

94SVP

Vishay OS-CON



## Vertical Surface Mounting Capacitors

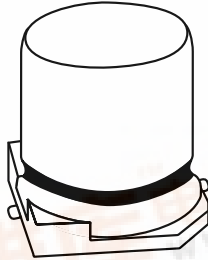


Fig.1 Component outline

### FEATURES

- New Vishay OS-CON series as results of polymerized organic semiconductor as electrolyte
- Features superior heat-proof characteristics compared with previously developed Vishay OS-CON series
- Particularly effective when used as surface mounting devices of the switching power supply
- Rated ripple current values are guaranteed at 105 °C
- No need to consider derating on maximum allowable ripple current



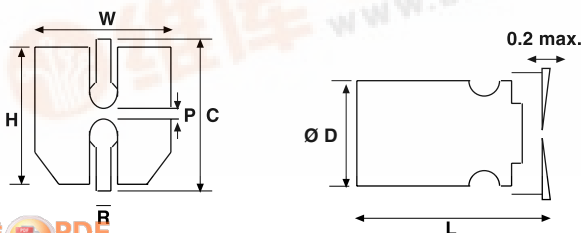
**RoHS**  
COMPLIANT

| QUICK REFERENCE DATA                                                                                        |                                                                                   |                                                        |             |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------|-------------|
| DESCRIPTION                                                                                                 | VALUE                                                                             |                                                        |             |
| Operating Temperature Range                                                                                 | - 55 °C to + 105 °C                                                               |                                                        |             |
| Capacitance Tolerance at 120 Hz                                                                             | M: ± 20 %                                                                         |                                                        |             |
| Tangent of Loss Angle (tan δ) at 120 Hz                                                                     | Values in Standard Ratings Table                                                  |                                                        |             |
| Leakage Current (µA/2 minutes) (or less)*                                                                   | Values in Standard Ratings Table                                                  |                                                        |             |
| Equivalent Series Resistance (Ω), (100 k to 300 kHz)                                                        | Values in Standard Ratings Table                                                  |                                                        |             |
| Characteristics at high temp. and low temp.<br>Impedance Ratio at 100 kHz, + 20 °C                          | - 55 °C                                                                           | Z/Z <sub>20 °C</sub>                                   | 1.0 to 1.25 |
|                                                                                                             | + 105 °C                                                                          | Z/Z <sub>20 °C</sub>                                   | 0.75 to1.0  |
| Endurance + 105 °C, 2000 hours<br>Rated Voltage Applied (25 WV to 20 V)<br>(1000 hours for A5/B6 sizes)     | ΔC/C                                                                              | Within ± 20 %                                          |             |
|                                                                                                             | tan δ                                                                             | ≤ 1.5 x the value of Tangent of Loss Angle             |             |
|                                                                                                             | ESR                                                                               | ≤ 1.5 x the value of ESR                               |             |
|                                                                                                             | Leakage Current                                                                   | ≤ The Value of Leakage Current                         |             |
| Damp heat (Steady state)<br>(+ 60 °C, 90 to 95 % RH, 1000 hours, no voltage)<br>(500 hours for A5/B6 sizes) | ΔC/C                                                                              | Within ± 20 %                                          |             |
|                                                                                                             | tan δ                                                                             | ≤ 1.5 x the value of Tangent of Loss Angle             |             |
|                                                                                                             | ESR                                                                               | ≤ 1.5 x the value of ESR                               |             |
|                                                                                                             | Leakage Current                                                                   | ≤ The Value of Leakage Current after Voltage Treatment |             |
| Reverse Voltage Guarantee                                                                                   | Temporary: < 20 % of the rated voltage<br>Continuous: < 10 % of the rated voltage |                                                        |             |
| Solder heat resistance (VPS)**<br>(215 °C x 90 s) or (230 °C x 60 s)<br>(Please consult us for A5/B6 sizes) | ΔC/C                                                                              | Within ± 10 %                                          |             |
|                                                                                                             | tan δ                                                                             | ≤ 1.3 x the value of Tangent of Loss Angle             |             |
|                                                                                                             | ESR                                                                               | ≤ 1.3 x the value of ESR                               |             |
|                                                                                                             | Leakage Current                                                                   | ≤ The Value of Leakage Current after Voltage Treatment |             |

\* If any doubt arises, measure the current after applying voltage (voltage treatment). Voltage Treatment: The rated voltage is applied to Vishay OS-CON (2.5 to 20 WV) for 120 minutes at 105 °C. (However, 20 V is applied to a 25 WV Vishay OS-CON).

\*\* Refer to Standard Ratings table for soldering recommendation.

