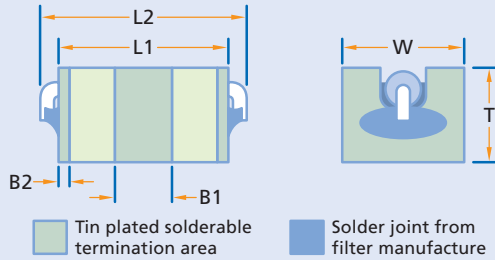


Surface Mount EMI Filters

Surface Mount C and Pi Filters

SBSG

The SBSG range has a 5A current rating for the Pi type, and 10A rating for the C type. Suitable for pick-and-place, these miniature surface mount filters offer assembly savings compared with conventional panel mounted filters. The combination of high current, high capacitance and high voltage makes them suitable for a wide range of applications including telecoms, mil/aerospace and industrial.

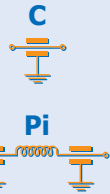


Specifications

| | mm | (inches) |
|----|-------------|-----------------|
| L1 | 4.55 ± 0.25 | (0.179 ± 0.010) |
| L2 | 5.25 ± 0.4 | (0.207 ± 0.015) |
| W | 3.20 ± 0.2 | (0.126 ± 0.008) |
| T | 2.50 ± 0.15 | (0.098 ± 0.006) |
| B1 | 1.50 ± 0.4 | (0.059 ± 0.015) |
| B2 | 0.30 ± 0.25 | (0.012 ± 0.010) |

Electrical Configuration Capacitance Measurement Current Rating

C & Pi Filters
At 1000hr point
Pi Section 5 amps dc
C Section 10 amps dc
-55°C to 125°C
0.005 Ohms Max.
0.5µH (Pi Section only)
0.2g typical (0.007oz)



Temperature Rating DC Resistance Ferrite Inductance, typical Weight

| Type No. (* = Preferred Value) | Capacitance (M = +/-20%) | Dielectric Code | Rated Voltage (Vd.c.) | DWV (Vd.c.) | Typical Insertion Loss (dB) 50 ohm System No Load | | | | | | | | | |
|-----------------------------------|-----------------------------|--------------------|-----------------------------|----------------|---|------|-------|--------|------|------------|------|-------|--------|------|
| | | | | | C Section | | | | | Pi Section | | | | |
| | | | | | 0.1MHz | 1MHz | 10MHz | 100MHz | 1GHz | 0.1MHz | 1MHz | 10MHz | 100MHz | 1GHz |
| * SBSG#1 5000102MX#2 | 1.0nF | X7R | 500 | 750 | 0 | 0 | 4 | 23 | 41 | 0 | 0 | 5 | 33 | 60+ |
| SBSG#1 5000152MX#2 | 1.5nF | X7R | 500 | 750 | 0 | 0 | 7 | 26 | 45 | 0 | 0 | 9 | 40 | 60+ |
| * SBSG#1 5000222MX#2 | 2.2nF | X7R | 500 | 750 | 0 | 0 | 10 | 30 | 50 | 0 | 0 | 11 | 47 | 60+ |
| SBSG#1 5000332MX#2 | 3.3nF | X7R | 500 | 750 | 0 | 0 | 13 | 33 | 52 | 0 | 0 | 14 | 54 | 60+ |
| * SBSG#1 5000472MX#2 | 4.7nF | X7R | 500 | 750 | 0 | 1 | 16 | 36 | 55 | 0 | 1 | 19 | 57 | 60+ |
| SBSG#1 5000682MX#2 | 6.8nF | X7R | 500 | 750 | 0 | 2 | 19 | 39 | 57 | 0 | 2 | 24 | 60+ | 60+ |
| * SBSG#1 5000103MX#2 | 10nF | X7R | 500 | 750 | 0 | 4 | 22 | 41 | 60+ | 0 | 5 | 29 | 60+ | 60+ |
| * SBSG#1 5000153MX#2 | 15nF | X7R | 500 | 750 | 0 | 7 | 25 | 44 | 60+ | 0 | 7 | 36 | 60+ | 60+ |
| * SBSG#1 5000223MX#2 | 22nF | X7R | 500 | 750 | 0 | 10 | 29 | 46 | 60+ | 0 | 11 | 42 | 60+ | 60+ |
| SBSG#1 5000333MX#2 | 33nF | X7R | 500 | 750 | 0 | 13 | 33 | 48 | 60+ | 0 | 14 | 51 | 60+ | 60+ |
| * SBSG#1 5000473MX#2 | 47nF | X7R | 500 | 750 | 1 | 16 | 35 | 50 | 60+ | 1 | 16 | 57 | 60+ | 60+ |
| SBSG#1 2000683MX#2 | 68nF | X7R | 200 | 500 | 2 | 19 | 39 | 54 | 60+ | 3 | 19 | 60+ | 60+ | 60+ |
| * SBSG#1 1000104MX#2 | 100nF | X7R | 100 | 250 | 4 | 22 | 41 | 57 | 60+ | 5 | 21 | 60+ | 60+ | 60+ |
| * SBSG#1 1000154MX#2 | 150nF | X7R | 100 | 250 | 7 | 25 | 45 | 60+ | 60+ | 8 | 23 | 60+ | 60+ | 60+ |
| * SBSG#1 0500224MX#2 | 220nF | X7R | 50 | 125 | 10 | 29 | 49 | 60+ | 60+ | 11 | 27 | 60+ | 60+ | 60+ |

