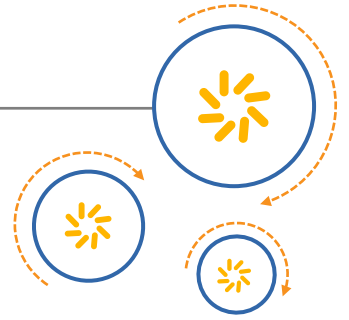




Qualcomm Technologies, Inc.



MDM9x45-NS MTP Configuration and Setup

80-NP527-32 D

April 3, 2015

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Revision history

Revision	Date	Description
A	Nov 2014	Initial release
B	Dec 2014	Updated Table 4-3, Figure 4-4 and Section 4.3.
C	Jan 2015	Updated Section 7.2
D	Apr 2015	Updated Table A.1

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Contents

1 Introduction.....	6
1.1 Purpose.....	6
1.2 Conventions	6
1.3 Technical assistance.....	6
2 MDM9x45-NS MTP Mechanical Design.....	7
2.1 Device form factor	7
2.2 Physical locations	8
3 SIM Configuration.....	10
4 MTP and Debug Fixture Configurations	11
4.1 Debug board DIP switch settings.....	11
4.2 MTP main board DIP switch for MDM9x45-NS	14
4.3 Push buttons.....	15
5 Shipment Information	16
5.1 Hardware components	16
5.2 Software components.....	16
6 Quick Hardware Setup and Usage	17
6.1 Bench setup for testing	17
6.1.1 As-built method	17
6.1.2 Power supply cable (Debug Board) method	18
6.1.3 Power supply cable (MTP Main Board) method	19
7 Quick Software Setup and Usage	20
7.1 Backing up a .qcn file from a device	21
7.2 Flashing the LE build.....	21
7.3 Flashing the TN build using QPST.....	24
7.4 Restoring a backup .qcn file to a device	27
A References.....	28
A.1 Related documents	28
A.2 Acronyms and terms	28

Figures

Figure 2-1 MDM9x45-NS MTP form factor	7
Figure 2-2 MDM9x45-NS MTP connectors and switch locations	8
Figure 2-3 MDM9x45-NS MTP buttons, USB, audio connectors, and SD card	9
Figure 2-4 MDM9x45-NS MTP UIM and volume buttons	9
Figure 2-5 SIM slot identifier	9
Figure 4-1 Debug board – Debug interfaces	11
Figure 4-2 Debug board DIP switches and power inputs	12
Figure 4-3 MTP9x45-NS with debug board attached	13
Figure 4-4 Main board DIP switch locations	14
Figure 6-1 As-built method.....	17
Figure 6-2 Power supply cable.....	18
Figure 6-3 Alternate method.....	19
Figure 7-1 MDM9x40 MTP setup	20

Tables

Table 4-1 S1 debug board DIP switch assignments.....	13
Table 4-2 S5 debug board DIP switch assignments.....	14
Table 4-3 Main board DIP switch assignments	15
Table 4-4 Fastboot settings	15

1 Introduction

1.1 Purpose

This document is a guide to the setup and configuration of the MDM9x45-NS (nonstacked) MTP device. This document briefly covers device hardware and is intended to provide a quick reference to setting up the device and updating its software.

The MDM9x45-NS MTP is the development platform for the MDM9x40 chipset using external LP-DDR2 memory.

1.2 Conventions

Function declarations, function names, type declarations, attributes, and code samples appear in a different font, for example, `#include`.

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

Shading indicates content that has been added or changed in this revision of the document.

1.3 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 CDMA Tech Support website, register for access or send email to support.cdmatech@qti.qualcomm.com.

2 MDM9x45-NS MTP Mechanical Design

2.1 Device form factor

Figure 2-1 shows the MDM9x45-NS MTP device form factor. The MTP shown also includes the optional display.

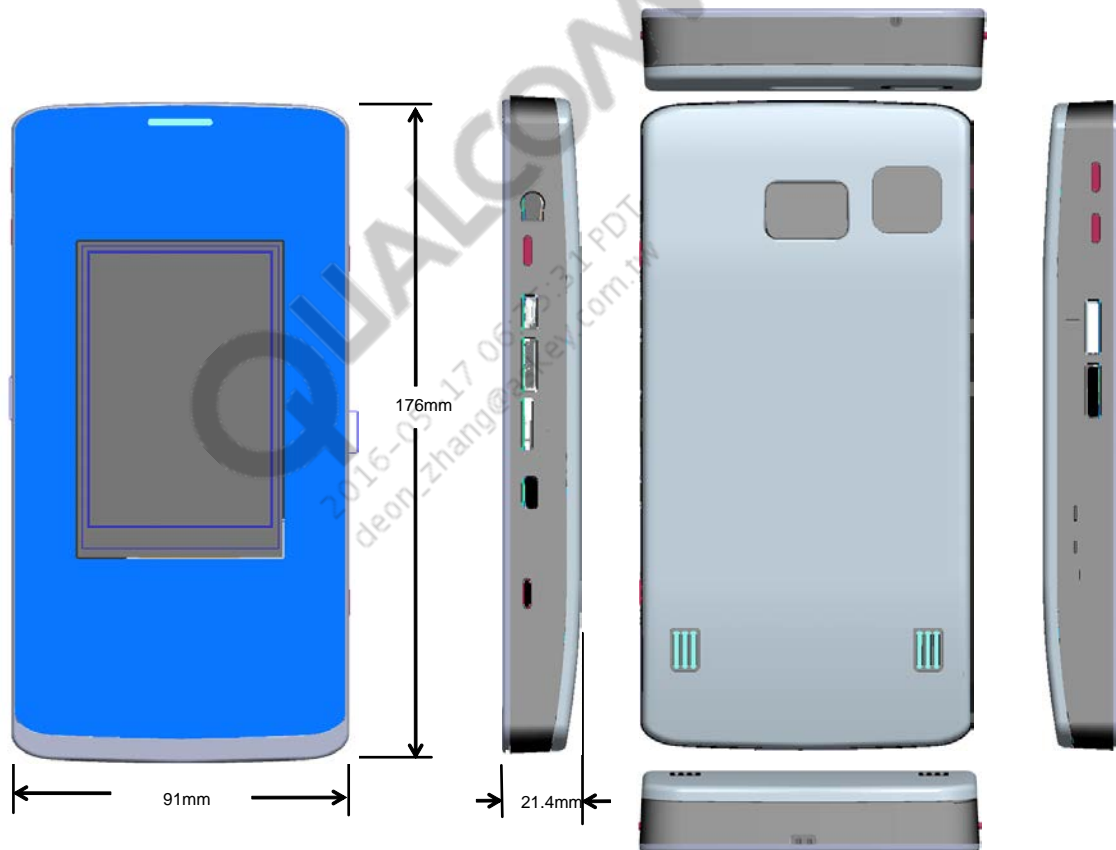


Figure 2-1 MDM9x45-NS MTP form factor

2.2 Physical locations

Figure 2-2 shows the locations of some important connectors and switches.

