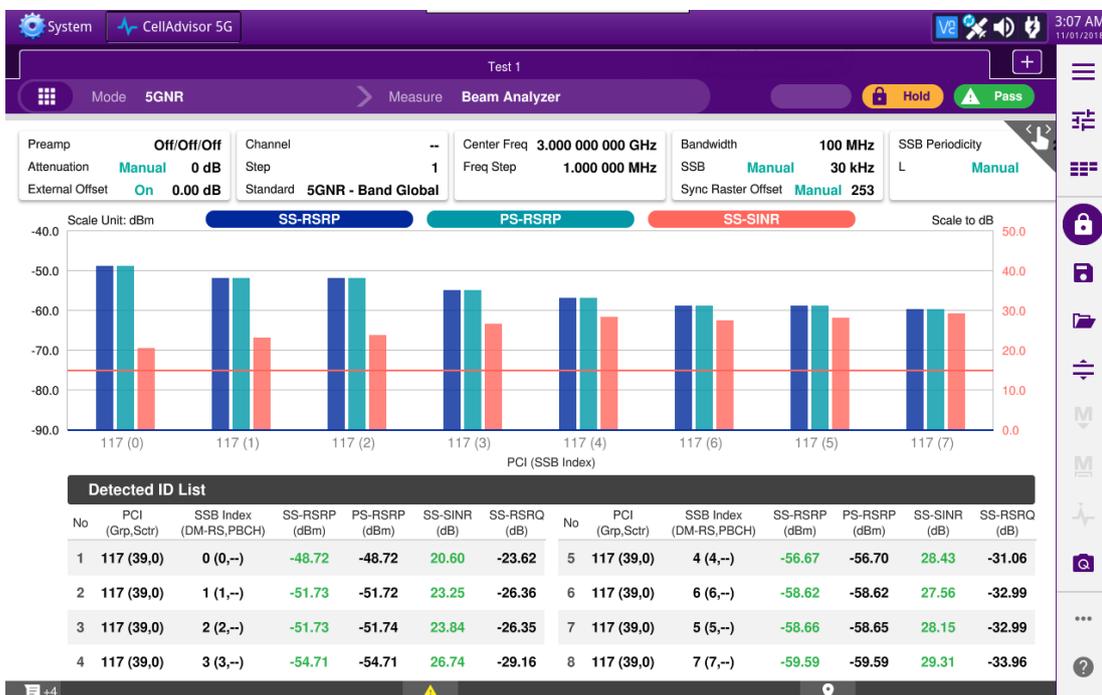


Case Study

# Using CellAdvisor 5G for Beam Analysis

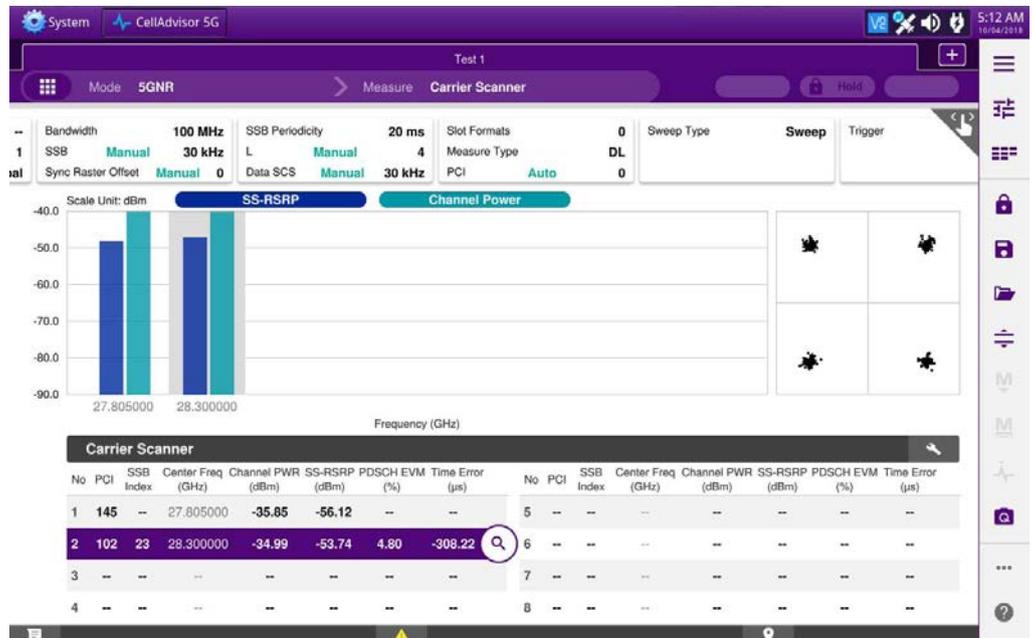
5G will revolutionize the connected world, bringing broadband capacity, gigabit speeds, ultra reliability, low latency, and massive machine type communication. Massive MIMO and antenna beamforming are the key technologies enabling 5G, which will change from static cell-centric coverage to dynamic user-based coverage for 5G radio access networks. Beamforming is the ability to generate and shape multiple beams using a much larger antenna array by manipulating the phase and amplitude of the signals thereby directing energy to a user's specific service area. At higher frequencies, such as frequency range 2 (FR2), millimeter wave (small wavelength) makes it easy to integrate a larger array into a relatively smaller form factor. Utilization of millimeter wave, which is essential for massive MIMO and beamforming, presents additional obstacles, as these frequencies are much more susceptible to propagation loss from environmental conditions. Validating over-the-air (OTA) performance is extremely important to ensure UE can perform beam tracking and switching in this challenging RF environment.



CellAdvisor 5G Beam Analyzer

## Problem Statement

To achieve gigabit throughput in 5G, 3GPP specs offer flexibility to deploy wider channel bandwidth by utilizing carrier aggregation and higher order spectrum. Frequency range 1 (FR1) which is sub-6GHz, offers channel bandwidth from 5MHz to 100MHz, and FR2 (millimeter wave) from 50MHz to 400MHz. However, typical field spectrum and interference analyzers don't even support 100MHz of channel bandwidth, and



CellAdvisor 5G Carrier Scanner

validating beam performance by performing beam scanning—which is a new 5G feature—is not supported at all. This offers a challenge for operators who need to perform beam-centric radio planning and optimization and need to quickly troubleshoot and identify the root cause of poor antenna and beamforming performance.

## Solution

VIAMI has partnered with top service providers to develop CellAdvisor 5G, the industry's most comprehensive field test solution, to aid in the deployment and maintenance of new 5G cells as well as legacy cell sites. CellAdvisor 5G is the ideal field portable solution to validate and deploy 5G radio access networks, and performs the following functions:

- 5G signal demodulation for a full 100MHz channel bandwidth, enabling real-time error vector magnitude (EVM) diagrams and modulation quality measurements
- 5G carrier scan measuring up to eight wide-band carriers' power as well as strongest beam power level and corresponding identifier (ID)
- 5G beam analyzer assessing individual beam IDs, power level, and corresponding signal-to-noise ratios
- 5G route map for coverage verification, mapping in real time the physical cell identity (PCI) and beam strength, as well as providing coverage data for post-processing
- Real-time spectrum and interference analysis with persistence display in 5G FR1 (Sub-6GHz) and FR2 (mmWave) bands

With CellAdvisor 5G, cell technicians for service providers can test all aspects of the cellular network, focusing on critical physical interfaces—fiber, coax, and RF—making it the most comprehensive, easiest to use portable wireless test equipment available.



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