

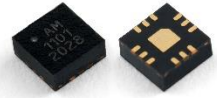
# AM1101 – Bypassable Amplifier



## 2 GHz to 26.5 GHz Bypassable Gain Block

### Description

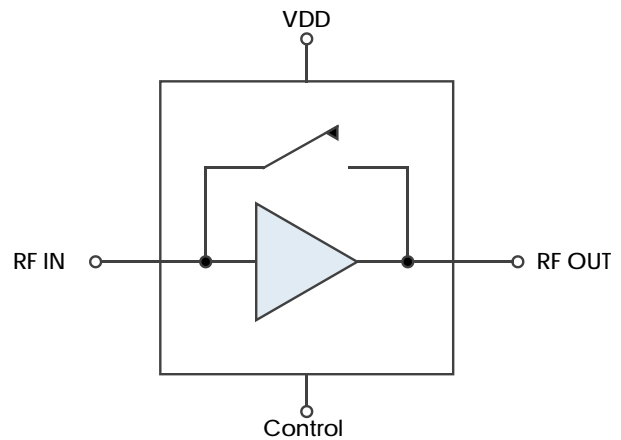
AM1101 is a wideband bypassable amplifier covering the 2 to 26.5 GHz frequency range. The device exhibits low noise figure and moderate gain across the entire frequency range while only drawing 100 mW of power. Packaged in a 3mm QFN with an integrated bypass path and internal 50 Ω matching, the AM1101 represents a dramatic size reduction when compared to discrete implementations of bypassable amplifiers.



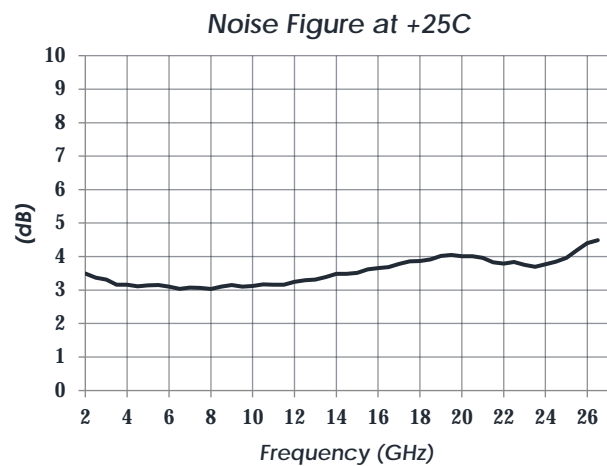
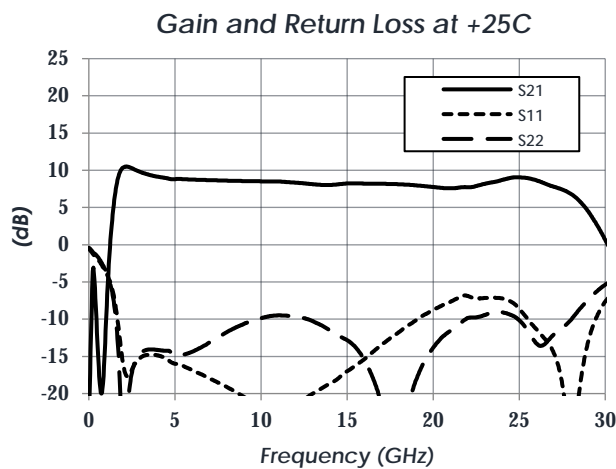
### Features

- 8 dB gain
- 3.5 dB Noise Figure
- +22 dBm OIP3
- +10 dBm P1dB
- 5 dB Insertion Loss Bypass Path
- +3.3V Supply
- 102 mW Power Consumption
- -40C to +85C Operation

### Functional Diagram



### Characteristic Performance



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### Revision History

Date	Revision Number	Notes
June 12, 2020	1	Initial Release
March 9, 2021	2	Added Logic Voltage Levels and Picture
November 19, 2021	3	Added Bypass IIP3 and P1dB

