

# VS Surface mount type

## series

- Standard
- Low ESR, High ripple current
- Load life of 2,000h at 105°C



## SPECIFICATIONS

| Items                        | Characteristics   |                                      |
|------------------------------|---|--------------------------------------|
| Temperature range            | -55 to +105°C   |                                      |
| Rated voltage range          | 2.5 to 25Vdc  |                                      |
| Capacitance range            | 6.8 to 1,500μF  |                                      |
| Capacitance tolerance        | ±20% [M] (at 20°C, 120Hz)   |                                      |
| Tangent of loss angle        | Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)                                |                                      |
| Leakage current              | Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)                      |                                      |
| ESR                          | Less than or equal to the value of Standard Ratings   |                                      |
| Characteristics of impedance | Z <sub>+105°C/Z<sub>+20°C</sub></sub> ≤ 1.25, Z <sub>-55°C/Z<sub>+20°C</sub></sub> ≤ 1.25 at 100kHz |                                      |
| Endurance                    | 105°C, 2,000 hrs at rated voltage   |                                      |
|                              | Appearance  | No significant damage                |
|                              | Capacitance change  | Within±20% of the initial value      |
|                              | Tangent of loss angle (tanδ)  | ≤150% of the initial specified value |
|                              | ESR(mΩ)   | ≤150% of the initial specified value |
|                              | Leakage current   | ≤The initial specified value         |
| Damp Heat (Steady State)     | 60°C, 90 to 95% RH, 1,000 hrs, No-applied Voltage   |                                      |
|                              | Appearance  | No significant damage                |
|                              | Capacitance change  | Within±20% of the initial value      |
|                              | Tangent of loss angle (tanδ)  | ≤150% of the initial specified value |
|                              | ESR(mΩ)   | ≤150% of the initial specified value |
|                              | Leakage current   | ≤The initial specified value         |
| Resistance to soldering heat | VPS (230°C, 75s)  |                                      |
|                              | Appearance  | No significant damage                |
|                              | Capacitance change  | Within±10% of the initial value      |
|                              | Tangent of loss angle (tanδ)  | ≤130% of the initial specified value |
|                              | ESR(mΩ)   | ≤130% of the initial specified value |
|                              | Leakage current   | ≤The initial specified value         |

\*In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

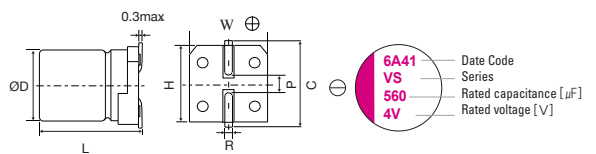
## SIZE LIST

(unit : mm)

| μF   | RV(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>(23.0) | 25<br>(28.7) |
|------|-----------|--------------|----------------------|----------------------|---------------------|--------------|--------------|--------------|
| 6.8  |           |              |                      |                      |                     |              |              | 6.3 x 5.9    |
| 10   |           |              |                      |                      |                     |              | 5 x 5.9      | 8 x 6.9      |
| 15   |           |              |                      |                      |                     | 5 x 5.9      |              |              |
| 22   |           |              |                      |                      |                     | 5 x 5.9      | 6.3 x 5.9    | 10 x 7.9     |
| 27   |           |              |                      |                      |                     |              | 6.3 x 5.9    |              |
| 33   |           |              |                      | 5 x 5.9              |                     |              | 8 x 6.9      | 8 x 11.9     |
| 39   |           | 5 x 5.9      |                      |                      |                     | 6.3 x 5.9    |              |              |
| 47   |           |              | 5 x 5.9              | 5 x 5.9              | 6.3 x 5.9           | 6.3 x 5.9    | 8 x 6.9      |              |
| 56   |           |              |                      | 6.3 x 5.9            | 6.3 x 5.9           | 8 x 6.9      | 10 x 7.9     | 10 x 12.6    |
| 68   |           | 5 x 5.9      |                      |                      |                     |              | 10 x 7.9     |              |
| 82   |           |              |                      | 6.3 x 5.9            |                     | 8 x 6.9      |              |              |
| 100  |           |              |                      | 6.3 x 5.9            |                     | 10 x 7.9     | 8 x 11.9     | 8 x 11.9     |
| 120  |           |              |                      | 6.3 x 5.9            | 8 x 6.9             |              |              |              |
| 150  |           |              | 6.3 x 5.9            |                      | 8 x 6.9<br>10 x 7.9 | 10 x 7.9     | 10 x 12.6    | 10 x 12.6    |
| 180  |           |              |                      |                      | 8 x 6.9<br>10 x 7.9 | 10 x 7.9     | 10 x 12.6    | 10 x 12.6    |
| 220  | 6.3 x 5.9 |              |                      | 8 x 6.9<br>10 x 7.9  |                     |              |              |              |
| 270  |           |              |                      | 10 x 7.9             |                     |              |              |              |
| 330  |           | 8 x 6.9      | 10 x 7.9             | 8 x 11.9<br>10 x 7.9 | 10 x 12.6           |              |              |              |
| 470  | 8 x 6.9   |              | 8 x 11.9<br>10 x 7.9 |                      | 10 x 12.6           |              |              |              |
| 560  |           | 8 x 11.9     |                      |                      | 10 x 12.6           |              |              |              |
| 680  | 8 x 11.9  | 10 x 7.9     |                      |                      |                     |              |              |              |
| 820  |           |              | 10 x 12.6            |                      |                     |              |              |              |
| 1000 |           |              | 10 x 12.6            |                      |                     |              |              |              |
| 1200 |           | 10 x 12.6    |                      |                      |                     |              |              |              |
| 1500 | 10 x 12.6 |              |                      |                      |                     |              |              |              |

