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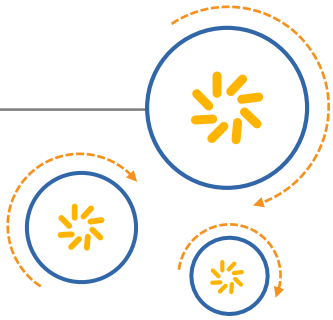

China Telecom Device Configuration and Testing Information

Application Note

80-NR766-1 Rev. E

December 19, 2014

Questions or comments: https://support.cdmatech.com/

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Revision history

Revision	Date	Description
A	Aug 2014	Initial release
B	Nov 2014	Numerous updates were made to the document
C	Nov 2014	Updates to test information for SVLTE and SRLTE devices
D	Dec 2014	Updated Table 3-10 and Table 4-10
E	Dec 2014	Updated Table 4-3

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1 Introduction

1.1 Purpose

This document describes how to configure devices for China Telecom (CT) lab conformance and commercial testing. The document also describes the User Equipment (UE) variants and the Protocol Implementation Conformance Statement (PICS) settings required for lab testing purposes.

This document is intended for engineers using devices based on MPSS.DI.3.0, MPSS.DI.4.0, MPSS.DPM.1.0, and later product lines, as indicated in their respective sections.

1.2 Conventions

Button and key names appear in bold font, e.g., click **Save** or press **Enter**.

1.3 References

Reference documents are listed in Table 1-1.

Table 1-1 Reference documents and standards

Ref.	Document	
Qualcomm Technologies, Inc.		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Q2	*Presentation: Modem Software Configuration*	80-N5576-96
Q3	*Application Note: Configuring a UE Using Binary Modem Configuration*	80-NP686-1
Q4	*MSM8916 (LA.1.0, LA.1.1, WP.1.0) MSM8916 Using MPSS.DPM.1.0 LTE Protocol Implementation Conformance Statement*	80-NN720-3
Q5	*MSM8916 (LA.1.0, LA.1.1, WP.1.0) MSM8916 Using MPSS.DPM.1.0 3G Protocol Implementation Conformance Statement*	80-NN720-2
Q6	*MSM8916 (LA.1.0, LA.1.1, WP.1.0) MSM8916 Using MPSS.DPM.1.0 GSM/GPRS/EGPRS Protocol Implementation Conformance Statement*	80-NN720-1
Q7	*Presentation: USB UICC Overview*	80-NN611-1
Q8	*UIM Driver Configurable Items*	80-NE596-2
Q9	*MSM8974 (LA.4.0, WP.3.0) MSM8926 (WP.2.0, LA.3.0) Using MPSS.DI.4.0 GSM/GPRS/EGPRS PICS*	80-NN102-1
Q10	*MSM8974 (LA.4.0, WP.3.0), MSM8926 (WP.2.0, LA.3.0) MSM8974/MSM8926 Using MPSS.DI.4.0 3G PICS*	80-NN102-2
Q11	*MSM8974 (LA, WP), 8926 (WP, LA) MSM8974_8926 Using MPSS.DI.4.0 LTE PICS*	80-NN102-3

1.4 Technical assistance

For assistance or clarification on information in this document, submit a case to Qualcomm Technologies, Inc. (QTI) at https://support.cdmatech.com/.

If you do not have access to the CDMATech Support website, register for access or send email to support.cdmatech@qti.qualcomm.com.

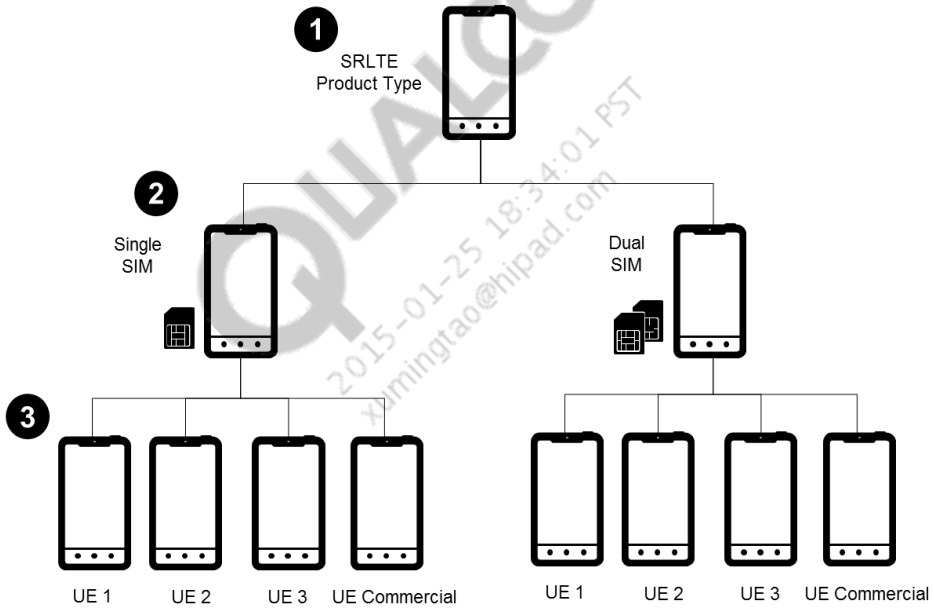
1.5 Acronyms

For definitions of terms and abbreviations, see [Q1].

2 Modem Configuration for China Telecom Devices

2.1 Relationship of product types and UE variants

Multiple device configurations are required for testing and submitting devices to China Telecom for Product Acceptance (PA). Figure 2-1 explains the relationship of product types and UE variants. It is important to note that UE variants are the devices tested during precertification.



1	Product Types	Two types of products can be submitted to CT for certification: ▪ SVLTE- product (handset) ▪ SRLTE product (handset) SRLTE is shown here for illustration purposes.
2	SIM Support	▪ Single SIM ▪ Dual SIM
3	Variants	Separate UE variants are required to meet CT lab conformance and commercial test requirements. OEMs create the UE variants by loading and activating different Modem Binary (MBN) configuration files on the device. OEMs can use the same device or multiple devices to represent the UE variants.

