



# 1DFO, 2DFO, 3DFO Series

Vishay Cera-Mite

## Low Dissipation Factor Disc Capacitors

### FEATURES

- Ideal for High Voltage Switching to 100 kHz
- Low DF Minimizes Self Heating at High Frequencies.
- Application Voltages: 500, 1000 and 1500 Vac.
- Economical Alternative to Film Capacitors.

The 1DFO, 2DFO, and 3DFO Series are designed to operate up to 500, 1000, and 1500 V<sub>RMS</sub>, respectively. Their low dissipation factor (DF) and stable temperature characteristics are well suited for operation at elevated frequency. Operating limits are governed by a suggested 30°C maximum case temperature rise as controlled by applied voltage and frequency dependent current. Power-rating charts covering the entire series provide operating guidelines for higher frequency applications.

### 1DFO SERIES - LOW DISSIPATION FACTOR

#### 561C Series

Application Range: 500 Vrms; 1000 Vdc

| Value<br>pF | Tol. | Catalog<br>Number | Temp<br>Char. | D<br>Diameter<br>(in / mm) | T<br>Thickness<br>(in / mm) | LS<br>Lead Space<br>(in / mm) |
|-------------|------|-------------------|---------------|----------------------------|-----------------------------|-------------------------------|
| 10          | J    | 1DF0Q10           | NP0           | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 12          | J    | 1DF0Q12           | NP0           | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 15          | J    | 1DF0Q15           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 18          | J    | 1DF0Q18           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 22          | J    | 1DF0Q22           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 27          | J    | 1DF0Q27           | N2200         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 33          | J    | 1DF0Q33           | N2200         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 39          | J    | 1DF0Q39           | N2200         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 47          | J    | 1DF0Q47           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 56          | J    | 1DF0Q56           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 68          | J    | 1DF0Q68           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 82          | J    | 1DF0Q82           | N1500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 100         | K    | 1DF0T10           | N2000         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 120         | K    | 1DF0T12           | N2000         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 150         | K    | 1DF0T15           | N2000         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 180         | K    | 1DF0T18           | N2000         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 220         | K    | 1DF0T22           | N2500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 270         | K    | 1DF0T27           | N2500         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 330         | K    | 1DF0T33           | N2800         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 390         | K    | 1DF0T39           | N2800         | .250 (6.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 470         | K    | 1DF0T47           | N2800         | .290 (7.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 560         | K    | 1DF0T56           | N2800         | .290 (7.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 680         | K    | 1DF0T68           | N2800         | .290 (7.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 820         | K    | 1DF0T82           | N2800         | .290 (7.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 1000        | K    | 1DF0D10           | N2800         | .370 (9.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 1200        | K    | 1DF0D12           | N2800         | .370 (9.4)                 | .156 (4.0)                  | .250 (6.4)                    |
| 1500        | K    | 1DF0D15           | N2800         | .405 (10.3)                | .156 (4.0)                  | .250 (6.4)                    |
| 1800        | K    | 1DF0D18           | N2800         | .440 (11.2)                | .156 (4.0)                  | .250 (6.4)                    |
| 2200        | K    | 1DF0D22           | N2800         | .460 (11.7)                | .156 (4.0)                  | .250 (6.4)                    |
| 2300        | K    | 1DF0D23           | N2800         | .460 (11.7)                | .156 (4.0)                  | .250 (6.4)                    |
| 2400        | K    | 1DF0D24           | N2800         | .460 (11.7)                | .156 (4.0)                  | .250 (6.4)                    |
| 2500        | K    | 1DF0D25           | N2800         | .460 (11.7)                | .156 (4.0)                  | .250 (6.4)                    |
| 2700        | K    | 1DF0D27           | N2800         | .490 (12.5)                | .156 (4.0)                  | .250 (6.4)                    |
| 3300        | K    | 1DF0D33           | N2800         | .530 (13.5)                | .156 (4.0)                  | .250 (6.4)                    |
| 3900        | K    | 1DF0D39           | N2800         | .560 (14.2)                | .156 (4.0)                  | .375 (9.5)                    |
| 4700        | K    | 1DF0D47           | N2800         | .630 (16.0)                | .156 (4.0)                  | .375 (9.5)                    |
| 5600        | K    | 1DF0D56           | N2800         | .680 (17.3)                | .156 (4.0)                  | .375 (9.5)                    |
| 6800        | K    | 1DF0D68           | N2800         | .760 (19.3)                | .156 (4.0)                  | .375 (9.5)                    |

