

# CKE/ CKH

## +105°C General Purpose Aluminum Electrolytic Capacitors



### FEATURES

- Lead Free Leads
  - In Stock
- Standardized Case Sizes
  - Multiple Case Styles

### SPECIFICATIONS

|  |   |  |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
|--|---|--|------|------|------|------|--------------------------------------|------------------|---|------|-----------------|-----|-----|-----|-----|--|
| Capacitance Tolerance  |   | ±20% at 120Hz, 20°C  |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
| Operating Temperature Range  |   | -55°C to 105°C (6.3 to 100WVDC)<br>-40°C to +105°C (160 to 400WVDC)<br>-25°C to +105°C (450WVDC) |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
| Surge Voltage  | WVDC  | 6.3  | 10   | 16   | 25   | 35   | 50                                   | 63               | 100   | 160  | 200             | 250 | 350 | 400 | 450 |  |
|  | SVDC  | 7.9  | 13   | 20   | 32   | 44   | 63                                   | 79               | 125   | 200  | 250             | 300 | 400 | 450 | 500 |  |
| Dissipation Factor<br>120Hz, 20°C  | WVDC  | 6.3  | 10   | 16   | 25   | 35   | 50                                   | 63               | 100   | 160  | 200             | 250 | 350 | 400 | 450 |  |
|  | tan δ   | .24  | .20  | .17  | .15  | .12  | .1                                   | .1               | .08   | .15  | .15             | .15 | .2  | .2  | .2  |  |
| Note: For above D.F. specifications, add .02 for every 1,000 µF above 1,000 µF |   |  |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
| Leakage Current  | WVDC  | 6.3 to 100 WVDC  |      |      |      |      |                                      |                  |   |      | 160 to 450 WVDC |     |     |     |     |  |
|  | Time  | 1 minute   |      |      |      |      | 2 minutes                            |                  |   |      | 2 minutes       |     |     |     |     |  |
|  |   | .03 CV or 4 µA, whichever is greater   |      |      |      |      | .01 CV or 3 µA, whichever is greater |                  |   |      | 0.03CV + 40µA   |     |     |     |     |  |
| Impedance Ratio<br>(Max.) @120Hz   | -25°C/20°C                                    | 4  | 3    | 2    | 2    | 2    | 2                                    | 2                | 2   | 3    | 3               | 3   | 6   | 6   | 15  |  |
|  | -40°C/20°C                                    | 10   | 8    | 6    | 4    | 3    | 3                                    | 3                | 3   | 4    | 4               | 4   | 10  | 10  | -   |  |
| Load Life  | 2,000 hours at 105°C with rated WVDC          |  |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
|  |   | Capacitance change<br>Dissipation factor<br>Leakage current                                      |      |      |      |      |                                      |                  | ≤ 20% of initial measured value<br>≤ 20% of initial specified value<br><100% initial specified value      |      |                 |     |     |     |     |  |
| Shelf Life   | 1,000 hours at 105°C with no voltage applied. |  |      |      |      |      |                                      |                  |   |      |                 |     |     |     |     |  |
|  |   | Capacitance change<br>Dissipation factor<br>Leakage current                                      |      |      |      |      |                                      |                  | ≤ 20% of initial measured value<br>≤ 200% of initial specified value<br>≤ 100% of initial specified value |      |                 |     |     |     |     |  |
| Ripple Current Multipliers   |   | Frequency (Hz)   |      |      |      |      |                                      | Temperature (°C) |   |      |                 |     |     |     |     |  |
|  | Capacitance (µF)                              | 50   | 120  | 400  | 1K   | 10K  | 100K                                 | +105             | +85   | ≤60  |                 |     |     |     |     |  |
|  | C≤10  | 0.8  | 1.0  | 1.3  | 1.45 | 1.65 | 1.7                                  | 1.0              | 1.4   | 1.75 |                 |     |     |     |     |  |
|  | 10<C≤100                                      | 0.8  | 1.0  | 1.23 | 1.36 | 1.48 | 1.53                                 | 1.0              | 1.4   | 1.75 |                 |     |     |     |     |  |
|  | 100<C≤1000                                    | 0.8  | 1.0  | 1.16 | 1.25 | 1.35 | 1.38                                 | 1.0              | 1.4   | 1.75 |                 |     |     |     |     |  |
| C>1000   | 0.8   | 1.0  | 1.11 | 1.17 | 1.25 | 1.28 | 1.0                                  | 1.4              | 1.75  |      |                 |     |     |     |     |  |

### SPECIAL ORDER OPTIONS

(See pages 33 thru 37)

- Special tolerances: ±10% (K), -10% + 30%
- Epoxy end sealed
- Ammo Pack
- Mylar sleeve
- Cut, Formed, Cut and Formed Leads



