



# Noise Source Product Manual



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# Safety and Operational Guidelines

## 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.

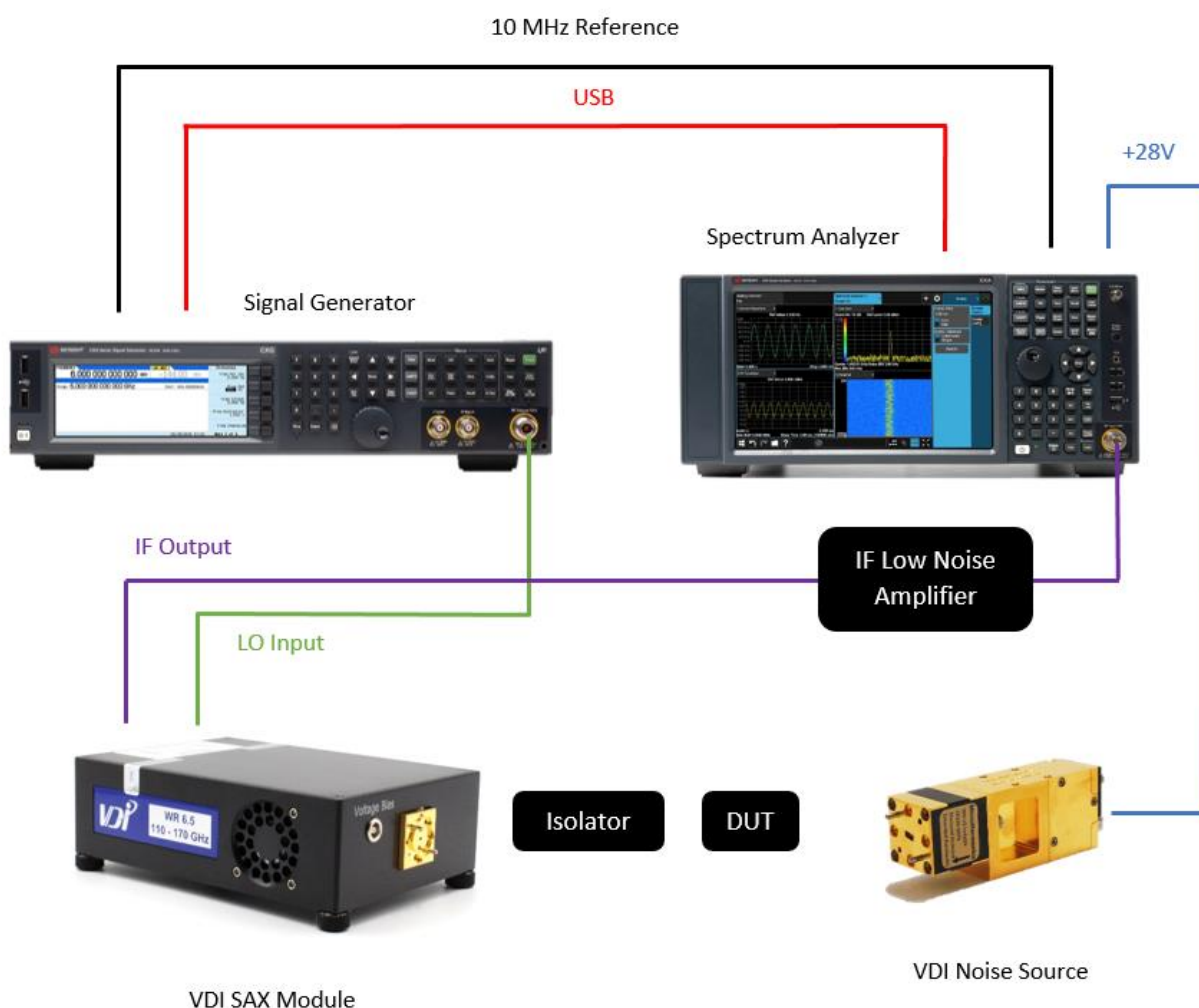
## Noise Sources

VDI Noise Sources offer high Excessive Noise Ratio (ENR) performance across full waveguide bands up to 220 GHz. VDI Noise Sources include waveguide isolators to improve the match between the NS and the DUT and are configured with a +28V voltage bias port, compatible with many spectrum analyzers or noise figure analyzers. Additional noise sources are under development. Contact VDI for more information.



