

# RLS

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



*For timing applications*

### FEATURES

- Alternative to Tantalum Capacitors
- Low Leakage Current
- Capacitance Range: .1  $\mu$ F to 1,000  $\mu$ F
- Voltage Range: 10 WVDC to 50 WVDC
- Solvent Tolerant End Seals Standard

### SPECIFICATIONS

|                                   |            |                                                                                           |                |     |      |      |                                                                                                   |      |                  |     |     |     |
|-----------------------------------|------------|-------------------------------------------------------------------------------------------|----------------|-----|------|------|---------------------------------------------------------------------------------------------------|------|------------------|-----|-----|-----|
| Capacitance Tolerance             |            | ±20% at 120Hz, 25°C                                                                       |                |     |      |      |                                                                                                   |      |                  |     |     |     |
| Operating Temperature Range       |            | -40°C to +85°C                                                                            |                |     |      |      |                                                                                                   |      |                  |     |     |     |
| Dissipation Factor<br>120Hz, 25°C | WVDC       | 10                                                                                        | 16             | 25  | 35   | 50   |                                                                                                   |      |                  |     |     |     |
|                                   | tan δ      | .2                                                                                        | .16            | .14 | .12  | .10  |                                                                                                   |      |                  |     |     |     |
| Impedance Ratio<br>(Max.) 120Hz   | WVDC       | 10                                                                                        | 16             | 25  | 35   | 50   |                                                                                                   |      |                  |     |     |     |
|                                   | -25°C/25°C | 3                                                                                         | 2              | 2   | 2    | 2    |                                                                                                   |      |                  |     |     |     |
|                                   | -40°C/25°C | 6                                                                                         | 4              | 4   | 3    | 3    |                                                                                                   |      |                  |     |     |     |
| Leakage Current                   | WVDC       | ≤ 50 WVDC                                                                                 |                |     |      |      |                                                                                                   |      |                  |     |     |     |
|                                   | Time       | 2 minutes                                                                                 |                |     |      |      |                                                                                                   |      |                  |     |     |     |
|                                   |            | .002CV or .4μA<br>whichever is greater                                                    |                |     |      |      |                                                                                                   |      |                  |     |     |     |
| Load Life                         |            | 2,000 hours, at 85°C with rated voltage                                                   |                |     |      |      |                                                                                                   |      |                  |     |     |     |
|                                   |            | 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 specification |                |     |      |      |                                                                                                   |      |                  |     |     |     |
| Ripple Current Multipliers        |            |                                                                                           | Frequency (Hz) |     |      |      |                                                                                                   |      | Temperature (°C) |     |     |     |
|                                   |            | Capacitance (μF)                                                                          | 50             | 120 | 400  | 1K   | 10K                                                                                               | 100K | +85              | +70 | +60 | +45 |
|                                   |            | C ≤ 10                                                                                    | 0.8            | 1.0 | 1.3  | 1.45 | 1.65                                                                                              | 1.7  | 1.0              | 1.3 | 1.5 | 1.8 |
|                                   |            | 10 < C ≤ 100                                                                              | 0.8            | 1.0 | 1.23 | 1.36 | 1.48                                                                                              | 1.53 | 1.0              | 1.3 | 1.5 | 1.8 |
|                                   |            | 100 < C ≤ 1000                                                                            | 0.8            | 1.0 | 1.16 | 1.25 | 1.35                                                                                              | 1.38 | 1.0              | 1.3 | 1.5 | 1.8 |
|                                   |            | C > 1000                                                                                  | 0.8            | 1.0 | 1.11 | 1.17 | 1.25                                                                                              | 1.28 | 1.0              | 1.3 | 1.5 | 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



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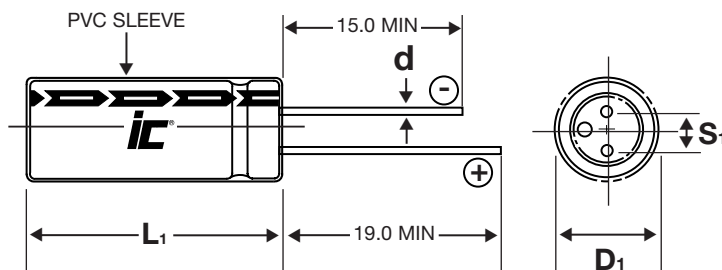
Aluminum Electrolytic

