2023

Low Noise Amplifiers Operational Manual

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Waveguide Amplifiers

VDI Low Noise Amplifiers are able to boost a small input RF signal to a large output RF signal and are optimized with low noise figure. VDI offers low noise amplifiers up to ~220 GHz with additional amplifiers under development.

Safety and Operational Guidelines

Read all instructions and information in this product manual before connecting the product to external equipment. Operational procedures must be followed for proper function. If you have questions, contact VDI before operating the product.

VDI assumes the customer is familiar with microwave, millimeter wave and VDI products in general. The user and customer are expected to understand all safety guidelines, health hazards and general advisories that may exist and are associated with the use of this device. VDI is not responsible for any human hazards that may exist or may occur while using this device.

Disassembly of any VDI components is prohibited and will void the product's warranty. VDI is not responsible for the warranty or guarantee of products that are damaged as a result of improper handling, testing, biasing, or use by the user.

Virginia Diodes, Inc. (VDI) accepts no liability for damage or injury resulting from or caused by:

- Improper use, disassembly or use for other purposes than those for which the module was designed;
- Use outside common safety, health or general advisories pertaining to microwave, millimeter wave and VDI products;
- Repairs carried out by persons other than VDI or its assigned agents;

Waveguide Inspection / Test Port Care

- Inspect waveguide flanges prior to making connections.
- Waveguide screws should be torqued in the range 20-50 cNm, greater torque can damage the interface.
- Making a connection with metal debris between the waveguide flanges can damage the waveguide interface and prevent repeatable connections.
- If debris is present, clean the flange with pre-dampened TexWipe wipes or swabs (e.g. Part Number TX1065).
- If these are not available, TexWipe cloths lightly dampened with ethanol may be used (e.g. Part Number TX604).
- Replace dust caps when the system is idle.

General Operating Practices and Recommendations

- Check with VDI before any measurement connection is attempted beyond those described in this manual or if it may exceed commonly accepted standards of practice.
- VDI does not recommend the use of liquid or paste for either thermal grounding of VDI components or for locking screws. Liquids/pastes wicking into the VDI components can damage the internal devices and worsen performance.

General Specifications for VDI Low Noise Amplifiers	
Description	**Specification**
DC Bias Voltage (V)	+9 ± 1
Maximum Weight (lbs.)	0.1
Maximum Case Temperature*	< 45°C

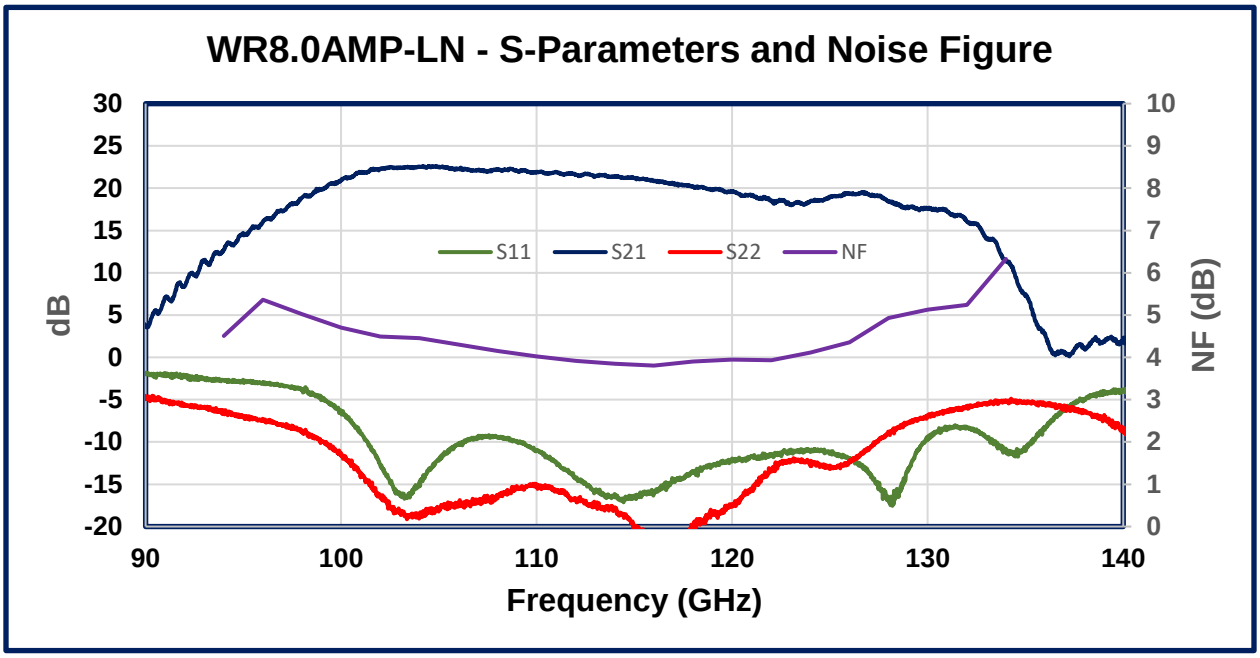
*Waveguide amplifiers must be connected to thermally grounded waveguide prior to biasing.

