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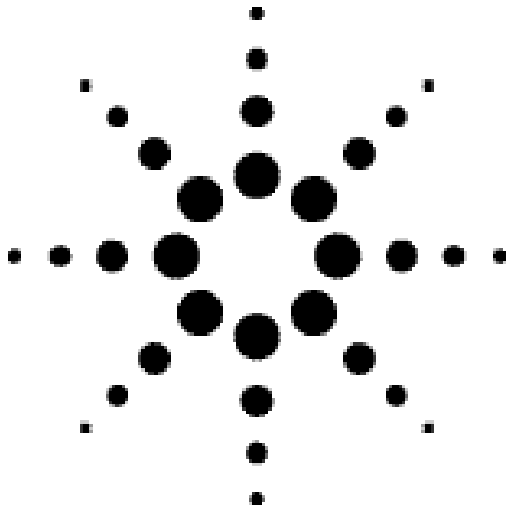
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Agilent Technologies

54720D

Data Sheet

Product Specifications

Time-Interval Measurement Accuracy Specifications

Real Time ±[(0.2)(sample interval) + 0.007%
of delta-time marker reading]

Equivalent Time ±(30 ps + 0.007% of delta-time marker reading)
(16 averages)
Typical Channel Characteristics
ADC Input Sources
(simultaneous 4 plug-in slots, each having its own 2-GSa/s
acquisition) ADC. Acquisition memory is 65,536 points per
slot.

Best Accuracy Calibration
Performing the best accuracy cal on a channel
just prior to a series of critical measurements
will ensure the most accurate results. This
cal adjusts the channel s gain, offset, and
linearity, and requires a specific plug-in to
stay installed in a specific mainframe slot.

Channel Skew Adjustment
The time skew between channels can be manually
eliminated all the way to the probe tip to 1-ps resolution.

Probe Calibration A probe calibration routine automatically
computes the offset and attenuation created
by the probe attached to the channel input.
Typical Time Base Characteristics
Time Base Scale (fullscreen is 10 divisions)
100 ps/div to 20 s/div
(in 1-2-5 or fine steps)

Time Base Position Range (auto sample rate and record length)
Pretrigger: 0 to 10 s or one fullscreen width, whichever is larger.
Posttrigger: 0 to 10 s or one fullscreen width, whichever is larger.

Trigger Interpolator Resolution: 1 ps

Time Base Window
Scale: 1 ps/div to the main time base scale

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factor
Position: The window must always stay in the time window defined by the main sweep.

Typical Triggering Characteristics

Sources
All four input plug-in slots can be used for triggering. See plug-in specifications for more details.

Edge Slope Positive/negative

Holdoff Range 60 ns to 320 ms

Pattern Trigger A pattern can be specified using any channel or external trigger input (up to four bits wide). Each of the inputs can be specified as high, low, or don t care with respect to the trigger level setting for that source. Trigger occurs when that pattern is entered or exited.

Glitch Trigger This mode makes it easy to look for glitches greater than or less than specified width on a single source. You can distinguish glitches down to 3 ns ±1 ns in width and can capture glitches as narrow as 500 ps in width.

Time-Qualified Pattern Trigger A trigger will occur on the first edge to exit a pattern only if it meets one of these 3 criteria: 1) pattern present <[time] 2) pattern present >[time] 3) pattern present in range >[time1] and <[time2].

The time settings are adjustable from 20 ns to 160 ms [±(3% + 2 ns)] with 10 ns resolution. Filter recovery time is <=12 ns.

State Trigger A pattern is specified on any three ofthe four inputs, with the fourth input used as a clock. Trigger occurs on the rising or falling edge of the input specified as the clock, and when the pattern is present or is not present. Setup time for the pattern with respect to the clock is 10 ns or less; hold time is zero.

TV Trigger Standard TV systems: 525 lines 60 Hz
625 lines 50 Hz
875 lines 60 Hz
User defined

Event-Delayed Trigger The trigger is qualified by an edge. The delay can be specified as a number of occurrences of a rising or falling edge of any of the inputs. After the delay, an occurrence of a rising or falling edge of any of the inputs will generate the trigger. The trigger occurrence value is selectable from 1 to 16,000,000. The maximum edge counting rate is 70 MHz. Edges occurring <30 ns after the qualifying edge may not be detected.

Time-Delayed Trigger The trigger is qualified by an edge.The

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delay is selectable from 30 ns to 160 ms.
After the delay, an occurrence of a rising
or falling edge on any one selected input
will generate the trigger.

Functions and Measurements

Functions Magnify Invert Add
Subtract Multiply Divide
Versus Integrate Differentiate
Min Max FFT (mag)
Histograms
Measurement limit testing
Waveform mask testing
Color graded display

Measurements V(ampltd) V(base) V(top)
Preshoot Overshoot V p-p
V(time) V(min) V(max)
V(rms) V(avg) V(upper)
V(middle) V(lower) FFT(freq)
FFT(mag) FFT(deltafreq) FFT(deltamag)
Duty cycle Delta time Period
Frequency T(fall) T(rise)
T(max) T(min) T(volt)
+ width - width

Histograms p-p median mean
std dev u ± 1 sigma u ± 2 sigma
u ± 3 sigma hits peak

Autoscale Can find repetitive signals:
> 50 Hz
< 1/2 max sample rate
duty cycle > 1 %
amplitude> 50 mV p-p
(HP 54722A > 150 mV p-p)

Display Update and HPIB Throughput

Maximum Display Update Rate: 550 Kpixels/s typical

Maximum HP-IB Transfer Rate: 500 Kbytes/s typical

Throughput Waveforms/second Measurements/second

Measurement	Vpp	Period
Front Panel Capture and Transfer Rate	170	44 > 39
HP-IB Capture and Transfer Rate	50	33 > 31

This throughput data was taken in the real-time sampling mode (250 MSa/s) with 512-point records on screen, no measurements, no interpolation, fast draw mode, infinite persistence, markers off, math off, and one channel acquisition. Vpp does not require threshold detection, but Period does.

Effective Bits

Effective Bits (HP 54721A System)	1 MHz	10 MHz	100 MHz	250 MHz	500 MHz	1 GHz
Real Time (4 GSa/s) with fs/4 filter interpolation	7.5	7.5	7.2	6.7	6.7	6.2
without fs/4 filter						

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interpolation 7.0 7.0 6.6 6.1 5.9 5.3

Digital Bandwidth
Limit (fs/20 FIR 8.0 7.9 8.2 7.8 - -
Filter)

Typical effective bits of resolution describes the dynamic performance of an ADC sine wave curve fit test. The inputs used are 90% of full scale amplitude sine waves.

FFT
Update rate for 1024 point record is 70 ms. Magnitude accuracy 0.26 db (3%) near dc to -3 db at max bandwidth.

Environmental Characteristics
Temperature Operating +10° C to +40° C
Nonoperating -40° C to +70° C

Humidity Operating Up to 95% relative humidity
(noncondensing) at +40° C
Nonoperating Up to 90% relative humidity
at +65° C

Altitude Operating Up to 4,600 meters (15,000 feet)
Nonoperating Up to 15,300 meters (50,000 feet)

Voltage 90 to 132 or 198 to 264 VAC, 48 to 66 Hz

Power 1200 VA; 650 W

Weight Net 26.4 kg (58 lbs)
Shipping 33.6 kg (74 lbs)

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