#### Note 1

Power ratings are based on still air 60°C ambient with additional 30°C rise due to self heating. Thermal effects such as forced air cooling, component encapsulation or other heat-sinking techniques will alter ratings. Actual circuit test is recommended.

#### Note 3

### APPLICATIONS:

- Fluorescent Ballasts
- Industrial Electronic Systems
- Switching Power Supplies
- Snubber Networks

### GENERAL SPECIFICATIONS

| Series:                      | 1DFO                                         | 2DFO                  | 3DFO                  |
|------------------------------|----------------------------------------------|-----------------------|-----------------------|
| Application Voltage:         | 500 Vrms<br>1000 Vdc                         | 1000 Vrms<br>2000 Vdc | 1500 Vrms<br>3000 Vdc |
| Dielectric Strength:         | 1200 Vrms<br>2500 Vdc                        | 2000 Vrms<br>4000 Vdc | 3000 Vrms<br>6000 Vdc |
| Dissipation Factor:          | 0.1% Maximum at 1 kHz and 25°C               |                       |                       |
| Maximum Service Temperature: | 125°C                                        |                       |                       |
| Power Rating:                | (Note 1) Limit to 30°C Case Temperature Rise |                       |                       |
| Insulation Resistance:       | 50,000 MΩ Minimum                            |                       |                       |

