Universal Wireless Test Set
MT8870A/MT8872A

TRX Test Module
MU887000A/MU887001A/MU887002A
Contents

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• Outline of MT8870A/MT8872A and Applications
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Positioning of MT8870A/MT8872A Test Solution
Solutions from R&D to Mass-Production

Research → Development → Evaluation → Prototype → Production → Repair

- Smartphone
- Tablet
- Cellular Module
- 5G NR
- LTE/LTE-Advanced
- NB-IoT/Cat-M
- W-CDMA
- GSM
- CDMA2000

- Connectivity Module
- Wearable / IoT devices
- AP / STB
- WLAN 802.11
- Bluetooth
- ZigBee/Z-Wave

- MT8820C Radio Communication Analyzer
- MT8862A Wireless Connectivity Test Set
- MT8870A Universal Wireless Test Set

- MT8000A Radio Communication Test Station
- MD8430A Signaling Tester
- MD8475A/B Signaling Tester

- MT8821C Radio Communication Analyzer
- MT8852B Bluetooth Test Set
- MT8862A Wireless Connectivity Test Set

- MS269xA/MS2850A Signal Analyzer
- MG370E/MG3740A Vector Signal Generator

- MG3710E/MG3740A Vector Signal Generator
- MT8852B Bluetooth Test Set
- MT8820C Radio Communication Analyzer

- GT8000A Universal Wireless Test Set
- Multiple Wireless Technologies

- Multiple Wireless Technologies
- Single Chipset

- Anritsu envision: ensure
Outline of MT8870A/MT8872A
Testers for Solving High-Density Production-Line Issues

The Universal Wireless Test Set MT8870A/MT8872A supports efficient non-signaling mode measurements on production lines for wireless communications devices.

Supports Various Wireless Standards
All-in-one tester supports various wireless standards including 5G NR, IEEE 802.11ax, etc. It also supports Tx tests, such as Tx power measurements and Tx modulation accuracy, and Rx tests, such as Rx sensitivity.

Versatile Modular Design
The versatile design matching customers’ production-line density and operation rate by Inserting/removing the number of installed MU887000A/01A/02A test modules and types helps optimize the capital-equipment investment.
Support for Various Wireless Communication Terminal Products

**Smartphone/Tablet**
- Cellular – Sub-6G/4G/3G/2G
- Connectivity – WLAN, BT
- GNSS – GPS/Galileo/GLONASS/BeiDou/QZSS

**Wi-Fi Router/Home gateway**
- Cellular – Sub-6G/4G/3G/2G
- Connectivity – 11a/b/g/n/ac/ax

**IoT Module**
- Cellular – Cat.M/NB-IoT/2G/3G/4G/Sub-6 GHz
- Connectivity – GPS, Zigbee, Z-Wave

**Automotive**
- Telematics – Sub-6G/4G/3G/2G
- Infotainment – WLAN, BT
- Navigation – GPS/Galileo/GLONASS/BeiDou/QZSS
- Safety - V2X
Versatile Platform

Futureproof Hardware

- The hardware has been designed bearing future advances in wireless standards in mind and offers customers a platform for the 5G era.
- The modular design eliminates the need for expensive hardware upgrades and helps cut capital-equipment costs.

Easily Expandable Software

- Advances in wireless standards are supported by adding measurement software with new functions to make best use of previously purchased hardware.
- Since the measurement software license is associated with the MT8870A/MT8872A hardware, multiple TRX test modules can be shared to cut costs.
MT8870A/MT8872A – Choice of Two Solutions –

MT8870A: Standard Chassis Size for Large-Scale Mass-Production Lines

– Slots for Four Modules
  - The MT8870A has slots for four easily installed and removed TRX test modules.
– Maximum of 48 RF Test Ports
  - Installing two MU887002A TRX test modules in the MT8870A provides a total of 48 RF test ports to help cut test times.