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Aluminum Electrolytic

## PHYSICAL DIMENSIONS

| WVDC (V)<br>(μF) | 6.3 (7.9) | 10 (13) | 16 (20)                   | 25 (32)        | 35 (44) | 50 (63)          | 63 (79)            | 100 (125)                   | 160 (200)          | 200 (250)         | 250 (300)                   | 350 (400)         | 400 (450)         | 450 (500)                   |
|------------------|-----------|---------|---------------------------|----------------|---------|------------------|--------------------|-----------------------------|--------------------|-------------------|-----------------------------|-------------------|-------------------|-----------------------------|
| .1               |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| .15              |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| .22              |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| .33              |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| .47              |           |         |                           |                |         | 5x11             |                    | 5x11                        |                    |                   | 6.3x11                      |                   |                   |                             |
| .68              |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| 1.0              |           |         |                           |                |         | 5x11             |                    | 5x11                        |                    |                   | 6.3x11                      | 6.3x11            | 8x11.5            | 10x12.5                     |
| 1.5              |           |         |                           |                |         | 5x11             |                    |                             |                    |                   |                             |                   |                   |                             |
| 2.2              |           |         |                           |                |         | 5x11             |                    | 5x11                        |                    |                   | 6.3x11                      | 6.3x11            | 8x11.5            | 10x12.5<br>10x20<br>8x11.5  |
| 3.3              |           |         |                           |                |         | 5x11             |                    | 5x11                        |                    | 6.3x11            | 6.3x11<br>8x11.5            | 8x11.5            | 10x12.5<br>8x11.5 | 10x13<br>12.5x20            |
| 4.7              |           |         |                           |                |         |                  |                    | 5x11                        | 6.3x11             | 6.3x11            | 10x12.5<br>6.3x11<br>8x11.5 | 10x12.5<br>8x11.5 | 10x12.5<br>10x16  | 10x12.5<br>10x20<br>12.5x20 |
| 6.8              |           |         |                           |                |         | 5x11             | 5x11               | 6.3x11                      |                    |                   | 10x16                       |                   |                   |                             |
| 10               |           |         |                           |                |         | 5x11             | 5x11               | 5x11<br>6.3x11              | 8x11.5             | 10x12.5<br>8x11.5 | 10x12.5<br>10x16            | 10x16<br>10x20    | 10x16<br>10x20    | 10x21<br>12.5x20            |
| 15               |           |         |                           |                |         | 5x11             | 6.3x11             | 8x11.5                      | 10x16              |                   | 10x20                       |                   |                   |                             |
| 22               |           |         |                           |                |         | 5x11             | 5x11<br>6.3x11     | 6.3x11<br>8x11.5            | 10x12.5<br>10x16   | 10x16<br>10x20    | 10x20<br>12.5x20            | 12.5x20           | 12.5x25           | 13x26<br>16x25<br>16x31.5   |
| 33               |           |         |                           |                |         | 5x11             | 6.3x11             | 10x12.5<br>8x11.5           | 10x16<br>10x20     | 10x20             | 12.5x20                     | 12.5x25           | 16x25<br>16x31.5  | 16x25<br>18x35.5            |
| 47               |           |         |                           | 5x11           | 5x11    | 6.3x11           | 6.3x11<br>8x11.5   | 10x12.5<br>10x16<br>8x11.5  | 10x20<br>12.5x20   | 12.5x20           | 12.5x20<br>13x21<br>12.5x25 | 16x25<br>16x35.5  | 16x25<br>16x31.5  | 16x31.5                     |
| 68               |           |         | 5x11                      | 6.3x11         |         | 8x11.5           | 10x12.5            | 10x16                       |                    | 16x25             | 16x31.5                     |                   |                   |                             |
| 100              |           |         | 5x11                      | 5x11           | 6.3x11  | 8x11.5           | 10x12.5<br>8x11.5  | 10x16<br>10x20              | 12.5x25            | 16x25             | 16x25<br>16x31.5            | 18x35.5<br>18x40  | 18x35.5           |                             |
| 150              |           | 6.3x11  |                           | 8x11.5         | 10x12.5 | 10x16            | 10x20              | 12.5x20                     |                    | 16x31             | 16x35.5                     |                   |                   |                             |
| 220              |           | 5x11    | 6.3x11                    | 6.3x11         | 8x11.5  | 10x12.5<br>10x16 | 10x16<br>10x20     | 12.5x20<br>12.5x25<br>16x25 | 16x31.5<br>16x35.5 | 16x35.5           | 18x35.5                     |                   |                   |                             |
| 330              |           | 6.3x11  | 6.3x11                    | 8x11.5         | 10x12.5 | 10x16<br>10x20   | 10x20<br>12.5x20   | 12.5x25<br>16x25            | 18x35.5            | 18x40             |                             |                   |                   |                             |
| 470              |           | 6.3x11  | 10x12.5<br>8x11.5         | 10x12.5        | 10x16   | 10x20<br>12.5x20 | 12.5x20<br>12.5x25 | 16x25<br>16x31.5            |                    |                   |                             |                   |                   |                             |
| 680              | 10x12.5   |         | 10x16                     |                | 12.5x20 | 12.5x25          | 16x25              |                             |                    |                   |                             |                   |                   |                             |
| 1000             | 8x11.5    | 10x12.5 | 10x12.5<br>10x16<br>10x20 | 10x16<br>10x20 | 12.5x20 | 12.5x25<br>16x25 | 16x25<br>16x31.5   | 18x35.5<br>18x40            |                    |                   |                             |                   |                   |                             |

Convert to inches, divide by 25.4.

