

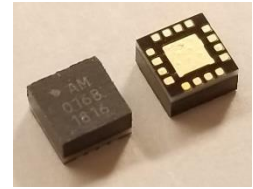
# AM1016B – Amplifier

## 20 MHz to 6 GHz Gain Block



### Description

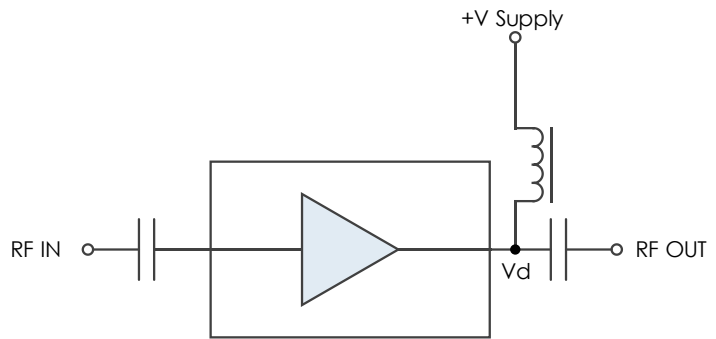
AM1016B is a high dynamic range cascadable gain block covering the 20 MHz to 6 GHz frequency range. The device exhibits flat gain, low noise figure and high third order intercept performance while also providing excellent gain stability over the operating temperature range. With internal 50Ω matching and packaged in a 3mm QFN, the AM1016B represents a compact total PCB footprint.



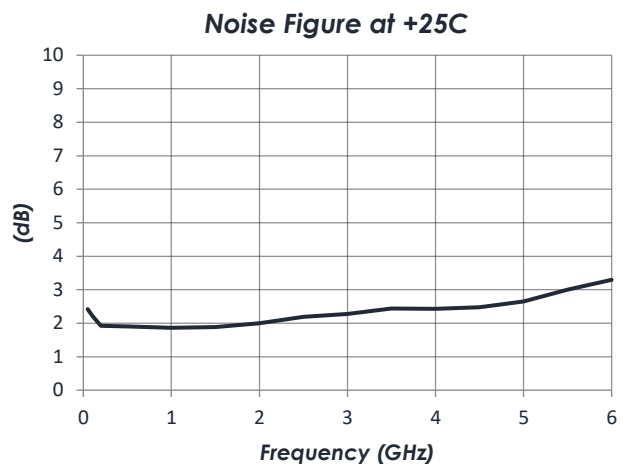
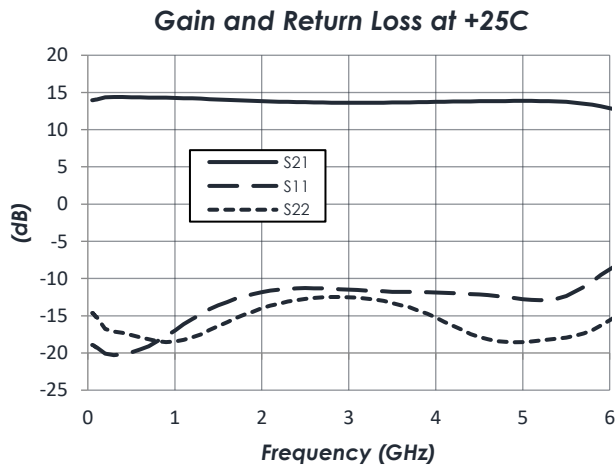
### Features

- 14 dB Gain
- 2.3 dB Noise Figure
- +33 dBm OIP3
- +17 dBm P1dB
- +3.3V, 53 mA
- 3mm QFN Package
- -40C to +85C Operation
- Unconditionally Stable

