

# Coaxial Low Pass Filter

## VLFG-490+

50Ω DC to 490 MHz



Generic photo used for illustration purposes only  
CASE STYLE: FF704

### The Big Deal

- Good power handling, 3.5 W
- Temperature stable
- Rugged, unibody construction
- Very good rejection, 45 dB typical

### Product Overview

VLFG-490+ is a 50Ω low pass filter built in rugged unibody construction. Covering DC-490 MHz bandwidth, these units offer good matching within the passband and high rejection in stopband. VLFG-490+ offer low insertion loss, and good power handling capability. It handles up to 3.5W 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.
3.5W 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.

#### 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)



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

### Features

- Low loss, 1.5 dB typical
- Very good rejection 45 dB typical
- Good power handling, 3.5 W
- Temperature stable
- Rugged unibody construction
- Connectorized package

### Applications

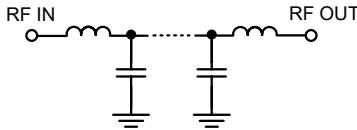
- Harmonic Rejection
- VHF/UHF transmitters / receivers
- Military radar applications
- Test and measurement
- Telecommunications & broadband wireless applications
- Satcom modems

### Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
<b>Pass Band</b>	Insertion Loss	DC-F1	DC - 490	—	1.5	2	dB
	Freq. Cut-Off	F2*	590	—	3.0	—	dB
	Return Loss	DC-F1	DC - 490	—	16	—	dB
<b>Stop Band</b>	Rejection Loss	F3-F4	800 - 960	20	56	—	dB
		F4-F5	960 - 1500	40	52	—	dB
		F5-F6	1500 - 3000	35	46	—	dB
		F6-F7	3000 - 8500	—	17	—	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.

### Functional Schematic



### Maximum Ratings

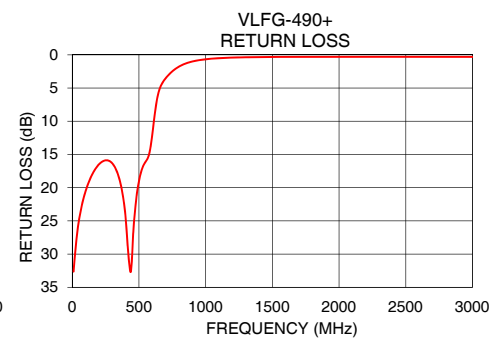
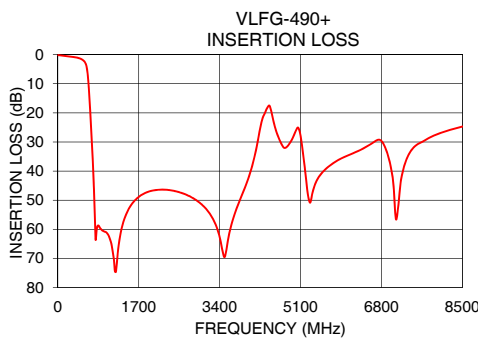
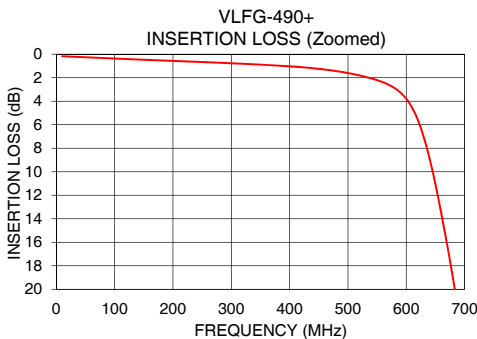
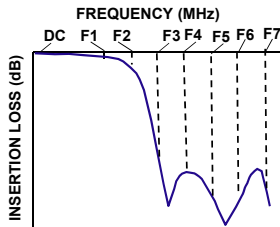
Operating Temperature	-55°C to 125°C
Storage Temperature	-55°C to 125°C
RF Power Input*	3.5 W max. @25°C

\*Passband rating, derate linearly to 0.9 W at 125°C ambient  
Permanent damage may occur if any of these limits are exceeded.

### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	Return Loss (dB)
10	0.17	32.63
100	0.37	20.53
300	0.77	16.33
400	1.03	24.48
490	1.52	20.16
590	3.26	13.48
685	20.46	3.93
720	31.32	3.07
800	63.43	1.77
960	60.60	0.77
1500	52.72	0.32
3000	51.14	0.31
4200	29.76	0.50
6100	34.59	0.43
6600	30.47	0.82
7000	39.07	1.30
7600	30.39	1.44
8000	27.16	0.92
8400	25.12	1.12
8500	24.71	1.26

### Typical Frequency Response



### Notes

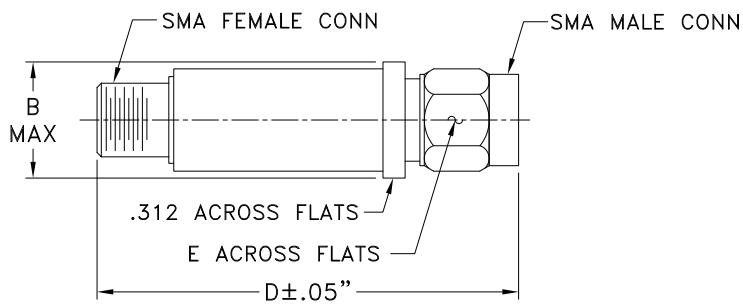
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**Coaxial Connections**

