CAPAFIM Products

APPLICATIONS

DC filtering for all types of application

PACKAGING

Rectangular stainless steel sandblasted case. Grounding is via a plug on the top of the case.

PRESENTATION

ELECTRICAL CHARACTERISTICS

Capacitance range C_n	88µF to 1620µF
Tolerance on C_n	±10%
DC voltage range	1200V to 3900V
Maximum hot-spot temperature	75°C
Life duration at nominal voltage and 75°C hot-spot temperature	100000 hours
Stray inductance	<400nH
Test voltage between terminals	$1.5V_n$ during 10s
Test voltage between short terminals and case	$6kV_{rms}$ (at 50Hz during 1mn)
Standard reference	Conforms with 61071 and 61881, IEC 60068 and IEC 60077

This catalog presents standard products, for specific products; please fill out the Guide for Customer's Specific Requirement on page 30.

CAPAFIM Products

Table of Values

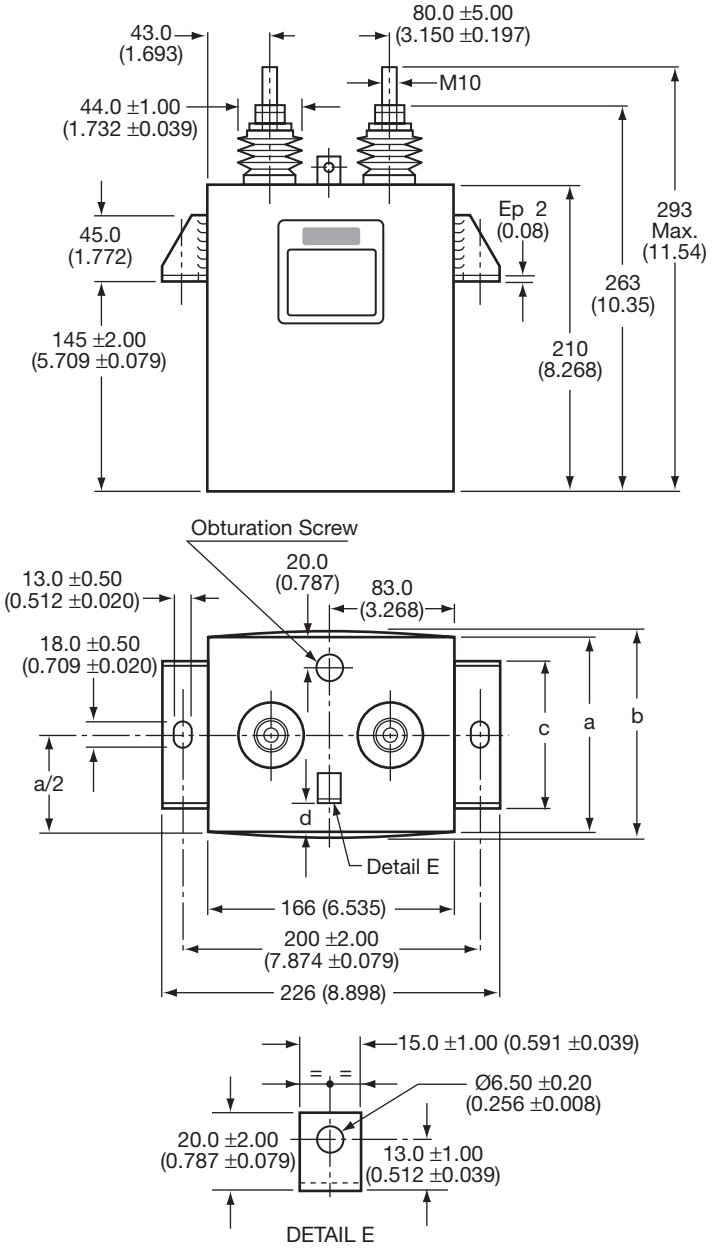
	Vn (V)	C (µF)	Imax (A)	Vr max (V)	Rs (mΩ)	Part Number
Type A	1200 → 1400	650	56	678	3.48	DNCFM1K4A0657
	1800	426	46	837	4.35	DNCFM1K8A4266
166	2000	338	40	939	5.33	DNCFM2K0A3386
	2200	288	36	1018	5.66	DNCFM2K2A2886
X	2400	228	32	1142	6.14	DNCFM2K4A2286
70	2600	192	30	1244	6.49	DNCFM2K6A1926
	2900	162	28	1357	6.83	DNCFM2K9A1626
X	3100	144	26	1436	7.08	DNCFM3K1A1446
210	3300	126	24	1538	7.35	DNCFM3K3A1266
	3500	112	22	1629	7.59	DNCFM3K5A1126
	3700	100	20	1719	7.83	DNCFM3K7A0107
	3900	88	18	1832	8.1	DNCFM3K9A0886

	Vn (V)	C (µF)	Imax (A)	Vr max (V)	Rs (mΩ)	Part Number
Type B	1200 → 1400	975	84	678	2.6	DNCFM1K4B9756
	1800	639	69	837	3.17	DNCFM1K8B6396
166	2000	507	60	939	3.49	DNCFM2K0B5076
	2200	432	54	1018	3.71	DNCFM2K2B4326
X	2400	342	48	1142	4.03	DNCFM2K4B3426
102	2600	288	45	1244	4.77	DNCFM2K6B2886
	2900	243	42	1357	5	DNCFM2K9B2436
X	3100	216	39	1436	5.16	DNCFM3K1B2166
210	3300	189	36	1538	5.34	DNCFM3K3B1896
	3500	168	33	1629	5.51	DNCFM3K5B1686
	3700	150	30	1719	5.67	DNCFM3K7B0157
	3900	132	27	1832	5.98	DNCFM3K9B1326

