ME7873L
LTE RF Conformance Test System
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LTE RF Conformance Test System

- Product Introduction -

October 2015
Anritsu Corporation
Version 13.0
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1. Summary of Conformance Test
What is the Conformance Test?

Conformance Test: CT

The CT is a 3GPP-defined (TS36.521\textsuperscript{1} and TS36.523\textsuperscript{1}) test case consisting of a set of fundamental tests. Passing these tests certifies that the DUT is 3GPP compliant.

\textsuperscript{1}: In case of LTE

Inter Operability Test: IOT

The IOT is a CT with actual carriers (base stations). Because the 3GPP standard has a nearly infinite permutation of parameters, connectivity with actual base stations must be verified. The IOT is formulated for each carrier (base station) based on service details offered by carriers and base station vendors.

In-House Test:

This in-house test is performed by UE vendors for quality assurance of their products. UE vendors create their own unique tests based on the design functions and data.
How Does the CT Fit Overall Product Verification?

- Network problems caused by non-compliant terminals not permitted
- Standard compliance important
- Conformance Test required for design inspection

Testing Real Network
- Proves terminal works with current
  - Network equipment
  - Configurations
  - Services

Conformance Testing
- Ensures terminal still works when:
  - Network equipment upgraded
  - New services added
  - Network architecture evolves
Who Should Do the Conformance Testing?

- Mobile terminal manufacturers
  - Proving to customers (network operators) that mobile terminals standard compliant

- Chipset and software component manufacturers supplying components or reference designs to mobile phone integrators
  - Proving that chipset designs standard compliant

- Specialist test houses
  - Offering conformance test and validation to manufacturers

- Network operators
  - Performing acceptance testing and QA
Race to Introduce LTE Service

3GPP Specifications Still Evolving

How to Test Conformance?
Which regulation version should we comply with?
What test range required for “Conformance?”
Who approves?
Where is CT done?
Possible in own facilities?

Define International Rule and Procedures!

GCF (Global Certification Forum)
The GCF and PTCRB were formed by network operators and UE manufacturers to provide consistent standards for product conformance testing.

It is a forum where various parties, test houses, test equipment companies, operators, and manufacturers can make declarations, present evidence, and receive approval.

The GCF itself does not perform any validation or conformance testing.

The GCF also approves test equipment (Conformance Test System) that is 3GPP compliant.
TP/TC Approval and Mobile Terminal Certification

**Test Environment**

- **Test case**
- **Test platform**

**Test house**
- Validation
  - ISO9000
  - ISO17025
  - GCF Certified

**Terminal Certification**

- Pre-validation
- **Test house**
  - ISO9000
  - ISO17025

- **Conformance test**

- **Anritsu Verification**

- Field trial
- CE, SAR, etc.

- **GCF**
  - Global Certification Forum
  - Publish on web site

- **Terminal manufacturers**

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*Anritsu* envision: ensure

**Slide 9**

ME7873L-E-L-1
2. Anritsu LTE Conformance Test System
Anritsu LTE Conformance Test Products

- **TS 36.521-1/-3**
  - *<RF/RRM Conformance Tests>*
  - **ME7873L**
    - LTE RF Conformance Test System
  - **ME7873L + W-CDMA**
    - LTE RF Conformance Test System + W-CDMA Option

- **TS 36.523-1**
  - *<Protocol Conformance Tests>*
  - **ME7834L**
    - LTE Mobile Device Test Platform
  - **ME7834L + W-CDMA**
    - LTE Mobile Device Test Platform + W-CDMA Option
Updating 3GPP Compliance

3GPP specification is updated every 3 months and the ME7873L Test System follows the update.
Contribution to the GCF

- GCF holds meetings every 3 months (usually in January, April, July, and October) where members discuss applicable standards for actual service management, their priority, and approval of Conformance Test Systems.

- Anritsu is currently working on validation of the ME7873L/ME7834L in collaboration with test houses every 3 months when GCF meetings are held. After validation, the test houses apply for GCF approval of validated test cases.

