Keysight Technologies N5262BWxx, N5262BTxx, and N5262BRxx Mini VNAX Frequency Extension Modules

KEYSIGHT TECHNOLOGIES

Product Note

Notices

Trademark Acknowledgments

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Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Keysight Technologies N5262BWxx, N5262BTxx and N5262BRxx Mini VNAX Frequency Extension Modules

The Keysight N5262BWxx Transceiver Modules (Tx/Rx), the N5262BRxx Receiver Modules (Rx), and the N5262BTxx Transmitter (TxRef) Modules are manufactured by Virginia Diodes, Inc. (VDI). These modules may be used with the Keysight N5222/24/25/27A/B PNA or N5242/44/45/47A/B PNA-X, or the Keysight N5261/62A or N5292A Controller to configure a banded millimeter-wave network analyzer system.

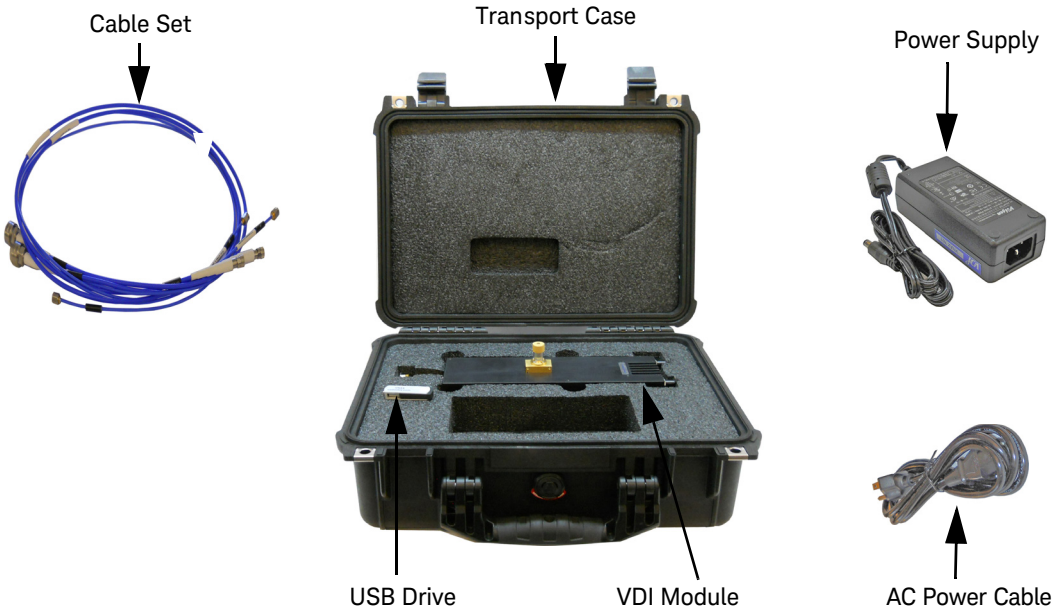
Refer to the VDI User's Guide (VDI-707.1) included on the USB drive or at: https://www.vadiodes.com/images/Products/VNA/Product_Manual/VDI-707.1-VNAx-Product-Manual.pdf

N5262BWxx transceiver modules have both a source and measurement receiver and can be used with the network analyzer to make S-parameter reflection measurements. Another transceiver or receiver module is required to make transmission measurements. Transceiver modules are also known as transmission/reflection modules.

N5262BTxx transmitter modules have only a source and a reference receiver. They can be used with the network analyzer to make S-parameter transmission measurements only and require a receiver module or a transceiver module to complete the network analyzer system.

N5262BRxx receiver modules have only a measurement receiver. They can be used with the network analyzer to make S-parameter transmission measurements only and require a transmitter module or a transceiver module to complete the network analyzer system.