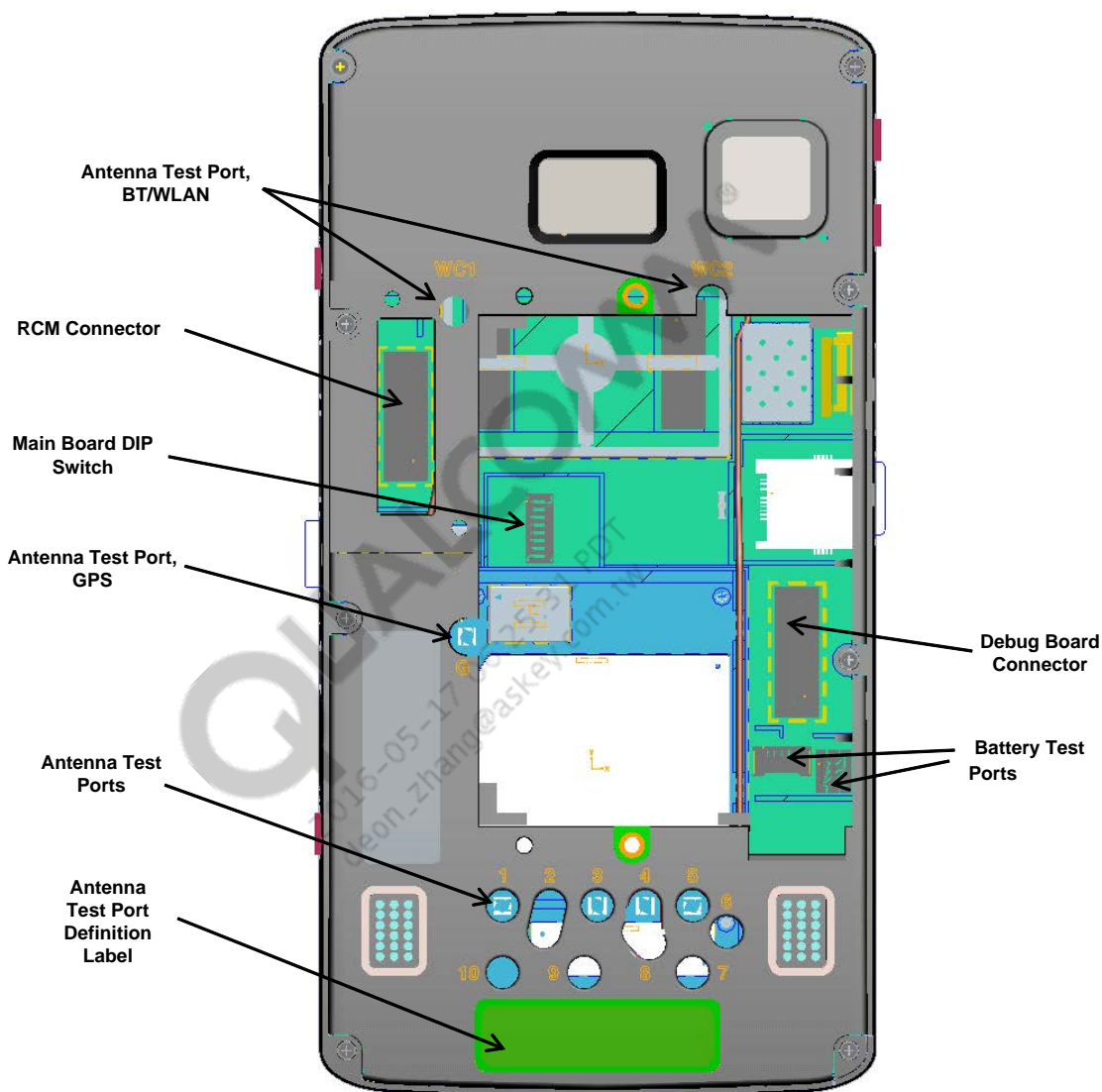


Figure 2-2 MDM9x45-NS MTP connectors and switch locations

Figure 2-3 shows the MDM9x45-NS MTP buttons, USB, audio connectors, and SD card.

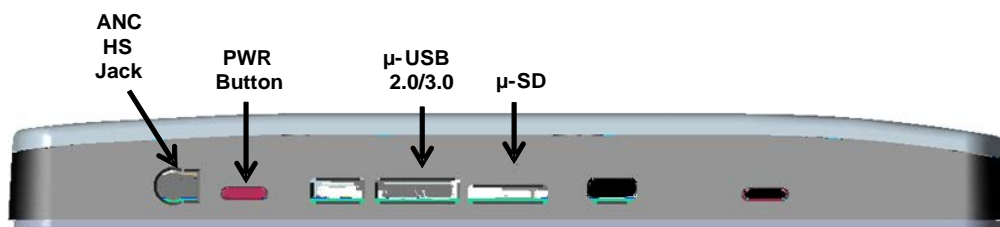


Figure 2-3 MDM9x45-NS MTP buttons, USB, audio connectors, and SD card

Figure 2-4 shows the MDM9x45-NS MTP UIM and volume buttons.



Figure 2-4 MDM9x45-NS MTP UIM and volume buttons

Figure 2-5 shows the SIM slot identifier.

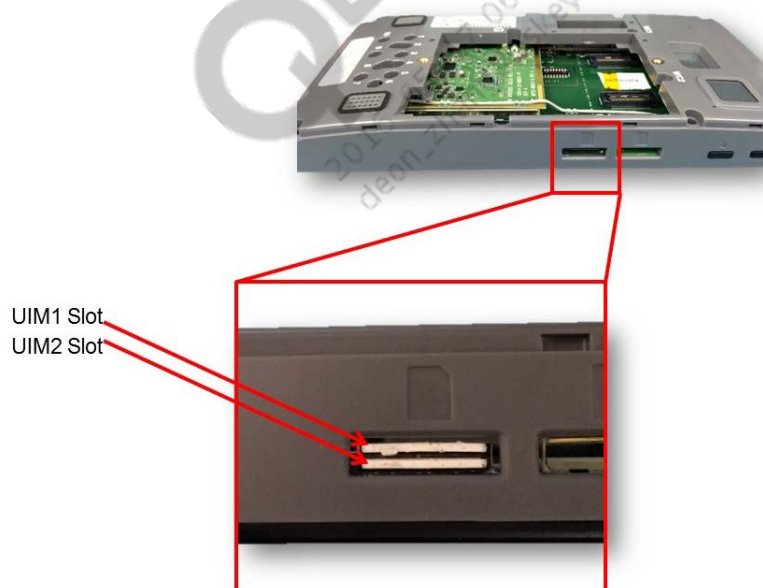


Figure 2-5 SIM slot identifier

3 SIM Configuration

The UIM driver is configurable to use SIM SLOT1 or SIM SLOT2. To use the secondary SIM slot, configure NV item 70210 to disable the primary slot (Slot 1) and enable the secondary slot (Slot 2).

