

Rigol DS6000 Application Note

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- **Measuring Video Signals with the DS6000:**

Video signals naturally are challenging to properly display on a digital storage oscilloscope's screen. This makes such signals a perfect example for the purpose of demonstrating the capabilities of the Rigol DS6000.

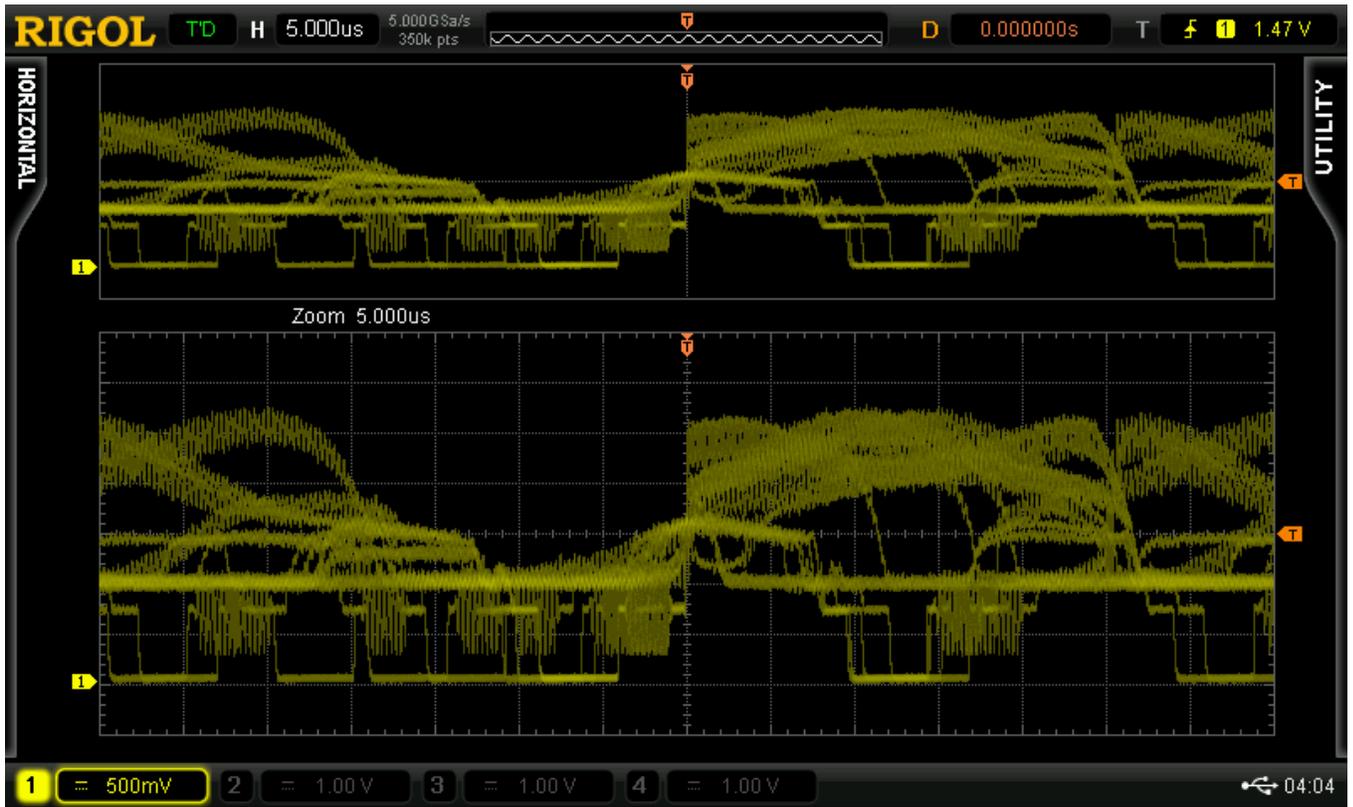
In this section we are going to demonstrate the rich features and capabilities of the DS6000 by analyzing with it an NTSC video signal.

