Agilent GS-8830 Series
RF Design Verification Test Systems

GS-8832 2G RF Design Verification Test
GS-8833 3G RF Design Verification Test
GS-8834 cdma2000®/1xEV-DO RF Design Verification Test
GS-8835 UMTS (2G+3G) RF Design Verification Test

Data Sheet

GS-8832

GS-8830 Series RF Design Verification Test System

A single platform for

- GSM, GPRS, EGPRS, and DARP (Bands GSM 850, GSM 900, DCS 1800, and PCS 1900)
  - 3GPP TS51.010-01. Section 12, 13, 14, and 21.
- W-CDMA, HSDPA, and HSUPA (Bands I to IX)
  - 3GPP TS34.121-1. Section 5, 6, 7, 9, and 10.
  - Rel.99, Rel.5, Rel.6, and Rel.7
- cdmaOne, cdma2000, 1xEV-DO, and 1xEV-DO Rev.A (Band Class 0, 1, 3, 4, 6 and 15)
  - 3GPP2 C.S0011-A1 and 3GPP2 C.S0033 V2.0

The GS-8830 Series is designed for mobile phone design verification and pre-conformance testing. In the design verification environment, tests can be easily configured or modified to suit your specific test requirements.

The GS-8830 Series is one of the families of scalable systems designed on the GS-8800 platform of test systems covering the entire product lifecycle:

- GS-8830 Series - design verification
- GS-8850 Series - conformance
- GS-8810 Series – manufacturing, quality assurance and R&D entry-level users.

The GS-8830 can be upgraded to the GS-8850 to perform conformance test, or scaled to the GS-8810 to support manufacturing and quality assurance test applications by re-using the GS-8830 hardware and software. The GS-8830 can also be easily upgraded to support new wireless formats to keep up to date with the latest technologies and safeguard your investment.

Agilent Technologies

GS-8830 Series RF Design Verification Test System Overview

The GS-8830 Series RF design verification test (DVT) systems are full-featured test systems for design verification and pre-conformance testing of multiple mobile technology formats. The GS-8830 Series systems perform high accuracy measurements and provide excellent repeatability and performance test. The multi-technology test platform supports GSM/GPRS/EGPRS (3GPP TS51.010-01), W-CDMA/HSDPA/HSUPA (3GPP TS34.121-1), and cdmaOne/cdma2000/1xEV-DO/1xEV-DO Rev.A (3GPP2 C.S0011-A1 and 3GPP2 C.S0033 V2.0).

Agilent GS-8830 Series systems are designed to meet existing radio format requirements while providing a flexible upgrade path for future formats.

The system architecture makes it easy to modify or scale the system configuration to provide the test capabilities needed for the different stages of your product's life cycle and perform conformance test, and manufacturing or quality assurance test applications.

Plus, the system's single-platform scalability for multiple radio technology formats, bands, and product life-cycle safeguards your investment.

GS-8830 Series System Characteristics

Flexibility

The GS-8830 Series supports multiple formats and bands

- GSM/GPRS/EGPRS (GSM 850, GSM 900, DCS 1800, PCS 1900)
- W-CDMA/HSDPA/HSUPA (Bands I to IX)
- cdmaOne/cdma2000/1xEV-DO/1xEV-DO Rev.A (Band Class 0, 1, 3, 4, 6 and 15)

In addition, the flexible measurement software provides users full control over parameters, as well as the ability to stress designs through a broad range of frequencies and power levels.

Easy-to-use UI (user interface)

GS-8830 Series systems are equipped with an easy-to-use UI, which makes it simple for end users to change test parameters and run design verification tests.

Scalability and upgradability

The GS-8830 2G, 3G, and cdma2000/1xEV-DO systems can each be easily upgraded to include other radio formats on the same hardware platform by adding the necessary radio format software option.

In addition, the systems can be scaled up to the GS-8850 for conformance testing, or scaled to the GS-8810 to support manufacturing and quality assurance testing.

