

SVP sets the standard for our SMD version of the OS-CON product line.  
Recommended for your SMD needs in switching power supplies.  
This product can support lead free-reflow.\*2



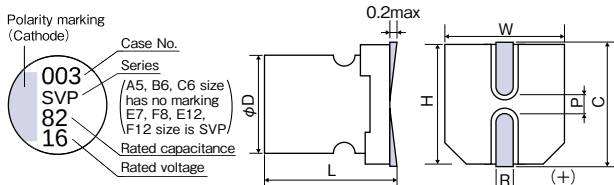
## Specifications

| 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 <sub>20°C</sub> | 0.75 to 1.25                                        |     |     |    |    |    |    |
|                                                                |                                                          | +105°C | Z/Z <sub>20°C</sub> | 0.75 to 1.25                                        |     |     |    |    |    |    |
| Endurance                                                      | 105°C, 2,000h, Rated voltage applied (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                                 | VPS (230°C X 75s)                                        | ΔC/C   |                     | Within ±10% of the initial value                    |     |     |    |    |    |    |
|                                                                |                                                          | DF     |                     | Within 1.3 times of the initial limit               |     |     |    |    |    |    |
|                                                                |                                                          | ESR    |                     | Within 1.3 times of 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 20V for 25V products for 120 minutes at 105°C.

\*2 Please refer to page 26 for reflow soldering conditions.

## Marking and dimensions



(unit : mm)

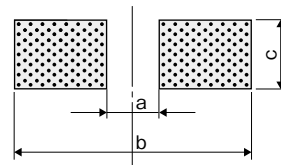
| Size code | φD±0.5 | L <sup>+0.1</sup> <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P±0.2 |
|-----------|--------|-----------------------------------|-------|-------|-------|------------|-------|
| A5        | 4.0    | 5.4                               | 4.3   | 4.3   | 5.0   | 0.6 to 0.8 | 1.0   |
| B6        | 5.0    | 5.9                               | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4   |
| C6        | 6.3    | 5.9                               | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1   |
| E7        | 8.0    | 6.9                               | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2   |
| F8        | 10.0   | 7.9                               | 10.3  | 10.3  | 11.0  | 0.6 to 0.8 | 4.6   |
| E12       | 8.0    | 11.9                              | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2   |
| F12       | 10.0   | 12.6                              | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6   |

## Size list

RV : Rated voltage

| μF    | RV  | 2.5 | 4.0 | 6.3 | 10    | 16     | 20  | 25  |
|-------|-----|-----|-----|-----|-------|--------|-----|-----|
| 3.3   |     |     |     |     | A5    | A5     |     |     |
| 4.7   |     |     |     |     | A5    |        |     | C6  |
| 6.8   |     |     |     |     | A5    |        | B6  | E7  |
| 10    |     |     |     |     | A5    |        |     |     |
| 15    |     |     |     |     |       | B6     |     |     |
| 22    |     |     |     | A5  |       | B6     | C6  | F8  |
| 27    |     |     |     |     |       |        | C6  |     |
| 33    |     |     |     |     |       |        | E7  | E12 |
| 39    |     | A5  |     |     | B6    | C6     |     |     |
| 47    |     | B6  |     |     |       |        |     |     |
| 56    |     |     | B6  |     | C6    |        | E7  | F8  |
| 68    |     |     |     |     | C6    |        | F8  | F12 |
| 82    |     |     |     |     |       | E7     |     |     |
| 100   |     |     |     |     |       | F8     |     |     |
| 120   |     |     |     |     | E7    |        | E12 |     |
| 150   |     |     |     |     |       |        |     |     |
| 180   |     |     |     |     | E7,F8 | F8     | F12 |     |
| 220   | C6  |     |     |     |       |        |     |     |
| 270   |     |     |     |     |       |        |     |     |
| 330   |     |     |     |     | F8    | F8,E12 | F12 |     |
| 470   |     |     |     |     |       |        |     |     |
| 560   |     |     |     |     |       |        |     |     |
| 680   | E12 |     |     |     |       |        |     |     |
| 820   |     |     |     |     |       |        |     |     |
| 1,200 |     |     |     |     |       |        |     |     |
| 1,500 | F12 |     |     |     |       |        |     |     |