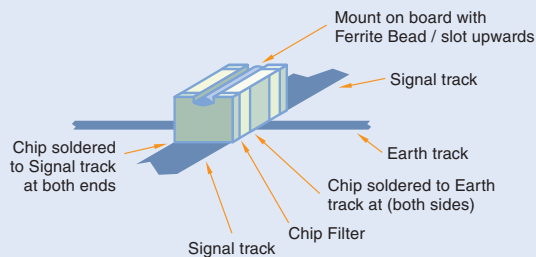
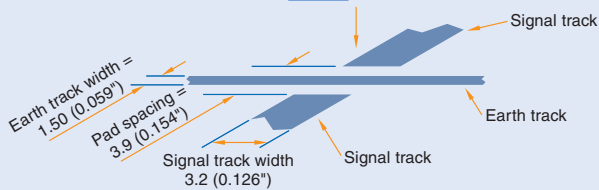
Note #1 For C Filter insert "C", for Pi Filter insert "P". Note #2 For taping on 7" reel insert "T", on 13" reel insert "R", if supplied in bulk insert "B". Insertion loss figures quoted are for filters mounted within a partition. It should be noted that some degradation will occur at higher frequencies for filters which are not fully shielded.

SBSG

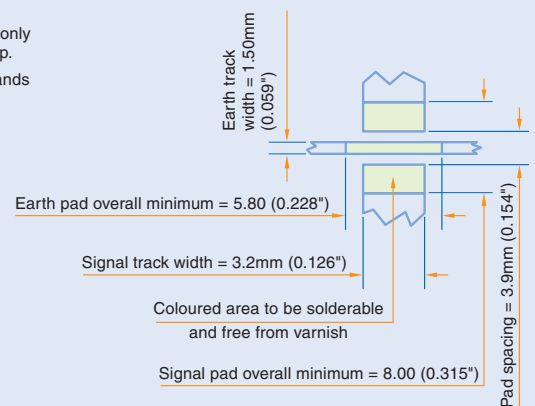
SM Pi or C filter mounted to board and soldered in identical manner to chip capacitor.

Solder connections made to each end (signal lines) and each side band (earth track).

Side bands provide earth contact points. Bands are formed on the sides of the chip only and are not continuous underneath the chip. Solder joints must be made to both side bands to ensure effective filtering.