Figure 1



Option Information

Refer to the section "Configuring a Module: Ordering a VDI VNAX Mini-Module, N526xBxx" on page 20 of the **Keysight Technologies Banded Millimeter Wave Network Analysis Technical Overview** at https://literature.cdn.keysight.com/litweb/pdf/5992-2177EN.pdf?id=2870369&cc=US&lc=eng#page=22

RF/LO Input Power Options

Option 120: Requires +10 dBm at the module input. Recommended for use with the test set and 1.2m cable set.

Option 500: Requires +2 dBm at the module input. Recommended for direct connect with 1.2m or 5m cable sets, or the test set with a 5m cable set.

NOTE **When using a 1.2m cable set with Option 500, ensure that is set to 2 dBm at module input. Reduce power on the PNA, or use attenuators.**

All models include a 9 Vdc power supply and have compatible options for use with a PNA/PNA-X or test set controller (see **Tables 1-5**, beginning on page 5).

Cable sets are available for purchase for use with the modules. For cable set options, see page 7.

For information on the controller, refer to the **N5261A and N5262A User's and Service Guide (N5262-90001)** at http://literature.cdn.keysight.com/litweb/pdf/N5262-90001.pdf?id=1541557

The TxRx and TxRef modules are available with internal micrometer adjustable (0-30 dB) attenuators. The Rx modules include an external attenuator for high sensitivity.

For ordering information, reference the **Keysight Technologies Banded Millimeter Wave Network Analysis Technical Overview** at https://literature.cdn.keysight.com/litweb/pdf/5992-2177EN.pdf?id=2870369&cc=US&lc=eng

Table 1 TxRx Transceiver Mini Modules (STD)

Waveguide Flange	Extended Frequency (GHz)	Keysight Model	VDI P/N (1.2 m Cable Set)	VDI P/N (5 m Cable Set)
WR28	26.5 to 40	N5262BW28-STD	VNAX-WR28TxRx-M-TST-XXX-1.2	VNAX-WR28TxRx-M-TST-XXX-5
WR19	40 to 60	N5262BW19-STD	VNAX-WR19TxRx-M-TST-XXX-1.2	VNAX-WR19TxRx-M-TST-XXX-5
WR15	47 to 77	N5262BW15-STD	VNAX-WR15TxRx-M-TST-XXX-1.2	VNAX-WR15TxRx-M-TST-XXX-5
WR12 *	55 to 95	N5262BW12-STD	VNAX-WR12TxRx-M-TST-XXX-1.2	VNAX-WR12TxRx-M-TST-XXX-5
WR10 *	67 to 115	N5262BW10-STD	VNAX-WR10TxRx-M-TST-XXX-1.2	VNAX-WR10TxRx-M-TST-XXX-5
WR8.0	90 to 140	N5262BW08-STD	VNAX-WR8.0TxRx-M-TST-XXX-1.2	VNAX-WR8.0TxRx-M-TST-XXX-5
WR6.5	110 to 170	N5262BW06-STD	VNAX-WR6.5TxRx-M-TST-XXX-1.2	VNAX-WR6.5TxRx-M-TST-XXX-5
WR5.1	140 to 220	N5262BW05-STD	VNAX-WR5.1TxRx-M-TST-XXX-1.2	VNAX-WR5.1TxRx-M-TST-XXX-5
WR4.3	260 to 400	N5262BW04-STD	VNAX-WR4.3TxRx-M-TST-XXX-1.2	VNAX-WR4.3TxRx-M-TST-XXX-5
WR3.4	220 to 330	N5262BW03-STD	VNAX-WR3.4TxRx-M-TST-XXX-1.2	VNAX-WR3.4TxRx-M-TST-XXX-5
WR2.8 **	260 to 400	N5262BW2B-STD	VNAX-WR2.8TxRx-M-TST-XXX-1.2	VNAX-WR2.8TxRx-M-TST-XXX-5
WR2.2 **	330 to 500	N5262BW02-STD	VNAX-WR2.2TxRx-M-TST-XXX-1.2	VNAX-WR2.2TxRx-M-TST-XXX-5