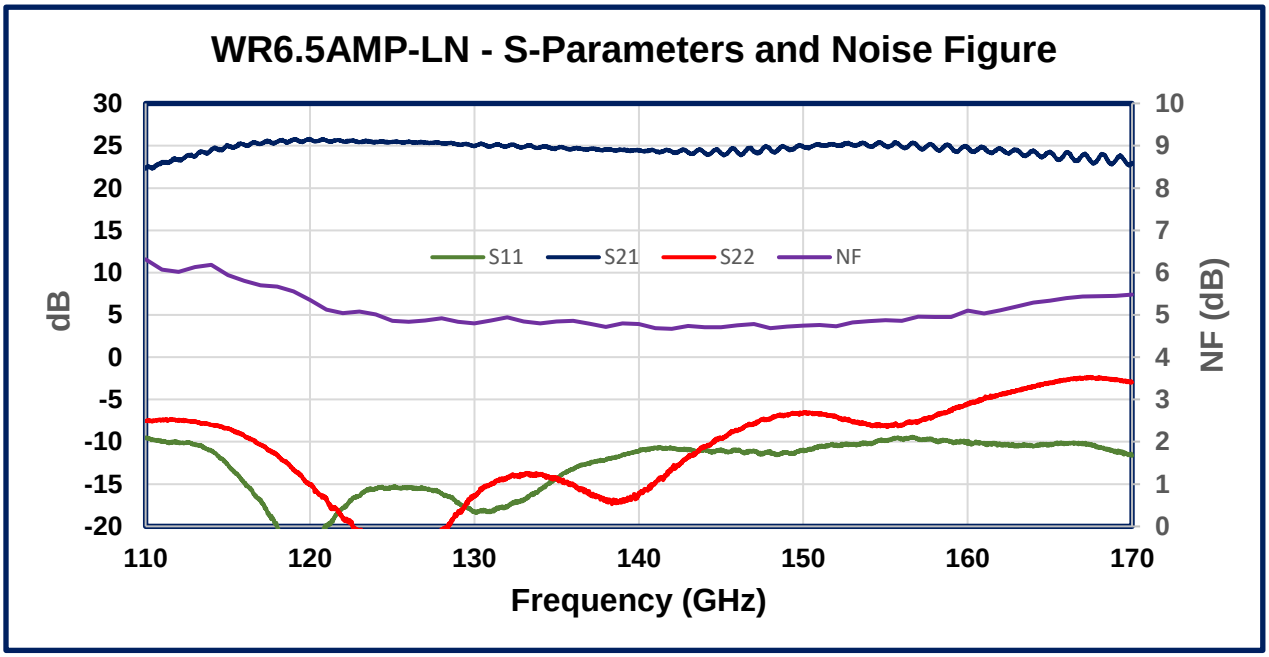
VDI Low Noise Amplifiers Specifications			
VDI Part Number	**WR8.0AMP-LN**	**WR6.5AMP-LN**	**WR5.1AMP-LN**
Amplifier Band (GHz)	95-130	110-170	140-220
Waveguide Interface	WR-8.0	WR-6.5	WR-5.1
Gain, S21 (dB, typical)	18	20	20
Noise Figure (dB, typical)	4.5	5.5	6
Output P1dB (dBm, typical)†	-	-5	-
Input Reflection, S11 (dB, typical)	-10	-10	-9
Output Reflection, S22 (dB, typical)	-10	-6	-6
Maximum RF Input Power (dBm)	-20	-20	-20
Bias Connector*	SMP(m)	SMP(m)	SMP(m)
Current Draw (Typical, Maximum, mA)	~100mA	~20mA	~20mA

