



## Lower Voltage Ceramic Singlelayer DC Disc Capacitors 1 kV<sub>DC</sub> to 3 kV<sub>DC</sub> Low Dissipation Factor

RoHS  
COMPLIANT**FEATURES**

- Low losses
- High stability
- Low DF minimizes self heating at HF
- Ideal for high switching to 100 kHz
- Radial leads
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**APPLICATIONS**

- SMPS
- HF ballast
- Snubber and HV circuits

**DESIGN**

The capacitors consist of a ceramic disc of which both sides are silver-plated. Connection leads are made of tinned copper having diameters of 0.022" (0.51 mm) or 0.025" (0.64 mm).

The capacitors may be supplied with radial kinked or straight leads having lead spacing of 0.250" (6.35 mm) or 0.375" (9.5 mm).

The standard tolerances are  $\pm 5\%$ ,  $\pm 10\%$ .

Coating is made of flammable retardant epoxy resin in accordance with "UL 94 V-0".

QUICK REFERENCE DATA			
DESCRIPTION	VALUE		
Ceramic Class	1		
Ceramic Dielectric	C0G, N1500, N2000, N2200, N2500, N2800		
Voltage (V <sub>DC</sub> )	1000	2000	3000
Min. Capacitance (pF)	10	10	10
Max. Capacitance (pF)	6800	6800	4700
Mounting	Radial		

**INSULATION RESISTANCE**

Min. 50 000 M $\Omega$

**TOLERANCE ON CAPACITANCE**

$\pm 5\%$ ,  $\pm 10\%$

**DISSIPATION FACTOR**

0.1 % max. at 1 kHz; 1 V

**CATEGORY TEMPERATURE RANGE**

-55 °C to +125 °C

**CLIMATIC CATEGORY ACC. TO EN 60068-1**

55/125/21

**OPERATING TEMPERATURE RANGE**

-55 °C to +105 °C

**CAPACITANCE RANGE**

10 pF to 6800 pF

**RATED VOLTAGE**

1000 V<sub>DC</sub> (500 V<sub>RMS</sub>)  
 2000 V<sub>DC</sub> (1000 V<sub>RMS</sub>)  
 3000 V<sub>DC</sub> (1500 V<sub>RMS</sub>)

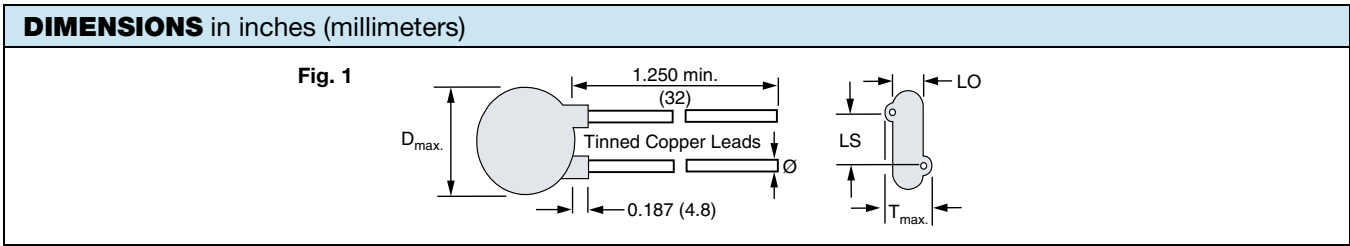
**DIELECTRIC STRENGTH BETWEEN LEADS**

Component test:

1000 V<sub>DC</sub>      2500 V<sub>DC</sub>, 2 s  
 2000 V<sub>DC</sub>      4000 V<sub>DC</sub>, 2 s  
 3000 V<sub>DC</sub>      6000 V<sub>DC</sub>, 2 s

**CERAMIC DIELECTRIC**

C0G, N1500, N2000, N2200, N2500, N2800 (Class 1)



