### MP

#### **Series**

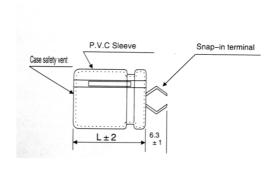
- Endurance with ripple current: 105°C 4000 hours
- Non solvent-proof type

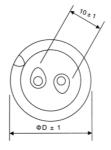


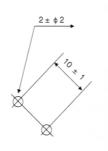
### **■**SPECIFICATIONS

Item	Characteristics								
Category Temperature Range	-25 ~ +105℃								
Voltage Range	160 ~ 450VDC								
Nominal Cap. Range	82 ~ 2700μF								
Capacitance Tolerance	± 20 % (at 120Hz , 20°C)								
Leakage Current	I= $3/CV$ (After 5 minutes ) where, I: max leakage current (μA), C: Nominal capacitance(μF), V:Rated voltage (V) (at 20°C)								
Dissipation Factor (MAX)	WV 16	0~400	420&4	150	1				
(tanδ) (at 120Hz ,20 $^{\circ}$ C)	tanδ 0.15		0.2	0.2					
Low Temp.Impedance	WV 160		0~400	~400 420&450					
Stability at 120Hz	Z-25°C / Z+20°	C	4		8				
	The following specifications shall be satisfied when the capacitors are restored to 20°C after								
			ith the rated	ripple	current is	s applied for 4000 hours at 105℃.			
Endurance	Capacitance ch	ange	≤ ±20% of the initial value						
	Dissipation Fac	tor	≤ 200% of the initial specified value						
	Leakage Current ≤ the initial specified value								
	The following specifications shall be satisfied when the capacitors are restored to 20℃ after								
	exposing them	for 1000 h	ours at 105	°C with	out voltag	ge applied.			
Shelf Life	Capacitance Ch	ange	≤ ±15% of the initial value						
-	Dissipation Fac	tor	≤ 150% o	f the in	itial spec	ified value			
	Leakage Currer	≤ The ini	tial spe	cified val	ue				

#### **■ DRAWING**







#### **■ MULTIPLIER FOR RIPPLE CURRENT**

#### (1) Frequency Coefficient

` ' '	•					
Freq.(Hz)	60(50)	120	300	1K	10K	50K
160~250	0.81	1.00	1.17	1.32	1.45	1.50
315~450	0.77	1.00	1.16	1.30	1.41	1.43

