



LTCC SMT

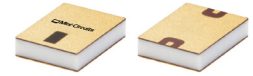
# High Pass Filter

## HFCV-2002+

50Ω 19.6 to 47 GHz

### THE BIG DEAL

- Pass Band, 19.6 to 47 GHz
- Low Insertion Loss, Typ. 1.6 dB
- Return Loss, Typ. 10 dB
- Stop Band Rejection, Typ. 21 dB
- Power Handling, 1W



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

- Test & Measurement Equipment
- 5G mmWave Radio Systems
- Satellite Communications
- ISM Applications

### PRODUCT OVERVIEW

The HFCV-2002+ is a miniature low temperature co-fired ceramic (LTCC) high pass filter with a 19.6 to 47 GHz passband supporting a variety of applications. This model provides 1.6 dB typical insertion loss over a wide band due to its rugged monolithic construction. Housed in a tiny 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
Passband	More than an octave bandwidth for wideband applications
Cost effective	LTCC is a scalable technology that is cost effective due to ease of production in high quantities.
Small size 1210	Allows for high layout density of circuit boards, while minimizing effects of parasites.
Surface Mountable	Suitable for very high volume automated assembly process.

REV. OR  
ECO-015970  
HFCV-2002+  
ATHARVA/CP/AM  
221222





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

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Stop Band	Insertion Loss	DC-F1	0.1 - 8	—	21.9	—	dB
		F1-F2	8.1 - 15	—	17.8	—	
Pass Band	Insertion Loss	F3-F4	19.6 - 26.5	—	1.0	1.7	dB
		F4-F5	26.6 - 38	—	1.6	2.4	
		F5-F6	38.1 - 47	—	2.2	3.8	
	Return Loss	F3-F4	19.6 - 26.5	—	15.1	—	dB
		F4-F5	26.6 - 38	—	10.7	—	
		F5-F6	38.1 - 47	—	15	—	

1. Measured on Mini-Circuits Test Board TB-HFCV-2002C+ with connectors and feedlines effects de-embedded using 2X Thru IEEE P370 method.

2. This component is not intended to act as a DC block. Please consult with Mini-Circuits for further details.

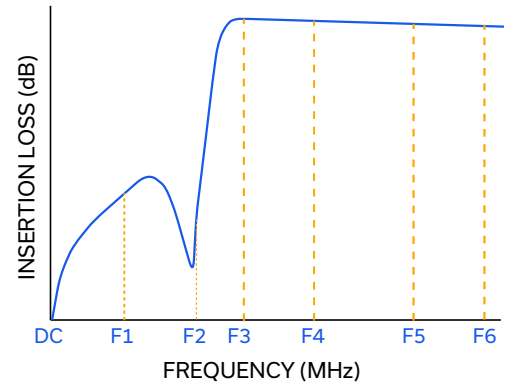
DC blocking capacitors are required in applications where DC voltage and/or current is present at either input or output ports.

### ABSOLUTE MAXIMUM RATINGS

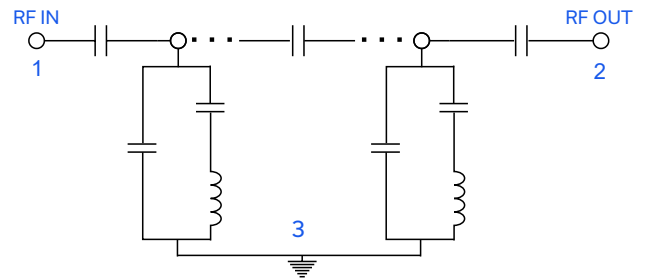
Parameter	Ratings
Operating Temperature	-55°C to +125°C
Storage Temperature	-55°C to +125°C
RF Power Input	1W max.

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

### TYPICAL FREQUENCY RESPONSE



### FUNCTIONAL SCHEMATIC





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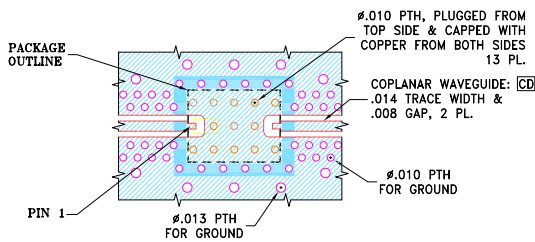
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### PIN CONNECTIONS

