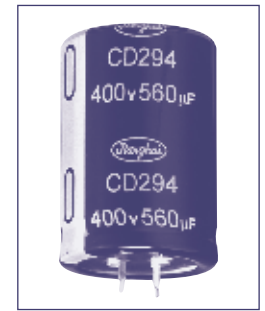
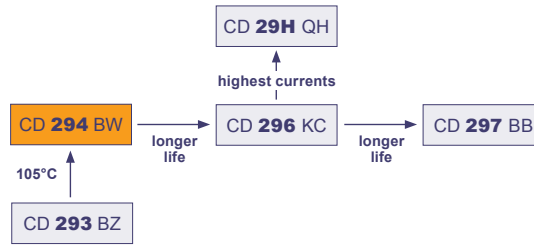


# CD 294 BW Series



4000 at 105°C

- Standard 105°C
- General Industry



| Item  | Characteristics  |   |
|---|--|---|
| Operating Temperature Range (°C)                        | -40 ~ +105   | -25 ~ +105  |
| Voltage Range (V)                                       | 16 ~ 100   | 160 ~ 500   |
| Capacitance Range (µF)                                  | 39 ~ 47 000  |   |
| Capacitance Tolerance (20°C, 120Hz)                     | ± 20%  |   |
| Leakage Current (µA)                                    | After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0,01CV or 1,5mA, whichever is smaller<br>C: Nominal Capacitance (µF) V: Rated Voltage (V) |   |
| Dissipation Factor (20°C, 120Hz)                        | <b>Rated Voltage (V)</b>   | <b>16</b> <b>25</b> <b>35</b> <b>50</b> <b>63~100</b> <b>160~400</b> <b>450~500</b> |
|   | Tan δ (max)  | 0,50    0,40    0,35    0,30    0,20    0,15    0,20                                |
| Stability at Low Temperature (Impedance Ratio at 120Hz) | <b>Rated Voltage (V)</b>   | <b>16~100</b> <b>160~200</b> <b>250~500</b>   |
|   | $Z_{-25°C} / Z_{+20°C}$  | 4   |
|   | $Z_{-40°C} / Z_{+20°C}$  | 15  |

|                     | Useful Life                           |                   | Load Life                             | Endurance Test                        | Shelf Life  |
|---------------------|---------------------------------------|-------------------|---------------------------------------|---------------------------------------|---|
| Lifetime            | <b>4 000h</b>                         | >180 000h         | 2 000h                                | 3 000h                                | 1 000h  |
| Leakage Current     | Not more than specified value         |                   | Not more than specified value         | Not more than specified value         | Not more than specified value                                     |
| Capacity Change     | Within ± 30% of initial value         |                   | Within ± 20% of initial value         | Within ± 20% of initial value         | Within ± 20% of initial value                                     |
| Dissipation Factor  | Not more than 300% of specified value |                   | Not more than 200% of specified value | Not more than 130% of specified value | Not more than 200% of specified value                             |
| Condition:          |                                       |                   |                                       |                                       |   |
| Applied Voltage     | $U_R$                                 | $U_R$             | $U_R$                                 | $U_R$                                 | $U_R = 0$   |
| Applied Current     | $I_R$                                 | $1,4 \times I_R$  | $I_R$                                 | $I_R = 0$                             | $I_R = 0$   |
| Applied Temperature | 105°C                                 | 40°C              | 105°C                                 | 105°C                                 | 105°C   |
| Failure Rate Level  | ≤ 1% Failure Rate                     | ≤ 1% Failure Rate | guaranteed                            |                                       | After test: $U_R$ to be applied for 30min >24h before measurement |

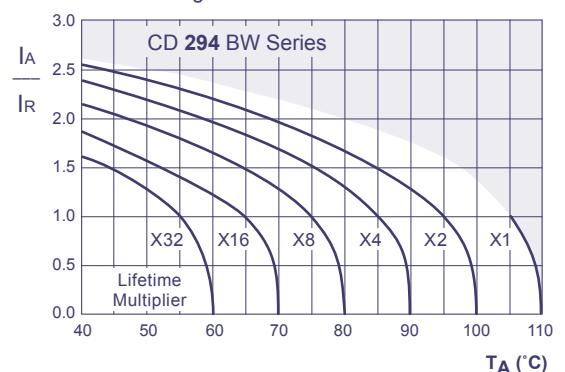
## Multiplier for Ripple Current

Frequency Coefficient

| Rated Voltage (V) | Frequency |       |      |       |         |
|-------------------|-----------|-------|------|-------|---------|
|                   | 50Hz      | 120Hz | 1kHz | 10kHz | ≥ 20kHz |
| ≤ 100             | 0,95      | 1,00  | 1,10 | 1,15  | 1,15    |
| 160 ~ 250         | 0,87      | 1,00  | 1,11 | 1,18  | 1,20    |
| ≥ 350             | 0,80      | 1,00  | 1,14 | 1,14  | 1,20    |

