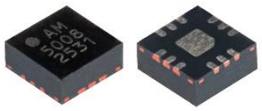
AM5008 – Mixer

2 GHz to 24 GHz Double Balanced Mixer

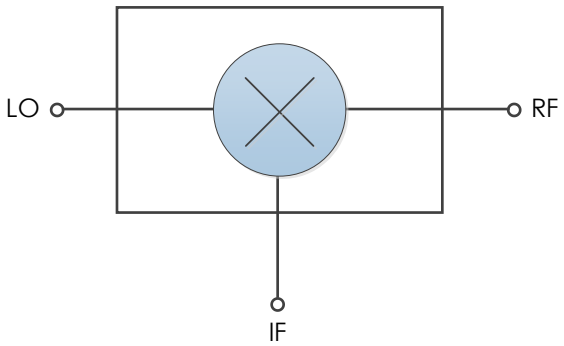
AM5008 is a wideband, double balanced mixer servicing the 2 to 24 GHz frequency range. Suitable for both downconvert and upconvert applications, the device exhibits high IIP3 and low conversion loss. Packaged in a compact 3mm QFN, the AM5008 is perfect for low SWaP applications.

FEATURES

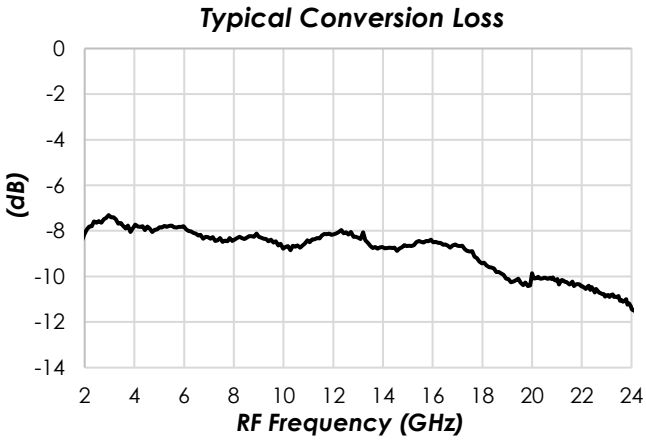
- 2 to 24 GHz RF
- 8.5 dB Conversion Loss
- DC to 3 GHz IF
- +18 dBm IIP3
- 16 to 20 dBm LO drive
- 38 dB Typical LO to RF Isolation
- 3 mm SMT QFN Package
- -40 °C to +85 °C Operation

