

# What You Can't See CAN Hurt You

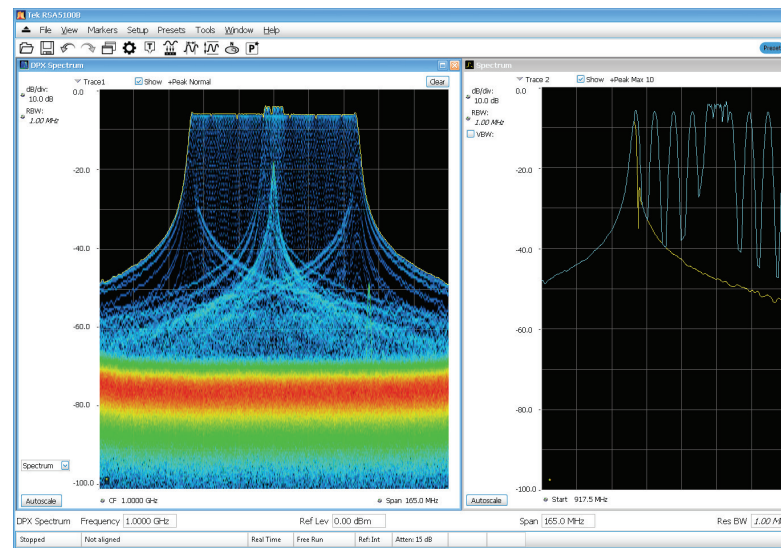
Expand your spectrum analysis capability with real-time insight

Advances in signal processing, fast synthesis technology, and the introduction of high-power devices based on Gallium Nitride (GaN) means that radar, electronic warfare and communications signals are all increasing in complexity. This complexity can often be understood or characterized by examining how the electromagnetic energy varies over time for both repetitive events and transient events that are difficult to track. Do you have the capability to see it, and can you characterize it? Do you fully understand that behavior and how it impacts your design and ultimately the mission goal?

Ensuring mission success means fully understanding electromagnetic wave behavior during design, manufacturing, and test and evaluation (T&E) of both systems and subsystems. It is critical to understand electronic warfare techniques, radar mode behavior and key communications/telemetry signals to ultimately comprehend how they operate in both the lab and in an operational environment. Tektronix Real-Time Spectrum Analyzers address these challenges with the ability to see transient events.

## Taking Spectrum Analysis to the Next Level

The advanced signal analysis capability of a Tektronix RSA fundamentally changes the way signals can be analyzed, especially if there are time domain phenomena that need to be observed in the frequency domain, such as pulse behavior, transient signals and signal-on-signal interference. Often these signals will go unnoticed and show up as intermittent system behavior, increasing the need for troubleshooting and costly redesign, resulting in schedule delays. Tektronix patented DPX® Digital Phosphor Technology exposes more signal detail than traditional ultra-high density displays, clearly showing signal details and anomalies that routinely go unnoticed (Figure 1). By displaying over three million spectral acquisitions per second, you can see events with sub-microsecond durations. Tektronix utilizes Fast Frame technology to enable acquisitions to be set up using segmented memory, which can dramatically increase the effective capture time for acquiring low-duty cycle events.



