Application Datasheet

Visual System Simulator for Wireless Communications Systems

Visual System Simulator (VSS) for wireless communications systems provides systems engineers with an end-to-end design environment that enables the creation of optimum system architecture. By precisely optimizing component values and eliminating the effects of impairments in the signal chain from the earliest stages of the design through to conformance testing, VSS is an invaluable addition to NI AWR Design Environment platform.

Features at a Glance

- Common wireless communications standards, including
  - LTE¹
  - WiFi
  - WLAN/802.11a/b/g/ac
  - WiMAX/802.11d-2004/802.16e-2005 (mobile and fixed)
  - 3G WCDMA FDD
  - DVB-H/DVB-T
  - GSM/EDGE
  - CDMA2000
  - IS95
- Test benches dedicated to specific wireless network standards

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¹ LTE: Long Term Evolution
The VSS Wireless Communications Design Flow Features and Advantage

**Wireless Standards:** VSS supports multiple wireless standards. Each one includes test benches for transmitter conformance testing and receiver sensitivity analysis. Additional details include:

- **LTE (Long Term Evolution)**
  - Supports latest ratified specifications inclusive of base station and user equipment

- **WiFi**
  - Supports IEEE 802.11a/b/g, including IEEE 802.11a-1999 Physical Layer 1 specifications
  - EVM and spectral emission mask for transmitter conformance testing

- **WiMAX**
  - Supports IEEE 802.16-2004 (fixed) and 802.16e-2005 (Mobile WiMAX) Physical Layer 1 specifications

- **Digital Video Broadcast (DVB)**
  - Supports DVB-H and DVB-T, ETSI EN 300 744, and V 1.5.1 (2004-06) Physical Layer 1 specifications

- **W-CDMA**
  - Supports latest ETSI Physical Layer 1 specifications

- **GSM/EDGE**
  - Supports 3GPP TS 45.005 V5.2.0 (2001-11) specifications

**Signal Path Intelligence:** With VSS RF Budget (RFB) analysis technology, traditional RF cascaded measurements such as gain, noise figure, and third-order intercept, as well as the ability to perform impedance mismatch throughout the signal path, are readily supported. Additionally, RF Inspector (RFI) quickly identifies the cause of intermodulation products and spurs in the RF path, including the effects of conversions and harmonics.

**Analysis:** Circuit envelope techniques efficiently simulate complex digital waveforms and provide access over time to the amplitude and phase modulation information of every harmonic of the signal. Furthermore, the VSS RF Planning wizard (RFP) aids in the selection of the most effective system architecture (mixers, filters, amplifiers, and synthesizers).

**Plug and Play:** LabVIEW, MATLAB, and C++ co-simulation capabilities enable “plug and play” support within VSS to expand capabilities, making custom models, scripts, and signal processing algorithms readily available. Likewise, for test and measurement compatibility, LabVIEW and TestWave link test and measurement equipment such as network and spectrum analyzers into VSS via local area network (LAN) or general purpose interface bus (GPIB).

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1 An additional VSS for LTE Communications Design Datasheet is also available and contains more detailed information pertaining to VSS features specific to LTE and supported LTE standards.