	2.40	120
47	470	5×11 ▲ 5×7	0.60 0.95	1.20 2.40	180 120	5×11 ▲ 4×11	0.60 1.30	1.20 2.60	180 120
56	560	5×7	0.95	2.40	120				
68	680	4×11	1.30	2.60	120				
82	820					5×11 ▲ 6.3×7	0.60 0.45	1.20 1.20	180 200
100	101	5×11	0.60	1.20	180	5×11 ▲ 5×15	0.60 0.50	1.20 1.00	180 235
120	121	6.3×7	0.45	1.20	200				
150	151	6.3×11 ▲ 5×15	0.25 0.50	0.50 1.00	290 235	6.3×11	0.25	0.50	290
180	181					6.3×11	0.25	0.50	290
220	221	6.3×11	0.25	0.50	290	▲ 6.3×15	0.23	0.46	430
330	331	6.3×11 ▲ 6.3×15	0.25 0.23	0.50 0.46	290 430	8×11.5	0.117	0.234	555
470	471	8×11.5	0.117	0.234	555	8×11.5	0.117	0.234	555
560	561	8×11.5	0.117	0.234	555				
680	681	10×12.5	0.090	0.18	755	10×12.5 ▲ 8×15	0.090 0.085	0.18 0.17	755 730
820	821	8×15 ▲ 10×12.5	0.085 0.090	0.17 0.18	730 755				
1000	102	10×12.5	0.090	0.18	755	10×16 ▲ 8×20	0.068 0.065	0.136 0.13	1050 995
1200	122	8×20 ▲ 10×16	0.065 0.068	0.13 0.136	995 1050	10×20	0.052	0.104	1220
1500	152	10×20	0.052	0.104	1220	10×20 ▲ 10×25	0.052 0.045	0.104 0.090	1220 1440
2200	222	12.5×20 ▲ 10×25	0.038 0.045	0.076 0.090	1655 1440	12.5×20 ▲ 10×31.5	0.038 0.035	0.076 0.070	1655 1815
2700	272	10×31.5	0.035	0.070	1815	12.5×25	0.030	0.060	1945
3300	332	12.5×20	0.038	0.076	1655	12.5×25 ▲ 12.5×31.5	0.030 0.025	0.060 0.050	1945 2310
3900	392	12.5×25	0.030	0.060	1945	12.5×35.5 ▲ 16×20	0.022 0.029	0.044 0.058	2510 2205
4700	472	16×25 ▲ 12.5×31.5	0.022 0.025	0.044 0.050	2555 2310	16×25	0.022	0.044	2555
5600	562	12.5×35.5 ▲ 16×20	0.022 0.029	0.044 0.058	2510 2205	16×25 ▲ 18×20	0.022 0.028	0.044 0.056	2555 2490
6800	682	16×25 ▲ 18×20	0.022 0.028	0.044 0.056	2555 2490	16×31.5 ▲ 18×25	0.018 0.020	0.036 0.040	3010 2740
8200	822	16×31.5	0.018	0.036	3010	16×35.5 ▲ 18×31.5	0.016 0.016	0.032 0.032	3150 3635
10000	103	16×31.5 ▲ 18×25	0.016 0.020	0.032 0.040	3150 2740	18×35.5	0.015	0.030	3680
12000	123	18×31.5	0.016	0.032	3635				
15000	153	18×35.5	0.015	0.030	3680	18×40	0.014	0.028	3800

