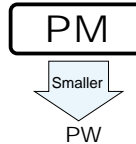


# ALUMINUM ELECTROLYTIC CAPACITORS

**PM** series Extremely Low Impedance, High Reliability



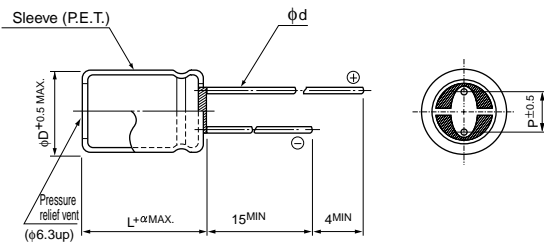
- High reliability withstanding 5000 hour load life at +105°C (3000/2000 hours for smaller case sizes as specified below).
- Capacitance ranges available based on the numerical values in E12 series under JIS.
- Compliant to the RoHS directive (2011/65/EU).



## ■ Specifications

Item		Performance Characteristics											
Category Temperature Range	-55 to +105°C (6.3 to 100V), -40 to +105°C (160 to 400V), -25 to +105°C (450V)												
Rated Voltage Range	6.3 to 450V												
Rated Capacitance Range	0.47 to 15000µF												
Capacitance Tolerance	±20% at 120Hz, 20°C												
Leakage Current	Rated Voltage (V)	6.3 to 100	160 to 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)											
Tangent of loss angle (tan δ)	For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF. Measurement frequency : 120Hz at 20°C												
	Rated Voltage (V)	6.3	10	16	25	35	50	63 to 100	160 to 350	400 · 450			
tan δ (MAX.)		0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.20	0.25			
Stability at Low Temperature	Impedance ratio (MAX.)	Rated voltage (V)		6.3 · 10	16	25 · 35	50 to 100	160 · 200	250	315 · 350	400	450	120Hz
		Z-25°C / Z+20°C		—									
		Z-40°C / Z+20°C		—									
		Z-55°C / Z+20°C		4	3	3	2	—	—	—	—	—	—
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 (2000 hours for φD=5 and 6.3, 3000 hours for φD=8) at 105°C, the peak voltage shall not exceed the rated voltage.			Capacitance change	Within ±20% of the initial capacitance value								
				tan δ	200% or less than the initial specified value								
				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 characteristic requirements listed at right.			Capacitance change	Within ±20% of the initial capacitance value								
				tan δ	150% or less than the initial specified value								
				Leakage current	Less than or equal to the initial specified value								
Marking	Printed with white color letter on dark brown sleeve.												

## ■ Radial Lead Type



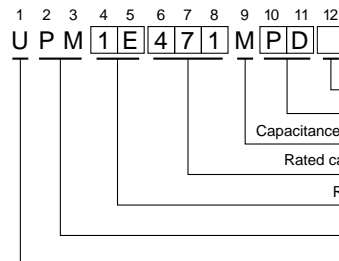
α	(φD < 10)	1.5
	(φD ≥ 10)	2.0

	(mm)							
φD	5	6.3	8	10	12.5	16	18	
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	
φd	0.5	0.5	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.

- Please refer to page 20 about the end seal configuration.

## Type numbering system (Example : 25V 470µF)

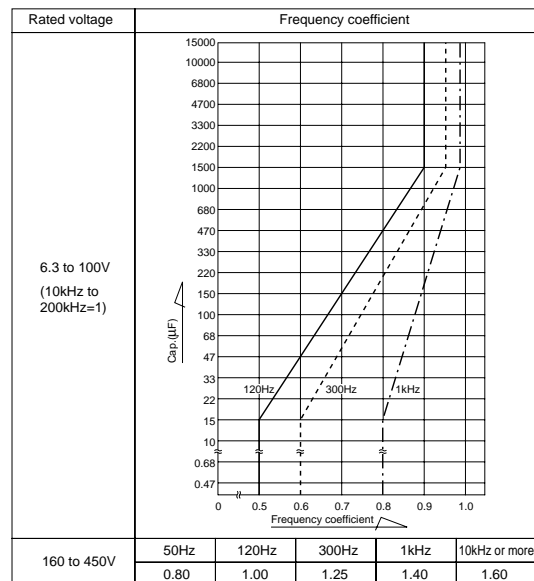


Size code	
Type	Code
Small Dia	—
Low Profile	6

### ※ Configuration

φ D	Pb-free leadwire Pb-free PET sleeve
5	DD
6.3	ED
8 · 10	PD
12.5 to 18	HD

## • Frequency coefficient of rated ripple current



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.

