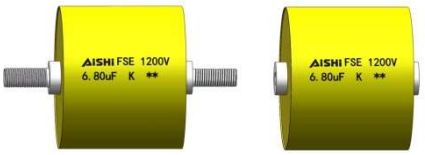
Double Metallized Polypropylene Film Snubber Capacitors
FSE Series - 1000 ~ 3000VDC (Axial Type with Stud)

Overview
The FSE Series is a polypropylene metallized film and double-sided metallized film with flam retardation plastic case or polyester tape wrapping filled with resin and terminals.

Applications
Widely used in high voltage, high frequency and pulse circuit and IGBT protection.

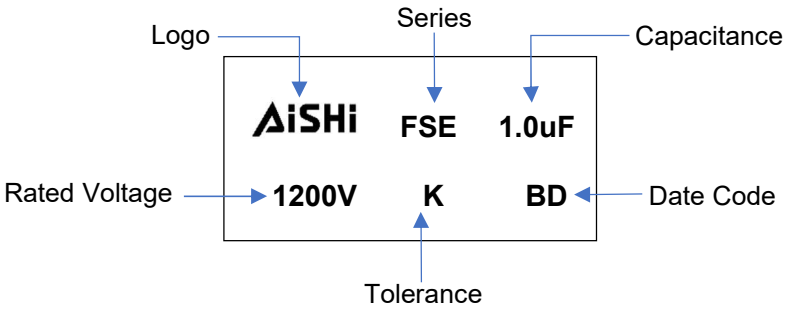
Features
- High ripple current
- Self-healing property
- Low losses
- Small inherent temperature rise
- High contact reliability
- Suitable for high frequency applications



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

Part Number System

F	SE	3B	K	105	037	FN6	5
Capacitor Type	Series	Voltage (VDC)	Tolerance	Capacitance (pF)	Size Code (L)	Terminal Code	Lead Length Code
F = Film	Snubber, GTO Type, Metallized PP Film	1000=3K 1200=3B 2000=3D 3000=3F	J = ±5% K = ±10%	First two digits = significant figures. Third digit = Number of zeros.	37mm=037 40mm=040 50mm=050 64mm=064	Refer to Terminal Code Table	Refer to Lead Length Code Table

Terminal Code

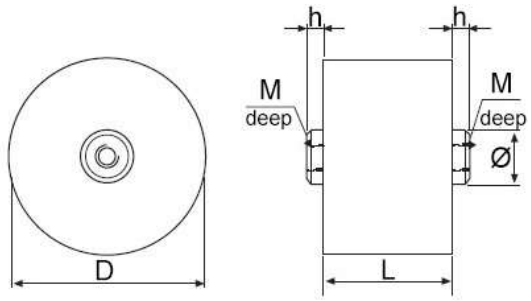
Digit One (Lead/Terminal Type)		Digit Two (Lead Space)		Digit Three (Terminal Size)	
Male terminal	M	NA	N	M5*8	5
Female terminal	F			M6*8	6
				M8*8	8
				M10*8	H
				M12*8	J

Lead Length Code

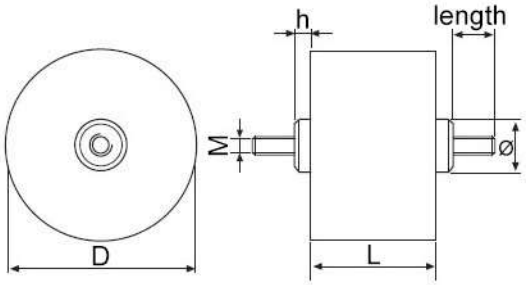
Lead Length
5mm=5
20mm=20

Dimension (mm)

