

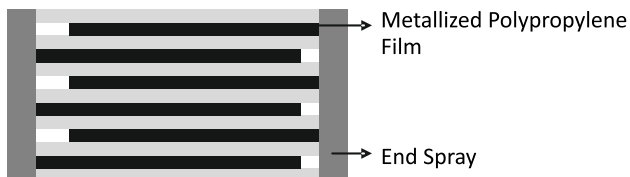
## DCL-23



### Highlights

- Self-Inductance as low as 11nH
- ESR as low as 0.5 m $\Omega$
- Low profile
- High thermal conductivity
- Life expectancy as high as 100 Khrs
- Integrated mounting flanges
- Flame retardant UL94 - V0, ROHS compliant

### Construction

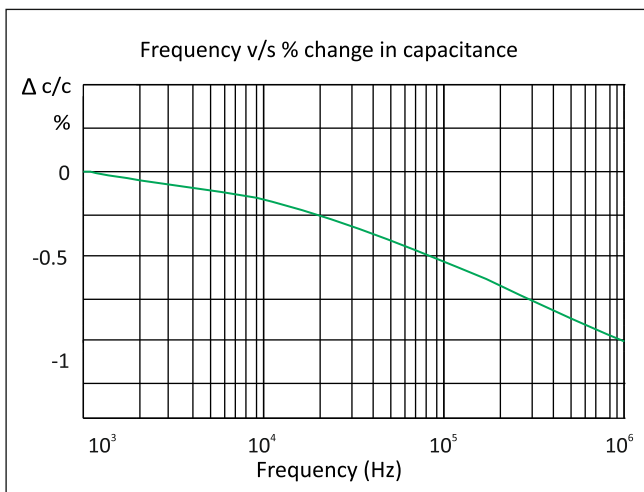
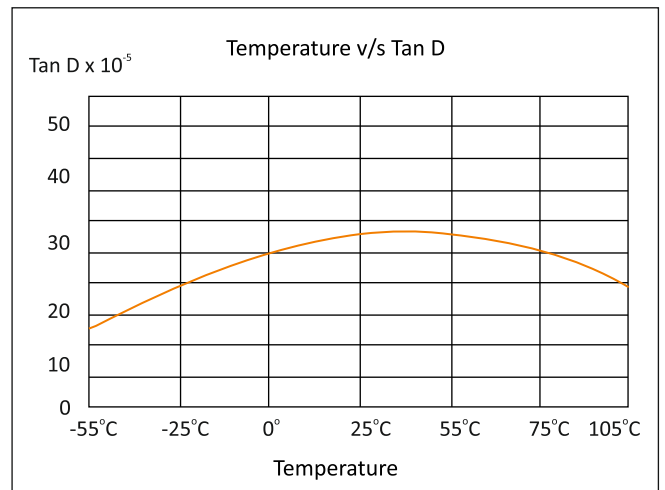
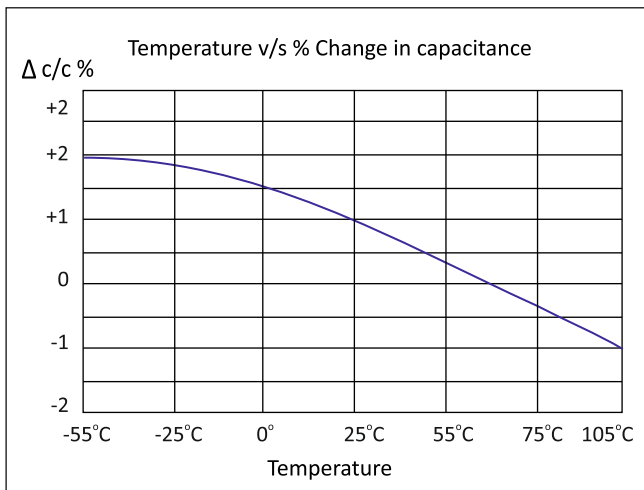
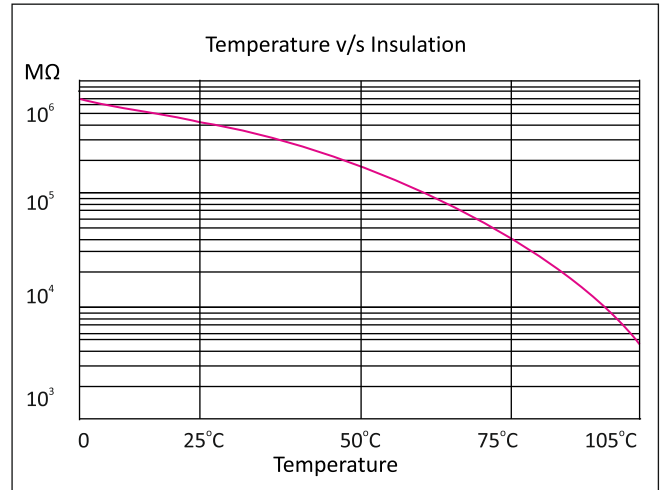
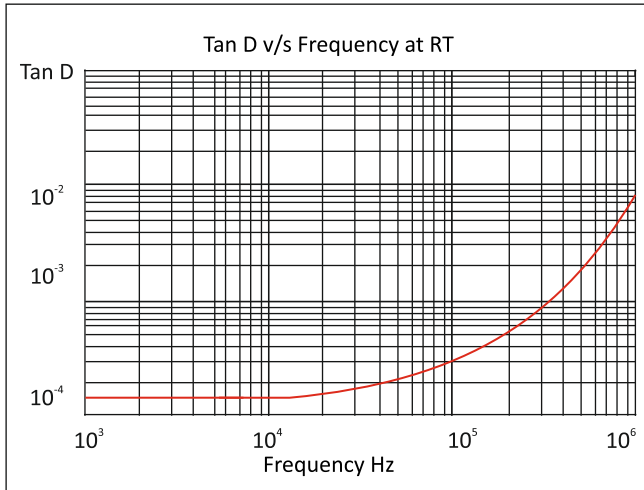


