

SPECIFICATIONS

		GDS-3102A	GDS-3104A
VERTICAL	Channels	2 CH+EXT	4 CH+EXT
	Bandwidth	DC to 1 GHz (-3 dB)@50 Ω input impedance; DC to 500 MHz (-3 dB)@1 MΩ input impedance	
	Calculated Rise Time	350 ps	
	Bandwidth Limit	20 MHz/100 MHz/200 MHz/350 MHz*1	
	Vertical Resolution	8 bits, (Max.12 bits with Hi Res) For 1 MΩ input impedance : 1 mV*2 to 10 V/div For 50 Ω input impedance:1 mV*2 to 1 V/div	*1. The tolerance of bandwidth limit is ± 10 %. *2. The bandwidth is limited to 20 MHz at 2 mV/div or below; The bandwidth is limited to 900 MHz at 5 mV/div
	Input Coupling	AC, DC, GND	
	Input Impedance	1 MΩ// 22 pF approx.	
	DC Gain Accuracy	1 mV : ±5 % full scale ; ≥2 mV : ±3 % full scale	
	Polarity	Normal , Invert	
	Maximum Input Voltage(1 MΩ)	300 Vrms, CAT II	
	Maximum Input Voltage(50 Ω)	5 Vrms	
	Offset Position Range	For 1 MΩ input impedance : 1 mV/div to 20 mV/div : ±1 V ; 50 mV/div to 500 mV/div : ±10 V ; 1 V/div to 5 V/div: ±100 V ; 10 V/div: ±1000 V For 50 Ω input impedance : 1 mV/div to 50 mV/div : ±1 V ; 100 mV/div to 1 V/div: ±10 V	
	Waveform Signal Process	+, - x, ÷FFT, User Defined Expression FFT: Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS, and FFT Window to Rectangular, Hamming, Hanning or Blackman	
TRIGGER	Source	2 CH model: CH1, CH2, Line , EXT ; 4 CH model: CH1 , CH2 , CH3 , CH4 , Line , EXT	
	Trigger Mode	Auto(Supports Roll Mode for 100 ms/div and slower), Normal, Single	
	Trigger Type	Edge, Pulse Width(Glitch), Video, Pulse Runt, Rise & Fall(Slope),Time out, Alternate, Event-Delay(1 to 65,535 events), Time-Delay (Duration, 4 ns to 10 s), Bus(I ² C,SPI,UART,CAN,LIN)	
	Trigger Holdoff Range	4 ns to 10 s	
	Coupling	AC, DC, LF rej. , HF rej. , Noise rej.	
	Sensitivity	1 div	
EXT TRIGGER	Range	±20 V	
	Sensitivity	DC to 100 MHz Approx. 100 mV ; 100 MHz to 350 MHz Approx. 150 mV	
	Input Impedance	1 MΩ ± 3 % // 22 pF	
HORIZONTAL	Range	1 ns/div to 1000 s/div (1-2-5 increments); ROLL : 100 ms/div to 1000 s/div	
	Pre-trigger	10 div maximum	
	Post-trigger	10,000,000 div max (depend on time base)	
	Accuracy	±5 ppm, about ±2 ppm increase in error per year	
X-Y MODE	X-Axis Input/Y-Axis Input Phase Shift	Channel 1, Channel 3 (for 4 CH model); Channel 2, Channel 4 (for 4 CH model) ±3° at 100 kHz	
SIGNAL ACQUISITION	Real Time Sample Rate	5 GSa/s half channels; 2.5 GSa/s all channels	
	Record Length	Max.200 Mpts/CH	
	Acquisition Mode	Normal, Average, Peak detect, High resolution, Single ; Average: Selectable from 2 to 512, Peak detect: 400 ps	
	Number of Segments	1 to 490,000 maximum	
CURSORS AND MEASUREMENT	Cursors	Amplitude, Time, Gating available; Unit:Seconds(s), Hz(1/s), Phase(degree), Ratio(%)	
	Automatic Measurement	38 sets with indicator: Pk-Pk, Max, Min, Amplitude, High, Low, Mean, Cycle Mean, RMS, Cycle RMS, Area, Cycle Area, ROVShoot, FOVShoot, RPREShoot, FPREShoot, Frequency, Period, RiseTime, FallTime, +Width, -Width, Duty Cycle, +Pulses, -Pulses, +Edges, -Edges, %Flicker, Flicker Idx ,FRR, FRF, FFR, FFF, LRR, LRF, LFR, LFF, Phase	
	Cursors Measurement	Voltage difference between cursors Δ (V) Time difference between cursors Δ (T)	
	Auto Counter	6 digits, range from 2 Hz minimum to the rated bandwidth	
CONTROL PANEL FUNCTION	Autoset	Single-button, automatic setup of all channels for vertical, horizontal and trigger systems, with “Undo Autoset”, “Fit Screen”/ “AC Priority” mode, and “Fine Scale” functions.	
	Save Setup	20 sets	
	Save Waveform	20 sets	
	Save Reference Waveform	4 sets	
POWER MEASUREMENTS (Option)		Power Quality, Harmonics, Ripple, In-rush current, Switching Loss, Modulation, SOA, Transient, Efficiency, B-H curve, Control Loop Response, PSRR, Turn On/Off	
AWG	Channels	2	
	Sample Rate	200 MSa/s	
	Vertical Resolution	14 bits	
	Max. Frequency	25 MHz	
	Waveforms	Sine, Square, Pulse, Ramp, DC, Noise, Sinc, Gaston, Lorentz, Exponential Rise, Exponential Fall, Haversine, Cardiac	
	Output Range	20 mVpp to 5 Vpp, HighZ; 10 mVpp to 2.5 Vpp, 50 Ω	
	Output Resolution	1 mV	
	Output Accuracy	2 % (1 kHz)	
	Offset Range	±2.5 V, High Z; ±1.25 V, 50 Ω	
	Offset Resolution	1 mV	
	Sine	Frequency Range:100 mHz to 25 MHz; Flatness(relative to 1 kHz): ± 0.5 dB < 15 MHz, ±1 dB (15 MHz to 25 MHz); Harmonic Distortion:-40 dBc; Stray(Non-harmonic):-40 dBc; Total Harmonic Distortion: 1 % ; S/N Ratio:40 dB	
	Square/Pulse	Frequency Range:100 mHz to 15 MHz ; Rise/Fall time: <15 ns ; Overshoot: <3 % ; Duty cycle Square:50 % & Pulse:0.4 % to 99.6 % ; Min. Pulse Width:30 ns ; Jitter:500 ps	
	Ramp	Frequency Range:100 mHz to 1 MHz ; Linearity: 1 % ; Symmetry: 0 % to 100 %	
SPECTRUM ANALYZER	Frequency Range	DC to 2.5 GHz(Max.) dual channel with spectrogram (based on advanced FFT). Notice: Frequency which exceeds analog front end bandwidth is uncalibrated	
	Span	1 kHz to 2.5 GHz(Max.)	
	Resolution Bandwidth	1 Hz to 2.5 MHz(Max.)	
	Reference Level	-80 dBm to +40 dBm in steps of 5 dBm	
	Vertical Units	dBV RMS; Linear RMS; dBm	
	Vertical Position	-12 divs to +12 divs	
	Vertical Scale	1 dB/div to 20 dB/div in a 1-2-5 Sequence	
	Display Average Noise Level	1 V/div < -40 dBm, Avg : 16 ; 100 mV/div < -60 dBm, Avg : 16 ; 10 mV/div < -80 dBm, Avg : 16	
	Spurious Response	2nd harmonic distortion < 35 dBc ; 3rd harmonic distortion < 40 dBc	
	Frequency Domain Trace Types	Normal ; Max Hold ; Min Hold ; Average (2 to 256)	
	Detection Methods	Sample ; +Peak ; -Peak ; Average	
	FFT Windows	FFT Factor : Hanning 1.44 ; Rectangular 0.89 ; Hamming 1.30 ; Blackman 1.68	