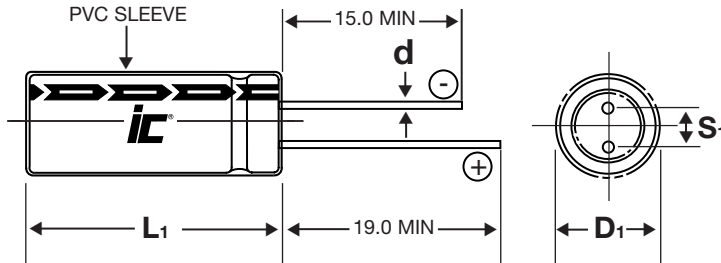
DxL(mm)

## PHYSICAL DIMENSIONS

| WVDC (SV)<br>(μF) | 6.3 (7.9)          | 10 (13)            | 16 (20)                     | 25 (32)                     | 35 (44)                       | 50 (63)                       | 63 (79) | 100 (125) | 160 (200) | 200 (250) | 250 (300) | 350 (400) | 400 (450) | 450 (500) |
|-------------------|--------------------|--------------------|-----------------------------|-----------------------------|-------------------------------|-------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1500              | 10x20              | →                  | 12.5x20                     | 12.5x25                     | 16x25                         | 18x31.5                       |         |           |           |           |           |           |           |           |
| 2200              | 10x16              | 10x16<br>10x20     | 10x21<br>12.5x20<br>12.5x25 | 12.5x25<br>16x25            | 16x25<br>16x31.5              | 16x31.5<br>16x35.5<br>18x35.5 | 18x35.5 |           |           |           |           |           |           |           |
| 3300              | 10x20              | 12.5x20            | 12.5x25<br>16x25            | 16x25<br>16x31.5            | 16x31.5<br>16x35.5<br>18x35.5 | 18x35.5                       |         |           |           |           |           |           |           |           |
| 4700              | 12.5x20            | 12.5x25<br>16x25   | 16x25<br>16x31.5            | 16x25<br>16x31.5<br>18x31.5 | 16x35.5<br>18x35.5            |                               |         |           |           |           |           |           |           |           |
| 6800              | 12.5x25            | 16x25              | 16x25<br>16x31.5            | 16x35.5<br>18x35.5          | 18x40                         |                               |         |           |           |           |           |           |           |           |
| 10000             | 16x25<br>16x31.5   | 16x31.5<br>18x35.5 | 16x35.5<br>18x31.5          | 18x40                       |                               |                               |         |           |           |           |           |           |           |           |
| 15000             | 16x31.5<br>16x35.5 | 16x35.5<br>18x35.5 | 18x40                       |                             |                               |                               |         |           |           |           |           |           |           |           |
| 22000             | 18x35.5<br>18x40   | 18x40              |                             |                             |                               |                               |         |           |           |           |           |           |           |           |

Convert to inches, divide by 25.4.

DxL(mm)



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

### LEAD INFORMATION V.S. CASE DIAMETER

|   | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 | 16.0 | 18.0 |
|---|-----|-----|-----|------|------|------|------|
| 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<sub>1</sub>=L + 1.5 mm Max.

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

S<sub>1</sub>=S±0.5 mm

## STANDARD PART LISTING

PLEASE NOTE: The CKE and CKH Series have been merged. CHECK PART NUMBERS CAREFULLY.

