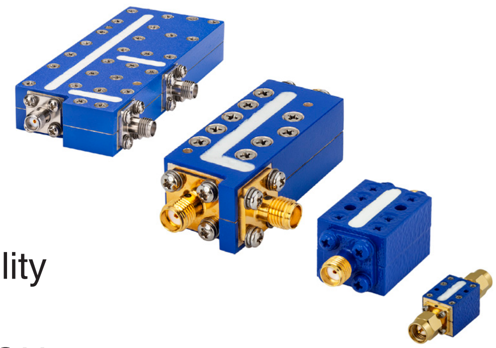
Suspended Substrate Stripline Filters and Multiplexers

50Ω DC to 26 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 26 GHz
- Stopband up to 26.5 GHz can extend 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

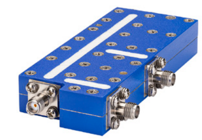
Feature	Advantages
Low insertion loss	Low signal loss results in better SNR in receiver front end and better power delivery to antenna in transmitters
Fast roll-off	Higher selectivity results in better adjacent channel rejection and dynamic range
Wide stopband	Wide, spur-free stop band results in better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

Suspended substrate stripline

Triplexer

Z3SS-7000-S+

50Ω DC to 15000 MHz
(DC-1600, 2600-5500, 7000-15000 MHz)



Generic photo used for illustration purposes only

CASE STYLE: UB2923

Connectors	Model
SMA-F	Z3SS-7000-S+

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

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	3 W max

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

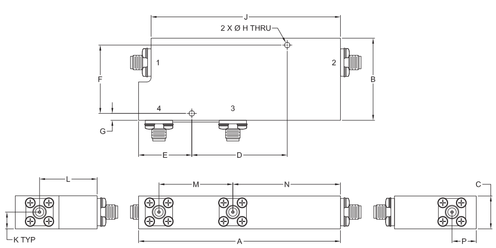
Coaxial Connections

Common Port	1
Low Pass Port (Channel-1)	2
Band Pass Port (Channel-2)	3
High Pass Port (Channel-3)	4

Features
- Low passband insertion loss of 1.5 dB typical
- Good flatness
- High rejection of 90 dB typical
- Wider passband and stopband

Applications
- Test and measurement
- Wireless communication system

Outline Drawing



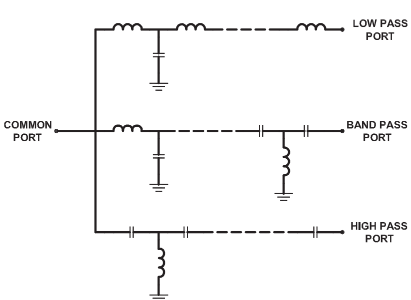
Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
3.70	**1.50**	**.60**	**1.750**	**.98**	**1.250**	**.13**	**.100**
93.98	38.10	15.24	44.45	24.77	31.75	3.18	2.54

J	K	L	M	N	P	Wt.
3.47	**.31**	**1.06**	**1.35**	**1.97**	**.44**	grams
88.16	7.78	26.81	34.40	50.10	11.29	**416**