Table 2 TxRx Transceiver Mini Modules with Attenuators (001)

Waveguide Flange	Extended Frequency (GHz)	Keysight Model	VDI P/N (1.2 m Cable Set)	VDI P/N (5 m Cable Set)
WR28	26.5 to 40	N5262BW28-001	VNAX-WR28TxRx-M-TST-A-XXX-1.2	VNAX-WR28TxRx-M-TST-A-XXX-5
WR19	40 to 60	N5262BW19-001	VNAX-WR19TxRx-M-TST-A-XXX-1.2	VNAX-WR19TxRx-M-TST-A-XXX-5
WR15	47 to 77	N5262BW15-001	VNAX-WR15TxRx-M-TST-A-XXX-1.2	VNAX-WR15TxRx-M-TST-A-XXX-5
WR12 *	55 to 95	N5262BW12-001	VNAX-WR12TxRx-M-TST-A-XXX-1.2	VNAX-WR12TxRx-M-TST-A-XXX-5
WR10 *	67 to 115	N5262BW10-001	VNAX-WR10TxRx-M-TST-A-XXX-1.2	VNAX-WR10TxRx-M-TST-A-XXX-5
WR8.0	90 to 140	N5262BW08-001	VNAX-WR8.0TxRx-M-TST-A-XXX-1.2	VNAX-WR8.0TxRx-M-TST-A-XXX-5
WR6.5	110 to 170	N5262BW06-001	VNAX-WR6.5TxRx-M-TST-A-XXX-1.2	VNAX-WR6.5TxRx-M-TST-A-XXX-5
WR5.1	140 to 220	N5262BW05-001	VNAX-WR5.1TxRx-M-TST-A-XXX-1.2	VNAX-WR5.1TxRx-M-TST-A-XXX-5
WR4.3	260 to 400	N5262BW04-001	VNAX-WR4.3TxRx-M-TST-A-XXX-1.2	VNAX-WR4.3TxRx-M-TST-A-XXX-5
WR3.4	220 to 330	N5262BW03-001	VNAX-WR3.4TxRx-M-TST-A-XXX-1.2	VNAX-WR3.4TxRx-M-TST-A-XXX-5
WR2.8 **	260 to 400	N5262BW28-001	VNAX-WR2.8TxRx-M-TST-A-XXX-1.2	VNAX-WR2.8TxRx-M-TST-A-XXX-5
WR2.2 **	330 to 500	N5262BW02-001	VNAX-WR2.2TxRx-M-TST-A-XXX-1.2	VNAX-WR2.2TxRx-M-TST-A-XXX-5

* WR10 and WR12 models have SE0 and SE1 special export options available for reduced export requirements. WR10 and WR12 models have DS0 (no attenuators) or DS1 (with attenuators) dual source for IMD measurement options available.

** WR2.2 = WM-570; WR2.8 = WM-710.

Table 3 TxRef Transmitter Mini Modules (STD)

Waveguide Flange	Extended Frequency (GHz)	Keysight Model	VDI P/N (1.2 m Cable Set)	VDI P/N (5 m Cable Set)
WR15	47 to 77	N5262BT15-STD	VNAX-WR15TxRef-M-TST-XXX-1.2	VNAX-WR15TxRef-M-TST-XXX-5
WR12 *	55 to 95	N5262BT12-STD	VNAX-WR12TxRef-M-TST-XXX-1.2	VNAX-WR12TxRef-M-TST-XXX-5
WR10 *	67 to 115	N5262BT10-STD	VNAX-WR10TxRef-M-TST-XXX-1.2	VNAX-WR10TxRef-M-TST-XXX-5
WR3.4	220 to 330	N5262BT03-STD	VNAX-WR3.4TxRef-M-TST-XXX-1.2	VNAX-WR3.4TxRef-M-TST-XXX-5
WR2.2 **	330 to 500	N5262BT02-STD	VNAX-WR2.2TxRef-M-TST-XXX-1.2	VNAX-WR2.2TxRef-M-TST-XXX-5

