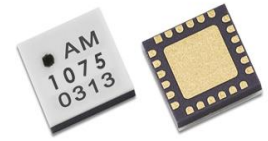


AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block

Description

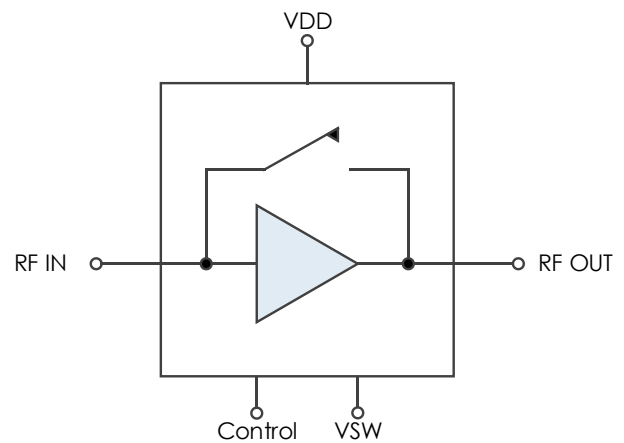
The AM1075 is a high dynamic range amplifier covering the 5 GHz to 26.5 GHz frequency range that offers a bypass mode. The device provides high gain with low bypass insertion loss and is capable of producing a +15 dBm output power with a single +3.3V supply. With internal 50Ω matching and packaged in a 4mm QFN, the AM1075 represents a dramatic size reduction over a discrete implementation of a bypassable amplifier.



Features

- 18 dB AVG Gain
- 4.0 dB TYP Insertion Loss in Bypass
- 4.0 dB Noise Figure
- +24 dBm OIP3
- +14 dBm P1dB
- +3.3 V, 82 mA TYP
- +3.3 V Logic
- -40C to +85C Operation
- 4mm QFN Package

Functional Diagram



Characteristic Performance

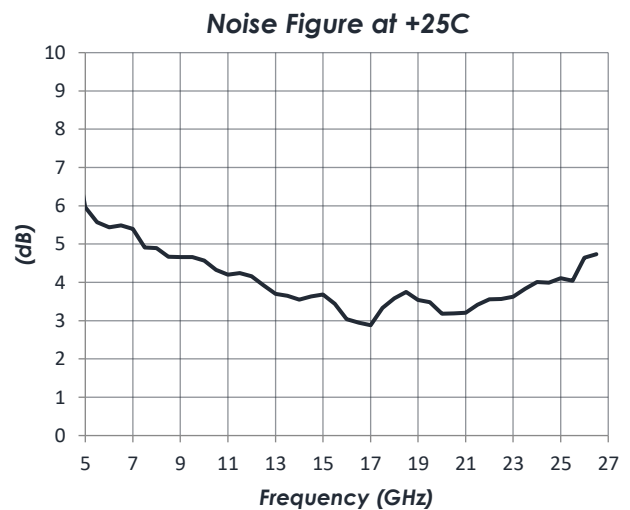
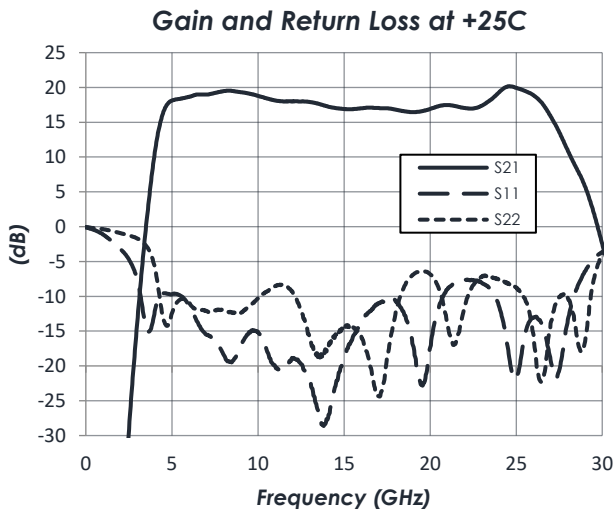


