

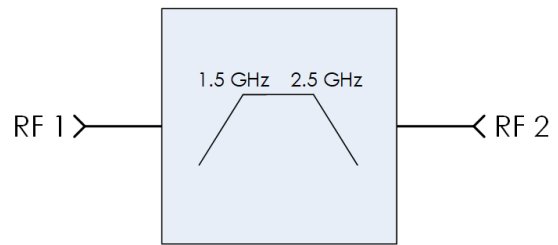
## Description

AM3231 is a passive bandpass filter implemented on chip that provides low loss and high rejection in a small 3 mm package. With a center frequency of 2.0 GHz, 1.9 GHz, or 1.8 GHz and a bandwidth of 1 GHz, AM3231 is useful as an IF filter in any RF system for image, LO, and spur rejection. AM3231 is AC coupled and matched to 50 ohms and operates over the -40C to +100C temperature range.

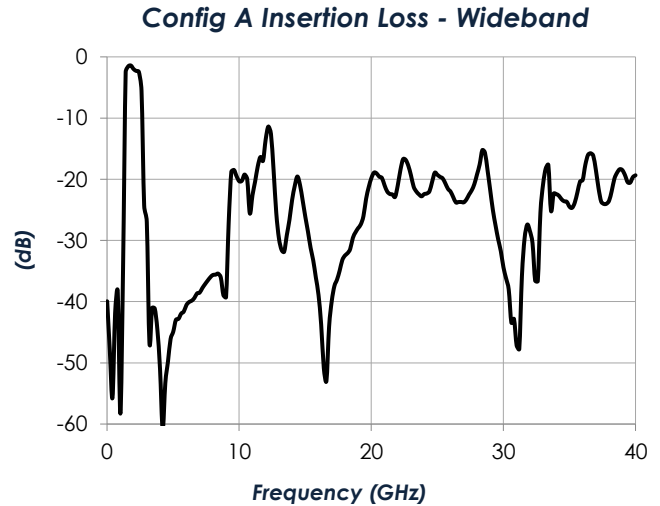
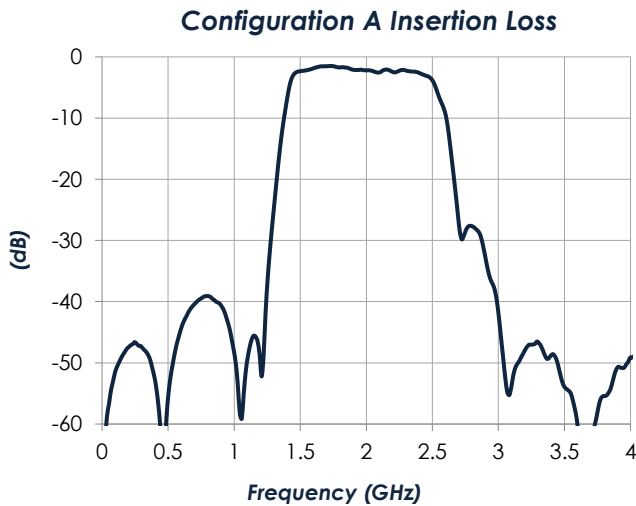
## Features

- 2 GHz Center Frequency
- 1 GHz Bandwidth
- 2.2 dB Loss at 2 GHz typ.
- 40 dB Rejection in Stopband typ.
- 2.2 dB Passband Flatness typ.
- 1.0 W Power Handling
- 3 mm QFN Package
- -40C to +100C Operation