Note: Please refer to case style drawing for details

Functional Schematic

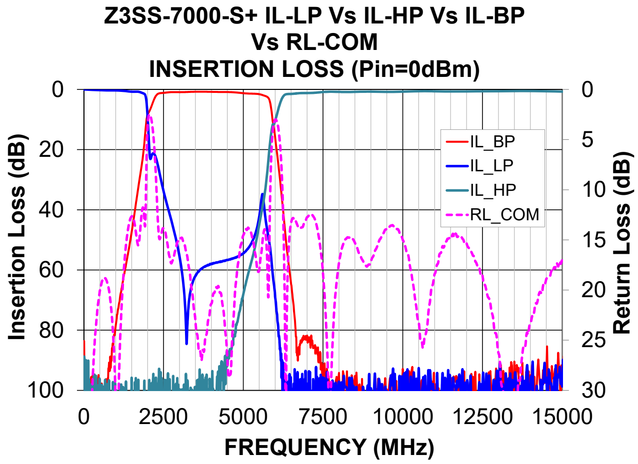


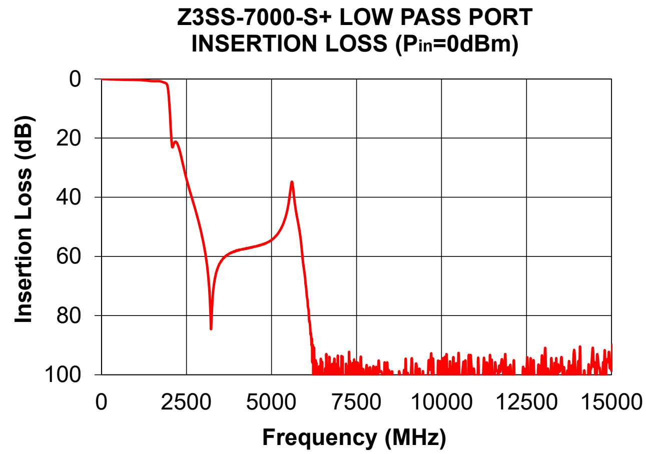
Electrical Specifications at 25°C

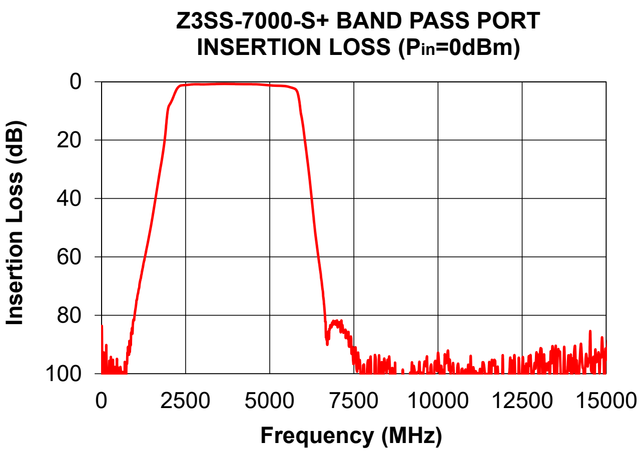
Parameter		Port	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass, Channel -1	DC - 1600	-	1.5	2.0	dB
		Band Pass, Channel -2	2600 - 5500	-	2.0	3.0	
		High Pass, Channel -3	7000 - 15000	-	2.0	3.0	
	Return Loss	Low Pass, Channel -1	DC - 1600	-	10	-	dB
		Band Pass, Channel -2	2600 - 5500	-	10	-	
		High Pass, Channel -3	7000 - 15000	-	8	-	
		Common	DC - 1600	-	10	-	
			2600 - 5500	-	10	-	
			7000 - 15000	-	8	-	
Stop Band Rejection		Low Pass, Channel-1	2600 - 3400	20	35	-	dB
			3400 - 4000	40	55	-	
			4000 - 15000	-	30	-	
		Band Pass, Channel -2	DC - 1600	25	40	-	
			7000 - 10000	60	80	-	
			10000 - 15000	-	90	-	
		High Pass, Channel -3	DC - 3400	-	90	-	
			3400 - 5500	25	40	-	