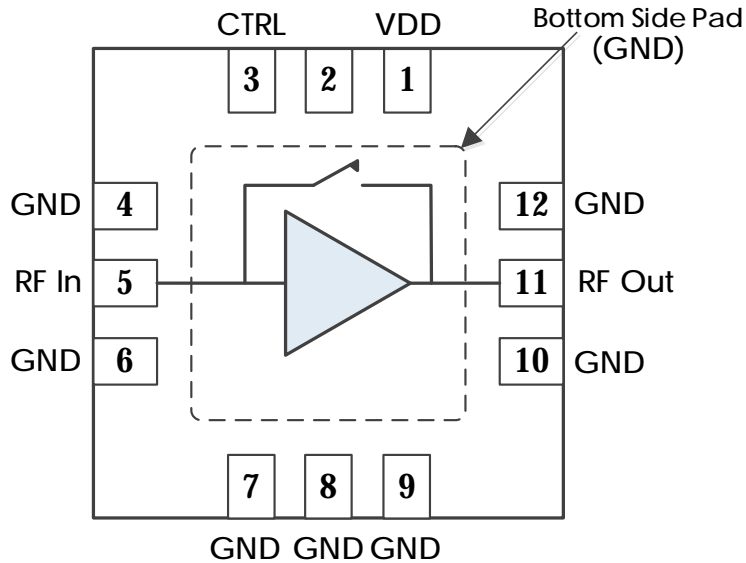
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## Pin Layout and Definitions

Note: All Un-Labeled Pins are NC or Ground



Pin Number	Pin Name	Pin Function
1	VDD	DC Power Input
2	NC	No connect
3	CTRL	Bypass/Amplifier Mode Control
4	GND	Ground – Common
5	RF In	RF Input – 50 Ohms – DC Coupled. External DC blocking capacitor required
6-10	GND	Ground – Common
11	RF Out	RF Output – 50 Ohms – DC Coupled. External DC blocking capacitor required
12	GND	Ground – Common

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## 2 GHz to 26.5 GHz Bypassable Gain Block

### Specifications

#### Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+3.5 V
RF Input Power		+20 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 3	



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

#### Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage		+3.3 V	
Operating Case Temperature	-40 C		+85 C
Operating Junction Temperature	-40 C		+125 C

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## 2 GHz to 26.5 GHz Bypassable Gain Block

### DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
DC Supply Voltage			+3.3 V	
DC Supply Current	Amplifier Enabled		31 mA	
	Amplifier Bypassed		1 mA	
Power Dissipated	Amplifier Enabled		102 mW	
	Amplifier Bypassed		3 mW	
Logic Level Low		-0.1 V		+0.4 V
Logic Level High		+2.2 V		+VDD
Control Current	CTL = +3.3V		125 $\mu$ A	

### RF Performance

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		2 GHz		26.5 GHz
Gain	f = 2 GHz		10 dB	
	f = 13 GHz		8 dB	
	f = 26.5 GHz		8 dB	
Return Loss	f = 13 GHz		-10 dB	
Output IP3	f = 2 GHz		+20 dBm	
	f = 13 GHz		+24 dBm	
	f = 26.5 GHz		+18 dBm	
Output P1dB	f = 2 GHz		+9 dBm	
	f = 13 GHz		+11 dBm	
	f = 26.5 GHz		+8 dBm	
Noise Figure	f = 13 GHz		3.5 dB	

### Timing Characteristics

Parameter	Minimum	Typical	Maximum
Switching Speed (Amp Bypass → Amp On)		70 ns	
Switching Speed (Amp On → Amp Bypass)		10 ns	

