Qualcomm
TECHNOLOGIES, INC

CT TA Test Manual

Application Note

80-NM982-2 A

September 30, 2014

Submit technical questions at:
https://support.cdmatech.com/

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Revision history

Revision	Date	Description
A	Sep 2014	Initial release

Note: There is no Rev. I, O, Q, S, X, or Z per Mil. standards.

1 Introduction

1.1 Purpose

This document summarizes the experience while passing CT and CTA test. OEMs can refer to this document to do related configurations and trouble shootings.

1.2 Scope

This document is applicable to DIME 3.0 and DPM1.0 SRLTE/SVLTE products.

1.3 Conventions

Function declarations, function names, type declarations, and code samples appear in a different font, e.g., `#include`.

If you are viewing this document using a color monitor, or if you print this document to a color printer, **red boldface** indicates code that is to be **added**, and ~~blue strikethrough~~ indicates code that is to be replaced or removed.

1.4 References

Reference documents are listed in Table 1-1. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.

Table 1-1 Reference documents and standards

Ref.	Document	
Qualcomm Technologies		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Q2	*Application Note: Code Changes for Making Emergency Call to be Originated on CDMA in China*	80-NA121-1
Q3	*Application Note: Enabling QMI Call for CT Conformance Test*	80-NT259-1
Q4	*Application Note*: CT BIP Test Common Issues and Debug Hint	80-NT296-1

1.5 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 Service website, register for access or send email to support.cdmatech@qti.qualcomm.com.

1.6 Acronyms

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

2 MBN Introduction

QC strongly suggests that MBN is used to eliminate configuration problem as much as we can. MBN introduction is already sent to all the customers. If OEM has any problem on MBN, you can contact TAM. We can provide face-to-face training in QC Shanghai office.

3 CT Test Summary

This chapter introduces key information for CT test.

1. Please label all devices with UE1/UE3/TEST according to different MBN configurations.
2. Please read this document and all the documents mentioned below during CT/CTA LE preparation.
3. When any issue is reported during the test, please fill cases with failure logs immediately. Please indicate CT failure case number like “TC-eHRPD-PCT-0101” in the case title.
4. We have regular onsite support team for Guangyuan CT test. Please contact them or call hotline directly when you meet any issue here.
5. TAM/DRI would send mail notification about latest known issue (CR and test code), please pay attention to the information and make modification per our suggestion. Please also check our monthly tech Journal which should contain CT issue summary as well.
6. The discussion on test mode between QC and CT is ongoing. If there is any conflict with CT on below setting during test, please contact QC onsite support team or your TAM ASAP.

3.1 Commercial/UE1/UE3/TEST stage configuration

Table 3-1 Commercial/UE1/UE3/TEST settings

SRLTE+G	Commercial	SRLTE_USIM _UE1	SRLTE_EPS_ONLY_ UE3	CT_SRLTE+G_ DSDS_TEST
NV10 Digital/Analog Mode Preference	Automatic	Automatic	Automatic	Automatic
NV65777 UE Usage Setting	Voice Centric	Data Centric	Data Centric	Data Centric
PM	subsidized	subsidized	subsidized	test
NV 850 CSPS/EPS only	CSPS	CSPS	EPS only	CSPS
NV70302 operator_name	70302=1	70302=0	70302=0	70302=1

3.2 Typical CT test issue

3.2.1 UE fails to camp on LTE network

Solution:

1. Please check if configuration is right per Table 3-1 at first. For lab test, especially LTE conformance test, **NV70302** should be **0** to disable CT features.
2. Please make sure CT SIM lock feature is disabled

3.2.2 LTE attach process fails

Solution:

For some CT Lab test, it needs to set APN NULL profile.Please refer to Chapter 5.2 to make code changes. Please note that CT will have some item in “basic function test” to check if APN meets their requirement. OEM needs to send different device for “basic function test” and tag the device carefully NOT to use NULL APN for “basic function test. For long term, we are planing better solution to avoid such complex operation.

3.2.3 UE fails to register 1x network under 1xSRLTE mode

Solution:

Please make sure Voice Centric/Data Centric mode is right as Voice Centric mode.

3.2.4 Sometimes FDD_SRLTE-03002 will fail due to no response for ping from UE side

Solution:

It is due to power save design and we will have DPM feature to filter out some ICMP packets. We suggest to disable DPM for lab test and it would not happen in commercial scenario.

```
adb root
adb wait-for-devices
adb shell setprop persist.dpm.feature  1 (if value is 3, it means enabled)
```

3.2.5 CT/CTA test may require 1st ECC from C sub.

Solution:

Please implement the code changes per to [Q2].

