



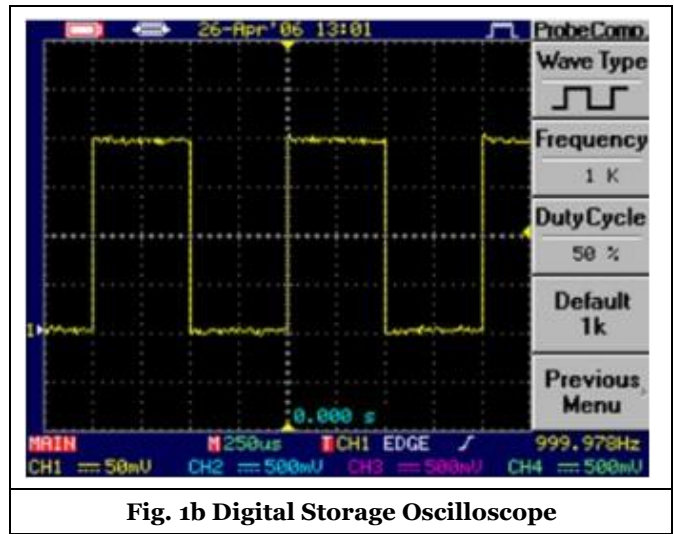
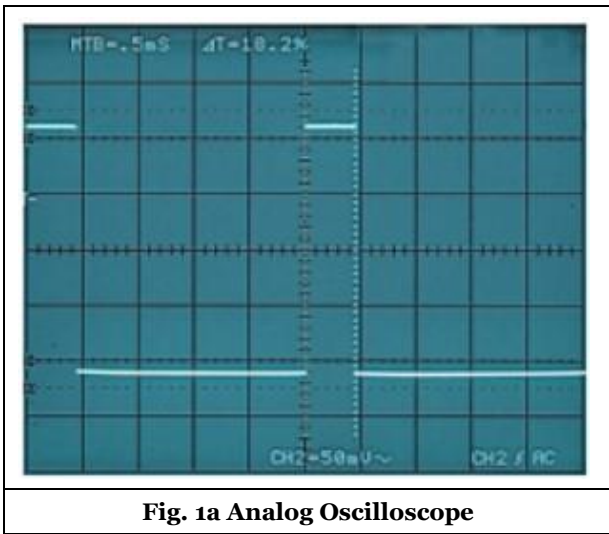
## VPO Technology



**GW INSTEK**  
Simply Reliable

The GW Instek GDS-3000 Series digital storage oscilloscopes are equipped with a built-in self-developed waveform image processing system which significantly enhances the waveform capture rate. We call this VPO (Visual Persistence Oscilloscope) Technology.

The first generation of analog oscilloscopes (Analog oscilloscope CRT display as shown in Figure Fig. 1a) utilized fluorescent materials to capture fast electronic signals to generate a dot on a screen. By controlling the intensity and bias of an electron beam, the brightness and tracking of a signal could be generated. This was used to reconstruct a waveform image that would be displayed on a screen for a short time. For this reason, one can observe the details of a signal while the signal is changing with the naked eye.



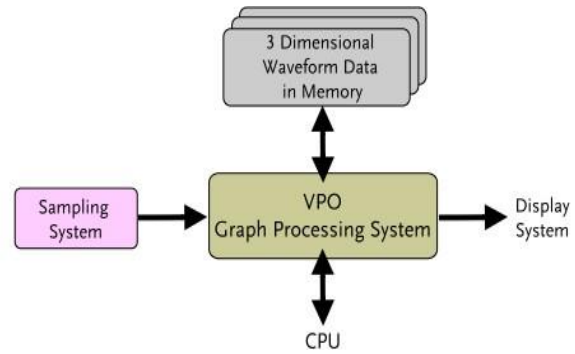
Digital storage oscilloscopes, usually viewed as 2nd generation oscilloscope (DSO, as shown in Figure Fig. 1b) mainly convert analog signals into digital signals through high-speed analog to digital converters (ADC). These signals are then stored in its memory for the CPU to process and draw the waveform. The design of a DSO puts some of its functions far beyond the reach of analog oscilloscopes. For example: waveform storage, math operations (Example: - \* / FFT), automatic measurements and pre-triggers. The only reason why analog oscilloscopes still fascinate so many people is because of their ability to display a signal in real-time.