#### (2) Temperature Coefficient

Ambient Temperature(℃)	40	60	70	85	105
Coefficient	2.40	2.10	1.78	1.65	1.00

## MP Series ■STANDARD RATINGS

270	WV(vdc)		10	60			1	80			2	200	
Ripple Current(Arms) at 120Hz 105°C	Palan <sub>eler</sub> Cap.(μF)	22	25	30	35	22	25	30	35	22	25	30	35
Ripple Current(Arms) at 120Hz 105°C   22×25	270	Case Size	e ФDxL (mr	m)————						22x25			
1.21		Ripple Cu	rrent(Arms	) at 120Hz	105°C—	<b>&gt;</b>				1.1			
1900   22x265	330												
152	390						25v25						
Section   Sect	470	1.02				1.52		00.05		22x35	1.55		
1.66	F60	22x30	25x25								25x30	30x25	
187	560		1.68	00.05						1.73		1.78	05:05
B20	680							30x30					
1000	820	22x40				1.99	2.16	2.17		22x50	25x35	30x35	
1200	1000	22x45(50)					2.43(2.47)	2.46	-		25x40(45)	30x40	
1500		2.36(2.41)							25,20		2.35(2.88)		
1500	1200						2.75					\ /	
1800	1500		25x50	30x45	35x35				35x35				35x40
2200   35x45   4.14   4.22   5.20   2.20   2.20   3.15   3.20   3.15   3.20   3	1800			30x50	35x40				35x40(45)				35x45(50
WV(vdc)	2200			3.53	35x45				35x50				3.74(3.82
WV(vdc)   220   250   315	2700				35x50				4.22				
Cap.(μF)  150  22 25 30 35 22 25 30 35 22 25 30 35  180  180  220  22x25  22x35  22x35  22x35  22x35  30x25  22x10  22x25  22x35  22x35  30x25  22x10  22x25  22x30  22x40  25x35  30x25  1.17  270  21.1  22x30  22x30  22x40  25x30  22x40  25x35  30x25  1.19  1.22  1.32  1.33  1.31  1.32  1.33  1.31  1.44  1.49  390  25x25  22x35  22x35  22x35  22x30  22x40  25x35  30x30  35x25  470  22x35  25x30  30x25  22x40  25x35  30x30  35x25  25x35  30x30  35x25  25x35  30x30  35x25  25x35  30x30  35x25  25x35  30x30  35x30  470  22x35  25x35  30x30  30x25  25x40  1.75  1.71  1.71  35x35  680  22x40  30x30  22x45(50)  25x35  30x30  35x25  25x50  30x40(45)  35x40  480  25x45(50)  25x46(45)  30x35  35x40  480  25x46(45)  30x35  35x40  480  25x46(45)  30x35  35x40  35x40  480  25x46(50)  25x40  35x45  35x40  35x46  35x45  35x45  35x45  35x45  35x45  35x45  35x45	140// 1				4.00								
150	VV V(vac)		22	20			2	50			3	315	
180													
180	ΦD Parameter Cap.(μF)	22	25	30	35	22	25	30	35	22		30	35
220		22	25	30	35	22	25	30	35	22x25		30	35
1.01   1.04   25x30   1.17	150	22	25	30	35	22	25	30	35	22x25 0.8	25	30	35
22x30	150	22	25	30	35		25	30	35	22x25 0.8 22x30 0.92	25 25x25		35
1.1	150	22	25	30	35	22x25	25	30	35	22x25 0.8 22x30 0.92 22x35	25 25x25	30x25	35
1.19	150 180 220		25	30	35	22x25 1.01	25	30	35	22x25 0.8 22x30 0.92 22x35 1.04	25 25x25 0.94	30x25	35
390	150 180 220	22x25 1.1	25	30	35	22x25 1.01 22x30		30	35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18	25 25x25 0.94 25x30 1.19	30x25 1.17	
1.39	150 180 220 270	22x25 1.1 22x30	25	30	35	22x25 1.01 22x30	25x25	30	35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45	25 25x25 0.94 25x30 1.19 25x35	30x25 1.17	35x25
470         1.55         1.56         1.63         1.62         1.7         1.71         35x35           560         22x40         30x30         22x45(50)         25x35         30x30         35x25         25x50         30x40(45)         2           1.73         1.79         1.8(1.82)         1.78         1.83         1.91         1.88         1.92(1.97)         35x40           680         22x45(50)         25x35         30x35         35x25         25x40(45)         30x35         35x30         30x50         2.29           1.94(1.99)         1.96         2.02         2.1         2.0(2.4)         2.06         2.15         2.21         35x45           820         25x40(45)         30x40         35x30         25x50         30x40(45)         35x35         2.57           820         25x40(45)         30x40         35x35         2.28         2.33(2.39)         2.38         35x50           1000         25x45         30x45         35x35         30x50         35x40         2.89           1200         2.51         2.59         2.63         2.68         2.72         2.22         2.89           1500         2.88         2.98         35x45	150 180 220 270 330	22x25 1.1 22x30		30	35	22x25 1.01 22x30 1.2	25x25 1.32		35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33	25 25x25 0.94 25x30 1.19 25x35 1.37	30x25 1.17	35x25
560         22x40         30x30         22x45(50)         25x35         30x30         35x25         25x50         30x40(45)         2           1.73         1.79         1.8(1.82)         1.78         1.83         1.91         1.88         1.92(1.97)         35x40           680         22x45(50)         25x35         30x35         35x25         25x40(45)         30x35         35x30         30x50         2.29           1.94(1.99)         1.96         2.02         2.1         2.0(2.4)         2.06         2.15         2.21         35x45           820         25x40(45)         30x40         35x30         25x50         30x40(45)         35x35         2.57           2.2(2.24)         2.29         2.36         2.28         2.33(2.39)         2.38         35x50           1000         25x45         30x45         35x35         30x50         35x40         2.89           1200         30x50         35x40         35x45         3.05         35x45         35x50           1500         35x45         35x50         35x50         35x50         35x50         35x50	150 180 220 270 330	22x25 1.1 22x30 1.19	25x25 1.39		35	22x25 1.01 22x30 1.2 22x35 1.62	25x25 1.32 25x30	30x25	35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52	30x25 1.17 30x30 1.4	35x25 1.49 35x30