## Multiplier for Lifetime

Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Snap-In

## Ratings for CD 294 BW Series

| U <sub>R,DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance | Max ESR<br>20°C,<br>120Hz | Typ ESR<br>20°C,<br>120Hz | Max Ripple Current<br>105°C,<br>120Hz | Size<br>Ø D x L |
|--|-------------------|---------------------------|---------------------------|---------------------------------------|-----------------|
| (V)  | (µF)              | (mΩ)                      | (mΩ)                      | (Arms)                                | (mm)            |
| <b>16<br/>(20)<br/>1C</b>                    | 6800              | 98                        | 69                        | 1,60                                  | 22 x 25         |
|  |                   | 67                        | 47                        | 1,99                                  | 22 x 30         |
|  | 10000             | 67                        | 47                        | 1,99                                  | 25 x 25         |
|  |                   | 56                        | 39                        | 2,28                                  | 22 x 35         |
|  | 12000             | 56                        | 39                        | 2,30                                  | 25 x 30         |
|  |                   | 56                        | 39                        | 2,38                                  | 30 x 25         |
|  | 15000             | 45                        | 31                        | 2,64                                  | 22 x 40         |
|  |                   | 45                        | 31                        | 2,68                                  | 25 x 35         |
|  | 18000             | 37                        | 26                        | 2,98                                  | 22 x 45         |
|  |                   | 37                        | 26                        | 3,04                                  | 25 x 40         |
|  |                   | 37                        | 26                        | 3,00                                  | 30 x 30         |
|  |                   | 37                        | 26                        | 3,10                                  | 35 x 25         |
|  | 22000             | 31                        | 22                        | 3,40                                  | 25 x 45         |
|  |                   | 31                        | 22                        | 3,39                                  | 30 x 35         |
|  | 27000             | 25                        | 18                        | 3,81                                  | 25 x 50         |
|  |                   | 25                        | 18                        | 3,83                                  | 30 x 40         |
|  |                   | 25                        | 18                        | 3,74                                  | 35 x 30         |
|  | 33000             | 21                        | 15                        | 4,30                                  | 30 x 45         |
| 21   |                   | 15                        | 4,24                      | 35 x 35                               |                 |
| 39000  | 18                | 12                        | 4,74                      | 30 x 50                               |                 |
|  | 18                | 12                        | 4,72                      | 35 x 40                               |                 |
| 47000  | 15                | 10                        | 5,27                      | 35 x 45                               |                 |
| <b>25<br/>(32)<br/>1E</b>                    | 4700              | 113                       | 80                        | 1,55                                  | 22 x 25         |
|  |                   | 79                        | 55                        | 1,91                                  | 22 x 30         |
|  | 6800              | 79                        | 55                        | 1,91                                  | 25 x 25         |
|  |                   | 65                        | 46                        | 2,14                                  | 22 x 35         |
|  | 8200              | 65                        | 46                        | 2,16                                  | 25 x 30         |
|  |                   | 65                        | 46                        | 2,25                                  | 30 x 25         |
|  | 10000             | 54                        | 38                        | 2,40                                  | 22 x 40         |
|  |                   | 54                        | 38                        | 2,44                                  | 25 x 35         |
|  | 12000             | 45                        | 31                        | 2,69                                  | 22 x 45         |
|  |                   | 45                        | 31                        | 2,74                                  | 25 x 40         |
|  |                   | 45                        | 31                        | 2,70                                  | 30 x 30         |
|  | 15000             | 45                        | 31                        | 2,80                                  | 35 x 25         |
|  |                   | 36                        | 25                        | 3,15                                  | 25 x 45         |
|  | 18000             | 36                        | 25                        | 3,13                                  | 30 x 35         |
|  |                   | 36                        | 25                        | 3,22                                  | 35 x 30         |
|  | 22000             | 30                        | 21                        | 3,54                                  | 25 x 50         |
|  |                   | 30                        | 21                        | 3,54                                  | 30 x 40         |
|  | 27000             | 25                        | 17                        | 4,24                                  | 30 x 45         |
| 25   |                   | 17                        | 3,96                      | 35 x 35                               |                 |
| 33000  | 20                | 14                        | 4,75                      | 35 x 45                               |                 |
|  | 17                | 12                        | 5,39                      | 35 x 50                               |                 |
| <b>35<br/>(44)<br/>1V</b>                    | 3300              | 141                       | 99                        | 1,43                                  | 22 x 25         |
|  |                   | 120                       | 84                        | 1,65                                  | 22 x 30         |
|  | 3900              | 99                        | 70                        | 1,78                                  | 25 x 25         |
|  |                   | 83                        | 59                        | 2,02                                  | 22 x 35         |
|  | 5600              | 83                        | 59                        | 2,04                                  | 25 x 30         |
|  |                   | 83                        | 59                        | 2,12                                  | 30 x 25         |
|  | 6800              | 69                        | 48                        | 2,28                                  | 22 x 40         |
|  |                   | 69                        | 48                        | 2,31                                  | 25 x 35         |
|  | 8200              | 57                        | 40                        | 2,67                                  | 22 x 50         |
|  |                   | 57                        | 40                        | 2,60                                  | 25 x 40         |
|  |                   | 57                        | 40                        | 2,56                                  | 30 x 30         |
|  | 10000             | 57                        | 40                        | 2,78                                  | 35 x 25         |
|  |                   | 47                        | 33                        | 2,92                                  | 25 x 45         |
|  | 12000             | 47                        | 33                        | 2,92                                  | 30 x 35         |
|  |                   | 39                        | 28                        | 3,26                                  | 25 x 50         |
|  | 15000             | 39                        | 28                        | 3,28                                  | 30 x 40         |
|  |                   | 39                        | 28                        | 3,20                                  | 35 x 30         |
|  | 18000             | 31                        | 22                        | 3,74                                  | 30 x 45         |
| 31   |                   | 22                        | 3,69                      | 35 x 35                               |                 |
| 22000  | 26                | 19                        | 4,16                      | 35 x 40                               |                 |
|  | 22                | 15                        | 4,92                      | 35 x 50                               |                 |
| <b>50<br/>(63)<br/>1H</b>                    | 1800              | 222                       | 155                       | 1,31                                  | 22 x 25         |
|  |                   | 181                       | 127                       | 1,45                                  | 22 x 30         |
|  | 2200              | 148                       | 104                       | 1,70                                  | 22 x 30         |
|  |                   | 148                       | 104                       | 1,70                                  | 25 x 25         |
|  | 3300              | 121                       | 85                        | 1,98                                  | 22 x 35         |
|  |                   | 121                       | 85                        | 2,00                                  | 25 x 30         |
|  | 3900              | 103                       | 72                        | 2,25                                  | 22 x 40         |
|  |                   | 103                       | 72                        | 2,28                                  | 25 x 35         |
|  | 4700              | 103                       | 72                        | 2,22                                  | 30 x 25         |
|  |                   | 85                        | 60                        | 2,56                                  | 22 x 45         |
|  | 5600              | 85                        | 60                        | 2,58                                  | 30 x 30         |
|  |                   | 85                        | 60                        | 2,67                                  | 35 x 25         |
|  | 6800              | 72                        | 50                        | 2,89                                  | 22 x 50         |
|  |                   | 72                        | 50                        | 2,81                                  | 25 x 40         |
|  | 6800              | 72                        | 50                        | 2,95                                  | 30 x 35         |
|  |                   | 59                        | 41                        | 3,37                                  | 25 x 50         |
|  | 6800              | 59                        | 41                        | 3,39                                  | 30 x 40         |
|  |                   | 59                        | 41                        | 3,31                                  | 35 x 30         |

