

The background of the slide is a blue-tinted photograph of a young child from behind, pointing their right arm towards the sky. In the upper right corner, several fighter jets are visible, leaving white smoke trails. The image is overlaid with a white geometric grid pattern consisting of several intersecting lines.

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PEACHTREE BUSINESS LINE OVERVIEW

Legacy: Defense / Software Defined Radio RF Engineering Roots

■ Locations:

Peachtree Corners

- Business Line HQ
- MMIC Design team
- RF Module design team
- RF test
- Module final assembly and test

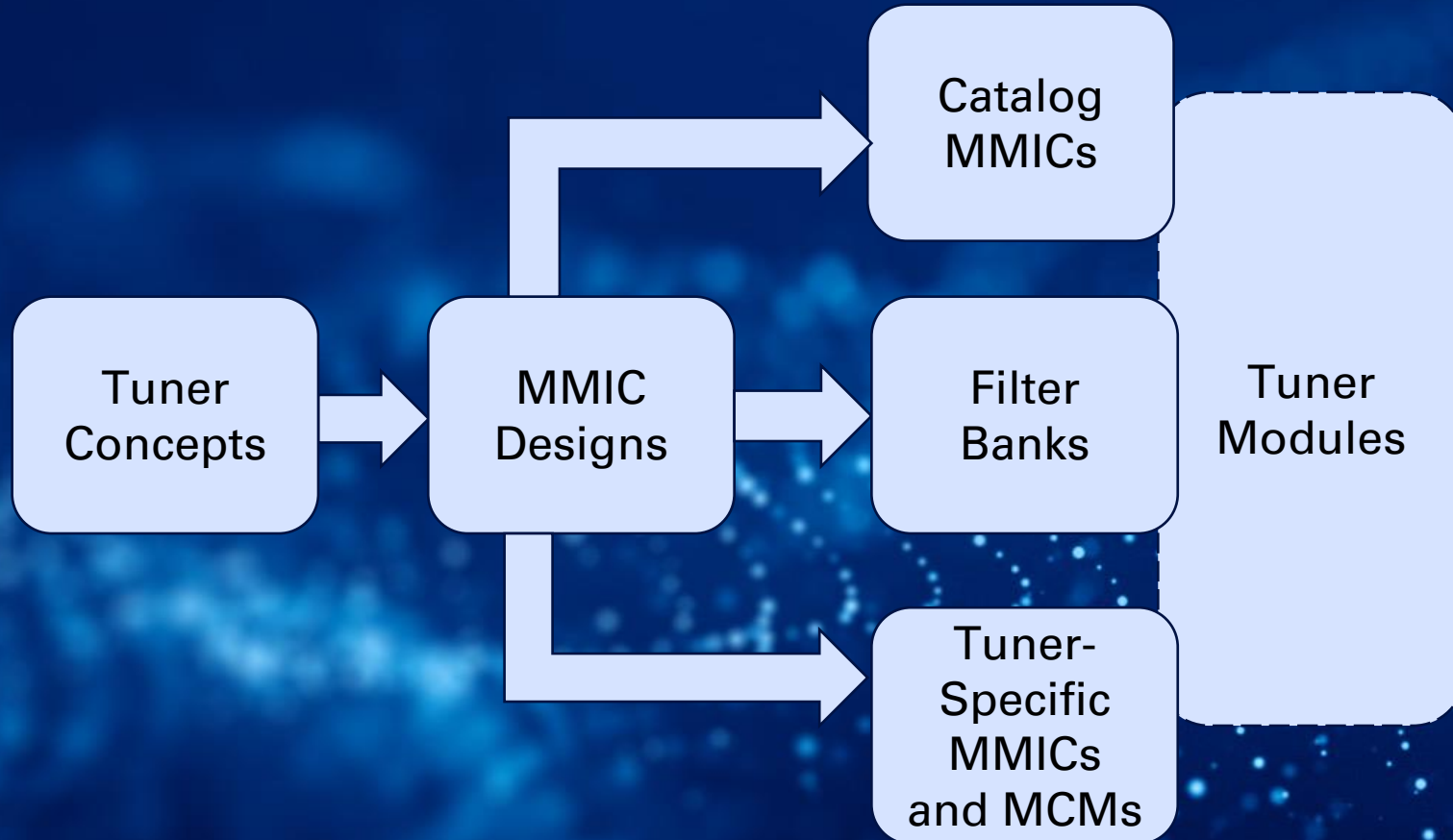


Marriottsville

- Module final assembly and test
- Digital design team
- RF Module Design team
- Systems Design team

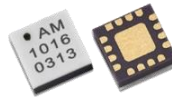


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Synergistic MMICs Enable Efficient Systems

Atlanta Micro designs MMICs; harmonizing component design to minimize space and power requirements.



Proprietary building blocks form packaged MCM's; achieving functionality and performance of large, discrete implementations.



Combining technologies, Atlanta Micro devices enable the creation of low SWaP modules, tuners and custom-designed solutions.



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AMPLIFIERS



Amplifier Technology

Broadband, high linearity gain blocks

ADC driver amplifiers

Slope correcting (Positive Gain Slope) amplifiers

Bypassable and cascadable options

Technology corners: < 40 GHz, < 30 dBm P1Db

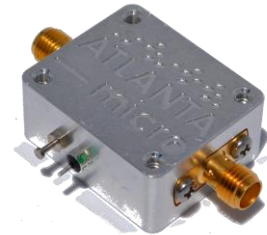
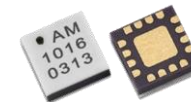
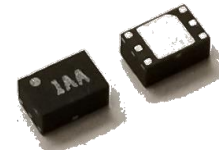
Chip scale packages: DFN and QFN

Die capability for select opportunities

Prototyping modules available

Most products in stock

Digi-Key partnership



Coming soon: Tunable gain/gain slope amplifiers

Amplifier Landing Page / Parametric Search

Amplifiers

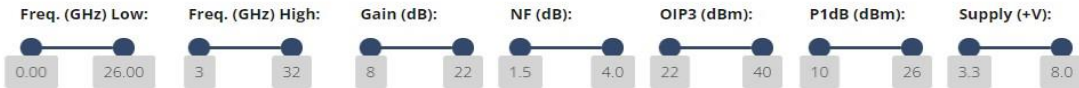
Jump to:

BYPASSABLE AMPLIFIERS

DRIVER AMPLIFIERS

LOW NOISE GAIN BLOCKS

GAIN EQUALIZING AMPLIFIERS



Package:

Package

Clear filters

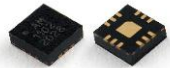
Part Number	Features	Freq. (GHz) Low	Freq. (GHz) High	Gain (dB)	NF (dB)	OIP3 (dBm)	P1dB (dBm)	Supply (+V)	Package	Module
Bypassable Amplifier										
AM1065	Positive Gain Slope	0.00	8	20	2.5	32	17	5.0	4mm	Yes
AM1065-2	Small Package	0.00	8	20	2.5	32	17	5.0	3mm	No
AM1067	Positive Gain Slope	5.00	20	20	3.5	27	14	3.3	4mm	No
AM1073	Bi-Directional	0.00	8	15	2.5	27	14	3.3	4mm	No
AM1077	Amplifier Off State	5.00	20	20	4.0	25	14	3.3	4mm	No
AM1081	High IP3, Positive Gain Slope	0.00	8	17	2.5	35	20	5.0	4mm	Yes
AM1081-2	High IP3, Small Package	0.00	8	17	2.5	35	20	5.0	3mm	No
AM1101	Broadband, AC Coupled, Low Power	2.00	26	8	3.5	22	10	3.3	3mm	No
Driver Amplifier										
AM1053	AC Coupled	5.00	20	20	2.5	25	16	3.3	3mm	Yes
AM1082	High P1dB, AC Coupled	5.00	17	22	3.0	31	20	5.0	3mm	Yes
AM1095	Broadband, AC Coupled	6.00	22	18	3.5	24	19	5.0	3mm	Yes
AM1111	Broadband, AC Coupled	2.00	18	16	2.5	32	21	5.0	3mm	No
AM1127	High P1dB, High IP2/IP3	0.02	6	19	3.5	39	23	6.0	4mm	No
Gain Equalizing Amplifier										
AM1110	Broadband, AC Coupled	2.00	18	14	4.0	27	17	3.3	3mm	Yes
Low Noise Gain Block										
AM1016A	Flat IP3, Low Power	0.02	6	15	2.5	30	18	3.3	3mm	Yes
AM1016B	Flat IP3, Low Power	0.02	6	14	2.3	33	17	3.3	3mm	Yes
AM1018A	High IP3	0.02	6	13	3.0	35	18	3.3	3mm	Yes