Figure 2-1 Hierarchy of product types and UE variants

2.2 MBN files

Modem Binary (MBN) files are mcfg.mbn files. They are essentially a set of critical NV/EFS settings that properly configure the UE to meet the operational requirements of a carrier's network. MBNs are also used to configure the UE to comply with lab testing and certification requirements.

There are two MBN types. Table 2-1 provides a brief description of each MBN type.

Table 2-1 Description of MBN types

MBN type	Purpose and details
Hardware (HW) MBN	▪ Prepares the UE for accepting a SW MBN. ▪ Must be loaded to UE before loading the SW MBNs ▪ There are separate HW MBNs for single-SIM devices and for dual-SIM devices
Software (SW) MBN	▪ Configure the UE to comply with lab testing and certification requirements ▪ Contains the necessary NV/EFS configuration for proper operation of the UE ▪ There are separate SW MBNs for single-SIM devices and for dual-SIM devices ▪ There are separate SW MBNs for each UE variant

2.2.1 Hardware MBN

The hardware MBN file is in the MPSS build at:
`<MODEM _BUILD>\modem_proc\mcfg\configs\mcfg_hw\generic\common\.`

This path is referred to as the `<hwmbnpath>`.

Table 2-2 shows the appropriate hardware MBN to load based on the SIM configuration of the device. It is recommended that you use QPST to load the hardware MBN. For instructions on how to load MBN files using QPST, see [Q3].

Table 2-2 Hardware MBN subfolder location and file

Chipset*	Device type	Location/BMC name*
MSM8916	Single SIM	`<hwmbnpath>\MTP8916_SingleSim\mcfg_hw.mbn`
MSM8916	Dual SIM	`<hwmbnpath>\MTP8916_DualSim\mcfg_hw.mbn`

*For other chipsets, the subfolder is similar, but the chipset name is different.

Modifications to the hardware MBN might be necessary to match the specific hardware design. The hardware MBN contains NV 4398 (UIM Select Default USIM Application) and NV 70210 (UIM HW Config), which configure many GPIO mappings. Verify that they are set correctly to match the specific hardware and provisioning requirements

NOTE: Single-SIM devices require value of 1 for NV 4398. Dual-SIM devices require a value of 0.

If changes are not required, then load the default hardware MBN. If changes are required, you can either set the correct NV values in the factory QCN or modify, generate, and load the default MBN. Figure 2-2 provides an overview of hardware MBN options. For more information on NV 70210, see [Q7] and [Q8].

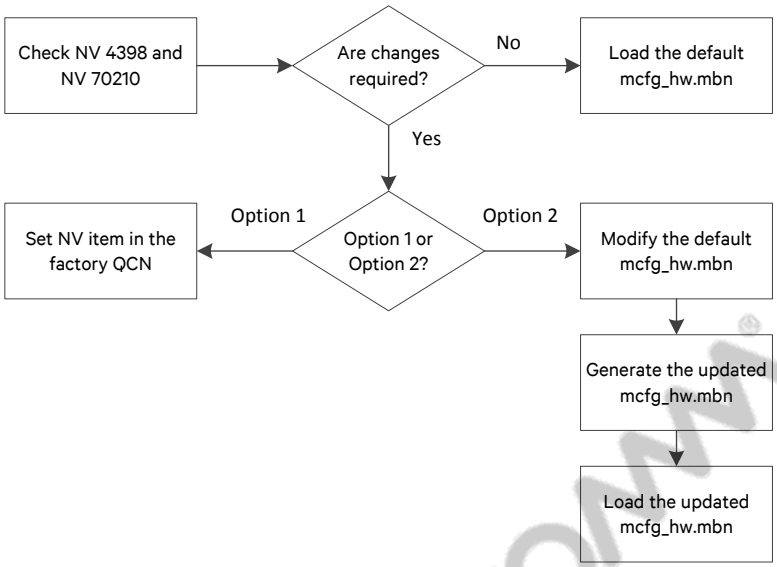


Figure 2-2 Hardware MBN options

2.2.2 Software MBN

The default software MBNs contain the QTI-recommended settings and the necessary configuration for proper operation on a China Telecom commercial network or for China Telecom lab testing. You provision the UE by loading and activating the default MBN that corresponds to the device type and SIM capabilities of the device.

The default software MBNs are built into the modem software and reside in the Android system partition. The default software MBNs are also located in the MPSS build at: `<MODEM_BUILD>\modem_proc\mcfg\configs\mcfg_sw\generic\CT\`.

This path is referred to as `<swmbnpath>`. The `<swmbnpath>` for the MBNs used in China Telecom lab conformance and commercial testing are in Chapter 3 for SVLTE product types and Chapter 4 for SRLTE product types.

Although the software MBNs are built in, you are still required to load and activate the MBNs. There are two methods to load and activate software MBNs on a UE.

- **Use the device UI** – This is the recommended method during testing because it enables faster switching between configurations. For more information, see Chapter 5.
- **Use QPST**– This is the recommended method for factory use, it can also be used during testing if necessary. For more information, see [Q3].

2.2.3 Configuring ADB settings for lab testing

Some remnant Android settings can affect testing even if provisioning is done in the hardware and software MBN. Execute the following ADB shell commands on the UE to remove unnecessary Android settings.

```
adb shell getprop persist.omh.enabled
```

If the previous command returns `True`, change it to `False`.

```
adb root
adb shell setprop persist.omh.enabled false
```

3 Configuration and Testing Information for SVLTE Products

3.1 Configuration

China Telecom has defined various lab conformance test cases that a product must pass as part of PA. Not all of the lab conformance testing can be done by using the commercial configuration. As such, there are several UE variants to meet the lab conformance test requirements and to test certain technology areas. Figure 3-1 shows the relationship between the SVLTE product type and the required UE variants.

