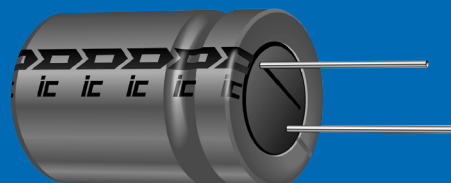


# SAK

## +85°C Low Profile Radial Lead Aluminum Electrolytic Capacitors



*For all general purpose applications*

### FEATURES

- Low Profile
- Capacitance range: 1  $\mu\text{F}$  to 10,000  $\mu\text{F}$
- Voltage range: 6.3 WVDC to 400 WVDC

### SPECIFICATIONS

| Capacitance Tolerance             |             | ±20% at 120Hz, 20°C                                                                       |               |      |      |                                                                                                |      |                 |       |                  |     |     |     |
|-----------------------------------|-------------|-------------------------------------------------------------------------------------------|---------------|------|------|------------------------------------------------------------------------------------------------|------|-----------------|-------|------------------|-----|-----|-----|
| Operating Temperature Range       |             | -40°C to +85°C                                                                            |               |      |      |                                                                                                |      |                 |       |                  |     |     |     |
| Dissipation Factor<br>120Hz, 20°C | WVDC        | 6.3                                                                                       | 10            | 16   | 25   | 35                                                                                             | 50   | 63              | 100   | 160              | 200 | 250 | 400 |
|                                   | tan δ       | .28                                                                                       | .24           | .20  | .16  | .14                                                                                            | .12  | .10             | .08   | .20              | .20 | .20 | .25 |
|                                   |             | Note: For above D.F. specifications, add .02 for every 1,000 µf above 1,000 µf            |               |      |      |                                                                                                |      |                 |       |                  |     |     |     |
| Impedance Ratio<br>(Max.) @120Hz  | WVDC        | 6.3                                                                                       | 10            | 16   | 25   | 35                                                                                             | 50   | 63              | 100   | 160              | 200 | 250 | 400 |
|                                   | -25/20°C    | 5                                                                                         | 4             | 3    | 2    | 2                                                                                              | 2    | 2               | 2     | 4                | 4   | 4   | 4   |
|                                   | -40/20°C    | 12                                                                                        | 10            | 8    | 5    | 4                                                                                              | 3    | 3               | 3     | 15               | 15  | 15  | 10  |
| Leakage Current                   | WVDC        | ≤100WVDC                                                                                  |               |      |      | ≤100WVDC                                                                                       |      |                 |       | ≥ 160WVDC        |     |     |     |
|                                   | Time        | 1 minute                                                                                  |               |      |      | 2 minutes                                                                                      |      |                 |       | 1 minute         |     |     |     |
|                                   |             | .03 CV or 4 µA<br>Whichever is greater                                                    |               |      |      | .01 CV or 3 µA<br>Whichever is greater                                                         |      |                 |       | .04 CV or 100 µA |     |     |     |
| Load Life                         |             | 2,000 hours at 85°C with rated WVDC<br>Capacitors will meet the requirements listed below |               |      |      |                                                                                                |      |                 |       |                  |     |     |     |
|                                   |             | Capacitance change<br>Dissipation factor<br>Leakage current                               |               |      |      | <20% of initial measured value<br><200% of initial specified value<br><Initial specified value |      |                 |       |                  |     |     |     |
| Shelf Life                        |             | 1,000 hours at 85°C with no voltage applied.<br>Units will meet load life specifications. |               |      |      |                                                                                                |      |                 |       |                  |     |     |     |
| Ripple Multipliers                | WVDC        | Capacitance (µF)                                                                          | Frequency(Hz) |      |      |                                                                                                |      | Temperature(°C) |       |                  |     |     |     |
|                                   | 6.3 to 100  |                                                                                           | 60            | 120  | 300  | 1K                                                                                             | 10K  | +105°C          | +85°C | +70°C            |     |     |     |
|                                   |             | ≤47                                                                                       | 0.75          | 1.0  | 1.35 | 1.57                                                                                           | 2.0  | 1.0             | 1.3   | 1.5              |     |     |     |
|                                   |             | 47<C≤470µF                                                                                | 0.8           | 1.0  | 1.23 | 1.32                                                                                           | 1.5  | 1.0             | 1.3   | 1.5              |     |     |     |
|                                   |             | 470<C≤1,000µF                                                                             | 0.85          | 1.0  | 1.1  | 1.13                                                                                           | 1.15 | 1.0             | 1.3   | 1.5              |     |     |     |
| 160 to 400                        | 10 to 150µF | 0.8                                                                                       | 1.0           | 1.25 | 1.40 | 1.60                                                                                           | 1.0  | 1.4             | 1.8   |                  |     |     |     |

