ADS900A Series Technical Specifications

Unless otherwise stated, all technical specifications apply to digital oscilloscope with the attenuation switch of the probe set to 10X.

- The instrument must be operated continuously for more than thirty minutes under the specified operating temperature.
- If the operating temperature range changes not less than 5℃, it is required to open the system function menu and execute “Self-calibration” program .

All specifications are guaranteed except those marked with “Typical”.

Oscilloscope

Vertical System

Analog Channel

Characteristics	Instruction		
Input Coupling	DC, AC, Ground		
Input Impedance	1 MΩ±2%, parallel with 20 pF±5 pF		
Probe attenuation coefficient setting	Common	10.00μX,20.00μX,50.00μX,100.00μX, 200.00μX,500.00μX,1.00mX,2.00mX, 5.00mX,10.00mX,20.00mX,50.00mX, 100.00mX,200.00mX,500.00mX,1.00X, 2.00X,5.00X,10.00X,20.00X,50.00X, 100.00X,200.00X,500.00X,1.00kX,2.00kX, 5.00kX,10.00kX,20.00kX, 50.00kX	
	Custom	1.00μX - 1.00MX	
Maximum Input Voltage	≤300 Vrms		
Vertical Resolution	12 bits		
Vertical Sensitivity	200 μV/div～10 V/div [1]		
Displacement	±2 V (200 μV/div – 200 mV/div) ±80 V (500 mV/div – 10 V/div)		
Analog bandwidth	ADS912A/ADS914A	125 MHz	
	ADS922A/ADS924A	250 MHz	
Single bandwidth	Full bandwidth		
Low Frequency (AC coupling, -3dB)	≥10 Hz (at BNC)		
Rising Time(at BNC, typical)	ADS912A/ADS914A	≤ 2.8 ns	
	ADS922A/ADS924A	≤ 1.4 ns	
DC Gain Accuracy	≤1 mV	3%	
	2 mV	2%	

	≥5 mV	1.5%
DC accuracy (average)	Delta Volts between any two averages of ≥16 waveforms acquired with the same scope setup and ambient conditions (△V): ±(2% rdg + 0.05 div)	
Channel–channel isolation	50 Hz: 100:1 10 MHz: 40:1	
Time delay between channel(typical)	150 ps	
Waveform inverted	Support	
Bandwidth limit	20 MHz, full bandwidth	

Description:

[1] : 200 μV/div is a digital magnification of 1mV/div.

Horizontal System

Analog Channel

Characteristics	Instruction
Scanning speed (s/div)	1 ns/div - 1000s/div, step by 1-2-5
Time base accuracy	±25 ppm (typical value, ambient temperature: +25℃)
Time interval (△T) measurement accuracy(DC ～ 100MHz)	Single: ±(1 interval time+|time base accuracy|×reading+0.2 ns) Average>16: ±(1 interval time +|time base accuracy|×reading+0.1 ns)
Sampling rate range	0.05 Sa/s～2.5 GSa/s
Maximum Storage Depth	100M

Acquire System

Characteristics	Instruction	
Acquire mode	Sample, Peak, High Res, Average, Segmentation	
Maximum real-time acquire rate	Four Channel, Dual Channel[1]	500 MSa/s
	Dual Channel[2]	1 GSa/s
	Single Channel	2 GSa/s
Waveform capture rate	Real-time acquire: 50,000 wfms/s Segment acquire: 700,000 wfms/s	
Record length	1k,10k,100k,1M,10M,25M,50M, 100M	
	Note: The record length is dynamic, changing with the number of channel openings and acquire mode	

Interpolation	Auto, Sinx/x, x
Segmentation	Maximum of 250,000 segments that can be acquired.

Description:

[1] : Limited to four-channel models, the maximum real-time sampling rate of dual channels must be one of the following conditions: CH1 and CH2 are both on, or CH3 and CH4 are both on.

[2]: Limited to four-channel models, the maximum real-time sampling rate of two channels should meet one of the following conditions: only one channel of CH1 and CH2 can be turned on, and only one channel of CH3 and CH4 can be turned on.

