SP Series

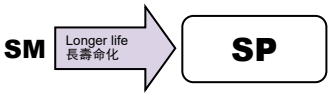
SNAP-IN TERMINAL TYPE, LONG LIFE

導箔型, 長壽命品



- Endurance 3000 hours at 85°C
  在 85°C 環境中耐久性 3000 小時
- Long life
  長壽命
- Comply with the RoHS & REACH
  符合 RoHS 與 REACH





□ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性	
Category Temperature Range 工作温度範圍	-40 ~ +85°C	-25 ~ +85°C
Voltage Range 額定工作電壓範圍	16 ~ 350V	400 ~ 450V
Capacitance Range 靜電容量範圍	82 ~ 68000μF	56 ~ 560μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C	
Leakage Current 漏電流	I ≤3$\sqrt{CV}$ (after 5 minutes application of rated voltage at 20°C) （在 20°C 環境中施加額定工作電壓 5 分鐘後） I: Leakage current (μA) 漏電流, C: Nominal capacitance (μF) 標稱靜電容量, V: Rated voltage (V) 額定電壓	

Dissipation Factor (tan δ) 損耗角正切

When nominal capacitance is over 1000μF, tan δ shall be added 0.01 to the listed value with increase of every 1000μF.
當標稱靜電容量大於 1000μF，其標稱靜電容量每增加 1000μF，損耗角正切增加 0.01。
Measurement frequency 測試頻率: 120Hz, Temperature 温度: 20°C

Rated Voltage (V) 額定工作電壓	16	25	35	50	63	80	100	160~250	350~450
tan δ (max.) 最大損耗角正切	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.10	0.15

Stability at Low Temperature 低温特性

Measurement frequency 測試頻率: 120Hz

Rated Voltage (V) 額定工作電壓		16	25~35	50~63	80~100	160~350	400, 450
Impedance Ratio 阻抗比	Z(-25°C) / Z(+20°C)	4	3	2	2	4	8
	Z(-40°C) / Z(+20°C)	15	10	8	5	—	—

Endurance 耐久性

When the capacitors are restored to 20°C after 3000 hours application of the rated voltage at 85°C, they meet the characteristics listed below.
在 85°C 環境中施加額定工作電壓 3000 小時後，待電容器恢復至 20°C 時進行測量，電容器的特性符合下表要求。

Capacitance Change 靜電容量變化率	Within ±20% of initial value 初始值的±20%以內
Dissipation Factor 損耗角正切	Less than 200% of specified value 不大於規範值的 200%
Leakage Current 漏電流	Less than specified value 不大於規範值

Shelf Life 高温貯存特性

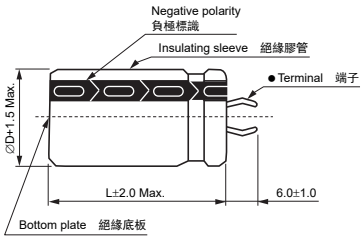
When the capacitors are restored to 20°C after leaving under no load at 85°C for 1000 hours, they meet the specified listed below.
在 85°C 環境中無負荷放置 1000 小時後，待電容器恢復至 20°C 時進行測量，電容器的特性符合下表要求。

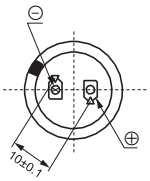
Capacitance Change 靜電容量變化率	Within ±20% of initial value 初始值的±20%以內
Dissipation Factor 損耗角正切	Less than 200% of specified value 不大於規範值的 200%
Leakage Current 漏電流	Less than specified value 不大於規範值

Marking 標識

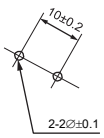
Printed with white colour on black sleeve (PVC) or printed with white colour on green sleeve (PET).
黑色膠管白字印刷（PVC）或綠色膠管白字印刷（PET）。

□ DRAWING & DIMENSIONS 外形圖及尺寸 (Unit: mm)

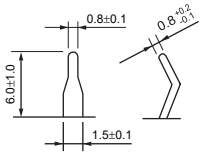




● PC board mounting holes dimensions
線路板安裝孔尺寸



● Terminal dimensions
端子尺寸



□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紋波電流頻率補償系數

Frequency 頻率		50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient 系數	~ 100μF	0.88	1.0	1.06	1.15	1.20
	160 ~ 250μF	0.85	1.0	1.20	1.25	1.45
	315μF ~	0.88	1.0	1.15	1.20	1.40