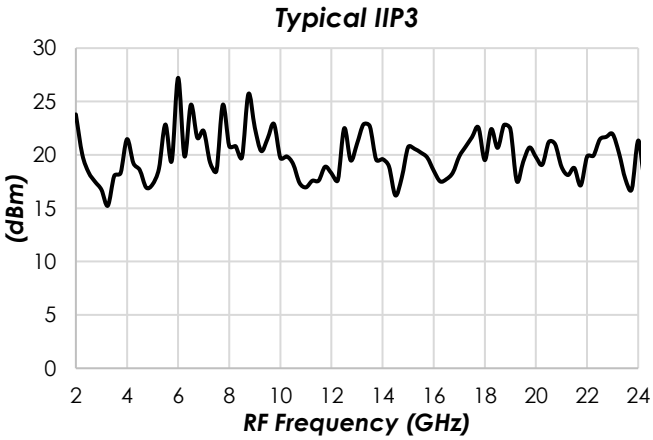


FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE





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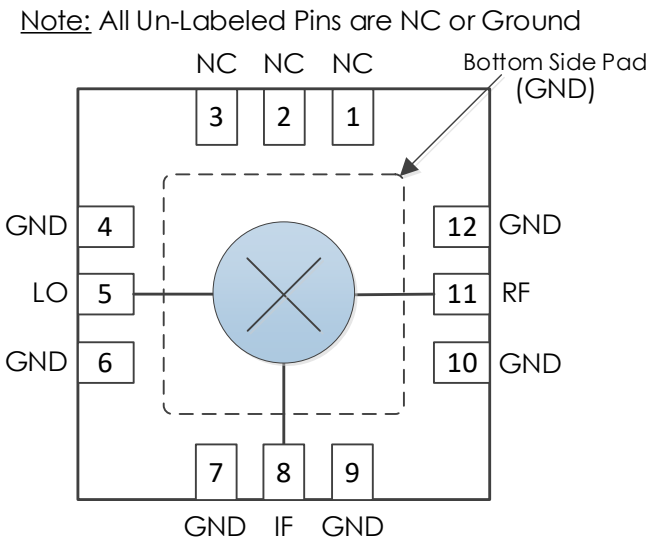
REVISION HISTORY

Date	Revision	Notes
8/6/2025	1	Initial Release
2/12/2026	1.1	Minor formatting

PIN LAYOUT AND DEFINITIONS



Pin	Name	Function
1-3	NC	Not Connected
4	GND	Ground - Common
5	LO	LO Input – 50 Ohms - DC Coupled to GND
6-7	GND	Ground - Common
8	IF	IF Output / Input – 50 Ohms - DC coupled to diodes.
9-10	GND	Ground - Common
11	RF	RF Input / Output – 50 Ohms - DC Coupled to GND
12	GND	Ground - Common

Note: DC blocking caps on pins 5, 8, 11 required if external DC voltage is present.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
RF Input Power		+24 dBm
LO Input Power		+24 dBm
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
Moisture Sensitivity Level	MSL 3	

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

Recommended Operating Conditions

	Minimum	Typical	Maximum
LO Input Power	+14 dBm		+20 dBm
Operating Case Temperature	-40 °C		+85 °C

RF Performance

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
RF Frequency Range		2 GHz		24 GHz
LO Frequency Range		2 GHz		24 GHz
IF Frequency Range		DC		3 GHz
Conversion Loss (LO = 16 dBm)	IF = 100 MHz		9 dB	12 dB
Input IP3 (LO = 16 dBm)	IF = 100 MHz, 10 MHz Tone Spacing	13 dBm	18 dBm	
LO to RF Isolation	IF 50 Ohm terminated		38 dB	
LO to IF Isolation	RF 50 Ohm terminated		25 dB	
RF to IF Isolation	LO 50 Ohm terminated		27 dB	
Input P1dB	IF = 100 MHz		+10 dBm	

Typical MxN Spur Suppression

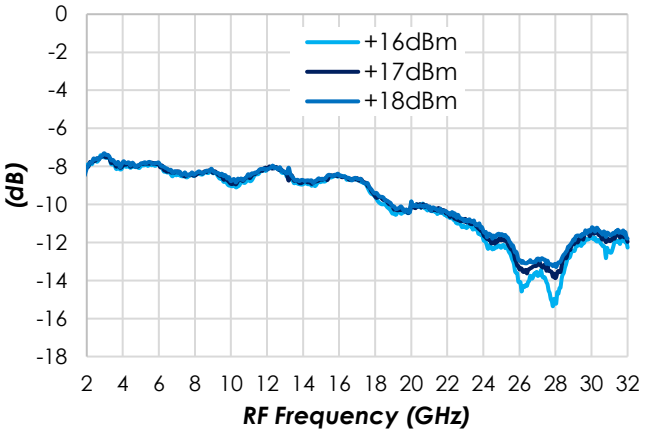
(IF=100 MHz, -10 dBm RF input, T = 25 °C)

RF	LO	LO = +14 dBm	LO = +16 dBm	LO = +20 dBm
1	1	-18 dBm	-18 dBm	-18 dBm
1	2	-24 dBc	-25 dBc	-26 dBc
2	1	-38 dBc	-42 dBc	-47 dBc
2	2	-62 dBc	-63 dBc	-65 dBc
2	3	-39 dBc	-42 dBc	-47 dBc
3	2	-59 dBc	-64 dBc	-71 dBc
3	3	-60 dBc	-65 dBc	-72 dBc
1	3	-18 dBc	-16 dBc	-14 dBc