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

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*Typical Performance Data*

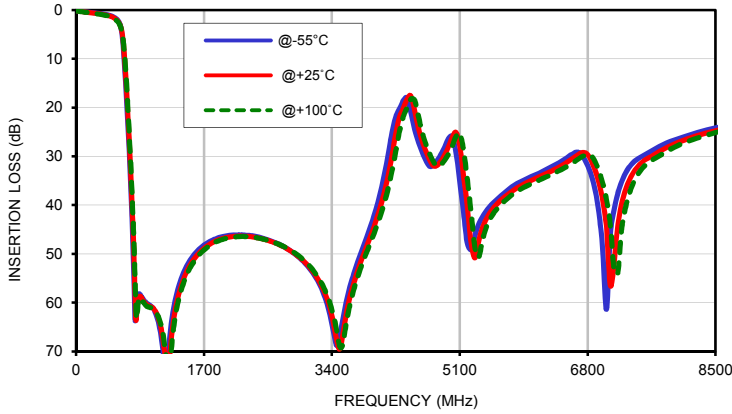
FREQ.  (MHz)	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C
10	0.13	0.17	0.21	33.92	32.80	30.21	34.24	32.63	30.28
40	0.20	0.24	0.28	29.09	27.00	25.39	28.16	26.30	24.85
100	0.32	0.37	0.41	23.10	22.21	21.39	21.34	20.53	19.88
200	0.51	0.57	0.60	18.53	18.92	19.79	16.51	16.49	16.84
300	0.67	0.77	0.84	18.41	17.90	17.99	17.16	16.33	16.07
400	0.90	1.03	1.12	20.91	20.81	20.47	24.77	24.48	23.07
420	0.96	1.10	1.20	22.20	21.90	21.76	29.54	29.89	28.45
460	1.14	1.30	1.41	23.69	22.59	23.02	25.94	25.91	28.00
490	1.35	1.52	1.64	21.62	20.93	21.25	20.23	20.16	20.62
500	1.43	1.60	1.73	20.78	20.28	20.52	19.07	19.00	19.28
590	3.23	3.26	3.38	16.22	19.10	19.94	12.28	13.48	13.78
600	3.90	3.79	3.86	12.65	15.80	17.45	10.41	11.98	12.57
685	22.60	20.46	19.16	1.67	2.15	2.59	3.23	3.93	4.53
700	27.28	24.96	23.52	1.40	1.78	2.12	2.91	3.53	4.07
720	33.94	31.32	29.69	1.16	1.46	1.72	2.53	3.07	3.54
800	60.97	63.43	63.09	0.69	0.88	1.03	1.46	1.77	2.04
850	58.33	58.75	59.13	0.55	0.72	0.84	1.07	1.31	1.49
900	59.56	59.76	60.07	0.46	0.61	0.71	0.81	1.00	1.14
960	60.37	60.60	60.83	0.37	0.52	0.61	0.62	0.77	0.87
1000	60.77	60.87	61.05	0.33	0.47	0.56	0.53	0.67	0.75
1100	64.43	63.54	63.12	0.26	0.39	0.48	0.40	0.50	0.56
1500	51.68	52.72	53.31	0.19	0.30	0.37	0.26	0.32	0.35
2000	46.32	46.66	46.81	0.22	0.32	0.37	0.24	0.30	0.32
2200	46.10	46.37	46.44	0.23	0.34	0.39	0.24	0.30	0.32
2300	46.20	46.43	46.51	0.24	0.35	0.40	0.24	0.30	0.32
2400	46.46	46.67	46.68	0.24	0.36	0.41	0.24	0.30	0.32
2500	46.88	47.01	47.02	0.24	0.36	0.43	0.23	0.30	0.32
2700	48.04	48.12	48.08	0.25	0.38	0.45	0.23	0.30	0.33
2900	49.96	49.88	49.77	0.26	0.39	0.48	0.22	0.31	0.34
3000	51.27	51.14	50.95	0.26	0.40	0.48	0.22	0.31	0.35
3300	58.58	57.79	57.15	0.27	0.42	0.51	0.22	0.32	0.37
3500	67.28	69.55	68.72	0.30	0.43	0.52	0.22	0.33	0.39
3700	53.60	55.56	56.87	0.35	0.47	0.56	0.21	0.34	0.41
3900	44.99	46.93	48.19	0.46	0.56	0.65	0.22	0.35	0.44
4000	40.14	42.62	44.17	0.60	0.67	0.75	0.23	0.37	0.46
4200	24.99	29.76	32.96	2.92	1.82	1.53	0.48	0.50	0.57
4500	24.41	20.62	18.50	1.64	2.06	2.56	0.60	1.35	2.33
4700	32.05	30.76	29.50	5.45	4.61	3.51	0.24	0.45	0.62
4900	28.00	29.72	30.76	1.30	1.89	2.85	0.24	0.42	0.57
5000	25.93	26.15	27.89	1.64	1.69	1.89	0.38	0.51	0.61
5300	46.29	50.84	48.58	0.38	0.69	1.04	0.17	0.40	0.57
5500	40.28	41.59	42.93	0.33	0.62	0.93	0.16	0.39	0.57
5700	37.40	38.30	39.10	0.35	0.61	0.91	0.17	0.40	0.59
5900	35.28	36.11	36.83	0.41	0.63	0.90	0.18	0.41	0.60
6000	34.56	35.31	36.01	0.44	0.65	0.90	0.18	0.42	0.60
6300	32.33	33.16	33.89	0.63	0.77	0.94	0.27	0.47	0.64
6500	30.54	31.48	32.30	0.88	0.96	1.06	0.56	0.61	0.72
6700	29.35	29.42	30.32	1.52	1.41	1.38	2.40	1.42	1.15
6900	37.04	32.88	31.10	2.90	2.57	2.31	1.14	2.23	2.87
7000	49.16	39.07	35.44	4.36	3.47	3.11	0.75	1.30	1.94
7300	33.53	37.03	40.75	13.32	24.92	14.68	0.65	0.77	0.91
7500	30.21	31.49	32.96	3.80	6.14	8.83	1.28	1.02	0.98
7700	28.43	29.55	30.41	1.78	2.70	3.64	1.20	1.65	1.61
7900	26.97	27.82	28.55	1.09	1.65	2.18	0.83	1.02	1.22
8000	26.41	27.16	27.79	0.90	1.39	1.85	0.83	0.92	1.03
8100	25.89	26.59	27.14	0.78	1.22	1.63	0.87	0.91	0.96
8200	25.40	26.05	26.55	0.70	1.11	1.48	0.95	0.95	0.97
8300	24.93	25.57	26.06	0.65	1.02	1.37	1.05	1.02	1.01
8400	24.52	25.12	25.58	0.63	0.97	1.30	1.18	1.12	1.09
8500	24.17	24.71	25.14	0.62	0.94	1.24	1.35	1.26	1.21