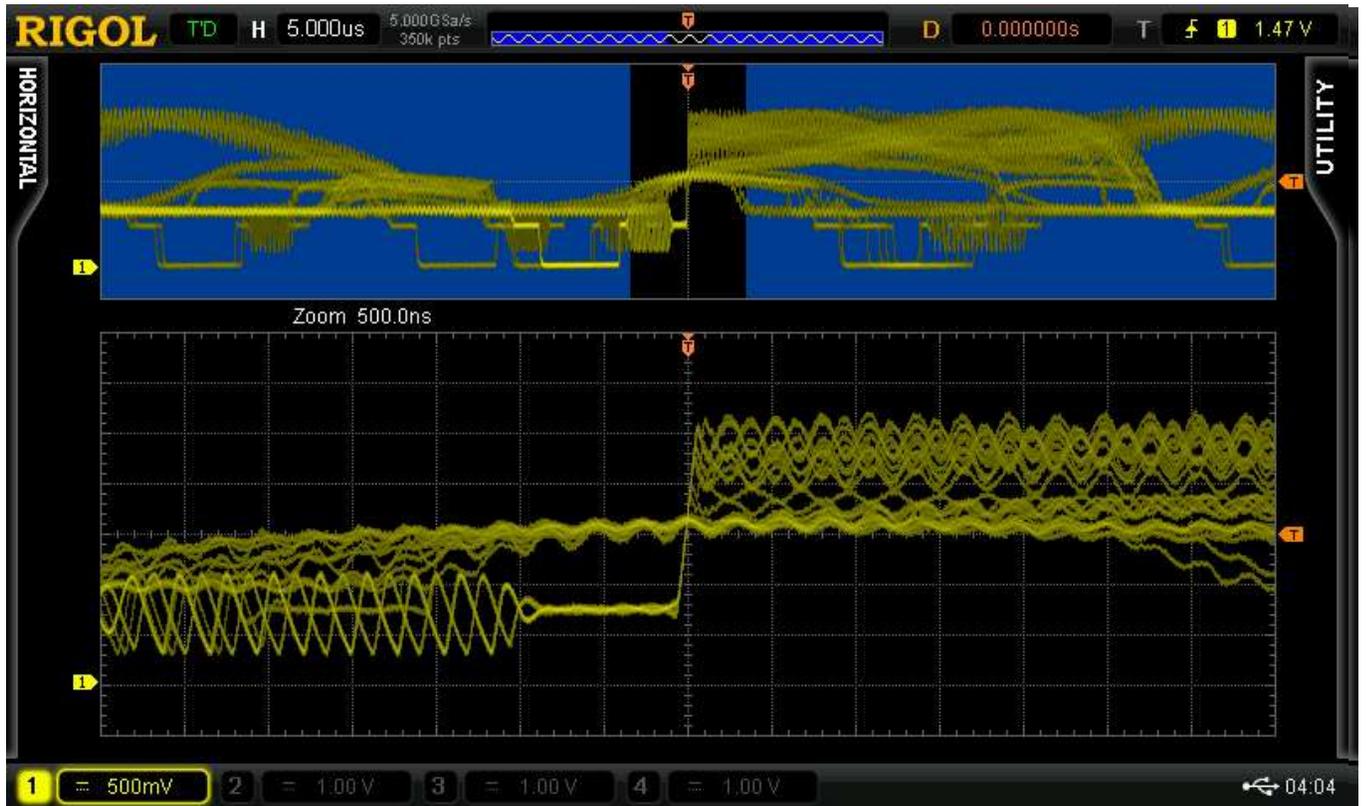
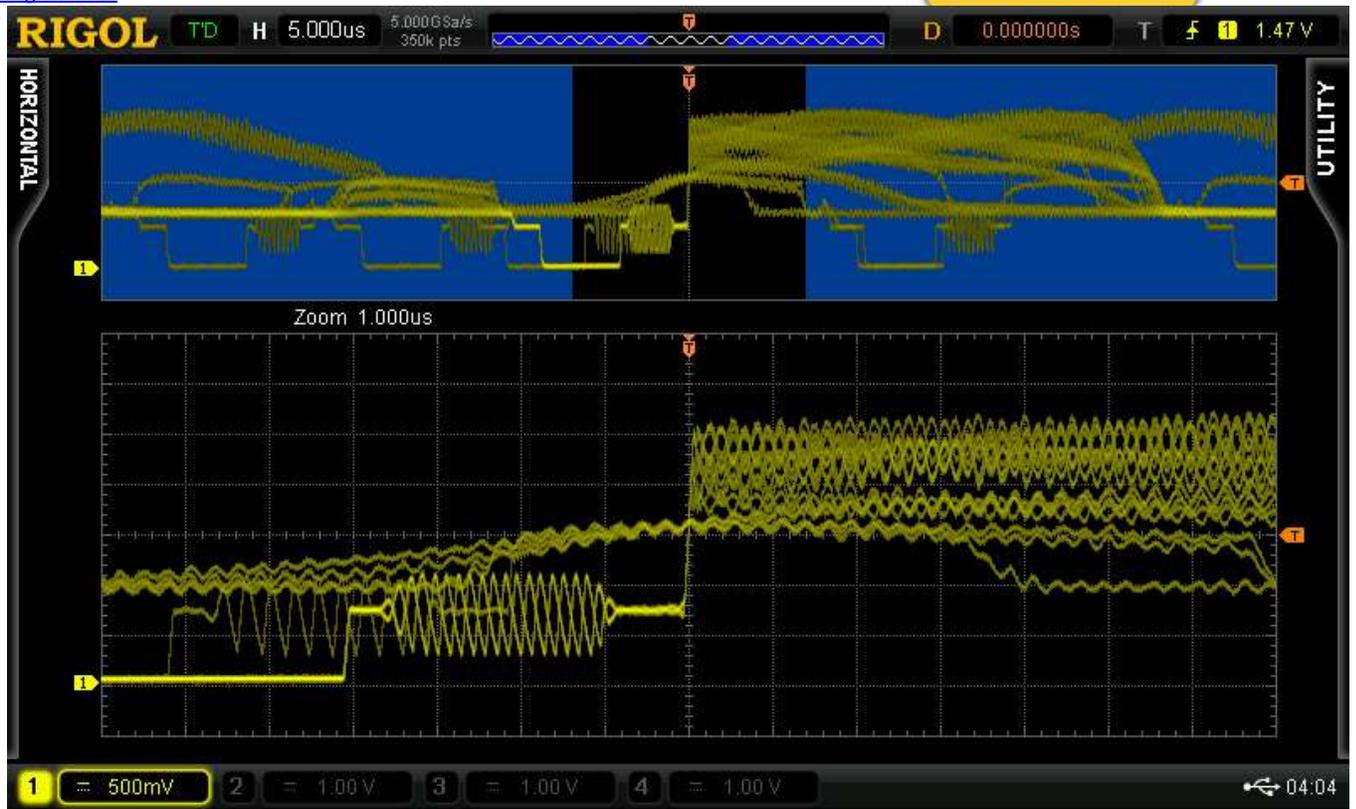
- 1- Connect the NTSC video signal to channel 1 of the DS6000. Ensure that the video signal is ON and then press the green "Auto" button. The resultant signal waveform will appear as below:

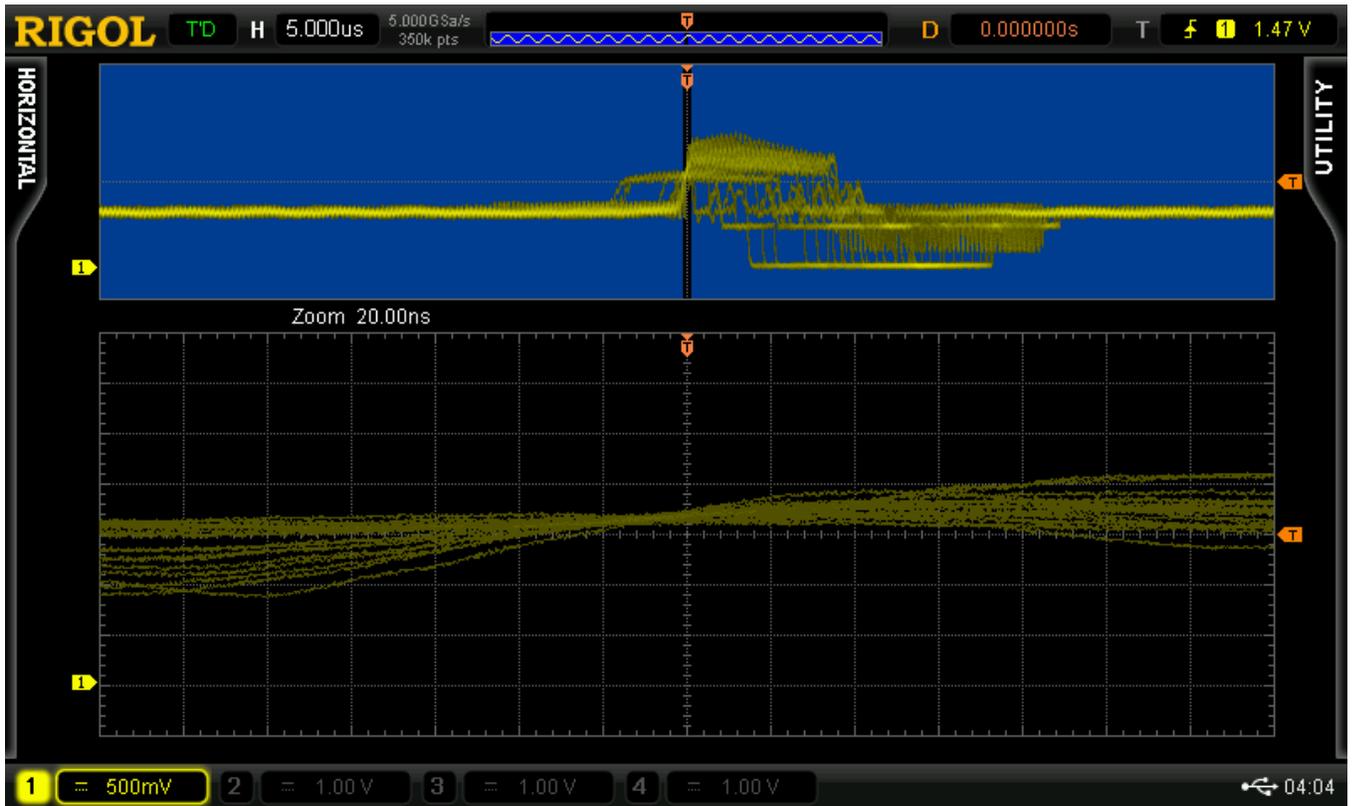
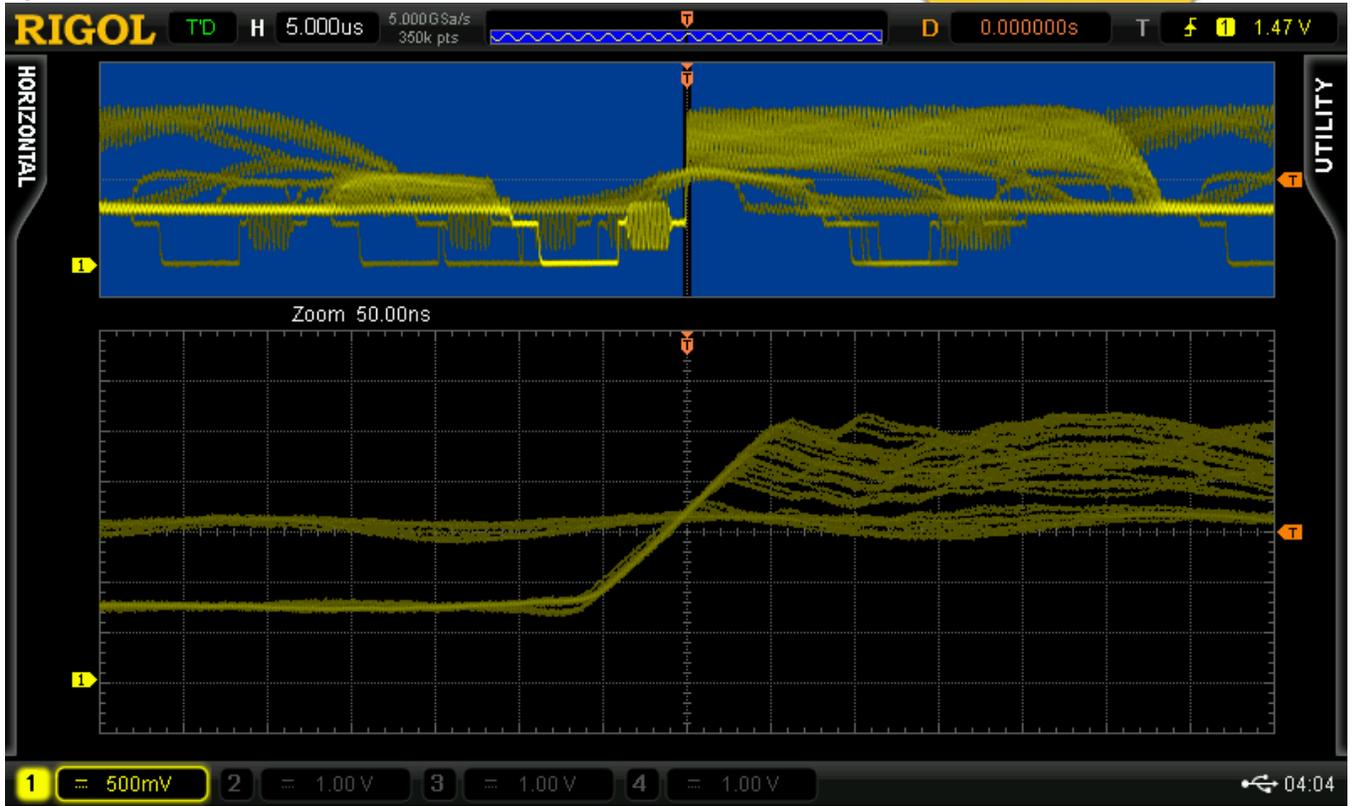


