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# SMD Aluminum Solid Capacitors with Conductive Polymer



## FEATURES

- Vishay OS-CON series utilizes a polymerized organic semiconductor as electrolyte
- Features superior heat-proof characteristics compared with previous OS-CON series
- For power supply and other applications where high ripple current and low impedance are necessary
- Rated ripple current values are guaranteed at 105 °C
- No need to consider derating on maximum allowable ripple current
- SMD version with base plate, containing no lead (Pb)
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

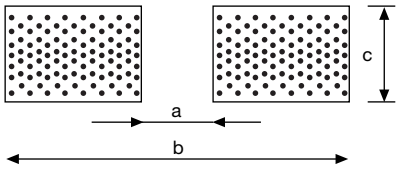

**RoHS**  
COMPLIANT

| 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 Electrical Data and Ordering Information table |  |              |
| Leakage current (µA/2 min) (or less) <sup>(1)</sup>   | Values in Electrical Data and Ordering Information table |  |              |
| Equivalent series resistance (Ω), (100 kHz to 300 kHz)  | Values in Electrical Data and Ordering Information table |  |              |
| Characteristics at high temp. and low temp.<br>Impedance ratio at 100 kHz, +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, 2000 h<br>Rated voltage applied (20 V for 25 V products)<br>(1000 h 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 h, no voltage)<br>(500 h 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                   |  |              |
|   | Continuous: < 10 % of the rated voltage                  |  |              |
| Solder heat resistance (VPS) <sup>(2)</sup><br>(230 °C x 75 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 |              |

## Notes

- (1) 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 WV to 20 WV) for 120 min at 105 °C. (However, 20 V is applied to a 25 WV Vishay OS-CON).
- (2) Refer to Soldering Profile and Land Pattern document [www.vishay.com/doc?90014](http://www.vishay.com/doc?90014) for soldering recommendation.

| DIMENSIONS in millimeters |  | SIZE CODE | Ø D<br>± 0.5 | L<br>max. | W<br>± 0.2 | H<br>± 0.2 | C<br>± 0.2 | R          | P<br>± 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 <sup>(1)</sup>   | 2.5   | 4     | 6.3     | 10     | 16     | 20   | 25   |
|                           | (SV) <sup>(2)</sup> | (3.3) | (5.2) | (8.2)   | (11.5) | (18.4) | (23) | (25) |
| 3.3                       |                     | -     | -     | -       | -      | A5     | -    | -    |
| 4.7                       |                     | -     | -     | -       | A5     | -      | -    | -    |
| 6.8                       |                     | -     | -     | -       | A5     | -      | -    | C6   |
| 10.0                      |                     | -     | -     | -       | A5     | -      | B6   | E7   |
| 15.0                      |                     | -     | -vb   | -       | A5     | B6     | -    | -    |
| 22.0                      |                     | -     | -     | A5      | -      | B6     | C6   | F8   |
| 27.0                      |                     | -     | -     | -       | -      | -      | C6   | -    |
| 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, F8 | F8     | F12  | -    |
| 180.0                     |                     | -     | -     | -       | -      | E12    | -    | -    |
| 220.0                     |                     | -     | -     | E7, F8  | -      | -      | -    | -    |
| 270.0                     |                     | -     | -     | -       | 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   | -     | -       | -      | -      | -    | -    |

**Notes**

<sup>(1)</sup> WV = Rated Voltage.

