

AM3023B – Filter Bank

Miniature Transmit/ Receive with Sub-Octave Filtering

AM3023B is a miniature filter bank module with sub-octave filters covering the 100 MHz to 6000 MHz frequency range with a full 80-MHz overlap from 400 to 6000 MHz. The device contains a bypassable amplifier section and supports both transmit and receive applications. The module is mounted to a circuit board as a surface mount device and provides an excellent front-end/ back-end for a broadband receiver, transmitter or transceiver requiring high dynamic range and small size, weight and power consumption.



*Quarter shown for relative size

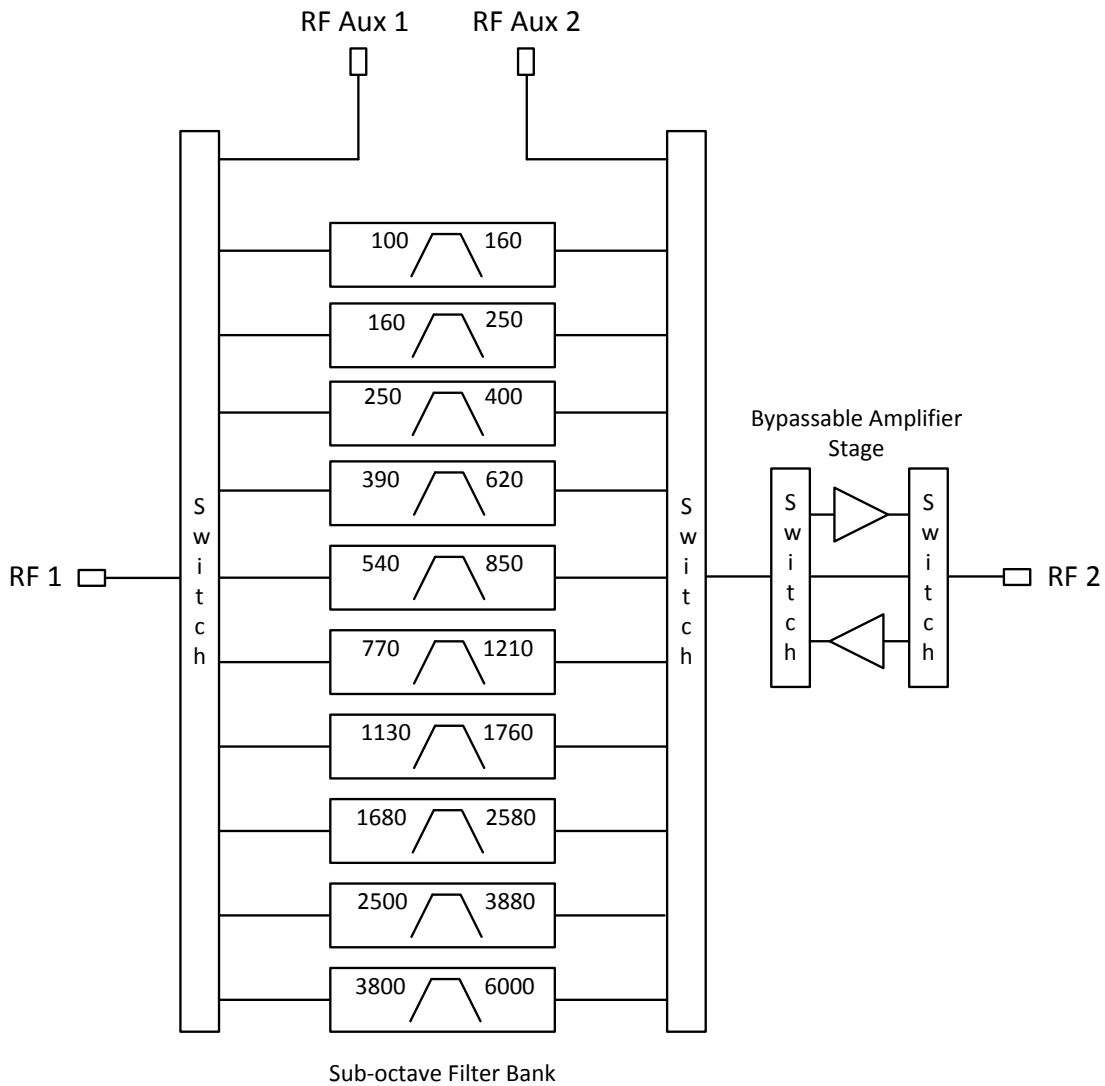
Features

- Sub-Octave Filter Bank
- Bypassable Amplifier Stage
- 5 dB Gain
- +3.3V DC Supply
- 0.20 Watts Power Consumption
- 20.5 mm L x 20.5 mm W x 3.3 mm H
(0.807" L x 0.807" W x 0.13" H)
- 0.2 oz Weight
- -40C to +85C Operation