Accuracy and repeatability

GS-8830 Series systems provide accurate measurements and repeatable results due to equipment stability and complete system calibration. They leverage the measurement speed, accuracy, and repeatability strengths of Agilent products; creating reliable, high performance design verification test systems.

Comprehensive test coverage

The GS-8830 Series systems cover a large array of test cases specified in 3GPP TS51.010-01, 3GPP TS34.121-1, 3GPP2 C.S0011-A1, and 3GPP2 C.S0033 V2.0. Agilent is committed to supporting more test case sections and enhancing test coverage as technology standards evolve.

Hardware Architecture

The GS-8830 base system is comprised of multiple racks (1.6 m in height) with integrated test equipment and test software.

The base or 'standard' system consists of:

- 8960 Series 10 (E5515C) wireless communications test set
- E4445A spectrum analyzer
- E4438C digital signal generator
- E8257D microwave generator
- 66311B power supply
- SR5500 fading simulator
- N1962A GSM filter module
- N1961A RF interface box
- E4418B single channel power meter
- E9304A (H18) 9KHz-18GHz Power sensor
- Industrial PC
- Wireless test manager software
- GS-8830 measurement software
- GS-883x calibration software
- GS-883x data viewer software

Optional 'add-on' components include[1]:

- Plus 1
  - Anite fader adapter unit
  - Anite baseband processor
- Plus 2
  - Anite fader adapter unit
  - Two Anite baseband processors
  - One additional 8960 Series 10 (E5515C) wireless communications test set
  - Anite CRMP/combiner
  - N8990A-P06 add-on RF test set

N1961A RF Interface Box

Automated testing is enabled by the N1961A RF interface box, which switches the appropriate instruments to the user equipment (UE) based on a particular test. It consists of functional modules such as a common filter module, reverse power protection module, fading module, maximize input level module, and a GSM/GPRS/ W-CDMA/CDMA filter module. Test procedure automation is achieved with a combination of the RF interface box, automated UE control feature, and the test software.

Software Architecture

The GS-8830 software is based on the Agilent wireless test manager (WTM) platform. GS-8830 software is an enhanced version of GS-8800 software and automates RF parametric tests according to the specified supported standards. The software's great value lies in its functions and features, which are specially designed to enhance the user's R&D design verification test experience.

The software is also designed with a user-friendly graphical user interface (GUI) (see Figure 1). In addition, the GS-8830 software is able to selectively perform subtests for a chosen test step to reduce the time required to identify root-cause failures.

The GS-8830 software automates test execution to enable a large number of test cases to run in a relatively short time frame.

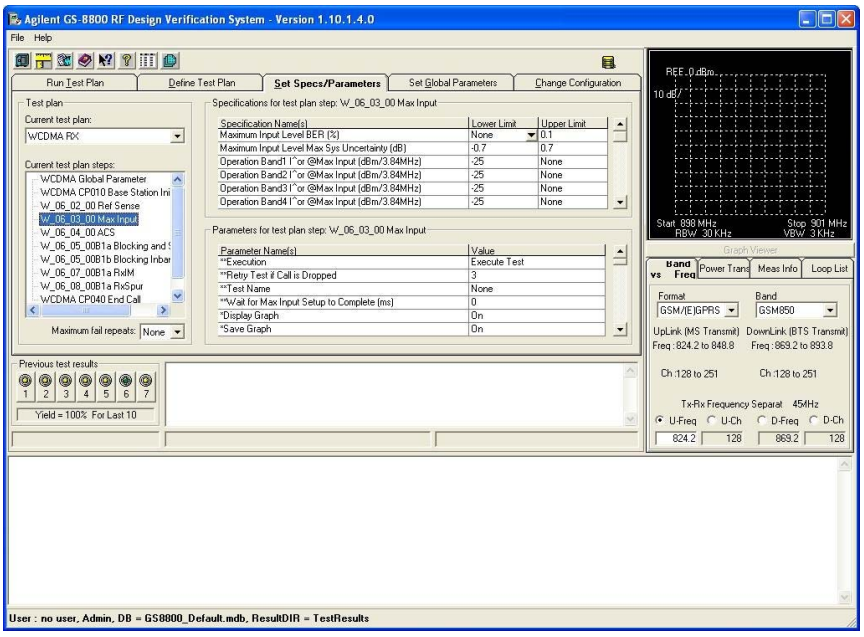

Figure 1. GS-8830 software GUI overview

[1] These add-ons are necessary to perform more comprehensive performance test requirements in the 3GPP standard, such as transmit diversity mode, and multi-cells configuration.