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Revision History

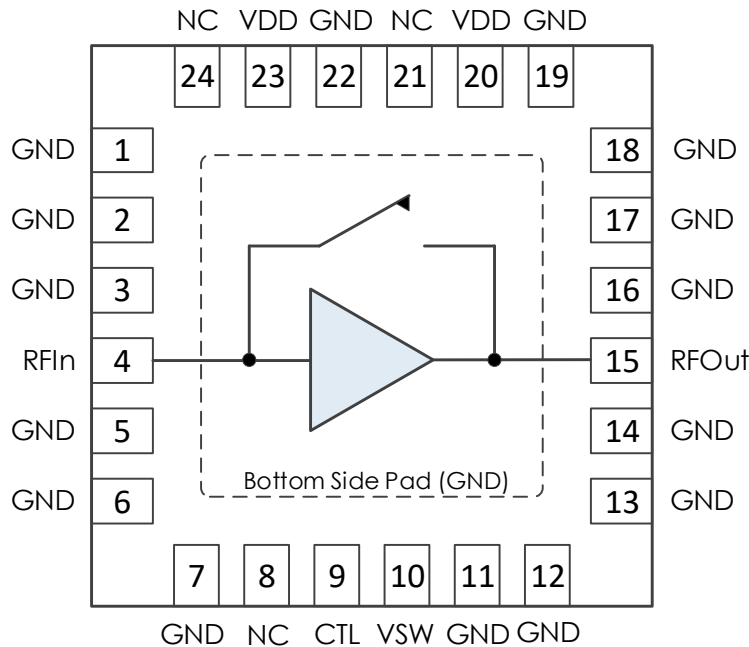
Date	Revision Number	Notes
September 21, 2018	1	Initial Release

AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block



Pin Layout and Definitions



Pin Number	Pin Name	Pin Function
1-3	GND	Ground – Common
4	RF In	RF Input – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required*
5-7	GND	Ground – Common
8	NC	Do Not Connect
9	CTL	Bypass/Amplifier Mode Control
10	VSW	DC Switch Power Input
11-14	GND	Ground – Common
15	RF Out	RF Output – 50 Ohms – DC Coupled. External DC Blocking Capacitor Required*
16-19	GND	Ground – Common
20	VDD	DC Power Input
21	NC	Do Not Connect
22	GND	Ground – Common
23	VDD	DC Power Input
24	NC	Do Not Connect
Case GND	GND	Ground – Common

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

AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block



Specifications

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+3.7 V
RF Input Power		+20 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 1	



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

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage	+2.7 V	+3.3 V	+3.6 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})	172

AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz 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	VDD = +3.3 V		82 mA	
Power Dissipated	VDD = +3.3 V		0.27 W	
DC Switch Voltage		+2.5 V	+VDD	+6.0 V
DC Switch Current			1 mA	
Logic Level Low		0.0 V		+0.5 V
Logic Level High		+2.0 V		+ V Switch

RF Performance

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		5.0 GHz		26.5 GHz
Gain	f = 5 GHz		18.1 dB	
	f = 16 GHz		17.0 dB	
	f = 26.5 GHz		17.7 dB	
Return Loss	f = 5 GHz		12.4 dB	
	f = 16 GHz		15.8 dB	
	f = 26.5 GHz		22.1 dB	
Output IP3			+24 dBm	
Output P1dB			+14 dBm	
Noise Figure			4.0 dB	
Bypass Insertion Loss			4.0 dB	

Timing Characteristics

Parameter	Minimum	Typical	Maximum
Switching Speed (Amp Bypass → Amp On)*		100 ns	
Switching Speed (Amp On → Amp Bypass)*		100 ns	

*Note: Measurements made without RC control line filtering

State Table

CTL	Amplifier
Low	Bypass
High	Enabled

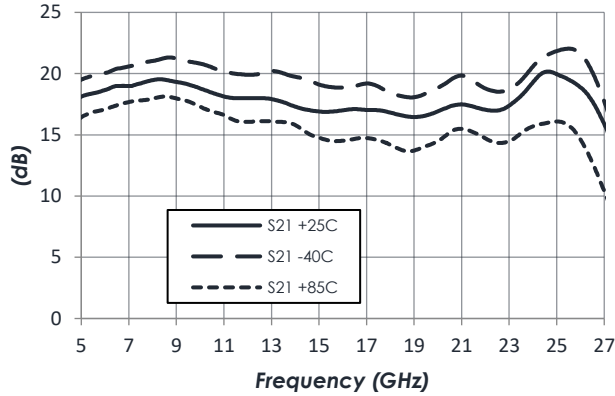
AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block

