

# Bluetooth Audio Test Set

MT8855A

## Introduction

This document provides specifications for the MT8855A *Bluetooth* Audio Test Set and lists ordering information and option and accessory codes.

A color brochure is also available (part number 11410-00496) from the Anritsu website ([www.us.anritsu.com](http://www.us.anritsu.com)). The color brochure provides in-depth descriptions of the MT8855A applications, as well as highlighting its features and benefits when testing a wide range of *Bluetooth* products.

A Product Information Sheet (part number 13000-00319) is also available for more detailed information on the PESQ (Perceptual Evaluation of Speech Quality) and ASTS (Artificial Speech-like Test Stimulus) options.



## Specifications

Parameter	Specification
<b>RF</b>	
RF connections	Type N (f), Impedance 50 Ohms
RF level	Support for both cable connections and over-air connections. Setting 1: Nominally -5 dBm for over-air connections Setting 2: Nominally -40 dBm for cable connections
Radio RF performance	Compliant with requirements of core specification 1.2, 2.0, 2.1 +EDR for initial frequency, modulation, drift, and sensitivity test cases.
<b>System Modes</b>	
Bluetooth Audio Measurements	Creates a <i>Bluetooth</i> connection to DUT and uses internal audio generator and analyzer for measurements
Bluetooth Pass Through	Creates a <i>Bluetooth</i> connection to the DUT, external audio source and analyzer routed through instrument line input and output.
Analogue Audio Measurements	Audio measurements using internal audio generator and analyzer with no <i>Bluetooth</i> connection.
<b>Profiles</b>	
Profiles	Headset, Hands-Free (Gateway and Device), A2DP (sink and source), AVRCP For DUTs that do not support HSP, HFP, A2DP profiles, a basic SCO/eSCO connection can be established for audio testing.
Supported codecs	CVSD, SBC, $\mu$ -Law, A-Law
<b>Audio Generators</b>	
Audio generators	2 linked for left and right channels
Freq range	20 Hz to 20 kHz
Freq resolution	1 Hz
Freq accuracy	0.1 Hz at 997 Hz. 100 ppm across full frequency range
<b>Line Output</b>	
Line output connectors	XLR, one each for left and right (usable for both balanced and unbalanced)
Line output level	Voltage range: 1 mV to 2V RMS into 600 Ohms or greater Plus tone off mode
Line output resolution	1mV
Line output level accuracy	$\pm 0.1$ dB at 997 Hz into 600 Ohms or greater for voltage range 100 mV to 2 V $\pm 0.5$ dB at 997 Hz into 600 Ohms or greater for voltages <100 mV
Line output flatness	$\pm 0.5$ dB at 20 Hz to 20 kHz relative to 997 Hz for voltage range 100 mV to 2 V $\pm 1$ dB from 20 Hz to 20 kHz relative to 997 Hz for voltages <100 mV
Line output distortion	$\leq -87$ dB THD+N at 997 Hz at 200 mV to 2 V output into 600 Ohm load
Output impedance	Impedance: <120 Ohm
<b>Speaker Output</b>	
Speaker output connector	4mm socket left and right outputs
Speaker output level	2 x 1 Watt into 8 Ohm Suitable for speakers with impedance in range 4 Ohm to 32 Ohm
Speaker output resolution	10 mV
Speaker output accuracy	$\pm 0.2$ dB at 997 Hz into 8 Ohms, 100 uW to 1 W
Speaker output flatness	$\pm 1.0$ dB from 20 Hz to 20 kHz at 100 mW relative to 997 Hz
Speaker output distortion	$< -50$ dB THD+N at 997 Hz at 100 mW
Speaker output impedance	<1 Ohm (nominal value 0.1 Ohm at room temperature)