Thread hole type



Bolt type



Rating and Part Number

Vdc	Cap Value μF	Dimensions D mm max	Dimensions L mm max	Irms 100KHz 70°C A	Peak Current A	$ESR_{Typical}$ 100KHZ mΩ	Rth k/W	dv/dt V/us	Output	Part Number
1000	1.5	45.0	37.0	43.0	825.0	1.0	11.0	550	M6*8	FSE3KK155037FN65
1000	3	56.0	40.0	55.0	1,500.0	0.8	7.4	500	M6*8	FSE3KK305040FN65
1000	4	65.0	40.0	65.0	2,000.0	0.8	6.0	500	M6*8	FSE3KK405040FN65
1000	5	72.0	40.0	70.0	2,500.0	0.7	5.0	500	M8*8	FSE3KK505040FN85
1000	6	78.0	40.0	80.0	3,000.0	0.7	4.5	500	M8*8	FSE3KK605040FN85
1000	7	84.0	40.0	85.0	3,500.0	0.6	4.0	500	M8*8	FSE3KK705040FN85
1000	8	75.0	50.0	85.0	3,600.0	0.6	4.0	450	M8*8	FSE3KK805050FN85
1000	10	86.0	50.0	88.0	4,500.0	0.7	3.5	450	M8*8	FSE3KK106050FN85
1000	12	86.0	50.0	95.0	5,400.0	0.7	3.5	450	M8*8	FSE3KK126050FN85
1200	1	45.0	37.0	40.0	700.0	1.2	11.5	700	M6*8	FSE3BK105037FN65
1200	2	52.0	40.0	45.0	1,200.0	1.0	8.5	600	M6*8	FSE3BK205040FN65
1200	3	62.0	40.0	60.0	1,800.0	0.8	6.5	600	M6*8	FSE3BK305040FN65
1200	4	72.0	40.0	70.0	2,400.0	0.7	5.0	600	M8*8	FSE3BK405040FN85
1200	5	80.0	40.0	80.0	3,000.0	0.7	4.5	600	M8*8	FSE3BK505040FN85
1200	6	86.0	40.0	85.0	3,600.0	0.7	4.0	600	M8*8	FSE3BK605040FN85
1200	8	86.0	50.0	90.0	4,000.0	0.7	3.8	500	M8*8	FSE3BK805050FN85
1200	10	86.0	50.0	95.0	5,000.0	0.7	3.5	500	M8*8	FSE3BK106050FN85
2000	0.5	45.0	37.0	35.0	600.0	1.5	12.0	1,200	M6*8	FSE3DK504037FN65
2000	1	56.0	40.0	50.0	1,200.0	1.2	7.5	1,200	M6*8	FSE3DK105040FN65
2000	1.5	68.0	40.0	60.0	1,800.0	1.0	5.5	1,200	M6*8	FSE3DK155040FN65
2000	2	78.0	40.0	75.0	2,400.0	0.9	4.5	1,200	M8*8	FSE3DK205040FN85
2000	2.5	88.0	40.0	80.0	3,000.0	0.8	4.0	1,200	M8*8	FSE3DK255040FN85
2000	3	82.0	50.0	80.0	2,550.0	0.8	4.0	850	M8*8	FSE3DK305050FN85
2000	4	86.0	50.0	85.0	3,400.0	0.8	3.5	850	M8*8	FSE3DK405050FN85
3000	0.68	50.0	50.0	35.0	816.0	2.5	12.0	1,200	M6*8	FSE3FK684037FN65
3000	0.75	52.0	50.0	45.0	900.0	2.0	7.5	1,200	M6*8	FSE3FK754050FN65
3000	1	60.0	50.0	50.0	1,200.0	1.5	5.5	1,200	M6*8	FSE3FK105050FN65
3000	1.2	67.0	50.0	60.0	1,440.0	1.4	4.5	1,200	M8*8	FSE3FK125050FN85
3000	1.5	73.0	50.0	65.0	1,800.0	1.2	4.0	1,200	M8*8	FSE3FK155050FN85
3000	2	85.0	50.0	70.0	2,400.0	1.0	4.0	1,200	M8*8	FSE3FK205050FN85
3000	2.5	93.0	50.0	85.0	3,000.0	0.9	3.5	1,200	M8*8	FSE3FK255050FN85
3000	0.68	38.0	64.0	30.0	578.0	4.0	14.5	850	M6*8	FSE3FK684064FN85
3000	1	45.0	64.0	40.0	850.0	3.0	8.5	850	M6*8	FSE3FK105064FN85
3000	1.5	55.0	64.0	55.0	1,275.0	2.0	6.5	850	M6*8	FSE3FK155064FN85
3000	2	63.0	64.0	60.0	1,700.0	1.5	5.5	850	M8*8	FSE3FK205064FN85
3000	2.5	70.0	64.0	70.0	2,125.0	1.4	5.0	850	M8*8	FSE3FK255064FN85
3000	3	76.0	64.0	85.0	2,550.0	1.2	4.0	850	M8*8	FSE3FK305064FN85