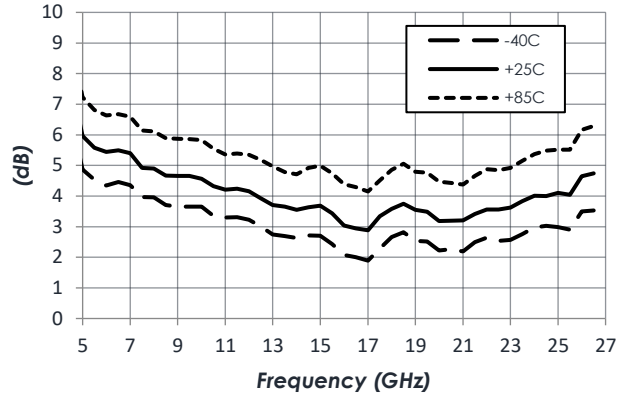
Typical Performance

(Amplifier Enabled, VDD = +3.3V, Id = 82 mA)

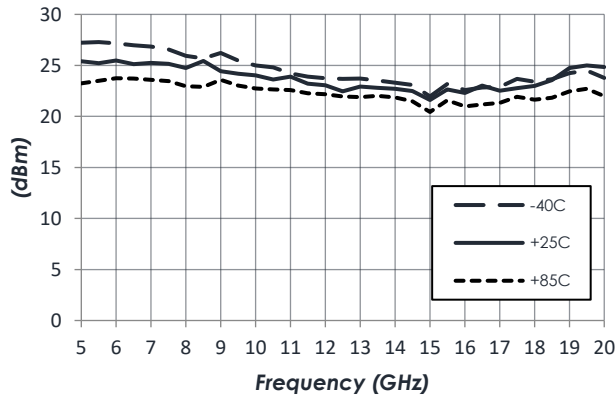
Gain vs Temperature



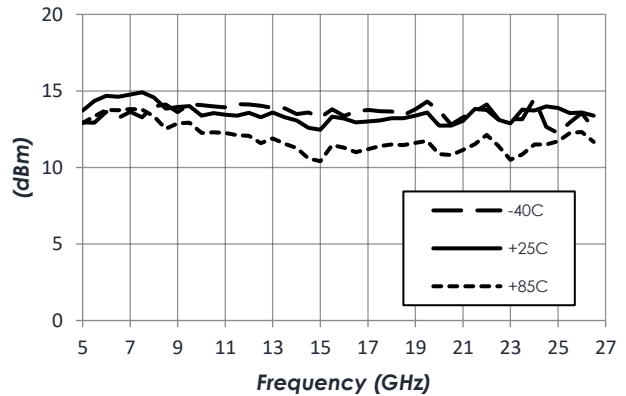
Noise Figure vs Temperature



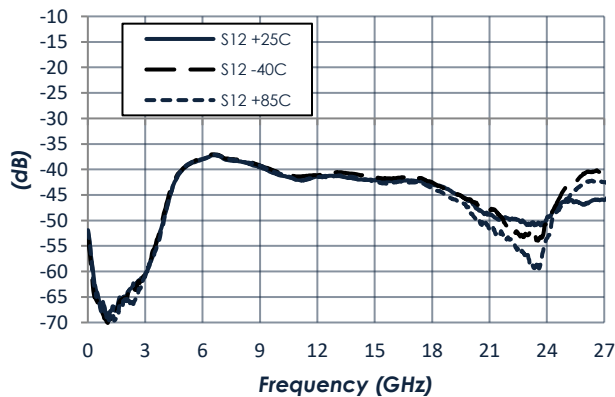
Output IP3 vs Temperature



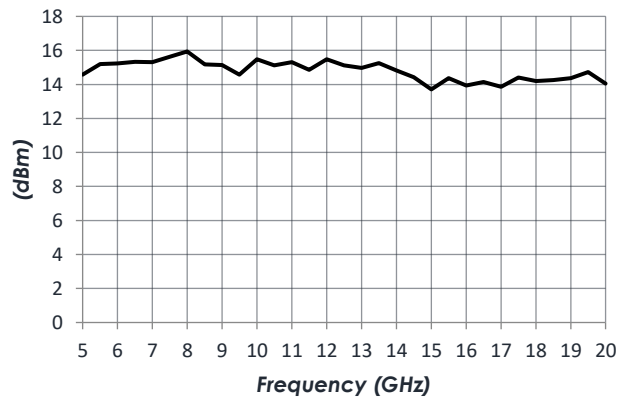
P1dB vs Temperature



Reverse Isolation vs Temperature



Power Saturation at +25C



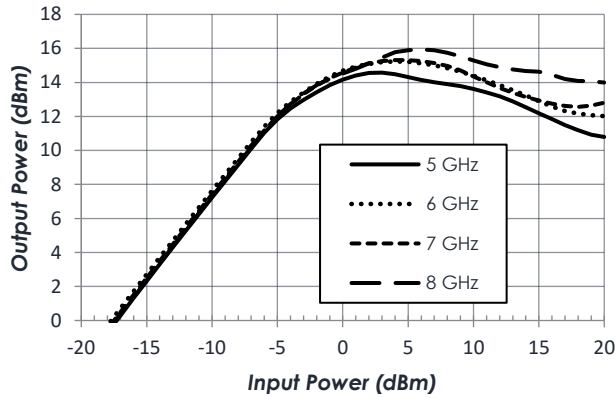
AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block

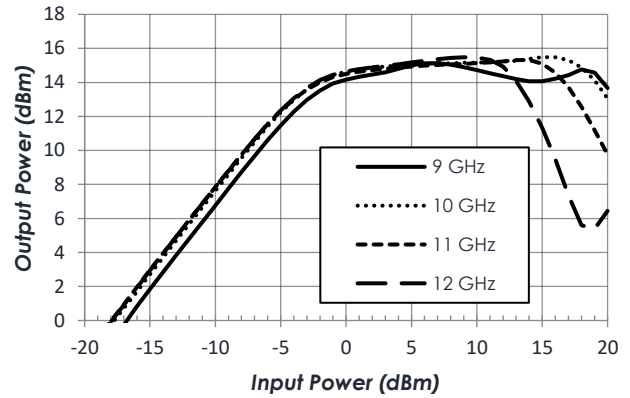
Typical Performance (continued)

(Amplifier Enabled, VDD = +3.3V, Id = 82 mA)

