

IV. SPECIFICATIONS FOR EACH SERIES

Conductive polymer type

SVP Series Standard SMD type



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

Marking : Polarity(⊖), Rated voltage, Lot.No.
(Purple) SVP(Upper E7), Rated capacitance.

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 Table7 | | |
| Leakage current ※1 | After 2 minutes | Less than or equal to the value of Table7 | | |
| ESR | — | Less than or equal to the value of Table7 | | |
| 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% | |
| | | 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 ※2 | (VPS) (230°C X 75s) | ΔC/C | Within ±10% | |
| | | tanδ | 1.3 times or less than an initial standard | |
| | | ESR | 1.3 times or less than 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 20V for 25V products for 120 minutes at 105°C.

※2 Refer to Page 56 for reflow soldering conditions.

(unit : mm)

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 | 0.6to0.8 | 1.0 |
| B6 | 5.0 | 5.9 | 5.3 | 5.3 | 6.0 | 0.6to0.8 | 1.4 |
| C6 | 6.3 | 5.9 | 6.6 | 6.6 | 7.3 | 0.6to0.8 | 2.1 |
| E7 | 8.0 | 6.9 | 8.3 | 8.3 | 9.0 | 0.6to0.8 | 3.2 |
| F8 | 10.0 | 7.9 | 10.3 | 10.3 | 11.0 | 0.6to0.8 | 4.6 |
| E12 | 8.0 | 11.9 | 8.3 | 8.3 | 9.0 | 0.8to1.1 | 3.2 |
| F12 | 10.0 | 12.6 | 10.3 | 10.3 | 11.0 | 0.8to1.1 | 4.6 |

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) |
|------|---------|-----------|---------|-----------|-----------|-----------|-----------|-----------|
| 3.3 | | | | | | A5 | | |
| 4.7 | | | | | A5 | | | |
| 6.8 | | | | | A5 | | B6 | C6 |
| 10 | | | | | A5 | | B6 | E7 |
| 15 | | | | | | 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 | | | | |
| 150 | | C6,E7 | | | E7 | F8 | F12 | |
| 180 | | | | | | F8,E12 | | |
| 220 | C6 | | | E7,F8 | | | | |
| 270 | | | | | F8 | | | |
| 330 | | E7 | | F8 | F8,E12 | F12 | | |
| 470 | | | | F8,E12 | | | | |
| 560 | | E12 | | | | | | |
| 680 | E12 | F8 | | | | | | |
| 820 | | | F12 | | | | | |
| 1200 | | F12 | | | | | | |
| 1500 | F12 | | | | | | | |

※For the minimum packing quantity, please refer to page 55.

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 |

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Table7 SVP Series Characteristics List

