Discover What's Possible™

AT&T IOT Test Packages (for RTD)

MX786201A-100 (Includes MX786201A-101, MX786201A-102, MX786201A-103, MX786201A-104, MX786201A-105, MX786201A-106, MX786201A-107, MX786201A-108) **Release 9.5.0**

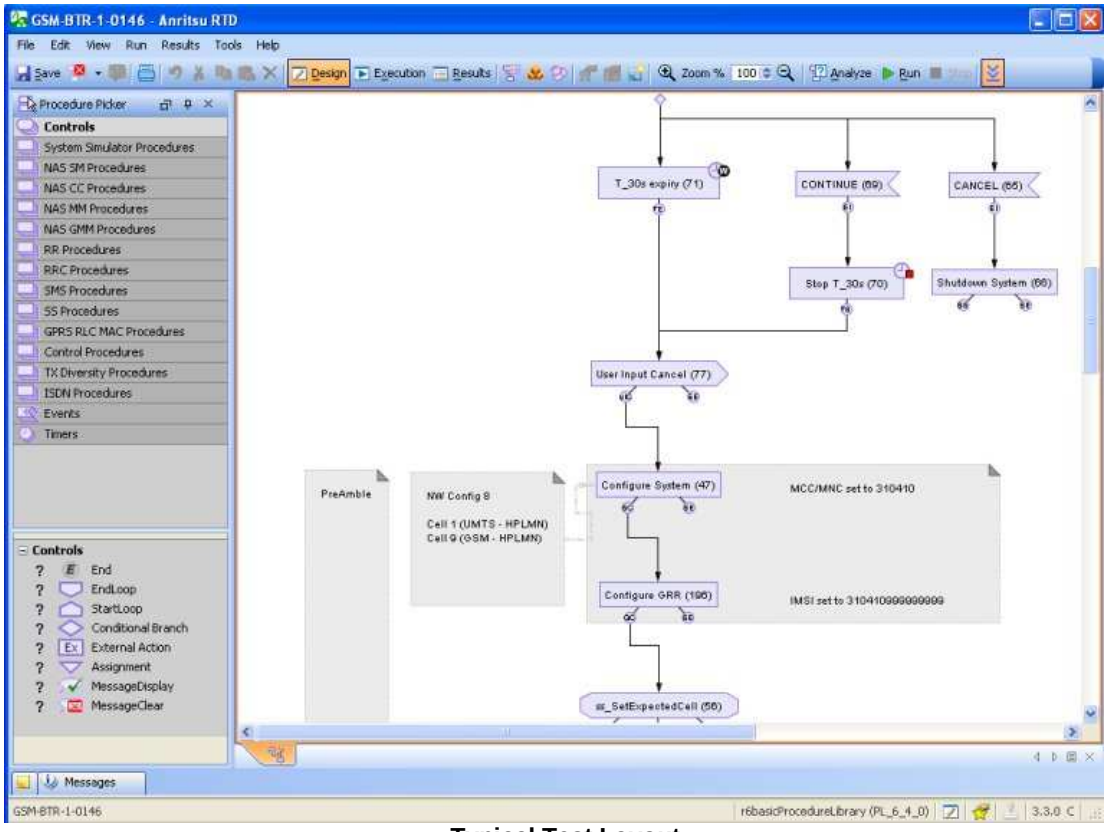
Introduction

The AT&T IOT Test Packages consist of a selection of tests that are taken from the AT&T terminal acceptance documents and may be mapped to the tests described in these documents. The tests are created for the RTD with an Anritsu multi-cell network model based on AT&T's Network description. It is used to ensure that UEs proposed for AT&T will meet defined requirements before deployment on the live network.

The tests can also be modified to provide a fast and highly efficient method for debugging of Band II UEs for the AT&T Network. This network model provides a quick entry point for test modification but should not be seen as a way to create similar libraries as the compound procedures and network model is restricted to use with the tests in each package.

Detailed test annotation and test flow

The graphical layout of each test makes it straightforward to visualize the test flow and hence verify and debug the UE's behavior. All the tests are annotated, enabling easy identification of logical and functional blocks so that they may be re-used by saving as a new test and then modifying. Test flow is available when manually investigating failures or when checking for specific conditions. Note that modified tests carry the licensing requirements of the original test.



