Agilent AN 1200-9

Histograms Simplify Analysis of Random Jitter

Application Note

Agilent Technologies 53310A Modulation Domain Analyzer

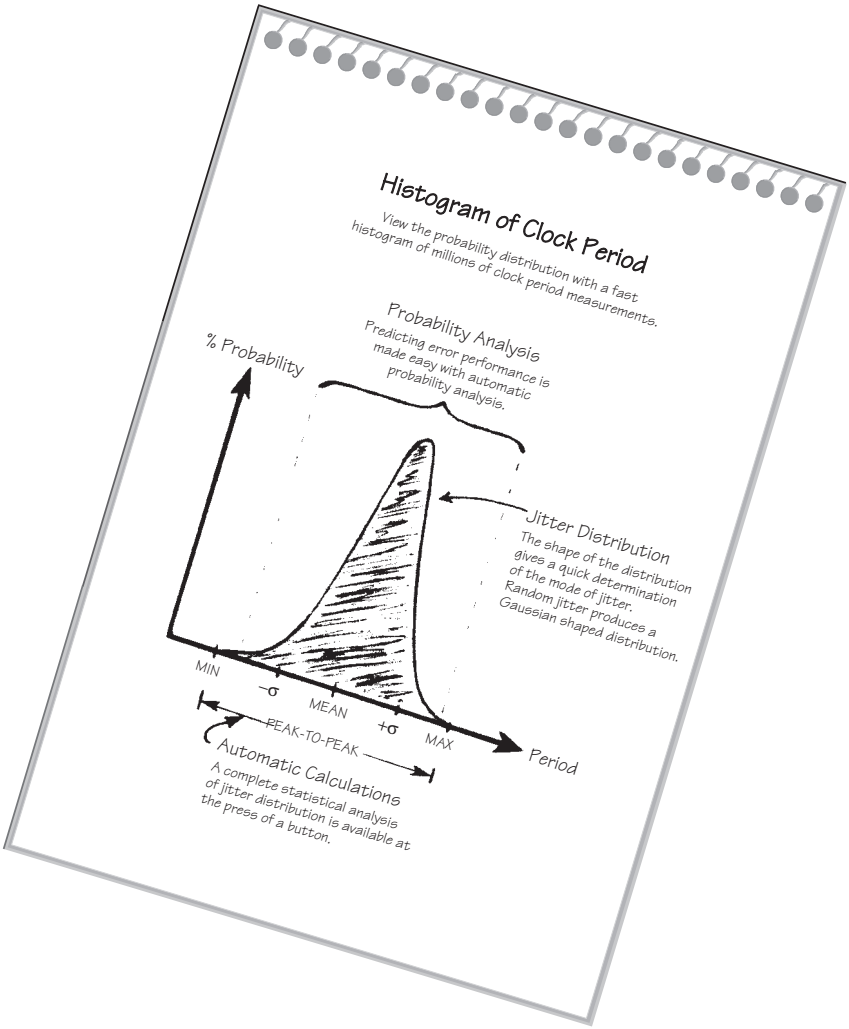
Better Characterization of Random Jitter

Situation

Digital circuits are virtually everywhere. The trend is toward more capable microprocessor-controlled systems that will run at faster and faster clock rates. As clock rates increase, characterization of timing accuracy and jitter becomes more important. Designers are finding an increased need to characterize jitter in order to achieve error-free design goals.

Problem

Excessive clock jitter can limit performance in digital systems. Jitter is an unintentional form of modulation that can have a wide variety of sources. Timing-related data errors will occur if jitter is beyond acceptable limits. Designers need a fast and easy way to obtain a complete characterization of clock jitter in microprocessor controlled circuits.



Agilent Technologies

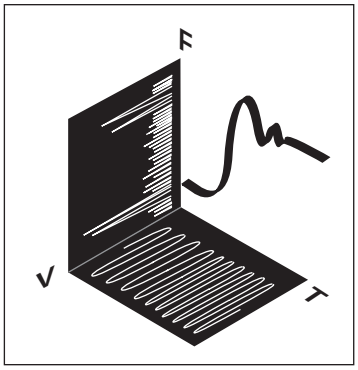
Innovating the HP Way

Solution
The Agilent Technologies 53310A Modulation Domain Analyzer's fast histograms make it easy to get a complete view of clock jitter. The shape of the histogram indicates the nature of the jitter. For example, a Gaussian-shaped distribution would suggest the jitter is random. Statistics are calculated automatically to provide the mean, minimum, maximum, standard deviation, and peak-to-peak values based upon millions of timing measurements. Error probabilities can be easily determined by setting high and low limits with the measurement markers.

Related Applications
- Microprocessor clock jitter
- Clock jitter in telecommunications systems
- Timing jitter in digital storage devices
- Timing jitter in integrated circuits
- Identification of periodic jitter sources
- Pulse repetition interval jitter in radar systems
- Timing jitter in electromechanical systems
- Data-to-clock jitter

The Modulation Domain gives you a new way to view your complex signals
Better ways to analyze your complex signals don't come along often. Now Agilent brings you the Modulation Domain—a way of looking at frequency or time interval measurements that directly and clearly reveals both intentional and unintentional modulation.

For frequency analysis, it's the missing piece of the puzzle. The Time Domain shows you amplitude (voltage) vs. time. The Frequency Domain gives you amplitude vs. frequency. The Modulation Domain plots frequency vs. time—an intuitive and insightful way of examining your signal's dynamic frequency modulation.



For timing measurements, the Modulation Domain's view of time interval vs. time allows you to both see and quantify timing jitter directly—taking you one step beyond the Time Domain's qualitative view.

By internet, phone, or fax, get assistance with all your test and measurement needs.

Online Assistance
www.agilent.com/find/assist

Phone or Fax
United States:
(tel) 1 800 452 4844

Canada:
(tel) 1 877 894 4414
(fax) (905) 206 4120

Europe:
(tel) (31 20) 547 2323
(fax) (31 20) 547 2390

Japan:
(tel) (81) 426 56 7832
(fax) (81) 426 56 7840

Latin America:
(tel) (305) 269 7500
(fax) (305) 269 7599

Australia:
(tel) 1 800 629 485
(fax) (61 3) 9272 0749

New Zealand:
(tel) 0 800 738 378
(fax) (64 4) 495 8950

Asia Pacific:
(tel) (852) 3197 7777
(fax) (852) 2506 9284

Product specifications and descriptions in this document subject to change without notice.

Copyright © 1998, 2000 Agilent Technologies
Printed in U.S.A. 8/00
5966-4482E

Agilent Technologies
Innovating the HP Way