



LTCC SURFACE MOUNT

# Band Pass Filter

## BFHK-1202+

50Ω 9.5 to 13.5 GHz

### THE BIG DEAL

- Ultra-High Stopband Rejection, 62 dB Typ.
- Surface mountable pick and place standard case style
- Standard small 1812 (4.5x3.2 mm) case style
- High quality distributed filter topology
- Wide rejection band
- Shielded construction preventing filter from de-tuning
- Reduced footprint area by employing LGA (Land Grid Array)
- Suited for very high-volume production
- Protected by US Patents 11,638,370 and 11,744,057



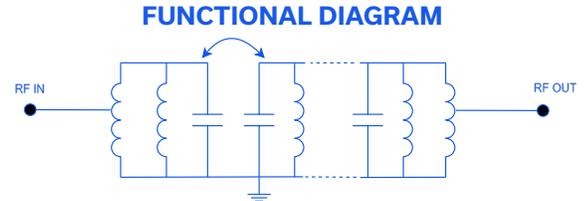
Generic photo used for illustration purposes only

### APPLICATIONS

- Test & Measurement Equipment
- Satellite Communications
- Aerospace and Defense Signal Conditioning

### PRODUCT OVERVIEW

Mini-Circuits' BFHK-1202+ Bandpass Filter delivers precision filtering for upper X-band through the lower edge of Ku-band in a compact, rugged ceramic package. Leveraging proprietary materials science and a distributed design topology, ensures highly repeatable performance for mission-critical designs. The filter provides typical passband loss of 0.85 dB from 9.5 to 13.5 GHz with exceptional stopband rejection of 46 dB from 0.1 to 4.5 GHz and 74 dB through 30 GHz, greatly suppressing interference and harmonics. The BFHK-1202+ is rated for up to 1 W of RF input power and operates over a wide temperature range of -55°C to +125°C, combining reliability and high performance for demanding SATCOM, radar, EW and test environments.



### ELECTRICAL SPECIFICATIONS<sup>1,2,3</sup> AT +25°C, Z<sub>0</sub> = 50Ω

Parameter	F#	Frequency (GHz)	Min.	Typ.	Max.	Units	
Passband	Center Frequency <sup>4</sup>	-	-	11.5	-	GHz	
	Insertion Loss	F4-F5	9.5-13.5	-	0.85	1	dB
	Return Loss	F4-F5	9.5-13.5	-	12.3	-	dB
Stopband, Lower	Rejection	DC-F1	0.1-4.5	40	46	-	dB
		F1-F2	4.5-6.5	37	42	-	
		F2-F3	6.5-7	35	42	-	
Stopband, Upper	Rejection	F6-F7	17.5-19	52	62	-	dB
		F7-F8	19-20	66	76	-	
		F8-F9	20-24	66	76	-	
		F9-F10	24-28	70	80	-	
		F10-F11	28-30	64	74	-	

1. Tested on Evaluation Board P/N TB-BFHK-1202C+ with the connector and feedline effects de-embedded using the 2X Thru IEEE P370 method.

2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

4. Typical variation ± 3%

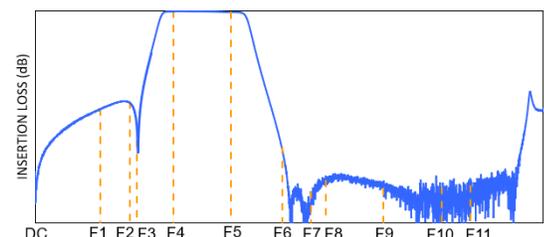
### ABSOLUTE MAXIMUM RATINGS<sup>5</sup>

Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power <sup>6</sup>	1 W

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

6. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 0.5 W at +125°C.

