



## • Specifications

| Items                        | Characteristics   |                                      |
|------------------------------|---|--------------------------------------|
| Temperature range            | -55 to +105°C   |                                      |
| Rated voltage range          | 16 to 50Vdc   |                                      |
| Capacitance range            | 10 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 | $Z_{+105^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}} \leq 1.25, Z_{-55^{\circ}\text{C}}/Z_{+20^{\circ}\text{C}} \leq 1.25$ at 100kHz |                                      |
| Endurance                    | 105°C, 10,000 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

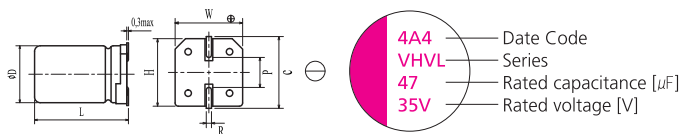
## • Size List

(unit: mm)

| µF   | RV (SV) | 16 (18.4) | 20 (23) | 25 (28.7) | 32 (36.8) | 35 (40.2) | 50 (57.5) |
|------|---------|-----------|---------|-----------|-----------|-----------|-----------|
| 10   |         |           |         |           |           |           | 6.3×5.9   |
| 18   |         |           |         |           |           |           | 8×6.9     |
| 22   |         |           |         |           | 6.3×5.9   | 6.3×5.9   | 8×6.9     |
| 27   |         |           |         | 5×5.9     |           |           |           |
| 39   |         |           |         |           |           | 8×6.9     | 8×11.9    |
| 47   |         |           |         | 6.3×5.9   |           | 8×6.9     | 8×11.9    |
| 56   |         |           | 5×5.9   | 6.3×5.9   |           |           | 8×11.9    |
| 68   |         |           |         |           | 8×6.9     |           | 10×12.6   |
| 82   | 5×5.9   |           |         | 8×6.9     |           | 8×11.9    |           |
| 100  |         |           |         | 8×6.9     |           |           | 10×12.6   |
| 120  |         |           | 6.3×5.9 |           | 8×11.9    | 10×12.6   |           |
| 150  |         |           |         |           |           |           | 10×12.6   |
| 180  | 6.3×5.9 |           | 8×6.9   | 8×11.9    |           |           | 10×12.6   |
| 220  |         |           |         |           | 10×12.6   |           |           |
| 270  | 8×6.9   |           |         |           |           |           |           |
| 330  |         |           |         | 10×12.6   |           |           |           |
| 390  |         |           | 8×11.9  |           |           |           |           |
| 560  | 8×11.9  |           | 10×12.6 |           |           |           |           |
| 1000 | 10×12.6 |           |         |           |           |           |           |
| 1500 | 10×12.6 |           |         |           |           |           |           |

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

## • Marking and Dimensions

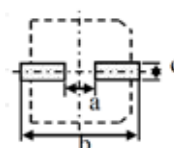


(unit: mm)

| Size    | ∅D±0.5 | L +0.1 -0.4 | W±0.2 | H±0.2 | C±0.2 | R       | P±0.2 |
|---------|--------|-------------|-------|-------|-------|---------|-------|
| 5×5.9   | 5.0    | 5.9         | 5.3   | 5.3   | 6.0   | 0.6~0.8 | 1.4   |
| 6.3×5.9 | 6.3    | 5.9         | 6.6   | 6.6   | 7.3   | 0.6~0.8 | 2.1   |
| 8×6.9   | 8.0    | 6.9         | 8.3   | 8.3   | 9.0   | 0.6~0.8 | 3.2   |
| 8×11.9  | 8.0    | 11.9        | 8.3   | 8.3   | 9.0   | 0.8~1.1 | 3.2   |
| 10×12.6 | 10.0   | 12.6        | 10.3  | 10.3  | 11.0  | 0.8~1.1 | 4.6   |

## • Recommended Land Pattern Dimension of PCB

(unit: mm)



