

# Metallized Polypropylene Film DC-Link Capacitors

## FDB Series - 500 ~ 1100VDC (Cylindrical Plastic Case)



### Overview

The FDB capacitor is constructed of metallized polypropylene film in cylindrical plastic case and filled with epoxy resin.

### Applications

Widely used in DC Link, high performance DC filtering, motor drive systems, welder, elevator, EV/HEV.

### Features

- Self-healing
- Low inductance
- High capacitance density
- Low ESR and high ripple current handling capability
- Long lifetime and can replace bank of series-connected electrolytic capacitors

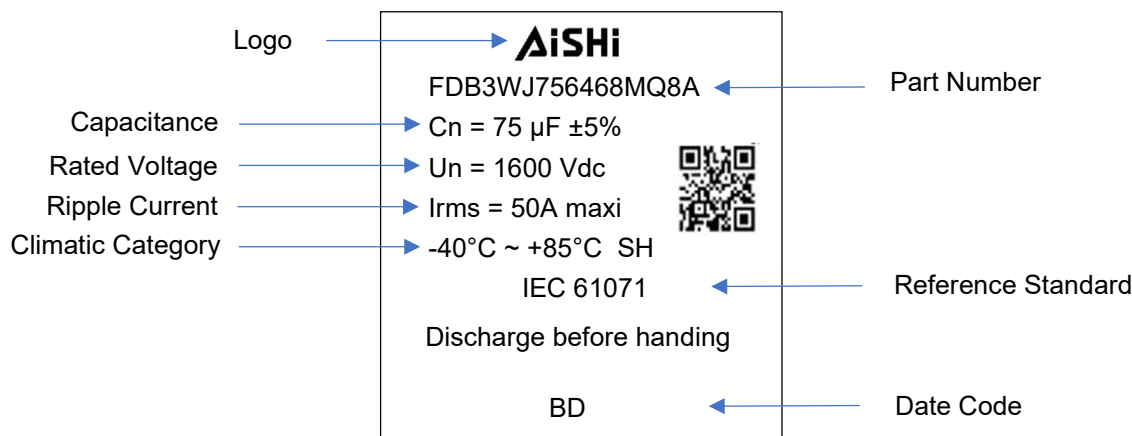


### Qualification

Reference Standard	IEC 61071
Climate Category	40/85/56 IEC 60068-1



### Marking



### Manufacturing Date Code

Year	Code	Month	Code
2018	A	Jan	1
2019	B	Feb	2
2020	C	Mar	3
2021	D	Apr	4
2022	E	May	5
2023	F	Jun	6

Year	Code	Month	Code
2024	G	Jul	7
2025	H	Aug	8
2026	J	Sep	9
2027	K	Oct	A
2028	L	Nov	N
2029	M	Dec	D

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### Part Number System

F	DB	3W	J	756	468	MQ8	A
Capacitor Type	Series	Voltage (VDC)	Tolerance	Capacitance (pF)	Size Code	Terminal Code	Terminal Length Code
F = Film	DC Link, Cylindrical Plastic Case, Metallized PP Film	500=2H 600=2K 800=2N 1000=3K 1100=3M	J = ±5% K = ±10%	First two digits = significant figures. Third digit = Number of zeros.	Refer to Size Code Table	Refer to Terminal Code Table	Refer to Terminal Length Code Table

### Size Code Table

Digit One Case Diameter: D		Digit Two and Three Case Height: H	
85mm	4	40mm	40
		51mm	51
		64mm	64
		76mm	76

### Terminal Code

Digit One (Lead/Terminal Type)		Digit Two (Terminal Space)	Digit Three (Terminal Size)		
Male Terminal	M	45.0mm	Q	M5	5
Female Terminal	F	N/A	N	M6	6
				M8	8