	Vn (V)	C (µF)	Imax (A)	Vr max (V)	Rs (mΩ)	Part Number
Type C	1200 → 1400	1300	112	678	1.99	DNCFM1K4C1307
	1800	852	92	837	2.43	DNCFM1K8C8526
166	2000	676	80	939	2.83	DNCFM2K0C6766
	2200	576	72	1018	3	DNCFM2K2C5766
X	2400	456	64	1142	3.24	DNCFM2K4C4566
134	2600	384	60	1244	3.41	DNCFM2K6C3846
	2900	324	56	1357	3.58	DNCFM2K9C3246
X	3100	288	52	1436	3.71	DNCFM3K1C2886
210	3300	252	48	1538	3.84	DNCFM3K3C2526
	3500	224	44	1629	4.47	DNCFM3K5C2246
	3700	200	40	1719	4.59	DNCFM3K7C0207
	3900	176	36	1832	4.72	DNCFM3K9C1766

	Vn (V)	C (µF)	Imax (A)	Vr max (V)	Rs (mΩ)	Part Number
Type D	1200 → 1400	1620	140	678	1.74	DNCFM1K4D1627
	1800	1060	115	837	2.09	DNCFM1K8D1067
166	2000	845	100	939	2.28	DNCFM2K0D8456
	2200	720	90	1018	2.41	DNCFM2K2D0727
X	2400	570	80	1142	2.77	DNCFM2K4D0577
166	2600	480	75	1244	2.91	DNCFM2K6D0487
X	2900	405	70	1357	3.05	DNCFM2K9D4056
	3100	360	65	1436	3.15	DNCFM3K1D0367
210	3300	315	60	1538	3.25	DNCFM3K3D3156
	3500	280	55	1629	3.35	DNCFM3K5D0287
	3700	250	50	1719	3.45	DNCFM3K7D0257
	3900	220	45	1832	4.06	DNCFM3K9D0227

millimeters (inches)



Terminals:	Creepage distance	77 (3.031)
	Air distance	40 (1.575)

Type	a	b	c	d	Weight (kg)
A	70 (2.756)	85 (3.346)	50 (1.969)	10 (0.394)	4.5
B	102 (4.016)	117 (4.606)	50 (1.969)	10 (0.394)	6
C	134 (5.276)	149 (5.866)	100 (3.937)	20 (0.787)	7.5
D	166 (6.535)	181 (7.126)	100 (3.937)	20 (0.787)	9

V_N DETERMINATION

The design is based upon the operating voltage V_w

$$V_w = V + V_r/2$$

where

$$V_r = \sqrt{2} \times I_{rms} / (\pi f C_n)$$

According to the tables of values, you should find a capacitor with required capacitance C_n and voltage V_n (provided that $V_n \geq V_w$).

You must also verify that the working current and the ripple voltage can be accepted by the capacitor.

THERMAL DESIGN

Total losses are calculated as follows:

$P = I_{rms}^2 (tg\delta_0/C_n 2\pi f + R_s)$

($tg\delta_0 = 3 \times 10^{-4}$ represents the dielectric losses of the polypropylene + rapeseed oil)

Calculate the hot-spot temperature:

$\theta_{HS} = \theta_{amb} + R_{th}P$

(Rth is the thermal resistance between hot-spot and ambient) (see the table value below)

Hot-spot temperature must be below 75°C.
If hot-spot temperature is higher, then chose another type and start again the calculation.

	Rth (°C/W)
Type A	1.44
Type B	1.24
Type C	1.08
Type D	0.96

Example:

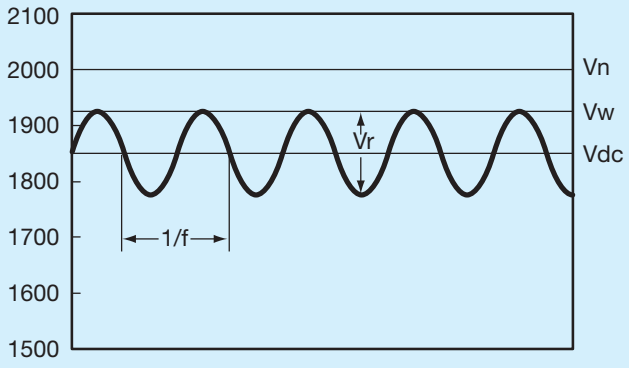
You need:

C = 500 µF
DC voltage = 1850 V
f = 300 Hz
I_{rms} = 50 A
θ_{amb} = 50°C

According to data:

V_r = 150 V peak-to-peak
V_w = 1850 + 150/2 = 1925 V

⇒ capacitor type B
V_n = 2000 V
C = 507µF
$I_{rms} < I_{max}$
$V_r \leq V_{max}$



Thermal Calculation:

Total losses

$P = 50^2 x(3x10^{-4}/(507x10^{-6}x2\pi x300)+3.49x10^{-3})$
$= 9.5W$

The hot-spot temperature in this example is therefore:

$\theta_{HS} = 50+1.24x9.5 = 61.8°C$
$\theta_{HS} < 75°C$

⇒ **Part number DNCFM2K0B5076**