

# ASAM18A

AXIe Advanced Signal Analyzer: 500 MHz to 18 GHz



- Frequency range: 500 MHz to 18 GHz with 1 Hz resolution
- Frequency switching: < 1  $\mu$ s
- Real Time control of frequency, phase and amplitude: BCD parallel
- PC control of frequency, phase and amplitude: PCIe and USB
- Downconversion: 1 GHz instantaneous bandwidth
- Multi-channel phase coherent operation

**Giga-tronics**

Solutions for Next Gen EW / Radar Test & Deployment

The Giga-tronics ASAM18A AXIe Advanced Signal Analyzer (ASA) is a real-time signal analyzer used for receiving agile, phase-coherent signals across the frequency range of 500 MHz to 18 GHz. The downconverting input allows the ASAM18A to receive complex, wide bandwidth signals for testing Radar and EW systems. The modular ASGM18A is based on the industry standard AXIe format and works with the Giga-tronics SRM100A System Reference Module and either the CHSIS2A AXIe 2-channel or CHSIS4A AXIe 4-channel chassis for multi-channel, phase coherent operation.

- Frequency range: 500 MHz to 18 GHz with 1 Hz resolution
- Frequency switching: < 1  $\mu$ s
- Real-time control of frequency, phase and amplitude: BCD parallel
- PC control of frequency, phase and amplitude: PCIe and USB
- Downconversion: 1 GHz instantaneous bandwidth
- Multi-channel phase coherent operation

This datasheet provides a summary of the key performance parameters for Giga-tronics ASAM18A AXIe Advanced Signal Analyzer. All specifications apply over the +20 to +30 °C temperature range after a 30 minute warmup period unless otherwise noted.

