Coaxial

Low Pass Filter

VLFG-3500+

50Ω DC to 3500 MHz

Generic photo used for illustration purposes only

CASE STYLE: FF704

The Big Deal

- Excellent power handling, 4.5W
- Temperature stable
- Rugged unibody construction
- Good rejection, 40 dB typical

Product Overview

VLFG-3500+ is a 50Ω low pass filter built in rugged unibody construction. Covering DC-3500 MHz bandwidth, these units offer good matching within the passband and good rejection in stopband. VLFG-3500+ offer low insertion loss, and excellent power handling capability. It handles up to 4.5W RF input power and provides a wide operating temperature range from -55°C to 125°C.

Key Features

Feature	Advantages
Low passband insertion loss	Suitable for high performance application.
4.5W Power handling	Supports a range of system power requirements.
Connectorized package	The connectorized package is easy to interface with other devices and well suited for test setups.

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

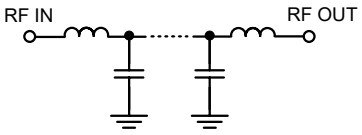
Features

- Low loss, 1.3 dB typical
- Good rejection 40 dB typical
- Excellent power handling, 4.5W
- Temperature stable
- Connectorized package
- Rugged unibody construction

Applications

- Military radar applications
- Test and measurement
- Telecommunication and broadband wireless applications

Functional Schematic



Electrical Specifications at 25°C

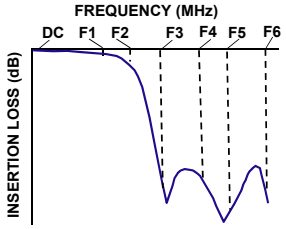
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC - 3500	—	1.3	2.2	dB
	Freq. Cut-Off	F2*	3970	—	3.0	—	dB
	Return Loss	DC-F1	DC - 3500	—	14	—	dB
Stop Band	Rejection Loss	F3-F4	4800 - 5000	20	35	—	dB
		F4-F5	5000 - 8500	30	38	—	dB
		F5-F6	8500 - 15000	—	25	—	dB

In Application where DC voltage is present at either input or output port, DC blocks are required.
* Typically, a ±5% frequency deviation from the stated value may occur on a unit-to-unit basis.

Maximum Ratings	
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input*	4.5W max.@25°C

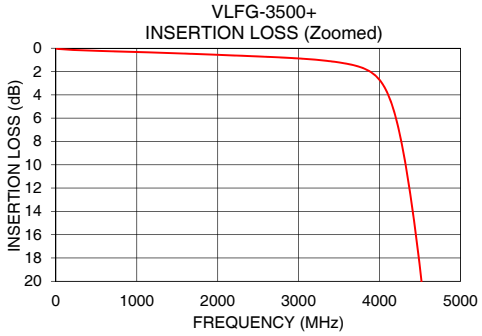
*Passband rating, derate linearly to 1W at 125°C ambient
Permanent damage may occur if any of these limits are exceeded.

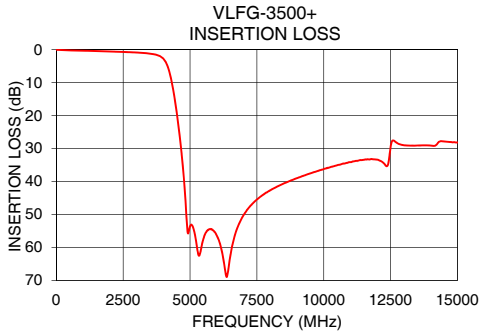
Typical Frequency Response

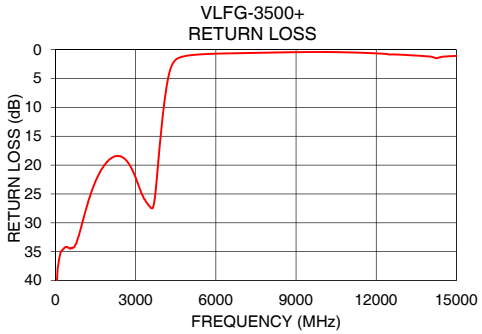


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	0.05	41.80
100	0.10	37.37
1000	0.32	30.03
1400	0.41	23.93
1800	0.51	20.20
3000	0.88	22.19
3500	1.22	27.04
3970	2.49	13.34
4100	3.89	8.18
4500	18.91	1.75
4800	42.15	1.15
5000	53.59	1.00
6000	56.36	0.70
7000	50.22	0.60
8500	40.62	0.46
10000	36.21	0.40
11000	34.11	0.47
12000	33.37	0.64
13000	29.00	0.89
15000	28.16	1.08