- The ME7873L is the leading RF test system, with most GCF/PTCRB Approved Test Cases (As of September, 2015). The future policy is to acquire validation quickly.
ME7873L LTE RF Conformance Test System

- Automated system for running 3GPP TS36.521 and TS34.121-1 compliant conformance tests.


- Band options support FDD Band 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, and 30 / TDD Band 33, 34, 35, 36, 37, 38, 39, 40, and 41.
ME7873L LTE RF Conformance Test System

- MD8470A Signalling Tester
- MG3710A / MG3700A Vector SG
- MF6900A Fading Simulator
- MD8480C W-CDMA Signalling Tester
- MN7451A Switching Unit
- ML2488B Power Meter
- MN7451A Switching Unit
- MS2692A Signal Analyzer
- MN7464D Filter Unit
- MN7462A Interface Unit
- MN7484B Rx Div Unit
- MN7463B RF Combiner Unit
- MG3692C CW SG
- MD8430A LTE Signalling Tester
- MS2690A Signalling Tester
ME7873L Composition

The ME7873L is composed of dedicated components, stand-alone system components and dedicated software.

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>Model</th>
<th>Name</th>
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<tbody>
<tr>
<td>MD8430A</td>
<td>Signalling Tester</td>
<td>MX787300L-0xx</td>
<td>FDD/TDD Band xx Capability</td>
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<td>Signal Analyzer</td>
<td>MX787311L</td>
<td>LTE RF Conformance Test Software</td>
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<td>Synthesized CW Generator</td>
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<td>Wideband Power Meter</td>
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<td>MN7463B</td>
<td>RF Combiner Unit</td>
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Features

- Full 3GPP compliance
- World First: Achieves 80% GCF Test Platform Approval
- The Most Approved GCF/PTCRB Test Cases
- Support TS36.521-1 TRX/Performance, TS36.521-3 RRM, and TS34.121-1 HSPA Rel-7/8 (partially)
- Support FDD/TDD
- Reduce Down Time Using the Tunable Filter
- R&TTE*1 Test
- LTE to CDMA2000/TD-SCDMA InterRAT Test
- Operator Acceptance Test
- Global Support
- Upgradeable from ME7873/74F
- LTE/UMTS Parallel Capability with ME7873L + W-CDMA option

*1: Compliant with the European ETSI-defined R&TTE RF TRx test items.
Not only are GCF/PTCRB-approved bands, but the following bands defined by 3GPP are also supported too. Unlisted bands can be supported by request.

### Additional Frequency Band Options

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<th>E-UTRA Operating BAND</th>
<th>UL Frequency [MHz]</th>
<th>DL Frequency [MHz]</th>
<th>Condition</th>
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<td>830-840</td>
<td>875-885</td>
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<tr>
<th>E-UTRA Operating BAND</th>
<th>UL Frequency [MHz]</th>
<th>DL Frequency [MHz]</th>
<th>Condition</th>
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<td>1850-1910</td>
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<td>37</td>
<td>1910-1930</td>
<td>1910-1930</td>
<td>Available</td>
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<tr>
<td>38</td>
<td>2570-2620</td>
<td>2570-2620</td>
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<td>39</td>
<td>1880-1920</td>
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</table>
The ME7873L can be customized from the TRX Basic configuration to TRX/Performance/RRM configuration depending on the customer’s requirements.

- **TRX Basic**
  - TS36.521-1 CH6,7 (Except spurious/blocking measurement)

- **TRX Full**
  - TS36.521-1 CH6,7

- **TRX/Perf**
  - TS36.521-1 CH6-10 (TRx/PERF TCs)

- **TRX/Perf/RRM**
  - TS36.521-1 CH6-10 (TRx/PERF)
  - TS36.521-3 RRM TCs
Upgrade from ME7873F/74F

Customers using the W-CDMA industry-standard ME7873F/ME7874F can optimize their investment by adding LTE functions to make the most of existing equipment.
UMTS/LTE Parallel Test Capability

Because the ME7873L + W-CDMA configuration performs parallel W-CDMA and LTE tests, the measurement time is the same as using two separate test sets*¹ but the cost is almost halved.

