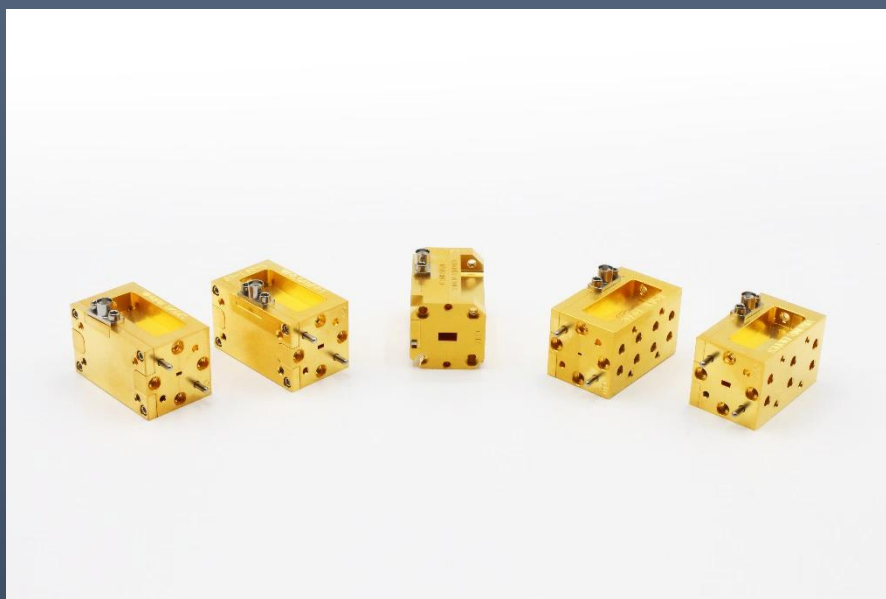




Low Noise Amplifiers Operational Manual



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Contents

Section 1 – IntroductionPages 2-3
Contents Page 2
Overview, Safety and Operational Guidelines Page 3

Section 2 – Product SpecificationsPage 4
Product Specifications – Low Noise Amplifiers..... Page 4

Appendix 1 – Amplifier PerformancePages 5-7
Amplifier Performance Pages 5-7

Appendix 2 – Amplifier DrawingsPage 8
Mechanical Drawing..... Page 8

Addendum – Product Updates and Company ContactsPage 9

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.

Product Specifications – Low Noise Amplifiers

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.