## Functional Diagram



## Characteristic Performance



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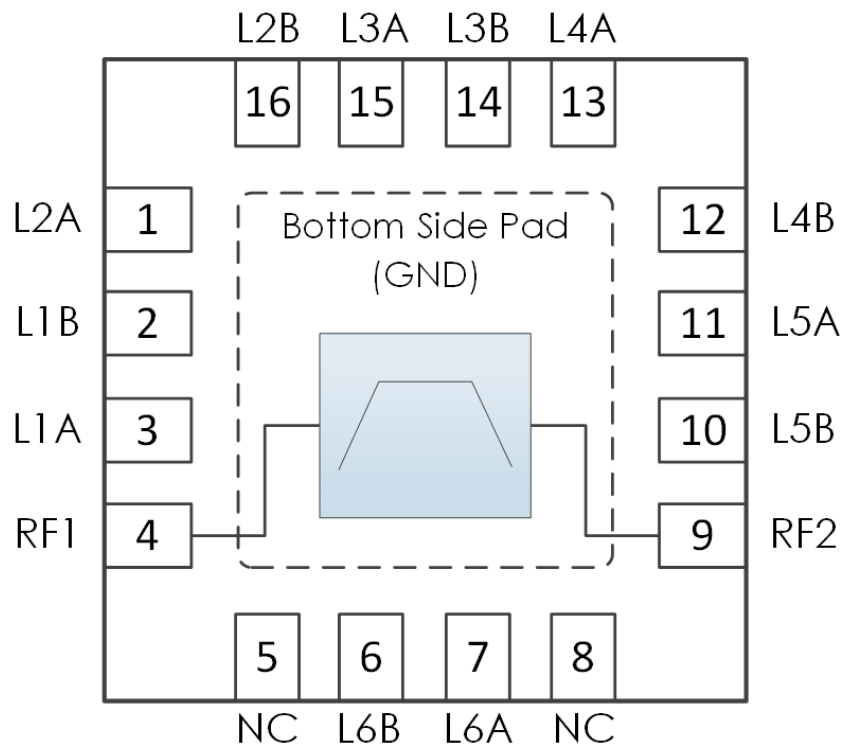
## Revision History

<b>Date</b>	<b>Revision Number</b>	<b>Notes</b>
January 3, 2024	1	Initial release
January 10, 2024	1.1	Added Wideband Insertion Loss Plot

# AM3231 – Filter

## 2 GHz Bandpass Filter

### Pin Layout and Definitions



Pin Number	Pin Name	Pin Function
1	L2A	External inductor L2 connection
2	L1B	External inductor L1 connection
3	L1A	External inductor L1 connection
4	RF1	RF Port 1 – 50 ohms, AC coupled
5	NC	Not Connected*
6	L6B	External inductor L6 connection
7	L6A	External inductor L6 connection
8	NC	Not Connected*
9	RF2	RF Port 2 – 50 ohms, AC coupled
10	L5B	External inductor L5 connection
11	L5A	External inductor L5 connection
12	L4B	External inductor L4 connection
13	L4A	External inductor L4 connection
14	L3B	External inductor L3 connection
15	L3A	External inductor L3 connection
16	L2B	External inductor L2 connection

#### Notes:

\* NC pins may be left open or connected to ground

# AM3231 – Filter

## 2 GHz Bandpass Filter



### Specifications

#### Absolute Maximum Ratings

	Minimum	Maximum
RF Input Power		+27 dBm
Operating Junction Temperature	-40 C	+150 C
Storage Temperature Range	-55 C	+150 C

**Note:** Any device operation beyond the Absolute Maximum Ratings may result in permanent damage to the device. The values listed in this table are extremes and do not imply functional operation of the device at these or any other conditions beyond what is listed under Recommended Operating Conditions. Any part subjected to conditions outside of what is recommended for an extended amount of time may suffer from reliability concerns.

#### Handling Information

	Minimum	Maximum
Storage Temperature Range (Recommended)	-50 C	+125 C
Moisture Sensitivity Level	MSL 1	



Atlanta Micro products are electrostatic sensitive. Follow safe handling practices to avoid damage.

