



LTCC SMT

# Low Pass Filter

## LFCV-2202+

Mini-Circuits

50Ω DC to 22 GHz

### THE BIG DEAL

- Stop Band Rejection, 40 dB Typ.
- Rugged, Ceramic Construction
- Stop Band Rejection, 35 dB Typ.
- Small size, 1210



Generic photo used for illustration purposes only

CASE STYLE: JV1210C-13

### +RoHS Compliant

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

### APPLICATIONS

- Communications, Radar, EW and ECM Defense Systems

### PRODUCT OVERVIEW

LFCV-2202+ is a miniature low temperature co-fired ceramic (LTCC) low pass filter with a DC to 22 GHz passband supporting a variety of applications. This model provides 1.7 dB typical insertion loss over a wide band due to its rugged monolithic construction. Housed in a small 1210 ceramic form factor, the filter is ideal for dense signal chain PCB layouts where it complements MMIC size and performance. The LTCC fabrication process assures minimal RF performance variation while delivering a product that is well suited for environmental extremes of high humidity and temperature.

### KEY FEATURES

Feature	Advantages
Ultra-wide Stopband	The LTCC lowpass filter provides a very good stopband rejection to 51 GHz suitable for high end applications.
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Cost effective	LTCC is scalable technology that is cost effective due to ease of production in high volume.
Small footprint (1210)	Allows for high layout density of circuit boards, while minimizing effects of parasitics.
Surface Mountable	Suitable for very high-volume automated assembly processes.

REV. OR  
ECO-016067  
LFCV-2202+  
WY/CP/AM  
221223





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### ELECTRICAL SPECIFICATIONS<sup>1,2</sup> AT 25°C

Parameter	F#	Frequency (GHz)	Min.	Typ.	Max.	Units	
Passband	Insertion Loss	F1 - F2	DC-22	—	1.7	2.3	dB
	Return Loss	F1 - F2	DC-22	—	14	—	dB
Stop Band	Insertion Loss	F3 - F4	29.8-42	30	40	—	dB
		F4 - F5	42-48	25	35	—	
		F5 - F6	48-51	—	25	—	

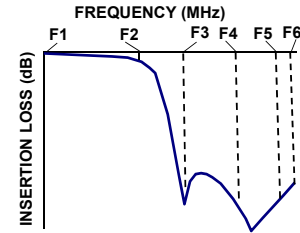
1. Measured on Mini-Circuits Test Board TB-LFCV-2202C+ with the connector and feedline effects de-embedded using the 2XThru IEEE P370 method
2. DC Blocking capacitors are required in Applications where DC voltage and/or current is present at either RF1 or RF2 ports.  
Please contact Mini-Circuits for alternatives if DC pass from RF1-RF2 is required.

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

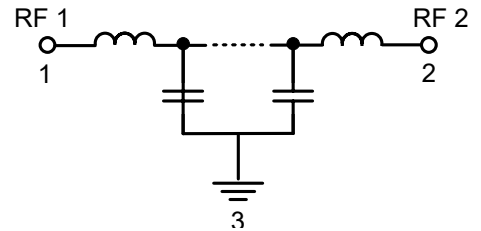
Parameter	Ratings
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +125°C
RF Power Input <sup>2</sup>	1W max.

1. Permanent damage may occur if any of these limits are exceeded.
2. Derate linearly to 0.5 W at 125°C.

### TYPICAL FREQUENCY RESPONSE



### FUNCTIONAL SCHEMATIC





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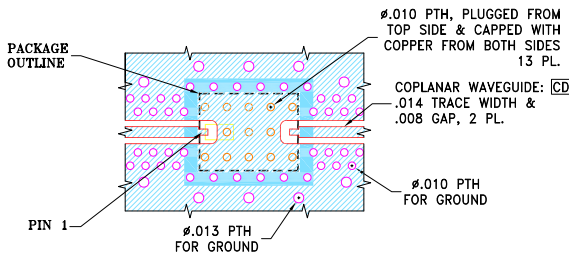
50Ω DC to 22 GHz