The GS-8830 measurement software provides integrated data collection. Results reporting, saved in a comma-separated value (CSV) format, allow easy sharing with other applications. The viewer software application (see Figure 2), provided as a standard option, allows you to perform off-line graphical analysis on measurement data.

The GS-8830 calibration software provides measurement points to collect path frequency characteristics, ensuring system measurements are within designated accuracy. The operation is simplified with clear instructions displayed on the screen.

Calibration results are stored in calibration files and used for all subsequent measurements. Frequent system calibration helps prevent bad cables or worn calibration equipment from jeopardizing the accuracy and repeatability of your measurement results.

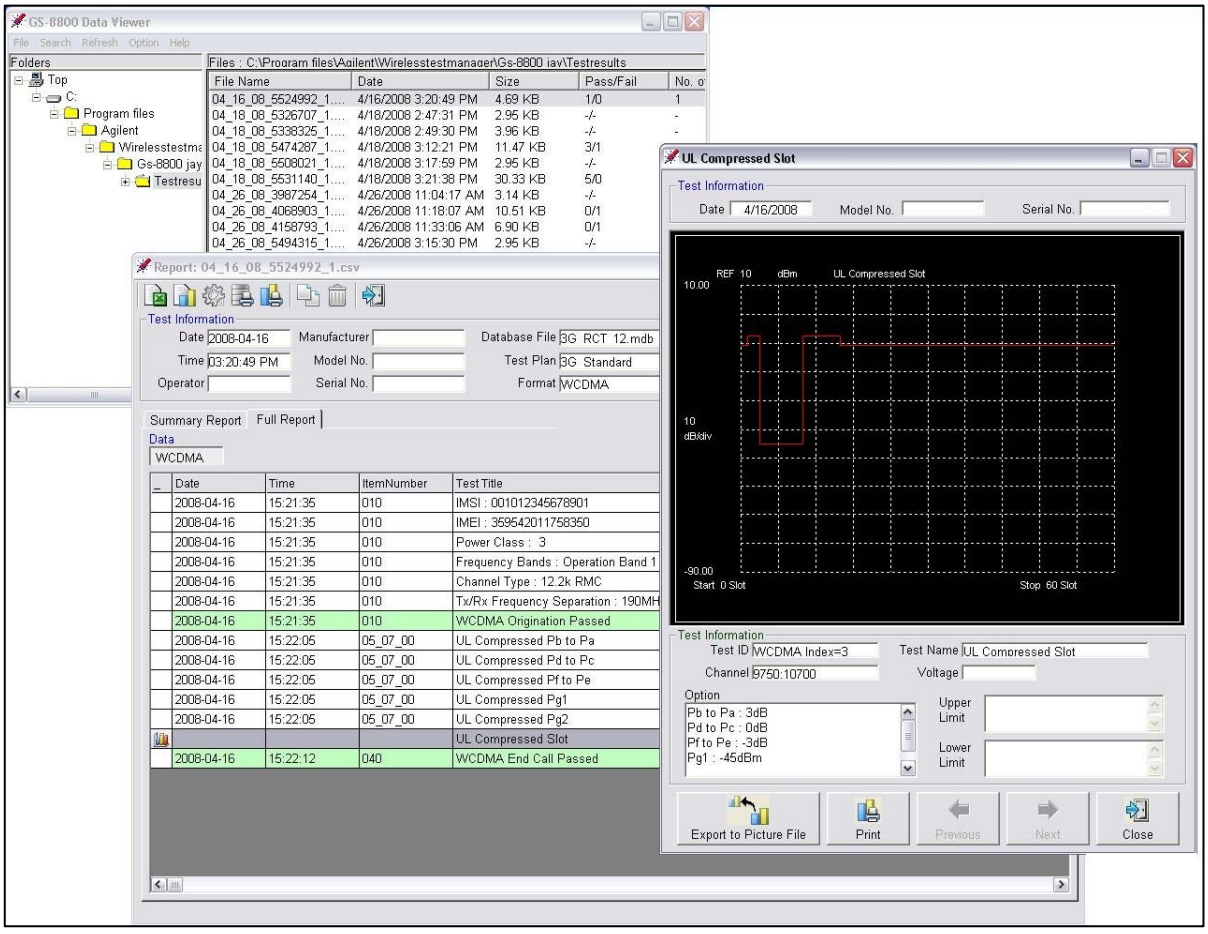

Figure 2. GS-8830 software data viewer

Specifications

Input and output

RF input/output

DUT RF IN/OUT (N1961A front)	Maximum input: 4 W CW, 0 VDC Maximum output: Typically +15 dBm, Input impedance: 50 Ohm nominal
CAL RF OUT (N1961A front)	Maximum output: +15 dBm Maximum reverse power: 1 W CW, 0 VDC Nominal impedance: 50 Ohm

External reference input

EXT REF IN (Located at rear panel of the rack)	Input frequency: 10 MHz (±5 ppm) Input level range: 0 to +13 dBm Input impedance: 50 Ohm nominal

PC/peripheral input/output

USB	Four auxiliary ports are available: one on the front I/O panel, two on the front panel, and one on the rear panel of the industrial PC
Serial (RS-232)	Two on the front I/O panel, DB9 male connector
LAN	One on the front I/O panel, one on the real I/O panel (for intra/internet connection) 100 Base-T Ethernet, RJ-45 connector
GPIB	One on the front I/O panel for additional instrument connection

Timebase specification

