Technical Data Sheet

Bluetooth Test Set

MT8852B

Introduction

This document provides specifications for the MT8852B *Bluetooth* Test Set and lists ordering information and option and accessory codes.

A color brochure (part number 11410-00399) is also available from the Anritsu website (www.us.anritsu.com). The brochure provides in-depth descriptions of MT8852B applications, features, and benefits when testing a wide range of *Bluetooth* products.

Specifications

Characteristic/Parameter	Specification
Basic Rate measurements	**All measurements made in compliance with *Bluetooth* core specifications 3.0 + HS Test Suite Structure (TSS) and Test Purposes (TP) Specification 1.2/2.0/2.0 + EDR/2.1/2.1 + EDR/3.0/3.0 + HS**
Output Power	**TRM/CA/01/C**
Measurement configuration	Hopping: OFF or ON – measure at Defined, All, or Any frequencies Loopback or TX mode Payload: PRBS 9 Packet type: DH1, DH3, DH5
Displayed results	Average power Peak power
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	+22 dBm to –50 dBm average power (+23 dBm peak power)
Resolution	0.1 dB
Accuracy	+20 dBm to –35 dBm, ±1 dB +22 dBm to +20 dBm, ±1.5 dB
Power Control	**TRM/CA/03/C**
Measurement configuration	Hopping: OFF Loopback or TX mode Payload: PRBS 9 Packet type: DH1, DH3, DH5
Displayed results	Maximum power Minimum power Maximum step size Minimum step size Power at each power step
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	+22 dBm to –35 dBm average power (+23 dBm peak power)
Resolution	0.1 dB
Accuracy	+20 dBm to –35 dBm, ±1 dB +22 dBm to +20 dBm, ±1.5 dB
Enhanced Power Control	**TRM/CA/14/C**
Measurement configuration	Hopping: OFF Loopback or TX mode Payload: PRBS9 Packet type: DH1, 2DH1, 3DH1
Displayed result	Maximum power for each packet type Minimum power for each packet type Maximum power step for each packet type Minimum power step for each packet type Maximum power difference at any step between DHn and 2DHn or 3DHn packets
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	+22 dBm to -35 dBm average power (+23 dBm peak power)
Resolution	0.1 dB
Accuracy	+20 dBm to -35 dBm, ±1.0 dB +22 dBm to +20 dBm, ±1.5 dB
Initial Carrier Frequency Tolerance	**TRM/CA/08/C**
Measurement configuration	Hopping: OFF or ON – measure at Defined, All, or Any frequencies Loopback or TX mode Payload: PRBS 9 Packet type: DH1
Displayed results	Average initial frequency error Maximum positive frequency error Maximum negative frequency error
Number of measurement frequencies	Three, default to RF Test Specification or user defined
RF input measurement range	+20 dBm to –35 dBm
Initial frequency error measurement range	0 Hz to ±150 kHz
Frequency resolution	1 kHz
Accuracy	500 Hz ± Frequency Standard

Characteristic/Parameter	Specification
Carrier Frequency Drift	**TRM/CA/09/C**
Measurement configuration	Hopping: OFF or ON – measure at Defined, All, or Any frequencies Loopback or TX mode Payload: 10101010 Packet type: DH1, DH3, DH5
Displayed results	Carrier frequency drift Drift rate
Number of measurement frequencies	Three, default to RF Test Specification or user defined
RF input measurement range	+20 dBm to –35 dBm
Frequency drift measurement range	0 Hz to 200 kHz, and >2000/50 µs
Frequency resolution	1 kHz
Sensitivity - Single Slot Packets	**RCV/CA/01/C**
Measurement configuration	Hopping: OFF or ON, user selectable Loopback only Payload: PRBS9 Packet type: DH1 Dirty transmitter (as defined in the RF test spec): ON or OFF, user defined
Displayed results	BER (percentage) Total number of bit errors and FER
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Number of measured bits	1 to 10,000 packets (216 to 2,160,000 bits)
Output power range	0 dBm to –90 dBm, resolution 0.1 dB
Output power accuracy	±1 dB, 0 dBm to –80 dBm
BER/FER measurement range	0.000% to 100%
BER/FER resolution	0.001%
Sensitivity - Multi Slot Packets	**RCV/CA/02/C**
Measurement configuration	Hopping: OFF or ON, user selectable Loopback only Payload: PRBS 9 Packet type: DH3, DH5 Dirty transmitter (as defined in RF test spec): ON or OFF, user defined
Displayed results	BER (percentage) Total number of bit errors and FER
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Number of measured bits	1 to 10,000 packets (for DH3, 1,464 to 14,640,000 bits), (for DH5, 2,712 to 27,120,000 bits)
Output power range	0 dBm to –90 dBm, 0.1 dB resolution
Output power accuracy	±1 dB, 0 dBm to –80 dBm
BER/FER measurement range	0.000% to 100%
BER/FER resolution	0.001%
Modulation Characteristics	**TRM/CA/07/C**
Measurement configuration	Hopping: OFF Loopback or TX mode Payload: 11110000 and 10101010 Packet type: DH1, DH3, DH5
Displayed results	Frequency deviation Δf1max Δf2max Δf1avg Δf2avg and Δf2avg/Δf1avg plus % of Δf2max <115 kHz
Number of measurement frequencies	Three, default to RF Test Specification or user defined
RF input measurement range	+20 dBm to –35 dBm
Deviation measurement range	0 Hz to 350 kHz peak
Deviation resolution	1 kHz
Accuracy	1% for modulation index = 0.32

