LTCC SURFACE MOUNT

Band Pass Filter

BFHK-1412+

50Ω 13.75 to 14.5 GHz

THE BIG DEAL

- High-Performance SIW Topology
- High Power Handling, 8.5 W
- Compact 1812 Package
- Excellent Stopband Rejection, Up to 58 dB Typ.
- Low Insertion Loss, 2.6 dB Typ.
- Suited for Very High-Volume Production

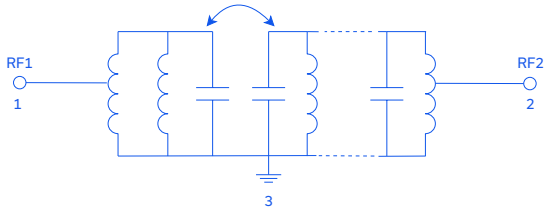


Generic photo used for illustration purposes only

APPLICATIONS

- SATCOM Ku-Band Uplink
- VSAT and Ground Station Terminals
- Aerospace & Defense RF Front Ends
- Test and Measurement Equipment

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' BFHK-1412+ is a high-performance bandpass filter designed for the SATCOM Ku-Band uplink, covering 13.75 to 14.5 GHz with exceptional power handling and high out-of-band rejection. This filter was designed with an advanced substrate integrated waveguide (SIW) topology to deliver waveguide-class selectivity, rejection and improved power handling while retaining its compact, LTCC footprint. This approach combines the low loss and high-Q performance of waveguide structures with the scalability and manufacturability of standard LTCC components.

ELECTRICAL SPECIFICATIONS[1,2,3] AT +25 °C, Z_0 = 50Ω

Parameter		F#	Frequency (GHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency[4]	–	–	–	14.125	–	GHz
	Insertion Loss	F5–F6	13.75–14	–	2.6	3.5	dB
		F6–F7	14–14.5	–	2.1	2.5	
	Return Loss	F5–F6	13.75–14	–	8.5	–	dB
		F6–F7	14–14.5	8	10	–	
Stopband, Lower	Rejection	DC–F1	DC–5	48	58	–	dB
		F1–F2	5–10	38	48	–	
		F2–F3	10–12.2	35	45	–	
		F3–F4	12.2–12.75	–	23	–	
Stopband, Upper	Rejection	F8–F9	16.3–18.5	40	50	–	dB
		F9–F10	18.5–27.5	48	58	–	
		F10–F11	27.5–31.2	43	53	–	

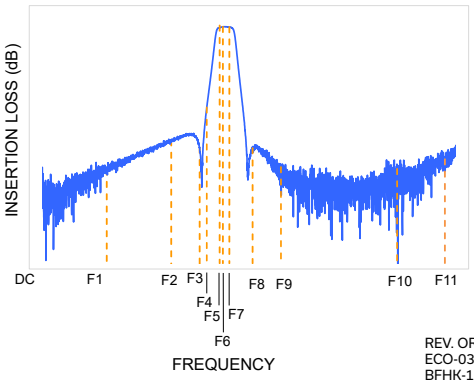
1. Tested in Evaluation Board P/N TB-BFHK-1412C+ with the connector and feedline effects de-embedded using the 2X Thru IEEE P370 method.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC block. 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 ±1.5%.

ABSOLUTE MAXIMUM RATINGS[5]

Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power[6]	8.5 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 2.2 W at +125 °C.