Table 4 TxRef Transmitter Mini Modules with Attenuators (001)

Waveguide Flange	Extended Frequency (GHz)	Keysight Model	VDI P/N (1.2 m Cable Set)	VDI P/N (5 m Cable Set)
WR15	47 to 77	N5262BT15-001	VNAX-WR15TxRef-M-TST-A-XXX-1.2	VNAX-WR15TxRef-M-TST-A-XXX-5
WR12 *	55 to 95	N5262BT12-001	VNAX-WR12TxRef-M-TST-A-XXX-1.2	VNAX-WR12TxRef-M-TST-A-XXX-5
WR10 *	67 to 115	N5262BT10-001	VNAX-WR10TxRef-M-TST-A-XXX-1.2	VNAX-WR10TxRef-M-TST-A-XXX-5
WR3.4	220 to 330	N5262BT03-001	VNAX-WR3.4TxRef-M-TST-A-XXX-1.2	VNAX-WR3.4TxRef-M-TST-A-XXX-5
WR2.2 **	330 to 500	N5262BT02-001	VNAX-WR2.2TxRef-M-TST-A-XXX-1.2	VNAX-WR2.2TxRef-M-TST-A-XXX-5

Table 5 Rx Receiver Mini Modules with High Sensitivity External Attenuators (001)

Waveguide Flange	Extended Frequency (GHz)	Keysight Model	VDI P/N (1.2 m Cable Set)	VDI P/N (5 m Cable Set)
WR28	26.5 to 40	N5262BR28-001	WR28Rx-M-HS-TST-XXX-1.2	WR28Rx-M-HS-TST-XXX-5
WR19	40 to 60	N5262BR19-001	WR19Rx-M-HS-TST-XXX-1.2	WR19Rx-M-HS-TST-XXX-5
WR15	47 to 77	N5262BR15-001	WR15Rx-M-HS-TST-XXX-1.2	WR15Rx-M-HS-TST-XXX-5
WR12 *	55 to 95	N5262BR12-001	WR12Rx-M-HS-TST-XXX-1.2	WR12Rx-M-HS-TST-XXX-5
WR10 *	67 to 115	N5262BR10-001	WR10Rx-M-HS-TST-XXX-1.2	WR10Rx-M-HS-TST-XXX-5
WR8.0	90 to 140	N5262BR08-001	WR8.0Rx-M-HS-TST-XXX-1.2	WR8.0Rx-M-HS-TST-XXX-5
WR6.5	110 to 170	N5262BR06-001	WR6.5Rx-M-HS-TST-XXX-1.2	WR6.5Rx-M-HS-TST-XXX-5
WR5.1	140 to 220	N5262BR05-001	WR5.1Rx-M-HS-TST-XXX-1.2	WR5.1Rx-M-HS-TST-XXX-5
WR4.3	260 to 400	N5262BR04-001	WR4.3Rx-M-HS-TST-XXX-1.2	WR4.3Rx-M-HS-TST-XXX-5
WR3.4	220 to 330	N5262BR03-001	WR3.4Rx-M-HS-TST-XXX-1.2	WR3.4Rx-M-HS-TST-XXX-5
WR2.8 **	260 to 400	N5262BR2B-001	WR2.8Rx-M-HS-TST-XXX-1.2	WR2.8Rx-M-HS-TST-XXX-5
WR2.2 **	330 to 500	N5262BR02-001	WR2.2Rx-M-HS-TST-XXX-1.2	WR2.2Rx-M-HS-TST-XXX-5

NOTE If ordering a cable set separately, use model number to determine the appropriate set.

* WR10 and WR12 models have SE0 and SE1 special export options available for reduced export requirements. WR10 and WR12 models have DS0 (no attenuators) or DS1 (with attenuators) dual source for IMD measurement options available.