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. 鋁電解電容器在疊加紋波電流後會引起發熱，溫度每上升 5~10°C 壽命會減半。若要保持長壽命性能，請在使用過程中適當降低紋波電流。

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SP Series

□ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

WV / ØD		16 (1C)				25 (1E)				35 (1V)			
μF		22	25	30	35	25	30	22	35	30	22	25	35
4700	472									22 x 25 2.21	25 x 25 2.42		
5600	562					22 x 25 2.31				22 x 30 2.69	25 x 25 2.69		
6800	682					22 x 25 2.38	25 x 25 2.78			22 x 35 2.70	25 x 25 2.67	30 x 25 2.99	
8200	822	22 x 25 2.43				22 x 25 2.56	25 x 25 2.85			22 x 35 3.09	25 x 30 3.12	30 x 25 3.04	
10000	103	22 x 25 2.60	25 x 25 2.81			22 x 30 2.97	25 x 25 2.93	30 x 25 3.21		22 x 40 3.22	25 x 35 3.37	30 x 25 3.36	35 x 25 3.32
12000	123	22 x 25 2.88	25 x 25 2.96			22 x 35 3.33	25 x 30 3.26	30 x 25 3.59	35 x 25 3.58	22 x 45 3.71	25 x 40 3.79	30 x 30 3.74	35 x 25 3.75
15000	153	22 x 30 3.45	25 x 25 3.38	30 x 25 3.60		22 x 40 3.68	25 x 35 3.77	30 x 25 3.73	35 x 25 3.96		25 x 45 4.55	30 x 35 4.54	35 x 25 4.37
18000	183	22 x 30 3.47	25 x 25 3.47			22 x 45 4.36	25 x 35 4.20	30 x 30 4.40	35 x 25 4.34		25 x 50 4.84	30 x 40 4.87	35 x 30 5.03
22000	223	22 x 35 3.84	25 x 30 3.93	30 x 25 4.08	35 x 25 4.15		25 x 45 4.71	30 x 35 4.70	35 x 25 4.60			30 x 45 5.79	35 x 55 5.71
27000	273	22 x 45 4.63	25 x 40 4.72					30 x 45 5.79	35 x 35 5.71				35 x 45 6.81
33000	333	22 x 50 5.20	25 x 45 5.41	30 x 35 5.40	35 x 25 5.19				35 x 40 6.31				
39000	393			30 x 40 6.02	35 x 30 5.88				35 x 45 6.92	→ Case size 尺寸 → Ripple current 紋波電流			
47000	473			30 x 45 6.95	35 x 35 6.85								
56000	563				35 x 40 7.39								
68000	683				35 x 45 8.06								

WV / ØD		50 (1H)				63 (1J)				80 (1K)			
μF		22	25	30	35	22	25	30	35	22	25	30	35
1200	122									22 x 25 1.62			
1500	152									22 x 25 1.81			
1800	182					22 x 25 1.90				22 x 30 2.14	25 x 25 2.14		
2200	222	22 x 25 1.93				22 x 30 2.35	25 x 25 2.30			22 x 35 2.37	25 x 30 2.39	30 x 25 2.48	
2700	272	22 x 25 2.05				22 x 35 2.50	25 x 25 2.34			22 x 40 2.78	25 x 35 2.82	30 x 25 2.74	
3300	332	22 x 30 2.41	25 x 25 2.38			22 x 35 2.62	25 x 30 2.69	30 x 25 2.78		22 x 45 3.14	25 x 40 3.20	30 x 30 3.16	35 x 25 3.24
3900	392	22 x 30 2.51	25 x 25 2.46			22 x 40 2.90	25 x 35 3.09	30 x 30 3.09		22 x 50 3.58	25 x 45 3.67	30 x 35 3.66	35 x 25 3.52
4700	472	22 x 35 2.83	25 x 30 3.03	30 x 25 3.01		22 x 50 3.49	25 x 40 3.37	30 x 30 3.37	35 x 25 3.36		25 x 50 4.10	30 x 40 4.13	35 x 30 4.03
5600	562	22 x 40 3.21	25 x 35 3.37	30 x 25 3.17	35 x 25 3.47		25 x 45 3.77	30 x 35 3.75	35 x 30 3.88			30 x 45 4.61	35 x 35 4.54
6800	682	22 x 45 3.73	25 x 35 3.59	30 x 30 3.56	35 x 25 3.64		25 x 50 4.41	30 x 40 4.41	35 x 30 4.04			30 x 50 5.18	35 x 40 5.15
8200	822		25 x 40 4.10	30 x 30 4.12	35 x 25 4.07								35 x 45 5.80
10000	103		25 x 50 4.91	30 x 35 4.68	35 x 30 4.59			30 x 50 5.49	35 x 40 5.47				35 x 50 6.69
12000	123			30 x 40 5.10	35 x 35 5.30				35 x 45 5.97	→ Case size 尺寸 → Ripple current 紋波電流			
15000	153			30 x 50 6.28	35 x 40 6.24								
18000	183				35 x 45 7.18								