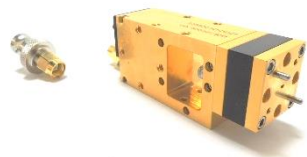
## Noise Figure Measurement Solution with VDI Noise Source

VDI Noise Sources can be used to measure the noise figure of amplifiers using a Keysight EXA or similar spectrum analyzer with the Noise Figure Measurement software, VDI down-converter (VDI SAX), and an external LO signal generator.



# Product Specifications – Noise Sources

General Specifications for VDI Noise Sources	
Description	Specification
DC Bias Voltage (V)	+28 ± 1
Current Draw (mA)	<10
Bias Voltage Connector	2.92mm(f)*
Maximum Weight (lbs.)	~0.1
Isolator Return Loss (Typical)	20dB
Output Flange	UG-387/U-M
Operating Temperature (Typical / Recommended)	25°C / 20-30°C



\*VDI to include a SMA(m) to BNC(f) adapter.

VDI Noise Source Specifications				
VDI Part Number	WR15NS	WR12NS	WR10NS	WR8.0NS
Frequency Band (GHz)	50-75	60-90	75-110	90-140
Waveguide Interface	WR-15	WR-12	WR-10	WR-8.0
ENR (dB, typical)*	17	15	15	10
VDI Part Number	WR6.5NS	WR5.1NS		
Frequency Band (GHz)	110-170	140-220		
Waveguide Interface	WR-6.5	WR-5.1		
ENR (dB, typical)*	10	8.5		

\*VDI to include an appropriately formatted ENR file (for use on a Keysight EXA or similar analyzer) in the shipped documentation.