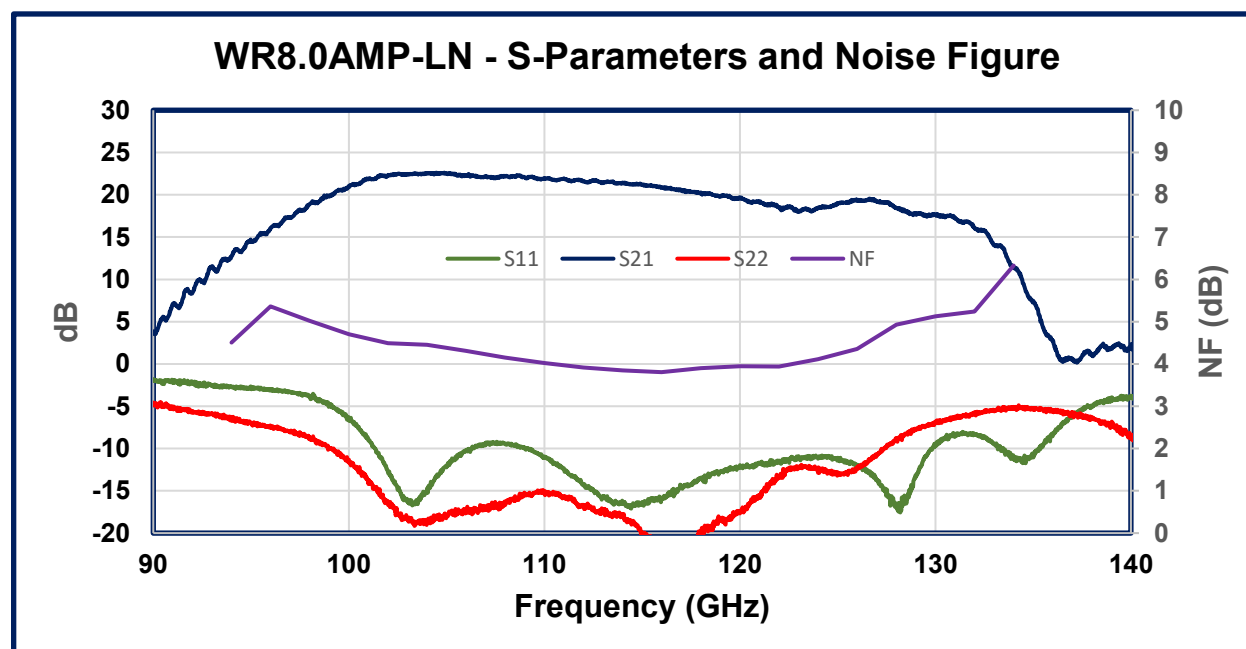
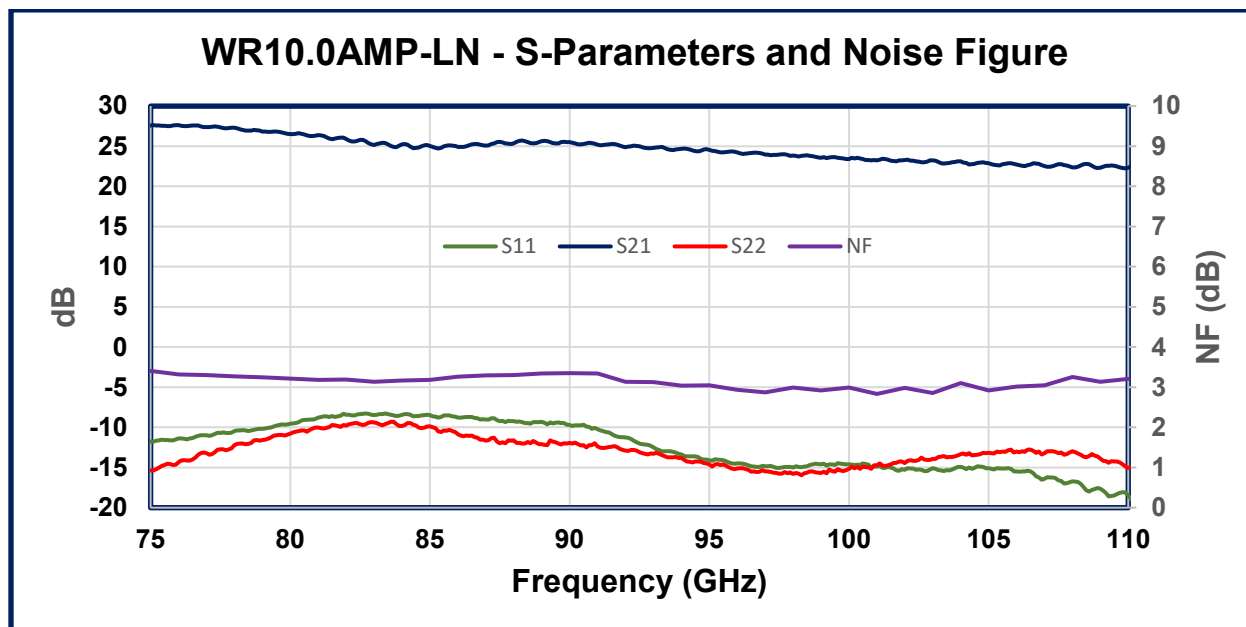


VDI Low Noise Amplifiers Specifications						
VDI Part Number	WR10.0AMP-LN	WR8.0AMP-LN	WR6.5AMP-LN	WR5.1AMP-LN	WR4.3AMP-LN-0200/0260	WR3.4AMP-LN
Amplifier Band (GHz)	75-110	95-130	110-170	140-220	200-260	220-330
Waveguide Interface	WR-10.0	WR-8.0	WR-6.5	WR-5.1	WR-4.3	WR-3.4
Gain, S ₂₁ (dB, typical)	23	18	20	24	20	13
Noise Figure (dB, typical)	4	4.5	6.5	6	7	8
Output P _{1dB} (dBm, typical)†	-	-	-5	-6	-	-
Input Reflection, S ₁₁ (dB, typical)	-10	-10	-10	-9	-6	-6
Output Reflection, S ₂₂ (dB, typical)	-10	-10	-6	-6	-10	-10
Maximum RF Input Power (dBm)	-20	-20	-20	-20	-20	-20
Bias Connector*	SMP(m)	SMP(m)	SMP(m)	SMP(m)	SMP(m)	SMP(m)
Current Draw (Typical, mA)	~50	~100	~50	~20	~20	~30

†All amplifiers will meet P_{1dB} specification listed above. P_{1dB} data will not be provided with each amplifier.

