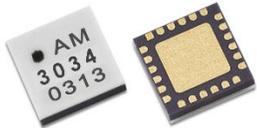


AM3034 – Filter Bank

Digitally Tunable 150 MHz to 450 MHz Lowpass

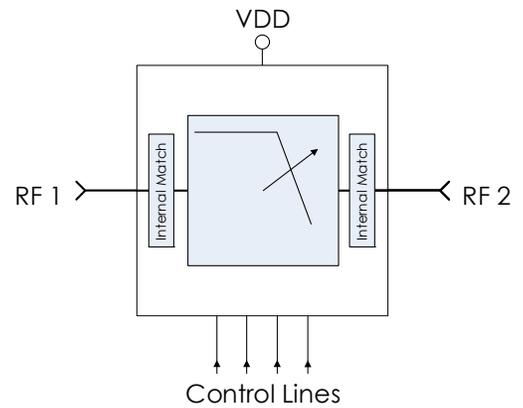


AM3034 is a miniature digitally tunable lowpass filter covering the 150 MHz to 450 MHz frequency range. The filter provides 16 selectable lowpass cutoff states with 4 digital control bits. The tunable lowpass filter can be combined with one of Atlanta Micro’s tunable highpass filters to provide a flexible tunable bandpass filter solution. AM3034 has internal 50Ω matching, is packaged in a 4mm QFN package, and operates over the -40C to +85C temperature range.

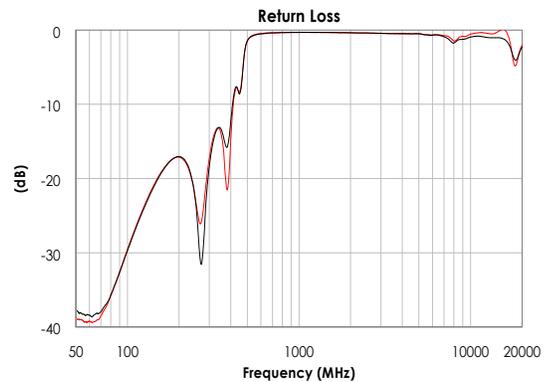
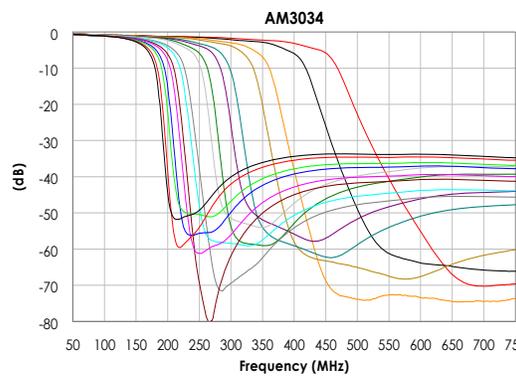
FEATURES

- Discrete Low Pass Cutoff Steps
- 4-bit Control, 3V or 5V Logic
- +3.3V to +5V DC Supply
- 1.0 dB AVG Insertion Loss
- +40 dBm Input IP3
- 4mm QFN Package
- -40C to +100C Operation
- No Calibration Required

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE



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CHARACTERISTIC PERFORMANCE 1