Trigger

Trigger System

Characteristics	Instruction	
Trigger source	CH1, CH2, CH3, CH4, LA	
Trigger mode	Auto, Normal, Single	
Trigger type	Edge trigger, Video trigger, Pulse trigger, Slope trigger, Runt trigger, Windows trigger, Timeout trigger, Nth trigger, Logic trigger, RS232/UART trigger, I2C trigger, SPI trigger, CAN trigger, LIN trigger	
50% level setting (typical)	Input signal frequency ≥ 50 Hz	
Trigger displacement	According to Record length and time base	
Holdoff range	100 ns to 10s	
Trigger sensitivity	0.3 div ~ 10 div	
Trigger level range	Internal	±4 divs from the center of the screen

Trigger Type

Characteristics	Instruction	
Edge Trigger	Couple	DC, AC, HF
	Slope	Rising, Falling
Video Trigger	Modulation	Support standard NTSC, PAL and SECAM broadcast systems
	Line number range	1-525 (NTSC) and 1-625 (PAL/SECAM)
Pulse Trigger	Trigger condition	Positive pulse: ＞, ＜, ＝ Negative pulse: ＞, ＜, ＝
	Pulse Width range	30 ns to 10 s
Slope Trigger	Trigger condition	Positive pulse: ＞, ＜, ＝ Negative pulse: ＞, ＜, ＝

	Time setting	30 ns to 10 s
Runt Trigger	Trigger condition	Positive pulse: ＞, ＜, ＝ Negative pulse: ＞, ＜, ＝
	Time setting	30 ns to 10 s
Windows Trigger	Trigger condition	Positive pulse: superamplitude entry, superamplitude exit, and superamplitude time Negative pulse: superamplitude entry, superamplitude exit, and superamplitude time
	Time setting	30 ns ~ 10 s
Timeout Trigger	Slope	Rising, Falling
	Idle Time	30 ns ~ 10 s
The Nth Edge Trigger	Slope	Rising, Falling
	Idle Time	30 ns ~ 10 s
	Edge Number	1 ~ 128
Logic trigger	Logic Mode	AND, OR, XOR,XNOR
	Input Mode	H, L, X, Rising, Falling
	Output Mode	Goes True, Goes False, Is True >, Is True <, Is True =
RS232/UART Trigger	Polarity	Normal, Inverted
	Trigger Condition	Start, Error, Chk Error, Data
	Baud Rate	Common, Custom
	Data Bits	5 bits, 6 bits, 7 bits, 8 bits
I2C Trigger	Trigger Condition	Start, Restart, Stop, Ack Lost, Addr, Data, Addr/Data
	Address Range /Byte Length	7 bits---->0 to 127 8 bits---->0 to 255 10 bits--->0 to 1023
	ByteLength	1 to 5
SPI Trigger	Trigger Condition	Timeout, CS
	Timeout value	30 ns to 10s
	Data Bits	4 bits to 32 bits
	Edge	Rising, Falling
CAN Trigger	Signal Type	CAN_H, CAN_L, TX, RX, DIFF
	Trigger Condition	Start, Type, Data, ID, ID/Data, End, Lost, Error
	Baud Rate	Common, Custom
	Sample Point	0.5% to 95%
	Frame Type	Data, Remote, Error, Overload
LIN Trigger	Condition	Break, ID, ID/Data, Data Error
	Baud Rate	Common, Custom

