Appendix A: Technical Specifications

All specifications herein mentioned apply to the series oscilloscopes. Before checking an oscilloscope from HANTEK to see if it complies with these specifications, make sure it meets the following conditions:

- The oscilloscope must have been operating continuously for twenty minutes under the specified operating temperature.
- The Do Self Cal operation must be performed through the Utility menu if the operating temperature changes by more than 5℃.
- The oscilloscope must be within the factory calibration interval.

All specifications are guaranteed unless noted 'typical'.

Oscilloscope Specifications

Horizontal

<table>
<tr><td>Sample Rate Range</td><td colspan="2">1GS/s(Single-channel); 500MSa/s(Dual-channel); 250MSa/s(Three/Fourchannel)</td></tr>
<tr><td>Waveform Interpolation</td><td colspan="2">(sin x)/x</td></tr>
<tr><td>Record Length</td><td colspan="2">Maximum 64K samples per single-channel; maximum 32K samples per dual-channel (4K, 32K optional)</td></tr>
<tr><td rowspan="2">SEC/DIV Range</td><td>DSO4084 DSO4104</td><td>DSO4204 DSO4254</td></tr>
<tr><td colspan="2">2ns/div to 100s/div, in a 1, 2, 5 sequence</td></tr>
<tr><td>Sample Rate and Delay Time Accuracy</td><td colspan="2">±50ppm</td></tr>
<tr><td rowspan="3">Delta Time Measurement Accuracy (Full Bandwidth)</td><td colspan="2">Single-shot, Normal mode
± (1 sample interval +100ppm × reading + 0.6ns)</td></tr>
<tr><td colspan="2">>16 averages
± (1 sample interval + 100ppm × reading + 0.4ns)</td></tr>
<tr><td colspan="2">Sample interval = s/div ÷ 200</td></tr>
</table>

Vertical

A/D Converter	8-bit resolution, each channel sampled simultaneously			
VOLTS/DIV Range	500μV/div to 10V/div at input BNC			
Position Range	500μV/div to 20mV/div, ±200mV 50mV/div to 200mV/div, ±1V 500mV/div to 2V/div, ±20V 5V/div to 10V/div, ±30V			
Selectable Analog Bandwidth Limit, typical	20MHz			
Low Frequency Response (-3db)	≤10Hz at BNC			
Rise Time at BNC, typical	DSO4084	DSO4104	DSO4204	DSO4254
	≤4.4ns	<3.5ns	≤1.8ns	<1.4ns
DC Gain Accuracy	±3% for Normal or Average acquisition mode, 10V/div to 10mV/div ±4% for Normal or Average acquisition mode, 5mV/div to 500μV/div			

Note: Bandwidth reduced to 6MHz when using a 1X probe.

Acquisition

Acquisition Modes	Normal, Peak Detect, Average and HR	
Acquisition Rate, typical	Up to 2000 waveforms per second per channel (Normal acquisition mode, no measurement)	
Single Sequence	Acquisition Mode	Acquisition Stop Time
	Normal, Peak Detect	Upon single acquisition on all channels simultaneously
	Average	After N acquisitions on all channels simultaneously, N can be set to 4, 8, 16, 32, 64 or 128

Trigger

Mode	Auto, Normal	
Level	CH1~CH4	±4 divisions from center of screen
	EXT	0~3.3V
Holdoff Range	20ns ~ 10s	
Trigger Level Accuracy	CH1~CH4	0.2div × volts/div within ±4 divisions from center of screen
	EXT	± (6% of setting + 40mV)
Edge Trigger		
Slope	Rising, Falling, Rising&Falling	
Source	CH1~CH4/EXT	
Pulse Width		
Polarity	Positive, Negative	
Condition(When)	<, >, !=, =	
Source	CH1~CH4	
Width Range	8ns ~ 10s	
Resolution	8ns	
Video Trigger		
Signal Standard	NTSC, PAL	
Source	CH1~CH4	
Sync	ScanLine, LinrNum, OddField, EvenField and AllField	
Slope Trigger		
Slope	Rising, Falling	
Condition(When)	<, >, !=, =	
Source	CH1 ~ CH4	
Time Range	8ns ~ 10s	
Resolution	8ns	
Overtime Trigger		
Source	CH1~CH4	
Polarity	Positive, Negative	
Time Range	8ns ~ 10s	

Resolution	8ns
Window Trigger	
Source	CH1~CH4
Pattern Trigger	
Pattern	0: Lower level; 1: High level;
Level	CH1~CH4
Interval Trigger	
Slope	Rising, Falling
Condition(When)	<, >, !=, =
Source	CH1~CH4
Time Range	8ns ~ 10s
Resolution	8ns
Under Amp	
Polarity	Positive, Negative
Condition(When)	<, >, !=, =
Source	CH1~CH4
Time Range	8ns ~ 10s
Resolution	8ns
UART Trigger	
Condition(When)	Start, Stop, Data, Parity Error, COM Error
Source (RX/TX)	CH1~CH4
Data format	Hex
Condition(When)	<, >, !=, =
Data Length	1 byte
Data Bits Width	5 bit, 6 bit, 7 bit, 8 bit
Parity Check	None, Odd, Even
Idle Level	High, Low
Baud Rate(Selectable)	110/300/600/1200/2400/4800/9600/14400/19200/38400/57600/115200/230400/380400/460400 bit/s
Baud Rate (Custom)	300bit/s~334000bit/s
LIN Trigger	

