



**THE DATASHEET OF  
SEK220M050ST**



# Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors

## Long Life, Aluminum Electrolytic



Type SEK is a radial leaded aluminum electrolytic capacitor with a +105 °C, long life rating. The volumetric efficient high CV product of the SEK makes it ideal for high density packaging in general purpose, coupling, decoupling, bypass and filtering circuit applications.

### Highlights

- +105 °C
- Long life
- High CV product
- General purpose applications
- Available in T&R and ammo pack

### Specifications

| Capacitance Range                               | 0.47 to 15,000 $\mu$ F  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
|---|---|---------------|--------------------|-------|----|----|------|-------|------|---------|----------------|---------|---------|--------------|-----|------------------|------|-----|-----|-----|-------------------|------|-----|-----|-----|-------------------|------|-----|-----|-----|---------------------|-------------------|---------|------|--------|------|--------|------|
| Capacitance Tolerance                           | $\pm$ 20%   |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Rated Voltage                                   | 6.3 to 450 Vdc  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Operating Temperature Range                     | -55 °C to +105 °C; 6.3 to 100 Vdc<br>-40 °C to +105 °C; 160 to 400 Vdc<br>-25 °C to +105 °C; 450 Vdc  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Maximum DC Leakage Current                      | After 2 minutes, with rated voltage at +20 °C<br>6.3 to 100 Vdc<br>$I = .01CV$ or 3 $\mu$ A Max (whichever is greater)<br>$\geq 160$ Vdc after 3 min, with rated voltage at +20 °C<br>$I = .03CV$ or 10 $\mu$ A Max (whichever is greater)<br>C = Capacitance in ( $\mu$ F)<br>V = Rated voltage<br>I = Leakage current in $\mu$ A  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Dissipation Factor @ 120 Hz, +25 °C             | <table border="1"> <tr> <td><b>WV (V)</b></td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>80</td> <td>100</td> <td>160-250</td> <td>350-450</td> </tr> <tr> <td><b>DF(%)</b></td> <td>26</td> <td>22</td> <td>18</td> <td>16</td> <td>14</td> <td>12</td> <td>10</td> <td>10</td> <td>10</td> <td>15</td> <td>20</td> </tr> </table> <p>For capacitors whose capacitance value exceeds 1000 <math>\mu</math>F, the value of DF (%) is increased 2% for every additional 1000 <math>\mu</math>F.</p>   | <b>WV (V)</b> | 6.3                | 10    | 16 | 25 | 35   | 50    | 63   | 80      | 100            | 160-250 | 350-450 | <b>DF(%)</b> | 26  | 22               | 18   | 16  | 14  | 12  | 10                | 10   | 10  | 15  | 20  |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>WV (V)</b>                                   | 6.3   | 10            | 16                 | 25    | 35 | 50 | 63   | 80    | 100  | 160-250 | 350-450        |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>DF(%)</b>                                    | 26  | 22            | 18                 | 16    | 14 | 12 | 10   | 10    | 10   | 15      | 20             |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Ripple Multipliers for Voltage and Temperature: | <table border="1"> <thead> <tr> <th rowspan="2">Rated WVDC</th> <th colspan="4">Ripple Multipliers</th> </tr> <tr> <th>60Hz</th> <th>120Hz</th> <th>1kHz</th> <th>10kHz</th> </tr> </thead> <tbody> <tr> <td><b>6 to 25</b></td> <td>0.80</td> <td>1.0</td> <td>1.1</td> <td>1.2</td> </tr> <tr> <td><b>35 to 100</b></td> <td>0.75</td> <td>1.0</td> <td>1.3</td> <td>1.4</td> </tr> <tr> <td><b>160 to 250</b></td> <td>0.70</td> <td>1.0</td> <td>1.4</td> <td>1.6</td> </tr> <tr> <td><b>350 to 400</b></td> <td>0.60</td> <td>1.0</td> <td>1.5</td> <td>1.8</td> </tr> </tbody> </table><br><table border="1"> <thead> <tr> <th>Ambient Temperature</th> <th>Ripple Multiplier</th> </tr> </thead> <tbody> <tr> <td>+105 °C</td> <td>1.00</td> </tr> <tr> <td>+85 °C</td> <td>1.50</td> </tr> <tr> <td>+70 °C</td> <td>1.80</td> </tr> </tbody> </table> | Rated WVDC    | Ripple Multipliers |       |    |    | 60Hz | 120Hz | 1kHz | 10kHz   | <b>6 to 25</b> | 0.80    | 1.0     | 1.1          | 1.2 | <b>35 to 100</b> | 0.75 | 1.0 | 1.3 | 1.4 | <b>160 to 250</b> | 0.70 | 1.0 | 1.4 | 1.6 | <b>350 to 400</b> | 0.60 | 1.0 | 1.5 | 1.8 | Ambient Temperature | Ripple Multiplier | +105 °C | 1.00 | +85 °C | 1.50 | +70 °C | 1.80 |
| Rated WVDC                                      | Ripple Multipliers  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
|   | 60Hz  | 120Hz         | 1kHz               | 10kHz |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>6 to 25</b>                                  | 0.80  | 1.0           | 1.1                | 1.2   |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>35 to 100</b>                                | 0.75  | 1.0           | 1.3                | 1.4   |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>160 to 250</b>                               | 0.70  | 1.0           | 1.4                | 1.6   |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| <b>350 to 400</b>                               | 0.60  | 1.0           | 1.5                | 1.8   |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Ambient Temperature                             | Ripple Multiplier   |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| +105 °C   | 1.00  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| +85 °C  | 1.50  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| +70 °C  | 1.80  |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Load Life Test                                  | Apply WVDC for 2000 hours at +105 °C<br>Capacitance change within 20% of initial limit<br>DF not to exceed 200% of initial requirement<br>Leakage current not to exceed 200% of initial   |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |
| Shelf Life Test                                 | 1000 hrs @105 °C with no voltage applied<br>Cap change within $\pm$ 20% of initial values<br>DF not to exceed 200% of initial requirement<br>DC leakage current meets initial requirement   |               |                    |       |    |    |      |       |      |         |                |         |         |              |     |                  |      |     |     |     |                   |      |     |     |     |                   |      |     |     |     |                     |                   |         |      |        |      |        |      |