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 0.1              | 50   | 104CKH050M                  | 1657.8640                    | 5   | 5x11                |
| 0.15             | 50   | 154CKH050M                  | 1105.2427                    | 5   | 5x11                |
| 0.22             | 50   | 224CKH050M                  | 753.5745                     | 7   | 5x11                |
| 0.33             | 50   | 334CKH050M                  | 502.3830                     | 8   | 5x11                |
| 0.47             | 50   | 474CKH050M                  | 352.7370                     | 10  | 5x11                |
| 0.47             | 100  | 474CKH100M                  | 282.1896                     | 10  | 5x11                |
| 0.47             | 250  | 474CKH250M                  | 529.1055                     | 11  | 6.3x11              |
| 0.68             | 50   | 684CKH050M                  | 243.8035                     | 10  | 5x11                |
| 1                | 50   | 105CKH050M                  | 165.7864                     | 13  | 5x11                |
| 1                | 100  | 105CKE100M                  | 132.6291                     | 16  | 5x11                |
| 1                | 250  | 105CKE250M                  | 248.6796                     | 16  | 6.3x11              |
| 1                | 350  | 105CKE350M                  | 331.5728                     | 16  | 6.3x11              |
| 1                | 400  | 105CKE400M                  | 331.5728                     | 16  | 8x11.5              |
| 1                | 450  | 105CKE450M                  | 331.5728                     | 17  | 10x12.5             |
| 1.5              | 50   | 155CKH050M                  | 110.5243                     | 15  | 5x11                |
| 2.2              | 50   | 225CKH050M                  | 75.3575                      | 20  | 5x11                |
| 2.2              | 100  | 225CKE100M                  | 60.2860                      | 24  | 5x11                |
| 2.2              | 250  | 225CKH250M                  | 113.0362                     | 24  | 6.3x11              |
| 2.2              | 350  | 225CKE350M                  | 150.7149                     | 21  | 6.3x11              |
| 2.2              | 400  | 225CKE400M                  | 150.7149                     | 26  | 8x11.5              |
| 2.2              | 450  | 225CKE450M                  | 150.7149                     | 31  | 10x12.5             |
| 2.2              | 450  | 225CKH450M                  | 150.7149                     | 31  | 10x20               |
| 2.2              | 450  | 225CKE450MJM                | 150.7149                     | 20  | 8x11.5              |
| 3.3              | 50   | 335CKE050M                  | 50.2383                      | 27  | 5x11                |
| 3.3              | 100  | 335CKE100M                  | 40.1906                      | 30  | 5x11                |
| 3.3              | 200  | 335CKE200M                  | 75.3575                      | 26  | 6.3x11              |
| 3.3              | 250  | 335CKE250MGM                | 75.3575                      | 28  | 6.3x11              |
| 3.3              | 250  | 335CKE250M                  | 75.3575                      | 33  | 8x11.5              |
| 3.3              | 350  | 335CKE350MJM                | 100.4766                     | 30  | 8x11.5              |
| 3.3              | 400  | 335CKE400M                  | 100.4766                     | 32  | 10x12.5             |
| 3.3              | 400  | 335CKE400MJM                | 100.4766                     | 34  | 8x11.5              |
| 3.3              | 450  | 335CKE450MLM                | 100.4766                     | 28  | 10x12.5             |
| 3.3              | 450  | 335CKE450MLM                | 100.4766                     | 28  | 10x13               |
| 3.3              | 450  | 335CKE450M                  | 100.4766                     | 41  | 12.5x20             |
| 4.7              | 100  | 475CKE100M                  | 28.2190                      | 35  | 5x11                |
| 4.7              | 160  | 475CKE160M                  | 52.9106                      | 29  | 6.3x11              |
| 4.7              | 200  | 475CKE200M                  | 52.9106                      | 35  | 6.3x11              |
| 4.7              | 250  | 475CKH250M                  | 52.9106                      | 36  | 10x12.5             |
| 4.7              | 250  | 475CKE250MGM                | 52.9106                      | 35  | 6.3x11              |
| 4.7              | 250  | 475CKE250M                  | 52.9106                      | 39  | 8x11.5              |
| 4.7              | 350  | 475CKE350M                  | 70.5474                      | 37  | 10x12.5             |
| 4.7              | 350  | 475CKE350MJM                | 70.5474                      | 39  | 8x11.5              |
| 4.7              | 400  | 475CKE400MLN                | 70.5474                      | 42  | 10x12.5             |
| 4.7              | 400  | 475CKE400M                  | 70.5474                      | 42  | 10x16               |
| 4.7              | 450  | 475CKE450MLN                | 70.5474                      | 32  | 10x12.5             |

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 4.7              | 450  | 475CKE450M                  | 70.5474                      | 43  | 10x20               |
| 4.7              | 450  | 475CKH450M                  | 70.5474                      | 49  | 12.5x20             |
| 6.8              | 50   | 685CKH050M                  | 24.3804                      | 40  | 5x11                |
| 6.8              | 63   | 685CKH063M                  | 24.3804                      | 42  | 5x11                |
| 6.8              | 100  | 685CKH100M                  | 19.5043                      | 52  | 6.3x11              |
| 6.8              | 250  | 685CKH250M                  | 36.5705                      | 65  | 10x16               |
| 10               | 50   | 106CKH050M                  | 16.5786                      | 46  | 5x11                |
| 10               | 63   | 106CKE063M                  | 16.5786                      | 46  | 5x11                |
| 10               | 100  | 106CKE100MEM                | 13.2629                      | 50  | 5x11                |
| 10               | 100  | 106CKH100M                  | 13.2629                      | 55  | 6.3x11              |
| 10               | 160  | 106CKE160M                  | 24.8680                      | 49  | 8x11.5              |
| 10               | 200  | 106CKE200M                  | 24.8680                      | 60  | 10x12.5             |
| 10               | 200  | 106CKE200MJM                | 24.8680                      | 57  | 8x11.5              |
| 10               | 250  | 106CKE250MLN                | 24.8680                      | 71  | 10x12.5             |
| 10               | 250  | 106CKH250M                  | 24.8680                      | 70  | 10x16               |
| 10               | 350  | 106CKE350MLQ                | 33.1573                      | 64  | 10x16               |
| 10               | 350  | 106CKE350M                  | 33.1573                      | 65  | 10x20               |
| 10               | 400  | 106CKE400MLQ                | 33.1573                      | 64  | 10x16               |
| 10               | 400  | 106CKE400M                  | 33.1573                      | 73  | 10x20               |
| 10               | 450  | 106CKE450MLU                | 33.1573                      | 27  | 10x21               |
| 10               | 450  | 106CKE450M                  | 33.1573                      | 65  | 12.5x20             |
| 15               | 50   | 156CKH050M                  | 11.0524                      | 58  | 5x11                |
| 15               | 63   | 156CKH063M                  | 11.0524                      | 65  | 6.3x11              |
| 15               | 100  | 156CKH100M                  | 8.8419                       | 80  | 8x11.5              |
| 15               | 160  | 156CKH160M                  | 16.5786                      | 80  | 10x16               |
| 15               | 250  | 156CKH250M                  | 16.5786                      | 90  | 10x20               |
| 22               | 50   | 226CKH050M                  | 7.5357                       | 68  | 5x11                |
| 22               | 63   | 226CKE063M                  | 7.5357                       | 70  | 5x11                |
| 22               | 63   | 226CKH063M                  | 7.5357                       | 70  | 6.3x11              |
| 22               | 100  | 226CKE100M                  | 6.0286                       | 85  | 6.3x11              |
| 22               | 100  | 226CKH100M                  | 6.0286                       | 96  | 8x11.5              |
| 22               | 160  | 226CKE160MLN                | 11.3036                      | 92  | 10x12.5             |
| 22               | 160  | 226CKE160M                  | 11.3036                      | 85  | 10x16               |
| 22               | 200  | 226CKE200MLQ                | 11.3036                      | 105   | 10x16               |
| 22               | 200  | 226CKH200M                  | 11.3036                      | 95  | 10x20               |
| 22               | 250  | 226CKE250MLU                | 11.3036                      | 105   | 10x20               |
| 22               | 250  | 226CKE250M                  | 11.3036                      | 130   | 12.5x20             |
| 22               | 350  | 226CKE350MNU                | 15.0715                      | 105   | 12.5x20             |
| 22               | 400  | 226CKE400M                  | 15.0715                      | 120   | 12.5x25             |
| 22               | 450  | 226CKE450MNV                | 15.0715                      | 100   | 13x26               |
| 22               | 450  | 226CKE450M                  | 15.0715                      | 130   | 16x25               |
| 22               | 450  | 226CKH450M                  | 15.0715                      | 130   | 16x31.5             |
| 33               | 50   | 336CKE050M                  | 5.0238                       | 85  | 5x11                |
| 33               | 63   | 336CKE063M                  | 5.0238                       | 95  | 6.3x11              |
| 33               | 100  | 336CKH100M                  | 4.0191                       | 140   | 10x12.5             |