Parameter	Specification
<b>Audio Analyzer</b>	
Audio analyzer	For left and right channels
Freq range	20 Hz to 20 kHz
<b>Line Input</b>	
Line input connection	BNC Impedance: 100k Ohms Input level: 10 mV to 4 V Measurement resolution: 1 mV
Measurements for line input	Level: Input levels 20 mV to 4 V: $\pm 0.5$ dB over 20 Hz to 20 kHz $\pm 0.1$ dB at 997 Hz Input levels 10 mV to 19 mV: $\pm 1$ dB over 20 Hz to 20 kHz $\pm 0.2$ dB at 997 Hz THD+N: Input level 1 V at 997 Hz: $\pm 0.5$ dB over range -80 dB to -20 dB Input levels 100 mV to 4 V at 997 Hz: $\pm 1.0$ dB over range -80 dB to -20 dB THD: Input levels 100 mV to 4 V at 997 Hz: $\pm 0.5$ dB over range -80 dB to -20 dB Stereo Separation: $\pm 1.0$ dB at input level 1 V at 997 Hz over dynamic range of 80 dB Stereo Phase: Mic input -90 to +270 $\pm 1$ degree $\pm 1$ sample at 997 Hz for input of 10 mV or greater, with signal to noise ratio of 30 dB or greater
<b>Microphone Input</b>	
Microphone input connection	XLR Impedance: 2k Ohms nominal Input level: 1 mV to 200 mV Measurement resolution: 0.1 mV Balanced Internal 48 V phantom power supply for accessory microphone. Compliant with EN61938: 1997.
Measurements for microphone input	Level accuracy: Input levels 10 mV to 200 mV: $\pm 0.2$ dB at 997 Hz $\pm 0.5$ dB, 100 Hz to 20 kHz -3 dB at 20 Hz Level accuracy: Input levels 2 mV to 9.9 mV: $\pm 0.5$ dB at 997 Hz $\pm 1$ dB, 100 Hz to 20 kHz -3 dB at 20 Hz THD+N: For input levels 10 mV to 100 mV: $\pm 0.5$ dB, -65 dB to -20 dB THD: For input levels 10 mV to 100 mV: $\pm 0.5$ dB, -65 dB to -20 dB Stereo Separation: Accuracy: $\pm 1$ dB at input level 10 mV at 997 Hz and 20 kHz over dynamic range of 60 dB Stereo Phase: Mic input -90 to +270 $\pm 1$ degree $\pm 1$ sample at 997 Hz for input of 10 mV or greater, having signal to noise ratio of 30 dB or greater
<b>Other Audio Outputs</b>	
Built-in speakers	2 integrated speakers
Headphone connector	3.5 mm stereo output for connection of standard headphones. Connection of a headset automatically mutes the internal speakers.
<b>Bluetooth Digital Output Level</b>	
Level of sinusoidal test signal relative to maximum peak sinusoid	0 dBFS to -40 dBFS

Parameter	Specification
<b>BlueAudio PC Application</b>	
BlueAudio software	<p>PC GUI application in VB.NET.</p> <p>Configures MT8855A hardware and displays results graphically and numerically.</p> <p>BlueAudio contains a Manual Mode in which individual tests are configured and run, and an Auto Test mode in which a test plan is generated and executed, with results automatically displayed in a report and saved to a database.</p>
BlueAudio display windows	<p>Measurement control:</p> <ul style="list-style-type: none"> <li>• Bluetooth profile</li> <li>• Bluetooth connection</li> <li>• Input/Output configuration</li> <li>• Measurement configuration</li> </ul> <p>Results:</p> <p>Left / Right channel results displayed simultaneously.</p> <ul style="list-style-type: none"> <li>• Numeric <ul style="list-style-type: none"> <li>– Level (5 frequency level measurements)</li> <li>– THD+N</li> <li>– THD (up to max 20 harmonics for 1 kHz tone, or less)</li> <li>– SINAD</li> <li>– Stereo separation</li> <li>– Stereo phase</li> <li>– PESQ/MOS (requires option)</li> </ul> </li> <li>• Graphical <ul style="list-style-type: none"> <li>– Freq response</li> <li>– FFT</li> <li>– THD+N vs level</li> <li>– THD+N vs Freq</li> </ul> </li> </ul>
PC requirements	<p>The BlueAudio application runs on Windows XP and Vista operating systems.</p> <p>The application supports English, Chinese, Japanese operating systems.</p> <p>BlueAudio runs through a USB connection to the MT8855A.</p>
<b>PESQ and MOS option</b>	
Option -032 PESQ/MOS	<p>Performs PESQ (Perceptual Evaluation of Speech Quality) and MOS (Mean Opinion Score) measurements on reference audio signals. Reference audio signals can be: user created, downloaded from the ITU web site or MT8855A-033 ASTS files.</p> <p>PESQ/MOS measurements are supported on HSP/HFP profiles with MT8855A role defined as Audio Gateway and SCO/eSCO connections.</p> <p>Anritsu licence the PESQ measurement algorithm from Psytechnics Limited. The PESQ measurement conforms to ITU-T P.862.</p>
Option -033 ASTS reference audio signals	<p>Artificial Speech-like Test Stimulus (ASTS) are audio files that have been specially formulated for use in PESQ measurements. They contain a full range of British and American English phonetic sounds in short, 10 second files. Male and female voices supplied.</p>
<b>User programming interface</b>	
API interface to MT8855A class library	<p>Documentation and programming examples that explain how to use the MT8855A Class Library to create user test programs.</p>
BlueStart	<p>A sample open source program developed in Visual Basic 2005 with comprehensive comments.</p>