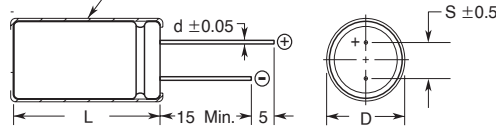
#### Regulatory Information

# Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors

## Outline Drawing

### Outline Dimensions (Millimeters)

Sleeving is PVC or PET (PET for all date codes after December 2019)



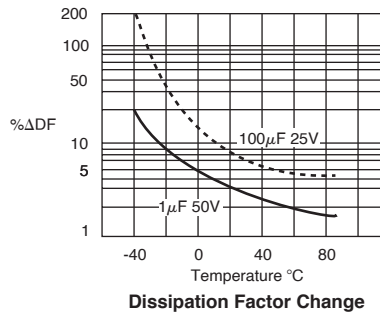
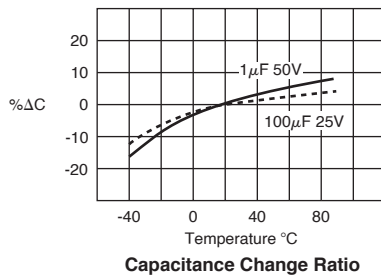
Case vented on diameters 6.3 and greater

sleeve adds .5 Max. to diameter and 2.0 Max. to length

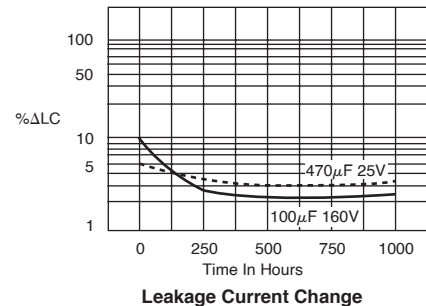
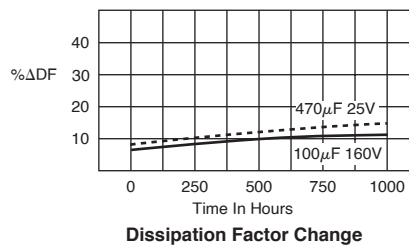
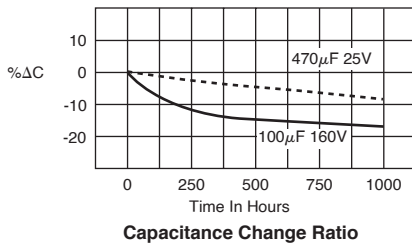
## Part Numbering System