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LOGIC ANALYZER (Option)	Sample Rate Bandwidth Record Length Input Channels Trigger Type Thresholds Quad Threshold Selections User-defined Threshold Range Maximum Input Voltage Minimum Voltage Swing Vertical Resolution	Per Channel 1G Sa/s 200 MHz Per Channel 10 M pts (max) 16 Digital (D15 to D0) Edge, Pattern, Pulse Width, Serial bus (I ² C, SPI, UART, CAN, LIN), Parallel Bus Settable thresholds for: D0 to D3, D4 to D7, D8 to D11, D12 to D15 TTL, CMOS(5 V, 3.3 V, 2.5 V), ECL, PECL, 0 V, User Defined ±5 V ±40 V ±250 mV 1 bit
FREQUENCY RESPONSE ANALYSIS	Frequency Range Input and Output Sources Number of Test Points Dynamic Range Test Amplitude Test Results Manual Measurements Plot Scaling	20 Hz to 25 MHz Channel 1 to 2 for 2 CH model ; Channel 1 to 4 for 4 CH model 10, 15, 30, 45, 90 points per decade selectable for logarithm scale; 2 to 1000 points selectable for linear scale > 80 dB (typical) 10 mVpp to 2.5 Vpp into 50 Ω, 20 mVpp to 5 Vpp into High-Z, Fixed test amplitude or custom amplitude for each decade Logarithmic or linear overlaid gain and phase plot, may also overlay with reference plots for cross comparison. Test results saved in csv format for offline analysis Tracking gain and phase markers Auto-scaled during test
DISPLAY SYSTEM	TFT LCD Type Waveform Update Rate Display Resolution Interpolation Waveform Display Display Graticule Display Mode	10.2" TFT LCD WVGA color display 200,000 wfms/sec max. 800 horizontal x 480 vertical pixels (WVGA) Sin (x)/x Dots, Vectors, Variable persistence(16 ms to 4 s), Infinite persistence, gray and color waveforms 8 x 10 divisions YT,XY
INTERFACE	RS-232C USB Port Ethernet Port VGA Video Port Optional GPIB Module Go/NoGo BNC Kensington Style Lock Power Supply Receptacles	DB-9 male connector USB 2.0 high-speed host port x 1 ; USB high-speed 2.0 device port x 1 RJ-45 connector, 10 M/100 Mbps with HP Auto-MDIX DB-15 female connector, monitor output for display on VGA monitor Fully programmable with IEEE488.2 compliance 5 V Max/10 mA open collector output Rear-panel security slot connects to standard Kensington-style lock ±12 V/500 mA for current probe usage. 2 sets for 2 CH model; 4 sets for 4 CH model
MISCELLANEOUS	Operating Line Voltage Range Multi-Language Menu On-Line Help Time Clock Internal Flash Disk Installed APP User Define Key	0 °C to 50 °C, Relative Humidity ≤ 80 % at 40 °C or below ; ≤ 45 % at 41 °C to 50 °C AC 100 V to 240 V, 50 Hz to 60 Hz, auto selection. power consumption:100 W Available Available Time and date, provide the date/time for saved data 800 Mega bytes Single-Level Cell flash memory Go/NoGo, DVM, DataLog, Digital Filter, Frequency Response Analyzer, Mask, Mount Remote Disk, Demo User can select one of the several different preset functions as shortcut key
DIMENSIONS &	420(W) mm X 253(H) mm X 113.8(D) mm, Approx. 4.6 kg	

Note : Three-year warranty, excluding probes & LCD display panel.