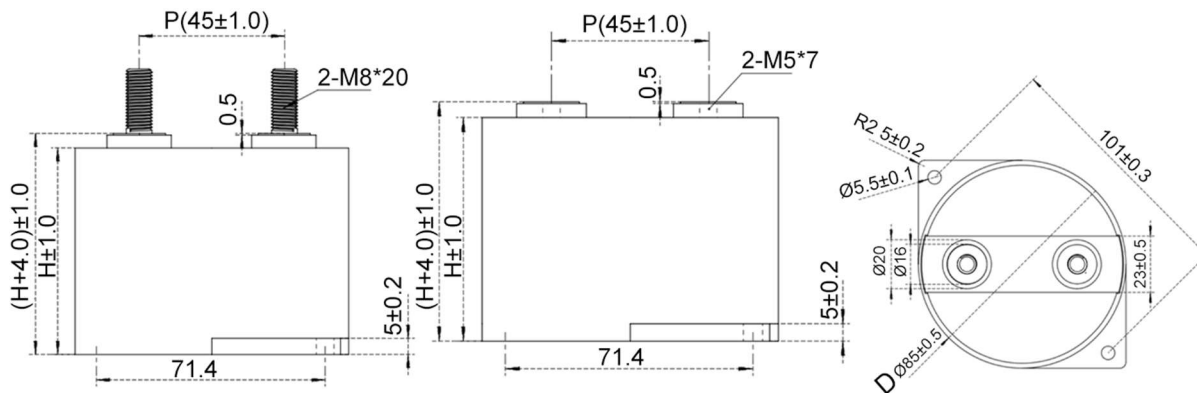
### Terminal Length Code

Terminal Length	
5mm	5
6mm	6
7mm	7
20mm	A
N/A	N

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### Outline Drawing (mm)



### Rating and Part Number

#### Male Terminal

Vdc	Cap Value µF	Dimensions			I <sub>rms</sub> 10KHz A (50°C)	Peak Current A	Surge Current A	ESR 1KHz mΩ	ESL nH	Thermal Res °C/W	dv/dt V/us	Pkg Qty pcs	Part Number
		D mm	H mm	P mm									
500	150	85	40	45	65	5,250	15,750	1.8	25	4.3	35	8	FDB2HK157440MQ8A
500	220	85	51	45	65	5,500	16,500	1.8	40	4.8	25	8	FDB2HK227451MQ8A
500	280	85	64	45	70	5,600	16,800	1.6	40	5.4	20	8	FDB2HK287464MQ8A
600	100	85	40	45	70	3,500	10,500	1.5	25	5.0	35	8	FDB2KK107440MQ8A
600	150	85	51	45	80	3,750	11,250	1.4	30	6.5	25	8	FDB2KK157451MQ8A
600	220	85	64	45	90	4,400	13,200	1.5	40	4.5	20	8	FDB2KK227464MQ8A
800	66	85	40	45	70	2,310	6,930	2.0	25	5.0	35	8	FDB2NK666440MQ8A
800	100	85	51	45	75	2,500	7,500	1.8	30	5.0	25	8	FDB2NK107451MQ8A
800	140	85	64	45	80	2,800	8,400	1.6	40	8.4	20	8	FDB2NK147464MQ8A
800	220	85	64	45	100	4,400	13,200	1.4	40	4.8	20	8	FDB2NK227464MQ8A
1000	66	85	40	45	70	2,310	6,930	1.0	25	4.2	35	8	FDB3KK666440MQ8A
1000	120	85	51	45	85	3,000	9,000	2.2	30	5.2	25	8	FDB3KK127451MQ8A
1000	140	85	64	45	100	2,800	8,400	1.5	40	3.1	20	8	FDB3KK147464MQ8A
1100	50	85	40	45	55	1,750	5,250	2.4	30	4.5	35	8	FDB3MK506440MQ8A
1100	100	85	51	45	55	2,500	7,500	2.0	30	4.5	25	8	FDB3MK107451MQ8A

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## FDB Series - 500 ~ 1100VDC (Cylindrical Plastic Case)