### Applications

- DC filtering
- Wind power inverters
- Solar power inverters
- Induction heaters
- Electric vehicle inverters
- Motor drives

## DCL-23

### Typical Performance Graphs



## DCL-23

### Technical Specifications

#### Physical Characteristics

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| • Electrode material   | Metallised polypropylene film                                 |
| • Winding construction | Polypropylene film, metallised polypropylene film             |
| • Enclosure            | Preformed UL 94-V0 plastic case with thermosetting resin-fill |
| • Terminals            | Nickel plated brass                                           |

#### Electrical Characteristics

|                                                |                                                             |
|------------------------------------------------|-------------------------------------------------------------|
| • Capacitance range                            | 12 $\mu$ F to 265 $\mu$ F                                   |
| • Capacity tolerance                           | $\pm 5\%$ (J), $\pm 10\%$ (K)                               |
| • Rated voltage VDC                            | 700, 800, 900, 1000, 1200, 1400, 1600, 1800                 |
| • Test voltage between terminals               | 1.3 x rated voltage VDC for 60 seconds (not to be repeated) |
| • Test voltage terminal to case                | 3KVAC at 50Hz for 60 seconds                                |
| • Dissipation factor (Tan d)                   | $\leq 0.0015$ at 100Hz and 25°C                             |
| • Temperature range                            | -40°C to +105°C                                             |
| • Insulation resistance $M\Omega \times \mu$ F | $\geq 5,000$ S at 25°C ( S = $M\Omega \times \mu$ F )       |
| • Reference Standard                           | IEC 61071 and IEC 60068                                     |

### Marking on Capacitors

Each capacitor will have the following information printed on it, sequentially:

- The Company's symbol  followed by the words ALCON
- The capacitor grade viz DCL-23
- The capacitance value MFD
- The rated voltage VDC
- The max current Arms
- Capacity tolerance and manufacturing code
- Part number on non-standard capacitors