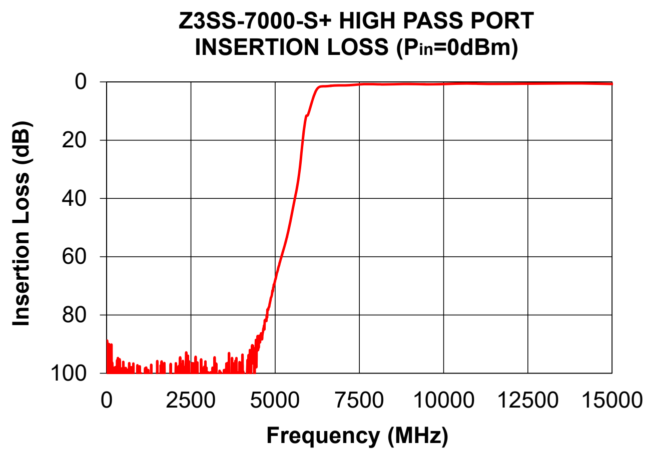
Typical Performance Data at 25°C

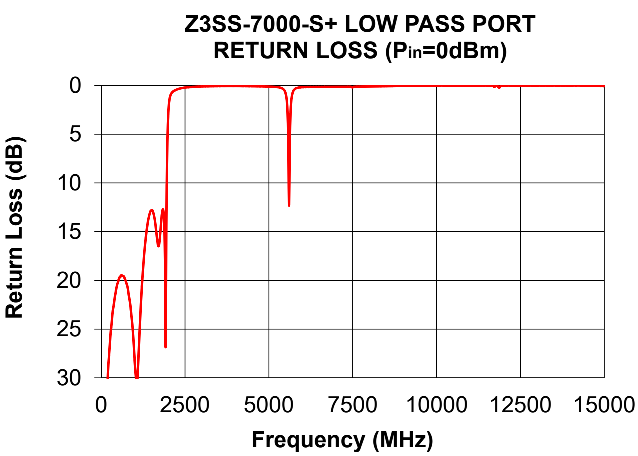
FREQ. (MHz)	INSERTION LOSS (dB) Low Pass Chanel -1	INSERTION LOSS (dB) Band Pass Chanel -2	INSERTION LOSS (dB) High Pass Chanel -3	RETURN LOSS (dB) Common	RETURN LOSS (dB) Low Pass Chanel -1	RETURN LOSS (dB) Band Pass Chanel -2	RETURN LOSS (dB) High Pass Chanel -3
10	0.03	83.62	88.77	33.69	31.25	0.00	0.01
1600	0.75	40.36	97.40	13.53	13.81	0.23	0.05
1760	0.88	28.96	108.69	14.34	15.20	0.33	0.06
1890	1.43	18.67	100.71	12.55	15.41	0.63	0.07
1970	4.67	9.80	113.04	6.50	6.58	1.63	0.07
2070	22.34	6.94	106.47	2.51	0.96	2.13	0.07
2210	21.47	3.14	105.68	5.81	0.48	6.07	0.08
2460	31.97	1.17	109.17	14.00	0.23	15.63	0.09
2600	37.92	1.02	107.62	15.04	0.19	14.52	0.11
3400	64.50	0.79	101.25	20.23	0.07	20.72	0.15
4000	57.94	0.80	97.27	21.35	0.06	22.28	0.18
5000	54.44	1.25	68.00	14.53	0.12	13.55	0.23
5500	42.27	1.58	44.96	18.00	0.82	24.50	0.31
6000	69.11	16.08	10.41	3.01	0.18	1.85	1.81
6240	101.48	39.23	2.48	11.34	0.14	0.59	9.70
7000	101.95	81.79	1.19	12.74	0.13	0.53	13.19
10000	96.55	92.90	0.73	14.99	0.01	0.95	14.09
12000	98.16	105.41	0.65	15.32	0.00	0.16	15.60
14400	97.83	93.32	0.57	19.55	0.01	0.26	18.98
15000	98.58	95.21	0.71	16.98	0.07	0.40	15.09

