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**SM** Miniature and general purpose Series

- Features: 105°C 2000 hours
- Features: For high quality , reliability application, high CV product
- Corresponding product to RoHS



■ Specifications

Item	Characteristics									
Operating Temperature Range	-40~+105°C					-25~+105°C				
Rated Voltage Range	6.3 ~ 100VDC					160 ~ 450VDC				
Rated Capacitance Range	0.47 ~ 15000μF					0.47 ~ 470μF				
Capacitance Tolerance	± 20 % at 120Hz , 20°C									
Leakage Current (MAX)(20°C)	I=0.01CV + 3(μA) ,whichever is greater. I=0.03CV+10(μA) (After rated voltage applied for 2 minutes )									
Dissipation Factor (MAX) (tan δ) (120Hz ,20°C)	WV	6.3	10	16	25	35	50	63~100	160~250	350~450
	tan δ	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.15	0.20
When nominal capacitance is over 1000uF , tan δ shall be added 0.02 to the listed value with increase of every 1000uF .										
Low Temperature Stability Impedance Ratio (MAX)	WV	6.3	10	16	25~100	160~250	350~450			
	Z(120Hz)									
	Z-25°C / Z+20°C	4	3	2	2	4	4			
	Z-40°C / Z+20°C	8	6	4	3	6	8			
Endurance	After applying rated voltage for 2000 hours at 105°C the capacitors shall meet the following requirements.									
	Capacitance Change	Within ± 20 % of initial value								
	Dissipation Factor	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. the capacitors shall meet the same requirement as Endurance.									

■ Diagram of Dimensions

φ D	5	6.3	8	10	12	13	16	18	22
p	2.0	2.5	3.5	5.0			7.5		10.0
φ d	0.5	0.5	0.6	0.6			0.8		0.8 ( 1.0 )
a	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0

( ) : L ≥ 40

■ Multiplier for Ripple Current

Frequency coefficient

Frequency (Hz)	120	300	1K	10K
6.3 ~ 100V Below 68 μ F	1.00	1.30	1.57	2.00
6.3 ~ 100V 100 ~ 470 μ F	1.00	1.23	1.34	1.50
6.3 ~ 100V 471 ~ 22000 μ F	1.00	1.10	1.13	1.15
160 ~ 450V ALL Cap ( μ F)	1.00	1.25	1.40	1.60

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## ■ Dimensions, Rated Ripple Current

Capacitance ( $\mu$ F)	Rated (Surge) Voltage														
	6.3 (8)		10 (13)		16 (20)		25 (32)		35 (44)		50 (63)		63 (79)		
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	
0.47												5x11	7	5x11	8
1.0												5x11	12	5x11	12
2.2												5x11	18	5x11	20
3.3												5x11	25	5x11	27
4.7												5x11	30	5x11	34
6.8												5x11	30	5x11	37
10										5x11	44	5x11	50	5x11	55
15										5x11	50	5x11	50	5x11	65
22								5x11	60	5x11	65	5x11	75	6.3x11	90
33						5x11	70	5x11	75	5x11	85	6.3x11	105	8x11	110
47				5x11	75	5x11	85	5x11	90	6.3x11	115	8x11	125	8x11	155
68				5x11	80	5x11	100	6.3x11	125	8x11	130	8x11	159	10x12.5	198
100	5x11	100	5x11	110	6.3x11	135	6.3x11	145	8x11	190	10x12.5	210	10x12.5	260	
150	5x11	120	6.3x11	130	8x11	180	8x11	200	10x12.5	240	10x12.5	289	10x16	330	
220	6.3x11	165	6.3x11	180	6.3x11	180	10x12.5	250	10x12.5	315	10x16	400	10x20	465	
					8x11	235									
330	8x11	200	8x11	255	10x12.5	285	10x12.5	355	10x16	440	10x20	535	13x20	650	
470	8x11	280	8x11	305	8x11	315	10x16	470	10x20	460	13x20	730	13x25	800	
					10x12.5	395			13x20	580					
680	10x12.5	320	10x12.5	420	10x16	530	10x20	650	13x20	730	13x25	860	16x25	1000	
1000	10x12.5	470	10x12.5	490	10x20	700	13x20	855	13x25	995	16x25	1110	16x32	1200	
			10x16	570											
1500	10x16	600	10x20	750	13x20	860	13x25	1020	16x25	1110	16x32	1350	16x36	1450	
2200	13x20	930	10x20	800	13x25	1150	16x25	1230	16x32	1450	18x36	1530			
			13x20	1010											
3300	13x20	1100	13x25	1220	16x25	1350	16x32	1450	18x36	1660					
	4700	16x25	1320	16x25	1410	16x25	1330	18x36	1690						
					16x32	1560									
6800	16x25	1490	16x32	1610	18x36	1790									
10000	16x32	1830	18x36	1980											
15000	18x36	2280													

☆ Size:  $D \phi \times L$  (mm) ☆ Ripple Current: (mA/rms). 105°C, 120Hz

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## ■ Dimensions, Rated Ripple Current

Capacitance ( $\mu$ F)	Rated (Surge) Voltage													
	100 (125)		160 (200)		200 (250)		250 (300)		350 (400)		400 (450)		450 (500)	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
0.47	5X11	10	5x11	12	5x11	12	5x11	12	6.3x11	14	6.3x11	14	6.3x11	16
1.0	5x11	15	5x11	17	6.3x11	17	6.3x11	17	8x11	20	8x11	20	8x11	22
2.2	5x11	22	6.3x11	25	6.3x11	25	8x11	29	10x12.5	35	10x12.5	35	10x12.5	37
3.3	5x11	29	8x11	36	8x11	36	10x12.5	42	10x16	47	10x12.5	42	10x16	51
											10x16	49		
4.7	5x11	37	8x11	43	10x12.5	50	10x12.5	52	10x16	55	10x16	57	10x16	59
6.8	5x11	46	10x12.5	54	10x12.5	60	10x12.5	62	10x20	65	10x16	67	13x20	69
10	6.3x11	65	10x12.5	70	10x16	80	10x16	75	13x20	95	10x20	75	13x25	99
							10x20	88			13x20	97		
15	8x11	82	10x16	90	10x20	110	13x20	120	13x20	140	13x25	145	16x25	150
22	8x11	115	10x20	130	10x16	140	13x20	130	16x25	165	13x20	120	16x25	145
							13x25	155			13x25	140	16x32	175
											16x25	170		
33	10x12.5	160	13x20	180	13x20	160	13x25	200	16x32	195	16x25	190	18x36	250
					13x25	190					16x32	230		
47	10x16	210	13x25	250	13x20	220	16x25	270	16x36	210	16x25	200	18x40	350
					13x25	260			18x36	240	16x32	250		
											18x36	300		
68	10x20	241	13x25	270	16x25	280	16x32	300	18x36	320	18x36	325	22x40	380
	10x20	305	16x25	390	16x32	400	18x36	440	18x40	300	18x36	290		
	13x20	385							22x40	360	22x40	365		
120											18x36	320		
											18x40	350		
150	13x25	414	16x32	435	16x36	450	18x40	600	22x40	480	22x40	465		
220	13x25	495	16x36	700	18x36	675	22x40	800						
	16x25	590			18x40	750								
330	16x25	720	18x40	850	18x40	780								
					22x40	920								
470	16x32	875	22x40	980										
680	16x36	1200												

☆ Size: D  $\phi$  x L (mm) ☆ Ripple Current: (mA/rms). 105°C, 120Hz