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

### • Standard Ratings

| Rated Voltage [Vdc] | Rated Capacitance [μF] | Size ØD x L [mm] | ESR (20°C, 100kHz) [mΩ] [max.] | Rated Ripple Current (105°C, 100kHz) [mA rms] | Tangent of Loss Angel [max] | Leakage Current [μA, max] | Part Number    |
|---------------------|------------------------|------------------|--------------------------------|---|-----------------------------|---------------------------|----------------|
| 16                  | 82                     | 5 x 5.9          | 27                             | 3000  | 0.12                        | 262                       | 16VHVL82MB6    |
|                     | 180                    | 6.3 x 5.9        | 22                             | 3300  | 0.12                        | 576                       | 16VHVL180MC6   |
|                     | 270                    | 8 x 6.9          | 22                             | 3300  | 0.12                        | 864                       | 16VHVL270MD7   |
|                     | 560                    | 8 x 11.9         | 14                             | 4950  | 0.12                        | 1792                      | 16VHVL560MD12  |
|                     | 1000                   | 10 x 12.6        | 12                             | 5400  | 0.12                        | 3200                      | 16VHVL1000ME12 |
|                     | 1500                   | 10 x 12.6        | 12                             | 5400  | 0.12                        | 4800                      | 16VHVL1500ME12 |
| 20                  | 56                     | 5 x 5.9          | 30                             | 2800  | 0.12                        | 224                       | 20VHVL56MB6    |
|                     | 120                    | 6.3 x 5.9        | 25                             | 3200  | 0.12                        | 480                       | 20VHVL120MC6   |
|                     | 180                    | 8 x 6.9          | 25                             | 3200  | 0.12                        | 720                       | 20VHVL180MD7   |
|                     | 390                    | 8 x 11.9         | 14                             | 4950  | 0.12                        | 1560                      | 20VHVL390MD12  |
|                     | 560                    | 10 x 12.6        | 12                             | 5400  | 0.12                        | 2240                      | 20VHVL560ME12  |
| 25                  | 27                     | 5 x 5.9          | 40                             | 2450  | 0.12                        | 135                       | 25VHVL27MB6    |
|                     | 47                     | 6.3 x 5.9        | 30                             | 2800  | 0.12                        | 235                       | 25VHVL47MC6    |
|                     | 56                     | 6.3 x 5.9        | 30                             | 2800  | 0.12                        | 280                       | 25VHVL56MC6    |
|                     | 82                     | 8 x 6.9          | 28                             | 3000  | 0.12                        | 410                       | 25VHVL82MD7    |
|                     | 100                    | 8 x 6.9          | 25                             | 3200  | 0.12                        | 500                       | 25VHVL100MD7   |
|                     | 180                    | 8 x 11.9         | 16                             | 4650  | 0.12                        | 900                       | 25VHVL180MD12  |
|                     | 330                    | 10 x 12.6        | 14                             | 5000  | 0.12                        | 1650                      | 25VHVL330ME12  |
| 32                  | 22                     | 6.3 x 5.9        | 35                             | 2700  | 0.12                        | 141                       | 32VHVL22MC6    |
|                     | 68                     | 8 x 6.9          | 25                             | 3200  | 0.12                        | 435                       | 32VHVL68MD7    |
|                     | 120                    | 8 x 11.9         | 20                             | 4000  | 0.12                        | 768                       | 32VHVL120MD12  |
|                     | 220                    | 10 x 12.6        | 18                             | 4650  | 0.12                        | 1408                      | 32VHVL220ME12  |
| 35                  | 22                     | 6.3 x 5.9        | 35                             | 2600  | 0.12                        | 154                       | 35VHVL22MC6    |
|                     | 39                     | 8 x 6.9          | 30                             | 2800  | 0.12                        | 273                       | 35VHVL39MD7    |
|                     | 47                     | 8 x 6.9          | 30                             | 2800  | 0.12                        | 329                       | 35VHVL47MD7    |
|                     | 82                     | 8 x 11.9         | 20                             | 4000  | 0.12                        | 574                       | 35VHVL82MD12   |
|                     | 120                    | 10 x 12.6        | 18                             | 4400  | 0.12                        | 840                       | 35VHVL120ME12  |
|                     | 150                    | 10 x 12.6        | 18                             | 4400  | 0.12                        | 1050                      | 35VHVL150ME12  |
|                     | 180                    | 10 x 12.6        | 18                             | 4400  | 0.12                        | 1260                      | 35VHVL180ME12  |
|                     | 10                     | 6.3 x 5.9        | 40                             | 2500  | 0.12                        | 100                       | 50VHVL10MC6    |
| 50                  | 18                     | 8 x 6.9          | 35                             | 2700  | 0.12                        | 180                       | 50VHVL18MD7    |
|                     | 22                     | 8 x 6.9          | 35                             | 2700  | 0.12                        | 220                       | 50VHVL22MD7    |
|                     | 39                     | 8 x 11.9         | 25                             | 3800  | 0.12                        | 390                       | 50VHVL39MD12   |
|                     | 47                     | 8 x 11.9         | 25                             | 3800  | 0.12                        | 470                       | 50VHVL47MD12   |
|                     | 56                     | 8 x 11.9         | 25                             | 3800  | 0.12                        | 560                       | 50VHVL56MD12   |
|                     | 68                     | 10 x 12.6        | 20                             | 4300  | 0.12                        | 680                       | 50VHVL68ME12   |
|                     | 100                    | 10 x 12.6        | 20                             | 4300  | 0.12                        | 1000                      | 50VHVL100ME12  |