General	
General	<p>Power supply: 85 to 264 V AC</p> <p>Frequency: 47 to 63 Hz</p> <p>Power: 50 Watt max, 25 Watt typical</p> <p>Dimensions: W:230 mm, H:110 mm, D:387 mm</p> <p>Weight: 3.5 Kg</p> <p>Operating temperature range: +5 °C to +40 °C</p> <p>Operating humidity: &lt;75% non condensing</p> <p>Safety: Complies with BS EN 61010-1 (Equivalent to IEC 61010-1).</p> <p>EMC: Conforms to the protection requirements of EEC Council Directive EN61326: 2006.</p>

## Ordering Information

Part number	Description
MT8855A	Bluetooth Audio Test Set
MT8855A-032	PESQ/MOS measurement option
MT8855A-033	Artificial Speech-like Test Stimulus (ASTS) audio files option
<b>Included Accessories</b>	
13000-00280	Operation manual (Printed)
2300-295	CD with BlueAudio software and PDF operation manual
2000-1611-R	USB cable for connection of MT8855A to PC
553-525-R	XLR (f) to BNC (f) adaptor (qty 2) for Line out socket
553-526-R	BNC (m) to phono (f) (qty 4)
<b>Optional Accessories</b>	
MT8855A-001	Rack mount kit (single)
MT8855A-003	Rack mount kit (side-by-side)
2000-1607-R	Standard microphone (including interface cable) (typical frequency response calibration data)
2000-1608-R	Calibrated microphone (including interface cable) (individually calibrated frequency response data)
2000-1612-R	Test speaker
2000-1613-R	2.4 GHz antenna and adaptor
MT8855A-098	Standard calibration to ANSI/NCSLI Z540-1 (Certificate of calibration only)
MT8855A-099	Premium calibration to ANSI/NCSLI Z540-1 (Certificate of calibration with test report and uncertainty data included)
D41310	Soft carry case



MT8855A Bluetooth Test Set shown with accessory 2.4 GHz antenna, test speaker and microphone accessories.

# Anritsu

## Anritsu Corporation

5-1-1 Onna, Atsugi-shi, Kanagawa, 243-8555 Japan  
Phone: +81-46-223-1111  
Fax: +81-46-296-1238

## • U.S.A.

### Anritsu Company

1155 East Collins Boulevard, Suite 100,  
Richardson, TX, 75081 U.S.A.  
Toll Free: 1-800-ANRITSU (267-4878)  
Phone: +1-972-644-1777  
Fax: +1-972-671-1877

## • Canada

### Anritsu Electronics Ltd.

700 Silver Seven Road, Suite 120, Kanata,  
Ontario K2V 1C3, Canada  
Phone: +1-613-591-2003  
Fax: +1-613-591-1006

## • Brazil

### Anritsu Eletrônica Ltda.

Praça Amadeu Amaral, 27 - 1 Andar  
01327-010 - Bela Vista - São Paulo - SP - Brasil  
Phone: +55-11-3283-2511  
Fax: +55-11-3288-6940

## • Mexico

### Anritsu Company, S.A. de C.V.

Av. Ejército Nacional No. 579 Piso 9, Col. Granada  
11520 México, D.F., México  
Phone: +52-55-1101-2370  
Fax: +52-55-5254-3147