### Rating and Part Number


#### Female Terminal

Vdc	Cap Value μF	Dimensions			Irms 10KHz A (50°C)	Peak Current A	Surge Current A	ESR 1KHz mΩ	ESL nH	Thermal Res °C/W	dv/dt V/us	Pkg Qty pcs	Part Number
		D	H	P									
		mm	mm	mm									
500	150	85	40	45	65.0	5,250	15,750	1.8	25	4.3	35	8	FDB2HK157440FQ55
500	220	85	51	45	65.0	5,500	16,500	1.8	40	4.8	25	8	FDB2HK227451FQ55
500	280	85	64	45	70.0	5,600	16,800	1.6	40	5.4	20	8	FDB2HK287464FQ55
600	100	85	40	45	70.0	3,500	10,500	1.5	25	5.0	35	8	FDB2KK107440FQ55
600	150	85	51	45	80.0	3,750	11,250	1.4	30	6.5	25	8	FDB2KK157451FQ55
600	220	85	64	45	90.0	4,400	13,200	1.5	40	4.5	20	8	FDB2KK227464FQ55
800	66	85	40	45	70.0	2,310	6,930	2.0	25	5.0	35	8	FDB2NK666440FQ55
800	100	85	51	45	75.0	2,500	7,500	1.8	30	5.0	25	8	FDB2NK107451FQ55
800	140	85	64	45	80.0	2,800	8,400	1.6	40	8.4	20	8	FDB2NK147464FQ55
800	220	85	64	45	100.0	4,400	13,200	1.4	40	4.8	20	8	FDB2NK227464FQ55
1000	66	85	40	45	70.0	2,310	6,930	1.0	25	4.2	35	8	FDB3KK666440FQ55
1000	120	85	51	45	85.0	3,000	9,000	2.2	30	5.2	25	8	FDB3KK127451FQ55
1000	140	85	64	45	100.0	2,800	8,400	1.5	40	3.1	20	8	FDB3KK147464FQ55
1100	50	85	40	45	55.0	1,750	5,250	2.4	30	4.5	35	8	FDB3MK506440FQ55
1100	100	85	51	45	55.0	2,500	7,500	2.0	30	4.5	25	8	FDB3MK107451FQ55

**General Technical Data**

Applications	DC Link / DC Filtering
Dielectric	Metallized Polypropylene Film
Reference Standard	IEC 61071
Climatic Category	40/85/56 IEC 60068-1
Rated Temperature T <sub>R</sub>	+85°C
Operating Temperature Range	-40°C ~ +85°C
Storage Temperature	-40°C ~ +85°C
Storage Conditions	Storage time: ≤24 months from the date marked on the label package. Temperature and relative humidity should be -10°C ~ +40°C and not more than 75%RH. RH ≤85% for 30 days randomly distributed throughout the year.
Storage Life	Product that passed less than 2 years from production, No need reconfirmation
RoHS Compliance	Compliant with the restricted substance requirement of Directive 2011/65/EU
Maximum Torque (Nm)	M5 = 4.5 M8 = 8.5

**Constructions**

Metallized Film	OPP & Al/Zn
Metal Sprayed	Zn
Connection Stripe	Tinned copper
Case	Cylindrical Plastic case (UL 94-V0)
Filling	Epoxy resin, flame retardant UL 94 V0
Terminal	Tinned brass
Film Construction	Mono Structure 

