

MOBILE MEASUREMENTS 5G AND LTE

On-site spectrum analysis

Providing a full spectrum scan and channel analysis for mobile bands based on the NRFP (National Radio Frequency Plan) channel plans. With years of spectrum management and analyzing experience, LS created software using regulation-based information to detect on site existing channels and give in-depth information on in-band activity.

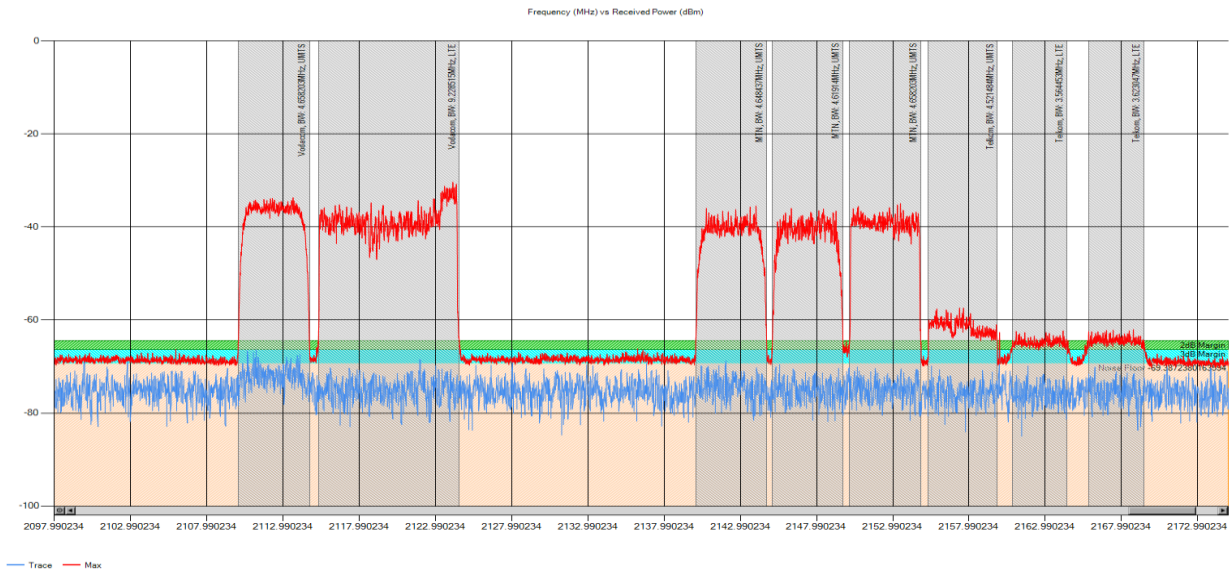


Figure 1: Spectrum occupancy plot with detected channels with service provider information (934 MHz - 960 MHz)

Mobile RPA measurements

LS provides a unique RF mobile measurement service for both LTE and 5G technologies. LS developed an RPA solution to be able to measure and extract important RF and demodulated parameters in the face of the antenna. This allows highly accurate delivery of:

LTE RPA Measurements

LTE downlink broadcast channels are demodulated to obtain information regarding LTE transmission. Each LTE sector (Cell ID) are then analyzed individually due to variations in heading, tilt, EIRP and beam width. The following can therefore be generated:

- Demodulated broadcast channel parameters synchronized with highly accurate GPS position
 - RSRP, RSSI, RSRQ
 - EARFCN, Cell ID, Physical Cell ID, Channel Bandwidth, Duplex Mode, # Antennas, PLMN Count, MCC/MNC, Country, Network (Service provide)
- Sectorized antenna radiation pattern display
- Combined sector 3D radiation pattern display
- Individual sector 3D radiation pattern display
- EIRP (Effective Isolated Radiated Power) calculation

5G NR RPA Measurements

A demand for 5G NR site analysis has become a crucial part of the 5G roll out process. Due to the complexity of 5G NR massive MIMO antenna systems, it is necessary to be able to demodulate and analyze every transmission beam per sector of a 5G mobile site.