## ■ Dimensions

φD×L (mm)

Cap.(μF)	V(Code) Code	6.3 (0J)		10 (1A)		16 (1C)		25 (1E)		35 (1V)	
		—	6	—	6	—	6	—	6	—	6
22	220									5 × 11	
27	270									5 × 11	
33	330							5 × 11		6.3 × 11	
39	390							5 × 11		6.3 × 11	
47	470					5 × 11		6.3 × 11		6.3 × 11	
56	560					5 × 11		6.3 × 11		6.3 × 11	
68	680			5 × 11		6.3 × 11		6.3 × 11		6.3 × 15	
82	820			5 × 11		6.3 × 11		6.3 × 11		6.3 × 15	
100	101	5 × 11		6.3 × 11		6.3 × 11		6.3 × 15		8 × 11.5	
120	121	5 × 11		6.3 × 11		6.3 × 11		6.3 × 15		8 × 15	10 × 12.5
150	151	6.3 × 11		6.3 × 11		6.3 × 15		8 × 11.5		8 × 15	10 × 12.5
180	181	6.3 × 11		6.3 × 11		6.3 × 15		8 × 15	10 × 12.5	8 × 20	10 × 15
220	221	6.3 × 11		6.3 × 15		8 × 11.5		8 × 15	10 × 12.5	8 × 20	10 × 15
270	271	6.3 × 15		6.3 × 15		8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15
330	331	6.3 × 15		8 × 11.5		8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15
390	391	8 × 11.5		8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 25	12.5 × 15
470	471	8 × 15	10 × 12.5	8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 31.5	16 × 15
560	561	8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 25	12.5 × 15	12.5 × 20	16 × 15
680	681	8 × 20	10 × 15	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	18 × 15
820	821	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 25	12.5 × 15	12.5 × 20	16 × 15	12.5 × 25	18 × 15
1000	102	10 × 20	12.5 × 15	10 × 20	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	18 × 15	12.5 × 31.5	16 × 20
1200	122	10 × 20	12.5 × 15	10 × 25	12.5 × 15	12.5 × 20	16 × 15	12.5 × 25	18 × 15	12.5 × 35.5	16 × 25
1500	152	10 × 25	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	18 × 15	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20
1800	182	10 × 31.5	16 × 15	12.5 × 20	16 × 15	12.5 × 31.5	16 × 20	12.5 × 35.5	16 × 25	16 × 31.5	18 × 25
2200	222	10 × 31.5	16 × 15	12.5 × 25	18 × 15	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20	16 × 35.5	18 × 31.5
2700	272	12.5 × 25	18 × 15	12.5 × 31.5	16 × 20	12.5 × 35.5	16 × 25	16 × 31.5	18 × 25	16 × 40	18 × 35.5
3300	332	12.5 × 25	18 × 15	12.5 × 35.5	16 × 20	12.5 × 40	18 × 20	16 × 35.5	18 × 31.5	18 × 40	
3900	392	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20	16 × 31.5	18 × 25	16 × 40	18 × 35.5		
4700	472	12.5 × 35.5	18 × 20	16 × 31.5	18 × 25	16 × 35.5	18 × 31.5	18 × 40			
5600	562	12.5 × 40	18 × 20	16 × 35.5	18 × 25	16 × 40	18 × 35.5				
6800	682	16 × 31.5	18 × 25	16 × 35.5	18 × 31.5	18 × 35.5					
8200	822	16 × 35.5	18 × 31.5	16 × 40	18 × 35.5	18 × 40					
10000	103	16 × 40	18 × 31.5	18 × 40							
12000	123	18 × 35.5									
15000	153	18 × 40									

Cap.(μF)	V(Code) Code	50 (1H)		63 (1J)		80 (1K)		100 (2A)	
		—	6	—	6	—	6	—	6
0.47	R47	5 × 11						5 × 11	
0.68	R68	5 × 11						5 × 11	
1	010	5 × 11						5 × 11	
1.5	1R5	5 × 11						5 × 11	
2.2	2R2	5 × 11						5 × 11	
3.3	3R3	5 × 11						5 × 11	
4.7	4R7	5 × 11				5 × 11		6.3 × 11	
6.8	6R8	5 × 11				5 × 11		6.3 × 11	
10	100	5 × 11		5 × 11		6.3 × 11		6.3 × 11	
12	120	5 × 11		5 × 11		6.3 × 11		6.3 × 11	
15	150	5 × 11		6.3 × 11		6.3 × 11		6.3 × 15	
18	180	5 × 11		6.3 × 11		6.3 × 11		6.3 × 15	
22	220	6.3 × 11		6.3 × 11		6.3 × 15		8 × 11.5	
27	270	6.3 × 11		6.3 × 11		6.3 × 15		8 × 15	10 × 12.5
33	330	6.3 × 11		6.3 × 15		8 × 11.5		8 × 15	10 × 12.5
39	390	6.3 × 11		6.3 × 15		8 × 15	10 × 12.5	8 × 20	10 × 15
47	470	6.3 × 15		8 × 11.5		8 × 15	10 × 12.5	10 × 20	12.5 × 15
56	560	6.3 × 15		8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15
68	680	8 × 11.5		8 × 15	10 × 12.5	10 × 20	12.5 × 15	10 × 25	12.5 × 15
82	820	8 × 15	10 × 12.5	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 31.5	16 × 15
100	101	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 25	12.5 × 15	10 × 31.5	16 × 15
120	121	8 × 20	10 × 15	10 × 20	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	16 × 15
150	151	10 × 20	12.5 × 15	10 × 25	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	18 × 15
180	181	10 × 20	12.5 × 15	10 × 31.5	16 × 15	12.5 × 25	16 × 15	12.5 × 31.5	16 × 20
220	221	10 × 25	12.5 × 15	12.5 × 20	16 × 15	12.5 × 31.5	18 × 15	12.5 × 35.5	16 × 25
270	271	10 × 31.5	16 × 15	12.5 × 25	18 × 15	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20
330	331	10 × 31.5	16 × 15	12.5 × 25	18 × 15	12.5 × 35.5	16 × 25	16 × 31.5	18 × 25
390	391	12.5 × 25	16 × 15	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20	16 × 35.5	18 × 31.5
470	471	12.5 × 25	18 × 15	12.5 × 35.5	16 × 25	16 × 31.5	18 × 25	16 × 40	18 × 35.5
560	561	12.5 × 31.5	16 × 20	12.5 × 40	18 × 20	16 × 35.5	18 × 31.5	18 × 35.5	
680	681	12.5 × 35.5	16 × 20	16 × 31.5	18 × 25	16 × 40	18 × 31.5	18 × 40	
820	821	12.5 × 40	18 × 20	16 × 35.5	18 × 31.5	18 × 35.5			
1000	102	16 × 31.5	18 × 25	16 × 40	18 × 35.5	18 × 40			
1200	122	16 × 35.5	18 × 31.5	18 × 40					
1500	152	16 × 40	18 × 31.5						
1800	182	18 × 35.5							
2200	222	18 × 40							