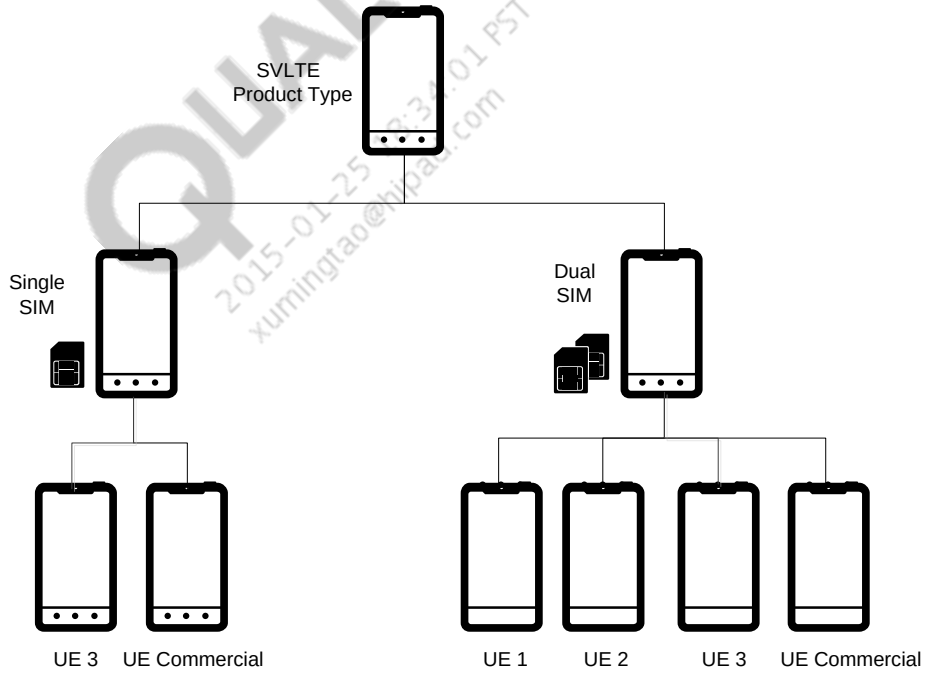


Figure 3-1 Relationship between SVLTE product type and UE variants

The UEs are configured by loading and activating the software MBNs listed in Table 3-1.

Table 3-1 UE to MBN relationship for DPM 1.0 and DI 1.0 and later

To make this UE variant…	…load this SW MBN	
	Single SIM	Dual SIM
UE1 (also known as TEST)	Not applicable	TEST-CT-SV-DS

To make this UE variant…	…load this SW MBN	
	Single SIM	Dual SIM
UE2 (also known as TEST_NO_APN)	Not applicable	TEST_NO_APN_CT-SV-DS
UE3 (also known as TEST_EPS_ONLY)	Commercial –CT-SV-SS, with NV changes	TEST_EPS_ONLY_CT-SV-DS
UE COMMERCIAL	Commercial –CT-SV-SS	Commercial –CT-SV-DS

Table 3-2 UE to MBN relationship for DPM 2.0 and later

To make this UE variant…	…load this SW MBN.	
	Single SIM	Dual SIM
UE1 (also known as TEST)	Not applicable	TEST-SVLTE-DSDA-CT
UE2 (also known as TEST_NO_APN)	Not applicable	TEST_NO_APN-SVLTE-DSDA-CT
UE3 (also known as TEST_EPS_ONLY)	Commercial –CT-SV-SS, with NV changes	TEST_EPS_ONLY-SVLTE-DSDA-CT
UE COMMERCIAL	Commercial –CT-SV-SS	Commercial-SRLTE- DSDA

The short names for the software MBNs are sometimes used interchangeably with the UE names. For example, UE1 is sometimes referred to as the TEST variant, UE2 as the TEST_NO_APN variant, and so on.

3.1.1 Purpose and settings of China Telecom SVLTE MBNs

Table 3-3 lists the types of tests and the key settings for each software MBN.

Table 3-3 Purpose and settings of China Telecom SVLTE MBNs

MBN	Purpose and settings	
COMMERCIAL	Purpose	Used for voice-centric tests and SVLTE-specific tests
	NV 70302	1
	PM File Setting	\subsidized
	Attach Setting	CS+PS
	APN Setting	Set
TEST	Purpose	Used for voice-centric tests and for all GCF L-C IRAT tests
	NV 70302	0
	PM File Setting	\test (with MCC 001 and GCF MCCs, all MCCs from \subsidized, and CDMA2000 roaming MCC+GCF PLMNs to be included in SVLTE list)
	Attach Setting	CS+PS
	APN Setting	Set

MBN	Purpose and settings	
TEST_NO_APN	Purpose	Used for voice-centric tests, RRM tests, RF tests, and LTE-only GCF test where SVLTE operation is not needed
	NV 70302	0
	PM File Setting	\subsidized
	Attach Setting	CS+PS
	APN Setting	All LTE\eHRPD profiles are removed
TEST_EPS_ONLY	Purpose	Used for data-centric tests and some protocol conformance test cases with EPS only attach
	NV 70302	0
	PM File Setting	\subsidized
	Attach Setting	PS only
	APN Setting	All LTE\eHRPD profiles are removed

3.1.2 Location of software MBNs

The location of the default software MBN files depends on if you are using the device UI or QPST to load and activate the MBNs.

Using device UI

If you are using the device UI to load and activate the MBNs, the default MBNs are built into the modem software and reside in the Android system partition. For instructions on how to load and activate MBNs using the device UI, see Chapter 5.

Using QPST

If you are using QPST to load and activate the MBNs, then you need to know the path to the MBNs. The path for the various MBNs is:

`<MODEM_BUILD>\modem_proc\mcfg\configs\mcfg_sw\generic\CT\`

This path is referred to as the `<swmbnpath>`.

Table 3-4 provides the location of the software MBNs for SVLTE devices. To ensure proper configuration, only load the MBNs that match the SIM support of the device under test. For instructions on how to load and activate MBNs using the QPST, see [Q3].

