

## FEATURES

- High ripple current.
- Two or three dimensions with same ratings.
- Aluminum case designed explosion-proof vent.
- Best for switching power supplies.
- Load life with ripple current : 105°C 5,000 hours.



## SPECIFICATIONS

Item	Performance Characteristics						
Operating Temperature Range	-40 to +105°C			-25 to +105°C			
Rated Working Voltage Range	10 to 100V			160 to 450V			
Nominal Capacitance Range	82 to 47000µF						
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	63~100
	tan δ (max.)	0.60	0.45	0.30	0.25	0.20	0.15
	Working Voltage (V)	160~400	420~450				
	tan δ (max.)	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	63~100
	Z-25°C / Z+20°C	6	6	6	6	4	3
	Z-40°C / Z+20°C	15	15	15	15	15	15
High Temperature Loading	Working Voltage (V)	160	250	315	350	400~420	450
	Z-25°C / Z+20°C	8	8	8	8	8	8
High Temperature Loading	Test time : 5,000 hours						Post test requirements at +20°C
	Test temperature : +105°C						Leakage current : ≤Initial specified value
High Temperature Loading	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
Shelf Life	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
Shelf Life	Cap. change : within ±15% of the initial measured value						tan δ : ≤150% of the initial specified value
	tan δ : ≤150% of the initial specified value						
Industrial Standard	JIS C - 5101-4 (IEC 60384-4)						

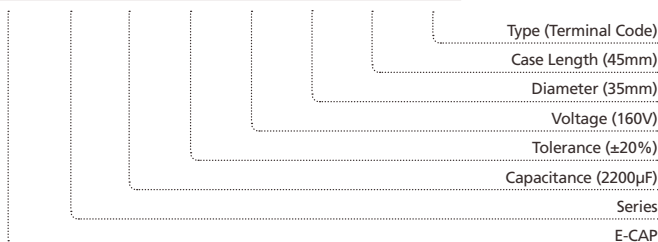
## RIPPLE CURRENT MULTIPLIER

### Frequency Coefficient

Coefficient	Freq. (Hz)	60	120	1k	10k~50k
Rated Voltage	10~100V	0.90	1.00	1.15	1.25
	160~250V	0.80	1.00	1.25	1.47
	315~450V	0.80	1.00	1.30	1.47

## PART NUMBER SYSTEM (EXAMPLE : 160V 2200µF)

1	2 3	4 5 6	7	8 9	10	11 12	13 14
E	EP	228	M	2C	Q	45	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
2200	228							22 x 25	1.10
3300	338							22 x 30	1.42
								25 x 25	1.41
3900	398					22 x 25	1.31	22 x 35	1.58
								25 x 30	1.58
4700	478					22 x 30	1.51	22 x 40	1.78
						25 x 25	1.51	30 x 25	1.77
5600	568							25 x 35	1.98
				22 x 25	1.44	22 x 35	1.70	30 x 30	1.98
								35 x 25	2.03
6800	688	22 x 25	1.30	22 x 30	1.66	22 x 40	1.92	22 x 50	2.26
				25 x 25	1.66	25 x 30	1.87	25 x 40	2.24
						30 x 25	1.90	25 x 50	2.57
8200	828			22 x 35	1.87	25 x 35	2.14	25 x 50	2.57
						30 x 30	2.15	30 x 35	2.50
						35 x 25	2.19	35 x 30	2.55
10000	109	22 x 30	1.65	22 x 40	2.12	22 x 50	2.45	30 x 40	2.86
				25 x 30	2.07				
		25 x 25	1.64	30 x 25	2.11	25 x 40	2.43	35 x 35	2.88
12000	129	22 x 35	1.85	25 x 35	2.37	25 x 50	2.78	30 x 50	3.32
		25 x 30	1.85	30 x 30	2.37	30 x 35	2.70	35 x 40	3.30
		30 x 25	1.89	35 x 25	2.42	35 x 30	2.76		
15000	159	22 x 40	2.12	22 x 50	2.74	30 x 40	3.13		
		25 x 35	2.16	25 x 40	2.71	35 x 35	3.16		
18000	189	22 x 50	2.45	25 x 50	3.11	30 x 50	3.64	35 x 50	4.29
		25 x 40	2.43						
		30 x 30	2.37	30 x 35	3.02				
		35 x 25	2.42	35 x 30	3.09	35 x 40	3.61		
22000	229	30 x 35	2.73	30 x 40	3.46				
		35 x 30	2.79	35 x 35	3.49				
27000	279	25 x 50	3.11	30 x 50	4.07	35 x 50	4.70		
		30 x 40	3.13	35 x 40	4.04				
33000	339	35 x 35	3.49						
39000	399	30 x 50	3.99	35 x 50	5.16				
		35 x 40	3.96						
47000	479	35 x 50	4.62						

