THE DATASHEET OF

SFJEL3000474MX1

Filter Type
SFJE

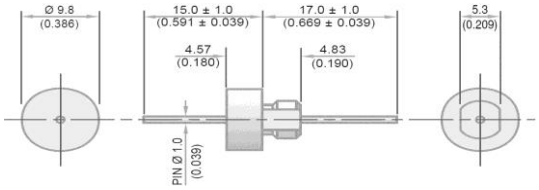
Feedthrough EMI Filter Datasheet

(¼-28 UNF Thread : 9.8mm Round Head)

Not Recommended for New Designs – Refer to SFJG Range for Replacement

Circuit Configurations Available

Dimensions mm (inches)



¼-28 UNF Class 2A Thread

Electrical Details	
Electrical Configuration	See Circuit Configuration
Capacitance Measurement	@ 1000hr Point
Current Rating	15A
Insulation Resistance (IR)	10GΩ or 1000ΩF
Temperature Rating	-55°C to +125°C
Ferrite Inductance (Typical)	Not Applicable
Mechanical Details	
Head Diameter	9.8mm *(0.386")*
Nut A/F	7.92mm *(0.312")*
Washer Diameter	11.35mm *(0.447")*
Mounting Torque	0.9Nm *(7.97lbf in)* max.
Mounting Hole Diameter	 6.7mm O.D., 5.5mm A/F *(0.264" O.D., 0.217" A/F)*
Max. Panel Thickness	2.3mm *(0.091")*
Weight (Typical)	3.0g *(0.11oz)*
Finish	Silver plate on copper undercoat

C Configuration

Ferrite Inductance (Typical) - 50nH						Typical Insertion Loss (db)					
Product Code	Hardware (Nuts & Washers etc.)	Capacitance ± 20%	Dielectric	Rated Voltage (dc)	DWV (dc)	0.01MHz	0.1MHz	1MHz	10MHz	100MHz	1GHz
SFJEC3K00101MC	0 = No hardware supplied 1 = supplied with standard nut and wavy washer Other options available – please contact factory	100pF	C0G	3kV#	3.6kV					4	22
SFJEC3K00151MC		150pF	C0G	3kV#	3.6kV					7	25
SFJEC3K00221MC		220pF	C0G	3kV#	3.6kV					10	29
SFJEC2K00331MC		330pF	C0G	2kV#	2.4kV					13	33
SFJEC2K00471MC		470pF	C0G	2kV#	2.4kV				1	16	35
SFJEC2K00681MC		680pF	C0G	2kV#	2.4kV				2	19	39
SFJEC2K00102MC		1.0nF	C0G	2kV#	2.4kV				4	23	41
SFJEC2K00152MX		1.5nF	X7R	2kV#	2.4kV				7	26	45
SFJEC2K00222MX		2.2nF	X7R	2kV#	2.4kV				10	30	50
SFJEC2K00332MX		3.3nF	X7R	2kV#	2.4kV				13	33	52
SFJEC2K00472MX		4.7nF	X7R	2kV#	2.4kV			1	16	36	55
SFJEC2K00682MX		6.8nF	X7R	2kV#	2.4kV			2	19	39	57
SFJEC2K00103MX		10nF	X7R	2kV#	2.4kV			4	22	41	60
SFJEC1K00153MX		15nF	X7R	1kV#	1.2kV			7	25	44	62
SFJEC1K00223MX		22nF	X7R	1kV#	1.2kV			10	29	46	65
SFJEC1K00333MX		33nF	X7R	1kV#	1.2kV			13	33	48	68
SFJEC1K00473MX		47nF	X7R	1kV#	1.2kV		1	16	35	50	70
SFJEC1K00683MX		68nF	X7R	1kV#	1.2kV		2	19	39	54	>70
SFJEC5000104MX		100nF	X7R	500#	750		4	22	41	57	>70
SFJEC5000154MX		150nF	X7R	500#	750		7	25	45	60	>70
SFJEC5000224MX		220nF	X7R	500#	750		10	29	49	62	>70
SFJEC5000334MX		330nF	X7R	500#	750		13	33	52	66	>70
SFJEC5000474MX		470nF	X7R	500	750	1	16	35	55	68	>70
SFJEC3000684MX		680nF	X7R	300	600	2	19	38	58	70	>70
SFJEC2000105MX		1.0µF	X7R	200	500	4	22	41	61	>70	>70
SFJEC1000155MX		1.5µF	X7R	100	250	7	25	45	64	>70	>70
SFJEC1000225MX		2.2µF	X7R	100	250	10	29	48	66	>70	>70
SFJEC0500335MX		3.3µF	X7R	50	125	14	34	52	70	>70	>70