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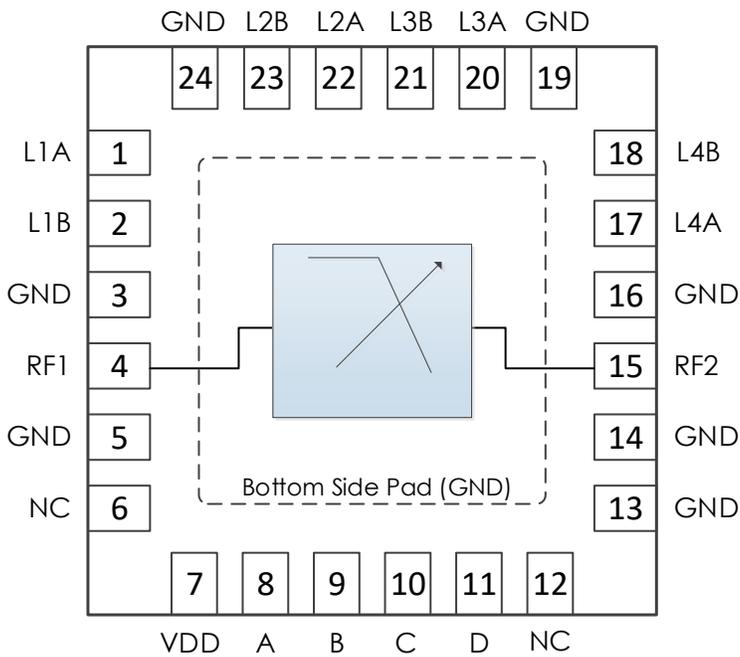
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REVISION HISTORY

Date	Revision	Notes
August 11, 2020	6	Updated to latest datasheet format. Operating temperature information updated.
December 15, 2020	6.1	Evaluation board image corrected.
June 20, 2024	7	Changed to Mercury branding. No content changes.

PIN LAYOUT AND DEFINITIONS



Pin	Name	Function
1	L1A	External Inductor L1 Connection A
2	L1B	External Inductor L1 Connection B
3	GND	Ground - Common
4	RF1	RF Port 1 - 50 ohms - DC coupled. External DC blocking capacitor required*
5	GND	Ground - Common
6	NC	Do Not Connect
7	VDD	DC Power Input
8	A	Control Bit A
9	B	Control Bit B
10	C	Control Bit C
11	D	Control Bit D
12	NC	Do Not Connect
13-14	GND	Ground - Common
15	RF2	RF Port 2 - 50 ohms - DC coupled. External DC blocking capacitor required*
16	GND	Ground - Common
17	L4A	External Inductor L4 Connection A
18	L4B	External Inductor L4 Connection B
19	GND	Ground - Common
20	L3A	External Inductor L3 Connection A
21	L3B	External Inductor L3 Connection B
22	L2A	External Inductor L2 Connection A
23	L2B	External Inductor L2 Connection B
24	GND	Ground - Common
Case GND	GND	Ground - Common

***Note:** DC blocking caps not required if in series with other Mercury parts of the same reference voltage.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+6.0 V
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.

Recommended Operating Conditions

	Testing Conditions	Min	Typical	Max
Supply Voltage		+3.1V	+3.3V	+5.2V
Operating Case Temperature	Vcc = +3.3V	-40 C		+100C
	+3.4V < Vcc < +5.2V	-40 C		+85C
Operating Junction Temperature		-40 C		+150C

Handling Information

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



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

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
DC Supply Voltage		+2.7 V	+5.0 V	
DC Supply Current	VDD = +3.3 V	1 mA		2 mA
	VDD = +5.0 V	1 mA		2 mA
Power Dissipated	VDD = +3.3 V	3.3 mW		6.6 mW
	VDD = +5.0 V	5 mW		10 mW
Logic Level Low		-0.1 V		+0.5 V
Logic Level High		+2.0 V		+VDD

State Table

D	C	B	A	Typical Cutoff Freq. (MHz)
L	L	L	L	153
L	L	L	H	156
L	L	H	L	162
L	L	H	H	165
L	H	L	L	172
L	H	L	H	177
L	H	H	L	185
L	H	H	H	190
H	L	L	L	215
H	L	L	H	226
H	L	H	L	246
H	L	H	H	264
H	H	L	L	309
H	H	L	H	333
H	H	H	L	385
H	H	H	H	450

RF Performance

(T = 25 °C unless otherwise specified)