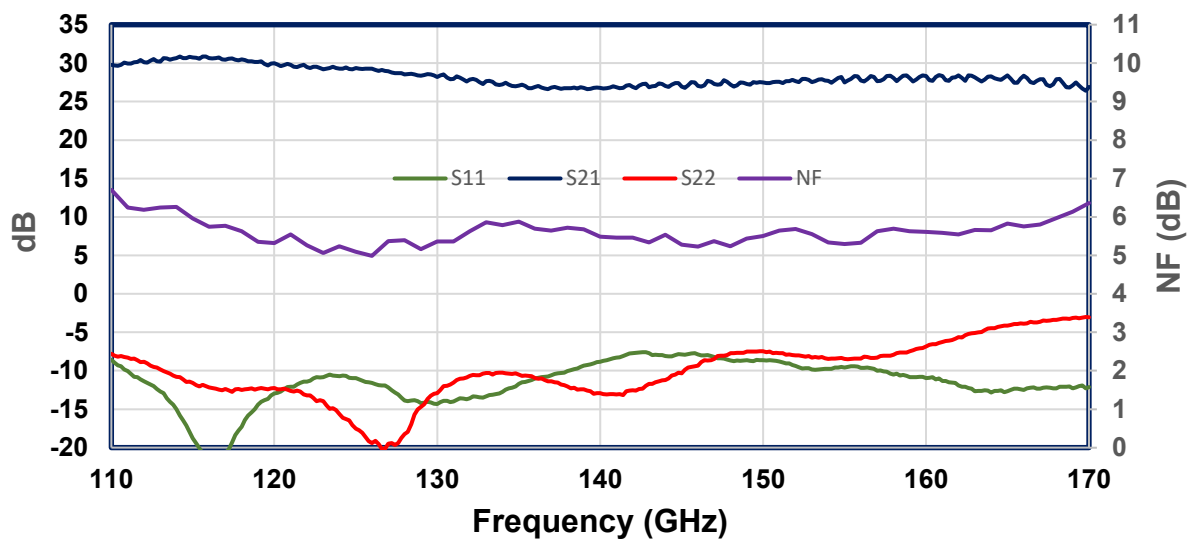
*Amplifiers with SMP(m) bias connectors include SMP(f) to LEMO and SMP(f) to SMA(m) cables. The SMP to LEMO 00 cable is for use with an SAX-UP or CCU module. The SMP to SMA cable is for general use.

Typical amplifier performance plots are provided below.