<sup>(2)</sup> (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.



| ELECTRICAL DATA AND ORDERING INFORMATION |                        |              |  |  |                                  |  |                                 |
|--|------------------------|--------------|--|--|----------------------------------|--|---------------------------------|
| U <sub>R</sub><br>(V)                    | C <sub>R</sub><br>(μF) | CASE<br>CODE | MAX. ESR<br>(100 kHz to 300 kHz)<br>(mΩ) | ALLOWABLE<br>RIPPLE CURRENT<br>AT 100 kHz, +105 °C<br>(mA) | MAX.<br>TANGENT OF<br>LOSS ANGLE | MAX. LEAKAGE<br>CURRENT<br>(μA)<br>(after 2 min) | PART NUMBER <sup>(1)</sup>      |
| 2.5                                      | 680                    | E12          | 16                                       | 4080   | 0.15                             | 340  | 94SVP687X02R5E12                |
|  | 1500                   | F12          | 13                                       | 5230   | 0.18                             | 750  | 94SVP158X02R5F12                |
| 4  | 33                     | A5           | 200                                      | 740  | 0.15                             | 66.0   | 94SVP336X0004A5                 |
|  | 39                     | B6           | 70                                       | 1100   | 0.12                             | 78   | 94SVP396X0004B6                 |
|  | 68                     | B6           | 70                                       | 1100   | 0.12                             | 136  | 94SVP686X0004B6                 |
|  | 150                    | C6           | 50                                       | 1620   | 0.12                             | 120  | 94SVP157X0004C6                 |
|  | 330                    | E7           | 35                                       | 2560   | 0.12                             | 264  | 94SVP337X0004E7                 |
|  | 680                    | F8           | 25                                       | 3700   | 0.12                             | 544  | 94SVP687X0004F8                 |
|  | 560                    | E12          | 16                                       | 4080   | 0.15                             | 448  | 94SVP567X0004E12                |
|  | 1200                   | F12          | 13                                       | 5230   | 0.18                             | 960  | 94SVP128X0004F12                |
| 6.3                                      | 22                     | A5           | 220                                      | 700  | 0.12                             | 69.3   | 94SVP226X06R3A5                 |
|  | 47                     | B6           | 90                                       | 1060   | 0.12                             | 148  | 94SVP476X06R3B6                 |
|  | 82                     | C6           | 50                                       | 1570   | 0.12                             | 103  | 94SVP826X06R3C6                 |
|  | 100                    | C6           | 40                                       | 1810   | 0.12                             | 126  | 94SVP107X06R3C6                 |
|  | 220                    | E7           | 35                                       | 2560   | 0.12                             | 277  | 94SVP227X06R3E7                 |
|  | 220                    | F8           | 30                                       | 3020   | 0.12                             | 277  | 94SVP227X06R3F8                 |
|  | 330                    | F8           | 25                                       | 3300   | 0.12                             | 416  | 94SVP337X06R3F8                 |
|  | 470                    | E12          | 17                                       | 3960   | 0.15                             | 592  | 94SVP477X06R3E12                |
|  | 470                    | F8           | 25                                       | 3700   | 0.12                             | 592  | 94SVP477X06R3F8                 |
|  | 820                    | F12          | 14                                       | 5040   | 0.15                             | 775  | 94SVP827X06R3F12                |
| 10                                       | 4.7                    | A5           | 260                                      | 660  | 0.08                             | 23.5   | 94SVP475X0010A5                 |
|  | 6.8                    | A5           | 260                                      | 660  | 0.09                             | 34.0   | 94SVP685X0010A5                 |
|  | 10                     | A5           | 240                                      | 670  | 0.10                             | 50.0   | 94SVP106X0010A5                 |
|  | 15                     | A5           | 240                                      | 700  | 0.10                             | 75.0   | 94SVP156X0010A5                 |
|  | 33                     | B6           | 130                                      | 990  | 0.15                             | 165  | 94SVP336X0010B6                 |
|  | 47                     | C6           | 60                                       | 1450   | 0.12                             | 94   | 94SVP476X0010C6                 |
|  | 56                     | C6           | 55                                       | 1510   | 0.12                             | 112  | 94SVP566X0010C6                 |
|  | 120                    | E7           | 40                                       | 2120   | 0.12                             | 240  | 94SVP127X0010E7                 |