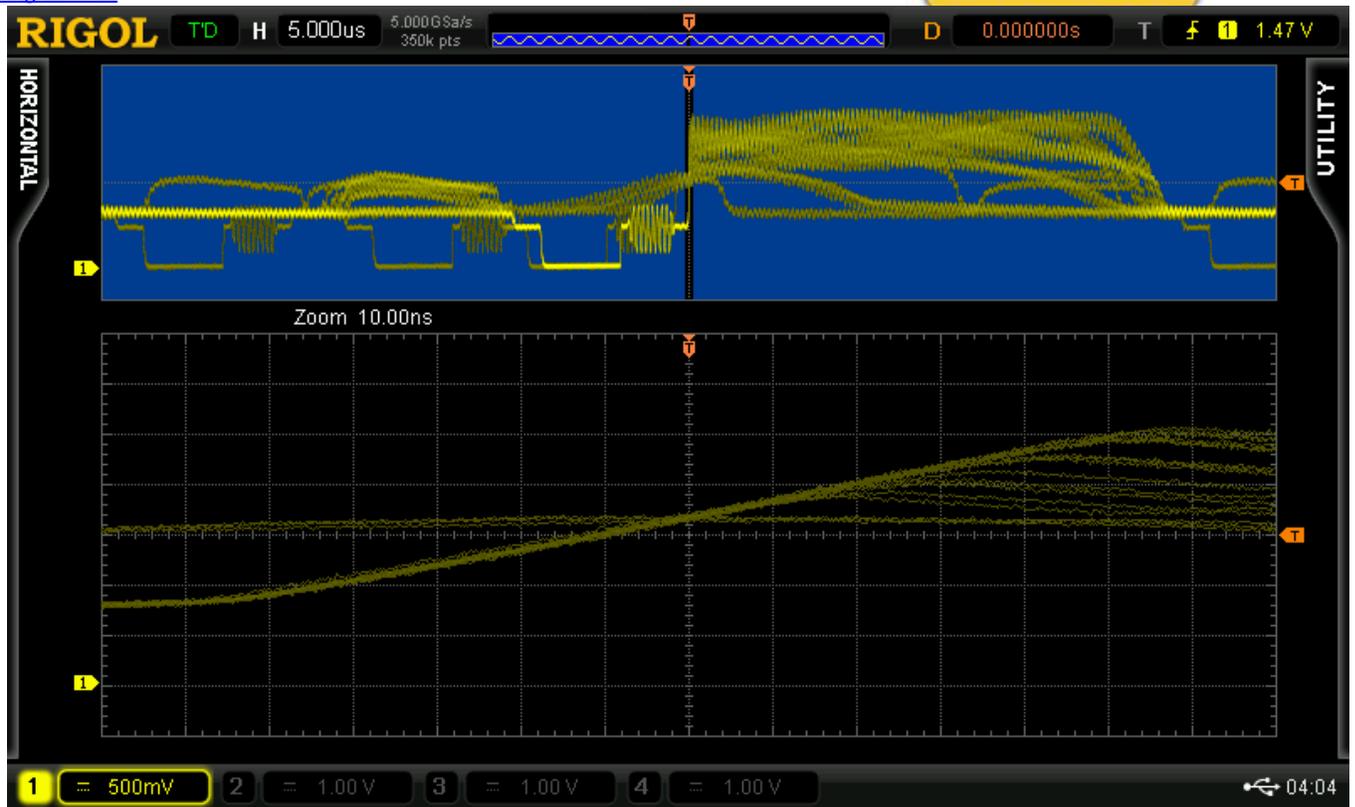


2- Then press the horizontal scale button in order to enable delayed sweep feature of the DS6000. One can notice the extensive level of detail of the captured signal by increasing the signal zoom by turning the horizontal scale knob.