※In case of low profile type, ⑥ will be put at 12th digit of type numbering system.

Dimension table for 160 to 450V products are shown in 208 page.

## Standard Ratings

Cap.(μF)		V(Code) Size code Item Code		6.3 (0J)										
				—						6				
				Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz						
100	101	5 × 11	0.85	1.70	150	99								
120	121	5 × 11	0.65	1.30	175	115								
150	151	6.3 × 11	0.49	0.98	225	155								
180	181	6.3 × 11	0.39	0.78	250	175								
220	221	6.3 × 11	0.30	0.60	285	205								
270	271	6.3 × 15	0.24	0.48	370	275								
330	331	6.3 × 15	0.20	0.40	405	310								
390	391	8 × 11.5	0.17	0.34	445	345								
470	471	8 × 15	0.14	0.28	550	435	10 × 12.5	0.14	0.28	635	455			
560	561	8 × 15	0.12	0.24	595	480	10 × 12.5	0.13	0.26	670	485			
680	681	8 × 20	0.10	0.20	730	605	10 × 15	0.11	0.22	825	580			
820	821	8 × 20	0.085	0.17	795	670	10 × 15	0.095	0.19	840	635			
1000	102	10 × 20	0.075	0.15	950	820	12.5 × 15	0.085	0.17	890	765			
1200	122	10 × 20	0.065	0.13	1060	895	12.5 × 15	0.075	0.15	950	835			
1500	152	10 × 25	0.055	0.11	1260	1090	12.5 × 15	0.065	0.13	1020	915			
1800	182	10 × 31.5	0.050	0.10	1370	1230	16 × 15	0.055	0.11	1270	1140			
2200	222	10 × 31.5	0.043	0.086	1470	1320	16 × 15	0.049	0.098	1340	1200			
2700	272	12.5 × 25	0.038	0.076	1700	1430	18 × 15	0.044	0.088	1500	1350			
3300	332	12.5 × 25	0.034	0.068	1710	1530	18 × 15	0.039	0.078	1600	1440			
3900	392	12.5 × 31.5	0.031	0.062	1980	1710	16 × 20	0.036	0.072	1770	1540			
4700	472	12.5 × 35.5	0.028	0.056	2230	1890	18 × 20	0.032	0.064	1920	1720			
5600	562	12.5 × 40	0.026	0.052	2460	2040	18 × 20	0.030	0.060	1980	1780			
6800	682	16 × 31.5	0.024	0.048	2510	2130	18 × 25	0.027	0.054	2350	1980			
8200	822	16 × 35.5	0.022	0.044	2770	2290	18 × 31.5	0.025	0.050	2600	2150			
10000	103	16 × 40	0.020	0.040	3110	2470	18 × 31.5	0.023	0.046	2720	2240			
12000	123	18 × 35.5	0.019	0.038	3050	2530								
15000	153	18 × 40	0.018	0.036	3300	2660								