*¹: Some test cases are not supported parallel testing.
R&D Functions (1/8)

- **Change parameters, such as level and frequency**

  Default parameters are set to 3GPP-standard values. Parameters, such as level, frequency, and RBs are changed easily by the control software. Non-default parameters are displayed in green.
R&D Functions (2/8)

◆ Real-time SS Log Trace

An SS log is displayed automatically when measurement starts. Real-time confirmation of message exchanges between the SS and terminal supports effective operation verification.

Normal Example

Wait 'PRACH Preamble' (event type1)
Received 'PRACH Preamble' (EVENT_RA_PREAMBLE_GROUP_A)
Send 'PRACH Response'
Received 'RRC Connection Request' (EVENT_UL_SCH_SETUP_REQ)
Send 'RRC Connection Setup'
Received 'UCI HARQ-ACK (EVENT_DL_ACK_SETUP_CNFR)'
Received 'RRC Connection Setup Complete'
Send 'DL Information Transfer / IDENTITY REQUEST'
Received 'UL Information Transfer / IDENTITY RESPONSE'
TMSI=001010123456789

Abnormal Example

Wait 'PRACH Preamble' (event type1)
Not receiving 'PRACH Preamble' (EVENT_RA_PREAMBLE_GROUP_A)
Error End
SS Log display function

An SS log is created automatically for each measurement item when measurement finishes. The logs can be checked using viewer software bundled with the ME7873L to troubleshoot test problems between the UE and test platform.
Search mode function

To develop reliable UE terminals with stable performance, the performance limits must be confirmed. The Search mode function performs tests while changing conditions to confirm UE performance.

The ME7873L can measure in two ways: “Hard Condition” with tight conditions and “Easy Condition” with looser conditions.

Hard Condition
It changes to severer measurement conditions, such as downlink and interference signal levels, and SNR, etc., at fixed steps.

Easy Condition
It changes to easier measurement conditions, such as downlink and interference signal levels, and SNR, etc., at fixed steps.
**RRM Graphical Tool**

Test items and results are displayed in real time as a histogram showing the UE operation trends at a glance.
R&D Functions (6/8)

- **Auto re-measurement function for Fail test**

  When multiple items are tested by one sequence file, Fail items are re-measured automatically.

- **Auto-measurement optimization to minimize measurement time**

  When multiple items are tested by one sequence file, the test system automatically measures in the order that minimizes measurement times.
**R&D Functions (7/8)**

**UE Automation Tool**

The UE Automation tool is a standard function. Customers can use it to send AT commands, simplifying automated measurement of various terminal types.
R&D Functions (8/8)

◆ **Cable Loss Measurement Tool**
This tool measures the frequency characteristics of the RF cable connecting the ME7873L and UE for use as cable loss data.
Test Result Format

Measurement results are saved to the server PC automatically in html, xml, or csv format.
Calibration and Correction

The measurement system uncertainty at each test procedure must comply with the 3GPP standards. The ME7873L has the following three calibration and correction functions to assure compliance.

- Fundamental correction at delivery
- Internal calibration at work start
- Run-time correction before each measurement

Calibration/ Fundamental Correction (At delivery) → Internal Calibration (At work start) → Run-time Correction (Before every measurement)
3. Support Service Proposal
Support Service Outline

The support service includes hardware and software from operation to maintenance to assure stable ME7873L operation.

- **Technical Support**
  - Technical support
    - Operational technical support and troubleshooting
  - Customer system status management
    - Understand customer's system status on regular basis for quick response

- **Software Update**
  - 3GPP follow up
    - Update ME7873L according to 3GPP standards
  - Validation
    - Acquire validation for GCF-defined target 3GPP standard

- **Operability UP**
  - Utility
  - Maintainability

- **Hardware Maintenance**
  - Repair service
    - Hardware repair
    - Backup loan unit during repair
  - Regular checks
    - Regularly checks of electrical parts that may degrade with time