| U <sub>R,DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance | Max ESR<br>20°C,<br>120Hz | Typ ESR<br>20°C,<br>120Hz | Max Ripple Current<br>105°C,<br>120Hz | Size<br>Ø D x L |
|--|-------------------|---------------------------|---------------------------|---------------------------------------|-----------------|
| (V)  | (µF)              | (mΩ)                      | (mΩ)                      | (Arms)                                | (mm)            |
| <b>50<br/>(63)<br/>1H</b>                    | 8200              | 49                        | 34                        | 3,71                                  | 30 x 45         |
|  |                   | 49                        | 34                        | 3,66                                  | 35 x 35         |
|  | 10000             | 40                        | 28                        | 4,09                                  | 30 x 50         |
|  |                   | 40                        | 28                        | 4,07                                  | 35 x 40         |
|  | 12000             | 34                        | 24                        | 4,50                                  | 35 x 45         |
|  |                   | 222                       | 155                       | 1,25                                  | 22 x 25         |
|  | 1800              | 148                       | 104                       | 1,52                                  | 22 x 30         |
|  |                   | 148                       | 104                       | 1,52                                  | 25 x 25         |
|  | 2200              | 121                       | 85                        | 1,73                                  | 22 x 35         |
|  |                   | 121                       | 85                        | 1,75                                  | 25 x 30         |
|  | 2700              | 99                        | 69                        | 1,97                                  | 22 x 40         |
|  |                   | 99                        | 69                        | 1,99                                  | 25 x 35         |
| 2700   | 99                | 69                        | 1,93                      | 30 x 25                               |                 |
|  | 81                | 57                        | 2,32                      | 22 x 50                               |                 |
| 3300   | 81                | 57                        | 2,27                      | 25 x 40                               |                 |
|  | 81                | 57                        | 2,24                      | 30 x 30                               |                 |
|  | 81                | 57                        | 2,41                      | 35 x 25                               |                 |
| 3900   | 68                | 48                        | 2,54                      | 25 x 45                               |                 |
|  | 68                | 48                        | 2,55                      | 30 x 35                               |                 |
| 4700   | 57                | 40                        | 2,88                      | 25 x 50                               |                 |
|  | 57                | 40                        | 2,90                      | 30 x 40                               |                 |
| 4700   | 57                | 40                        | 2,83                      | 35 x 30                               |                 |
|  | 48                | 34                        | 3,28                      | 30 x 45                               |                 |
| 5600   | 48                | 34                        | 3,24                      | 35 x 35                               |                 |
|  | 40                | 28                        | 3,73                      | 30 x 50                               |                 |
| 6800   | 40                | 28                        | 3,71                      | 35 x 40                               |                 |
|  | 8200              | 33                        | 23                        | 4,16                                  | 35 x 45         |
| 10000  | 27                | 19                        | 4,69                      | 35 x 50                               |                 |
|  | 820               | 324                       | 227                       | 1,11                                  | 22 x 25         |
| 1000   | 266               | 186                       | 1,25                      | 22 x 25                               |                 |
|  | 222               | 155                       | 1,39                      | 22 x 30                               |                 |
| 1200   | 222               | 155                       | 1,39                      | 25 x 25                               |                 |
|  | 177               | 124                       | 1,61                      | 22 x 35                               |                 |
| 1500   | 177               | 124                       | 1,62                      | 25 x 30                               |                 |
|  | 148               | 104                       | 1,83                      | 22 x 40                               |                 |
| 1800   | 148               | 104                       | 1,81                      | 30 x 25                               |                 |
|  | 121               | 85                        | 2,09                      | 22 x 45                               |                 |
| 2200   | 121               | 85                        | 2,01                      | 25 x 35                               |                 |
|  | 121               | 85                        | 2,10                      | 30 x 30                               |                 |
| 2200   | 121               | 85                        | 2,17                      | 35 x 25                               |                 |
|  | 99                | 69                        | 2,43                      | 25 x 45                               |                 |
| 2700   | 99                | 69                        | 2,43                      | 30 x 35                               |                 |
|  | 81                | 57                        | 2,76                      | 25 x 50                               |                 |
| 3300   | 81                | 57                        | 2,78                      | 30 x 40                               |                 |
|  | 81                | 57                        | 2,71                      | 35 x 30                               |                 |
| 3900   | 69                | 48                        | 3,12                      | 30 x 45                               |                 |
|  | 69                | 48                        | 3,07                      | 35 x 35                               |                 |
| 4700   | 57                | 40                        | 3,56                      | 30 x 50                               |                 |
|  | 57                | 40                        | 3,50                      | 35 x 40                               |                 |
| 5600   | 48                | 34                        | 3,87                      | 35 x 45                               |                 |
|  | 40                | 28                        | 4,19                      | 35 x 50                               |                 |
| 5600   | 474               | 332                       | 1,07                      | 22 x 25                               |                 |
| 820  | 324               | 227                       | 1,35                      | 22 x 30                               |                 |
|  | 324               | 227                       | 1,35                      | 25 x 25                               |                 |
| 1000   | 266               | 186                       | 1,54                      | 22 x 35                               |                 |
|  | 266               | 186                       | 1,56                      | 25 x 30                               |                 |
| 1200   | 222               | 155                       | 1,74                      | 22 x 40                               |                 |
|  | 222               | 155                       | 1,76                      | 25 x 35                               |                 |
| 1200   | 222               | 155                       | 1,71                      | 30 x 25                               |                 |
|  | 177               | 124                       | 1,99                      | 22 x 45                               |                 |
| 1500   | 177               | 124                       | 2,03                      | 25 x 40                               |                 |
|  | 177               | 124                       | 2,00                      | 30 x 30                               |                 |
| 1500   | 177               | 124                       | 2,07                      | 35 x 25                               |                 |
|  | 148               | 104                       | 2,28                      | 25 x 45                               |                 |
| 1800   | 148               | 104                       | 2,27                      | 30 x 35                               |                 |
|  | 121               | 85                        | 2,57                      | 25 x 50                               |                 |
| 2200   | 121               | 85                        | 2,59                      | 30 x 40                               |                 |
|  | 121               | 85                        | 2,52                      | 35 x 30                               |                 |
| 2700   | 99                | 69                        | 2,94                      | 30 x 45                               |                 |
|  | 99                | 69                        | 2,90                      | 35 x 35                               |                 |
| 3300   | 81                | 57                        | 3,32                      | 30 x 50                               |                 |
|  | 81                | 57                        | 3,31                      | 35 x 40                               |                 |
| 3900   | 69                | 48                        | 3,69                      | 35 x 45                               |                 |
|  | 57                | 40                        | 4,14                      | 35 x 50                               |                 |
| 160<br>(200)<br>2C                           | 330               | 603                       | 423                       | 1,16                                  | 22 x 25         |
|  | 390               | 511                       | 358                       | 1,43                                  | 22 x 30         |
| 470  | 424               | 297                       | 1,52                      | 22 x 35                               |                 |
|  | 424               | 297                       | 1,55                      | 25 x 25                               |                 |
| 560  | 356               | 249                       | 1,62                      | 22 x 40                               |                 |
|  | 356               | 249                       | 1,73                      | 25 x 30                               |                 |