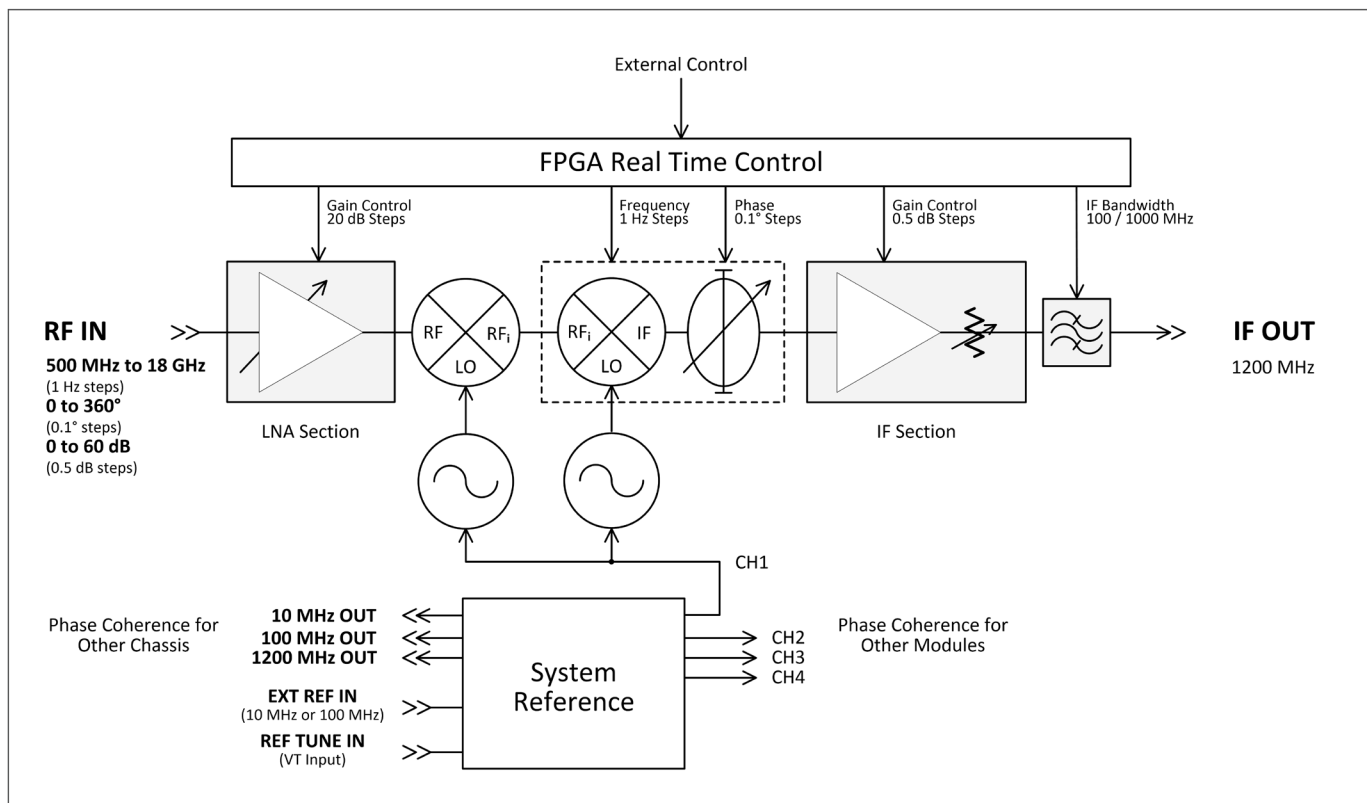


Figure 1 ASAM18A AXIe Signal Analyzer Module Block Diagram

## PER CHANNEL SPECIFICATIONS

## RF Input

Frequency Range	500 MHz to 18 GHz
Frequency Resolution BCD, PCIe or USB Interface	1 Hz
Input Impedance	50 $\Omega$
Input Source Match	< 2.5 : 1
RF Input Connector	Type-N (F)
Absolute Maximum Power	+10 dBm

## RF Input to IF Output Characteristics

Conversion Gain Range	0 to 60 dB
Conversion Gain Resolution	0.5 dB
Group Delay	< 20 ns
Group Delay Variation	$\pm$ 500 ps
Spectral Polarity	Inverting or non-inverting (user selectable)

RF to IF Gain Distribution<sup>1</sup> (Refer to Figure 1.0)

Gain Range	LNA Section Gain	IF Section Gain
0.0 to 19.5 dB	0.0 dB	0.0 to 19.5 dB
20.0 to 39.5 dB	20.0 dB	0.0 to 19.5 dB
40.0 to 60.0 dB	40.0 dB	0.0 to 20.0 dB

## Recommended Gain Setting vs. RF Input Power Level

RF Input Power Level	Recommended Gain Range
-20.0 to 0.0 dBm	0.0 to 19.5 dB
-40.0 to -20.0 dBm	20.0 to 39.5 dB
< -40.0 dBm	40.0 to 60.0 dB

## Receiver Characteristics vs. Gain Setting

Gain Range	Noise Figure	Input P1 dB
0.0 to 19.5 dB	< 40 dB	+5 dBm
20.0 to 39.5 dB	< 23 dB	-15 dBm
40.0 to 60.0 dB	< 10 dB	-35 dBm

Spurious Free Dynamic Range<sup>2</sup>

Gain Setting	Input Power	SFDR
0.0 dB	0.0 dBm	$\geq$ 75 dB
19.5 dB	-19.5 dBm	$\geq$ 65 dB
20.0 dB	-20.0 dBm	$\geq$ 75 dB
39.5 dB	-39.5 dBm	$\geq$ 65 dB
40.0 dB	-40.0 dBm	$\geq$ 75 dB
60.0 dB	-60.0 dBm	$\geq$ 65 dB

<sup>1</sup> Automatically Controlled

<sup>2</sup> Receiver IF BW = 100 MHz and Spectrum Analyzer RBW = 30 kHz

Residual Noise Floor (See Figure 2)