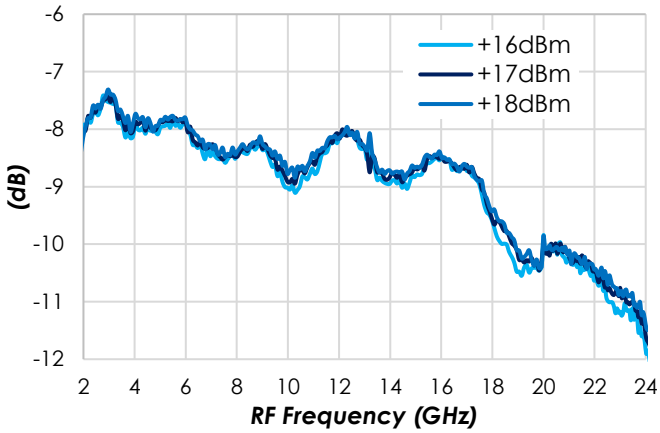
TYPICAL PERFORMANCE

(T = 25 °C, IF= 100 MHz, RF= 6 GHz Unless Otherwise Specified)

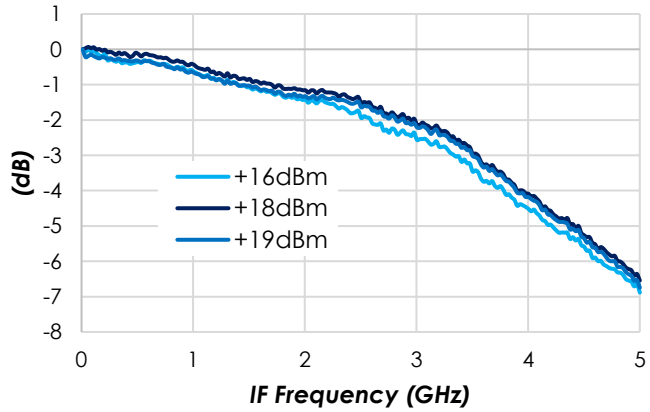
RF to IF Conversion Loss



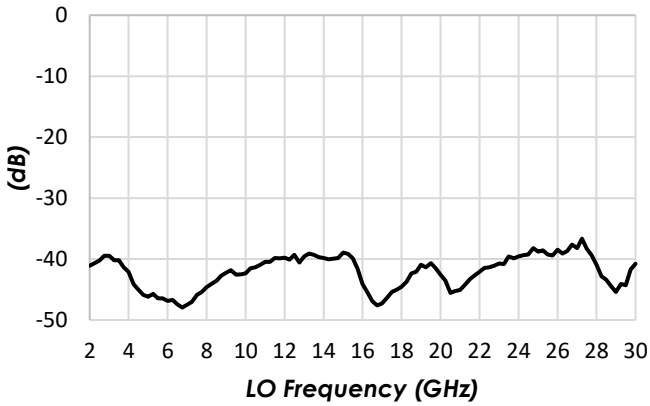