**ORDERING INFORMATION, CERAMIC 1 kV<sub>DC</sub> LOW DISSIPATION FACTOR**

C (pF)	TOL. (%)	D <sub>max.</sub> DIAMETER INCH (mm)	T <sub>max.</sub> THICKNESS INCH (mm)	LS LEAD SPACE INCH (mm) ± 1 mm	LO LEAD OFFSET INCH (mm) ± 0.5 mm	WIRE SIZE		FIG.	ORDERING CODE		
						AWG	INCH (mm)				
<b>C0G (NPO)</b>											
10	± 5	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.043 (1.1)	22	0.025 (0.64)	1	561R1DF0Q10		
12					0.051 (1.3)				561R1DF0Q12		
<b>N1500</b>											
22	± 5	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.043 (1.1)	22	0.025 (0.64)	1	561R1DF0Q22		
47					0.071 (1.8)				561R1DF0Q47		
56					0.055 (1.4)				561R1DF0Q56		
68					0.059 (1.5)				561R1DF0Q68		
82					0.047 (1.2)				561R1DF0Q82		
<b>N2200</b>											
33	± 10	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.043 (1.1)	22	0.025 (0.64)	1	561R1DF0Q33		
<b>N2000</b>											
100	± 10	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.059 (1.5)	22	0.025 (0.64)	1	561R1DF0T10		
120					0.055 (1.4)				561R1DF0T12		
150					0.043 (1.1)				561R1DF0T15		
180					0.043 (1.1)				561R1DF0T18		
<b>N2500</b>											
220	± 10	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.059 (1.5)	22	0.025 (0.64)	1	561R1DF0T22		
270					0.043 (1.1)				561R1DF0T27		
<b>N2800</b>											
330	± 10	0.250 (6.4)	0.156 (4.0)	0.250 (6.4)	0.047 (1.2)	22	0.025 (0.64)	1	561R1DF0T33		
390					0.047 (1.2)				561R1DF0T39		
470					0.059 (1.5)				561R1DF0T47		
560		0.290 (7.4)			0.055 (1.4)				561R1DF0T56		
680					0.047 (1.2)				561R1DF0T68		
820					0.043 (1.1)				561R1DF0T82		
1000		0.370 (9.4)			0.055 (1.4)				561R1DF0D10		
1200					0.047 (1.2)				561R1DF0D12		
1500					0.047 (1.2)				561R1DF0D15		
1800		0.440 (11.2)			0.051 (1.3)				561R1DF0D18		
2200		0.460 (11.7)			0.047 (1.2)				561R1DF0D22		
2700		0.490 (12.4)			0.047 (1.2)				561R1DF0D27		
3300		0.530 (13.5)			0.047 (1.2)				561R1DF0D33		
3900		0.560 (14.2)			0.156 (4.0)				0.375 (9.5)	0.047 (1.2)	561R1DF0D39
4700		0.630 (16.0)								0.047 (1.2)	561R1DF0D47
5600		0.680 (17.3)								0.047 (1.2)	561R1DF0D56
6800		0.760 (19.3)								0.047 (1.2)	561R1DF0D68

**Note**

- Alternate lead spacings of 5 mm, 7.5 mm or 10 mm are available on request.



