



Low Impedance, High Reliability
For Switching Power Supplies
series



Smaller



Low Impedance

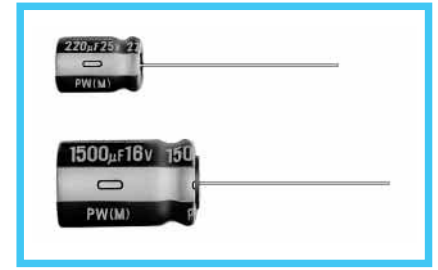
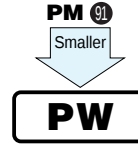


Long Life



Anti-Solvent
Feature
(Through
100V only)

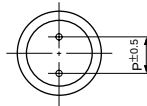
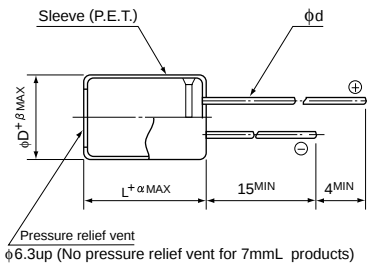
- Smaller case size and lower impedance than PM series.
- Low impedance and high reliability withstanding 2000 hours to 8000 hours.
- Capacitance ranges available based on the numerical values in E12 series under JIS.



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-25°C / Z+20°C	—	—	—	—	3	3	4	6	15		
		Z-40°C / Z+20°C	—	—	—	—	4	6	8	10	—		
Z-55°C / Z+20°C		3	3	3	3	—	—	—	—	—			
Endurance	After an application of D.C. bias voltage plus the rated ripple current for 8000 hours (2000 hours for D = 4, 5 and 6.3, 3000 hours for D = 8, 5000 hours for D = 10, 7000 hours for D = 12.5) 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										
	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												
Marking	Printed with white color letter on dark brown sleeve.												

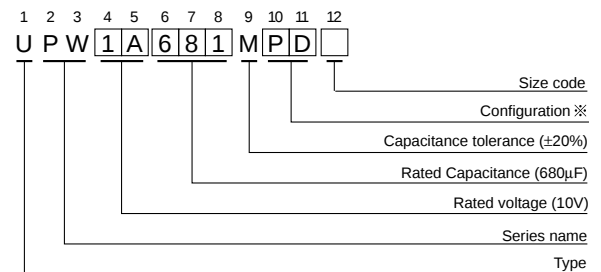
Radial Lead Type



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



※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve	Sn-Pb finished leadwire PVC sleeve (containing Pb)
4 · 5	DD	DH
6.3	ED (7mm L : DD)	EH (7mm L : DH)
8 · 10	PD	PH
12.5 ~ 18	HD	HH
20 ~ 25	RD	RH

※ Please contact to us if other configurations are required.

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 19, 20, 21 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 × 11 ▲ 6.3 × 15	0.25 0.23	0.50 0.46	290 430
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	760 730
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	1950 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 2210
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 2210	16 × 25 ▲ 18 × 20	0.022 0.028	0.044 0.056	2560 2490
6800	682	16 × 25 ▲ 18 × 20	0.022 0.028	0.044 0.056	2560 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	760
						▲ 8 × 15	0.085	0.17	730
470	471	10 × 12.5	0.090	0.18	760	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	1660
						▲ 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	1950
1800	182					12.5 × 31.5	0.025	0.050	2310
						▲ 16 × 20	0.029	0.058	2210
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 × 25	0.022	0.044	2555
		▲ 16 × 20	0.029	0.058	2210				
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	2560	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

Cap. (μF)	V(Code) Item Code	35 (1V)				50 (1H)			
		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	635 620
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	760 730	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	1660 1815	12.5 × 25 ▲ 16 × 20	0.050 0.048	0.10 0.096	1840 1840
820	821					12.5 × 35.5 ▲ 18 × 20	0.034 0.042	0.068 0.084	2290 2420
1000	102	12.5 × 25	0.030	0.060	1950	16 × 25	0.034	0.068	2235
1200	122	12.5 × 31.5 ▲ 16 × 20	0.025 0.029	0.050 0.058	2310 2210	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	540	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	890	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	1290	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	1770					
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	2270					
		* 18 × 20	0.055	0.11	2290					
820	821	16 × 31.5	0.043	0.086	2670					
		▲ 18 × 25	0.043	0.086	2590					
1000	102	16 × 31.5	0.043	0.086	2770	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	3100					
2200	222	18 × 40	0.028	0.056	3200					

▲ : 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.

V(Code)		160		200		250		315		350		400		450	
Cap. (μF)	Code	2C		2D		2E		2F		2V		2G		2W	
0.47	R47	6.3 × 11	12	6.3 × 11	12	6.3 × 11	12	8 × 11.5	11	8 × 11.5	11				
1	010	6.3 × 11	17	6.3 × 11	17	6.3 × 11	17	8 × 11.5	16	10 × 12.5	17	10 × 12.5	16	10 × 12.5	18
2.2	2R2	6.3 × 11	25	6.3 × 11	25	8 × 11.5	29	10 × 12.5	28	10 × 16	31	10 × 16	27	10 × 20	29
3.3	3R3	8 × 11.5	36	8 × 11.5	36	10 × 12.5	42	10 × 12.5	34	10 × 16	38	10 × 20	36	12.5 × 20	41
4.7	4R7	8 × 11.5	43	10 × 12.5	50	10 × 12.5	50	10 × 16	45	10 × 20	49	10 × 20	43	12.5 × 20	49
10	100	10 × 12.5	70	10 × 16	80	10 × 20	88	10 × 20	72	12.5 × 20	82	12.5 × 25	72	16 × 25	75
22	220	10 × 20	130	10 × 20	140	12.5 × 25	155	12.5 × 25	120	16 × 25	130	16 × 25	110	16 × 31.5	115
33	330	12.5 × 20	180	12.5 × 25	190	12.5 × 25	190	16 × 25	155	16 × 31.5	160	16 × 31.5	140	● 18 × 35.5	145
47	470	12.5 × 25	220	12.5 × 25	220	16 × 25	230	16 × 35.5	190	● 18 × 35.5	200	● 18 × 35.5	170	20 × 40	175
100	101	16 × 25	330	16 × 31.5	335	● 18 × 35.5	340	Δ 18 × 40	285	20 × 40	290	22 × 50	350	25 × 50	350
220	221	● 18 × 35.5	500	Δ 18 × 40	515	20 × 40	525	22 × 50	540	25 × 50	550				
330	331	20 × 40	900	22 × 40	1100	22 × 50	1150								
470	471	22 × 50	1200	22 × 50	1310	25 × 50	1350							Case size	※

※ Rated Ripple (mA rms) at 105°C 120Hz

Size 20 × 31 is available for capacitors marked " ● "

Size 20 × 35 is available for capacitors marked " Δ "

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