### SPECIAL ORDER OPTIONS

(See pages 33 thru 37)

- Special tolerances:  $\pm 10\%$  (K),  $-10\% + 30\%$  (Q)
- Tape and Reel/Ammo-Pack
- Cut, Formed, Cut and Formed, and Snap In Leads



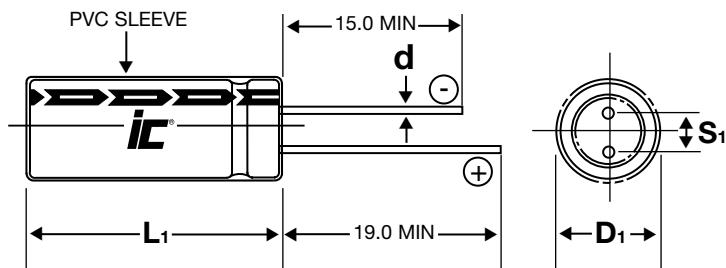
3757 W. Touhy Ave., Lincolnwood, IL 60712 • (847) 675-1760 • Fax (847) 673-2850 • [www.illcap.com](http://www.illcap.com)

## PHYSICAL DIMENSIONS

| WVDC<br>(SV)<br>(μF) | 6.3<br>(8) | 10<br>(13) | 16<br>(20) | 25<br>(32) | 35<br>(44) | 50<br>(63) | 63<br>(79) | 100<br>(125) | 160<br>(200) | 200<br>(250) | 250<br>(300) | 400<br>(450) |
|----------------------|------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|
| 1                    |            |            |            |            |            | 5x9        |            | 5x9          |              |              |              |              |
| 2.2                  |            |            |            |            |            | 5x9        |            | 5x9          |              |              |              |              |
| 3.3                  |            |            |            |            |            | 5x9        |            | 5x9          |              |              |              |              |
| 4.7                  |            |            |            |            |            | 5x9        |            | 5x9          |              |              |              |              |
| 10                   |            |            |            |            |            |            | 5x9        | 6.3x9        |              |              |              | 16x15        |
| 22                   |            |            |            |            |            | 5x9        | 6.3x9      | 8x9          |              |              | 16x15        | 18x15        |
| 33                   |            |            |            |            | 5x9        | 6.3x9      | 6.3x9      | 10x9         |              | 16x15        | 18x15        | 18x20        |
| 47                   |            |            |            | 5x9        |            | 6.3x9      | 8x9        | 10x12.5      | 16x15        | 18x15        | 18x20        | 18x25        |
| 68                   |            |            |            |            |            |            |            |              | 18x15        |              | 18x20        |              |
| 100                  |            | 5x9        |            | 6.3x9      | 8x9        | 10x9       | 10x12.5    | 12.5x15      | 18x20        |              | 18x25        |              |
| 150                  |            |            |            |            |            |            |            |              |              | 18x25        |              |              |
| 220                  |            | 6.3x9      | 8x9        |            | 10x9       |            | 12.5x12.5  | 16x15        |              |              |              |              |
| 330                  | 6.3x9      | 8x9        |            | 10x9       | 10x12.5    | 12.5x12.5  | 12.5x15    | 18x20        |              |              |              |              |
| 470                  |            | 8x9        | 10x9       | 10x12.5    | 12.5x12.5  | 16x15      | 18x15      | 18x25        |              |              |              |              |
| 1000                 | 10x9       | 10x12.5    | 12.5x12.5  | 12.5x15    | 16x15      | 18x20      | 18x25      |              |              |              |              |              |
| 2200                 |            | 12.5x15    | 16x15      | 18x15      | 18x20      | 18x25      |            |              |              |              |              |              |
| 3300                 |            | 16x15      | 18x15      | 18x20      |            |            |            |              |              |              |              |              |
| 4700                 | 16x15      | 18x15      | 18x20      | 18x25      |            |            |            |              |              |              |              |              |
| 6800                 | 18x15      | 18x20      | 18x25      |            |            |            |            |              |              |              |              |              |
| 10000                | 18x20      | 18x25      |            |            |            |            |            |              |              |              |              |              |