ORDERING INFORMATION, CERAMIC 2 kV <sub>DC</sub> LOW DISSIPATION FACTOR														
C (pF)	TOL. (%)	D <sub>max.</sub> DIAMETER INCH (mm)	T <sub>max.</sub> THICKNESS INCH (mm)	LS LEAD SPACE INCH (mm) ± 1 mm	LO LEAD OFFSET INCH (mm) ± 0.5 mm	WIRE SIZE		FIG.	ORDERING CODE					
						AWG	INCH (mm)							
<b>N1500</b>														
33	± 5	0.290 (7.4)	0.195 (5.0)	0.250 (6.4)	0.098 (2.5)	20	0.032 (0.81)	1	564R2DF0Q33					
39			0.180 (4.6)		0.083 (2.1)				564R2DF0Q39					
47			0.170 (4.3)		0.071 (1.8)				564R2DF0Q47					
<b>N2000</b>														
56	± 5	0.290 (7.4)	0.210 (5.3)	0.250 (6.4)	0.110 (2.8)	20	0.032 (0.81)	1	564R2DF0Q56					
68			0.190 (4.8)		0.091 (2.3)				564R2DF0Q68					
82			0.175 (4.5)		0.075 (1.9)				564R2DF0Q82					
100			0.170 (4.3)		0.071 (1.8)				564R2DF0T10					
<b>N2500</b>														
120	± 10	0.290 (7.4)	0.185 (4.7)	0.250 (6.4)	0.087 (2.2)	20	0.032 (0.81)	1	564R2DF0T12					
150			0.170 (4.3)		0.071 (1.8)				564R2DF0T15					
180			0.185 (4.7)		0.071 (1.8)				564R2DF0T18					
270		0.330 (8.4)	0.170 (4.3)		0.079 (2.0)				564R2DF0T27					
470		0.400 (10.2)	0.170 (4.3)		0.075 (1.9)				564R2DF0T47					
<b>N2800</b>														
220	± 10	0.290 (7.4)	0.170 (4.3)	0.250 (6.4)	0.087 (2.2)	20	0.032 (0.81)	1	564R2DF0T22					
330		0.330 (8.4)	0.185 (4.7)		0.083 (2.1)				564R2DF0T33					
390		0.330 (8.4)	0.175 (4.5)		0.075 (1.9)				564R2DF0T39					
560		0.400 (10.2)	0.185 (4.7)		0.087 (2.2)				564R2DF0T56					
680		0.400 (10.2)	0.170 (4.3)		0.075 (1.9)				564R2DF0T68					
820		0.430 (10.9)	0.175 (4.5)		0.075 (1.9)				564R2DF0T82					
1000		0.460 (11.7)	0.170 (4.3)		0.075 (1.9)				564R2DF0D10					
1500		0.530 (13.5)			0.071 (1.8)				564R2DF0D15					
1800		0.560 (14.2)			0.170 (4.3)				0.071 (1.8)	564R2DF0D18				
2200		0.680 (17.3)	0.170 (4.3)		0.180 (4.6)				0.375 (9.5)	0.083 (2.1)	20	0.032 (0.81)	1	564R2DF0D22
2300					0.175 (4.5)					0.079 (2.0)				564R2DF0D23
2400					0.175 (4.5)					0.075 (1.9)				564R2DF0D24
2700				0.170 (4.3)	0.071 (1.8)					564R2DF0D27				
3300				0.720 (18.3)	0.170 (4.3)					0.071 (1.8)				564R2DF0D33
3900		0.790 (20.1)	0.180 (4.6)	0.075 (1.9)	0.375 (9.5)				0.075 (1.9)	20	0.032 (0.81)	1	564R2DF0D39	
4700		0.900 (22.9)		0.083 (2.1)					564R2DF0D47					
5600		0.900 (22.9)		0.170 (4.3)					0.075 (1.9)				564R2DF0D56	
6800		0.950 (24.1)		0.170 (4.3)					0.071 (1.8)				564R2DF0D68	

- Note**
- Alternate lead spacings of 5 mm, 7.5 mm or 10 mm are available on request.