- **Calibration**
  - Calibration service
    - Calibration at customer's site
    - System calibration to assure reliable measurement accuracy
    - Correction, calibration and result report
4. Summary
Anritsu offers a future-proof conformance test system with wide scalability and high reliability

Reliability
- Full 3GPP compliance (GCF Approved Test System)
- Various correction/calibration functions to improve measurement reliability

Evolving
- Fast and flexible response to new technology
- Updates to evolving 3GPP standard

Scalability
- Measurement functions implemented selectively
- Operating bands implemented selectively
- Future-proof upgrades based on existing platform
Appendix 1
Measurement Functional Options
Measurement Functional Options 1

[LTE Rel-8 FDD RF/RRM Conformance Test Case]

- **MX787311L-002 LTE TRX Test Cases Conformance Package1**
  Measurement of WI-080 TRX Test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787311L-003 LTE TRX Test Cases Conformance Package2**
  Measurement of WI-080 TRX Test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787311L-021 LTE TRX Test Cases Conformance Package3**
  Measurement of WI-080 TRX Test cases (TS36.521-1 Part of Chapter 6)

- **MX787311L-004 LTE Performance Test Cases Conformance Package1**
  Measurement of WI-080 Performance Test cases (TS36.521-1 Part of Chapter 8)

- **MX787311L-005 LTE 4x2MIMO Test Cases Conformance Package1**
  Measurement of WI-080 4x2MIMO Test cases (TS36.521-1 Part of Chapter 8)

- **MX787311L-006 LTE CQI Test Cases Conformance Package1**
  Measurement of WI-080 CQI Test cases (TS36.521-1 Part of Chapter 9)

- **MX787311L-011 LTE RRM Test Cases Conformance Package1**
  Measurement of WI-080 RRM Test cases (Part of TS36.521-3)

- **MX787311L-023 LTE RRM Test Cases Conformance Package2**
  Measurement of WI-080 RRM Test cases (Part of TS36.521-3)
Measurement Functional Options 2

[LTE Rel-8 FDD RF/RRM Conformance Test Case]

- **MX787311L-012 LTE to UMTS/GSM Test Cases Conformance Package1**
  Measurement of WI-080 RRM LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787311L-022 UMTS to LTE Test Cases Conformance Package1**
  Measurement of WI-080 RRM UMTS to LTE InterRAT Test cases (Part of TS34.121-1)

- **MX787311L-024 LTE to UMTS/GSM Test Cases Conformance Package2**
  Measurement of WI-080 RRM LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787311L-013 LTE to CDMA2000 Test Cases Conformance Package1**
  Measurement of WI-080 RRM LTE to CDMA2000 InterRAT Test cases (Part of TS36.521-3)
Measurement Functional Options 3

[LTE Rel-9/Rel-10 Non CA FDD RF/RRM Conformance Test Case]

- **MX787311L-061 WI-150 Performance Package1**
  Measurement of WI-150 Performance Test cases (Part of TS36.521-1)

- **MX787311L-062 WI-150 4x2MIMO Package1**
  Measurement of WI-150 4x2MIMO Test cases (Part of TS36.521-1)

- **MX787311L-063 WI-150 RRM Package1**
  Measurement of WI-150 RRM Test cases (Part of TS36.521-3)

- **MX787311L-064 WI-150 LTE to UMTS/GSM Package1**
  Measurement of WI-150 RRM LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787311L-065 WI-150 UMTS to LTE Package1**
  Measurement of WI-150 RRM UMTS to LTE InterRAT Test cases (Part of TS34.121-1)

- **MX787311L-066 LTE to UMTS/GSM Package2**
  Measurement of Rel-9 RRM LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787311L-075 eMBMS Package1**
  Measurement of WI-164 eMBMS test cases (TS36.521-1 Part of Chapter 10)

- **MX787311L-085 eICIC Performance Package1**
  Measurement of FDD eICIC performance test cases (TS36.521-1 Part of Chapter 8 and 9)

- **MX787311L-086 eICIC RRM Package1**
  Measurement of FDD eICIC RRM test cases (Part of TS36.521-3)
Measurement Functional Options 4

[LTE Rel-10 FDD CA RF/RRM Conformance Test Case]