- To enable the primary slot (Slot 1):

```
NV 70210
hw_config.UIM[0].DISABLE_UIM = FALSE
hw_config.UIM[1].DISABLE_UIM = TRUE
```

- To enable the secondary slot (Slot 2):

```
NV 70210
hw_config.UIM[0].DISABLE_UIM = TRUE
hw_config.UIM[1].DISABLE_UIM = FALSE
```

For the physical locations of the UIM1 and UIM2 slots, see [Figure 2-4](#).

4 MTP and Debug Fixture Configurations

4.1 Debug board DIP switch settings

Figure 4-1 shows the debug board DIP switch settings and power inputs.

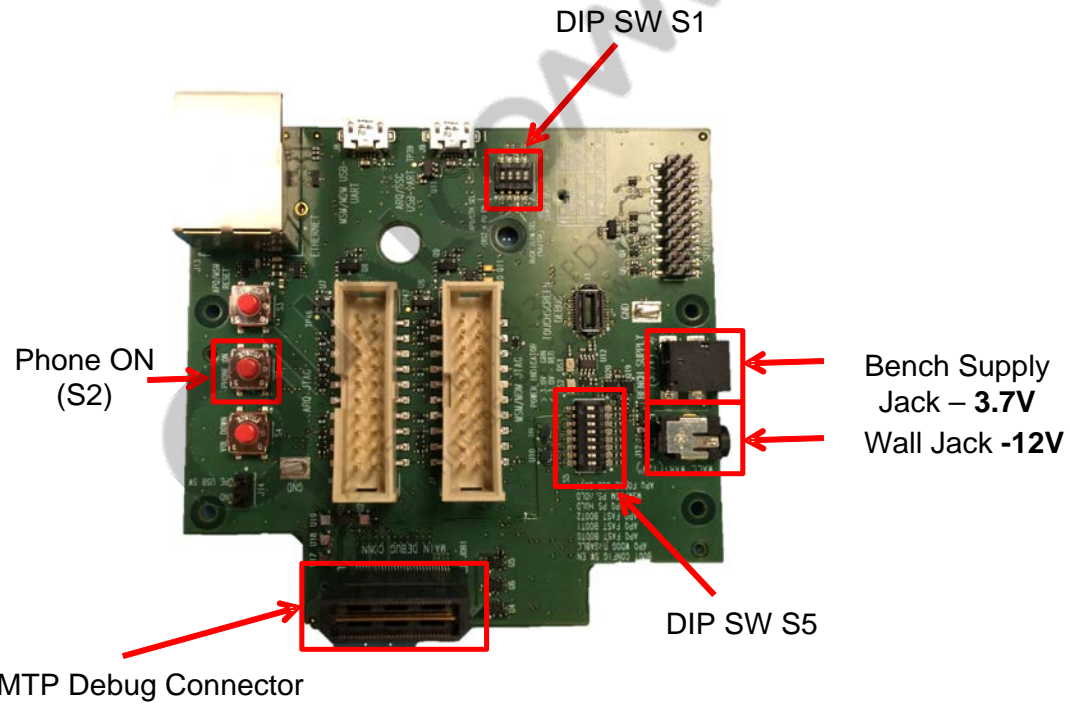


Figure 4-1 Debug board – Debug interfaces

Figure 4-2 shows the debug interfaces on the debug board.

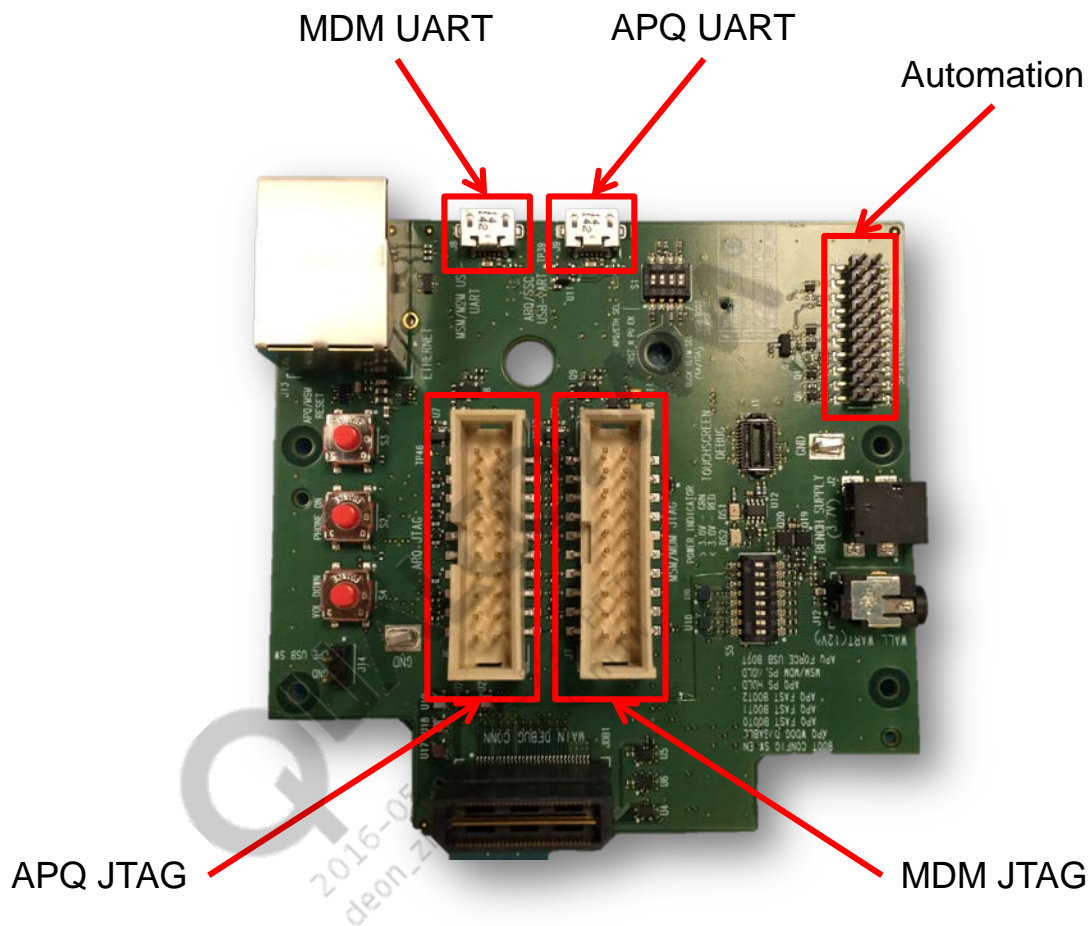


Figure 4-2 Debug board DIP switches and power inputs

Figure 4-3 shows the MTP9x45-NS with the debug board attached.