ORDERING INFORMATION, CERAMIC 3 kV <sub>DC</sub> LOW DISSIPATION FACTOR										
C (pF)	TOL. (%)	D <sub>max.</sub> DIAMETER INCH (mm)	T <sub>max.</sub> THICKNESS INCH (mm)	LS LEAD SPACE INCH (mm) ± 1 mm	LO LEAD OFFSET INCH (mm) ± 0.5 mm	WIRE SIZE		FIG.	ORDERING CODE	
						AWG	INCH (mm)			
<b>N1500</b>										
10	± 5	0.290 (7.4)	0.185 (4.7)	0.250 (6.4)	0.087 (2.2)	20	0.032 (0.81)	1	564R3DF0Q10	
27			0.220 (5.6)		0.122 (3.1)				564R3DF0Q27	
33			0.195 (5.0)		0.098 (2.5)				564R3DF0Q33	
39			0.190 (4.8)		0.094 (2.4)				564R3DF0Q39	
47			0.330 (8.4)		0.225 (5.7)				0.126 (3.2)	564R3DF0Q47
<b>N2200</b>										
12	± 5	0.290 (7.4)	0.210 (5.3)	0.250 (6.4)	0.110 (2.8)	20	0.032 (0.81)	1	564R3DF0Q12	
22		0.330 (8.4)	0.210 (5.3)		0.110 (2.8)				564R3DF0Q22	
<b>N2000</b>										
56	± 5	0.290 (7.4)	0.210 (5.3)	0.250 (6.4)	0.110 (2.8)	20	0.032 (0.81)	1	564R3DF0Q56	
68			0.190 (4.8)		0.098 (2.5)				564R3DF0Q68	
82			0.185 (4.7)		0.091 (2.3)				564R3DF0Q82	
<b>N2500</b>										
100	± 10	0.290 (7.4)	0.205 (5.2)	0.250 (6.4)	0.106 (2.7)	20	0.032 (0.81)	1	564R3DF0T10	
120		0.290 (7.4)	0.190 (4.8)		0.091 (2.3)				564R3DF0T12	
220		0.330 (8.4)	0.190 (4.8)		0.091 (2.3)				564R3DF0T22	
<b>N2800</b>										
150	± 10	0.290 (7.4)	0.200 (5.1)	0.250 (6.4)	0.091 (2.3)	20	0.032 (0.81)	1	564R3DF0T15	
180		0.290 (7.4)	0.190 (4.8)		0.091 (2.3)				564R3DF0T18	
270		0.330 (8.4)	0.205 (5.2)		0.110 (2.8)				564R3DF0T27	
330		0.330 (8.4)	0.190 (4.8)		0.091 (2.3)				564R3DF0T33	
390		0.400 (10.2)	0.215 (5.5)		0.102 (2.6)				564R3DF0T39	
470		0.400 (10.2)	0.195 (5.0)		0.087 (2.2)				564R3DF0T47	
560		0.430 (10.9)	0.200 (5.1)		0.102 (2.6)				564R3DF0T56	
680		0.460 (11.7)	0.195 (5.0)		0.087 (2.2)				564R3DF0T68	
820		0.490 (12.5)	0.195 (5.0)	0.102 (2.6)	564R3DF0T82					
1000		0.530 (13.5)	0.190 (4.8)	0.091 (2.3)	564R3DF0D10					
1200		0.560 (14.2)	0.190 (4.8)	0.375 (9.5)	0.091 (2.3)				564R3DF0D12	
1500		0.620 (15.8)			0.091 (2.3)				564R3DF0D15	
1800		0.680 (17.3)			0.098 (2.5)				564R3DF0D18	
2200		0.720 (18.3)			0.094 (2.4)				564R3DF0D22	
2700		0.790 (20.1)			0.190 (4.8)				0.087 (2.2)	564R3DF0D27
3300		0.900 (22.9)			0.200 (5.1)				0.102 (2.6)	564R3DF0D33
4700	0.950 (24.1)	0.185 (4.7)			0.087 (2.2)	564R3DF0D47				

**Note**

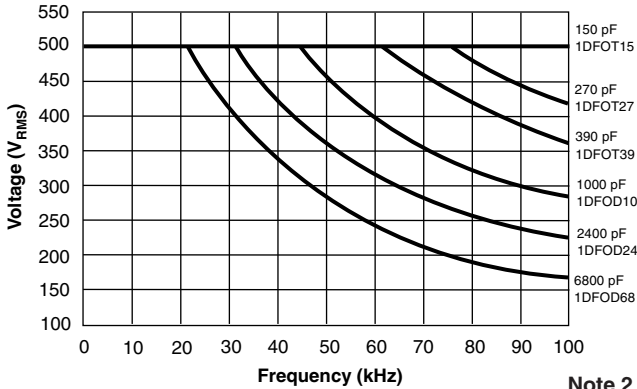
- Alternate lead spacings of 5 mm, 7.5 mm or 10 mm are available on request.

