

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

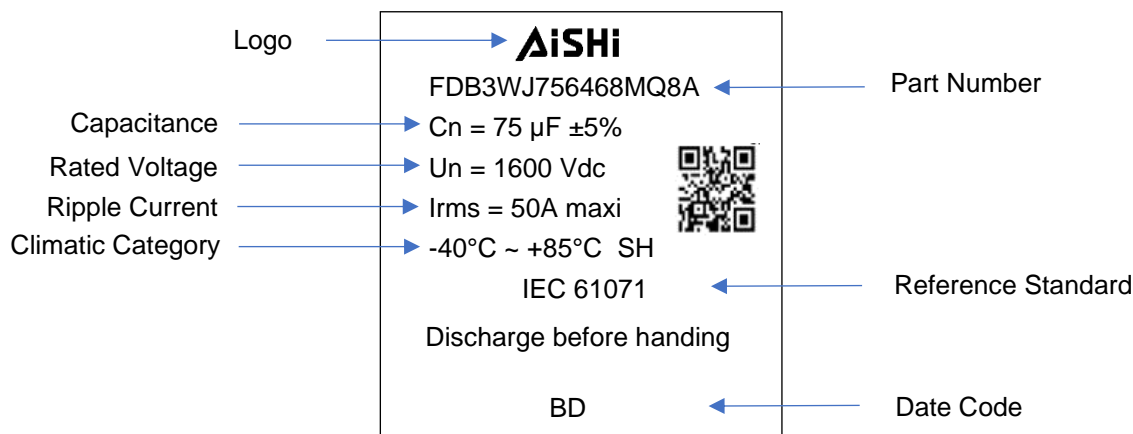


Qualification

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

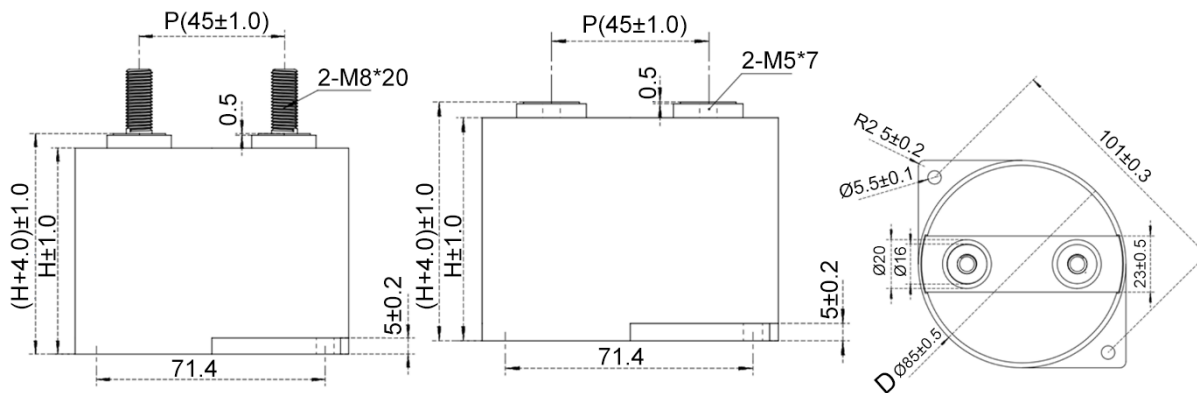
Terminal Length Code

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 _{rms} 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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Rating and Part Number


Female Terminal

Vdc	Cap Value μF	Dimensions			I _{rms} 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 _R	+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 

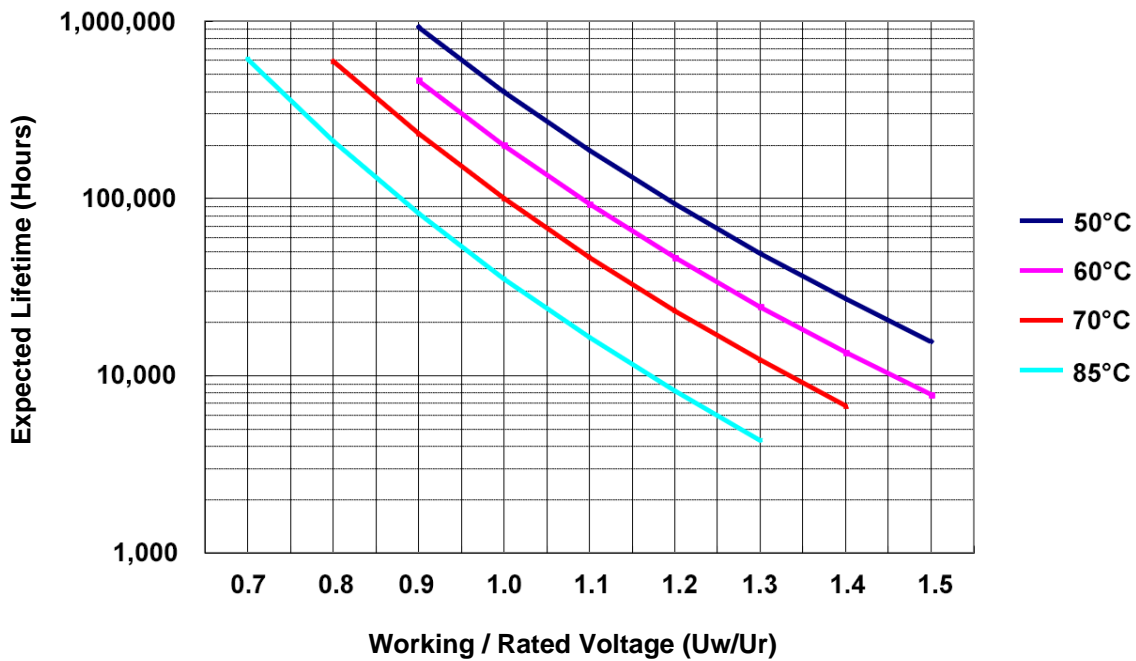
Electrical Characteristics

Voltage Range	500Vdc ~ 1100Vdc
Capacitance Range	50 μ F ~ 280 μ F
Capacitance Tolerance	\pm 5% or \pm 10% at +25°C
Capacitance	Measuring Frequency at 1kHz Measuring Voltage: 1 ± 0.2 V
Standard Atmospheric Conditions for Static Test	Ambient temperature 15°C to 35°C (If there is any doubt on the results, the measurements shall be made at +20 +/- 5°C) Relative humidity 45% to 75% (If there is any doubt on the results, the measurements shall be made at 60% to 70 %.) Air pressure 86 kPa to 106 kPa.
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 _{AC} 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	≤ 100 FIT
Max. Altitude	4000m, when above 2000m current derating as per 1.35%/100m
Overvoltage	Maximum duration within one day
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>Test Conditions: 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>Performance: Capacitance Change Rate ($\Delta C/C$): $\leq \pm 3\%$ Insulation Resistance: $\geq 50\%$ 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.

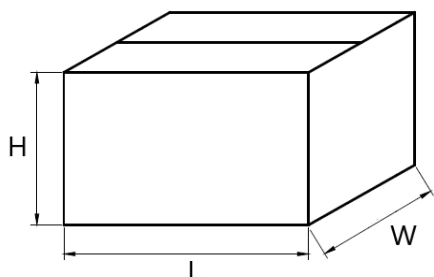


Table 1 carton dimensions

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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