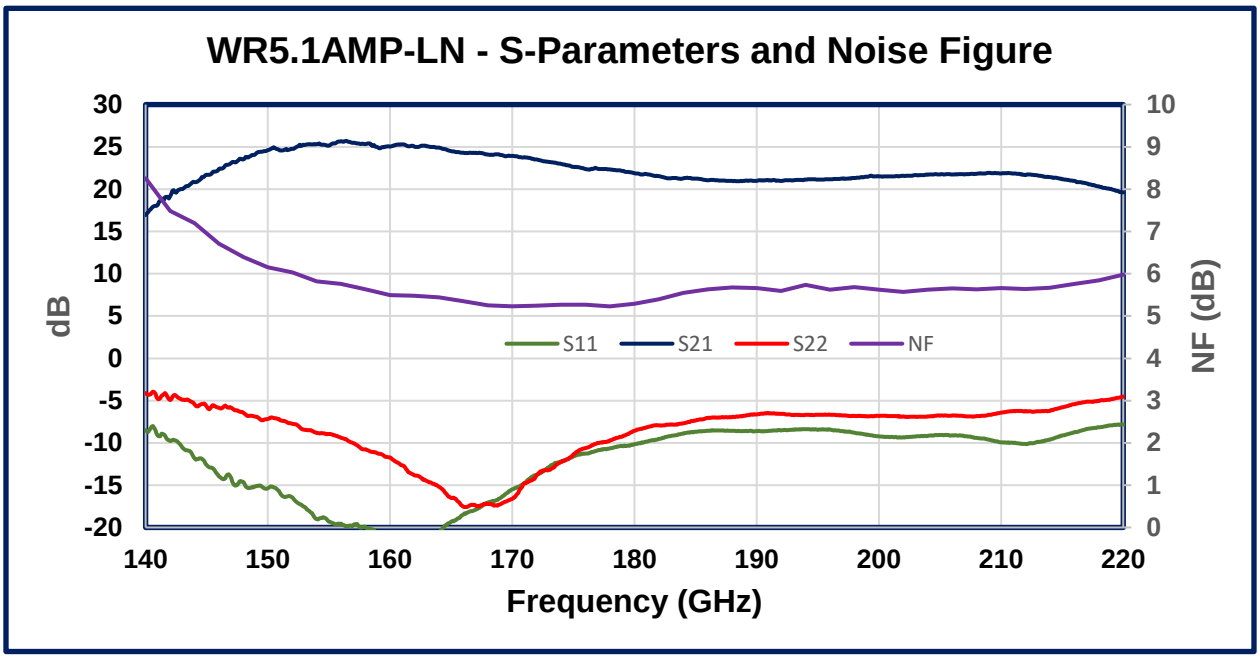
†All amplifiers will meet P1dB specification listed above. P1dB data will not be provided with each amplifier.

*Amplifiers with SMP(m) bias connectors include SMP(f) to LEMO and SMP(f) to SMA(m) cables. The SMP to LEMO 00 cable is for use with an SAX-UP or CCU module. The SMP to SMA cable is for general use.