PAD DIMENSIONS - C & Pi Filter



Notes on pad design

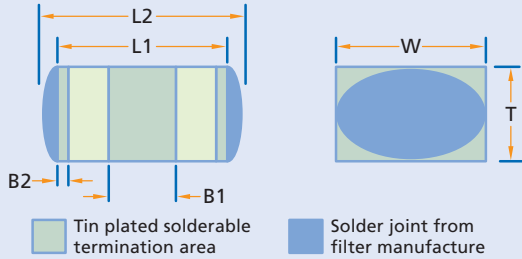
1. Pad / track design assumes 2oz copper track material.
2. Track width quoted allows for operation at max. rated current at 125°C.
3. Different operating conditions may allow alternative track designs to be used. Although any pad must be able to support continuous operating current at max. operating temperature.

Surface Mount EMI Filters

Surface Mount C and Pi Filters

SBSM

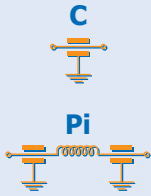
The SBSM range of surface mount EMI filters has been designed for use on pcbs, and is suitable for both signal and power lines. Capacitance values up to 470nF are available, with a 10A current rating for pi-section filters and 20A rating for 'C' types. The high capacitance, high current and high voltage ratings make them suitable for a wide range of applications including telecoms, mil/aerospace and industrial.



Specifications

| | mm | (inches) |
|-----------|------------|-----------------|
| L1 | 5.7 ± 0.4 | (0.224 ± 0.015) |
| L2 | 6.6 ± 0.4 | (0.260 ± 0.015) |
| W | 5.0 ± 0.4 | (0.197 ± 0.015) |
| T | 3.18 ± 0.2 | (0.125 ± 0.005) |
| B1 | 2.25 ± 0.4 | (0.088 ± 0.015) |
| B2 | 0.3 ± 0.25 | (0.012 ± 0.01) |

| Electrical Configuration | C & Pi Filters |
|-----------------------------|--|
| Capacitance Measurement | At 1000hr point |
| Current Rating | Pi Section 10 amps dc C Section 20 amps dc |
| Temperature Rating | -55°C to 125°C |
| DC Resistance | 0.005 ohms max |
| Ferrite Inductance, typical | 0.5µH (Pi section only) 0.5g typical (0.18oz) |
| Weight | |