### 2DFO SERIES - LOW DISSIPATION FACTOR

#### 564C Series

Application Range: 1000 Vrms; 2000 Vdc

| Value<br>pF | Tol. | Catalog<br>Number | Temp<br>Char. | D<br>Diameter<br>(in / mm) | T<br>Thickness<br>(in / mm) | LS<br>Lead Space<br>(in / mm) |
|-------------|------|-------------------|---------------|----------------------------|-----------------------------|-------------------------------|
| 10          | J    | 2DF0Q10           | NP0           | .290 (7.4)                 | .160 (4.1)                  | .250 (6.4)                    |
| 12          | J    | 2DF0Q12           | N1500         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 15          | J    | 2DF0Q15           | N2200         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 18          | J    | 2DF0Q18           | N2200         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 22          | J    | 2DF0Q22           | N2200         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 27          | J    | 2DF0Q27           | N1500         | .290 (7.4)                 | .220 (5.6)                  | .250 (6.4)                    |
| 33          | J    | 2DF0Q33           | N1500         | .290 (7.4)                 | .195 (5.0)                  | .250 (6.4)                    |
| 39          | J    | 2DF0Q39           | N1500         | .290 (7.4)                 | .180 (4.6)                  | .250 (6.4)                    |
| 47          | J    | 2DF0Q47           | N1500         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 56          | J    | 2DF0Q56           | N2000         | .290 (7.4)                 | .210 (5.3)                  | .250 (6.4)                    |
| 68          | J    | 2DF0Q68           | N2000         | .290 (7.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 82          | J    | 2DF0Q82           | N2000         | .290 (7.4)                 | .175 (4.5)                  | .250 (6.4)                    |
| 100         | K    | 2DF0T10           | N2000         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 120         | K    | 2DF0T12           | N2500         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 150         | K    | 2DF0T15           | N2500         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 180         | K    | 2DF0T18           | N2800         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 220         | K    | 2DF0T22           | N2800         | .290 (7.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 270         | K    | 2DF0T27           | N2500         | .330 (8.4)                 | .170 (4.3)                  | .250 (6.4)                    |
| 330         | K    | 2DF0T33           | N2800         | .330 (8.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 390         | K    | 2DF0T39           | N2800         | .330 (8.4)                 | .175 (4.5)                  | .250 (6.4)                    |
| 470         | K    | 2DF0T47           | N2500         | .400 (10.2)                | .170 (4.3)                  | .250 (6.4)                    |
| 560         | K    | 2DF0T56           | N2800         | .400 (10.2)                | .185 (4.7)                  | .250 (6.4)                    |
| 680         | K    | 2DF0T68           | N2800         | .400 (10.2)                | .170 (4.3)                  | .250 (6.4)                    |
| 820         | K    | 2DF0T82           | N2800         | .430 (10.9)                | .175 (4.5)                  | .250 (6.4)                    |
| 1000        | K    | 2DF0D10           | N2800         | .460 (11.7)                | .170 (4.3)                  | .250 (6.4)                    |
| 1200        | K    | 2DF0D12           | N2800         | .490 (12.5)                | .170 (4.3)                  | .250 (6.4)                    |
| 1500        | K    | 2DF0D15           | N2800         | .530 (13.5)                | .170 (4.3)                  | .250 (6.4)                    |
| 1800        | K    | 2DF0D18           | N2800         | .560 (14.2)                | .170 (4.3)                  | .375 (9.5)                    |
| 2200        | K    | 2DF0D22           | N2800         | .680 (17.3)                | .180 (4.6)                  | .375 (9.5)                    |
| 2300        | K    | 2DF0D23           | N2800         | .680 (17.3)                | .175 (4.5)                  | .375 (9.5)                    |
| 2400        | K    | 2DF0D24           | N2800         | .680 (17.3)                | .175 (4.5)                  | .375 (9.5)                    |
| 2500        | K    | 2DF0D25           | N2800         | .680 (17.3)                | .170 (4.3)                  | .375 (9.5)                    |
| 2700        | K    | 2DF0D27           | N2800         | .680 (17.3)                | .170 (4.3)                  | .375 (9.5)                    |
| 3300        | K    | 2DF0D33           | N2800         | .720 (18.3)                | .170 (4.3)                  | .375 (9.5)                    |
| 3900        | K    | 2DF0D39           | N2800         | .790 (20.1)                | .170 (4.3)                  | .375 (9.5)                    |
| 4700        | K    | 2DF0D47           | N2800         | .900 (22.9)                | .180 (4.6)                  | .375 (9.5)                    |
| 5600        | K    | 2DF0D56           | N2800         | .900 (22.9)                | .170 (4.3)                  | .375 (9.5)                    |
| 6800        | K    | 2DF0D68           | N2800         | .950 (24.1)                | .170 (4.3)                  | .375 (9.5)                    |

#### Note 2

For convenience, power rating charts are shown to 100 kHz. Higher frequency operation is permissible with appropriate derating. Consult factory for application suggestions.

#### Note 3

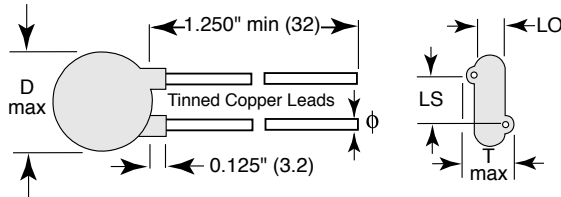
# 1DFO, 2DFO, 3DFO Series

Vishay Cera-Mite

Low Dissipation Factor Disc Capacitors



Fig 8



## WIRE LEAD INFORMATION

| SERIES | Φ WIRE SIZE<br>AWG / in / mm | "LO" TYP LEAD OFFSET<br>in / mm |
|--------|------------------------------|---------------------------------|
| 1DFO   | 22 .025 (.64)                | .045 (1.2)                      |
| 2DFO   | 20 .032 (.81)                | .075 (1.8)                      |
| 3DFO   | 20 .032 (.81)                | .095 (2.4)                      |

