

Rigol DSA1000 Application Note

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DSA1000 Tutorial Intro

DSA1000 is Rigol's line of spectrum analyzers. Throughout this tutorial we will attempt to introduce some of the significant capabilities of the DSA1000 family in addition to demonstrating the ease of use of the DSA1000 interface.

Displaying the spectrum of a signal:

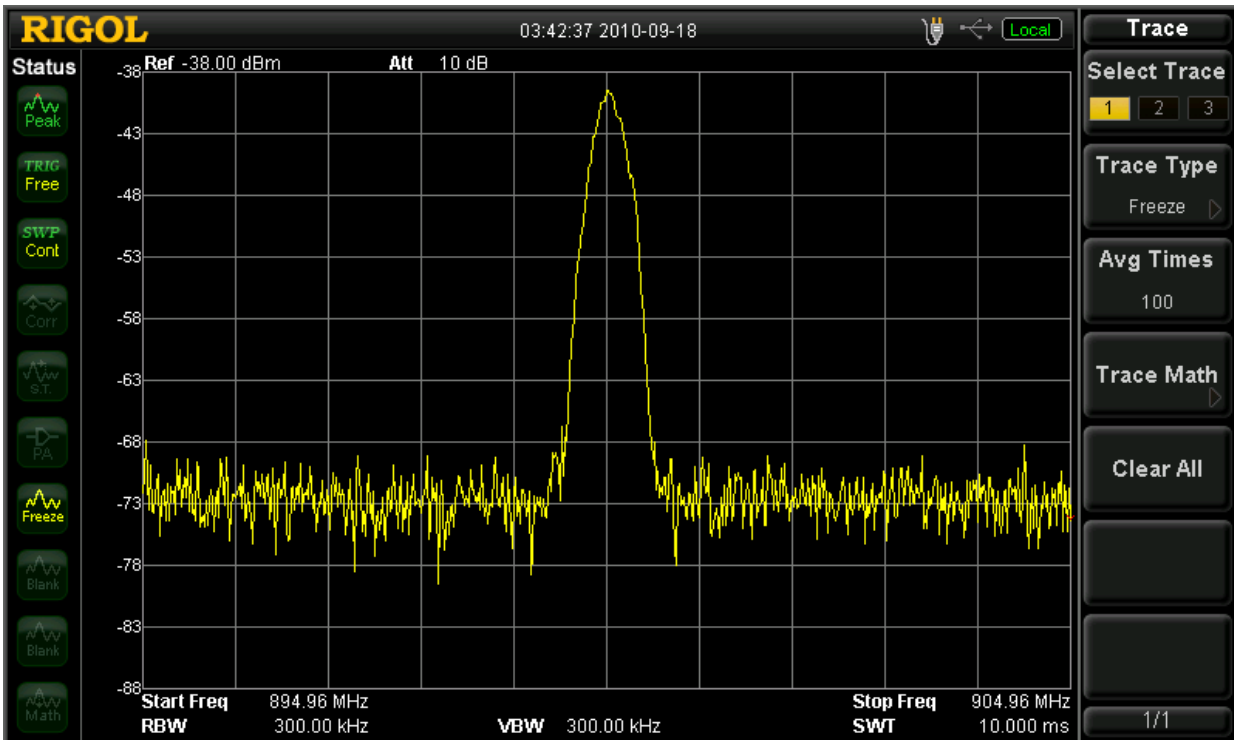
For this experiment, the following equipment will be needed:

- Function Generator
- Coaxial cable connector N-Type connector to BNC connector

Set the function generator to output a 100 mVpp sine wave at 100MHz. Then connect the function generator to the RF input of the DSA1000 series analyzer. After connecting the function generator to the spectrum analyzer, you should observe a spectrum graph as observed below.