TYPICAL FREQUENCY RESPONSE



REV. OR
ECO-030941
BFHK-1412+
MCL NY
260827

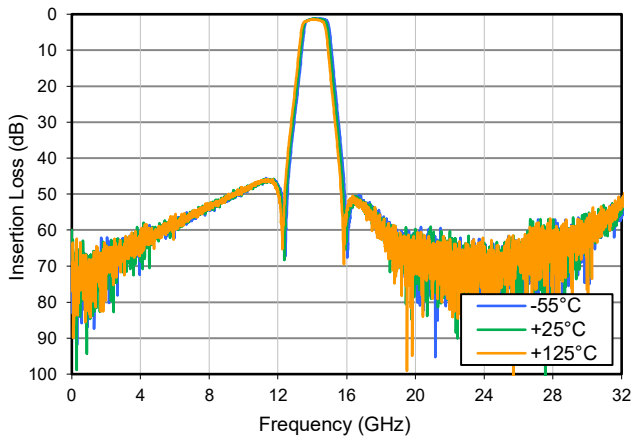
Band Pass Filter

BFHK-1412+

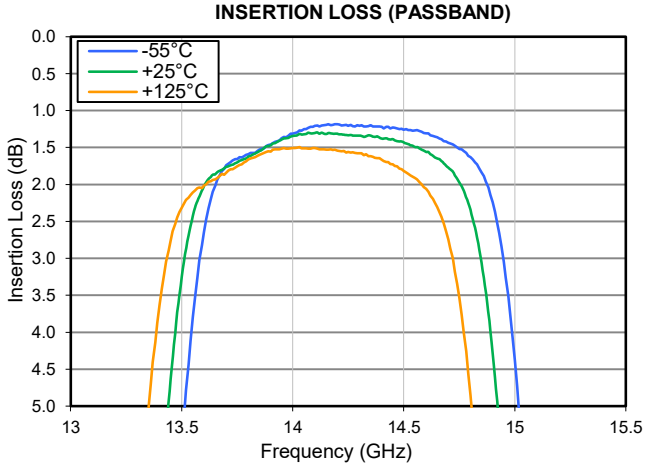
50Ω 13.75 to 14.5 GHz

TYPICAL PERFORMANCE GRAPHS

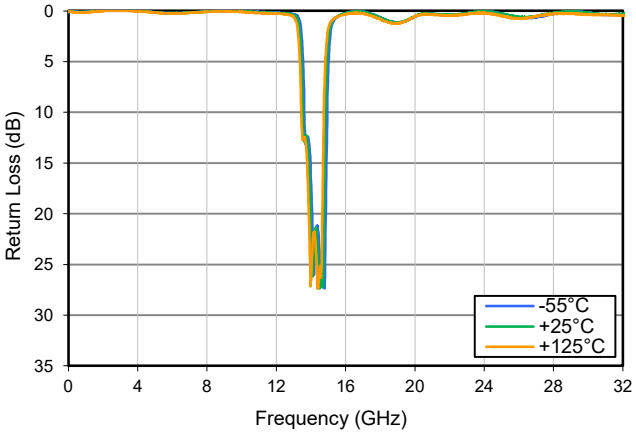
INSERTION LOSS



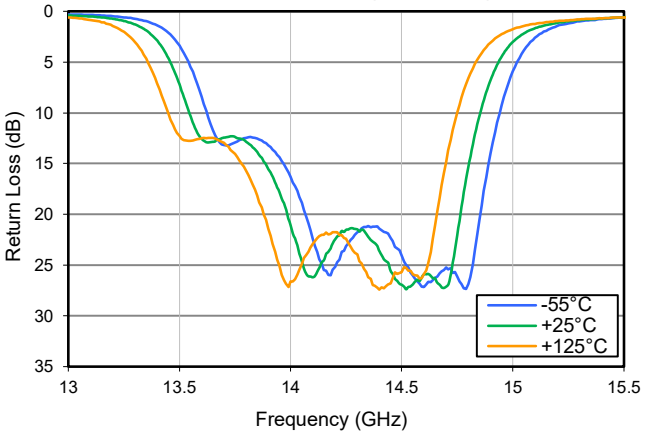
INSERTION LOSS (PASSBAND)



RETURN LOSS



RETURN LOSS (PASSBAND)