## STANDARD PART LISTING

PLEASE NOTE: The CKE and CKH Series have been merged. CHECK PART NUMBERS CAREFULLY.

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 33               | 100  | 336CKE100M                  | 4.0191                       | 120   | 8x11.5              |
| 33               | 160  | 336CKE160MLQ                | 7.5357                       | 125   | 10x16               |
| 33               | 160  | 336CKE160M                  | 7.5357                       | 120   | 10x20               |
| 33               | 200  | 336CKE200MLU                | 7.5357                       | 140   | 10x20               |
| 33               | 250  | 336CKE250M                  | 7.5357                       | 150   | 12.5x20             |
| 33               | 350  | 336CKE350MNV                | 10.0477                      | 170   | 12.5x25             |
| 33               | 400  | 336CKE400M                  | 10.0477                      | 160   | 16x25               |
| 33               | 400  | 336CKH400M                  | 10.0477                      | 160   | 16x31.5             |
| 33               | 450  | 336CKE450MQV                | 10.0477                      | 33  | 16x25               |
| 33               | 450  | 336CKE450M                  | 10.0477                      | 170   | 18x35.5             |
| 47               | 25   | 476CKH025M                  | 5.2911                       | 80  | 5x11                |
| 47               | 35   | 476CKE035M                  | 4.2328                       | 90  | 5x11                |
| 47               | 50   | 476CKE050M                  | 3.5274                       | 110   | 6.3x11              |
| 47               | 63   | 476CKE063M                  | 3.5274                       | 110   | 6.3x11              |
| 47               | 63   | 476CKH063M                  | 3.5274                       | 135   | 8x11.5              |
| 47               | 100  | 476CKE100M                  | 2.8219                       | 160   | 10x12.5             |
| 47               | 100  | 476CKH100M                  | 2.8219                       | 180   | 10x16               |
| 47               | 100  | 476CKE100MJM                | 2.8219                       | 140   | 8x11.5              |
| 47               | 160  | 476CKE160MLU                | 5.2911                       | 150   | 10x20               |
| 47               | 160  | 476CKE160M                  | 5.2911                       | 160   | 12.5x20             |
| 47               | 200  | 476CKE200M                  | 5.2911                       | 170   | 12.5x20             |
| 47               | 250  | 476CKE250MNU                | 5.2911                       | 190   | 12.5x20             |
| 47               | 250  | 476CKE250M                  | 5.2911                       | 200   | 12.5x25             |
| 47               | 250  | 476CKE250MNU                | 5.2911                       | 190   | 13x21               |
| 47               | 350  | 476CKE350M                  | 7.0547                       | 190   | 16x25               |
| 47               | 350  | 476CKH350M                  | 7.0547                       | 190   | 16x35.5             |
| 47               | 400  | 476CKE400MQV                | 7.0547                       | 200   | 16x25               |
| 47               | 400  | 476CKE400M                  | 7.0547                       | 210   | 16x31.5             |
| 47               | 450  | 476CKE450MQW                | 7.0547                       | 155   | 16x31.5             |
| 68               | 16   | 686CKH016M                  | 4.1447                       | 95  | 5x11                |
| 68               | 25   | 686CKH025M                  | 3.6571                       | 105   | 6.3x11              |
| 68               | 50   | 686CKH050M                  | 2.4380                       | 165   | 8x11.5              |
| 68               | 63   | 686CKH063M                  | 2.4380                       | 190   | 10x12.5             |
| 68               | 100  | 686CKH100M                  | 1.9504                       | 255   | 10x16               |
| 68               | 200  | 686CKH200M                  | 3.6571                       | 235   | 16x25               |
| 68               | 250  | 686CKH250M                  | 3.6571                       | 255   | 16x31.5             |
| 100              | 16   | 107CKE016M                  | 2.8184                       | 110   | 5x11                |
| 100              | 25   | 107CKE025MEM                | 2.4868                       | 125   | 5x11                |
| 100              | 35   | 107CKE035M                  | 1.9894                       | 150   | 6.3x11              |
| 100              | 50   | 107CKH050M                  | 1.6579                       | 180   | 8x11.5              |
| 100              | 63   | 107CKH063M                  | 1.6579                       | 210   | 10x12.5             |
| 100              | 63   | 107CKE063MJM                | 1.6579                       | 200   | 8x11.5              |
| 100              | 100  | 107CKE100MLQ                | 1.3263                       | 240   | 10x16               |
| 100              | 100  | 107CKE100M                  | 1.3263                       | 290   | 10x20               |
| 100              | 160  | 107CKE160M                  | 2.4868                       | 250   | 12.5x25             |