#### Recommended Operating Conditions

	Minimum	Typical	Maximum
Operating Case Temperature	-40 C		+100 C

#### RF Performance – Configuration A: 2.0 GHz Center

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Passband Range		1.5 GHz		2.5 GHz
Bandwidth			1 GHz	
Passband Flatness			2.2 dB	
Stopband Rejection	f < 1.25 GHz		40 dB	
	f > 3.0 GHz		40 dB	
Insertion Loss	f = 1.5 GHz		2.4 dB	
	f = 2.0 GHz		2.2 dB	
	f = 2.5 GHz		3.6 dB	
Return Loss	f = 1.5 GHz		14 dB	
	f = 2.0 GHz		8.5 dB	
	f = 2.5 GHz		12 dB	

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# AM3231 – Filter

## 2 GHz Bandpass Filter



### RF Performance – Configuration B: 1.9 GHz Center

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Passband Range		1.4 GHz		2.4 GHz
Bandwidth			1.0 GHz	
Passband Flatness			1.8 dB	
Stopband Rejection	f < 1.1 GHz		40 dB	
	f > 2.8 GHz		40 dB	
Insertion Loss	f = 1.4 GHz		2.2 dB	
	f = 1.9 GHz		2.4 dB	
	f = 2.4 GHz		3.3 dB	
Return Loss	f = 1.4 GHz		22 dB	
	f = 1.9 GHz		8.3 dB	
	f = 2.4 GHz		18 dB	

### RF Performance – Configuration C: 1.8 GHz Center

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Passband Range		1.3 GHz		2.3 GHz
Bandwidth			1 GHz	
Passband Flatness			1.7 dB	
Stopband Rejection	f < 1 GHz		45 dB	
	f > 2.8 GHz		40 dB	
Insertion Loss	f = 1.3 GHz		3.5 dB	
	f = 1.8 GHz		2.1 dB	
	f = 2.3 GHz		2.7 dB	
Return Loss	f = 1.3 GHz		8.6 dB	
	f = 1.8 GHz		10 dB	
	f = 2.3 GHz		14 dB	