## DCL-23

### Standard Capacitors Values

| Rated voltage VDC | Nominal Capacitance MFD at 1 KHz | Case size $\phi \times Lmm$ | Case Code | Typical ESR m $\Omega$ at Fr* KHz | Fr** KHz | Rise in core temperature per watt dissipated°C | Ripple current rating Irms at 10 KHz to 100KHz |      |      |      |       | Ordering Code           |
|-------------------|----------------------------------|-----------------------------|-----------|-----------------------------------|----------|------------------------------------------------|------------------------------------------------|------|------|------|-------|-------------------------|
|                   |                                  |                             |           |                                   |          |                                                | 25°C                                           | 45°C | 65°C | 85°C | 105°C |                         |
| 700               | 85                               | 85 x 40                     | Y1        | 0.65                              | 156      | 14.2                                           | 91                                             | 79   | 66   | 46   | 11    | SD000850700AQ0Y1____K01 |
|                   | 100                              | 85 x 51                     | Y2        | 0.75                              | 105      | 12.3                                           | 96                                             | 83   | 69   | 49   | 12    | SD001000700AQ0Y2____K01 |
|                   | 142                              | 85 x 51                     | Y2        | 0.75                              | 105      | 12.3                                           | 96                                             | 83   | 69   | 49   | 12    | SD001420700AQ0Y2____K01 |
|                   | 205                              | 85 x 64                     | Y3        | 0.95                              | 71       | 10.8                                           | 87                                             | 75   | 63   | 44   | 10    | SD002050700AQ0Y3____K01 |
|                   | 265                              | 85 x 79                     | Y4        | 1.65                              | 61       | 8.9                                            | 77                                             | 67   | 55   | 39   | 9     | SD002650700AQ0Y4____K01 |
| 800               | 70                               | 85 x 40                     | Y1        | 0.56                              | 168      | 14.2                                           | 86                                             | 74   | 61   | 42   | 9     | SD000700800AQ0Y1____K01 |
|                   | 88                               | 85 x 40                     | Y1        | 0.65                              | 156      | 14.2                                           | 91                                             | 79   | 66   | 46   | 11    | SD000880800AQ0Y1____K01 |
|                   | 140                              | 85 x 51                     | Y2        | 0.75                              | 105      | 12.3                                           | 96                                             | 83   | 69   | 49   | 12    | SD001400800AQ0Y2____K01 |
|                   | 200                              | 85 x 64                     | Y3        | 0.95                              | 71       | 10.8                                           | 87                                             | 75   | 63   | 44   | 10    | SD002000800AQ0Y3____K01 |
|                   | 260                              | 85 x 79                     | Y4        | 1.65                              | 61       | 8.9                                            | 77                                             | 67   | 55   | 39   | 9     | SD002600800AQ0Y4____K01 |
| 900               | 65                               | 85 x 40                     | Y1        | 0.50                              | 68       | 14.2                                           | 84                                             | 92   | 59   | 40   | 8     | SD000650900AQ0Y1____K01 |
|                   | 100                              | 85 x 51                     | Y2        | 0.78                              | 98       | 12.3                                           | 93                                             | 81   | 71   | 51   | 12    | SD001000900AQ0Y2____K01 |
|                   | 150                              | 85 x 64                     | Y3        | 0.97                              | 73       | 10.8                                           | 85                                             | 76   | 64   | 45   | 13    | SD001500900AQ0Y3____K01 |
|                   | 200                              | 85 x 79                     | Y4        | 1.70                              | 69       | 8.9                                            | 75                                             | 65   | 53   | 37   | 8     | SD002000900AQ0Y4____K01 |
| 1000              | 47                               | 85 x 40                     | Y1        | 0.80                              | 176      | 14.2                                           | 85                                             | 73   | 62   | 38   | 10    | SD000471000AQ0Y1____K01 |
|                   | 52                               | 85 x 40                     | Y1        | 1.00                              | 182      | 14.2                                           | 87                                             | 75   | 63   | 44   | 10    | SD000521000AQ0Y1____K01 |
|                   | 88                               | 85 x 51                     | Y2        | 0.80                              | 136      | 12.3                                           | 89                                             | 77   | 64   | 45   | 11    | SD000881000AQ0Y2____K01 |
|                   | 120                              | 85 x 64                     | Y3        | 1.18                              | 91       | 10.8                                           | 78                                             | 68   | 56   | 40   | 9     | SD001201000AQ0Y3____K01 |
|                   | 170                              | 85 x 79                     | Y4        | 2.21                              | 75       | 8.9                                            | 69                                             | 60   | 50   | 35   | 8     | SD001701000AQ0Y4____K01 |
| 1200              | 38                               | 85 x 40                     | Y1        | 1.05                              | 254      | 14.2                                           | 72                                             | 62   | 52   | 37   | 9     | SD000381200AQ0Y1____K01 |
|                   | 63                               | 85 x 51                     | Y2        | 1.19                              | 179      | 12.3                                           | 74                                             | 64   | 53   | 38   | 9     | SD000631200AQ0Y2____K01 |
|                   | 88                               | 85 x 64                     | Y3        | 1.46                              | 116      | 10.8                                           | 69                                             | 60   | 50   | 35   | 8     | SD000881200AQ0Y3____K01 |
|                   | 118                              | 85 x 79                     | Y4        | 2.80                              | 96       | 8.9                                            | 57                                             | 49   | 41   | 29   | 7     | SD001181200AQ0Y4____K01 |
| 1400              | 20                               | 85 x 40                     | Y1        | 1.28                              | 294      | 14.2                                           | 63                                             | 55   | 45   | 32   | 8     | SD000201400AQ0Y1____K01 |
|                   | 34                               | 85 x 51                     | Y2        | 1.47                              | 218      | 12.3                                           | 64                                             | 55   | 46   | 33   | 8     | SD000341400AQ0Y2____K01 |
|                   | 48                               | 85 x 64                     | Y3        | 1.87                              | 143      | 10.8                                           | 61                                             | 53   | 44   | 31   | 7     | SD000481400AQ0Y3____K01 |
|                   | 64                               | 85 x 79                     | Y4        | 3.81                              | 124      | 8.9                                            | 52                                             | 45   | 37   | 27   | 6     | SD000641400AQ0Y4____K01 |
| 1600              | 18                               | 85 x 40                     | Y1        | 1.48                              | 352      | 14.2                                           | 62                                             | 54   | 45   | 32   | 7     | SD000181600AQ0Y1____K01 |
|                   | 30                               | 85 x 51                     | Y2        | 1.71                              | 260      | 12.3                                           | 62                                             | 54   | 45   | 32   | 7     | SD000301600AQ0Y2____K01 |
|                   | 42                               | 85 x 64                     | Y3        | 2.18                              | 171      | 10.8                                           | 59                                             | 51   | 42   | 30   | 7     | SD000421600AQ0Y3____K01 |
|                   | 55                               | 85 x 79                     | Y4        | 4.56                              | 151      | 8.9                                            | 48                                             | 42   | 35   | 24   | 6     | SD000551600AQ0Y4____K01 |
| 1800              | 12                               | 85 x 40                     | Y1        | 1.69                              | 460      | 14.2                                           | 57                                             | 49   | 41   | 29   | 7     | SD000121800AQ0Y1____K01 |
|                   | 21                               | 85 x 51                     | Y2        | 1.86                              | 336      | 12.3                                           | 58                                             | 50   | 42   | 30   | 7     | SD000211800AQ0Y2____K01 |
|                   | 30                               | 85 x 64                     | Y3        | 2.81                              | 226      | 10.8                                           | 50                                             | 43   | 36   | 26   | 6     | SD000301800AQ0Y3____K01 |
|                   | 40                               | 85 x 79                     | Y4        | 5.63                              | 185      | 8.9                                            | 43                                             | 37   | 31   | 22   | 5     | SD000401800AQ0Y4____K01 |