\*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

## MARKING AND DIMENSIONS



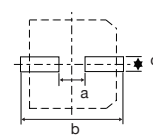
(unit : mm)

| Size      | ΦD±0.5 | L <sup>+0.1<br/>-0.4</sup> | W±0.2 | H±0.2 | C±0.2 | R          | P±0.2 |
|-----------|--------|----------------------------|-------|-------|-------|------------|-------|
| 5 x 5.9   | 5.0    | 5.9                        | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4   |
| 6.3 x 5.9 | 6.3    | 5.9                        | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1   |
| 8 x 6.9   | 8.0    | 6.9                        | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2   |
| 10 x 7.9  | 10.0   | 7.9                        | 10.3  | 10.3  | 11.0  | 0.6 to 0.8 | 4.6   |
| 8 x 11.9  | 8.0    | 11.9                       | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2   |
| 10 x 12.6 | 10.0   | 12.6                       | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6   |

## RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)

| Size      | a   | b    | c   |
|-----------|-----|------|-----|
| 5 x 5.9   | 1.4 | 7.4  | 1.6 |
| 6.3 x 5.9 | 2.1 | 9.1  | 1.6 |
| 8 x 6.9   | 2.8 | 11.1 | 1.9 |
| 10 x 7.9  | 4.3 | 13.1 | 1.9 |
| 8 x 11.9  | 2.8 | 11.1 | 1.9 |
| 10 x 12.6 | 4.3 | 13.1 | 1.9 |