Convert to inches, divide by 25.4

DxL(mm)



LEAD INFORMATION V.S. CASE DIAMETER

| D | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 | 16.0 | 18.0 |
|---|-----|-----|-----|------|------|------|------|
| 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  |
| B | 0.5 | 0.5 | 0.5 | 0.5  | 0.8  | 0.5  | 0.5  |

$L_1 = L + 1.0$  mm Max.  $D \leq 8$  mm  
 $L_1 = L + 1.5$  mm Max.  $D \geq 10$  mm  
 $D_1 = D + B$  Max.  
 $S_1 = S \pm 0.5$  Max.

**SAK****+ 85°C Low Profile  
Lead Aluminum  
Electrolytic Capacitor****STANDARD PART LISTING**

| Capacitance<br>( $\mu$ F) | WVDC | IC <sup>®</sup> PART<br>NUMBER | Maximum<br>ESR<br>$\Omega$<br>120Hz, +20°C | Maximum RMS<br>Ripple Current<br>(mA)<br>120Hz, +85°C | Dimensions<br>DxL<br>(mm) |
|---------------------------|------|--------------------------------|--------------------------------------------|-------------------------------------------------------|---------------------------|
| 1                         | 50   | 105SAK050M                     | 198.944                                    | 13                                                    | 5x9                       |
| 1                         | 100  | 105SAK100M                     | 132.629                                    | 21                                                    | 5x9                       |
| 2.2                       | 50   | 225SAK050M                     | 90.429                                     | 26                                                    | 5x9                       |
| 2.2                       | 100  | 225SAK100M                     | 60.286                                     | 30                                                    | 5x9                       |
| 3.3                       | 50   | 335SAK050M                     | 60.286                                     | 35                                                    | 5x9                       |
| 3.3                       | 100  | 335SAK100M                     | 40.191                                     | 40                                                    | 5x9                       |
| 4.7                       | 50   | 475SAK050M                     | 42.328                                     | 40                                                    | 5x9                       |
| 4.7                       | 100  | 475SAK100M                     | 28.219                                     | 50                                                    | 5x9                       |
| 10                        | 63   | 106SAK063M                     | 16.579                                     | 70                                                    | 5x9                       |
| 10                        | 100  | 106SAK100M                     | 13.263                                     | 80                                                    | 6.3x9                     |
| 10                        | 400  | 106SAK400M                     | 41.447                                     | 140                                                   | 16x15                     |
| 22                        | 50   | 226SAK050M                     | 9.043                                      | 90                                                    | 5x9                       |
| 22                        | 63   | 226SAK063M                     | 7.536                                      | 110                                                   | 6.3x9                     |
| 22                        | 100  | 226SAK100M                     | 6.029                                      | 135                                                   | 8x9                       |
| 22                        | 250  | 226SAK250M                     | 15.071                                     | 280                                                   | 16x15                     |
| 22                        | 400  | 226SAK400M                     | 18.839                                     | 280                                                   | 18x15                     |
| 33                        | 35   | 336SAK035M                     | 7.033                                      | 100                                                   | 5x9                       |
| 33                        | 50   | 336SAK050M                     | 6.029                                      | 120                                                   | 6.3x9                     |
| 33                        | 63   | 336SAK063M                     | 5.024                                      | 135                                                   | 6.3x9                     |
