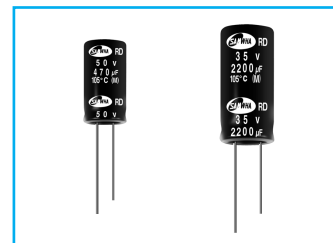
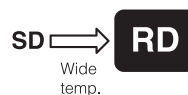


## RD Wide Temperature Range Series

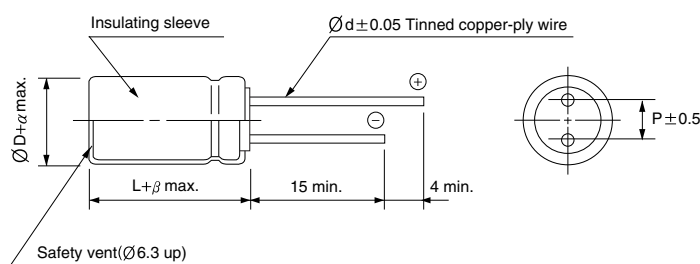
- Standard series for general purpose
- High CV value
- Wide operating temperature range of -55 ~ +105°C
- Complied to the RoHS directive



| Item                                                                          | Characteristics                                                                                                                                                           |      |              |      |            |                                   |      |                               |              |         |         |     |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------|------|------------|-----------------------------------|------|-------------------------------|--------------|---------|---------|-----|
| Operating temperature range                                                   | WV                                                                                                                                                                        |      | 6.3 ~ 100    |      |            | 160 ~ 450                         |      |                               | 500          |         |         |     |
|                                                                               | Temperature range                                                                                                                                                         |      | -55 ~ +105°C |      |            | -40 ~ +105°C                      |      |                               | -25 ~ +105°C |         |         |     |
| Leakage current max.                                                          | WV ≤ 100                                                                                                                                                                  |      |              |      |            |                                   |      | WV > 100                      |              |         |         |     |
|                                                                               | I = 0.01CV or 3μA whichever is greater (after 2 min)<br>I = 0.03CV or 4μA whichever is greater (after 1 min)                                                              |      |              |      |            |                                   |      | I = 0.02CV+15μA (after 5 min) |              |         |         |     |
| Capacitance tolerance                                                         | ±20% at 120Hz, 20°C                                                                                                                                                       |      |              |      |            |                                   |      |                               |              |         |         |     |
| Dissipation factor max.<br>(at 120Hz, 20°C)                                   | Capacitance > 1000μF : tanδ increases by 0.02 for each 1000μF from below value.                                                                                           |      |              |      |            |                                   |      |                               |              |         |         |     |
|                                                                               | WV                                                                                                                                                                        | 6.3  | 10           | 16   | 25         | 35                                | 50   | 63                            | 100          | 160~250 | 350~500 |     |
|                                                                               | tanδ                                                                                                                                                                      | 0.28 | 0.24         | 0.20 | 0.16       | 0.14                              | 0.12 | 0.10                          | 0.08         | 0.15    | 0.20    |     |
| Low temperature characteristics<br>(Impedance ratio at 120Hz)                 | WV                                                                                                                                                                        |      | 6.3          | 10   | 16         | 25                                | 35   | 50~100                        | 160          | 200~350 | 400~450 | 500 |
|                                                                               | Z-25°C/Z+20°C                                                                                                                                                             |      | 5            | 4    | 3          | 2                                 | 2    | 2                             | 4            | 6       | 10      | 12  |
|                                                                               | Z-40°C/Z+20°C                                                                                                                                                             |      | 12           | 10   | 8          | 5                                 | 4    | 3                             | 6            | 8       | 12      | —   |
| Load life<br>(after application of the rated voltage for 2000 hours at 105°C) | Leakage current                                                                                                                                                           |      |              |      |            | Less than specified value         |      |                               |              |         |         |     |
|                                                                               | Capacitance change                                                                                                                                                        |      |              |      |            | Within ±20% of initial value      |      |                               |              |         |         |     |
|                                                                               | tanδ                                                                                                                                                                      |      |              |      |            | Less than 200% of specified value |      |                               |              |         |         |     |
|                                                                               | ØD                                                                                                                                                                        |      |              |      | ØD ≤ 8     |                                   |      |                               | ØD ≥ 10      |         |         |     |
|                                                                               | Life time                                                                                                                                                                 |      |              |      | 1000 hours |                                   |      |                               | 2000 hours   |         |         |     |
| Shelf life (at 105°C)                                                         | After 1000 hours no load test, leakage current, capacitance and tanδ are same as load life value.<br>The measurement shall be performed at 20°C by the KS C IEC 60384 - 4 |      |              |      |            |                                   |      |                               |              |         |         |     |

