

# SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS



UPGRADE

**SC** Chip type, Standard Series

**S**  
Solvent Proof  
WV ≤ 100V



- Chip type higher capacitance in larger case size
- Designed for surface mounting on high density PC board
- Applicable to automatic insertion machine using carrier tape
- Complied to the RoHS directive



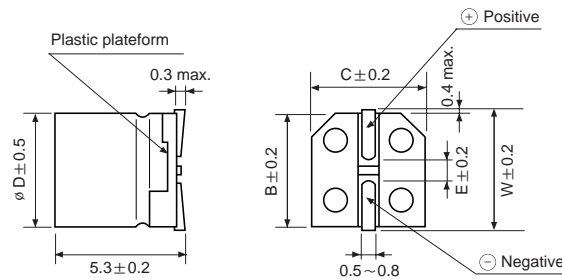
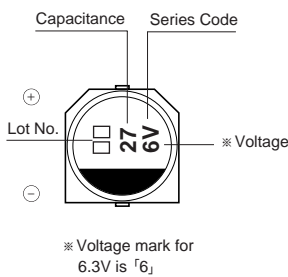
| Item  | Characteristics   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|---|---|--|----------------|----------------|----------------|----------------|----------------|----------------|-----------|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---|---|---------------|----|----|---|---|---|---|---|----|
| Operating temperature range   | -40 ~ +85°C   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Leakage current max.  | WV ≤ 100 I = 0.01CV or 3μA whichever is greater (after 2 minutes)<br>WV ≥ 160 I = 0.04CV + 100μA(after 1 minutes)   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Capacitance tolerance   | ±20% at 120Hz, 20°C   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Dissipation factor max.<br>(at 120Hz, 20°C)   | <table border="1"> <tr> <td>WV</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>tanδ</td> <td>0.35<br/>(0.40)</td> <td>0.28<br/>(0.35)</td> <td>0.20<br/>(0.24)</td> <td>0.16<br/>(0.20)</td> <td>0.13<br/>(0.16)</td> <td>0.12<br/>(0.15)</td> <td>0.09<br/>(0.12)</td> </tr> </table>  | WV   | 4              | 6.3            | 10             | 16             | 25             | 35             | 50        | tanδ      | 0.35<br>(0.40) | 0.28<br>(0.35) | 0.20<br>(0.24) | 0.16<br>(0.20) | 0.13<br>(0.16) | 0.12<br>(0.15) | 0.09<br>(0.12) |   |   |               |    |    |   |   |   |   |   |    |
|   | WV  | 4  | 6.3            | 10             | 16             | 25             | 35             | 50             |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | tanδ  | 0.35<br>(0.40)                                   | 0.28<br>(0.35) | 0.20<br>(0.24) | 0.16<br>(0.20) | 0.13<br>(0.16) | 0.12<br>(0.15) | 0.09<br>(0.12) |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| <table border="1"> <tr> <td>WV</td> <td>63</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> <td>400</td> <td>450</td> </tr> <tr> <td>tanδ</td> <td>0.12</td> <td>0.12</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> <td>0.25</td> <td>0.25</td> </tr> </table> | WV  | 63   | 100            | 160            | 200            | 250            | 400            | 450            | tanδ      | 0.12      | 0.12           | 0.20           | 0.20           | 0.20           | 0.25           | 0.25           |                |   |   |               |    |    |   |   |   |   |   |    |
| WV  | 63  | 100  | 160            | 200            | 250            | 400            | 450            |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| tanδ  | 0.12  | 0.12   | 0.20           | 0.20           | 0.20           | 0.25           | 0.25           |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Figures in( ) are for small size, over the 6.3 × 5.8(φ D × L)   |   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Low temperature characteristics<br>(Impedance ratio at 120Hz)   | <table border="1"> <tr> <td>WV</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35 ~ 100</td> <td>160 ~ 250</td> <td>400 ~ 450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>6</td> <td>10</td> </tr> </table> | WV   | 4              | 6.3            | 10             | 16             | 25             | 35 ~ 100       | 160 ~ 250 | 400 ~ 450 | Z-25°C/Z+20°C  | 6              | 5              | 4              | 3              | 2              | 2              | 3 | 6 | Z-40°C/Z+20°C | 12 | 10 | 8 | 6 | 4 | 3 | 6 | 10 |
|   | WV  | 4  | 6.3            | 10             | 16             | 25             | 35 ~ 100       | 160 ~ 250      | 400 ~ 450 |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | Z-25°C/Z+20°C   | 6  | 5              | 4              | 3              | 2              | 2              | 3              | 6         |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Z-40°C/Z+20°C   | 12  | 10   | 8              | 6              | 4              | 3              | 6              | 10             |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Load life<br>(after application of the rated voltage for 2000 hours at 85°C)  | Leakage current   | Less than specified value                        |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | Capacitance change  | Within ±20% of initial value (Small size : ±25%) |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | tanδ  | Less than 200% of specified value                |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Shelf life (at 85°C)  | After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
| Resistance to soldering heat  | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them at 250°C for 30 seconds.   |  |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | Leakage current   | Less than specified value                        |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | Capacitance change  | Within ±10% of initial value                     |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |
|   | tanδ  | Less than specified value                        |                |                |                |                |                |                |           |           |                |                |                |                |                |                |                |   |   |               |    |    |   |   |   |   |   |    |