Snap-In

Customer specific products and adaptations on request.

## Ratings for CD 294 BW Series

| U <sub>R,DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance           | Max ESR<br>20°C,<br>120Hz | Typ ESR<br>20°C,<br>120Hz | Max Ripple Current<br>105°C,<br>120Hz | Size<br>Ø D x L |         |
|--|-----------------------------|---------------------------|---------------------------|---------------------------------------|-----------------|---------|
| (V)  | (µF)                        | (mΩ)                      | (mΩ)                      | (Arms)                                | (mm)            |         |
| <b>160<br/>(200)<br/>2C</b>                  | 680                         | 293                       | 205                       | 1,70                                  | 22 x 45         |         |
|  |                             | 293                       | 205                       | 1,81                                  | 25 x 35         |         |
|  |                             | 293                       | 205                       | 1,82                                  | 30 x 25         |         |
|  | 820                         | 243                       | 170                       | 1,81                                  | 22 x 50         |         |
|  |                             | 243                       | 170                       | 1,98                                  | 25 x 40         |         |
|  |                             | 243                       | 170                       | 1,98                                  | 30 x 30         |         |
|  |                             | 243                       | 170                       | 1,93                                  | 35 x 25         |         |
|  | 1000                        | 199                       | 140                       | 2,04                                  | 25 x 45         |         |
|  |                             | 199                       | 140                       | 2,14                                  | 30 x 35         |         |
|  | 1200                        | 166                       | 117                       | 2,12                                  | 25 x 50         |         |
|  |                             | 166                       | 117                       | 2,22                                  | 30 x 40         |         |
|  |                             | 166                       | 117                       | 2,40                                  | 35 x 30         |         |
|  | 1500                        | 133                       | 93                        | 2,46                                  | 30 x 45         |         |
|  |                             | 133                       | 93                        | 2,53                                  | 35 x 35         |         |
|  |                             | 111                       | 78                        | 2,98                                  | 35 x 45         |         |
|  | 2200                        | 91                        | 64                        | 3,10                                  | 35 x 50         |         |
|  | <b>180<br/>(225)<br/>2K</b> | 270                       | 737                       | 516                                   | 1,08            | 22 x 25 |
|  |                             | 330                       | 603                       | 423                                   | 1,30            | 22 x 30 |
| 390  |                             | 511                       | 358                       | 1,35                                  | 25 x 25         |         |
| 470  |                             | 424                       | 297                       | 1,50                                  | 22 x 35         |         |
|  |                             | 424                       | 297                       | 1,62                                  | 25 x 30         |         |
| 560  |                             | 356                       | 249                       | 1,62                                  | 22 x 40         |         |
|  |                             | 356                       | 249                       | 1,69                                  | 25 x 35         |         |
|  |                             | 356                       | 249                       | 1,67                                  | 30 x 25         |         |
| 680  |                             | 293                       | 205                       | 1,76                                  | 22 x 50         |         |
|  |                             | 293                       | 205                       | 1,72                                  | 25 x 40         |         |
|  |                             | 293                       | 205                       | 1,74                                  | 30 x 30         |         |
|  |                             | 293                       | 205                       | 1,92                                  | 35 x 25         |         |
| 820  |                             | 243                       | 170                       | 1,78                                  | 25 x 45         |         |
|  |                             | 243                       | 170                       | 1,85                                  | 30 x 35         |         |
|  |                             | 199                       | 140                       | 1,91                                  | 25 x 50         |         |
| 1000   |                             | 199                       | 140                       | 2,01                                  | 30 x 40         |         |
|  |                             | 199                       | 140                       | 2,16                                  | 35 x 30         |         |
|  |                             | 166                       | 117                       | 2,19                                  | 30 x 45         |         |
| 1200   |                             | 166                       | 117                       | 2,34                                  | 35 x 35         |         |
|  |                             | 133                       | 93                        | 2,36                                  | 30 x 50         |         |
| 1500   |                             | 133                       | 93                        | 2,56                                  | 35 x 40         |         |
|  |                             | 111                       | 78                        | 2,67                                  | 35 x 45         |         |
| 220  |                             | 905                       | 634                       | 1,08                                  | 22 x 25         |         |
| 270  |                             | 737                       | 516                       | 1,20                                  | 22 x 30         |         |