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Miniature Sub-Octave

Functional Diagram



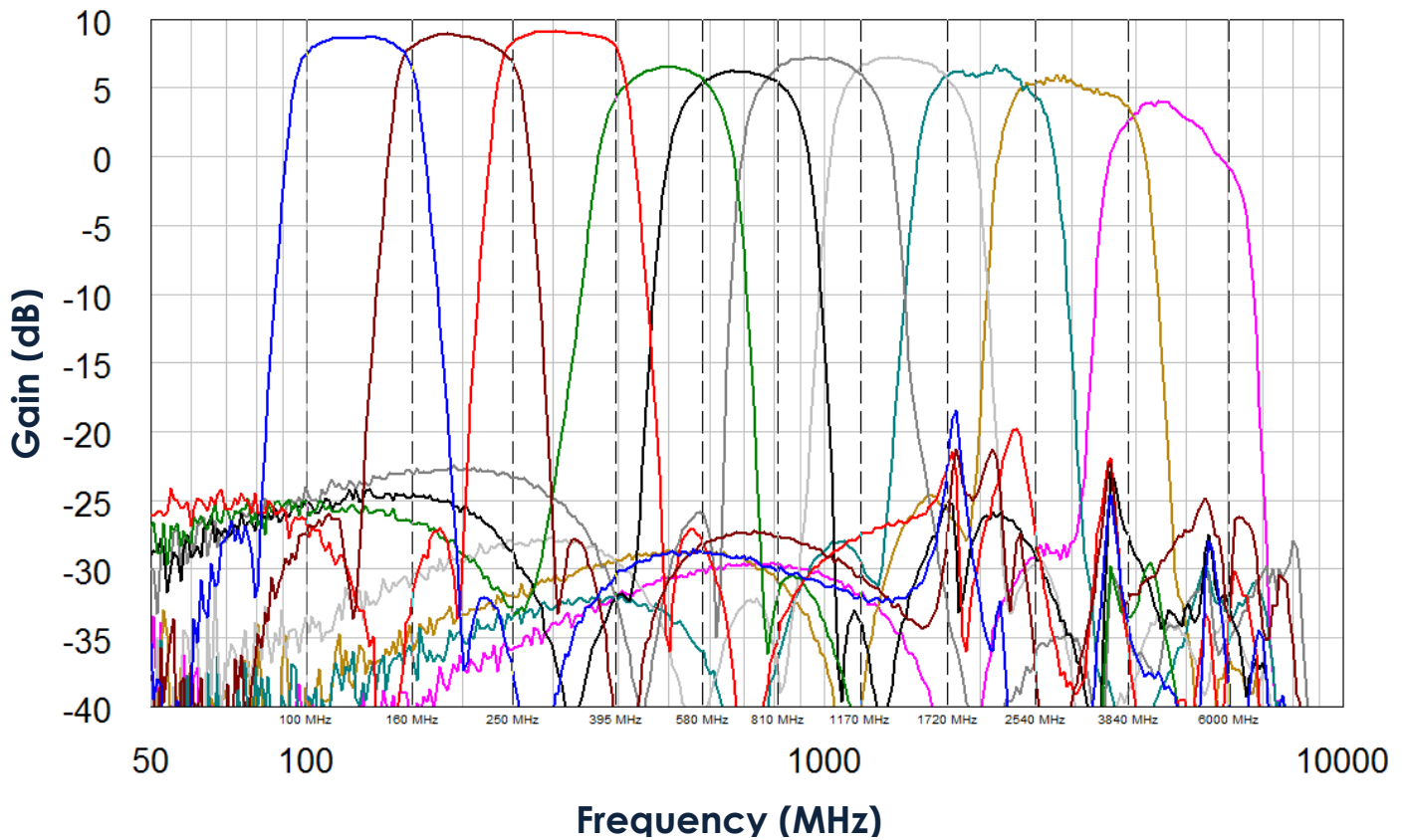
Functional Diagram Notes

1. RF Aux 1 and RF Aux 2 are optional ports that can be used for external filtering or can be connected together to provide a filter bypass path.

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Typical Frequency Response



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Specifications	Minimum	Typical	Maximum
Frequency Range	2 MHz		6000 MHz
Sub-octave filters	100 MHz		6000 MHz
RF 1 to RF 2, Amplifier Enabled:			
Gain		7 dB	
Noise Figure		9 dB	
Input IP3		+22 dBm	
Input IP2 (100MHz – 6GHz)		+60 dBm	
RF 1 to RF 2, Amplifier Bypassed:			
Gain		-10 dB	
Noise Figure		10 dB	
Input IP3		+40 dBm	
Input IP2 (100MHz – 6GHz)		+70 dBm	
RF 2 to RF 1, Amplifier Enabled:			
Gain		7 dB	
Noise Figure		4 dB	
Output IP3		+23 dBm	
Output P1dB		+10 dBm	
RF 2 to RF 1, Amplifier Bypassed:			
Gain		-10 dB	
Noise Figure		10 dB	
Output IP3		+32 dBm	
Output P1dB		+16 dBm	
Input Return Loss		10 dB	
Output Return Loss		10 dB	
RF Input Level			+17 dBm
Filter Bank Switching Speed			1 us
Logic Level Low	-0.1V		+0.4V
Logic Level High	+2.7V		+3.3V
Package Size		20.5 x 20.5 x 3.30mm	
DC Supply Voltage	+3.1V	+3.3 V	+3.5V
DC Supply Current		60 mA	
Power Consumption		0.20 W	
Operating Temperature	-40 C		+85 C
Storage Temperature	-50 C		+125 C

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Pin Definitions