- **MX787312L-001 TRX Test Cases Package1**
  Measurement of Rel-10 FDD CA TRX test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787312L-002 TRX Test Cases Package2**
  Measurement of WI-162 FDD TRX test cases (TS36.521-1 Part of Chapter 7)

- **MX787312L-003 TRX Test Cases Package3**
  Measurement of WI-162 FDD TRX test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787312L-004 Performance Test Cases Package1**
  Measurement of WI-162 FDD Performance test cases (TS36.521-1 Part of Chapter 8 and 9)

- **MX787312L-005 Performance Test Cases Package2**
  Measurement of Rel-10 FDD CA Performance test cases (TS36.521-1 Part of Chapter 8)

- **MX787312L-006 4x2MIMO Test Cases Package1**
  Measurement of WI-162 FDD 4x2MIMO test cases (TS36.521-1 Part of Chapter 8)

- **MX787312L-007 4x2MIMO Test Cases Package2**
  Measurement of Rel-10 FDD CA 4x2MIMO test cases (TS36.521-1 Part of Chapter 8)

- **MX787312L-008 Performance Test Cases Package3**
  Measurement of WI-162 FDD Performance test cases (TS36.521-1 Part of Chapter 8)

- **MX787312L-009 Performance Test Cases Package4**
  Measurement of Rel-10 FDD CA Performance test cases (TS36.521-1 Part of Chapter 8)
Measurement Functional Options 5

[LTE Rel-10 FDD CA RF/RRM Conformance Test Case]

- **MX787312L-011 RRM Test Cases Package1**
  Measurement of WI-162 FDD RRM test cases (Part of TS36.521-3)

- **MX787312L-012 LTE to UMTS Test Cases Package1**
  Measurement of WI-162 FDD RRM LTE to UMTS InterRAT test cases (Part of TS36.521-3)

- **MX787312L-013 RRM Test Cases Package2**
  Measurement of WI-162 FDD RRM test cases (Part of TS36.521-3)
Measurement Functional Options 6

[LTE Rel-8 TDD RF/RRM Conformance Test Case]

- **MX787361L-002 TD-LTE TRX Test Cases Conformance Package1**
  Measurement of WI-090 TRX Test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787361L-003 TD-LTE TRX Test Cases Conformance Package2**
  Measurement of WI-090 TRX Test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787361L-004 TD-LTE Perf Test Cases Conformance Package1**
  Measurement of WI-090 Performance Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-005 TD-LTE 4x2MIMO Test Cases Conformance Package1**
  Measurement of WI-090 4x2MIMO Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-006 TD-LTE CQI Test Cases Conformance Package1**
  Measurement of WI-090 CQI Test cases (TS36.521-1 Part of Chapter 9)

- **MX787361L-026 TD-LTE CQI Test Cases Conformance Package2**
  Measurement of WI-090 CQI Test cases (TS36.521-1 Part of Chapter 9)

- **MX787361L-011 TD-LTE RRM Test Cases Conformance Package1**
  Measurement of WI-090 RRM Test cases (Part of TS36.521-3)

- **MX787361L-023 TD-LTE RRM Test Cases Conformance Package2**
  Measurement of WI-090 RRM Test cases (Part of TS36.521-3)
Measurement Functional Options 7

[LTE Rel-8/Rel-9 TDD RF/RRM Conformance Test Case]

- **MX787361L-022** TD-SCDMA to TD-LTE Test Cases Conformance Package1
  Measurement of WI-090 RRM TD-SCDMA to LTE InterRAT Test cases (Part of TS34.122)

- **MX787361L-024** TD-LTE to UMTS/GSM Test Cases Conformance Package1
  Measurement of WI-090 LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787361L-025** TD-LTE to TD-SCDMA Test Cases Conformance Package1
  Measurement of WI-090 LTE to TD-SCDMA InterRAT Test cases (Part of TS36.521-3)