| 330  | 603                         | 423                       | 1,30                      | 22 x 30                               |                 |         |
|  | 603                         | 423                       | 1,35                      | 25 x 25                               |                 |         |
| 390  | 511                         | 358                       | 1,41                      | 22 x 35                               |                 |         |
| 470  | 424                         | 297                       | 1,50                      | 22 x 40                               |                 |         |
|  | 424                         | 297                       | 1,47                      | 25 x 30                               |                 |         |
| 560  | 424                         | 297                       | 1,56                      | 30 x 25                               |                 |         |
|  | 356                         | 249                       | 1,58                      | 22 x 45                               |                 |         |
| 680  | 356                         | 249                       | 1,65                      | 25 x 35                               |                 |         |
|  | 293                         | 205                       | 1,68                      | 22 x 50                               |                 |         |
|  | 293                         | 205                       | 1,80                      | 25 x 40                               |                 |         |
| 820  | 293                         | 205                       | 1,82                      | 30 x 30                               |                 |         |
|  | 293                         | 205                       | 1,96                      | 35 x 25                               |                 |         |
|  | 243                         | 170                       | 1,87                      | 25 x 50                               |                 |         |
| 1000   | 243                         | 170                       | 1,99                      | 30 x 35                               |                 |         |
|  | 243                         | 170                       | 2,07                      | 35 x 30                               |                 |         |
|  | 199                         | 140                       | 2,17                      | 30 x 45                               |                 |         |
| 1200   | 199                         | 140                       | 2,22                      | 35 x 35                               |                 |         |
|  | 166                         | 117                       | 2,22                      | 30 x 50                               |                 |         |
| 1500   | 166                         | 117                       | 2,42                      | 35 x 40                               |                 |         |
|  | 133                         | 93                        | 2,59                      | 35 x 45                               |                 |         |
| 1800   | 111                         | 78                        | 2,70                      | 35 x 50                               |                 |         |
| <b>200<br/>(250)<br/>2D</b>                  | 180                         | 1106                      | 774                       | 0,94                                  | 22 x 25         |         |
|  | 220                         | 905                       | 634                       | 1,10                                  | 22 x 30         |         |
|  | 270                         | 905                       | 634                       | 1,15                                  | 25 x 25         |         |
|  | 330                         | 737                       | 516                       | 1,13                                  | 22 x 35         |         |
|  |                             | 603                       | 423                       | 1,20                                  | 22 x 40         |         |
|  | 390                         | 603                       | 423                       | 1,30                                  | 25 x 30         |         |
|  |                             | 603                       | 423                       | 1,30                                  | 30 x 25         |         |
|  |                             | 511                       | 358                       | 1,26                                  | 22 x 45         |         |
|  | 470                         | 511                       | 358                       | 1,41                                  | 25 x 35         |         |
|  |                             | 424                       | 297                       | 1,37                                  | 22 x 50         |         |
|  |                             | 424                       | 297                       | 1,52                                  | 25 x 40         |         |
|  | 560                         | 424                       | 297                       | 1,36                                  | 30 x 30         |         |
|  |                             | 424                       | 297                       | 1,40                                  | 35 x 25         |         |
|  |                             | 356                       | 249                       | 1,59                                  | 25 x 45         |         |
|  | 680                         | 356                       | 249                       | 1,57                                  | 30 x 35         |         |
|  |                             | 356                       | 249                       | 1,56                                  | 35 x 30         |         |
|  | 820                         | 293                       | 205                       | 1,66                                  | 25 x 50         |         |
|  |                             | 293                       | 205                       | 1,76                                  | 30 x 40         |         |
|  | 1000                        | 243                       | 170                       | 1,83                                  | 30 x 45         |         |
|  |                             | 243                       | 170                       | 1,82                                  | 35 x 35         |         |
|  |                             | 199                       | 140                       | 1,87                                  | 30 x 50         |         |
|  | 1200                        | 199                       | 140                       | 1,99                                  | 35 x 40         |         |
|  | 166                         | 117                       | 2,10                      | 35 x 45                               |                 |         |