Waveform

Waveform Measurement

Characteristics	Instruction	
Cursor Measurement	△V, △T, △T&△V between cursors, auto cursor, support XY/FFT/ZOOM window, based on screen percentage	
	Number	2 pairs of XY cursors
	Manual mode	△V, △T
	Tracing mode	The voltage value and time value of the X waveform point are tracked by fixing the Y axis The fixed X-axis tracks the voltage value and time value of the Y waveform point
	Auto measurement cursor	Allows the cursor to be displayed during automatic measurements
	XY Mode	The voltage parameters of the corresponding channel waveforms were measured in XY timebase mode X= Channel 1, Y= Channel 2
Auto measurement	Number	43 automatic measurements with up to 8 measurements displayed simultaneously
	Measurement source	CH1 - CH4
	Measurement area	Primary time base, extended time base, cursor area
	Vertical	Period, + Width, Rise Time, +Duty, Frequency, - Width, Fall Time, -Duty and ScrDuty
	Horizontal	Vavg, Vpp, Vamp, StdDev, Vmax, Vtop, VRMS, Overshoot, Vmin, Vbase, CycRms and Preshoot
	Blend	+PulseCnt, -PulseCnt, RiseCnt, FallCnt, Area and CycArea
	Channel	Delay(1 ⏋ -2 ⏋), Delay(1 ⏋ -2 ⏊), Delay(1 ⏊ -2 ⏋), Delay(1 ⏊ -2 ⏊), Phase(1 ⏋ -2 ⏋), Phase(1 ⏋ -2 ⏊), Phase(1 ⏊ -2 ⏋), Phase(1 ⏊ -2 ⏊), FRR(1⏋-2⏋), FRF(1⏋-2⏊), FFR(1⏊-2⏋), FFF(1⏊-2⏊), LRR(1⏋-2⏋), LRF(1⏋-2⏊), LFR(1⏊-2⏋) and LFF(1⏊-2⏊)

Mathematical operation	+, -, * ,/ ,&& ,||, ^, ！, Tan, Intg, Diff, Sqrt, Lg, Ln, Exp, Abs, Sine, CoSin, User Defined Function, digital filter (low pass, high pass, band pass, band reject), FFT(Vrms, dBVrms, Radians, Degrees)

Waveform Analysis

Characteristics	Instruction	
Pass Fail	The signal under test is compared with a user-defined rule (template), providing the number of passes, failures, and the total number of tests. Pass/fail events can trigger immediate stop, buzzer, and screenshot.	
	Source	CH1 - CH4
	Type	Horizontal, vertical and other measurement items
	Measurement	Data statistics: Pass, Fail and the total number
	Acquire mode	All modes are supported except Zoom, XY, FFT and scroll
Color Grade	Provide three view of waveform intensity, color temperature level >16, 256 color scale display	
	Source	CH1 - CH4
	Waveform brightness	brightness
	Acquire mode	Only basic waveforms are supported
Record	The measured signal is segmented and stored according to trigger events. Specifically, when each trigger event occurs, all captured waveform data is saved as a segment in volatile memory, with a maximum of 125,000 frames that can be acquired.	
	Source	CH1 - CH4
	Analysis	Supports frame-by-frame or continuous playback, and allows for calculation, measurement, and decoding of the played waveforms.

Decode

Characteristics	Instruction
Decode Number	2, Both protocol types can be decoded and switched simultaneously
Decode Type	RS232/UART, I2C, SPI, LIN, CAN
RS232/UART	Decode RS232/UART bus TX/RX signals at speeds up to 10 Mb/s (5 to 8 bits), supporting parity bit (odd parity, even parity, or no parity) and stop bit (1 to 2 bits) configuration. Source Channel: CH1~CH4

I2C	Decode the I2C bus addresses (including or excluding the read/write bit), data, and ACK. Source Channel: CH1~CH4
SPI	Decode SPI bus MISO/MOSI data (4 to 32 bits). The mode supports timeout and chip select (CS). Source Channel: CH1~CH4
CAN	Decode remote frames of the CAN bus at speeds up to 1 Mb/s (ID, byte count, CRC), as well as overload frames and data frames (standard/extended ID, control field, data field, CRC, ACK). Supported CAN bus signal types include CAN_H, CAN_L, TX, RX and DIFF. Source Channel: CH1~CH4
LIN	Decode LIN bus versions 1.X or 2.X, with speeds up to 10 kb/s. Decode and display synchronization, identifier, data, and checksum. Source Channel: CH1~CH4