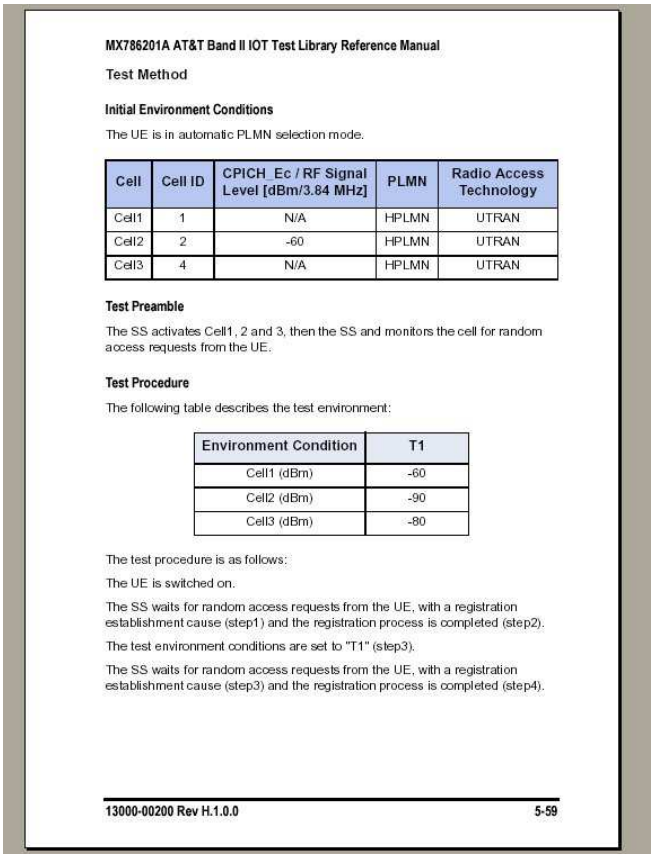
Typical Test Layout

Library support and documentation

The documentation provided with the Libraries includes all the information needed to understand the test method, its purpose and criteria applied to prove a pass or failure. This is documented in a way that will be familiar to users that have studied the 3GPP processes. The document references blocks and areas annotated within the test window.

See example below for a test “Cell Selection with Cells of Different URA, Idle Mode”.

The Test Purpose is to verify that the UE correctly selects an HPLMN cell in the UMTS1900 band from power up. Verify that the UE correctly reselects the HPLMN cell in the UMTS850 band from idle mode when reselection criteria are met and two of the cells for reselection are in a different URA.



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Test Method

Initial Environment Conditions

The UE is in automatic PLMN selection mode.

Cell	Cell ID	CPICH_Ec / RF Signal Level [dBm/3.84 MHz]	PLMN	Radio Access Technology
Cell1	1	N/A	HPLMN	UTRAN
Cell2	2	-60	HPLMN	UTRAN
Cell3	4	N/A	HPLMN	UTRAN

Test Preamble

The SS activates Cell1, 2 and 3, then the SS and monitors the cell for random access requests from the UE.

Test Procedure

The following table describes the test environment:

Environment Condition	T1
Cell1 (dBm)	-60
Cell2 (dBm)	-90
Cell3 (dBm)	-80

The test procedure is as follows:

The UE is switched on.

The SS waits for random access requests from the UE, with a registration establishment cause (step1) and the registration process is completed (step2).

The test environment conditions are set to "T1" (step3).

The SS waits for random access requests from the UE, with a registration establishment cause (step3) and the registration process is completed (step4).

