

SEP series is a radial lead version of SVP series using conductive polymer. Lead free-flow is supported.*2



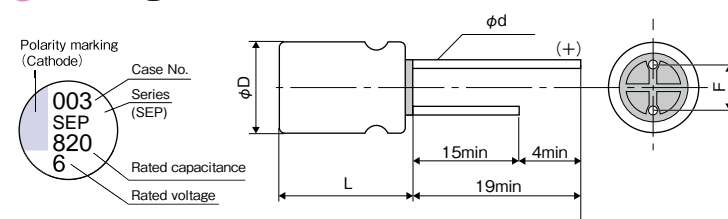
Specifications

| Items | | Condition | | Specifications | | | | | | |
|--|--|--|---------------------|---|-----|-----|----|----|----|----|
| Rated voltage | (V) | - | | 2.5 | 4.0 | 6.3 | 10 | 16 | 20 | 25 |
| Surge voltage | (V) | Room temperature | | 3.3 | 5.2 | 8.2 | 12 | 18 | 23 | 25 |
| Category temperature range | (°C) | - | | -55 to +105 | | | | | | |
| Capacitance tolerance | (%) | 120Hz/20°C | | M : ±20 | | | | | | |
| Dissipation Factor (DF) | | 120Hz/20°C | | Please see the attached characteristics list | | | | | | |
| Leakage current*1 | | Rated voltage applied, after 2 minutes | | Please see the attached characteristics list | | | | | | |
| Equivalent series resistance (ESR) | | 100kHz to 300kHz/20°C | | Please see the attached characteristics list | | | | | | |
| 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% of the initial value | | | | | | |
| | | DF | | Within 1.5 times of the initial limit | | | | | | |
| | | ESR | | Within 1.5 times of the initial limit | | | | | | |
| | | LC | | Within the initial limit | | | | | | |
| Damp heat(Steady state) | 60°C, 90 to 95%RH, 1,000h, No-applied voltage | ΔC/C | | Within ±20% of the initial value | | | | | | |
| | | DF | | Within 1.5 times of the initial limit | | | | | | |
| | | ESR | | Within 1.5 times of the initial limit | | | | | | |
| | | LC | | Within the initial limit (after voltage processing) | | | | | | |
| Resistance to soldering heat*2 | Flow method (260±5°C X 10s) | ΔC/C | | Within ±5% of the initial value | | | | | | |
| | | DF | | Within the initial limit | | | | | | |
| | | ESR | | Within the initial limit | | | | | | |
| | | LC | | Within the initial limit (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.

*2 Please refer to page 26 for flow soldering conditions.

Marking and dimensions



(unit : mm)

| Size code | φD ±0.5 | L max | 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

| μF | RV | 2.5 | 4.0 | 6.3 | 10 | 16 | 20 | 25 |
|-------|-----|-----|-----|-----|-----|-----|--------|-----|
| 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 | | | | |
| 1,200 | | | F13 | | | | | |
| 1,500 | F13 | | | | | | | |

