



## FEATURES

- Highly reliable capacitors that withstand under high ripple current.
- Two or three dimensions with same ratings.
- Aluminum case designed explosion-proof vent.
- Best for switching power supplies.

## SPECIFICATIONS

Item	Performance Characteristics									
Operating Temperature Range	-40 to +105°C				-25 to +105°C					
Rated Working Voltage Range	10 to 100V				160 to 500V					
Nominal Capacitance Range	47 to 56000µF									
Capacitance Tolerance	±20% at 120Hz, +20°C									
Leakage Current	I ≤ 3√CV (µA) after 5 minutes application of rated working voltage at +20°C									
tan δ (120Hz, +20°C)	Working Voltage (V)	10	16	25	35	50	63	80	100	
	tan δ (max.)	0.55	0.50	0.45	0.35	0.30	0.30	0.25	0.20	
	Working Voltage (V)	160~220	250	315~385	400~500					
	tan δ (max.)	0.15	0.15	0.15	0.20					
For capacitance value >33000µF, add following calculated value: $\frac{(\text{rated capacitance}) - 33000\mu\text{F}}{10000\mu\text{F}} \times 0.1$										
Low Temperature Characteristics	Impedance ratio max. at 120Hz									
	Working Voltage (V)	10	16	25	35	50	63	80	100	
	Z-25°C / Z+20°C	6	6	6	6	4	3	3	3	
	Z-40°C / Z+20°C	15	15	15	15	15	15	15	15	
High Temperature Loading	Working Voltage (V)	160~180	200~220	250	315~385	400	450	500		
	Z-25°C / Z+20°C	8	8	8	8	8	8	8		
	Test time	: 2,000 hours			Post test requirements at +20°C					
	Test temperature	: +105°C			Leakage current : ≤Initial specified value					
Shelf Life	Test conditions	: Rated DC working voltage with rated ripple current			Cap. change : within ±20% of the initial measured value					
					tan δ : ≤200% of the initial specified value					
		At +105°C no voltage applied after 1,000 hours and then being stabilized at +20°C the capacitors shall meet the following limits								
	Leakage current : ≤Initial specified value			Cap. change : within ±15% of the initial measured value						
	tan δ : ≤150% of the initial specified value									
Industrial Standard	JIS C - 5101-4 (IEC 60384-4)									

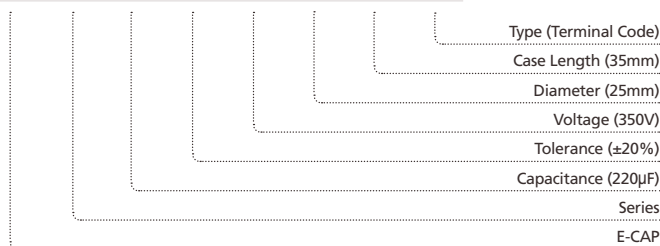
## RIPPLE CURRENT MULTIPLIER

### Frequency Coefficient

Coefficient	Freq. (Hz)	Rated Voltage			
		60	120	1k	10k~50k
	10~100V	0.90	1.00	1.15	1.25
	160~250V	0.80	1.00	1.25	1.47
	315~500V	0.80	1.00	1.30	1.47