Cap.(μF)		V(Code) Size code Item Code		10 (1A)										
				—						6				
				Case size φD × L (mm)	Impedance (Ω)MAX.		Rated ripple (mArms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz						
68	680	5 × 11	0.80	1.60	155	97								
82	820	5 × 11	0.65	1.30	175	110								
100	101	6.3 × 11	0.55	1.10	210	135								
120	121	6.3 × 11	0.44	0.88	235	160								
150	151	6.3 × 11	0.35	0.70	265	185								
180	181	6.3 × 11	0.29	0.58	290	205								
220	221	6.3 × 15	0.24	0.48	370	270								
270	271	6.3 × 15	0.20	0.40	405	300								
330	331	8 × 11.5	0.16	0.32	460	350								
390	391	8 × 15	0.14	0.28	550	430	10 × 12.5	0.15	0.30	635	430			
470	471	8 × 15	0.12	0.24	595	475	10 × 12.5	0.13	0.26	670	475			
560	561	8 × 20	0.10	0.20	730	590	10 × 15	0.11	0.22	700	565			
680	681	8 × 20	0.085	0.17	795	660	10 × 15	0.090	0.18	825	635			
820	821	10 × 20	0.070	0.14	985	835	12.5 × 15	0.080	0.16	920	780			
1000	102	10 × 20	0.060	0.12	1060	915	12.5 × 15	0.065	0.13	1040	895			
1200	122	10 × 25	0.050	0.10	1260	1120	12.5 × 15	0.060	0.12	1060	930			
1500	152	10 × 31.5	0.045	0.090	1450	1290	16 × 15	0.050	0.10	1330	1190			
1800	182	12.5 × 20	0.039	0.078	1470	1320	16 × 15	0.044	0.088	1420	1270			
2200	222	12.5 × 25	0.034	0.068	1710	1530	18 × 15	0.039	0.078	1600	1440			
2700	272	12.5 × 31.5	0.030	0.060	1980	1740	16 × 20	0.035	0.070	1740	1560			
3300	332	12.5 × 35.5	0.026	0.052	2230	1960	16 × 20	0.031	0.062	1850	1660			
3900	392	12.5 × 40	0.024	0.048	2460	2120	18 × 20	0.028	0.056	2050	1840			
4700	472	16 × 31.5	0.023	0.046	2420	2170	18 × 25	0.026	0.052	2350	2020			
5600	562	16 × 35.5	0.021	0.042	2610	2340	18 × 25	0.024	0.048	2440	2100			
6800	682	16 × 35.5	0.020	0.040	2770	2410	18 × 31.5	0.022	0.044	2720	2280			
8200	822	16 × 40	0.019	0.038	3110	2530	18 × 35.5	0.021	0.042	3050	2420			
10000	103	18 × 40	0.017	0.034	3300	2730								

※ In case of low profile type, ① will be put at 12th digit of type numbering system.

## Standard Ratings

V(Code) Size Code Item Cap.(μF) Code		16 (1C)										
		—					6					
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
20°C / 100kHz	-10°C / 100kHz		105°C / $\frac{10\text{kHz to } 200\text{kHz}}$	105°C / 120Hz	20°C / 100kHz	-10°C / 100kHz		105°C / $\frac{10\text{kHz to } 200\text{kHz}}$	105°C / 120Hz			
47	470	5 × 11	0.80	1.60	155	92						
56	560	5 × 11	0.65	1.30	175	105						
68	680	6.3 × 11	0.50	1.00	220	135						
82	820	6.3 × 11	0.42	0.84	240	155						
100	101	6.3 × 11	0.35	0.70	265	175						
120	121	6.3 × 11	0.29	0.58	290	195						
150	151	6.3 × 15	0.23	0.46	375	260						
180	181	6.3 × 15	0.20	0.40	405	285						
220	221	8 × 11.5	0.16	0.32	460	335						
270	271	8 × 15	0.14	0.28	550	410	10 × 12.5	0.14	0.28	635	430	
330	331	8 × 15	0.12	0.24	595	455	10 × 12.5	0.12	0.24	670	480	
390	391	8 × 20	0.10	0.20	730	570	10 × 15	0.10	0.20	730	570	
470	471	8 × 20	0.090	0.18	770	615	10 × 15	0.090	0.18	825	615	
560	561	10 × 20	0.075	0.15	950	770	12.5 × 15	0.080	0.16	920	745	
680	681	10 × 20	0.065	0.13	1060	845	12.5 × 15	0.070	0.14	985	815	
820	821	10 × 25	0.055	0.11	1260	1030	12.5 × 15	0.060	0.12	1060	895	
1000	102	10 × 31.5	0.047	0.094	1410	1210	16 × 15	0.055	0.11	1270	1090	
1200	122	12.5 × 20	0.041	0.082	1430	1250	16 × 15	0.046	0.092	1390	1220	
1500	152	12.5 × 25	0.036	0.072	1700	1490	18 × 15	0.041	0.082	1560	1400	
1800	182	12.5 × 31.5	0.032	0.064	1880	1690	16 × 20	0.037	0.074	1700	1530	
2200	222	12.5 × 31.5	0.028	0.056	2010	1800	16 × 20	0.033	0.066	1800	1620	
2700	272	12.5 × 35.5	0.025	0.050	2230	1990	16 × 25	0.030	0.060	2190	1800	
3300	332	12.5 × 40	0.023	0.046	2460	2160	18 × 20	0.027	0.054	2090	1880	
3900	392	16 × 31.5	0.022	0.044	2510	2220	18 × 25	0.025	0.050	2350	2060	
4700	472	16 × 35.5	0.020	0.040	2770	2410	18 × 31.5	0.023	0.046	2720	2240	
5600	562	16 × 40	0.019	0.038	3110	2530	18 × 35.5	0.022	0.044	2620	2350	
6800	682	18 × 35.5	0.018	0.036	3050	2610						
8200	822	18 × 40	0.017	0.034	3300	2730						

