Design with Confidence
Selecting the Right Spectrum Analyzer

Tektronix®
Selecting the Right Spectrum Analyzer

Spectrum Analyzers to effectively characterize time-variant signals and solve unexpected problems with DPX™ Live RF spectrum display. Standard on all real-time spectrum analyzers ranging from handheld to high performance benchtop instruments.

- **Performance Spectrum Analyzers** integrate revolutionary DPX™ Live RF spectrum display with the industry-leading dynamic range and bandwidth combination.
- **Mid-Range Spectrum Analyzers** deliver performance capabilities, including DPX™ Live RF spectrum display and frequency mask trigger, for complete time-correlated analysis in the frequency, time and modulation domains.
- **Handheld Spectrum Analyzers** scan the RF environment, reliably classify signals, and locate signals with the industry’s only integrated mapping solution.

Delivering Confidence to Confront the Most Challenging Microwave and RF Designs
Spectrum Analyzer
Product Section

<table>
<thead>
<tr>
<th></th>
<th>RSA6000 Series</th>
<th>RSA3000 Series</th>
<th>H600/SA2600 Series</th>
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</thead>
<tbody>
<tr>
<td><strong>Frequency Range</strong></td>
<td>9 kHz to 20 GHz</td>
<td>DC to 8 GHz</td>
<td>10 kHz to 6.2 GHz</td>
</tr>
<tr>
<td><strong>Capture Bandwidth</strong></td>
<td>Up to 110 MHz</td>
<td>Up to 36 MHz</td>
<td>20 MHz</td>
</tr>
<tr>
<td><strong>Minimum Event Duration for 100% Probability of Intercept (POI)</strong></td>
<td>As brief as 10.3 µs</td>
<td>As brief as 20 µs</td>
<td>As brief as 125 µs</td>
</tr>
<tr>
<td><strong>SFDR (typical)</strong></td>
<td>Down to -78 dBc</td>
<td>Down to -73 dBc</td>
<td>Down to -70 dBc</td>
</tr>
<tr>
<td><strong>DANL (equivalent at 1 Hz RBW)</strong></td>
<td>Down to -170 dBm/Hz</td>
<td>Down to -151 dBm/Hz</td>
<td>Down to -163 dBm/Hz</td>
</tr>
<tr>
<td><strong>Phase Noise (typical at 10 kHz offset)</strong></td>
<td>≤ -110 dBc/Hz</td>
<td>≤ -112 dBc/Hz</td>
<td>≤ -96 dBc/Hz</td>
</tr>
<tr>
<td><strong>Phase Noise (typical at 1 MHz offset)</strong></td>
<td>≤ -134 dBc/Hz</td>
<td>≤ -135 dBc/Hz</td>
<td>≤ -110 dBc/Hz</td>
</tr>
<tr>
<td><strong>DPX Live RF Spectrum Display</strong></td>
<td>&gt; 292,000 Spectrums/s</td>
<td>&gt; 48,000 Spectrums/s</td>
<td>&gt; 10,000 Spectrums/s</td>
</tr>
</tbody>
</table>

**Applications**
- Spectrum Management – Find Interference and Unknown Signals
- Radar/EW – Full Characterization of Pulsed and Hopping Systems
- Radar/Satellite Communications – Analyze Time-variant Behavior of Cognitive Radio and Software-defined Radio Systems
- RF Debug – Components, Modules, and Systems
- EMI Diagnostics – Increase Confidence That Designs Will Pass Compliance Testing MIL-STD and CISPR
- Radio/Satellite Communications – Software Defined Radio (SDR) and Field Tactical Radio Transceiver Measurements
- Spectrum Management – Find Interference and Unknown Signals
- Radar/EW – Characterize Radar and Pulsed RF Signals
- RF Debug – Components, Modules, and Systems
- Wireless Communications – Broad Range of Standard-specific Options for Analysis of RFID, 3GPP, 3GPP2, LTE, WiMAX, and WLAN Systems
- Radio/Satellite Communications – Comprehensive Baseband and IQ Analysis, Analog Demodulation, and Audio Distortion Measurement
- Spectrum Monitoring and Surveillance – Quickly Recognize Presence of New Unwanted Signals by Comparing Current Results Against Previously Saved Spectrum Surveys
- Interference Detection and Troubleshooting – Find Radio Signals that Appear and Disappear
- Spectrum Management – Find Unknown Signals and Interference
- Signal Hunting – Search Indoors with Single-touch Tap-and-Walk Interface, or Outdoors with Built-in GPS
- Signal Identification – Built-in Classification Tools Enable You to Efficiently Categorize Signals as Desirable or Undesirable
- Signal Intelligence – Discover Signals within Signals
- Homeland Security – Discover signals of interest that other instruments can’t even see
Design with Confidence

Featured Performance Product: RSA6000 Series Spectrum Analyzer
DPX® Live RF Spectrum Display
Discover previously unseen signal behavior. Improve test confidence and catch very short duration transients missed by conventional spectrum analyzers.

