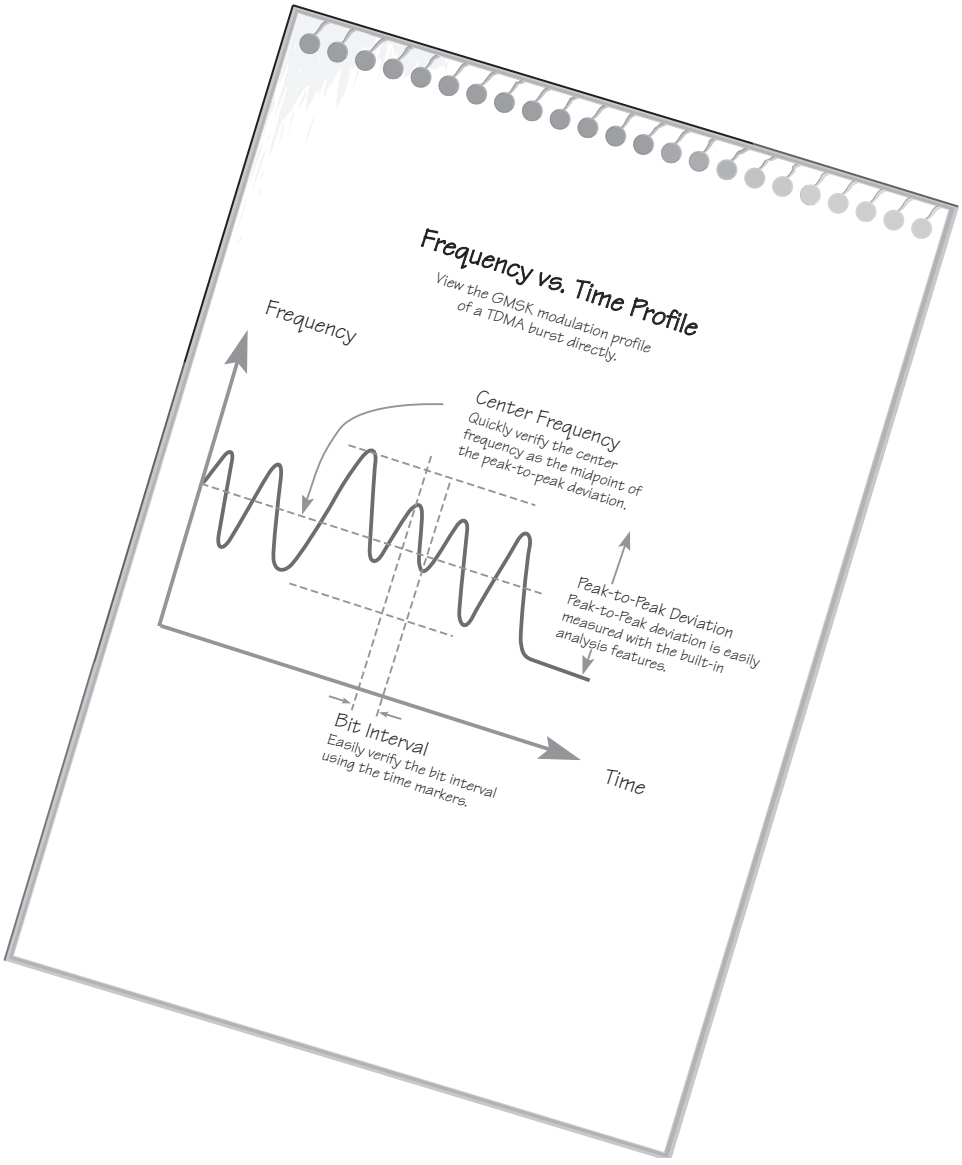
Agilent AN 1200-11

Examine GMSK Modulation in GSM and PCN Mobile Communications Systems

Application Note

Agilent Technologies 53310A
Modulation Domain Analyzer



Agilent Technologies
Innovating the HP Way

Flexible Modulation Analysis for GSM and PCN Radios

Situation

Current analog mobile communications systems have reached capacity limits in several large population centers. Future systems will utilize Time Division Multiple Access (TDMA) techniques to increase capacity. These new mobile communication systems employ complex digital modulation techniques such as Gaussian Filtered Frequency or Minimum Shift Keying to transmit voice and data at high speeds with low error rates. Examples of such digital systems are Groupe Speciale Mobile (GSM), second generation digital cordless (CT2), and Digital European Cordless Telephone (DECT).

Problem

These new digital modulation techniques are difficult to characterize using conventional test equipment. The burst nature of the TDMA technique places rigorous requirements on test equipment. Verifying parameters such as peak deviation, center frequency and bit interval are critical to achieving design goals. Fast, direct views of the modulation are needed to improve frequency and timing characterization, and shorten design cycles.

Solution

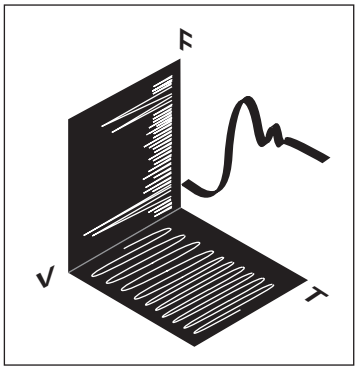
The Agilent Technologies 53310A Modulation Domain Analyzer with Option 031 provides a direct profile of modulation in a single TDMA burst. Measurement markers allow you to quickly verify key parameters such as peak-to-peak deviation, center frequency and bit interval.

Infinite display persistence can be used to view an eye diagram of the modulated RF carrier. This provides a quick, qualitative view of modulation accuracy. The 53310A provides wireless communication system designers with a general purpose tool to examine modulation performance directly.

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.

Related Applications

- Examining frequency hopping sequences of hopped cellular radios or secure communication systems
- Examining turn-on time of mobile radios
- Examining channel switching and lock times in mobile radios
- Characterizing peak deviation and center frequency for CT2 and DECT radios
- Characterizing VCO and phase-locked loop response

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 © 1997, 2000 Agilent Technologies
Printed in U.S.A. 9/00
5965-9650E

Agilent Technologies
Innovating the HP Way