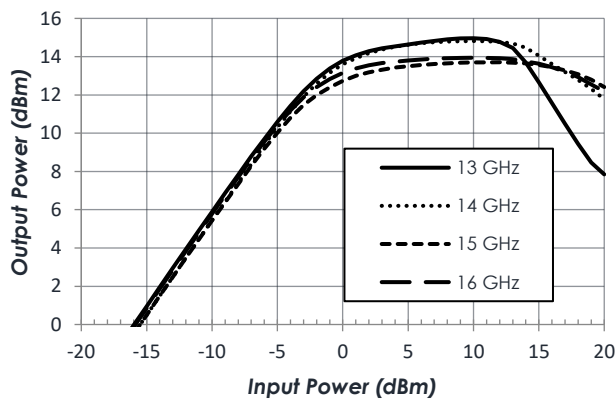
Pin vs. Pout at +25C



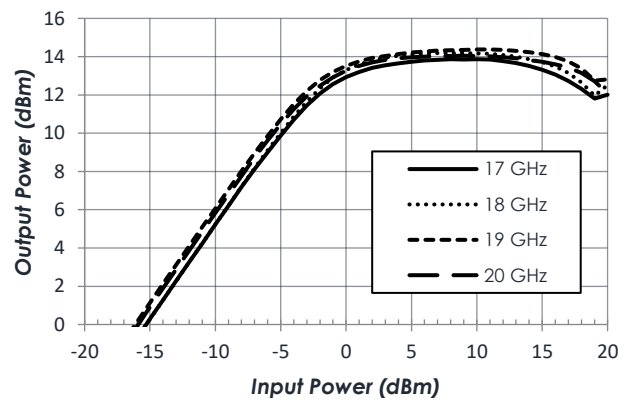
Pin vs. Pout at +25C



Pin vs. Pout at +25C



Pin vs. Pout at +25C

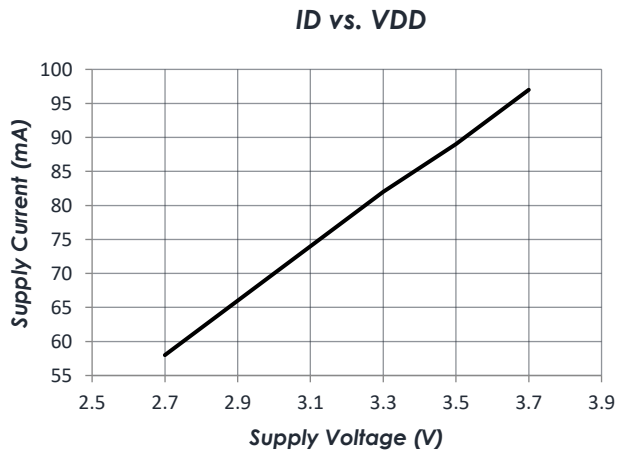
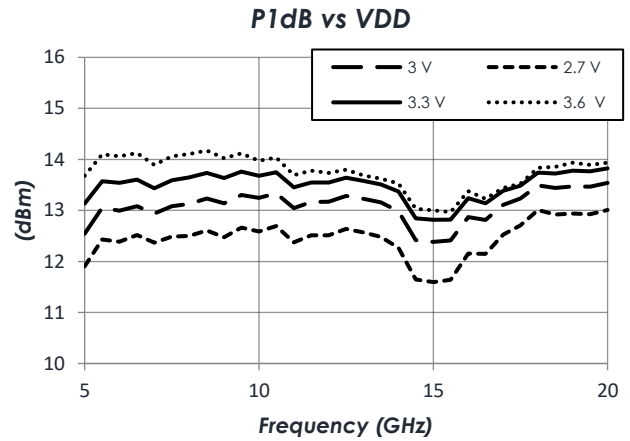