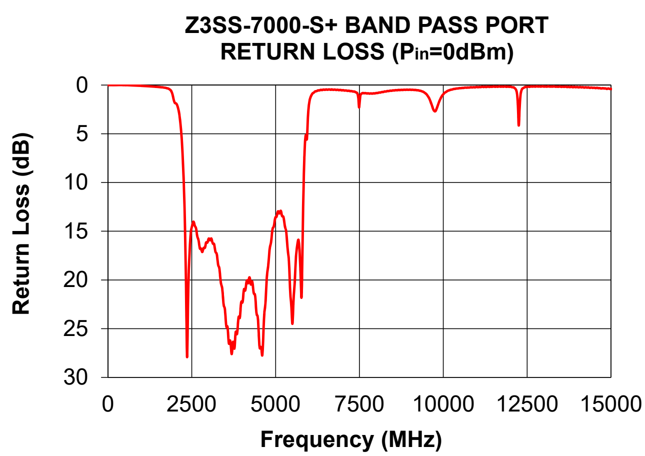












Mini-Circuits®

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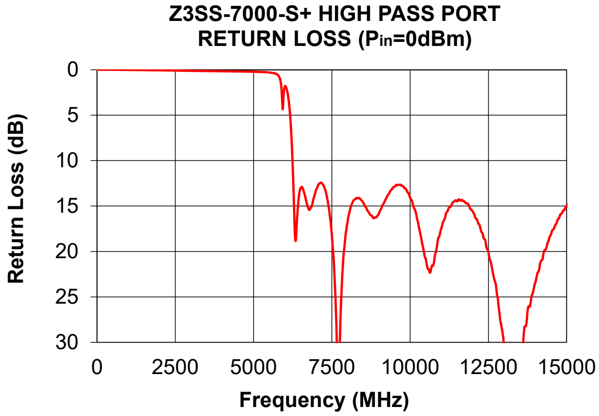
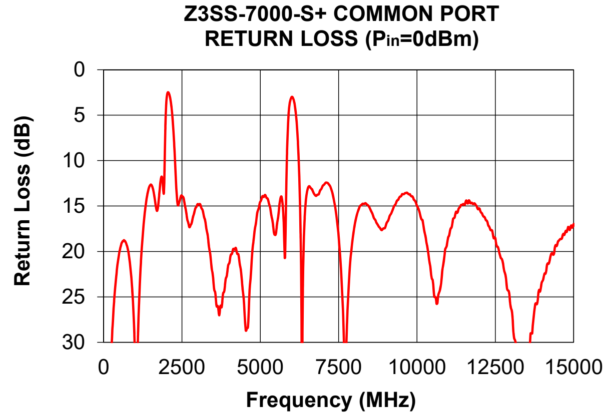
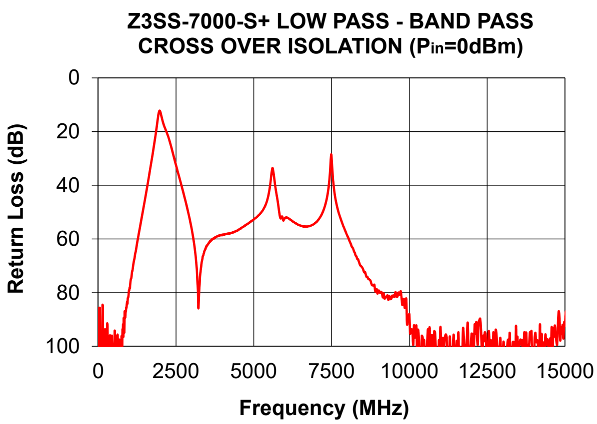
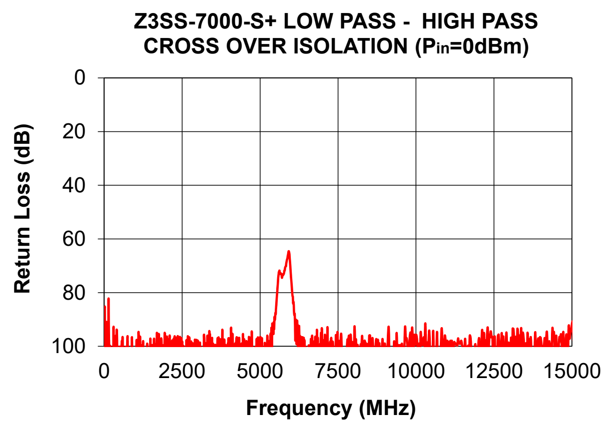
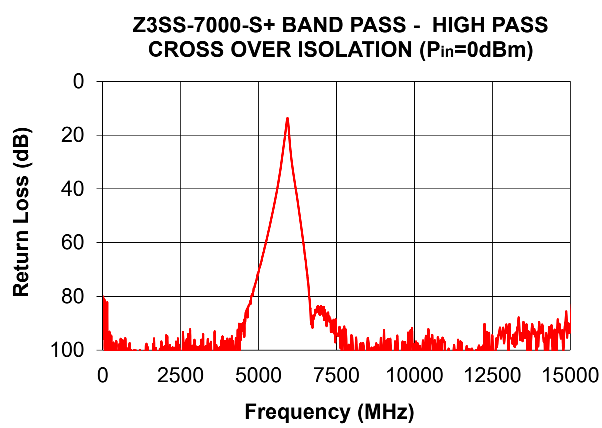

Z3SS-7000-S+ HIGH PASS PORT
RETURN LOSS (Pin=0dBm)
Return Loss (dB)
0
5
10
15
20
25
30
0
2500
5000
7500
10000
12500
15000
Frequency (MHz)


Z3SS-7000-S+ COMMON PORT
RETURN LOSS (Pin=0dBm)
Return Loss (dB)
0
5
10
15
20
25
30
0
2500
5000
7500
10000
12500
15000
Frequency (MHz)


Z3SS-7000-S+ LOW PASS - BAND PASS
CROSS OVER ISOLATION (Pin=0dBm)
Return Loss (dB)
0
20
40
60
80
100
0
2500
5000
7500
10000
12500
15000
Frequency (MHz)


Z3SS-7000-S+ LOW PASS - HIGH PASS
CROSS OVER ISOLATION (Pin=0dBm)
Return Loss (dB)
0
20
40
60
80
100
0
2500
5000
7500
10000
12500
15000
Frequency (MHz)


Z3SS-7000-S+ BAND PASS - HIGH PASS
CROSS OVER ISOLATION (Pin=0dBm)
Return Loss (dB)
0
20
40
60
80
100
0
2500
5000
7500
10000
12500
15000
Frequency (MHz)