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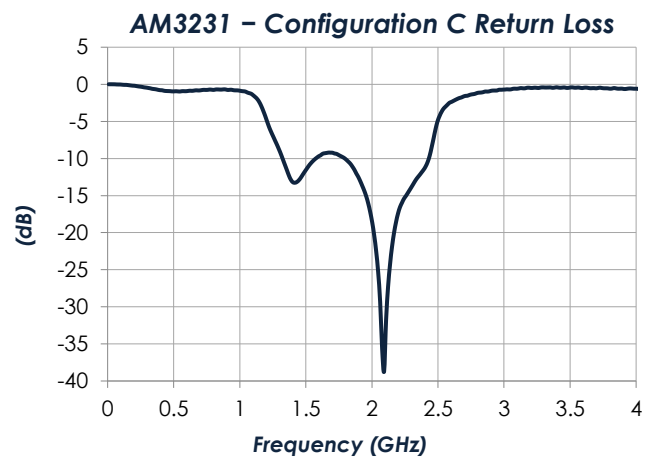
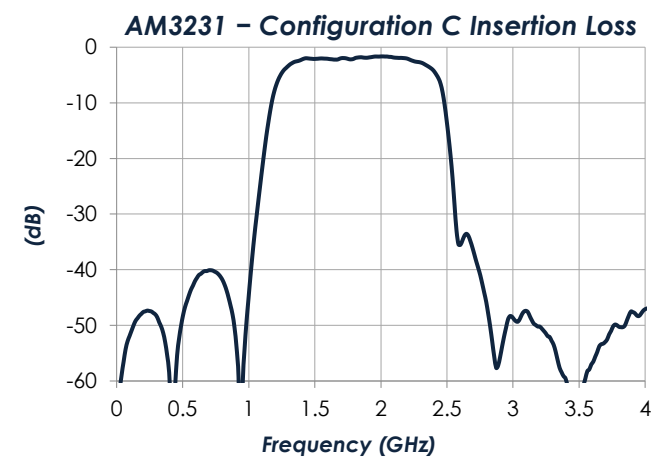
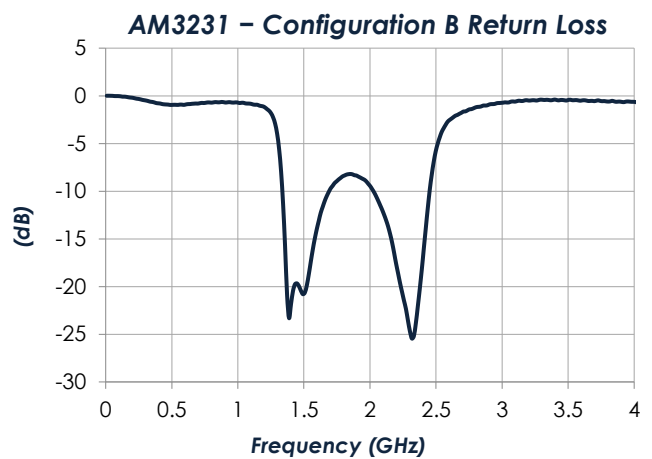
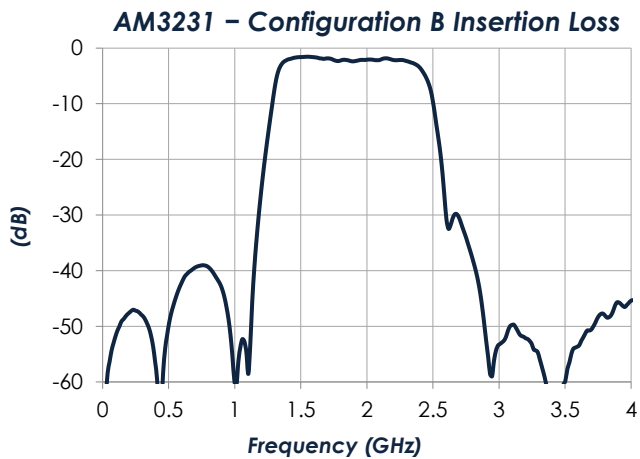
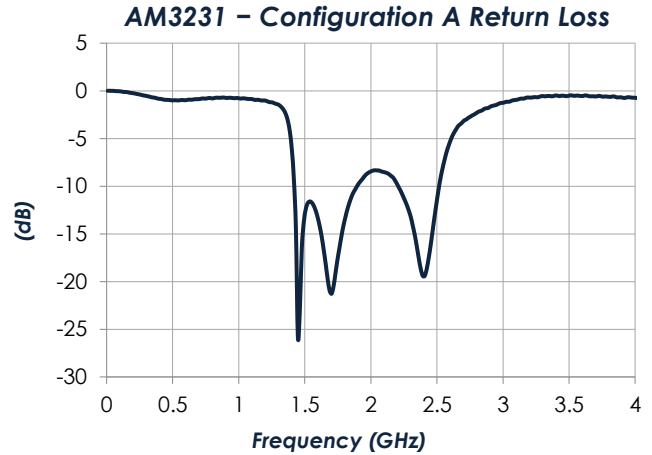
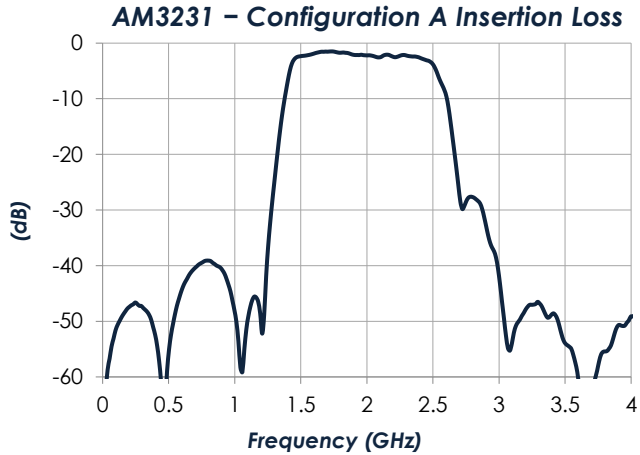
# AM3231 – Filter

## 2 GHz Bandpass Filter



### Typical Performance

(T = 25 °C unless otherwise specified.)