Multi-Domain Time Correlation
Accelerate troubleshooting and analysis by pinpointing the root cause of problems in multiple domains. Analyze captured data in any/all domains at any time with correlated markers.

Microsoft® Windows® Operating System
Increase your productivity by integrating your spectrum analyzer in your workgroup’s infrastructure. Tektronix OpenChoice® allows you to leverage the power of graphics-based analysis tools such as Excel® and MATLAB® with seamless connectivity built right into the spectrum analyzer.

Triggering Expertise
Save time by isolating signal anomalies that other instruments can’t even trigger on. Isolate hard to find hardware and software anomalies with cross domain triggering between multiple instruments.

Secure and Reliable Design
Store information reliably in secure or rugged environments with removable drives (SSD, HDD, or DVD ±RW).

Seamless Data Capture
Observe the entire duration of signal events, like frequency hopping sequences, PLL settling times, turn on transients, and multiple pulses.

Familiar Controls
Quickly navigate with familiar spectrum analyzer controls, plus fast access to all acquisition and measurement settings.

Automatic Pulse Measurement and Detection
Simplify test and save test time with multiple measurements on the same captured data. Reduce cost of test with a versatile single instrument that replaces multiple test sets.
Detection is the first step in understanding and resolving any problem relating to time-variant signals. As new applications utilize wireless transmission, new channels crowd into available bandwidth, and RF/Microwave systems become digital-based, you need better tools to find and interpret complex behaviors and interactions.

Tektronix’ patented DPX® Live RF spectrum display, standard in our spectrum analyzers, reveals signal details that are completely missed by conventional spectrum analyzers and vector signal analyzers. The DPX Live RF spectrum display shows signals never seen before, giving you instant insight and greatly accelerates discovery and diagnosis.

Discover
Visualize Previously Unseen Signal Behavior

DPX Live RF Spectrum Display
Revolutionary DPX Live RF spectrum display reveals transient signal behavior that helps you discover instability, glitches and interference.
Infrequently occurring transient is seen in detail. The frequency of occurrence is color-graded, indicating the infrequent transient event in blue and the noise background in red.
Swept DPX Mode
Swept DPX re-invents the way swept spectrum analysis is done. You can now sweep DPX across the full input range of the instrument.
This new level of performance reduces the chance of missing time-interleaved and transient signals that are missed by traditional spectrum analyzers during broadband searches.

DPX Density Measurement
DPX Density enables you to determine the statistical occurrence of any signal on the display within a particular area during a defined period of time.
DPX spectrum bitmap also allows you to visualize signals within signals.
Trigger
Isolate Elusive Signals Reliably and Efficiently

Whether you are mitigating hardware and software problems, or analyzing signals that can disrupt proper function of your transmitter, you need to be able to isolate signals that occur very quickly or anomalies that may only be visible in the frequency domain. Tektronix has a long history of innovative triggering capability, and our spectrum analyzers lead the industry in triggering functionality and flexibility. Our spectrum analyzers provide unique triggers essential for troubleshooting modern digitally implemented RF systems. In addition to conventional trigger methods, you can also select from time-qualified, power, runt, density, and frequency mask triggers to reliably capture your signal of interest.

Frequency Mask Trigger
Tektronix’ exclusive Frequency Mask Trigger enables the creation of a customizable mask that looks for violations in the frequency domain. Frequency Mask Trigger enables the reliable capture of small signals even if spectral events are detected at a much lower level than adjacent signals with a 100% probability of intercept for events as brief as 10.3 µs in duration.
DPX Density™ Trigger

Trigger on signals within signals at the click of a button that other instruments can't even see.

The unique Trigger On This™ function invokes the DPX Density measurement and automatically sets a trigger slightly below the current measured density level.

Time-qualified Trigger

Time qualification can be applied to enable the capture of the 'short pulse' or 'long pulse' in a pulse train, or only trigger when a frequency domain event lasts for a specified time.

Runt triggers capture troublesome infrequent pulses that either turn on or turn off to an incorrect level, greatly reducing time-to-fault.
Selecting the Right Spectrum Analyzer

As the complexity of new components, devices and systems continues to increase, the ability to acquire and store a record of time-variant event when it occurs and thoroughly analyze its unique behavior in time-correlated, multiple domains is becoming increasingly essential.

Tektronix spectrum analyzers seamlessly capture and record all signals across a user-selected span and duration. Transient, pulsed and other time-variant signals are all captured as a seamless time record into deep memory. Our industry-leading combination of dynamic range and bandwidth enables time-correlated analysis across multiple domains (time, frequency, modulation, statistical, and code domain) with a single acquisition.