## PART NUMBER SYSTEM (EXAMPLE : 350V 220µF)

1	2 3	4 5 6	7	8 9	10	11 12	13 14
E	HP	227	M	2V	O	35	SW



### STANDARD RATINGS

Voltage (Code)		10V (1A)		16V (1C)		25V (1E)		35V (1V)	
Cap. (µF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
2700	278							20 x 25	1.62
3300	338							20 x 30	1.94
								22 x 25	1.90
3900	398					20 x 25	1.72	20 x 35	2.02
								22 x 30	2.00
4700	478					20 x 30	2.04	20 x 40	2.21
						22 x 25	2.00	22 x 35	2.20
								25 x 25	2.20
5600	568			20 x 25	1.89	20 x 35	2.23	22 x 35	2.40
						22 x 30	2.20	25 x 30	2.40
						20 x 40	2.72	22 x 40	2.60
6800	688	20 x 25	1.41	20 x 30	2.25	22 x 30	2.40	25 x 35	2.78
				22 x 25	2.20	25 x 25	2.40	30 x 25	2.78
8200	828	20 x 30	1.67	20 x 35	2.43	22 x 35	2.70	22 x 50	2.90
				22 x 30	2.40	25 x 30	2.70	25 x 40	2.90
						30 x 25	2.70	30 x 30	2.90
10000	109	20 x 30	1.88	20 x 40	2.79	22 x 40	3.00	25 x 45	3.20
				22 x 30	2.60	25 x 35	3.00		
		22 x 25	1.80	25 x 25	2.60	30 x 30	3.00	30 x 35	3.20
12000	129	20 x 35	2.23	22 x 35	2.90	22 x 50	3.20	25 x 50	3.50
		22 x 30	2.20	25 x 30	2.90	25 x 40	3.20	30 x 40	3.50
		25 x 25	2.20	30 x 25	2.90	30 x 30	3.20	35 x 30	3.50
15000	159	20 x 40	2.31	22 x 40	3.20	25 x 45	3.60	30 x 45	3.90
		22 x 35	2.30	25 x 35	3.20	30 x 35	3.60	35 x 35	3.90
		25 x 25	2.30	30 x 30	3.20	35 x 30	3.60		
		22 x 40	2.52	22 x 45	3.50	30 x 40	3.90		
18000	189	25 x 30	2.40	25 x 40	3.50			35 x 40	4.51
		30 x 25	2.49	30 x 30	3.50	35 x 35	3.90		
22000	229	22 x 45	2.60	25 x 45	3.80	30 x 45	4.30		
		25 x 35	2.60	30 x 35	3.80			35 x 45	5.24
		30 x 25	2.60	35 x 30	3.80	35 x 35	4.30		
27000	279	22 x 50	3.19	25 x 50	4.20				
		25 x 40	3.10	30 x 40	4.20	35 x 45	4.80		
		30 x 30	3.10	35 x 30	4.20				
33000	339	25 x 45	3.40	30 x 45	4.70				
		30 x 35	3.40			35 x 50	5.55		
		35 x 30	3.40	35 x 35	4.70				
39000	399	30 x 40	3.79	30 x 50	5.10				
		35 x 30	3.70	35 x 40	5.10				
47000	479	30 x 45	4.26	35 x 45	5.50				
		35 x 35	4.20						
56000	569	35 x 40	5.00						

Maximum Allowable Ripple Current (Arms) at 105°C 120Hz

Case Size  $\Phi$ D x L (mm)