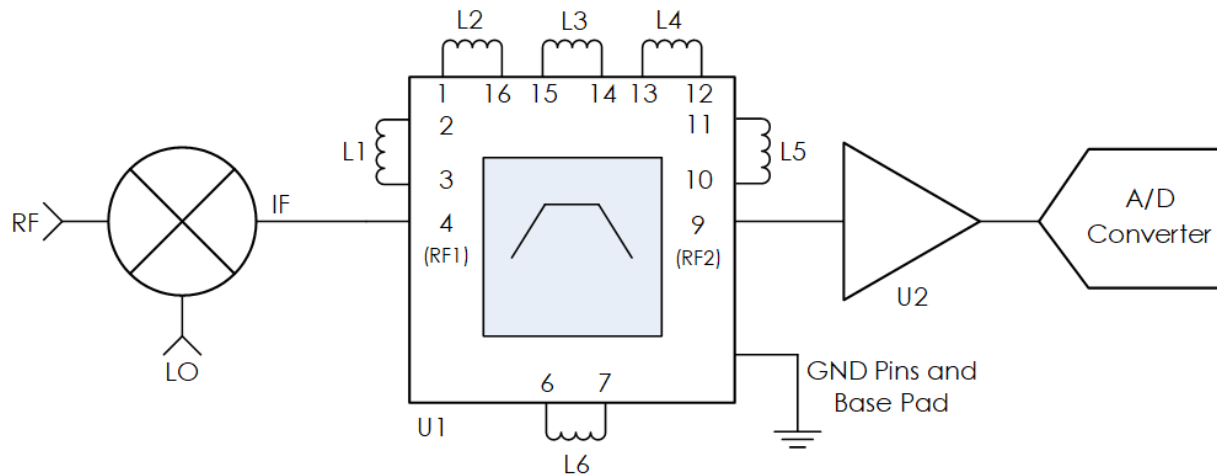


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# AM3231 – Filter

## 2 GHz Bandpass Filter

### Typical Application



### Configuration A Recommended Component List (or equivalent): 2.0 GHz Center

Part	Value	Part Number	Manufacturer
U1		AM3231	Atlanta Micro
U2		AM1025B	Atlanta Micro
L1, L2, L3	1.7 nH	0402DC-1N7XJRW	Coilcraft
L4	3.5 nH	0402DC-3N5XGRW	Coilcraft
L5	4.5 nH	0402DC-4N5XGRW	Coilcraft
L6	5.8 nH	0402DC-5N8XGRW	Coilcraft

### Configuration B Recommended Component List (or equivalent): 1.9 GHz Center

Part	Value	Part Number	Manufacturer
U1		AM3231	Atlanta Micro
U2		AM1025B	Atlanta Micro
L1, L2	2.1 nH	0402DC-2N1XJRW	Coilcraft
L3	1.9 nH	0402DC-1N9XJRW	Coilcraft
L4	4.4 nH	0402DC-4N4XGRW	Coilcraft
L5	5.3 nH	0402DC-5N3XGRW	Coilcraft
L6	7.2 nH	0402DC-7N2XGRW	Coilcraft

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# AM3231 – Filter



## 2 GHz Bandpass Filter

### Configuration C Recommended Component List (or equivalent): 1.8 GHz Center

Part	Value	Part Number	Manufacturer
U1		AM3231	Atlanta Micro
U2		AM1025B	Atlanta Micro
L1	2.1 nH	0402DC-2N1XJRW	Coilcraft
L2	2.3 nH	0402DC-2N3XJRW	Coilcraft
L3	2.0 nH	0402DC-2N0XJRW	Coilcraft
L4	4.8 nH	0402DC-4N8XGRW	Coilcraft
L5	7.3 nH	0402DC-7N3XGRW	Coilcraft
L6	9.5 nH	0402DC-9N5XGRW	Coilcraft