V(Code) Size Code Item Cap.(μF) Code		25 (1E)										
		—					6					
		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
20°C / 100kHz	-10°C / 100kHz		105°C / $\frac{10\text{kHz to } 200\text{kHz}}$	105°C / 120Hz	20°C / 100kHz	-10°C / 100kHz		105°C / $\frac{10\text{kHz to } 200\text{kHz}}$	105°C / 120Hz			
33	330	5 × 11	0.80	1.60	155	88						
39	390	5 × 11	0.65	1.30	175	100						
47	470	6.3 × 11	0.55	1.10	210	125						
56	560	6.3 × 11	0.44	0.88	235	140						
68	680	6.3 × 11	0.36	0.72	260	160						
82	820	6.3 × 11	0.30	0.60	285	180						
100	101	6.3 × 15	0.24	0.48	370	245						
120	121	6.3 × 15	0.20	0.40	405	275						
150	151	8 × 11.5	0.16	0.32	460	320						
180	181	8 × 15	0.14	0.28	550	390	10 × 12.5	0.15	0.30	635	395	
220	221	8 × 15	0.11	0.22	625	455	10 × 12.5	0.13	0.26	670	435	
270	271	8 × 20	0.095	0.19	750	560	10 × 15	0.11	0.22	700	525	
330	331	8 × 20	0.085	0.17	795	610	10 × 15	0.095	0.19	825	575	
390	391	10 × 20	0.070	0.14	985	770	12.5 × 15	0.080	0.16	920	720	
470	471	10 × 20	0.065	0.13	1060	810	12.5 × 15	0.070	0.14	985	785	
560	561	10 × 25	0.055	0.11	1260	990	12.5 × 15	0.060	0.12	1060	860	
680	681	10 × 31.5	0.046	0.092	1420	1180	16 × 15	0.055	0.11	1270	1050	
820	821	12.5 × 20	0.041	0.082	1440	1210	16 × 15	0.049	0.098	1340	1130	
1000	102	12.5 × 25	0.036	0.072	1700	1430	18 × 15	0.043	0.086	1520	1310	
1200	122	12.5 × 25	0.032	0.064	1760	1550	18 × 15	0.039	0.078	1600	1400	
1500	152	12.5 × 31.5	0.029	0.058	1980	1780	16 × 20	0.034	0.068	1770	1590	
1800	182	12.5 × 35.5	0.026	0.052	2230	1960	16 × 25	0.031	0.062	2190	1780	
2200	222	12.5 × 40	0.024	0.048	2460	2120	18 × 20	0.028	0.056	2050	1840	
2700	272	16 × 31.5	0.022	0.044	2510	2220	18 × 25	0.025	0.050	2350	2060	
3300	332	16 × 35.5	0.020	0.040	2770	2410	18 × 31.5	0.023	0.046	2720	2240	
3900	392	16 × 40	0.019	0.038	3110	2530	18 × 35.5	0.021	0.042	3050	2420	
4700	472	18 × 40	0.018	0.036	3300	2660						

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

**PM** series

■ Standard Ratings

Cap. (μF)		V(Code)		35 (1V)									
		Size code		—					6				
		Item	Case size ΦD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		Case size ΦD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
Code			20°C / 100kHz	-10°C / 100kHz	105°C / <sup>10kHz to</sup> <sub>200kHz</sub>	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / <sup>10kHz to</sup> <sub>200kHz</sub>	105°C / 120Hz		
<b>22</b>	220	5 × 11	0.75	1.50	160	85							
<b>27</b>	270	5 × 11	0.60	1.20	180	99							
<b>33</b>	330	6.3 × 11	0.49	0.98	225	125							
<b>39</b>	390	6.3 × 11	0.41	0.82	245	140							
<b>47</b>	470	6.3 × 11	0.34	0.68	270	160							
<b>56</b>	560	6.3 × 11	0.28	0.56	295	180							
<b>68</b>	680	6.3 × 15	0.24	0.48	370	230							
<b>82</b>	820	6.3 × 15	0.19	0.38	415	265							
<b>100</b>	101	8 × 11.5	0.16	0.32	460	305							
<b>120</b>	121	8 × 15	0.14	0.28	550	370	10 × 12.5	0.15	0.30	635	375		
<b>150</b>	151	8 × 15	0.12	0.24	595	415	10 × 12.5	0.12	0.24	680	435		
<b>180</b>	181	8 × 20	0.10	0.20	730	520	10 × 15	0.11	0.22	700	500		
<b>220</b>	221	8 × 20	0.085	0.17	795	580	10 × 15	0.090	0.18	825	560		
<b>270</b>	271	10 × 20	0.070	0.14	985	735	12.5 × 15	0.080	0.16	920	690		
<b>330</b>	331	10 × 20	0.060	0.12	1060	810	12.5 × 15	0.065	0.13	1020	780		
<b>390</b>	391	10 × 25	0.055	0.11	1260	955	12.5 × 15	0.060	0.12	1060	825		
<b>470</b>	471	10 × 31.5	0.046	0.092	1450	1130	16 × 15	0.055	0.11	1270	1010		
<b>560</b>	561	12.5 × 20	0.041	0.082	1430	1160	16 × 15	0.048	0.096	1360	1100		
<b>680</b>	681	12.5 × 25	0.036	0.072	1700	1370	18 × 15	0.042	0.084	1540	1270		
<b>820</b>	821	12.5 × 25	0.032	0.064	1760	1490	18 × 15	0.038	0.076	1620	1370		
<b>1000</b>	102	12.5 × 31.5	0.029	0.058	1980	1710	16 × 20	0.034	0.068	1770	1530		
<b>1200</b>	122	12.5 × 35.5	0.026	0.052	2230	1920	16 × 25	0.031	0.062	2190	1740		
<b>1500</b>	152	12.5 × 40	0.024	0.048	2460	2120	18 × 20	0.028	0.056	2050	1840		
<b>1800</b>	182	16 × 31.5	0.022	0.044	2510	2220	18 × 25	0.025	0.050	2350	2060		
<b>2200</b>	222	16 × 35.5	0.020	0.040	2770	2410	18 × 31.5	0.023	0.046	2720	2240		
<b>2700</b>	272	16 × 40	0.018	0.036	3110	2610	18 × 35.5	0.021	0.042	3050	2420		
<b>3300</b>	332	18 × 40	0.017	0.034	3300	2730							