### TYPICAL FREQUENCY RESPONSE





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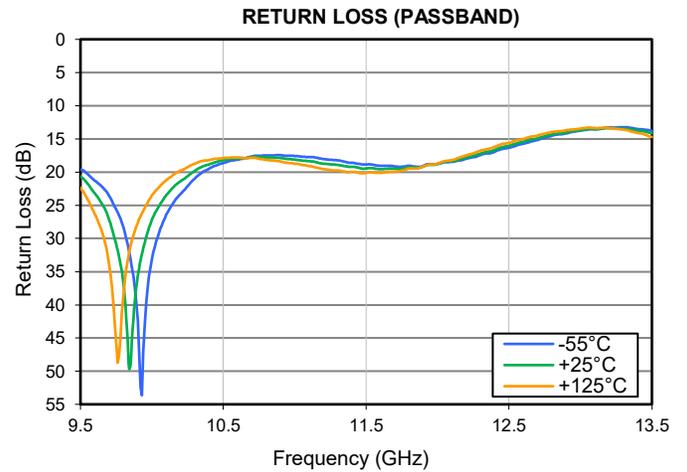
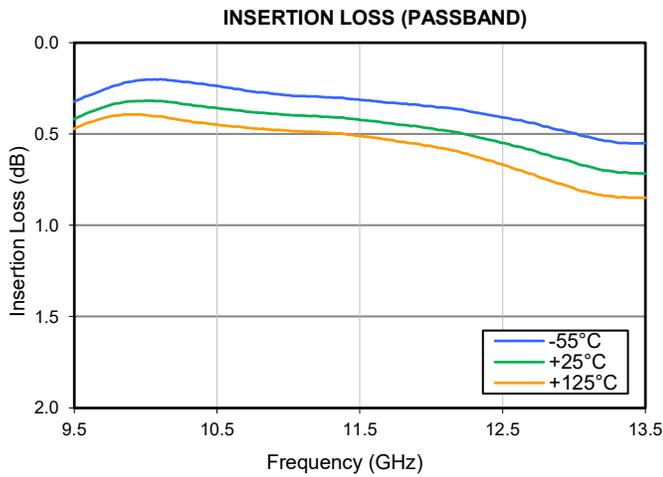
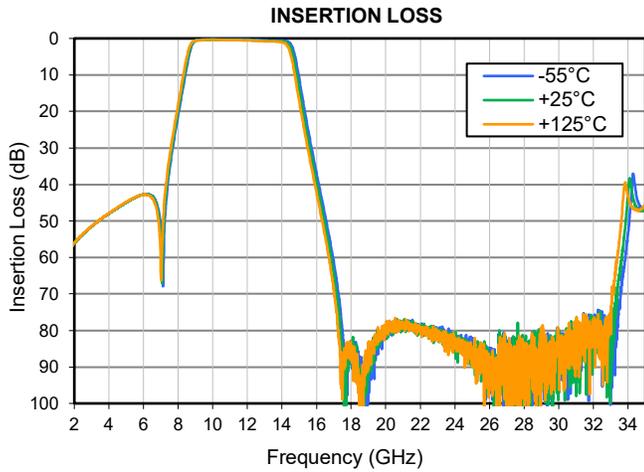
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Mini-Circuits

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### TYPICAL PERFORMANCE GRAPHS





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## FUNCTIONAL DIAGRAM

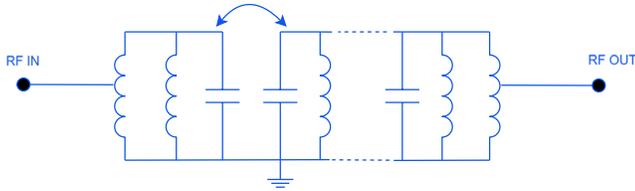
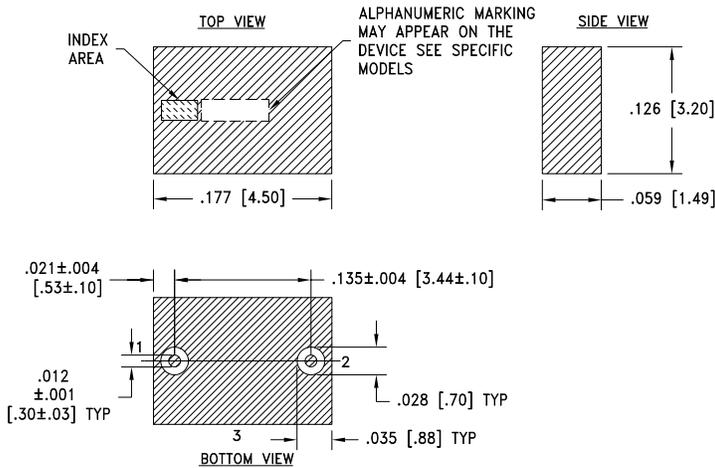


