

# SEP Series

Standard radial lead type

Guaranteed at 105°C for 3,000h

This is a radial lead type using conductive polymer based on the SVP series.  
Lead free-flow is supported.



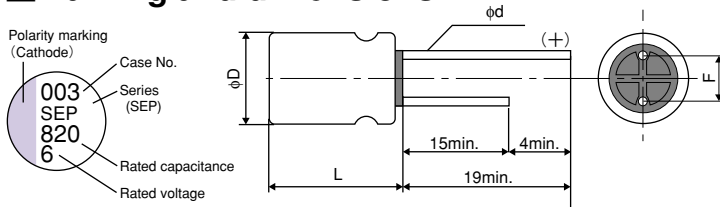
## Specifications

Items	Conditions	Characteristics	
Category temperature range	—	-55°C to +105°C	
Tolerance on rated capacitance	120Hz	M ±20%	
Tangent of loss angle	120Hz	Less than or equal to the value of Table11	
Leakage current ※1	After 2 minutes	Less than or equal to the value of Table11	
ESR	100KHz to 300KHz	Less than or equal to the value of Table11	
Characteristics of impedance ratio at high temp. and low temp.	Based the value at 100KHz, +20°C	-55°C	Z / Z 20°C 0.75 to 1.25
		+105°C	Z / Z 20°C 0.75 to 1.25
Endurance	105°C, 3,000h, Rated voltage applied (2.5V→2,000h), (25V→20V applied)	ΔC/C	Within ±20%
		tanδ	1.5 times or less than an initial standard
		ESR	1.5 times or less than an initial standard
		Leakage current	Below an initial standard
Damp heat (Steady state)	60°C, 90 to 95%RH, 1,000h, No-applied voltage	ΔC/C	Within ±20%
		tanδ	1.5 times or less than an initial standard
		ESR	1.5 times or less than an initial standard
		Leakage current	Below an initial standard (after voltage processing)
Resistance to soldering heat	Flow method (260±5°C X 10s)	ΔC/C	Within ±5%
		tanδ	Below an initial standard
		ESR	Below an initial standard
		Leakage current	Below an initial standard (after voltage processing)

※1 In case of some problems for measured values, measure after applying rated voltage for 2.5 to 20V products or temperature derating voltage for 25V products for 120 minutes at 105°C.

## Marking and dimensions

(unit : mm)



Size Code	φD±0.5	Lmax.	F	φd±0.05
C6	6.3	6.0	2.5±0.5	0.45
E7	8.0	7.0	3.5±0.5	0.45
F8	10.0	8.0	5.0±0.5	0.50
E12	8.0	12.0	3.5±0.5	0.60
F13	10.0	13.0	5.0±0.5	0.60

## Size List

RV : Rated voltage (SV) : Surge voltage (Room temperature)

μF	RV (SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (12)	16 (18.4)	20 (23.0)	25 (25.0)
6.8								C6
10								E7
22							C6	F8
33							E7	E12
39						C6		
47							E7	
56					C6		F8	F13
68							F8	
82				C6		E7		
100			C6				F8,E12	
120					E7			
150			C6	E7		F8	F13	
180						E12		
220			E7					
270					F8			
330			E7	F8	E12	F13		
470			F8	E12				
560			E12		F13			
680		E12	F8					
820				F13				
1200			F13					
1500		F13						

※For the minimum packing quantity, please refer to page 55.

Table11 SEP Series Characteristics List

Size Code	Part Number	Rated voltage (V)	Rated capacitance ( $\mu$ F)	ESR 100kHz to 300kHz (m $\Omega$ ) (max.)	Rated ripple current 100kHz (mA rms) at 105°C	Tangent of loss angle (max.)	Leakage current ( $\mu$ A) (max.) <sup>※1</sup>
C6	25SEP6R8M <sup>※2</sup>	25	6.8	80	1200	0.10	170
	20SEP22M	20	22	60	1450	0.10	220
	16SEP39M	16	39	50	1620	0.10	312
	10SEP56M	10	56	45	1700	0.12	280
	6SEP82M	6.3	82	45	1700	0.12	258
	4SEP100M	4	100	40	1810	0.12	200
	4SEP150M	4	150	40	1810	0.12	300
E7	25SEP10M <sup>※2</sup>	25	10	60	1500	0.10	250
	20SEP33M	20	33	45	1890	0.12	330
	20SEP47M	20	47	45	1890	0.12	470
	16SEP82M	16	82	40	2120	0.12	656
	10SEP120M	10	120	35	2560	0.12	600
	6SEP150M	6.3	150	35	2560	0.12	472
	4SEP220M	4	220	35	2560	0.12	440
	4SEP330M	4	330	35	2560	0.12	660
F8	25SEP22M <sup>※2</sup>	25	22	50	2000	0.10	275
	20SEP56M	20	56	40	2400	0.12	224
	20SEP68M	20	68	40	2400	0.12	272
	20SEP100MX	20	100	35	2570	0.12	400
	16SEP150M	16	150	30	3020	0.12	480
	10SEP270M	10	270	25	3700	0.12	540
	6SEP330M	6.3	330	25	3700	0.12	416
	4SEP470M	4	470	25	3700	0.12	376
	4SEP680M	4	680	25	3700	0.12	544
E12	25SEP33M <sup>※2</sup>	25	33	30	2980	0.12	413
	20SEP100M	20	100	24	3320	0.15	400
	16SEP180M	16	180	20	3640	0.15	576
	10SEP330M	10	330	17	3950	0.15	660
	6SEP470M	6.3	470	15	4210	0.15	592
	4SEP560M	4	560	13	4520	0.15	448
	2R5SEP680M	2.5	680	13	4520	0.15	340
F13	25SEP56M <sup>※2</sup>	25	56	28	3800	0.12	700
	20SEP150M	20	150	20	4320	0.15	600
	16SEP330M	16	330	16	4720	0.15	792
	10SEP560M	10	560	13	5230	0.15	840
	6SEP820M	6.3	820	12	5440	0.15	775
	4SEP1200M	4	1200	12	5440	0.18	960
	2R5SEP1500M	2.5	1500	12	5440	0.18	750

※1 After 2 minutes

※2 The surge voltage of 25V products is 25V. Please consider SVPD series 25V products (whose surge voltage is 29V) in placing a new order.

Frequency coefficient for ripple current

Frequency	120Hz $\leq$ f < 1kHz	1kHz $\leq$ f < 10kHz	10kHz $\leq$ f < 100kHz	100kHz $\leq$ f $\leq$ 500kHz
Coefficient	0.05	0.3	0.7	1