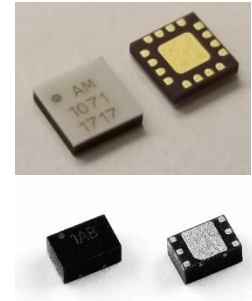


AM1071 - Amplifier

DC to 18 GHz Gain Block

Description

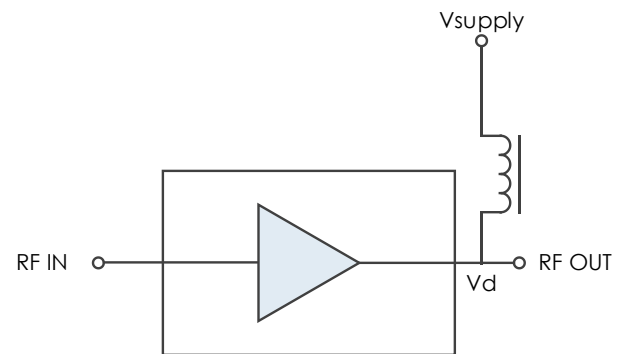
The AM1071 is a DC-coupled broadband gain block covering up to 18 GHz. The device exhibits high third order intercept performance, excellent gain stability over the operating temperature range, and a gain flatness within +/- 1 dB of nominal gain useful in many broadband applications. With internal 50Ω matching and packaged in either a 3mm QFN or a 1.3mm x 2mm DFN, the AM1071 represents a compact total PCB footprint.



Features

- 12 dB Gain
- 3.5 dB Noise Figure
- +30 dBm OIP3
- +16 dBm P1dB
- +5V, 70 mA Supply
- 3mm QFN or 1.3mm x 2mm DFN
- -40C to +85C Operation

Functional Diagram



Characteristic Performance

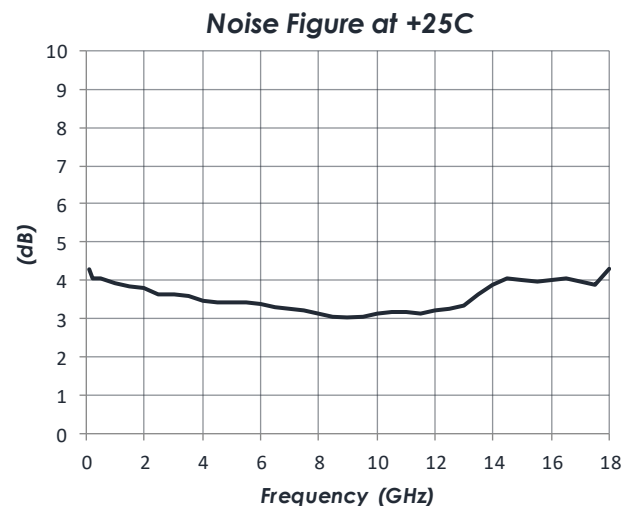
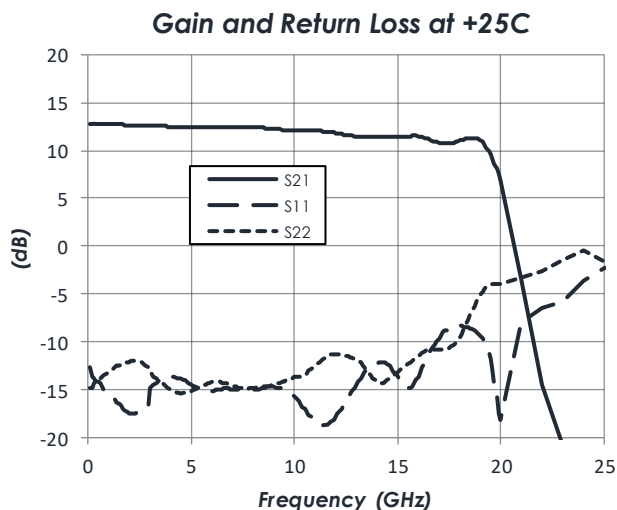


