

# Suspended Substrate Stripline Filters and Multiplexers

50Ω DC to 40 GHz

## The Big Deal

- Low insertion loss
- Ultra-wide passband width
- Fast roll-off with wide stopband
- Good power handling and temperature stability
- Passband up to 40 GHz
- Stopband up to 40 GHz



## Product Overview

Mini-Circuits' Suspended Substrate Stripline filters offer low insertion loss by implementing printed circuit board suspended between two parallel ground planes, providing high Q. Low insertion loss combined with wide stopband makes them an excellent choice for wideband instruments and systems like ECM, ECCM, ELINT and ultra-broadband receivers.

Low pass, high pass, band pass, band stop, diplexer and multiplexer designs can be realized with this technology. Advanced filter design and construction can achieve stopband width greater than 6x the center frequency, and temperature stability will be better than other printed circuit realizations because the fields are mainly in the air rather than in a dielectric. The inside walls of the housing hold the circuit and prevent movement that could be caused by vibration or mechanical shock, making these designs excellent candidates for harsh operating environments.

Suspended substrate stripline filters can be realized in small form factors with high-quality, precise machining for applications where size is critical. Excellent repeatability across units is achieved through precise tuning and process control.

## Key Features

Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitters
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide, spur-free stop band results in better receiver sensitivity
High power handling	Well suited for transmitter applications
Excellent temperature stability	Ensures minimal variation in electrical performance across temperature

### Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.  
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.  
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



# Suspended substrate stripline Low Pass Filter

## ZLSS-4G-S+

50Ω DC to 4000 MHz



### Features

- Low passband IL
- High rejection of 90 dB typ.
- Wider stopband
- Connectorized package and small size

Generic photo used for illustration purposes only

CASE STYLE: RA2456  
Connectors Model  
SMA-F ZLSS-4G-S+

### Applications

- Harmonic rejection
- Transmitters / Receivers
- Lab use

### Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	DC-F1	DC-4000	—	1.0	2.0	dB
	VSWR	DC-F1	DC-4000	—	2.1	—	:1
Stop Band	Insertion Loss	F2-F3	5500-6300	20	30	—	dB
		F3-F4	6300-7500	40	50	—	dB
		F4-F5	7500-9500	60	80	—	dB
		F5-F6	9500-20000	—	90	—	dB
		F6-F7	20000-26500	—	80	—	dB
		VSWR	F2-F7	5500-26500	—	20	—

### Maximum Ratings

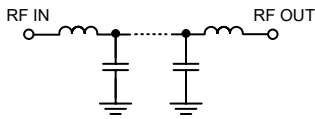
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input at Passband	10W max. at 25°C

Permanent damage may occur if any of these limits are exceeded.

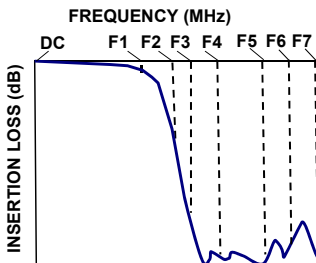
### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	0.01	1.01	10	0.38
100	0.02	1.11	100	0.38
1000	0.61	1.92	250	0.37
4000	0.67	1.32	500	0.36
4400	1.72	2.21	750	0.35
4500	3.08	3.52	1000	0.35
4800	12.14	18.38	1250	0.36
5050	20.72	37.90	1500	0.37
5400	31.16	59.29	1750	0.39
5500	33.83	63.62	2000	0.40
6000	45.74	80.16	2250	0.39
6300	51.98	84.43	2500	0.39
7500	73.22	77.52	2750	0.41
9500	99.32	50.75	3000	0.43
12500	107.31	52.61	3250	0.47
15000	105.89	80.51	3500	0.50
17500	123.13	349.41	3750	0.53
20000	125.57	161.84	3800	0.54
25000	93.97	111.38	3900	0.57
26500	90.40	1032.92	4000	0.61

### Functional Schematic

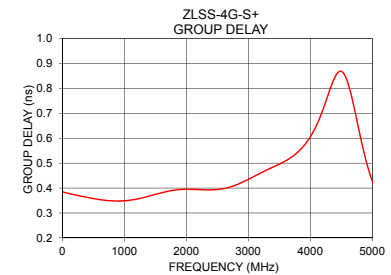
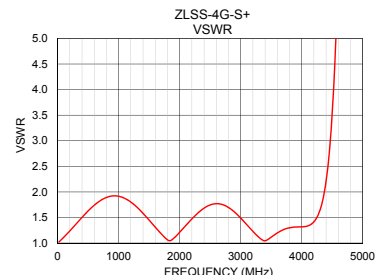
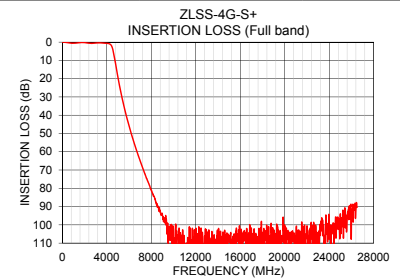
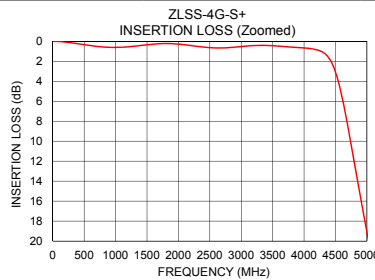


### Typical Frequency Response



**+RoHS Compliant**

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications



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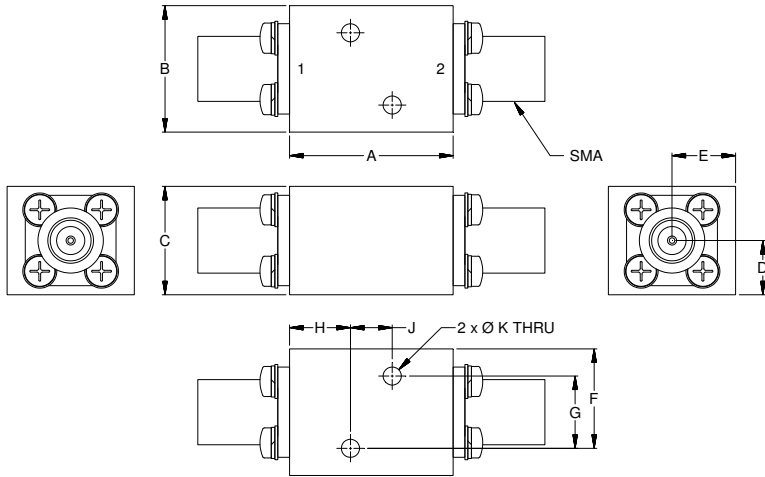


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## Coaxial Connections

PORT - 1	SMA FEMALE
PORT - 2	SMA FEMALE

## Outline Drawing



## Outline Dimensions ( $\frac{\text{inch}}{\text{mm}}$ )

A	B	C	D	E	F	G	H	J	K	Wt.
.90	.70	.60	.30	.35	.55	.400	.34	.230	.100	grams
22.86	17.78	15.24	7.62	8.89	13.97	10.16	8.51	5.84	2.54	55

Note: Please refer to case style drawing for details

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