MT8872A: Compact Chassis with Full MT8870A Compatibility

– Smaller Footprint
  - The compact Chassis fits tighter installation spaces than standard 19-inch rackmounts to save space on congested lines.
– Full Compatibility with MT8870A
  - Full MT8870A compatibility facilitates laboratory usage for creating production-line software and troubleshooting line issues.
MU88700xA – Evolving TRX Test Modules –

Choice of Three TRX Test Modules
- Choice of modules matching measurement requirements for mixed install in same Chassis
- Measurement software license shared by all TRX test modules
- Adjustable number of installed TRX test modules optimizes balance of line productivity, production performance, and production costs

<table>
<thead>
<tr>
<th>Connector Types</th>
<th>MU887000A</th>
<th>MU887001A</th>
<th>MU887002A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test port 1 and 2: Full-duplex</td>
<td>Test port 1: Full-duplex</td>
<td>Test port 1 to 12: Full-duplex</td>
<td></td>
</tr>
<tr>
<td>Test port 3 and 4: Half-duplex</td>
<td>Test port 3 and 4: Half-duplex</td>
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<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>10 MHz to 3.8 GHz, 3.8 to 6.0 GHz (Option)</td>
<td>10 MHz to 3.8 GHz, 3.8 to 6.0 GHz (Option)</td>
<td>400 MHz to 6.0 GHz</td>
</tr>
<tr>
<td>Output Level Setting Range</td>
<td>Test port 1 and 2</td>
<td>Test port 1 to 4</td>
<td>Test port 1 to 12</td>
</tr>
<tr>
<td>-130 to -10 dBm (≤3.8 GHz)</td>
<td>-130 to -10 dBm (≤3.8 GHz)</td>
<td>-130 to -10 dBm (≤3.8 GHz)</td>
<td></td>
</tr>
<tr>
<td>-130 to -18 dBm (&gt;3.8 GHz)</td>
<td>-130 to -18 dBm (&gt;3.8 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test port 3 and 4</td>
<td>-120 to -8 dBm</td>
<td>-120 to 0 dBm (≤3.8 GHz)</td>
<td></td>
</tr>
<tr>
<td>-120 to -8 dBm (&gt;3.8 GHz)</td>
<td>-120 to 0 dBm (&gt;3.8 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Level Setting Range</td>
<td>Test port 1 and 2</td>
<td>Test port 1 to 4</td>
<td>Test port 1 to 12</td>
</tr>
<tr>
<td>-65 to +35 dBm (CW, 350 MHz ≤ f ≤ 6.0 GHz)</td>
<td>-65 to +35 dBm (CW, 350 MHz ≤ f ≤ 6.0 GHz)</td>
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<td></td>
</tr>
<tr>
<td>Test port 3 and 4</td>
<td>-65 to +25 dBm (CW, 350 MHz ≤ f ≤ 6.0 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-65 to +25 dBm (CW, 350 MHz ≤ f ≤ 6.0 GHz)</td>
<td>-65 to +25 dBm (CW, 350 MHz ≤ f ≤ 6.0 GHz)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote Control Interface</td>
<td>Ethernet, GPIB (Option)</td>
<td>Ethernet, GPIB (Option)</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Broadcast</td>
<td>Not supported</td>
<td>Not supported</td>
<td>Supported</td>
</tr>
<tr>
<td>FM/Audio</td>
<td>Supported</td>
<td>Supported</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
24 RF Test Ports
- 5G terminals, including smartphones have more built-in antennas to implement fast, high-capacity communications, which causes issues with extra infrastructure costs to solve problems resulting from having too few RF test ports. With two TRX functions per MU887002A unit and each function having 12 RF test ports, each MU887002A has a total of 24 RF test ports for testing multi-antenna terminals.

Broadcast Signal Output From up to 12 RF Test Ports
- Since the MU887002A has a built-in divider at the output side, the same signal can be output simultaneously from up to 12 RF ports, supporting shorter test times through reception of the same signal without requiring an external divider.

200-MHz Measurement Bandwidth
- The MU887002A measurement bandwidth is 200 MHz as standard to support future 5G NR sub-6 GHz 2CC tests without changing hardware.

High Output Overcoming Measurement System Power Losses
- Because the MU887002A can simultaneously output a –5 dBm high-output signal (modulation wave) from all 24 RF test ports, it supports tests such as Max Input Level measurement (Rx test) without requiring an external amplifier.
- The MU887002A is the only module supporting all-at-once Rx tests of multiple terminals at over-the-air (OTA) testing.