Condition(When)	Interval Field, Sync Field, Id field, Sync Id Error, Identifier, Id and Data
Source	CH1~CH4
Data format	Hex
Baud Rate (Selectable)	110/300/600/1200/2400/4800/9600/14400/19200/38400/57600/115200/230400/380400/460400 bit/s
Baud Rate (Custom)	300bit/s~334000bit/s
CAN Trigger	
Condition(When)	Start Bit, Remote Frame, Data Frame Id, Frame Id, DataFrame Id A, Error Frame, All Error, Ack Error, Overload Fram
Source	CH1~CH4
Data format	Hex
Baud Rate (Selectable)	10000, 20000, 33300, 500000, 62500, 83300, 100000, 125000, 250000, 500000, 800000, 1000000
Baud Rate (Custom)	5kbit/s~1Mbit/s
SPI Trigger	
Condition	Data
Source (CS/CLK/Data)	CH1~CH4
Data format	Hex
Data Length	4, 8, 16, 24, 32
IIC Trigger	
Source (SDA/SCL)	CH1~CH4
Data format	Hex
Data Index	0~7
When(Condition)	Start, Stop, No Ack, Address, Data, Restart

Inputs

Inputs	
Input Coupling	DC, AC or GND

Input Impedance, DC coupled	1MΩ±2% in parallel with 20pF±3pF
Probe Attenuation	1X, 10X
Supported Probe Attenuation Factors	1X, 10X, 100X, 1000X
Overvoltage Category	300V CAT II
Maximum Input Voltage	300V_{RMS} (10X)

Measurements

Cursors	Voltage difference between cursors: △V Time difference between cursors: △T Reciprocal of △T in Hertz (1/ΔT)
Automatic Measurements	Frequency, Period, Average, Pk-Pk, RMS, PeriodRms, Min, Max, RiseTime, FallTime, + Width, - Width, + Duty, - Duty, Vbase, Vtop, Vmid, Vamp, Overshoot, Preshoot, PeriodAvg, FOVShoot, RPREShoot, BWidth, FRR, FFF, FRF, FFR, LRR, LRF, LFR and LFF

General Specifications

Display	
Display Type	7 inch 64K color TFT (diagonal liquid crystal)
Display Resolution	800 horizontal by 480 vertical pixels
Display Contrast	Adjustable
Probe Compensator Output	
Output Voltage, typical	About 2Vpp into ≥1MΩ load
Frequency,	1kHz

typical		
Power Supply		
Supply Voltage	100-120VAC$_{RMS}$(±10%), 45Hz to 440Hz, CAT Ⅱ 120-240VAC$_{RMS}$(±10%), 45Hz to 66Hz, CAT Ⅱ	
Power Consumption	<30W	
Fuse	T, 3.15A, 250V, 5x20mm	
Environmental		
Operating Temperature	0 to 50 °C (32 to 122 °F)	
Operation Humidity	≤90% relative humidity	
Storage Temperature	-40 to +71 °C (-40 to 159.8 °F)	
Storage Humidity	≤60% relative humidity	
Cooling Method	Convection	
Altitude	Operating and Nonoperating	3,000m (10,000 feet)
	Random Vibration	0.31g$_{RMS}$ from 50Hz to 500Hz, 10 minutes on each axis
	Nonoperating	2.46g$_{RMS}$ from 5Hz to 500Hz, 10 minutes on each axis
Mechanical Shock	Operating	50g, 11ms, half sine

Mechanical	
Dimension	318 x 110 x 150mm(L x W x H)
Weight	2900g

Arbitrary Waveform Generator Mode

Waveform Frequency	Sine: 0.1Hz~25MHz Square: 0.1Hz~10MHz Ramp: 0.1Hz~1MHz EXP: 0.1Hz~5MHz
Amplitude	5mV~3.5Vp-p(50Ω) 10mV~7Vp-p(High impedance)
DAC	2K~200MHz adjustable
Frequency Resolution	0.10%
Channel	1CH waveform output
Waveform Depth	4KSa
Vertical Resolution	12 bit
Frequency Stability	<30ppm
Output Impedance	50 Ω

Appendix B: Accessories

All the following accessories are available by contacting your local HANTEK distributor.

Standard Accessories

- Probe×4 (1.5m), 1:1, (10:1) Passive Probes
- A Power line
- A USB Line
- A BNC to BNC(Only for the scopes with waveform generator function)
- A PC software CD of the oscilloscope
- Warranty Card
- Manufacturer Certificate
- Certificate Of Calibration