| Type | Capacitance       | Tolerance    | Rated Voltage | Packaging                    | Lead Configuration          |
|------|-------------------|--------------|---------------|------------------------------|-----------------------------|
|      | ( $\mu\text{F}$ ) | (%)          | (Vdc)         |                              |                             |
| SEK  | 100               | M            | 100           | S                            | T                           |
|      | 3R0 = 3           | K = $\pm 10$ | 6R3 = 6.3     | A = Tape & Ammo              | 1 = Lead cut                |
|      | 100 = 10          | M = $\pm 20$ | 010 = 10      | E = Different Characteristic | 2 = Lead form               |
|      | 101 = 100         |              | 100 = 100     | R = Tape & Reel              | 4 = Lead crimp & cut (form) |
|      | 102 = 1000        |              |               | S = Standard                 | T = Standard                |

## Temperature Characteristics



## Load Life Characteristics



## Ratings

| Cap<br>( $\mu$ F)              | Catalog<br>Part Number | Max ESR<br>120 Hz<br>25 °C<br>( $\Omega$ ) | Max Ripple<br>120 Hz<br>105 °C<br>(mA) | Size in. (mm)   |               |                   |                  |
|--------------------------------|------------------------|--|--|-----------------|---------------|-------------------|------------------|
|                                |                        |  |  | Diameter<br>(D) | Length<br>(L) | Lead Space<br>(S) | Lead Dia.<br>(d) |
| <b>6.3 Vdc (8 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 100                            | SEK101M6R3ST           | 3.45                                       | 100                                    | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 220                            | SEK221M6R3ST           | 1.57                                       | 165                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 330                            | SEK331M6R3ST           | 1.05                                       | 200                                    | .248 (6.3)      | .453 (11.5)   | .098 (2.5)        | .0197 (0.5)      |
| 470                            | SEK471M6R3ST           | 0.73                                       | 280                                    | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 1000                           | SEK102M6R3ST           | 0.35                                       | 470                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 2200                           | SEK222M6R3ST           | 0.17                                       | 930                                    | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3300                           | SEK332M6R3ST           | 0.12                                       | 1100                                   | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4700                           | SEK472M6R3ST           | 0.10                                       | 1320                                   | .630 (16.0)     | .984 (26.0)   | .295 (7.5)        | .0315 (0.8)      |
| 6800                           | SEK682M6R3ST           | 0.07                                       | 1490                                   | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 10000                          | SEK103M6R3ST           | 0.06                                       | 1830                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 15000                          | SEK153M6R3ST           | 0.05                                       | 2280                                   | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>10 Vdc (13 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 47                             | SEK470M010ST           | 6.21                                       | 75                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 100                            | SEK101M010ST           | 2.92                                       | 110                                    | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 220                            | SEK221M010ST           | 1.33                                       | 180                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 330                            | SEK331M010ST           | 0.88                                       | 255                                    | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 470                            | SEK471M010ST           | 0.62                                       | 305                                    | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 1000                           | SEK102M010ST           | 0.29                                       | 570                                    | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 2200                           | SEK222M010ST           | 0.14                                       | 1010                                   | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3300                           | SEK332M010ST           | 0.10                                       | 1220                                   | .512 (13.0)     | .984 (25.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4700                           | SEK472M010ST           | 0.08                                       | 1410                                   | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 6800                           | SEK682M010ST           | 0.07                                       | 1610                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 10000                          | SEK103M010ST           | 0.05                                       | 1980                                   | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 15000                          | SEK153M010ST           | 0.04                                       | 3330                                   | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>16 Vdc (20 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 33                             | SEK330M016ST           | 7.24                                       | 70                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 47                             | SEK470M016ST           | 5.08                                       | 85                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 100                            | SEK101M016ST           | 2.39                                       | 135                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 220                            | SEK221M016ST           | 1.09                                       | 235                                    | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 330                            | SEK331M016ST           | 0.72                                       | 285                                    | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 470                            | SEK471M016ST           | 0.51                                       | 395                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 1000                           | SEK102M016ST           | 0.24                                       | 700                                    | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 2200                           | SEK222M016ST           | 0.12                                       | 1150                                   | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3300                           | SEK332M016ST           | 0.09                                       | 1350                                   | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4700                           | SEK472M016ST           | 0.07                                       | 1560                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 6800                           | SEK682M016ST           | 0.06                                       | 1790                                   | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 10000                          | SEK103M016ST           | 0.05                                       | 2884                                   | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>25 Vdc (32 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 10                             | SEK100M025ST           | 21.23                                      | 50                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 22                             | SEK220M025ST           | 9.65                                       | 60                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 33                             | SEK330M025ST           | 6.43                                       | 75                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 47                             | SEK470M025ST           | 4.52                                       | 90                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 100                            | SEK101M025ST           | 2.12                                       | 145                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 220                            | SEK221M025ST           | 0.97                                       | 250                                    | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 330                            | SEK331M025ST           | 0.64                                       | 355                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |

# Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors



| Cap<br>( $\mu$ F)              | Catalog<br>Part Number | Max ESR<br>120 Hz<br>25 °C<br>( $\Omega$ ) | Max Ripple<br>120 Hz<br>105 °C<br>(mA) | Size in. (mm)   |               |                   |                  |
|--------------------------------|------------------------|--|--|-----------------|---------------|-------------------|------------------|
|                                |                        |  |  | Diameter<br>(D) | Length<br>(L) | Lead Space<br>(S) | Lead Dia.<br>(d) |
| <b>25 Vdc (32 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 470                            | SEK471M025ST           | 0.45                                       | 470                                    | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 1000                           | SEK102M025ST           | 0.21                                       | 855                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 2200                           | SEK222M025ST           | 0.11                                       | 1230                                   | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3300                           | SEK332M025ST           | 0.08                                       | 1450                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 4700                           | SEK472M025ST           | 0.07                                       | 1690                                   | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 6800                           | SEK682M025ST           | 0.05                                       | 2856                                   | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>35 Vdc (44 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 22                             | SEK220M035ST           | 8.44                                       | 65                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 33                             | SEK330M035ST           | 5.63                                       | 85                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 47                             | SEK470M035ST           | 3.95                                       | 115                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 100                            | SEK101M035ST           | 1.86                                       | 190                                    | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 220                            | SEK221M035ST           | 0.84                                       | 315                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 330                            | SEK331M035ST           | 0.56                                       | 440                                    | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 470                            | SEK471M035ST           | 0.40                                       | 580                                    | .512 (13.0)     | .787 (20.0)   | .197 (5.0)        | .0236 (0.6)      |
| 1000                           | SEK102M035ST           | 0.19                                       | 995                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 2200                           | SEK222M035ST           | 0.10                                       | 1450                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 3300                           | SEK332M035ST           | 0.07                                       | 1660                                   | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 4700                           | SEK472M035ST           | 0.06                                       | 2674                                   | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>50 Vdc (63 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                           | SEKR47M050ST           | 338.80                                     | 7.0                                    | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 1.0                            | SEK010M050ST           | 159.24                                     | 12.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 2.2                            | SEK2R2M050ST           | 72.38                                      | 18.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 3.3                            | SEK3R3M050ST           | 48.25                                      | 25.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 4.7                            | SEK4R7M050ST           | 33.88                                      | 30.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 10                             | SEK100M050ST           | 15.92                                      | 50.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 22                             | SEK220M050ST           | 7.24                                       | 75.0                                   | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 33                             | SEK330M050ST           | 4.83                                       | 105.0                                  | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 47                             | SEK470M050ST           | 3.39                                       | 125.0                                  | .248 (6.3)      | .453 (11.5)   | .098 (2.5)        | .0197 (0.5)      |
| 100                            | SEK101M050ST           | 1.59                                       | 210.0                                  | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 220                            | SEK221M050ST           | 0.72                                       | 400.0                                  | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 330                            | SEK331M050ST           | 0.48                                       | 535.0                                  | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 470                            | SEK471M050ST           | 0.34                                       | 730.0                                  | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 1000                           | SEK102M050ST           | 0.16                                       | 1110.0                                 | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 2200                           | SEK222M050ST           | 0.08                                       | 1530.0                                 | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 3300                           | SEK332M050ST           | 0.47                                       | 2478.0                                 | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>63 Vdc (79 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 4.7                            | SEK4R7M063ST           | 28.23                                      | 34                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 10                             | SEK100M063ST           | 13.27                                      | 55                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 22                             | SEK220M063ST           | 6.03                                       | 90                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 33                             | SEK330M063ST           | 4.02                                       | 110                                    | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 47                             | SEK470M063ST           | 2.82                                       | 155                                    | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 100                            | SEK101M063ST           | 1.33                                       | 260                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 220                            | SEK221M063ST           | 0.60                                       | 460                                    | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 330                            | SEK331M063ST           | 0.40                                       | 650                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 470                            | SEK471M063ST           | 0.28                                       | 800                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 1000                           | SEK102M063ST           | 0.13                                       | 1200                                   | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |

Parts highlighted in yellow are obsolete.

# Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors



| Cap<br>( $\mu$ F)                | Catalog<br>Part Number | Max ESR<br>120 Hz<br>25 °C<br>( $\Omega$ ) | Max Ripple<br>120 Hz<br>105 °C<br>(mA) | Size in. (mm)   |               |                   |                  |
|----------------------------------|------------------------|--|--|-----------------|---------------|-------------------|------------------|
|                                  |                        |  |  | Diameter<br>(D) | Length<br>(L) | Lead Space<br>(S) | Lead Dia.<br>(d) |
| <b>100 Vdc (125 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M100ST           | 282.33                                     | 10                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 1.0                              | SEK010M100ST           | 132.70                                     | 15                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 2.2                              | SEK2R2M100ST           | 60.32                                      | 22                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 3.3                              | SEK3R3M100ST           | 40.21                                      | 29                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 4.7                              | SEK4R7M100ST           | 28.23                                      | 37                                     | .197 (5.0)      | .433 (11.0)   | .079 (2.0)        | .0197 (0.5)      |
| 10.0                             | SEK100M100ST           | 13.27                                      | 65                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 22.0                             | SEK220M100ST           | 6.03                                       | 115                                    | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 33.0                             | SEK330M100ST           | 4.02                                       | 160                                    | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 47.0                             | SEK470M100ST           | 2.82                                       | 210                                    | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 100.0                            | SEK101M100ST           | 1.33                                       | 385                                    | .512 (13.0)     | .787 (20.0)   | .197 (5.0)        | .0236 (0.6)      |
| 220.0                            | SEK221M100ST           | 0.60                                       | 590                                    | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 330.0                            | SEK331M100ST           | 0.40                                       | 720                                    | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 470.0                            | SEK471M100ST           | 0.28                                       | 875                                    | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>160 Vdc (200 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M160ST           | 423.50                                     | 12                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 1.0                              | SEK010M160ST           | 199.04                                     | 17                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 2.2                              | SEK2R2M160ST           | 90.47                                      | 25                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 3.3                              | SEK3R3M160ST           | 60.32                                      | 36                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 4.7                              | SEK4R7M160ST           | 42.35                                      | 43                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 10                               | SEK100M160ST           | 19.90                                      | 70                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 22                               | SEK220M160ST           | 9.05                                       | 130                                    | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M160ST           | 6.03                                       | 180                                    | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 47                               | SEK470M160ST           | 4.23                                       | 270                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 100                              | SEK101M160ST           | 1.99                                       | 330                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 220                              | SEK221M160ST           | 0.90                                       | 500                                    | .630 (16.0)     | 1.42 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 330                              | SEK331M160ST           | 0.60                                       | 850                                    | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>200 Vdc (250 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M200ST           | 423.50                                     | 12                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 1.0                              | SEK010M200ST           | 199.04                                     | 17                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 2.2                              | SEK2R2M200ST           | 90.47                                      | 25                                     | .248 (6.3)      | .453 (11.5)   | .098 (2.5)        | .0197 (0.5)      |
| 3.3                              | SEK3R3M200ST           | 60.32                                      | 36                                     | .248 (6.3)      | .453 (11.5)   | .098 (2.5)        | .0197 (0.5)      |
| 4.7                              | SEK4R7M200ST           | 42.35                                      | 50                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 10                               | SEK100M200ST           | 19.90                                      | 80                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 22                               | SEK220M200ST           | 9.05                                       | 140                                    | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M200ST           | 6.03                                       | 190                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 47                               | SEK470M200ST           | 4.23                                       | 220                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 100                              | SEK101M200ST           | 1.99                                       | 335                                    | .630 (16.0)     | .984 (25.0)   | .295 (7.5)        | .0315 (0.8)      |
| 220                              | SEK221M200ST           | 0.90                                       | 515                                    | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>250 Vdc (300 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M250ST           | 423.50                                     | 12                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 1.0                              | SEK010M250ST           | 199.04                                     | 17                                     | .248 (6.3)      | .433 (11.0)   | .098 (2.5)        | .0197 (0.5)      |
| 2.2                              | SEK2R2M250ST           | 90.47                                      | 29                                     | .248 (6.3)      | .453 (11.5)   | .098 (2.5)        | .0197 (0.5)      |
| 3.3                              | SEK3R3M250ST           | 60.32                                      | 42                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 4.7                              | SEK4R7M250ST           | 42.35                                      | 50                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 10.0                             | SEK100M250ST           | 19.90                                      | 88                                     | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |

Parts highlighted in yellow are obsolete.

# Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors



| Cap<br>( $\mu$ F)                | Catalog<br>Part Number | Max ESR<br>120 Hz<br>25 °C<br>( $\Omega$ ) | Max Ripple<br>120 Hz<br>105 °C<br>(mA) | Size in. (mm)   |               |                   |                  |
|----------------------------------|------------------------|--|--|-----------------|---------------|-------------------|------------------|
|                                  |                        |  |  | Diameter<br>(D) | Length<br>(L) | Lead Space<br>(S) | Lead Dia.<br>(d) |
| <b>250 Vdc (300 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 22                               | SEK220M250ST           | 9.05                                       | 155                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M250ST           | 6.03                                       | 190                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 47                               | SEK470M250ST           | 4.23                                       | 230                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 100                              | SEK101M250ST           | 1.99                                       | 340                                    | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>350 Vdc (400 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M350ST           | 564.67                                     | 14                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 1.0                              | SEK010M350ST           | 265.39                                     | 20                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 2.2                              | SEK2R2M350ST           | 120.63                                     | 35                                     | .315 (8.0)      | .453 (11.5)   | .138 (3.5)        | .0236 (0.6)      |
| 3.3                              | SEK3R3M350ST           | 80.42                                      | 47                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4.7                              | SEK4R7M350ST           | 56.47                                      | 55                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 10                               | SEK100M350ST           | 26.54                                      | 95                                     | .394 (10.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 22                               | SEK220M350ST           | 12.06                                      | 165                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M350ST           | 8.04                                       | 195                                    | .512 (13.0)     | .984 (25.0)   | .197 (5.0)        | .0236 (0.6)      |
| 47                               | SEK470M350ST           | 5.65                                       | 240                                    | .630 (16.0)     | 1.42 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| 100                              | SEK101M350ST           | 2.65                                       | 360                                    | .709 (18.0)     | 1.65 (42.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>400 Vdc (450 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M400ST           | 564.67                                     | 14                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 1.0                              | SEK010M400ST           | 265.39                                     | 20                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 2.2                              | SEK2R2M400ST           | 120.63                                     | 35                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3.3                              | SEK3R3M400ST           | 80.42                                      | 50                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4.7                              | SEK4R7M400ST           | 56.47                                      | 58                                     | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 10                               | SEK100M400ST           | 26.54                                      | 100                                    | .512 (13.0)     | .787 (20.0)   | .197 (5.0)        | .0236 (0.6)      |
| 22                               | SEK220M400ST           | 12.06                                      | 170                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M400ST           | 8.04                                       | 205                                    | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 47                               | SEK470M400ST           | 5.65                                       | 255                                    | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |
| <b>450 Vdc (500 Volts Surge)</b> |                        |  |  |                 |               |                   |                  |
| 0.47                             | SEKR47M450ST           | 564.67                                     | 14                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 1.0                              | SEK010M450ST           | 265.39                                     | 20                                     | .315 (8.0)      | .433 (11.0)   | .138 (3.5)        | .0236 (0.6)      |
| 2.2                              | SEK2R2M450ST           | 120.63                                     | 35                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 3.3                              | SEK3R3M450ST           | 80.42                                      | 50                                     | .394 (10.0)     | .512 (13.0)   | .197 (5.0)        | .0236 (0.6)      |
| 4.7                              | SEK4R7M450ST           | 56.47                                      | 58                                     | .394 (10.0)     | .630 (16.0)   | .197 (5.0)        | .0236 (0.6)      |
| 10                               | SEK100M450ST           | 26.54                                      | 100                                    | .512 (13.0)     | .827 (21.0)   | .197 (5.0)        | .0236 (0.6)      |
| 22                               | SEK220M450ST           | 12.06                                      | 170                                    | .512 (13.0)     | .984 (26.0)   | .197 (5.0)        | .0236 (0.6)      |
| 33                               | SEK330M450ST           | 8.04                                       | 205                                    | .630 (16.0)     | 1.26 (32.0)   | .295 (7.5)        | .0315 (0.8)      |
| 47                               | SEK470M450ST           | 5.65                                       | 255                                    | .709 (18.0)     | 1.40 (36.0)   | .295 (7.5)        | .0315 (0.8)      |

Parts highlighted in yellow are obsolete.