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FUNCTIONAL DIAGRAM

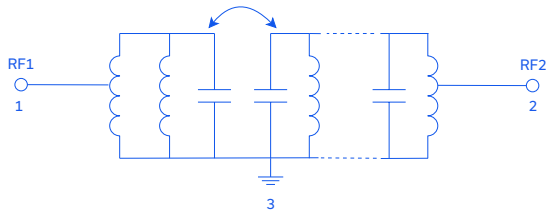
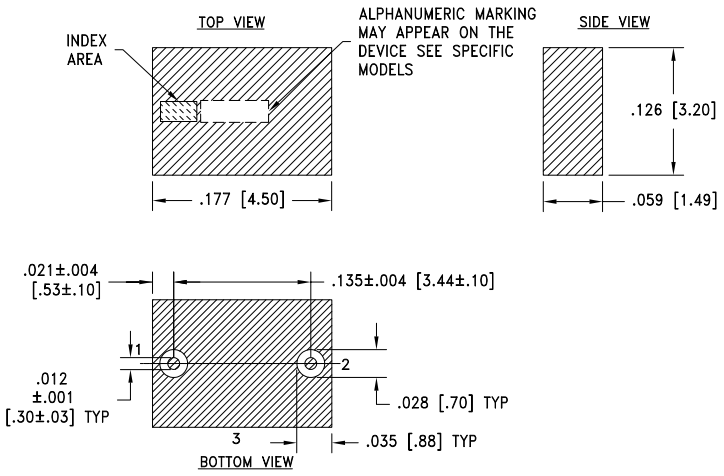


Figure 1. BFHK-1412+ Functional Diagram

PAD DESCRIPTION

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

CASE STYLE DRAWING

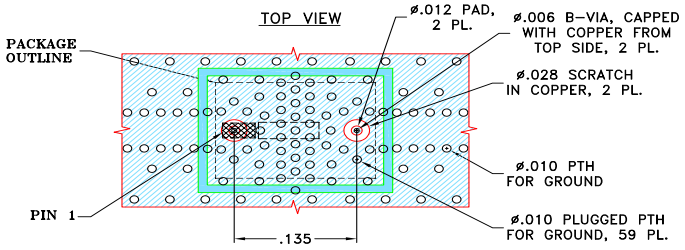


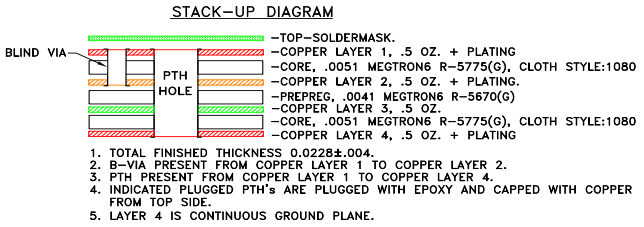
Weight: .126 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.01; 3 Pl. ±.005

PRODUCT MARKING*: F646

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

SUGGESTED PCB LAYOUT: PL-730





NOTES:
1. PCB IS MULTILAYER PCB, SEE STACK–UP DIAGRAM.
2. 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.
3. 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

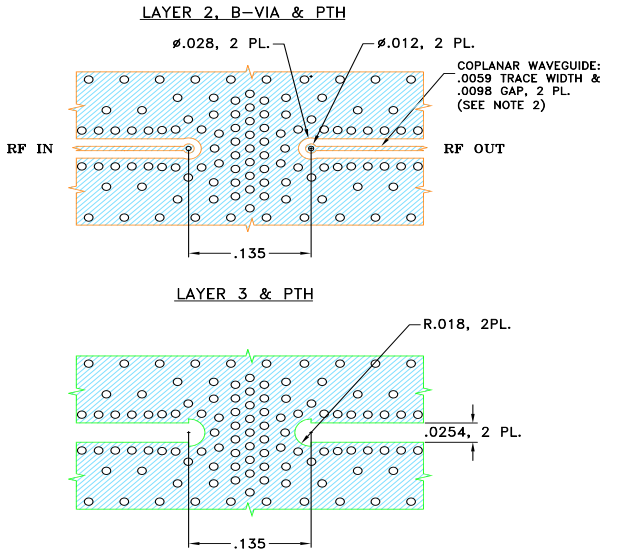


Figure 2. Suggested PCB Layout

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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-1412C+ Gerber File
Environmental Rating	ENV164

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