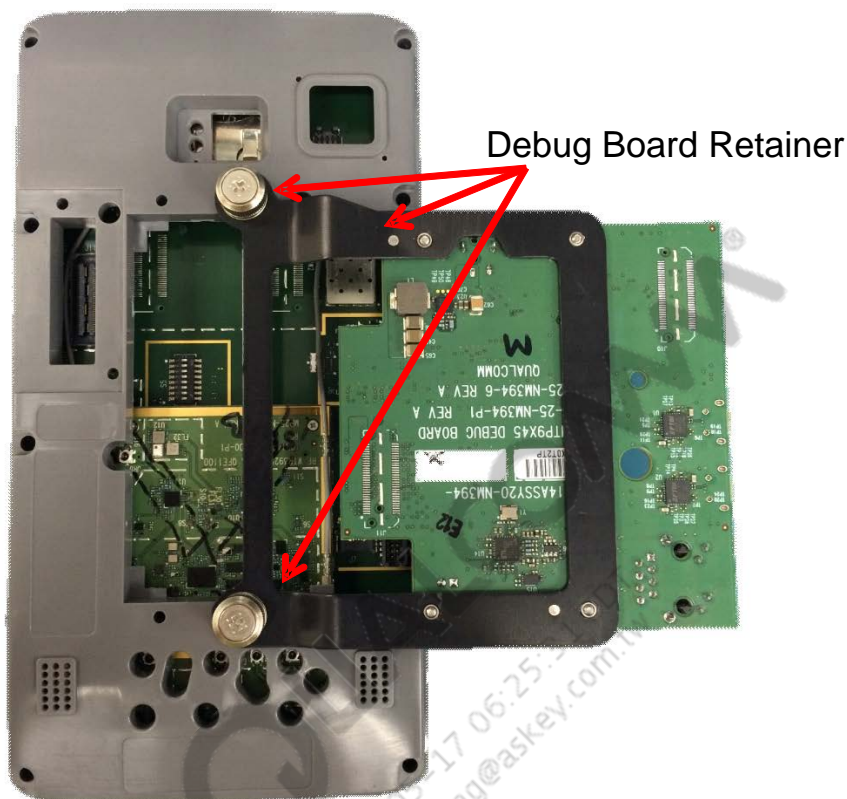


Figure 4-3 MTP9x45-NS with debug board attached

NOTE: MDM9x45-NS BOOT_CONFIG DIP switches are located on the main board where the MDM9x40 IC is located. They are *not* located on the debug board. See Section 4.2 for main board DIP switch settings.

Table 4-1 S1 debug board DIP switch assignments

Switch	Netname	Default	Option
S1-1	NA	Off	<ul style="list-style-type: none"> Not used, leave in OFF position
S1-2	JTAG_TRST	Off	<ul style="list-style-type: none"> On – Internal use only (Do not use) Off – JTAG_TRST driven by JTAG with no Pull-ups
S1-3	Auto Power	Off	<ul style="list-style-type: none"> On – Auto ON, MTP powers on as soon as power is applied to Debug Board Off – Manual ON, PHONE_ON button (S2) has to be pressed to turn on MTP
S1-4	NA	Off	<ul style="list-style-type: none"> Not used, leave in OFF position

Table 4-2 S5 debug board DIP switch assignments

Switch	Netname	Default	Option
S5-1	NA	NA	NA
S5-2	NA	NA	NA
S5-3	NA	NA	NA
S5-4	NA	NA	NA
S5-5	NA	NA	NA
S5-6	NA	NA	NA
S5-7	MDM_PS_HOLD	Off	<ul style="list-style-type: none"> On – MDM_PS_HOLD pulled high Off – MDM_PS_HOLD controlled by JTAG_DET_N
S5-8	NA	NA	NA

4.2 MTP main board DIP switch for MDM9x45-NS

Figure 4-4 shows the main board DIP switch locations.

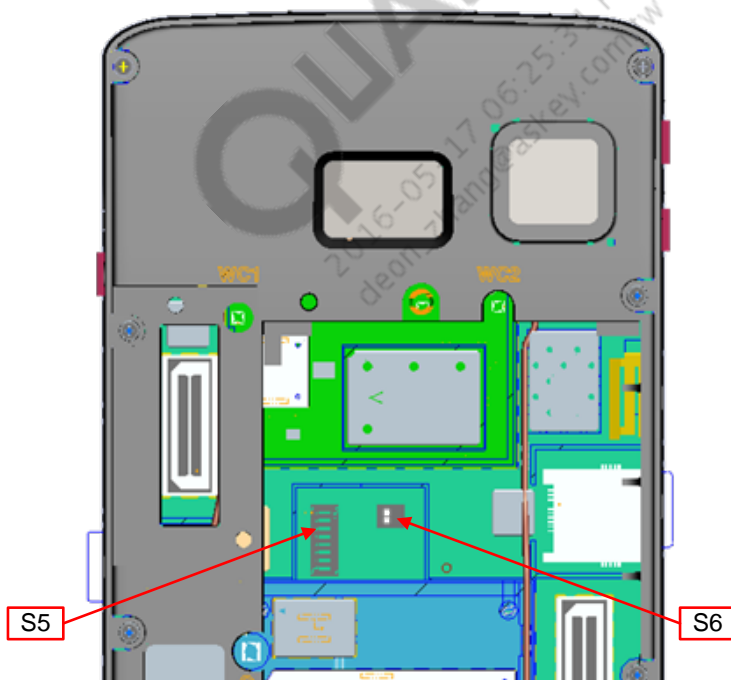
**Figure 4-4 Main board DIP switch locations**

Table 4-3 shows the main board S5 DIP switch assignments.

Keep switches on main board DIP switch S6 in the **Off** position.

Table 4-3 Main board DIP switch assignments

Switch	Netname	Default	Option
S5-1	SS USB Boot (Only available when S5-6 "Forced MDM USB Boot" is On)	Off	<ul style="list-style-type: none"> On – Enabled Off – Disabled
S5-2	MDM FAST_BOOT_SELECT_2	Off	<ul style="list-style-type: none"> On – High Off – Low
S5-3	MDM FAST_BOOT_SELECT_1	Off	<ul style="list-style-type: none"> On – High Off – Low
S5-4	MDM FAST_BOOT_SELECT_0	Off	<ul style="list-style-type: none"> On – High Off – Low
S5-5	Watchdog Timer Disable	Off	<ul style="list-style-type: none"> On – Disabled Off – Enabled
S5-6	Forced MDM USB Boot	Off	<ul style="list-style-type: none"> On – Enabled Off – Disabled
S5-7	NA	Off	<ul style="list-style-type: none"> Not used
S5-8	NA	Off	<ul style="list-style-type: none"> Not used leave OFF

Table 4-4 shows the fastboot settings.

Table 4-4 Fastboot settings

Boot_Config_2	Boot_Config_1	Boot_Config_0	
0	0	0	NAND, USB if NAND boot fails
0	0	1	PCIe
0	1	0	USB
–	–	–	All other configs invalid

4.3 Push buttons

The MDM9x45-NS MTP has the following access points:

- Hardware power (power switch button)
- Reset – Power and volume down
- Fastboot – Volume up

See Figure 2-3 and Figure 2-4 for button locations.

5 Shipment Information

This chapter describes the hardware and software components shipped as part of the MDM9x45-NS MTP package.