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 100              | 200  | 107CKE200M                  | 2.4868                       | 260   | 16x25               |
| 100              | 250  | 107CKE250MQV                | 2.4868                       | 310   | 16x25               |
| 100              | 250  | 107CKE250M                  | 2.4868                       | 320   | 16x31.5             |
| 100              | 350  | 107CKE350MRY                | 3.3157                       | 370   | 18x35.5             |
| 100              | 350  | 107CKE350M                  | 3.3157                       | 330   | 18x40               |
| 100              | 400  | 107CKE400M                  | 3.3157                       | 310   | 18x35.5             |
| 150              | 10   | 157CKH010M                  | 2.2105                       | 125   | 6.3x11              |
| 150              | 25   | 157CKH025M                  | 1.6579                       | 180   | 8x11.5              |
| 150              | 35   | 157CKH035M                  | 1.3263                       | 230   | 10x12.5             |
| 150              | 50   | 157CKH050M                  | 1.1052                       | 260   | 10x16               |
| 150              | 63   | 157CKH063M                  | 1.1052                       | 315   | 10x20               |
| 150              | 100  | 157CKH100M                  | 0.8842                       | 410   | 12.5x20             |
| 150              | 160  | 157CKH160M                  | 1.6579                       | 330   | 16x31.5             |
| 150              | 200  | 157CKH200M                  | 1.6579                       | 350   | 16x35.5             |
| 220              | 10   | 227CKE010M                  | 1.5071                       | 150   | 5x11                |
| 220              | 16   | 227CKE016M                  | 1.2811                       | 190   | 6.3x11              |
| 220              | 25   | 227CKE025MGM                | 1.1304                       | 200   | 6.3x11              |
| 220              | 35   | 227CKE035M                  | 0.9043                       | 260   | 8x11.5              |
| 220              | 50   | 227CKE050M                  | 0.7536                       | 310   | 10x12.5             |
| 220              | 50   | 227CKH050M                  | 0.7536                       | 345   | 10x16               |
| 220              | 63   | 227CKE063M                  | 0.7536                       | 340   | 10x16               |
| 220              | 63   | 227CKH063M                  | 0.7536                       | 400   | 10x20               |
| 220              | 100  | 227CKE100MNU                | 0.6029                       | 390   | 12.5x20             |
| 220              | 100  | 227CKE100M                  | 0.6029                       | 510   | 12.5x25             |
| 220              | 100  | 227CKH100M                  | 0.6029                       | 570   | 16x25               |
| 220              | 160  | 227CKE160MQW                | 1.1304                       | 410   | 16x31.5             |
| 220              | 160  | 227CKE160M                  | 1.1304                       | 420   | 16x35.5             |
| 220              | 200  | 227CKE200M                  | 1.1304                       | 500   | 16x35.5             |
| 220              | 250  | 227CKE250M                  | 1.1304                       | 485   | 18x35.5             |
| 330              | 10   | 337CKE010M                  | 1.0048                       | 210   | 6.3x11              |
| 330              | 16   | 337CKE016MGM                | 0.8541                       | 225   | 6.3x11              |
| 330              | 25   | 337CKE025M                  | 0.7536                       | 280   | 8x11.5              |
| 330              | 35   | 337CKE035M                  | 0.6029                       | 350   | 10x12.5             |
| 330              | 50   | 337CKE050M                  | 0.5024                       | 410   | 10x16               |
| 330              | 50   | 337CKH050M                  | 0.5024                       | 460   | 10x20               |
| 330              | 63   | 337CKE063M                  | 0.5024                       | 470   | 10x20               |
| 330              | 63   | 337CKH063M                  | 0.5024                       | 540   | 12.5x20             |
| 330              | 100  | 337CKE100M                  | 0.4019                       | 620   | 12.5x25             |
| 330              | 100  | 337CKH100M                  | 0.4019                       | 700   | 16x25               |
| 330              | 160  | 337CKE160M                  | 0.7536                       | 550   | 18x35.5             |
| 330              | 200  | 337CKE200M                  | 0.7536                       | 675   | 18x40               |
| 470              | 10   | 477CKE010M                  | 0.7055                       | 260   | 6.3x11              |
| 470              | 16   | 477CKH016M                  | 0.5997                       | 370   | 10x12.5             |
| 470              | 16   | 477CKE016M                  | 0.5997                       | 320   | 8x11.5              |
| 470              | 25   | 477CKE025M                  | 0.5291                       | 370   | 10x12.5             |