500 MHz to 18.0 GHz	$\leq -125$ dBm / Hz
---------------------	----------------------

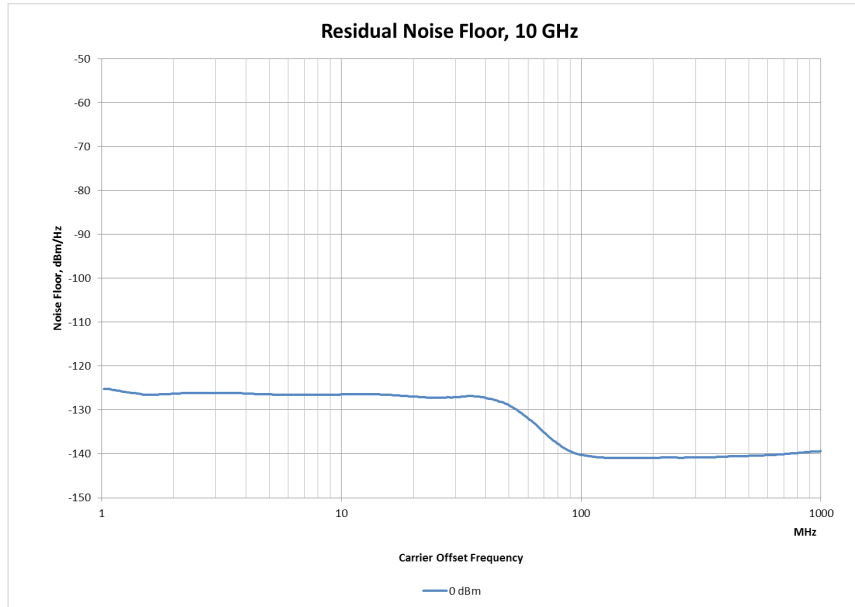


Figure 2 Typical Residual Noise Floor at 10 GHz with Gain Setting = 40 dB

Two-Tone Intermodulation (See Figure 3)

500 MHz to 18.0 GHz	$\leq -60$ dBc
---------------------	----------------

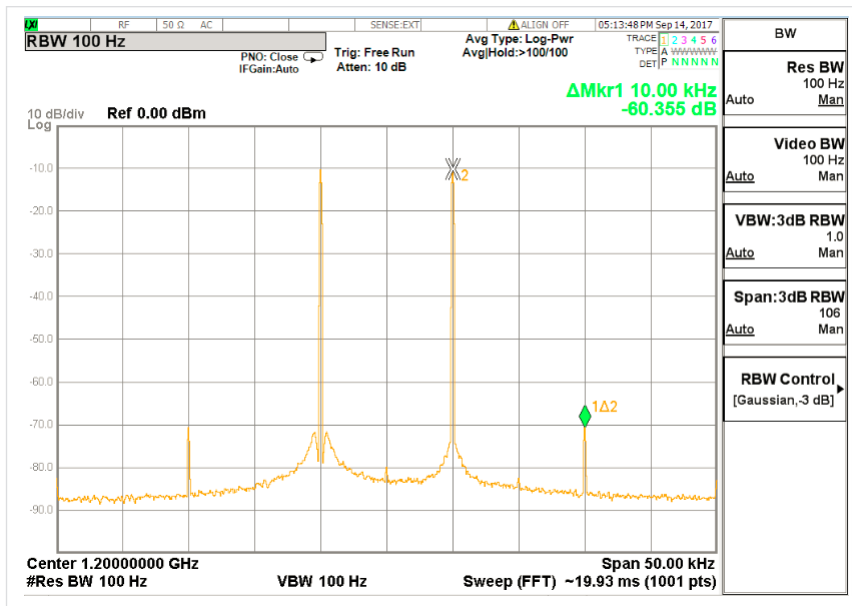


Figure 3 Typical Two-Tone Intermodulation Performance for two targets with 10 kHz Doppler Separation

**IF Output Characteristics**

Center Frequency	1200 MHz
Bandwidth <sup>3</sup>	100 MHz or 1 GHz (user selectable)
Output P1 dB	+5 dBm
Output Impedance	50 Ω