## Taping & Packaging

Fig. 1 - Formed Taping



Fig. 2 - Straight Taping (5φ, 6.3φ, 8φ)



Fig. 3 - Straight Taping (Under 10φ, 12φ, 13φ)



Fig. 4 - Straight Taping (16φ, 18φ)



Standard Lead Spacing of Taped Components is 5mm  
Other Lead Spacing is Available by Special Order

| Code      | D       | A    | d     | P    | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | F            | W    | W <sub>0</sub> | H     | H <sub>0</sub> | D <sub>0</sub> | t    | ih   | Fig. |
|-----------|---------|------|-------|------|----------------|----------------|----------------|--------------|------|----------------|-------|----------------|----------------|------|------|------|
| Tolerance | 0.5     | 1.0  | ±0.05 | ±1.0 | ±0.2           | ±0.7           | ±1.3           | +0.8<br>-0.2 | ±0.5 | Min.           | ±0.75 | ±0.5           | ±0.2           | ±0.2 | Max. |      |
| Item      | 4 ~ 6.3 | 7.0  | 0.45  | 12.7 | 12.7           | 3.85           | 6.35           | 5.0          | 18.0 | 12.5           | 18.5  | 16.0           | 4.0            | 0.7  | 2.0  | 1    |
|           | 5 ~ 8   | 12.5 | 0.5   | 12.7 | 12.7           | 3.85           | 6.35           | 5.0          | 18.0 | 12.5           | 18.5  | 16.0           | 4.0            | 0.7  | 2.0  |      |
|           | 5, 6.3  | 12.5 | 0.5   | 12.7 | 12.7           | 5.1            | 6.35           | 2.5          | 18.0 | 12.5           | 18.5  | —              | 4.0            | 0.7  | 2.0  | 2    |
|           | 8       | 12.5 | 0.5   | 12.7 | 12.7           | 4.6            | 6.35           | 3.5          | 18.0 | 12.5           | 18.5  | —              | 4.0            | 0.7  | 2.0  |      |
|           | 10      | 21.0 | 0.6   | 12.7 | 12.7           | 3.85           | 6.35           | 5.0          | 18.0 | 12.5           | 18.5  | —              | 4.0            | 0.7  | 2.0  | 3    |
|           | 12, 13  | 26.0 | 0.6   | 15.0 | 15.0           | 5.0            | 7.5            | 5.0          | 18.0 | 12.5           | 18.5  | —              | 4.0            | 0.7  | 2.0  |      |
| 16, 18    | 26.0    | 0.8  | 30.0  | 15.0 | 3.75           | 7.5            | 7.5            | 18.0         | 12.5 | 18.0           | —     | 4.0            | 0.7            | 2.0  |      |      |

| Capacitor Diameter D (mm) | Ammo Pack Box Dimensions (mm) |       |     | Quantity Per Ammo Pack Box |
|---------------------------|-------------------------------|-------|-----|----------------------------|
|                           | A±5                           | B Max | C±3 |                            |
| 4                         | 250                           | 340   | 54  | 3000                       |
| 5                         | 250                           | 340   | 54  | 2,000                      |
| 6.3                       | 290                           | 340   | 54  | 2,000                      |
| 8                         | 250                           | 340   | 54  | 1,000                      |
| 10 (12 L)                 | 290                           | 340   | 54  | 600                        |
| 10 (16 L)                 | 350                           | 340   | 59  | 600                        |
| 10 (20 L)                 | 340                           | 340   | 71  | 600                        |
| 12, 13                    | 340                           | 340   | 71  | 400                        |
| 16                        | 340                           | 340   | 71  | 300                        |



| Tape And Reel Quantities |            |                  |
|--------------------------|------------|------------------|
| Case Diameter D (mm)     | Reel Width | Reel Qty. (Pcs.) |
| 4                        | 44         | 1500             |
| 5                        | 44         | 1200             |
| 6                        | 44         | 1000             |
| 8                        | 44         | 800              |
| 10 (12L)                 | 44         | 600              |
| 10 (16L)                 | 50         | 600              |
| 12, 13                   | -          | -                |
| 16                       | -          | -                |

## Type SEK 105 °C Radial Leaded Aluminum Electrolytic Capacitors

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