RF to IF Conversion Loss



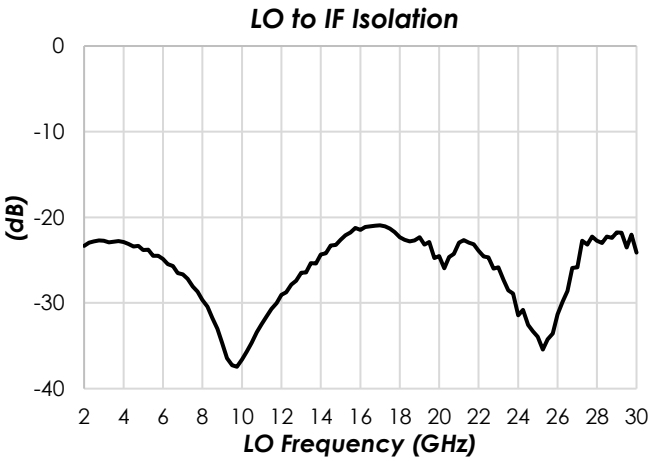
Relative IF Response



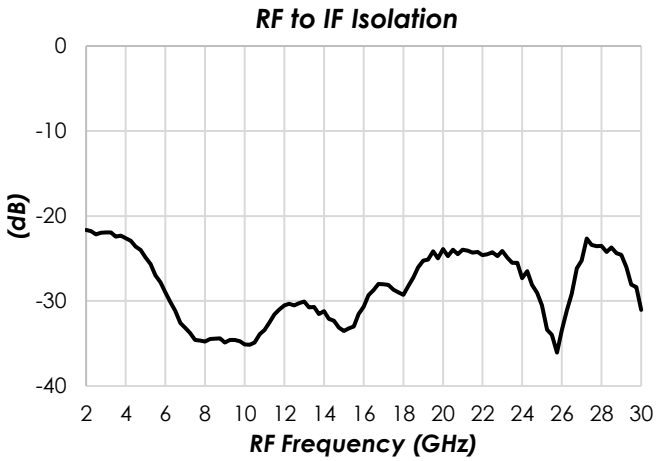
LO to RF Isolation



LO to IF Isolation

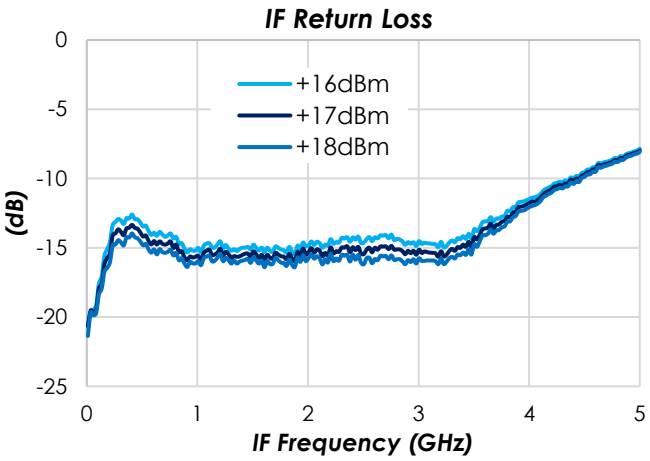


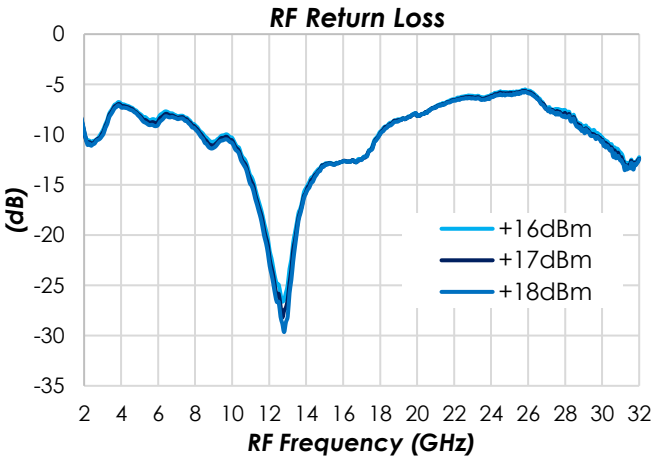