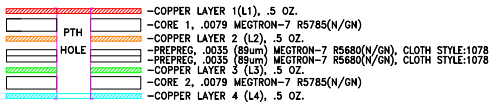
RF IN	1
RF OUT	2
GROUND	3

PRODUCT MARKING: VJ

### EVALUATION BOARD MCL P/N: TB-HFCV-2002C+ SUGGESTED PCB LAYOUT (PL-743)



#### STACK-UP DIAGRAM



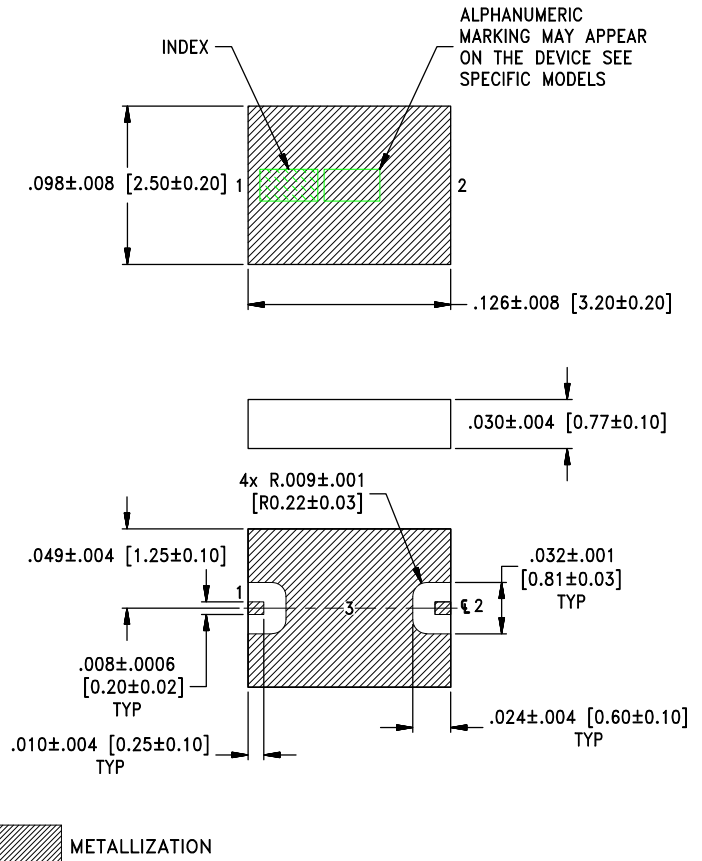
- TOTAL FINISHED THICKNESS 0.028 ± 10%.
- PTH PRESENT FROM COPPER LAYER 1 TO COPPER LAYER 4.
- INDICATED ON TOP VIEW PTH'S ARE PLUGGED WITH EPOXY AND CAPPED WITH COPPER FROM TOP SIDE.
- L2, L3 AND L4 ARE CONTINUOUS GROUND PLANES.

#### 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



Weight: .024 grams

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

### TAPE & REEL INFORMATION: F74



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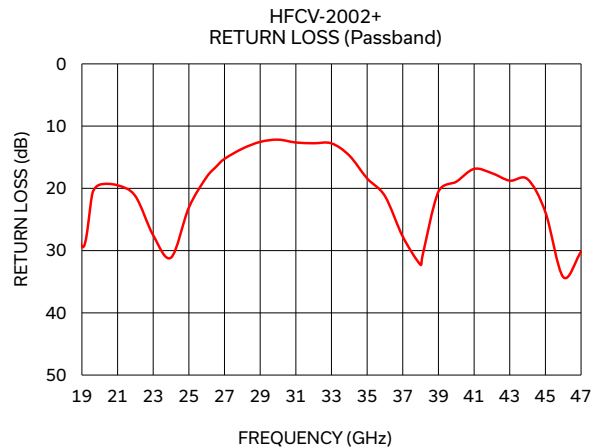
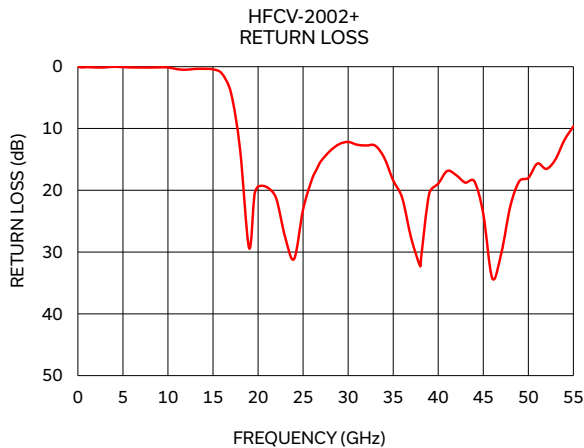
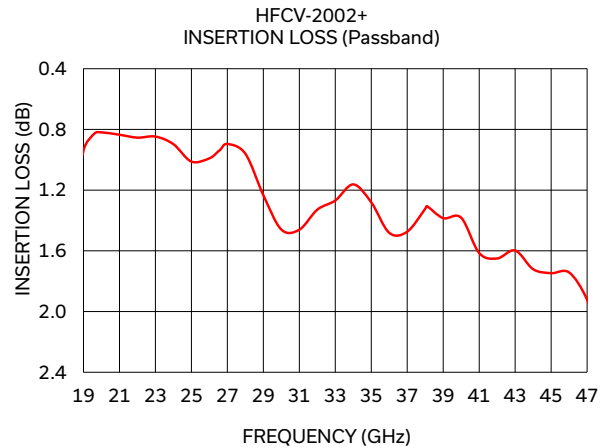
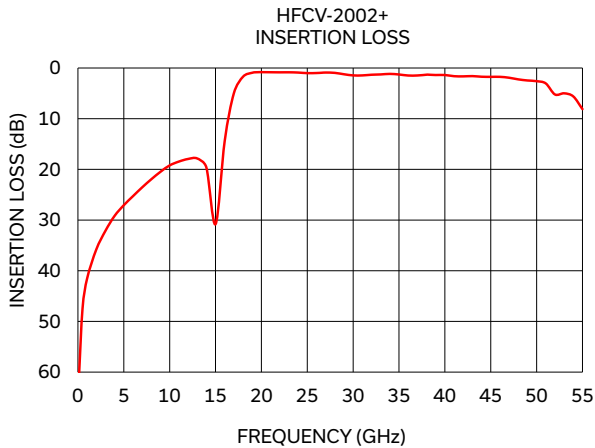
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### TYPICAL PERFORMANCE DATA AT 25°C

Frequency (GHz)	Insertion Loss (dB)	Return Loss (dB)
0.10	61.44	0.07
0.5	47.51	0.12
1.0	41.55	0.07
5.0	27.07	0.07
6.0	25.29	0.12
7.0	23.55	0.13
8.0	21.95	0.14
9.0	20.48	0.12
10	19.21	0.12
15	30.81	0.43
20	0.82	19.41
25	1.01	23.08
30	1.46	12.18
40	1.38	18.94
55	8.12	9.66



- 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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