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

■ Standard ratings

Cap. (μF)	V(Code) Item Code	16 (1C)				25 (1E)			
		Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	—10°C / 100kHz			20°C / 100kHz	—10°C / 100kHz	
4.7	4R7					5×11	0.60	1.20	180
10	100	5×11	0.60	1.20	180	5×11	0.60	1.20	180
		▲ 4×7					2.00	5.00	65
15	150	4×7	2.00	5.00	65				
22	220	5×11	0.60	1.20	180	5×11	0.60	1.20	180
		▲ 5×7	0.95	2.40	120	▲ 5×7	0.95	2.40	120
27	270	5×7	0.95	2.40	120	4×11	1.30	2.60	120
33	330	5×11	0.60	1.20	180				
		▲ 6.3×7	0.45	1.20	200	5×11	0.60	1.20	180
39	390	4×11	1.30	2.60	120	5×11	0.60	1.20	180
						▲ 6.3×7	0.45	1.20	200
47	470	5×11	0.60	1.20	180	5×11	0.60	1.20	180
56	560	5×11	0.60	1.20	180				
		▲ 6.3×7	0.45	1.20	200	5×15	0.50	1.00	235
82	820	5×15	0.50	1.00	235	6.3×11	0.25	0.50	290
100	101	6.3×11	0.25	0.50	290	6.3×11	0.25	0.50	290
120	121	6.3×11	0.25	0.50	290	6.3×15	0.23	0.46	430
150	151	6.3×11	0.25	0.50	290	8×11.5	0.117	0.234	555
180	181	6.3×15	0.23	0.46	430				
220	221	8×11.5	0.117	0.234	555	8×11.5	0.117	0.234	555
330	331	8×11.5	0.117	0.234	555	10×12.5	0.090	0.18	755
						▲ 8×15	0.085	0.17	730
470	471	10×12.5	0.090	0.18	755	10×16	0.068	0.136	1050
		▲ 8×15	0.085	0.17	730	▲ 8×20	0.065	0.13	995
560	561					10×20	0.052	0.104	1220
680	681	10×16	0.068	0.136	1050				
		▲ 8×20	0.065	0.13	995	10×20	0.052	0.104	1220
820	821	10×20	0.052	0.104	1220	10×25	0.045	0.090	1440
1000	102	10×20	0.052	0.104	1220	12.5×20	0.038	0.076	1655
						▲ 10×31.5	0.035	0.070	1815
1200	122	10×25	0.045	0.090	1440				
1500	152	12.5×20	0.038	0.076	1655	16×25	0.022	0.044	2555
		▲ 10×31.5	0.035	0.070	1815	▲ 12.5×25	0.030	0.060	1945
1800	182					12.5×31.5	0.025	0.050	2310
						▲ 16×20	0.029	0.058	2205
2200	222	12.5×25	0.030	0.060	1945	16×25	0.022	0.044	2555
						▲ 18×20	0.028	0.056	2490
						※ 12.5×35.5	0.022	0.044	2510
2700	272	12.5×31.5	0.025	0.050	2310				
		▲ 16×20	0.029	0.058	2205	16×25	0.022	0.044	2555
3300	332	16×25	0.022	0.044	2555	16×31.5	0.018	0.036	3010
		▲ 12.5×35.5	0.022	0.044	2510	▲ 18×25	0.020	0.040	2740
3900	392	16×25	0.022	0.044	2555	16×35.5	0.016	0.032	3150
		▲ 18×20	0.028	0.056	2490	▲ 18×31.5	0.016	0.032	3635
4700	472	16×31.5	0.018	0.036	3010				
		▲ 18×25	0.020	0.040	2740	18×35.5	0.015	0.030	3680
5600	562	16×35.5	0.016	0.032	3150				
		▲ 18×31.5	0.016	0.032	3635				
6800	682	18×35.5	0.015	0.030	3680	18×40	0.014	0.028	3800
8200	822	18×35.5	0.015	0.030	3680				
10000	103	18×40	0.014	0.028	3800				

▲ : 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.

■ Standard ratings

V(Code)		35 (1V)				50 (1H)			
Cap.(μF)	Code	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
			20°C / 100kHz	—10°C / 100kHz			20°C / 100kHz	—10°C / 100kHz	
0.47	R47					5×11	5.00	10.0	25
1	010					5×11	3.50	7.00	40
2.2	2R2					5×11	3.00	6.00	55
3.3	3R3					5×11	2.60	5.20	65
4.7	4R7	5×11	0.60	1.20	180	5×11	2.30	4.60	90
6.8	6R8	4×7	2.00	5.00	65				
10	100	5×11 ▲ 5×7	0.60 0.95	1.20 2.40	180 120	5×11 ▲ 4×11	1.40 2.50	2.80 5.00	120 90
12	120	5×7	0.95	2.40	120				
18	180	4×11	1.30	2.60	120	5×11	1.30	2.60	155
22	220	5×11	0.60	1.20	180	5×11	1.20	2.40	170
27	270	5×11 ▲ 6.3×7	0.60 0.45	1.20 1.20	180 200	5×15	0.90	1.80	215
33	330	5×11	0.60	1.20	180	6.3×11	0.43	0.86	300
39	390	5×15	0.50	1.00	235				
47	470	6.3×11	0.25	0.50	290	6.3×11	0.43	0.86	300
56	560	6.3×11	0.25	0.50	290	6.3×15	0.40	0.80	360
82	820	6.3×15	0.23	0.46	430	8×11.5	0.234	0.468	485
100	101	8×11.5	0.117	0.234	555	8×11.5	0.234	0.468	485
120	121					8×15 ▲ 10×12.5	0.155 0.162	0.31 0.324	635 615
150	151	8×11.5	0.117	0.234	555	10×12.5	0.162	0.324	615
180	181					8×20 ▲ 10×16	0.120 0.119	0.240 0.238	860 850
220	221	10×12.5 ▲ 8×15	0.090 0.085	0.18 0.17	755 730	10×16 ▲ 10×20	0.119 0.090	0.238 0.18	850 1030
270	271					10×25	0.082	0.164	1200
330	331	10×16 ▲ 8×20	0.068 0.065	0.136 0.13	1050 995	10×20 ▲ 10×31.5	0.090 0.060	0.18 0.12	1030 1610
390	391	10×20	0.052	0.104	1220	12.5×20	0.063	0.126	1480
470	471	10×20	0.052	0.104	1220	12.5×20	0.060	0.12	1500
560	561	10×25	0.045	0.090	1440	12.5×25	0.050	0.10	1832
680	681	12.5×20 ▲ 10×31.5	0.038 0.035	0.076 0.070	1655 1815	12.5×25 ▲ 16×20	0.050 0.048	0.10 0.096	1832 1835
820	821					12.5×35.5 ▲ 18×20	0.034 0.042	0.068 0.084	2285 2420
1000	102	12.5×25	0.030	0.060	1945	16×25	0.034	0.068	2235
1200	122	12.5×31.5 ▲ 16×20	0.025 0.029	0.050 0.058	2310 2205	16×31.5 ▲ 18×25	0.028 0.029	0.056 0.058	2700 2610
1500	152	16×25 ▲ 12.5×35.5	0.022 0.022	0.044 0.044	2555 2510	16×31.5 ▲ 16×35.5	0.028 0.025	0.056 0.050	2700 2790
1800	182	16×25 ▲ 18×20	0.022 0.028	0.044 0.056	2555 2490	18×31.5	0.025	0.050	3000
2200	222	16×31.5 ▲ 18×25	0.018 0.020	0.036 0.040	3010 2740	18×35.5	0.023	0.046	3100
2700	272	16×35.5 ▲ 18×31.5	0.016 0.016	0.032 0.032	3150 3635				
3300	332	18×35.5	0.015	0.030	3680				
4700	472	18×40	0.014	0.028	3800				