* * WR2.2 = WM-570; WR2.8 = WM-710.

Table 6 Available TxRx Cable Sets

Keysight Cable Option[a]	VDI Part Number	Description
501	CS-TST-TxRx-1.2	1.2m cable set for controller
505	CS-TST-TxRx-5	5m cable set for controller
201	CS-24-TxRx-1.2	1.2m cable set for 26.5 GHz PNA or PNA-X
205	CS-24-TxRx-5	5m cable set for 26.5 GHz PNA or PNA-X
401	CS-40-TxRx-1.2	1.2m LF cable set for > 43 GHz PNA or PNA-X
405	CS-40-TxRx-5	5m dual cable set for > 43 GHz PNA or PNA-X

a. TxRx cable sets include IF (2x), LO and RF cables.

Table 7 Available Rx Cable Sets

Keysight Cable Option[a]	VDI Part Number	Description
501	CS-TST-Rx-1.2	1.2m cable set for controller
505	CS-TST-Rx-5	5m cable set for controller
201	CS-24-Rx-1.2	1.2m cable set for 26.5 GHz PNA or PNA-X
205	CS-24-Rx-5	5m cable set for 26.5 GHz PNA or PNA-X
401	CS-40-Rx-1.2	1.2m LF cable set for > 43 GHz PNA or PNA-X
405	CS-40-Rx-5	5m dual cable set for > 43 GHz PNA or PNA-X

a. Rx cable sets include IF and LO cables.

Table 8 Available TxRef Cable Sets

Keysight Cable Option[a]	VDI Part Number	Description
501	CS-TST-TxRef-1.2	1.2m cable set for controller
505	CS-TST-TxRef-5	5m cable set for controller
201	CS-24-TxRef-1.2	1.2m cable set for 26.5 GHz PNA or PNA-X
205	CS-24-TxRef-5	5m cable set for 26.5 GHz PNA or PNA-X
401	CS-40-TxRef-1.2	1.2m LF cable set for > 43 GHz PNA or PNA-X
405	CS-40-TxRef-5	5m dual cable set for > 43 GHz PNA or PNA-X

a. TxRef cable sets include LO/RF and one IF cable.

Serial Numbers

The product serial number is the OEM serial number **VNAXxxxx** (xxxx = numbers in the OEM serial number) assigned by Virginia Diodes, Inc. Refer to the label on the product for the serial number.

Serial Number Prefix Information

For model **N5262BW02 (WR2.2TxRx-M)**, new serial number prefix US6002 indicates a test port power specified by VDI at -3 dBm typical. Old serial number prefix US5625 indicates a test port power specified by VDI at -8 dBm typical.

For models **N5262BW03 (WR3.4TxRx-M)**, and **N5262BT03 (WR3.4TxRef-M)**, serial number prefix US5918 indicates a test port power specified by VDI at +1 dBm typical. Serial number prefix US5427 indicates a test port power specified by VDI at -6 dBm typical.

For model **N5262BW05 (WR5.1TxRx-M)**, new serial number prefix US6002 indicates a test port power specified by VDI at +6 dBm typical. Old serial number prefix US5425 indicates a test port power specified by VDI at -1 dBm typical.

For model **N5262BW06 (WR6.5TxRx-M)**, serial number prefix US5921 indicates a test port power specified by VDI at +13 dBm typical. Serial number prefix US5425 indicates a test port power specified by VDI at +9 dBm typical.

For model **N5262BW10 (WR10TxRx-M)**, new serial number prefix US5918 indicates a test port power specified by VDI at +18 dBm typical. Old serial number prefix US5803 indicates a test port power specified by VDI at +11 dBm typical. Old serial number prefix US5725 indicates a change from a rear heat-sink to a rear fan cooling system.