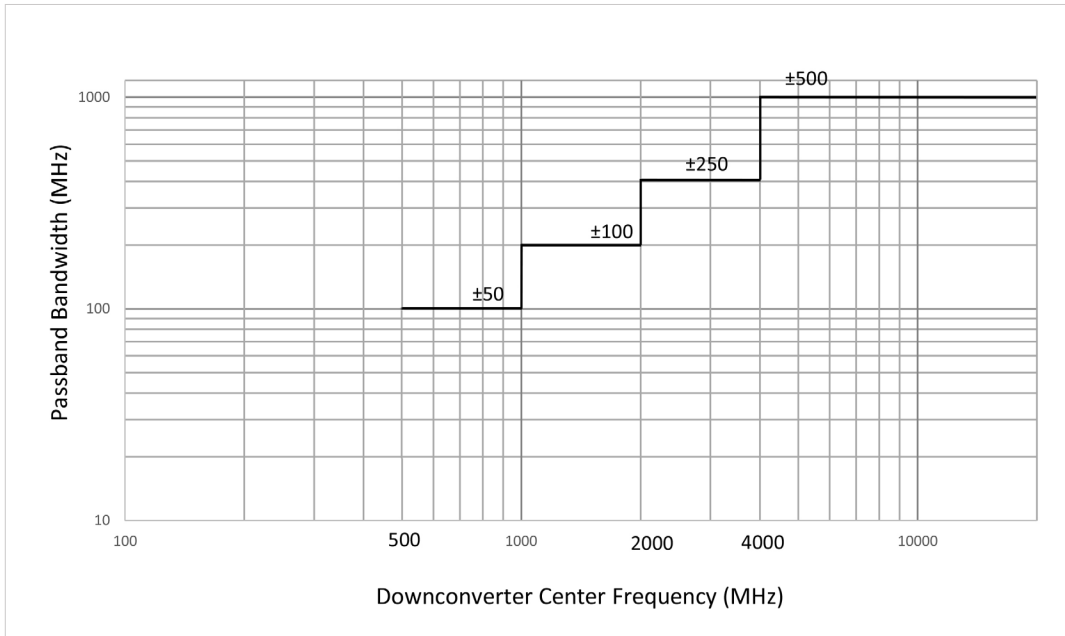


Figure 4 - IF Bandwidth versus Output Carrier Frequency

**IF Output Power Flatness (dB RMS)**

CARRIER FREQUENCY (MHz)	INSTANTANEOUS BANDWIDTH				
	± 10 MHz	± 50 MHz	± 100 MHz	± 250 MHz	± 500 MHz
500 to 1,000 (L-Band)	0.1 dB	0.6 dB			
1,000 to 2,000 (S-Band)	0.1 dB	0.6 dB	1.1 dB		
2,000 to 4,000 (C-Band)	0.25 dB	0.6 dB	1.1 dB	1.7 dB	
4,000 to 8,000 (X-Band)	0.1 dB	0.6 dB	1.1 dB	1.7 dB	1.9 dB
8,000 to 12,000 (Ku-Band)	0.1 dB	0.6 dB	1.1 dB	1.7 dB	1.9 dB
12,000 to 18,000	0.1 dB	0.6 dB	1.1 dB	1.7 dB	1.9 dB

Table 1 - IF Signal Flatness using 1200 MHz IF Output

<sup>3</sup> Bandwidth automatically switches to 100 MHz below RF frequency of 2.0 GHz regardless of setting

**Instrument Control**

Parallel Interface (Option BCD) Frequency Control Amplitude Control Phase Control	Positive TRUE, BCD format, 11 digits with TTL strobe Positive TRUE, BCD format, 3 digits with TTL strobe Positive TRUE, BCD format, 4 digits with TTL strobe
Serial Interface	Mini-USB (full instrument control using Advanced Signal Control Software)
PCIe	2 lane PCIe (full instrument control using Advanced Signal Control Software)

**System Control**

PCIe	PCIe X8 GEN2 (full instrument control)
Ethernet	10/100/1000 Mbps (chassis status only)
Graphical User Interface	Advanced Signal Control Software
Programming Interface	Giga-tronics Proprietary API (GTSigAn.dll, GTSigConn.dll)

**Inputs and Outputs**

RF In	Type-N (F), 50 $\Omega$
Parallel Interface	Parallel hardware control TTL input (OPT BCD)
Sync Out	+5 V output pulse
Trigger In	Accepts TTL input signal > 50 ns PW
1200 MHz IF Out	SMA (F), 50 $\Omega$

Frequency Switching Characteristics

Phase Coherent Frequency Switching	Full bandwidth 1 Hz resolution
Frequency Settling Time <sup>4</sup>	< 300 ns
Phase Settling Time <sup>5</sup>	< 300 ns
Latency	117 ns ±2 ns
Trigger Input	Edge-triggered 50 ns min PW {front panel SMA (F)}
Trigger Polarity	Rising or falling edge (user selectable)
Sync Output	50 ns PW (nominal)
Sync Output Delay	75 ns to 200 μs from Trigger Input (user selectable)
Amplitude Settling Time <sup>6</sup>	< 300 ns
IF Output Blanking Time	25 ns to 200 μs PW (user selectable)