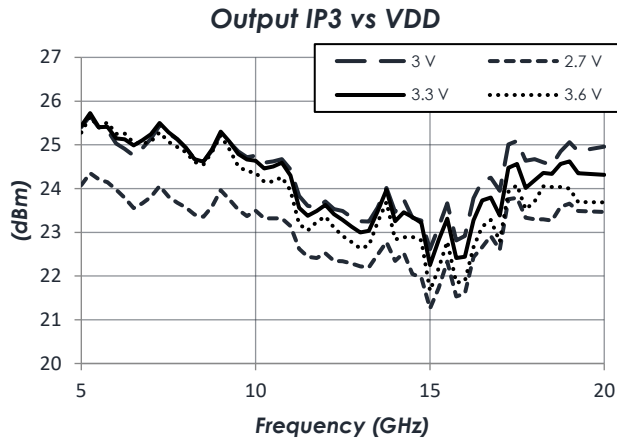


AM1075 – Bypassable Amplifier

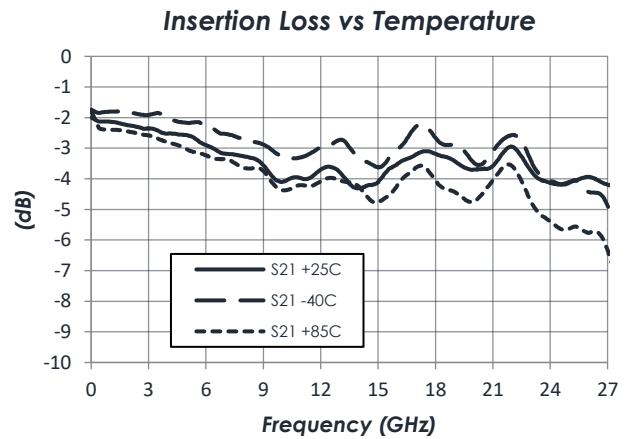
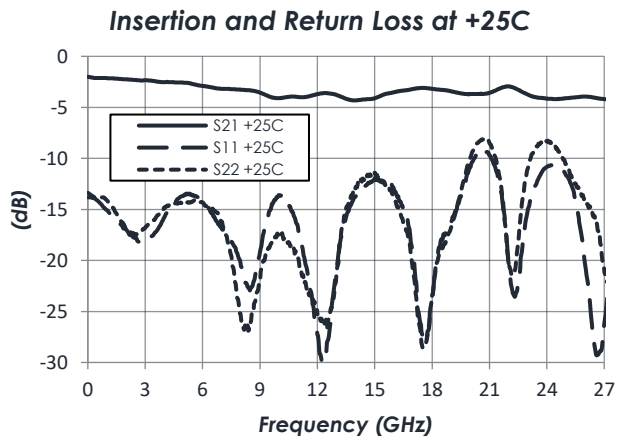
5 GHz to 26.5 GHz Gain Block

Typical Performance (continued)

(Amplifier Enabled)