*Typical Performance Data*

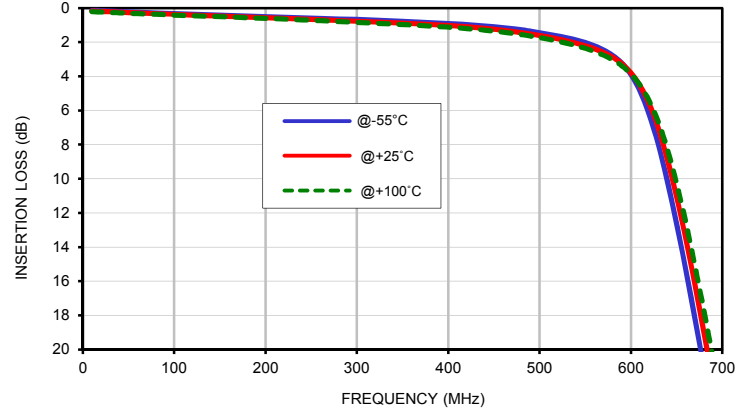
FREQ.  (MHz)	GROUP DELAY		
	(nsec)		
	@-55°C	@+25°C	@+100°C
10	1.24	1.24	1.18
11	1.24	1.23	1.18
12	1.24	1.23	1.18
13	1.24	1.23	1.18
14	1.23	1.22	1.18
15	1.23	1.22	1.18
16	1.23	1.21	1.18
17	1.23	1.21	1.18
18	1.22	1.20	1.18
19	1.22	1.20	1.18
20	1.22	1.20	1.18
40	1.22	1.20	1.18
60	1.22	1.20	1.18
80	1.22	1.20	1.18
100	1.22	1.20	1.18
120	1.23	1.20	1.19
140	1.24	1.21	1.20
160	1.25	1.22	1.21
180	1.26	1.24	1.22
200	1.28	1.26	1.24
220	1.31	1.28	1.26
240	1.33	1.30	1.29
260	1.37	1.34	1.32
280	1.40	1.37	1.35
300	1.45	1.41	1.39
320	1.50	1.46	1.44
340	1.56	1.52	1.49
360	1.63	1.58	1.55
380	1.70	1.65	1.62
400	1.78	1.73	1.69
420	1.87	1.81	1.77
440	1.97	1.90	1.86
460	2.07	2.00	1.95
480	2.18	2.10	2.05
490	2.30	2.21	2.15
500	2.43	2.32	2.26
510	2.58	2.45	2.38
520	2.74	2.59	2.51
530	2.91	2.75	2.65
540	3.11	2.92	2.81
550	3.32	3.11	2.98

## Typical Performance Curves

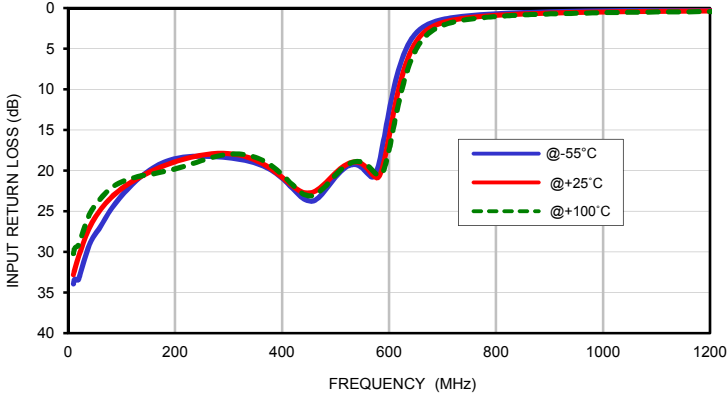
**INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



