GDS-3000 Series
500/350/250/150MHz Digital Storage Oscilloscope

FEATURES
- 500/350/250/150MHz Bandwidth, 2/4 Input Channel
- 5GSa/s Real-time Sampling Rate and 100GSa/s Equivalent Time Sampling Rate
- 25k Points Memory for Each Input Channel
- VPO (Visual Persistence Oscilloscope) Technology to Display Less-Frequently-Occurred Signals
- 8" 800 x 600 High Resolution TFT LCD Display
- Unique Split Screen System with Independent Setting and Display for Each Input Channel
- Three Built-in Input Impedance Selections: 50Ω/75Ω/1MΩ
- Optional Power Analysis Software for Power Source Measurement and Analysis
- Optional Serial bus Analysis Software for Trigger & Decode of I²C, SPI and UART Interfaces
GDS-3000 Series

The GDS-3000 Series digital storage oscilloscope is a full-featured and powerful tool that allows you to tackle complex measurement issues with ease. The GDS-3000 Series, carrying a maximum bandwidth of 500MHz, is equipped with a real-time sampling rate up to 5GSa/s and an equivalent-time sampling rate of 100GSa/s. The large 8-inch SVGA LCD screen, combined with the advanced digital signal processing technology VPO, provides meticulous detail and clarity for the displayed waveforms. The GDS-3000 Series gives you confidence not to miss any part of the test signal in the product verification and debugging stages and allows you to speed up your task without hesitation.

SGSa/s Sampling & VPO Technology

The GDS-3000 Series adopts VPO (Visual Persistence Oscilloscope) signal processing technology to enhance the performance of multi-gray-scale waveform display. The FPGA parallel processing, instead of conventional microprocessor architecture, is applied in GDS-3000 Series design to significantly increase the data processing speed and therefore increase the waveform update rate. This technology allows the GDS-3000 Series to display waveforms with various gray scales based on the occurrence frequencies, a fashion analogous to the analog oscilloscope display. As the visual persistence oscilloscope contains 3-dimension waveform data, including amplitude, time and intensity, for each waveform spot, it provides more useful signal information than a normal digital storage oscilloscope can do. The high-speed data processing of VPO technology enables the signal analysis of rapid events such as video, jitter, glitch and runt.

The GDS-3000 Series features a maximum real-time sampling rate of 5GSa/s, which is superior to most of the equivalent oscilloscopes available in the market today. (4GSa/s maximum sampling rate for GDS-3502 & GDS-3504 and 2.5GSa/s maximum sampling rate for GDS-3152 & GDS-3352s). The series is also equipped with an equivalent-time sampling rate of 100 GSa/s, providing an economic solution for the waveform acquisition and reconstruction of very high-speed repetitive signals. The fast-acquisition capability along with VPO signal processing technology, make GDS-3000 a very handy tool for observing occasionally-occurred signals such as transient and inrush events. With powerful technology, GDS-3000 Series gives you full confidence in every acquisition of complex waveform that adheres to high-speed circuit design of modern products.

Ethernet
500/350/250/150 MHz Digital Storage Oscilloscope

A High-tech Platform Carrying Advanced Technologies

1. 8” TFT LCD Panel
   The bright 8” TFT LCD display makes multiple signal observation easy.

2. 5GSa/s Real-time Sampling Rate for Fast Waveform Capture
   The high speed sampling technology used for data acquisition truthfully reconstructs complex signals.

3. VPO Signal Processing Technology
   VPO signal processing technology displays waveforms in 3 dimensions - amplitude, time and intensity.

4. Compact Design
   With a depth of only 5 inches, the compact size of the product doesn’t occupy valuable work space.

5. Split Window Function (Split Screen)
   The GDS-3000 Series supports up to four independently operated and triggered windows at a time so that you can simultaneously monitor up to 4 signals carrying different characteristics.

6. Auto-Range Function
   The Auto Range function automatically adjusts the time base and/or the vertical scale of displayed waveform when the frequency and/or the amplitude of input signal changed.