|  | 150                    | E7           | 35                                       | 2560   | 0.12                             | 300  | 94SVP157X0010E7                 |
|  | 150                    | F8           | 35                                       | 2670   | 0.12                             | 300  | 94SVP157X0010F8                 |
|  | 270                    | F8           | 30                                       | 3020   | 0.12                             | 540  | 94SVP277X0010F8                 |
|  | 330                    | E12          | 19                                       | 3740   | 0.15                             | 660  | 94SVP337X0010E12                |
|  | 560                    | F12          | 15                                       | 4870   | 0.15                             | 840  | 94SVP567X0010F12                |
| 16                                       | 3.3                    | A5           | 280                                      | 590  | 0.07                             | 26.4   | 94SVP335X0016A5                 |
|  | 15                     | B6           | 150                                      | 920  | 0.10                             | 120  | 94SVP156X0016B6                 |
|  | 22                     | B6           | 120                                      | 980  | 0.10                             | 176  | 94SVP226X0016B6                 |
|  | 39                     | C6           | 65                                       | 1390   | 0.10                             | 125  | 94SVP396X0016C6                 |
|  | 56                     | E7           | 50                                       | 1800   | 0.12                             | 179  | 94SVP566X0016E7                 |
|  | 82                     | E7           | 45                                       | 1890   | 0.12                             | 262  | 94SVP826X0016E7                 |
|  | 100                    | F8           | 40                                       | 2400   | 0.12                             | 320  | 94SVP107X0016F8                 |
|  | 150                    | F8           | 35                                       | 2670   | 0.12                             | 480  | 94SVP157X0016F8                 |
|  | 180                    | E12          | 22                                       | 3480   | 0.15                             | 576  | 94SVP187X0016E12                |
|  | 330                    | F12          | 17                                       | 4580   | 0.15                             | 792  | 94SVP337X0016F12                |
|  | 20                     | 10           | B6                                       | 170  | 850                              | 0.10   | 100                             |
| 22                                       |                        | C6           | 65                                       | 1390   | 0.10                             | 88   | 94SVP226X0020C6                 |
| 27                                       |                        | C6           | 60                                       | 1450   | 0.10                             | 108  | 94SVP276X0020C6                 |
| 33                                       |                        | E7           | 50                                       | 1700   | 0.12                             | 132  | 94SVP336X0020E7                 |
| 47                                       |                        | E7           | 50                                       | 1750   | 0.12                             | 188  | 94SVP476X0020E7                 |
| 56                                       |                        | F8           | 45                                       | 2200   | 0.12                             | 224  | 94SVP566X0020F8                 |
| 68                                       |                        | F8           | 45                                       | 2200   | 0.12                             | 272  | 94SVP686X0020F8                 |
| 100                                      |                        | E12          | 25                                       | 3260   | 0.15                             | 400  | 94SVP107X0020E12                |
| 150                                      |                        | F12          | 21                                       | 4220   | 0.15                             | 600  | 94SVP157X0020F12                |
| 25 <sup>(2)</sup>                        | 6.8                    | C6           | 80                                       | 1200   | 0.10                             | 85   | 94SVP685X0025C6 <sup>(2)</sup>  |
|  | 10                     | E7           | 60                                       | 1500   | 0.10                             | 125  | 94SVP106X0025E7 <sup>(2)</sup>  |
|  | 22                     | F8           | 50                                       | 2000   | 0.10                             | 275  | 94SVP226X0025F8 <sup>(2)</sup>  |
|  | 33                     | E12          | 30                                       | 2980   | 0.12                             | 413  | 94SVP336X0025E12 <sup>(2)</sup> |
|  | 56                     | F12          | 28                                       | 3800   | 0.12                             | 700  | 94SVP566X0025F12 <sup>(2)</sup> |

**Notes**

<sup>(1)</sup> Part numbers shown are for ± 20 % capacitance tolerance (X0).

<sup>(2)</sup> 25 V rated parts are not for new design. Please check 94SVPD ([www.vishay.com/doc?90022](http://www.vishay.com/doc?90022)) for replacement.



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