- **MX787361L-061** WI-150 TD-LTE Performance Package1
  Measurement of WI-150 TD-LTE Performance Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-062** WI-150 TD-LTE 4x2MIMO Package1
  Measurement of WI-150 TD-LTE 4x2MIMO Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-063** WI-150 TD-LTE RRM Package1
  Measurement of WI-150 TD-LTE RRM Test cases (Part of TS36.521-3)

- **MX787361L-064** WI-150 TD-LTE to UMTS/GSM Package1
  Measurement of WI-150 TD-LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)

- **MX787361L-065** WI-150 TD-LTE to TD-SCDMA Package1
  Measurement of WI-150 TD-LTE to TD-SCDMA InterRAT Test cases (Part of TS36.521-3)

- **MX787361L-066** WI-150 TD-LTE to UMTS/GSM Package2
  Measurement of WI-150 TD-LTE to UMTS/GSM InterRAT Test cases (Part of TS36.521-3)
Measurement Functional Options 8

[LTE Rel-9/Rel-10 Non CA TDD RF/RRM Conformance Test Case]

- **MX787361L-070 WI-151 Package1**
  Measurement of WI-151 Test cases (Part of TS36.521-3)

- **MX787361L-071 WI-151 Package2**
  Measurement of WI-151 Test cases (Part of TS36.521-3)

- **MX787361L-075 TD-LTE eMBMS Package1**
  Measurement of Rel-9 TD-LTE eMBMS test cases (TS36.521-1 Part of Chapter 10)

- **MX787361L-080 WI-139 Package1**
  Measurement of WI-139 Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-081 WI-139 Package2**
  Measurement of WI-139 Test cases (TS36.521-1 Part of Chapter 8)

- **MX787361L-085 TD-LTE eICIC Performance Package1**
  Measurement of TDD eICIC performance Test cases (TS36.521-1 Part of Chapter 8 and 9)

- **MX787361L-086 TD-LTE eICIC RRM Package1**
  Measurement of TDD eICIC RRM Test cases (TS36.521-3 Part of Chapter 7, 8 and 9)
Measurement Functional Options 9

[LTE Rel-10 TDD CA RF/RRM Conformance Test Case]

- **MX787362L-002 TRX Test Cases Package1**
  Measurement of WI-162 TDD TRX test cases (TS36.521-1 Part of Chapter 6 and 7)

- **MX787362L-003 TRX Test Cases Package2**
  Measurement of WI-162 TDD TRX test cases (TS36.521-1 Part of Chapter 6)

- **MX787362L-005 Performance Test Cases Package2**
  Measurement of WI-162 TDD Performance test cases (TS36.521-1 Part of Chapter 8)

- **MX787362L-007 4x2MIMO Test Cases Package2**
  Measurement of WI-162 TDD 4x2MIMO test cases (TS36.521-1 Part of Chapter 8)

- **MX787362L-009 Performance Test Cases Package4**
  Measurement of WI-162 TDD Performance test cases (TS36.521-1 Part of Chapter 8)

- **MX787362L-011 RRM Test Cases Package1**
  Measurement of WI-162 TDD RRM test cases (Part of TS36.521-3)

- **MX787362L-013 RRM Test Cases Package2**
  Measurement of WI-162 TDD RRM test cases (Part of TS36.521-3)
Measurement Functional Options 10

[RF Test Case]

- **MX787311L-033 R&TTE Test Cases**
  Measurement of R&TTE RF Test cases

- **MX787311L-037 Band17 Supplementary RF Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-038 Band17 Supplementary RF Test Cases2**
  Acceptance RF Test Cases for the US operator

- **MX787311L-039 Band17 Supplementary RF Test Cases3**
  Acceptance RF Test Cases for the US operator

- **MX787311L-040 R61 RRM Test Cases1**
  Acceptance RRM Test Cases for the US operator

- **MX787311L-041 R61 RRM Test Cases2**
  Acceptance RRM Test Cases for the US operator

- **MX787312L-040 R61 CA RRM Test Cases1**
  Acceptance CA RRM Test Cases for the US operator

- **MX787312L-037 R64 CA TRX Test Cases1**
  Acceptance CA RF Test Cases for the US operator
Measurement Functional Options 11