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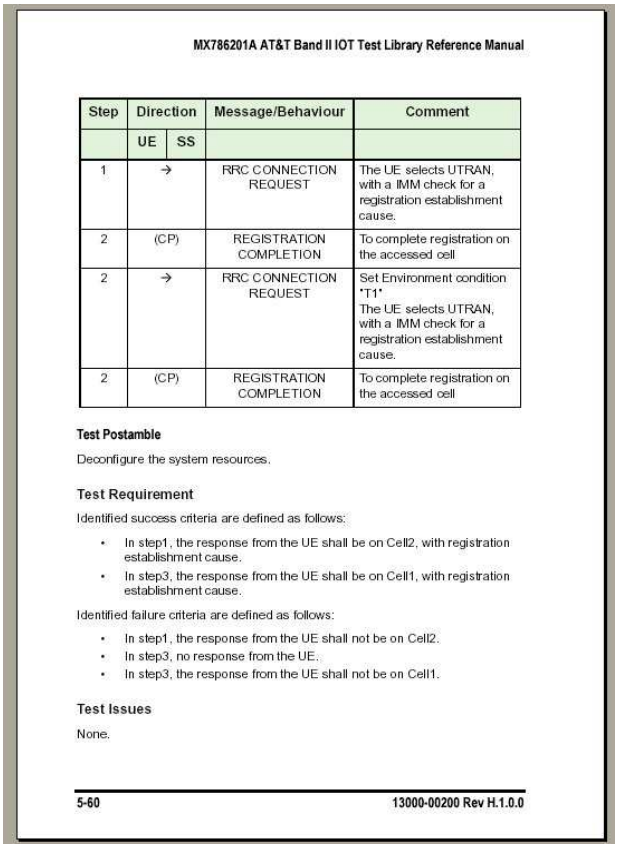
Shows cells used from network model

See example below showing Test Procedure with expected messages and behavior and also the criteria for pass and failure



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Step	Direction		Message/Behaviour	Comment
	UE	SS		
1	→		RRC CONNECTION REQUEST	The UE selects UTRAN, with a IMM check for a registration establishment cause.
2	(CP)		REGISTRATION COMPLETION	To complete registration on the accessed cell
2	→		RRC CONNECTION REQUEST	Set Environment condition "T1" The UE selects UTRAN, with a IMM check for a registration establishment cause.
2	(CP)		REGISTRATION COMPLETION	To complete registration on the accessed cell

Test Postamble

Deconfigure the system resources.

Test Requirement

Identified success criteria are defined as follows:

- In step1, the response from the UE shall be on Cell2, with registration establishment cause.
- In step3, the response from the UE shall be on Cell1, with registration establishment cause.

Identified failure criteria are defined as follows:

- In step1, the response from the UE shall not be on Cell2.
- In step3, no response from the UE.
- In step3, the response from the UE shall not be on Cell1.

Test Issues

None.

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Shows expected behavior

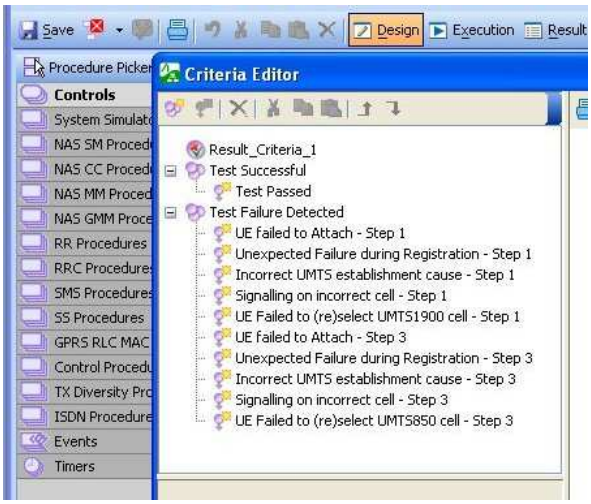
The library has been proven with Anritsu equipment against UEs mandated by AT&T.

Many of the tests can be run from a single key press and if AT commands are supported by the UE; a fully automatic test campaign is possible. This makes regression testing simple and by using the Criteria editor within the RTD tool, all results are given a preliminary judgment, avoiding the need to study the test logs. The criteria may be changed at any stage to allow very fast result management and report generation without having to re-run the tests. Using the Result criteria to quickly focus in on specific failure causes can lead to greater efficiency.

Criteria Editor

A judgment of the test is made using the criteria set within each test. At a high level: this is shown by a simple pass or fail .
Further investigation reveals the cause of failure or abnormality.

The screen below shows the criteria applied to the example test. These criteria have been approved by AT&T and may determine incorrect behavior that can be traced back to the protocol messages in the resultant log.
The test criteria may be modified by the user to prove specific functionality and applied to new and existing tests. For existing tests it has the added benefit that tests do not need to be re-run to analyze results against new criteria.