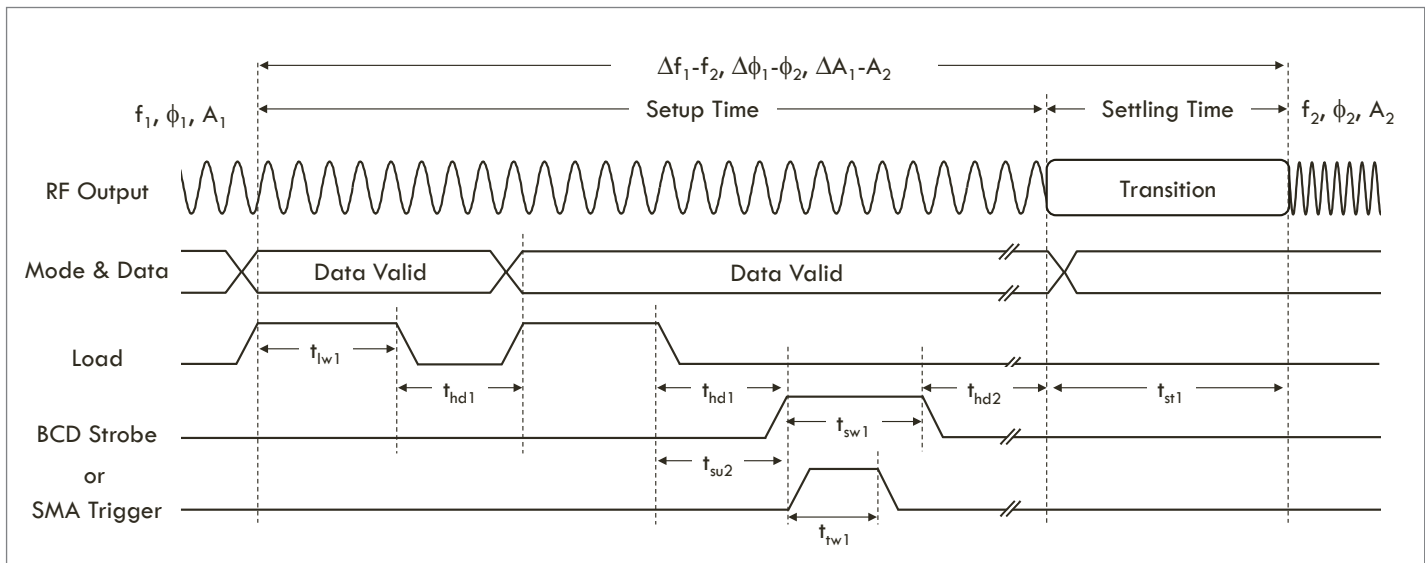


Figure 4 ASGM18A Switching Speed Definitions and Timing

Frequency Switching Characteristics Nominal Performance

Parameter	Description	Min
$t_{sw1}$	BCD Strobe width	60 ns
$t_{hd1}$	Hold time - data stable while load is de-asserted	40 ns
$t_{iw1}$	Load width	60 ns
$t_{hd1}$	Hold time - data stable while BCD strobe is de-asserted	40 ns
$t_{su1}$	Setup time	60 ns
$t_{tw1}$	Trigger width	30 ns
$t_{su2}$	Setup time	40 ns
$t_{hd3}$	Hold time - data stable while SMA trigger is de-asserted	30 ns
$t_{st1}$	Settling time	300 ns

4 Time for frequency to settle within 1 Hz of final value after receiving a trigger.  
 5 Time for phase to settle within 0.1 degree of final value after receiving a trigger.  
 6 Time for amplitude to settle within 0.5 dB of final value after receiving a trigger.