### Functional Diagram



### Characteristic Performance



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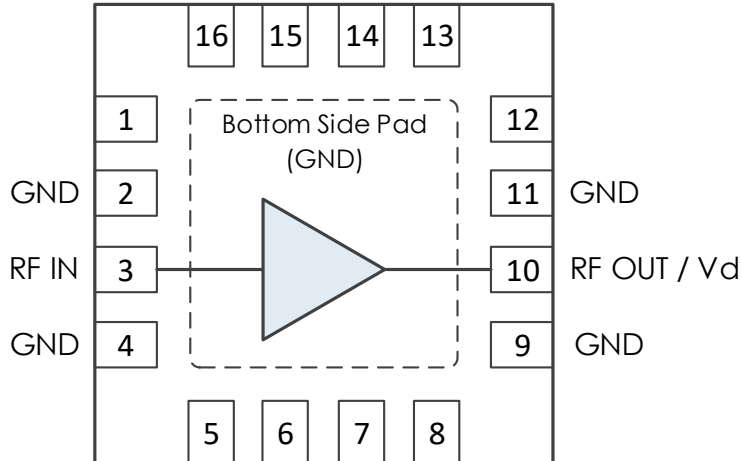
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## Revision History

<b>Date</b>	<b>Revision Number</b>	<b>Notes</b>
May 14, 2018	0	Preliminary Release
May 24, 2018	1	Initial Release
July 20, 2018	2	Max RF Input Power Value Changed
April 9, 2019	3	Pinout Corrected, Functional Diagram Added, Plots Resized, Part Picture Added.

### Pin Layout and Definitions

**NOTE:** All Non-Named Pins Are NC or GND



Pin Number	Pin Name	Pin Function
1	NC	Not Connected*
2	GND	Ground – Common
3	RF IN	RF Input – 50 ohms – DC Coupled, External DC Block Required
4	GND	Ground - Common
5 - 8	NC	Not Connected*
9	GND	Ground – Common
10	RF OUT / Vd	RF Output and DC Power Input – 50 ohms – DC Coupled, External DC Block Required
11	GND	Ground - Common
12 - 16	NC	Not Connected*
Bottom Pad	GND	Ground – Common

\*Note: NC pins may be grounded or left open.

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## Specifications

### Absolute Maximum Ratings

	Minimum	Maximum
Device Voltage, Vd	-0.3 V	+3.4 V
RF Input Power		+25 dBm
Operating Junction Temperature	-40 C	+150 C
Storage Temperature Range	-50 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 3	



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

### Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage, Vsupply	+2.8 V	+3.3 V	+3.7 V
Device Voltage, Vd	+2.5 V	+3.0 V	+3.4 V
Operating Case Temperature	-40 C	+25 C	+85 C
Operating Junction Temperature	-40 C		+116 C

### Thermal Information

	Thermal Resistance (°C / W)
Junction to Case Thermal Resistance ( $\theta_{JC}$ )	196.4

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### DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Device Voltage, Vd	Vsupply = +3.3 V	+2.5 V	+3.0 V	+3.4 V
DC Supply Current	Vsupply = +3.3 V	50 mA	53 mA	57 mA
Power Dissipated	Vsupply = +3.3 V		0.16 W	

### RF Performance

(T = 25 °C unless otherwise specified)