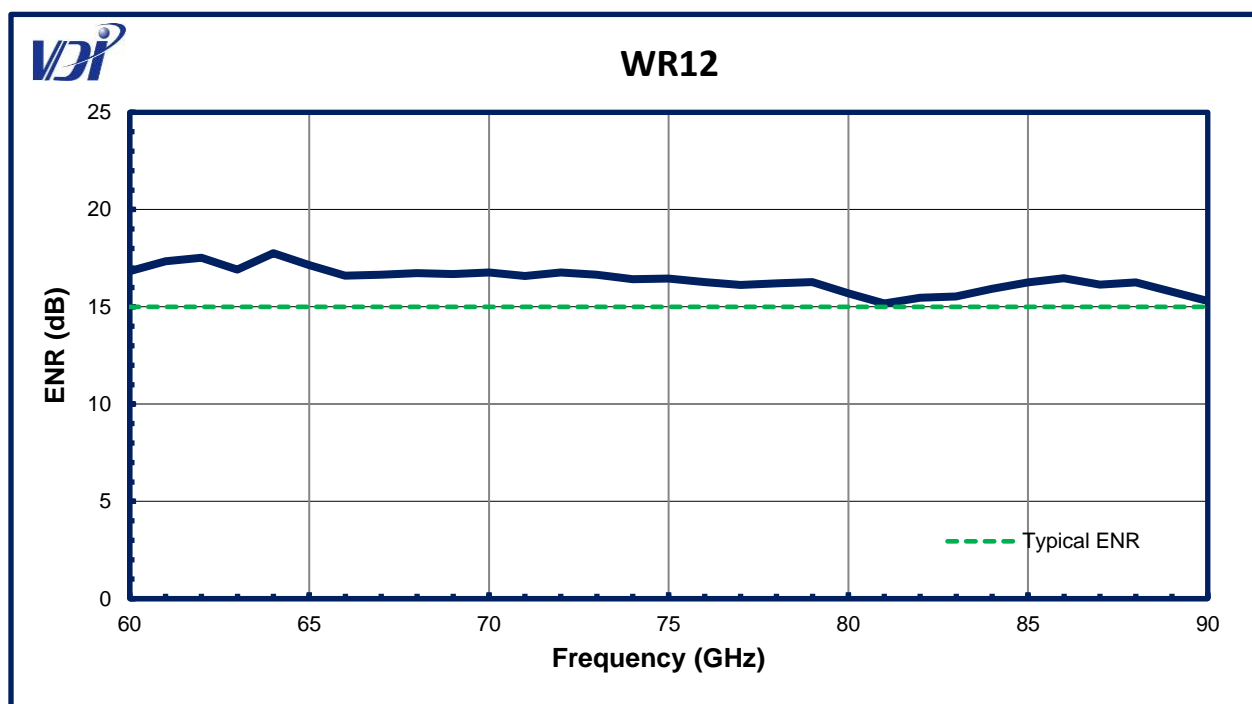
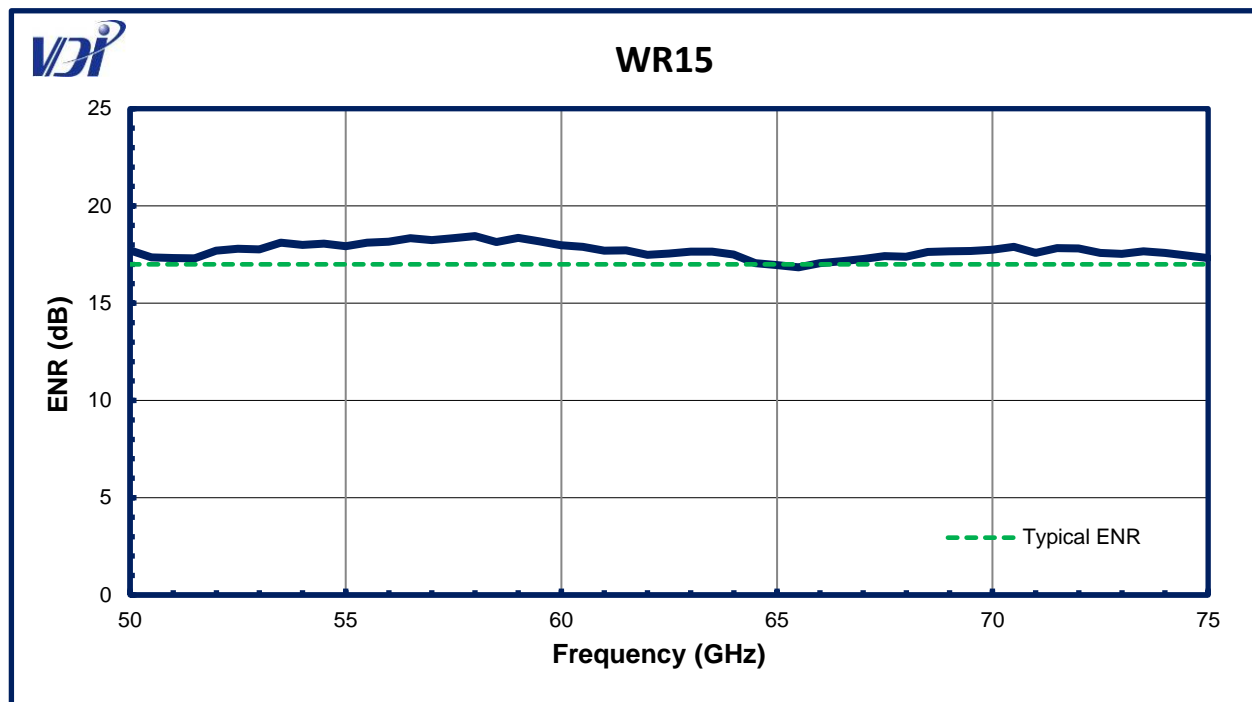
## Sample ENR File Format

Comments shown in red. Red text is not included on the .csv file.