SEP series characteristics list

| Size code | Part number | Rated voltage (V) | Rated capacitance (μF) | ESR(mΩ) (max) 100kHz to 300kHz/20°C | Rated ripple current 100kHz (mA _{rms}) at 105°C | DF (% max) | Leakage current (μA)(max) After 2 minutes |
|------------|-------------|-------------------|------------------------|-------------------------------------|---|------------|---|
| C6 | 25SEP6R8M*1 | 25 | 6.8 | 80 | 1200 | 10 | 170 |
| | 20SEP22M | 20 | 22 | 60 | 1450 | 10 | 220 |
| | 16SEP39M | 16 | 39 | 50 | 1620 | 10 | 312 |
| | 10SEP56M | 10 | 56 | 45 | 1700 | 12 | 280 |
| | 6SEP82M | 6.3 | 82 | 45 | 1700 | 12 | 258 |
| | 4SEP100M | 4.0 | 100 | 40 | 1810 | 12 | 200 |
| | 4SEP150M | 4.0 | 150 | 40 | 1810 | 12 | 300 |
| E7 | 25SEP10M*1 | 25 | 10 | 60 | 1500 | 10 | 250 |
| | 20SEP33M | 20 | 33 | 45 | 1890 | 12 | 330 |
| | 20SEP47M | 20 | 47 | 45 | 1890 | 12 | 470 |
| | 16SEP82M | 16 | 82 | 40 | 2120 | 12 | 656 |
| | 10SEP120M | 10 | 120 | 35 | 2560 | 12 | 600 |
| | 6SEP150M | 6.3 | 150 | 35 | 2560 | 12 | 472 |
| | 4SEP220M | 4.0 | 220 | 35 | 2560 | 12 | 440 |
| | 4SEP330M | 4.0 | 330 | 35 | 2560 | 12 | 660 |
| | F8 | 25SEP22M*1 | 25 | 22 | 50 | 2000 | 10 |
| 20SEP56M | | 20 | 56 | 40 | 2400 | 12 | 224 |
| 20SEP68M | | 20 | 68 | 40 | 2400 | 12 | 272 |
| 20SEP100MX | | 20 | 100 | 35 | 2570 | 12 | 400 |
| 16SEP150M | | 16 | 150 | 30 | 3020 | 12 | 480 |
| 10SEP270M | | 10 | 270 | 25 | 3700 | 12 | 540 |
| 6SEP330M | | 6.3 | 330 | 25 | 3700 | 12 | 416 |
| 4SEP470M | | 4.0 | 470 | 25 | 3700 | 12 | 376 |
| 4SEP680M | | 4.0 | 680 | 25 | 3700 | 12 | 544 |
| E12 | 25SEP33M*1 | 25 | 33 | 30 | 2980 | 12 | 413 |
| | 20SEP100M | 20 | 100 | 24 | 3320 | 15 | 400 |
| | 16SEP180M | 16 | 180 | 20 | 3640 | 15 | 576 |
| | 10SEP330M | 10 | 330 | 17 | 3950 | 15 | 660 |
| | 6SEP470M | 6.3 | 470 | 15 | 4210 | 15 | 592 |
| | 4SEP560M | 4.0 | 560 | 13 | 4520 | 15 | 448 |
| | 2R5SEP680M | 2.5 | 680 | 13 | 4520 | 15 | 340 |
| F13 | 25SEP56M*1 | 25 | 56 | 28 | 3800 | 12 | 700 |
| | 20SEP150M | 20 | 150 | 20 | 4320 | 15 | 600 |
| | 16SEP330M | 16 | 330 | 16 | 4720 | 15 | 792 |
| | 10SEP560M | 10 | 560 | 13 | 5230 | 15 | 840 |
| | 6SEP820M | 6.3 | 820 | 12 | 5440 | 15 | 775 |
| | 4SEP1200M | 4.0 | 1200 | 12 | 5440 | 18 | 960 |
| | 2R5SEP1500M | 2.5 | 1500 | 12 | 5440 | 18 | 750 |

*1 The surge voltage of 25V products is 25V. Please consider SEPF series 25V products (whose surge voltage is 29V) in placing a new order.

Frequency coefficient for ripple current

| Frequency | 120Hz ≤ f < 1kHz | 1kHz ≤ f < 10kHz | 10kHz ≤ f < 100kHz | 100kHz ≤ f ≤ 500kHz |
|-------------|------------------|------------------|--------------------|---------------------|
| Coefficient | 0.05 | 0.3 | 0.7 | 1 |

Selection guide

Series system diagram
Image of case size
Products list
Packing specifications (SMD type)
Packing specifications (Radial lead type)

Technical data

Recommended soldering condition
Fundamental structure
Characteristics
Reliability

Surface mount type

SVPF
SVPE
SVPS
SVPD
SVPC
SVPB
SVPA
SVQP
SVP

Radial lead type

SEPF
SEPC
SEQP
SEP

Catalog Deletion and EOL series

POSCAP
POSCAP Line-up

Guidelines and precautions for use

Selection guide

Series system diagram
Image of case size
Products list
Explanation of part numbers
Packing specifications

Technical data

Marking
Recommended land pattern dimension
Recommended soldering condition
Fundamental structure
Characteristics
Reliability

Surface mount type

TPU
TPH
TPG
TPSF
TPE
TPB/TPC
TPL·TPLF
TPF
TA
TV
TH
TQC

Catalog Deletion and EOL models