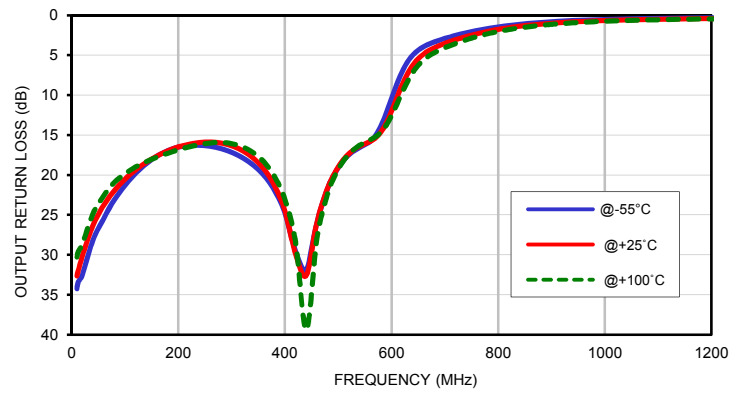
**INSERTION LOSS vs. TEMPERATURE (Zoomed)**  
INPUT POWER = 0 dBm



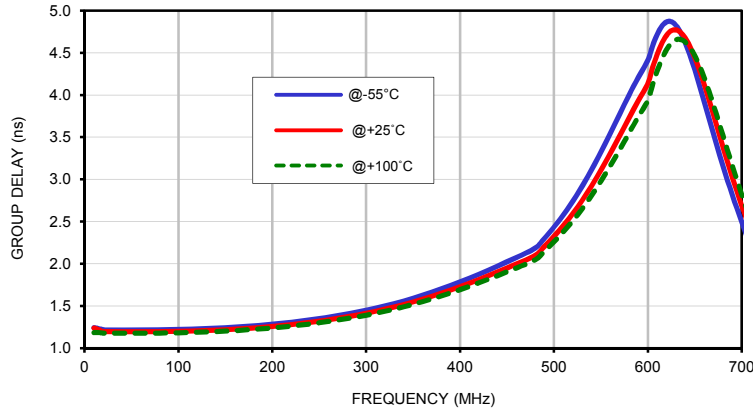
**INPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**OUTPUT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**GROUP DELAY vs. TEMPERATURE**  
INPUT POWER = 0 dBm

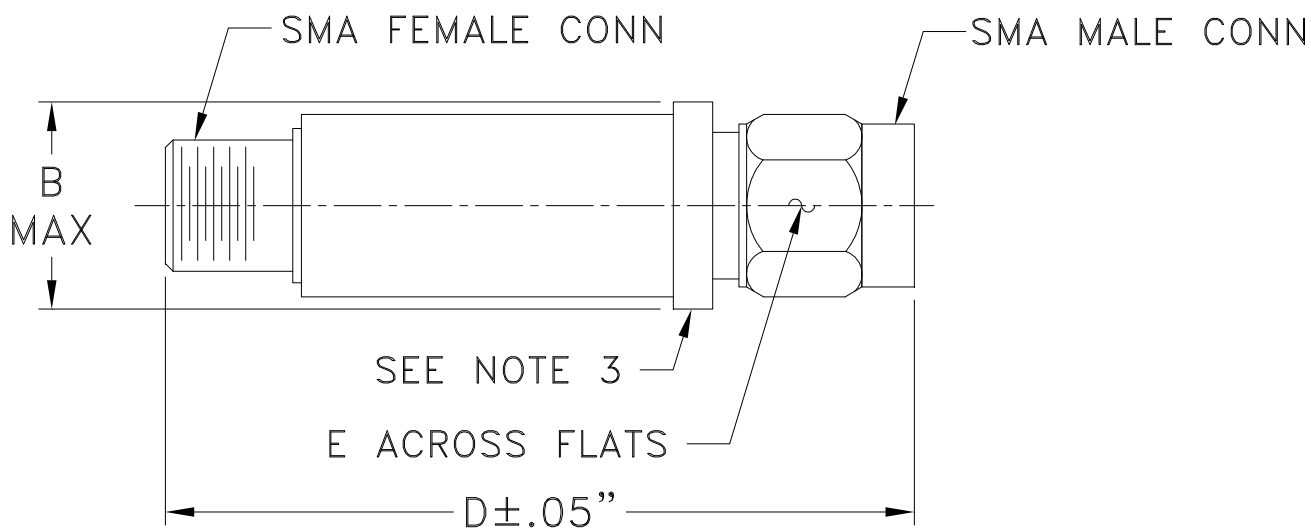


# Case Style

# 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.

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RF/IF MICROWAVE COMPONENTS

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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, Except +100°C