Pin Number	Name	Function
1	GND	Ground - Common
2	RF Aux 2	Optional 2 MHz to 6 GHz RF port that can be used for external filtering or connected to Pin 4 for a filter bypass path. 50 ohms – AC coupled.
3	GND	Ground - Common
4	RF Aux 1	Optional 2 MHz to 6 GHz RF port that can be used for external filtering or connected to Pin 2 for a filter bypass path. 50 ohms – AC coupled.
5	GND	Ground - Common
6	RF 1	RF Port 1 - 2 MHz to 6 GHz – 50 ohms – AC coupled.
7 - 9	GND	Ground - Common
10	Band Sel A_0	Filter Band Select A_0
11	Band Sel A_1	Filter Band Select A_1
12	Band Sel A_2	Filter Band Select A_2
13	Band Sel B_0	Filter Band Select B_0
14	Band Sel B_1	Filter Band Select B_1
15 - 16	Vcc	+3.3V DC Power Input
17	Amp En_0	Amplifier Enable Line 0
18	Amp En_1	Amplifier Enable Line 1
19	Amp Sel_0	Amplifier Path Select 0
20	Amp Sel_1	Amplifier Path Select 1
21	Amp Sel_2	Amplifier Path Select 2
22	GND	Ground - Common
23	RF 2	RF Port 2 - 2 MHz to 6 GHz – 50 ohms – AC coupled.
24 - 32	GND	Ground - Common

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Control Tables

Filter Bands:

Band Select Control Line					Filter Band
A_0	A_1	A_2	B_0	B_1	
L	L	L	H	H	RF Aux Out / RF Aux In
L	L	L	L	L	100 – 160 MHz
L	L	L	L	H	160 – 250 MHz
L	L	L	H	L	250 – 400 MHz
L	L	H	L	L	390 – 620 MHz
H	H	H	L	L	540 – 850 MHz
H	H	L	L	L	770 – 1210 MHz
L	H	L	L	L	1130 – 1760 MHz
H	L	H	L	L	1680 – 2580 MHz
H	L	L	L	L	2500 – 3880 MHz
L	H	H	L	L	3800 – 6000 MHz