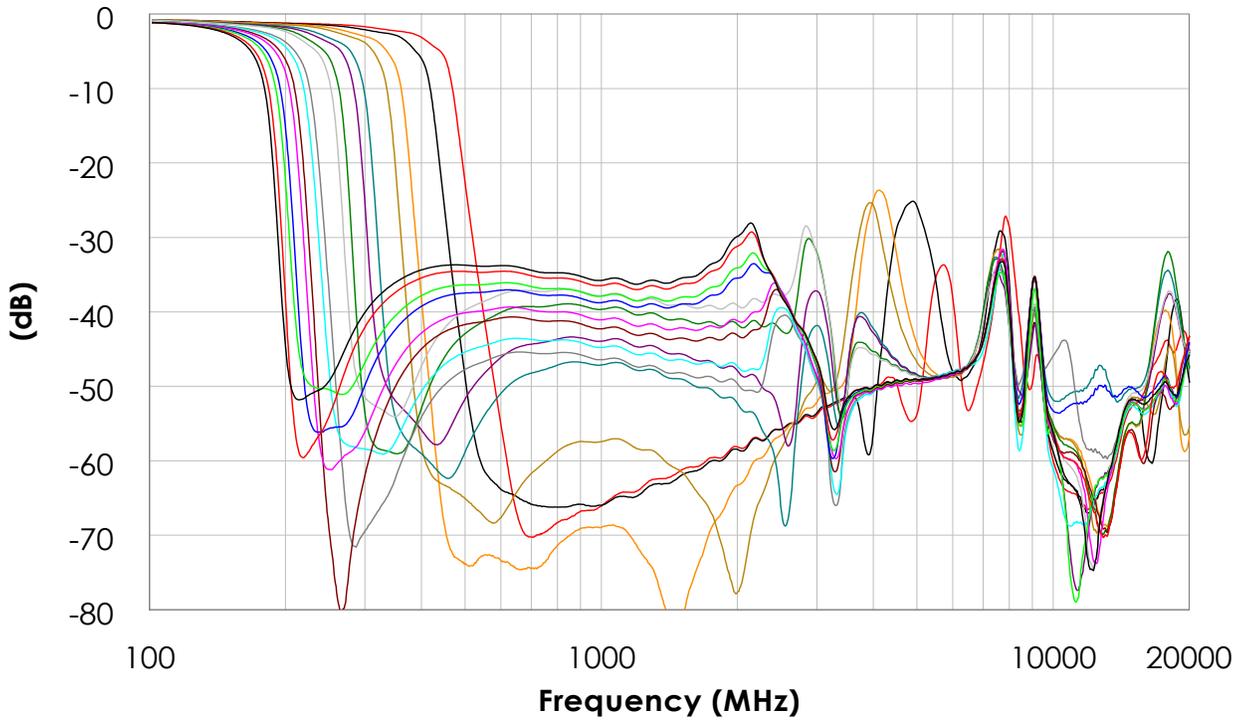
Param	Testing Conditions	Min	Typical	Max
Frequency Range		150 MHz		450 MHz
Insertion Loss			1.0 dB	
Return Loss			15 dB	
Input IP3	ABCD = 1111		+40 dBm	