### State Table

CTL	Amplifier
Low	Bypassed
High	Enabled

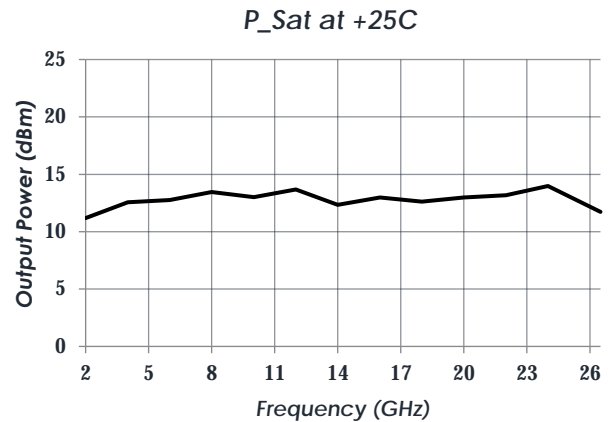
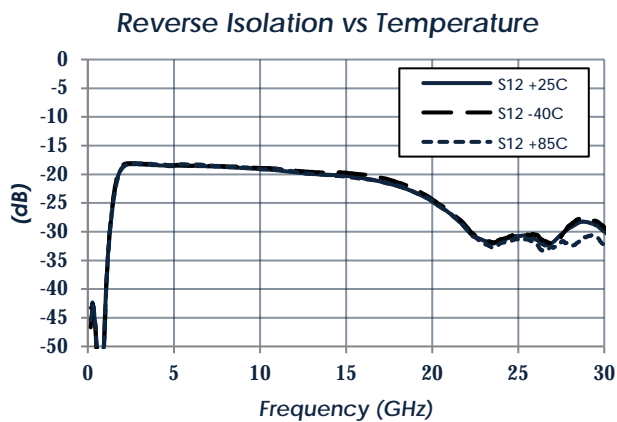
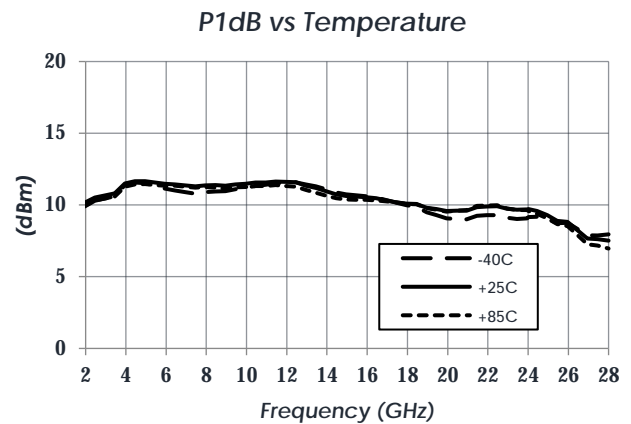
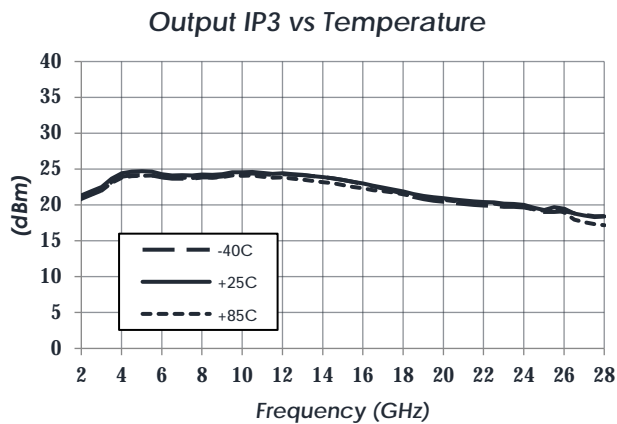
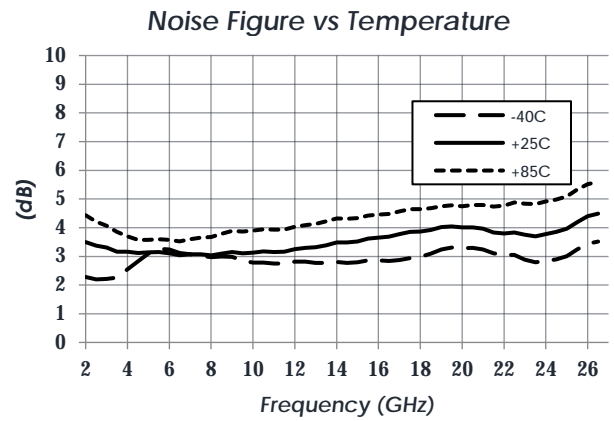
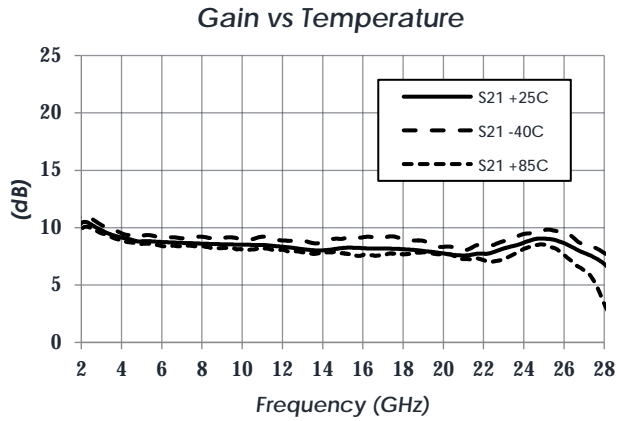
# AM1101 – Bypassable Amplifier

