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Agilent Technologies E1852B *Bluetooth* Test Set

Data Sheet



- A low-cost stand-alone solution
- Establishes a link using standard *Bluetooth*™ protocol
- Fast functional test and performance test over the RF-interface
- Additional features aid module calibration and diagnostics
- Qualified by the *Bluetooth* SIG

Bluetooth

Agilent Technologies

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Functionality

Test Mode with or without frequency hopping

Ability to act as a *Bluetooth* Master, perform *Inquiry* and establish a *Paged* connection in test mode [*Bluetooth* Specification 1.1] with a *Bluetooth* device.

DUT mode: Transmitter mode or loopback mode, with or without data whitening

Transmitter measurements: Provide the following results:

- Average Power
- Peak Power
- Frequency Offset
- Frequency Drift
- Frequency Drift Rate
- Frequency Deviation [0F calibrated]
- Graphical results showing frequency vs. time, power vs. time, power vs. channel number

Receiver measurement:

- Number of test bits settable, up to 1.6 million
- Bit Error Rate
- Packet Error Rate

Results averaging: 1 to 200

Poll period: 1-255

Packet types: DH1, DH3, DH5, HV3, AUX1

Packet length: Variable, according to the *Bluetooth* specifications for each packet type supported

Packet payload: 00000000, 11111111, 01010101, 00001111, Pseudo-random (PN9), User-defined

Power control: Instruct DUT (Device Under Test) to increase/decrease RF output power

Normal Mode

Ability to act as a *Bluetooth* Master, perform *Inquiry* and establish a *Paged* connection [*Bluetooth* Specification 1.1] with a *Bluetooth* device.

Transmitter measurements:

- Power & Frequency measurement results based on the use of a zero length payload
- Graphical results showing frequency vs. time, power vs. time, power vs. channel number

Receiver measurements:

- Packet Error Rate

Results averaging: 1 to 200

Poll period: 1

Packet payload: No payload is present in this mode

Power control: Instruct DUT (Device Under Test) to increase/decrease RF output power.

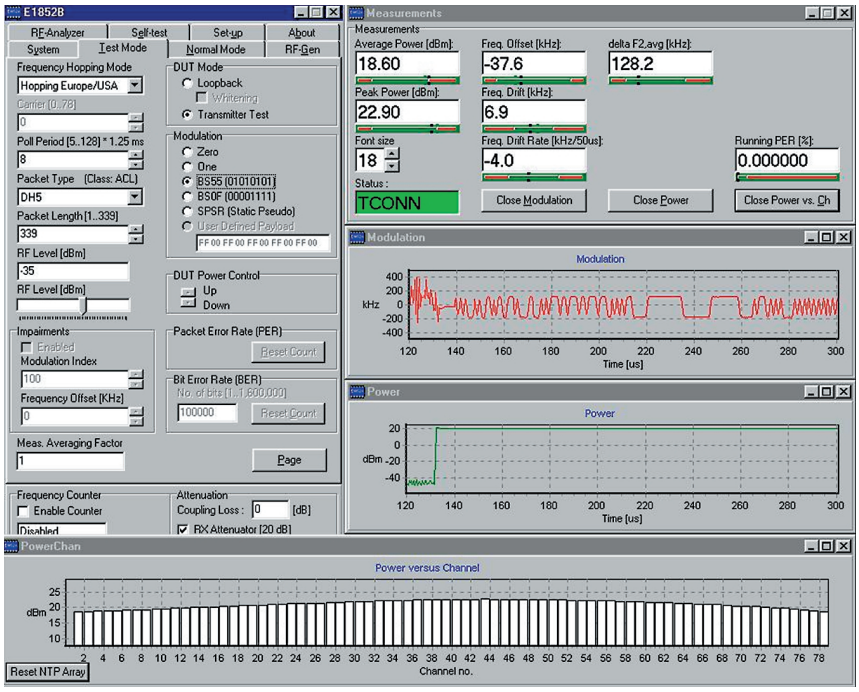
RF-Analyzer

Transmitter measurements as described in Test Mode, but for use when no link is established. (DH1, DH3 or DH5 packets and 01010101, 00110011 or 00001111 payloads only)

RF-Generator

Burst or continuous signal on any channel, with selectable power output and frequency offset. (01010101, 00110011, and 00001111 payloads supported)

The PC-based user interface is easy to learn and use. The measurement summary shows all transmitter and receiver measurements, with bar graphs using pass/fail limits.