## DRAWING

Unit : mm



| ØD | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 22   |
|----|-----|-----|-----|-----|------|-----|-----|------|
| P  | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0 |
| Ød | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0  |
| α  | 0.5 |     |     |     |      |     |     | 1.0  |
| β  | 1.5 |     | 2.0 |     |      |     |     | 3.0  |

## FREQUENCY COEFFICIENT OF PERMISSIBLE RIPPLE CURRENT

| WV      | Frequency | 60Hz | 120Hz | 1kHz | 10kHz | 50kHz | 100kHz ≤ |
|---------|-----------|------|-------|------|-------|-------|----------|
| 6.3~100 | ~ 47      | 0.75 | 1.00  | 1.55 | 2.00  | 2.00  | 2.00     |
|         | 68 ~ 680  | 0.80 | 1.00  | 1.35 | 1.50  | 1.62  | 1.75     |
|         | 820 ~     | 0.85 | 1.00  | 1.15 | 1.15  | 1.32  | 1.50     |
| 160~500 | ~ 220     | 0.80 | 1.00  | 1.40 | 1.60  | 1.70  | 1.80     |
|         | 330 ~     | 0.90 | 1.00  | 1.13 | 1.15  | 1.32  | 1.50     |

# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

**RD** series

## ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV<br>Item<br>μF | 6.3          |                                           | 10           |                                           | 16           |                                           | 25           |                                           |
|------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|
|                  | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz |
| 68               |              |                                           |              |                                           |              |                                           | 5 × 11       | 108                                       |
| 82               |              |                                           |              |                                           |              |                                           | 6.3 × 11     | 137                                       |
| 100              |              |                                           |              |                                           | 5 × 11       | 119                                       | 6.3 × 11     | 151                                       |
| 150              |              |                                           | 5 × 11       | 134                                       | 6.3 × 11     | 167                                       | 6.3 × 11     | 185                                       |
| 220              | 5 × 11       | 146                                       | 5 × 11       | 162                                       | 6.3 × 11     | 203                                       | 6.3 × 11     | 224                                       |
| 330              | 6.3 × 11     | 206                                       | 6.3 × 11     | 228                                       | 6.3 × 11     | 248                                       | 8 × 11.5     | 324                                       |
| 470              | 6.3 × 11     | 246                                       | 6.3 × 11     | 272                                       | 8 × 11.5     | 349                                       | 8 × 11.5     | 386                                       |
| 680              | 8 × 11.5     | 348                                       | 8 × 11.5     | 386                                       | 8 × 11.5     | 420                                       | 10 × 12.5    | 540                                       |
| 820              | 8 × 11.5     | 382                                       | 10 × 12.5    | 493                                       | 10 × 16      | 587                                       | 10 × 20      | 708                                       |
| 1000             | 8 × 11.5     | 422                                       | 10 × 12.5    | 544                                       | 10 × 16      | 648                                       | 10 × 20      | 820                                       |
| 1500             | 10 × 16      | 621                                       | 10 × 16      | 680                                       | 10 × 20      | 797                                       | 12.5 × 20    | 1017                                      |
| 2200             | 10 × 16      | 713                                       | 10 × 16      | 774                                       | 10 × 20      | 898                                       | 12.5 × 20    | 1100                                      |
|                  | 10 × 20      | 778                                       | 10 × 20      | 844                                       | 12.5 × 20    | 1055                                      | 12.5 × 25    | 1235                                      |
| 3300             | 12.5 × 16    | 983                                       | 12.5 × 20    | 1148                                      | 12.5 × 20    | 1184                                      | 16 × 25      | 1562                                      |
| 4700             | 12.5 × 20    | 1219                                      | 12.5 × 20    | 1272                                      | 12.5 × 25    | 1459                                      | 16 × 25      | 1752                                      |
|                  |              |                                           | 12.5 × 25    | 1421                                      | 16 × 25      | 1657                                      | 16 × 31.5    | 1916                                      |
| 6800             | 12.5 × 25    | 1480                                      | 16 × 25      | 1737                                      | 16 × 25      | 1811                                      | 16 × 35.5    | 2176                                      |
|                  |              |                                           |              |                                           | 16 × 31.5    | 1982                                      | 18 × 35.5    | 2335                                      |
| 10000            | 16 × 25      | 1807                                      | 16 × 31.5    | 2172                                      | 16 × 31.5    | 2140                                      | 18 × 35.5    | 2497                                      |
| 15000            | 16 × 31.5    | 2128                                      | 16 × 35.5    | 2323                                      | 18 × 35.5    | 2545                                      |              |                                           |
|                  | 16 × 35.5    | 2233                                      | 18 × 35.5    | 2482                                      |              |                                           |              |                                           |
| 22000            | 18 × 31.5    | 2411                                      |              |                                           |              |                                           |              |                                           |