Now, press the Auto-Tune button (under Sweep Control). You should know observe the following spectrum graph as below:



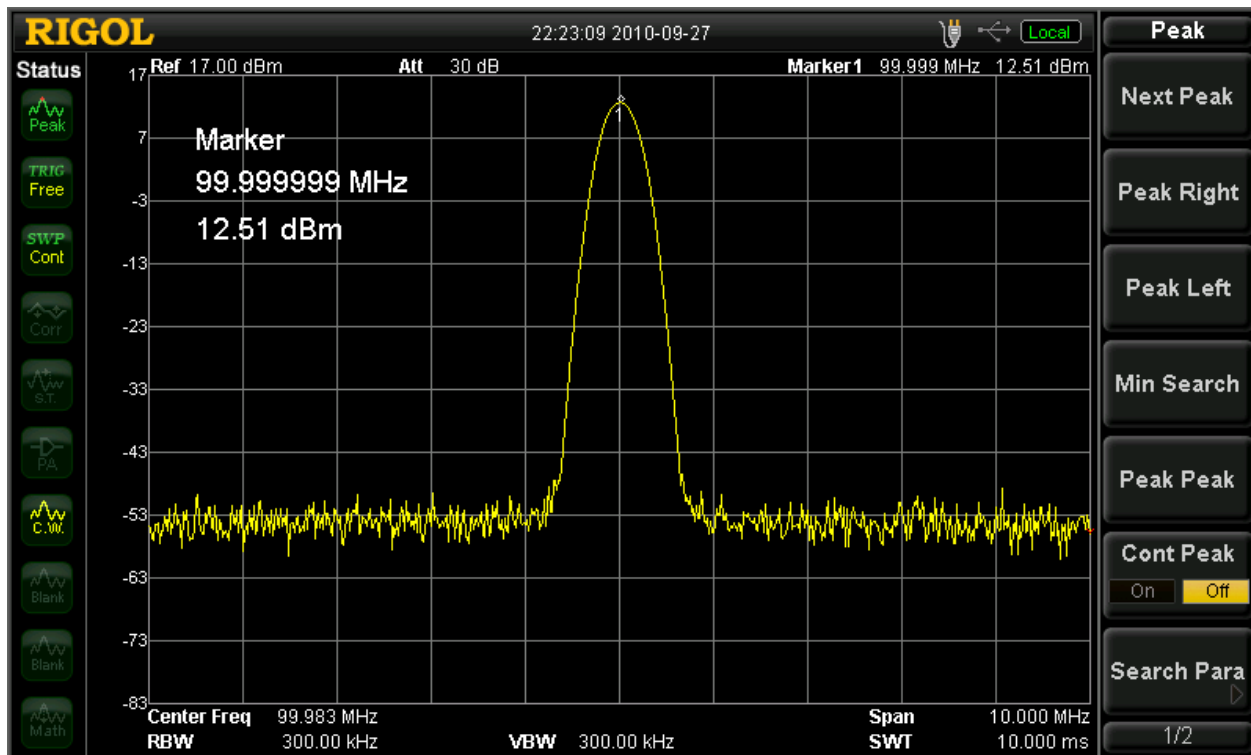
The Auto-Tune feature is a very useful and time saving feature to use. Whenever faced with uncertainty about the position of the center frequency on the spectrum graph, the Auto-Tune feature will assist the user center the display at the highest peak in the input signal.

Markers:

Markers are used for the purpose of obtaining accurate information about a specific data point on the spectrum graph. For demonstration purposes, with the DSA1000 in the same state as the figure above, press the “Peak” key.



As observed a marker will be placed at the center of the display. The peak button is used for the purpose of placing a marker at the highest point amplitude wise of on the spectrum graph as in the picture below:



Similarly, if another peak exists to the left or the right of the current peak, using the “L-Peak” and “R-Peak” buttons allows us to navigate amongst signal peaks. In the above case, only one real peak exists, as this is a pure sine wave. Alternatively, the peak menu on the left can be used to navigate through the signal’s peak. It appears when the “Peak” button is pressed.