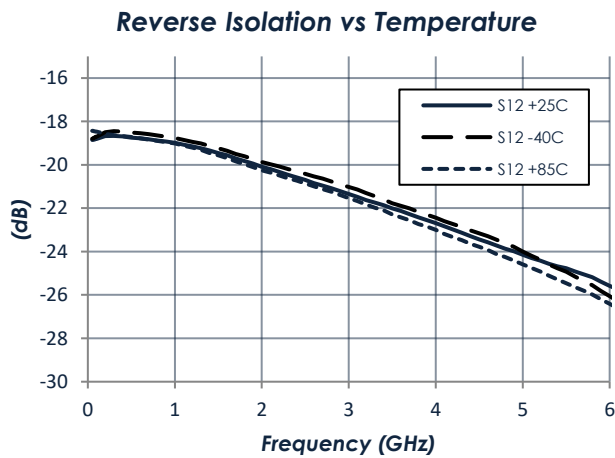
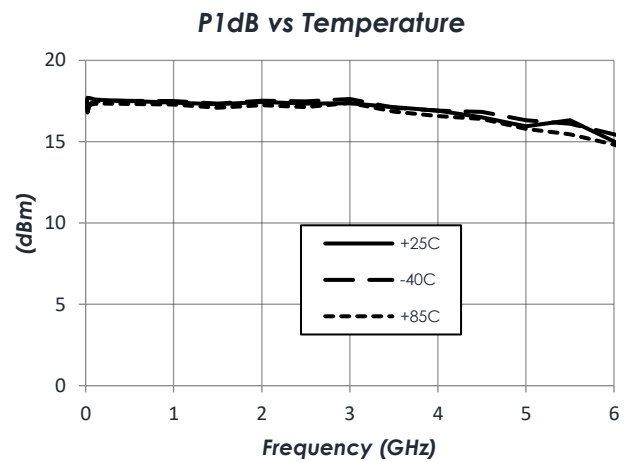
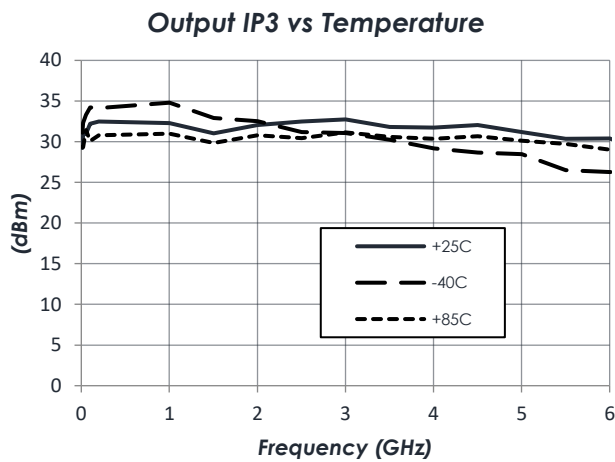
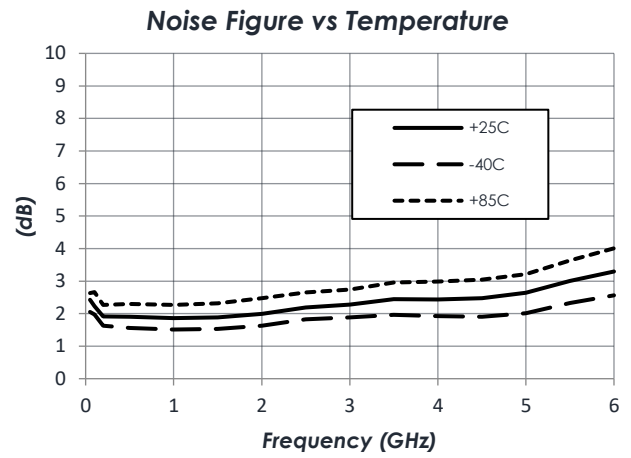
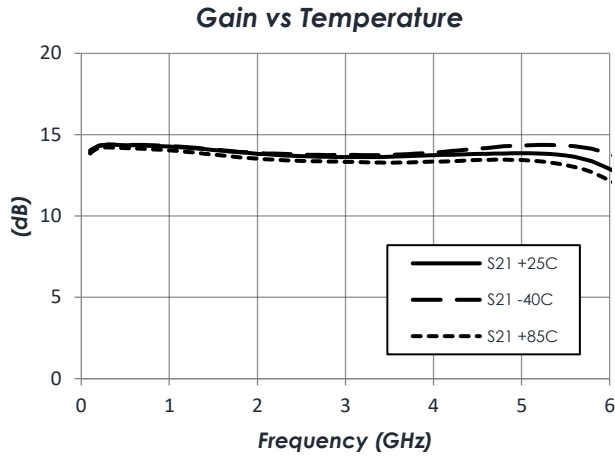
Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		DC		6 GHz
Gain	f = 3 GHz		14 dB	
Output IP3	f = 3 GHz		+33 dB	
Output P1dB	f = 3 GHz		+17 dB	
Noise Figure	f = 3 GHz		2.3 dB	

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## 20 MHz to 6 GHz Gain Block

### Typical Performance

(Vd = +3.0V, ID = 53mA)



