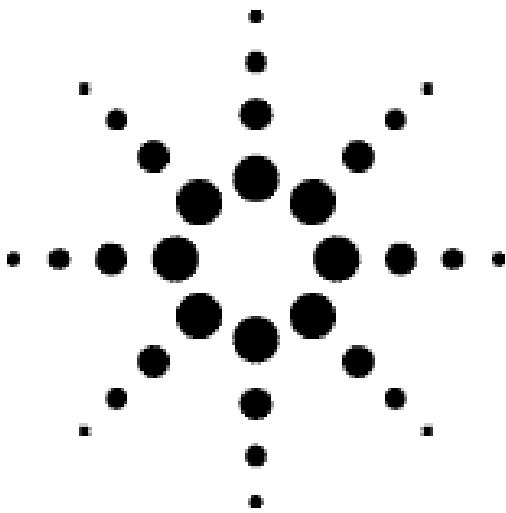


# Agilent 5372A Frequency & Time Interval Analyzer

Data Sheet



## Product Specifications

### Single Frequency Measurement

**Least Significant Digit Displayed:**

$$\pm ((200 \text{ ps}) / (\text{Sample Interval})) \times \text{Frequency}$$

**Resolution:**

$$\pm ((150 \text{ ps rms} + (1.4 \times \text{Trigger Error})) / (\text{Sample Interval}) \times \text{Frequency})$$

**Accuracy:**  $\pm$  Resolution  $\pm$  (Time Base Aging  $\times$  Frequency)  
Continuous Frequency Measurements (mean estimation)

**rms Resolution** (for number of measurements/block  $>3$ ):  
 $((\text{square root of } (13.5) \times (150 \text{ ps rms} + 1.4 \times \text{Trigger Error})) /$   
 $(\# \text{ of Blocks})^{1/2} \times (\# \text{ of Meas./Block})^{3/2} \times \text{Sample Interval}) \times \text{Freq.}$

**Accuracy:**  $\pm$  Resolution  $\pm$  (Time Base Aging  $\times$  Frequency)

### Time Interval Measurements

**Least Significant Digit Displayed:**

$$\pm ((200 \text{ ps}) / (\text{square root of } (N)))$$

$N$  = number of measurements averaged

**Resolution:**  $\pm$  ((150 ps rms  $\pm$  Start Trigger Error  
 $\pm$  Stop Trigger Error) / (square root of (N)))

**Accuracy:**  $\pm$  Resolution  $\pm$  (Time Base Aging  
 $\times$  Time Interval)  
 $\pm$  Trigger Level Timing Error  
 $\pm$  1 ns Systematic Error

(Systematic error can be reduced to  $<100$  ps with the HP J06-59992A) Time Interval Calibrator)

Input: Channels A and B

The following refers to an 5372A with 54002A pods installed.

**Range:** dc to 500 MHz.

**Sensitivity:** (x1 attenuation, minimum hysteresis)

15 mV rms sine wave (45 mV pk-pk), typically 10 mV rms.

45 mV pk-pk for pulse input.

Hysteresis control is available to reduce input sensitivity to trigger noise.

**Dynamic Range:**

x1:45 mV pk-pk to 2 V pk-pk.

x2.5 attenuator: 115 mV pk-pk to 5 V pk-pk.

**Minimum Pulse Width:**

1 ns for all measurement modes except holdoff arming.

1.5 ns with holdoff arming.

Input: Channel C (option 030)

Type N Connector

**Range:** 100 MHz - 2 GHz (divide-by-4 prescaler).

**Sensitivity:** (0 dB attenuation)

100 MHz to 1.5 GHz: -25 dBm.

1.5 GHz to 2 GHz: -20 dBm.

**Dynamic Range:**

100 MHz to 1.5 GHz: -25 dBm to +7 dBm.

1.5 GHz to 2 GHz: -20 dBm to +7 dBm.

Trigger level fixed at 0V NOMINAL.

**Impedance:** ac coupled, 50 ohm, VSWR <2.5.

External Arm

**Range:** dc coupled to 100 MHz.

**Minimum Pulse Width:** 5 ns

**Impedance:** 1 Mohm NOMINAL, shunted by <50 pf.

**Triggering** adjustable in 20 mV steps

Range  $\pm 5.00$  V

Measurement Control

**Holdoff or Sample:**

0 to  $4 \times 10^9$  events (65,000 events with fast meas. mode); 2 ns to 8.0 seconds (131 usec with fast meas. mode).

**Edge Holdoff or Sampling:** HP 5372A becomes armed after a delay from edge as follows:

Ext Arm arms A or B <15 ns

B arms A, A arms B <8 ns

A arms A, B arms B <5 ns

**Interval Sampling:** 100 ns to 8 seconds (131 usec with fast meas. mode).



**Cycle Sampling:** Cycles of input signal or 500 MHz time base in discrete steps:  $2^4$ ,  $2^8$ ,  $2^{12}$ ,  $2^{16}$ ,  $2^{20}$ ,  $2^{24}$ ,  $2^{28}$  ( $2^4$ ,  $2^8$ ,  $2^{12}$  with fast mode).

**Random Sampling:** Start of subsequent measurement delayed by a random number of events between 6 and 17 on channel A. Maximum input frequency 100 MHz.

**Inhibit Input:** Rear panel input will inhibit memory acquisition when signal is above/below threshold (programmable from front panel, or HP-IB). Inhibit is independent of other arming and sampling.

**Pre-trigger:** Measurements can be acquired before and after a pre-trigger event. These include an edge on the external arm channel for frequency, period, or time interval measurements or a detected time interval value for time interval measurements.

Rear Panel

**Frequency Standard Output:** 10 MHz. Short term stability not specified.

**Frequency Standard Input:** 1, 2, 5, or 10 MHz input.

**Gate Outputs:** Falling TTL edge indicates measurement sample.

**Delay Outputs:** Falling TTL edge indicates completion of holdoff arming.

**Inhibit Input:** Programmable input level suppresses measurement acquisition.

**TI Detect:** Output is low for duration of out-of-range measurements.

**FastPort Outputs** (option 020): Three 40-pin connectors provide unprocessed data directly from count hardware. 16 bits of data and 1 strobe for each connector.

### **Broad measurement selection**

Measurements include frequency and period; time interval, +/- time interval, and continuous time interval; phase deviation, and phase A relative to B; time deviation (jitter); and specialized measurements including pulse width, duty cycle, and rise/fall time.

### **Quick and easy analysis**

Built-in functions, including window margin analysis from time interval histogram data, averaged results, and statistics, simplify measurement analysis. Calculated Allan Variance specifies frequency stability in the time domain.

### **Graphic display**

Results reveal maximum information at a glance. Markers provide read-out and analysis of your measurements. Numerical results can also be displayed.

### **200 ps single-shot LSD**

There is usually no need to repeat a signal simply to accommodate your test equipment. If you can work with a repetitive signal, the 5372A provides signal averaging to improve resolution.