General Technical Data

Applications	High voltage, high frequency and pulse circuit / IGBT Modules Protection
Dielectric	Double Metallized Polypropylene Film
Reference Standard	IEC 61071
Climatic Category	40/85/56 IEC 60068-1
Operating Temperature Range	-40°C ~ +105°C (+85°C observing voltage must be de-rating at 1.35% per °C)
Protection	Polyester wrapping with epoxy resin fill
Installation	Any position
Packaging	Packed in cardboard boxes with protection for the terminals
Storage Conditions	Storage time: ≤24months from the date marked on the label package Average relative humidity per year ≤70% RH≤85% for 30 days randomly distributed throughout the year Dew is absent Temperature: -40°C ~ +85°C
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
Application note and limiting conditions	These capacitors are designed only for DC voltage so should not be used for AC line. The continuous peak voltage shall not exceed the rated DC voltage rating

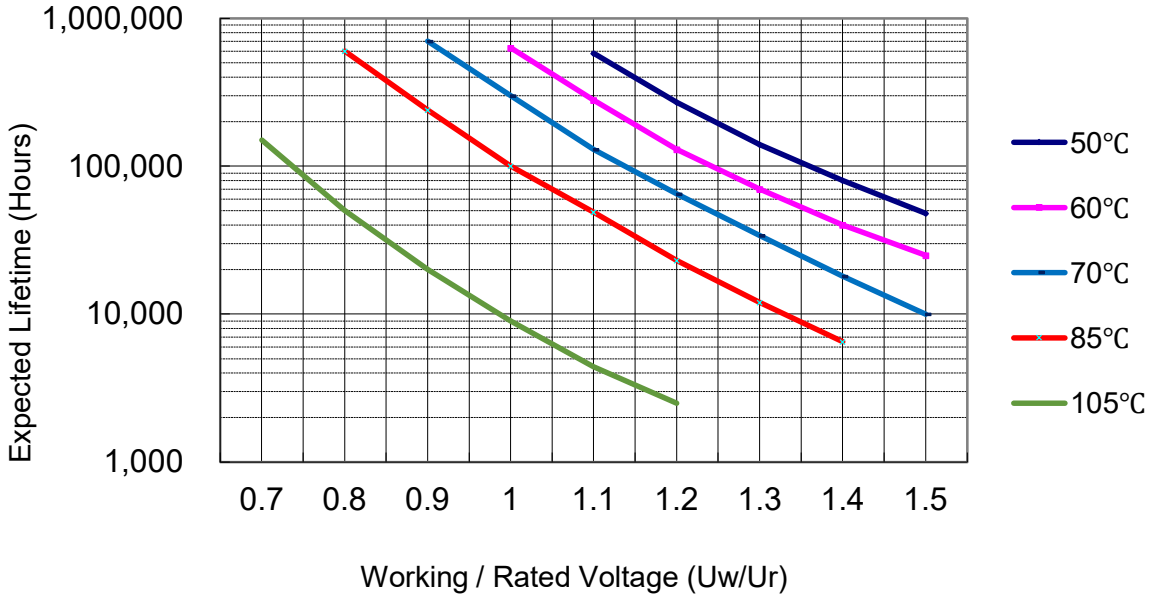
Construction

Metallized Film	OPP & Al (Single Side Metallized and Double Sided Metallized)
Metal Sprayed	Sn/Zn Alloy
Terminal	Tinned brass
Case \ Wrap	Plastic case or Wrap of Polyester Film
Filling	Epoxy Resin (UL94V-0)
Film Construction	Internal Series Connection 

