

WJ1000A

mmWaveJudge Remote Receiver

Introduction

The Keysight WJ1000A mmWaveJudge remote receiver is used with a WaveJudge wireless analyzer platform, either WJ5000A or WJ5900A, to extend reception to mmWave frequencies. The WaveJudge solution is ideal for analyzing and troubleshooting complex 5G NR protocol, timing, and RF issues for quick identification and resolution.



Specifications

These specifications describe the performance of the Keysight WJ1000A mmWaveJudge Remote Receiver. mmWaveJudge is used with a WaveJudge wireless analyzer platform, either the WJ5000A or the WJ5900A, to extend reception to mmWave frequencies for analysis of 5G NR frequency range 2 (FR2) networks and devices.

Receiver specifications

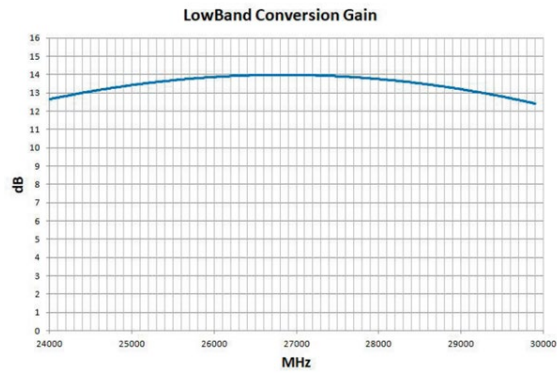
Specifications describe the performance expected at the mm input port of the mmWaveJudge receiver.

Description	Specification	Conditions
mmWave frequency		
Frequency ranges	24 to 30 GHz 37 to 42.5 GHz	
Bandwidth	≤ 800 MHz	
mmWave amplitude		
Input power	-5 dBm	IP3
	-9 dBm	P1dB
	< -25 dBm	Ideal power level for good linearity
	< 0 dB	Maximum power level
Input return loss	< -13 dB	50 ohms, single-ended
Conversion gain	See Figures 1 and 2	
mmWave noise		
Noise figure	< 6 dB	SSB
Phase noise	See Figure 3	Normalized to 4 GHz

Receiver characteristics

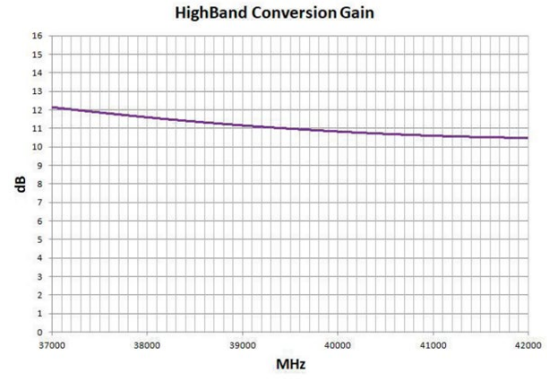
The following table describes the physical characteristics of the mmWaveJudge receiver.

Description	Characteristic	Connection	Connector type
LO input	2.6 to 4.7 GHz	LO OUT port of WJ5000/5900A RF module	2.92 mm female connector, standard thread, 50 ohms
IF output	2.6 to 4.7 GHz	RF IN port of WJ5000/5900A RF module	2.92 mm female connector, standard thread, 50 ohms
RF input	24 to 30 GHz, 37 to 42.5 GHz	Device under test	2.92 mm female connector, standard thread, 50 ohms
DC power		RF PWR port of WJ5000A 5G RF module or mmWave port of WJ5900A RF module	USB type C
Operation	WaveJudge software	Residing on a PC connected to WJ5000 or WJ5900A	Ethernet
Physical dimensions	3 x 2 x 0.7 inches (W x H x D) (7.62 x 5.08 x 1.778 cm)		



Low band 24 GHz to 30 GHz

Figure 1. Conversion gain for 24 to 30 GHz



High band 37 GHz to 42.5 GHz

Figure 2. Conversion gain for 37 to 42.5 GHz

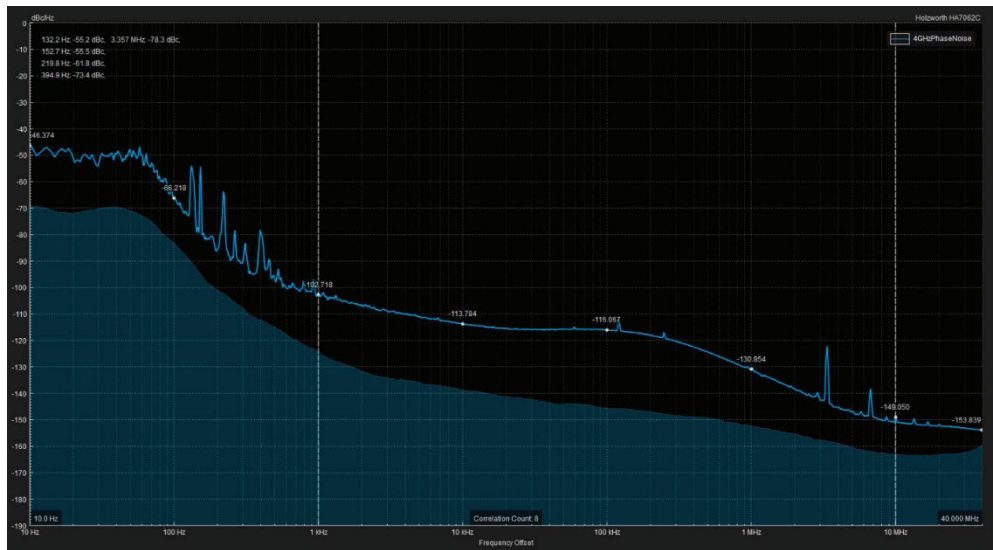


Figure 3. Phase noise analysis

Analyze and Troubleshoot 5G NR FR2

As a mmWave to IF (intermediate frequency) converter, the palm-sized mmWaveJudge works seamlessly with 5G NR RF modules used in the WJ5000A or WJ5900A wireless analyzer platform to extend 5G NR analysis to FR2.

- Powerful over-the-air test solution for 5G NR base station and UE developers, and 5G NR operators
- Visibility across the whole 5G protocol stack from PHY to upper layers
- 2x2 MIMO or massive MIMO applications at mmWave frequencies
- Root cause troubleshooting and analysis

Whether in live, high-traffic wireless networks, or in the controlled atmosphere of chambered environments, Keysight's mmWaveJudge remote receiver captures communication between a mmWave gNodeB (gNB) and a mmWave device and down converts the frequency for effective analysis and troubleshooting using either of the WaveJudge wireless analyzer platforms - WJ5000A or WJ5900A.

For more information

For more insights on how to analyze and troubleshoot 5G NR protocol, timing, and RF behavior as well as those of other technologies, check the following links.

For analysis in real time or later analysis with captured IQ data, visit [Wireless Analyzer Platforms](#).

To analyze and troubleshoot protocol, timing, and RF behavior for LTE, 5G NR, Wi-Fi and more, look at [SJ001A WaveJudge Wireless Analyzer Toolset](#) software solutions.