



MMIC REFLECTIONLESS

High Pass Filter

XHF2-1832+

50Ω 18.3 to 30 GHz

THE BIG DEAL

- Match to 50Ω in the stop band, eliminates undesired reflections
- Cascadable
- Excellent Power handling
- Temperature stable, up to +105°C
- Small size, 2 x 2 mm
- Protected by US Patent No. 8,392,495

*Generic photo used for illustration purposes only*

CASE STYLE: MC1630-1

+RoHS Compliant

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

APPLICATIONS

- Wi-Fi
- WiMax
- Microwave Radio
- Military & Space

GENERAL DESCRIPTION

Mini-Circuits' XHF2-1832+ reflectionless filter employs a novel filter topology which absorbs and terminates stop band signals internally rather than reflecting them back to the source. This new capability enables unique applications for filter circuits beyond those suited to traditional approaches. Traditional filters are reflective in the stop band, sending signals back to the source at 100% of the power level. These reflections interact with neighboring components and often result in inter-modulation and other interferences. Reflectionless filters eliminate stop band reflections, allowing them to be paired with sensitive devices and used in applications that otherwise require circuits such as isolation amplifiers or attenuators.

KEY FEATURES

| Feature | Advantages |
|---|---|
| Easy integration with sensitive reflective components, e.g. mixers, multipliers | Reflectionless filters absorb unwanted signals falling in filter stopband, preventing reflections back to the source. This reduces generation of additional unwanted signals without the need for extra components like attenuators, improving system dynamic range and saving board space. |
| Enables stable integration of wideband amplifiers | Because reflectionless filters maintain good impedance in the stopband; they can be integrated with high gain, wideband amplifiers without the risk of creating instabilities in these out of band regions. |
| Cascadable | Reflectionless filters can be cascaded in multiple sections to provide sharper and higher attenuation, while also preventing any standing waves that could affect passband signals. Low & highpass filters can be cascaded to realize bandpass filters. |
| Excellent power handling in a tiny surface mount device | High power handling extends the usability of these filters to the transmit path for inter-stage filtering. |
| Small size, 2x2mm QFN-Style | Allows replacement of filter/attenuator pairs with a single reflectionless filter, saving board space. |
| Excellent repeatability of RF performance | Through semiconductor IPD process, X-series filters are inherently repeatable for large volume production. |
| Operating temperature up to +105 °C | Suitable for operation close to high power components. |

IPD - Integrated Passive Device, is a GaAs semiconductor process

REV. C
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XHF2-1832+
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PAGE 1 OF 5



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ELECTRICAL SPECIFICATIONS¹ AT +25°C

| Parameter | | F# | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------|-------------------|---------|-----------------|------|------|------|------|
| Stop Band | Rejection | DC - F' | DC - 9000 | — | 6.7 | — | dB |
| | Frequency Cut-off | F' - F1 | 9000 - 14600 | 12.9 | 14.0 | — | |
| | | F2 | 17500 | — | 3.0 | — | :1 |
| | VSWR | DC - F' | DC - 9000 | — | 2.8 | — | |
| | | F' - F1 | 9000 - 14600 | — | 1.7 | — | |
| Pass Band | Insertion Loss | F3 - F4 | 18300 - 25000 | — | 2.1 | — | dB |
| | | F4 - F5 | 25000 - 30000 | — | 1.3 | — | |
| | | F3 - F4 | 18300 - 25000 | — | 1.7 | — | :1 |
| | VSWR | F4 - F5 | 25000 - 30000 | — | 1.7 | — | |

1. Measured on Mini-Circuits Characterization Test Board TB-883-1832+

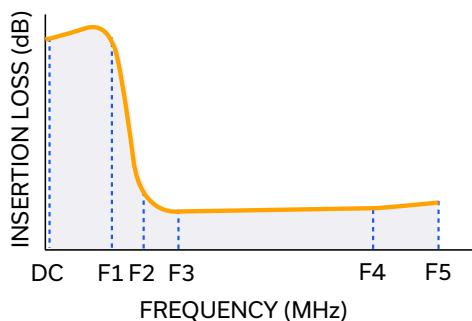
ABSOLUTE MAXIMUM RATINGS²

| Parameter | Ratings |
|---|-----------------|
| Operating Temperature | -55°C to +105°C |
| Storage Temperature | -65°C to +150°C |
| RF Power Input, Passband (F3-F5) ² | 0.32 W at +25°C |
| RF Power Input, Stopband (DC-F3) ³ | 0.09 W at +25°C |

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

3. Passband rating derates linearly to 0.16W at 105°C ambient

4. Stopband rating derates linearly to 0.04W at 105°C ambient

SPECIFICATION DEFINITION

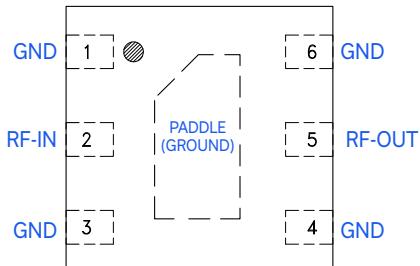
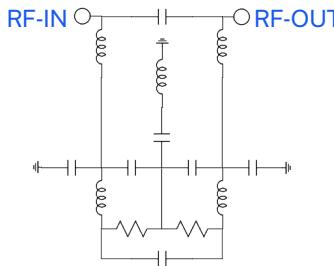