Characteristic/Parameter	Specification
Maximum Input Level	**RCV/CA/06/C**
Measurement configuration	Hopping: OFF Loopback only Payload: PRBS 9 Packet type: DH1
Displayed results	BER (percentage) Total number of bit errors and FER
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Number of measured bits	1 to 10,000 packets (216 – 2,160,000 bits)
Output power range	0 dBm to –90 dBm, resolution 0.1 dB
Output power accuracy	±1 dB, 0 dBm to –80 dBm
EDR Measurements	
EDR Relative Transmit Power	**TRM/CA/10/C**
Measurement configuration	Hopping: Off and On – measure at Defined, All, or Any frequencies Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5 Loopback or TX mode EUT power level: Max and Min
Displayed results	Max differential power (from all packets) Min differential power (from all packets) Average differential power (over all packets)
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	+20 to –35 dBm average power (+23 dBm peak power)
Relative power resolution	0.01db, GFSK to π/4DQPSK and 8DPSK
Relative power accuracy	Relative power measurement accuracy between GFSK and π/4DQPSK or 8DPSK, 0.2 dB typical for a power difference of <6 dB
Relative power measurement range	Relative power measurement range between GFSK and π/4DQPSK or 8DPSK, $(P_{GFSK}–8\ dB) < P_{DPSK} < (P_{GFSK} +4\ dB)$
EDR Carrier Frequency Stability and Modulation Accuracy	**TRM/CA/11/C**
Measurement configuration	Hopping: Off and On – measure at Defined, All, or Any frequencies Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5 Loopback or TX mode EUT power level: Max and Min
Displayed results	Initial frequency error ω_i Frequency error ω_o Frequency error $\omega_i + \omega_o$ RMS DEVM (block with greatest DEVM value displayed) Peak DEVM 99% DEVM Average RMS DEVM (average DEVM for all blocks measured)
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Carrier frequency stability measurement range	0 Hz to ±100 kHz
Carrier frequency stability accuracy	500 Hz ± Frequency Standard
Carrier frequency stability resolution	1 kHz
RMS DEVM range	30% π/4DQPSK, 20% 8DPSK
RMS DEVM resolution	0.1% π/4DQPSK and 8DPSK
Peak DEVM range	0 to 50% π/4DQPSK, 0 to 30% 8DPSK
Peak DEVM resolution	0.1% π/4DQPSK and 8DPSK

Characteristic/Parameter	Specification
EDR Differential Phase Encoding	**TRM/CA/12/C**
Measurement configuration	Hopping: OFF and ON, user selectable Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5. Number of test packets: default 100 TX mode only
Displayed results	Number of packets received Number of packets with payload data errors Percentage of errored packets
Number of measurement frequencies	Three, default to RF Test Specification or user defined
EDR Sensitivity	**RCV/CA/07/C**
Measurement configuration	Hopping: OFF and ON, user selectable Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5. Bit threshold control: Threshold 1, 1.6 million bits, Threshold 2, 16 million bits (user editable) Loopback only Dirty transmitter (as defined in RF test spec): ON or OFF, user selectable
Displayed results	Overall BER (displayed in exponential format) Number of bits in error Number of packets sent by test set Number of packets received in error by EUT
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Output power range	0 to –90 dBm, resolution 0.1 dB
Output power accuracy	±1 dB, 0 dBm to –80 dBm
EDR BER Floor Performance	**RCV/CA/08/C**
Measurement configuration	Hopping: OFF and ON, user selectable Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5 Bit threshold control: Threshold 1, 8 million bits, Threshold 2, 160 million bits (user editable) Loopback only
Displayed results	Overall BER (displayed in exponential format) Number of bits in error Number of packets sent by test set Number of packets received in error by EUT
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Output power range	0 to –90 dBm, resolution 0.1 dB
Output power accuracy	±1 dB, 0 dBm to –80 dBm
EDR Maximum Input Level	**RCV/CA/10/C**
Measurement configuration	Hopping: OFF and ON, user selectable Modulations: π/4DQPSK and 8DPSK Packet type: 2-DH1, 3, 5 and 3-DH1, 3, 5 Number of bits: default 1.6 million (user editable) Loopback only
Displayed results	Overall BER (displayed in exponential format) Number of bits in error Number of packets sent by test set Number of packets received in error by EUT
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Output power range	0 to –90 dBm, resolution 0.1 dB
Output power accuracy	±1 dB, 0 dBm to –80 dBm