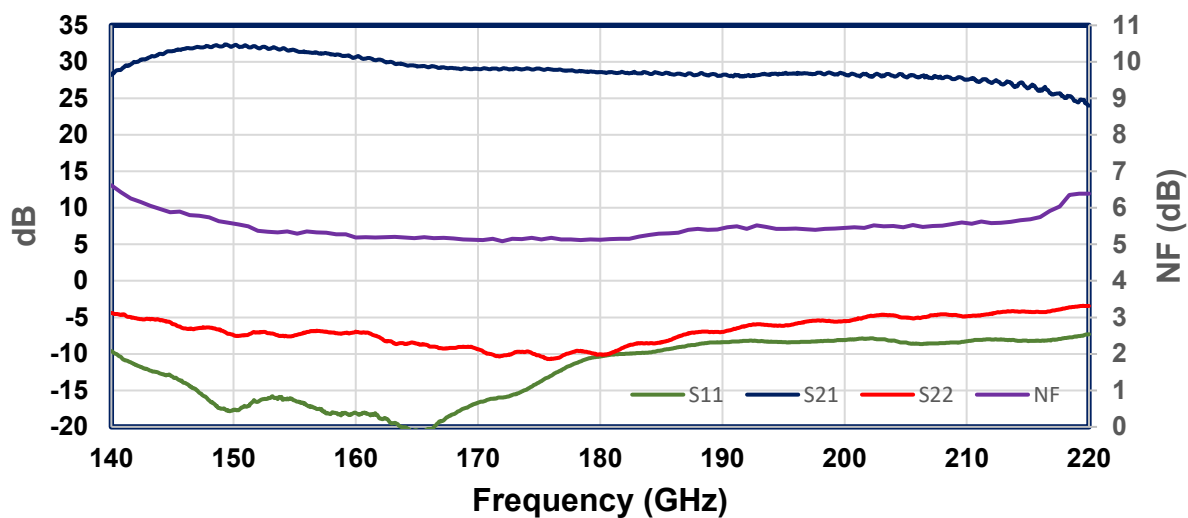


Amplifier Performance – Continued

WR6.5AMP-LN - S-Parameters and Noise Figure

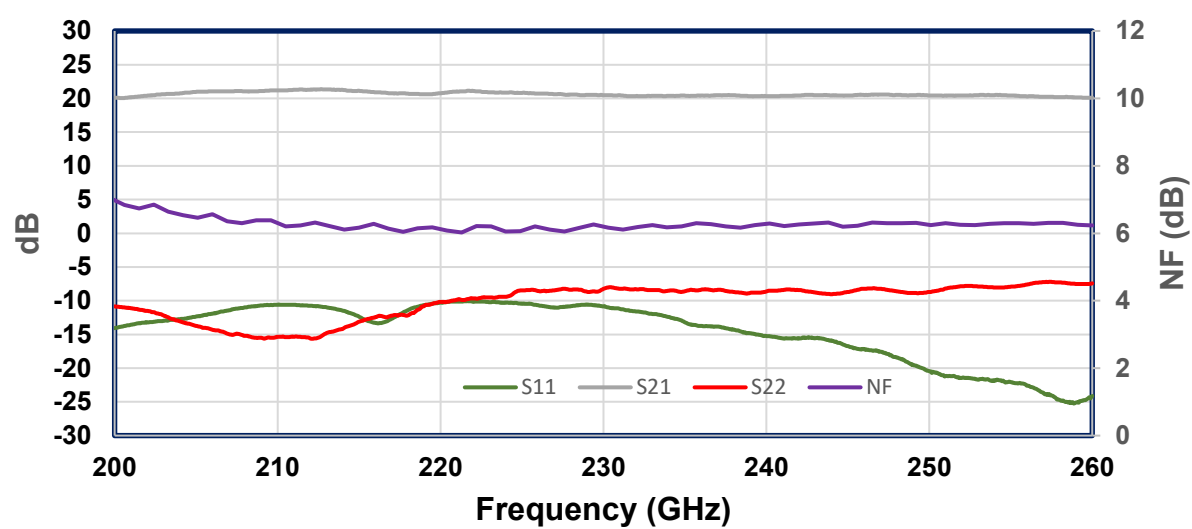


WR5.1AMP-LN - S-Parameters and Noise Figure

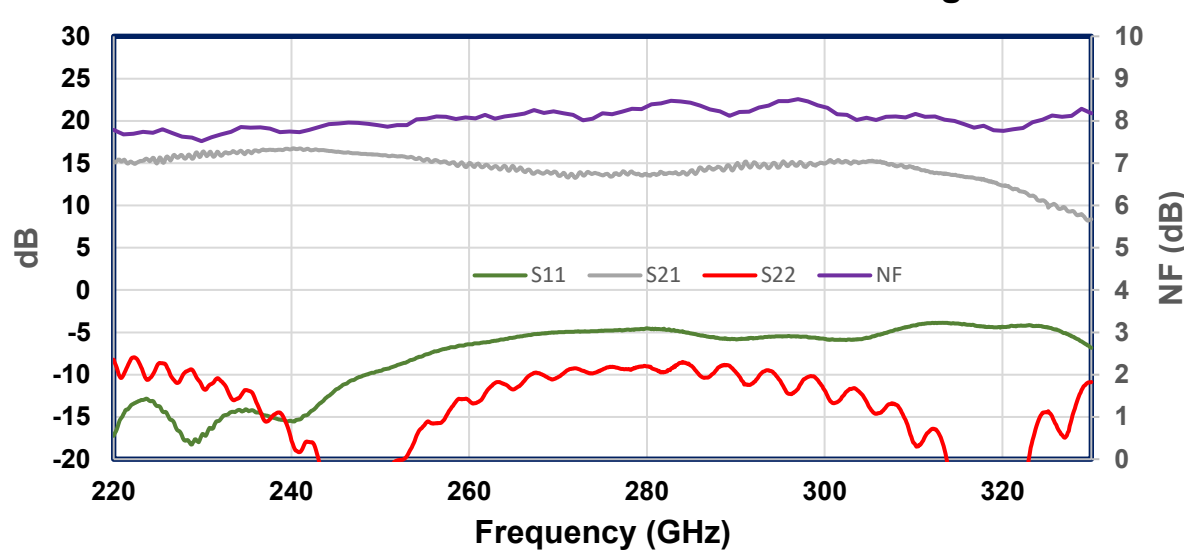


Amplifier Performance – Continued

WR4.3AMP-LN-0200/0260 - S-Parameters and Noise Figure

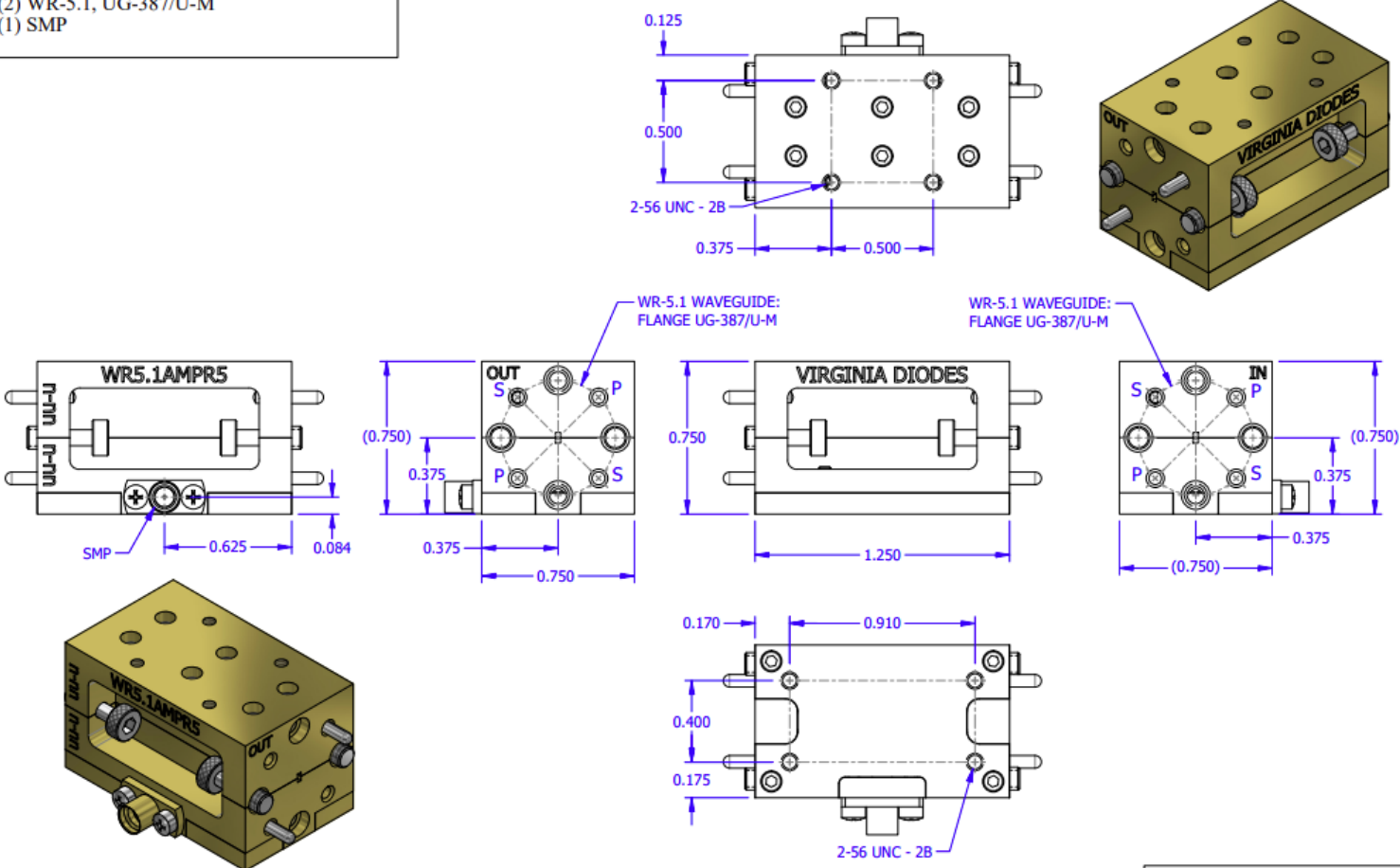


WR3.4AMP-LN - S-Parameters and Noise Figure



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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

MODEL #:
WR5.1AMP

MATERIAL:
ALUMINUM ALLOY (MAY BE GOLD PLATED)

LAST REV. DATE:
10/17/2022

LAST REV.:
R5V1

SHEET:
1 OF 1

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.

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