

# C4DE, Low Inductance, 400 – 1,000 VDC, for DC Link

## Overview

The C4DE capacitor is a polypropylene metallized film capacitor with a cylindrical, plastic box-type design filled with resin, and uses screw terminals.

## Applications

Typical applications include DC filtering and energy storage.

## Benefits

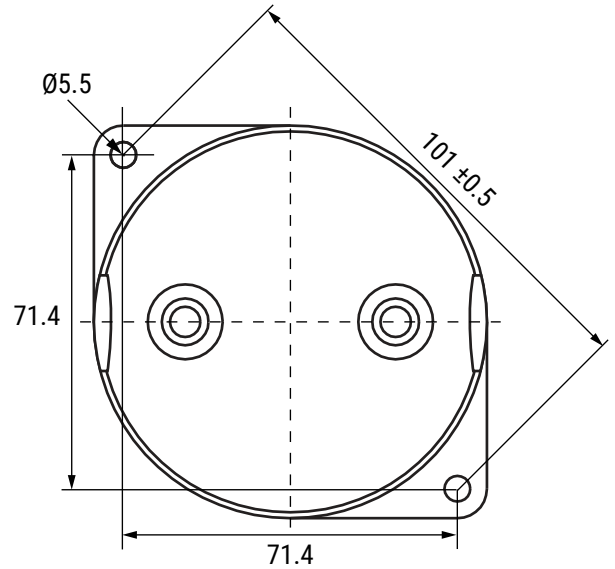
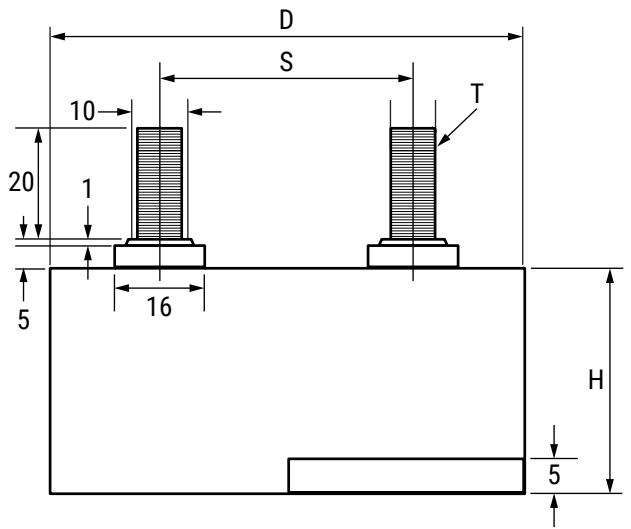
- Self-healing
- Low loss
- High ripple current
- High capacitance density
- Low inductance



## Part Number System

| C4DE                            | F                                          | P                                             | Q                       | 6175                                                                                                                               | A8T            | K         |
|---------------------------------|--------------------------------------------|-----------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------|
| Series                          | Rated Voltage (VDC)                        | Case & Fixing Bolt Code                       | Terminal Style          | Capacitance Code (pF)                                                                                                              | Internal Code  | Tolerance |
| C4DE = MKP, DC Link Application | F = 400<br>H = 600<br>I = 800<br>N = 1,000 | P = Cylindrical plastic case with fixing feet | Q = M8 threaded inserts | Digits two – four indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added. | A8T = Standard | K = 10%   |

## Dimensions – Millimeters



| D    | H  | S  | Terminations (T) |
|------|----|----|------------------|
| ±0.5 | ±1 | ±1 |                  |
| 84   | 40 | 45 | M8 x 20          |
| 84   | 51 | 45 | M8 x 20          |
| 84   | 64 | 45 | M8 x 20          |

## Qualifications

|                     |                     |
|---------------------|---------------------|
| Reference Standards | IEC 61071, EN 61071 |
|---------------------|---------------------|

## Performance Characteristics

|                                                                            |                                                                                                                     |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| IEC Climatic Category                                                      | 40/85/56                                                                                                            |
| Temperature Range                                                          | -40°C to +85°C                                                                                                      |
| Capacitance Tolerance                                                      | ±10%                                                                                                                |
| Capacitance Deviation in the Operating Temperature Range of -40°C to +85°C | ±1.5% max on capacitance value measured at +20 °C                                                                   |
| Test Voltage Terminal to Terminal ( $V_{TT}$ )                             | 1.5 $V_n$ for 10 seconds at +25°C                                                                                   |
| Test Voltage Terminal to Case ( $V_{TC}$ )                                 | 3 kV – 50 Hz for 2 seconds                                                                                          |
| Derated Voltage and Lifetime Expectancy                                    | 1.2 x $V_n$ at +85°C = 1,000 hours                                                                                  |
|                                                                            | 1 x $V_n$ at +85°C = 10,000 hours                                                                                   |
|                                                                            | 0.9 x $V_n$ at +85°C = 100,000 hours                                                                                |
| Derated Temperature and Lifetime expectancy                                | For working temperature between +85°C and +70°C, an increasing factor of 0.67 on the rated lifetime must be applied |
| Installation                                                               | Any position                                                                                                        |

## Environmental Compliance

As a leading global supplier of electronic components and an environmentally conscious company, KEMET continually aspires to improve the environmental effects of our manufacturing processes and our finished electronic components.