Timing Characteristic

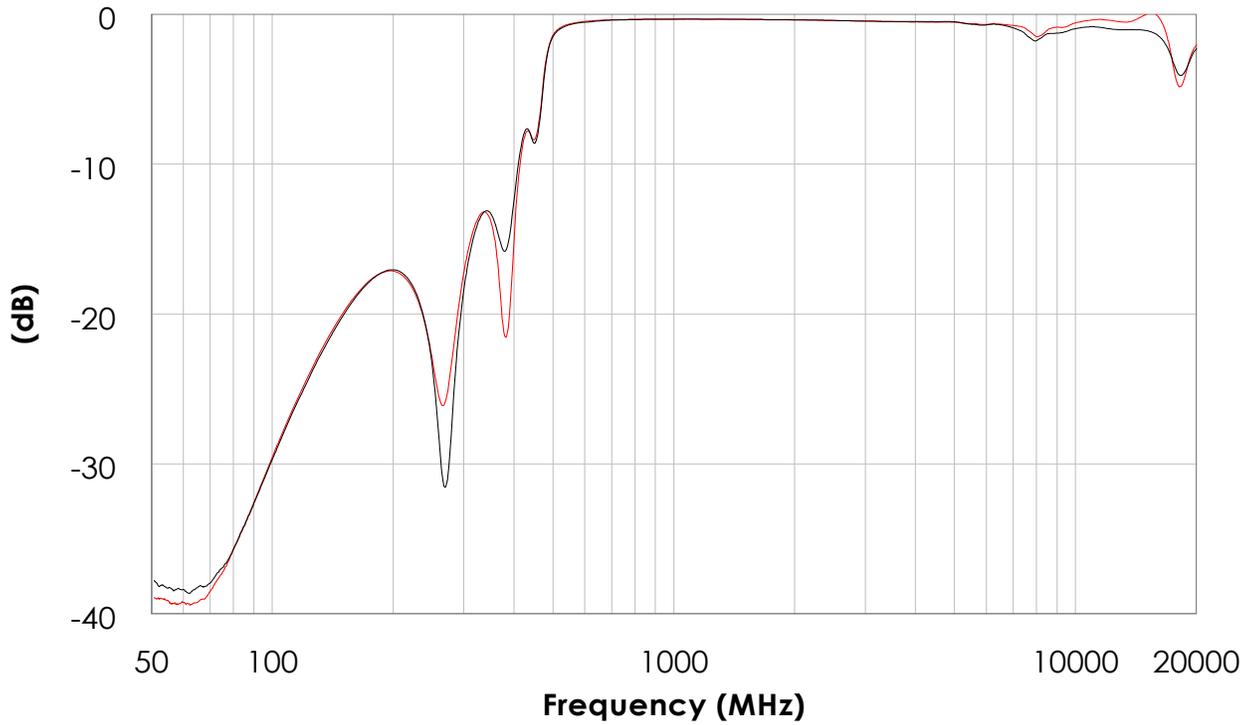
Parameter	Minimum	Typical	Maximum
Switching Speed			1 μs