| Size Code | Part Number ※1 | Rated Voltage (V) | Rated Capacitance (μF) | ESR 100kHz to 300kHz (mΩ) (max.) | Rated ripple current (mA _{rms}) | Tangent of loss angle (max.) | Leakage current (μA) (max.) ※2 |
|-------------|----------------|-------------------|------------------------|----------------------------------|---|------------------------------|--------------------------------|
| A5 | 16SVP3R3M | 16 | 3.3 | 260 | 660 | 0.07 | 26.4 |
| | 10SVP4R7M | 10 | 4.7 | 240 | 670 | 0.08 | 23.5 |
| | 10SVP6R8M | 10 | 6.8 | 240 | 670 | 0.09 | 34.0 |
| | 10SVP10M | 10 | 10 | 220 | 700 | 0.10 | 50.0 |
| | 10SVP15M | 10 | 15 | 200 | 740 | 0.10 | 75.0 |
| | 6SVP22M | 6.3 | 22 | 200 | 740 | 0.12 | 69.3 |
| | 4SVP33M | 4 | 33 | 200 | 740 | 0.15 | 66.0 |
| B6 | 20SVP10M | 20 | 10 | 120 | 1020 | 0.10 | 100 |
| | 16SVP15M | 16 | 15 | 120 | 1020 | 0.10 | 120 |
| | 16SVP22M | 16 | 22 | 90 | 1060 | 0.10 | 176 |
| | 10SVP33M | 10 | 33 | 70 | 1100 | 0.12 | 165 |
| | 6SVP47M | 6.3 | 47 | 70 | 1100 | 0.12 | 148 |
| | 4SVP39M | 4 | 39 | 70 | 1100 | 0.12 | 78 |
| | 4SVP68M | 4 | 68 | 60 | 1400 | 0.12 | 136 |
| C6 | 25SVP6R8M ※3 | 25 | 6.8 | 80 | 1200 | 0.10 | 85 |
| | 20SVP22M | 20 | 22 | 60 | 1450 | 0.10 | 88 |
| | 20SVP27M | 20 | 27 | 60 | 1450 | 0.10 | 108 |
| | 16SVP39M | 16 | 39 | 50 | 1620 | 0.10 | 125 |
| | 10SVP47M | 10 | 47 | 50 | 1620 | 0.12 | 94 |
| | 10SVP56M | 10 | 56 | 45 | 1700 | 0.12 | 112 |
| | 6SVP82M | 6.3 | 82 | 45 | 1700 | 0.12 | 103 |
| | 6SVP100M | 6.3 | 100 | 40 | 1810 | 0.12 | 126 |
| | 6SVP120MV | 6.3 | 120 | 17 | 2780 | 0.12 | 151 |
| | 4SVP150MX | 4 | 150 | 40 | 1810 | 0.12 | 120 |
| 2R5SVP220M | 2.5 | 220 | 23 | 2390 | 0.12 | 110 | |
| E7 | 25SVP10M ※3 | 25 | 10 | 60 | 1500 | 0.10 | 125 |
| | 20SVP33M | 20 | 33 | 45 | 1890 | 0.12 | 132 |
| | 20SVP47M | 20 | 47 | 45 | 1890 | 0.12 | 188 |
| | 16SVP56M | 16 | 56 | 45 | 1890 | 0.12 | 179 |
| | 16SVP82M | 16 | 82 | 40 | 2120 | 0.12 | 262 |
| | 10SVP120M | 10 | 120 | 35 | 2560 | 0.12 | 240 |
| | 10SVP150MX | 10 | 150 | 35 | 2560 | 0.12 | 300 |
| | 6SVP220MX | 6.3 | 220 | 35 | 2560 | 0.12 | 277 |
| | 4SVP150M | 4 | 150 | 35 | 2560 | 0.12 | 120 |
| | 4SVP330M | 4 | 330 | 35 | 2560 | 0.12 | 264 |
| F8 | 25SVP22M ※3 | 25 | 22 | 50 | 2000 | 0.10 | 275 |
| | 20SVP56M | 20 | 56 | 40 | 2400 | 0.12 | 224 |
| | 20SVP68M | 20 | 68 | 40 | 2400 | 0.12 | 272 |
| | 16SVP100M | 16 | 100 | 35 | 2670 | 0.12 | 320 |
| | 16SVP150M | 16 | 150 | 30 | 3020 | 0.12 | 480 |
| | 16SVP180MX | 16 | 180 | 30 | 3020 | 0.12 | 576 |
| | 10SVP150M | 10 | 150 | 30 | 3020 | 0.12 | 300 |
| | 10SVP270M | 10 | 270 | 25 | 3700 | 0.12 | 540 |
| | 10SVP330MX | 10 | 330 | 25 | 3700 | 0.12 | 660 |
| | 6SVP220M | 6.3 | 220 | 25 | 3700 | 0.12 | 277 |
| | 6SVP330M | 6.3 | 330 | 25 | 3700 | 0.12 | 416 |
| | 6SVP470MX | 6.3 | 470 | 25 | 3700 | 0.12 | 592 |
| 4SVP680M | 4 | 680 | 25 | 3700 | 0.12 | 544 | |
| E12 | 25SVP33M ※3 | 25 | 33 | 30 | 2980 | 0.12 | 413 |
| | 20SVP100M | 20 | 100 | 24 | 3320 | 0.15 | 400 |
| | 16SVP180M | 16 | 180 | 20 | 3640 | 0.15 | 576 |
| | 10SVP330M | 10 | 330 | 17 | 3950 | 0.15 | 660 |
| | 6SVP470M | 6.3 | 470 | 15 | 4210 | 0.15 | 592 |
| | 4SVP560M | 4 | 560 | 13 | 4520 | 0.15 | 448 |
| 2R5SVP680M | 2.5 | 680 | 13 | 4520 | 0.15 | 340 | |
| F12 | 25SVP56M ※3 | 25 | 56 | 28 | 3800 | 0.12 | 700 |
| | 20SVP150M | 20 | 150 | 20 | 4320 | 0.15 | 600 |
| | 16SVP330M | 16 | 330 | 16 | 4720 | 0.15 | 792 |
| | 10SVP560M | 10 | 560 | 13 | 5230 | 0.15 | 840 |
| | 6SVP820M | 6.3 | 820 | 12 | 5440 | 0.15 | 775 |
| | 4SVP1200M | 4 | 1200 | 12 | 5440 | 0.18 | 960 |
| 2R5SVP1500M | 2.5 | 1500 | 12 | 5440 | 0.18 | 750 | |

※1 Capacitance tolerance : M ±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 ≤ f < 1kHz | 1kHz ≤ f < 10kHz | 10kHz ≤ f < 100kHz | 100kHz ≤ f ≤ 500kHz |
|-------------|------------------|------------------|--------------------|---------------------|
| Coefficient | 0.05 | 0.3 | 0.7 | 1 |



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