Characteristic/Parameter	Specification
Low Energy Measurements	**BLE measurements made in compliance with *Bluetooth* RF test specification RF_PHY.TS/4.0.0**
BLE Output power	**TRM-LE/CA/01/C and TRM-LE/CA/02/C**
Measurement configuration	DUT configured to transmit Test Reference Packets. Packet payload: PRBS9
Displayed results	Average power Peak to average power
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	+22 dBm to –50 dBm average power (+23 dBm peak power)
Resolution	0.1 dB
Accuracy	+20 dBm to -35 dBm, ±1.0 dB +22 dBm to +20 dBm, ±1.5 dB
BLE Modulation characteristics	**TRM-LE/CA/05/C**
Measurement configuration	DUT configured to transmit Test Reference Packets. Packet payload: 11110000 and 10101010
Displayed results	Frequency deviation Δf1max Δf2max Δf1avg Δf2avg, Δf2avg / Δf1 avg ratio, %Δf2max, > 185 kHz
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	RF input: +20 dBm to -35 dBm Deviation: 0 Hz to 500 kHz peak
Resolution	Deviation: 1 kHz
Accuracy	1% for modulation index 0.5
BLE Carrier frequency offset and drift	**TRM-LE/CA/06/C and TRM-LE/CA/07/C**
Measurement configuration	DUT configured to transmit Test Reference Packets. Packet payload: 10101010
Displayed results	Carrier frequency error Frequency drift Drift rate
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Measurement range	RF input: +20 dBm to -35 dBm Frequency: 500 kHz
Frequency Resolution	1 kHz
Accuracy	500 Hz ± Frequency standard
BLE Receiver sensitivity	**RCV-LE/CA/01/C and RCV-LE/CA/02/C**
Measurement configuration	DUT configured to receive Test Reference Packets. Packet payload: PRBS9 Full support of Dirty Transmitter as defined in test specification
Displayed results	Receiver PER. Requires DUT to support HCI UART or USB or 2-Wire interface for automated PER results.
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Output power range	0 dBm to –90 dBm, resolution 0.1 dB
Output power accuracy	± 1 dB, 0 dBm to –80 dBm
BLE Maximum input signal level	**RCV-LE/CA/06/C**
Measurement configuration	DUT configured to receive Test Reference Packets. Packet payload: PRBS9
Displayed results	Receiver PER. Requires DUT to support HCI UART or USB or 2-Wire interface for automated PER results.
Number of measurement frequencies	Three, default to RF Test Specification or user defined
Output power range	0 dBm to –90 dBm, resolution 0.1 dB
Output power accuracy	± 1 dB, 0 dBm to –80 dBm
BLE PER report integrity	**RCV-LE/CA/07/C**
Measurement configuration	DUT configured to receive Test Reference Packets. Packet payload: PRBS9 CRC corruption: Alternate packets Number of test packets: Random [100 ≤ RND ≤ 1500]
Displayed results	Receiver PER. Requires DUT to support HCI UART or USB or 2-Wire interface for automated PER results.
Number of measurement frequencies	One, default to RF Test Specification or user defined
Output power range	0 dBm to –90 dBm, resolution 0.1 dB
Output power accuracy	± 1 dBm (0 dBm to –80 dBm)

Characteristic/Parameter	Specification
MT8852B Signal Generator	
Frequency	
Frequency range	2.40 to 2.5 GHz
Frequency resolution	1 kHz
Frequency accuracy	As frequency standard ±500 Hz
Level	
Amplitude range	0 dBm to –90 dBm
Amplitude accuracy	±1 dB (0 dBm to –80 dBm)
Amplitude resolution	±0.1 dB
Output impedance	50 Ω (nominal)
Output VSWR	1.5:1 (typically 1.3) Adjacent channels 3 or higher –40 dBc
GFSK modulation	
Modulation index	Variable, 0.25 to 0.50 (125 kHz to 250 kHz)
Modulation index resolution	0.01
Modulation index accuracy	1% for Modulation Index = 0.32
Baseband filter	BT=0.5
π/4DQPSK modulation	
Modulation index accuracy	<5% RMS DEVM
Baseband filter	BT=0.4
8DPSK modulation	
Modulation index accuracy	<5% RMS DEVM
Baseband filter	BT=0.4
MT8852B Measuring Receiver	
Frequency	
Frequency range	2.40 to 2.5 GHz
Frequency resolution	1 kHz
Frequency accuracy	As frequency standard ±500 Hz
Level	
Range	+22 dBm to –55 dBm average power
Power measurement accuracy	±1 dB (+20 dBm to –35 dBm)
Input VSWR	1.5:1
Damage level	+25 dBm
Resolution	0.1 dB
GFSK modulation	
Deviation measurement range	0 to 350 kHz peak
Accuracy	1% for Modulation Index = 0.32
EUT Control Interface	
RS232 HCI commands	The EUT control interface provides RS232 HCI commands to the EUT through a standard RS-232 interface. The interface meets the requirements of the *Bluetooth* specification for HCI UART transport layer. A RS232 cable is supplied.
USB HCI commands	The EUT control interface provides USB HCI commands to the EUT through a standard USB interface. The interface meets the requirements of the *Bluetooth* specification section H:2. A USB cable is supplied.
2-Wire control	For test control of *Bluetooth* low energy devices the EUT control interface supports the 2-Wire specification