#### Notes:

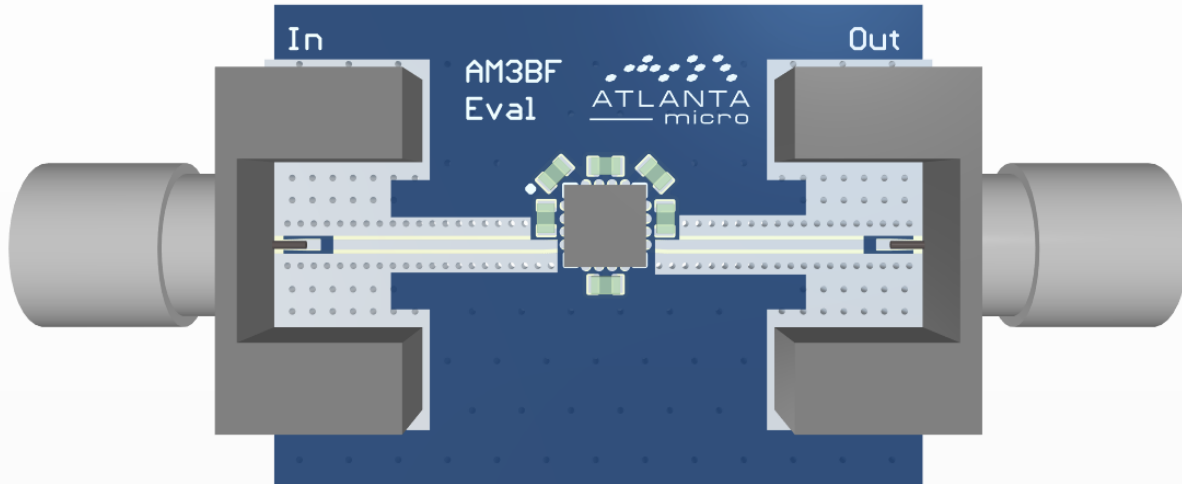
1. L1-L6 should be placed close to AM3231.

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**AM3231 – Filter**  
**2 GHz Bandpass Filter**  
**Evaluation PC Board**



**Part Ordering Details**

Description	Part Number
2.9 mm x 2.9 mm x 0.8 mm QFN package	AM3231
AM3231 Evaluation Board with Connectors	AM3231 Eval

**Related Parts**

Part Number	Description
AM3056	0.75 GHz to 1.25 GHz Bandpass
AM3232	0.75 GHz to 1.25 GHz Bandpass
AM3188	2.5 GHz to 3.5 GHz Bandpass
AM3187	3.25 GHz to 4.25 GHz Bandpass
AM3103	1 GHz to 3 GHz Digitally Tunable Bandpass

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# AM3231 – Filter

## 2 GHz Bandpass Filter



### Component Compliance Information

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Substance List	Allowable Maximum Concentration
Lead (Pb)	<1000 PPM (0.1% by weight)
Mercury (Hg)	<1000 PPM (0.1% by weight)
Cadmium (Cd)	<75 PPM (0.0075% by weight)
Hexavalent Chromium (CrVI)	<1000 PPM (0.1% by weight)
Polybrominated Biphenyls (PBB)	<1000 PPM (0.1% by weight)
Polybrominated Diphenyl ethers (PBDE)	<1000 PPM (0.1% by weight)
Decabromodiphenyl Deca BDE	<1000 PPM (0.1% by weight)
Bis (2-ethylhexyl) Phthalate (DEHP)	<1000 PPM (0.1% by weight)
Butyl Benzyl Phthalate (BBP)	<1000 PPM (0.1% by weight)
Dibutyl Phthalate (DBP)	<1000 PPM (0.1% by weight)
Diisobutyl Phthalate (DIBP)	<1000 PPM (0.1% by weight)

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