- Also rated for operation at 115Vac 400Hz. Self-heating will occur – evaluation in situ recommended

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L-C Configuration

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SFJEL3K00221MC		220pF	C0G	3kV#	3.6kV					12	30
SFJEL2K00331MC		330pF	C0G	2kV#	2.4kV				1	16	34
SFJEL2K00471MC		470pF	C0G	2kV#	2.4kV				2	19	38
SFJEL2K00681MC		680pF	C0G	2kV#	2.4kV				3	22	41
SFJEL2K00102MC		1.0nF	C0G	2kV#	2.4kV				6	25	44
SFJEL2K00152MX		1.5nF	X7R	2kV#	2.4kV				9	29	48
SFJEL2K00222MX		2.2nF	X7R	2kV#	2.4kV				12	31	51
SFJEL2K00332MX		3.3nF	X7R	2kV#	2.4kV				15	35	54
SFJEL2K00472MX		4.7nF	X7R	2kV#	2.4kV			1	18	39	57
SFJEL2K00682MX		6.8nF	X7R	2kV#	2.4kV			2	21	41	60
SFJEL2K00103MX		10nF	X7R	2kV#	2.4kV			4	23	43	63
SFJEL1K00153MX		15nF	X7R	1kV#	1.2kV			7	27	46	66
SFJEL1K00223MX		22nF	X7R	1kV#	1.2kV			10	30	48	68
SFJEL1K00333MX		33nF	X7R	1kV#	1.2kV			13	34	50	70
SFJEL1K00473MX		47nF	X7R	1kV#	1.2kV		1	17	37	51	>70
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SFJEL5000104MX		100nF	X7R	500#	750		4	22	44	60	>70
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SFJEL5000334MX		330nF	X7R	500#	750		13	33	53	68	>70
SFJEL5000474MX		470nF	X7R	500	750	1	16	35	56	70	>70
SFJEL3000684MX		680nF	X7R	300	600	2	19	38	58	>70	>70
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SFJEL0500335MX		3.3μF	X7R	50	125	14	34	52	70	>70	>70

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Ordering Information

Type	Case Style	Thread	Electrical configuration	Voltage (dc)	Capacitance in picofarads (pF)	Capacitance Tolerance	Dielectric	Hardware
SF	**J**	**E**	**C**	**500**	**0102**	**M**	**X**	**0**
Syfer Filter	7.92mm A/F	¼-28 UNF	C = C Filter L = L-C Filter	050 = 50V 100 = 100V 200 = 200V 300 = 300V 500 = 500V 1K0 = 1kV 2K0 = 2kV 3K0 =3kV	First digit is 0. Second and third digits are significant figures of capacitance code. The fourth digit is the number of zeros following. Examples: 0101 = 100pF 0332 = 3300pF	M = ± 20%	C = C0G/NP0 X = X7R	0 = Without 1 = With

Note: The addition of a 4-digit numerical suffix code can be used to denote changes to the standard part.

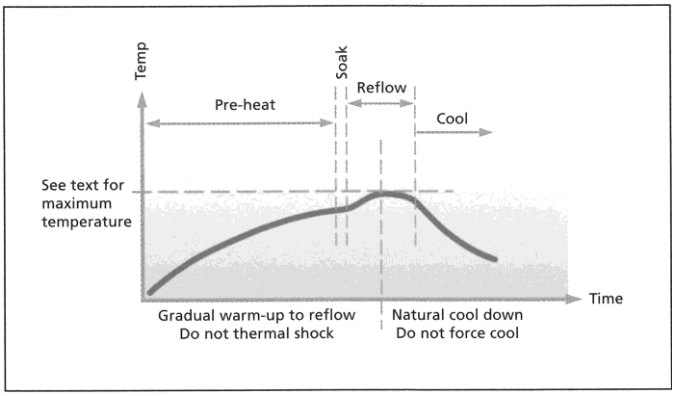
Options include for example: change of pin length / custom body dimensions or threads / alternative voltage rating / non-standard intermediate capacitance values / test requirements.

Please refer specific requests to the factory.

Surface Mount and Panel Mount Solder-in filters

Solder pad layouts are included with the detailed information **for each part.**

Recommended soldering profile



Soldering of filters

The soldering process should be controlled such that the filter does not experience any thermal shocks which may induce thermal cracks in the ceramic dielectric.

The pre-heat temperature rise of the filter should be kept to around 2°C per second. In practice successful temperature rises tend to be in the region of 1.5°C to 4°C per second dependent upon substrate and components.

The introduction of a soak after pre-heat can be useful as it allows temperature uniformity to be established across the substrate thus preventing substrate warping. The magnitude or direction of any warping may change on cooling imposing damaging stresses upon the filter.