* Note: Filter Band control table is not the same as AM3023/ AM3023A

Amplifier Path Select:

Control Line			Amplifier Path
Amp Sel_0	Amp Sel_1	Amp Sel_2	
L	L	H	RF 1 to RF 2
L	H	L	Bypass
H	L	L	RF 2 to RF 1

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Amplifier Enable:

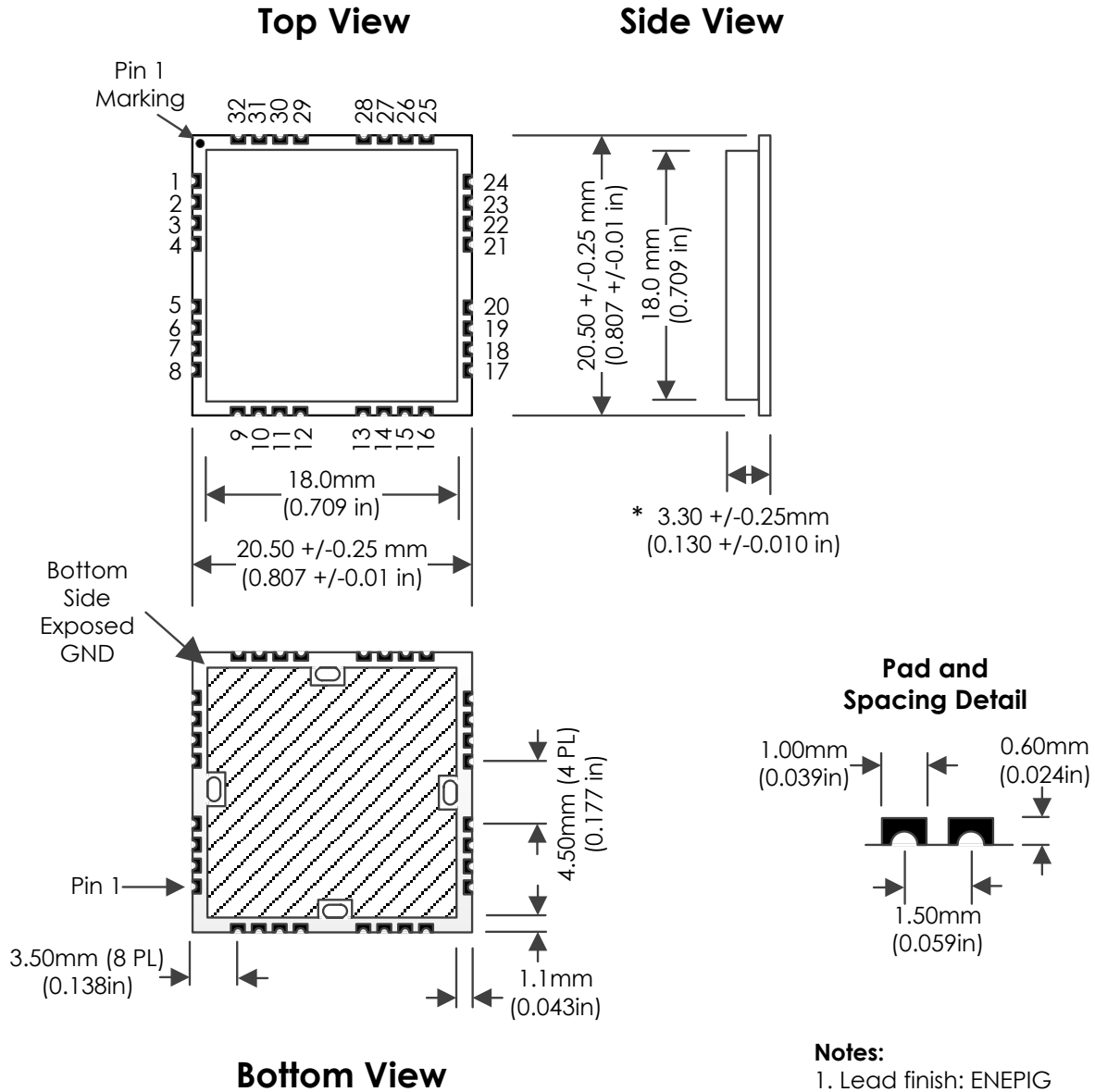
Control Line		Amplifier Enabled
Amp En_0	Amp En_1	
0	0	Both Off
0	1	RF 2 to RF 1
1	0	RF 1 to RF 2
1	1	Both On