Characteristic/Parameter	Specification
Audio Specifications	
Number of SCO channels supported	3
Codec air interfaces supported	CVSD, A-Law, μ-Law
Frequency response	(–3 dB) measured CODEC in to CODEC out: 160 Hz –3.5 kHz. Measured with 50 Ω source impedance and 10 MΩ load impedance
Maximum input / output signal level	3.4 V_{pk-pk} = 1.2V RMS
Distortion/noise	A law: typical –37 dB at 1 kHz, 1V RMS μ law: typical –37 dB at 1 kHz, 1V RMS CVSD: typical –30 dB at 300 Hz, 1V RMS
Input/Output connectors	3.5 mm audio jack plugs (one for each SCO channel)
Input impedance	20 kΩ
Minimum output load	600 Ω
Internal audio source	1 kHz fixed frequency
AFH (Option 15)	**Supported in ACL and SCO connections**
Displays	Active channel vs. time, FER vs. time
Other features	ACL connection timer, resolution 1 ms
Frequency Standard	
Frequency	10 MHz
Temperature Stability	±0.5 ppm, –10 ºC to +85 ºC
Aging (1st year)	±1.0 ppm
Aging (over 10 years)	±2.5 ppm, including year 1
Rear Panel Connectors	
External frequency standard input	Rear panel BNC socket, 50 Ω 1 volt
Output 1	TTL output for TX ON, TX DATA, RX DATA, and correlator
Output 2	TTL output for RX ON, TX DATA, RX DATA, and correlator
Input 1	For service use only
GPIB	
IEE 488.2	Offers full instrument control as standard
RS232	
RS232	Offers full instrument control as standard
General	
Power supply	85 to 264 Volts AC
Frequency	47 to 63 Hz
Power	150 VA Max
Environmental	
Operating temperature	5 to +40 ºC
Operating humidity	20% to 75%
Safety	Complies with IEC 61010-1
EMC	Conforms to the protection requirements of EEC Council Directive 89/336/EEC
Size and Weight	
Dimensions	216.5 mm x 88 mm x 380 mm
Weight	<3.45 kg

Ordering Information

Part number	Description
MT8852B	*Bluetooth* Test Set with EDR and Audio
MT8852B-040	*Bluetooth* Test Set with no EDR and no Audio
MT8852B-041	*Bluetooth* Test Set with no EDR and with Audio
MT8852B-042	*Bluetooth* Test Set with EDR and no Audio
MT8852B-043	*Bluetooth* low energy measurements only
Included accessories	
MT8852B operation manual	
MT8852B remote programming manual	
BlueSuite software (standard version)	
RS 232 HCI control interface lead	
USB HCI control interface lead	
RS 232 cable for firmware updates	
Power cord for destination country	
Certificate of calibration	
3.5 mm jack plugs (qty 3) Audio versions only	
BlueTest2 software	
Options and accessories	
MT8852B-001	Rack mount kit, single unit
MT8852B-003	Rack mount kit, side by side
MT8852B-014	Headset and Hands-free profile emulator software
MT8852B-015	Adaptive frequency hopping option
MT8852B-017	IQ data output
MT8852B-027	*Bluetooth* low energy measurements
MT8852B-319	Retrofit Audio to MT8852B
MT8852B-325	Retrofit EDR to MT8852B
MT8852B-330	Retrofit Basic Rate measurements to MT8852B-043
MT8852B-098	Standard calibration to ANSI/NCSL Z540
MT8852B-099	Premium calibration to ANSI/NCSL Z540 (Test report and uncertainty data included)
MX885201B	BlueSuite Pro3 software application
2000-1613-R	*Bluetooth* antenna and adaptor
D41310	Soft carry bag

Notes

Notes

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