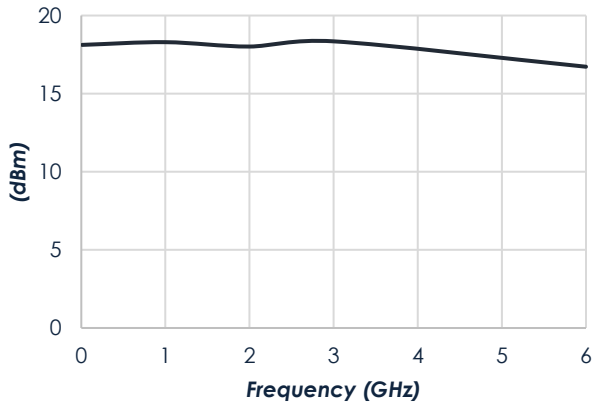
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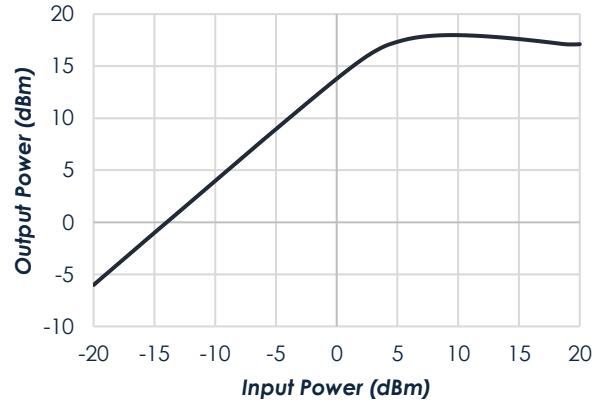
### Typical Performance (continued)

(Vd = +3.0V, ID = 53mA)

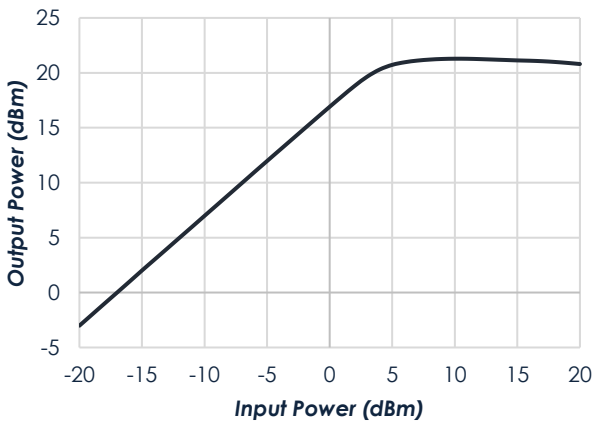
**Saturated Output Power**



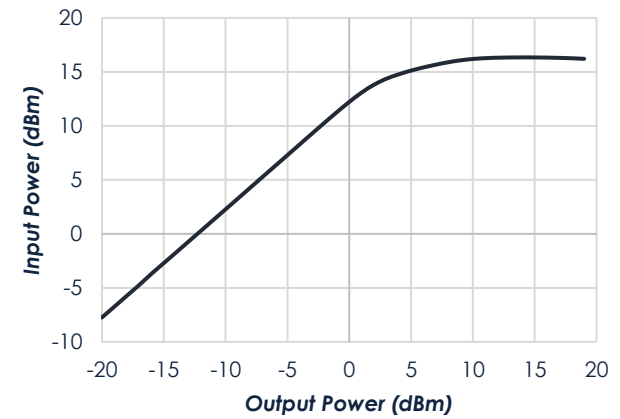
**Pin vs Pout at 1GHz**



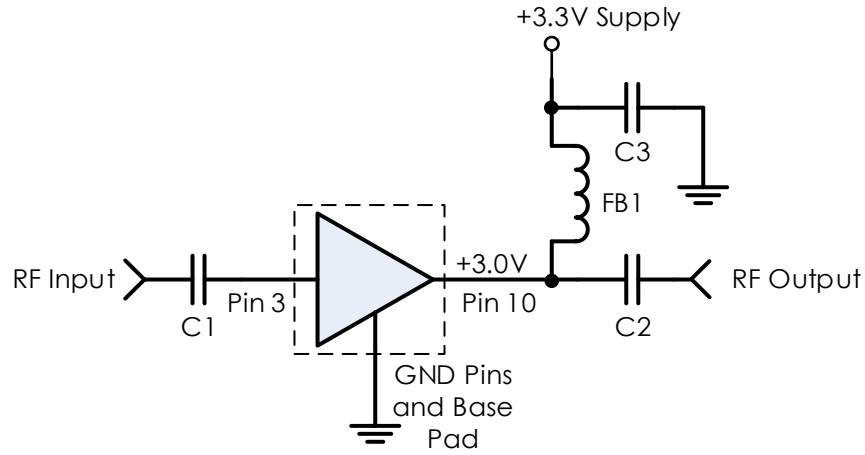
**Pin vs Pout at 3GHz**



**Pin vs Pout at 6GHz**



**Typical Application**



**Recommended Component List (or equivalent):**

Part	Value	Part Number	Manufacturer
C1, C2	0.1 uF	0402BB104KW160	Passives Plus
C3	0.1 uF	GRM155R71C104KA88	Murata
FB1	-	MMZ1005A222E	TDK