Amplifier Product Examples

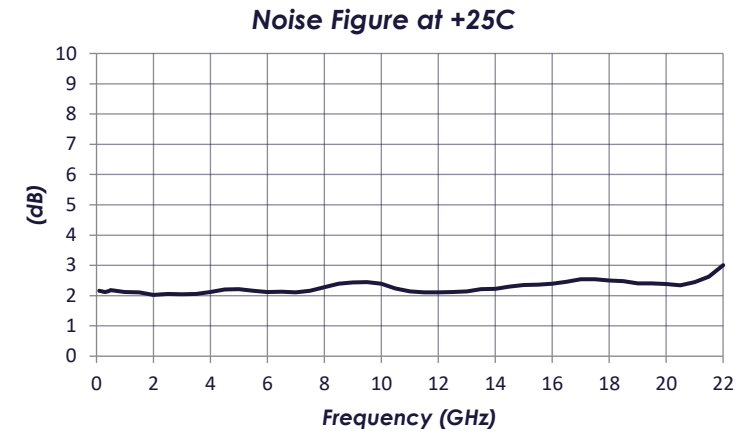
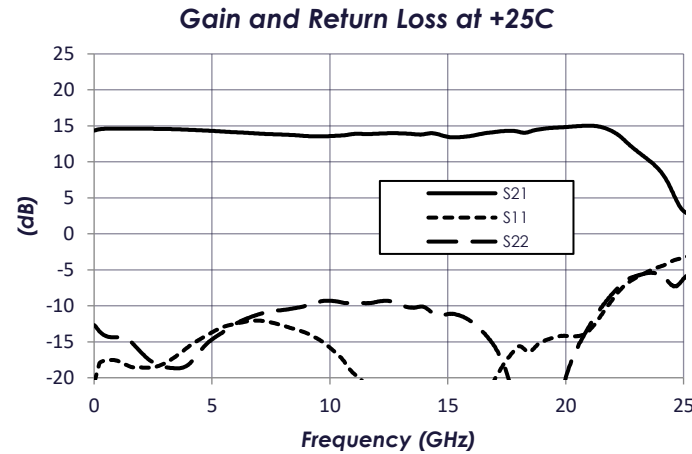
AM1102

Broadband gain block

DC to 22 GHz



3mm QFN

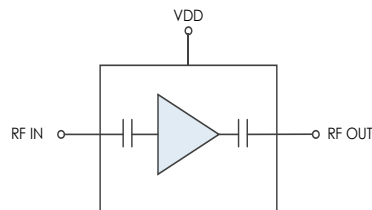


Note: Flat gain curve and low noise figure over a wide frequency band.

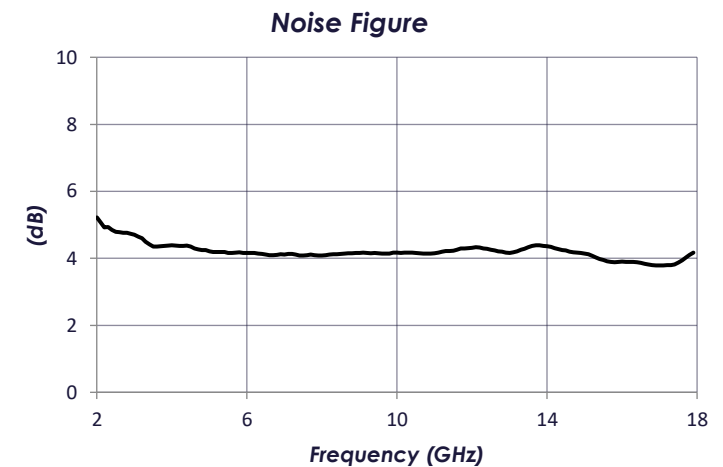
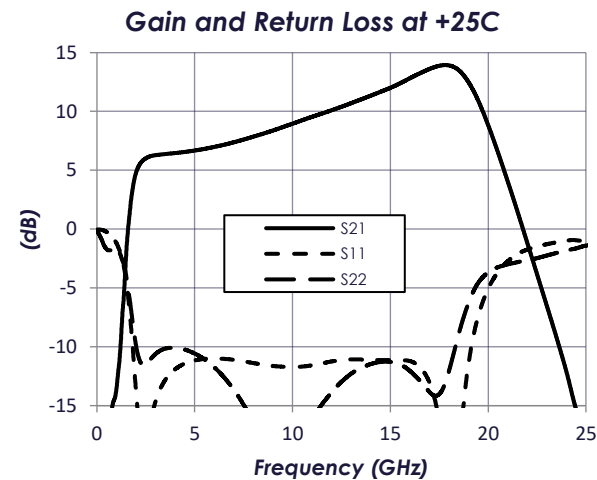
AM1110

Slope correcting

2 to 18 GHz



3mm QFN



Amplifier Product Examples

AM1129

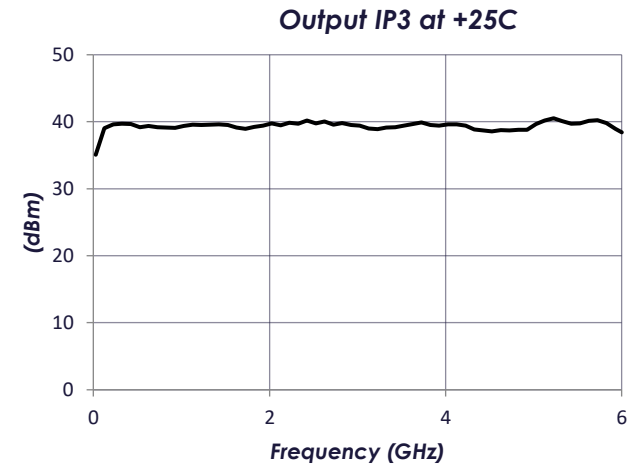
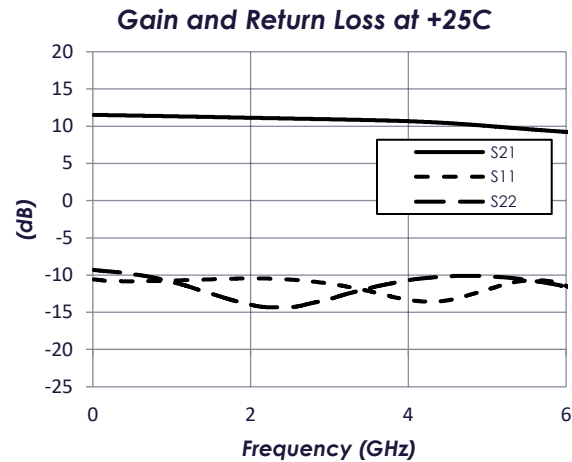
High Linearity Amp

.02 – 6.0 GHz

40 dBm OIP3

63 dBm OIP2

3mm QFN



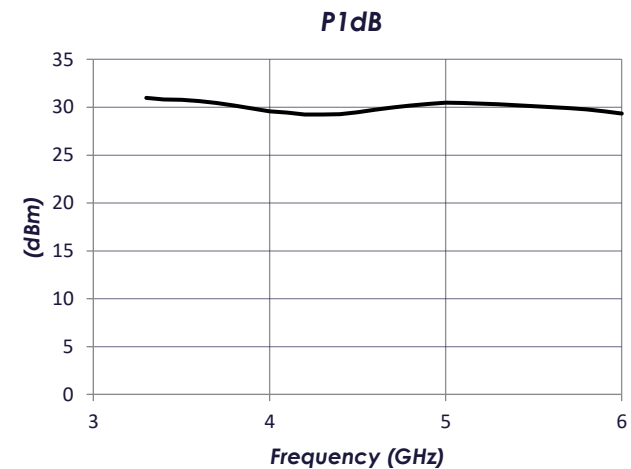
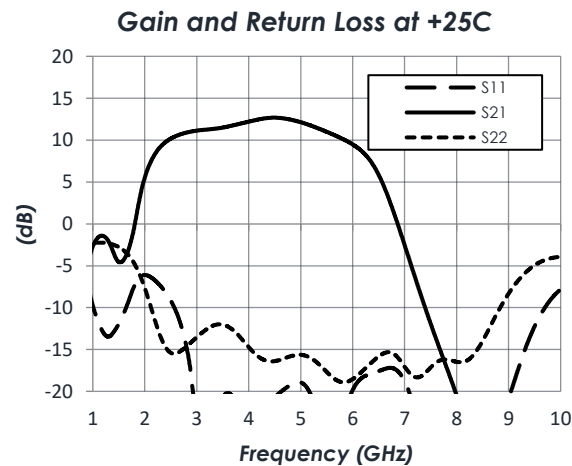
AM1153

High P1dB Amp

3.3 to 6.0 GHz

+30 dBm P1dB

5mm QFN



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Slope Correcting Amplifiers -- Fixed

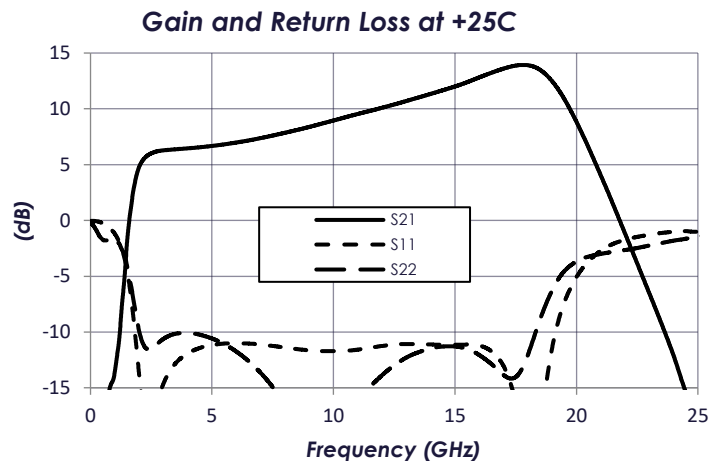
- Fixed, positive gain slope amplifiers with varying slope values
- Broadband capability
- Chip scale packages (3mm QFN)
- Internal decoupling caps