CHIP TYPES

## DRAWING

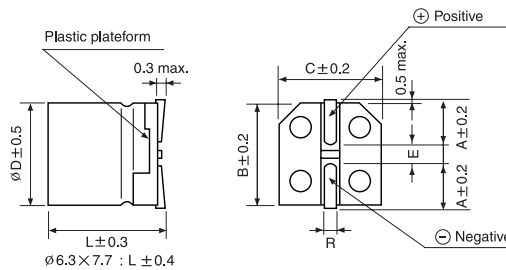
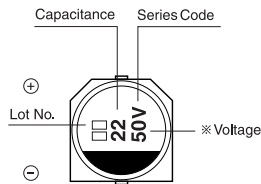
Unit : mm

(φ 4, φ 5, φ 6.3 × 5.3mmL)

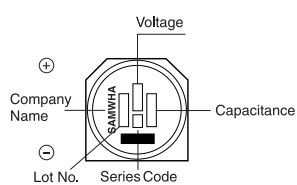


| φ D × L     | W   | A   | B    | C    | E   | R       |
|-------------|-----|-----|------|------|-----|---------|
| 4 × 5.3     | 4.8 |     | 4.3  | 4.3  | 1.0 | 0.5~0.8 |
| 5 × 5.3     | 6.0 |     | 5.3  | 5.3  | 1.4 | 0.5~0.8 |
| 6.3 × 5.3   | 7.1 |     | 6.6  | 6.6  | 2.2 | 0.5~0.8 |
| 6.3 × 5.8   |     | 2.4 | 6.6  | 6.6  | 2.2 | 0.5~0.8 |
| 6.3 × 7.7   |     | 2.4 | 6.6  | 6.6  | 2.2 | 0.5~0.8 |
| 8 × 6.2     |     | 3.3 | 8.3  | 8.3  | 2.3 | 0.5~0.8 |
| 8 × 10      |     | 2.9 | 8.3  | 8.3  | 3.1 | 0.8~1.1 |
| 10 × 10     |     | 3.2 | 10.3 | 10.3 | 4.5 | 0.8~1.1 |
| 12.5 × 13.5 |     | 4.6 | 12.8 | 12.8 | 4.5 | 1.1~1.4 |

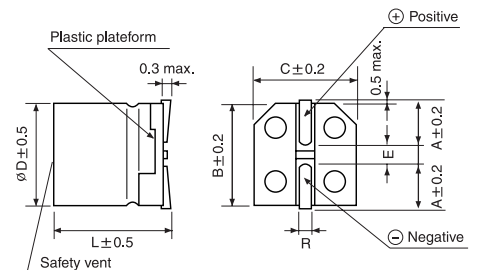
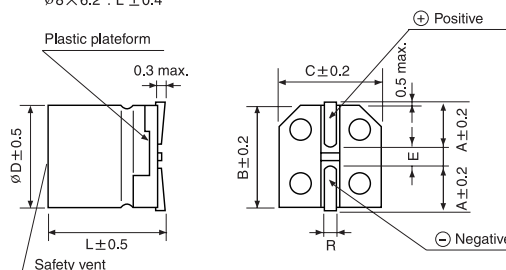
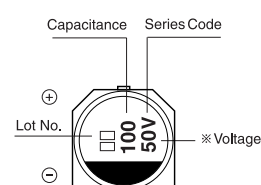
(φ 6.3, φ 8 × 6.2)