## STANDARD PART LISTING

PLEASE NOTE: The CKE and CKH Series have been merged. CHECK PART NUMBERS CAREFULLY.

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 470              | 35   | 477CKE035M                  | 0.4233                       | 450   | 10x16               |
| 470              | 50   | 477CKE050M                  | 0.3527                       | 560   | 10x20               |
| 470              | 50   | 477CKH050M                  | 0.3527                       | 610   | 12.5x20             |
| 470              | 63   | 477CKE063M                  | 0.3527                       | 610   | 12.5x20             |
| 470              | 63   | 477CKH063M                  | 0.3527                       | 700   | 12.5x25             |
| 470              | 100  | 477CKE100M                  | 0.2822                       | 720   | 16x25               |
| 470              | 100  | 477CKH100M                  | 0.2822                       | 880   | 16x31.5             |
| 680              | 6.3  | 687CKH6R3M                  | 0.5851                       | 375   | 10x12.5             |
| 680              | 16   | 687CKH016M                  | 0.4145                       | 490   | 10x16               |
| 680              | 35   | 687CKH035M                  | 0.2926                       | 695   | 12.5x20             |
| 680              | 50   | 687CKH050M                  | 0.2438                       | 825   | 12.5x25             |
| 680              | 63   | 687CKH063M                  | 0.2438                       | 925   | 16x25               |
| 1000             | 6.3  | 108CKE6R3M                  | 0.3979                       | 390   | 8x11.5              |
| 1000             | 10   | 108CKE010M                  | 0.3316                       | 470   | 10x12.5             |
| 1000             | 16   | 108CKE016MLN                | 0.2818                       | 500   | 10x12.5             |
| 1000             | 16   | 108CKE016M                  | 0.2818                       | 550   | 10x16               |
| 1000             | 16   | 108CKH016M                  | 0.2818                       | 640   | 10x20               |
| 1000             | 25   | 108CKE025MLQ                | 0.2487                       | 610   | 10x16               |
| 1000             | 25   | 108CKE025M                  | 0.2487                       | 660   | 10x20               |
| 1000             | 35   | 108CKH035M                  | 0.1989                       | 820   | 12.5x20             |
| 1000             | 50   | 108CKE050M                  | 0.1658                       | 970   | 12.5x25             |
| 1000             | 50   | 108CKH050M                  | 0.1658                       | 1100  | 16x25               |
| 1000             | 63   | 108CKE063M                  | 0.1658                       | 940   | 16x25               |
| 1000             | 63   | 108CKH063M                  | 0.1658                       | 1210  | 16x31.5             |
| 1000             | 100  | 108CKE100MRY                | 0.1326                       | 1000  | 18x35.5             |
| 1000             | 100  | 108CKE100M                  | 0.1326                       | 1410  | 18x40               |
| 1500             | 6.3  | 158CKH6R3M                  | 0.2874                       | 585   | 10x20               |
| 1500             | 16   | 158CKH016M                  | 0.2100                       | 800   | 12.5x20             |
| 1500             | 25   | 158CKH025M                  | 0.1879                       | 905   | 12.5x25             |
| 1500             | 35   | 158CKH035M                  | 0.1547                       | 1140  | 16x25               |
| 1500             | 50   | 158CKH050M                  | 0.1326                       | 1250  | 18x31.5             |
| 2200             | 6.3  | 228CKE6R3M                  | 0.2110                       | 660   | 10x16               |
| 2200             | 10   | 228CKE010MLQ                | 0.1809                       | 705   | 10x16               |
| 2200             | 10   | 228CKE010M                  | 0.1809                       | 810   | 10x20               |
| 2200             | 16   | 228CKE016MLU                | 0.1583                       | 710   | 10x21               |
| 2200             | 16   | 228CKE016M                  | 0.1583                       | 950   | 12.5x20             |
| 2200             | 16   | 228CKH016M                  | 0.1583                       | 1000  | 12.5x25             |
| 2200             | 25   | 228CKE025M                  | 0.1432                       | 1100  | 12.5x25             |
| 2200             | 25   | 228CKH025M                  | 0.1432                       | 1170  | 16x25               |
| 2200             | 35   | 228CKE035M                  | 0.1206                       | 1180  | 16x25               |
| 2200             | 35   | 228CKH035M                  | 0.1206                       | 1340  | 16x31.5             |
| 2200             | 50   | 228CKE050MQW                | 0.1055                       | 1410  | 16x31.5             |
| 2200             | 50   | 228CKE050M                  | 0.1055                       | 1470  | 16x35.5             |
| 2200             | 50   | 228CKH050M                  | 0.1055                       | 1530  | 18x35.5             |