**TAPE AND REEL OPTIONS**

Part number codes and specifications for tape and reel packaging are found in the general information document - find web-link below.

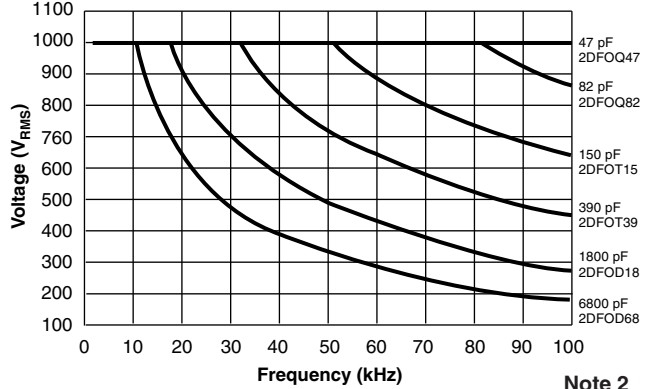


Power Rating - 1DFO Series 500 V<sub>RMS</sub> Low DF - Note 1



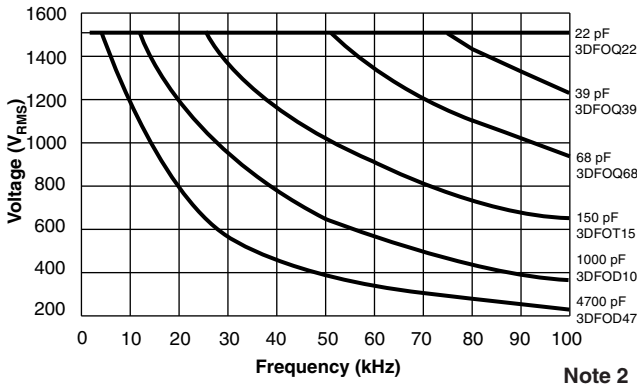
Note 2

Power Rating - 2DFO Series 1000 V<sub>RMS</sub> Low DF - Note 1



Note 2

Power Rating - 3DFO Series 1500 V<sub>RMS</sub> Low DF - Note 1



Note 2

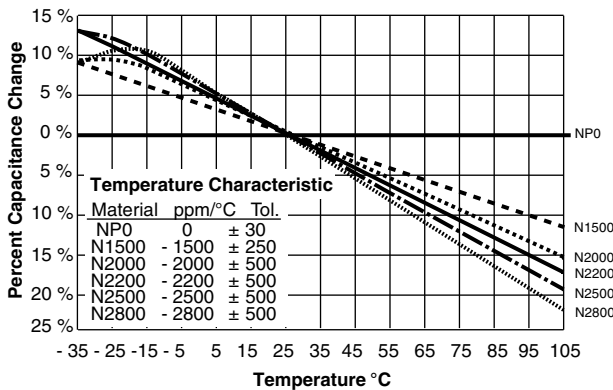
Note 1

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 for application recommended.

Note 2

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

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



Temperature Characteristic

Material ppm/°C Tol.

NP0	0	± 30
N1500	- 1500	± 250
N2000	- 2000	± 500
N2200	- 2200	± 500
N2500	- 2500	± 500
N2800	- 2800	± 500

RELATED DOCUMENTS

General Information

[www.vishay.com/doc?23140](http://www.vishay.com/doc?23140)

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# OCEAN CHIPS

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Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».



«**JONHON**» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«**FORSTAR**» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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