(φ 12.5 × 13.5mmL)



(φ 8 × 10, φ 10 × 10)



# SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS



## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| $\mu\text{F}$ \diagdown WV | 4       |    | 6.3       |     | 10        |     | 16        |       | 25        |       | 35        |         | 50        |         |
|----------------------------|---------|----|-----------|-----|-----------|-----|-----------|-------|-----------|-------|-----------|---------|-----------|---------|
| 0.1                        |         |    |           |     |           |     |           |       |           |       |           |         | 3×5.3     | 2.4     |
|                            |         |    |           |     |           |     |           |       |           |       |           |         | 4×5.3     | 3.2     |
| 0.22                       |         |    |           |     |           |     |           |       |           |       |           |         | 3×5.3     | 3.5     |
|                            |         |    |           |     |           |     |           |       |           |       |           |         | 4×5.3     | 4.7     |
| 0.33                       |         |    |           |     |           |     |           |       |           |       |           |         | 3×5.3     | 4.3     |
|                            |         |    |           |     |           |     |           |       |           |       |           |         | 4×5.3     | 5.7     |
| 0.47                       |         |    |           |     |           |     |           |       |           |       |           |         | 3×5.3     | 5.2     |
|                            |         |    |           |     |           |     |           |       |           |       |           |         | 4×5.3     | 6.8     |
| 1.0                        |         |    |           |     |           |     |           |       |           |       |           |         | 3×5.3     | 7.5     |
|                            |         |    |           |     |           |     |           |       |           |       |           |         | 4×5.3     | 10      |
| 2.2                        |         |    |           |     |           |     |           |       |           |       |           | 3×5.3   | 10        |         |
|                            |         |    |           |     |           |     |           |       |           |       |           | 4×5.3   | 11        | 4×5.3   |
| 3.3                        |         |    |           |     |           |     |           |       |           | 3×5.3 | 12        |         |           |         |
|                            |         |    |           |     |           |     |           |       |           | 4×5.3 | 15        | 4×5.3   | 16        | 4×5.3   |
| 4.7                        |         |    |           |     |           |     |           | 3×5.3 | 13        |       |           |         |           | 4×5.3   |
|                            |         |    |           |     |           |     |           | 4×5.3 | 16        | 4×5.3 | 18        | 4×5.3   | 19        | 5×5.3   |
| 10                         | 3×5.3   | 13 | 3×5.3     | 16  | 4×5.3     | 21  | 4×5.3     | 21    | 4×5.3     | 24    | 4×5.3     | 27      | 5×5.3     | 41      |
|                            | 4×5.3   | 16 | 4×5.3     | 19  |           |     |           |       | 5×5.3     | 30    | 5×5.3     | 32      | 6.3×5.3   | 43      |
| 22                         | 3×5.3   | 19 | 4×5.3     | 29  | 4×5.3     | 28  | 4×5.3     | 30    | 5×5.3     | 41    |           | 6.3×5.3 | 55        | 6.3×5.3 |
|                            | 4×5.3   | 24 |           |     | 5×5.3     | 36  | 5×5.3     | 41    | 6.3×5.3   | 53    |           |         |           | 6.3×5.8 |
| 33                         | 4×5.3   | 29 | 4×5.3     | 30  | 4×5.3     | 34  | 5×5.3     | 43    | 5×5.3     | 50    | 6.3×5.3   | 65      | 6.3×5.8   | 94      |
|                            |         |    | 5×5.3     | 41  | 5×5.3     | 44  | 6.3×5.3   | 58    | 6.3×5.3   | 64    | 6.3×5.3   | 67      | 8×6.2     | 95      |
| 47                         | 4×5.3   | 35 | 4×5.3     | 36  | 5×5.3     | 47  | 5×5.3     | 52    | 6.3×5.3   | 70    | 6.3×7.7   | 94      | 6.3×7.7   | 105     |
|                            |         |    | 5×5.3     | 48  | 6.3×5.3   | 62  | 6.3×5.3   | 69    | 6.3×5.8   | 72    | 8×6.2     | 105     | 8×10      | 140     |
| 100                        | 5×5.3   | 54 | 5×5.3     | 60  | 6.3×5.3   | 80  | 6.3×5.3   | 88    |           |       | 6.3×7.7   | 132     | 8×10      | 181     |
|                            | 6.3×5.3 | 68 | 6.3×5.8   | 82  | 6.3×5.8   | 82  | 6.3×5.8   | 91    | 8×6.2     | 145   | 8×10      | 175     | 10×10     | 195     |
| 220                        | 6.3×5.3 | 93 | 6.3×5.8   | 91  | 6.3×7.7   | 173 | 6.3×7.7   | 162   | 8×10      | 232   |           |         |           |         |
|                            |         |    |           |     | 8×6.2     | 175 | 8×10      | 215   | 10×10     | 250   | 10×10     | 265     | 10×10     | 320     |
| 330                        |         |    | 6.3×7.7   | 188 |           |     |           |       |           |       |           |         |           |         |
|                            |         |    | 8×6.2     | 190 | 8×10      | 240 | 8×10      | 270   | 10×10     | 305   | 10×10     | 360     | 12.5×13.5 | 600     |
| 470                        |         |    | 8×10      | 265 | 8×10      | 290 | 8×10      | 307   |           |       |           |         |           |         |
|                            |         |    |           |     |           |     | 10×10     | 330   | 10×10     | 400   | 12.5×13.5 | 600     |           |         |
| 1000                       |         |    | 8×10      | 370 |           |     |           |       |           |       |           |         |           |         |
|                            |         |    | 10×10     | 400 | 10×10     | 454 | 12.5×13.5 | 710   | 12.5×13.5 | 820   |           |         |           |         |
| 1500                       |         |    | 10×10     | 480 | 12.5×13.5 | 850 |           |       |           |       |           |         |           |         |
| 2200                       |         |    | 12.5×13.5 | 890 | 12.5×13.5 | 960 |           |       |           |       |           |         |           |         |