TYPICAL PERFORMANCE

AM3034

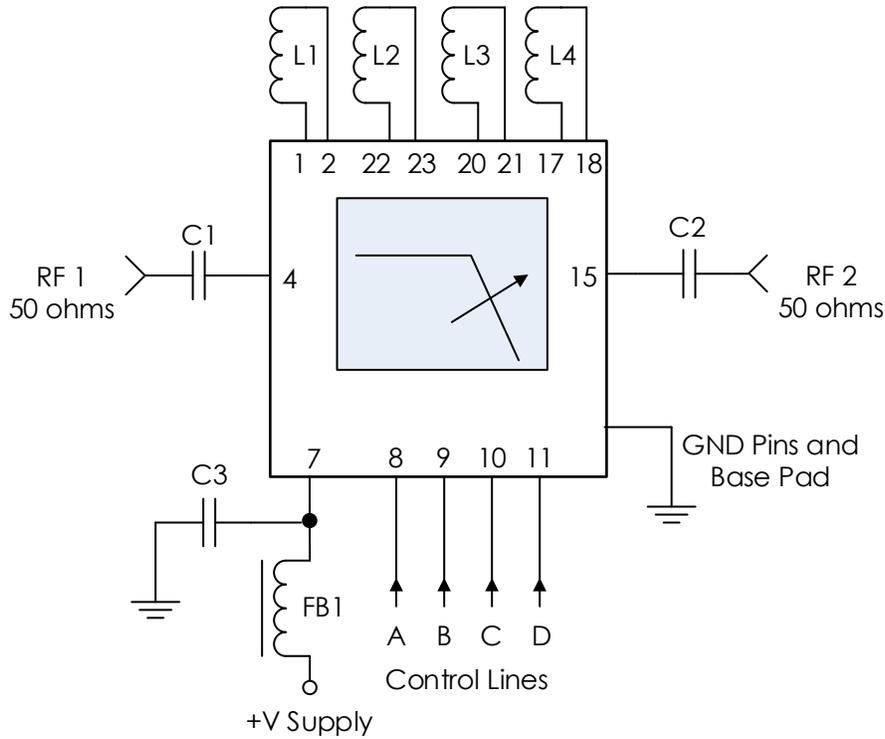


Return Loss



TYPICAL APPLICATION

Multiple Passives



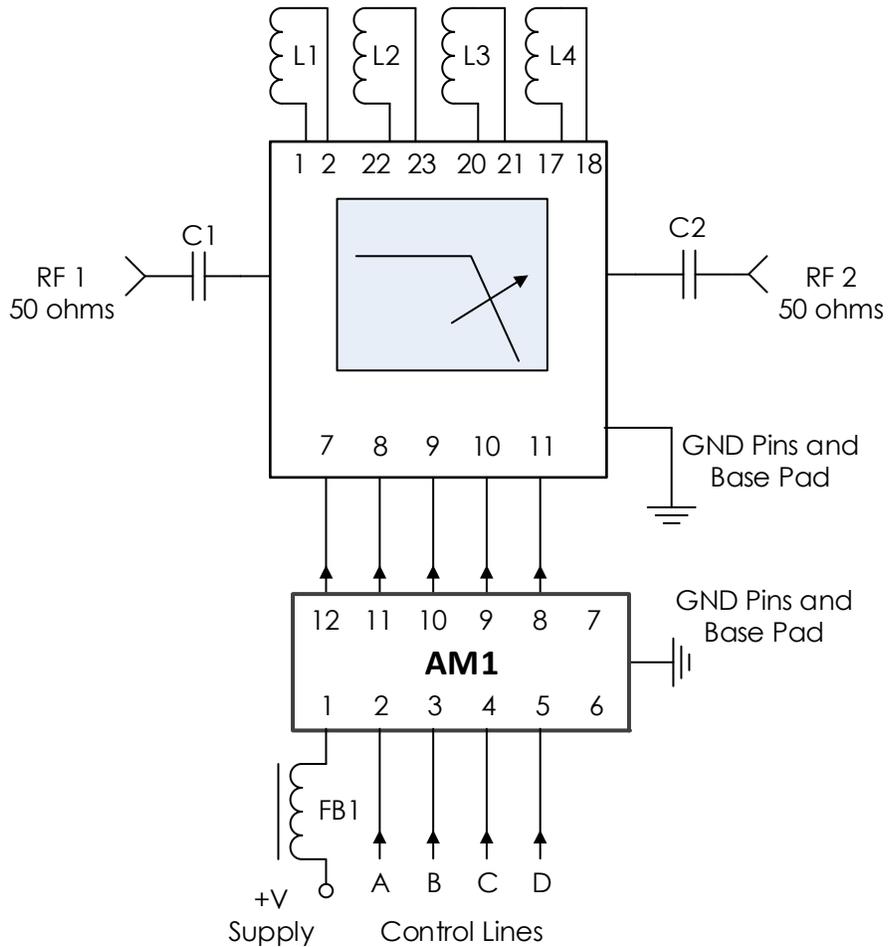
Recommended Component List (or Equivalent)

Part	Value	Part Number	Manufacturer
C1, C2	0.1 μ F	0201BB104KW160	Passives Plus
C3	0.1 μ F	C1005X7R1H104K050BB	TDK
FB1	-	MMZ1005A222E	TDK
L1, L4	24 nH	0402HP-24NXGLW	Coilcraft
L2, L3	27 nH	0402HP-27NXGLW	Coilcraft

Notes:

1. RF blocking capacitors should be high performance, low-loss, broadband capacitors for optimum performance.
2. RC filtering on the control lines is recommended to prevent digital noise from coupling to the RF path.
 - a. Select control line RC filter values based on desired logic source decoupling and switching speed.

