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Analog Arts

ST985

VT995

XT995

Product Specifications [1]

REV 070119A

1. These models include a one-channel oscilloscope, a spectrum analyzer, and an arbitrary waveform/ function generator.

TDR (Typical)	ST985	VT995	XT995
Cable Range	50cm to 1000km (1.5 ft - 620 miles)		50cm to 10m Option 3000Km
Resolution (Length Measurement) <30 m (<100 ft) <1 k m (<3300 ft) >1 k m (>3300 ft)	3 cm (0.1 feet) 30 cm (1 feet) 1 m (30 feet)		0.5 mm (0.02 inches)
Sampling Rate	100 GHz		
Live Wire		✓	Optional
Accuracy 1m (3 ft) < Length < 300m (1000 ft) Other Lengths	1% of reading 3% of reading		
TDR (CH2) Input Impedance	124 Ω || 5 pF		
TDR Pulse Rise Time Range	2 ns 1.6 Vp-p		
Velocity Factor	User selectable (default: 0.67)		
Impedance Measurement	10 Ω to 2 kΩ (Accuracy: 3%)		
Capacitance Measurement	10 pF to 2 uF (Accuracy 3%)		
Cable Inductance Measurement	10nH to 2mH (Accuracy 3%)		
Default Loss Measurement Frequencies	1 MHz (adjustable), 2 MHz, 3 MHz, 6 MHz, 12 MHz, 24 MHz, 50 MHz		
FDR	1 Hz < f < 50 MHz		
Time Base	5 ns - 100 ms/ division		
Accuracy Frequency Time Base Attenuation Measurement	100 ppm 100 ppm 0.5dB		
Operation	Auto, manual		
Auto Calibration Duration	1 minute		

Oscilloscope (Typical)	
Bandwidth (Max at probe tip) [1] 500 mV/ Div (10X probe) - 50 mV/ Div (1X probe) 1 V/ Div (10X probe) - 100 mV/ Div (1X probe) 2 V/ Div (10X probe) - 200 mV/ Div (1X probe) 5 V/ Div (10X probe) - 500 mV/ Div (1X probe) 20 V/ Div (10X probe) - 2 V/ Div (1X probe)	 1 GHz 500 MHz 250 MHz 250 MHz 100 MHz
Rise time	1.0 nS
Input channels	1
Vertical resolution	8 bits
DC accuracy	< ±3%
Input characteristics	1 MΩ in parallel with 5 pF
CMRR (Common Mode Rejection Ratio)	> 70 dB (@ 100 MHz)
Input type	Single–ended, BNC connector
Input coupling	Software selectable AC/ DC
Input ranges (full scale) 10x probe 1x probe	 ±80 mV to ±80 V in 10 ranges ±8 mV to ±8 V in 10 ranges
Overload protection	±150 V (DC+AC peak)
Sampling rate Real Effective	 100 MHz 25 GHz
Vertical Sensitivity 1x probe 10x probe	 2 mV - 2 V / DIV 20 mV - 20 V / DIV
Buffer memory size	1024 KB
Time base	1 ns/div to 100 ms/div
Timing accuracy [2]	50 ppm
Trigger Mode – Internal Channel 1 Trigger Threshold	 Rising edge/ Falling edge/ Auto/ Normal/ Single Adjustable

Spectrum Analyzer (Typical)	
Common features between the oscilloscope and the spectrum analyzer have the same specifications.	
Frequency Bandwidth [1]	1 GHz
Display Span (Default)	204.8 KHz to 60 MHz
Minimum Span **(at selected Display Bandwidth)**	100 KHz (display bandwidth of 51.2 MHz) 5 KHz (display bandwidth of 2.56 MHz) 400 Hz (display bandwidth of 204.8 MHz)
Resolution	(Span / 2^{18}) 0.78 Hz to 195 Hz
Spectrum Flatness	1 dB
Frequency Error [2]	100 ppm
Relative Frequency Accuracy	> 1 ppm
Maximum number of bins	1M
Dynamic Range	8 bits (< 65 dB)
Spurious Free Range	< 70 dB (@ 10 MHz, 2 V range)
Frequency Response	±0.5 dB
Reference Levels (10 ranges) 1x Probe 10x Probe	 - 35 dBV to 25 dBV (0.6 to 5.623 VRMS) - 25 dBV to 35 dBV (0.06 to 56.23 VRMS)
Display modes	Sampling, peak hold, average, history
Windowing types	Rectangular, Bartlett, Gaussian (2.5, 3.5, 4.5), Triangular, Blackman, Blackman–Harris, Hamming, Hanning, Welch, Kaiser Bessel, Flat Top

