



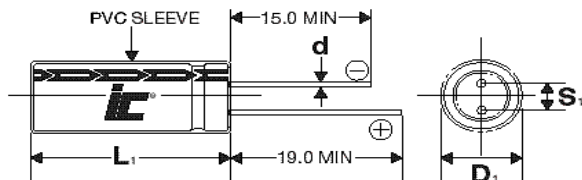
#### FEATURES

Small size – Low Profile – Lead Free Leads

#### APPLICATIONS

Filtering – Bypass – Coupling – Blocking

| Operating Temperature Range                              |                | -40°C to +85°C                                                |                  |    |                |                                       |      |      |      |                  |     |     |     |  |  |
|----------------------------------------------------------|----------------|---------------------------------------------------------------|------------------|----|----------------|---------------------------------------|------|------|------|------------------|-----|-----|-----|--|--|
| Capacitance Tolerance                                    |                | ±20% at 120 Hz, 20°C                                          |                  |    |                |                                       |      |      |      |                  |     |     |     |  |  |
| Surge voltage                                            | WVDC           | 6.3                                                           | 10               | 16 | 25             | 35                                    | 50   | 63   | 100  | 160              | 200 | 250 | 400 |  |  |
|                                                          | SVDC           | 7.9                                                           | 13               | 20 | 32             | 44                                    | 63   | 79   | 125  | 200              | 250 | 300 | 450 |  |  |
| Dissipation Factor                                       | WVDC           | 6.3                                                           | 10               | 16 | 25             | 35                                    | 50   | 63   | 100  | 160              | 200 | 250 | 400 |  |  |
|                                                          | Tan δ          | .28                                                           | .24              | .2 | .16            | .14                                   | .12  | .1   | .08  | .2               | .2  | .2  | .25 |  |  |
|                                                          |                | Add .02 for every 1000uF above 1000uF                         |                  |    |                |                                       |      |      |      |                  |     |     |     |  |  |
| Leakage current                                          |                | ≤100 WVDC                                                     |                  |    |                | ≤100 WVDC                             |      |      |      | 160 to 400 WVDC  |     |     |     |  |  |
|                                                          |                | 1 Minutes                                                     |                  |    |                | 2 Minutes                             |      |      |      | 1 Minutes        |     |     |     |  |  |
|                                                          |                | .03CV or 4uA,<br>Whichever is greater                         |                  |    |                | .01CV or 3uA,<br>Whichever is greater |      |      |      | .04CV or 100uA   |     |     |     |  |  |
| Low temperature stability<br>Impedance ratio<br>(120 Hz) | WVDC           | 6.3                                                           | 10               | 16 | 25             | 35                                    | 50   | 63   | 100  | 160              | 200 | 250 | 400 |  |  |
|                                                          | -25°C to +20°C | 5                                                             | 4                | 3  | 2              | 2                                     | 2    | 2    | 2    | 4                | 4   | 4   | 4   |  |  |
|                                                          | -40°C to +20°C | 12                                                            | 10               | 8  | 5              | 4                                     | 3    | 3    | 3    | 15               | 15  | 15  | 10  |  |  |
| Load Life                                                |                | 2000 hours at 85°C with rated WVDC and ripple current applied |                  |    |                |                                       |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Capacitance change                                            |                  |    |                | ≤20% of initial measured value        |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Dissipation factor                                            |                  |    |                | ≤200% of maximum specified value      |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Leakage current                                               |                  |    |                | ≤100% of maximum specified value      |      |      |      |                  |     |     |     |  |  |
| Shelf Life                                               |                | 1000 hours at 105°C with no voltage applied                   |                  |    |                |                                       |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Capacitance change                                            |                  |    |                | ≤20% initial measured value           |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Dissipation factor                                            |                  |    |                | ≤200% of maximum specified value      |      |      |      |                  |     |     |     |  |  |
|                                                          |                | Leakage current                                               |                  |    |                | ≤100% of maximum specified value      |      |      |      |                  |     |     |     |  |  |
| Ripple Current Multipliers                               |                | WVDC                                                          | Capacitance (uF) |    | Frequency (Hz) |                                       |      |      |      | Temperature (°C) |     |     |     |  |  |
|                                                          |                |                                                               |                  |    | 50             | 120                                   | 300  | 1k   | 10k  | +85              | +70 | +60 |     |  |  |
|                                                          |                | 6.3 to 100V                                                   | C<47             |    | .75            | 1.0                                   | 1.35 | 1.57 | 2.0  | 1.0              | 1.3 | 1.5 |     |  |  |
|                                                          |                | 6.3 to 100V                                                   | 47<C<470         |    | .8             | 1.0                                   | 1.23 | 1.32 | 1.5  | 1.0              | 1.3 | 1.5 |     |  |  |
|                                                          |                | 6.3 to 100V                                                   | C>470            |    | .85            | 1.0                                   | 1.1  | 1.13 | 1.15 | 1.0              | 1.3 | 1.5 |     |  |  |
|                                                          | 160 to 400V    | all                                                           |                  | .8 | 1.0            | 1.25                                  | 1.40 | 1.60 | 1.0  | 1.4              | 1.8 |     |     |  |  |