Criteria applied to test

Watermarking of tests and results

We encourage users to make copies of the tests and make changes for debug and other purpose, so all tests in the Library have a watermark that is broken if the test is modified. This provides confidence to the user and AT&T that the tests and results from original tests have not been modified.

SHOWS THE TEST AND RESULTS ARE WATERMARKED

WATERMARK BROKEN

Test and Library Development in the future

Tests that are suited to the RTD Test System will be created and supported by Anritsu with cooperation from AT&T. The intention is to release more tests every 3 months to align with the AT&T processes.

699 RTD tests
The library currently includes 699 RTD tests that cover a range of needs. The intention is to populate the libraries with all the tests relevant to AT&T's requirements over the next year and maintain them on a quarterly basis.
Test sections covered today include:

Section	Test cases
Physical RF	2
UMTS AMR Support	34
Network Selection	80
2G PS Data	6
RAB/Multi RAB/SRB	45
RRC & IRAT	22
UMTS Functional	15
HSPA Functional	41
Call Processing	168
TTY	18
MWI	16
ENS	35
EONS	142
AT Commands	51
USSD	5
Release 7 HSPA	6
SIM-ME Interface	1
UICC Application Interoperability	12
Total	**699**
Signaling only (Alt Tests)	56
Suspended	1
Example Tests	42
Utility	5

Note: Sub Tests
These are tests that appear on the main AT&T document under one major heading, so they are not counted when filtering on the spreadsheet.

Signaling only test cases (Alternative versions)
These test cases are supplied as signaling only versions, so the user may test the signalling functionality without the need for speech path verification or data transfer. These test case alternative versions are therefore suited to automated regression testing.

Example tests
We have continued to include tests that have been removed from the AT&T acceptance process. Although they may not be required for the AT&T process, they do provide test coverage.

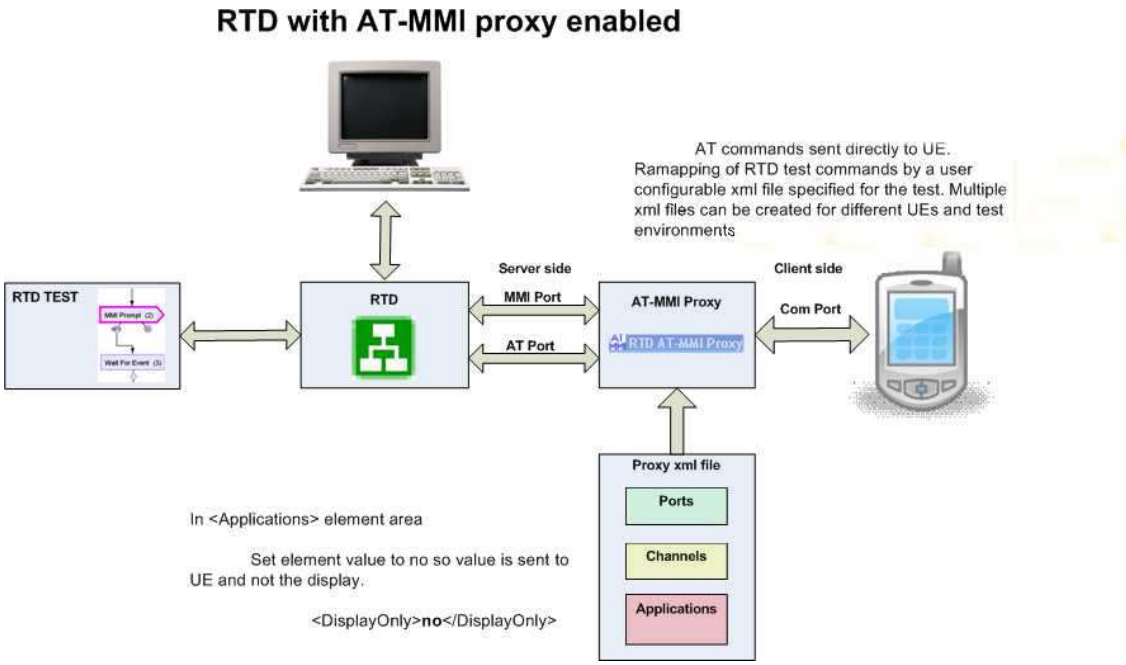
Utility Tests
These Utility Tests are used to set up initialized conditions for registration, forbidden PLMNs and cable losses in the test jigs.