Table of Contents

Description	1	Recommended Operating Conditions ...	5
Features	1	Thermal Information	5
Functional Diagram	1	DC Electrical Characteristics	6
Characteristic Performance	1	RF Performance	6
Revision History	2	Typical Performance	7
Pin Layout and Definitions	3	Typical Application	9
3mm QFN	3	Part Ordering Details	10
1.3mm x 2mm DFN	4	Related Parts	10
Specifications	5	Evaluation PC Board	10
Absolute Maximum Ratings	5	Component Compliance Information	11
Handling Information	5		

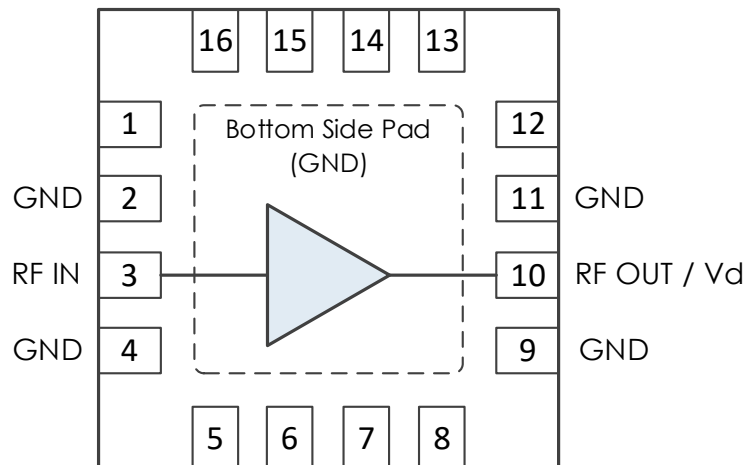
Revision History

Date	Revision Number	Notes
August 26, 2020	3	Updated to latest datasheet format. More comprehensive data added.
December 4, 2020	4	Added pinout and evaluation board image for AM1071-2

Pin Layout and Definitions

3mm QFN

NOTE: All Non-Named Pins Are NC or GND

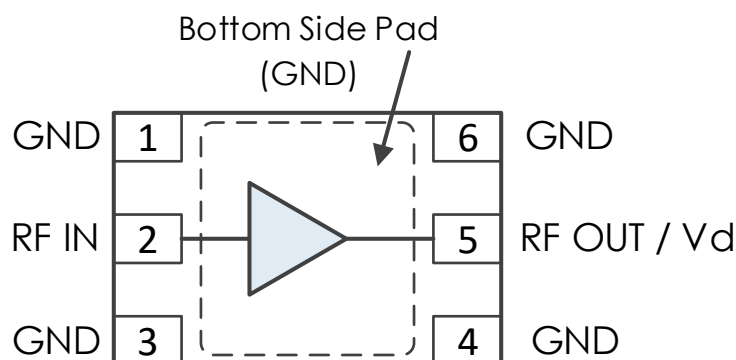


Pin Number	Pin Name	Pin Function
1	NC	Not Connected*
2	GND	Ground – Common
3	RF In	RF Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required
4	GND	Ground – Common
5 – 8	NC	Not Connected*
9	GND	Ground – Common
10	RF Out / Vd	RF Output and DC Power Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required.
11	GND	Ground – Common
12 - 16	NC	Not Connected*
Bottom Pad	GND	Ground – Common

***Note:** NC pins may be left floating or grounded. Grounding these pins is recommended.

Pin Layout and Definitions (continued)

1.3mm x 2mm DFN



Pin Number	Pin Name	Pin Function
1	GND	Ground - Common
2	RF In	RF Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required
3,4	GND	Ground - Common
5	RF Out, Vd	RF Output and DC Power Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required
6	GND	Ground - Common
Case GND	GND	Ground - Common

AM1071 - Amplifier

DC to 18 GHz Gain Block

Specifications

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+6.0 V
RF Input Power		+13 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	AM1071-1	MSL 1
	AM1071-2	MSL 3