| D | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|---|-----|-----|-----|-----|------|-----|-----|
| S | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| d | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |

L<sub>1</sub>=L+1.5mm Max.

D<sub>1</sub>=D+0.5mm Max.

S<sub>1</sub>=S+0.5 mm

mm

# SAK

+85°C, Low Profile, 2000 hours

| Capacitance (μF) | WVDC | IC PART NUMBER             | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxL (mm) |
|------------------|------|----------------------------|-------------------------------|-----------------------------------------------|---------------|
| 1                | 50   | <a href="#">105SAK050M</a> | 198.944                       | 13                                            | 5x9           |
| 1                | 100  | <a href="#">105SAK100M</a> | 132.629                       | 21                                            | 5x9           |
| 2.2              | 50   | <a href="#">225SAK050M</a> | 90.429                        | 26                                            | 5x9           |
| 2.2              | 100  | <a href="#">225SAK100M</a> | 6.029                         | 30                                            | 5x9           |
| 3.3              | 50   | <a href="#">335SAK050M</a> | 60.286                        | 35                                            | 5x9           |
| 3.3              | 100  | <a href="#">335SAK100M</a> | 40.191                        | 40                                            | 5x9           |
| 4.7              | 50   | <a href="#">475SAK050M</a> | 42.328                        | 40                                            | 5x9           |
| 4.7              | 100  | <a href="#">475SAK100M</a> | 28.219                        | 50                                            | 5x9           |
| 10               | 63   | <a href="#">106SAK063M</a> | 16.579                        | 70                                            | 5x9           |
| 10               | 100  | <a href="#">106SAK100M</a> | 13.263                        | 80                                            | 6.3x9         |
| 10               | 400  | <a href="#">106SAK400M</a> | 41.447                        | 140                                           | 16x15         |
| 22               | 50   | <a href="#">226SAK050M</a> | 9.043                         | 90                                            | 5x9           |
| 22               | 63   | <a href="#">226SAK063M</a> | 7.536                         | 110                                           | 6.3x9         |
| 22               | 100  | <a href="#">226SAK100M</a> | 6.029                         | 135                                           | 8x9           |
| 22               | 250  | <a href="#">226SAK250M</a> | 15.071                        | 280                                           | 16x15         |
| 22               | 400  | <a href="#">226SAK400M</a> | 18.839                        | 280                                           | 18x15         |
| 33               | 35   | <a href="#">336SAK035M</a> | 7.033                         | 100                                           | 5x9           |
| 33               | 50   | <a href="#">336SAK050M</a> | 6.029                         | 120                                           | 6.3x9         |
| 33               | 63   | <a href="#">336SAK063M</a> | 5.024                         | 135                                           | 6.3x9         |