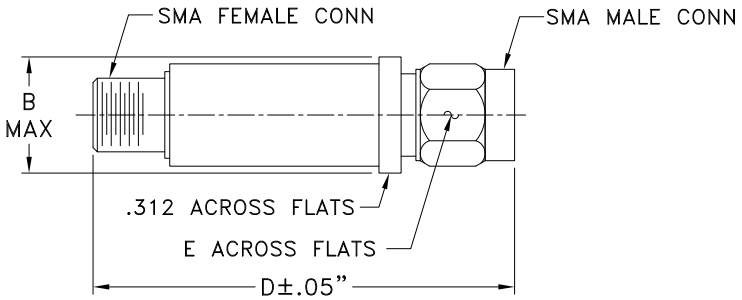


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Coaxial Connections

PORT - 1	SMA-Male
PORT - 2	SMA-Female

Outline Drawing



Outline Dimensions (inch / mm)

B	D	E	wt.
.410	**1.43**	**.312**	grams
10.41	36.32	7.92	10

Note: Please refer to case style drawing for details

Coaxial Low Pass Filter VLFG-3500+

Typical Performance Data

FREQ. (MHz)	INSERTION LOSS (dB)			INPUT RETURN LOSS (dB)			OUTPUT RETURN LOSS (dB)		
	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C
10	0.07	0.08	0.09	47.59	44.54	42.36	46.04	44.86	40.95
60	0.06	0.08	0.09	46.15	45.19	39.09	45.96	43.68	38.37
100	0.06	0.08	0.09	48.50	43.26	37.54	47.53	41.36	36.41
300	0.08	0.12	0.14	30.74	39.21	42.50	29.77	34.02	34.51
500	0.09	0.15	0.18	35.87	37.67	50.07	30.21	29.71	29.67
700	0.11	0.18	0.21	32.35	33.10	34.18	26.95	26.34	25.63
900	0.14	0.21	0.26	27.95	28.38	28.79	24.02	23.56	23.13
1100	0.16	0.25	0.30	23.88	24.70	24.74	21.34	21.32	20.93
1300	0.20	0.30	0.35	21.45	21.96	21.92	19.67	19.54	19.19
1500	0.24	0.34	0.41	19.44	19.91	20.00	18.16	18.15	17.94
1700	0.27	0.40	0.46	18.18	18.42	18.56	17.26	17.09	16.95
1900	0.32	0.45	0.52	16.92	17.38	17.61	16.25	16.34	16.28
2100	0.36	0.51	0.58	16.63	16.75	17.05	16.13	15.89	15.93
2300	0.40	0.56	0.64	16.38	16.49	16.87	15.93	15.72	15.86
2500	0.44	0.61	0.70	16.58	16.52	16.90	16.08	15.79	15.99
2700	0.50	0.67	0.77	16.63	16.77	17.09	16.03	16.06	16.28
2900	0.55	0.75	0.86	16.94	17.12	17.32	16.35	16.46	16.67
3100	0.63	0.84	0.97	17.06	17.39	17.43	16.65	16.97	17.13
3300	0.72	0.96	1.11	17.54	17.60	17.48	17.57	17.79	17.94
3500	0.85	1.13	1.31	17.89	17.78	17.60	19.06	19.56	20.07
3700	1.06	1.39	1.63	17.21	17.06	16.66	20.78	22.11	22.89
3970	1.83	2.40	2.87	11.61	10.73	10.03	14.07	13.06	12.27
4100	2.80	3.71	4.46	7.90	7.06	6.47	9.70	8.94	8.44
4300	6.33	8.22	9.79	3.53	3.12	2.90	5.47	5.31	5.33
4500	13.70	16.69	19.03	1.51	1.57	1.61	3.52	3.67	3.80