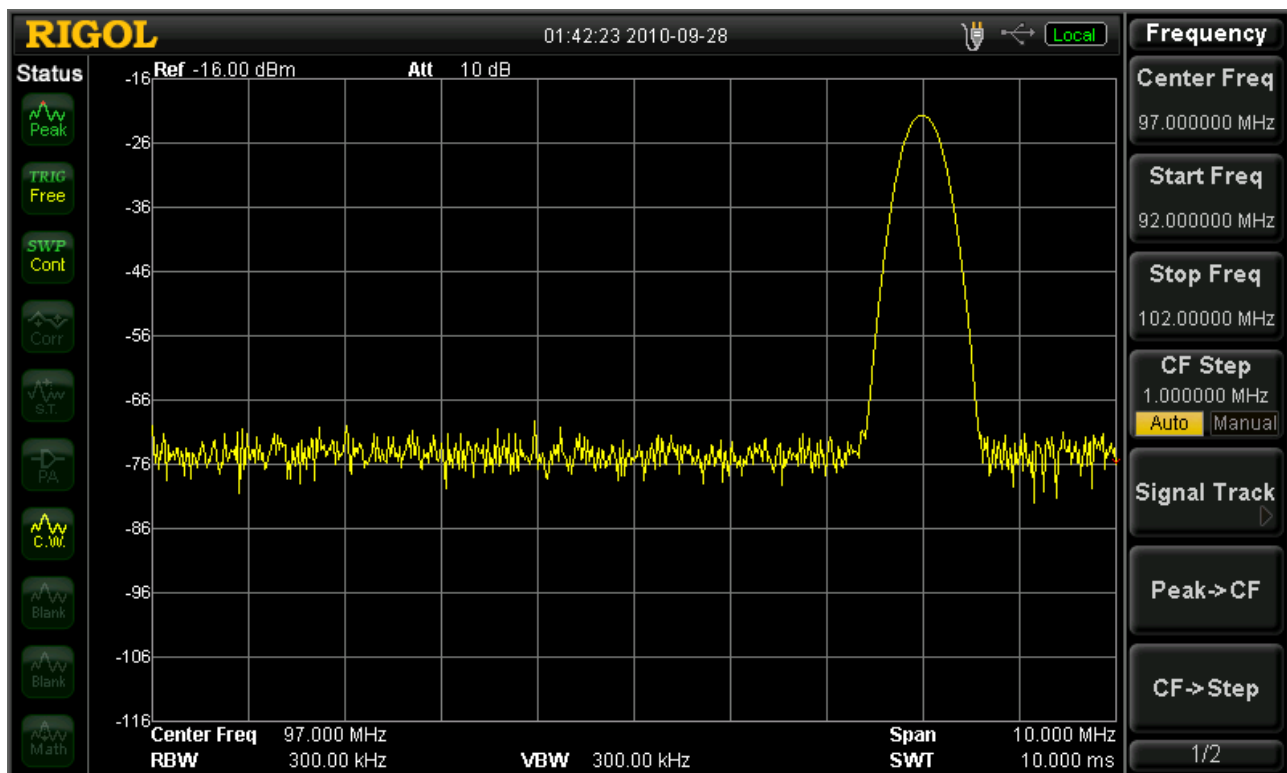


Frequency Controls:

Pressing the black “FREQ” button, will expose the Frequency menu on the right hand side of the screen.

We can see that the frequency is centered at 100 MHz, which is the frequency of the sine wave being inputted into the system.

Push the “Center Frequency” soft button; this will highlight the center frequency value selection and using the numeric pad change the center frequency to a different value. With a new center frequency, we can now observe a shift in the peak location on the display as below:

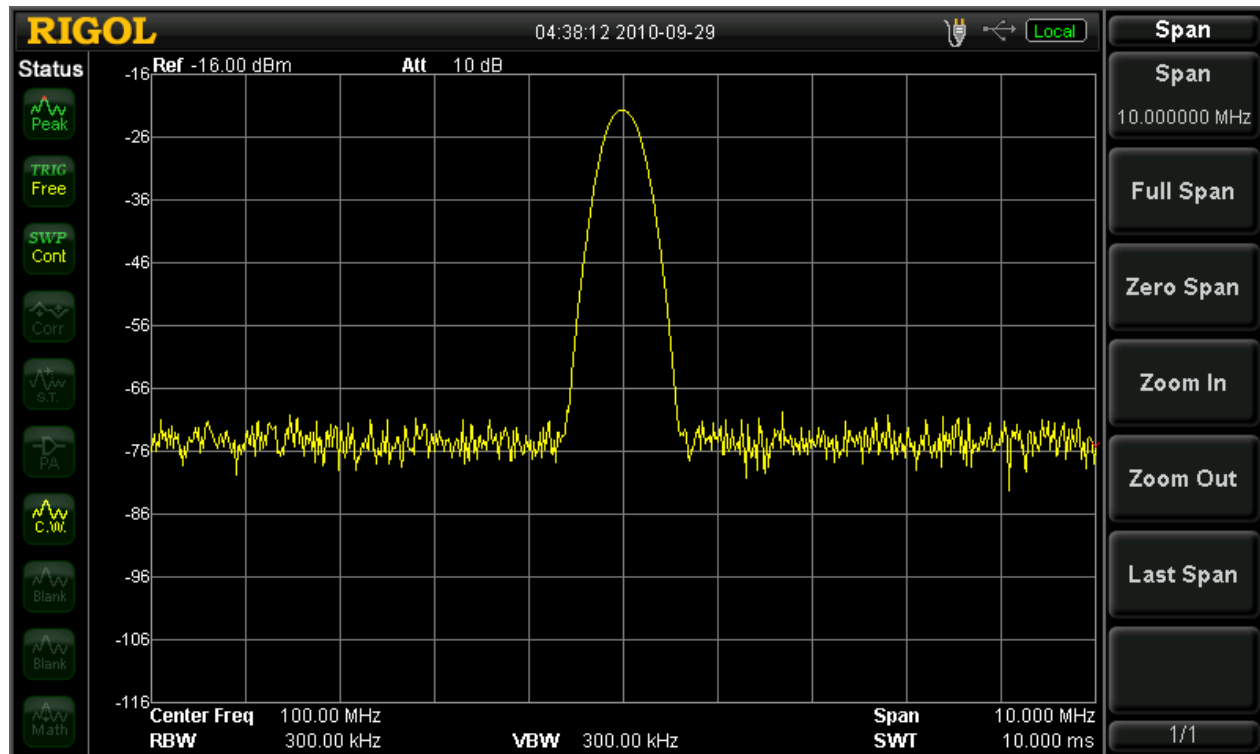




Span Adjustment:

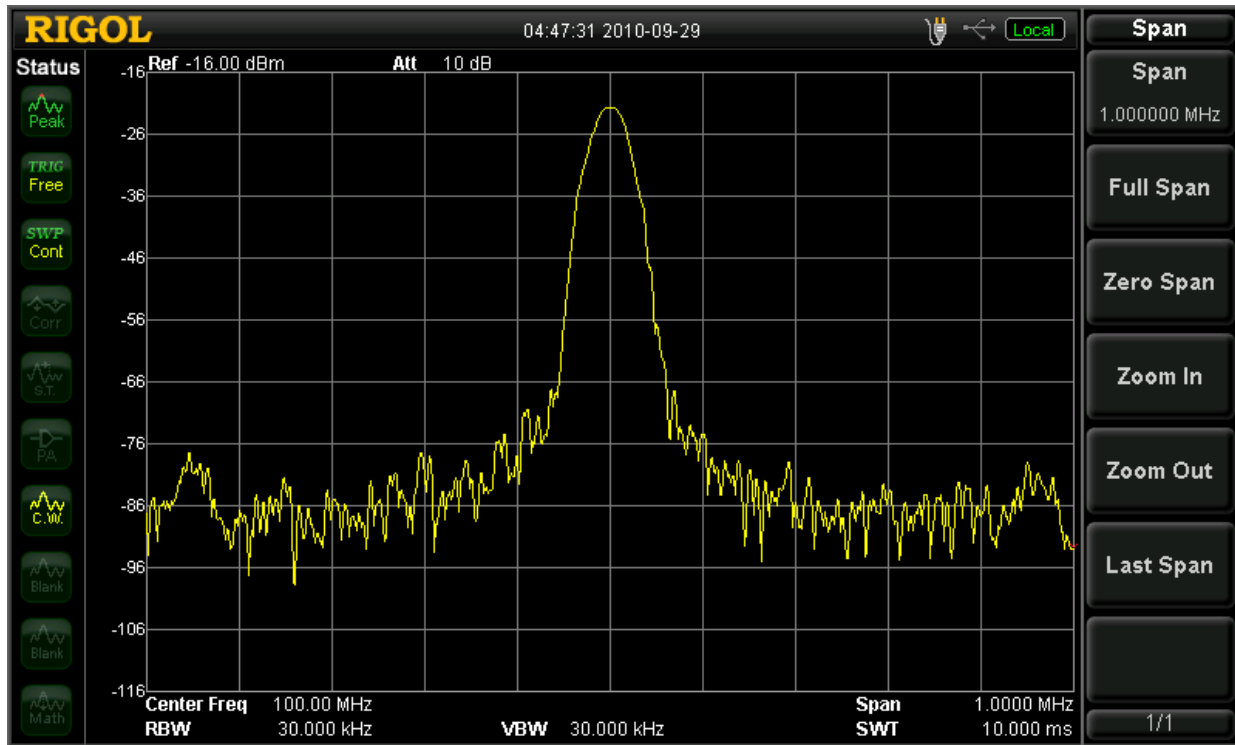
In this section we explore the span adjustment capability. First, press the “Auto tune” button, the peak of the waveform goes back to the center of the screen.