Table 3-4 Location of software MBNs for SVLTE devices for DPM 1.0 or DI 1.0 and later

SIM support	UE variant	Location/MBN name
Single SIM	COMMERCIAL	`<swmbnpath>\Commercial-CT-SV-SS\mcfg_sw.mbn`
	EPS_ONLY	`<swmbnpath>\Commercial-CT-SV-SS\mcfg_sw.mbn`, but set NV 850 = 1 and 65777 = 1
Dual SIM	TEST	`<swmbnpath>\TEST-CT-SV-DS \mcfg_sw.mbn`

SIM support	UE variant	Location/MBN name
	TEST_NO_APN	<swmbnpath>\TEST_NO_APN_CT-SV-DS \mcfg_sw.mbn
	TEST_EPS_ONLY	<swmbnpath>\TEST_EPS_ONLY_CT-SV-DS \mcfg_sw.mbn
	COMMERCIAL	<swmbnpath>\Commercial-CT-SV-DS\mcfg_sw.mbn

Table 3-5 Location of software MBNs for SVLTE devices for DPM 2.0 and later

SIM support	UE variant	Location/MBN name
Single SIM	COMMERCIAL	<swmbnpath>\SVLTE\SS\Commercial\mcfg_sw.mbn
	EPS_ONLY	<swmbnpath>\SVLTE\SS\Commercial\mcfg_sw.mbn, but set NV 850 = 1 and 65777 = 1
Dual SIM	TEST	<swmbnpath>\SVLTE\DSDA\TEST\mcfg_sw.mbn
	TEST_NO_APN	<swmbnpath>\SVLTE\DSDA\TEST_NO_APN \mcfg_sw.mbn
	TEST_EPS_ONLY	<swmbnpath>\SVLTE\DSDA\TEST_EPS_ONLY \mcfg_sw.mbn
	COMMERCIAL	<swmbnpath>\ SVLTE\DSDA\Commercial \mcfg_sw.mbn

3.2 Testing information

This section provides information about the lab and commercial testing of SRLTE devices for CT. Use this information for internal pretesting and formal testing at carrier or third-party labs. The section covers the following:

- PICS information for UE1, UE2, and UE3
- Changes to PICS for UE1, UE2, and UE3
- Test plans applicable to each UE variant
- MBNs for each UE variant

3.2.1 PICS for SVLTE

It is a prerequisite that you know which version of modem software is used in your chipset.

- MSM8916.LA uses a version of MPSS.DPM.1 or MPSS.DPM.2.
- MSM8939.LA uses a version of either MPSS.DPM.1 or MPSS.DPM.2.
- MSM8974.LA uses a version of MPSS.DI.1 or higher.

Once you know which version you are using, do the following:

1. Download the appropriate set of Excel workbooks listed in Table 3-6.
2. Load the PICS from the columns listed in the table.

Table 3-6 List of PICS documents and columns for LTE testing for DPM 1.0 or DI 1.0 and later

If your modem software is…	…download this document	Load the PICS from this column
MPSS.DPM.1.0	80-NN720-3	▪ For UE1 and UE3 load VzW/Sprint Data Centric (SVLTE; FDD single mode) ▪ For UE2 load ROW Voice Centric (FDD single Mode)

Table 3-7 shows the applicable test plans and PICS changes for each UE variant. Change the PICS to the indicated values after you load them into your test equipment.

Table 3-7 Applicable test plans and PICS changes for SVLTE UE variants for DPM 1.0 or DI 1.0 and later

UE variant	Applicable test plans	Change the following PICS items…	…to this value
Commercial	▪ All applicable China Telecom test plans (see Table 3-10) ▪ All field testing	NA	NA
UE1 Home, voice-centric	▪ Combined-attach LTE IRAT to CDMA2000 protocol conformance ▪ Some China Telecom test plans	pc_CS_PS_voice_centric	TRUE
		pc_CS_PS_data_centric	FALSE
		pc_voice_PS_1_CS_2	FALSE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		px_UE_CS_PS_ UsageSetting_Tested	VOICE_CENTRIC
		px_UE_PS_UsageSetting_ Tested	VOICE_CENTRIC
		All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported
UE2 Roam, voice-centric, no APNs	▪ Combined-attach LTE ONLY protocol conformance ▪ LTE RF conformance ▪ LTE RRM	pc_voice_PS_1_CS_2	FALSE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		pc_SRVCC_GERAN_ UTRAN	FALSE
		All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported
UE3 Home, data-centric, EPS only	EPS attach only LTE protocol conformance	pc_attach	TRUE
		pc_Combined_attach	FALSE
		pc_voice_PS_1_CS_2	FALSE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		pc_PS_data_centric	TRUE
		pc_CS_PS_data_centric	FALSE

UE variant	Applicable test plans	Change the following PICS items…	…to this value
		px_AttachTypeTested	EPS_ATTACH_ ONLY
		All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported

Table 3-8 List of PICS documents and columns for LTE testing for DPM 2.0 and later

If your modem software is…	…download this document	Load the PICS from this column
MPSS.DPM.2.0	80-NT063-3	▪ For UE1 and UE3 load China Telecom SVLTE Lab (FDD Single Mode) ▪ For UE2 load ROW Voice Centric (FDD single Mode)

Table 3-9 Applicable test plans and PICS changes for SVLTE UE variants for DPM 2.0 and later

UE variant	Applicable test plans	Change the following PICS items…	…to this value
Commercial	▪ All applicable CT test plans (see Table 3-10) ▪ All Field testing	NA	NA
UE1 Home, voice-centric	▪ Combined-attach LTE IRAT to CDMA2000 protocol conformance ▪ Some CT test plans	All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported
UE2 Roam, voice-centric, no APNs	▪ Combined-attach LTE ONLY protocol conformance ▪ LTE RF conformance ▪ LTE RRM	pc_voice_PS_1_CS_2	FALSE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		pc_SRVCC_GERAN_ UTRAN	FALSE
		All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported
UE3 Home, data-centric, EPS only	EPS attach only LTE protocol conformance	pc_attach	TRUE
		pc_Combined_attach	FALSE
		pc_PS_data_centric	TRUE
		pc_CS_PS_data_centric	FALSE
		px_UE_CS_PS_ UsageSetting_Tested	DATA_CENTRIC
		px_UE_PS_UsageSetting_ Tested	DATA_CENTRIC

UE variant	Applicable test plans	Change the following PICS items…	…to this value
		px_AttachTypeTested	EPS ATTACH ONLY
		All applicable pc_eBand**X**_supported, where **X** is eBand number	Update eBands supported

3.2.2 Test plans and related UE variant

Table 3-10 lists the test plans and the related UE variants required for testing.