| WV<br>Item<br>μF | 35           |                                           | 50           |                                           | 63           |                                           | 100          |                                           |
|------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|
|                  | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz |
| 2.2              |              |                                           | 5 × 11       | 24                                        | 5 × 11       | 26                                        |              |                                           |
| 3.3              |              |                                           | 5 × 11       | 29                                        | 5 × 11       | 32                                        | 5 × 11       | 32                                        |
| 4.7              |              |                                           | 5 × 11       | 35                                        | 5 × 11       | 38                                        | 5 × 11       | 38                                        |
| 6.8              |              |                                           | 5 × 11       | 42                                        | 5 × 11       | 46                                        | 5 × 11       | 46                                        |
| 10               |              |                                           | 5 × 11       | 51                                        | 5 × 11       | 56                                        | 5 × 11       | 56                                        |
| 15               |              |                                           | 5 × 11       | 62                                        | 5 × 11       | 68                                        | 6.3 × 11     | 78                                        |
| 22               |              |                                           | 5 × 11       | 75                                        | 5 × 11       | 83                                        | 6.3 × 11     | 95                                        |
| 33               |              |                                           | 5 × 11       | 92                                        | 6.3 × 11     | 116                                       | 8 × 11.5     | 139                                       |
| 47               | 5 × 11       | 96                                        | 6.3 × 11     | 127                                       | 6.3 × 11     | 139                                       | 10 × 12.5    | 190                                       |
| 68               | 6.3 × 11     | 132                                       | 8 × 11.5     | 180                                       | 8 × 11.5     | 197                                       | 10 × 16      | 251                                       |
| 82               | 6.3 × 11     | 145                                       | 8 × 11.5     | 198                                       | 8 × 11.5     | 216                                       | 10 × 16      | 290                                       |
| 100              | 6.3 × 11     | 160                                       | 8 × 11.5     | 218                                       | 8 × 11.5     | 239                                       | 10 × 16      | 304                                       |
| 150              | 8 × 11.5     | 231                                       | 8 × 11.5     | 267                                       | 10 × 12.5    | 340                                       | 10 × 20      | 406                                       |
| 220              | 8 × 11.5     | 280                                       | 10 × 12.5    | 376                                       | 10 × 16      | 451                                       | 12.5 × 20    | 564                                       |
| 330              | 10 × 12.5    | 400                                       | 10 × 16      | 504                                       | 10 × 20      | 603                                       | 16 × 25      | 856                                       |
| 470              | 10 × 16      | 521                                       | 10 × 20      | 657                                       | 12.5 × 20    | 844                                       | 16 × 25      | 1021                                      |
| 680              | 10 × 20      | 684                                       | 12.5 × 20    | 927                                       | 12.5 × 25    | 1107                                      | 16 × 31.5    | 1344                                      |
| 820              | 12.5 × 20    | 880                                       | 12.5 × 25    | 1050                                      | 16 × 25      | 1300                                      | 16 × 35.5    | 1627                                      |
| 1000             | 12.5 × 20    | 974                                       | 12.5 × 25    | 1226                                      | 16 × 25      | 1490                                      | 18 × 35.5    | 1835                                      |
| 1500             | 12.5 × 25    | 1136                                      | 16 × 25      | 1442                                      | 16 × 35.5    | 1770                                      |              |                                           |
|                  | 16 × 20      | 1188                                      | 16 × 31.5    | 1578                                      | 18 × 31.5    | 1812                                      |              |                                           |
| 2200             | 16 × 25      | 1426                                      | 16 × 31.5    | 1709                                      | 16 × 35.5    | 1891                                      |              |                                           |
| 3300             | 16 × 35.5    | 1857                                      | 16 × 35.5    | 1794                                      | 18 × 40      | 2689                                      |              |                                           |
|                  | 18 × 31.5    | 1900                                      | 18 × 35.5    | 2152                                      |              |                                           |              |                                           |
| 4700             | 16 × 35.5    | 2073                                      |              |                                           |              |                                           |              |                                           |
|                  | 18 × 35.5    | 2224                                      |              |                                           |              |                                           |              |                                           |
| 6800             | 18 × 40      | 2510                                      |              |                                           |              |                                           |              |                                           |