4 CT International Roaming

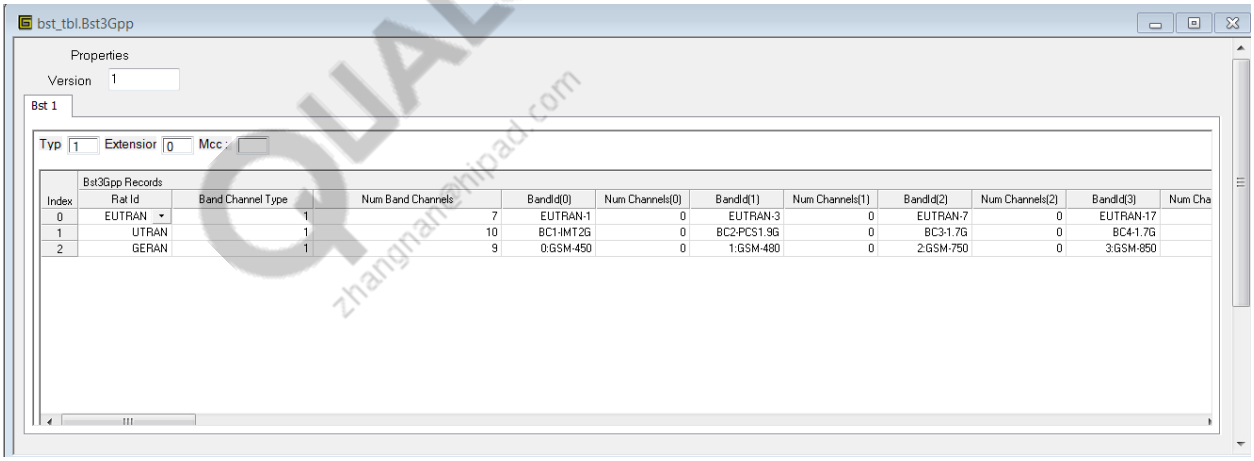
This chapter introduces the necessary configuration and experience for CT IR test.

4.1 CT IR test configuration

4.1.1 bst_tbl

Please load QC provided `bst_tbl` file to `EFS/sd` path to optimize scans in a location area.

Figure 4-1 bst_tbl



4.1.2 spv_timer_connected

Please load QC provided `spv_timer_connected` file to `nv/item_files/modem/lte/ML1/`. The EFS file has a default value of 88 13 indicate that the timer value is 5000 ms. This is a tentative value and is determined based on testing and performance characterization.

4.1.3 noservice value in carrier_policy.xml file

Change “noservice” from 20 mins to 2mins in `carrier_policy.xml`. To fix HK back to SZ, LTE OOS but long time cannot go back on 1x issue.

```
      <!-- Define the OOS timer with a 2 minute interval -->
      <define_timer name = "noservice" interval = "2" units = "min" id =
"1" />
```

4.1.4 sxlte_mccs value in carrier_policy.xml file

Exclude the 310 from “sxlte_mccs” in `carrier_policy.xml`. To fix one roaming issue related to ATT network.

```
<!-- List of the MCCs in which SRLTE is allowed -->
<mcc_list name="sxlte_mccs"> 455 460 001 ~~310~~ 330 374 </mcc_list>
```

4.2 Typical FT test issue

4.2.1 1x MT call miss issue

When UE was power up and it cannot search LTE. UE will do BSR to search LTE which deactivate 1x. This will cause 1x miss page and impact 1x MT call setup rate

Solution:

There is an enhancement in the field test with CR 715836. It will solve the above issue. With this enhancement, LTE will search in the background which will not impact 1x MT page performance. New NV 73561 will be used for controlling this feature. The default value was TRUE which enable this feature. So MBN should not do any further modification. This CR is alrady included from release of 8916 9/25 release.

4.2.2 Emergency call fails

Emergency call fails due to wrong pbm_hardcoded_ecc_list configuration which is empty. This bug is introduction in 8916 9/11,9/18 release

Solution:

We already have CR726291 to fix this issue and this CR will be part of 8916 9/25 mainline release.

5 Data Service

This chapter introduces data service configuration and issue summary.

5.1 Profile configuration

5.1.1 LTE profile

For LTE, the APN name should be "ctlte".

5.1.2 eHRPD profile

For eHRPD, the `profile_000.txt` should be properly configured. The APN name is "ctlte", this should be the same as LTE's APN name. Make sure put `profile_000.txt` file to EFS folder `/application_specific_profiles/`

The `profile_000.txt` example:

```
APN_String:  ctlte;
PDN_Label:   internet;
PDN_IP_Version_Type:  V4_V6;
RAN_Type:  HRPD_eHRPD;
```

5.1.3 1x/HRPD

For CT NW, set **NV#67291** (internal_auth) to **0**. This will make modem use PPP username/password from AP APN setting.

5.2 Set NULL APN for Lab test

For some test scenario, OEM needs to set NULL APN for the CT test.