[RF Test Case]

- **MX787311L-047 Band13 Supplementary RF Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-049 Band13 Supplementary RRM Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-034 Band4 Supplementary TRx Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-035 Band4 Supplementary Performance Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-036 Band4 Supplementary 4x2MIMO Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-054 Band2 Supplementary TRx Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-055 Band2 Supplementary Performance Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787311L-056 Band2 Supplementary 4x2MIMO Test Cases**
  Acceptance RF Test Cases for the US operator
Measurement Functional Options 12

[RF Test Case]

- **MX787312L-034 CA Supplementary RX Test Cases**
  Acceptance CA RF Test Cases for the US operator

- **MX787312L-035 CA Supplementary Performance Test Cases**
  Acceptance CA RF Test Cases for the US operator

- **MX787312L-050 InterBand RRM Test Cases**
  Acceptance RRM Test Cases for the US operator

- **MX787311L-044 SV-LTE TRX Test Cases**
  Acceptance SV-LTE Test Cases for the US operator

- **MX787311L-045 SV-LTE Power Backoff Test Case**
  Acceptance SV-LTE Test Cases for the US operator

- **MX787311L-046 SV-LTE Power Headroom Reporting Test Cases**
  Acceptance SV-LTE Test Cases for the US operator

- **MX787311L-048 SV-LTE CDMA2000 RF Test Cases**
  Acceptance SV-LTE Test Cases for the US operator
Measurement Functional Options 13

[RF Test Case]

- **MX787311L-094 RF Supplementary Test Cases1 for T-Mobile**
  Acceptance RF Test Cases for the US operator

- **MX787311L-091 Band26 Supplementary TRX Test Cases**
  Acceptance RF Test Cases for the US operator

- **MX787361L-090 Band41 Supplementary TRX Test Cases**
  Acceptance RF Test Cases for the US operator
Measurement Functional Options 14

[UMTS Rel-7/8 RF Conformance Test Case]

- **MX787391L-001 WI-069 TRx Test Case**
  Measurement of WI-069 TRX Test cases (TS34.121-1 Part of Chapter 6)

- **MX787391L-002 WI-069 Performance Test Cases**
  Measurement of WI-069 Performance Test cases (TS34.121-1 Part of Chapter 9)

- **MX787391L-011 WI-070 Performance Test Cases**
  Measurement of WI-070 Performance Test cases (TS34.121-1 Part of Chapter 9)

- **MX787391L-021 WI-113 Performance Test Cases**
  Measurement of WI-113 Performance Test cases (TS34.121-1 Part of Chapter 9)

- **MX787391L-031 WI-129 TRx Test Cases**
  Measurement of WI-129 TRX Test cases (TS34.121-1 Part of Chapter 6 and 7)

- **MX787391L-032 WI-129 Performance Test Cases**
  Measurement of WI-129 Performance Test cases (TS34.121-1 Part of Chapter 9)

- **MX787391L-041 WI-124 Performance Test Case**
  Measurement of WI-124 Performance Test case (TS34.121-1 Part of Chapter 9)

- **MX787391L-091 UMTS Test Cases Package1**
  Acceptance RF Test Cases for the Japan operator
Appendix 2
System Installation
Customer Supplied Parts (1/2)

● DC Power Supply

The following models is required when controlling the power supply using the ME7873L.

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>pcs</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>N6700B</td>
<td>Mainframe</td>
<td>1</td>
<td>Keysight Technologies, Inc</td>
</tr>
<tr>
<td>N6732B*1</td>
<td>8 V, 6.25 A, 50 W DC Power Module</td>
<td>4^2</td>
<td></td>
</tr>
<tr>
<td>N6709A</td>
<td>Low-Profile MPS Mainframe Rack Mount Kit</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*1: At rack mounting, the maximum current is 2 A. To draw more than 2 A of current, use a separate cable to supply DC to the terminal. However, since this will prevent rack mounting, decide on the installation location for the DC power supply in advance.

When using a power supply other than the N6732B, ask the power supply manufacture for details.

*2: Four modules are required when testing up to four mobiles continuously.