5.1 Hardware components

The hardware components are:

- Main baseband board
 - MDM9x40
 - PMD9645
 - WCD9330 – Audio codec (I2S default)
 - Memory
 - 4 GB x8 NAND
 - 2 GB x32 LPDDR2
- QFE Global 3DL RF card (Subject to change based on RF configuration)
 - WTR3925
 - WTR4905
 - QFE2340/QFE3335/QFE3345
 - QFE1035/QFE1040/QFE1045
 - QFE3100
- WLAN/BT card – QCA6174A-1
- Debug board
- Internal antennas
- 27 SPM channels (power)

5.2 Software components

The shipped MTP is preflashed with the TN build. MTP is calibrated before shipping and has a valid QCN, which should be backed up for future usage.

6 Quick Hardware Setup and Usage

6.1 Bench setup for testing

There are three battery emulation methods:

- As-built method
- Power supply cable (Debug Board) method
- Power supply cable (MTP Main Board) method

6.1.1 As-built method

Figure 6-1 shows the as-built method, connecting the debug board to the MTP and the wall wart to the debug board.



Figure 6-1 As-built method

6.1.2 Power supply cable (Debug Board) method

A power supply cable (MCN: 364-78245-0000) may be used with an external power supply for VBATT when the buck regulator on the debug board is not used. For this configuration, the debug board must be installed. Adjust the external power supply nominal output (input to Debug Board) to +3.7 VDC and do not adjust higher than +4.4 V.



Figure 6-2 Power supply cable

6.1.3 Power supply cable (MTP Main Board) method

In this configuration, the deluxe debug board is not used as VBATT for the MTP. Instead, the power supply cable mates to the battery connector on the MTP's Main board. In this configuration, the external VBATT source must be properly adjusted to a nominal voltage of +3.7 VDC and should not exceed +4.4 V.



Figure 6-3 Alternate method

7 Quick Software Setup and Usage

The shipped MTP is preflashed with the TN build, which uses L4 as the microkernel for AMSS software. MTP is calibrated before shipping and has a valid QCN, which should be backed up for future usage. Although the QCN is generated for the TN build, it is still applicable for the LE build, hence the same QCN should be used in case the user wants to flash the LE build instead of the preflashed TN build. To set up the MTP, follow the flowchart in [Figure 7-1](#).

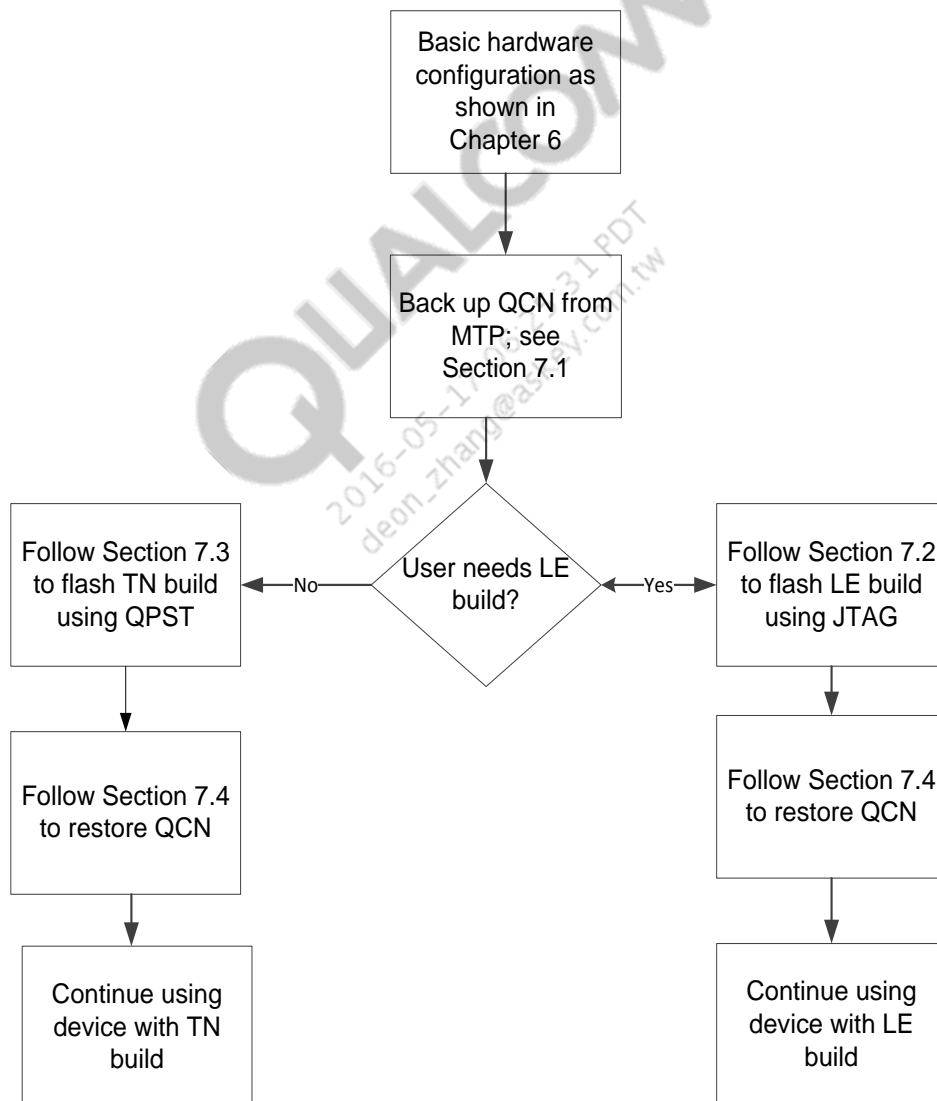


Figure 7-1 MDM9x40 MTP setup

Refer to *MDM9x40/MDM9x45 LE Build and Integration Guide* (80-NP527-11) for installing Android™ adb, fastboot, and host USB interface.

7.1 Backing up a .qcn file from a device

Before backing up a .qcn file from the device, QPST must be set up using the instructions in Qualcomm Product Support Tool (QPST) 2.7 User Guide, 80-V1400-3.

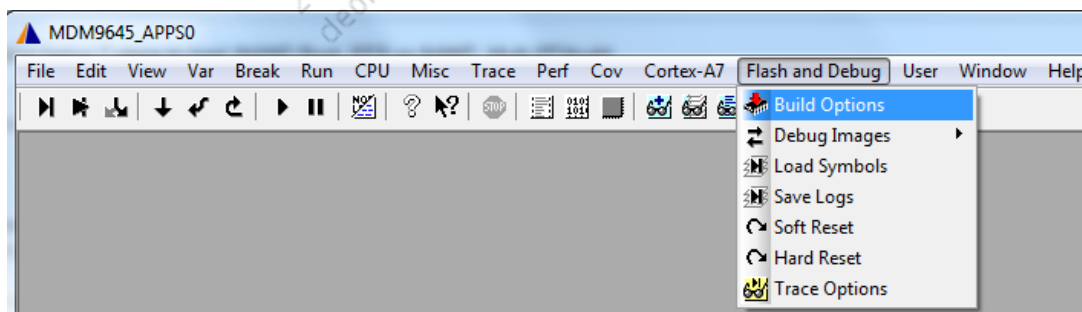
To back up a .qcn file from the device:

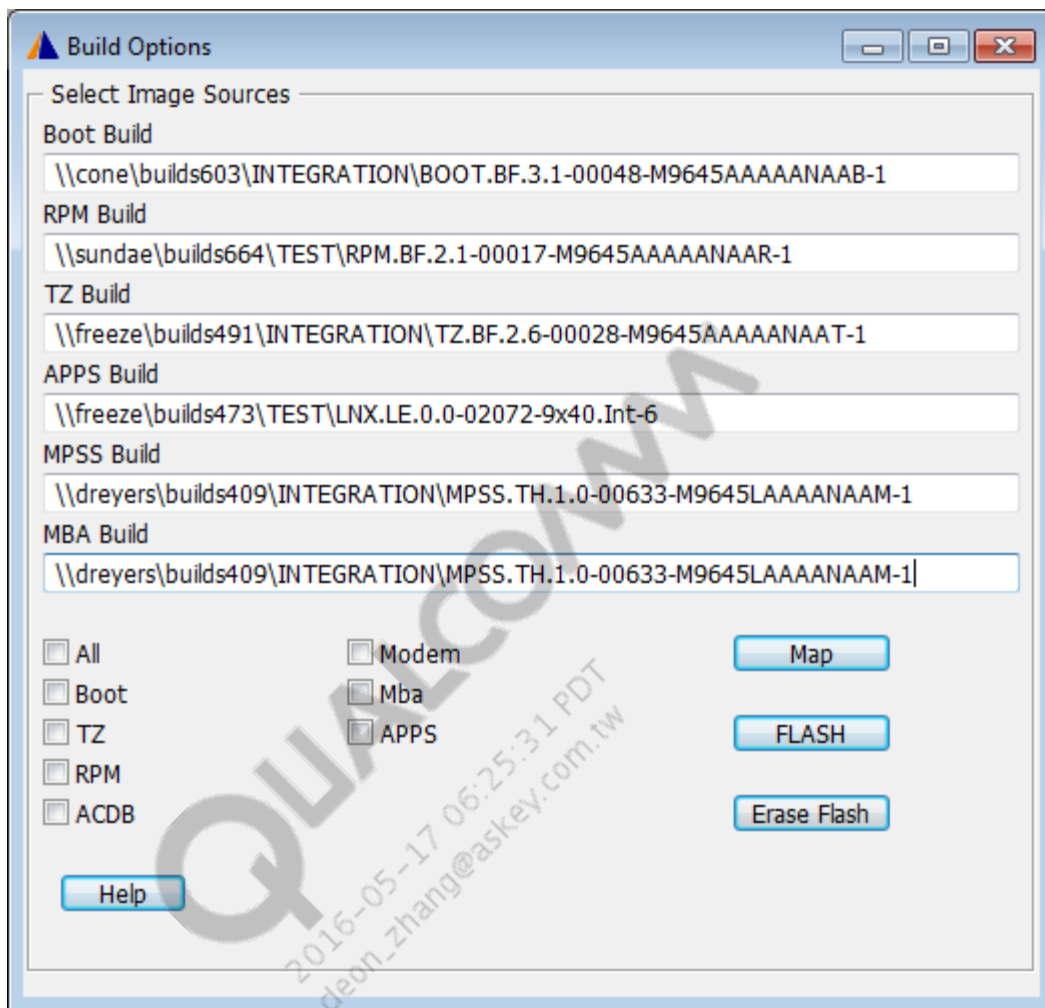
1. Connect the MTP using USB.
2. Click **Start** and select **Programs**→**QPST**→**Software Download**.
3. Select the Backup tab.
4. Browse for and select your device.
5. Browse for and select where to put the .qcn file.
6. Click **Start** to back up the .qcn file.

7.2 Flashing the LE build

To flash the LE build:

1. Connect the JTAG to the MTP.
2. Connect the USB to the MTP.
 - Download the Qualcomm USB host driver at <http://support.cdmatech.com/>. Go to Documents and Downloads/Software Tools/USB Drivers Software Code/USB_WWAN_WINDOWS10025, and refer to the readme file inside the driver package.
3. Open Trace32 ARM Cortex-A7 windows.
4. Click on **FLASH and Debug** and choose **Build Options**.





5. Erase the device, click **Erase Flash**.

```
Erasing entire chip
+++++ Erase Chip Succeeded
Entire Chip is Erased
```

6. Flash the images, check **All**, click **Map**, and click **Flash**.

- After JTAG loading is finished, a new CMD window automatically opens and it will flash all APSS and NHLOS images in Fastboot mode.

```
X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>fastboot flash boot \\freeze\
builds473\TEST\LNK.LE.0.0-02072-9x40.Int-6\apps_proc\oe-core\build\tmp-eglibc\de
ploy\images\mdmzirc\mdmzirc-boot.img
target reported max download size of 110100480 bytes
sending 'boot' (5340 KB)...
OKAY [ 0.164s]
writing 'boot'...
OKAY [ 0.734s]
finished. total time: 0.904s

X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>fastboot flash system \\freez
e\builds473\TEST\LNK.LE.0.0-02072-9x40.Int-6\apps_proc\oe-core\build\tmp-eglibc\
deploy\images\mdmzirc\mdmzirc-sysfs.ubi
target reported max download size of 110100480 bytes
sending 'system' (16896 KB)...
OKAY [ 0.508s]
writing 'system'...
OKAY [ 2.343s]
finished. total time: 2.857s

X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>fastboot flash userdata \\fre
eze\builds473\TEST\LNK.LE.0.0-02072-9x40.Int-6\apps_proc\oe-core\build\tmp-eglib
c\deploy\images\mdmzirc\mdmzirc-usrfs.ubi
target reported max download size of 110100480 bytes
sending 'userdata' (27392 KB)...
OKAY [ 0.799s]
writing 'userdata'...
OKAY [ 4.599s]
finished. total time: 5.404s

X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>fastboot flash modem \\dreyer
s\builds612\INTEGRATION\M9640AAATWNLBD100013.1\common\tools\cmm\...\build\NON-
HLOS.ubi
target reported max download size of 110100480 bytes
sending 'modem' (41472 KB)...
OKAY [ 1.202s]
writing 'modem'...
OKAY [ 5.632s]
finished. total time: 6.838s

X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>fastboot continue
resuming boot...
OKAY [ 0.012s]
finished. total time: 0.014s

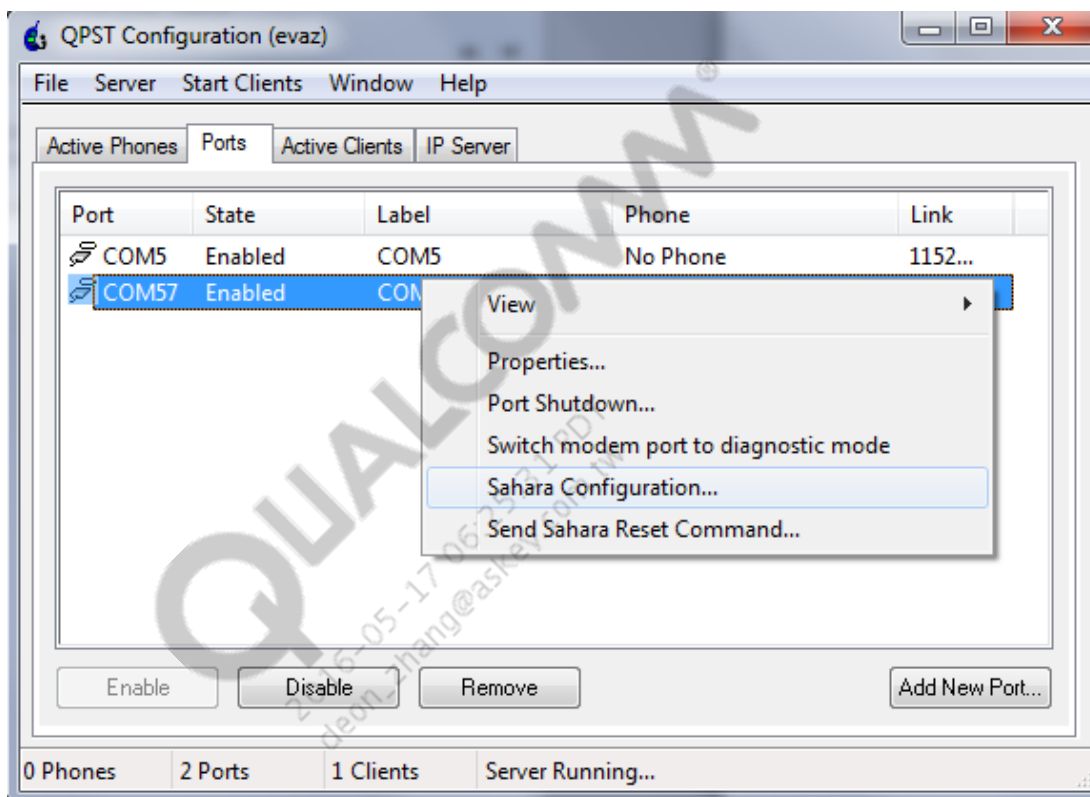
X:\INTEGRATION\M9640AAATWNLBD100013.1\common\build>timeout /t 10

Waiting for 9 seconds, press a key to continue ...
```