1.73         1.79         1.8(1.82)         1.78         1.83         1.91         1.88         1.92(1.97)         35x40           680         22x45(50)         25x35         30x35         35x25         25x40(45)         30x35         35x30         30x50         2.29           1.94(1.99)         1.96         2.02         2.1         2.0(2.4)         2.06         2.15         2.21         35x45           820         25x40(45)         30x40         35x30         25x50         30x40(45)         35x35         2.57           1000         25x45         30x45         35x35         30x50         35x40         2.89           1200         30x50         35x40         35x45         2.68         2.72         2.89           1500         2.88         2.98         3.05         35x50         35x50         35x50	150 180 220 270 330 390	22x25 1.1 22x30 1.19	25x25 1.39 25x30	30x25	35	22x25 1.01 22x30 1.2 22x35 1.62 22x40	25x25 1.32 25x30	30x25	35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45	30x25 1.17 30x30 1.4	35x25 1.49 35x30 1.82
820         1.94(1.99)         1.96         2.02         2.1         2.0(2.4)         2.06         2.15         2.21         35x45           820         25x40(45)         30x40         35x30         25x50         30x40(45)         35x35         2.57           1000         25x45         30x45         35x35         30x50         35x40         2.89           1200         30x50         35x40         35x45         3.05         35x45           1500         35x45         35x50         35x50         35x50	150 180 220 270 330 390 470	22x25 1.1 22x30 1.19 22x35 1.55	25x25 1.39 25x30	30x25 1.63	35	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62	25x25 1.32 25x30 1.43	30x25 1.51		22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25 25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7	30x25 1.17 30x30 1.4 30x35 1.71	35x25 1.49 35x30 1.82 35x35
820         25x40(45)         30x40         35x30         25x50         30x40(45)         35x35         2.57           1000         25x45         30x45         35x35         2.28         2.33(2.39)         2.38         35x50           1000         25x45         30x45         35x35         30x50         35x40         2.89           1200         30x50         35x40         35x45         35x45         35x45           1500         35x45         35x50         35x50         35x50	150 180 220 270 330 390 470	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73	25x25 1.39 25x30 1.56	30x25 1.63 30x30 1.79		22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78	30x25 1.51 30x30 1.83	35x25 1.91	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97)	35x25 1.49 35x30 1.82 35x35 2 35x40
1000     25x45     30x45     35x35     30x50     35x40     2.89       1200     30x50     35x40     35x45     35x45       1500     35x45     35x50       1800     35x50	150 180 220 270 330 390 470 560	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56	30x25 1.63 30x30 1.79 30x35	35x25	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45)	30x25 1.51 30x30 1.83 30x35	35x25 1.91 35x30	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29
1200 2.51 2.59 2.63 2.68 2.72 35x45 35x45 35x45 35x50 35x45 35x50 35x50 35x50 35x50 35x50 35x50	150 180 220 270 330 390 470 560 680	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56 25x35 1.96 25x40(45)	30x25 1.63 30x30 1.79 30x35 2.02 30x40	35x25 2.1 35x30	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45) 2.0(2.4) 25x50	30x25 1.51 30x30 1.83 30x35 2.06 30x40(45)	35x25 1.91 35x30 2.15 35x35	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29 35x45 2.57
1500 2.88 2.98 3.05 35x50 35x50 33x41 3.49 35x50	150 180 220 270 330 390 470 560 680 820	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56 25x40(45) 2.2(2.24) 25x45	30x25 1.63 30x30 1.79 30x35 2.02 30x40 2.29 30x45	35x25 2.1 35x30 2.36 35x35	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45) 2.0(2.4) 25x50	30x25 1.51 30x30 1.83 30x35 2.06 30x40(45) 2.33(2.39) 30x50	35x25 1.91 35x30 2.15 35x35 2.38 35x40	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29 35x45 2.57 35x50
3.41 3.49 35x50	150 180 220 270 330 390 470 560 680 820 1000	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56 25x40(45) 2.2(2.24) 25x45	30x25 1.63 30x30 1.79 30x35 2.02 30x40 2.29 30x45 2.59	35x25 2.1 35x30 2.36 35x35 2.63	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45) 2.0(2.4) 25x50	30x25 1.51 30x30 1.83 30x35 2.06 30x40(45) 2.33(2.39) 30x50	35x25 1.91 35x30 2.15 35x35 2.38 35x40 2.72	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29 35x45 2.57 35x50
1800 35x50	150 180 220 270 330 390 470 560 680 820 1000	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56 25x40(45) 2.2(2.24) 25x45	30x25 1.63 30x30 1.79 30x35 2.02 30x40 2.29 30x45 2.59 30x50	35x25 2.1 35x30 2.36 35x35 2.63 35x40 2.98	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45) 2.0(2.4) 25x50	30x25 1.51 30x30 1.83 30x35 2.06 30x40(45) 2.33(2.39) 30x50	35x25 1.91 35x30 2.15 35x35 2.38 35x40 2.72 35x45 3.05	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29 35x45 2.57 35x50
3.82	150 180 220 270 330 390 470 560 680 820 1000 1200	22x25 1.1 22x30 1.19 22x35 1.55 22x40 1.73 22x45(50)	25x25 1.39 25x30 1.56 25x40(45) 2.2(2.24) 25x45	30x25 1.63 30x30 1.79 30x35 2.02 30x40 2.29 30x45 2.59 30x50	35x25 2.1 35x30 2.36 35x35 2.63 35x40 2.98 35x45	22x25 1.01 22x30 1.2 22x35 1.62 22x40 1.62 22x45(50)	25x25 1.32 25x30 1.43 25x35 1.78 25x40(45) 2.0(2.4) 25x50	30x25 1.51 30x30 1.83 30x35 2.06 30x40(45) 2.33(2.39) 30x50	35x25 1.91 35x30 2.15 35x35 2.38 35x40 2.72 35x45 3.05 35x50	22x25 0.8 22x30 0.92 22x35 1.04 22x40 1.18 22x45 1.33 22x50	25x25 0.94 25x30 1.19 25x35 1.37 25x40 1.52 25x45 1.7 25x50	30x25 1.17 30x30 1.4 30x35 1.71 30x40(45) 1.92(1.97) 30x50	35x25 1.49 35x30 1.82 35x35 2 35x40 2.29 35x45 2.57 35x50