NOTE All Models include a 9V power supply

NOTE 5m modules can be used with 1.2 cable sets when power is reduced. Refer to VDI Users Guide recommendations.

NOTE Refer to Table 1 through Table 5 to identify the VDI part numbers of the cable set supplied with each module:

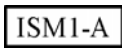
C40 - direct connect to PNA > 43.5 GHz
C24 - direct connect to PNA > 26.5 GHz
CTS - connect to controller

Cable set is included when Option 201, 205, 401, 405, 501 or 505 is ordered (see tables on page 7). When Option NOC is ordered, no cable set is supplied and XXX will be blank.

NOTE Modules sold for use with 1.2 meter cable sets have a 10 dBm (± 3 dBm) RF and LO power requirement at module inputs. For direct connection ONLY using FOM, the PNA source power may indicate unleveled at 10 dBm. Reduce power until the unleveled warning turns off, ensuring the power level is at least 7 dBm at input to module.

Instrument Markings

Listed below are definitions for the markings that may be found on the product.

	The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instructions in the documentation.
	The AC symbol indicates the required nature of the line module input power.
	This symbol indicates separate collection for electrical and electronic equipment, mandated under EU law. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive).
	This symbol indicates that the power line switch is ON.
	This symbol indicates that the power line switch is in the STANDBY position.
	This symbol indicates that the power line switch is in the OFF position.
	This symbol is used to identify a terminal which is internally connected to the product frame or chassis.
	The CE mark is a registered trademark of the European Community.
ccr.keysight@keysight.com	The Keysight email address is required by EU directives applicable to our product.
	The CSA mark is a registered trademark of the CSA International.
	This is a symbol of an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 5).
	This is a marking to indicate product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001).
	Direct Current.
IP 2 0	The instrument has been designed to meet the requirements of IP 2 0 for egress and operational environment.
	The RCM mark is a registered trademark of the Australian Communications and Media Authority.
	Indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.
	This symbol on all primary and secondary packaging indicates compliance to China standard GB 18455-2001.
	South Korean Certification (KC) mark; includes the marking's identifier code.

EMC Compliance

Complies with the essential requirements of the European EMC Directive as well as current editions of the following standards (dates and editions are cited in the Declarations of Conformity):

- IEC/EN 61326-1
- CISPR Pub 11 Group 1, Class A
- AS/NZS CISPR 11
- ICES/NMB-001
  This ISM device complies with Canadian ICES-001.
  Cet appareil ISM est conforme a la norme NMB-001 du Canada.

South Korean Class A EMC Declaration

If there is a "KC" mark on the instrument, then the following statement applies:

This equipment has been conformity assessed for use in business environments. In a residential environment, this equipment may cause radio interference.

※ This EMC statement applies to the equipment only for use in a business environment.

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Complies with the following standard (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61010-1

Acoustic Statement (European Machinery Directive)

Acoustic noise emission
LpA <70 dB
Operator position
Normal operation mode per ISO 7779

To find a current Declaration of Conformity for a specific Keysight product, go to:
https://regulations.about.keysight.com/DoC/default.htm

Keysight Support, Services, and Assistance

To verify the contents shipped with your product, refer to the "Box Content List" included with the shipment.

Inspect the shipping container. If the container or packing material is damaged, it should be kept until the contents of the shipment have been checked mechanically and electrically. If there is any physical damage, refer to “Contacting Keysight” below. Keep the damaged shipping materials (if any) for inspection by the carrier and a Keysight Technologies representative.

Keysight Technologies provides warranty service, if a repair is needed. The product is serviced by VDI, which requires that the product be returned to VDI or Keysight.

Contacting Keysight

Assistance with test and measurement needs, and information on finding a local Keysight office are available on the Internet at:
http://www.keysight.com/find/assist

You can also purchase accessories or documentation items on the Internet at:
http://www.keysight.com/find

If you do not have access to the Internet, contact your field engineer.

NOTE

In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine the warranty status of your unit.

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