•Case size ∅D×L(mm), ripple current (A rms) at 85°C, 120Hz •尺寸∅D×L(mm)，紋波電流(A rms)於 85°C, 120Hz

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SP Series

□ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

WV / ØD		100 (2A)				160 (2C)				200 (2D)			
μF		22	25	30	35	22	25	30	35	22	25	30	35
220	221									22 x 25 1.15			
270	271					22 x 25 1.27				22 x 25 1.30			
330	331					22 x 25 1.40				22 x 25 1.40	25 x 25 1.43		
390	391					22 x 30 1.62				22 x 25 1.42	25 x 25 1.63		
470	471					22 x 30 1.77	25 x 25 1.77			22 x 30 1.68	25 x 25 1.68	30 x 25 1.85	
560	561					22 x 30/35 1.92/2.05	25 x 25 1.92	30 x 25 2.02		22 x 35 1.97	25 x 30 2.05	30 x 25 2.05	
680	681					22 x 35 2.12	25 x 30 2.22	30 x 25 2.22		22 x 40 2.24	25 x 30 2.13	30 x 25 2.21	35 x 25 2.10
820	821					22 x 40 2.32	25 x 30 2.32	30 x 25 2.31	35 x 25 2.50	22 x 45 2.32	25 x 35 2.23	30 x 30 2.62	35 x 25 2.39
1000	102					22 x 50 2.88	25 x 40 2.86	30 x 30 2.82	35 x 25 2.79	22 x 50 2.57	25 x 40 2.50	30 x 30 2.47	35 x 25 2.53
1200	122	22 x 30 2.12	25 x 25 2.10				25 x 45 3.27	30 x 35 3.25	35 x 30 3.24		25 x 45 2.89	30 x 35 2.88	35 x 30 2.97
1500	152	22 x 35 2.45	25 x 30 2.43	30 x 25 2.46				30 x 40 3.77	35 x 35 3.75		25 x 55 3.41	30 x 45 3.46	35 x 35 3.42
1800	182	22 x 40 2.77	25 x 35 2.77	30 x 25 2.65				30 x 45 4.10	35 x 35 4.08			30 x 50 3.97	35 x 40 3.95
2200	222	22 x 45 3.12	25 x 40 3.20	30 x 30 3.10	35 x 25 3.14				35 x 45 4.72			30 x 60 4.51	35 x 45 4.35
2700	272		25 x 45 3.61	30 x 35 3.60	35 x 30 3.71				35 x 55 5.53				35 x 55 4.79
3300	332		25 x 50 4.06	30 x 40 4.05	35 x 35 4.07								
3900	392			30 x 45 4.60	35 x 35 4.50								
4700	472			30 x 50 5.13	35 x 40 5.12								
5600	562				35 x 45 5.75	→ Case size 尺寸 → Ripple current 紋波電流							
6800	682				35 x 50 6.01								

