MDO3000 Series vs. Regular Scope FFTs
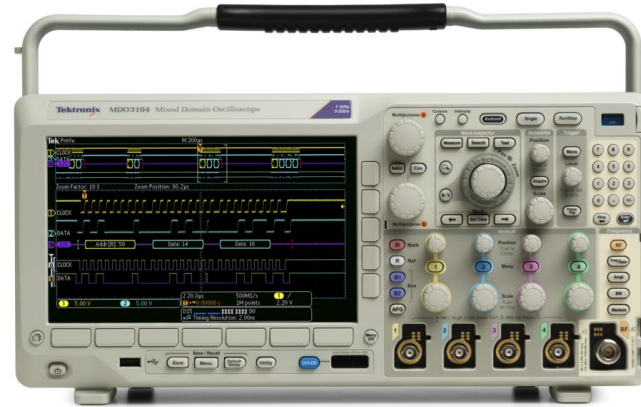
Dedicated RF Acquisition System

- ~15 dB better dynamic range than scope FFT

- RF support to 3 GHz in a 100 MHz – 1 GHz scope

- Doesn't use one of the scope's four analog inputs (MDO3000 provides dedicated N-connector input for spectrum analyzer)

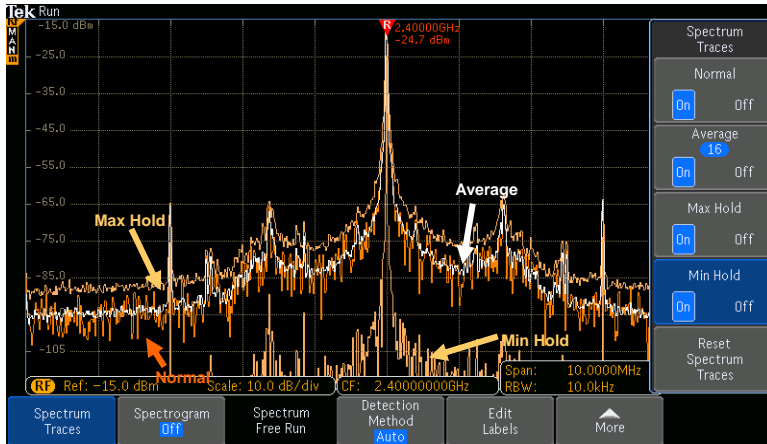### User Interface Designed For Easy Spectrum Analysis

- Dedicated front panel controls make spectral analysis easy

- Automatic markers identify spectral peaks

- Spectral analysis features such as assorted trace types, detection methods, and automated measurements

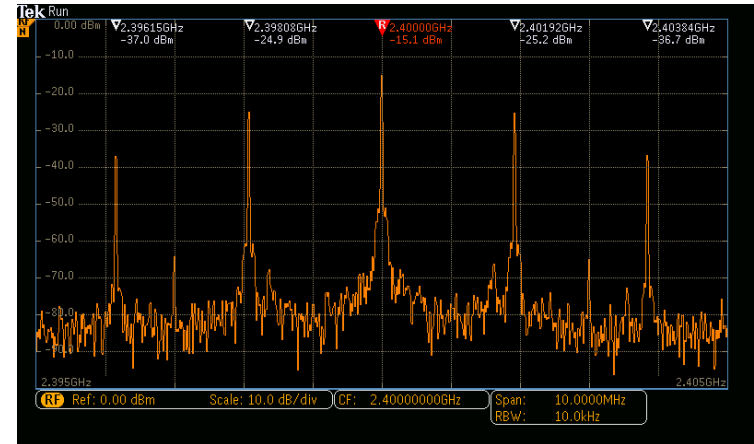**Tektronix**

MDO3000 Series vs. Regular Scope FFTs
## COMPETITIVE FACT SHEET

Spectrum Traces

Unlike traditional FFT, the MDO3000 supports typical spectrum analyzer traces: Normal, Average, Max Hold and Min Hold.

Automatic Markers

Automatic Markers identify spectral peaks, with the reference marker assigned to the highest amplitude peak. Manual Markers can also be used to investigate other areas of interest in the spectrum or to measure phase noise and noise density.

Spectrogram Display
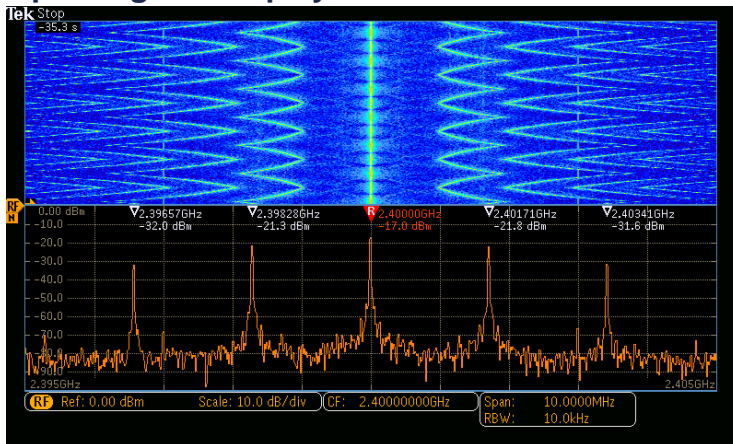
Spectrograms enable easy visual understanding of slowly changing RF phenomena