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

■ Standard ratings

V(Code)		Item	63 (1J)				100 (2A)			
Cap(μF)	Code		Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz	Case size φD×L (mm)	Impedance (Ω MAX.)		Rated ripple (mA rms) 105°C / 100kHz
				20°C / 100kHz	—10°C / 100kHz			20°C / 100kHz	—10°C / 100kHz	
0.47	R47					5×11	43.0	86.0	20	
1	010					5×11	20.0	40.0	30	
2.2	2R2					5×11	9.80	19.6	44	
3.3	3R3					5×11	6.60	13.2	58	
4.7	4R7	5×11	4.70	9.40	68	5×11	4.60	9.20	74	
6.8	6R8	5×11	2.50	5.00	95	5×11	3.50	7.00	95	
		▲ 4×11	3.50	7.00	80					
10	100	5×11	2.10	4.20	110	6.3×11	1.80	3.60	130	
12	120	5×11	2.00	4.00	145					
15	150	6.3×11	1.20	2.40	160	8×11.5	0.83	1.66	180	
18	180	5×15	1.30	2.60	200	6.3×15	0.80	1.60	200	
22	220	6.3×11	0.71	1.42	250	8×11.5	0.68	1.36	230	
33	330	6.3×11	0.71	1.42	250	10×12.5	0.46	0.92	320	
		▲ 8×15				0.45	0.90	360		
39	390	6.3×15	0.70	1.40	330					
47	470	8×11.5	0.342	0.684	405	10×16	0.37	0.74	420	
						▲ 8×20	0.37	0.74	420	
68	680	8×11.5	0.342	0.684	405	10×20	0.30	0.60	490	
82	820					10×25	0.25	0.50	540	
100	101	10×12.5	0.256	0.512	535	12.5×20	0.18	0.36	580	
		▲ 8×15	0.23	0.46	535					
120	121	10×16	0.194	0.388	600					
150	151	10×16	0.194	0.388	660	12.5×25	0.13	0.26	710	
180	181	10×20	0.147	0.294	885	12.5×31.5	0.12	0.24	790	
		▲ 12.5×15	0.15	0.30	1020	▲ 16×20	0.13	0.26	750	
220	221	10×20	0.147	0.294	885	16×25	0.10	0.20	890	
		▲ 10×25	0.13	0.26	1050	▲ 18×20	0.11	0.22	850	
270	271	16×15	0.090	0.18	1410					
330	331	12.5×20	0.085	0.17	1285	16×25	0.090	0.18	1080	
390	391	12.5×25	0.070	0.14	1720	18×25	0.083	0.166	1260	
		▲ 18×15	0.086	0.172	1690					
470	471	12.5×25	0.070	0.14	1720	16×31.5	0.076	0.152	1310	
		▲ 12.5×31.5	0.055	0.11	2090					
		※ 16×20	0.059	0.118	1765					
560	561					18×31.5	0.068	0.136	1370	
680	681	16×25	0.050	0.10	2160	16×35.5	0.064	0.128	1410	
		▲ 12.5×35.5	0.047	0.094	2265					
		※ 18×20	0.055	0.11	2290					
820	821	16×31.5	0.043	0.086	2670					
		▲ 18×25	0.043	0.086	2585					
1000	102	16×31.5	0.043	0.086	2670	18×40	0.047	0.094	1520	
		▲ 16×35.5	0.036	0.072	2770					
1200	122	18×31.5	0.032	0.064	2950					
1500	152	18×35.5	0.030	0.060	3095					
2200	222	18×40	0.028	0.056	3200					