

# SD series

- High frequency and low impedance, high ripple current resistance.
- Suitable for return-circuit of switching power source.
- RoHS Compliance.
- 高頻低阻抗、耐高紋波。
- 適用於開關電源迴路。



## SPECIFICATIONS

Items 項目	Characteristics 特性												
Capacitance Tolerance 靜電容量誤差	± 20%(120Hz,20°C)												
Operating Temperature Range 適用溫度範圍	-40 ~ +105°C						-25 ~ +105°C						
Rated Voltage Range 額定電壓範圍	6.3 ~ 400VDC						450VDC						
Leakage Current 洩漏電流	V ≤ 100V I ≤ 0.01CV or 3 ( μA) ( After 2 minutes application of DC rated voltage, at 20°C) V > 100V I ≤ 0.03CV +20 ( μA) ( After 5 minutes application of DC rated voltage, at 20°C)												
Dissipation Factor 散逸因素( tan δ)	Measurement Frequency: 120Hz. Temperature: 20°C												
	Rated Voltage(V)	6.3	10	16	25	30	35	50	63~80	100	160~250	400~450	600
	tan δ(Max)	0.22	0.19	0.16	0.14	0.13	0.12	0.10	0.08	0.07	0.20	0.24	0.24
When nominal capacitance over 1000μF, tanδ shall be added 0.02 to the listed value with increase of every 1000μF.													
Low Temperature Stability 低温特性 Impedance Ratio(Max) 阻抗比率(最大值)	Measurement Frequency: 120Hz.												
	Rated Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400	450	
	Z(-25°C)/Z(20°C)	4	3	2	2	2	2	2	2	3	5	6	
	Z(-40°C)/Z(20°C)	8	6	4	3	3	3	3	3	6	10	12	
Load Life 負荷壽命	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.												
	Capacitance Change	Within ± 20% of Initial Value											
	tan δ	200% or less of Initial Specified Value											
	Leakage Current	Initial Specified Value or less											
Shelf Life 放置壽命	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to them 4.1 of JIS C5101-4.												
	Capacitance Change	Within ± 20% of Initial Value											
	tan δ	200% or less of Initial Specified Value											
	Leakage Current	Initial Specified Value or less											
Standards 參照標準	JIS C 5101-4 (IEC 60384)												

## Frequency Coefficient of Permissible Ripple Current

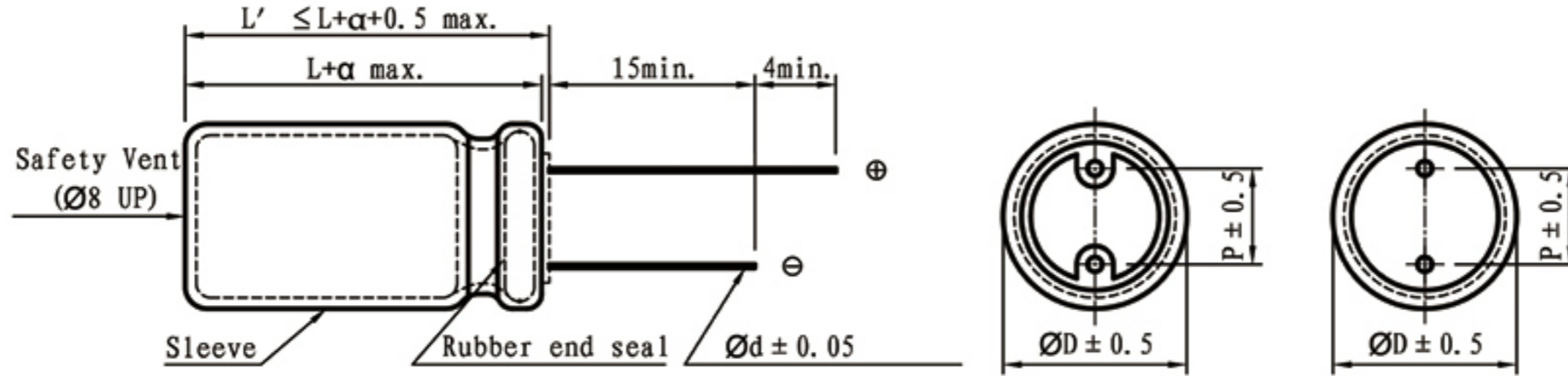
Rated Voltage (V)	Capacitance (μF)	Frequency (Hz)				
		50	120	1K	10K	100K
6.3 ~ 100	0.47 ~ 100	0.45	0.55	0.75	0.90	1.00
	220 ~ 1000	0.60	0.70	0.85	0.95	1.00
	1500 ~ 15000	0.70	0.80	0.95	0.98	1.00
160 ~ 450	2.2 ~ 330	0.55	0.65	0.80	0.90	1.00

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use , the rms ripple current has to be reduced.

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**DIMENSIONS(mm)**



$\phi D$	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
$\phi d$	0.5	0.5	0.5	0.6	0.6	0.8	0.8

$\alpha$	(L < 16) 1.0
	(L ≥ 16) 2.0

**STANDARD RATINGS**

D×L(mm) ; R.C.(mA rms) at 105°C 100KHz ; IMP ( $\Omega$  max)at 20°C 100KHz.