Notes:

1. The bandwidth indicates the highest frequency at which a sine wave can be represented by the oscilloscope with a 10 dB loss. This also applies for narrow band signals. For non-periodical wide band signals the bandwidth is limited by the Nyquist criteria. For the specified real time sampling rate of 120 MHz, the bandwidth is limited to about 50 MHz.
2. For a better performance, please contact the factory.

AWG, Arbitrary Waveform Generator (Typical)	
Arbitrary waveform length Ram (Memory)	2 to 64K adjustable 64K (Optional: Bigger Memory [3])
Amplitude resolution	12-bits (with 14-bits optional)
Sample rate Standard Functions Arbitrary	 100 MHz 1 MHz to 100 MHz
Frequency adjustment resolution	10 mHz (with 1 µHz optional)
Standard waveforms	DC, Sine, square, pulse, triangle, ramps (rising, falling), noise, exponent (rising, falling), sinc, cardiac, burst (gated, single), log continuous sweep, linear continuous sweep, gated (ASK, FSK, PSK) AM, FM, Burst (*modulating signals; pulse, square, rising ramp, falling ramp, triangle, sinc, cardiac, rising exponent, falling exponent, noise, edited waveforms*)
Output Amplitude **(Frequencies < 5MHz)** Open circuit 50 Ω **(Frequencies > 5MHz)** Open circuit 50 Ω **Accuracy (up to 100 kHz)** **Adjustment resolution**	 0 to ±3.5V(7 Vpp) 0 to ±1.75V(3.5 Vpp) 0 to ±3.0V(6 Vpp) 0 to ±1.5V(3.0 Vpp) .1% of the specified output ± 5mV 3 digits (1mv)
Output Offset Open circuit 50 Ω Accuracy Adjustment resolution	 0 to ± 2.2V(7 Vpp) 0 to ± 2.2V(3.5 Vpp) 2% ± 5mV (0.1% Optional) 3 digits(1mv)
Output impedance	50 Ω (Optional: 0 to 75 Ω)
Output Current	60 mA (With the standard 50 Ω impedance)
Sync	TTL compatible

AWG, Frequencies Ranges	
Sine Wave **Square, Pulse** **Triangle, Ramp** **Sinc, Cardiac, Exponent** **Noise (White) Bandwidth** **AM, FM (Carrier)** **Sweep** **Burst (Burst Rate)** **Digital (shift keying rate)**	10 mHz to 10 MHz 10 mHz to 5 MHz 10 mHz to 100 KHz 1 Hz to 1 MHz 10 MHz 1 Hz to 1 MHz DC to 5 MHz 100 Hz to 1 MHz 1 kHz to 1 MHz
Resolution	10 mHz (1 µHz optional)
Accuracy, at room temperature **Temp Coefficient** **Aging**	2% ±5mV (.1% optional) 20 ppm/°C 10 ppm/yr
AWG, Waveform Characteristics - 50 Ω Termination	
Sine Wave Output Flatness <1 MHz <10 MHz	 0.1 dB 0.5 dB
Sine Wave (2Vpp) **Adjustment resolution** **Harmonic Distortion/ Spurious** Dc to 100 kHz 100 kHz to 10 MHz **Noise** Dc to 100 kHz 100 kHz to 10 MHz 1 MHz to 10 MHz **Phase noise**	 10 mHz (1 µHz optional) -70 dBc -60 dBc -60 dBc -55 dBc < -60 dBc in a 50 kHz band
Square Wave, Triangle, Ramp (2Vpp) Frequency Adjustment resolution Rise/ Fall time (Square Wave) Overshoot (Square Wave) Settling time Asymmetry Duty cycle adjustment resolution Jitter Linearity (Triangle, Ramp)	 10 mHz - 5 MHz 10 mHz (1 µHz optional) < 4 nS 1% 10 nS to .5% of final value < 2 nS 5% to 95% (1MHz) 10nS < 10pS (rms) .1% of peak output