WV / ØD		250 (2E)				350 (2V)				400 (2G)			
μF		22	25	30	35	22	25	30	35	22	25	30	35
68	680									22 x 25 0.72			
82	820					22 x 25 0.70				22 x 25 0.80			
100	101					22 x 25 0.77	25 x 20 0.73			22 x 25 0.81	25 x 20 0.79		
120	121					22 x 25 0.99	25 x 20 0.80			22 x 30 1.04	25 x 25 1.06		
150	151						25 x 25 1.00	30 x 25 1.04		22 x 30 1.06	25 x 25 1.06	30 x 25 1.24	
180	181	22 x 25 1.01				22 x 35 1.15	25 x 30 1.20	30 x 25 1.37		22 x 35 1.16	25 x 30 1.23	30 x 25 1.45	35 x 25 1.54
220	221	22 x 25 1.18	25 x 25 1.24			22 x 40 1.30	25 x 30 1.28	30 x 25 1.37		22 x 40 1.39	25 x 30 1.33	30 x 25 1.38	35 x 25 1.44
270	271	22 x25 1.21	25 x 25 1.30			22 x 45 1.42	25 x 35 1.40	30 x 30 1.41	35 x 25 1.42	22 x 45 1.54	25 x 35 1.48	30 x 30 1.56	35 x 25 1.53
330	331	22 x 35 1.35	25 x30 1.38	30 x 25 1.40		22 x 50 1.69	25 x 40 1.64	30 x 30 1.64	35 x 25 1.77	22 x 50 1.70	25 x 45 1.76	30 x 35 1.76	35 x 30 1.68
390	391	22 x 40 1.57	25 x 30 1.57	30 x 25 1.58			25 x 45 1.84	30 x 35 1.88	35 x 30 1.90		25 x 45 1.86	30 x 40 1.89	35 x 35 1.97
470	471	22 x 40 1.72	25 x 35 1.73	30 x 30 1.80				30 x 40 1.91	35 x 30 1.95			30 x 45 2.18	35 x 40 2.12
560	561	22 x 45 2.02	25 x 40 2.04	30 x 35 2.01	35 x 30 2.11			30 x 45 2.15	35 x 40 2.20				35 x 45 2.20
680	681	22 x 50 2.48	25 x 45 2.54	30 x 30 2.38	35 x 30 2.54								
820	821		25 x 50 2.92	30 x 45 2.78	35 x 40 2.87								
1000	102		25 x 55 3.06	30 x 50 3.11	35 x 45 3.06								
1200	122				35 x 50 3.20	→ Case size 尺寸 → Ripple current 紋波電流							
1500	152			30 x 60 4.06	35 x 55 3.92								

•Case size ∅D×L(mm), ripple current (A rms) at 85°C, 120Hz •尺寸∅D×L(mm)，紋波電流(A rms)於 85°C, 120Hz

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SP Series

□ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

WV / ØD		450 (2W)			
μF		22	25	30	35
56	560	22 x 25 0.68			
68	680	22 x 20 0.58			
82	820	22 x 25 0.69	25 x 25 0.75		
100	101	22 x 25 0.77	25 x 25 0.83		
120	121	22 x 35 0.97	25 x 25 0.91	30 x 25 1.10	
150	151	22 x 35 1.20	25 x 30 1.16	30 x 25 1.16	
180	181	22 x 40 1.21	25 x 35 1.31	30 x 30 1.19	35 x 25 1.35
220	221	22 x 50 1.48	25 x 40 1.47	30 x 35 1.42	35 x30 1.45
270	270		25 x 45 1.59	30 x 35 1.69	35 x 30 1.61
330	331		25 x 50 1.76	30 x 40 1.93	35 x 35 1.88
390	391			30 x 45 2.00	35 x 40 1.95
470	471			30 x 50 2.15	35 x 45 2.10
560	561				35 x 50 2.26

→ Case size ∅D×L(mm)
→ Ripple current (A rms) at 85°C, 120Hz

→ 尺寸∅D×L(mm)
→ 紋波電流(A rms)於 85°C, 120Hz

● Please refer to page 23 “Packaging Specifications” for the minimum package quantity. 最小包裝數量請查閱第 23 頁“包裝標準”。
● Please refer to page 18 for the Part Number System. 產品編碼規則請查閱第 18 頁。

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