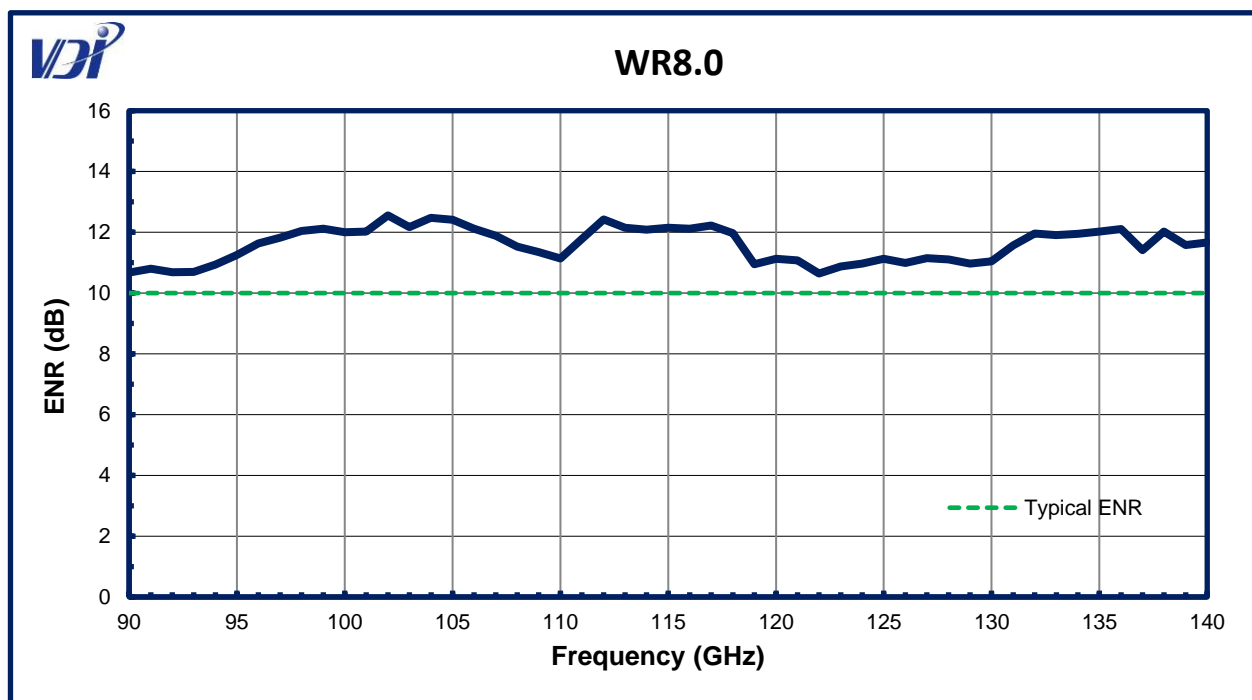
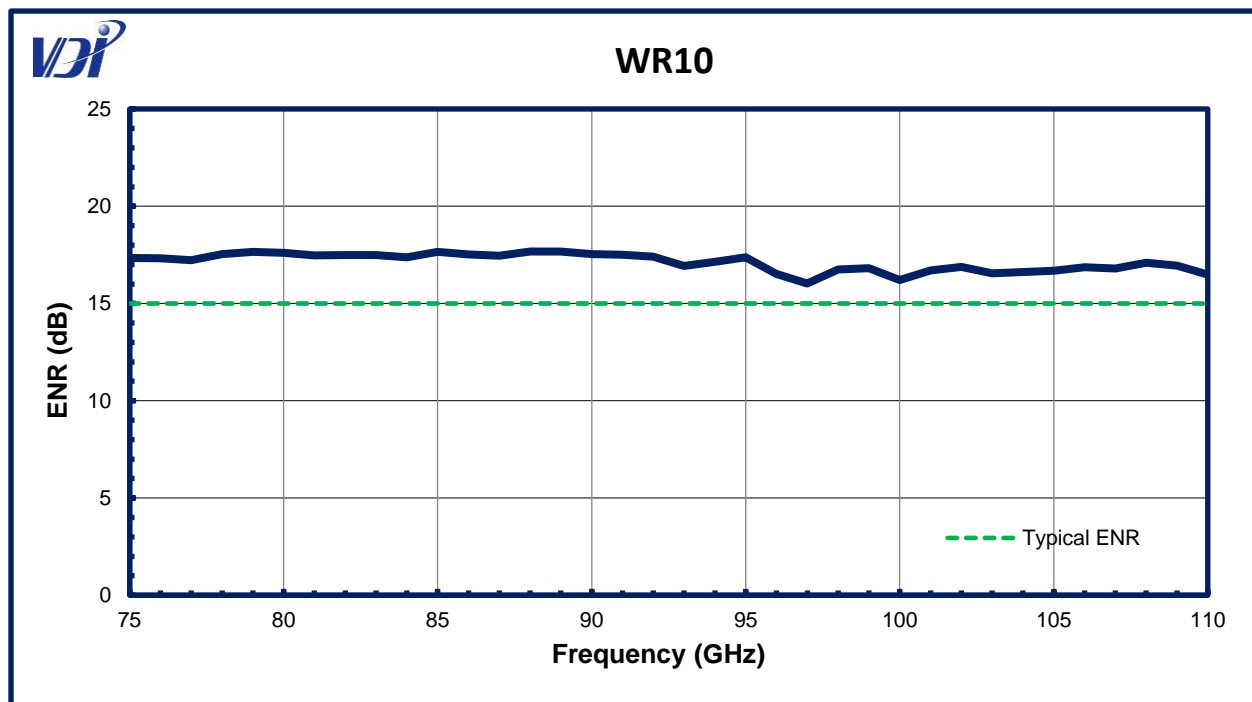
```
[Filetype ENR],
[Version A.27.05], Instrument (Spectrum Analyzer) Software Revision Number*
[Serialnumber WR6.5X6SHM-IR1 1-05], Noise Source Serial Number
[Model WR6.5NS], Noise Source Model Number
1.09995E+11,11.02815447
1.10995E+11,11.17974241
1.11995E+11,11.91899908
1.12995E+11,11.08859996
1.13995E+11,10.90244843
1.14995E+11,11.08731449
...
```