## RD series

### ● DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

| WV<br>Item<br>μF | 160          |                                           | 200          |                                           | 250          |                                           | 350          |                                           |
|------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|
|                  | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz |
| 2.2              | 6.3 × 11     | 23                                        | 6.3 × 11     | 23                                        | 6.3 × 11     | 23                                        | 6.3 × 11     | 23                                        |
| 3.3              | 6.3 × 11     | 29                                        | 6.3 × 11     | 29                                        | 6.3 × 11     | 30                                        | 8 × 11.5     | 34                                        |
| 4.7              | 6.3 × 11     | 34                                        | 6.3 × 11     | 34                                        | 8 × 11.5     | 40                                        | 8 × 11.5     | 40                                        |
|                  |              |                                           | 8 × 11.5     | 40                                        |              |                                           | 10 × 12.5    | 47                                        |
| 6.8              | 8 × 11.5     | 49                                        | 8 × 11.5     | 49                                        | 10 × 12.5    | 56                                        | 10 × 12.5    | 56                                        |
|                  |              |                                           | 10 × 12.5    | 56                                        |              |                                           | 10 × 16      | 62                                        |
| 10               | 8 × 11.5     | 59                                        | 8 × 11.5     | 59                                        | 10 × 12.5    | 68                                        | 10 × 16      | 75                                        |
|                  | 10 × 12.5    | 68                                        | 10 × 12.5    | 68                                        |              |                                           |              |                                           |
| 15               | 10 × 12.5    | 84                                        | 10 × 12.5    | 84                                        | 10 × 16      | 92                                        | 10 × 16      | 92                                        |
|                  | 10 × 16      | 92                                        | 10 × 16      | 92                                        |              |                                           | 10 × 20      | 100                                       |
| 22               | 10 × 12.5    | 102                                       | 10 × 16      | 111                                       | 10 × 16      | 111                                       | 12.5 × 20    | 143                                       |
|                  | 10 × 16      | 111                                       |              |                                           | 10 × 20      | 121                                       |              |                                           |
| 33               | 10 × 16      | 136                                       | 10 × 20      | 149                                       | 10 × 20      | 149                                       | 12.5 × 25    | 190                                       |
|                  | 10 × 20      | 149                                       |              |                                           | 12.5 × 20    | 175                                       |              |                                           |
| 47               | 10 × 20      | 177                                       | 12.5 × 20    | 208                                       | 12.5 × 20    | 203                                       | 16 × 25      | 252                                       |
|                  | 12.5 × 20    | 208                                       |              |                                           | 12.5 × 25    | 227                                       |              |                                           |
| 68               | 12.5 × 25    | 273                                       | 16 × 20      | 279                                       | 12.5 × 25    | 267                                       | 16 × 31.5    | 332                                       |
| 82               | 12.5 × 25    | 302                                       | 16 × 25      | 333                                       | 16 × 25      | 333                                       | 18 × 31.5    | 391                                       |
| 100              | 12.5 × 25    | 331                                       | 16 × 25      | 368                                       | 16 × 25      | 368                                       | 18 × 31.5    | 432                                       |
| 150              | 16 × 25      | 450                                       | 16 × 25      | 450                                       | 16 × 31.5    | 450                                       | 18 × 35.5    | 554                                       |
| 220              | 16 × 31.5    | 596                                       | 18 × 31.5    | 641                                       | 18 × 35.5    | 671                                       | 22 × 41      | 721                                       |
|                  |              |                                           | 18 × 35.5    | 671                                       | 18 × 40      | 694                                       |              |                                           |
| 330              | 18 × 31.5    | 784                                       | 18 × 40      | 863                                       | 22 × 41      | 968                                       |              |                                           |
| 470              | 18 × 40      | 1030                                      | 22 × 41      | 1155                                      |              |                                           |              |                                           |
| 680              | 22 × 41      | 1390                                      |              |                                           |              |                                           |              |                                           |