AM1110/AM1113/AM1114

AM1110

■ Features

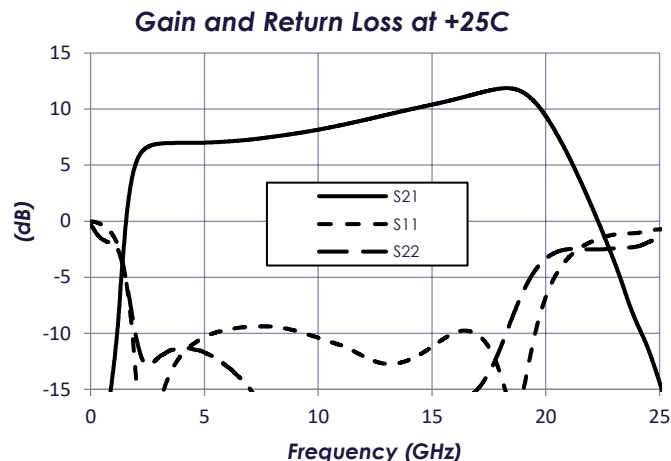
- 9 dB Gain Slope
- 5 dB Gain at 2 GHz
- 14 dB Gain at 18 GHz
- 4 dB Noise Figure
- +27 dBm OIP3
- +17 dBm P1dB
- +3.3V Operation
- 205 mW Power Consumption
- 3mm QFN
- -40C to +85C Operation



AM1113

■ Features

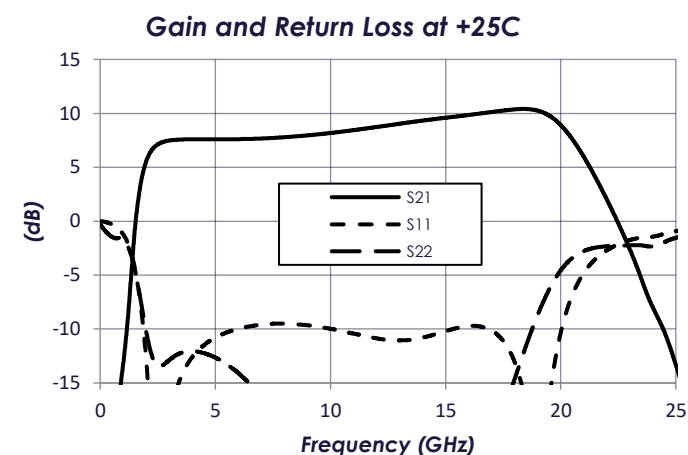
- 7 dB Gain Slope
- 5 dB Gain at 2 GHz
- 12 dB Gain at 18 GHz
- 4 dB Noise Figure
- +27 dBm OIP3
- +17 dBm P1dB
- +3.3V Operation
- 198 mW Power Consumption
- 3mm QFN
- -40C to +85C Operation



AM1114

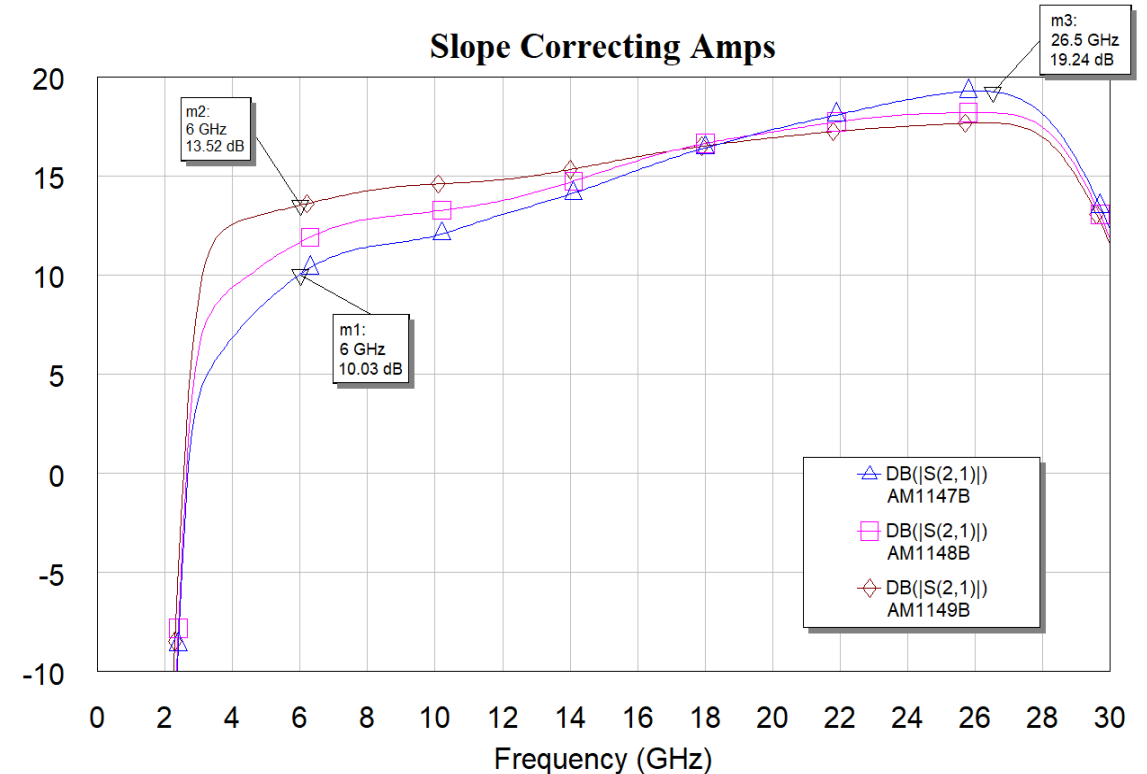
■ Features

- 5 dB Gain Slope
- 5 dB Gain at 2 GHz
- 10 dB Gain at 18 GHz
- 4 dB Noise Figure
- +27 dBm OIP3
- +17 dBm P1dB
- +3.3V Operation
- 198 mW Power Consumption
- 3mm QFN
- -40C to +85C Operation



Coming Soon:

- **AM1147/AM1148/AM1149:** 6 – 26 GHz slope correcting family
- **AM1145:** variable gain slope amplifier
 - ✓ Gain slope selectable with high/low digital control.
 - ✓ 2 – 18 GHz frequency range
- **AM1146:** Selectable gain amplifier family
 - ✓ Gain selectable with high/low digital control
 - ✓ Flat gain response
 - ✓ 2 – 18 GHz frequency range
- **AM1144:** 17 – 40 GHz LNA – On Website
- **AM1153:** 3.3 – 6 GHz Power Amp, +30dBm P1dB



Standard LNAs with modest positive gain slope (1-3dB)

■ AM1084	0 - 6 GHz	+2 dB	16 dB Gain	+21 dBm P1dB
■ AM1085	0 - 6 GHz	+2 dB	16 dB Gain	+20 dBm P1dB
■ AM1163	0 - 10 GHz	+2 dB	15 dB Gain	+18 dBm P1dB
■ AM1067	5 - 20 GHz	+3 dB	20 dB Gain	+14 dBm P1dB
■ AM1099	26 - 31 GHz	+1 dB	15 dB Gain	+14 dBm P1dB