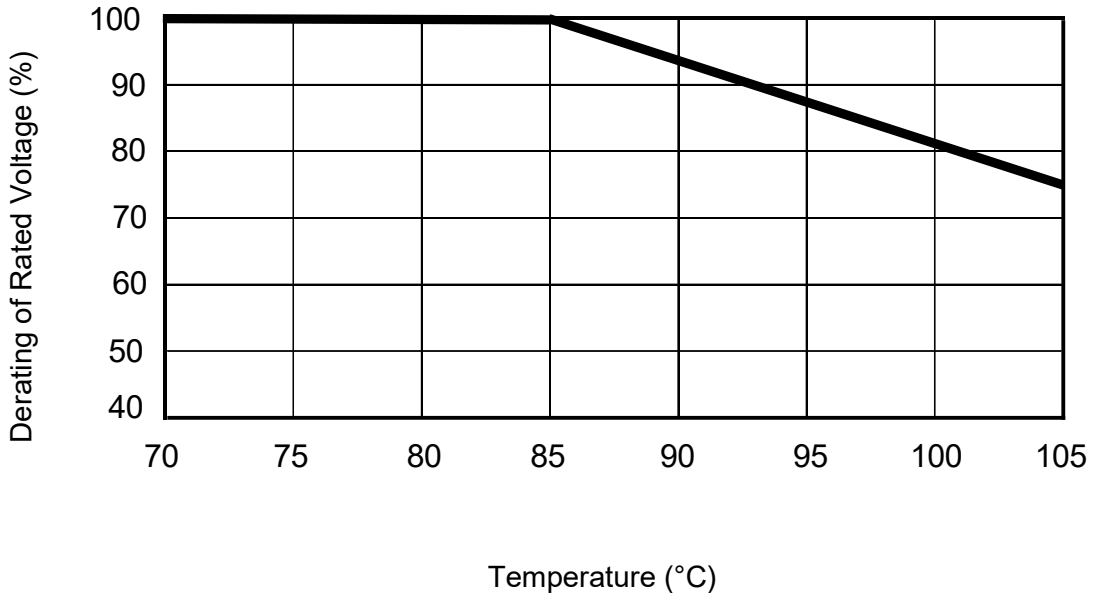
Electrical Characteristics

Voltage Range	1000Vdc ~ 3000Vdc
Capacitance Range	0.5μF ~ 12.0μF
Capacitance Tolerance	±5% or ±10% at +25°C
Capacitance	Measuring Frequency at 1kHZ Measuring Voltage:1±0.2V
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.
Voltage Between Terminals U_{TT}	1.5 x V_R VDC for 10 seconds (between terminations) @ +25°C ±5°C
Voltage Between Terminals and Case U_{TC}	3000VAC, 60s（at+20+/-2°C）
Dielectric Dissipation Factor Tgδ 0	≤2×10^{-4}
Dissipation factor	0.0010（0.1%） at 25°C，1KHz
Insulation Resistance	R between leads, for C ≤ 0.33 μF at 100 V; 1 min > 100 000 MΩ RC between leads, for C > 0.33 μF at 100 V; 1 min > 30 000 s
Self-Inductance	<1nH per mm of lead spacing
Hot-Spot	≤85°C
Life Expectancy	100,000 hours (U_R，Θhotspot=85°C)
Failure Rate	100 Fit
Max. Altitude	2000 m
Overvoltage Apply 110% of rated voltage Apply 115% of rated voltage Apply 120% of rated voltage Apply 130% of rated voltage	**Maximum duration within one day** 30% of on-load duration 30 mins 5 mins 1 min
Application note and limiting conditions	These capacitors are designed only for DC voltage so should not be used for AC line The continuous peak voltage shall not exceed the rated DC voltage rating

Expected Life Curve

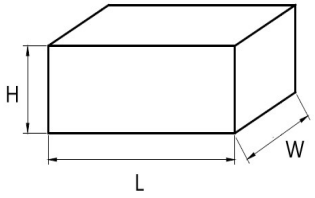


Derating of Rated Voltage Vs Temperature

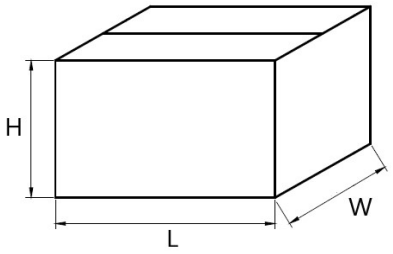


Packaging Information

Inner Box Specifications (Dimensions)			
Box #	L ±3mm	W±3mm	H ±3mm
# 1	331	331	25
# 2	331	331	35
# 3	331	331	50
# 4	331	331	80
# 5	350	170	35
# 6	350	170	50
# 7	350	170	80



Outer Box Specifications (Dimensions)			
Box #	L ±5mm	W±5mm	H ±5mm
# 1	350	340	265
# 2	370	360	265



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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