Automating tests

Running the Test Cases Using the AT/MMI Proxy for Automation

The RTD provides proxy control of the AT command set to the UE through the RTD Test Cases. It enables automated testing to be achieved through a serial port on the control PC. In order to use the AT commands provided within the test cases, the RTD AT/MMI command interface must be set to use the appropriate serial port connection and an appropriate proxy.xml file is applied to map the AT/MMI commands to match those supported by the UE.
Prompts on the screen can be suppressed when automation is used.
Some points to note:

- In general automated testing can be carried out via the use of the AT command set [3GPP TS27.007]
- Full control of a UE is only possible if the UE vendor has made provision for an automated testing interface
- The combined AT/MMI proxy was developed as a flexible interface which can adapt to many different types of UEs through the use of a configuration file 'proxy.xml'
- Where the vendor has not implemented a given AT command, for instance AT+CFUN which is used to power cycle the UE between tests, it may be possible to use the Keypad Control command (AT+CKPD) which simulates the pressing of the UE key pad via the AT command interface.



Running the RTD within a test system

The RTD may also be controlled using remote commands and integrated into a total test system. The RTD is compatible with a number of remote commands that allow Tests to be RUN, ANALYZED, etc. Further integration is required by AT&T and is described below.

PCOM Script Integration

The AT&T Library has been designed to work with PCOM scripts - the preferred AT&T method for ensuring USIMs are configured correctly before processing tests.

The USIMs may be programmed using a standard SIM card reader (the PC Twin Reader from Gemalto is a good source)

UICCs are available from suppliers specified in the AT&T test documentation.

The Oberthur PCOM system is available from:

Oberthur Card Systems,
3150 Ana Street,
Rancho Dominguez
CA 90221,
USA
TEL:+1 310 884 3526

In order to automate the PCOM scripts into a total test system it is recommended that the Gemalto Test & Perso Automation Tool, EBD010 is used. This is available from:

Gemalto,
Arboretum Plaza II
9442 Capital of Texas Highway North, Suite 400
Austin, TX 78759
Tel: +1 512 257 3900

Automation can be accomplished with the test system as shown in the test example.

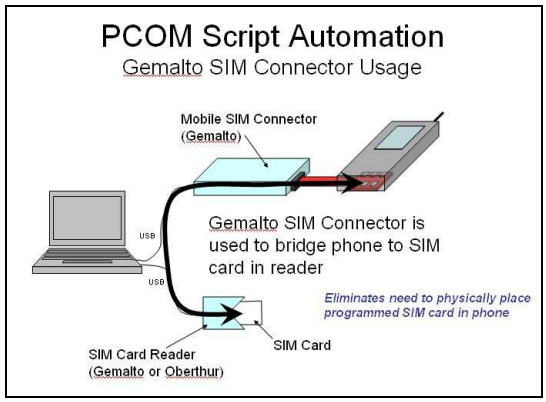
Program USIM with required PCOM script
Start Gemalto SIM Connector

Normal Test Procedure

Stop Gemalto SIM Connector

Test Example

Without the Gemalto it is possible to program the USIM, before placing it in the terminal for testing.