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FILTER TECHNOLOGIES

Filter Technology Overview

Digitally tunable filters and filter banks

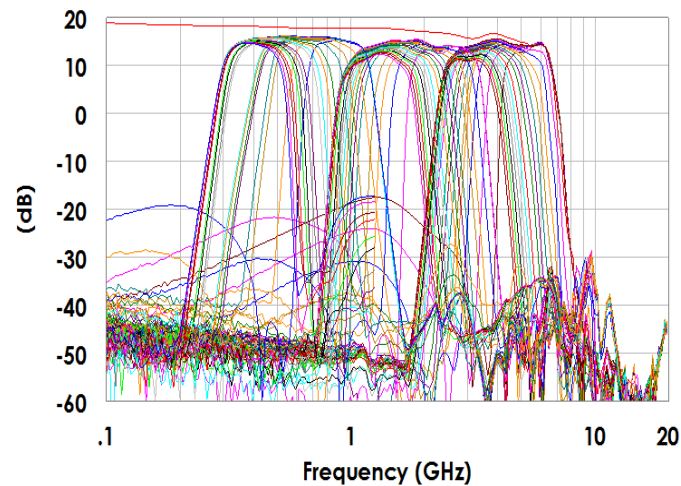
Miniature switched, fixed filter banks

Analog-tuned bandpass filters

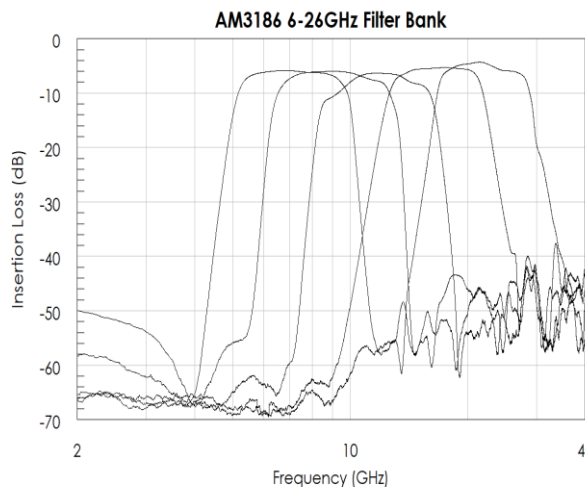
Analog-tuned notch filters

Passive, broadband filters in chip scale packages

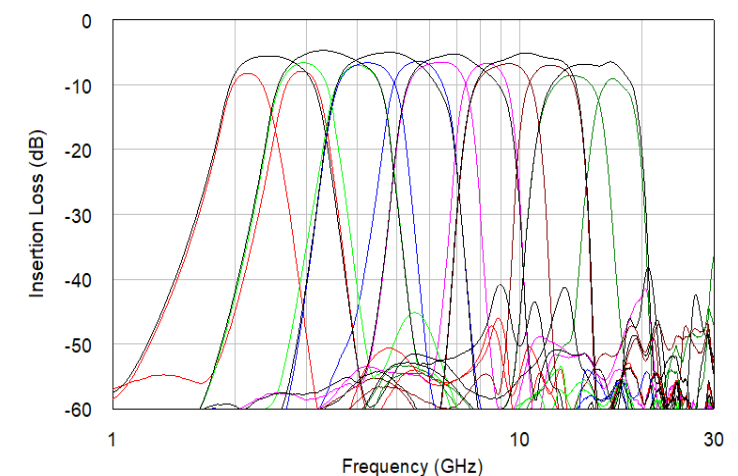
Digitally Tunable Filter Bank



Switched Filter Bank



Analog Tuned Filter Bank

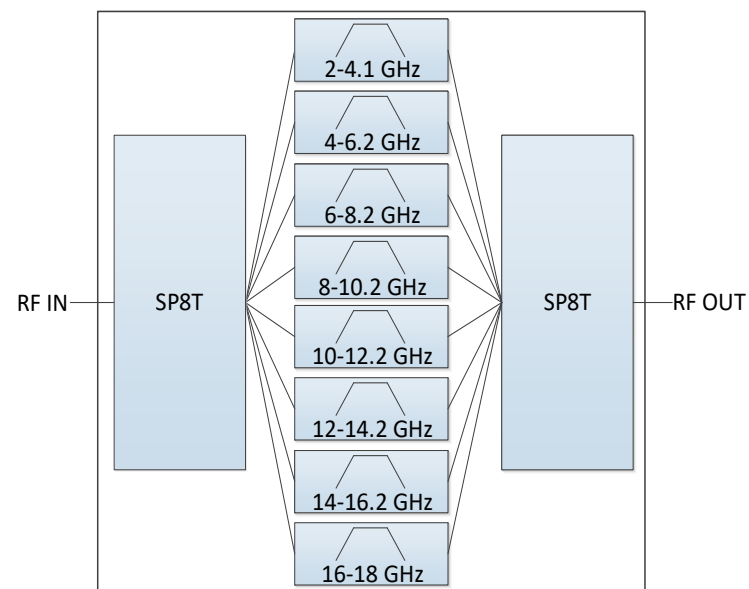
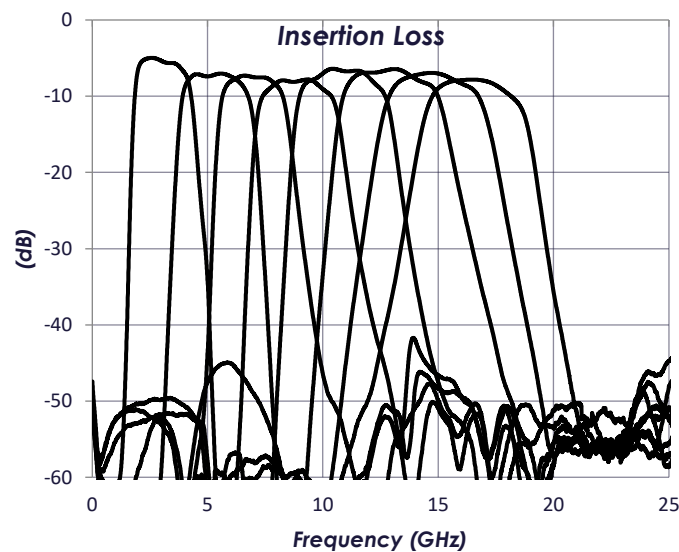


Filters – Switched Filter Bank

Switched Filter Bank Technology overview

- Out-of-band rejection -40dB or better
- Wideband rejection
- Chip scale packages
- Sub-Octave and Fixed Bandwidth options

AM3215 – 2 - 18 GHz, 2 GHz Constant Bandwidth Switched Filter Bank, 9mm QFN

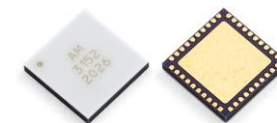
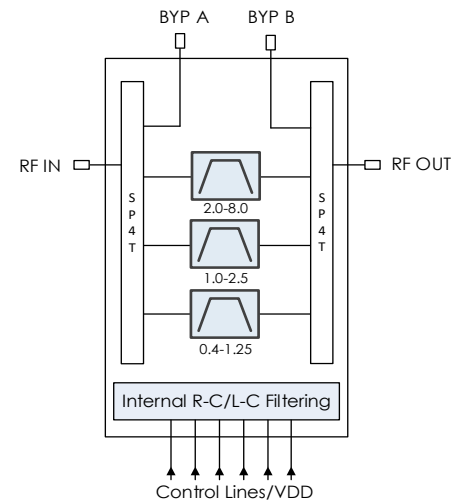
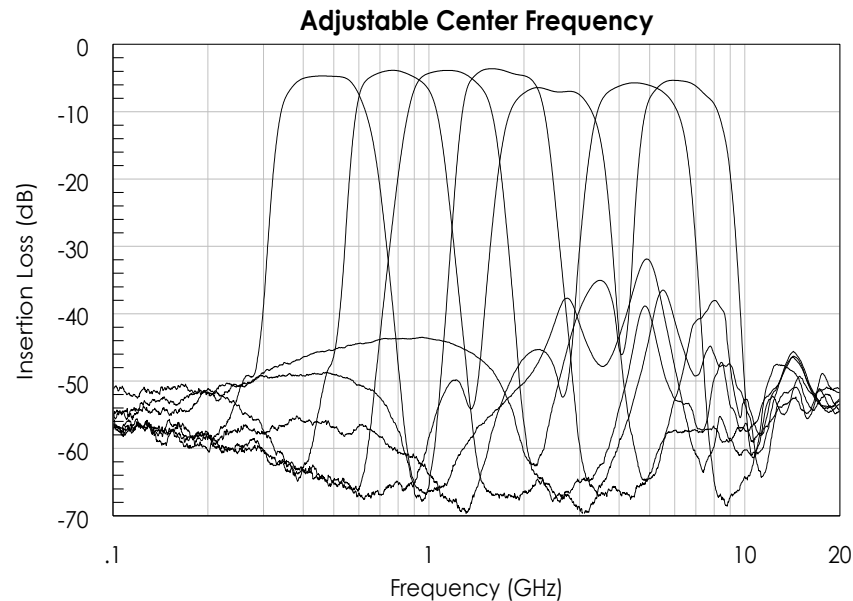


Filters – Digitally Tunable Filters

Digitally Tunable Filter Technology overview

- Digitally Selectable highpass and lowpass corners via lookup table
- Logic high/low control pins
- 30 MHz to 26.5 GHz frequency ranges
- Bandwidth selectable from full bank width to ~15% center frequency
- Typical +27dBm power handling capability

AM3152: 0.4 – 8 GHz Digitally Tunable Bandpass Filter Bank, 6mm QFN

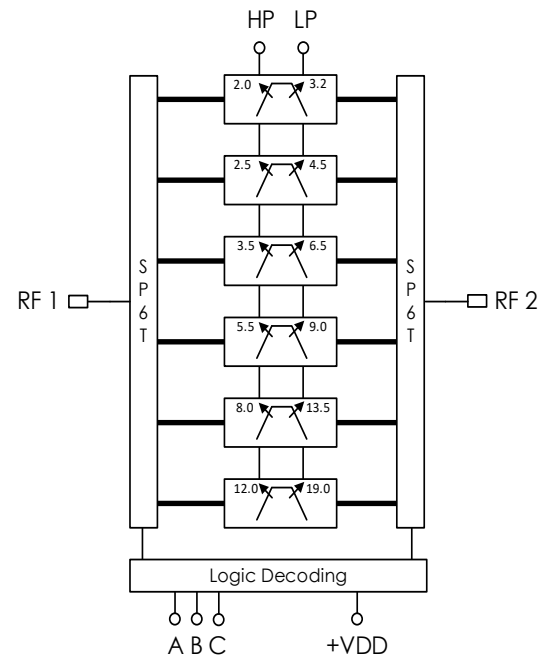
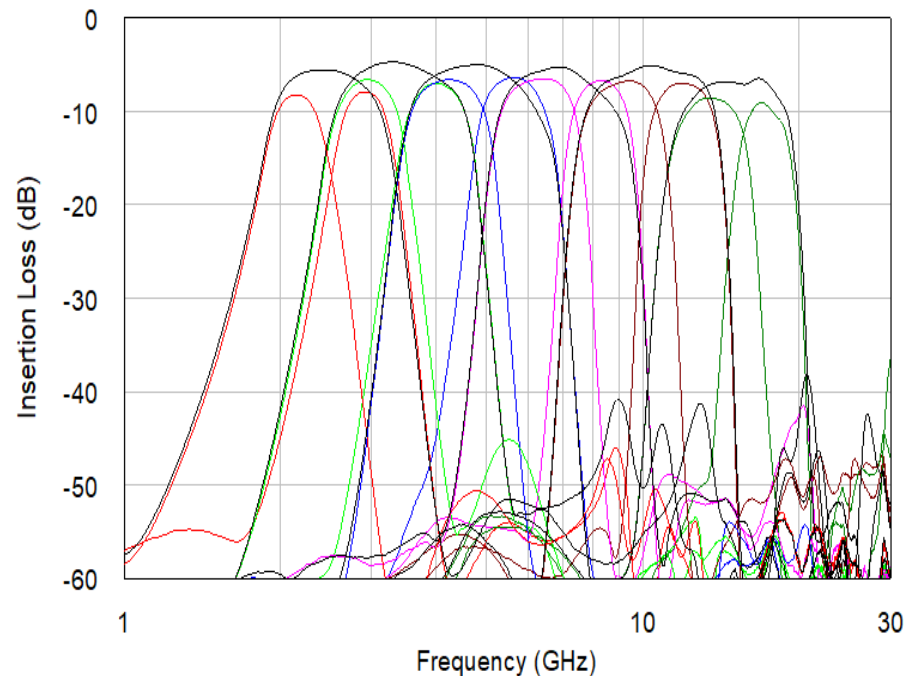