## 2 GHz to 26.5 GHz Bypassable Gain Block



### Typical Performance

(VDD = +3.3 V, Amplifier Enabled)

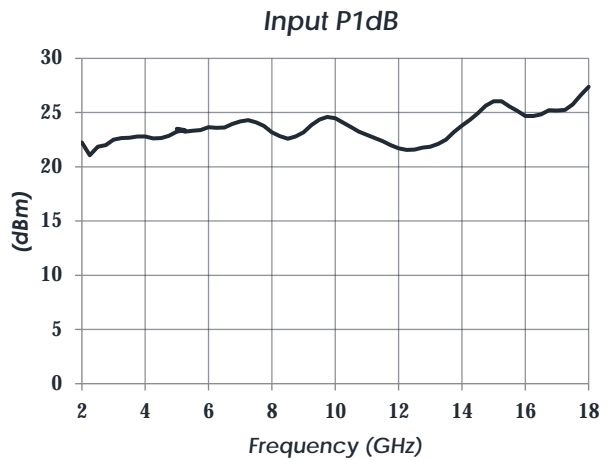
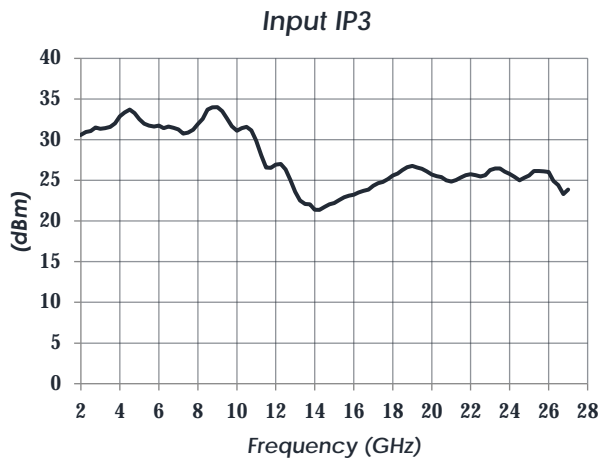
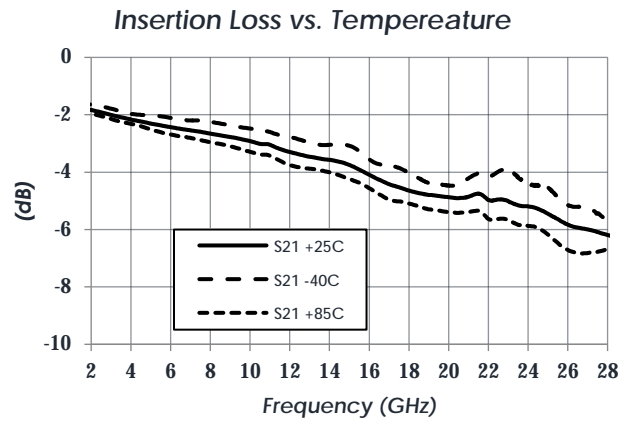
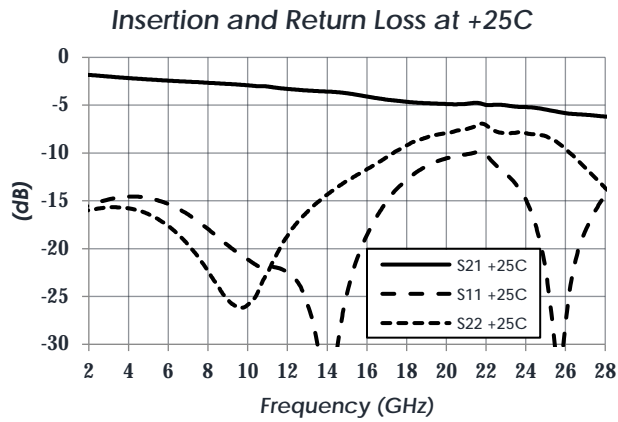