\*Software Revision Number on the file provided by VDI will default to A.27.05. But should be reviewed and adjusted by the user if they use a different SA or revision number.

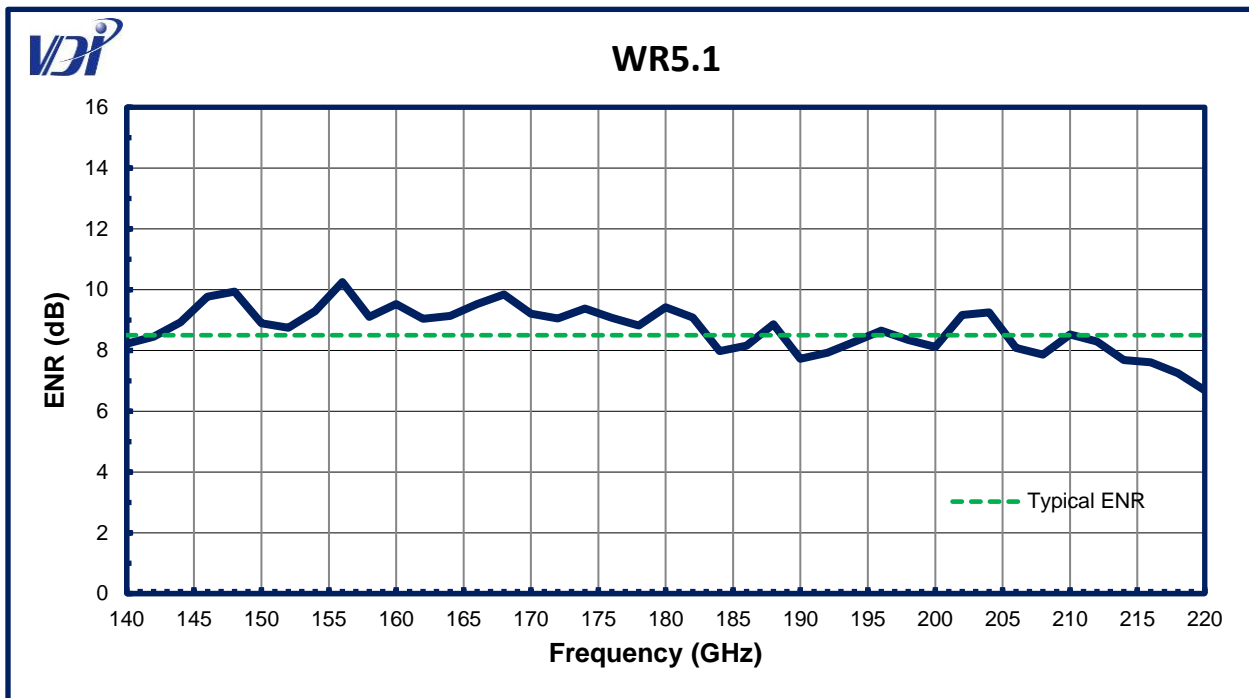
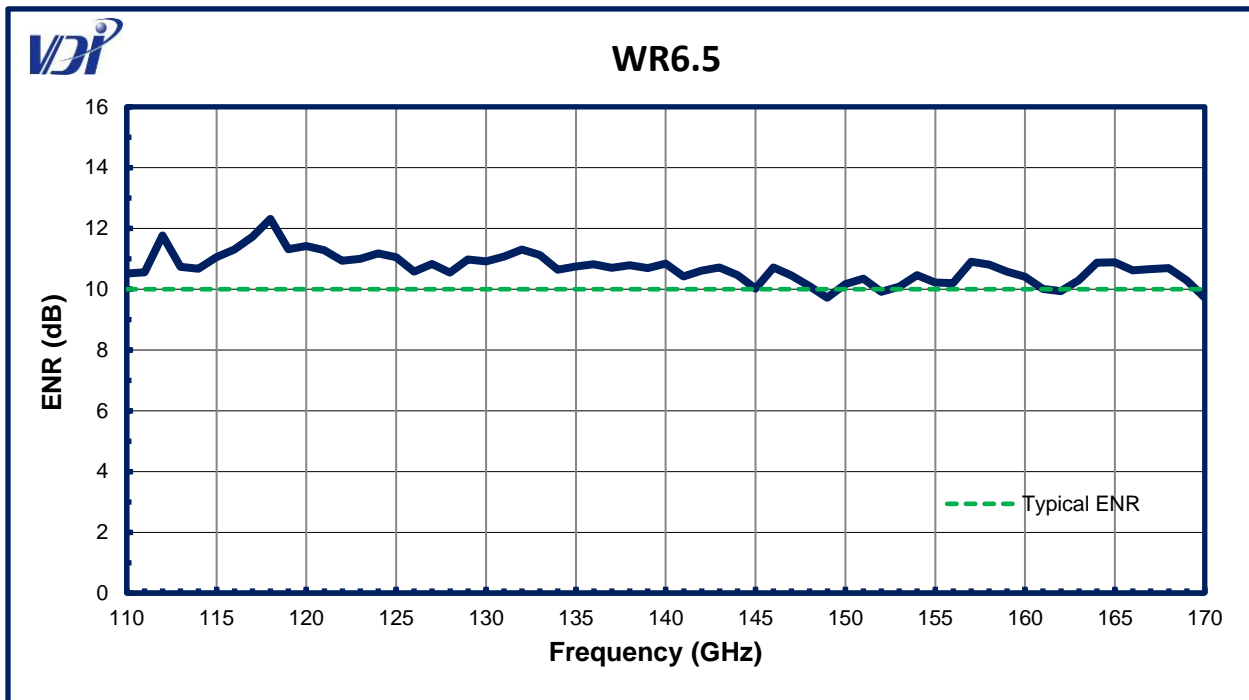
Typical noise source performance plots are provided below.