Table 3-10 Test plans and UE variants for DPM and DI versions 1.0 and later

For this test area…	…use this UE variant
International Roaming / Power On	Commercial
FDD and CDMA IRAT	Commercial
TDD and CDMA IRAT	Test plan not yet available
TDD and FDD IRAT	Test plan not yet available
eHRPD and HRPD IRAT	Commercial
IRAT Protocol	Commercial
IRAT Performance	Commercial
FDD-LTE DT	Commercial
TDD-LTE DT	Test plan not yet available
CA Mobility Handover Scenarios	Test plan not yet available
FDD CA RRC Signaling Tests	Test plan not yet available
FDD CA Data Performance	Test plan not yet available
FDD CA Protocol Conformance	Test plan not yet available
FDD CA RF Conformance Test	Test plan not yet available
FDD CA RRM	Test plan not yet available
FDD SVLTE	Commercial
TDD SVLTE	Test plan not yet available
FDD SRLTE	Test plan not applicable
TDD SRLTE	Test plan not applicable
LTE Protocol Conformance	For Single SIM: ▪ Commercial for combined ATTACH test cases ▪ Commercial with NVs set to EPS only for EPS ATTACH ONLY test cases For Dual SIM: ▪ TEST_NO_APN for combined ATTACH test cases ▪ TEST_EPS_ONLY for EPS ATTACH ONLY test cases
LTE RF Conformance	For Single SIM: ▪ Commercial for combined ATTACH test cases For Dual SIM: ▪ TEST_NO_APN

For this test area…	…use this UE variant
LTE RRM	For Single SIM: ▪ Commercial for combined ATTACH test cases For Dual SIM: ▪ TEST_NO_APN
SVLTE RF Performance	Commercial
SVLTE Protocol Conformance	Commercial

4 Configuration and Testing Information for SRLTE Products

4.1 Configuration

China Telecom has defined various lab conformance test cases that a product must pass as part of PA. Not all of the lab conformance testing can be done by using the commercial configuration. As such, there are several UE variants to meet the lab conformance test requirements and to test certain technology areas. Figure 4-1 shows the relationship between the SRLTE product type and the required UE variants.

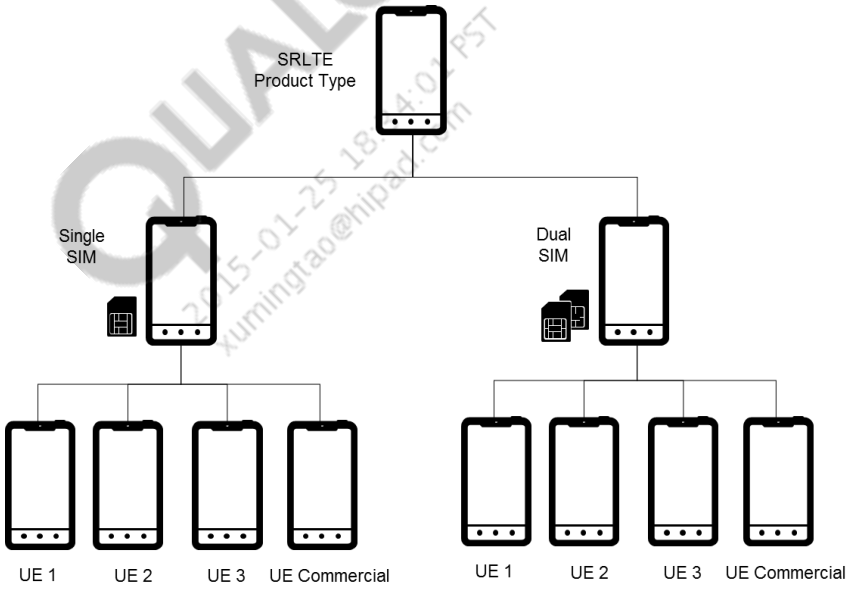


Figure 4-1 Relationship between SRLTE product type and UE variants

The UEs are configured by loading and activating the software MBNs listed in Table 4-1 and Table 4-2.

Table 4-1 UE-to-MBN relationship; DPM 1.0 or DI 1.0 later

To make this UE variant…	…load this SW MBN	
	Single SIM	Dual SIM
UE1 (also known as TEST)	TEST-CT-SR-SS	TEST-CT-SR-DS

To make this UE variant…	…load this SW MBN	
	Single SIM	Dual SIM
UE2 (also known as TEST_NO_APN)	TEST_NO_APN_CT-SR-SS	TEST_NO_APN_CT-SR-DS
UE3 (also known as TEST_EPS_ONLY)	TEST_EPS_ONLY_CT-SR-SS	TEST_EPS_ONLY_CT-SR-DS
UE Commercial (also known as Commercial)	Commercial-CT-SR-SS	Commercial-CT-SR-DS

Table 4-2 UE-to-MBN relationship; DPM 2.0 and later

To make this UE variant…	…load this SW MBN	
	Single SIM	Dual SIM
UE1 (also known as TEST)	TEST-SRLTE-SS-CT	TEST-SRLTE-DSDS-CT
UE2 (also known as TEST_NO_APN)	TEST_NO_APN_SRLTE-SS-CT	TEST_NO_APN_SRLTE-DSDS-CT
UE3 (also known as TEST_EPS_ONLY)	TEST_EPS_ONLY_SRLTE-SS-CT	TEST_EPS_ONLY_SRLTE-DSDS-CT
UE Commercial (also known as Commercial)	Commercial-SRLTE-SS-CT	Commercial-SRLTE-DSDS-CT

The short names for the software MBNs are sometimes used interchangeably with the UE names. For example, UE1 is sometimes referred to as the TEST variant, UE2 as the TEST_NO_APN variant, and so on.