4570	17.13	20.42	22.99	1.23	1.35	1.42	3.07	3.24	3.34
4735	26.49	30.53	33.73	0.89	1.07	1.16	2.21	2.37	2.44
4800	30.67	35.09	38.69	0.82	1.00	1.09	1.95	2.10	2.16
5000	46.06	53.22	60.98	0.65	0.84	0.92	1.31	1.47	1.53
5500	54.64	53.38	53.57	0.39	0.60	0.67	0.56	0.74	0.82
5700	52.54	52.83	49.43	0.31	0.53	0.61	0.41	0.60	0.72
5900	49.84	49.57	49.98	0.24	0.47	0.54	0.30	0.51	0.62
6100	49.98	50.74	49.31	0.19	0.42	0.50	0.24	0.45	0.59
6300	53.11	53.93	53.95	0.13	0.37	0.46	0.16	0.39	0.54
6500	49.97	51.81	51.02	0.08	0.32	0.43	0.12	0.36	0.53
6700	50.88	53.67	52.82	0.04	0.29	0.41	0.11	0.34	0.53
6900	49.77	47.19	49.62	0.02	0.28	0.40	0.09	0.34	0.55
7100	47.70	49.36	47.24	0.02	0.25	0.40	0.08	0.33	0.57
7300	43.21	46.31	46.02	0.02	0.25	0.40	0.11	0.35	0.58
7500	43.60	44.09	42.60	0.03	0.24	0.42	0.10	0.36	0.62
7700	44.07	43.39	44.30	0.05	0.24	0.40	0.10	0.36	0.62
7900	42.33	42.29	41.45	0.07	0.22	0.43	0.11	0.37	0.65
8000	41.91	41.98	39.89	0.06	0.22	0.44	0.12	0.38	0.66
8300	41.08	40.40	42.19	0.07	0.23	0.42	0.13	0.38	0.61
8500	38.66	41.36	41.23	0.03	0.23	0.44	0.18	0.39	0.63
8700	42.35	42.58	41.99	0.06	0.20	0.43	0.13	0.37	0.59
9000	38.73	39.27	38.76	0.04	0.23	0.46	0.14	0.38	0.60
10000	33.60	33.31	34.77	0.11	0.32	0.47	0.10	0.38	0.52
10500	34.01	33.73	34.19	0.11	0.30	0.41	0.03	0.31	0.46
11000	34.13	34.24	35.10	0.10	0.31	0.38	0.03	0.27	0.41
11500	33.00	32.85	33.54	0.13	0.34	0.38	0.03	0.23	0.37
12000	33.75	34.35	34.65	0.08	0.34	0.38	0.06	0.21	0.36
12500	35.20	30.74	29.07	0.15	0.48	0.44	0.02	0.39	0.51
13000	30.18	31.17	31.38	0.09	0.41	0.45	0.07	0.22	0.40
13500	30.86	31.49	31.80	0.08	0.48	0.55	0.08	0.24	0.45
14000	30.17	30.82	31.10	0.09	0.57	0.69	0.07	0.28	0.55
14500	28.77	29.01	29.43	0.22	0.99	0.97	0.05	0.34	0.67
14600	28.23	28.59	29.16	0.44	0.84	0.92	0.03	0.35	0.70
14700	28.31	28.35	28.77	0.33	0.74	0.91	0.04	0.35	0.73
15000	27.44	27.11	27.13	0.01	0.68	1.00	0.03	0.40	0.82