**STANDARD RATINGS**

Voltage (Code)		50V (1H)		63V (1J)		80V (1K)		100V (2A)	
Cap. (μF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
560	567							20 x 25	0.95
680	687							20 x 30	1.15
								22 x 25	1.09
820	827					20 x 25	1.04	20 x 35	1.31
								22 x 30	1.40
1000	108			20 x 25	1.21	20 x 30	1.24	20 x 35	1.43
						22 x 25	1.19	22 x 30	1.47
								25 x 25	1.45
1200	128			20 x 30	1.43	20 x 35	1.43	20 x 40	1.61
				22 x 25	1.40	22 x 30	1.50	22 x 35	1.69
								25 x 30	1.68
1500	158	20 x 25	1.29	20 x 35	1.52	20 x 35	1.57	22 x 40	1.97
				22 x 30	1.50	22 x 30	1.59	25 x 35	1.98
						25 x 25	1.59	30 x 25	1.95
1800	188	20 x 30	1.53	20 x 35	1.72	20 x 40	1.77	22 x 45	2.23
		22 x 25	1.50	22 x 30	1.70	22 x 35	1.79	25 x 40	2.20
				25 x 25	1.70	25 x 30	1.71	30 x 30	2.20
2200	228	20 x 35	1.72	20 x 40	2.01	22 x 40	2.03	25 x 45	2.53
		22 x 30	1.70	22 x 30	1.87	25 x 35	2.10	30 x 35	2.55
				25 x 30	2.00	30 x 25	1.98	35 x 30	2.60
2700	278	20 x 35	1.82	22 x 40	2.20	22 x 45	2.39	25 x 50	2.82
		22 x 30	1.80	25 x 35	2.20	25 x 40	2.35	30 x 40	2.86
		25 x 25	1.80	30 x 25	2.20	30 x 30	2.35	35 x 35	2.90
3300	338	20 x 40	2.01	22 x 45	2.60	25 x 45	2.64	30 x 45	3.30
		22 x 35	2.00	25 x 35	2.39	30 x 35	2.61	35 x 35	3.25
		25 x 30	2.00	30 x 30	2.50	35 x 30	2.60		
3900	398	22 x 40	2.23	25 x 40	2.57	25 x 25	2.92	30 x 50	3.60
		25 x 30	2.20			30 x 40	2.82		
		30 x 25	2.20	30 x 35	2.70	35 x 30	2.97	35 x 40	3.67
4700	478	22 x 45	2.50	25 x 50	3.00	30 x 45	3.34	35 x 45	3.80
		25 x 35	2.43	30 x 40	3.00				
		30 x 30	2.50	35 x 30	3.00	35 x 35	3.38		
5600	568	22 x 50	2.80	30 x 40	3.22	30 x 50	3.80	35 x 50	4.05
		25 x 40	2.80						
		30 x 30	2.76	35 x 35	3.30	35 x 40	3.80		
6800	688	25 x 45	3.30	30 x 50	3.86				
		30 x 35	3.30			35 x 45	3.90		
		35 x 30	3.30	35 x 40	3.84				
8200	828	30 x 40	3.71	35 x 45	4.43	35 x 50	4.20		
		35 x 35	3.85						
10000	109	30 x 45	4.30	35 x 50	5.11				
		35 x 40	4.49						
12000	129	35 x 45	4.56						
15000	159	35 x 50	4.80						

Maximum Allowable Ripple Current (Arms) at 105°C 120Hz

Case Size  $\Phi$ D x L (mm)

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### STANDARD RATINGS

Voltage (Code)		160V (2C)		180V (2P)		200V (2D)		220V (2N)	
Cap. (µF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
180	187							20 x 25	0.90
220	227			20 x 25	1.00	20 x 25	1.00	20 x 30 22 x 25	1.00 1.00
270	277	20 x 25	1.10	20 x 30 22 x 25	1.10 1.00	20 x 30 22 x 25	1.10 1.10	20 x 35 22 x 30	1.15 1.15
330	337	20 x 30 22 x 25	1.20 1.20	20 x 30 22 x 25	1.20 1.20	20 x 35 22 x 30 25 x 25	1.20 1.25 1.25	20 x 40 22 x 35 25 x 25	1.25 1.25 1.25
390	397	20 x 35 22 x 30	1.42 1.30	20 x 35 22 x 30 25 x 25	1.30 1.35 1.35	20 x 40 22 x 30 25 x 25	1.31 1.35 1.35	20 x 45 22 x 35 25 x 30	1.40 1.40 1.40
470	477	20 x 40 22 x 30 25 x 25	1.34 1.55 1.55	20 x 40 22 x 35 25 x 30	1.40 1.50 1.50	22 x 35 25 x 30 30 x 25	1.50 1.50 1.50	22 x 40 25 x 30 30 x 25	1.51 1.44 1.50
560	567	22 x 35 25 x 30	1.67 1.67	22 x 40 25 x 30 30 x 25	1.67 1.67 1.67	22 x 40 25 x 30 30 x 25	1.67 1.59 1.67	22 x 45 25 x 35 30 x 30 35 x 25	1.70 1.64 1.70 1.71
680	687	22 x 40 25 x 35 30 x 25	1.82 1.85 1.82	22 x 45 25 x 35 30 x 30	1.78 1.78 1.78	22 x 45 25 x 35 30 x 30	1.78 1.72 1.78	25 x 40 30 x 35 35 x 30	1.84 1.93 1.89
820	827	22 x 45 25 x 35 30 x 30	2.04 2.04 2.04	22 x 50 25 x 40 30 x 30	2.04 2.04 2.04	25 x 40 30 x 35 35 x 25	1.99 2.04 2.04	25 x 45 30 x 40 35 x 30	2.08 2.19 2.16
1000	108	25 x 45 30 x 35	2.40 2.25	25 x 45 30 x 35 35 x 30	2.30 2.30 2.30	25 x 50 30 x 35 35 x 30	2.42 2.30 2.30	30 x 45 35 x 35	2.50 2.44
1200	128	25 x 50 30 x 35 35 x 30	2.62 2.49 2.49	30 x 40 35 x 35	2.55 2.55	30 x 40 35 x 35	2.65 2.65	35 x 40	2.79
1500	158	30 x 40 35 x 35	2.84 2.84	30 x 45 35 x 35	2.90 2.90	35 x 40	3.08	35 x 45	3.22
1800	188	30 x 50 35 x 35	3.32 3.00	35 x 40	3.30	35 x 45	3.48		
2200	228	35 x 45	3.50	35 x 50	3.65				