## • U.K.

### Anritsu EMEA Ltd.

200 Capability Green, Luton, Bedfordshire LU1 3LU, U.K.  
Phone: +44-1582-433280  
Fax: +44-1582-731303

## • France

### Anritsu S.A.

12 Avenue du Québec,  
Bâtiment Iris 1-Silic 638,  
91140 VILLEBON SUR YVETTE, France  
Phone: +33-1-60-92-15-50  
Fax: +33-1-64-46-10-65

## • Germany

### Anritsu GmbH

Nemetschek Haus, Konrad-Zuse-Platz 1  
81829 München, Germany  
Phone: +49 (0) 89 442308-0  
Fax: +49 (0) 89 442308-55

## • Italy

### Anritsu S.p.A.

Via Elio Vittorini, 129, 00144 Roma, Italy  
Phone: +39-06-509-9711  
Fax: +39-06-502-2425

## • Sweden

### Anritsu AB

Borgafjordsgatan 13, 164 40 KISTA, Sweden  
Phone: +46-8-534-707-00  
Fax: +46-8-534-707-30

## • Finland

### Anritsu AB

Teknobulevardi 3-5, FI-01530 VANTAA, Finland  
Phone: +358-20-741-8100  
Fax: +358-20-741-8111

## • Denmark

### Anritsu A/S (for Service Assurance)

### Anritsu AB (for Test & Measurement)

Kirkebjerg Allé 90 DK-2605 Brøndby, Denmark  
Phone: +45-7211-2200  
Fax: +45-7211-2210

## • Russia

### Anritsu EMEA Ltd.

### Representation Office in Russia

Tverskaya str. 16/2, bld. 1, 7th floor.  
Russia, 125009, Moscow  
Phone: +7-495-363-1694  
Fax: +7-495-935-8962

## • United Arab Emirates

### Anritsu EMEA Ltd.

### Dubai Liaison Office

P O Box 500413 - Dubai Internet City  
Al Thuraya Building, Tower 1, Suite 701, 7th Floor  
Dubai, United Arab Emirates  
Phone: +971-4-3670352  
Fax: +971-4-3688460

## • Singapore

### Anritsu Pte. Ltd.

60 Alexandra Terrace, #02-08, The Comtech (Lobby A)  
Singapore 118502  
Phone: +65-6282-2400  
Fax: +65-6282-2533

## • India

### Anritsu Pte. Ltd.

### India Branch Office

3rd Floor, Shri Lakshminarayan Niwas, #2726, 80 ft Road,  
HAL 3rd Stage, Bangalore - 560 075, India  
Phone: +91-80-4058-1300  
Fax: +91-80-4058-1301

## • P. R. China (Hong Kong)

### Anritsu Company Ltd.

Units 4 & 5, 28th Floor, Greenfield Tower, Concordia Plaza,  
No. 1 Science Museum Road, Tsim Sha Tsui East,  
Kowloon, Hong Kong, P.R. China  
Phone: +852-2301-4980  
Fax: +852-2301-3545

## • P. R. China (Beijing)

### Anritsu Company Ltd.

### Beijing Representative Office

Room 2008, Beijing Fortune Building,  
No. 5, Dong-San-Huan Bei Road,  
Chao-Yang District, Beijing 100004, P.R. China  
Phone: +86-10-6590-9230  
Fax: +86-10-6590-9235

## • Korea

### Anritsu Corporation, Ltd.

8F Hyunjuk Bldg. 832-41, Yeoksam-Dong,  
Kangnam-ku, Seoul, 135-080, Korea  
Phone: +82-2-553-6603  
Fax: +82-2-553-6604

## • Australia

### Anritsu Pty Ltd.

Unit 21/270 Ferntree Gully Road, Notting Hill  
Victoria, 3168, Australia  
Phone: +61-3-9558-8177  
Fax: +61-3-9558-8255

## • Taiwan

### Anritsu Company Inc.

7F, No. 316, Sec. 1, Neihu Rd., Taipei 114, Taiwan  
Phone: +886-2-8751-1816  
Fax: +886-2-8751-1817

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