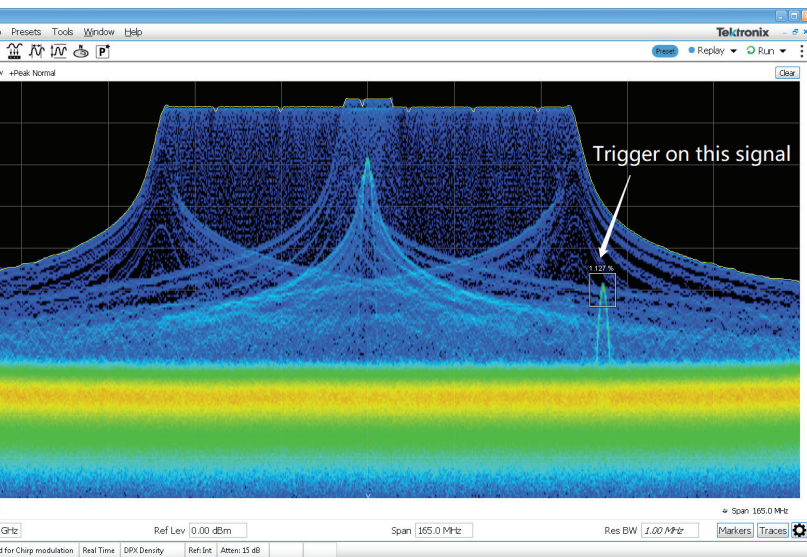
**Figure 1:** DPX Technology (left) allows you to see short duration events missed by conventional spectrum analyzers.

## Make All of Your Measurements at the Same Time

With a conventional spectrum analyzer, you can only reconfigure the instrument to perform specific measurement sets. Most users find these types of measurement mode changes time consuming, and limit measurement operations to a few basic parameters. With a more advanced signal capture and processing architecture, a Tektronix Real-Time Spectrum Analyzer can capture multiple extended event records at high speeds. The Tektronix RSA can serve multiple measurement capabilities simultaneously without the need to exit from one mode of operation to another. This is done by simply selecting a display, such as frequency vs. time, spectrum, pulse analysis, or an advanced demodulation such as OFDM (Figure 2). An added benefit is the time correlating different displays, allowing detection of time-dependent behavior in multiple measurement domains.



**Figure 2:** Multiple measurement screens allow you to easily visualize performance.



**Figure 3:** When you can trigger on DPX density, you can trigger on signals sometimes hidden under other signals.

## See More with the Industry's Most Comprehensive Set of Triggers

Tektronix invented the world's first triggered oscilloscope in 1946, and since then all Tek instruments have had the industry's most comprehensive trigger system, especially with respect to real-time spectrum analysis. Traditional spectrum analyzers have basic TTL external triggers and a power/amplitude trigger. To deliver ultimate signal insight, Tektronix has improved this functionality by adding bandpass filter triggering to complement the traditional full span triggers. However, if you are dealing with a complex and congested signal environment, innovations such as frequency mask and DPX density triggers mean that you can view transient signals masked by other signals (Figure 3), allowing you to gain impressive levels of insight.

## Ensure Mission Success with Real-Time Spectrum Analysis

Tektronix RSAs are the only tools that can give you the capability to see, characterize, and fully understand time and frequency domain phenomena such as pulse behavior, transient signal effects, and signal-in-signal interference. These key capabilities will help you achieve success in the following applications:

<b>Signal Analysis</b>	Lab-grade signal quality measurement in multiple domains, time, frequency, pulse, IQ, and constellation measurements.
<b>Real-Time Spectrum Recording</b>	Understand RF behavior over time in the lab and on the range with high-fidelity recording up to 2.75 hours at 800 MHz full bandwidth.
<b>Spurious Emission</b>	High-speed, high dynamic range spurious search and evaluation.
<b>Real-Time Receiver</b>	IQFlow™ allows for RSAs to be used as COTS operational receivers.
<b>Signal Intelligence and Interference Hunting</b>	Multiple units can be networked together for broad geographic spectrum coverage. Portable units can be used with a directional antenna and RSA Map Software to locate signals of interest.

The advanced signal analysis capability of an RSA fundamentally changes the way signals can be analyzed. This capability allows you to observe signals that you previously could not detect – either transient signals, signals within signals, or signal and spectrum behavior – over longer periods of time.

To compare RSA capabilities, visit [tek.com/specification-compare-spectrum-analyzers](https://tek.com/specification-compare-spectrum-analyzers) or contact your local salesperson to learn more about how a Tektronix Real-Time Spectrum Analyzer can help solve your most difficult analysis challenges.