Filters – Analog Tuned Filters

Analog tuned filter technology highlights:

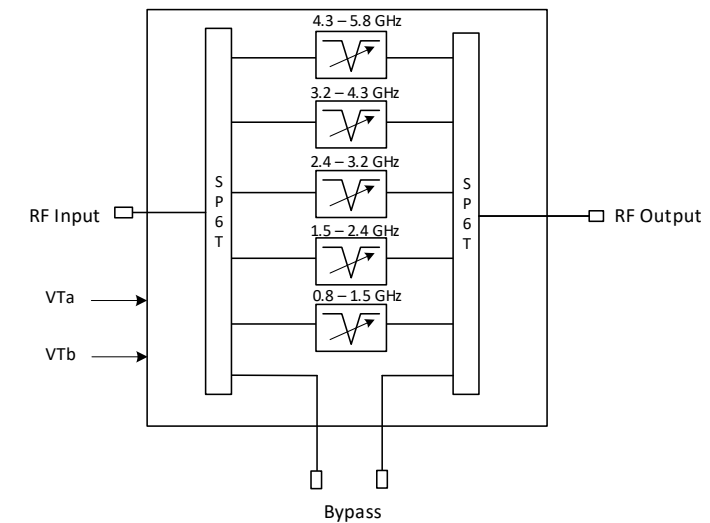
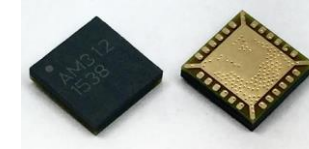
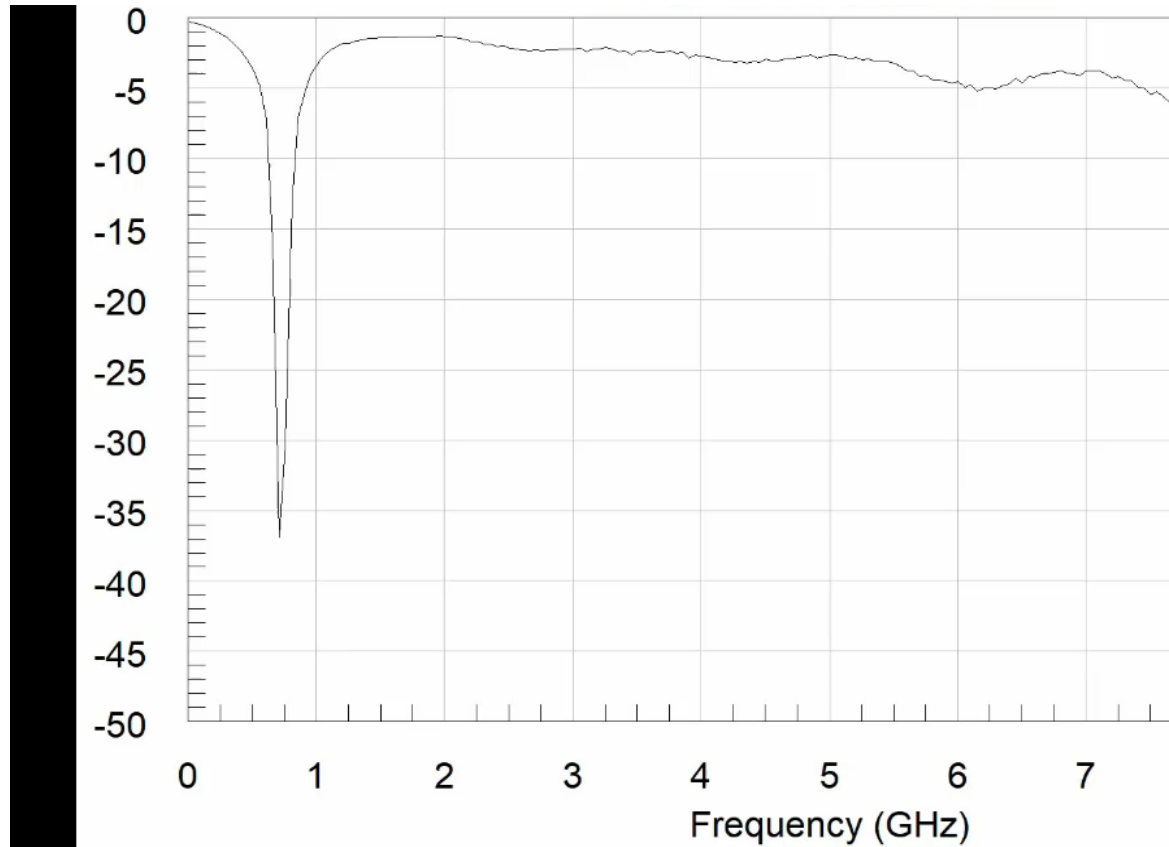
- Analog tuning of both highpass and lowpass corners allows precise settings
- Tunable bandwidth to a minimum of ~20% center frequency
- Maximum bandwidth varies by band setting
- Typical +27dB max RF input power handling

AM3089: 2 - 18 GHz Analog-Tunable Bandpass Filter Bank, 10mm QFN



Filters – Tunable Notch Filters

1 to 6 GHz Tunable Notch Filters



Coming soon: Tunable Notch family to 19 GHz

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Upcoming Filter Designs:

- **AM3155:** AM3150 + AM3151 including external components in 1" x 0.5" package. (Q3 '22)
- **AM3195:** 2 – 18 GHz Amplified Pre-selector. Combined amplifier and filter solution, unable <7 GHz, sub-octave bank >7 GHz for low system NF. (In pre-release)
- **Tunable Notch filters** to 19 GHz
- **AM3071:** USB controlled module containing AM3150+AM3151+AM3152

A young boy is seen from behind, pointing his right arm towards a bright blue sky filled with white clouds. In the upper right corner, several fighter jets are visible, leaving white smoke trails. The entire image is overlaid with a white geometric grid consisting of several intersecting lines that form various sized polygons. The overall color palette is dominated by shades of blue.

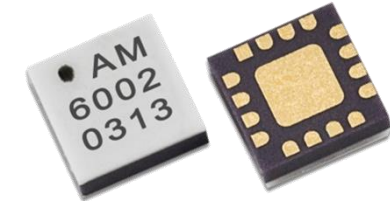
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SWITCHES, ATTENUATORS, SPLITTERS

Switches and Attenuators

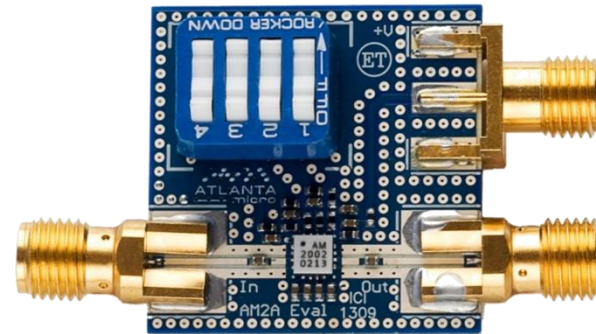
Key Features

- No negative voltages required
- On-chip logic/decoders
- 3mm and 4mm QFN packages



Switch Highlights:

- AM6011 – SP8T (DC-10 GHz)
- AM6015 - SP6T (DC-18 GHz)
- AM6017 - SP4T (DC-26.5 GHz)
- AM6031 – SPDT absorptive (DC - 20 GHz)
- AM6042 – SP4T Absorptive (DC – 20 GHz)



Attenuator:

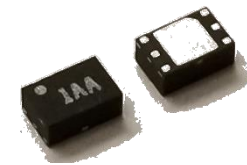
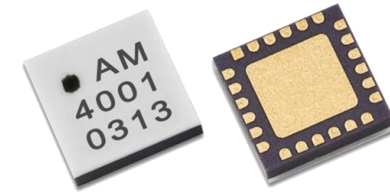
- AM2005 31 dB Step Attenuator (DC - 20 GHz)
- AM2010 31 dB Step Attenuator (DC – 30 GHz)



Splitters

Designed for small size, low loss, flat frequency response and broad frequency coverage

- AM4001: 2 - 18 GHz, 4mm QFN
- AM4008: 2 - 26.5 GHz, 1.3x2.0mm (16% area of 4mm QFN)
- AM4009: 6 – 24 GHz; 25dB isolation; 3mm QFN
- AM4026: DC – 30 GHz; 30dB isolation; 4mm QFN



✓ Chip-scale device packaging for space-constrained applications.