| 33                        | 100  | 336SAK100M                     | 4.019                                      | 170                                                   | 10x9                      |
| 33                        | 200  | 336SAK200M                     | 10.048                                     | 350                                                   | 16x15                     |
| 33                        | 250  | 336SAK250M                     | 10.048                                     | 350                                                   | 18x15                     |
| 33                        | 400  | 336SAK400M                     | 12.560                                     | 350                                                   | 18x20                     |
| 47                        | 25   | 476SAK025M                     | 5.644                                      | 110                                                   | 5x9                       |
| 47                        | 50   | 476SAK050M                     | 4.233                                      | 140                                                   | 6.3x9                     |
| 47                        | 63   | 476SAK063M                     | 3.527                                      | 175                                                   | 8x9                       |
| 47                        | 100  | 476SAK100M                     | 2.822                                      | 230                                                   | 10x12.5                   |
| 47                        | 160  | 476SAK160M                     | 7.055                                      | 420                                                   | 16x15                     |
| 47                        | 200  | 476SAK200M                     | 7.055                                      | 420                                                   | 18x15                     |
| 47                        | 250  | 476SAK250M                     | 7.055                                      | 420                                                   | 18x20                     |
| 47                        | 400  | 476SAK400M                     | 8.818                                      | 420                                                   | 18x25                     |
| 68                        | 160  | 686SAK160M                     | 4.876                                      | 490                                                   | 18x15                     |
| 68                        | 250  | 686SAK250M                     | 4.876                                      | 490                                                   | 18x20                     |
| 100                       | 10   | 107SAK010M                     | 3.979                                      | 135                                                   | 5x9                       |
| 100                       | 25   | 107SAK025M                     | 2.653                                      | 180                                                   | 6.3x9                     |
| 100                       | 35   | 107SAK035M                     | 2.321                                      | 210                                                   | 8x9                       |
| 100                       | 50   | 107SAK050M                     | 1.989                                      | 240                                                   | 10x9                      |
| 100                       | 63   | 107SAK063M                     | 1.658                                      | 300                                                   | 10x12.5                   |
| 100                       | 100  | 107SAK100M                     | 1.326                                      | 370                                                   | 12.5x15                   |
| 100                       | 160  | 107SAK160M                     | 3.316                                      | 590                                                   | 18x20                     |
| 100                       | 250  | 107SAK250M                     | 3.316                                      | 590                                                   | 18x25                     |
| 150                       | 200  | 157SAK200M                     | 2.210                                      | 710                                                   | 18x25                     |
| 220                       | 10   | 227SAK010M                     | 1.809                                      | 220                                                   | 6.3x9                     |