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

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage	+4.5 V	+5.0 V	+5.7 V
Device Voltage, Vd	+4.3 V	+4.8 V	+5.5 V
Operating Case Temperature	-40 C		+85 C
Operating Junction Temperature	-40 C		+125 C

Thermal Information

	Thermal Resistance (°C / W)
Junction to Case Thermal Resistance (θ_{JC})	112

AM1071 - Amplifier

DC to 18 GHz Gain Block

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
DC Supply Voltage		+4.5 V	+5.0 V	+5.7 V
DC Device Voltage, Vd		+4.3 V	+4.8 V	+5.5 V
DC Device Current, Id	Vd = +4.8 V	54 mA	70 mA	79 mA
Power Dissipated	Vd = +4.8 V	0.26 W	0.34 W	0.38 W

RF Performance

(T = 25 °C unless otherwise specified)

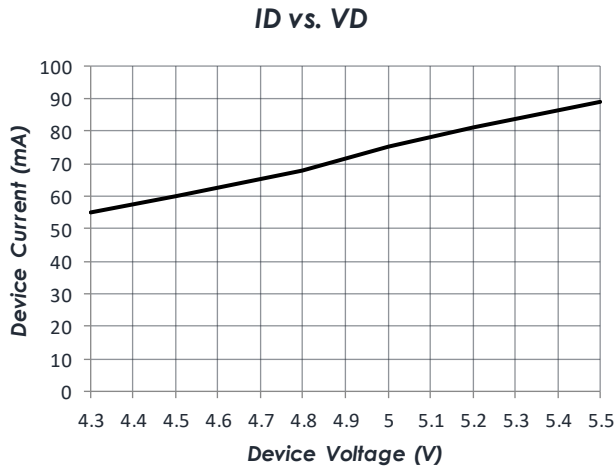
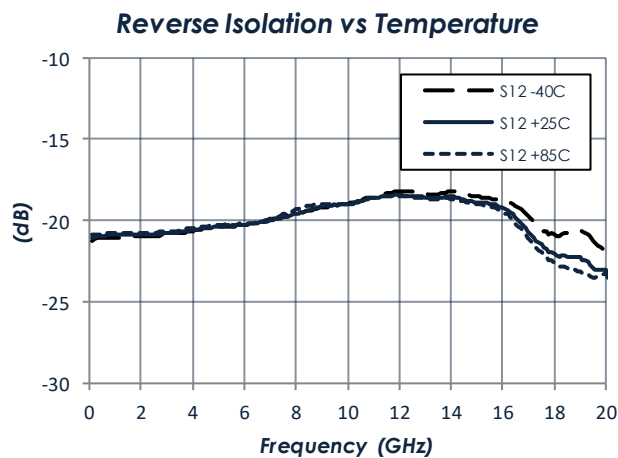
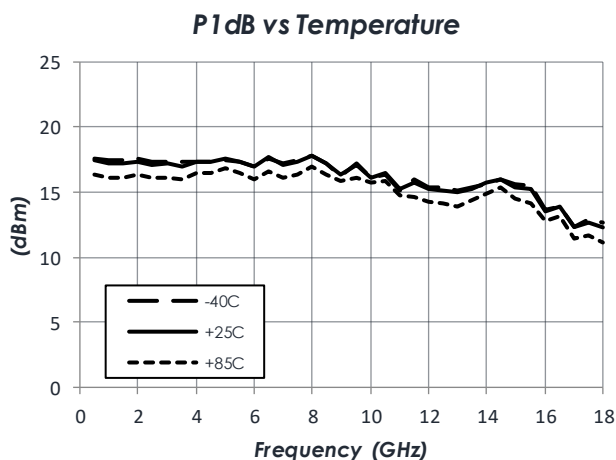
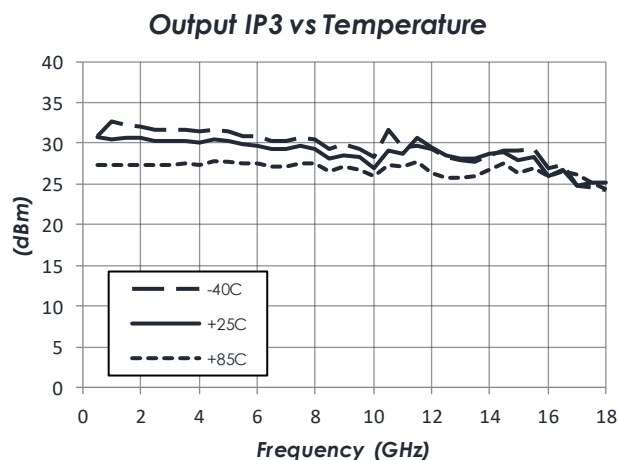
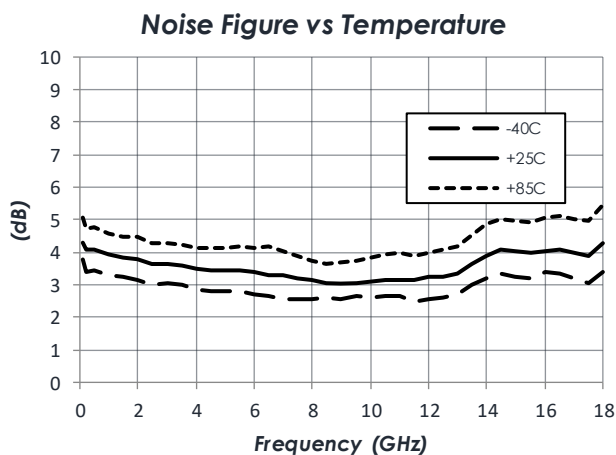
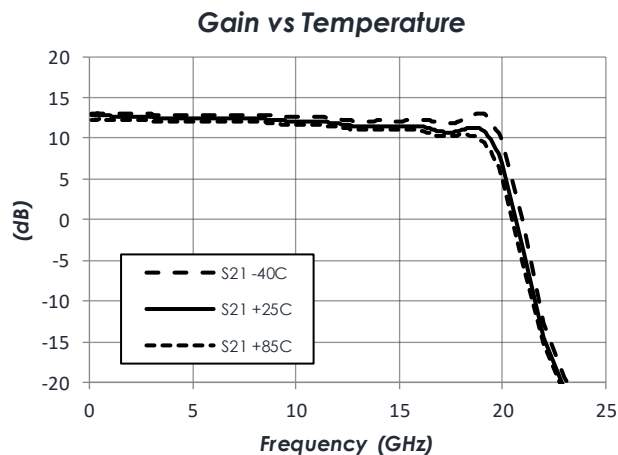
Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		DC		18 GHz
Gain			12 dB	
Return Loss			15 dB	
Output IP3			+30 dBm	
Output P1dB			+16 dBm	
Noise Figure			3.5 dB	