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TUNERS

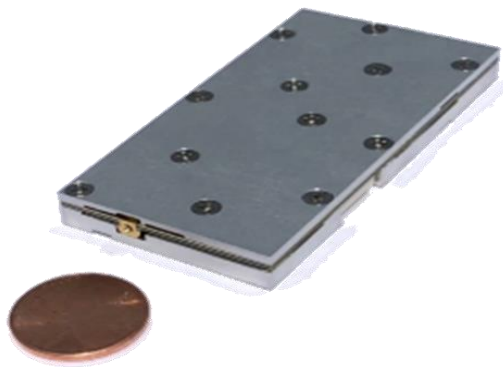


Mercury / Atlanta Micro Division – Miniature Tuner Products

■ Features:

- High-performance, low-SWaP tuners optimized for SIGINT, DF, and Spectrum Monitoring applications.
- Selection of frequency ranges, Bandwidths, and output IF's.
- SPI control with coherency features for multi-channel applications.
- Integrated LO's, controller, power/control line filtering.
- Standard product solutions to 26 GHz coming soon.

AM9018 dimensions: 35.6 x 76.2 x 6.8 mm



Standard Tuner/Converter Products include:

- AM9012 – 2 MHz to 6 GHz, 80-MHz Bandwidth, 3.0 W, Rx
- AM9017 – 100 MHz to 18 GHz, 500-MHz Bandwidth, 1 GHz IF 3.1 W, Rx
- AM9018*** – 900 MHz to 18 GHz, 1 GHz Bandwidth, 2 GHz IF, 6 W, Rx
- AM9030*** – 900 MHz to 18 GHz, 1 GHz Bandwidth, 2 GHz IF, Tx
- AM9035 -- 18 GHz to 40 GHz, 1 GHz IBW, Rx
- AM9036 -- 900 MHz to 18 GHz, 1 GHz IBW, 4 Channel Coherent Rx

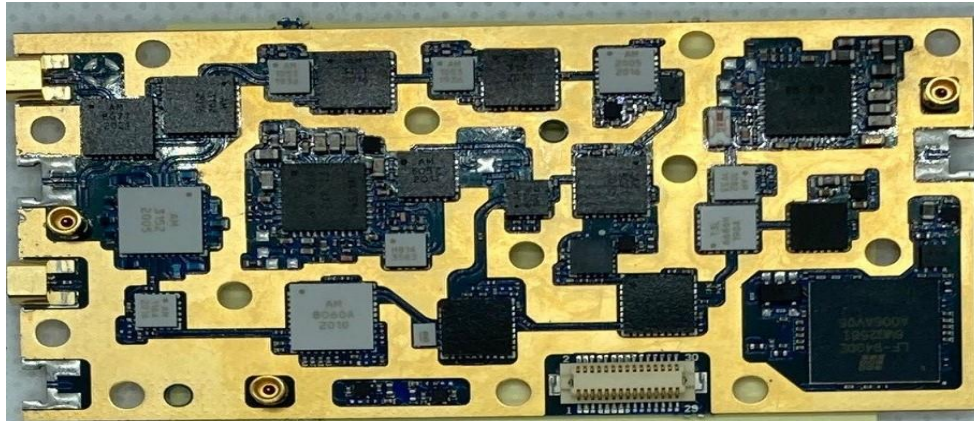
*** Footprint and software compatible to simplify Rx/Tx combinations**

AM9018 – Closer look

Features

- 0.4 GHz to 18 GHz Frequency Range
- 2 GHz IF Output Frequency
- 1 GHz Bandwidth
- Optional 500 MHz bandwidth with 1 GHz IF center
- Input Signal Limiter
- Calibration Input Port
- Sub-Octave Preselection
- 14 dB Noise Figure, +5 dBm IIP3
- +5.0V and +3.3V DC Operation
- 6.0 W Max Power Consumption
- -40C to +85C Operation
- 1.40" x 3.00" x 0.270" (35.6 x 76.2 x 6.8 mm)

• Footprint and software compatible with AM9030 Tx version.



RF Specification Details

Parameter	Notes	Minimum	Typical	Maximum
Frequency Range		0.4 GHz		18 GHz
Instantaneous Bandwidth			1.0 GHz	
IF Center Frequency			2.0 GHz	
Tune Frequency Range		0.4 GHz		17.5 GHz
Frequency Reference	External Reference Required		100 MHz, 0 dBm	
Input IP3			+5 dBm	
Noise Figure			14 dB	
Image Rejection		70 dB		
IF Rejection		70 dB		
LO Leakage			-80 dBm	
Gain			25 dB	
Gain Control / Attenuation Range ¹			60 dB (1 dB Steps)	
Tuning Speed			200 us	
Phase Noise	1 kHz Offset		-90 dBc/Hz	
	10 kHz Offset		-100 dBc/Hz	
	100 kHz Offset		-100 dBc/Hz	
	1 MHz Offset		-118 dBc/Hz	
	10 MHz Offset		-132 dBc/Hz	

Maximum Ratings

	Minimum	Maximum
RF Input Power		+20 dBm
Operating Temperature	-40 C	+85 C
Storage Temperature Range	-55 C	+150 C

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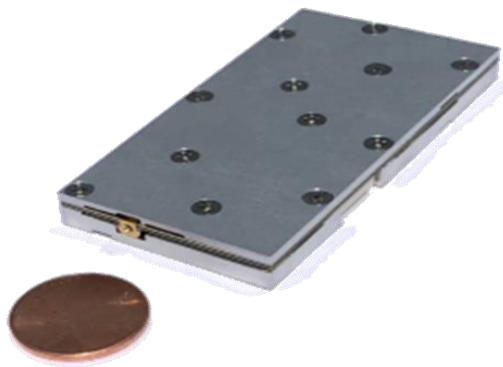
Current Tuner Products

■ Features:

- High-performance, low-SWaP tuners optimized for SIGINT, DF, and Spectrum Monitoring applications.
- Selection of frequency ranges, Bandwidths, and output IF's.
- SPI control with coherency features for multi-channel applications.
- Integrated LO's, controller, power/control line filtering.
- Standard product solutions to 26 GHz coming soon.

Standard Tuner Products include:

AM9018 dimensions: 35.6 x 76.2 x 6.8 mm



AM9012 – 2 MHz to 6 GHz, 80-MHz Bandwidth, 3.0 W, Rx

AM9017 – 100 MHz to 18 GHz, 500-MHz Bandwidth, 1 GHz IF 3.1 W, Rx

AM9018* – 900 MHz to 18 GHz, 1 GHz Bandwidth, 2 GHz IF, 6 W, Rx

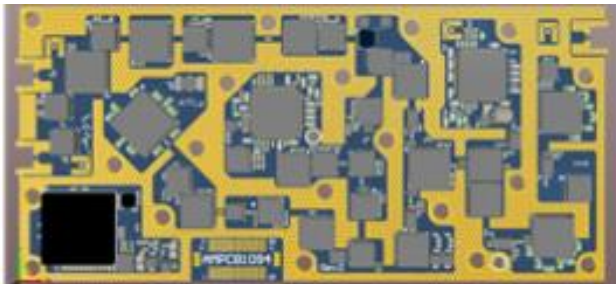
AM9030* – 900 MHz to 18 GHz , 1 GHz Bandwidth, 2 GHz IF, Tx

*** Footprint and software compatible to simplify Rx/Tx combinations**

Next Generation Tuner Solutions

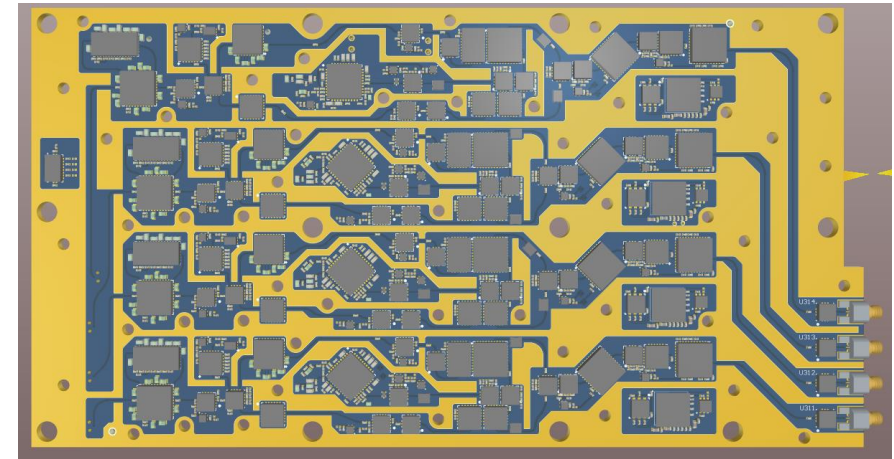
■ AM9018/AM9030 Next Generation

- 0.4 to 26.5 GHz Frequency range
- Same footprint and similar software control
- Similar power and performance
- Q3 2022 Release for AM9032 (Rx)
- Late 2022 release for Tx version



■ Multi-channel designs:

- Four channel VPX daughter-card formfactor
- 20 Mhz to 18 GHz operation
- 1 or 3 GHz IF
- 22 Watts power consumption
- 50 dB Channel Isolation