Bode Plot

Characteristics	Instruction
Start frequency	10 Hz ~ 25 MHz
End frequency	10 Hz ~ 25 MHz
Points/Decade	10 ~ 100
Amplitude	2mV ~ 6V

AFG

Characteristics	Instruction	
Channel	1	
Sample Rate	160 MSa/s	
Vertical Resolution	14 bits	
Maximum frequency	30 MHz	
Waveform	Standard waveforms	Sine wave, square wave, ramp wave, pulse wave, noise
	Arbitrary waveforms	Butterworth, X^2 and EOG etc 28 built-in waveforms
Frequency Feature		
Sine wave	1 μHz to 30 MHz	
Square wave	1 μHz to 15 MHz	
Ramp wave	1 μHz to 1 MHz	
Pulse wave	1 μHz to 10 MHz	
Noise wave(-3 dB)	20 MHz (Gaussian white noise)	
Arbitrary wave(except DC)	1 μHz to 10 MHz	

Frequency resolution		1 μHz or 9 significant figures
Frequency stability		±25 ppm, 0 to 40℃
Frequency aging rate		±25 ppm per year
Amplitude characteristic		
Output amplitude	High Z	2 mVpp to 10 Vpp (≤10 MHz) 2 mVpp to 5 Vpp (≤30 MHz)
	50Ω	1 mVpp to 5 Vpp (≤10 MHz) 1 mVpp to 2.5 Vpp (≤30 MHz)
Amplitude accuracy		±(1% of setting + 1 mVpp) (typical 1kHz sine,0V offset)
Amplitude resolution		1mVpp or 5 bits
DC offset range (AC+DC)	High Z	±5 Vpk - Amplitude Vpp/2 (≤10 MHz) ±2.5 Vpk - Amplitude Vpp/2 (≤30 MHz)
	50Ω	±2.5 Vpk - Amplitude Vpp/2 (≤10 MHz) ±1.25 Vpk - Amplitude Vpp/2 (≤30 MHz)
DC offset accuracy		±(1 % of |setting|+ 1 mV + amplitude Vpp * 0.5%)
Offset resolution		1 mVpp
Output Impedance		50Ω (typical)
Waveforms characteristic		
Sine		
Bandwidth flatness(1Vpp,relative 1kHz,50Ω)		≤10 MHz: ±0.3 dB ≤30 MHz: ±0.5 dB
Harmonic distortion		Typical value (0dBm) DC to 1 MHz: <-65 dBc 1 MHz to 30 MHz: <-60 dBc
Total harmonic distortion		<0.2%, 10Hz to 20kHz, 1Vpp
Non-harmonic distortion		Typical value(0dBm) ≤10 MHz: <70 dBc >10 MHz: <70 dBc + 6 c/sound interval
Phase noise		Typical value(0dBm,10kHz offset) 10MHz: ≤-110dBc/Hz
Square		
Rising falling time		<20 ns
Jitter		200 ps +25 ppm
Overshoot		<5%
Ramp		
Linearity		<the 1% of maximum output (typical value 1 kHz,1 Vpp, symmetry50%)
Symmetry		0% to 100%

Pulse	
Period	100 ns to 1Ms
Pulsewidth	≥64 ns
Overshoot	<5%
Jitter	200 ps +25 ppm
Noise	
Type	Gaussian white noise
Bandwidth (-3dB)	20 MHz
Arbitrary	
Bandwidth	10 MHz
Waveforms length	2 to 8192 points
Sample rate	160 MSa/s
Amplitude accuracy	14 bits
Modulation characteristic	
Modulate type	AM, FM, PM, FSK
AM	
Carrier	Sine, Square, Ramp, Arb(Except DC)
Internal modulation waveform	Sine, Square, Ramp, Noise
Internal amplitude modulation frequency	2 mHz to 20 kHz
Depth	0% to 100%
FM	
Carrier	Sine, Square, Ramp, Arb(Except DC)
Internal modulation waveform	Sine, Square, Ramp, Noise
Internal modulation frequency	2 mHz to 20 kHz
Frequency offset	2 mHz to Carrier frequent
PM	
Carrier	Sine, Square, Ramp, Arb(Except DC)
Internal modulation waveform	Sine, Square, Ramp, Noise
Internal phase modulation frequency	2 mHz to 20 kHz
Phase deviation range	0° to 180°
FSK	