## PHYSICAL DIMENSIONS

| WVDC<br>(μF)<br>(SV) | 10<br>(13) | 16<br>(20) | 25<br>(32) | 35<br>(44) | 50<br>(63) |
|----------------------|------------|------------|------------|------------|------------|
| 0.1                  |            |            |            | →          | 5x11       |
| 0.15                 |            |            |            | →          | 5x11       |
| 0.22                 |            |            |            | →          | 5x11       |
| 0.33                 |            |            |            | →          | 5x11       |
| 0.47                 |            |            |            | →          | 5x11       |
| 0.68                 |            |            |            | →          | 5x11       |
| 1                    |            |            |            | →          | 5x11       |
| 1.5                  |            |            |            | →          | 5x11       |
| 2.2                  |            |            |            | →          | 5x11       |
| 3.3                  |            |            |            | →          | 5x11       |
| 4.7                  |            |            |            | →          | 5x11       |
| 6.8                  |            |            |            | →          | 5x11       |
| 10                   |            |            | →          | 5x11       | 5x11       |
| 15                   |            |            | →          | 5x11       | 6.3x11     |
| 22                   | →          | 5x11       | 5x11       | 6.3x11     | 6.3x11     |
| 33                   | →          | 5x11       | →          | 6.3x11     | 8x11.5     |
| 47                   | 5x11       | 6.3x11     | 6.3x11     | →          | 8x11.5     |
| 68                   | →          | 6.3x11     | →          | 8x11.5     | 10x12.5    |
| 100                  | 6.3x11     | 8x11.5     | 8x11.5     | 10x12.5    | 10x16      |
| 150                  | →          | 8x11.5     | 10x12.5    | 10x16      | 10x20      |
| 220                  | 8x11.5     | 10x12.5    | 10x16      | 10x20      | 12.5x20    |
| 330                  | 10x12.5    | 10x16      | 10x20      | 12.5x20    |            |
| 470                  | 10x16      | 10x20      |            |            |            |
| 1000                 | 12.5x20    |            |            |            |            |

Convert to inches, divide by 25.4

DxL(mm)



NOTE: Case Vent is standard on all diameter ≥8.0mm

LEAD INFORMATION VS. CASE DIAMETER

| D | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 |
|---|-----|-----|-----|------|------|
| S | 2.0 | 2.5 | 3.5 | 5.0  | 5.0  |
| d | 0.5 | 0.5 | 0.6 | 0.6  | 0.6  |
| B | 0.5 | 0.5 | 0.5 | 0.5  | 0.8  |

D≤8.0, L<sub>1</sub>=L+1.0 Max.

D>8.0, L<sub>1</sub>=L+1.5 Max.

D<sub>1</sub>=D+B Max.

S<sub>1</sub>=S±.05mm Max.

## STANDARD PART LISTING

| Capacitance<br>( $\mu$ F) | WVDC | ic <sup>®</sup> PART<br>NUMBER | Maximum<br>ESR<br>$\Omega$<br>120Hz, +25°C | Maximum RMS<br>Ripple Current<br>(mA)<br>120Hz, +85°C | Dimensions<br>DxL<br>(mm) |
|---------------------------|------|--------------------------------|--------------------------------------------|-------------------------------------------------------|---------------------------|
| 0.1                       | 50   | 104RLS050M                     | 1657.86                                    | 6                                                     | 5x11                      |
| 0.15                      | 50   | 154RLS050M                     | 1105.243                                   | 7                                                     | 5x11                      |
| 0.22                      | 50   | 224RLS050M                     | 753.575                                    | 8                                                     | 5x11                      |
| 0.33                      | 50   | 334RLS050M                     | 502.383                                    | 9                                                     | 5x11                      |
| 0.47                      | 50   | 474RLS050M                     | 352.737                                    | 10                                                    | 5x11                      |
| 0.68                      | 50   | 684RLS050M                     | 243.804                                    | 10                                                    | 5x11                      |
| 1.0                       | 50   | 105RLS050M                     | 165.786                                    | 19                                                    | 5x11                      |
| 1.5                       | 50   | 155RLS050M                     | 110.524                                    | 28                                                    | 5x11                      |
| 2.2                       | 50   | 225RLS050M                     | 75.357                                     | 33                                                    | 5x11                      |
| 3.3                       | 50   | 335RLS050M                     | 50.238                                     | 38                                                    | 5x11                      |
| 4.7                       | 50   | 475RLS050M                     | 35.274                                     | 50                                                    | 6.3x11                    |
| 6.8                       | 50   | 685RLS050M                     | 24.380                                     | 63                                                    | 5x11                      |
| 10                        | 35   | 106RLS035M                     | 19.894                                     | 57                                                    | 5x11                      |
| 10                        | 50   | 106RLS050M                     | 16.579                                     | 80                                                    | 5x11                      |
| 15                        | 35   | 156RLS035M                     | 13.263                                     | 70                                                    | 8x11                      |
| 15                        | 50   | 156RLS050M                     | 11.052                                     | 110                                                   | 6.3x11                    |
| 22                        | 16   | 226RLS016M                     | 12.057                                     | 75                                                    | 5x11                      |
| 22                        | 25   | 226RLS025M                     | 10.550                                     | 81                                                    | 5x11                      |
| 22                        | 35   | 226RLS035M                     | 9.043                                      | 100                                                   | 6.3x11                    |
| 22                        | 50   | 226RLS050M                     | 7.536                                      | 140                                                   | 6.3x11.5                  |
| 33                        | 16   | 336RLS016M                     | 8.038                                      | 95                                                    | 5x11                      |
| 33                        | 35   | 336RLS035M                     | 6.029                                      | 120                                                   | 6.3x11                    |
| 33                        | 50   | 336RLS050M                     | 5.024                                      | 170                                                   | 8x11.5                    |
| 47                        | 10   | 476RLS010M                     | 7.055                                      | 105                                                   | 5x11                      |
| 47                        | 16   | 476RLS016M                     | 5.644                                      | 125                                                   | 6.3x11                    |
| 47                        | 25   | 476RLS025M                     | 4.938                                      | 136                                                   | 6.3x11                    |