# Noise Source Performance – Continued

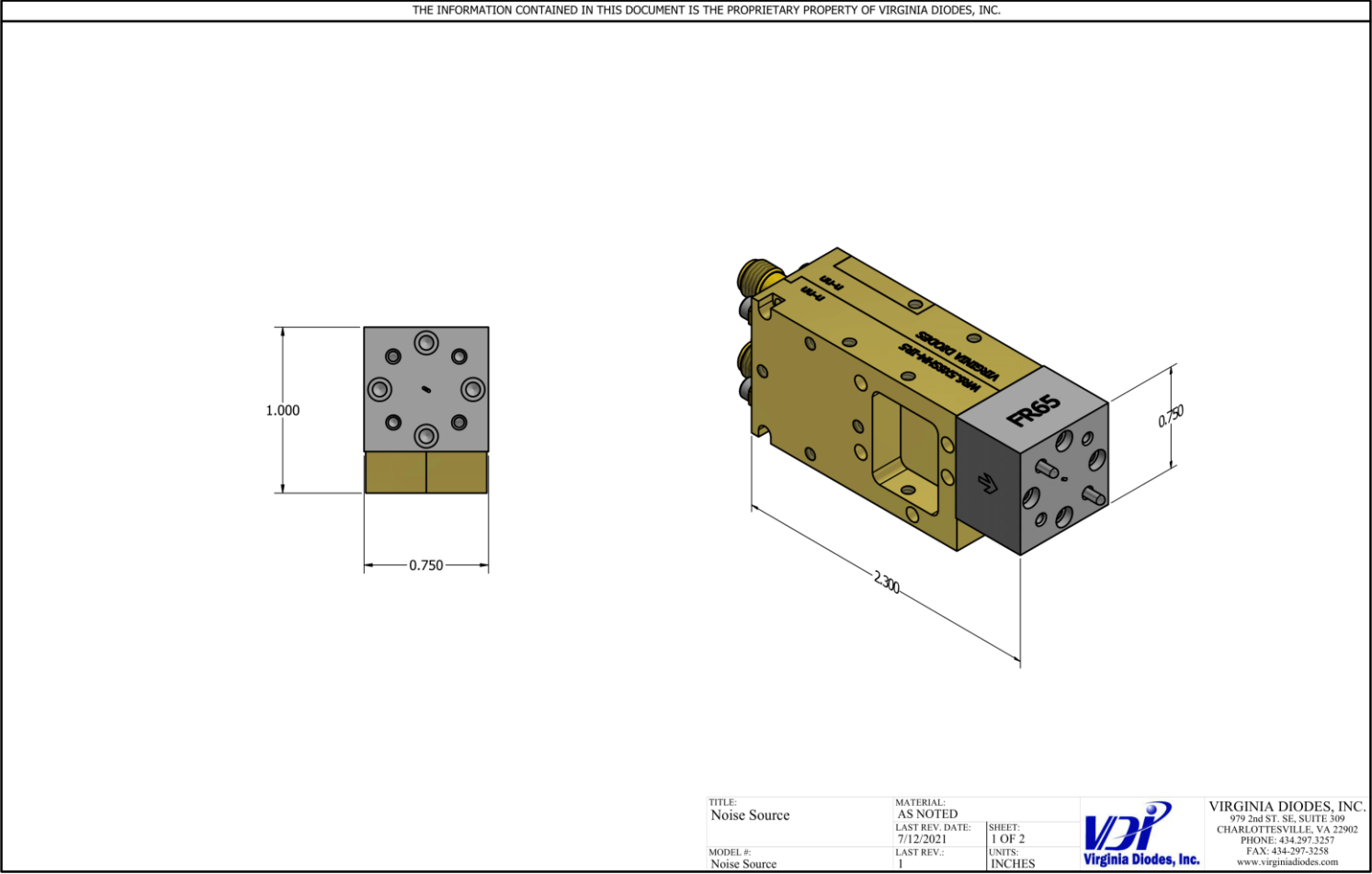


# Noise Source Performance – Continued





Drawing of the WR6.5NS is shown. The length of the WR6.5NS is 2.30". The length of the Noise Source can vary by band (~2.28" to ~2.58").



# 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:

### Virginia Diodes, Inc.

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