Figure 1. BFHK-1202+ Functional Diagram

## PAD DESCRIPTION

Function	Pad Number	Description
RF1 <sup>2</sup>	1	Connects to RF Input Port
RF2 <sup>2</sup>	2	Connects to RF Output Port
GROUND	3	Connects to Ground on PCB, (See drawing PL-730)

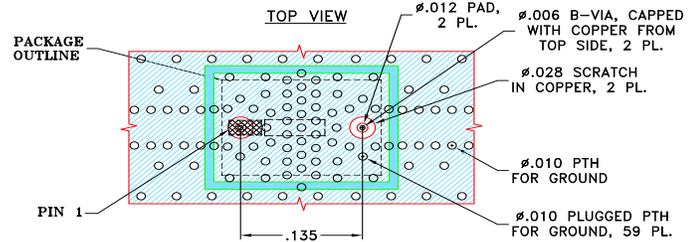
## CASE STYLE DRAWING



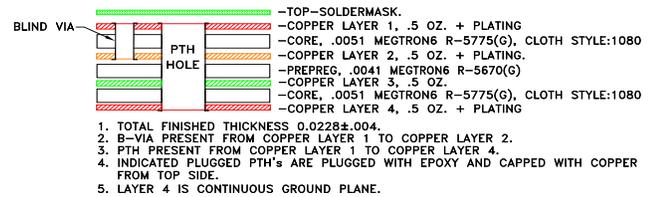
## PRODUCT MARKING\*: F606

\*Marking may contain other features or characters for internal lot control.

## SUGGESTED PCB LAYOUT: PL-730



### STACK-UP DIAGRAM

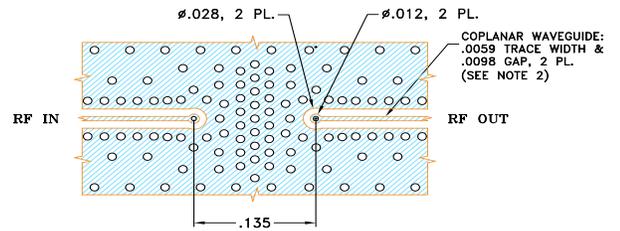


### NOTES:

- PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
- TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR MEGTRON6 R-5775(G), CLOTH STYLE:1080 WITH DIELECTRIC THICKNESS .0051; COPPER: 1/2 OZ.+PLATING. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- COPPER LAYER 4 OF THE PCB ARE CONTINUOUS GROUND PLANE.

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

### LAYER 2, B-VIA & PTH



### LAYER 3 & PTH

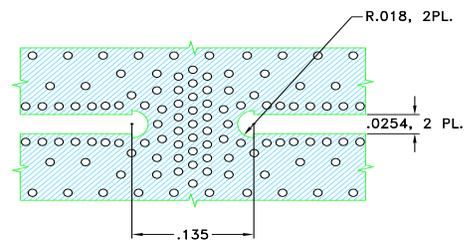


Figure 2. Suggested PCB Layout



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	NM1812C-3 Lead Finish: Tin over Nickel Plating
RoHS/REACH Status	Compliant
Tape and Reel	F77
Suggested Layout for PCB Design	PL-730
Evaluation Board	TB-BFHK-1202C+ Gerber File
Environmental Rating	ENV06T12

### 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-Circuits' 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)

