

IV. SPECIFICATIONS FOR EACH SERIES

Conductive polymer type

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.

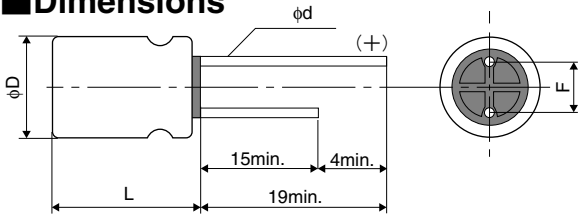
Marking : Polarity(⊖), Rated voltage, Rated capacitance (Purple) Lot.No., SEP

■ 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 Table10 | | |
| Leakage current ※1 | After 2 minutes | Less than or equal to the value of Table10 | | |
| ESR | — | Less than or equal to the value of Table10 | | |
| 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.

■ 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 (room temperature)

| μF | RV (SV) | 2.5 (3.3) | 4 (5.2) | 6.3 (8.2) | 10 (11.5) | 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 53.

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Table10 SEP Series Characteristics List

| Size Code | Part Number ※1 | Rated Voltage (V) | Rated Capacitance (μ F) | ESR 100kHz to 300kHz (m Ω) (max.) | Rated ripple current 100kHz (mA _{rms}) at 105°C | Tangent of loss angle (max.) | Leakage current (μ A) (max.)※2 |
|-----------|-------------------|----------------------|---------------------------------|---|--|---------------------------------|--|
| C6 | 25SEP6R8M ※3 | 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 ※3 | 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 ※3 | 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 ※3 | 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 ※3 | 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 Capacitance tolerance : M \pm 20%

※2 After 2 minutes

※3 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 |