Carrier	Sine, Square, Ramp, Arb(Except DC)
FSK rate	2 mHz to 100kHz
FSK hopfreq	1 μHz to Maximum frequency of corresponding carrier
Voltage range and sensitivity(No modulation source)	
Input resistance	1M Ω

Counter

Characteristics	Instruction
Source	CH1, CH2, CH3, CH4, D0-D15, Follow trigger
Measurement type	Frequency, period
Statistic parameter	Type, Max, Min, Avg
Maximum frequency	Maximum analog bandwidth
Resolution	6 bits

DVM

Characteristics	Instruction
Source	CH1, CH2, CH3, CH4
Function	AC RMS, DC, AC+DC RMS
Resolution	4 bits
Limit warnings	Support upper and lower limit setting, over-limit condition setting, over-limit prompt

LA

Characteristics	Instruction
Vertical	
Input channel	16 [D0:D15] , One group is D0 to D7, and one group is D8 to D15
Threshold range	±20.0 V, step by 10 mV
Threshold accuracy	± (100 mV+3% threshold setting)
Threshold selection	TTL, CMOS, ECL, PECL, custom
Maximum input voltage	±40 V peak CAT I; The instantaneous overvoltage is 800 Vpk
Maximum input dynamic range	±10 V + threshold
Minimum input signal swing	500 mVpp
Input impedance	100 kΩ || 8 pF

Vertical resolution	1 bit
Horizontal	
Minimum detectable pulse width	5 ns
Maximum input frequency	200 MHz
Time delay between channels	± 5 ns

Command

Characteristics	Instruction
Common support	Supports the standard SCPI command set
Error message Definition	Error Message
Support status reporting mechanism	Status Reporting
Support for synchronization mechanisms	Synchronization

General Technical Specification

Display

Characteristic	Instruction
Display Type	7 inch Colored LCD (Liquid Crystal Display)
Display Resolution	1024 (Horizontal) × 600 (Vertical) Pixels
Display Colors	24 colors, TFT
Grid	18 horizontal cells * 8 vertical cells
Afterglow	Off, infinity, adjustable time (1 second, 2 seconds, 5 seconds)
Brightness level	256 levels

Processor system

Characteristic	Instruction
System memory	2GB RAM
Operating system	Android
Internal non-volatile	8GB

Output of the Probe Compensator

Characteristics	Instruction
Output voltage(typical)	About 3.3 V, with the Peak-to-Peak voltage ≥1MΩ
Frequency(typical)	1 kHz Square

Others

Characteristics	Instruction
Communication Interface	HDMI; USB device *1, USB Host *1 ; Trig Out(P/F); LAN interface
Power Supply	Type-C power supply interface[1]; DC:12V 4A
Battery	11.1V, 5000mAh (optional) battery is fully charged, it can provide power for approximately 2 hours.
Power Consumption	≤48W
Touch Screen	Multi-touch Capacitive screen

Description:

[1]: Without generator:the adapter is required to support a handshake protocol of 12V/≥3A;

With generator: the adapter is required to support a handshake protocol of 12V/≥4A.

Environment

Characteristics	Instruction
Temperature	Working temperature: 0℃ ～ 40℃ Storage temperature: -20℃ ～ +60℃
Relative humanity	≤90%
Height	Operating: 3,000 m Non-operating: 15,000 m
Cooling Method	Fan cooling

Mechanical Specifications

Characteristics	Instruction
Dimension	260 mm(L)*160 mm(H)*78 mm(W)
Weight	Approx. 1.5kg (without battery) Approx. 1.7kg (with battery)

Interval Period of Adjustment:

One year is recommended for the calibration interval period.

7007020100223

V1.0.2