***Temperature test data was based on the underlying chip.**

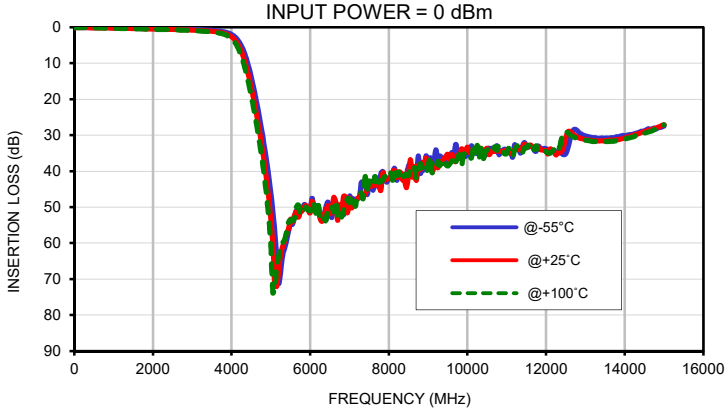
Typical Performance Data

FREQ.	GROUP DELAY		
	(nsec)		
(MHz)	@-55°C	@+25˚C	@+100˚C
10	0.16	0.16	0.15
100	0.17	0.16	0.16
200	0.17	0.16	0.16
300	0.17	0.16	0.16
400	0.17	0.16	0.16
500	0.17	0.16	0.16
600	0.17	0.16	0.16
700	0.17	0.16	0.16
800	0.18	0.16	0.16
900	0.18	0.17	0.16
1000	0.18	0.17	0.16
1100	0.18	0.17	0.16
1200	0.18	0.17	0.16
1300	0.18	0.17	0.17
1400	0.19	0.18	0.17
1500	0.19	0.18	0.17
1600	0.19	0.18	0.17
1700	0.19	0.18	0.18
1800	0.20	0.19	0.18
1900	0.20	0.19	0.18
2000	0.20	0.19	0.19
2100	0.21	0.20	0.19
2200	0.21	0.20	0.20
2300	0.22	0.21	0.20
2400	0.23	0.22	0.21
2500	0.23	0.22	0.22
2600	0.24	0.23	0.23
2700	0.25	0.24	0.24
2800	0.26	0.25	0.25
2900	0.27	0.26	0.26
3000	0.28	0.27	0.27
3100	0.29	0.29	0.29
3160	0.30	0.30	0.30
3180	0.31	0.30	0.30
3200	0.31	0.31	0.30
3280	0.32	0.32	0.32
3300	0.33	0.32	0.32
3380	0.34	0.34	0.34
3400	0.34	0.34	0.34
3450	0.36	0.36	0.36
3500	0.37	0.38	0.38

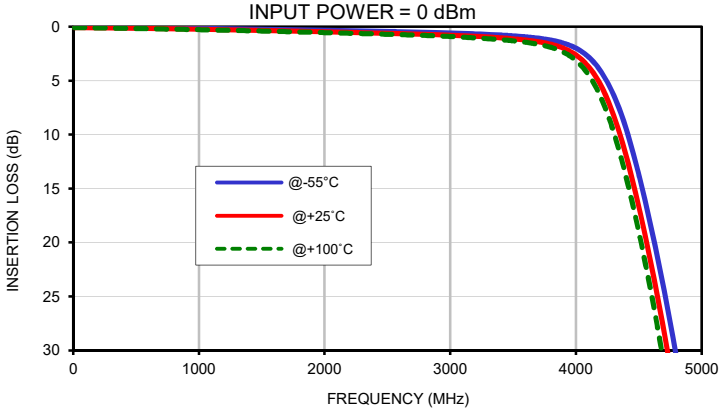
***Temperature test data was based on the underlying chip.**

Typical Performance Curves

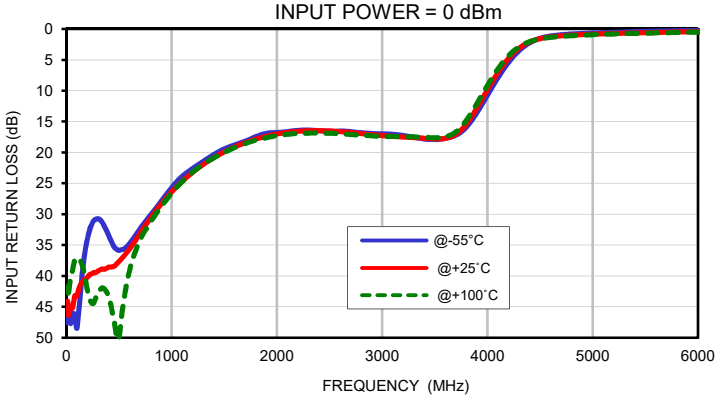
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



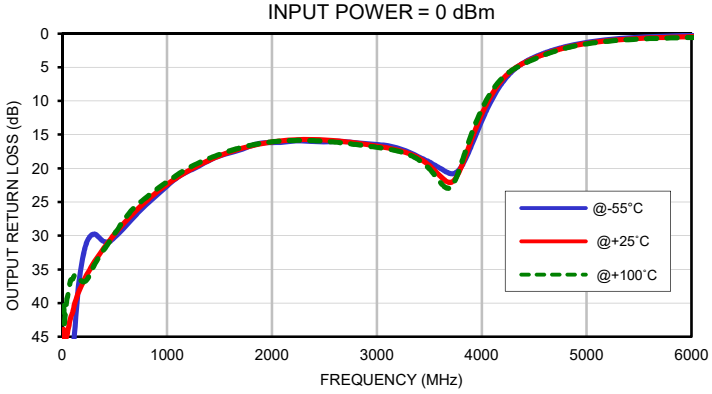
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