Press the “SPAN” button, the span side menu will appear on the right hand side of the screen.



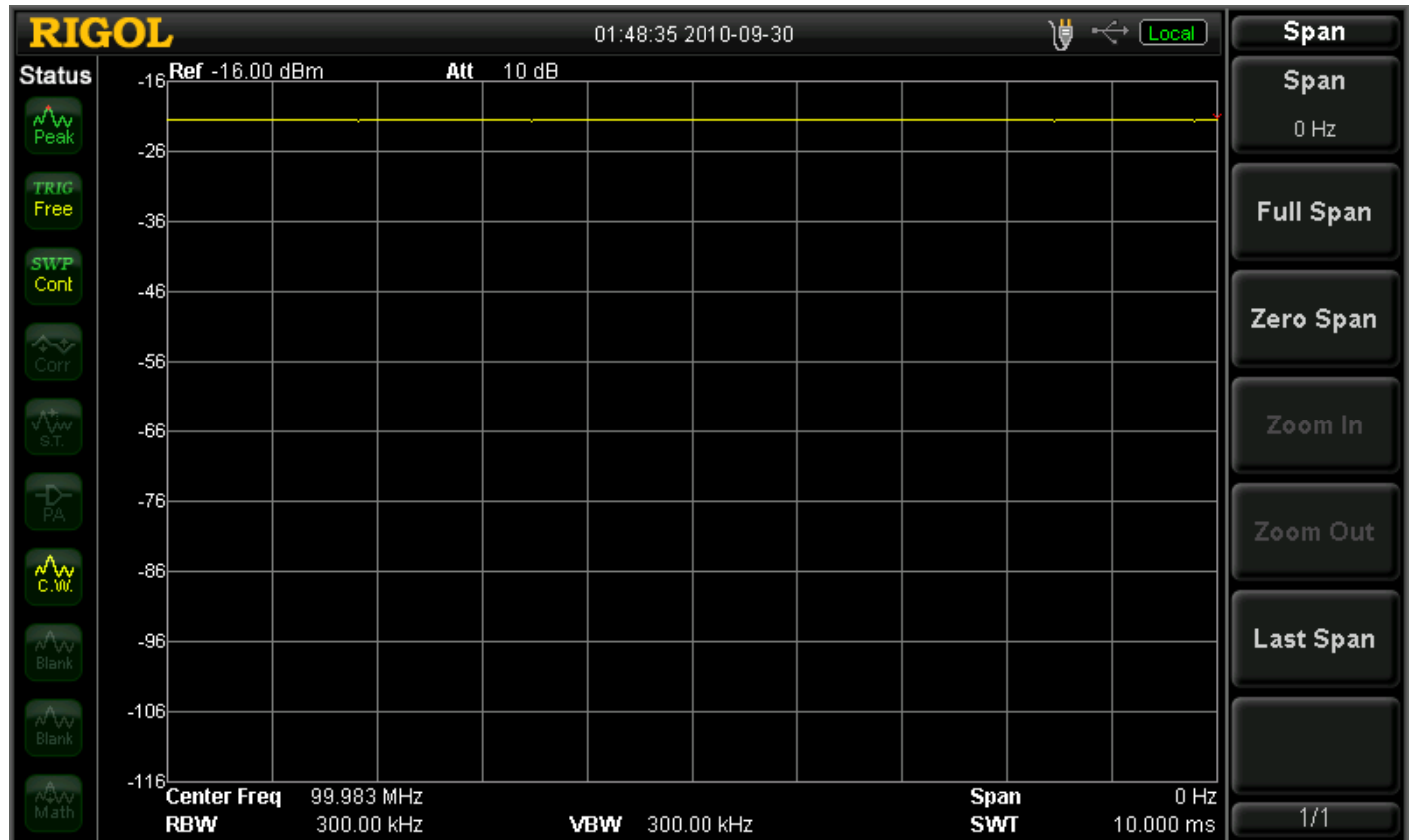


Press the "Span" soft button, using the numeric keypad, enter 10 MHz



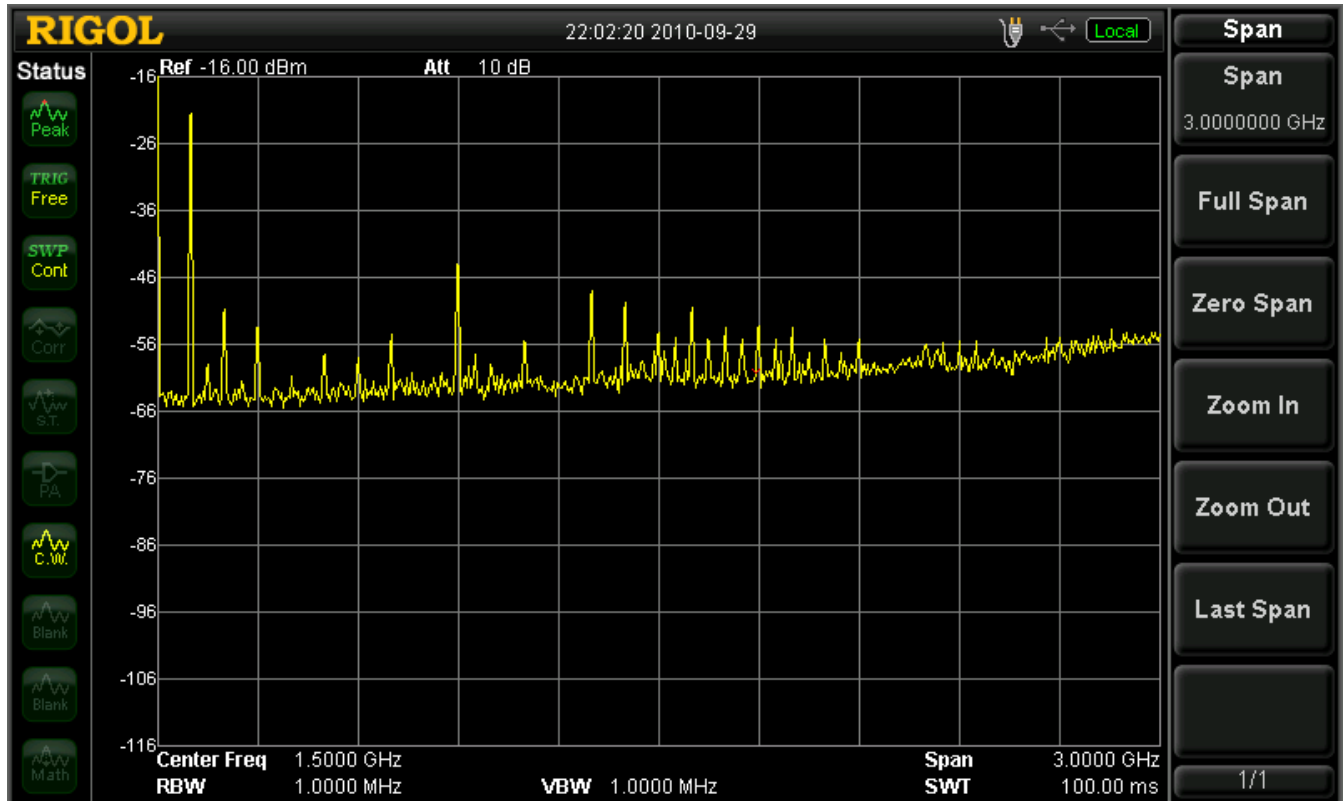


Press the “Zero Span” soft button; you will observe the time domain characteristics of the signal at the center frequency specified, however it’s worth noting, this option is more useful for observing the envelope of a modulated wave rather than that of a carrier, though the amplitude of a carrier wave can be observed:





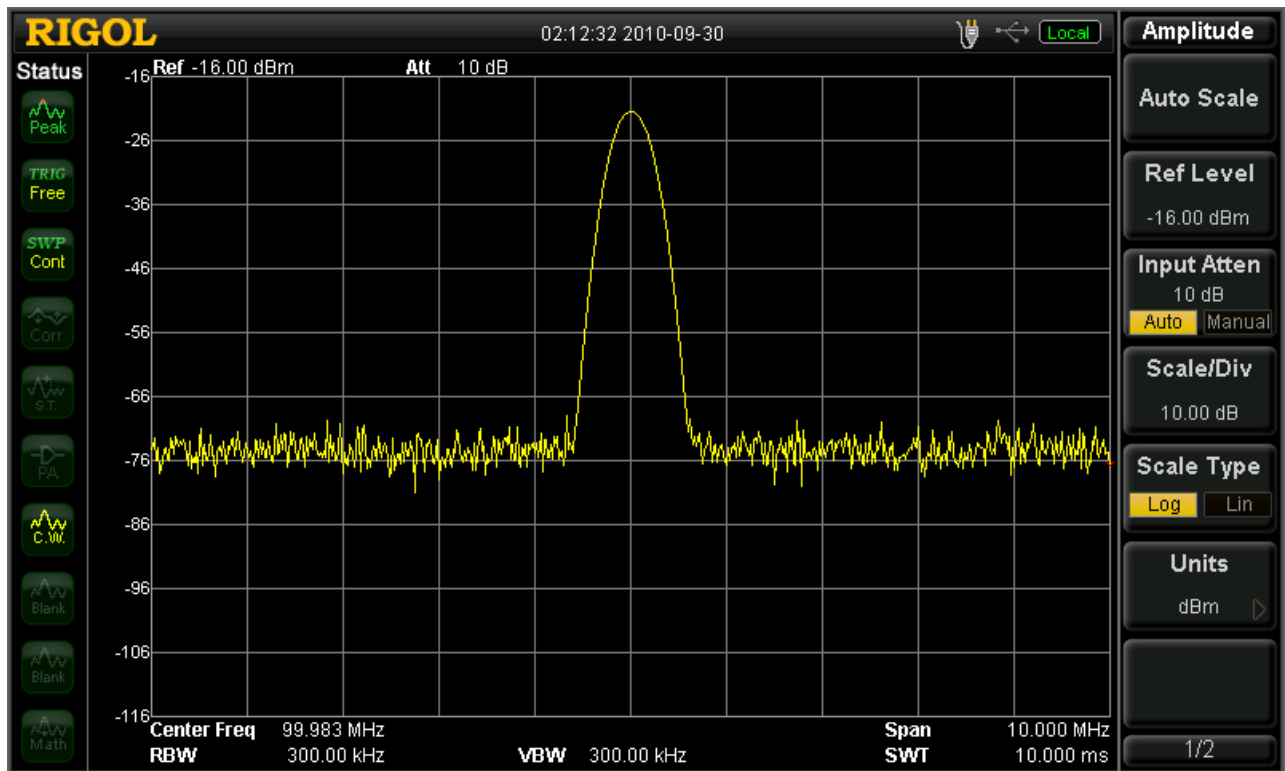
Press the “Full Span” button; you will observe the characteristics of the entire visible spectrum to the analyzer, as seen below.





Amplitude Adjustment:

Press the black “AMPT” button; you will observe the amplitude menu on the right hand side as below:



Press the “Ref Level” soft button; you will observe the amplitude drop down as below:

Press the “Auto Scale” soft button; you will observe the amplitude return back to an optimal position on the screen:

For more information or questions contact us directly at:

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How-To Guide



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