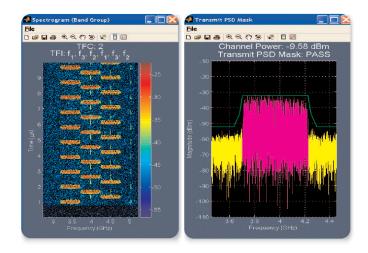# Tektronix Solutions for Ultra Wide Band RF Measurements

While most radio transmissions are high power density with narrow bandwidth, Ultra Wide Band (UWB) transmitters use low power density with ultra wide bandwidth. This presents unique challenges to designers of UWB devices who must trigger, acquire and analyze the single-shot, coherent waveform. Whether engineers are designing and integrating UWB radios, chirp radar, or WiMedia UWB devices into consumer, military, or computer systems, several challenges arise:

– Needing to accurately capture the full UWB spectrum, with thousands of symbols as a single, real-time waveform

– Difficulty performing spectral analysis on the complete, live signal – not using post-processing on incremental segments

– How to quickly and accurately track fast, complex frequency shifts

– Needing to analyze the actual emitted power of a particular band, and detect violations

– Needing to time correlate RF analysis with baseband digital and analog analysis

– Receiver testing with reliable and repeatable UWB signal generation

Tektronix provides solutions to these challenges, to help you bring your UWB device to market faster. By coupling the world's fastest real-time oscilloscopes and UWB spectral analysis software utilities, you can debug and verify your UWB system with confidence.

Tektronix Ultra Wide Band (UWB) RF Solutions

– TDS6000C oscilloscopes, with the widest real-time modulated bandwidth available, to capture the entire UWB spectrum.

– TDSUWB Spectral Analysis and TDSUWB+WiMedia Spectral Analysis software utility programs, provide spectral analysis, software down-conversion, and power spectral analysis of UWB radio transmissions.

– The TDSUWB utilities also operate on the TDS6000B and TDS7000B, up to the real-time bandwidth of the instrument.

– AWG710B Signal Generator with a sample rate of 4.2GS/s enables you to generate Baseband IF signals for receiver testing.

– AWG710B also enable the generation of I/Q modulated signals using 2 channels. 2 instruments in a master slave configuration are required.

– The iLink™ toolset enables total system visibility with an integrated Logic Analyzer and Oscilloscope solution that delivers time-correlated digital, analog and RF signals. Seeing these cross domain views simultaneously makes it easy to see, for example, how a timing problem in the digital domain may cause a frequency spur in the RF realm, and how this relates to the system operation.

Tektronix

Enabling Innovation

Tektronix Solutions for Ultra Wide Band RF Measurements

► Application Fact Sheet

The Solution Starts with High-Performance Instruments

– The TDS6154C is the world's fastest, real-time oscilloscope, with the widest modulated bandwidth available (15 GHz) for direct RF capture.

– AWG710B for baseband IF or I/Q modulated signal generation – the widest modulation bandwidth available with 8-bit signal generation, 2.1 GHz

Flexible Utilities for Advanced UWB Measurements

– TDSUWB Spectral Analysis utility software brings General Purpose Spectral Analysis to an instrument with sufficient Modulation Bandwidth to evaluate and debug UWB communication and radar in real time. Analyzing changes in frequency with time isapplicable to a wide variety of electrical and optical signals as well. This utility package can be characterized as General purpose Spectral Analysis

– TDSUWB WiMedia Spectral Analysis utility software extends spectrum analysis to make specific measurements of RF signal quality for the WiMedia radio. This utility software identifies the time frequency codes (TFC), selects the correct Power Spectral Density mask for that TFC and performs the PSD (Power Spectral Density) mask test and measures channel power. Violations are captured and circled on the display and the software announces a failure.

– UWB Waveform creation for the AWG710B Signal Generator can be easily accomplished by using the powerful internal equation editor and sequencer, or by using math packages such as MatLab.

For Further Information

Tektronix offers an extensive collection of resources that can be used in classrooms and labs to help simplify instruction and learning for technology educators. Simply contact your local authorized Tektronix representative or visit www.tektronix.com/discoveryzone.

Tektronix

Enabling Innovation