Conversely, this is also the greatest disadvantage of digital storage oscilloscopes. As the CPU in a DSO does not have the processing power to process a waveform as fast as the signal is changing; only part of the signal is captured and processed. The section of time for when a signal is not captured is called Dead Time (Fig. 1c). The longer the dead time is, the greater the chance of not detecting a rapid change in the signal. If a DSO cannot detect such signals then it is unable to meet the demands of a modern measurement instrument.



The waveform image processing system designed and developed by GW Instek are mainly used to share the data processing with the CPU, shortening the time needed to draw a waveform and consequently increasing the waveform capture rate.

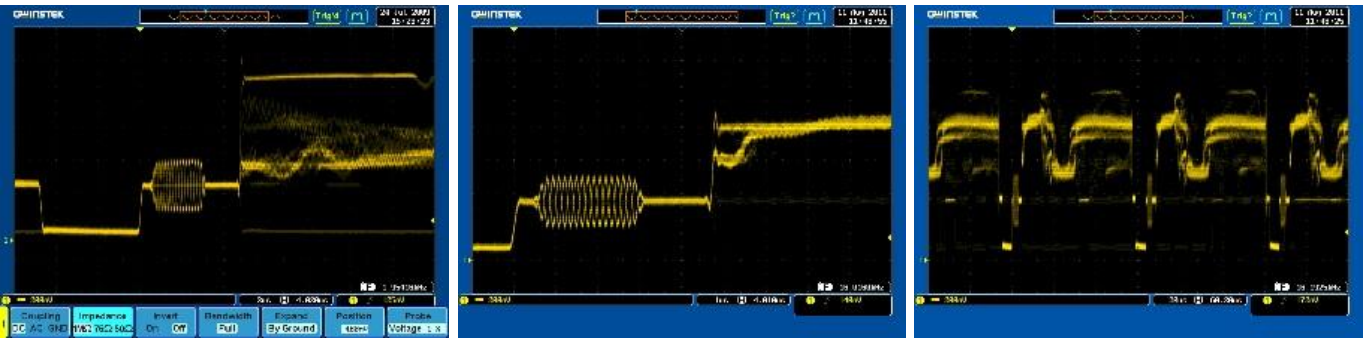
Furthermore, in order to create a display performance similar to that of analog oscilloscopes, the waveform data for all channels is displayed as a three dimensional image (amplitude, time and intensity). When a strong signal is generated, the waveform will be brighter and the waveform will persist for a longer time, allowing users to easily grasp any instantaneous changes in the waveform. By using an image processing system, waveform data can be quickly acquired by the DSO, processed and displayed on the screen with multiple levels of intensity almost as quickly as an analog oscilloscope.



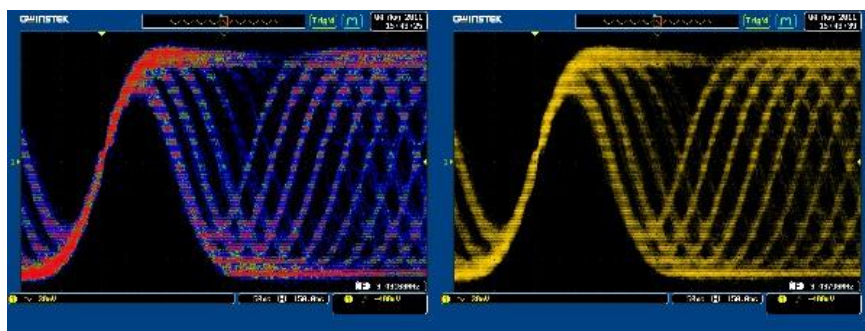
**Fig 2 VPO Illustration**

By using VPO technology and a 5 GSa/sec sampling rate, the GDS-3000 Series significantly enhances waveform capture rate, allowing users to clearly observe video signals, DVD signals, and FM signals.