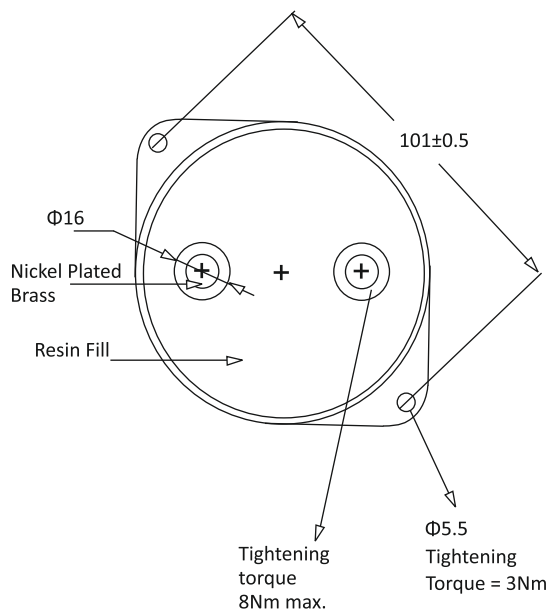
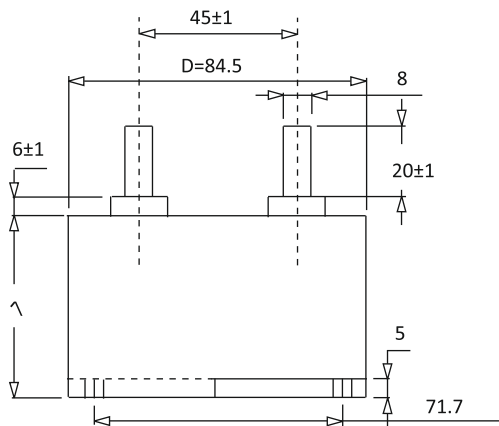
Custom designed capacitors are available on request