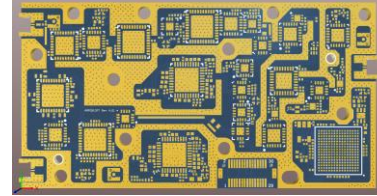


18 GHz+ Tuner solutions / capabilities

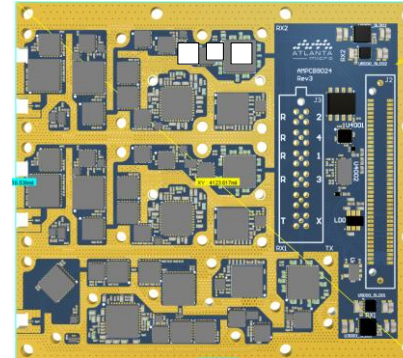
	Min Freq (GHz)	Max Freq (GHz)	IBW (GHz)	IF Center (GHz)	Gain (dB)	NF (dB)	IIP3 (dBm)	DC Power (W)	Size Per channel	Architecture	Notes
AM9017 (1 Ch Rx)	0.1	18	0.5	1.0	8	15	+3	4	2.7" x 1.4"	Dual mix	Full Production
AM9018 (1 Ch Rx)	0.4	18	1.0	2.0	24	14	+3	5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual mix	Production
AM9030 (1 Ch Tx)	0.4	18	0.5/1.0	1.0/2.0	6			5.5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual Mix	Production
AM9032 (1 Ch Rx)	0.4	26.5	1.0	2.0	24	16	+3	5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual mix	In Design (APR 23 release)
AM9020 (1 Ch)	2	18	2.0	4.0	30	12	+2	4.5	3.0" x 1.0"	Dual mix	In Design (JUN 23 release)
AM9035 (4 Ch Rx, 1 Tx)	18	40	1.0	4.0	TBD	TBD	TBD	TBD	TBD		TBD
AM9033 (4 Ch Rx)	0.1	18	0.5 / 1.0	1.0 / 2.45	25	12	+3	4	4.4" x .78"	Single mix	In Design 5.7" x 3.1" total
AM9026 (1 Ch Rx)	0.1	18	0.2	0.25	16	10	+5	8	3.0" x 1.6"	Dual mix	Captive
AM9029 (Rx/Tx)											

Footprint comparisons

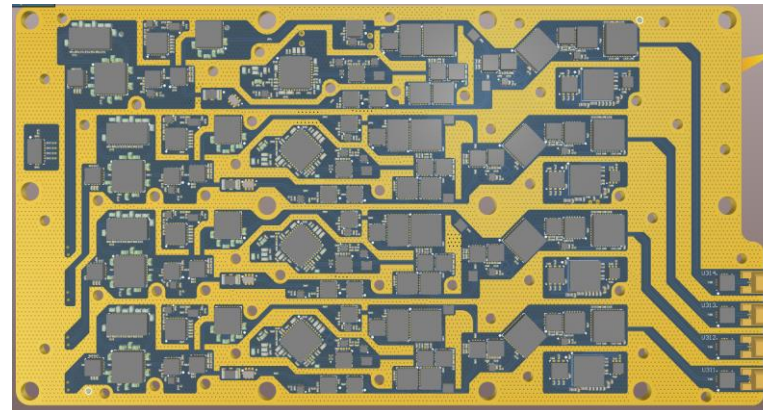
AM9017
(2.7" x 1.4")



AM9024
(3.1" x 2.7")



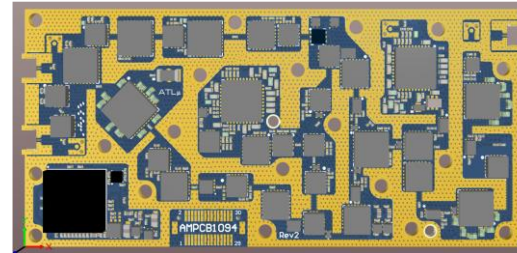
AM9033
(5.8" x 3.1")



Footprint comparisons

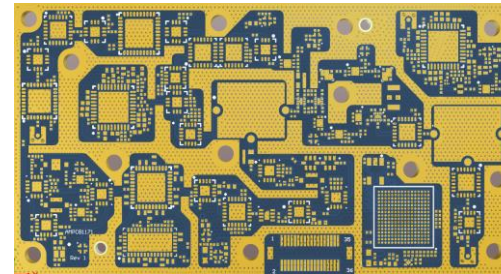
AM9018

(3.0" x 1.4")



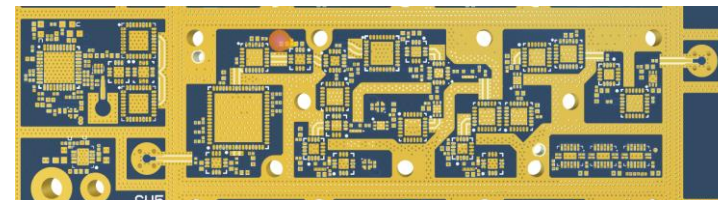
AM9026

(3.0" x 1.6")



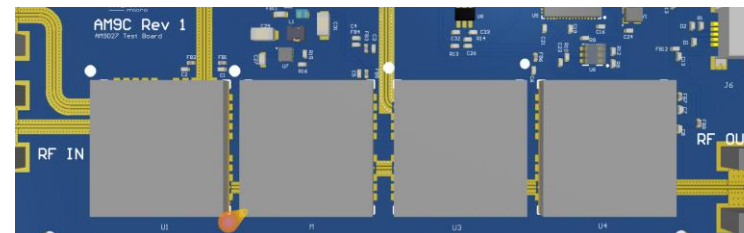
AM9028 (single chan, no LOs)

(3.0" x 1.0")



AM9027 (no LOs)

(3.5" x 0.81")



AM9029 – Modular Rx/Tx Channel solution

Description

AM9029 chipset is a high dynamic range miniature tuner module covering 1.0 GHz to 18 GHz.

Optional removal of the 1.0 GHz to 6 GHz path for minimum size.

Multiple channels support with post processing chips.

Very low SWaP with easy circuit board mounting for multi-channel receiver applications.

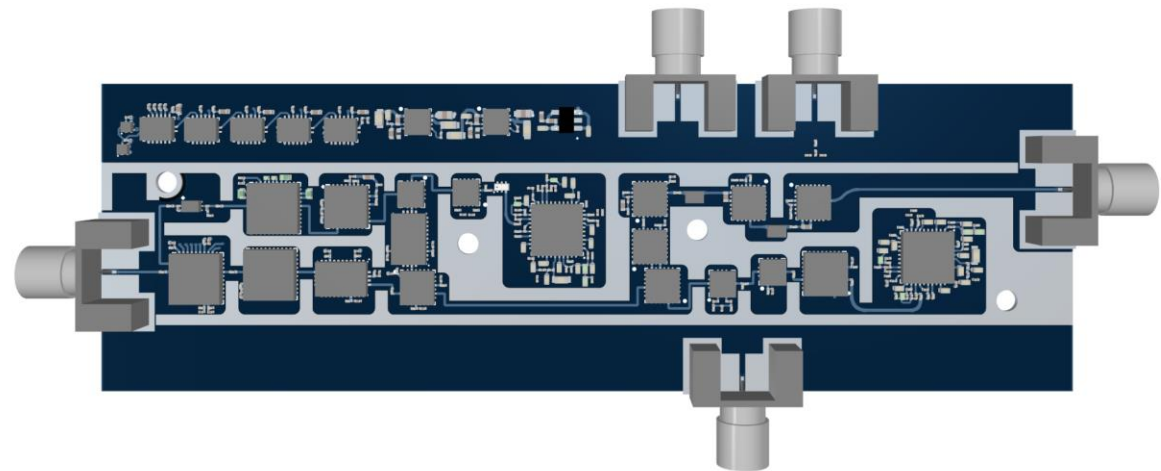
Sub-octave preselectors, pre-amplifiers, local oscillator (option), frequency converters, power and control line filtering, and integrated SPI control included.

Analog IF output frequency centered at 3.8 GHz with a 2.0 GHz bandwidth.

Tuner interface and control accomplished by providing RF input, DC voltages, frequency reference, SPI control, and ADC connection.

Features

- 1.0 GHz to 18 GHz Frequency Range
- 2 GHz Bandwidth
- 3.8 GHz IF Output Frequency
- Sub-Octave Preselection
- 14 dB Noise Figure, +2 dBm IIP3
- +5.0V, and +13V DC Operation
- 9.2 W Power Consumption (eval board)
- -40C to +85C Operation
- PCB 4.2" x 1.3" (106.7 x 33.0 mm)



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CUSTOM PRODUCTS



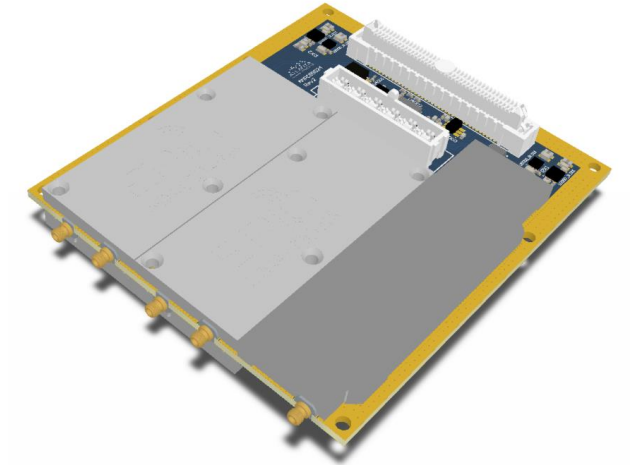
Mercury / Atlanta Micro Division – Custom Subsystems

Need something a little different?