**Video Signal Acquisition**



**DVD Signal Acquisition**



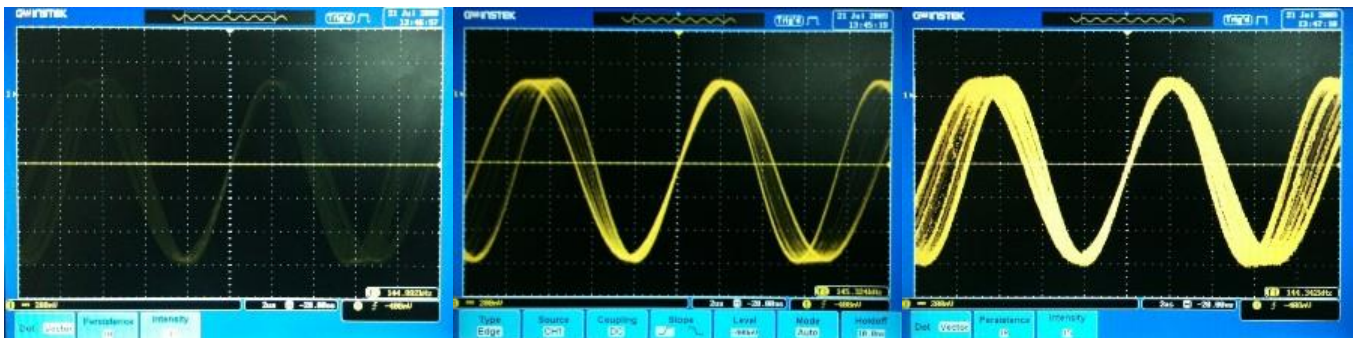


### FM Signal Acquisition

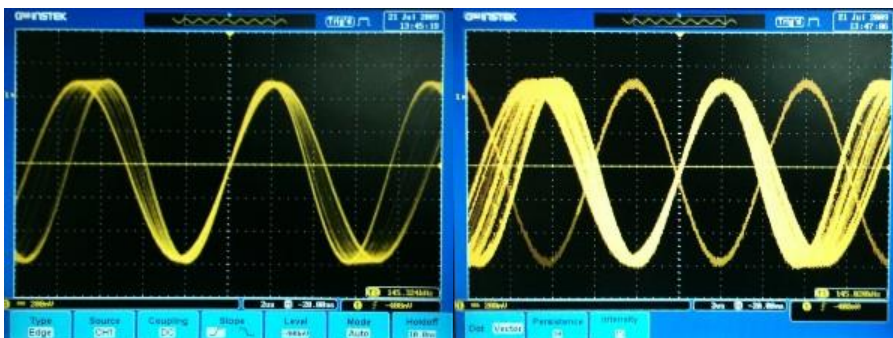


By adjusting the intensity and persistence of waveforms, the GDS-3000 Series enables users to clearly observe and analyze intermittent events.

### Waveform Intensity



### Waveform Persistence Time



Therefore, the new generation of VPO oscilloscopes are equipped with the characteristics of analog oscilloscopes and the numerous features of second generation digital storage oscilloscopes, including: waveform storage, math operations (Example: + - \* / FFT), automatic measurements and other accurate measurement functions. With these features, the GDS-3000 becomes the best instrument for analyzing intermittent events and video signals.

### GDS-3000 Series Introduction

GDS-3000 series is an innovative testing platform providing up to 500 MHz bandwidth, 4 analogue input channels, 5GSa/s, and VPO technology (Visual Persistence Oscilloscope). Beside these, it also equips an innovative split screen system with independent horizontal settings, vertical settings and triggers. This is a new function which can be used in testing, research, and manufacturing. With power analysis and serial bus analysis software, GDS-3000 series also enables engineers to expedite product testing, developing, and manufacturing.

#### Features

- \* 500/350/250/150MHz with 2/4 Channels
- \* Max. 5GSa/s RT or 100GSa/s ET Sampling Rate
- \* Independent Memory for Each Channel
- \* VPO Technology
- \* Large 8-inch 800x600 Display
- \* Split Screen Function
- \* 3 Built-in Impedances (50Ω/75Ω/1MΩ)
- \* Power Analysis Software (Optional)
- \* Serial Bus Analysis Software for I2C, SPI and UART (Optional)

GDS-3000 series				
Model	Channels	Bandwidth	sampling rate	memory length
GDS-3152	2Ch + Ext	150MHz	2.5GSa/s	25k points
GDS-3154	4Ch + Ext		5GSa/s	
GDS-3252	2Ch + Ext	250MHz	2.5GSa/s	
GDS-3254	4Ch + Ext		5GSa/s	
GDS-3352	2Ch + Ext	350MHz	5GSa/s	
GDS-3354	4Ch + Ext		5GSa/s	
GDS-3502	2Ch + Ext	500MHz	4GSa/s	
GDS-3504	4Ch + Ext		4GSa/s	

For more information about product, power analysis software, and its corresponding accessories, please visit our website:

[http://www.gwinstek.com/en-global/products/Oscilloscopes/Digital\\_Storage\\_Oscilloscopes/GDS-3000](http://www.gwinstek.com/en-global/products/Oscilloscopes/Digital_Storage_Oscilloscopes/GDS-3000)

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