| Capacitance (µF) | WVDC | IC <sup>®</sup> PART NUMBER | Maximum ESR Ω<br>120Hz,+20°C | Maximum RMS Ripple Current (mA)<br>120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 2200             | 63   | 228CKE063M                  | 0.1055                       | 1650  | 18x35.5             |
| 3300             | 6.3  | 338CKE6R3M                  | 0.1507                       | 880   | 10x20               |
| 3300             | 10   | 338CKE010M                  | 0.1306                       | 1040  | 12.5x20             |
| 3300             | 16   | 338CKH016M                  | 0.1155                       | 1220  | 12.5x25             |
| 3300             | 16   | 338CKH016M                  | 0.1155                       | 1300  | 16x25               |
| 3300             | 25   | 338CKE025M                  | 0.1055                       | 1240  | 16x25               |
| 3300             | 25   | 338CKH025M                  | 0.1055                       | 1460  | 16x31.5             |
| 3300             | 35   | 338CKE035MQW                | 0.0904                       | 1500  | 16x31.5             |
| 3300             | 35   | 338CKE035M                  | 0.0904                       | 1560  | 16x35.5             |
| 3300             | 35   | 338CKH035M                  | 0.0904                       | 1650  | 18x35.5             |
| 3300             | 50   | 338CKE050M                  | 0.0804                       | 1780  | 18x35.5             |
| 4700             | 6.3  | 478CKE6R3M                  | 0.0847                       | 1090  | 12.5x20             |
| 4700             | 10   | 478CKE010M                  | 0.0847                       | 1280  | 12.5x25             |
| 4700             | 10   | 478CKH010M                  | 0.0988                       | 1410  | 16x25               |
| 4700             | 16   | 478CKE016M                  | 0.0741                       | 1310  | 16x25               |
| 4700             | 16   | 478CKH016M                  | 0.0882                       | 1600  | 16x31.5             |
| 4700             | 25   | 478CKE025MQV                | 0.0811                       | 1570  | 16x25               |
| 4700             | 25   | 478CKE025M                  | 0.0811                       | 1530  | 16x31.5             |
| 4700             | 25   | 478CKH025M                  | 0.0811                       | 1780  | 18x31.5             |
| 4700             | 35   | 478CKE035MQY                | 0.0705                       | 1780  | 16x35.5             |
| 4700             | 35   | 478CKE035M                  | 0.0705                       | 1830  | 18x35.5             |
| 6800             | 6.3  | 688CKE6R3M                  | 0.0585                       | 1350  | 12.5x25             |
| 6800             | 10   | 688CKE010M                  | 0.0488                       | 1390  | 16x25               |
| 6800             | 16   | 688CKE016MQV                | 0.0707                       | 1600  | 16x25               |
| 6800             | 16   | 688CKE016M                  | 0.0707                       | 1630  | 16x31.5             |
| 6800             | 25   | 688CKE025MQY                | 0.0658                       | 1850  | 16x35.5             |
| 6800             | 25   | 688CKE025M                  | 0.0658                       | 1880  | 18x35.5             |
| 6800             | 35   | 688CKE035M                  | 0.0585                       | 2000  | 18x40               |
| 10000            | 6.3  | 109CKE6R3M                  | 0.0398                       | 1450  | 16x25               |
| 10000            | 6.3  | 109CKH6R3M                  | 0.0696                       | 1790  | 16x31.5             |
| 10000            | 10   | 109CKE010MLQ                | 0.0630                       | 1820  | 16x31.5             |
| 10000            | 10   | 109CKE010M                  | 0.0630                       | 1760  | 16x35.5             |
| 10000            | 10   | 109CKH010M                  | 0.0630                       | 1965  | 18x35.5             |
| 10000            | 16   | 109CKE016MQY                | 0.0580                       | 1930  | 16x35.5             |
| 10000            | 16   | 109CKE016M                  | 0.0580                       | 1960  | 18x31.5             |
| 10000            | 25   | 109CKE025M                  | 0.0547                       | 2000  | 18x40               |
| 15000            | 6.3  | 159CKE6R3MQW                | 0.0575                       | 1820  | 16x31.5             |
| 15000            | 6.3  | 159CKE6R3M                  | 0.0575                       | 1850  | 16x35.5             |
| 15000            | 10   | 159CKE010MQY                | 0.0531                       | 2050  | 16x35.5             |
| 15000            | 10   | 159CKE010M                  | 0.0531                       | 2050  | 18x35.5             |
| 15000            | 16   | 159CKE016M                  | 0.0497                       | 2210  | 18x40               |
| 22000            | 6.3  | 229CKE6R3MRY                | 0.0497                       | 2280  | 18x35.5             |
| 22000            | 6.3  | 229CKE6R3M                  | 0.0497                       | 2300  | 18x40               |
| 22000            | 10   | 229CKE010M                  | 0.0467                       | 2420  | 18x40               |