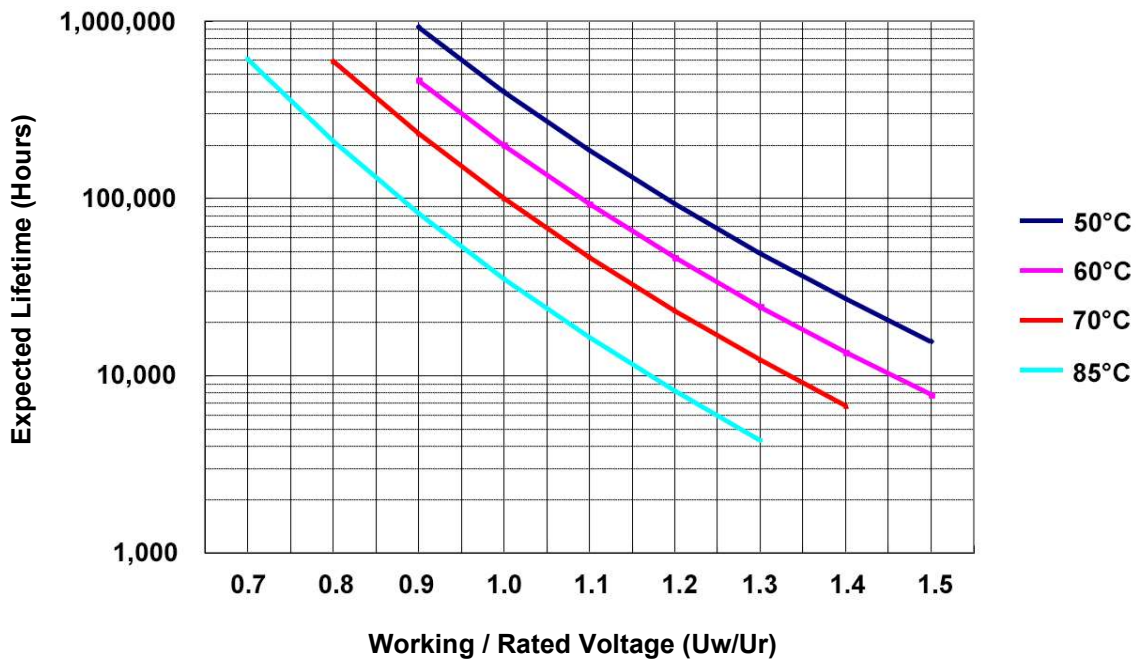
**Electrical Characteristics**

Voltage Range	500Vdc ~ 1100Vdc
Capacitance Range	50 $\mu$ F ~ 280 $\mu$ F
Capacitance Tolerance	$\pm$ 5% or $\pm$ 10% at +25°C
Capacitance	Measuring Frequency at 1kHz Measuring Voltage: $1\pm 0.2$ V
Standard Atmospheric Conditions for Static Test	<p><b>Ambient temperature</b> 15°C to 35°C (If there is any doubt on the results, the measurements shall be made at +20 +/- 5°C)</p> <p><b>Relative humidity</b> 45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70 %.)</p> <p><b>Air pressure</b> 86 kPa to 106 kPa.</p>
Visual examination, Marking (Non-Destructive)	Appearance: no remarkable abnormality
Voltage Between Terminals $U_{TT}$	1.5 x $V_R$ VDC for 10 seconds
Voltage Between Terminals and Case $U_{TC}$	4000V <sub>AC</sub> 50/60Hz 10 seconds
Dissipation factor	$\leq$ 0.0020 at 1KHz
Insulation Resistance	$IR \times C \geq 10,000$ s at 100VDC 1minute at +25°C
Hot-Spot	$\leq 85^\circ$ C
Life Expectancy	$\geq 100,000$ hours at rated voltage and Hot-Spot Temperature $T=+70^\circ$ C
Failure Rate	$\leq 100$ FIT
Max. Altitude	4000m, when above 2000m current derating as per 1.35%/100m
<b>Overvoltage</b>	<b>Maximum duration within one day</b>
Apply 110% of rated voltage	30% of on-load duration
Apply 115% of rated voltage	30 mins
Apply 120% of rated voltage	5 mins
Apply 130% of rated voltage	1 min
Apply 150% of rated voltage	30 ms every time, 100 ms/day

**Environmental Test**

High Temperature Loading	<p><b>Test Conditions:</b>                  Testing method per IEC 61071                  Test Temperature: +85 +/-2 °C.                  Apply 130% of rated voltage for 1,000 +24/-0 hours.                  Duration: 500 hours                  1000 charges and discharges                  At 1.3 x I peak (maximum respective peak current in continuous operation)                  Duration: 500 hours</p> <p><b>Performance:</b>                  Capacitance Change Rate (<math>\Delta C/C</math>): <math>\leq \pm 3\%</math>                  Insulation Resistance: <math>\geq 50\%</math> of initial limit</p>
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**Expected Life Curve**



**Packaging Information**

Capacitors are well protected by foams. And then are packaged in the cartons.

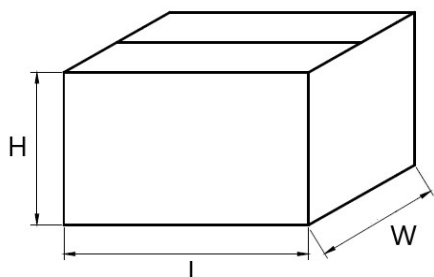


Table 1 carton dimensions

Carton No.	L (mm)	W (mm)	H (mm)
1	375	285	235
2	375	285	300
3	375	285	330
4	375	285	365
5	375	285	265

Every carton contains capacitors as per the following Table 2.

Table 2 Capacitor quantity of each carton

Capacitor Diameter (mm)	Quantity (pcs)
85	24



### Cautions and Warnings

- Don't exceed the upper category temperature.
- For longtime storage, maximum relative humidity 80%, no dew allowed on the capacitor.
- Do not use or store capacitor in corrosive atmosphere, in the dusty environment's regular maintenance and cleaning especially of the terminals is required to avoid conductive path between terminal / or terminal and ground.
- Don't apply any mechanical stress to the capacitor terminals, and avoid any compressive, tensile or flexural stress.
- Avoid overload of the capacitors
- Do not have unlimited service life expectancy, the max service life expectancy may vary depending on the application the capacitor is used in.

### Disclaimer

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