E01, E03, E07 SBSP ranges are compatible with all standard solder types including lead-free, maximum temperature 260°C. For SBSG, SBSM and SFSS ranges, solder time should be minimised, and the temperature controlled to a maximum of 220°C. For SFSR, SFST and SFSU ranges the maximum temperature is 250°C.

Cooling to ambient temperature should be allowed to occur naturally. Natural cooling allows a gradual relaxation of thermal mismatch stresses in the solder joints. Draughts should be avoided. Forced air cooling can induce thermal breakage, and cleaning with cold fluids immediately after a soldering process may result in cracked filters.

Note: The use of FlexiCap™ terminations is strongly recommended to reduce the risk of mechanical cracking.

Soldering to axial wire leads

Soldering temperature

The tip temperature of the iron should not exceed 300°C.

Dwell time

Dwell time should be 3-5 seconds maximum to minimise the risk of cracking the capacitor due to thermal shock.

Heat sink

Where possible, a heat sink should be used between the solder joint and the body, especially if longer dwell times are required.

Bending or cropping of wire leads

Bending or cropping of the filter terminations should not be carried out within 4mm (0.157”) of the epoxy encapsulation, the wire should be supported when cropping.

Soldering irons should not be used for mounting surface mount filters as they can result in thermal shock damage to the chip capacitor.

A more comprehensive application note covering installation of all Syfer products is available on the Syfer website.

Resin filled screw mounted EMI filters

General

The ceramic capacitor, which is the heart of the filter, can be damaged by thermal and mechanical shock, as well as by over-voltage. Care should be taken to minimise the risk of stress when mounting the filter to a panel and when soldering wire to the filter terminations.

Mounting to chassis

Mounting torque

It is important to mount the filter to the bulkhead or panel using the recommended mounting torque, otherwise damage may be caused to the capacitor due to distortion of the case. When a threaded hole is to be utilised, the maximum mounting torque should be 50% of the specified figure which relates to unthreaded holes. For details of torque figures for each filter range, please see below.

	Torque (max.)	
Thread	With nut	Into tapped hole
M2.5 & 4-40 UNC	-	0.15Nm (1.32lbf in)
M3	0.25Nm (2.21lbf in)	0.15Nm (1.32lbf in)
6-32 UNC	0.3Nm (2.65lbf in)	0.15Nm (1.32lbf in)
M3.5	0.35Nm (3.09lbf in)	0.18Nm (1.59lbf in)
M4 & 8-32 UNC	0.5Nm (4.42lbf in)	0.25Nm (2.21lbf in)
M5, 12-32 UNEF & 2BA	0.6Nm (5.31lbf in)	0.3Nm (2.65lbf in)
M6 & 1/4-28 UNF	0.9Nm (7.97lbf in)	-

Tools

Hexagonal devices should be assembled using a suitable socket. Round bodied filters may be fitted to the panel in one of two ways (and should not be fitted using pliers or other similar tools which may damage them):

- Round bodies with slotted tops are designed to be screwed in using a simple purpose-designed tool.
- Round bodies without slotted tops are intended to be inserted into slotted holes and retained with a nut.

Grounding

To ensure the proper operation of the filters, the filter body should be adequately grounded to the panel to allow an effective path for the interference. The use of locking adhesives is not recommended, but if used should be applied after the filter has been fitted.

Minimum plate thickness

Users should be aware that the majority of these filters have an undercut between the thread and the mounting flange of the body, equal to 1.5 x the pitch of the thread. Mounting into a panel thinner than this undercut length may result in problems with thread mating and filter position. It is recommended that a panel thicker than this undercut length be used wherever possible.

Maximum plate thickness

This is specified for each filter in order that the nut can be fully engaged even when using a washer.

Soldering to axial wire leads

Soldering temperature

The tip temperature of the iron should not exceed 300°C.

Dwell time

Dwell time should be 3-5 seconds maximum to minimise the risk of cracking the capacitor due to thermal shock.

Heat sink

Where possible, a heat sink should be used between the solder joint and the body, especially if longer dwell times are required.

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RoHS compliance

All surface mount filters, resin sealed panel mount filters and power filters are fully RoHS compliant through material exemption, although care must be taken not to exceed the maximum soldering temperatures of surface mount parts.

Standard hermetic sealed panel mount filters use SnPb solders as part of their assembly, and are intended for exempt applications such as aerospace or military. Substitution of the SnPb solder with Pb free solders is possible to create a RoHS compliant part – please contact factory for further details.

Looking for pricing, stock, or lifecycle information?

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- Shortage Management
- Alternative Solution
- Excess Inventory Management