- **Capturing Signal Glitches using the DS6000:**

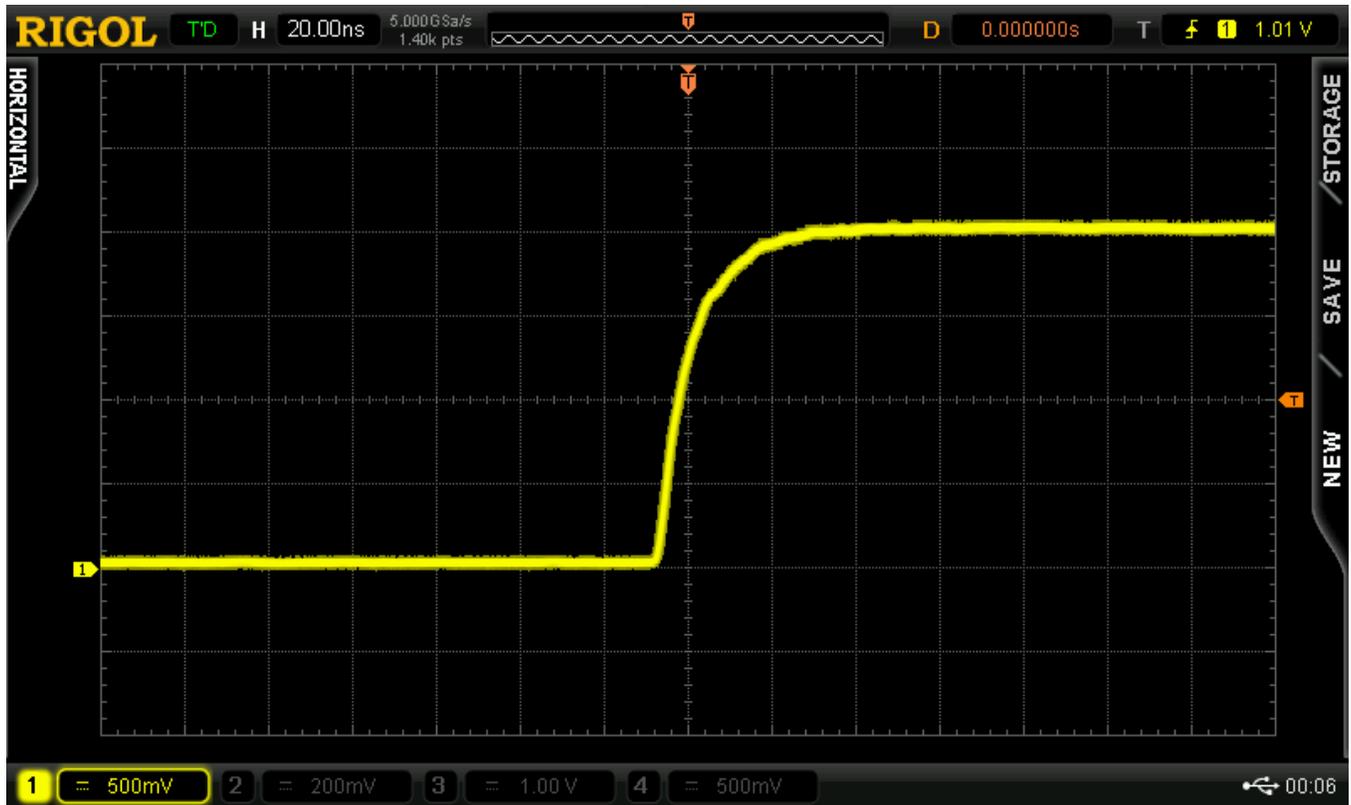
The Rigol DS6000 series family features a 120,000 waveforms a second update rate. This is a serious advantage when examining signals for absolute integrity.

