

5G Fixed Wireless Radio Validation

Anritsu recently hosted a major network equipment manufacturer (NEM) at our factory in Morgan Hill, CA USA to perform some early validation of their 28 GHz 5G radios. The application is to use radios for 5G fixed wireless access to compete with fiber to the home. The NEM required the use of the Anritsu Spectrum Master™ MS2720T spectrum analyzer to test the performance of these next-generation 28 GHz 5G radios in a coverage mapping exercise. The spectrum analyzer was used to measure key parameters of the NEM prototype radio in a variety of real-world environments.



Spectrum Master MS2720T Highlights:

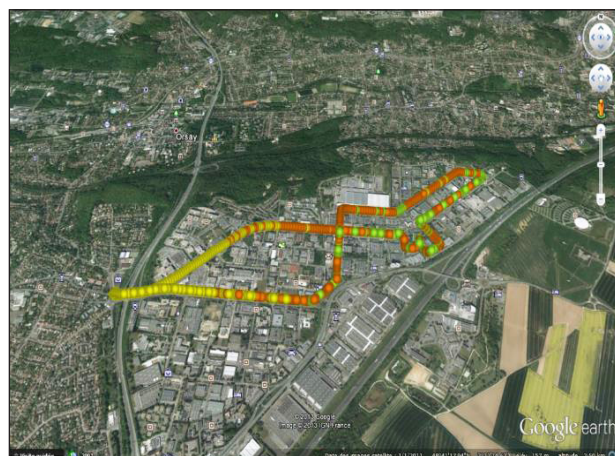
- Frequency Ranges: 9 kHz to 9 GHz, 13 GHz, 20 GHz, 32 GHz and 43 GHz
- Measurements: Occupied Bandwidth, Channel Power, ACPR, C/I, Emission Mask, Spurious Emissions, Field Strength
- Interference Analyzer: Spectrogram, Signal Strength, RSSI, Mapping
- Dynamic Range: > 106 dB in 1 Hz RBW @ 2.4 GHz
- DANL: -164 dBm in 1 Hz RBW @ 1 GHz preamp On
- Phase Noise: -112 dBc/Hz @ 10 kHz offset at 1 GHz
- 1 Hz to 10 MHz Resolution Bandwidth (RBW)
- PIM Alert (a downloadable easyTest™ script)
- Standard three-year warranty (battery one-year warranty)



The radio was mounted in multiple locations at varying heights in different urban and rural settings. Because of the significant free space attenuation at 28 GHz, a horn antenna was used in conjunction with the MS2720T to provide additional receiver gain. Moreover, the directional nature of the horn antenna required the use of four MS2720T/antenna pairs to provide complete 360 degree receive capability. In addition, each of the MS2720T's were configured with a GPS

location receiver. As the automobile was driven through the area, the handheld spectrum analyzers were able to plot received signal strength with location. To acquire comprehensive data on the NEM's radio performance, the route taken for the Over-the-Air (OTA) measurements passed through various environmental conditions, including attenuation from tree foliage and multi-path from houses and office buildings.

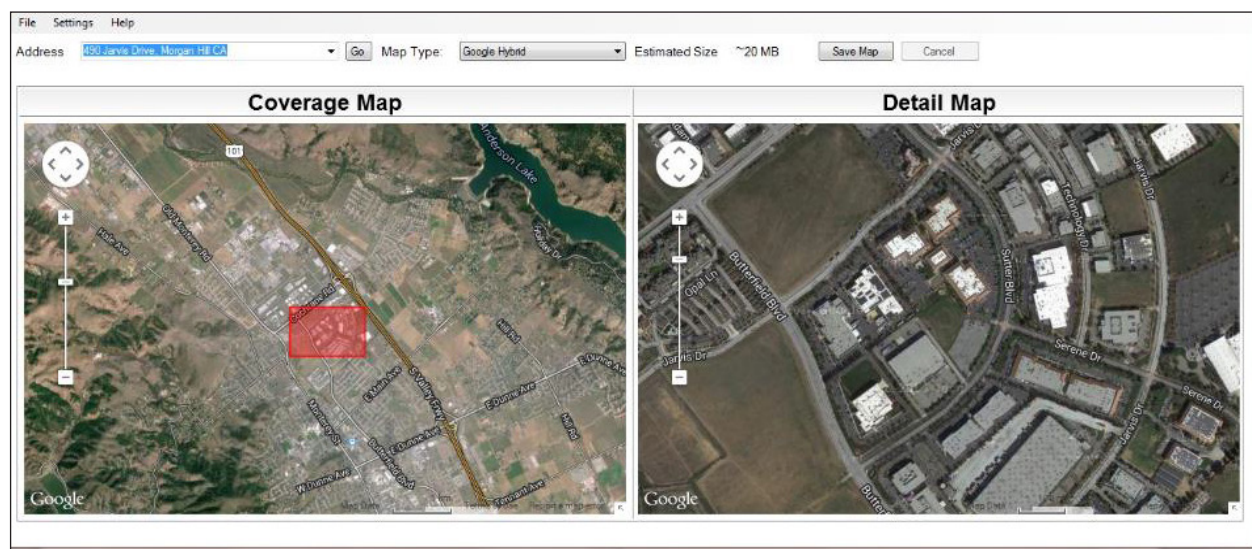
Each Spectrum Master MS2720T was connected to a respective horn antenna via an RF cable, allowing all received power acquired by the handheld spectrum analyzers to be displayed simultaneously on a PC in real-time. Among the measurements conducted were coverage mapping and power of arrival due to multi-path effects.



Outdoor Coverage Mapping Capability Features:

- Requires only one frequency carrier to monitor (RSSI or ACPR) and for appropriate instrument setup (reference level, pre-amplification, ...)
- Provides color coded thresholds (levels) on the map
- Maps by GPS distance or increment of time
- Exports the measurement as a .kml for use with Google Earth

The Spectrum Master MS2720T handheld spectrum analyzers also featured Anritsu's easyMap Tools. In this configuration, real-time maps that included the location of each measurement were created, displayed and stored on a PC in real-time.



easyMap Tools

- Enables downloading of maps for on-instrument mapping

This exercise confirmed the suitability of the MS2720T for field trials of first generation 5G fixed wireless access radios, and Anritsu's ability to help major NEMs bring new products to market early.