7. High Speed USB 2.0 Port
   USB Host port for easy access of stored data.

8. Three Input Impedance Selections
   The three built-in input impedances (75Ω, 50Ω, 1MΩ) can be selected to meet the requirements of various applications.

9. Serial Bus Triggering and Decode (Optional)
   2 dedicated keys used for setting recall in the serial bus analysis applications supporting UART, I²C and SPI serial bus.

10. Independent Channel Design
    The independent zone of vertical operations for each channel substantially increases the measurement efficiency.

SELECTION GUIDE

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<th>Model</th>
<th>GDS-3504</th>
<th>GDS-3502</th>
<th>GDS-3354</th>
<th>GDS-3252</th>
<th>GDS-3354</th>
<th>GDS-3352</th>
<th>GDS-3354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth</td>
<td>500MHz</td>
<td>100MHz</td>
<td>150MHz</td>
<td>250MHz</td>
<td>150MHz</td>
<td>150MHz</td>
<td>150MHz</td>
</tr>
<tr>
<td>Channels</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Record Length</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
<td>25k/Channel</td>
</tr>
<tr>
<td>Real-Time Sampling</td>
<td>4 GSa/s</td>
<td>4 GSa/s</td>
<td>5 GSa/s</td>
<td>5 GSa/s</td>
<td>5 GSa/s</td>
<td>2.5 GSa/s</td>
<td>2.5 GSa/s</td>
</tr>
<tr>
<td>Equivalent Time Sampling</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
<td>100GSa/s</td>
</tr>
</tbody>
</table>

* 2 Channels on Max Sampling Rate : 2GSa/s (GDS-3354/3352); 2.5GSa/s (GDS-3354/3352/3254/3154); 1.25GSa/s (GDS-3252/3152)
* 3, 4 Channels on Max Sampling Rate : 2GSa/s (GDS-3354); 1.25GSa/s (GDS-3354/3352/3254/3154)

11. USB Ports as Standard
    USB Host/Device interfaces for easy access of stored data and direct print-out through a PictBridge compatible printer.

12. LAN Port as Standard
    LAN interfaces for remote control and monitoring.

13. Line Output
    3.5mm stereo sound output for Go/NoGo buzzer.

14. RS-232 Interface

15. SVGA Video Output
    SVGA video output port allows the transfer of DSO screen image to an external projector or monitor for remote monitoring or big screen observation.

16. Go/NoGo BNC
    The open collector output signal allows external instrument to be controlled by the test result.

17. Trigger Output Port
    A 5V TTL Level trigger signal is available for the synchronization with other devices.

18. Self-Calibration Signal Output
    Self-Calibration signal output for input channel vertical gain calibration.

Multi-Language Support

The GDS-3000 Series interface supports multiple languages to provide the utmost convenience for cross-country team cooperation and multinational engineering efforts.
The GDS-3000 Series supports simultaneous measurement of up to 28 waveform measurement items grouped into three main waveform parameters: amplitude, time and delay measurements. The display modes include an individual mode and a Display All mode. The former can display any 8 of the automatic measurements while the later can display all the automatic measurements for a channel.

Besides Edge trigger, the GDS-3000 Series also offers various trigger functions, including Video, Pulse Width, Runt, Rise Time & Fall Time (specific time length), Alternate, Delay by Time, Delay by Event, and Hold-Off. The high-sampling rate, the VPO signal processing & display, and the flexible trigger function all together make the GDS-3000 Series a powerful tool for waveform capture and display of various types of signals.

To observe fundamental and harmonic frequency components of a signal, the FFT function on a digital storage oscilloscope is often used. Typically the traditional unit of the FFT is decibel (dB). However, when using dB it is sometimes difficult to identify the fundamental frequency of a signal from a noisy spectrum. With FFT/linear mode, the GDS-3000 Series can clearly display the fundamental frequency of an acquired waveform. The FFT function of GDS-3000 supports Rectangular, Hamming, Hanning, and Black-harris windows.