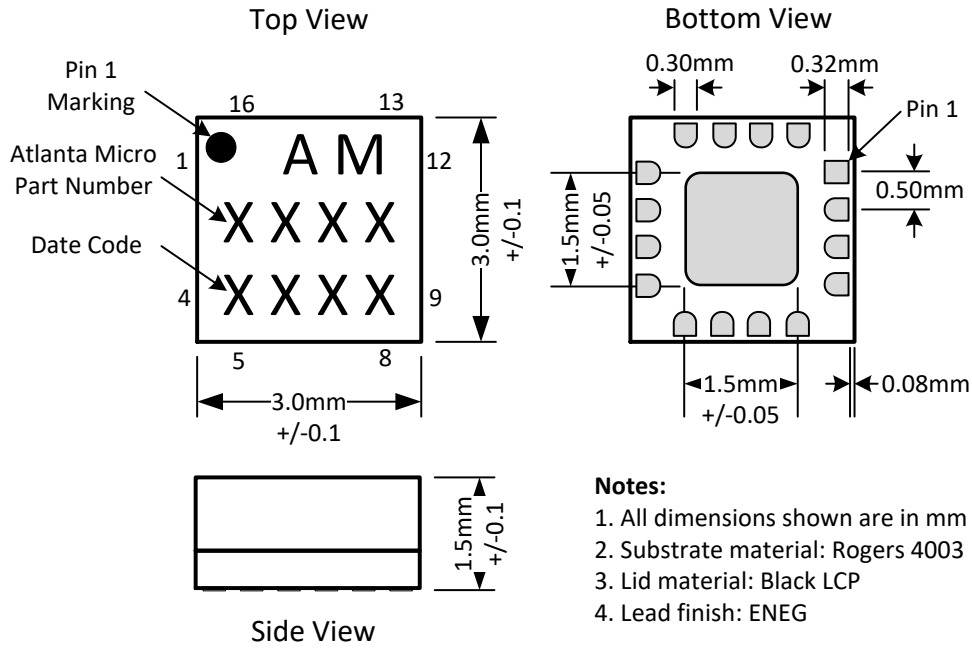
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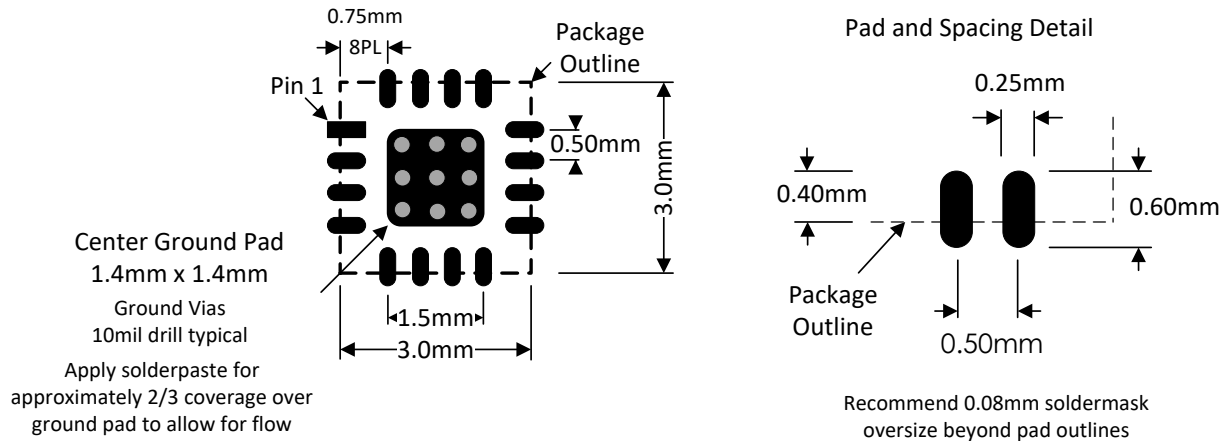