RF to IF Isolation

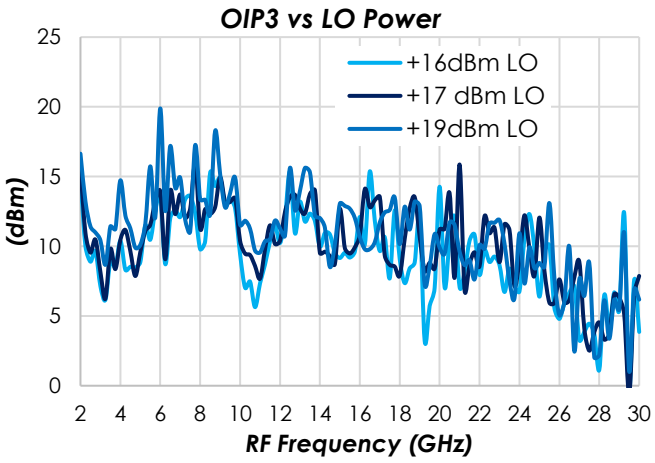


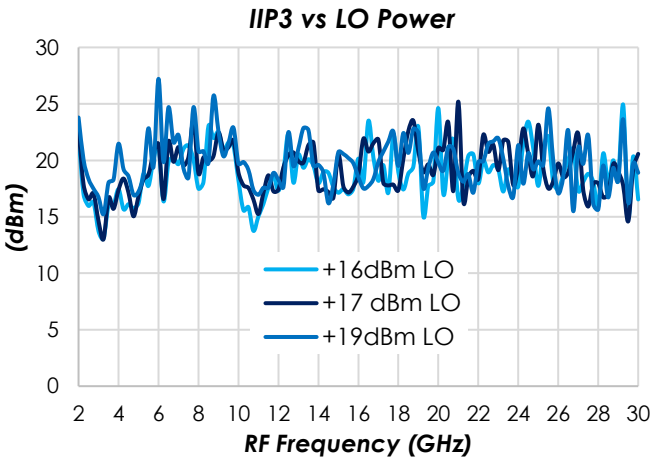
TYPICAL PERFORMANCE (CONTINUED)

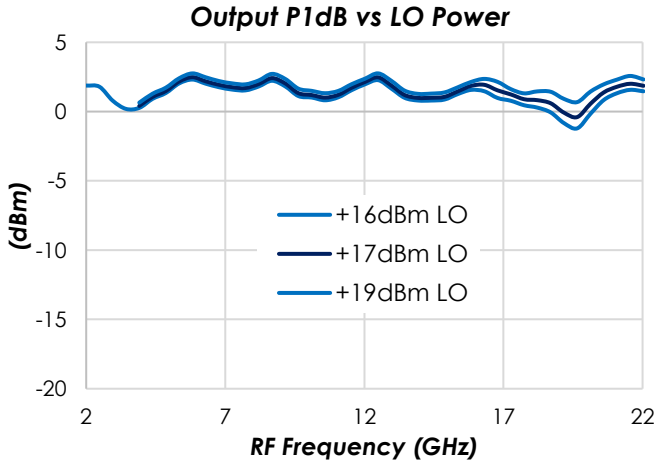
(T = 25 °C, IF= 100 MHz, RF= 6 GHz Unless Otherwise Specified)

