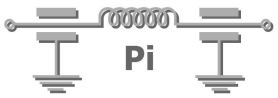
Filter Type
SBSPP

Surface Mount EMI Filter Datasheet

Circuit Configuration



Electrical Details

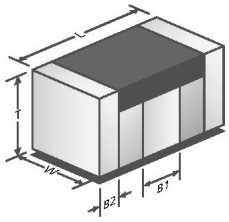
Electrical Configuration	Pi Filter
Capacitance Measurement	@ 1000hr Point
Current Rating	1A
Insulation Resistance (IR)	10GΩ or 1000ΩF
Temperature Rating	-55ºC to +125ºC
Ferrite Inductance (Typical)	0.30µH (@ 1MHz)

Mechanical Details

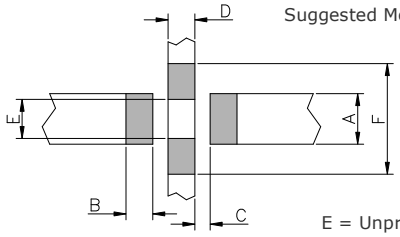
Terminals & Finish – End & Side	Sn Plated over Flexicap™ Termination
Construction	Ceramic Multi Layer Chip Capacitor Multi Layer Ferrite Bead Inductor Connection via Flexicap™ Termination
Weight (Typical)	0.07g *(0.0025oz)*

Dimensions mm

L	3.20±0.3 (0.126”±0.012”)
W	1.65±0.3 (0.065”±0.012”)
T	1.60±0.20 (0.063”±0.008”)
B1	0.95±0.3 (0.037”±0.012”)
B2	0.50±0.25 (0.020”±0.010”)



Suggested Mounting Pad Details



A	1.20 (0.047”)
B	0.90 (0.035”)
C	0.60 (0.024”)
D	0.80 (0.030”)
E	1.00 (0.039”)
F	2.90 (0.114”)

E = Unprinted solder area between ground pads

It is recommended that designers independently confirm pad dimensions are acceptable, particularly with respect to higher working voltages

							Typical No-Load Insertion Loss (dB)*				
Product Code	Packing	Capacitance (±20%)	Dielectric	Rated Voltage (dc)	DWV (dc)	Approximate Resonant Frequency (MHz)	0.1MHz	1MHz	10MHz	100MHz	1GHz
SBSPP1000220MC	B = Bulk Packed T = Tape-and-Reel (178mm / 7” reels) R = Tape-and-Reel (330mm / 13” reels)	22pF	C0G	100	250	1000	0	0	0	2	22
SBSPP1000470MC		47pF	C0G	100	250	620	0	0	0	4	16
SBSPP1000101MC		100pF	C0G	100	250	400	0	0	0	7	14
SBSPP1000221MC		220pF	C0G	100	250	260	0	0	1	14	12
SBSPP1000471MC		470pF	C0G	100	250	180	0	0	2	25	16
SBSPP1000102MX		1.0nF	X7R	100	250	120	0	0	4	37	16
SBSPP1000152MX		1.5nF	X7R	100	250	90	0	0	7	37	16
SBSPP1000222MX		2.2nF	X7R	100	250	72	0	0	9	37	16
SBSPP1000332MX		3.3nF	X7R	100	250	59	0	1	13	37	16
SBSPP1000472MX		4.7nF	X7R	100	250	50	0	2	14	37	16
SBSPP1000682MX		6.8nF	X7R	100	250	38	0	4	24	37	16
SBSPP1000103MX		10nF	X7R	100	250	33	0	5	24	37	16
SBSPP1000153MX		15nF	X7R	100	250	26	0	8	32	37	16
SBSPP0500223MX		22nF	X7R	50	125	21	0	10	38	37	16
SBSPP0500333MX		33nF	X7R	50	125	17	1	13	46	37	16
SBSPP0500473MX		47nF	X7R	50	125	13	2	16	50	37	16
SBSPP0500683MX		68nF	X7R	50	125	10	3	20	54	37	16
SBSPP0250104MX		100nF	X7R	25	67.5	8.5	6	19	52	37	16
SBSPP0250154MX		150nF	X7R	25	67.5	7	8	24	56	37	16

* - Insertion Loss performance quoted is measured on an open board mounted on a brass backplane in a 50Ω system. Performance curves can be supplied on request. Performance in circuit is liable to be different and is affected by board material, track layout, grounding efficiency and circuit impedances. Shielding can be used to improve high frequency performance.

Ordering Information

Type	Case Style	Thread	Electrical configuration	Voltage (dc)	Capacitance in picofarads (pF)	Capacitance Tolerance	Dielectric	Packing
SB	**S**	**P**	**P**	**100**	**0153**	**M**	**X**	**T**
Syfer Board Filter	Surface Mount	Size Code P (nominally 1206)	P = Pi Filter	025 = 25V 050 = 50V 100 = 100V	First digit is 0. Second and third digits are significant figures of capacitance code. The fourth digit is the number of zeros following. Examples: 0472 = 4700pF 0153 = 15000pF	M = ±20%	X = X7R	B = Bulk T = Taped (7”) R = Taped (13”)

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 finish / alternative voltage rating / non-standard intermediate capacitance values / test requirements. Please refer specific requests to the factory.

Tel: +44 1603 723300 | Email SyferSales@knowles.com | www.knowlescapacitors.com/syfer

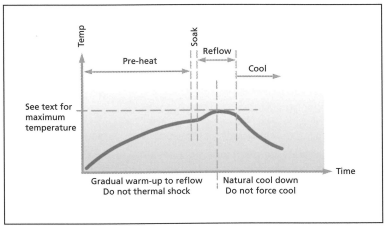
Reeled Quantities

178mm (7") reel	1206	330mm (13") reel	1206
	1500		6000

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.

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