# AM1101 – Bypassable Amplifier

## 2 GHz to 26.5 GHz Bypassable Gain Block

### Typical Performance (continued)

(VDD= +3.3 V, Amplifier Bypassed)

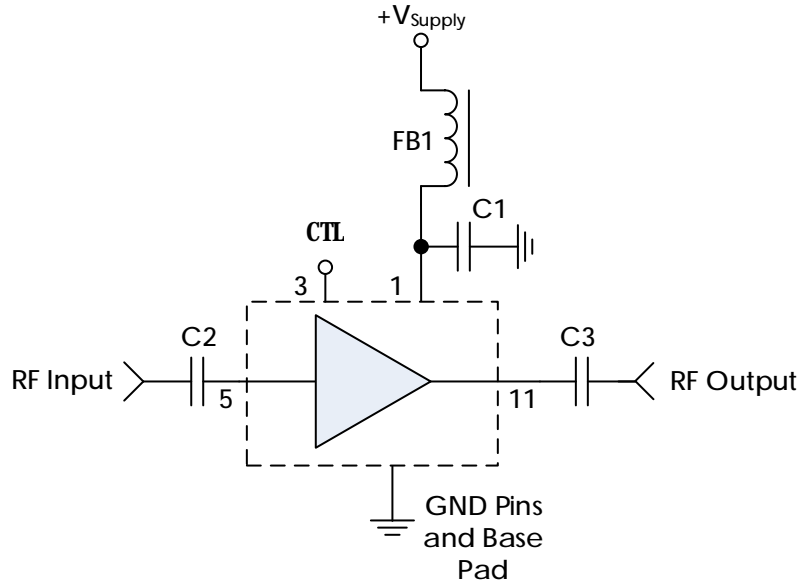


# AM1101 – Bypassable Amplifier



2 GHz to 26.5 GHz Bypassable Gain Block

## Typical Application



### Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
C1	0.1 uF	C1005X7R1H104K05BB	TDK
C2, C3	0.1 uF	0201BB104KW160	Passives Plus
FB1	-	MMZ1005A222E	TDK

### Notes:

1. DC blocking capacitors should be high performance, low-loss, broadband capacitors for optimum performance.
2. Control line filtered internally providing high frequency isolation.