AM1071 - Amplifier

DC to 18 GHz Gain Block

Typical Performance

($V_d = 4.8V$, $I_d = 70mA$, $T=25C$ unless otherwise specified)



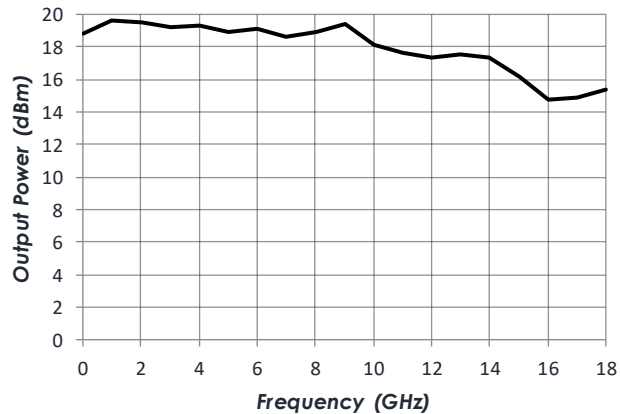
AM1071 - Amplifier

DC to 18 GHz Gain Block

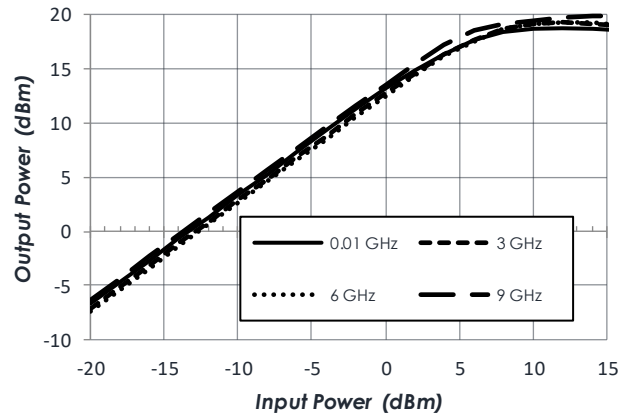
Typical Performance (continued)

($V_d = 4.8V$, $I_d = 70mA$, $T=25C$ unless otherwise specified)

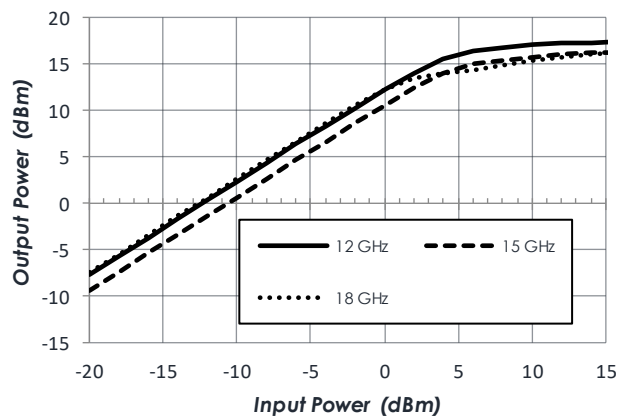
P_{Sat} at +25C



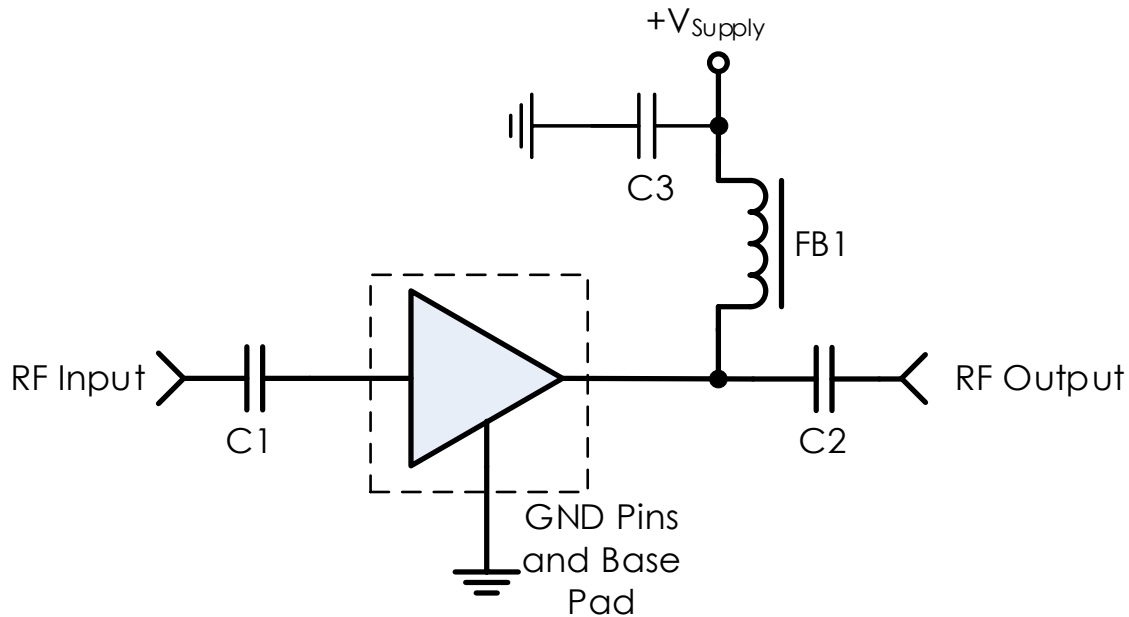
Pin vs. Pout at +25C



Pin vs. Pout at +25C



Typical Application



Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
C1, C2	0.1 μ F	0201BB104KW160	Passive Plus
C3	0.1 μ F	GRM155R71C104KA88	Murata
FB1	-	MMZ1005A222E	TDK

Notes:

1. NC pins may be floating or grounded. Grounding these pins is recommended.
2. DC blocking capacitors should be high-performance, low-loss capacitors for optimum performance.

