



WaveJudge 5G Wireless Testing OTA

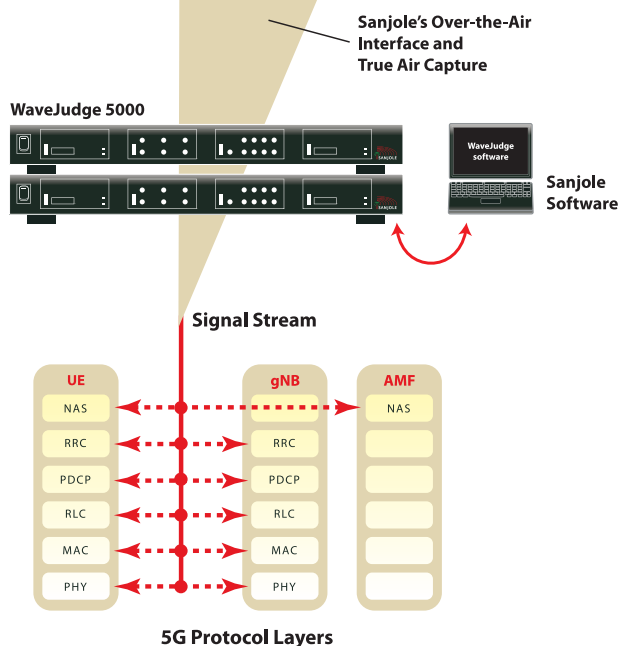
With the adoption of 5G NR as the worldwide 5G standard, developers and service providers are now tasked with finding appropriate and effective wireless test tools to enable first-to-market success.

The Sanjole WaveJudge has been a solid over-the-air test solution for emerging wireless technologies and continues to prove its worth with its new 5G module.



This is the first over-the-air 5G monitoring solution to give you visibility into the interaction between protocol and physical layers in wireless transmissions. Using high-speed programmable hardware for in-the-field updates, the module ensures scalability and investment protection by operating as a plug-in component for the industry-leading, full-featured WaveJudge 5000 platform. It eliminates the need to rely on unproven single function 5G test systems that lack the comprehensive and multi-functional test architecture of the WaveJudge platform hardware, software and user interface.





Sub 6 GHz + mmWave testing all in a single system

Today's 5G testing requires a system that allows both testing of RF channels below 6 GHz along with new IF and mmWave frequencies and wider channel bandwidths. With the flexibility of the WaveJudge, you can invest in a single system and be assured it will cover all your troubleshooting requirements for 5G!

PHY first please...

WaveJudge 5000 5G analyzer allows testing of all PHY layer aspects which are new to 5G. Verify all your physical channels and leverage this use to integration testing once the upper layers are implemented. With an all-layer solution you can get started early in R&D of the PHY layers while planning for upper layer integration testing and inter-operability of devices.

Best 5G modules in class

With our superior RF performance, you have the correct tool for the rigorous testing requirements laid out by the complexities of 5G. Sanjole's 5G RX module is the latest addition to our WaveJudge 5000 family of modules and includes analysis of 800 MHz (8x100 MHz) channel BW in a 1400 MHz window and superior dynamic range! The module supports sub 6 GHz testing along with IF captures from 3 GHz – 11 GHz. The module also interfaces with our remote mmWave radio receiver supporting 28 GHz and 38 GHz bands.

Test 3GPP 5G NR non-standalone and standalone with the same system components

Our software based PHY approach allows quick testing along with protection of investment as you navigate, develop and test through the evolving 3GPP 5G NR standards.

Protection of investment for 4G/5G interworking testing

The WaveJudge 5000's modularity enables testing of interworking between both 4G and 5G. Troubleshooting non-standalone 5G with 4G anchor cells is made possible through our award-winning WaveJudge software which supports both technologies in a single easy to use interface.

Locate complex issues

With WaveJudge's cross layer correlation capabilities it has never been easier to locate those complex issues that cause delays in your production goals. Unlike systems that combine multiple test components, our extensive PHY layer analysis engine is mapped directly with our upper layer decode capabilities. The WaveJudge 5000 allows testing 5G at all layers with full correlation!

BENEFITS AT A GLANCE

With the Sanjole WaveJudge 5000 and 5G module you can

- Achieve faster time to market using our industry proven test platform and state-of-the-art 5G modules
- Understand the interactions between 5G user equipment and gNB base station at all layers
- Evaluate conditions in mixed 5G and 4G environments (5G NSA)
- Test the behavior and performance characteristics of networks resulting from the addition of IoT devices and data
- Analyze the PHY layer early in development while maintaining same platform for upper layer correlation
- Evaluate mobile applications including autonomous vehicles and vehicle-to-vehicle communications
- Identify complex causes of interoperability problems
- Improve the performance of the overall wireless connection
- Verify gNB behavior from an over-the-air interface, including complex antennae and modulation schemes
- Evaluate the impact on performance of 5G MIMO, beamforming and scheduling
- Capture wireless conditions in the field for replay in the lab
- Accurately identify anomalies that affect throughput and delay

KEY FEATURES AND TEST CAPABILITIES

The WaveJudge 5G module currently supports the following with more new features being added weekly to accommodate advancements in the 5G standard.

- Massive MIMO
- Beamforming
- Sub-6 GHz and mmWave spectrums
- 800 MHz analysis over 1.4 GHz channel bandwidth
- Software defined radios to handle different PHY
- Highly scalable platform for easy configuration of complex test cases

Specifications

Modulation Formats

- OFDMA/SC-FDMA with BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM

Port Triggers

- Manual Trigger In
- Trigger on Power

Traces

- Constellation
- Time Domain Power
- EVM vs. SubCarrier
- EVM vs. Symbol Time
- MIMO Rank per subcarrier
- MIMO Rank per symbol
- Spectral Flatness (Frequency Domain)
- Amplitude Flatness (Time Domain)
- CCDF, PAPR
- Spectral Power
- Amplitude, Phase, Frequency during synchronization signal
- Impulse Response

Statistics

- EVM
- EVM Peak
- Reference signal EVM
- Carrier and Sampling Clock Frequency Error
- IQ Offset
- CFI Error Rate
- Payload Bits
- RSSI, RSRP, RSRQ

Protocol Analyzer Decodes

- Physical Channels
- MAC
- RLC
- PDCP
- RRC
- NAS
- WireShark supported decodes available

5G RXJudge Module

- Channel Coverage Extent including Instantaneous Bandwidth (Range -700 to Range +700)
- Full Range of Channel Frequencies: 2.3 GHz – 11.7 GHz
- Channel Center Frequencies

at 100 MHz Bandwidth: 2.35 GHz – 11.65 GHz

at 200 MHz Bandwidth: 2.4 GHz – 11.7 GHz

- Instantaneous Bandwidth: 1400 MHz
- Interconnects with 28 GHz and 38 GHz mmWave remote RX

Call for a Demonstration

To inquire about a demonstration or for more information, please call Sanjole at 1-808-457-1452 or email sales@sanjole.com.

About Sanjole

Sanjole is a leader in 5G, 4G and WIFI testing and innovation with expertise in emerging wireless technologies. Sanjole provides problem solving capabilities from inside the wireless network through over-the-air analysis tools that provide visibility into events spanning multiple layers. Sanjole has been involved from the very beginning of LTE as a test vendor in the LTE/SAE Trial Initiative (LSTI) events for both fixed and wireless devices. Our work with the WiMAX Forum and 3GPP, participation in the Small Cell Forum, TETRA, WIFI Alliance, MulteFire Alliance and extensive experience in interoperability trials, enable deep insight into the complex technical issues specific to the LTE and 4G and 5G community.

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