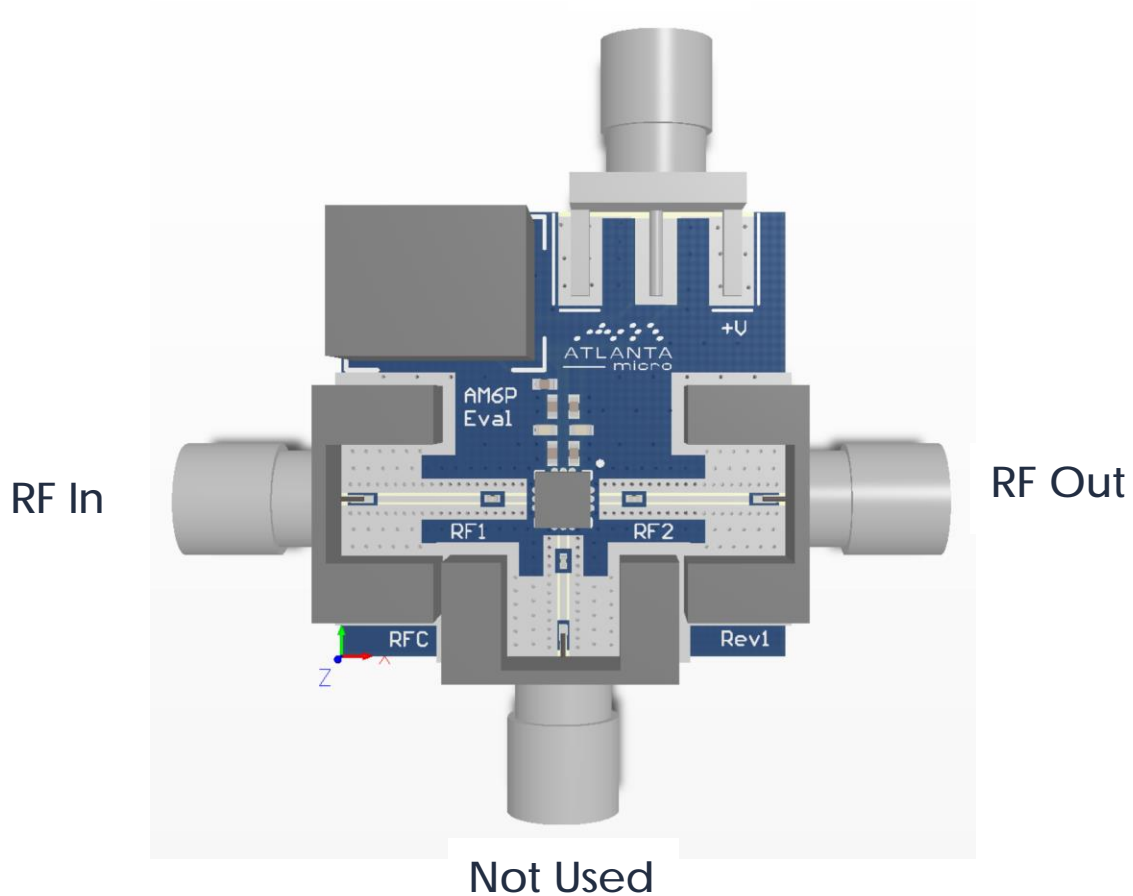
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2 GHz to 26.5 GHz Bypassable Gain Block

Evaluation PC Board

+VDD



Note: Some items shown in the image above may not be installed on the evaluation board

## Related Parts

Part Number	Description		
AM1067	5 GHz	to 20 GHz	Bypassable Amplifier
AM1075	5 GHz	to 26.5 GHz	Bypassable Amplifier
AM1100	2 GHz	to 26.5 GHz	Low Noise Amplifier
AM1102	DC	to 21 GHz	Low Noise Amplifier

# AM1101 – Bypassable Amplifier



## 2 GHz to 26.5 GHz Bypassable Gain Block

### Component Compliance Information

**RoHS:** Atlanta Micro, 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 Atlanta Micro 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)
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)

**REACH:** Atlanta Micro, Inc. neither uses nor intentionally adds any of the substances considered to be a Substance of Very High Concern (SVHC) as defined by the EU Regulation (EC) No. 1907-2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH).

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Atlanta Micro takes its responsibility as a global partner seriously and will use due diligence within our supply chain to ensure all standards are met to the best of our knowledge.