Cap. (μF)		V(Code)		50 (1H)									
		Size code		—					6				
		Item	Case size ΦD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		Case size ΦD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mArms)		
Code			20°C / 100kHz	-10°C / 100kHz	105°C / <sup>10kHz to</sup> <sub>200kHz</sub>	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / <sup>10kHz to</sup> <sub>200kHz</sub>	105°C / 120Hz		
<b>0.47</b>	R47	5 × 11	23.0	46.0	22	11							
<b>0.68</b>	R68	5 × 11	16.0	32.0	28	14							
<b>1</b>	010	5 × 11	11.0	22.0	36	18							
<b>1.5</b>	1R5	5 × 11	7.50	15.0	45	22							
<b>2.2</b>	2R2	5 × 11	5.00	10.0	54	27							
<b>3.3</b>	3R3	5 × 11	3.30	6.60	66	33							
<b>4.7</b>	4R7	5 × 11	2.20	4.40	81	40							
<b>6.8</b>	6R8	5 × 11	1.80	3.60	91	45							
<b>10</b>	100	5 × 11	1.40	2.80	115	57							
<b>12</b>	120	5 × 11	1.20	2.40	125	62							
<b>15</b>	150	5 × 11	0.93	1.86	145	72							
<b>18</b>	180	5 × 11	0.80	1.60	165	79							
<b>22</b>	220	6.3 × 11	0.65	1.30	195	100							
<b>27</b>	270	6.3 × 11	0.53	1.06	215	115							
<b>33</b>	330	6.3 × 11	0.43	0.86	240	135							
<b>39</b>	390	6.3 × 11	0.36	0.72	260	150							
<b>47</b>	470	6.3 × 15	0.30	0.60	330	195							
<b>56</b>	560	6.3 × 15	0.25	0.50	360	220							
<b>68</b>	680	8 × 11.5	0.20	0.40	415	255							
<b>82</b>	820	8 × 15	0.17	0.34	505	320	10 × 12.5	0.18	0.36	530	330		
<b>100</b>	101	8 × 20	0.14	0.28	620	410	10 × 15	0.16	0.32	580	385		
<b>120</b>	121	8 × 20	0.12	0.24	755	455	10 × 15	0.13	0.26	755	435		
<b>150</b>	151	10 × 20	0.10	0.20	820	570	12.5 × 15	0.11	0.22	785	545		
<b>180</b>	181	10 × 20	0.085	0.17	945	635	12.5 × 15	0.095	0.19	845	605		
<b>220</b>	221	10 × 25	0.075	0.15	1150	760	12.5 × 15	0.080	0.16	920	670		
<b>270</b>	271	10 × 31.5	0.065	0.13	1200	900	16 × 15	0.070	0.14	1120	840		
<b>330</b>	331	10 × 31.5	0.055	0.11	1300	995	16 × 15	0.060	0.12	1210	925		
<b>390</b>	391	12.5 × 25	0.048	0.096	1440	1120	16 × 15	0.055	0.11	1270	990		
<b>470</b>	471	12.5 × 25	0.044	0.088	1500	1190	18 × 15	0.046	0.092	1470	1170		
<b>560</b>	561	12.5 × 31.5	0.040	0.080	1720	1360	16 × 20	0.044	0.088	1550	1260		
<b>680</b>	681	12.5 × 35.5	0.036	0.072	1900	1530	16 × 20	0.040	0.080	1630	1350		
<b>820</b>	821	12.5 × 40	0.033	0.066	2120	1700	18 × 20	0.036	0.072	1810	1530		
<b>1000</b>	102	16 × 31.5	0.030	0.060	2150	1830	18 × 25	0.033	0.066	2020	1730		
<b>1200</b>	122	16 × 35.5	0.028	0.056	2320	1990	18 × 31.5	0.031	0.062	2140	1880		
<b>1500</b>	152	16 × 40	0.026	0.052	2650	2170	18 × 31.5	0.029	0.058	2340	1990		
<b>1800</b>	182	18 × 35.5	0.025	0.050	2620	2210							
<b>2200</b>	222	18 × 40	0.024	0.048	2790	2300							