In addition, the following equipment can also be controlled. However, since rack-mounting is not possible when using the 2306-PJ, decide on the installation location for the DC power supply in advance.

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>pcs</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2306-PJ</td>
<td>Dual-Channel Battery/Charger Simulator</td>
<td>2^3</td>
<td>Keithley Instruments</td>
</tr>
<tr>
<td></td>
<td>with 500mA Range</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*3: Two sets of the 2306-PJ are required when testing up to four mobiles continuously.
Customer Supplied Parts (2/2)

● Temperature Chamber

One of the following equipment is required to control the temperature chamber from the ME7873L.

<table>
<thead>
<tr>
<th>Model</th>
<th>Name</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>SH-241</td>
<td>Temperature &amp; Humidity Chamber</td>
<td>ESPEC Corp.</td>
</tr>
<tr>
<td>SH-242</td>
<td>Temperature &amp; Humidity Chamber</td>
<td></td>
</tr>
<tr>
<td>VT4002</td>
<td>EMC Shielding with Temperature</td>
<td>Votsch</td>
</tr>
<tr>
<td>105</td>
<td>Benchtop Temperature Chamber</td>
<td>TestEquity</td>
</tr>
<tr>
<td>107</td>
<td>Benchtop Temperature Chamber</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Temperature Chamber</td>
<td></td>
</tr>
</tbody>
</table>

*1: GPIB Cable (Double-Shield, 2m) is required to control this chamber automatically.
*2: USB-RS232C Converter Cable (2m) is required to control this chamber automatically.
Delivery Time
3 months (changes with stock situation)

Onsite Installation
Anritsu engineer visits delivery site to perform system setup calibration. Required time varies with system composition

- System Setup (assembly, wiring, software installation)
- System Correction
- UE Functional Tests
- System Performance Tests
- Explanation at Delivery Acceptance
Support After Delivery

The following warranty is offered for free of charge after product delivery.

Duration

- Newly Purchased: 1 year (from next month after installation)
- Upgrade: 3 month (from next month after installation)

Support Contents

- Hardware guarantee: Repair faults for all products in the system and re-calibration if needed

Support service applies to new hardware and software. Guarantee for customer-provided parts follows the upgrade guarantee on condition of calibrating each instrument.

Hardware guarantee in upgrading is applied only when a hardware is added or modified.

Free-of-charge guarantee period extendable by charged service contract.
System Installation Environment

The system installation environment must meet the following specifications.

<table>
<thead>
<tr>
<th>Items</th>
<th>Condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>1597(H) × 570(W) × 797(D) mm</td>
<td>1 rack *1</td>
</tr>
<tr>
<td></td>
<td>1597(H) × 1140(W) × 797(D) mm</td>
<td>2 rack *1</td>
</tr>
<tr>
<td></td>
<td>1597(H) × 2280(W) × 797(D) mm</td>
<td>4 rack *1 (ME7873L + W-CDMA configuration)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>510 kg or less</td>
<td>ME7873L Configuration *2</td>
</tr>
<tr>
<td></td>
<td>1010 kg or less</td>
<td>ME7873L + W-CDMA Configuration *2</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>100 to 120, or 200 to 240 Vac</td>
<td></td>
</tr>
<tr>
<td><strong>Wattage</strong></td>
<td>4400 VA or less</td>
<td>ME7873L Configuration *3</td>
</tr>
<tr>
<td></td>
<td>6600 VA or less</td>
<td>ME7873L + W-CDMA Configuration *3</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
<td>15 to 35°C (Operating)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 to 50°C (Storage)</td>
<td></td>
</tr>
</tbody>
</table>

*1: Secure using hooks at rack top recommended. Basic calibration at acceptance inspection must meet this requirement.
*2: The installation location must be able to safely bear the above floor loads plus 100 kg for basic calibration equipment at acceptance inspection.
*3: Sufficient power (600 VA) for basic calibration at acceptance inspection as well as for ME7873L must be supplied.
*4: Basic calibration at acceptance inspection must meet this requirement. Use in air-conditioned room recommended for stable measurement.