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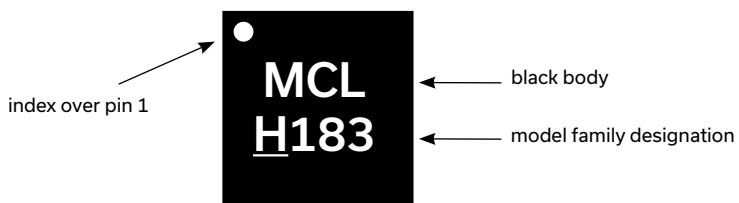
50Ω 18.3 to 30 GHz

SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION



| Function | Pad Number | Description |
|----------|-----------------|--------------------------------|
| RF-IN | 2 | RF Input Pad |
| RF-OUT | 5 | RF Output Pad |
| GND | 1,3,4,6, Paddle | Connected to ground externally |

PRODUCT MARKING



Marking may contain other features or characters for internal lot control



MMIC REFLECTIONLESS

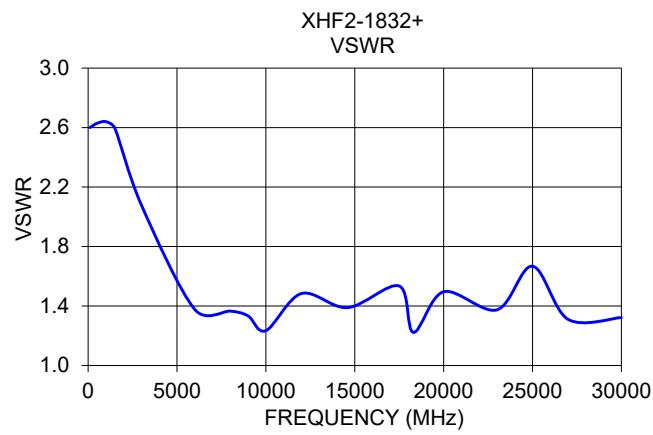
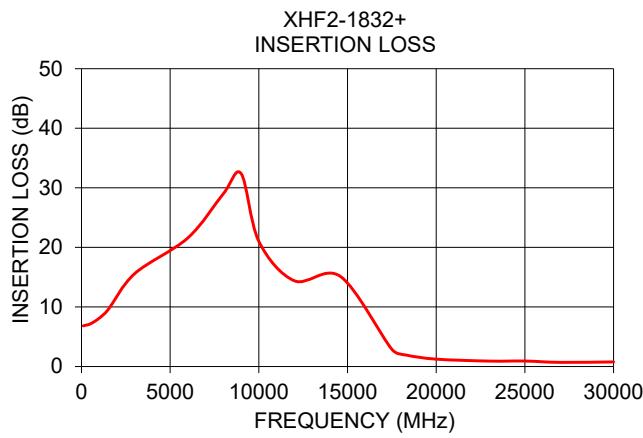
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TYPICAL PERFORMANCE DATA AT +25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) |
|-----------------|---------------------|-----------|
| 100 | 6.83 | 2.60 |
| 500 | 7.16 | 2.63 |
| 1000 | 8.12 | 2.64 |
| 1500 | 9.54 | 2.60 |
| 3000 | 15.60 | 2.08 |
| 6000 | 21.60 | 1.38 |
| 8000 | 29.02 | 1.37 |
| 9000 | 32.39 | 1.33 |
| 10000 | 21.01 | 1.23 |
| 12000 | 14.40 | 1.48 |
| 14600 | 15.12 | 1.39 |
| 17500 | 2.90 | 1.53 |
| 18300 | 1.93 | 1.22 |
| 20000 | 1.24 | 1.50 |
| 23000 | 0.91 | 1.37 |
| 25000 | 0.92 | 1.67 |
| 27000 | 0.70 | 1.31 |
| 30000 | 0.78 | 1.32 |





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ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

| | |
|--|---|
| Performance Data & Graphs | Data Graphs S-Parameter (S2P Files) Data Set (.zip file) |
| Case Style | MC1630-1 Plastic package, exposed paddle lead finish: matte-tin |
| Tape & Reel Standard quantities available on reel | F66 7" reels with 20, 50, 100, 200, 500, 1000, 2000 or 3000 devices |
| Suggested Layout for PCB Design | PL-499 |
| Evaluation Board | TB-883-1832+ (without connectors) TB-883-1832C+ (with connectors) B20-118-F1+ connector sold separately |
| Environmental Ratings | ENV82 |

ESD RATING

Human body model (HBM): Class 1A (250 to<500 V) in accordance with ANSI/ESD 5.1-2001

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-Circuit's 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



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