# Conductive Polymer Aluminum Capacitors

## STANDARD RATINGS

| Rated Voltage [Vdc] | Rated Capacitance [μF] | Size Φ D x L [mm] | ESR (20°C, 100kHz) [mΩ] [max.] | Rated Ripple Current (105°C, 100kHz) [mA <sub>rms</sub> ] | Tangent of Loss Angel [max.] | Leakage Current [μA, max.] | Part Number |
|---------------------|------------------------|-------------------|--------------------------------|---|------------------------------|----------------------------|-------------|
| 2.5                 | 220                    | 6.3 x 5.9         | 23                             | 2390  | 0.10                         | 110                        | 2VS220MC6   |
|                     | 470                    | 8 x 6.9           | 23                             | 3300  | 0.10                         | 235                        | 2VS470MD7   |
|                     | 680                    | 8 x 11.9          | 13                             | 4520  | 0.10                         | 340                        | 2VS680MD12  |
|                     | 1500                   | 10 x 12.6         | 12                             | 5440  | 0.10                         | 750                        | 2VS1500ME12 |
| 4                   | 39                     | 5 x 5.9           | 70                             | 1100  | 0.10                         | 78                         | 4VS39MB6    |
|                     | 68                     | 5 x 5.9           | 60                             | 1400  | 0.10                         | 136                        | 4VS68MB6    |
|                     | 150                    | 6.3 x 5.9         | 40                             | 1810  | 0.10                         | 120                        | 4VS150MC6   |
|                     | 330                    | 8 x 6.9           | 35                             | 2560  | 0.10                         | 264                        | 4VS330MD7   |
|                     | 560                    | 8 x 11.9          | 13                             | 4520  | 0.10                         | 448                        | 4VS560MD12  |
|                     | 680                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 544                        | 4VS680ME8   |
|                     | 1200                   | 10 x 12.6         | 12                             | 5440  | 0.10                         | 960                        | 4VS1200ME12 |
| 6.3                 | 47                     | 5 x 5.9           | 70                             | 1100  | 0.10                         | 148                        | 6VS47MB6    |
|                     | 82                     | 6.3 x 5.9         | 45                             | 1700  | 0.10                         | 103                        | 6VS82MC6    |
|                     | 100                    | 6.3 x 5.9         | 40                             | 1810  | 0.10                         | 126                        | 6VS100MC6   |
|                     | 120                    | 6.3 x 5.9         | 40                             | 1810  | 0.10                         | 151                        | 6VS120MC6   |
|                     | 220                    | 8 x 6.9           | 35                             | 2560  | 0.10                         | 277                        | 6VS220MD7   |
|                     | 220                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 277                        | 6VS220ME8   |
|                     | 330                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 416                        | 6VS330ME8   |
|                     | 470                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 592                        | 6VS470ME8   |
|                     | 470                    | 8 x 11.9          | 15                             | 4210  | 0.10                         | 592                        | 6VS470MD12  |
|                     | 820                    | 10 x 12.6         | 12                             | 5440  | 0.10                         | 1033                       | 6VS820ME12  |
| 1000                | 10 x 12.6              | 12                | 5440                           | 0.10  | 1260                         | 6VS1000ME12                |             |
| 10                  | 33                     | 5 x 5.9           | 70                             | 1100  | 0.10                         | 165                        | 10VS33MB6   |
|                     | 47                     | 6.3 x 5.9         | 50                             | 1620  | 0.10                         | 94                         | 10VS47MC6   |
|                     | 56                     | 6.3 x 5.9         | 45                             | 1700  | 0.10                         | 112                        | 10VS56MC6   |
|                     | 120                    | 8 x 6.9           | 35                             | 2560  | 0.10                         | 240                        | 10VS120MD7  |
|                     | 150                    | 8 x 6.9           | 35                             | 2560  | 0.10                         | 300                        | 10VS150MD7  |
|                     | 150                    | 10 x 7.9          | 30                             | 3020  | 0.10                         | 300                        | 10VS150ME8  |
|                     | 270                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 540                        | 10VS270ME8  |
|                     | 330                    | 8 x 11.9          | 17                             | 3950  | 0.10                         | 660                        | 10VS330MD12 |
|                     | 330                    | 10 x 7.9          | 25                             | 3700  | 0.10                         | 660                        | 10VS330ME8  |
|                     | 560                    | 10 x 12.6         | 13                             | 5230  | 0.10                         | 1120                       | 10VS560ME12 |
| 16                  | 15                     | 5 x 5.9           | 120                            | 1020  | 0.10                         | 120                        | 16VS15MB6   |
|                     | 22                     | 5 x 5.9           | 90                             | 1060  | 0.10                         | 176                        | 16VS22MB6   |
|                     | 39                     | 6.3 x 5.9         | 50                             | 1620  | 0.10                         | 125                        | 16VS39MC6   |
|                     | 47                     | 6.3 x 5.9         | 50                             | 1620  | 0.10                         | 150                        | 16VS47MC6   |
|                     | 56                     | 8 x 6.9           | 45                             | 1890  | 0.10                         | 179                        | 16VS56MD7   |
|                     | 82                     | 8 x 6.9           | 40                             | 2120  | 0.10                         | 262                        | 16VS82MD7   |
|                     | 100                    | 10 x 7.9          | 35                             | 2670  | 0.10                         | 320                        | 16VS100ME8  |
|                     | 150                    | 10 x 7.9          | 30                             | 3020  | 0.10                         | 480                        | 16VS150ME8  |
|                     | 180                    | 8 x 11.9          | 20                             | 3640  | 0.10                         | 576                        | 16VS180MD12 |
|                     | 180                    | 10 x 7.9          | 30                             | 3020  | 0.10                         | 576                        | 16VS180ME8  |
| 330                 | 10 x 12.6              | 16                | 4720                           | 0.10  | 1056                         | 16VS330ME12                |             |
| 470                 | 10 x 12.6              | 16                | 4720                           | 0.10  | 1504                         | 16VS470ME12                |             |
| 20                  | 10                     | 5 x 5.9           | 120                            | 1020  | 0.10                         | 100                        | 20VS10MB6   |
|                     | 22                     | 6.3 x 5.9         | 60                             | 1450  | 0.10                         | 88                         | 20VS22MC6   |
|                     | 27                     | 6.3 x 5.9         | 60                             | 1450  | 0.10                         | 108                        | 20VS27MC6   |
|                     | 33                     | 8 x 6.9           | 45                             | 1890  | 0.10                         | 132                        | 20VS33MD7   |
|                     | 47                     | 8 x 6.9           | 45                             | 1890  | 0.10                         | 188                        | 20VS47MD7   |
|                     | 56                     | 10 x 7.9          | 40                             | 2400  | 0.10                         | 224                        | 20VS56ME8   |
|                     | 68                     | 10 x 7.9          | 40                             | 2400  | 0.10                         | 272                        | 20VS68ME8   |
|                     | 100                    | 8 x 11.9          | 24                             | 3320  | 0.10                         | 400                        | 20VS100MD12 |
| 150                 | 10 x 12.6              | 20                | 4320                           | 0.10  | 600                          | 20VS150ME12                |             |
| 25                  | 6.8                    | 6.3 x 5.9         | 80                             | 1200  | 0.10                         | 85                         | 25VS6R8MC6  |
|                     | 10                     | 8 x 6.9           | 60                             | 1500  | 0.10                         | 125                        | 25VS10MD7   |
|                     | 22                     | 10 x 7.9          | 50                             | 2000  | 0.10                         | 275                        | 25VS22ME8   |
|                     | 33                     | 8 x 11.9          | 30                             | 2980  | 0.10                         | 413                        | 25VS33MD12  |
|                     | 56                     | 10 x 12.6         | 28                             | 3800  | 0.10                         | 700                        | 25VS56ME12  |
|                     | 100                    | 8 x 11.9          | 30                             | 3320  | 0.10                         | 500                        | 25VS100MD12 |
| 150                 | 10 x 12.6              | 25                | 4320                           | 0.10  | 750                          | 25VS150ME12                |             |