In Europe (RoHS Directive) and in some other geographical areas such as China (China RoHS), legislation has been enacted to prevent or otherwise limit the use of certain hazardous materials, including lead (Pb), in electronic equipment. KEMET monitors legislation globally to ensure compliance and endeavors to adjust our manufacturing processes and/or electronic components as may be required by applicable law.

For military, medical, automotive, and some commercial applications, the use of lead (Pb) in the termination is necessary and/or required by design. KEMET is committed to communicating RoHS compliance to our customers. Information related to RoHS compliance will be provided in data sheets and using specific identifiers on the packaging labels.

All KEMET power film capacitors are RoHS compliant.

**Table 1 – Ratings & Part Number Reference**

| Cap Value (μF)         | VDC   | Maximum Dimensions (mm) |        | Ripple Current  |                 |                 |                 | Peak Current (A) | ESR (Max) 100 kHz (mΩ) | ESL (nH) | dV/dt (V/μs) | Packaging Quantity | Part Number     |
|------------------------|-------|-------------------------|--------|-----------------|-----------------|-----------------|-----------------|------------------|------------------------|----------|--------------|--------------------|-----------------|
|                        |       | D                       | L      | 10 kHz 25°C (A) | 10 kHz 45°C (A) | 10 kHz 65°C (A) | 10 kHz 85°C (A) |                  |                        |          |              |                    |                 |
| 175                    | 400   | 84                      | 40     | 100             | 100             | 80              | 46              | 4,375            | 0.5                    | 25       | 25           | 12                 | C4DEFPQ6175A8TK |
| 260                    | 400   | 84                      | 51     | 100             | 100             | 77              | 45              | 5,200            | 0.62                   | 32       | 20           | 12                 | C4DEFPQ6260A8TK |
| 380                    | 400   | 84                      | 64     | 100             | 94              | 73              | 42              | 5,700            | 0.81                   | 40       | 15           | 12                 | C4DEFPQ6380A8TK |
| 100                    | 600   | 84                      | 40     | 100             | 93              | 72              | 42              | 3,000            | 0.6                    | 25       | 30           | 12                 | C4DEHPQ6100A8TK |
| 150                    | 600   | 84                      | 51     | 100             | 90              | 70              | 40              | 3,750            | 0.75                   | 32       | 25           | 12                 | C4DEHPQ6150A8TK |
| 220                    | 600   | 84                      | 64     | 100             | 85              | 65              | 38              | 4,400            | 1                      | 40       | 20           | 12                 | C4DEHPQ6220A8TK |
| 68                     | 800   | 84                      | 40     | 100             | 87              | 68              | 40              | 2,380            | 0.7                    | 25       | 35           | 12                 | C4DEIPQ5680A8TK |
| 100                    | 800   | 84                      | 51     | 100             | 84              | 65              | 37              | 3,000            | 0.9                    | 32       | 30           | 12                 | C4DEIPQ6100A8TK |
| 140                    | 800   | 84                      | 64     | 91              | 77              | 60              | 35              | 3,500            | 1.2                    | 40       | 25           | 12                 | C4DEIPQ6140A8TK |
| 47                     | 1,000 | 84                      | 40     | 96              | 81              | 63              | 36              | 1,739            | 0.8                    | 25       | 37           | 12                 | C4DENPQ5470A8TK |
| 68                     | 1,000 | 84                      | 51     | 92              | 77              | 60              | 35              | 2,176            | 1.1                    | 32       | 32           | 12                 | C4DENPQ5680A8TK |
| 100                    | 1,000 | 84                      | 64     | 86              | 72              | 56              | 32              | 2,700            | 1.3                    | 40       | 27           | 12                 | C4DENPQ6100A8TK |
| Capacitance Value (μF) | VDC   | D (mm)                  | L (mm) | Ripple Current  |                 |                 |                 | Peak Current     | ESR                    | ESL      | dV/dt (V/μs) | Packaging Quantity | Part Number     |

## Materials & Environment

The selection of raw materials that KEMET uses for the production of its electronic components is the result of extensive experience. KEMET directs specific attention toward environmental protection. KEMET selects its suppliers according to ISO 9001 standards and performs statistical analyses on raw materials before acceptance for use in manufacturing our electronic components. All materials are, to the best of KEMET's knowledge, non-toxic and free from cadmium; mercury; chrome and compounds; polychlorine triphenyl (PCB); bromide and chlorinedioxins bromurate clorurate; CFC and HCFC; and asbestos.