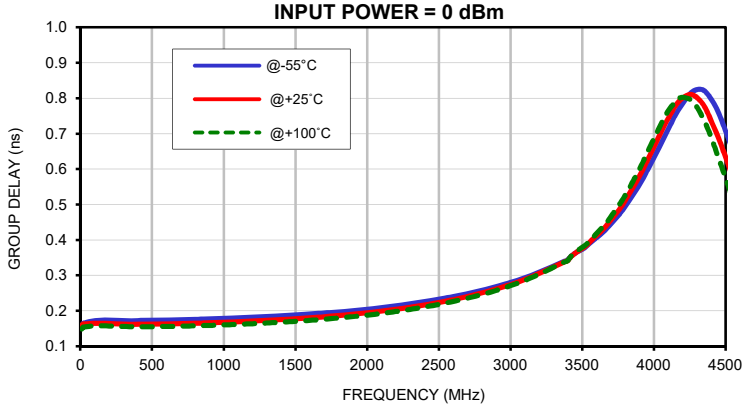
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm

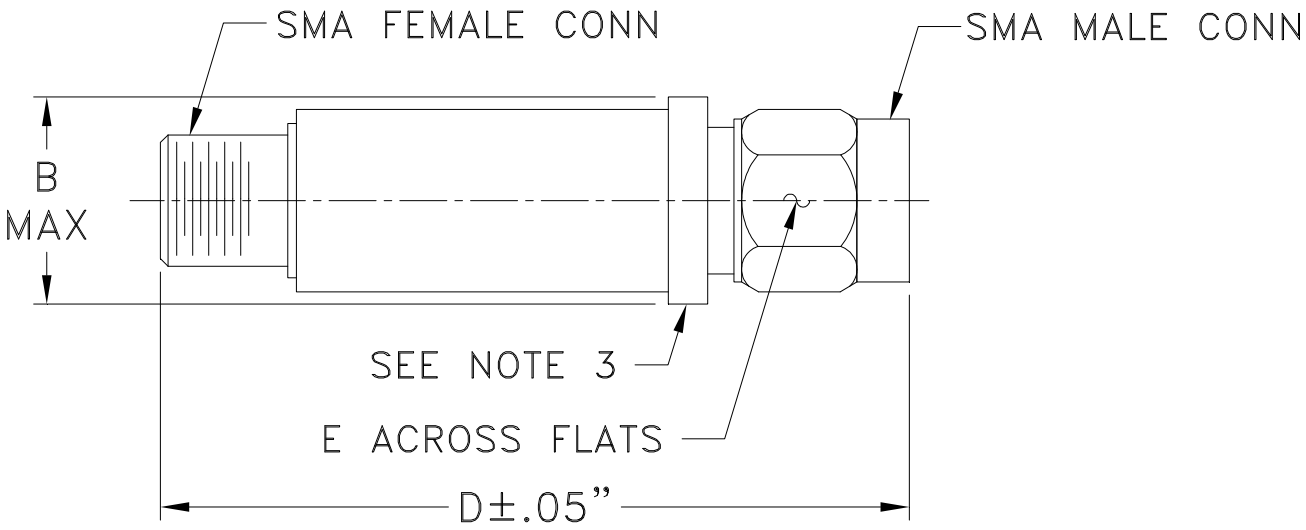


***Temperature test data was based on the underlying chip.**

Case Style FF

FF704

Outline Dimensions



CASE #.	A	B	C	D	E	WT GRAMS
FF704	-- --	.410 (10.41)	-- --	1.43 (36.32)	.312 (7.92)	10.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .04; 3Pl. ± .030

Notes:

1. Case material: Stainless steel.
2. Case finish: Gold plated.
3. Round Flange may have .312 Across Flats in some models.

Mini-Circuits

Environmental Specifications ENV113

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, Except +100°C