## 3DFO SERIES - LOW DISSIPATION FACTOR

564C Series

Application Range: 1500 Vrms, 3000 VDC

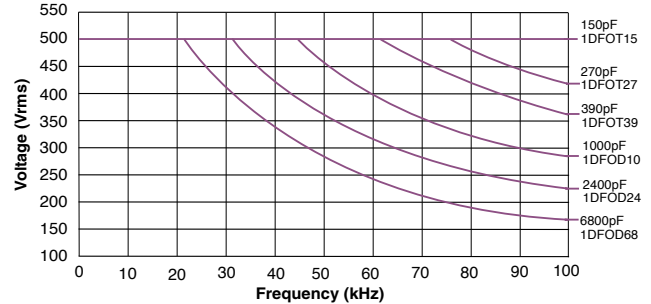
| VALUE<br>pF | TOL. | CATALOG<br>NUMBER | TEMP<br>CHAR. | D<br>DIAMETER<br>(in / mm) | T<br>THICKNESS<br>(in / mm) | LS<br>LEAD SPACE<br>(in / mm) |
|-------------|------|-------------------|---------------|----------------------------|-----------------------------|-------------------------------|
| 10          | 5%   | 3DF0Q10           | N1500         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 12          | 5%   | 3DF0Q12           | N2200         | .290 (7.4)                 | .210 (5.3)                  | .250 (6.4)                    |
| 15          | 5%   | 3DF0Q15           | N2200         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 18          | 5%   | 3DF0Q18           | N2200         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 22          | 5%   | 3DF0Q22           | N2200         | .330 (8.4)                 | .210 (5.3)                  | .250 (6.4)                    |
| 27          | 5%   | 3DF0Q27           | N1500         | .290 (7.4)                 | .220 (5.6)                  | .250 (6.4)                    |
| 33          | 5%   | 3DF0Q33           | N1500         | .290 (7.4)                 | .195 (5.0)                  | .250 (6.4)                    |
| 39          | 5%   | 3DF0Q39           | N1500         | .290 (7.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 47          | 5%   | 3DF0Q47           | N1500         | .330 (8.4)                 | .225 (5.7)                  | .250 (6.4)                    |
| 56          | 5%   | 3DF0Q56           | N2000         | .290 (7.4)                 | .210 (5.3)                  | .250 (6.4)                    |
| 68          | 5%   | 3DF0Q68           | N2000         | .290 (7.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 82          | 5%   | 3DF0Q82           | N2000         | .290 (7.4)                 | .185 (4.7)                  | .250 (6.4)                    |
| 100         | 10%  | 3DF0T10           | N2500         | .290 (7.4)                 | .205 (5.2)                  | .250 (6.4)                    |
| 120         | 10%  | 3DF0T12           | N2500         | .290 (7.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 150         | 10%  | 3DF0T15           | N2800         | .290 (7.4)                 | .200 (5.1)                  | .250 (6.4)                    |
| 180         | 10%  | 3DF0T18           | N2800         | .290 (7.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 220         | 10%  | 3DF0T22           | N2500         | .330 (8.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 270         | 10%  | 3DF0T27           | N2800         | .330 (8.4)                 | .205 (5.2)                  | .250 (6.4)                    |
| 330         | 10%  | 3DF0T33           | N2800         | .330 (8.4)                 | .190 (4.8)                  | .250 (6.4)                    |
| 390         | 10%  | 3DF0T39           | N2800         | .400 (10.2)                | .215 (5.5)                  | .250 (6.4)                    |
| 470         | 10%  | 3DF0T47           | N2800         | .400 (10.2)                | .195 (5.0)                  | .250 (6.4)                    |
| 560         | 10%  | 3DF0T56           | N2800         | .430 (10.9)                | .200 (5.1)                  | .250 (6.4)                    |
| 680         | 10%  | 3DF0T68           | N2800         | .460 (11.7)                | .195 (5.0)                  | .250 (6.4)                    |
| 820         | 10%  | 3DF0T82           | N2800         | .490 (12.5)                | .195 (5.0)                  | .250 (6.4)                    |
| 1000        | 10%  | 3DF0D10           | N2800         | .530 (13.5)                | .190 (4.8)                  | .250 (6.4)                    |
| 1200        | 10%  | 3DF0D12           | N2800         | .560 (14.2)                | .190 (4.8)                  | .375 (9.5)                    |
| 1500        | 10%  | 3DF0D15           | N2800         | .620 (15.8)                | .190 (4.8)                  | .375 (9.5)                    |
| 1800        | 10%  | 3DF0D18           | N2800         | .680 (17.3)                | .190 (4.8)                  | .375 (9.5)                    |
| 2200        | 10%  | 3DF0D22           | N2800         | .720 (18.3)                | .190 (4.8)                  | .375 (9.5)                    |
| 2300        | 10%  | 3DF0D23           | N2800         | .720 (18.3)                | .190 (4.8)                  | .375 (9.5)                    |
| 2400        | 10%  | 3DF0D24           | N2800         | .790 (20.1)                | .195 (5.0)                  | .375 (9.5)                    |
| 2500        | 10%  | 3DF0D25           | N2800         | .790 (20.1)                | .195 (5.0)                  | .375 (9.5)                    |
| 2700        | 10%  | 3DF0D27           | N2800         | .790 (20.1)                | .190 (4.8)                  | .375 (9.5)                    |
| 3300        | 10%  | 3DF0D33           | N2800         | .900 (22.9)                | .200 (5.1)                  | .375 (9.5)                    |
| 3900        | 10%  | 3DF0D39           | N2800         | .900 (22.9)                | .190 (4.8)                  | .375 (9.5)                    |
| 4700        | 10%  | 3DF0D47           | N2800         | .950 (24.1)                | .185 (4.7)                  | .375 (9.5)                    |