## Recommended land pattern dimension of PWB



(unit : mm)

| Size code | a   | b    | c   |
|-----------|-----|------|-----|
| A5        | 1.0 | 6.2  | 1.6 |
| B6        | 1.4 | 7.4  | 1.6 |
| C6        | 2.1 | 9.1  | 1.6 |
| E7        | 2.8 | 11.1 | 1.9 |
| F8        | 4.3 | 13.1 | 1.9 |
| E12       | 2.8 | 11.1 | 1.9 |
| F12       | 4.3 | 13.1 | 1.9 |

## SVP 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 |
|-----------|-------------|-------------------|------------------------|----------------------------------------|--------------------------------------------------------------|------------|----------------------------------------------|
| A5        | 16SVP3R3M   | 16                | 3.3                    | 260                                    | 660                                                          | 7          | 26.4                                         |
|           | 10SVP4R7M   | 10                | 4.7                    | 240                                    | 670                                                          | 8          | 23.5                                         |
|           | 10SVP6R8M   | 10                | 6.8                    | 240                                    | 670                                                          | 9          | 34                                           |
|           | 10SVP10M    | 10                | 10                     | 220                                    | 700                                                          | 10         | 50                                           |
|           | 10SVP15M    | 10                | 15                     | 200                                    | 740                                                          | 10         | 75                                           |
|           | 6SVP22M     | 6.3               | 22                     | 200                                    | 740                                                          | 12         | 69.3                                         |
| B6        | 4SVP33M     | 4.0               | 33                     | 200                                    | 740                                                          | 15         | 66                                           |
|           | 20SVP10M    | 20                | 10                     | 120                                    | 1020                                                         | 10         | 100                                          |
|           | 16SVP15M    | 16                | 15                     | 120                                    | 1020                                                         | 10         | 120                                          |
|           | 16SVP22M    | 16                | 22                     | 90                                     | 1060                                                         | 10         | 176                                          |
|           | 10SVP33M    | 10                | 33                     | 70                                     | 1100                                                         | 12         | 165                                          |
|           | 6SVP47M     | 6.3               | 47                     | 70                                     | 1100                                                         | 12         | 148                                          |
| C6        | 4SVP39M     | 4.0               | 39                     | 70                                     | 1100                                                         | 12         | 78                                           |
|           | 4SVP68M     | 4.0               | 68                     | 60                                     | 1400                                                         | 12         | 136                                          |
|           | 25SVP6R8M※1 | 25                | 6.8                    | 80                                     | 1200                                                         | 10         | 85                                           |
|           | 20SVP22M    | 20                | 22                     | 60                                     | 1450                                                         | 10         | 88                                           |
|           | 20SVP27M    | 20                | 27                     | 60                                     | 1450                                                         | 10         | 108                                          |
|           | 16SVP39M    | 16                | 39                     | 50                                     | 1620                                                         | 10         | 125                                          |
| E7        | 10SVP47M    | 10                | 47                     | 50                                     | 1620                                                         | 12         | 94                                           |
|           | 10SVP56M    | 10                | 56                     | 45                                     | 1700                                                         | 12         | 112                                          |
|           | 6SVP82M     | 6.3               | 82                     | 45                                     | 1700                                                         | 12         | 103                                          |
|           | 6SVP100M    | 6.3               | 100                    | 40                                     | 1810                                                         | 12         | 126                                          |
|           | 6SVP120MV   | 6.3               | 120                    | 17                                     | 2780                                                         | 12         | 151                                          |
|           | 4SVP150MX   | 4.0               | 150                    | 40                                     | 1810                                                         | 12         | 120                                          |
| F8        | 2R5SVP220M  | 2.5               | 220                    | 23                                     | 2390                                                         | 12         | 110                                          |
|           | 25SVP10M※1  | 25                | 10                     | 60                                     | 1500                                                         | 10         | 125                                          |
|           | 20SVP33M    | 20                | 33                     | 45                                     | 1890                                                         | 12         | 132                                          |
|           | 20SVP47M    | 20                | 47                     | 45                                     | 1890                                                         | 12         | 188                                          |
|           | 16SVP56M    | 16                | 56                     | 45                                     | 1890                                                         | 12         | 179                                          |
|           | 16SVP82M    | 16                | 82                     | 40                                     | 2120                                                         | 12         | 262                                          |