Scenario:

In CT LAB Test, the scenario below is very common and it will cause issue:

1. The UE already be powered on and be used before, that means it is not the first time to boot on when LAB Test. This will cause the UE already attach to LTE before.
2. The LAB's LTE Attach APN is configured different with the UE's Preloaded value or last time value, for example:

a. The CT's commercial APN is CTLTE, but the LAB's is different

b. Or the UE be inserted with CU/CMCC/LAB's USIM Card and used before

3. The LAB Equipment should be configured as LTE only

With Above scenario, when the UE be booting in LAB, since the Last attaching LTE APN is different with the LAB's expectation, so the UE will failed to attach LTE.

Solution:

1. Push the empty Apn config xml to system:

   a. **adb root**

   b. **adb remount**

   c. **adb push apns-conf.xml /system/etc (push the empty APN config xml to system as below)**

   apns-conf.xml:

```
<apn carrier="null"
      mcc="440"
      mnc="10"
      apn=""
      user=""
      server=""
      password=""
      mmsc=""
      type="ia"
       protocol="IPV4V6"
/>
```

   d. **adb shell sync (Replace the mcc/mnc with the one corresponding to the IMSI of the Sim card used.)**

2. Go to Settings->More->Mobile networks->Access points: Menu-> Reset to default. After this step you should see the newly added "null" apn in the list.

3. With steps above, the APN will be empty in AP side, since maybe the UE already be used before, so you need also empty the profiles in MP side to restore the UE to initial state.

Use QPST to delete the "`data`" and "`pdp_profiles`" folder in MP side,then click the QPST's reset to restart the UE (this is important, you must use QPST's reset to restart the UE, otherwise the File operation via QPST will not take effect)

4. **adb reboot**

5. Now after the UE restarts, the initial LTE attach will use the NULL APN (NW allocates the APN) to attach, it surely will successful. Then Tester can add the expected APNs per Lab requirement via Modem Tool or Via APN UI.

6. Now, when tester enters into the APN List UI, it is for the USIM LTE Card/IMSI in Multi-mode Card Mode, so tester can add the expected APNs per LAB requirement via APN UI and select it. The UE will trigger the LTE re-attach by the new created/selected APN immediately.

6 IRAT Test

6.1 Typical iRAT issue

6.1.1 iRAT issue between LTE and eHRPD

handoff fails due to profile mismatch. While device is eHRPD, OMH profile is selected instead of eHRPD profile from EFS.

Solution:

Please make sure CR691825 is merged in the build. This CR is in latest 8916 post CS2 baseline.

In `ds707_data_session_profile.c`, need to add the yellow part below.

```
ds707_data_session_profile_id ds707_data_session_get_default_profile
(
  void
)
{
  ds707_data_session_profile_id profile_id;

  if ( ds707_data_session_is_nvruim_profiles_available() &&
       ( ( (ds707_pkt_mgr_get_current_sys_mode() == SYS_SYS_MODE_HDR) &&
           (ds707_pkt_is_ehrpd_mode_of_operation() == FALSE) ) ||
         ( ds707_pkt_mgr_get_current_sys_mode() == SYS_SYS_MODE_CDMA ) ) )
  {
    profile_id = ds707_data_session_get_default_profile_id();
  }
  else
  {
    profile_id = DATA_SESSION_DEFAULT_PROFILE;
  }

  return profile_id;
}
```

6.1.2 iRAT issue with USB tethering mode

Fail to do IPv6 data service under USB tethering mode.

Solution:

Please make sure Linux CR654872 is merged in the build. It will affect some iRAT test case related to USB tethering.

7 UIM and BIP Test

7.1 NV setting for card

Please make sure below configuration for BIP test. For those OEM not using MBN, reminder them to make sure NV65674 = C6. Latest MBN should have correct setting for it.

- NV65683 = Android
- NV6876 = 5 (Auto)
- NV65674 = 0x20C6

7.2 Log mask

To capture the log completely in one time, you need to enable options below in your QXDM log:

```
MSG [00021/02] User Interface Module
MSG [03000/02] UMTS/High
MSG [00000/02] Legacy
LOG [0x1098] UIM Application Protocol Data Unit
LOG [0x14CE] Internal -UIM DS Data
LOG [0x1572 – 0x1585] Data Protocol Logging
LOG [0x11EB] Protocol Services Data
```

7.3 CT BIP test summary

CT has BIP test cases which are used to update the EFs on the card such as PRL/ERPL via the BIP channels. Please read [Q4] before the test or use it as debug manual when meet any failure cases.

8 QMI Setting

8.1 Enable QMI call for CT conformance test

CT may request to run test case in lab via QMICM interface. Also considering debug purpose, OEM should support QMICM command and logging simultaneously. Please refer to [Q3] to implement it.