Determining a signal's lack of anomalies is not always an easy task. Especially if an anomaly like a glitch for instance occurs within a very short time period and is beyond the equipment's capability to be captured; for this purpose, this Glitch capturing experiment is a very good demonstration of the performance capabilities of the DS6000 series.

For the purpose of the demonstration, we will input a square wave signal into the DS6000 input, however a glitch signal will be introduced randomly as well. The glitch lasts less than 30ns on the input side.

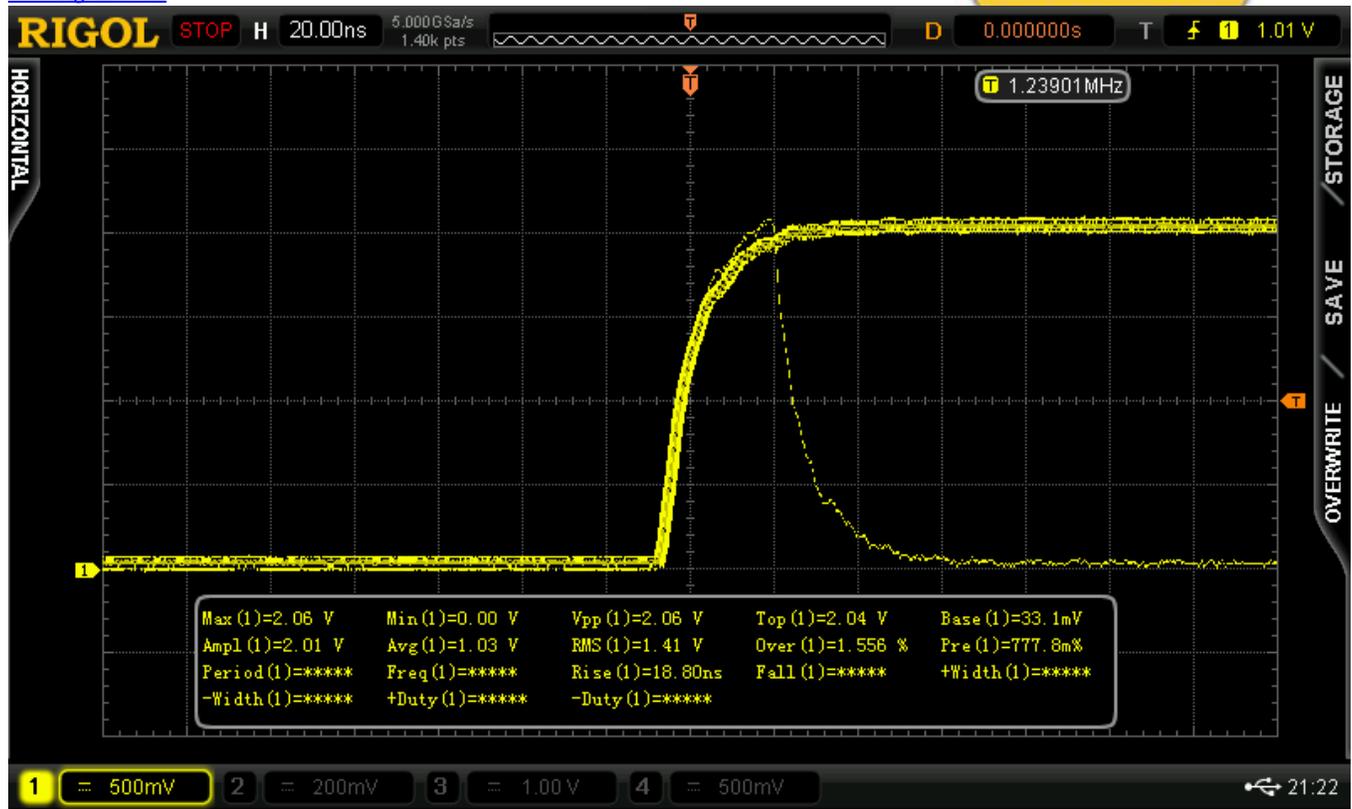


The image below is of the square wave signal described above:



The glitch signal is intermittent and appears for much less than a second on the screen before it disappears. For the purpose of making it more visible in this tutorial, we will turn display persistence on. To accomplish that, press “Display” button, in the display menu, then set “Persis.Time” to 200ms

Additionally, to display all of the measurable wave characteristics, we press the “MEAS” button, and then press the “Display All” soft button on the MEASURE right hand side menu. Also for the purpose of measuring the wave’s frequency, the frequency-counter is enabled.

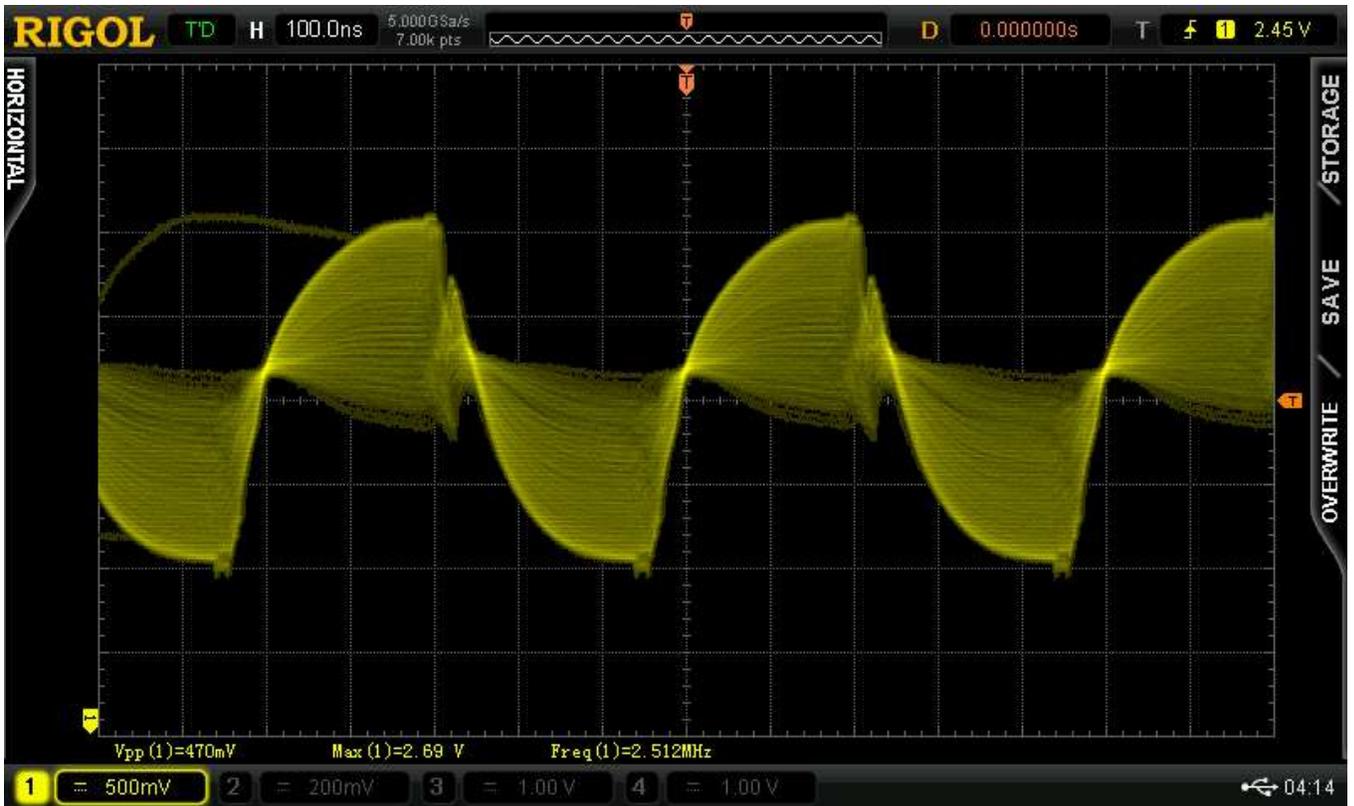


As we can observe from the snapshot above, the DS6000 proves capable of capturing the signal glitch due to its high waveform update rate and its high resolution capabilities are reflected in the accuracy of the signal – glitch capture as observed.