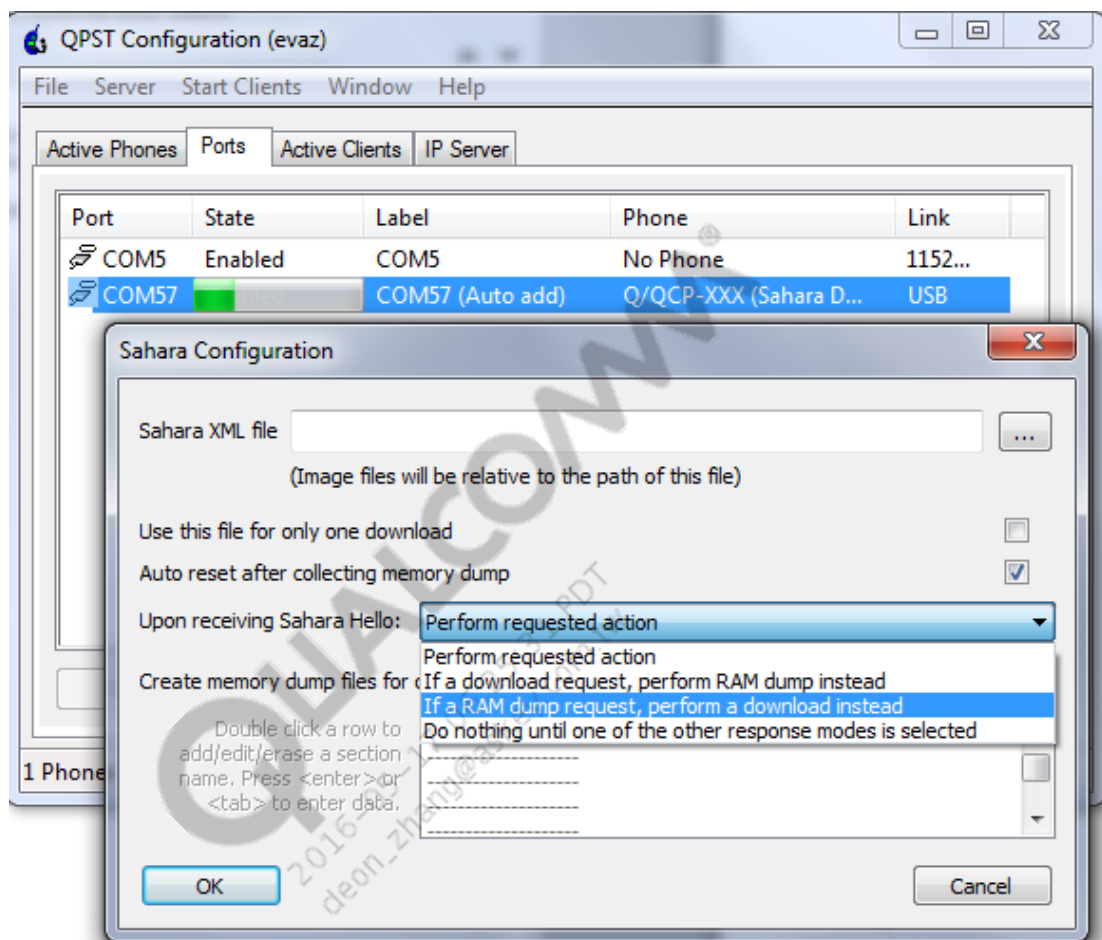
7.3 Flashing the TN build using QPST

As a prerequisite to flashing the APSS and non-HLOS images, verify that the latest version of QPST is installed. To flash the APSS and non-HLOS images:

1. Open QPST Configuration.
2. Right-click the port on which the phone is present and select **Sahara Configuration**.

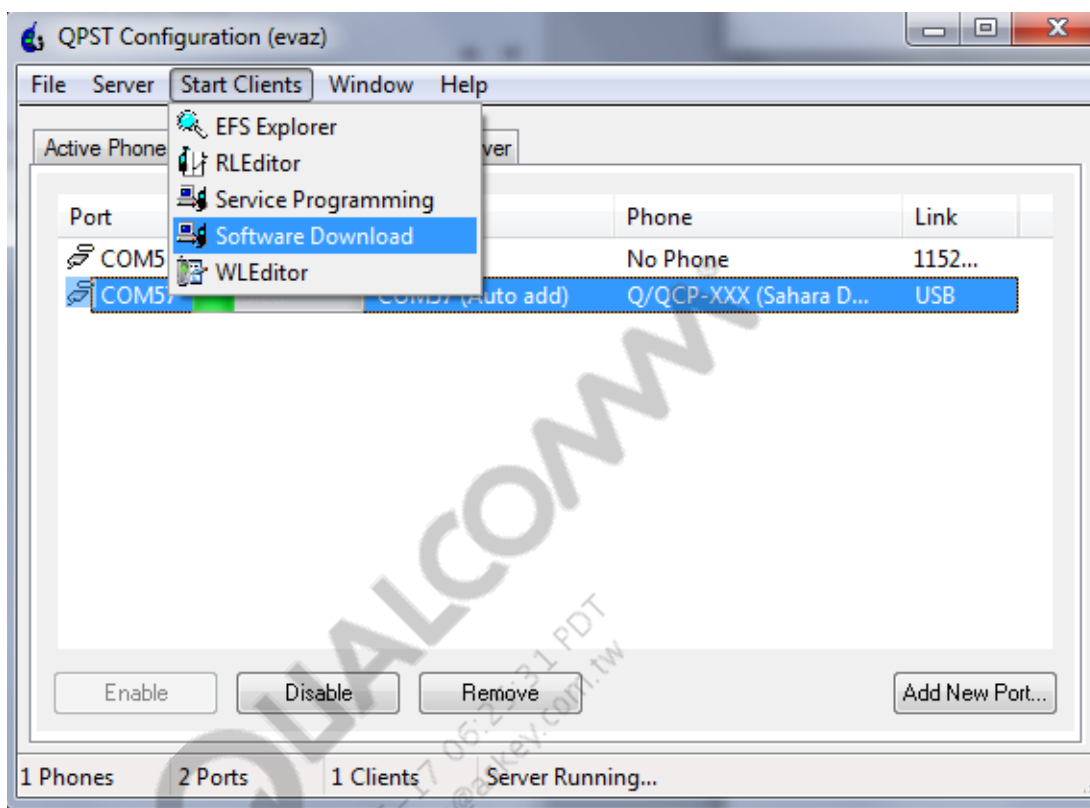


3. In the Upon receiving Sahara Hello drop-down menu, select **If a RAM dump request, perform a download instead**.

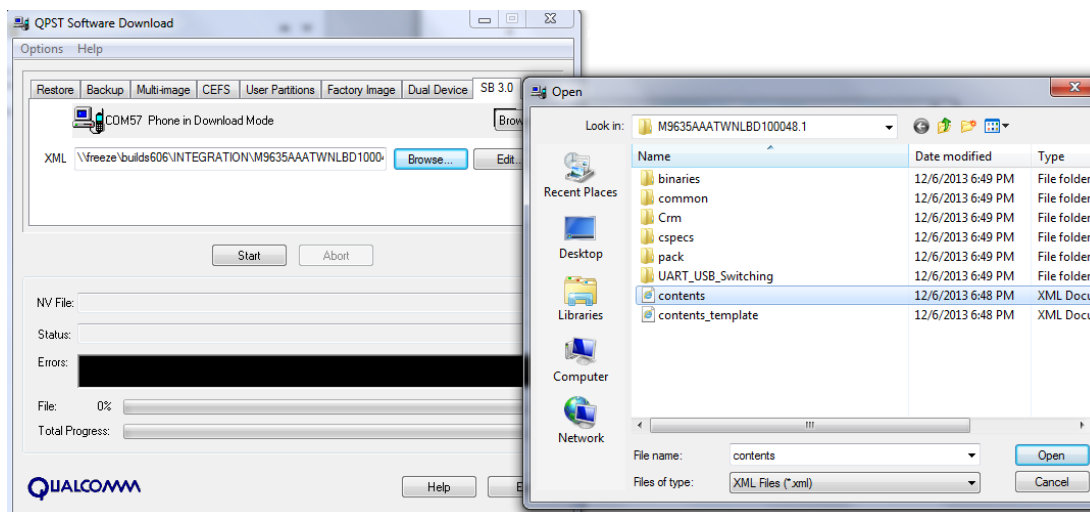


4. Click **OK**.

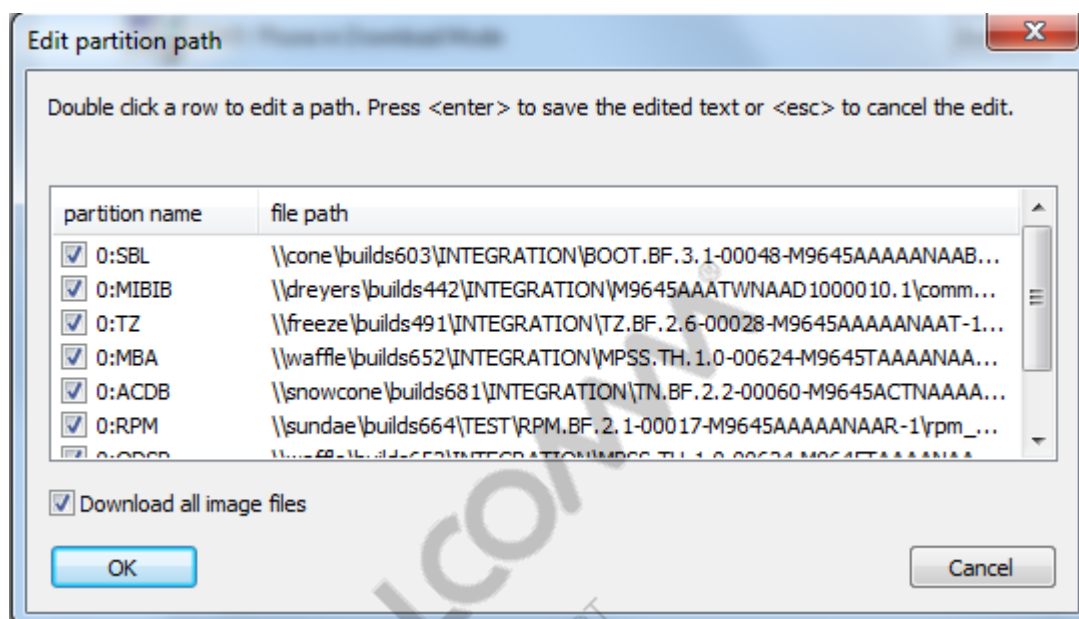
- Click **Start Clients**→**Software Download**.



- Scroll to the right and click the **SB 3.0** tab.
- Click **Browse** next to the XML input field.
- Navigate to the metabuild (common build) location, select contents.xml, and click **Open**.



9. Click the Edit button to click the checkboxes of the download images.



10. Click **OK**.
11. Click **Start**.

7.4 Restoring a backup .qcn file to a device

Before restoring a backup .qcn file to a device, install QPST using the instructions in Qualcomm Product Support Tool (QPST) 2.7 User Guide, 80-V1400-3.

To restore a backup .qcn file to a device:

1. Connect the MTP device via USB.
2. Click **Start** and select **Programs**→**QPST**→**Software Download**.
3. Select the Restore tab.
4. Browse for and select your device.
5. Browse for and select your .qcn file. Note that you cannot use .qcn files intended for/taken from other devices, since each device is calibrated independently. The .qcn files are not interchangeable between serial numbers.
6. Click **Start** to reload the .qcn file.

A References

A.1 Related documents

Title	Number
Qualcomm Technologies, Inc.	
<i>Qualcomm Product Support Tool (QPST) 2.7 User Guide</i>	80-V1400-3
<i>MDM9x40/MDM9x45 LE Build and Integration Guide</i>	80-NP527-11

A.2 Acronyms and terms

Acronym or term	Definition
NS	Nonstacked
MTP	Modem Test Platform