DATASHEET

Spirent Vertex® High Frequency Converter

Enabling Channel Emulation for 5G Applications

The Vertex High Frequency Converter (HFC) was developed to bring advanced channel emulation test capabilities to 5G applications by extending the Vertex channel emulator frequency range from radio frequency (RF) bands to higher mmWave frequency bands. Depending on the model, the Vertex HFC converts RF ranges between 0.75GHz and 6GHz to mmWave (mmW) ranges between 5.9GHz and 40.5GHz and vice versa, allowing channel characteristic simulation in millimeter band scenarios required for 5G implementation. It can also be customized to support other mmW frequencies.

Typical Application Scenarios

The Vertex HFC can be used to inject RF channel emulation between a mmW band eNodeB (eNB) and mmW band device (Figure 1). Other scenarios include upconverting from an RF band network emulator or eNB to a mmW band device (Figure 2).

Key Features

- Supports basic 2x2 MIMO or massive MIMO applications at mmW bands
- Four models to accommodate different conversion ranges and capacities
- Supports internal or external local oscillator (LO)

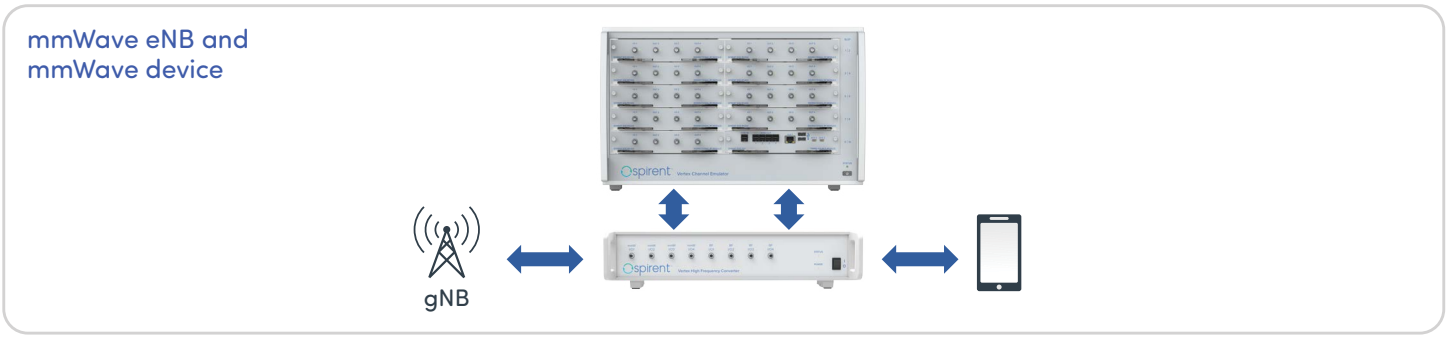

Figure 1

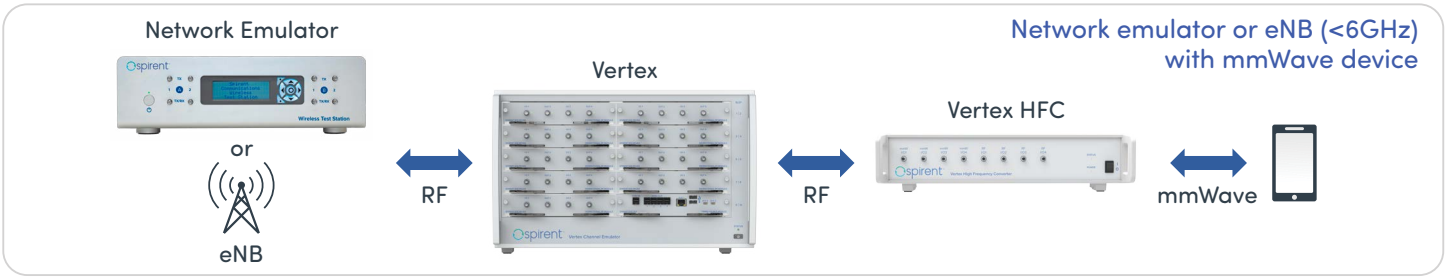

Figure 2

Available in Four Configurations

The Vertex HFC is available in four different frequency ranges to best suit the application and accommodates up to 4 channels per instrument. An individual unit addresses entry level 2x2 bidirectional tests or multiple units can be strung together for multi-Vertex instrument applications.

Frequency range	24.25 to 29.5GHz	37 to 40.5GHz	9-13GHz	5.9-10GHz
Model Number	VCE6-HFC-4C-27GHz	VCE6-HFC-4C-39GHz	VCE6-HFC-4C-11GHz	VCE6-HFC-4C-7GHz
LO	23. 5GHz	35GHz	14.5GHz	11.75GHz
External LO level	4dBm	4dBm	4dBm	4dBm
Internal RF filter	DC-6GHz	DC-6GHz	DC-6GHz	DC-6GHz
Internal mmW filter	24.25 to 29.5GHz	37 to 40.5GHz	9-13GHz	5.9-10GHz
Input frequency	0.75 to 6GHz	2 to 5.5GHz	1.5 to 5.5GHz	1.75to 5.85GHz
Maximum input power level to any RF/ mmWave port	<27.5dBm	<27.5dBm	<27.55dBm	<27.5dBm
Nominal RF input power level for 5G NR, 100MHz	-2dBm	-2dBm	0dBm	0dBm
Nominal mmWave power level for 5G NR, 100MHz	-2dBm	-2dBm	0dBm	0dBm
Conversion loss	<22dB	<24dB	<22dB	<22dB
10MHz reference	External	External	External	External
In-band spurious emission	-40dBc	-40dBc	-40dBc	-40dBc
Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Input VSWR	<1.5	<1.5	<1.5	<1.5
Typical phase noise of LO	-115dBc/Hz (@100kHz)	-105dBc/Hz (@100kHz)	-125dBc/Hz (@100kHz)	-128dBc/Hz (@100kHz)

Note: When multiple HFCs are used in a system to increase channel capacity, please be sure their external clocks are are all connected to the same qualified 10MHz clock source.

About Spirent Communications
Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks. We help bring clarity to increasingly complex technological and business challenges. Spirent's customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled. For more information visit: **www.spirent.com**

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