| 33               | 100  | <a href="#">336SAK100M</a> | 4.019                         | 170                                           | 10x9          |
| 33               | 200  | <a href="#">336SAK200M</a> | 10.048                        | 350                                           | 16x15         |
| 33               | 250  | <a href="#">336SAK250M</a> | 10.048                        | 350                                           | 18x15         |
| 33               | 400  | <a href="#">336SAK400M</a> | 12.56                         | 350                                           | 18x20         |
| 47               | 25   | <a href="#">476SAK025M</a> | 5.644                         | 110                                           | 5x9           |
| 47               | 50   | <a href="#">476SAK050M</a> | 4.233                         | 140                                           | 6.3x9         |
| 47               | 63   | <a href="#">476SAK063M</a> | 3.527                         | 175                                           | 8x9           |
| 47               | 100  | <a href="#">476SAK100M</a> | 2.822                         | 230                                           | 10x12.5       |
| 47               | 160  | <a href="#">476SAK160M</a> | 7.055                         | 420                                           | 16x15         |
| 47               | 200  | <a href="#">476SAK200M</a> | 7.055                         | 420                                           | 18x15         |
| 47               | 250  | <a href="#">476SAK250M</a> | 7.055                         | 420                                           | 18x20         |
| 47               | 400  | <a href="#">476SAK400M</a> | 8.818                         | 420                                           | 18x25         |
| 68               | 160  | <a href="#">686SAK160M</a> | 4.876                         | 490                                           | 18x15         |
| 68               | 250  | <a href="#">686SAK250M</a> | 4.876                         | 490                                           | 18x20         |
| 100              | 10   | <a href="#">107SAK010M</a> | 3.979                         | 135                                           | 5x9           |
| 100              | 25   | <a href="#">107SAK025M</a> | 2.653                         | 180                                           | 6.3x9         |
| 100              | 35   | <a href="#">107SAK035M</a> | 2.321                         | 210                                           | 8x9           |
| 100              | 50   | <a href="#">107SAK050M</a> | 1.989                         | 240                                           | 10x9          |
| 100              | 63   | <a href="#">107SAK063M</a> | 1.658                         | 300                                           | 10x12.5       |
| 100              | 100  | <a href="#">107SAK100M</a> | 1.326                         | 370                                           | 12.5x15       |
| 100              | 160  | <a href="#">107SAK160M</a> | 3.316                         | 590                                           | 18x20         |
| 100              | 250  | <a href="#">107SAK250M</a> | 3.316                         | 590                                           | 18x25         |
| 150              | 200  | <a href="#">157SAK200M</a> | 2.21                          | 710                                           | 18x25         |