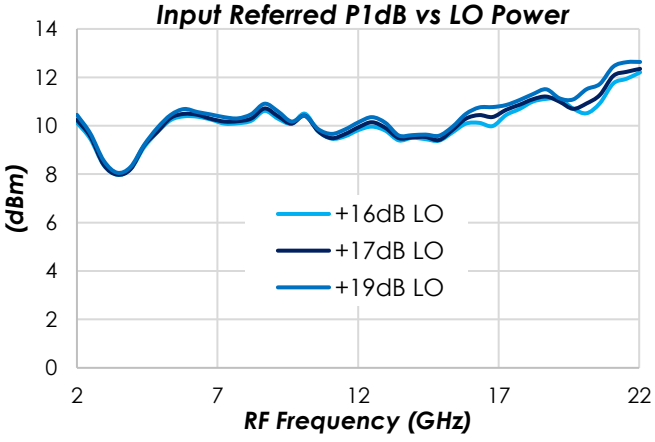








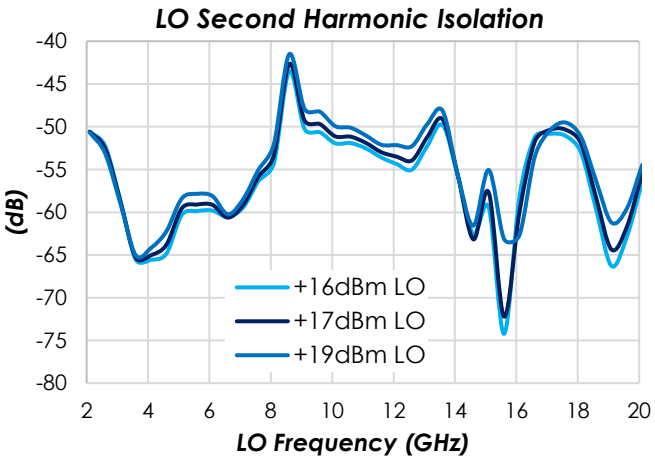


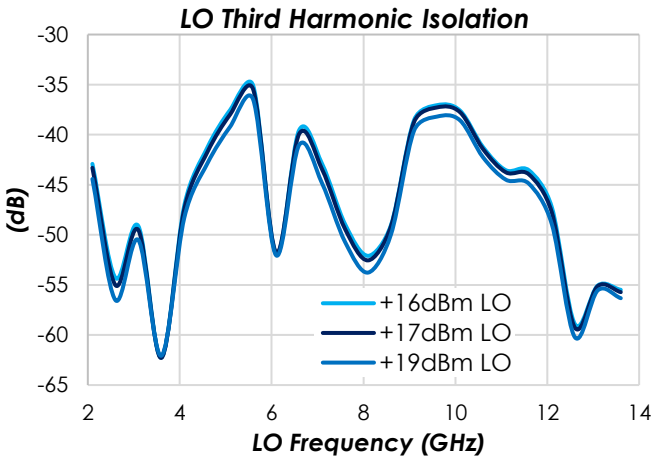


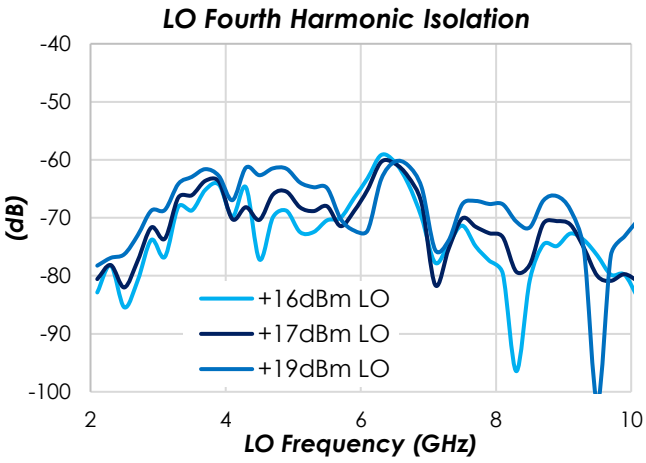
NOTE: IP3 is measured with two input tones spaced 10 MHz apart at IF=100 MHz.

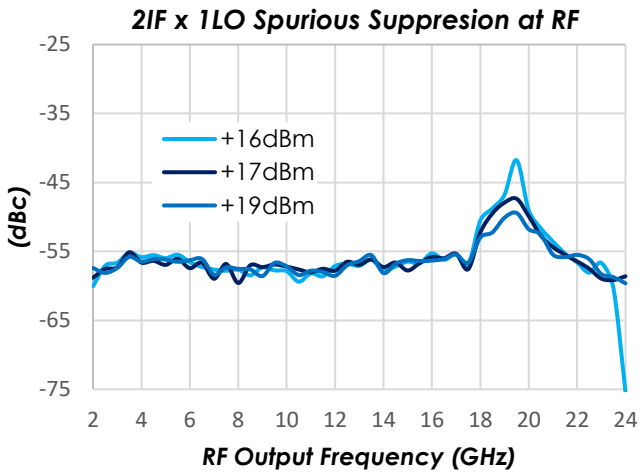
TYPICAL PERFORMANCE (CONTINUED)

