



Agilent AN 1200-7

Simplified Analysis of Phase Locked Loop Capture and Tracking Range

Application Note

Agilent Technologies 53310A
Modulation Domain Analyzer

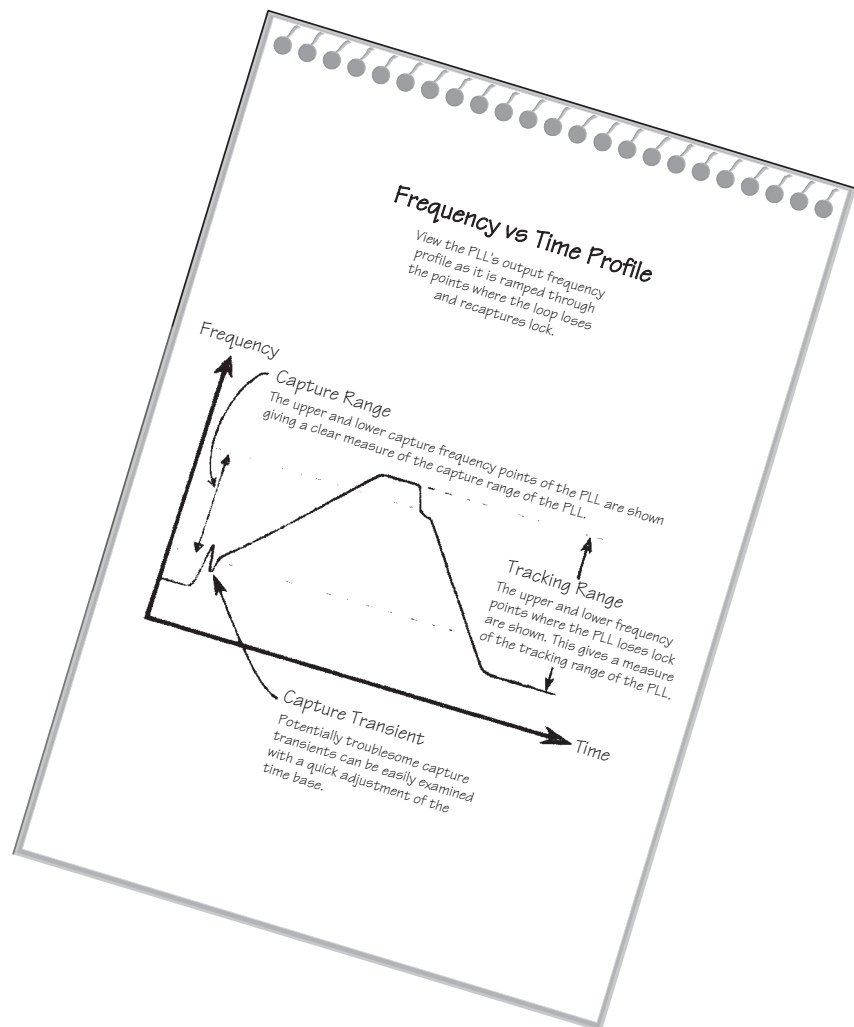
Direct Analysis of Phase-Locked Loops

Situation

Phase-Locked Loops (PLLs) are common yet essential circuits in many electronic applications. They may be used as narrowband filters to recover signals embedded in noise, or for synchronizing digital transmissions in communication applications. Other traditional uses include frequency synthesizers, demodulators, multipliers, dividers, and many more.

Problem

The analysis of PLLs is challenging. Components can be assessed individually, but closed loop characterization is often difficult to obtain. Both transient and dynamic frequency response are of interest to the designer. Fast and direct analysis of parameters such as capture and tracking range are needed to improve characterization and shorten design cycles.



Agilent Technologies

Innovating the HP Way

Solution

The Agilent Technologies 53310A Modulation Domain Analyzer's ability to measure and display a signal's continuous frequency over time makes dynamic frequency analysis of PLLs easy. A direct measure of the PLL's capture and tracking range is obtained by monitoring the output frequency while the PLL is forced to go in and out of lock. A quick and simple view of the PLL's capture and tracking range can now be displayed in one direct measurement.

Related Applications

- Carrier lock time and switching of cellular radios
- Switching characterization of PLLs, VCOs, and frequency synthesizers
- Frequency profile PLL output during acquisition
- Clock recovery circuit analysis
- Velocity profiles of motion control systems

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

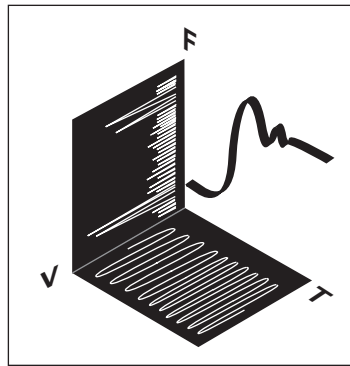
Product specifications and descriptions in this document subject to change without notice.

Copyright © 1998, 2000 Agilent Technologies
Printed in U.S.A. 8/00
5966-4480E

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.



Agilent Technologies

Innovating the HP Way