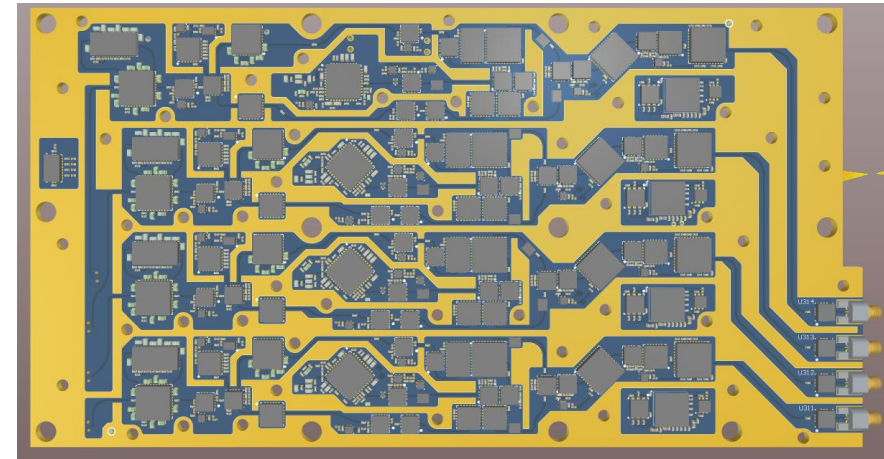
- Tuner designs can be modified for *custom IF output*, low frequency bypass, and higher frequency direct digitization.
- Custom subsystems often include:
 - Multiple channels on a single board
 - Custom bandwidth designs up to 2 GHz
 - Custom mechanical integration with standard formfactors
 - Tx / Rx channel combinations
 - Very-low SWaP requirements
 - 26 GHz Broadband Capability, 40 GHz near-term roadmap



3"x 3" 2.5W Power Amp



3.1" x 2.7" 1Tx + 4Rx; 6 - 18 GHz
FMC formfactor

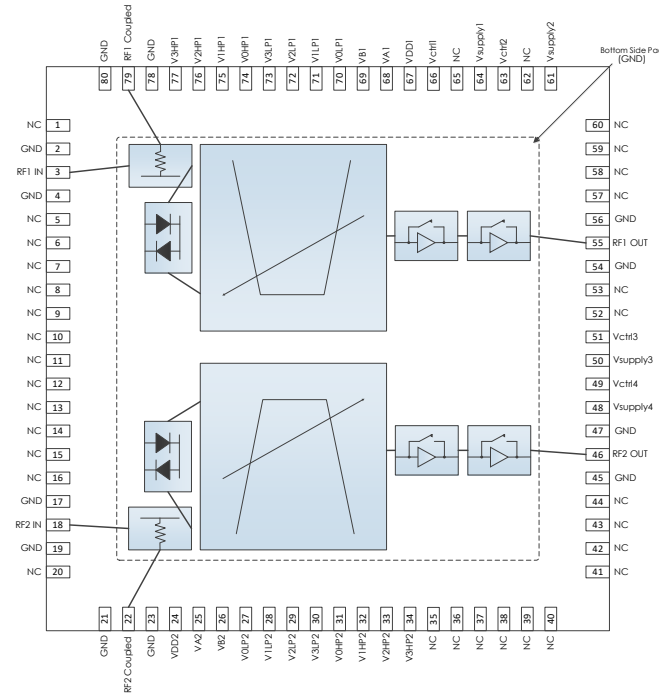
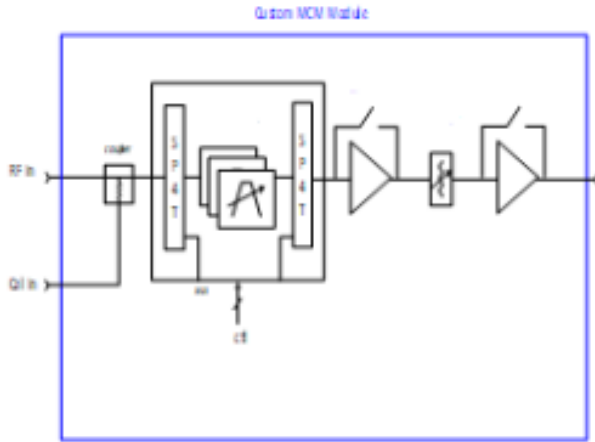


18 GHz, 4-channel daughter card solution

Custom MCM Packaging Technology

Custom MCMs shrink design footprints and board complexity

- Example: 2-18 GHz Rx Tunable filter chain with variable gain.
 - Discrete space approx: 20mm x 30mm
 - MCM: 12mm x 12 mm



Part Number Decoder

- AM1xxx = Amplifiers
- AM2xxx = Attenuators
- AM3xxx = Filters
- AM4xxx = Splitter/Couplers
- AM6xxx = Switches
- AM9xxx = Tuner
- Package suffixes
 - M = Module

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THANK YOU.

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ROADMAP PRODUCTS

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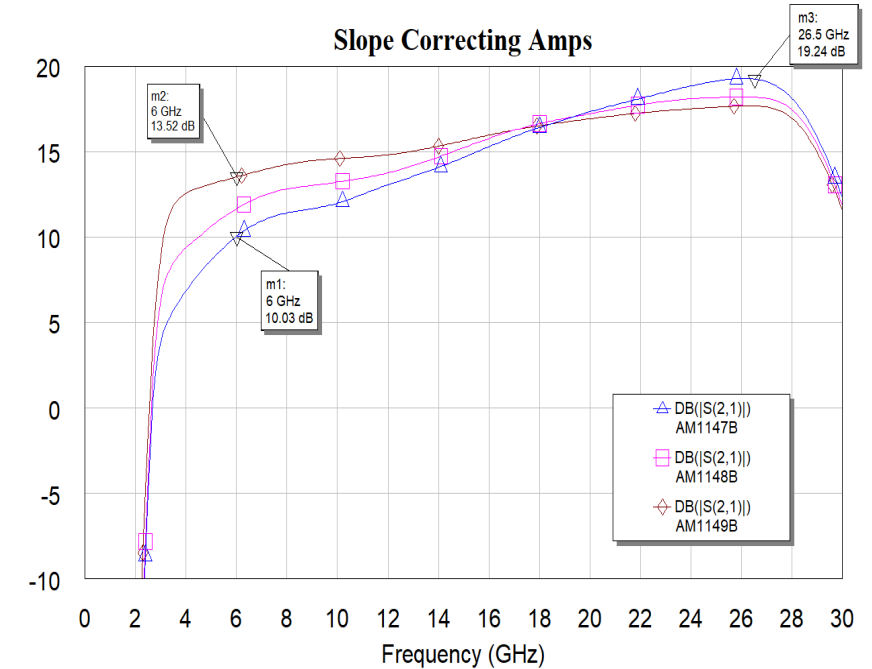
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Amplifiers Coming Soon

- **AM1147/AM1148/AM1149:** 6 – 26 GHz slope correcting family
- **AM1145:** variable gain slope amplifier
 - ✓ Gain slope selectable with high/low digital control.
 - ✓ 2 – 18 GHz frequency range
- **AM1146:** Selectable gain amplifier family
 - ✓ Gain selectable with high/low digital control
 - ✓ Flat gain response
 - ✓ 2 – 18 GHz frequency range
- **AM1144:** 17 – 40 GHz LNA – Released 4/20/22
- **AM1153:** 3.3 – 6 GHz, Power Amp, +30dBm P1dB



Filters Coming soon

- **AM3155:** AM3150 + AM3151 with external components in 1" square package. (Q3 '22)
- **AM3195:** 2 – 18 GHz Amplified pre-selector. Combined amplifier and filter solution optimized for low system NF. (Limited Availability Now)
- **AM3152** re-spin: 0.4 to 4.0 GHz digitally tunable.
- Tunable Notch Filters to 19 GHz
- **AM3071** – USB controlled module AM3150+AM3151+AM3152 (Just Released)

18 GHz+ Tuner solutions / capabilities

	Min Freq (GHz)	Max Freq (GHz)	IBW (GHz)	IF Center (GHz)	Gain (dB)	NF (dB)	IIP3 (dBm)	DC Power (W)	Size Per channel	Architecture	Notes
AM9017 (1 Ch Rx)	0.1	18	0.5	1.0	8	15	+3	4	2.7" x 1.4"	Dual mix	Full Production
AM9018 (1 Ch Rx)	0.4	18	1.0	2.0	24	14	+3	5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual mix	Production
AM9030 (1 Ch Tx)	0.4	18	0.5/1.0	1.0/2.0	6			5.5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual Mix	Production
AM9032 (1 Ch Rx)	0.4	26.5	1.0	2.0	24	16	+3	5	3.0" x 1.5" 35.6 x 76.2 x 6.8 mm	Dual mix	In Design (Q3 release)
AM9028 (8 Ch)	2	18	2.0	4.0	30	12	+2	4.5	3.0" x 1.0" (no LO)	Dual mix	8" x 5" total Captive
AM9024 (4 Ch Rx, 1 Tx)	6	18	1.0	3.0	6	12	+5	3.5	2.0" x 0.9"	Single mix	3.1" x 2.7" total Captive
AM9033 (4 Ch Rx)	0.1	18	0.5 / 1.0	1.0 / 2.45	25	12	+3	4	4.4" x .78"	Single mix	In Design (Q3) 5.7" x 3.1" total VPX daughter card
AM9026 (1 Ch Rx)	0.1	18	0.2	0.25	16	10	+5	8	3.0" x 1.6"	Dual mix	Captive
AM9027 (1 Ch Rx)	2	18	0.5	1.0	40	15	+2	2.0	3.4" x 0.8" (no LO)	Single mix	Captive