### Package Details

#### Package Drawing



#### Recommended Footprint

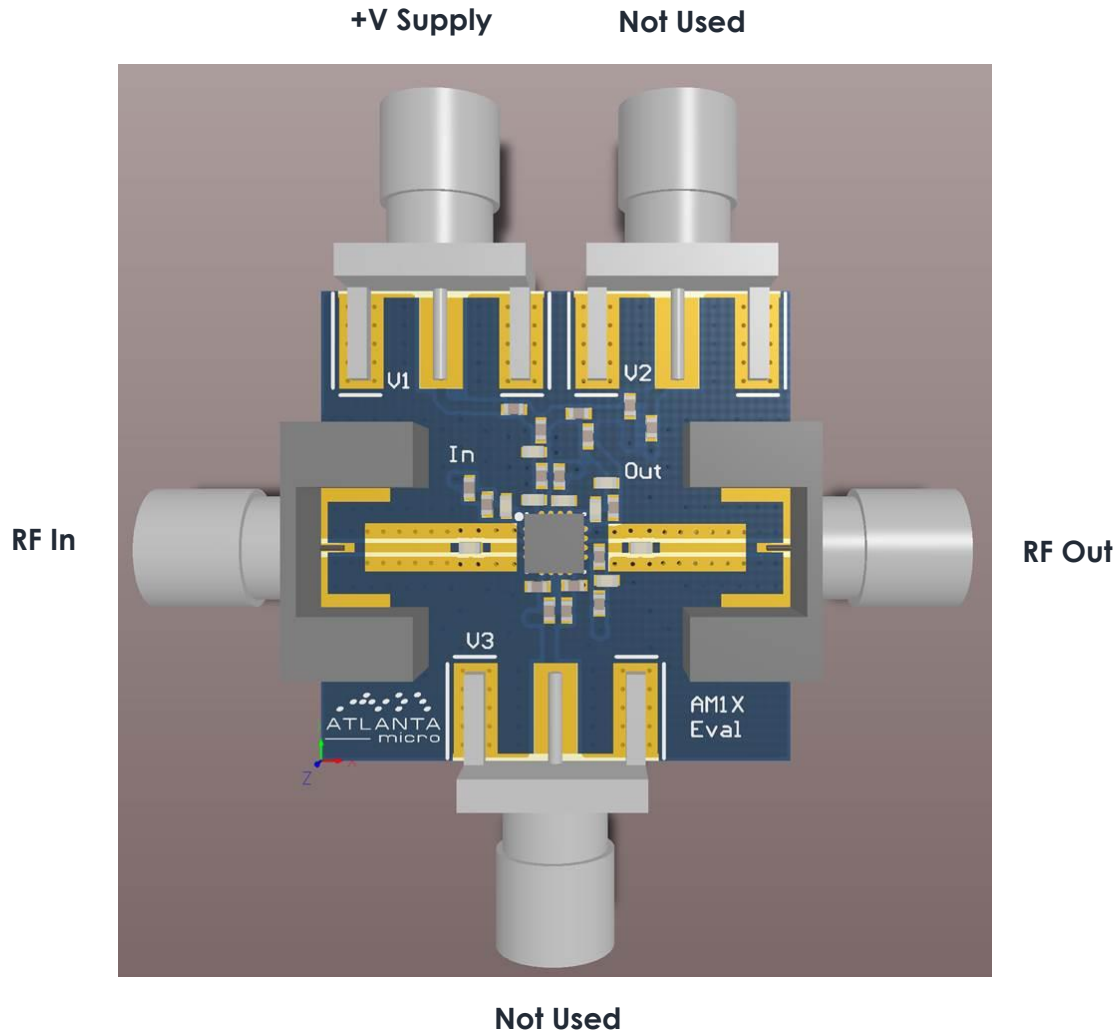


# AM1016B – Amplifier

## 20 MHz to 6 GHz Gain Block



### AM1016B Evaluation Board



### Related Parts

Part Number	Description
AM1018C	DC – 6 GHz Gain Block
AM1031C	DC – 8 GHz Gain Block
AM1063	DC – 10 GHz Gain Block
AM1064	DC – 8 GHz Gain Block

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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)

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