Spectral Measurements
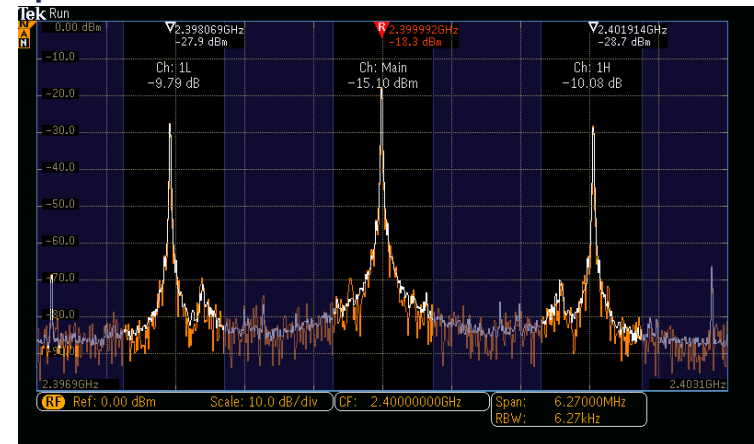
Typical spectrum analyzer measurements are supported, including Channel Power, Adjacent Channel Power Ratio, and Occupied Bandwidth

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MDO3000 Series vs. Regular Scope FFTs

COMPETITIVE FACT SHEET

	Tektronix MDO3000	Agilent X3000, 7000, 9000, 90000	LeCroy WR Mxi-A, 6Zi	R&S RTM / RTO
① Specifications				
Analog Channel Bandwidth	100 MHz - 1 GHz	100 MHz - 4 GHz	400 MHz - 4 GHz	600 MHz - 4 GHz
Dedicated RF Input	Std.	--	--	--
Maximum RF Frequency	3 GHz	Determined by scope bandwidth		
Frequency Response	Flat	Rolls off to 3dB down at rated bandwidth (not flat at higher frequencies)		
Spurious Free Dynamic Range	-55 dBc (-60 dBc typical)	not specified, but ~45 dBc		
② Spectrum Analysis				
Automatic Peak Markers	Std.	--	opt. w/ -SPECTRUM	--
Manual Markers	Std.	Std. (cursors)	Std. (cursors)	Std. (cursors)
Trace Types	Normal, Max Hold, Min Hold, Average	Normal	Normal	Normal
Detection Methods	+ Peak, -Peak, Average, Sample	Sample	Sample	Sample
Measurements	Channel Power, Adjacent Channel Power Ratio, Occupied Bandwidth, Noise Density, Phase Noise	--	--	--
Spectrogram	Std.	--	--	--
Preamp availability for low-amplitude signals	Opt.	--	--	--
③ Usability				
Front panel access to common SA controls	Std.	--	--	--
Front panel keypad for numeric entry	Std.	--	--	--
④ Price				
Minimum cost to analyze up to 3 GHz RF	$5,970 (MDO3012 w/ MDO3SA)	$36,500 (DSO9404A)	$30,995 (WR 640Zi)	$37,800 (RTO1044)

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MDO3000 Series vs. Regular Scope FFTs
COMPETITIVE FACT SHEET

1 Specifications

Tektronix MDO3000

- ✓ Dedicated SA input doesn't use up one of the scope's four analog channels.
- ✓ RF Frequency range not determined by scope analog bandwidth – you can get the right level of performance for both your RF needs and your analog/digital needs
- ✓ Spectrum analyzer has flat frequency response across the entire range leading to more accurate measurements
- ✓ Integrated spectrum analyzer provides 60 dBc (typical) dynamic range, far better than a scope's analog channels

Regular Scope FFT

- ✗ Must give up one of the scope's analog channels to view an FFT.
- ✗ To get multi-GHz RF performance, you need to buy a multi-GHz scope which may be way more than needed or budgeted.
- ✗ Signal amplitude rolls off to 3dB at the scope's rated bandwidth. Therefore RF measurements made anywhere near the rated bandwidth of the scope are being attenuated significantly
- ✗ Typical scope FFTs provide ~45dBc dynamic range

2 Spectrum Analysis

Tektronix MDO3000

- ✓ Spectrum peaks are automatically labeled (both frequency and amplitude) making signal identification easy
- ✓ Typical spectrum analyzer trace types are supported including Normal, Max Hold, Min Hold, and Average
- ✓ Typical spectrum analyzer detection methods are supported including +Peak, -Peak, Average, and Sample
- ✓ Typical spectrum analyzer measurements are supported including Channel Power, Adjacent Channel Power Ratio, and Occupied Bandwidth.
- ✓ TPA-N-PRE preamp available for investigation of very low amplitude signals

Regular Scope FFT

- ✗ Manual cursors are typically required to identify the frequency and amplitude of peaks in the spectrum
- ✗ Only Normal trace is available
- ✗ Only Sample detection is available
- ✗ Spectral measurements not typically available
- ✗ No preamp available

3 Usability

Tektronix MDO3000

- ✓ The MDO3000 was designed for simple RF analysis. As such, dedicated front panel controls are provided for the most common adjustments (Center Frequency, Span, Reference Level, RBW, Markers, etc).
- ✓ Front panel keypad makes specific value entry easy (for example, precise Center Frequencies)

Regular Scope FFT

- ✗ Regular scope FFTs are not designed for serious RF analysis. Controls are always buried in menus and adjustments often have unforseen consequences as the time and frequency domains are all tied to a single acquisition system
- ✗ No front panel keypad

4 Prices

Tektronix MDO3000

- ✓ Purchase the analog BW you need (from 100 MHz to 1 GHz) while still being able to capture RF signals up to 3 GHz.
- ✓ 100 MHz, 4 ch. scope w/ 3 GHz RF: $6,490

  1 GHz, 4 ch. scope w/ 3 GHz RF: $16,400

Regular Scope FFT

- ✗ Forced to purchase a scope with analog bandwidth sufficient to view the RF frequency range of interest, even though that bandwidth may be well beyond what you need to observe your analog and digital signals.
- ✗ 4 GHz, 4 ch. scope: ~$37,000

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