Exponential (2Vpp)	
Frequency	10 mHz- 1 MHz
Adjustment resolution	10 mHz (1 µHz optional)
Rise/Fall time	< 4 nS
Damping factor	-1,000 to 1,000
Jitter	< 10pS (rms)
Sinc, Cardiac (2Vpp)	
Frequency	10 mHz- 1 MHz
Adjustment resolution	10 mHz (1 µHz optional)
Zero crossings	2 to 1,000
Noise	
Type	White
Bandwidth	20 MHz
AM, FM (2Vpp)	
Carrier (-3dB)	10 mHz to 1 MHz
Modulating signal	any internal waveform including Arb
Frequency	10 mHz to 1MHz
Modulation depth	0% to 150% (AM) - 0% to 150% (FM)
Source	internal (external optional)
ASK, FSK, PSK (2Vpp)	
Frequency	10 mHz to 1 MHz
Modulating signal	any internal waveform including Arb
Frequency	10 mHz to 5 MHz
Gating signal	5 (TTL, CMOS) to 1.2 V (CMOS, TTL, LVTTL)
Burst (2Vpp)	
Carrier (-3dB)	10 mHz to 1 MHz
Source	any internal waveform including Arb
Rate	100 mHz to 1 MHz
Count	variable
Gate source	internal (external optional)
Trigger	single, internal rate, external(optional)
Sweep	
Type	linear or log (exponential)
Direction	up or down
Start frequency	0 to 1 MHz
Stop frequency	0 to 1 MHz
Sweep time	1 uS to 1 mS

AWG, Editing tools	
Signal processing Math operation Filtering Windowing	addition, subtraction, multiplication, gain, clip, absolute, resize, invert, mirror, expand to fit smoothing, ideal low pass, first order low pass Gaussians, Blackman, Blackman-Harris, Cosine, Hanning, Hamming, Flat-Top, Kaiser-Bessel, Welch, Triangular
Signal library	sine, square, triangle, falling ramp, rising ramp, rising exponent, falling exponent, sinc, cardiac, noise
GUI Editors	pen, line, manual, insert
Options	save / recall in .txt & .csv format
Units Frequency Amplitude Offset	 Hz, kHz, MHz mVpp,Vpp mV, V
Protection	short circuit
Configuration time Arbitrary save Arbitrary Recall Setting save Setting Recall Function	 10 mS 100 mS 10 mS 100 mS 100 mS

3. For a bigger memory size, please contact the factory.

Physical Properties	
Dimensions	128.0 x 77.0 x 31.6 (mm), 5.0 x 3.0 x 1.2 (inches)
Weight	350 grams, 12 Ounces
Other	
PC Requirements Recommended	Operating system: 32/ 64-bit edition of Microsoft Windows XP (SP3), Vista, Windows 7/ Windows 8/ Windows 10 Ports: USB 2.0/ 3.0 compliant port
Environmental Operating environment Temperature range Humidity **Storage environment** Temperature range Humidity	 0 °C to 40 °C for normal operation 15 °C to 32 °C for quoted accuracy 5% to 80% RH, non–condensing -20 °C to +60 °C 5% to 95% RH, non–condensing
Software	Save setting, recall setting, save plot, recall/print plot, zoom in vertical, zoom in horizontal, pen editor, line editor, DSP, variable sampling rate