Capture

Record Seamless Spans Accurately

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Spectrogram

Spectrogram shows oscillator instability and setting characteristics, which enables measurement of frequency and amplitude variance over time.

Selecting the event displayed in the DFX spectrum, the spectrogram and frequency domain view automatically correlate at the precise moment in time.
Overlap FFT Processing

Increasingly fast signals make it even more challenging to understand their behavior with traditional spectrum analyzers.

Overlap FFT processing, enabled by seamless event capture, allows precise analysis of very fast signals over varying time resolutions.

Acquisition Replay

Thoroughly characterize subtle signal behavior over long periods of time by efficiently capturing many segmented acquisition records.

Familiar media-player buttons let you replay data records anywhere within the captured memory using a single click to pause, resume, and adjust the replay speed, giving you direct control when replaying multiple segmented records.
A comprehensive understanding of complex signal behaviors involves analysis while signals are frequency hopping, switching modulation, bursting, and settling. Efficiently analyzing these signals delivers the productivity and confidence you need from the bench to the field that cannot be achieved with traditional spectrum analyzers.

Tektronix spectrum analyzers accelerate troubleshooting and analysis by pinpointing the root cause of problems in multiple time-correlated domains. You can make multiple automatic measurements, or analyze captured data in any/all domains at any point in time with correlated markers, which enable you to resolve the complex problems that often occur in today’s RF/Microwave systems.

Multi-Domain Modulation Analysis
Continued performance trade-offs between spectrum, quality, and efficiency requires time-correlated, multi-domain views that provide a new level of insight into design or operational problems.

ACLR, symbol decode, and vector modulation quality are performed on a single acquisition, combined with the continuous monitoring of the DPX Live RF spectrum display.
Automatic Pulse Analysis

Multi-domain analysis of pulsed signals for time, power, quality, and frequency is required to fully characterize their complex behavior. This has never before been achieved in a single-box solution.

The integration of automatic pulse measurements improves test reproducibility. Easily validate designs using automated pulse measurements of impulse response, peak power, pulse width, rise time, ripple, droop, overshoot, pulse-to-pulse phase, and many more.

Phase Noise and Jitter

Phase noise and jitter measurements remain a fundamental component of assessing overall RF/Microwave performance. Correlating these measurements across both our oscilloscopes and spectrum analyzers provides the complete confidence you need for testing your designs.

Tektronix spectrum analyzers enable fast measurements of large carrier offsets which cannot be performed with conventional test equipment. Dynamic range can be optimized for maximum performance and reduced measurement uncertainty.
Applications

Delivering Confidence in RF/Microwave Designs

Today’s RF/Microwave world is merging the digital computing and traditional analog RF technologies. This integration of digital and analog RF is presenting engineers with a new highly complex environment, necessitating a new generation of RF/Microwave test tools.

Tektronix delivers the signal generation and analysis capabilities required to overcome the most challenging RF and microwave design challenges with confidence. To learn more about the applications highlighted here, and many more, please visit us at www.tektronix.com/rf.

Radar/EW

With today’s rapid advances in radar test and electronic warfare technology, developing and manufacturing highly specialized and innovative electronic products requires leading-edge technology and tools. Our innovative test equipment reduces uncertainty during the design process and delivers confidence in the integrity of increasingly complex designs.
Spectrum Management/Surveillance
Solve today’s demanding signal detection and exploitation challenges with world-class instrumentation for detection, identification, mapping, and hunting down signals or sources of interference. DPX Live RF spectrum display will change the way you search and discover elusive signals.

Radio/Satellite Communications
Whether you are moving into digital radio implementation or deploying mission-critical satellite systems, our innovative test solutions deliver the measurement confidence you need in your designs. Our signal generation and analysis tools provide the unique insight necessary for the development and debugging of modern communication systems.
Maintain Your Spectrum Analyzer at Peak Performance

Tektronix spectrum analyzers come standard with a 1-year warranty covering all parts and labor. Tektronix offers a range of repair and calibration plans to extend your coverage and keep your instrument operating at optimal performance.

**Repair Service Extended Coverage**
- Save money with multi-year coverage
- Priority service
- Covers equipment, parts, labor and transportation
- Applicable software, safety and reliability updates

**Calibration Service Coverage**
- Accredited calibration
- Traceable calibration
- Functional verification
- Applicable software, safety and reliability updates
- Calibration records retention

**Multi-Vendor Calibration Service**
- Single point of contact for all of your calibration needs
- Simplify your operations and reduce administrative costs
- On-site delivery for convenience and reduced downtime

For Further Information
Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com

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