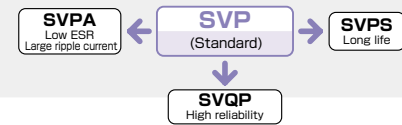


SVP Series


Standard

Standard SMD type product.
Use for surface mounted type switching power supplies.
This product can support lead free-reflow. ※2



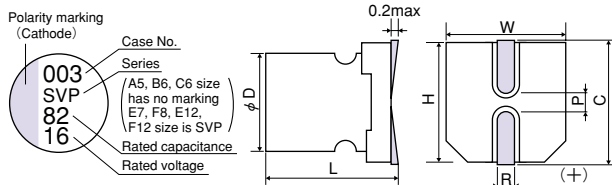
Specifications

| 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 _{20°C} | 0.75 to 1.25 | | | | | |
| | | +105°C | Z/Z _{20°C} | 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 12 for reflow soldering conditions.

Marking and dimensions

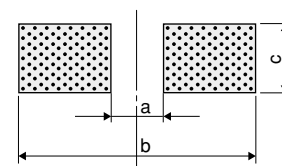


| Size code | φD ±0.5 | L ^{+0.1} _{-0.4} | W ±0.2 | H ±0.2 | C ±0.2 | R | P ±0.2 |
|-----------|---------|-----------------------------------|--------|--------|--------|------------|--------|
| A5 | 4.0 | 5.4 | 4.3 | 4.3 | 5.0 | 0.6 to 0.8 | 1.0 |
| B6 | 5.0 | 5.9 | 5.3 | 5.3 | 6.0 | 0.6 to 0.8 | 1.4 |
| 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 | 2.5 | 4.0 | 6.3 | 10 | 16 | 20 | 25 |
|-------|-----|-----|-------|--------|--------|-----|-----|
| 3.3 | | | | | A5 | A5 | |
| 4.7 | | | | A5 | | | |
| 6.8 | | | | A5 | | | C6 |
| 10 | | | | A5 | | B6 | E7 |
| 15 | | | | A5 | B6 | | |
| 22 | | | A5 | | B6 | C6 | F8 |
| 27 | | | | | | C6 | |
| 33 | | A5 | | B6 | | E7 | E12 |
| 39 | | B6 | | | C6 | | |
| 47 | | | B6 | C6 | | E7 | |
| 56 | | | | C6 | E7 | F8 | F12 |
| 68 | | B6 | | | | F8 | |
| 82 | | | C6 | | E7 | | |
| 100 | | | C6 | | F8 | E12 | |
| 120 | | | C6 | E7 | | | |
| 150 | | C6 | | E7,F8 | F8 | F12 | |
| 180 | | | | | F8,E12 | | |
| 220 | C6 | | E7,F8 | | | | |
| 270 | | | | F8 | | | |
| 330 | | E7 | F8 | F8,E12 | F12 | | |
| 470 | | | F8 | | | | |
| 560 | | E12 | F8 | | | | |
| 680 | E12 | | | | | | |
| 820 | | | F12 | | | | |
| 1,200 | | F12 | | | | | |
| 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(m Ω) (max) 100kHz to 300kHz/20 $^{\circ}\text{C}$ | Rated ripple current 100kHz (mA rms) at 105 $^{\circ}\text{C}$ | DF (% max) | Leakage current (μA) (max) 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 |
| | 4SVP33M | 4.0 | 33 | 200 | 740 | 15 | 66 |
| B6 | 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 |
| | 4SVP39M | 4.0 | 39 | 70 | 1100 | 12 | 78 |
| | 4SVP68M | 4.0 | 68 | 60 | 1400 | 12 | 136 |
| C6 | 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 |
| | 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 |
| | 2R5SVP220M | 2.5 | 220 | 23 | 2390 | 12 | 110 |
| E7 | 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 |
| | 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 |
| F8 | 25SVP22M *1 | 25 | 22 | 50 | 2000 | 10 | 275 |
| | 20SVP56M | 20 | 56 | 40 | 2400 | 12 | 224 |
| | 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 |
| | 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 |
| | E12 | 25SVP33M *1 | 25 | 33 | 30 | 2980 | 12 |
| 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 |
| | 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 \leq f < 1kHz | 1kHz \leq f < 10kHz | 10kHz \leq f < 100kHz | 100kHz \leq f \leq 500kHz |
|-------------|-----------------------|-----------------------|-------------------------|-------------------------------|
| Coefficient | 0.05 | 0.3 | 0.7 | 1 |