Maximum Allowable Ripple Current (Arms) at 105°C 120Hz

Case Size  $\Phi$ D x L (mm)

**STANDARD RATINGS**

Voltage (Code)		250V (2E)		315V (2F)		350V (2V)		385V (2Y)	
Cap. (μF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
56	566							20 x 25	0.37
68	686					20 x 25	0.47	20 x 30	0.44
								22 x 25	0.45
82	826			20 x 25	0.64	20 x 30	0.54	20 x 30	0.50
								22 x 30	0.52
100	107			20 x 30	0.69	20 x 30	0.60	20 x 35	0.56
						22 x 25	0.69	20 x 30	0.58
120	127			20 x 30	0.75	20 x 35	0.68	25 x 25	0.57
								20 x 40	0.66
150	157	20 x 25	0.79	22 x 25	0.75	22 x 25	0.70	22 x 30	0.68
				20 x 35	0.82	20 x 40	0.78	25 x 30	0.68
				22 x 30	0.82	22 x 30	0.77	22 x 40	0.79
180	187	20 x 30	0.90	25 x 25	0.82	22 x 30	0.77	25 x 30	0.78
				20 x 40	0.90	22 x 35	0.87	30 x 25	0.75
				22 x 30	0.86	22 x 40	0.87	22 x 40	0.84
220	227	22 x 25	1.00	25 x 25	0.86	25 x 30	0.92	25 x 35	0.86
				22 x 35	0.98	30 x 25	0.90	30 x 30	0.88
				25 x 30	1.04	22 x 40	1.00	22 x 45	0.96
270	277	20 x 35	1.10	30 x 25	1.04	25 x 35	1.04	25 x 35	0.94
				22 x 40	1.10	30 x 30	1.02	30 x 30	1.00
				22 x 30	1.18	22 x 45	1.11	25 x 45	1.13
330	337	25 x 30	1.30	25 x 35	1.04	25 x 40	1.11	30 x 35	1.08
				25 x 40	1.33	25 x 40	1.18	30 x 30	1.17
				30 x 25	1.35	30 x 25	1.16	30 x 30	1.17
390	397	22 x 40	1.49	22 x 45	1.27	30 x 30	1.17	35 x 30	1.10
				25 x 40	1.40	25 x 45	1.29	30 x 45	1.31
				25 x 30	1.30	25 x 45	1.29	35 x 30	1.24
470	477	30 x 25	1.49	30 x 30	1.33	25 x 50	1.51	30 x 45	1.41
				30 x 30	1.33	30 x 35	1.43	35 x 35	1.40
				35 x 30	1.47	30 x 40	1.57	35 x 40	1.68
560	567	22 x 45	1.65	30 x 40	1.70	30 x 40	1.57	35 x 40	1.68
				25 x 40	1.65	35 x 30	1.69		
				30 x 30	1.65	35 x 35	1.69		
680	687	25 x 45	1.80	35 x 30	1.70	30 x 50	1.85	35 x 45	1.87
				30 x 40	1.95	35 x 40	1.90		
				30 x 35	1.80	35 x 40	1.90		
820	827	25 x 50	2.03	35 x 35	2.05	35 x 45	2.20		
				30 x 35	2.00				
				35 x 30	2.00				
1000	108	30 x 40	2.30	35 x 45	2.20				
				35 x 35	2.30				
1200	128	30 x 50	2.70						
				35 x 40	2.69				