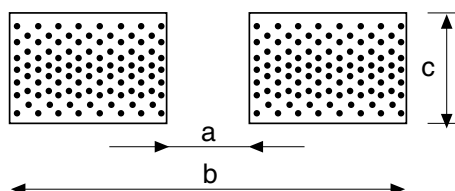
### DIMENSIONS in millimeters



| DIMENSIONS in millimeters |           |        |         |         |         |            |         |
|---------------------------|-----------|--------|---------|---------|---------|------------|---------|
| SIZE CODE                 | Ø D ± 0.5 | L max. | W ± 0.2 | H ± 0.2 | C ± 0.2 | R          | P ± 0.2 |
| A5                        | 4.0       | 5.5    | 4.3     | 4.3     | 5.0     | 0.5 to 0.8 | 1.0     |
| B6                        | 5.0       | 6.0    | 5.3     | 5.3     | 6.0     | 0.5 to 0.8 | 1.4     |
| C6                        | 6.3       | 6.0    | 6.6     | 6.6     | 7.3     | 0.5 to 0.8 | 2.1     |
| E7                        | 8.0       | 7.0    | 8.3     | 8.3     | 9.0     | 0.5 to 0.8 | 3.2     |
| F8                        | 10.0      | 8.0    | 10.3    | 10.3    | 11.0    | 0.5 to 0.8 | 4.6     |
| E12                       | 8.0       | 12.0   | 8.3     | 8.3     | 9.0     | 0.8 to 1.1 | 3.2     |
| F12                       | 10.0      | 12.7   | 10.3    | 10.3    | 11.0    | 0.8 to 1.1 | 4.6     |



# RECOMMENDED LAND PATTERN



## DIMENSIONS in millimeters

| 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 |

## CASE CODE LIST

| CAPACITANCE<br>( $\mu$ F) | WV<br>(SV) | 2.5<br>(3.3) | 4<br>(5.2) | 6.3<br>(8.2) | 10<br>(11.5) | 16<br>(18.4) | 20<br>(23) | 25<br>(25) |
|---------------------------|------------|--------------|------------|--------------|--------------|--------------|------------|------------|
| 3.3                       | -          | -            | -          | -            | -            | A5           | -          | -          |
| 4.7                       | -          | -            | -          | -            | A5           | -            | -          | -          |
| 6.8                       | -          | -            | -          | -            | A5           | -            | -          | C6         |
| 10.0                      | -          | -            | -          | -            | A5           | -            | B6         | E7         |
| 15.0                      | -          | -            | -          | -            | A5           | B6           | -          | -          |
| 27.0                      | -          | -            | -          | -            | -            | -            | C6         | -          |
| 22.0                      | -          | -            | -          | A5           | -            | B6           | C6         | F8         |
| 33.0                      | -          | -            | A5         | -            | B6           | -            | E7         | E12        |
| 39.0                      | -          | -            | B6         | -            | -            | C6           | -          | -          |
| 47.0                      | -          | -            | -          | B6           | C6           | -            | E7         | -          |
| 56.0                      | -          | -            | -          | -            | C6           | E7           | F8         | F12        |
| 68.0                      | -          | -            | B6         | -            | -            | -            | F8         | -          |
| 82.0                      | -          | -            | -          | C6           | -            | E7           | -          | -          |
| 100.0                     | -          | -            | -          | C6           | -            | F8           | E12        | -          |
| 120.0                     | -          | -            | -          | -            | E7           | -            | -          | -          |
| 150.0                     | -          | -            | C6, E7     | -            | E7, F8       | F8           | F12        | -          |
| 180.0                     | -          | -            | -          | -            | -            | E12          | -          | -          |
| 220.0                     | -          | -            | -          | E7, F8       | -            | -            | -          | -          |
| 270.0                     | -          | -            | -          | -            | E7, F8       | -            | -          | -          |
| 330.0                     | -          | -            | E7         | F8           | E12          | F12          | -          | -          |
| 470.0                     | -          | -            | -          | F8, E12      | -            | -            | -          | -          |
| 560.0                     | -          | -            | E12        | -            | F12          | -            | -          | -          |
| 680.0                     | -          | E12          | F8         | -            | -            | -            | -          | -          |
| 820.0                     | -          | -            | -          | F12          | -            | -            | -          | -          |
| 1200.0                    | -          | -            | F12        | -            | -            | -            | -          | -          |
| 1500.0                    | -          | F12          | -          | -            | -            | -            | -          | -          |

\*\*\* WV = Rated Voltage. \*\*\*\* (SV) = Surge Voltage (at room temperature). The description contents are subject to change due to technical improvement without notice. Please ask for latest specifications for order and use.