Internal timebase	Internal timebase of the 8960/E5515C wireless communications test set is fed to all other instruments in the system. The 8960's internal oven-controlled crystal oscillator's specifications are as follows: • Aging rates: < ±0.1 ppm per year, < ±0.005 ppm peak-to-peak per day during any 24-hour period starting 24 hours or more after a cold start • Temperature stability: < ±0.01 ppm, frequency variation from +25 °C over the temperature range 0 to +55 °C Warm-up time: 5 minutes to be within ±0.1 ppm of frequency at one hour, 15 minutes to be within ±0.01 ppm of frequency at one hour
External timebase	When the external reference signal is present on the EXT REF IN, the system instruments will be locked to it

Recommended system path loss calibration interval

Nominal	One year
Exception	System path loss calibration must be performed when any of the following events occur in the related signal path: • Any instrument RF interconnect cable is replaced • Any instrument is calibrated Any instrument is repaired and re-calibrated

General specifications

Operating conditions

General	Indoor
Storage temperature	–20 to +70 °C
Operating temperature	+10 to +30 °C
Accuracy specified temperature	+20 to +30 °C (Refer to measurement accuracy specification of individual radio technology for further information)
Humidity (relative)	5 to 80% relative humidity (non-condensing)
Altitude	0 to 2 km
Power requirement	90 to 254 VAC, 50 to 60 Hz, 4118 VA maximum

Rack dimensions

1.6 m rack (EIA: 32 RU)	1620 mm x 1200 mm x 905 mm (63.8 in x 47.2 in x 35.6 in)
Two/three racks configuration (H x W x D)	When mounting work surfaces, maximum extra-depth is 500 mm (19.7 in)

Weight

1.6 m rack x 2 racks	505 kg maximum (1,110 lbs)
1.6 m rack x 3 racks	714 kg maximum (1,570.8 lbs)

Regulatory compliance

Safety
IEC 61010-1:2001/EN 61010-1:2001
Canada: CAN/CSA-C22.2
No. 61010-1-04, 206349
USA ANSI/UL 61010-1:2004

Standard limit
IEC 61326:2002/EN
61326:1997+A1:1998+A2:2001+A3:2003
Reference standards
CISPR 11:1990/EN 55011:1990
Class A Group 1

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