| WV<br>Item<br>μF | 400          |                                           | 450          |                                           | 500          |                                           |
|------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|--------------|-------------------------------------------|
|                  | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz | ØD×L<br>(mm) | Ripple current<br>(mA rms)<br>105°C 120Hz |
| 2.2              | 8 × 11.5     | 28                                        | 8 × 11.5     | 23                                        |              |                                           |
| 3.3              | 8 × 11.5     | 34                                        | 10 × 12.5    | 33                                        |              |                                           |
|                  | 10 × 12.5    | 39                                        | 10 × 16      | 36                                        |              |                                           |
| 4.7              | 10 × 12.5    | 47                                        | 10 × 12.5    | 39                                        | 10 × 16      | 59                                        |
| 6.8              | 10 × 16      | 62                                        | 10 × 16      | 52                                        | 10 × 16      | 72                                        |
| 10               | 10 × 16      | 75                                        | 10 × 20      | 68                                        | 12.5 × 25    | 88                                        |
|                  | 10 × 20      | 82                                        | 12.5 × 20    | 80                                        |              |                                           |
| 15               | 12.5 × 20    | 118                                       | 12.5 × 20    | 96                                        | 12.5 × 30    | 115                                       |
| 22               | 12.5 × 20    | 140                                       | 12.5 × 25    | 127                                       | 16 × 25      | 159                                       |
|                  | 12.5 × 25    | 155                                       | 16 × 25      | 144                                       |              |                                           |
| 33               | 16 × 25      | 211                                       | 16 × 25      | 177                                       | 16 × 31.5    | 207                                       |
| 47               | 16 × 25      | 252                                       | 16 × 31.5    | 231                                       | 18 × 31.5    | 261                                       |
| 68               | 16 × 31.5    | 332                                       | 16 × 35.5    | 291                                       | 18 × 35.5    | 335                                       |
|                  | 18 × 31.5    | 356                                       |              |                                           |              |                                           |
| 82               | 18 × 31.5    | 391                                       | 18 × 31.5    | 327                                       | 18 × 40      | 370                                       |
| 100              | 18 × 35.5    | 453                                       | 18 × 40      |                                           |              |                                           |
| 150              | 22 × 41      | 596                                       |              |                                           |              |                                           |