| U <sub>R,DC</sub><br>(Surge Voltage)<br>Code | Rated Capacitance | Max ESR<br>20°C,<br>120Hz | Typ ESR<br>20°C,<br>120Hz | Max Ripple Current<br>105°C,<br>120Hz | Size<br>Ø D x L |
|--|-------------------|---------------------------|---------------------------|---------------------------------------|-----------------|
| (V)  | (µF)              | (mΩ)                      | (mΩ)                      | (Arms)                                | (mm)            |
| <b>350<br/>(400)<br/>2V</b>                  | 68                | 2926                      | 1610                      | 0,56                                  | 22 x 25         |
|  | 100               | 1990                      | 1095                      | 0,70                                  | 22 x 30         |
|  |                   | 1990                      | 1095                      | 0,70                                  | 25 x 25         |
|  | 120               | 1658                      | 912                       | 0,73                                  | 22 x 35         |
|  |                   | 1327                      | 730                       | 0,79                                  | 22 x 40         |
|  |                   | 1327                      | 730                       | 0,82                                  | 25 x 30         |
|  | 150               | 1327                      | 730                       | 0,82                                  | 30 x 25         |
|  |                   | 1106                      | 608                       | 0,81                                  | 22 x 45         |
|  |                   | 1106                      | 608                       | 0,89                                  | 25 x 35         |
|  | 180               | 1106                      | 608                       | 0,90                                  | 30 x 30         |
|  |                   | 905                       | 498                       | 0,93                                  | 22 x 50         |
|  | 220               | 905                       | 498                       | 0,97                                  | 25 x 40         |
|  |                   | 905                       | 498                       | 0,98                                  | 35 x 25         |
|  |                   | 737                       | 406                       | 1,01                                  | 25 x 50         |
|  | 270               | 737                       | 406                       | 1,05                                  | 30 x 35         |
|  |                   | 737                       | 406                       | 1,01                                  | 35 x 30         |
|  |                   | 603                       | 332                       | 1,16                                  | 30 x 45         |
|  | 330               | 603                       | 332                       | 1,16                                  | 35 x 35         |
| 511  |                   | 281                       | 1,26                      | 30 x 50                               |                 |
| 390  | 511               | 281                       | 1,26                      | 35 x 40                               |                 |
|  | 424               | 233                       | 1,35                      | 35 x 45                               |                 |
| 560  | 356               | 196                       | 1,51                      | 35 x 50                               |                 |
| <b>400<br/>(450)<br/>2G</b>                  | 68                | 2926                      | 1522                      | 0,47                                  | 22 x 25         |
|  | 82                | 2427                      | 1262                      | 0,56                                  | 22 x 30         |
|  |                   | 2427                      | 1262                      | 0,65                                  | 25 x 25         |
|  | 100               | 1990                      | 1035                      | 0,60                                  | 22 x 30         |
|  |                   | 1658                      | 863                       | 0,64                                  | 22 x 35         |
|  |                   | 1658                      | 863                       | 0,70                                  | 25 x 30         |
|  | 120               | 1658                      | 863                       | 0,78                                  | 30 x 25         |
|  |                   | 1327                      | 690                       | 0,70                                  | 22 x 40         |
|  |                   | 1327                      | 690                       | 0,73                                  | 25 x 35         |
|  | 150               | 1106                      | 575                       | 0,78                                  | 22 x 50         |
|  |                   | 1106                      | 575                       | 0,82                                  | 25 x 40         |
|  |                   | 1106                      | 575                       | 0,83                                  | 30 x 30         |
|  | 180               | 1106                      | 575                       | 0,86                                  | 35 x 25         |
|  |                   | 905                       | 471                       | 0,87                                  | 25 x 45         |
|  |                   | 905                       | 471                       | 0,86                                  | 30 x 35         |
|  | 220               | 737                       | 384                       | 0,94                                  | 25 x 50         |
|  |                   | 737                       | 384                       | 0,95                                  | 30 x 40         |
|  |                   | 737                       | 384                       | 0,91                                  | 35 x 30         |
| 270  | 603               | 314                       | 1,11                      | 30 x 45                               |                 |
|  | 603               | 314                       | 1,13                      | 35 x 35                               |                 |
|  | 511               | 266                       | 1,15                      | 30 x 50                               |                 |
| 330  | 511               | 266                       | 1,26                      | 35 x 40                               |                 |
|  | 424               | 221                       | 1,31                      | 35 x 45                               |                 |
|  | 424               | 221                       | 1,31                      | 35 x 50                               |                 |
| 390  | 356               | 185                       | 1,50                      | 35 x 50                               |                 |
|  | 4737              | 2369                      | 0,47                      | 22 x 25                               |                 |
|  | 3903              | 1951                      | 0,56                      | 22 x 30                               |                 |
| 470  | 3903              | 1951                      | 0,65                      | 25 x 25                               |                 |
|  | 3236              | 1618                      | 0,64                      | 22 x 35                               |                 |
|  | 2653              | 1327                      | 0,70                      | 22 x 40                               |                 |
| 560  | 2653              | 1327                      | 0,70                      | 25 x 30                               |                 |
|  | 2653              | 1327                      | 0,78                      | 30 x 25                               |                 |
|  | 2211              | 1106                      | 0,73                      | 22 x 45                               |                 |
| 680  | 2211              | 1106                      | 0,73                      | 25 x 35                               |                 |
|  | 1769              | 885                       | 0,78                      | 22 x 50                               |                 |
|  | 1769              | 885                       | 0,82                      | 25 x 40                               |                 |
| 820  | 1769              | 885                       | 0,83                      | 30 x 30                               |                 |
|  | 1769              | 885                       | 0,86                      | 35 x 25                               |                 |
|  | 1474              | 737                       | 0,87                      | 25 x 45                               |                 |
| 980  | 1474              | 737                       | 0,86                      | 30 x 35                               |                 |
|  | 1206              | 603                       | 0,94                      | 25 x 50                               |                 |
|  | 1206              | 603                       | 0,95                      | 30 x 40                               |                 |
| 1100   | 1206              | 603                       | 0,91                      | 35 x 30                               |                 |
|  | 983               | 492                       | 1,11                      | 30 x 45                               |                 |
|  | 983               | 492                       | 1,13                      | 35 x 35                               |                 |
| 1200   | 804               | 402                       | 1,15                      | 30 x 50                               |                 |
|  | 804               | 402                       | 1,26                      | 35 x 40                               |                 |
|  | 681               | 341                       | 1,31                      | 35 x 45                               |                 |
| 1300   | 565               | 283                       | 1,50                      | 35 x 50                               |                 |
|  | 39                | 6802                      | 3401                      | 0,35                                  | 22 x 30         |
|  | 47                | 5644                      | 2822                      | 0,41                                  | 22 x 35         |
| 1400   | 56                | 4737                      | 2369                      | 0,47                                  | 22 x 40         |
|  | 68                | 3901                      | 1951                      | 0,54                                  | 22 x 45         |
|  | 82                | 3235                      | 1618                      | 0,62                                  | 25 x 40         |
| 1500   | 100               | 2653                      | 1327                      | 0,67                                  | 25 x 45         |
|  | 120               | 2211                      | 1106                      | 0,77                                  | 25 x 50         |
|  | 120               | 2211                      | 1106                      | 0,72                                  | 35 x 30         |
| 1600   | 150               | 1769                      | 885                       | 0,85                                  | 30 x 40         |
|  | 180               | 1474                      | 737                       | 1,01                                  | 30 x 50         |
|  | 220               | 1206                      | 603                       | 1,12                                  | 35 x 45         |
| 270  | 983               | 492                       | 1,29                      | 35 x 50                               |                 |