| Capacitance<br>( $\mu$ F) | WVDC | ic <sup>®</sup> PART<br>NUMBER | Maximum<br>ESR<br>$\Omega$<br>120Hz, +25°C | Maximum RMS<br>Ripple Current<br>(mA)<br>120Hz, +85°C | Dimensions<br>DxL<br>(mm) |
|---------------------------|------|--------------------------------|--------------------------------------------|-------------------------------------------------------|---------------------------|
| 47                        | 50   | 476RLS050M                     | 3.527                                      | 230                                                   | 8x11.5                    |
| 68                        | 16   | 686RLS016M                     | 3.901                                      | 150                                                   | 6.3x11                    |
| 68                        | 35   | 686RLS035M                     | 2.926                                      | 200                                                   | 8x11.5                    |
| 68                        | 50   | 686RLS050M                     | 2.438                                      | 295                                                   | 10x12.5                   |
| 100                       | 10   | 107RLS010M                     | 3.316                                      | 160                                                   | 6.3x11                    |
| 100                       | 16   | 107RLS016M                     | 2.653                                      | 212                                                   | 8x11.5                    |
| 100                       | 25   | 107RLS025M                     | 2.321                                      | 220                                                   | 8x11.5                    |
| 100                       | 35   | 107RLS035M                     | 1.989                                      | 255                                                   | 10x12.5                   |
| 100                       | 50   | 107RLS050M                     | 1.658                                      | 400                                                   | 10x16                     |
| 150                       | 16   | 157RLS016M                     | 1.768                                      | 255                                                   | 8x11.5                    |
| 150                       | 25   | 157RLS025M                     | 1.547                                      | 265                                                   | 10x12.5                   |
| 150                       | 35   | 157RLS035M                     | 1.326                                      | 295                                                   | 10x16                     |
| 150                       | 50   | 157RLS050M                     | 1.105                                      | 450                                                   | 10x20                     |
| 220                       | 10   | 227RLS010M                     | 1.507                                      | 274                                                   | 8x11.5                    |
| 220                       | 16   | 227RLS016M                     | 1.206                                      | 322                                                   | 10x12.5                   |
| 220                       | 25   | 227RLS025M                     | 1.055                                      | 375                                                   | 10x16                     |
| 220                       | 35   | 227RLS035M                     | 0.904                                      | 442                                                   | 10x20                     |
| 220                       | 50   | 227RLS050M                     | 0.754                                      | 550                                                   | 12.5x20                   |
| 330                       | 10   | 337RLS010M                     | 1.005                                      | 355                                                   | 10x12.5                   |
| 330                       | 16   | 337RLS016M                     | 0.804                                      | 425                                                   | 10x16                     |
| 330                       | 25   | 337RLS025M                     | 0.703                                      | 500                                                   | 10x20                     |
| 330                       | 35   | 337RLS035M                     | 0.603                                      | 595                                                   | 12.5x20                   |
| 470                       | 10   | 477RLS010M                     | 0.705                                      | 460                                                   | 10x16                     |
| 470                       | 16   | 477RLS016M                     | 0.564                                      | 505                                                   | 10x20                     |
| 1000                      | 10   | 108RLS010M                     | 0.332                                      | 805                                                   | 12.5x20                   |