| Capacitance<br>( $\mu$ F) | WVDC | IC <sup>®</sup> PART<br>NUMBER | Maximum<br>ESR<br>$\Omega$<br>120Hz, +20°C | Maximum RMS<br>Ripple Current<br>(mA)<br>120Hz, +85°C | Dimensions<br>DxL<br>(mm) |
|---------------------------|------|--------------------------------|--------------------------------------------|-------------------------------------------------------|---------------------------|
| 220                       | 16   | 227SAK016M                     | 1.507                                      | 270                                                   | 8x9                       |
| 220                       | 35   | 227SAK035M                     | 1.055                                      | 330                                                   | 10x9                      |
| 220                       | 63   | 227SAK063M                     | 0.754                                      | 470                                                   | 12.5x12.5                 |
| 220                       | 100  | 227SAK100M                     | 0.603                                      | 620                                                   | 16x15                     |
| 330                       | 6.3  | 337SAK6R3M                     | 1.407                                      | 250                                                   | 6.3x9                     |
| 330                       | 10   | 337SAK010M                     | 1.206                                      | 300                                                   | 8x9                       |
| 330                       | 25   | 337SAK025M                     | 0.804                                      | 370                                                   | 10x9                      |
| 330                       | 35   | 337SAK035M                     | 0.703                                      | 460                                                   | 10x12.5                   |
| 330                       | 50   | 337SAK050M                     | 0.603                                      | 520                                                   | 12.5x12.5                 |
| 330                       | 63   | 337SAK063M                     | 0.502                                      | 600                                                   | 12.5x15                   |
| 330                       | 100  | 337SAK100M                     | 0.402                                      | 830                                                   | 18x20                     |
| 470                       | 10   | 477SAK010M                     | 0.847                                      | 360                                                   | 8x9                       |
| 470                       | 16   | 477SAK016M                     | 0.705                                      | 400                                                   | 10x9                      |
| 470                       | 25   | 477SAK025M                     | 0.564                                      | 520                                                   | 10x12.5                   |
| 470                       | 35   | 477SAK035M                     | 0.494                                      | 570                                                   | 12.5x12.5                 |
| 470                       | 50   | 477SAK050M                     | 0.423                                      | 730                                                   | 16x15                     |
| 470                       | 63   | 477SAK063M                     | 0.353                                      | 840                                                   | 18x15                     |
| 470                       | 100  | 477SAK100M                     | 0.282                                      | 1080                                                  | 18x25                     |
| 1000                      | 6.3  | 108SAK6R3M                     | 0.464                                      | 490                                                   | 10x9                      |
| 1000                      | 10   | 108SAK010M                     | 0.398                                      | 620                                                   | 10x12.5                   |
| 1000                      | 16   | 108SAK016M                     | 0.332                                      | 700                                                   | 12.5x12.5                 |
| 1000                      | 25   | 108SAK025M                     | 0.265                                      | 820                                                   | 12.5x15                   |
| 1000                      | 35   | 108SAK035M                     | 0.232                                      | 990                                                   | 16x15                     |
| 1000                      | 50   | 108SAK050M                     | 0.199                                      | 1180                                                  | 18x20                     |
| 1000                      | 63   | 108SAK063M                     | 0.166                                      | 1410                                                  | 18x25                     |
| 2200                      | 10   | 228SAK010M                     | 0.211                                      | 950                                                   | 12.5x15                   |
| 2200                      | 16   | 228SAK016M                     | 0.181                                      | 1170                                                  | 16x15                     |
| 2200                      | 25   | 228SAK025M                     | 0.151                                      | 1350                                                  | 18x15                     |
| 2200                      | 35   | 228SAK035M                     | 0.136                                      | 1520                                                  | 18x20                     |
| 2200                      | 50   | 228SAK050M                     | 0.121                                      | 1750                                                  | 18x25                     |
| 3300                      | 10   | 338SAK010M                     | 0.151                                      | 1270                                                  | 16x15                     |
| 3300                      | 16   | 338SAK016M                     | 0.131                                      | 1430                                                  | 18x15                     |
| 3300                      | 25   | 338SAK025M                     | 0.111                                      | 1660                                                  | 18x20                     |
| 4700                      | 6.3  | 478SAK6R3M                     | 0.120                                      | 1380                                                  | 16x15                     |
| 4700                      | 10   | 478SAK010M                     | 0.113                                      | 1530                                                  | 18x15                     |
| 4700                      | 16   | 478SAK016M                     | 0.099                                      | 1740                                                  | 18x20                     |
| 4700                      | 25   | 478SAK025M                     | 0.085                                      | 2060                                                  | 18x25                     |
| 6800                      | 6.3  | 688SAK6R3M                     | 0.112                                      | 1640                                                  | 18x15                     |
| 6800                      | 10   | 688SAK010M                     | 0.088                                      | 1830                                                  | 18x20                     |
| 6800                      | 16   | 688SAK016M                     | 0.078                                      | 2120                                                  | 18x25                     |
| 10000                     | 6.3  | 109SAK6R3M                     | 0.076                                      | 1950                                                  | 18x20                     |
| 10000                     | 10   | 109SAK010M                     | 0.070                                      | 2230                                                  | 18x25                     |