Smallest Footprint



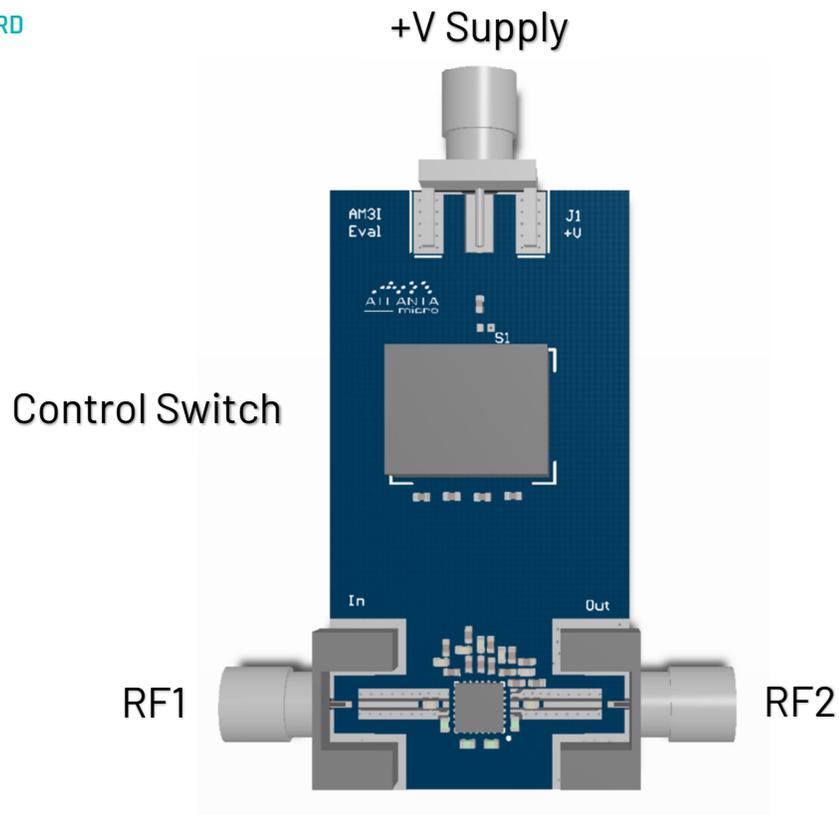
Recommended Component List (or Equivalent)

Part	Value	Part Number	Manufacturer
C1, C2	0.1 μ F	0201BB104KW160	Passives Plus
FB1	-	MMZ1005A222E	TDK
L1, L4	24 nH	0402HP-24NXGLW	Coilcraft
L2, L3	27 nH	0402HP-27NXGLW	Coilcraft
AM1	-	AM35	Mercury

Notes:

1. RF blocking capacitors should be high performance, low-loss, broadband capacitors for optimum performance.
2. AM35 provides power and control line filtering with high frequency isolation to 50+ GHz.
 - a. See AM35 datasheet for performance details. AM35 is a 1.5mm x 3mm device.

EVALUATION PC BOARD



RELATED PARTS

Part Number		Description
AM3029	1.5 GHz to 3.0 GHz	Digitally Tunable Lowpass
AM3030	3.5 GHz to 6.5 GHz	Digitally Tunable Lowpass
AM3035	500 MHz to 1.2 GHz	Digitally Tunable Lowpass
AM3150	30 MHz to 550 MHz	Digitally Tunable Lowpass
AM3031	1.0 GHz to 1.8 GHz	Digitally Tunable Highpass
AM3032	2.5 GHz to 4.5 GHz	Digitally Tunable Highpass
AM3033	100 MHz to 225 MHz	Digitally Tunable Highpass
AM3036	330 MHz to 700 MHz	Digitally Tunable Highpass
AM3151	20 MHz to 320 MHz	Digitally Tunable Highpass

COMPONENT COMPLIANCE INFORMATION

RoHS: Mercury Systems, Inc. hereby certifies that all products comply with the EC Directive 2011/65/EC on the Restriction of Hazardous Substances, commonly known as EU-RoHS 6 and 10. All products supplied by Mercury shall be compliant with the European Directive 2011/65/EC based on the following substance list.

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)

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