## STANDARD RATINGS

| CASE CODE | PART NUMBER*    | RATED VOLTAGE (V) | RATED CAPACITANCE ( $\mu$ F) | MAX. ESR (100 k to 300 kHz) (m $\Omega$ ) | ALLOWABLE RIPPLE CURRENT (mAmps) at 100 kHz, + 105 °C | MAX. TANGENT OF LOSS ANGLE | MAX. LEAKAGE CURRENT ( $\mu$ A) (After 2 Minutes) |
|-----------|-----------------|-------------------|------------------------------|-------------------------------------------|-------------------------------------------------------|----------------------------|---------------------------------------------------|
| A5        | 94SVP335X0016A5 | 16                | 3.3                          | 280                                       | 590                                                   | 0.07                       | 26.4                                              |
|           | 94SVP475X0010A5 | 10                | 4.7                          | 260                                       | 660                                                   | 0.08                       | 23.5                                              |
|           | 94SVP685X0010A5 | 10                | 6.8                          | 260                                       | 660                                                   | 0.09                       | 34.0                                              |
|           | 94SVP106X0010A5 | 10                | 10                           | 240                                       | 670                                                   | 0.10                       | 50.0                                              |
|           | 94SVP156X0010A5 | 10                | 15                           | 240                                       | 670                                                   | 0.10                       | 75.0                                              |
|           | 94SVP226X06R3A5 | 6.3               | 22                           | 220                                       | 700                                                   | 0.12                       | 69.3                                              |
|           | 94SVP336X0004A5 | 4                 | 33                           | 200                                       | 740                                                   | 0.15                       | 66.0                                              |

\* Part Numbers shown are for  $\pm 20$  % capacitance tolerance (X0).