\*\* Fr =Typical resonant frequency (Tol.±30%)

## DCL-23

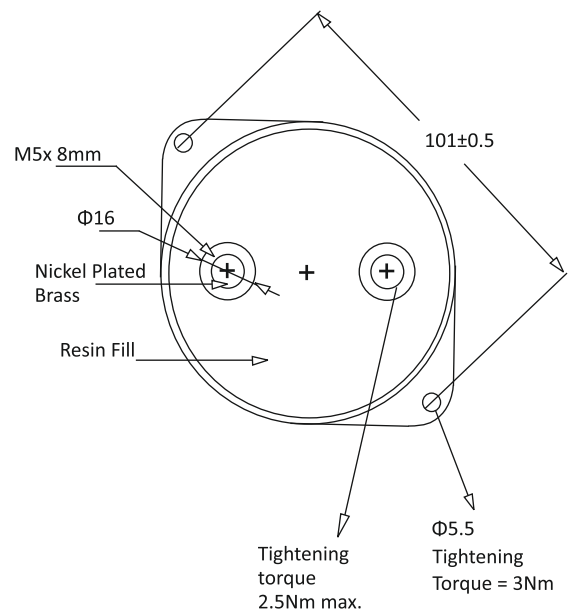
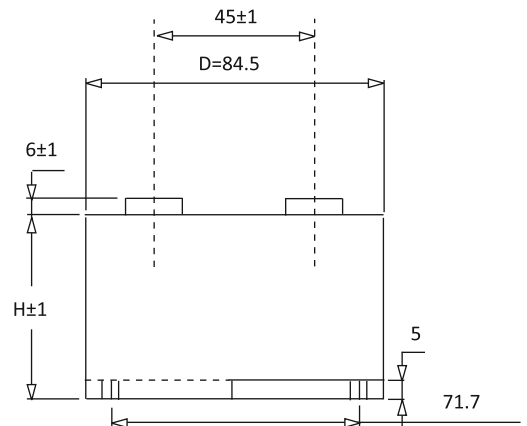
### Capacitor Drawing and Terminal Styles

**Terminal Style : MS**



**Dimensions in mm**

**Terminal Style : FS**



**Dimensions in mm**

## DCL-23

### Life Expectancy

#### Steps to calculate Hotspot Temperature

- 1 Locate the capacitor and the ESR from the electrical specifications
- 2 Dissipated heat = (  $I_{rms}^2 \times ESR$  )
- 3 Get the value from table 1 for Rth (°C/watt)
- 4 Calculate internal temperature rise = (  $I_{rms}^2 \times ESR$  ) x Rth (°C/watt)
- 5 Hotspot temperature of capacitor = T Ambient + (  $I_{rms}^2 \times ESR$  ) x Rth (°C/watt)
- 6 From the graph given below expected life can be obtained
- 7 Ensure that the voltage and current specification are not exceeded

| Can size<br>D x H | Rth<br>°C/Watt |
|-------------------|----------------|
| 85 x 40           | 14.2°C         |
| 85 x 51           | 12.3°C         |
| 85 x 64           | 10.8°C         |
| 85 x 79           | 8.9°C          |

**Example:** If 88 MFD/800 VDC is being used at 40 Arms in a 40°C Ambient; then ESR from the table ( on page 4 ) = 0.00065Ω and the case size is Ø85 x 40mm

The dissipated wattage =  $40 \times 40 \times 0.00065\Omega = 1.04$  watts

Temperature rise =  $1.04 \times 14.2^\circ\text{C/Watt} = 14.76^\circ\text{C}$

The hotspot core temperature inside the capacitor = 40°C (Ambient) + 14.76 (Rise) = **54.76 say 55°C**

**From the graph below: If the capacitor is being used at 75% of Vrdc then the expected life will be approx 480,000 hours**