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

## Standard Ratings

Cap. (μF)	Code	Item	63 (1J)									
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)	
				20°C / 100kHz		105°C / 10kHz to 200kHz			20°C / 100kHz		105°C / 120Hz	
				20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz
10	100	5 × 11	1.06	2.12	135	67						
12	120	5 × 11	0.93	1.86	145	72						
15	150	6.3 × 11	0.73	1.46	185	92						
18	180	6.3 × 11	0.63	1.26	195	100						
22	220	6.3 × 11	0.52	1.04	215	110						
27	270	6.3 × 11	0.43	0.86	240	130						
33	330	6.3 × 15	0.35	0.70	305	170						
39	390	6.3 × 15	0.30	0.60	330	190						
47	470	8 × 11.5	0.25	0.50	365	215						
56	560	8 × 15	0.21	0.42	450	275	10 × 12.5	0.23	0.46	450	275	
68	680	8 × 15	0.17	0.34	500	315	10 × 12.5	0.19	0.38	495	310	
82	820	8 × 20	0.15	0.30	600	385	10 × 15	0.16	0.32	580	375	
100	101	10 × 20	0.12	0.24	750	495	12.5 × 15	0.14	0.28	695	460	
120	121	10 × 20	0.10	0.20	820	555	12.5 × 15	0.12	0.24	750	510	
150	151	10 × 25	0.090	0.18	950	665	12.5 × 15	0.095	0.19	845	590	
180	181	10 × 31.5	0.075	0.15	1110	790	16 × 15	0.080	0.16	1050	750	
220	221	12.5 × 20	0.065	0.13	1140	835	16 × 15	0.070	0.14	1120	820	
270	271	12.5 × 25	0.055	0.11	1340	1000	18 × 15	0.060	0.12	1290	965	
330	331	12.5 × 25	0.049	0.098	1420	1090	18 × 15	0.050	0.10	1410	1080	
390	391	12.5 × 31.5	0.043	0.086	1620	1260	16 × 20	0.047	0.094	1500	1170	
470	471	12.5 × 35.5	0.039	0.078	1780	1420	16 × 25	0.042	0.084	1700	1350	
560	561	12.5 × 40	0.035	0.070	1950	1580	18 × 20	0.039	0.078	1730	1400	
680	681	16 × 31.5	0.032	0.064	2050	1700	18 × 25	0.035	0.070	1940	1610	
820	821	16 × 35.5	0.029	0.058	2220	1880	18 × 31.5	0.032	0.064	2110	1780	
1000	102	16 × 40	0.027	0.054	2370	2050	18 × 35.5	0.029	0.058	2280	1970	
1200	122	18 × 40	0.025	0.050	2510	2210						

Cap. (μF)	Code	Item	80 (1K)									
			Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)	
				20°C / 100kHz		105°C / 10kHz to 200kHz			20°C / 100kHz		105°C / 120Hz	
				20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz
4.7	4R7	5 × 11	4.20	11.00	53	26						
6.8	6R8	5 × 11	2.60	7.00	68	34						
10	100	6.3 × 11	1.70	4.60	87	43						
12	120	6.3 × 11	1.40	3.80	96	48						
15	150	6.3 × 11	1.20	3.20	104	52						
18	180	6.3 × 11	1.00	2.70	150	58						
22	220	6.3 × 15	0.77	2.10	180	71						
27	270	6.3 × 15	0.63	1.70	220	80						
33	330	8 × 11.5	0.53	1.40	275	132						
39	390	8 × 15	0.46	1.20	300	156	10 × 12.5	0.49	1.30	380	155	
47	470	8 × 15	0.39	1.10	360	175	10 × 12.5	0.42	1.10	410	174	
56	560	8 × 20	0.34	0.92	490	208	10 × 15	0.36	0.97	500	202	
68	680	10 × 20	0.28	0.76	570	264	12.5 × 15	0.31	0.84	520	249	
82	820	10 × 20	0.25	0.68	620	284	12.5 × 15	0.27	0.73	560	273	
100	101	10 × 25	0.21	0.57	795	347	12.5 × 15	0.23	0.62	605	308	
120	121	10 × 31.5	0.18	0.49	870	406	16 × 15	0.20	0.54	663	444	
150	151	10 × 31.5	0.15	0.41	955	459	16 × 15	0.18	0.47	699	484	
180	181	12.5 × 25	0.13	0.35	1040	520	16 × 15	0.15	0.41	766	543	
220	221	12.5 × 31.5	0.12	0.32	1160	595	18 × 15	0.13	0.35	881	643	
270	271	12.5 × 31.5	0.10	0.27	1270	667	16 × 20	0.11	0.30	1240	742	
330	331	12.5 × 35.5	0.088	0.24	1450	767	16 × 25	0.099	0.27	1440	874	
390	391	12.5 × 40	0.078	0.21	1610	822	18 × 20	0.089	0.24	1450	908	
470	471	16 × 31.5	0.069	0.19	1790	1150	18 × 25	0.080	0.22	1650	1060	
560	561	16 × 35.5	0.062	0.17	2000	1300	18 × 31.5	0.072	0.19	1750	1210	
680	681	16 × 40	0.055	0.15	2200	1470	18 × 31.5	0.065	0.18	1850	1300	
820	821	18 × 35.5	0.049	0.13	2250	1590						
1000	102	18 × 40	0.044	0.12	2370	1790						