AM1071 - Amplifier

DC to 18 GHz Gain Block

Part Ordering Details

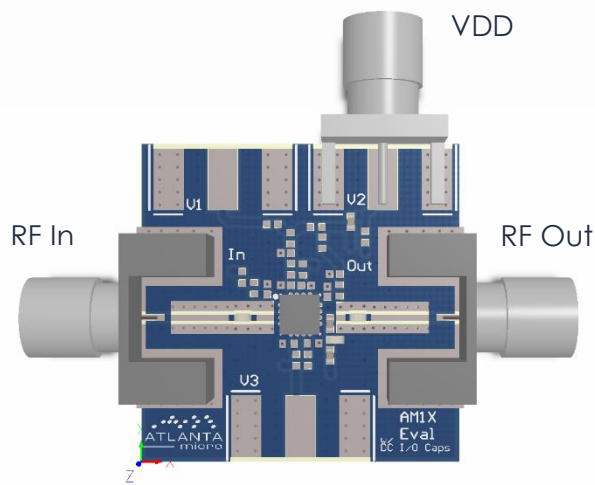
Description	Part Number
3mm 16 Lead QFN	AM1071-1
1.3mm x 2mm 6 Lead DFN	AM1071-2
AM1071-1 Evaluation Board	AM1071-1 Eval
AM1071-2 Evaluation Board	AM1071-2 Eval

Related Parts

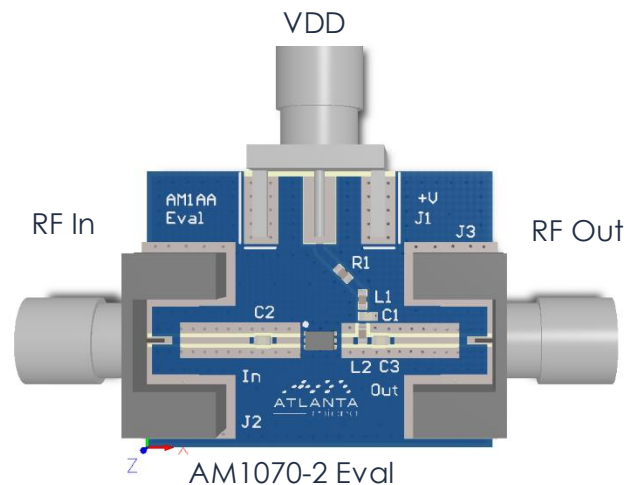
Part Number	Description
AM1070	DC to 18 GHz +3.3V Gain Block
AM1102	DC to 22 GHz Broadband Low Noise Amplifier
AM1063-1	DC to 10 GHz Gain Block
AM1063-2	DC to 10 GHz Miniature Gain Block
AM1163-1	DC to 10 GHz Low Noise Amplifier
AM1163-2	DC to 10 GHz Miniature Low Noise Amplifier
AM1053	5 GHz to 20 GHz Gain Block / Driver Amplifier
AM1082	5 GHz to 17 GHz Gain Block / Driver Amplifier

Evaluation PC Board

(Not all components shown will necessarily be installed)



AM1070-1 Eval



AM1070-2 Eval

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).

Conflict Materials: Atlanta Micro does not knowingly use materials that are sourced from the Democratic Republic of Congo (DRC) or any other known conflict regions. Atlanta Micro's supply chain is comprised of sources that are both environmentally and socially responsible. We periodically review this requirement with our vendors to ensure continued compliance.

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.