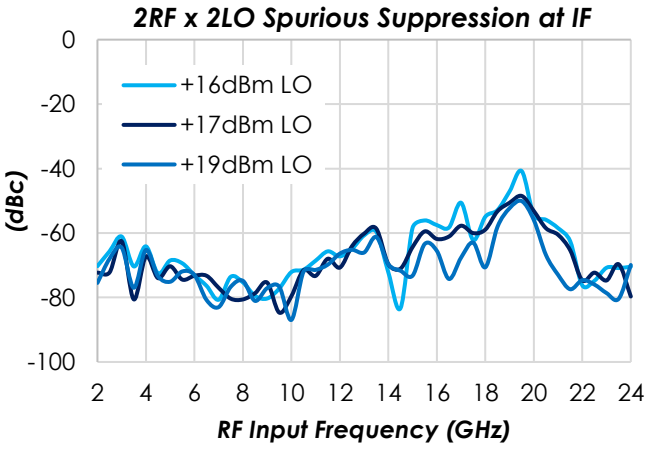
(T = 25 °C, IF= 100 MHz, RF= 6 GHz Unless Otherwise Specified)





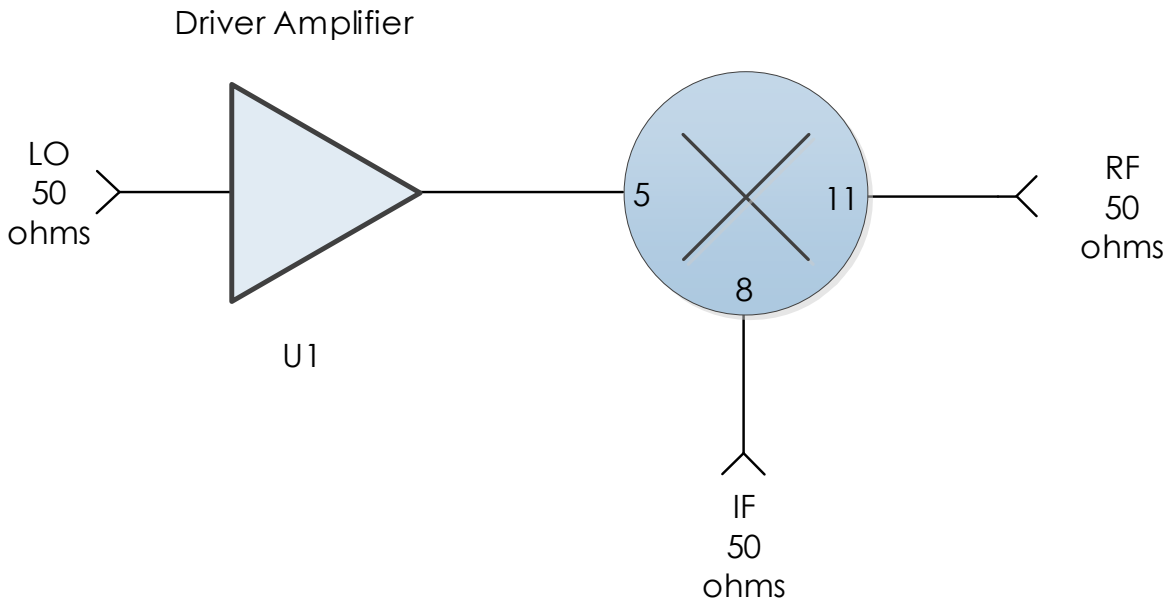






NOTE: Suppression is measured relative to the fundamental IF/RF. Isolation is measured relative to the fundamental LO.

