

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



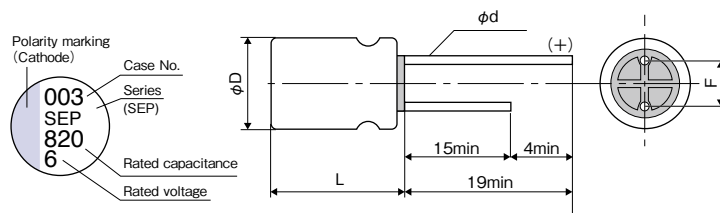
## Specifications

| 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                                     | (℃)                                                                     | —                                      |                    | -55 to +105                                         |     |     |    |    |    |    |
| Capacitance tolerance                                          | (%)                                                                     | 120Hz/20℃                              |                    | M : ±20                                             |     |     |    |    |    |    |
| Dissipation Factor (DF)                                        |                                                                         | 120Hz/20℃                              |                    | 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℃                   |                    | Please see the attached characteristics list        |     |     |    |    |    |    |
| Characteristics of impedance ratio at high temp. and low temp. | Based the value at 100kHz, +20℃                                         | -55℃                                   | Z/Z <sub>20℃</sub> | 0.75 to 1.25                                        |     |     |    |    |    |    |
|                                                                |                                                                         | +105℃                                  | Z/Z <sub>20℃</sub> | 0.75 to 1.25                                        |     |     |    |    |    |    |
| Endurance                                                      | 105℃, 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℃, 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℃ 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 13 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  |     | 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)<br>100kHz to 300kHz/20°C | Rated ripple current<br>100kHz (mA <sub>rms</sub> ) at 105°C | DF (% max) | Leakage current (μA)(max)<br>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         | 275                                          |
|           | 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                   |