A SVGA video output port in the rear panel of GDS-3000 Series allows the screen-image transfer from DSO to an external projector or a monitor for remote monitoring or big screen observation. This direct image transfer feature greatly increase the efficiency of presentation in the meeting, teaching in the class, remote monitoring of hazardous events from a secured zone, and fast and easy monitoring in the production line.

Using a USB port coupled with FreeWave remote monitoring software is the easiest and most convenient way to capture data from the GDS-3000 Series. With FreeWave, a screenshot can be saved as an image file (.bmp), jpeg and waveform data (.csv). Not only can FreeWave monitor and record waveforms over a long period of time, but previously recorded waveforms can also be observed. Instrument settings can even be configured without the need to learn incomprehensible command line syntax. With the simple user interface and robust features, FreeWave allows you to get the most out of the GDS-3000 with little effort.
Two high-speed USB 2.0 Host ports located in both front panel and rear panel are used for easy access of stored data. In the rear panel, a USB Device port is available for remote control and hardcopy print-out through a PostScript compatible printer. RS-232 and LAN interfaces are provided as standard for system communication & ATE applications.

A SVGA video output port allows the transfer of DSO screen image to an external projector or monitor for remote monitoring or big screen observation. A GPIB to USB adapter is available as an option for interface conversion though the USB Device port in the front panel.

### M. VARIOUS INTERFACES SUPPORT

### N. SERIAL BUS ANALYSIS SOFTWARE SUPPORTING I2C, SPI and UART (OPTIONAL)

With serial bus technology being widely used in embedded applications, the proper triggering and analysis of flowing data, control signal and associated pulse waveforms in serial bus communication has been a difficult job and challenge to design engineers. The Serial Bus Analysis software of GDS-3000 Series carries complete analysis tools for triggering and decoding of commonly used serial bus interfaces, including I2C, SPI,

### O. POWER ANALYSIS SOFTWARE FOR POWER SUPPLY MEASUREMENTS (OPTIONAL)

The Power Analysis software contains four measurement functions, including Power Quality, Harmonics, Ripple and Inrush Current. The Power Quality analysis function allows the measurements of Voltage, Current, Frequency, Power and other quality related parameters for power source efficiency improvement. The Harmonics analysis function performs evaluation of power waveform distortion and gives harmonic test data for power source design and quality check. This function is complied with IEC 61000-3-2 standard. The Ripple measurement function, acquires the ripple and noise overriding the DC waveform, is used to evaluate the DC power source quality. The Inrush Current measurement function is used to measure the power-on surge current, which may cause the damage of the device circuit.