Note 3

Alternate lead spacing of 5mm, 7.5mm, and 10mm are available bulk or tape & reel.

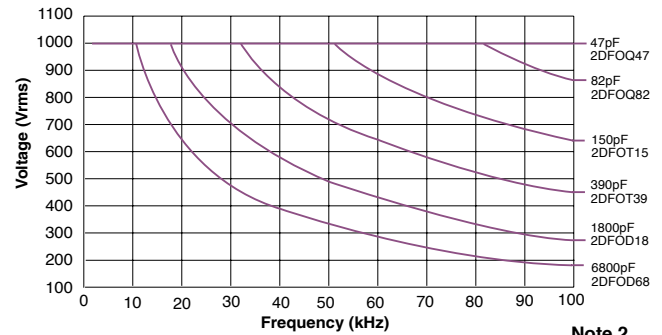
Note 3

Power Rating - 1DFO Series 500 Vrms Low DF - Note 1



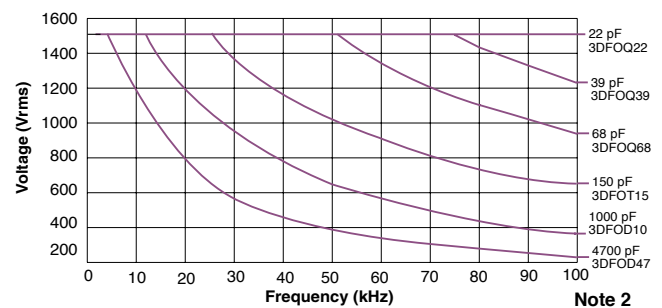
Note 2

Power Rating - 2DFO Series 1000 Vrms Low DF - Note 1



Note 2

Power Rating - 3DFO Series 1500 Vrms Low DF - Note 1



Note 2

Temperature Characteristics for 1DFO, 2DFO & 3DFO Series