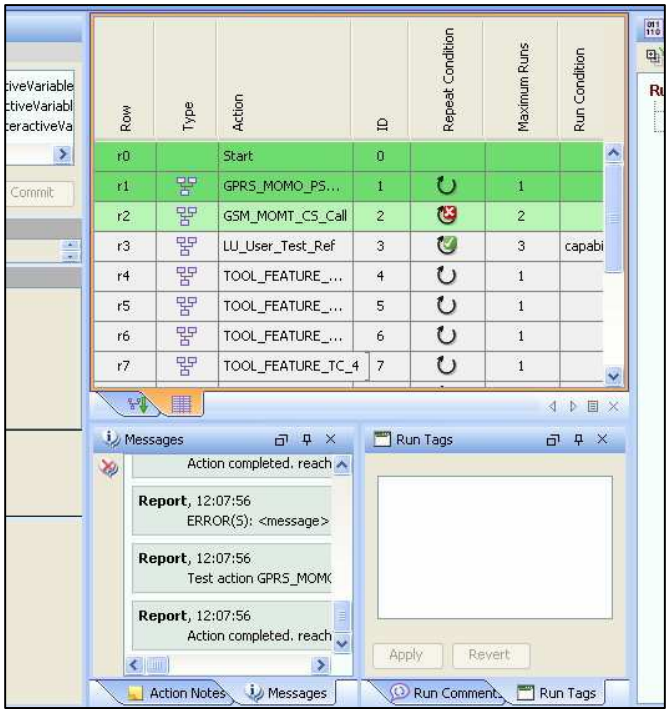
Typical system

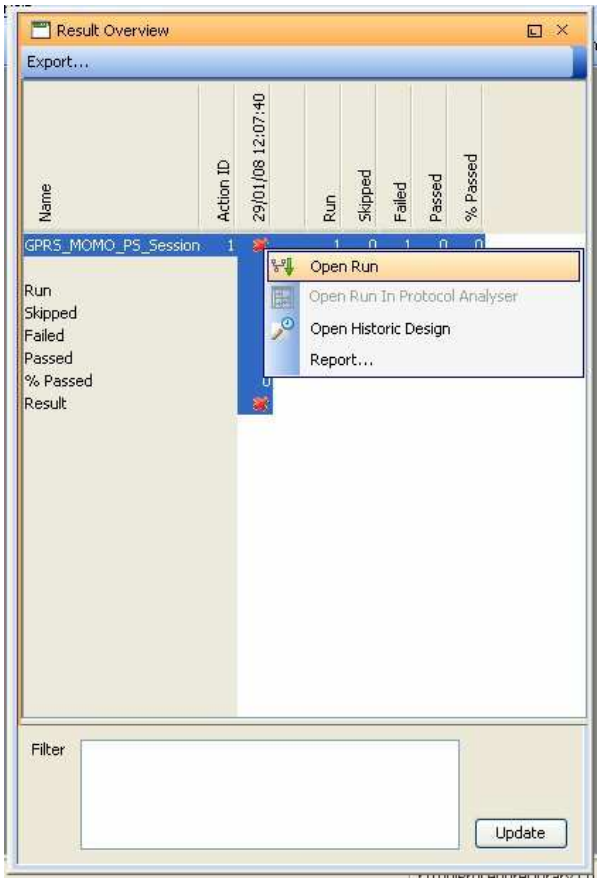
Campaign management within the tool

The RTD now includes campaign management. This provides the user with the ability to create test runs that can be run remotely.

Tests can be repeated depending on rules set by the user. Results are generated in a tabular form and can be exported to form part of a formal report.

A campaign may be used to run an entire suite of conformance tests, or inter-operability tests, or any other large grouping of tests.





Test Results

Test results may be summarized for reports and exported to external formats (such as XML or CSV).

Library Support

Support and maintenance of the library includes upgrading and re-validating existing test cases to new platform versions of RTD. Every time the RTD platform is upgraded to enable new features or improve stability and/or usability, the test cases are re-validated against an approved AT&T method. Each current test case needs to be upgraded and tested for 2 consecutive passes against a selection of Reference UEs.

Changes to the test specifications will require maintenance of test cases based on AT&T's new requirements which occurs every 3 months. An important maintenance activity for this was moving all our test cases to use AT&T's PCOM scripts. This development effort resulted in new compound procedures to facilitate changing PLMNs, MCCs, MNCs, and other related USIM parameters.

We have support staff in the USA, UK and Japan to provide support to customers on issues they may have with their devices using AT&T test cases.

Ordering information

RTD users now have the ability to purchase the Libraries outright or subscribe to them on an annual basis to suit their fiscal needs.

1. Purchasing the tests requires the customer to order each individual Library package. Further packages will be released throughout the year. Details are in the Roadmap which can be supplied by your local Anritsu representative.