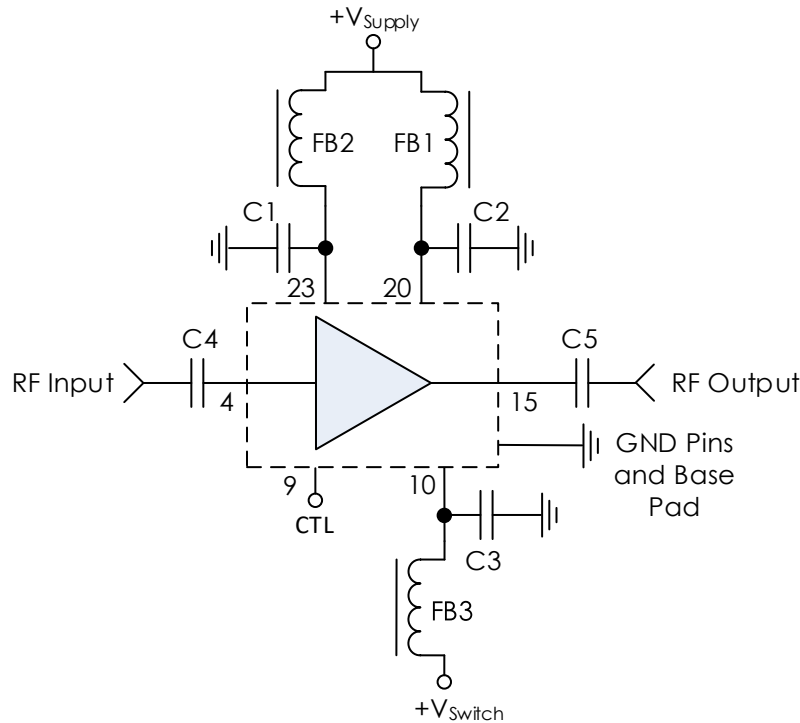
(Amplifier Bypassed, VDD = +3.3V, Id = 0 mA)



AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block

Typical Application



Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
FB1 – FB3	-	MMZ1005A222E	TDK
C1 – C3	0.1 μ F	C1005X7R1H104K050BB	TDK
C4, C5	0.1 μ F	0201BB104KW160	Passives Plus

Notes:

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

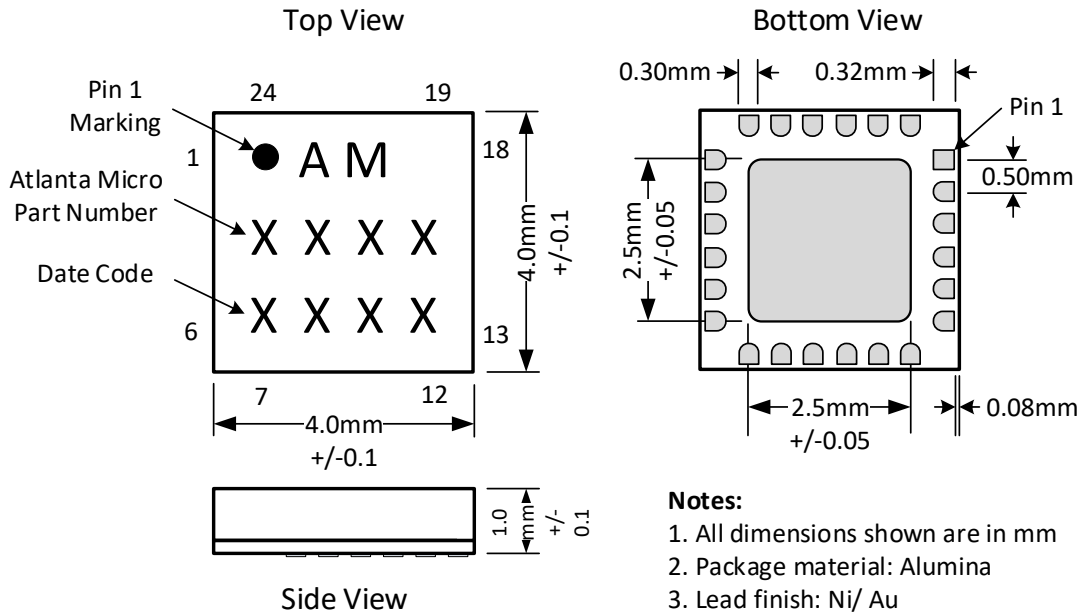
AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block