Note: For typical operation with one amplifier enabled at a time and to reduce the total number of control lines, Amp Sel_0 can be connected to Amp En_1 and Amp Sel_2 can be connected to Amp En_0.

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Package Details

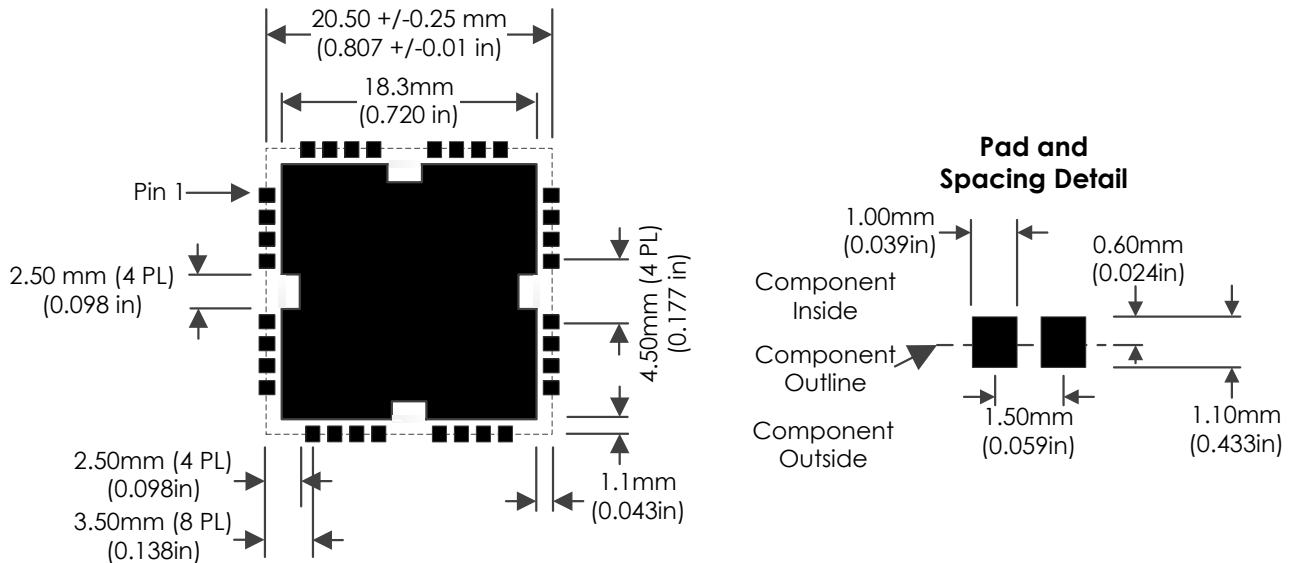


* Note: Height change from AM3023A from 0.12" nominal to 0.13" nominal

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Recommended PC Footprint



Recommended Assembly Procedure

It is recommended to attach the bottom side ground pad to the printed circuit board using a highly conductive silver epoxy and then hand solder the 32 pins along the part's perimeter to their intended printed circuit board pads using lead-free solder.

The recommended silver epoxy is MG Chemicals part 8331S and the recommended assembly thickness is 3 to 5 mils.

If the part is attached, both the ground pad and perimeter pins, to the circuit board using a typical lead-free solder reflow process reaching temperatures of 260C, the excessive temperature can cause internal parts to the filter bank to reflow and possibly cause damage to the part. If a solder reflow process must be used, it is recommended to use a lower temperature leaded solder profile, typically 225C maximum.