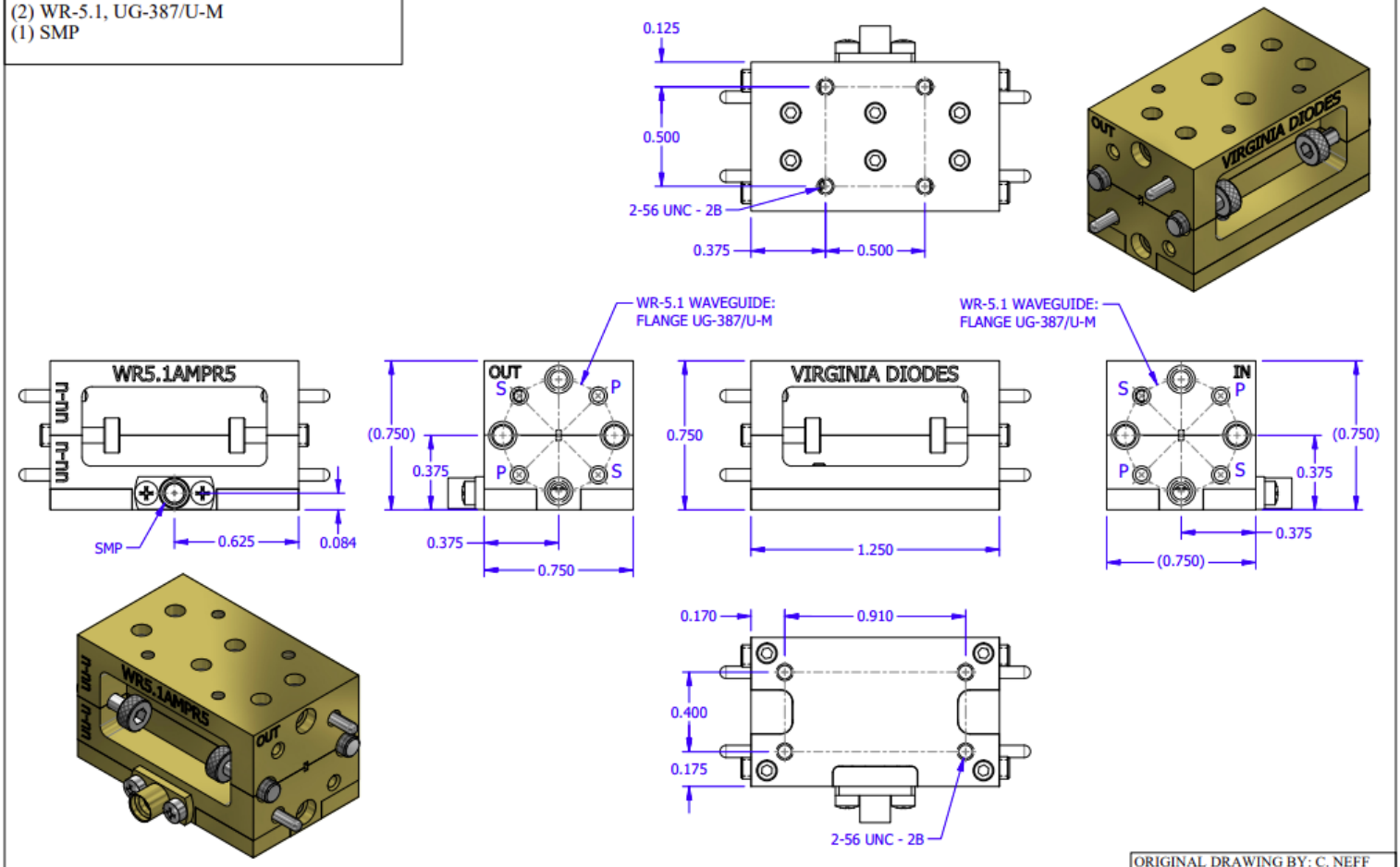
Typical amplifier performance plots are provided below.







WAVEGUIDE FLANGES:
(2) WR-5.1, UG-387/U-M
(1) SMP



NOTE: SPECIFICATIONS AND CHARACTERISTICS ARE TYPICAL AND SUBJECT TO CHANGE AT ANY TIME.

TITLE: WR5.1AMPR5V1	MATERIAL: ALUMINUM ALLOY (MAY BE GOLD PLATED)	
	LAST REV. DATE: 10/17/2022	SHEET: 1 OF 1
MODEL #: WR5.1AMP	LAST REV.: R5V1	UNITS: INCH

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Addendum — Product Updates and Company Contacts

The Virginia Diodes staff of engineering and physical science professionals works to continually improve our products. We also depend upon feedback from colleagues and customers. Ideas to simplify operations, improve performance or add capabilities are always welcome. Be certain that Virginia Diodes has your latest contact details including a phone number and an email address to receive update advisories.

Contact VDI:
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