# 94SVP

Vishay OS-CON

Vertical Surface Mounting Capacitors



| STANDARD RATINGS |                   |                   |                        |                                  |                                                       |                            |                                             |
|------------------|-------------------|-------------------|------------------------|----------------------------------|-------------------------------------------------------|----------------------------|---------------------------------------------|
| CASE CODE        | PART NUMBER*      | RATED VOLTAGE (V) | RATED CAPACITANCE (μF) | MAX. ESR (100 k to 300 kHz) (mΩ) | ALLOWABLE RIPPLE CURRENT (mAmps) at 100 kHz, + 105 °C | MAX. TANGENT OF LOSS ANGLE | MAX. LEAKAGE CURRENT (μA) (After 2 Minutes) |
| B6               | 94SVP106X0020B6   | 20                | 10                     | 170                              | 850                                                   | 0.10                       | 100                                         |
|                  | 94SVP156X0016B6   | 16                | 15                     | 150                              | 920                                                   | 0.10                       | 120                                         |
|                  | 94SVP226X0016B6   | 16                | 22                     | 150                              | 920                                                   | 0.15                       | 176                                         |
|                  | 94SVP336X0010B6   | 10                | 33                     | 130                              | 990                                                   | 0.15                       | 165                                         |
|                  | 94SVP476X006R3B6  | 6.3               | 47                     | 90                               | 1060                                                  | 0.15                       | 148                                         |
|                  | 94SVP396X0004B6   | 4                 | 39                     | 70                               | 1100                                                  | 0.15                       | 78                                          |
|                  | 94SVP686X0004B6   | 4                 | 68                     | 70                               | 1100                                                  | 0.15                       | 136                                         |
| C6               | 94SVP685X0025C6   | 25                | 6.8                    | 80                               | 1200                                                  | 0.10                       | 85                                          |
|                  | 94SVP226X0020C6   | 20                | 22                     | 65                               | 1390                                                  | 0.10                       | 88                                          |
|                  | 94SVP276X0020C6   | 20                | 27                     | 60                               | 1450                                                  | 0.10                       | 108                                         |
|                  | 94SVP396X0016C6   | 16                | 39                     | 65                               | 1390                                                  | 0.10                       | 125                                         |
|                  | 94SVP476X0010C6   | 10                | 47                     | 60                               | 1450                                                  | 0.12                       | 94                                          |
|                  | 94SVP566X0010C6   | 10                | 56                     | 55                               | 1510                                                  | 0.12                       | 112                                         |
|                  | 94SVP107X006R3C6  | 6.3               | 100                    | 40                               | 1810                                                  | 0.12                       | 126                                         |
|                  | 94SVP826X006R3C6  | 6.3               | 82                     | 50                               | 1570                                                  | 0.12                       | 103                                         |
| E7               | 94SVP157X0004C6   | 4                 | 150                    | 50                               | 1620                                                  | 0.12                       | 120                                         |
|                  | 94SVP106X0025E7   | 25                | 10                     | 60                               | 1500                                                  | 0.10                       | 125                                         |
|                  | 94SVP336X0020E7   | 20                | 33                     | 50                               | 1700                                                  | 0.12                       | 132                                         |
|                  | 94SVP476X0020E7   | 20                | 47                     | 50                               | 1700                                                  | 0.12                       | 188                                         |
|                  | 94SVP566X0016E7   | 16                | 56                     | 50                               | 1800                                                  | 0.12                       | 179                                         |
|                  | 94SVP826X0016E7   | 16                | 82                     | 45                               | 1890                                                  | 0.12                       | 262                                         |
|                  | 94SVP127X0010E7   | 10                | 120                    | 40                               | 2120                                                  | 0.12                       | 240                                         |
|                  | 94SVP157X0010E7   | 10                | 150                    | 35                               | 2560                                                  | 0.12                       | 300                                         |
|                  | 94SVP157X0004E7   | 4                 | 150                    | 35                               | 2350                                                  | 0.12                       | 120                                         |
| F8               | 94SVP337X0004E7   | 4                 | 330                    | 35                               | 2560                                                  | 0.12                       | 264                                         |
|                  | 94SVP227X006R3E7  | 6.3               | 220                    | 35                               | 2560                                                  | 0.12                       | 277                                         |
|                  | 94SVP226X0025F8   | 25                | 22                     | 50                               | 2000                                                  | 0.10                       | 275                                         |
|                  | 94SVP566X0020F8   | 20                | 56                     | 45                               | 2200                                                  | 0.12                       | 224                                         |
|                  | 94SVP686X0020F8   | 20                | 68                     | 45                               | 2200                                                  | 0.12                       | 272                                         |
|                  | 94SVP107X0016F8   | 16                | 100                    | 40                               | 2400                                                  | 0.12                       | 320                                         |
|                  | 94SVP157X0016F8   | 16                | 150                    | 35                               | 2670                                                  | 0.12                       | 480                                         |
|                  | 94SVP157X0010F8   | 10                | 150                    | 35                               | 2670                                                  | 0.12                       | 300                                         |
|                  | 94SVP277X0010F8   | 10                | 270                    | 30                               | 3020                                                  | 0.12                       | 540                                         |
| E12              | 94SVP227X006R3F8  | 6.3               | 220                    | 30                               | 3020                                                  | 0.12                       | 277                                         |
|                  | 94SVP477X006R3F8  | 6.3               | 470                    | 25                               | 3700                                                  | 0.12                       | 592                                         |
|                  | 94SVP337X006R3F8  | 6.3               | 330                    | 25                               | 3300                                                  | 0.12                       | 416                                         |
|                  | 94SVP687X0004F8   | 4                 | 680                    | 25                               | 3700                                                  | 0.12                       | 544                                         |
|                  | 94SVP336X0025E12  | 25                | 33                     | 30                               | 2980                                                  | 0.12                       | 413                                         |
|                  | 94SVP107X0020E12  | 20                | 100                    | 25                               | 3260                                                  | 0.15                       | 400                                         |
|                  | 94SVP187X0016E12  | 16                | 180                    | 22                               | 3480                                                  | 0.15                       | 576                                         |
|                  | 94SVP337X0010E12  | 10                | 330                    | 19                               | 3740                                                  | 0.15                       | 660                                         |
|                  | 94SVP477X006R3E12 | 6.3               | 470                    | 17                               | 3960                                                  | 0.15                       | 592                                         |
| F12              | 94SVP567X0004E12  | 4                 | 560                    | 16                               | 4080                                                  | 0.15                       | 448                                         |
|                  | 94SVP687X002R5E12 | 2.5               | 680                    | 16                               | 4080                                                  | 0.15                       | 340                                         |
|                  | 94SVP566X0025F12  | 25                | 56                     | 28                               | 3800                                                  | 0.12                       | 700                                         |
|                  | 94SVP157X0020F12  | 20                | 150                    | 21                               | 4220                                                  | 0.15                       | 600                                         |
|                  | 94SVP337X0016F12  | 16                | 330                    | 17                               | 4580                                                  | 0.15                       | 792                                         |
|                  | 94SVP567X0010F12  | 10                | 560                    | 15                               | 4870                                                  | 0.15                       | 840                                         |
| F12              | 94SVP827X006R3F12 | 6.3               | 820                    | 14                               | 5040                                                  | 0.15                       | 775                                         |
|                  | 94SVP128X0004F12  | 4                 | 1200                   | 13                               | 5230                                                  | 0.18                       | 960                                         |
|                  | 94SVP158X002R5F12 | 2.5               | 1500                   | 13                               | 5230                                                  | 0.18                       | 750                                         |

\* Part Numbers shown are for ± 20 % capacitance tolerance (X0).



### Notice

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