Part Number	Library Package
MX786201A-101	**AT&T IOT Library Package 1 (For RTD)**
MX786201A-102	**AT&T IOT Library Package 2 (For RTD)**
MX786201A-103	**AT&T IOT Library Package 3 (For RTD)**
MX786201A-104	**AT&T IOT Library Package 4 (For RTD)**
MX786201A-105	**AT&T IOT Library Package 5 (For RTD)**
MX786201A-106	**AT&T IOT Library Package 6 (For RTD)**
MX786201A-107	**AT&T IOT Library Package 7 (For RTD)**
MX786201A-108	**AT&T IOT Library Package 8 (For RTD)**
	Future packages are described in the Roadmap
	Note that 5 Utility Tests are included in all packages

2. Purchasing an annual subscription provides access to all available tests for the period of subscription.

Part Number	Library Package
MX786201A-100	**AT&T LIBRARY SUBSCRIPTION AND SUPPORT**
	Note that 5 Utility Tests are included

3. Subscribers to the libraries may convert to purchasing the libraries. There is a reduced price for those libraries already supplied.

Part Number	Library Package
MX786201A-151	**AT&T IOT Library Package 1 (for RTD), upgrade from subscription**
MX786201A-152	**AT&T IOT Library Package 2 (for RTD), upgrade from subscription**
MX786201A-153	**AT&T IOT Library Package 3 (for RTD), upgrade from subscription**
MX786201A-154	**AT&T IOT Library Package 4 (for RTD), upgrade from subscription**

MX786201A-155	**AT&T IOT Library Package 5 (for RTD), upgrade from subscription**
MX786201A-156	**AT&T IOT Library Package 6 (for RTD), upgrade from subscription**
MX786201A-157	**AT&T IOT Library Package 7 (for RTD), upgrade from subscription**
MX786201A-158	**AT&T IOT Library Package 8 (for RTD), upgrade from subscription**
	Future packages are described in the Roadmap
	Note that 5 Utility Tests are included in all packages

- **NOTE:**
- Option 100 provides a license to use all released AT&T tests for one year. This option should be ordered on its own and includes the support and maintenance of the tests for a year from date of purchase.
- We expect to release 2 packages per year with update releases quarterly. Please ask your Anritsu Representative for the latest roadmap
- These tests are under continuous maintenance with AT&T and may change to meet their future requirements.

Part Number	Optional Accessories
MX786201A-126	**AT&T IOT Test SIM Card for RTD**
MX786201A-127	**AT&T IOT Test UICC Card for RTD**
MX786201A-128	**AT&T IOT Test SIM Card (Non AT&T SIM) for RTD**

- **NOTE:**
- One set of the SIM / UICCs is provided with the library when purchased and when subscription is renewed
- The PCOM scripts for the library are included with the package.

	Recommended MD8480C Configuration	
Part Number	**Product Description**	**Quantity**
MD8480C	W-CDMA SIGNALLING TESTER	1
MU848060C	TDMA2	1
MU848060C-01	EGPRS(R99)	1
MU848072C1	BTS UNIT	2
MU848072C-01	HSDPA	3
MU848072C-02	HSUPA	3
MD8480C-03	ADDITIONAL RF UNIT2	1
MX848001A-01	W-CDMA SIGNALLING TESTER TX DIVERSITY	1
MX848001A-02	W-CDMA SIGNALLING TESTER COMPRESSED MODE	1
MX848001A-05	W-CDMA SIGNALLING TESTER GSM FREQUENCY HOPPING	1
MX848001C-11	HSDPA TX DIVERSITY	
MX848041C	FIRMWARE FOR CIPHERING	1
MX848041A-01	TX DIVERSITY FOR CIPHERING	1
MX848041A-02	COMPRESSED MODE FOR CIPHERING	1
MX848041A-05	GSM FREQUENCY HOPPING FOR CIPHERING	1
MX848041A-10	HSDPA CIPHERING	1
MX848041A-11	HSDPA TX DIVERSITY FOR CIPHERING	1
MX848045C	GSM/GPRS2 CIPHERING	1
MC0011A	WEB ACCESS KEY	
MD8480C-SS150	1 YEAR SUPPORT SERVICE (W/G/HSPA)	1
MD8480C-SS151	1 YEAR SUPPORT SERVICE CIPHERING (W/G/HSPA)	1
Z1218A	MD8480C SOFTWARE WITH CIPHERING CD-ROM	1

- **NOTE: The configuration above is recommended to allow all tests in the libraries to be run. Tests are validated using this configuration only.**
- **Please note that this release of the package Test Cases has been validated on RTDv3.7.0_B with Patch 1A applied.**

Anritsu

Specifications are subject to change without notice.

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