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

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

Specifications are subject to change without notice. Should a safety or technical concern arise regarding the product, please be sure to contact our sales offices or agents immediately.

**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
390	397							22 x 25	0.78
560	567							22 x 30	0.99
								25 x 25	0.98
680	687					22 x 25	0.97	22 x 35	1.12
								22 x 40	1.26
820	827					22 x 30	1.12	25 x 30	1.23
								30 x 25	1.25
1000	108			22 x 25	1.00	22 x 35	1.70	25 x 35	1.41
						25 x 25	1.92	30 x 30	1.42
								35 x 25	1.45
1200	128			22 x 30	1.15	22 x 40	1.42	22 x 50	1.60
						25 x 30	1.39	25 x 40	1.59
				25 x 25	1.15	30 x 25	1.41	30 x 35	1.61
1500	158	22 x 25	1.02	22 x 35	1.32	25 x 35	1.62	25 x 50	1.86
								30 x 40	1.87
								35 x 30	1.85
1800	188	22 x 30	1.17	22 x 40	1.49	22 x 50	1.84		
				25 x 30	1.45	25 x 40	1.82	35 x 35	2.07
		25 x 25	1.17	30 x 25	1.48	30 x 30	1.78		
						35 x 25	1.82		
2200	228	22 x 35	1.33	25 x 35	1.67	25 x 50	2.11	30 x 50	2.40
				30 x 30	1.68	30 x 35	2.05		
				35 x 25	1.71	35 x 30	2.09	35 x 40	2.39
2700	278	22 x 40	1.51	22 x 50	1.92	30 x 40	2.35		
		25 x 30	1.47	25 x 40	1.90			35 x 50	2.81
		30 x 25	1.50	30 x 35	1.93	35 x 35	2.37		
3300	338	25 x 35	1.70	25 x 50	2.20	30 x 50	2.75		
		30 x 30	1.70						
		35 x 25	1.74	35 x 30	2.18	35 x 40	2.73		
3900	398	22 x 50	1.91	30 x 40	2.41				
		25 x 40	1.89	35 x 35	2.43				
4700	478	30 x 35	2.11	30 x 50	2.80	35 x 50	3.46		
		35 x 30	2.16	35 x 40	2.78				
5600	568	25 x 50	2.38						
		30 x 40	2.39						
		35 x 35	2.41						
6800	688	30 x 50	2.79	35 x 50	3.55				
		35 x 40	2.78						
10000	109	35 x 50	3.57						

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

Case Size ΦD x L (mm)