Maximum Allowable Ripple Current (Arms) at 105°C 120Hz

Case Size ΦD x L (mm)

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## STANDARD RATINGS

Voltage (Code)		400V (2G)		420V (2M)		450V (2W)		500V (2H)	
Cap. (µF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
47	476					20 x 25	0.39	22 x 25	0.35
56	566	20 x 25	0.51	20 x 25	0.51	20 x 30	0.51	22 x 25	0.38
						22 x 25	0.50		
68	686	20 x 30	0.56	20 x 30	0.56	20 x 35	0.56	22 x 30	0.45
		22 x 25	0.55	22 x 25	0.55	22 x 30	0.53		
						25 x 25	0.53		
82	826	20 x 30	0.64	20 x 35	0.64	20 x 35	0.64	22 x 35	0.54
		22 x 25	0.64	22 x 25	0.64	22 x 30	0.64		
						25 x 25	0.64		
100	107	20 x 35	0.70	20 x 35	0.70	22 x 30	0.65	22 x 35	0.56
		22 x 30	0.70	22 x 30	0.70	25 x 25	0.64		
		25 x 25	0.70	25 x 25	0.70	30 x 25	0.72		
120	127	20 x 40	0.75	20 x 40	0.75	22 x 40	0.80	22 x 40	0.64
		22 x 30	0.70	22 x 30	0.70	25 x 30	0.80		
				30 x 25	0.78	30 x 25	0.80		
150	157	22 x 40	0.88	22 x 40	0.88	22 x 40	0.84	25 x 40	0.76
		25 x 30	0.83	25 x 35	0.88	25 x 35	0.88		
		30 x 25	0.88	30 x 25	0.88	30 x 30	0.88		
180	187	22 x 40	0.93	22 x 40	0.90	25 x 40	1.00	30 x 35	0.86
		25 x 35	0.98	25 x 35	0.92				
				30 x 30	0.98	30 x 30	0.96		
						35 x 25	0.94		
220	227	22 x 45	1.05	22 x 45	1.05	25 x 45	1.12	30 x 40	0.97
		25 x 35	1.04	30 x 30	1.03	30 x 35	1.12		
		30 x 30	1.10	35 x 25	1.10	35 x 30	1.12		
270	277	25 x 50	1.29	25 x 50	1.37	30 x 40	1.28	30 x 45	1.12
		30 x 35	1.22	30 x 35	1.18	35 x 35	1.28		
		35 x 30	1.22	35 x 30	1.22				
330	337	30 x 45	1.55	30 x 45	1.49	30 x 45	1.39		
		35 x 30	1.44	35 x 30	1.36	35 x 40	1.45		
390	397	30 x 45	1.60	30 x 45	1.60	35 x 40	1.55		
		35 x 35	1.60	35 x 40	1.66				
470	477	35 x 40	1.90	35 x 40	1.81	35 x 50	1.85		
560	567	35 x 45	2.12						

Maximum Allowable Ripple Current (Arms) at 105°C 120Hz

Case Size  $\Phi$ D x L (mm)

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