*Only four-channel models support SPI function.*

### HIGH VOLTAGE DIFFERENTIAL PROBE

### CURRENT PROBE

### CURRENT PROBE POWER SUPPLY

### CURRENT PROBE POWER SUPPLY

### PROBE BANDWIDTH

### PROBE BANDWIDTH

### POWER SUPPLY CONNEXIONS

### ACCESSORIES

### POWER ANALYSIS SOFTWARE FOR POWER SUPPLY MEASUREMENTS (OPTIONAL)

### POWER ANALYSIS SOFTWARE FOR POWER SUPPLY MEASUREMENTS (OPTIONAL)

### POWER SUPPLY CONNEXIONS

### ACCESSORIES
### SPECIFICATIONS

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<th>Bandwidth</th>
<th>Rise Time</th>
<th>Bandwidth Limit</th>
<th>Vertical Resolution</th>
<th>Vertical Resolution (1MΩ)</th>
</tr>
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<tbody>
<tr>
<td>DC–150MHz</td>
<td>20MHz</td>
<td>1.4ns</td>
<td>200MHz</td>
<td>2mv/2V/div</td>
<td>2mv/2V/div</td>
</tr>
<tr>
<td>DC–250MHz</td>
<td>20MHz</td>
<td>1.4ns</td>
<td>300MHz</td>
<td>2mv/2V/div</td>
<td>2mv/2V/div</td>
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<tr>
<td>DC–350MHz</td>
<td>20MHz</td>
<td>1.4ns</td>
<td>450MHz</td>
<td>2mv/2V/div</td>
<td>2mv/2V/div</td>
</tr>
<tr>
<td>DC–500MHz</td>
<td>20MHz</td>
<td>1.4ns</td>
<td>550MHz</td>
<td>2mv/2V/div</td>
<td>2mv/2V/div</td>
</tr>
</tbody>
</table>

#### TRIGGER

- **Source**: CH1, CH2, Line, EXT, 4CH mod.
- **Mode**: Normal, Single, Auto, Mix, Pulse
- **Trigger Type**: Edge, Pulse Width, Video, Run, Rise & Fall
- **Delay**: 1ns, 5ns, 10ns
- **Auto Trigger**: Automates the time base and/or the vertical scale of displayed waveform when the frequency and/or the amplitude of the input signal changed.

#### X-Y MODE

- **Channel**: Channel 1, Channel 2, Channel 3, Channel 4
- **Phase Shift**: 0° ± 100°

#### SIGNAL ACQUISITION

- **Real Time Sample Rate**: 2.5GSa/s
- **Sample Rate**: 2.5GSa/s
- **Memory Depth**: 5GSa/s
- **Acquisition Mode**: 5GSa/s
- **Normal**: 1000 points, peak detect, high resolution, single sample
- **Auto**: 2–256 waveforms, peak detect, drawing

#### Cursors and Measurement

- **Cursor Functions**: Time, Voltage, Time, Voltage, Time, Voltage
- **Auto Measurement**: Time, Voltage, Time, Voltage, Time, Voltage
- **Auto Counter**: 25 points, peak detect, normal, peak detect, single sample

#### POWER MEASUREMENTS

- **Power Quality Measurements**: VRMS, Freq, Magn, Phase, Freq, Phase, Freq, Phase
- **Power Factor Measurements**: VRMS, Freq, Magn, Phase, Freq, Phase, Freq, Phase
- **Phase Angle**: VRMS, Freq, Magn, Phase, Freq, Phase, Freq, Phase

#### CONTROL PANEL FUNCTION

- **Auto Range**: Single-button, automatic setup of all channels for vertical, horizontal, and trigger systems, with undo auto range.
- **Save Setup**: Save waveform details, including setup information and waveform data.

### INTERFACE

- **RS-232C**: 9-pin, high-speed serial port
- **USB**: 2 sets, 2.0, high-speed host port, 1 set, 2.0, high-speed device port
- **Ethernet (10/100):** RJ-45 connector, 10/100Mbps
- **Monitor**: 15-pin, D-sub, SVGA
- **GPIB**: 25-pin, D-sub, GPIB

### ORDERING INFORMATION

- **GDS-3502**: 500MHz x 2 channels, Visual Persistence DSO
- **GDS-3352**: 350MHz x 2 channels, Visual Persistence DSO
- **GDS-3354**: 350MHz x 4 channels, Visual Persistence DSO
- **GDS-3504**: 350MHz x 2 channels, Visual Persistence DSO

### ACCESORIES

- **100kHz/100A Current Probe**: For measuring currents up to 100A.
- **25MHz/50A Current Probe**: For measuring currents up to 50A.
- **50MHz/30A Current Probe**: For measuring currents up to 30A.
- **100MHz/30A Current Probe**: For measuring currents up to 30A.

### FREE SOFTWARE

- **FreeWave**: Power analysis software, Power quality (Harmonic), I/V, NVA, RMS current measurements.

### SIMILARITY

- **Auto Range**: Single-button, automatic setup of all channels for vertical, horizontal, and trigger systems, with undo auto range.
- **Save Setup**: Save waveform details, including setup information and waveform data.