**General Specifications**

Environmental	MIL-PRF-28800F for Temperature, Humidity and Altitude only. Operating Random Vibration: 5 to 500 Hz, 0.21 grms. Survival Random Vibration: 5 to 500 Hz, 2.09 grms
Safety	EN61010-1:2010
Emissions	EN61326-1:2013
Weight ASAM18A 2-CH Systems 4-CH Systems	16 lbs Up to 89 lbs (40.4 kg) depending upon configuration Up to 146 lbs (66.2 kg) depending upon configuration
Dimensions ASAM18A 2-CH Systems 4-CH Systems	2.5" H x 13.75" W x 12.0" D 7.25" H X 19.0" W X 24.5" D 12.3" H X 19.0" W X 24.5" D
Power ASAM18A 2-CH Systems 4-CH Systems	< 200 Watts < 450 Watts (include chassis) < 900 Watts (include chassis)
Form Factor	AXIe



## Selection Guide by Application

Model Number	APPLICATION				OPTIONS			
	Real-Time Synthesizer	AXIe Companion	Real-Time Threat Emulation	Radar Quiet Target Generator	OPT-ATT Electronic Step Attenuator	OPT-UP1 1200 MHz IF Input	OPT-BCD Parallel BCD Input	OPT-TCI TEmS Control Interface
<b>ASGM18A</b> 100 MHz to 18 GHz Advanced Signal Generator Module	●	●	●	●	●	●	●	●
<b>ASAM18A</b> 500 MHz to 18 GHz Advanced Signal Analyzer Module	●	●	●				●	
<b>SRM100A</b> System Reference Module	●	●	●	●				
<b>CHSIS2A / CHSIS4A</b> 2-Channel or 4-Channel AXIe System Chassis	●	●	●	●				
<b>CHSISBK</b> AXIe Blank Module: 2-Slot	●	●	●	●				
<b>ONS</b> On-Site System Configuration Service	●	●	●	●				
<b>TEmS</b> Threat Emulation Software and Control System			●					

## Ordering Information

Model Number	Description
ASGM18A OPT-ATT OPT-UP1 OPT-BCD OPT-TCI	AXIe Advanced Signal Generator: 100 MHz to 18 GHz Electronic Step Attenuator for 90 dB Dynamic Range 1200 MHz IF Upconverter Input Parallel BCD Input Control Interface TEmS Control Interface
ASAM18A OPT-BCD	AXIe Advanced Signal Analyzer: 500 MHz to 18 GHz Parallel BCD Input Control Interface
SRM100A	AXIe System Reference Module: 10 MHz, 100 MHz, 1200 MHz
CHSIS2A	2-Channel AXIe System Chassis (4U) (For 1 or 2 channel systems)
CHSIS4A	4-Channel AXIe System Chassis (7U) (For 1 to 4 channel systems)
CHSISBK	AXIe Blank Module: 2-Slot cover for Airflow Management and Backplane Termination
EWS20	Extended 2 Year Warranty
EWS40	Extended 4 Year Warranty
Consultancy	Professional Consultation

## Standard Warranty



Giga-tronics warrants to the Customer that all manufactured products conform to published specifications and are free from defects in material and workmanship for one year. The period begins on the date of shipment and only applies to normal operation of the product within the appropriate service condition. Giga-tronics shall have no responsibility hereunder for any defect or damage caused by improper storage, improper installation, unauthorized modification, misuse, neglect, inadequate maintenance, accident, or any part which has been repaired or altered by anyone other than Giga-tronics or its authorized representative, or not in accordance with Giga-tronics furnished instructions. <https://go-asg.gigatronics.com/warranty>

## Extended Warranty



Extended warranty (Service and Calibration) can only be purchased at time of ordering or within 30 days after the ship date. Service for extended warranties will be performed by Giga-tronics Incorporated, its Microsource subsidiary; or, an authorized Giga-tronics Service Center. Prices do not include freight, insurance, handling, taxes, duties or any other related shipping charges. Extended warranty service and extended calibration options are based on the original ship date of the product. Extended calibration option requires that units be calibrated annually, if applicable. <https://go-asg.gigatronics.com/warranty>



American Systems Registrar, LLC certified ISO 9001:2008  
 Certification: <https://go-asg.gigatronics.com/quality>

**ISO 9001:2008**

## Giga-tronics Support Services

At Giga-tronics, we understand the challenges you face. Our support services begin from the moment you call us. We help you achieve both top-line growth and bottom-line efficiencies by working to identify your precise needs and implement smart and result orientated solutions. We believe and commit ourselves in providing you with more than just our superior test solutions. For technical support, contact:

Phone: +1 925.328.4650 | Email: [asg-info@gigatronics.com](mailto:asg-info@gigatronics.com)

All data is subject to change without notice. For the latest information on Giga-tronics products and applications, please visit : <https://go-asg.gigatronics.com>