TYPICAL APPLICATION



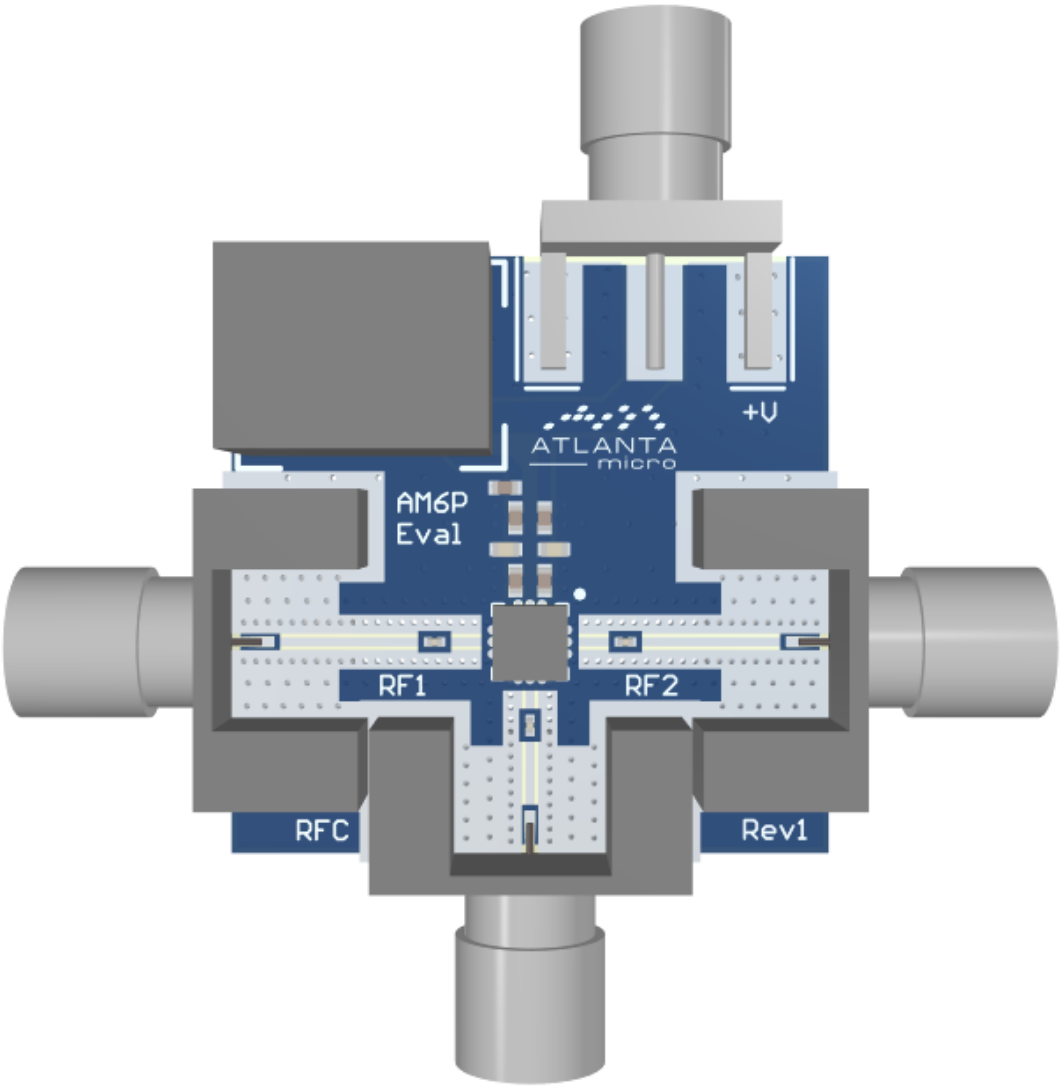
RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

Part	Value	Part Number	Manufacturer
U1	Amp	AM1136	Mercury Systems
U1	Amp	AM1160	Mercury Systems

Note:

1. Pin 5, 8, 11 must have an external DC blocking capacitor if an external voltage is present.

EVALUATION PC BOARD



Note: Board may not have all components in drawing installed.

RELATED PARTS

Part Number				Description
AM5007	6 GHz	to	26 GHz	Double Balanced Mixer
AM1136	1.4 GHz	to	18 GHz	High P1dB Wideband Amplifier
AM1160	1.2 GHz	to	18 GHz	Low Noise Gain Block Amplifier

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 (CrVl)	<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-ethylheyl) 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: Mercury Systems, 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: Mercury does not knowingly use materials that are sourced from the Democratic Republic of Congo (DRC) or any other known conflict regions. Mercury'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.

Mercury 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.

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