| $\mu\text{F}$ \diagdown WV | 63        |     | 100       |     | 160       |     | 200       |     | 250       |     | 400       |     | 450       |     |
|----------------------------|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|
| 2.2                        |           |     |           |     |           |     |           |     |           |     |           |     | 10×10     | 85  |
| 3.3                        |           |     | 6.3×5.8   | 29  |           |     |           |     |           |     | 10×10     | 90  | 10×10     | 100 |
| 4.7                        | 6.3×5.8   | 31  | 6.3×5.8   | 35  |           |     | 10×10     | 100 | 10×10     | 100 | 12.5×13.5 | 115 | 12.5×13.5 | 115 |
|                            |           |     | 8×6.2     | 40  |           |     |           |     |           |     |           |     |           |     |
| 10                         | 8×5.8     | 46  | 8×10      | 77  | 10×10     | 100 | 12.5×13.5 | 150 | 12.5×13.5 | 150 |           |     |           |     |
| 22                         | 8×6.2     | 96  | 8×10      | 100 | 12.5×13.5 | 240 | 12.5×13.5 | 260 |           |     |           |     |           |     |
| 33                         | 8×10      | 117 | 10×10     | 130 | 12.5×13.5 | 260 |           |     |           |     |           |     |           |     |
| 47                         | 10×10     | 140 | 10×10     | 155 |           |     |           |     |           |     |           |     |           |     |
| 68                         | 10×10     | 160 | 12.5×13.5 | 350 |           |     |           |     |           |     |           |     |           |     |
| 100                        | 12.5×13.5 | 370 |           |     |           |     |           |     |           |     |           |     |           |     |

← Ripple current (mA rms) at 85°C, 120Hz  
 — Case size  $\varnothing$  D×L (mm)