4.1.1 Purpose and settings of China Telecom SRLTE MBNs

Table 4-3 lists the types of tests and the key settings for each software MBN.

Table 4-3 Settings and purpose of China Telecom SRLTE MBNs

MBN	Purpose and settings	
COMMERCIAL	Purpose	Used for voice-centric tests and SRLTE-specific tests
	NV 70302	1
	PM File Setting	\subsidized
	Attach Setting	CS+PS
	APN Setting	Set
TEST	Purpose	Used for data-centric tests and for all GCF L-C IRAT and CT-specific tests such as IRAT, DT, and so on
	NV 70302	0
	PM File Setting	\test (with MCC 001 and GCF MCCs, all MCCs from \subsidized, and CDMA2000 roaming MCC)

MBN	Purpose and settings	
	Attach Setting	CS+PS
	APN Setting	Set
TEST_NO_APN	Purpose	Used for data-centric tests, LTE-only protocol tests, LTE RRM tests, and LTE RF tests
	NV 70302	0
	PM File Setting	\subsidized
	Attach Setting	CS+PS
	APN Setting	All LTE\eHRPD profiles are removed
TEST_EPS_ONLY	Purpose	Used for data-centric tests and some protocol conformance test cases with EPS only attach
	NV 70302	0
	PM File Setting	\subsidized
	Attach Setting	PS only
	APN Setting	All LTE\eHRPD profiles are removed

4.1.2 Location of software MBNs

The location of the default software MBN files depends on if you are using the device UI or QPST to load and activate the MBNs.

Using device UI

If you are using the device UI to load and activate the MBNs, the default MBNs are built into the modem software and reside in the Android system partition. For instructions on how to load and activate MBNs using the device UI, see [Q3].

Using QPST

If you are using QPST to load and activate the MBNs, then you need to know the path to the MBNs. The path for the various MBNs is:

`<MODEM_BUILD>\modem_proc\mcfg\configs\mcfg_sw\generic\CT\`

This path is referred to as the `<swmbnpath>`.

Chapter 4 provides the location of the software MBNs for SRLTE devices. To ensure proper configuration, only load the MBNs that match the SIM support of the device under test. For instructions on how to load and activate MBNs using the QPST, see [Q3].

Table 4-4 Location of software MBNs for SRLTE devices based on DPM.1.0 or DI 1.0 and later

SIM support	UE variant	Location/MBN name
Single SIM	UE1	`<swmbnpath>\TEST-CT-SR-SS\mcfg_sw.mbn`
	UE2	`<swmbnpath>\TEST_NO_APN_CT-SR-SS\mcfg_sw.mbn`
	UE3	`<swmbnpath>\TEST_EPS_ONLY_CT-SR-SS\mcfg_sw.mbn`
	Commercial	`<swmbnpath>\Commercial-CT-SR-SS\mcfg_sw.mbn`
Dual SIM	UE1	`<swmbnpath>\TEST-CT-SR-DS \mcfg_sw.mbn`

SIM support	UE variant	Location/MBN name
	UE2	<swmbnpath>\TEST_NO_APN_CT-SR-DS\mcfg_sw.mbn
	UE3	<swmbnpath>\TEST_EPS_ONLY_CT-SR-DS\mcfg_sw.mbn
	Commercial	<swmbnpath>\Commercial-CT-SR-DS\mcfg_sw.mbn

Table 4-5 Location of software MBNs for SRLTE devices based on DPM.2.0 and later

SIM support	UE variant	Location/MBN name
Single SIM	UE1	<swmbnpath>\TEST-SRLTE-SS\mcfg_sw.mbn
	UE2	<swmbnpath>\TEST_NO_APN_SRLTE-SS\mcfg_sw.mbn
	UE3	<swmbnpath>\TEST_EPS_ONLY_SRLTE-SS\mcfg_sw.mbn
	Commercial	<swmbnpath>\SRLTE\SS\Commercial\mcfg_sw.mbn
Dual SIM	UE1	<swmbnpath>\SRLTE\DSDS\TEST\mcfg_sw.mbn
	UE2	<swmbnpath>\SRLTE\DSDS\TEST_NO_APN\mcfg_sw.mbn
	UE3	<swmbnpath>\SRLTE\DSDS\TEST_EPS_ONLY\mcfg_sw.mbn
	Commercial	<swmbnpath>\SRLTE\DSDS\Commercial mcfg_sw.mbn

4.2 Testing information

This section provides information about the lab and commercial testing of SRLTE devices for China Telecom. Use this information for internal pretesting and formal testing at carrier or third-party labs. The section covers the following:

- PICS information for UE1, UE2, and UE3
- Changes to PICS for UE1, UE2, and UE3
- Test plans applicable to each UE variant
- MBNs for each UE variant

4.2.1 PICS information for SRLTE

It is a prerequisite that you know which version of modem software is used in your chipset.

- MSM8916.LA uses a version of MPSS.DPM.1 or MPSS.DPM.2.
- MSM8939.LA uses a version of either MPSS.DPM.1 or MPSS.DPM.2
- MSM8974.LA uses a version of MPSS.DI.1 or higher

Once you know which version you are using, do the following:

1. Download the appropriate set of Excel workbooks listed in Table 4-6.
2. Load the PICS from the columns listed in the table.

Table 4-6 List of PICS documents and columns for LTE testing for DPM.1.0 or DI 1.0 and later

If your modem software is…	…download this document	Load the PICS from this column
MPSS.DPM.1.0	80-NN720-3	▪ For UE1 and UE3 load VzW/Sprint Data Centric (SVLTE; FDD single mode) ▪ For UE2 load ROW Data Centric (FDD single Mode)
MPSS.DI.1.0	80-NC254-48	
MPSS.DI.3.0	80-NM323-3	
MPSS.DI.4.0	80-NN102-3	

Table 4-7 shows the applicable test plans and PICS changes for each UE variant. Change the PICS to the indicated values after you load them into your test equipment.