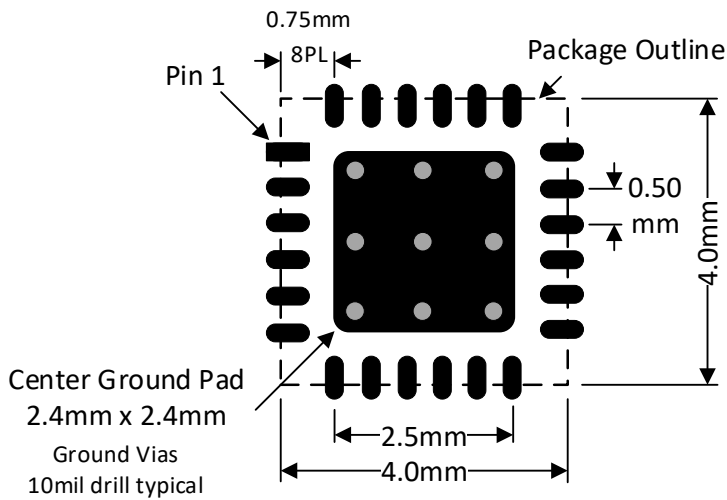


Package Details

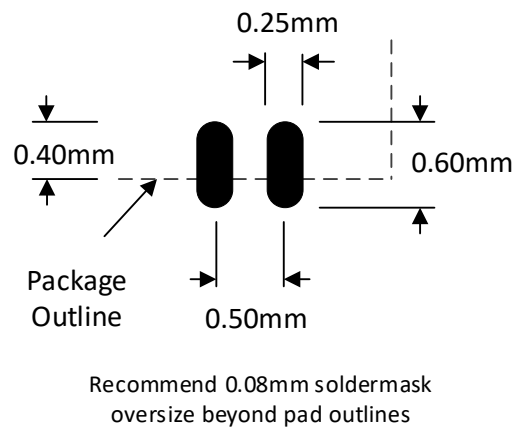
Package Drawing



Recommended Footprint



Pad and Spacing Detail

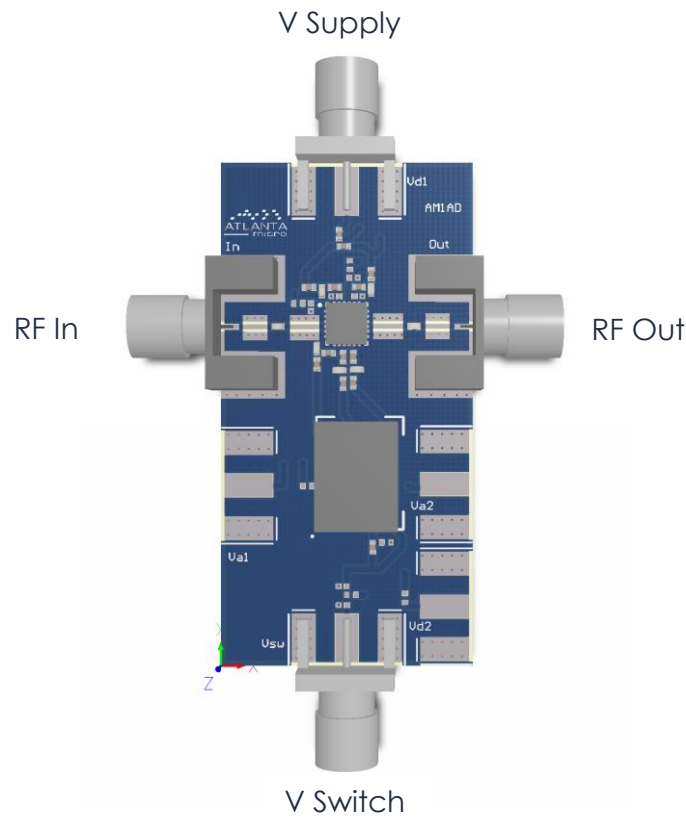


AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz Gain Block



Evaluation PC Board



***Note:** Some of the components shown may not be installed

Related Parts

Part Number	Description
AM1065	DC to 8 GHz Bypassable Gain Block
AM1067	5 GHz to 20 GHz Bypassable Gain Block
AM1073	DC to 8 GHz Bidirectional / Bypassable Gain Block
AM1074	6 GHz to 26.5 GHz Gain Block
AM1077	5 GHz to 20 GHz Bypassable Gain Block w/ Isolation State

AM1075 – Bypassable Amplifier

5 GHz to 26.5 GHz 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 RoHS II. 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)

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.