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## STANDARD RATINGS

Voltage (Code)		160V (2C)		200V (2D)		250V (2E)		315V (2F)	
Cap. (µF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
150	157							22 x 30	0.86
180	187							22 x 35	0.98
								25 x 30	1.01
220	227					22 x 30	1.09	22 x 40	1.10
								30 x 25	1.17
270	277			22 x 25	1.10	22 x 35	1.28	22 x 45	1.24
								25 x 35	1.27
330	337					25 x 30	1.42	22 x 50	1.39
								25 x 40	1.45
								30 x 30	1.40
390	397	22 x 30	1.42	22 x 35	1.47	22 x 45	1.61	25 x 45	1.60
				25 x 30	1.50	25 x 35	1.53		
						30 x 30	1.62		
470	477			22 x 40	1.64	22 x 50	1.79	25 x 50	1.78
								30 x 40	1.81
								35 x 30	1.82
560	567	22 x 35	1.77	22 x 45	1.82	25 x 45	1.98	30 x 45	2.02
		25 x 30	1.81	25 x 35	1.82	30 x 35	1.95	35 x 35	2.00
				30 x 25	1.78				
680	687	22 x 40	1.98	22 x 50	1.90	25 x 50	2.21	30 x 50	2.21
		25 x 35	2.01	25 x 40	1.98	30 x 40	2.18	35 x 40	2.29
				30 x 25	1.96	30 x 30	1.98		
820	827	22 x 45	2.20	25 x 45	2.20	30 x 45	2.45	35 x 45	2.57
				30 x 35	2.22	35 x 35	2.38		
				25 x 45	2.65	25 x 50	2.46		
1000	108	30 x 35	2.55	30 x 40	2.53	35 x 40	2.72	35 x 50	2.89
		35 x 25	2.55	35 x 35	2.77				
		25 x 50	2.93	30 x 45	2.84				
1200	128	30 x 40	2.84	35 x 35	2.88	35 x 45	3.05		
		35 x 30	2.86						
		30 x 45	3.17					35 x 40	3.34
1500	158	35 x 35	3.22						
		30 x 50	3.53	35 x 45	3.74				
2200	228	35 x 45	4.14						
2700	278	35 x 50	4.68						

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

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**STANDARD RATINGS**

Voltage (Code)		350V (2V)		400V (2G)		420V (2M)		450V (2W)	
Cap. (μF)	Code	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
82	826							22 x 30	0.64
100	107			22 x 30	0.71	22 x 30	0.71	22 x 35 25 x 30	0.74 0.75
120	127	22 x 30	0.78	22 x 35	0.80	22 x 35 25 x 30	0.80 0.83	22 x 40	0.82
150	157	22 x 35	0.90	22 x 40 25 x 35	0.91 0.99	22 x 40	0.91	22 x 45 25 x 35 30 x 30	0.93 0.94 1.00
180	187	25 x 30	1.01	22 x 45 25 x 35 30 x 30	1.01 1.03 1.10	22 x 45 25 x 40 30 x 30	1.01 1.10 1.10	22 x 50 25 x 40 30 x 30	1.01 1.03 1.03
220	227	22 x 45 25 x 35 30 x 30	1.16 1.14 1.21	22 x 50 25 x 40	1.14 1.19	25 x 45 30 x 35 35 x 25	1.20 1.21 1.22	25 x 45 30 x 35 35 x 30	1.16 1.17 1.24
270	277	22 x 50 25 x 40 30 x 30	1.26 1.31 1.27	25 x 50 30 x 35	1.39 1.35	25 x 50 30 x 40 35 x 30	1.35 1.37 1.38	25 x 50 30 x 40 35 x 35	1.31 1.33 1.39
330	337	25 x 45 30 x 35	1.46 1.43	30 x 45 35 x 30	1.59 1.52	30 x 45 35 x 35	1.50 1.54	30 x 50	1.58
390	397	25 x 50 30 x 40 35 x 35	1.62 1.60 1.76	30 x 45 35 x 35	1.68 1.67	30 x 50 35 x 40	1.72 1.73	35 x 40	1.73
470	477	30 x 45 35 x 35	1.81 1.83	30 x 50 35 x 40	1.89 1.90	35 x 45	1.94	35 x 50	1.98
560	567	30 x 50 35 x 40	2.00 2.07	35 x 45	2.12	35 x 50	2.17		
680	687	35 x 45	2.34	35 x 50	2.39				
820	827	35 x 50	2.62						

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