More Antennas to support 5G

MU887002A
Introduction to Various Measurement Methods
Multi-DUT Measurement – Ping-Pong Method –

**Higher Production Efficiency Resulting from Continuous Measurement**

- The Ping-Pong measurement method alternately measures two terminals under test connected to the measuring instrument to increase production-line efficiency.
- Since up to four test modules can be installed in the MT8870A, four connected terminals can be tested alternately.
- With four RF test ports, up to eight dual-antenna terminals can be connected to one MU887000A/01A unit. With two TRx test functions in one MU887002A unit supporting 24 RF test ports, up to 8 mobiles each with six antennas can be connected.

![Diagram showing the Ping-Pong measurement method](image-url)
Multi-DUT Measurement
– Multi-DUT Measurement Scheduler Method –

Higher Production Efficiency Resulting from Internal Controller

- The built-in Multi-DUT Measurement Scheduler MX887090A software manages the MU88700xA software and hardware resources using a dedicated internal controller supporting operation of the MU88700xA as multiple virtual instruments to optimize the instrument operation rate and cut test times per terminal under test.
Reduce Measurement Time using MU887002A

Efficient Rx Testing using Combination of Broadcast CAL and Ping-Pong Measurement Methods at Calibration

- The MU887002A can output the same signal simultaneously from up to 12 RF ports of one TRX test module.
- Mass-production efficiency is improved by combination with the Ping-Pong measurement method.

![Diagram showing time reduction through broadcasting CAL with Ping-Pong method]

Broadcasting CAL with Ping-Pong
Reduce Measurement Time using MU887002A

Efficient Rx Testing using Broadcast Signal Output at Verification
- Since the MU887002A can output the same signal simultaneously from up to 12 ports, Rx tests can be performed simultaneously for multiple terminals to cut Rx test times.

Efficient Tx Testing using Multi-DUT Measurement Scheduler Measurement Method at Verification
- The MU887002A can operate as multiple virtual measuring instruments by managing software and hardware with a dedicated internal controller to optimize instrument operation and cut Tx test times per terminal.
One-stage Solution Improve Production Efficiency

Improved Mass-Production Performance thru One-Stage Optimization

- Measurement on production lines is commonly divided into a number of stages due to limits on the tester’s number of RF ports. This results in longer setup times for each measurement stage, more operators, and more measuring instruments, causing inevitable cost increases for mass-production inspection. Using the MU887002A to implement one-stage testing improves mass-production line productivity.
Simpler Measurement System using MU887002A – Connectivity Products –

Simplified Measurement System for Connectivity Products’ Mass-Production Line

- Multiband Wi-Fi routers may have up to 12 built-in antennas (four for 2.4 GHz band and eight for 5GHz band), so production-line inspections require use of external components, which complicates the measurement system.
- These external dividers can be eliminated just by using the MU887002A to simplify the measurement system. In addition, the incidence of measurement errors and power loss caused by external dividers is reduced.
Introduction to Tools for PC
For Troubleshooting and Maintenance

CombiView

- CombiView is PC application software with a GUI; it displays useful information such as the DUT Tx power status, modulation constellation, etc., for R&D applications, production-line configuration, troubleshooting, etc.
  - Displays Tx measurement results graphically at Windows and controls signal generator for Rx tests
  - Remote-controls MT8870A/MT8872A via GPIB I/F (option) or Ethernet I/F

MT8870A Utility Tool (MX887900A)

- The MX887900A is a MT8870A/MT8872A software utility tool that can be installed on a PC. It can be used to detect MT8870A/MT8872A connected to a network via either Ethernet or GPIB option to batch-update internal firmware, etc.
Appendix
Web Downloads of Documents and Firmware

Anritsu Web Site
- For downloading catalogs, product introductions, etc.
- Accessible by everyone

My Anritsu
- For downloading instruction manuals, firmware, software tools, etc.
- Requires creation of My Anritsu account and registration
  https://login.anritsu.com/signin?