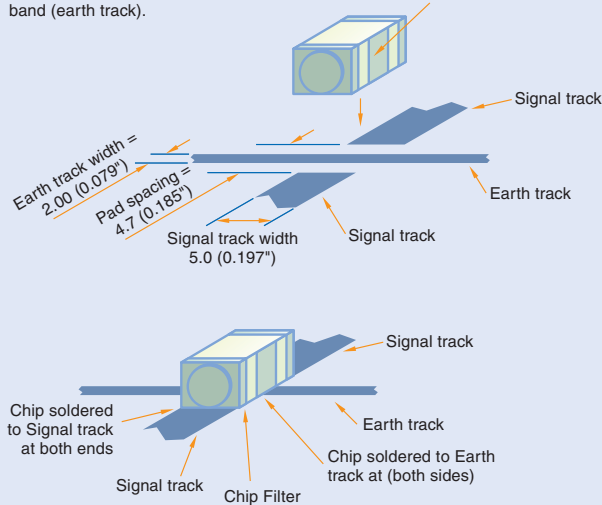
| Type No. (* = Preferred Value) | Capacitance (M = +/-20%) | Dielectric Code | Rated Voltage (Vd.c.) | DWV (Vd.c.) | Typical Insertion Loss (dB) 50 ohm System No Load | | | | | | | | | |
|-----------------------------------|-----------------------------|--------------------|-----------------------------|----------------|---|------|-------|------------|------|--------|------|-------|--------|------|
| | | | | | C Section | | | Pi Section | | | | | | |
| | | | | | 0.1MHz | 1MHz | 10MHz | 100MHz | 1GHz | 0.1MHz | 1MHz | 10MHz | 100MHz | 1GHz |
| * SBSM #1 5000102MX#2 | 1.0nF | X7R | 500 | 750 | 0 | 0 | 4 | 23 | 41 | 0 | 0 | 5 | 33 | 60+ |
| SBSM #1 5000152MX#2 | 1.5nF | X7R | 500 | 750 | 0 | 0 | 7 | 26 | 45 | 0 | 0 | 9 | 40 | 60+ |
| * SBSM #1 5000222MX#2 | 2.2nF | X7R | 500 | 750 | 0 | 0 | 10 | 30 | 50 | 0 | 0 | 11 | 47 | 60+ |
| * SBSM #1 5000332MX#2 | 3.3nF | X7R | 500 | 750 | 0 | 0 | 13 | 33 | 52 | 0 | 0 | 14 | 54 | 60+ |
| * SBSM #1 5000472MX#2 | 4.7nF | X7R | 500 | 750 | 0 | 1 | 16 | 36 | 55 | 0 | 1 | 19 | 57 | 60+ |
| SBSM #1 5000682MX#2 | 6.8nF | X7R | 500 | 750 | 0 | 2 | 19 | 39 | 57 | 0 | 2 | 24 | 60+ | 60+ |
| * SBSM #1 5000103MX#2 | 10nF | X7R | 500 | 750 | 0 | 4 | 22 | 41 | 60+ | 0 | 5 | 29 | 60+ | 60+ |
| * SBSM #1 5000153MX#2 | 15nF | X7R | 500 | 750 | 0 | 7 | 25 | 44 | 60+ | 0 | 7 | 36 | 60+ | 60+ |
| * SBSM #1 5000223MX#2 | 22nF | X7R | 500 | 750 | 0 | 10 | 29 | 46 | 60+ | 0 | 11 | 42 | 60+ | 60+ |
| SBSM #1 5000333MX#2 | 33nF | X7R | 500 | 750 | 0 | 13 | 33 | 48 | 60+ | 0 | 14 | 51 | 60+ | 60+ |
| * SBSM #1 5000473MX#2 | 47nF | X7R | 500 | 750 | 1 | 16 | 35 | 50 | 60+ | 1 | 16 | 57 | 60+ | 60+ |
| SBSM #1 5000683MX#2 | 68nF | X7R | 500 | 750 | 2 | 19 | 39 | 54 | 60+ | 3 | 19 | 60+ | 60+ | 60+ |
| * SBSM #1 2000104MX#2 | 100nF | X7R | 200 | 500 | 4 | 22 | 41 | 57 | 60+ | 5 | 21 | 60+ | 60+ | 60+ |
| SBSM #1 2000154MX#2 | 150nF | X7R | 200 | 500 | 7 | 25 | 45 | 60+ | 60+ | 8 | 23 | 60+ | 60+ | 60+ |
| * SBSM #1 1000224MX#2 | 220nF | X7R | 100 | 250 | 10 | 29 | 49 | 60+ | 60+ | 11 | 27 | 60+ | 60+ | 60+ |
| * SBSM #1 1000334MX#2 | 330nF | X7R | 100 | 250 | 13 | 33 | 52 | 60+ | 60+ | 14 | 35 | 60+ | 60+ | 60+ |
| * SBSM #1 0500474MX#2 | 470nF | X7R | 50 | 125 | 16 | 35 | 55 | 60+ | 60+ | 17 | 41 | 60+ | 60+ | 60+ |

Note #1 For C Filter insert "C", for Pi Filter insert "P". **Note #2** For taping on 7" reel insert "T", on 13" reel insert "R", if supplied in bulk insert "B".
Insertion loss figures quoted are for filters mounted within a partition. It should be noted that some degradation will occur at higher frequencies for filters which are not fully shielded.