| Capacitance (μF) | WVDC | IC PART NUMBER             | Maximum ESR (Ω) 120 Hz, +20°C | Maximum RMS Ripple Current (mA) 120 Hz, +85°C | Dims DxL (mm) |
|------------------|------|----------------------------|-------------------------------|-----------------------------------------------|---------------|
| 220              | 10   | <a href="#">227SAK010M</a> | 1.809                         | 220                                           | 6.3x7         |
| 220              | 16   | <a href="#">227SAK016M</a> | 1.507                         | 270                                           | 8x9           |
| 220              | 35   | <a href="#">227SAK035M</a> | 1.055                         | 330                                           | 10x9          |
| 220              | 63   | <a href="#">227SAK063M</a> | 0.754                         | 470                                           | 12.5x12.5     |
| 220              | 100  | <a href="#">227SAK100M</a> | 0.603                         | 620                                           | 16x15         |
| 330              | 6.3  | <a href="#">337SAK6R3M</a> | 1.407                         | 250                                           | 6.3x9         |
| 330              | 10   | <a href="#">337SAK010M</a> | 1.206                         | 300                                           | 8x9           |
| 330              | 25   | <a href="#">337SAK025M</a> | 0.804                         | 370                                           | 10x9          |
| 330              | 35   | <a href="#">337SAK035M</a> | 0.703                         | 460                                           | 10x12.5       |
| 330              | 50   | <a href="#">337SAK050M</a> | 0.603                         | 520                                           | 12.5x12.5     |
| 330              | 63   | <a href="#">337SAK063M</a> | 0.502                         | 600                                           | 12.5x15       |
| 330              | 100  | <a href="#">337SAK100M</a> | 0.402                         | 830                                           | 18x20         |
| 470              | 10   | <a href="#">477SAK010M</a> | 0.847                         | 360                                           | 8x9           |
| 470              | 16   | <a href="#">477SAK016M</a> | 0.706                         | 400                                           | 10x9          |
| 470              | 25   | <a href="#">477SAK025M</a> | 0.564                         | 520                                           | 10x12.5       |
| 470              | 35   | <a href="#">477SAK035M</a> | 0.494                         | 570                                           | 12.5x12.5     |
| 470              | 50   | <a href="#">477SAK050M</a> | 0.423                         | 730                                           | 16x15         |
| 470              | 63   | <a href="#">477SAK063M</a> | 0.353                         | 840                                           | 18x15         |
| 470              | 100  | <a href="#">477SAK100M</a> | 0.282                         | 1080                                          | 18x25         |
| 1000             | 6.3  | <a href="#">108SAK6R3M</a> | 0.464                         | 490                                           | 10x9          |
| 1000             | 10   | <a href="#">108SAK010M</a> | 0.398                         | 620                                           | 10x12.5       |
| 1000             | 25   | <a href="#">108SAK025M</a> | 0.265                         | 820                                           | 12.5x15       |
| 1000             | 35   | <a href="#">108SAK035M</a> | 0.232                         | 990                                           | 16x15         |
| 1000             | 50   | <a href="#">108SAK050M</a> | 0.199                         | 1180                                          | 18x20         |
| 1000             | 63   | <a href="#">108SAK063M</a> | 0.166                         | 1410                                          | 18x25         |
| 2200             | 10   | <a href="#">228SAK010M</a> | 0.211                         | 950                                           | 12.5x15       |
| 2200             | 16   | <a href="#">228SAK016M</a> | 0.181                         | 1170                                          | 16x15         |
| 2200             | 25   | <a href="#">228SAK025M</a> | 0.151                         | 1350                                          | 18x15         |
| 2200             | 35   | <a href="#">228SAK035M</a> | 0.136                         | 1520                                          | 18x20         |
| 2200             | 50   | <a href="#">228SAK050M</a> | 0.121                         | 1750                                          | 18x25         |
| 3300             | 10   | <a href="#">338SAK010M</a> | 0.151                         | 1270                                          | 16x15         |
| 3300             | 16   | <a href="#">338SAK016M</a> | 0.131                         | 1430                                          | 18x15         |
| 3300             | 25   | <a href="#">338SAK025M</a> | 0.111                         | 1660                                          | 18x20         |
| 4700             | 6.3  | <a href="#">478SAK6R3M</a> | 0.12                          | 1380                                          | 16x15         |
| 4700             | 10   | <a href="#">478SAK010M</a> | 0.113                         | 1530                                          | 18x15         |
| 4700             | 16   | <a href="#">478SAK016M</a> | 0.099                         | 1740                                          | 18x20         |
| 4700             | 25   | <a href="#">478SAK025M</a> | 0.085                         | 2060                                          | 18x25         |
| 6800             | 6.3  | <a href="#">688SAK6R3M</a> | 0.1                           | 1640                                          | 18x15         |
| 6800             | 10   | <a href="#">688SAK010M</a> | 0.09                          | 1830                                          | 18x20         |
| 6800             | 16   | <a href="#">688SAK016M</a> | 0.08                          | 2120                                          | 18x25         |
| 10000            | 6.3  | <a href="#">109SAK6R3M</a> | 0.08                          | 1950                                          | 18x20         |
| 10000            | 10   | <a href="#">109SAK010M</a> | 0.07                          | 2230                                          | 18x25         |