### PAD CONNECTIONS

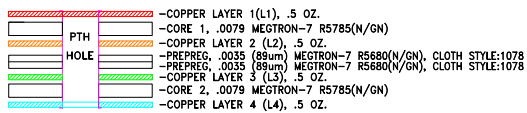
RF 1	1
RF 2	2
GROUND	3

### PRODUCT MARKING: VT

### SUGGESTED PCB LAYOUT (PL-743)



#### STACK-UP DIAGRAM



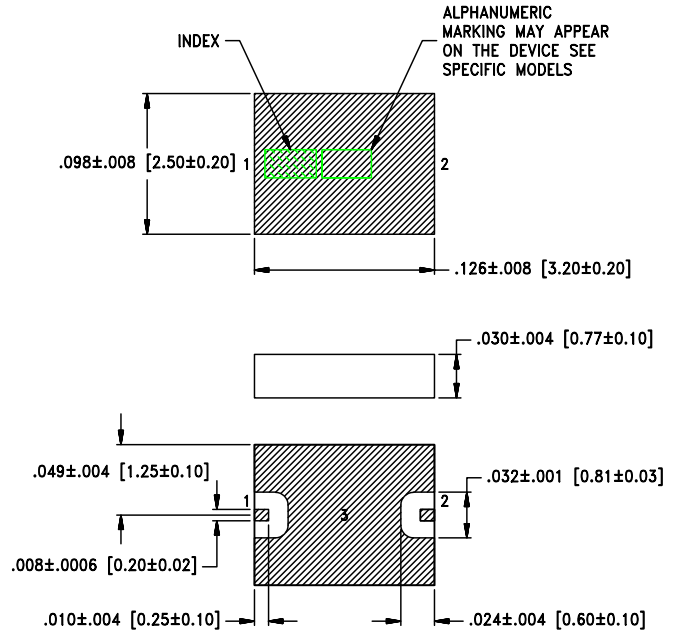
- TOTAL FINISHED THICKNESS  $0.026 \pm 10\%$ .
- PTH PRESENT FROM COPPER LAYER 1 TO COPPER LAYER 4.
- INDICATED ON TOP VIEW PTH'S ARE PLUGGED WITH EPOXY AND CAPPED WITH COPPER FROM TOP SIDE.
- L2, L3 AND L4 ARE CONTINUOUS GROUND PLANES.

#### NOTES:

- PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
- TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR MEGTRON-7 R-5785(N/GN), WITH DIELECTRIC THICKNESS .0079; COPPER: 1/2 OZ. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### OUTLINE DRAWING



METALLIZATION

Weight: .024 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.010; 3 Pl. ±.005

### OUTLINE DIMENSIONS (Inches mm)

A	B	C	D	E	F	G	H	wt
.126	.098	.030	.049	.008	.010	.024	.032	grams
3.2	2.5	0.8	1.2	0.20	0.3	0.6	0.8	0.030

### TAPE & REEL INFORMATION: F74



CERAMIC

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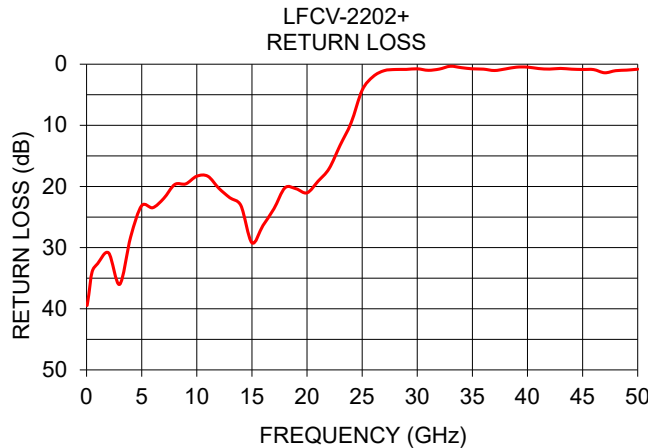
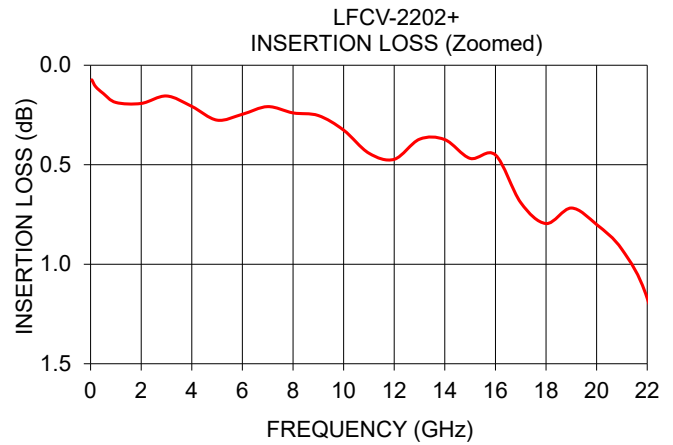
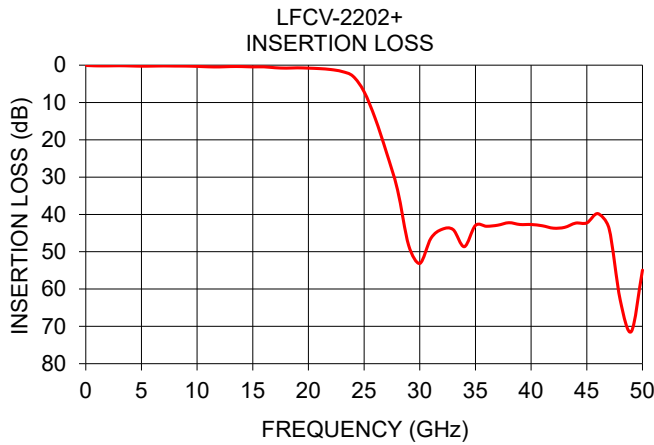
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### TYPICAL PERFORMANCE DATA AT 25°C

Frequency (GHz)	Insertion Loss (dB)	Return Loss (dB)
0.05	0.07	39.47
0.5	0.14	33.97
1.0	0.19	32.63
5.0	0.28	23.13
6.0	0.25	23.48
7.0	0.21	21.96
8.0	0.24	19.68
9.0	0.25	19.57
10	0.33	18.32
15	0.47	29.21
20	0.80	21.04
25	7.13	4.26
30	53.14	0.75
40	42.70	0.48
50	54.92	0.82



#### 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



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