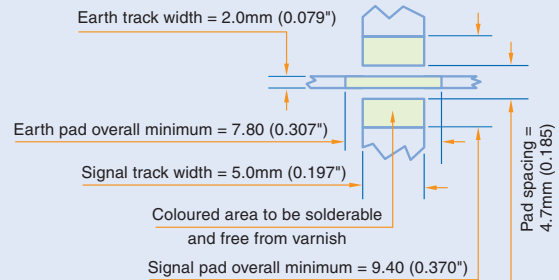
SBSM

SM Pi or C filter mounted to board and soldered in identical manner to chip capacitor.
Solder connections made to each end (signal lines) and each side band (earth track).

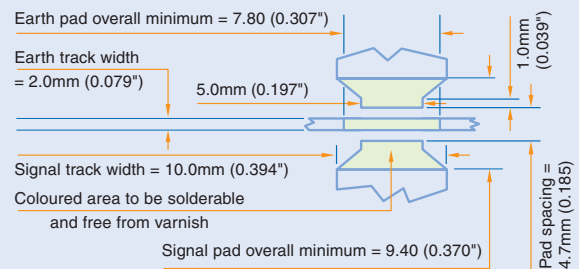
Side bands provide earth contact points. Bands are formed on the sides of the chip only and are not continuous underneath the chip.
Solder joints must be made to both side bands to ensure effective filtering.



PAD DIMENSIONS - Pi Filter



PAD DIMENSIONS - C Filter



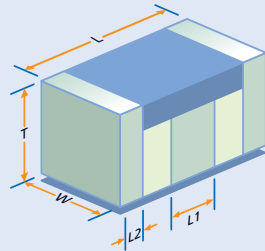
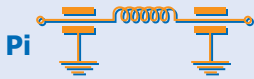
Surface Mount EMI Filters

Surface Mount Pi Filters

SBSP

A range of miniature surface mount pi-filters is available from Syfer Technology. In a size of only 1206, it offers an unbeatable combination of size and performance. With a 1A current rating, the SBSP range is available with working voltages up to 100Vdc. The use of X7R and COG ceramic dielectrics allows capacitance values from 22pF to 150nF, making it suitable for both signal and power lines and ensuring impressive EMI filtering performance up to 1GHz and higher. Ideal for telecoms, power supplies and industrial electronic equipment, the operating temperature range of -55°C to 125°C ensures they are also suitable for mil/aerospace applications.

Circuit configuration



Electrical Specifications

| | mm | (inches) |
|-----------|-------------|-------------------|
| L | 3.2mm ± 0.3 | (0.126" ± 0.012") |
| W | 1.6mm ± 0.3 | (0.063" ± 0.012") |
| T | 1.6mm ± 0.2 | (0.063" ± 0.008") |
| L1 | 0.95 ± 0.3 | (0.037" ± 0.012") |
| L2 | 0.5 ± 0.25 | (0.020" ± 0.010") |

| | | |
|-------------------------------------|-----------------------|--------|
| Electrical Configuration | Pi Filter | |
| Capacitance Measurement | At 1000hr point | |
| Rated Current | 1 amp dc | |
| Operating Temperature | -55°C to 125°C | |
| DC Resistance | 0.5 Ohms Max | |
| Weight | 0.5g typical (0.18oz) | |
| Dielectric Withstand Voltage | Rated Voltage | DWV |
| | 100Vdc | 250Vdc |
| | 50Vdc | 125Vdc |
| | 25Vdc | 63Vdc |
| Ferrite Inductance | 0.25µH | |