Table 4-7 Applicable test plans and PICS changes for SRLTE UE variants for DPM.1.0 or DI 1.0 and later

UE variant	Applicable test plans	Change the following PICS items…	to this value
Commercial	▪ All applicable China Telecom test plans (see Table 4-10) ▪ All field testing	NA	NA
UE1 Home, data-centric	▪ Combined-attach LTE IRAT to CDMA2000 protocol conformance ▪ Some China Telecom test plans	pc_1xRTT	TRUE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		pc_voice_PS_1_CS_2	FALSE
		All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported
UE2 Roam, data-centric, no APNs	▪ Combined-attach LTE ONLY protocol conformance ▪ LTE RF conformance ▪ LTE RRM	pc_IMS	FALSE
		All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported
UE3 Home, data-centric, EPS only	EPS attach only LTE protocol conformance	pc_1xRTT	TRUE
		pc_attach	TRUE
		pc_Combined_attach	FALSE
		pc_IMS	FALSE
		pc_VOLTE	FALSE
		pc_voice_PS_1_CS_2	FALSE
		pc_CS_PS_data_centric	FALSE
		pc_PS_data_centric	TRUE
		px_AttachTypeTested	EPS ATTACH ONLY
		All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported

Table 4-8 List of PICS documents and columns for LTE testing for DPM 2.0 and later

If your modem software is…	…download this document	Load the PICS from this column
MPSS.DPM.2.0	80-NT063-3	▪ For UE1 and UE3 load China Telecom SRLTE Lab (FDD Single Mode) ▪ For UE2 load ROW Data Centric (FDD single Mode)

Table 4-9 Applicable test plans and PICS changes for SRLTE UE variants for DPM 2.0 and later

UE variant	Applicable test plans	Change the following PICS items…	to this value
Commercial	▪ All applicable China Telecom test plans (see Table 4-10) ▪ All field testing	NA	NA
UE1 Home, data-centric	▪ Combined-attach LTE IRAT to CDMA2000 protocol conformance ▪ Some China Telecom test plans	All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported
UE2 Roam, data-centric, no APNs	▪ Combined-attach LTE ONLY protocol conformance ▪ LTE RF conformance ▪ LTE RRM	pc_1xRTT	FALSE
		pc_IMS	FALSE
		All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported
UE3 Home, data-centric, EPS only	EPS attach only LTE protocol conformance	pc_attach	TRUE
		pc_Combined_attach	FALSE
		pc_CS_PS_data_centric	FALSE
		pc_PS_data_centric	TRUE
		px_AttachTypeTested	EPS ATTACH ONLY
		All applicable pc_eBand**X**_supported where **X** is the eBand number	Update eBands supported

NOTE: For "Commercial" UE variant, verify that the test equipment uses the correct China Telecom-specific PLMNs and/or MCCs in the test script. The test script may need to be updated/modified to match the PLMNs in the carrier_policy.xml file.

4.2.2 Test plans and related UE variant

Table 4-10 is a list of test plans and the related UE variants required for testing.

Table 4-10 Test plans and UE variants for DPM and DI versions 1.0 and later

For this test area…	…use this UE variant
International Roaming / Power On	Commercial
FDD and CDMA IRAT	TEST
TDD and CDMA IRAT	Test plan not yet available
TDD and FDD IRAT	Test plan not yet available
eHRPD and HRPD IRAT	Commercial
IRAT Protocol	TEST
IRAT Performance	TEST
FDD-LTE DT	TEST
TDD-LTE DT	Test plan not yet available
CA Mobility Handover Scenarios	Test plan not yet available
FDD CA RRC Signaling Tests	Test plan not yet available
FDD CA Data Performance	Test plan not yet available
FDD CA Protocol Conformance	Test plan not yet available
FDD CA RF Conformance Test	Test plan not yet available
FDD CA RRM	Test plan not yet available
FDD SVLTE	Test plan not applicable
TDD SVLTE	Test plan not applicable
FDD SRLTE	Commercial
TDD SRLTE	Test plan not yet available
LTE Protocol Conformance	▪ TEST for combined ATTACH test cases L<>C IRAT ▪ TEST_NO_APN for combined ATTACH test cases, LTE only ▪ TEST_EPS_ONLY for EPS ATTACH ONLY test cases
LTE RF Conformance	TEST_NO_APN
LTE RRM	TEST_NO_APN
SVLTE RF Performance	Test plan not applicable
SVLTE Protocol Conformance	Test plan not applicable

5 UI Applications for Loading and Activating MBNs

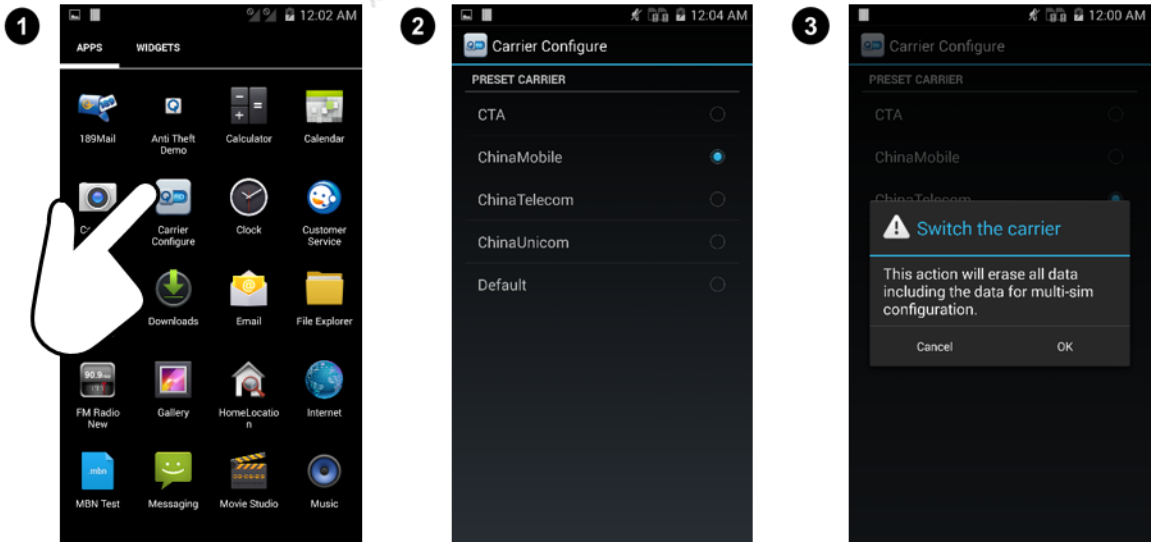
There are three UI applications involved in loading and activating MBNs. Use the applications in the following sequence:

1. Use the Carrier Configure application to select the carrier.
2. Use the Device type setting application to:
   - Select the mode and SIM configurations
   - Load MBNs
3. Use the MBN Test application to activate an MBN and to switch between MBNs loaded in the previous step.