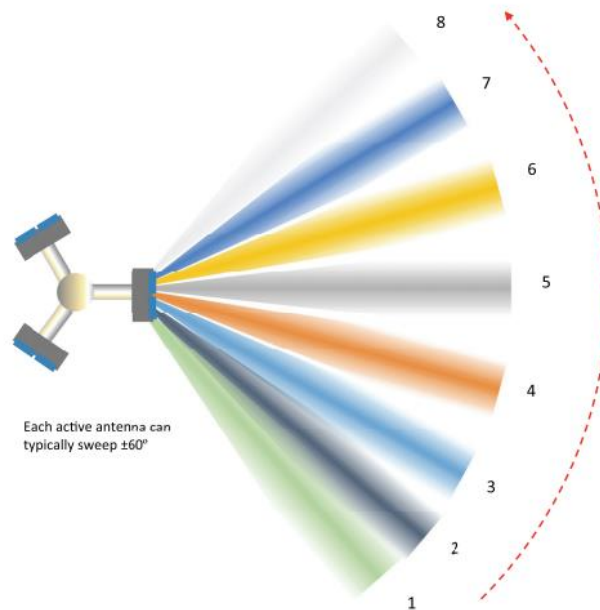


Figure 2: Primary synchronisation signal step sweeping across antenna beams (ref: <https://dl.cdn-anritsu.com/en-us/test-measurement/files/Application-Notes/Application-Note/11410-01160A.pdf>)

5G massive MIMO antennas consist of multiple beams (primarily 8), over which the primary and secondary synchronization signals sweep. The 5G NR RPA system of LS enables demodulation of these synchronization signals over 8 beams simultaneously to be able to extract usable parameters for analysis. With this information it is possible to generate:

- Demodulated synchronisation parameters synchronized with highly accurate GPS position
 - Channel power and channel power spectrum density
 - Physical Cell ID information

- Cell ID,
 - Frequency Error,
 - detected beams and
 - sector ID
 - Synchronization Signal Block information
 - Beam power and EVM for
 - RS-PBCH, PBCH, PSS, SSS channels
 - SS-RSRP, SS-RSRQ, SS-SINR
- Constellation data collection
 - Modulation type
 - IQ pairs per selected beam

Web report

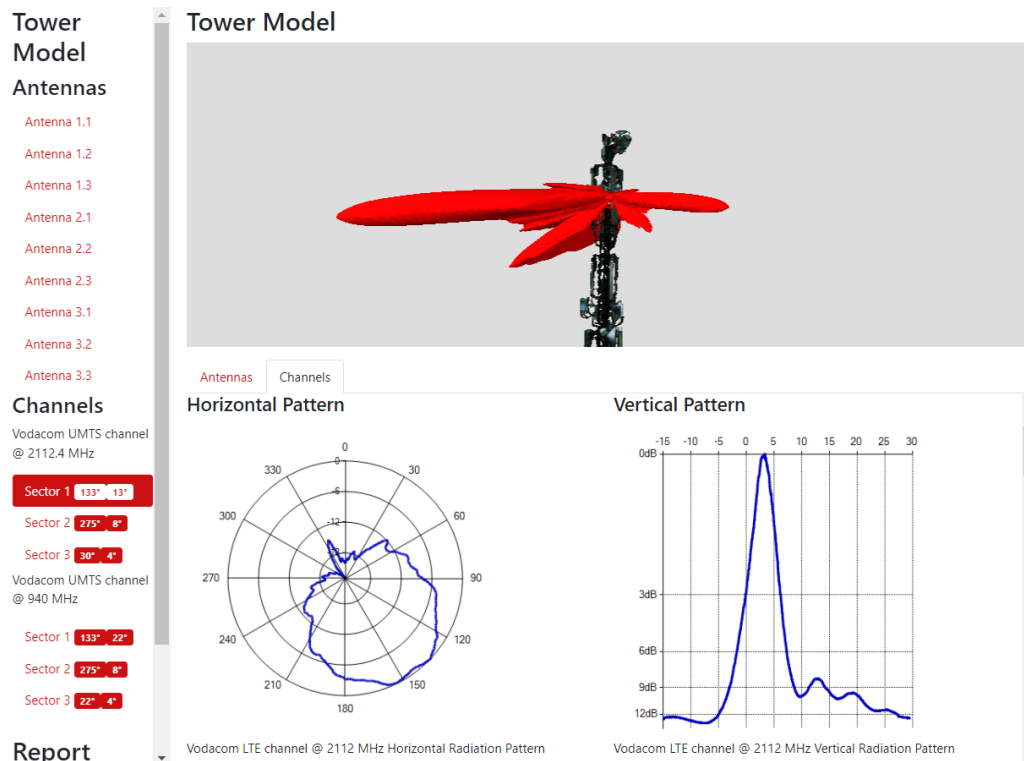


Figure 3: LS Interactive web report to view 3D radiation patterns and information per sector

GIS sites overview