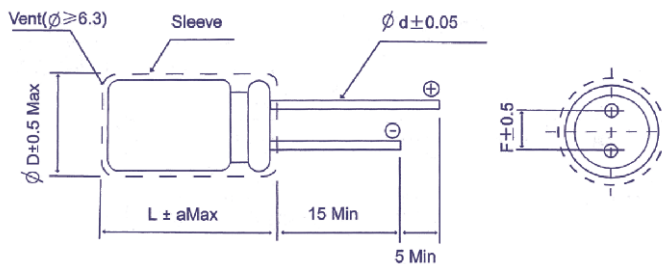
Customer specific products and adaptations on request.

## Order Code **SMD, Radial, Snap-In**

| EC                          | R                     | 1C                   | PT   | 101   | M   | FF  | 25  | 0611  | JExxxx            |
|-----------------------------|-----------------------|----------------------|--|---|---|---|---|---|-------------------|
| Technology                  | Terminal Type         | Rated Voltage Code   | Series Code  | Capacitance Code (in $\mu\text{F}$ )                            | Capacitance Tolerance   | Lead Form   | Terminal/Pitch Size   | Size $\varnothing D \times L$                     | for Specials only |
| EC = Electrolytic Capacitor | SMD = V<br>Radial = R | 2,5V = 0E<br>4V = 0G | CD <b>110</b> = PT<br>CD <b>11GL</b> = GL  | 0,47 = R47<br>1,0 = 010   | <b><math>\pm 20\%</math></b> = M<br>$\pm 10\%$ = K                  | SMD:<br><b>Taped</b> = FF<br>Terminal = T2  |   | 4x7 = 0407<br>5x11,5 = 0511                       |                   |
| PC = Polymer Capacitor      | Snap-In = S           | 6,3V = 0J            | CD <b>261</b> = LK<br>CD <b>261X</b> = QX<br>CD <b>262</b> = QM<br>CD <b>263</b> = BK<br>CD <b>269</b> = PH<br>CD <b>269L</b> = HL<br>CD <b>281</b> = LL<br>CD <b>281L</b> = LH<br>CD <b>287</b> = GC<br>CD <b>28L</b> = QL<br>CD <b>293</b> = BZ<br>CD <b>294</b> = BW<br>CD <b>295</b> = BC<br>CD <b>296</b> = KC<br>CD <b>297</b> = BB<br>CD <b>299</b> = PG<br>CD <b>29D</b> = HR<br>CD <b>29H</b> = QH<br>CD <b>29L</b> = QL<br><b>HVC</b> = VC<br><b>HVM</b> = VM<br><b>HCP/HCN</b> = CP/CN<br><b>HPN</b> = PN<br><b>HPE/HEN</b> = PE/EN | 2,2 = 2R2<br>10 = 100<br>100 = 101<br>1000 = 102<br>10000 = 103 | +20 / -0% = R<br>+20 / -10% = V<br>+30 / -10% = Q<br>+50 / -10% = T | Radial:<br><b>Taped</b> = FF<br><b>Long Lead</b> = LL<br>Cut 5,0mm = CB<br><b>Cut 4,5mm</b> = CC<br>Cut 4,0mm = CD<br>Cut 3,5mm = CE<br>Cut 3,0mm = CF  | 2,0mm = 20<br>2,5mm = 25<br>3,5mm = 35<br>5,0mm = 50<br>7,5mm = 75<br>10,0mm = 12 | 6,3x11,5 = 0611<br>35x80 = 3580<br>45x100 = 45100 |                   |
|                             |                       |                      |  |   |   | on request: alternative lead forms (Keyed Polarity, axial, 90° - angle, others)<br><b>Snap-In:</b><br>4,0mm Pin Length = T4    2 Pin = P2<br>6,3mm Pin Length = T6    3 Pin = P3<br>Soldering Pin = S4        4 Pin = P4<br>5 Pin = P5<br>preferred |   |   |                   |

## Technical Specification **Radial Type**

Dimensions for loose, long-lead type (bulk)  
Order Code: LL



| L                | L ≤ 7 |      |     |     |     | L ≥ 11 |     |     |     |      |      |      |      |      |      |
|------------------|-------|------|-----|-----|-----|--------|-----|-----|-----|------|------|------|------|------|------|
| $\varnothing D$  | 3     | 4    | 5   | 6,3 | 8   | 5      | 6,3 | 8   | 10  | 12,5 | 16   | 18   | 20   | 22   | 25   |
| F                | 1     | 1,5  | 2,0 | 2,5 | 3,5 | 2,0    | 2,5 | 3,5 | 5,0 | 7,5  | 10,0 | 12,5 | 15,0 | 17,5 | 20,0 |
| $\varnothing d$  | 0,4   | 0,45 |     | 0,5 |     | 0,6    |     | 0,8 |     | 1,0  |      | 1,2  |      | 1,5  |      |
| $a_{\text{Max}}$ | 1,0   |      |     |     |     | 2,0    |     |     |     |      |      |      |      |      |      |

in mm

Dimensions for loose, short cut leads (bulk)  
Order Code: CC (CB, CD, CE, CF)

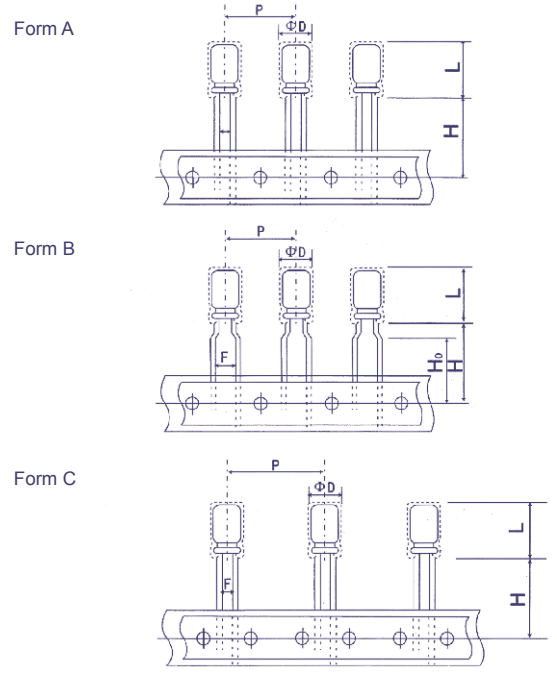
|             | Straight Lead |                  |           |           |           | Bended Lead |  |  |  |  |
|-------------|---------------|------------------|-----------|-----------|-----------|-------------|--|--|--|--|
|             |               |                  |           |           |           |             |  |  |  |  |
| <b>Code</b> | CB            | <b>CC</b>        | CD        | CE        | CF        |             |  |  |  |  |
| <b>I</b>    | 5,0 ± 0,5     | <b>4,5 ± 0,5</b> | 4,0 ± 0,5 | 3,5 ± 0,5 | 3,0 ± 0,5 |             |  |  |  |  |

preferred in mm

## Dimensions for Ammopack taping

Order Code: FF (FD)