Cap ( $\mu F$ )	V Item	6.3			10			16			25		
		D x L	R.C.	IMP	D x L	R.C.	IMP	D x L	R.C.	IMP	D x L	R.C.	IMP
4.7											5x11	50	1.50
10											5x11	80	1.50
22											5x11	110	0.800
47					5x11	140	0.650	5x11	170	0.650	5x11	170	0.650
68					5x11	160	0.650	5x11	210	0.550	6.3x11	210	0.550
100					5x11	180	0.650	6.3x11	270	0.300	6.3x11	270	0.300
220	6.3x11	270	0.300		6.3x11	295	0.300	8x12	520	0.200	8x12	550	0.200
330	6.3x11	320	0.300		8x12	528	0.200	8x12	550	0.200	10x13	720	0.100
470	8x12	528	0.200		8x12	550	0.200	10x13	720	0.100	10x16	850	0.075
680	8x12	550	0.200		10x13	760	0.100	10x16	850	0.075	10x20	1200	0.058
1000	10x13	780	0.100		10x16	875	0.075	10x20	1200	0.058	13x21	1450	0.055
1500	10x16	950	0.075		10x20	1250	0.058	13x21	1450	0.055	13x25	1850	0.040
2200	10x25	1420	0.055		13x21	1450	0.055	13x25	1850	0.043	16x26	2250	0.030
3300	13x21	1550	0.055		13x25	1850	0.043	16x26	2250	0.030	16x32	2850	0.027
4700	13x25	1950	0.035		16x26	2250	0.030	16x32	2850	0.027	18x35	3120	0.025
6800	16x26	2460	0.030		16x32	2850	0.027	18x35	3120	0.025	18x40	3650	0.023
10000	16x32	2890	0.027		18x35	3120	0.025	18x40	3650	0.023			
15000	16x35	2950	0.025		18x40	3650	0.023						

Cap ( $\mu F$ )	V Item	35			50			63			100		
		D x L	R.C.	IMP	D x L	R.C.	IMP	D x L	R.C.	IMP	D x L	R.C.	IMP
0.47					5x11	25	7.500				5x11	20	15.00
1					5x11	40	5.300				5x11	30	15.00
2.2					5x11	55	4.500				5x11	44	9.800
3.3					5x11	65	3.900				5x11	58	6.600
4.7	5x11	85	2.000		5x11	90	2.300	5x11	65	4.494	5x11	74	4.600
10	5x11	100	1.200		5x11	110	1.400	5x11	110	2.252	6.3x11	130	1.805
22	5x11	120	1.000		5x11	140	1.200	6.3x11	200	1.000	8x12	280	1.360
33	5x11	210	0.430		6.3x11	240	0.480	6.3x11	250	0.900	10x13	450	0.460
47	6.3x11	270	0.300		6.3x11	240	0.480	8x12	420	0.800	10x16	650	0.390
68	8x12	525	0.300		8x12	525	0.300	10x13	525	0.760	10x20	750	0.288
100	8x12	550	0.200		8x12	550	0.250	10x13	550	0.580	13x21	950	0.208
220	10x13	720	0.100		10x16	720	0.170	10x20	850	0.170	16x26	1250	0.104
330	10x16	850	0.075		10x20	850	0.150	13x21	1250	0.142	16x32	1510	0.088
470	10x20	1200	0.058		13x21	1450	0.090	13x25	1500	0.070	16x36	1720	0.072
680	13x21	1450	0.055		13x25	1850	0.070	16x26	1780	0.055	18x35	1950	0.064
1000	13x25	1850	0.043		16x26	2250	0.048	16x32	2120	0.043	18x40	2320	0.047
1500	16x26	2250	0.030		16x32	2850	0.043	18x35	2310	0.033			
2200	16x32	2850	0.027		18x35	3120	0.040	18x40	2540	0.032			
3300	18x35	3120	0.025										
4700	18x40	3650	0.023										

※ 13mm may be replaced by 12.5mm upon customer's request.

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## STANDARD RATINGS

D×L(mm) ; R.C.(mA rms) at 105°C 100KHz ; IMP (Ω max)at 20°C 100KHz.

Cap (μF)	V (Code) Item	160 (2C)			200 (2D)			250 (2E)		
		D x L	R.C.	IMP	D x L	R.C.	IMP	D x L	R.C.	IMP
2.2								8x12	105	13.0
3.3		8x12	104	11.0	8x12	113	11.0	8x12	122	11.0
4.7		8x12	112	6.50	8x12	126	6.10	10x13	140	4.30
10		10x13	180	4.30	10x13	210	3.80	10x16	300	3.50
22		10x16	250	3.00	10x20	465	2.70	13x21	485	2.80
33		10x20	570	1.90	10x25	600	1.40	13x21	620	2.13
47		13x21	730	1.20	13x21	730	1.20	13x25	810	1.60
68		13x21	850	0.86	13x25	985	0.70	16x26	1010	1.07
100		16x26	1285	0.50	16x26	1285	0.50	16x32	1405	0.62
220		16x36	1450	0.29	18x32	1510	0.36	18x40	1490	0.38
330		18x35	1850	0.26						

Cap (μF)	V (Code) Item	400 (2G)			450 (2W)		
		D x L	R.C.	IMP	D x L	R.C.	IMP
2.2		6.3x12	50	27	8x12	60	28.0
		8x12	80	13	10x13	90	23.0
3.3		8x12	90	16.5	8x12	80	23.0
		10x13	110	8.2	10x16	126	20.0
4.7		8x12	90	9.5	8x14	95	12.5
		10x16	160	4.8	10x20	170	6.20
10		10x16	170	6.1	10x16	160	7.50
		10x20	195	3.0	13x21	280	3.70
22		13x21	290	4.0	13x21	280	7.00
		13x25	350	1.95	16x26	580	3.50
33		13x21	400	3.00	13x25	420	3.60
		13x25	480	1.50	16x26	610	1.60
47		13x25	530	1.25	16x26	650	1.90
		16x26	720	1.10	16x32	850	0.85
68		16x26	750	1.10	18x32	940	0.71
		16x32	820	0.55			
100		18x26	850	1.00	18x35	1000	1.00
		18x35	950	0.48	18x40	1100	0.43

※ 13mm may be replaced by 12.5mm upon customer's request.