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Performance

The test set will meet its specification after 2 hours of storage within the stated operating range, 60 minutes after turn on.

RF-Generator

Frequency:

Range	2402MHz - 2480MHz, 79 channels at 1 MHz spacing
Modulation	In accordance with *Bluetooth* Radio Specification Version 1.1

Output Power:

Range	-85dBm to 0dBm
Resolution	0.1dB
Accuracy[1,2] over the output range	
-85 to -10 dBm	±1.0 dB at 25 °C ±3 °C (±1.4 dB over full operating temperature)
>-10 to 0 dBm	±1.1 dB at 25 °C ±3 °C (±1.9 dB over full operating temperature)

RF-Analyzer

Frequency:

Range	2402MHz - 2480MHz 79 channels at 1 MHz spacing
Demodulation	±400 kHz maximum
Error	±(Timebase error + 5 kHz) (nominal)

Power Measurement:

Range	-55 dBm to +23 dBm
Resolution	0.1 dB
Accuracy[3] over the input range	
-30 to +23 dBm	±0.9 dB at 25 °C ±3 °C (±1.3 dB over full operating temperature)

Frequency Counter Input

Range	10 kHz to 15 MHz
Frequency Error	±(Timebase error + 100 Hz) (nominal)
Resolution	1 Hz
Sensitivity	0.5V RMS (nominal)

Frequency Reference

Internal Timebase:	
Drift due to temperature	±2.0 ppm
Aging	±1.0 ppm / year
Frequency Reference input:	
Frequency	10 MHz (nominal)
Sensitivity	150 mV into 50 Ω (nominal)



General Specifications

Impairments

Frequency Offset	-75khz to +75khz (settable in 1kHz steps)
Modulation Index	0.28 to 0.35 (settable in 0.01 steps)

Input/Output Connectors

RF In/Out N(f), 50 Ω (nominal)
Counter In BNC(f), high impedance
GPIB Connector, IEEE 488 Standard
Parallel Port 25-pin D-sub(m)
Serial Port [RS-232] 9-pin D-sub(f) used for firmware downloads
Frequency reference input, BNC(f), 50 Ω nominal
Audio, BNC(f), 50 Ω nominal supports A-Law, µ-Law and CVSD codec formats

- Input
- Output

Analog Outputs, BNC(f), 50 Ω nominal

- *Bluetooth* Slot Clock (625µs interval)
- Received Data (inverted)
- Receive Slot Sync
- Power Envelope

Environmental Conditions

Operating Temperature	+15°C to +45°C
Operating Humidity	Up to 95% relative humidity to 40°C (non-condensing)

Power Consumption

Supply Voltage	100-120VAC, 200-240VAC 50-60Hz, 30VA maximum

Mechanical

Dimensions	92mm(H) x 280mm(D) x 484mm(W) Designed for rack-mounting
Weight	3.6Kg

Software Supplied

- PC-based user interface
- VXI *plug&play* driver (Agilent VEE, Labview, C++ & others)
- Scripting software and examples

Computer Requirements

The test set requires the use of a PC (not supplied) with:

- Pentium® Processor or higher, 32MB RAM or more, 200MB available on hard drive
- Windows® 95, Windows® 98, Windows® 2000, Windows NT® 4.0(SP 3)
- GPIB or dedicated bi-directional parallel port
- 1024 x 768 resolution color monitor
- Microsoft Internet Explorer version 4.0 or higher/Netscape Communicator Version 4.0 or higher and internet connection required to download software/firmware upgrades

[1] A measurement uncertainty of 0.43 dB is included in these limits
[2] This specification is not applicable above -24dBms when used in frequency hopping mode
[3] A measurement uncertainty of 0.36 dB is included in these limits

These uncertainty values are calculated using ISO TAG4, in line with the 'Guide to the Expression of Uncertainty in Measurement' and are based on a standard uncertainty multiplied by a coverage factor of k = 2, providing a level of confidence of approximately 95%.

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