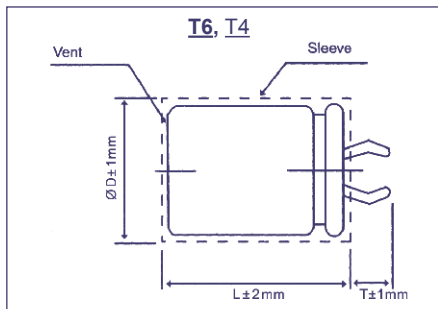
| Code | Case Range |         | Dimensions |          |         |         | Form |
|------|------------|---------|------------|----------|---------|---------|------|
|      | Ø D        | L (max) | H ± 0,75   | Ho ± 0,5 | F ± 0,5 | P ± 0,1 |      |
| FF   | 4 ~ 5      | 13      | 18,5       | 17       | 2,5     | 12,7    | B    |
|      | 6,3        | 13      | 18,5       | -        | 2,5     | 12,7    | A    |
|      | 8          | 13      | 18,5       | -        | 3,5     | 12,7    |      |
|      | 4 ~ 8      | 7       | 17,5       | 16       | 5,0     | 12,7    | B    |
|      | 5 ~ 6,3    | 13      | 18,5       |          |         |         |      |
|      | 8          | 22      | 20,0       |          |         |         |      |
|      |            | 10      | 22         | 18,5     | -       | -       | 15,0 |
|      | 12,5       | 27      | 18,5       | -        | -       | -       | C    |
| FD   | 12,5       | 27      | 18,5       | -        | -       | 25,4    |      |
| FF   | 16 ~ 18    | 27      | 18,5       | -        | 7,5     | 30,0    |      |



in mm

## Technical Specification Snap-In Type

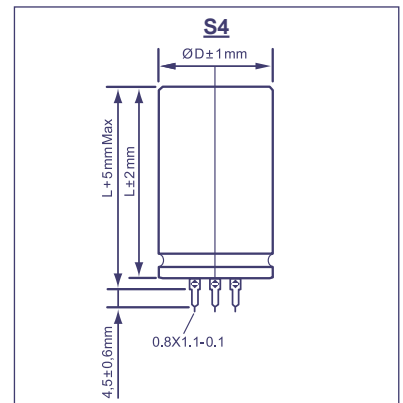
Pin Type: Snap-In Order Code: T6, T4



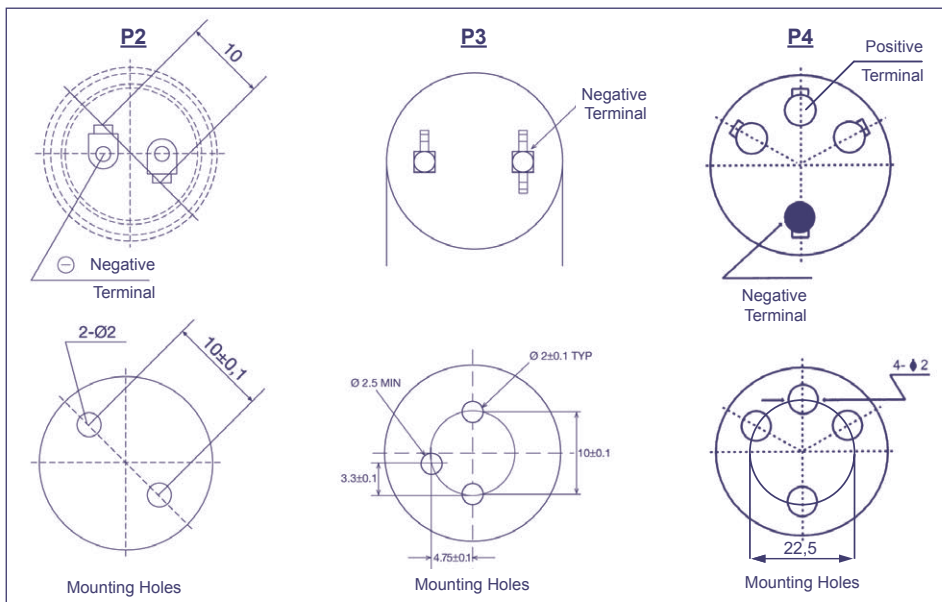
| Terminal   | T6  | T4  |
|------------|-----|-----|
| Pin Length | 6,3 | 4,0 |

**preferred**

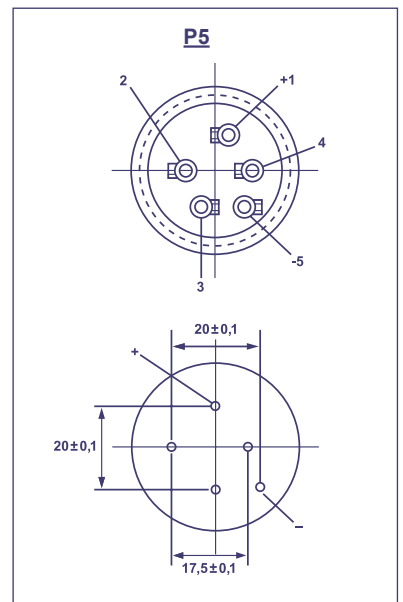
Pin Type: Soldering Order Code: S4



Snap-In Terminal Order Code: P2, P3, P4



Soldering Terminal Order Code: P5



P3 only as T4 Terminal available, P4 for Ø D ≥ 30mm, P5 for Ø D ≥ 40mm