| E12       | 10SVP120M   | 10                | 120                    | 35                                     | 2560                                                         | 12         | 240                                          |
|           | 10SVP150MX  | 10                | 150                    | 35                                     | 2560                                                         | 12         | 300                                          |
|           | 6SVP220MX   | 6.3               | 220                    | 35                                     | 2560                                                         | 12         | 277                                          |
|           | 4SVP330M    | 4.0               | 330                    | 35                                     | 2560                                                         | 12         | 264                                          |
|           | 25SVP22M※1  | 25                | 22                     | 50                                     | 2000                                                         | 10         | 275                                          |
|           | 20SVP56M    | 20                | 56                     | 40                                     | 2400                                                         | 12         | 224                                          |
| F12       | 20SVP68M    | 20                | 68                     | 40                                     | 2400                                                         | 12         | 272                                          |
|           | 16SVP100M   | 16                | 100                    | 35                                     | 2670                                                         | 12         | 320                                          |
|           | 16SVP150M   | 16                | 150                    | 30                                     | 3020                                                         | 12         | 480                                          |
|           | 16SVP180MX  | 16                | 180                    | 30                                     | 3020                                                         | 12         | 576                                          |
|           | 10SVP150M   | 10                | 150                    | 30                                     | 3020                                                         | 12         | 300                                          |
|           | 10SVP270M   | 10                | 270                    | 25                                     | 3700                                                         | 12         | 540                                          |
| F12       | 10SVP330MX  | 10                | 330                    | 25                                     | 3700                                                         | 12         | 660                                          |
|           | 6SVP220M    | 6.3               | 220                    | 25                                     | 3700                                                         | 12         | 277                                          |
|           | 6SVP330M    | 6.3               | 330                    | 25                                     | 3700                                                         | 12         | 416                                          |
|           | 6SVP470MX   | 6.3               | 470                    | 25                                     | 3700                                                         | 12         | 592                                          |
|           | 4SVP680M    | 4.0               | 680                    | 25                                     | 3700                                                         | 12         | 544                                          |
|           | 25SVP33M※1  | 25                | 33                     | 30                                     | 2980                                                         | 12         | 413                                          |
| F12       | 20SVP100M   | 20                | 100                    | 24                                     | 3320                                                         | 15         | 400                                          |
|           | 16SVP180M   | 16                | 180                    | 20                                     | 3640                                                         | 15         | 576                                          |
|           | 10SVP330M   | 10                | 330                    | 17                                     | 3950                                                         | 15         | 660                                          |
|           | 6SVP470M    | 6.3               | 470                    | 15                                     | 4210                                                         | 15         | 592                                          |
|           | 4SVP560M    | 4.0               | 560                    | 13                                     | 4520                                                         | 15         | 448                                          |
|           | 2R5SVP680M  | 2.5               | 680                    | 13                                     | 4520                                                         | 15         | 340                                          |
| F12       | 25SVP56M※1  | 25                | 56                     | 28                                     | 3800                                                         | 12         | 700                                          |
|           | 20SVP150M   | 20                | 150                    | 20                                     | 4320                                                         | 15         | 600                                          |
|           | 16SVP330M   | 16                | 330                    | 16                                     | 4720                                                         | 15         | 792                                          |
|           | 10SVP560M   | 10                | 560                    | 13                                     | 5230                                                         | 15         | 840                                          |
|           | 6SVP820M    | 6.3               | 820                    | 12                                     | 5440                                                         | 15         | 775                                          |
|           | 4SVP1200M   | 4.0               | 1200                   | 12                                     | 5440                                                         | 18         | 960                                          |
| F12       | 2R5SVP1500M | 2.5               | 1500                   | 12                                     | 5440                                                         | 18         | 750                                          |

※1 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 ≤ 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

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Surface mount type

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

Catalog Deletion and EOL models