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

## Standard Ratings

Cap. (μF)	V(Code)	Size code	100 (2A)										
			Item	—						6			
				Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)		Case size φD × L (mm)	Impedance (Ω) MAX.		Rated ripple (mA rms)	
					20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz		20°C / 100kHz	-10°C / 100kHz	105°C / 10kHz to 200kHz	105°C / 120Hz
0.47	R47	5 × 11	43.0	116.0	17	8							
0.68	R68	5 × 11	23.0	62.0	23	11							
1	010	5 × 11	17.0	46.0	27	13							
1.5	1R5	5 × 11	10.0	27.0	35	17							
2.2	2R2	5 × 11	6.60	18.0	43	21							
3.3	3R3	5 × 11	4.10	11.0	54	27							
4.7	4R7	6.3 × 11	2.80	7.60	68	34							
6.8	6R8	6.3 × 11	1.90	5.10	83	41							
10	100	6.3 × 11	1.20	3.20	104	52							
12	120	6.3 × 11	1.00	2.70	150	57							
15	150	6.3 × 15	0.81	2.20	180	65							
18	180	6.3 × 15	0.67	1.80	220	73							
22	220	8 × 11.5	0.55	1.50	275	122							
27	270	8 × 15	0.47	1.30	300	146	10 × 12.5	0.50	1.40	380	145		
33	330	8 × 15	0.38	1.00	360	169	10 × 12.5	0.42	1.10	410	166		
39	390	8 × 20	0.33	0.89	490	202	10 × 15	0.36	0.97	500	193		
47	470	10 × 20	0.28	0.76	570	252	12.5 × 15	0.31	0.84	520	239		
56	560	10 × 20	0.24	0.65	620	274	12.5 × 15	0.27	0.73	560	258		
68	680	10 × 25	0.21	0.57	795	326	12.5 × 15	0.23	0.62	605	289		
82	820	10 × 31.5	0.18	0.49	870	386	16 × 15	0.19	0.51	681	433		
100	101	10 × 31.5	0.15	0.41	955	438	16 × 15	0.17	0.46	719	475		
120	121	12.5 × 25	0.13	0.35	1040	519	16 × 15	0.14	0.38	793	531		
150	151	12.5 × 25	0.11	0.30	1120	553	18 × 15	0.12	0.32	917	635		
180	181	12.5 × 31.5	0.098	0.26	1270	641	16 × 20	0.11	0.30	1240	706		
220	221	12.5 × 35.5	0.087	0.23	1450	730	16 × 25	0.093	0.25	1440	854		
270	271	12.5 × 40	0.072	0.19	1610	843	18 × 20	0.080	0.22	1450	918		
330	331	16 × 31.5	0.062	0.17	1790	1160	18 × 25	0.070	0.19	1650	1080		
390	391	16 × 35.5	0.053	0.14	2000	1340	18 × 31.5	0.062	0.17	1850	1240		
470	471	16 × 40	0.047	0.13	2200	1530	18 × 35.5	0.056	0.15	1970	1410		
560	561	18 × 35.5	0.041	0.11	2250	1680							
680	681	18 × 40	0.036	0.097	2300	1910							

※ In case of low profile type, 6 will be put at 12th digit of type numbering system.

Cap. (μF)	V(Code)	160		200		250		315		350		400		450	
		2C	2D	2E	2F	2V	2G	2W							
1	010	8 × 11.5	19	8 × 11.5	19	8 × 11.5	19	8 × 11.5	19	10 × 12.5	21	10 × 12.5	17	10 × 15	17
2.2	2R2	8 × 11.5	30	8 × 11.5	30	10 × 12.5	32	10 × 12.5	32	10 × 15	34	10 × 15	28	10 × 20	28
3.3	3R3	10 × 12.5	50	10 × 12.5	50	10 × 15	52	10 × 15	52	10 × 20	54	10 × 20	47	12.5 × 20	48
4.7	4R7	10 × 12.5	57	10 × 15	60	10 × 15	60	10 × 20	65	10 × 20	65	12.5 × 20	55	12.5 × 25	55
10	100	10 × 15	90	10 × 20	95	12.5 × 20	98	12.5 × 20	98	12.5 × 25	100	12.5 × 25	85	16 × 25	90
22	220	12.5 × 20	140	12.5 × 25	145	16 × 25	150	16 × 25	150	16 × 25	150	16 × 31.5	130	16 × 35.5	135
33	330	12.5 × 25	175	16 × 25	180	16 × 25	180	16 × 31.5	185	16 × 35.5	190	18 × 35.5	170	18 × 40	170
47	470	16 × 25	220	16 × 25	220	16 × 31.5	225	18 × 35.5	235	18 × 40	240				
100	101	16 × 35.5	330	18 × 40	345	18 × 40	345							Case size φD × L (mm)	※

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