This chapter describes the procedures for using each of the applications.

5.1 Carrier Configure application

Follow these steps to launch the Carrier Configure application and to select China Telecom as the carrier.



1. Tap the Carrier Configure icon to launch the application. The PRESET CARRIER screen appears.
2. Do one of the following:

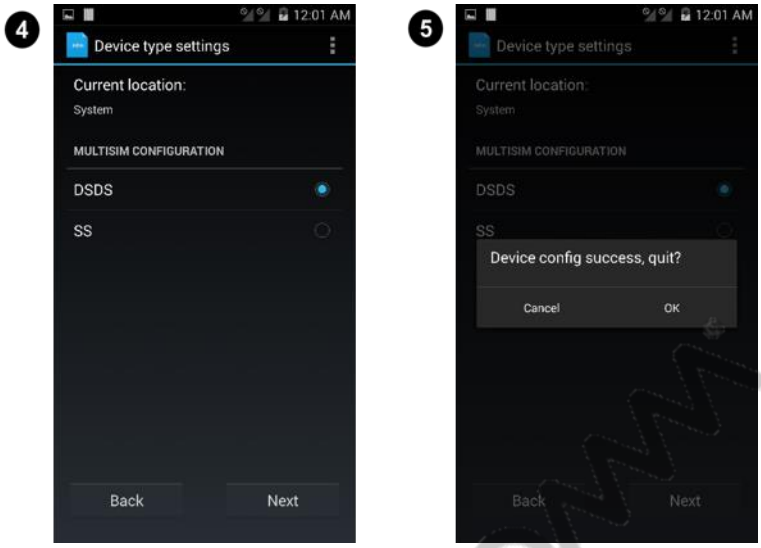
- If China Telecom is already selected, press the **Home** key or the **Back** key on the device to exit the application. Continue to the next section.
- If China Telecom is not selected, then select China Telecom. A message appears warning you that switching the carrier erases all data including the data for multi-SIM configuration.

3. Tap **OK**. The device reboots. Continue to the next section.

5.2 Device type setting application

Follow these steps to launch the Device type setting application and to configure the device with the appropriate settings.

1. Type ***#*# 6266344#*#*** in the keypad to launch the Device type setting application. The UI for the Device type setting application automatically appears.
2. Select the carrier then tap **Next**.
3. Select the device mode then tap **Next**. The CSFB and SGLTE options are for 5-mode CSFB and for 5-mode SGLTE



4. Choose the SIM configuration then tap **Next**.
5. Tap **OK** to confirm the device configuration.

5.4 MBN Test application

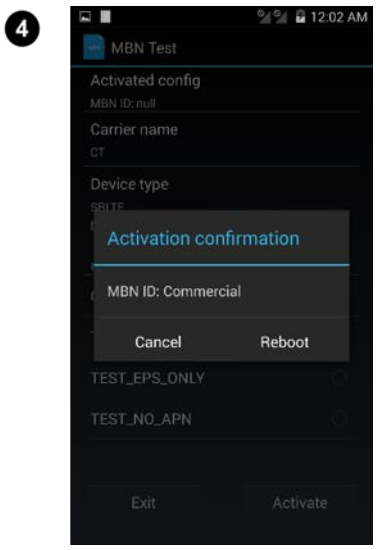
The MBN Test application provides an easy-to-use UI for activating MBNs. MBN Test is the recommended method during testing because it enables faster switching between configurations. QPST is also used to activate the MBNs and is the preferred method for factory use. For more information on using QPST to load and activate MBNs, see [Q3].

To use the MBN Test application to activate an MBN, do the following:

1. Type ***#*# 76266344#*#*** in the keypad to install the MBN Test application. The MBN Test application icon appears in the device UI.
2. Tap the MBN Test application icon.

   The MBN Test screen appears and displays the following information:

   - Activated config: The current activated MBN
   - Carrier name: The carrier selected from the Device type setting application
   - Device type: The mode and multi-SIM configuration selected from the Device type setting application
   - List of MBNs loaded on the device
3. Select an MBN from the CHOOSE CONFIG section of the UI then tap **Activate**.



4. Tap **Reboot**. The device reboots and the selected MBN is now active.

Removing the MBN Test application

When you remove the MBN Test application, you remove the icon from the device UI so that the end users are not able to access the application. Do this before providing the device to end users who should not have permissions to change configurations. If necessary, reinstall the application by following the procedures in the previous section.

NOTE: Do not remove the application from the devices that you are submitting to China Telecom for PA testing.

To remove the MBN Test application, type ***#*#33266344#*#*** in the keypad. The MBN Test application icon disappears from the device UI.

6 Lab Testing Tips

- For all GCF and China Telecom-specific testing, test in a shielded environment to prevent the UE from acquiring over-the-air/live network signals. Acquiring such live networks negatively impacts the outcome of the tests and may produce erroneous results.
- Ensure that good RF calibration is performed on all the test samples/UE variants that are used.
- Verify that the primary and secondary RF ports of each RAT are connected to the test equipment correctly.
- Verify that any required cable loss is compensated correctly on the test equipment.
- Follow the guidelines in Chapters 3 and 4 for using the correct UE variant and PICS files for various testing conditions, as applicable.