| Type No. | Capacitance (±20%) | Dielectric Code (Vd.c.) | Rated Voltage | Typical Insertion Loss (dB) 50 ohm System No Load | | | | |
|------------------------------|-----------------------|-------------------------------|------------------|---|------|-------|--------|------|
| | | | | Pi Section | | | | |
| | | | | 0.1MHz | 1MHz | 10MHz | 100MHz | 1GHz |
| SBSPP1000220MC# ¹ | 22pF | COG | 100 | 0 | 0 | 0 | 1 | 12 |
| SBSPP1000470MC# ¹ | 47pF | COG | 100 | 0 | 0 | 0 | 3 | 21 |
| SBSPP1000101MC# ¹ | 100pF | COG | 100 | 0 | 0 | 0 | 7 | 32 |
| SBSPP1000221MC# ¹ | 220pF | COG | 100 | 0 | 0 | 1 | 13 | 45 |
| SBSPP1000471MC# ¹ | 470pF | COG | 100 | 0 | 0 | 2 | 22 | 58 |
| SBSPP1000102MX# ¹ | 1nF | X7R | 100 | 0 | 0 | 5 | 33 | 60+ |
| SBSPP1000152MX# ¹ | 1.5nF | X7R | 100 | 0 | 0 | 9 | 40 | 60+ |
| SBSPP1000222MX# ¹ | 2.2nF | X7R | 100 | 0 | 0 | 11 | 47 | 60+ |
| SBSPP1000332MX# ¹ | 3.3nF | X7R | 100 | 0 | 0 | 14 | 54 | 60+ |
| SBSPP1000472MX# ¹ | 4.7nF | X7R | 100 | 0 | 1 | 19 | 57 | 60+ |
| SBSPP1000682MX# ¹ | 6.8nF | X7R | 100 | 0 | 2 | 24 | 60+ | 60+ |
| SBSPP1000103MX# ¹ | 10nF | X7R | 100 | 0 | 5 | 29 | 60+ | 60+ |
| SBSPP1000153MX# ¹ | 15nF | X7R | 100 | 0 | 7 | 36 | 60+ | 60+ |
| SBSPP0500223MX# ¹ | 22nF | X7R | 50 | 0 | 11 | 42 | 60+ | 60+ |
| SBSPP0500333MX# ¹ | 33nF | X7R | 50 | 0 | 14 | 51 | 60+ | 60+ |
| SBSPP0500473MX# ¹ | 47nF | X7R | 50 | 1 | 16 | 57 | 60+ | 60+ |
| SBSPP0500683MX# ¹ | 68nF | X7R | 50 | 3 | 19 | 60+ | 60+ | 60+ |
| SBSPP0250104MX# ¹ | 100nF | X7R | 25 | 5 | 21 | 60+ | 60+ | 60+ |
| SBSPP0250154MX# ¹ | 150nF | X7R | 25 | 8 | 23 | 60+ | 60+ | 60+ |

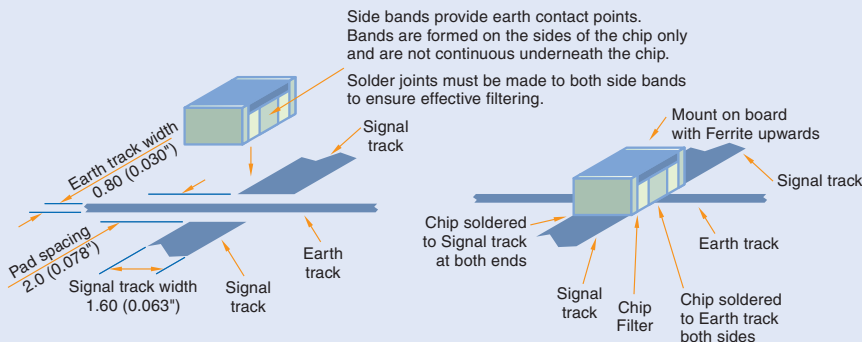
Note #¹ T = Taped, B = Bulk, R = Large Reel

Insertion loss figures quoted are for filters mounted within a partition, it should be noted that some degradation will occur at higher frequencies for filters which are not fully shielded.

SBSP

Mounting Information and Soldering Procedures

SM Pi chip filter mounted to board and soldered in identical manner to chip capacitor. Solder connections made to each end (signal lines) and each side band (earth track).



Recommended Pad/Track details