- **Capturing Amplitude Modulation Glitch using the DS6000:**

In this experiment we use the D6000 to measure an amplitude modulated signal as seen below:



However, deep within this signal is a glitch. The glitch is very hard to find and can only be spotted utilizing the DS6000 UltraVision zoom technology.

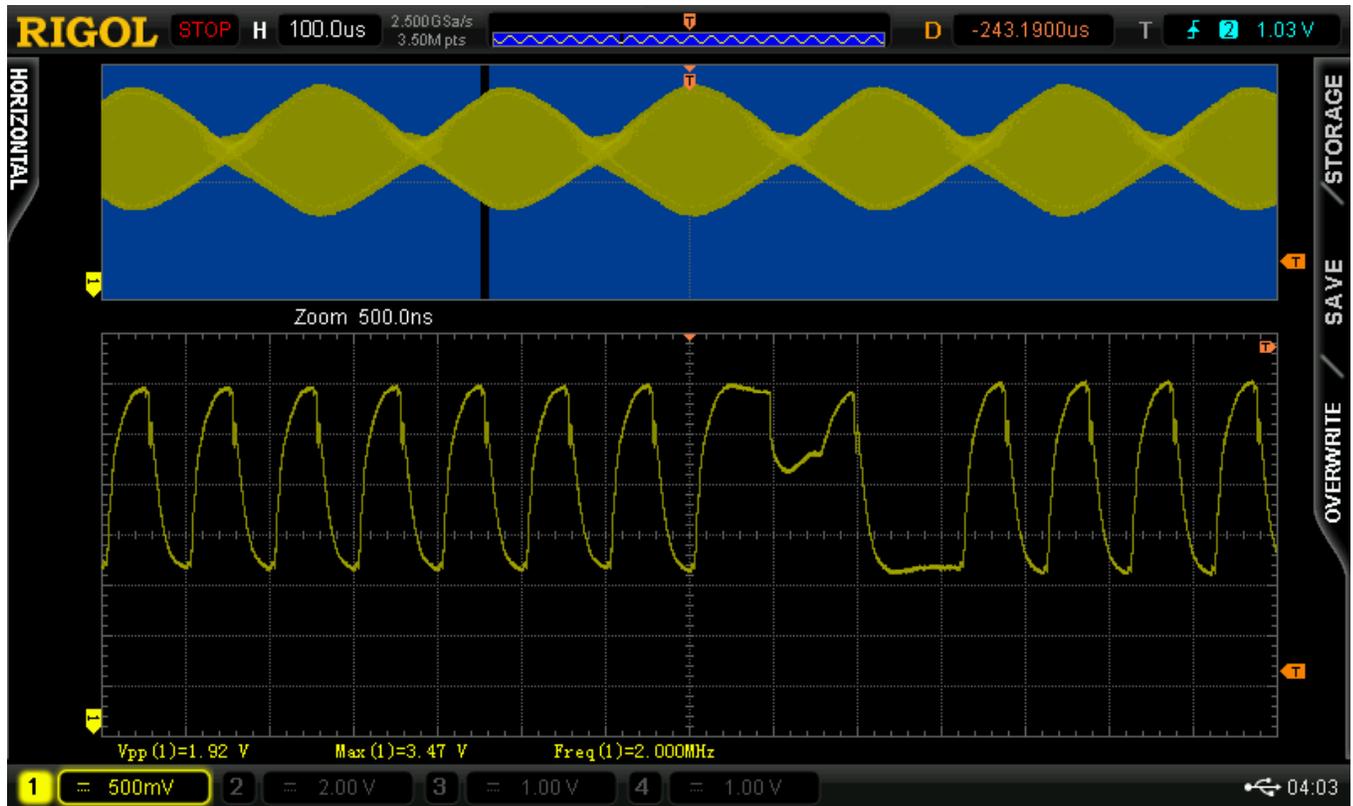
Connect the Channel 1 to the AM pin and Channel 2 to the Sync pin.

Press the “AUTO” button. Remove Channel 2 from the screen by pressing “CH2” button repetitively.

We then proceed to show the envelope of the wave by adjusting the



horizontal time scale to 100uS using the horizontal time scale knob. Then, press the Horizontal time scale knob. Once the knob is pressed, we can use the zoom feature as seen in the picture below to zoom in and view the glitch. Though less than a division in length the glitch was easily detected when UltraVision was engaged as observed below:



Thanks to Rigol's UltraVision, the DS6000 can capture very fine changes in the signal's waveform such as this slight glitch in the AM wave.

For more information or questions contact us directly at:

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