# MP Series ■STANDARD RATINGS

WV(vdc) 350				4	00		420					
Paramo <sub>fer</sub> Cap.(μF)	22	25	30	35	22	25	30	35	22	25	30	35
100	Case Size	e ФDxL (m	m)———		22x25				22x25			
	Ripple Current(Arms) at 120Hz 105°C				▶ 0.66				0.66			
120	22x25				22x30				22x30	25x25		
120	0.72				0.75				0.75	0.77		
150	22x30				22x35	25x25			22x35			
130	0.84				0.86	0.83			0.86			
180		25x25			22x40	25x30	30x25			25x30(35)	30x25	
100		0.94			0.96	0.97	1.02		0.96(0.98)	0.97(1.01)	1.02	
220	22x35(40)	25x30	30x225		22x45	25x35		35x25	22x50	25x40	30x30	35x25
220	1.04(1.06)	1.07	1.13		1.09	1.12		1.22	1.11	1.14	1.14	1.22
270	22x45	25x35	30x30	35x25	22x50	25x40(45)	30x30			25x45	30x35	35x30
210	1.2	1.24	1.27	1.35	1.23	1.26(1.29)	1.27			1.29	1.3	1.38
330	22x50	25x40	30x35			25x50	30x35	35x30		25x50	30x40	35x35
330	1.36	1.39	1.43			1.44	1.43	1.52		1.44	1.48	1.54
390		25x45	30x40	35x30			30x40	35x35			30x45	35x40
330		1.55	1.6	1.66			1.6	1.52			1.64	1.73
470		25x50	30x45	35x35			30x45(50)	35x40			30x50	35x45
470		1.72	1.81	1.83			1.81(1.84)	1.9			1.84	1.94
560			30x50	35x40				35x45			<u> </u>	35x50
300			2	2.07				2.12				2.17
680				35x45				35x50				
				2.34				2.39				
820				35x50								
020				2.62								

WV(vdc)	450							
Рагал <sub>еге</sub> , Сар.(µF)	22	25	30	35				
82	22x25							
02	0.59							
100	22x30	25x25						
100	0.69	0.7						
120	22x35							
120	0.77							
150	22x40(45)	25x30(35)	30x25					
130	0.88(0.9)	0.88(0.92)	0.93					
180	22x50	25x40	30x30	35x25				
100	1.01	1.03	1.03	1.1				
220		25x45	30x35	35x30				
220		1.16	1.17	1.24				
270		25x50	30x40	35x25				
270		1.31	1.33	1.39				
330			30x45					
330			1.51					
390			30x50	35x40(45)				
390			1.67	1.73(1.77)				
470				35x50				
470				1.98				