## Dissipation Factor

Dissipation factor is a complex function involved with capacitor inefficiency. The  $\tan\delta$  may vary up and down with increased temperature. For more information, refer to Performance Characteristics.

## Sealing

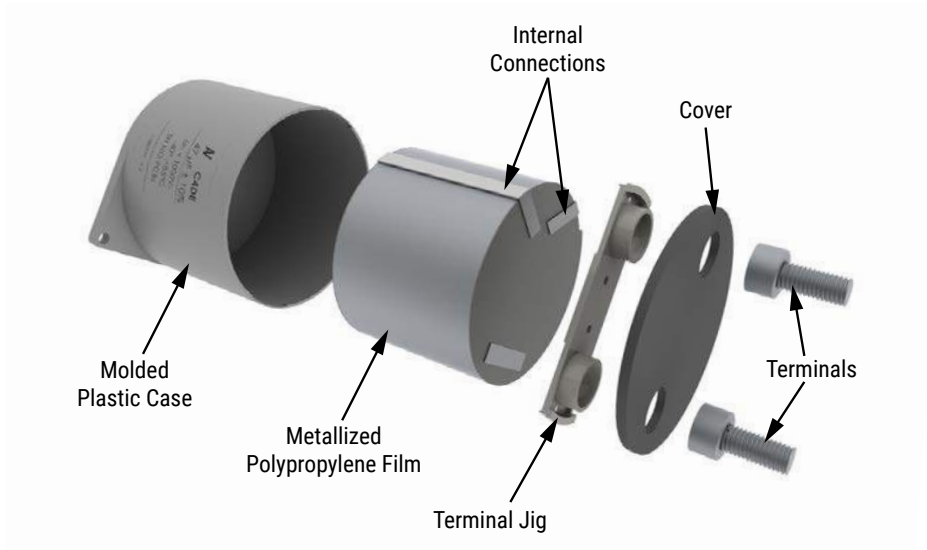
### Hermetically Sealed Capacitors

As the temperature increases, the pressure inside the capacitor increases. If the internal pressure is high enough, it can cause a breach in the capacitor. Such a breach can result in leakage, impregnation, filling fluid, or moisture susceptibility.

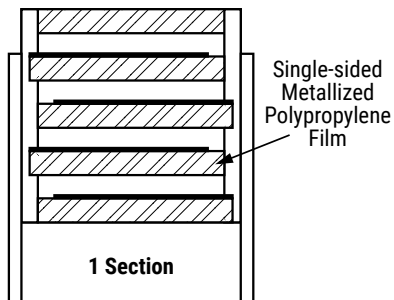
### Barometric Pressure

The altitude at which hermetically sealed capacitors are operated controls the capacitor's voltage rating. As the barometric pressure decreases, the susceptibility to terminal arc-over increases. Non-hermetic capacitors can be affected by internal stresses due to pressure changes. These effects can be in the form of capacitance changes, dielectric arc-over, and/or low insulation resistance. Altitude can also affect heat transfer. Heat that is generated in an operation cannot be dissipated properly, and high  $RI^2$  losses and eventual failure can result.

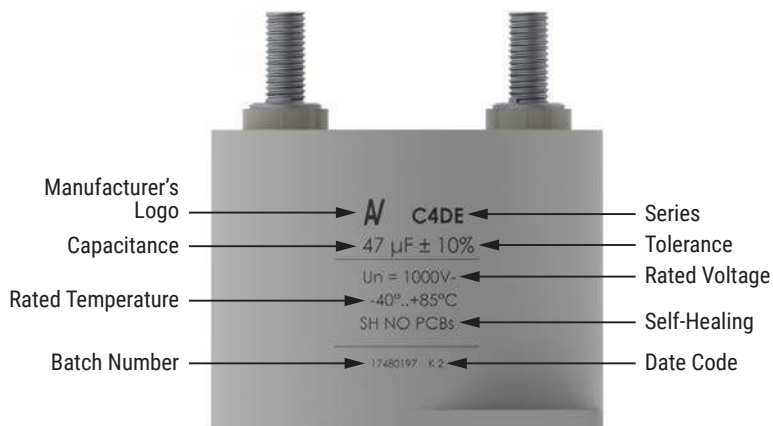
## Construction



## Winding Scheme



## Marking



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