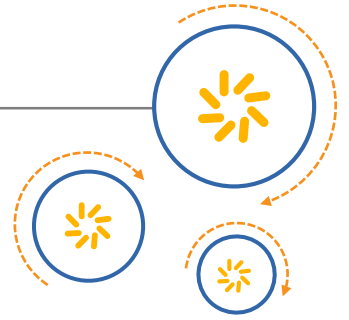




Qualcomm Technologies, Inc.



# Configure Preferred Frequency List in LTE

80-P2177-1 D

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## Revision history

Revision	Date	Description
A	September 2015	Initial release
B	October 2015	Updated Chapter 3
C	November 2015	Updated Chapter 3
D	May 2016	Updated Chapter 2

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# 1 Introduction

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## 1.1 Purpose

This document explains the preferred frequency list EFS file used to configure a set of fixed EARFCNs for LTE scanning. The newly configured EARFCNs are scanned for service before a full band scan but after the ACQ\_DB scan.

## 1.2 Conventions

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

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://createpoint.qti.qualcomm.com/>.

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

## 2 Configure preferred frequency list EFS file

NOTE: Numerous changes were made in this chapter.

When multiple LTE cells are deployed by various carriers, the HPLMN EARFCN can have a weaker signal than other LTE carrier cells. Therefore, the UE could be unable to camp on HPLMN EARFCN when a default scan is performed.

To prevent such scenarios, OEMs can configure EARFCNs statically in the preferred frequency list EFS file. The EARFCNs in the preferred frequency list EFS file are prioritized for scanning when an acquisition is triggered.

### 2.1 Preferred frequency list EFS file

Create a preferred frequency list EFS file as follows:

- EFS file name – `pref_freq_list`
- EFS location – `/nv/reg_files/modem/lte/rrc/csp/`

The following table lists the EFS file `pref_freq_list` structure.

Bits	Field description	Valid range
1 to 16	First EARFCN	Valid EARFCN
17 to 32	Second EARFCN (continue until rest of entries)	Valid EARFCN

For example, to obtain 06 EARFCNs in the preferred frequency list, the EFS file is programmed as follows:

**0C 94 A2 94 D2 94 D4 94 01 95 00 96**

- **0C 94** – Corresponds to 940C, EARFCN 37900
- **A2 94** – Corresponds to 94A2, EARFCN 38050
- **D2 94** – Corresponds to 94D2, EARFCN 38098
- **D4 94** – Corresponds to 94D4, EARFCN 38100
- **01 95** – Corresponds to 9501, EARFCN 38145
- **00 96** – Corresponds to 9600, EARFCN 38400

**NOTE:** A maximum of 20 EARFCNs can be set in this EFS file.

**NOTE:** A new change is made in software with CR 944277 to increase the number of EARFCNs stored in the EFS file to 32 and the change is present on PL's - MPSS.AT.1.1 /MPSS.TA.2.3/ MPSS.TH .2.0.1 and later.

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### 3 Order of scan

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The policy manager (PM) informs LTE the type of frequency list to scan: Default or carrier-preferred frequency list (CPFL).

When there is a carrier\_policy.xml loaded and CPFL feature is defined, PM will inform LTE of CPFL during the following scenarios:

- Based on the device location (home MCC)
- Power-up
- OOS

When the UE moves to a roaming area (roam MCC), LTE scan is defaulted as if there is no preferred frequency list and no band\_priority\_list EFS file.

The band scan is performed as follows:

1. The PM sends the scan request with a preferred frequency list to be used for scanning.
2. A list frequency scan (LFS) is performed on the EARFCNs present in the ACQ\_DB for the bands in the band\_priority\_list.
3. If step 2 fails to acquire a cell, a preferred frequency list scan, if pref\_freq\_list is present, is performed for all prioritized EARFCNs in the pref\_freq\_list based on the band\_priority\_list.
4. If step 3 fails, a full frequency scan (FFS) is performed on the bands in the band\_priority\_list.
5. If step 4 fails, an LFS is performed on the remaining EARFCNs in the ACQ\_DB.
6. If step 5 fails, a preferred frequency list scan, if pref\_freq\_list is present, is performed for the rest of the prioritized EARFCNs in the pref\_freq\_list.
7. If step 6 fails, an FFS is performed on the remaining bands supported by the UE.

**NOTE:** Previously scanned EARFCNs (from step 2, 3, 5 and 6) present in the pref\_freq\_list are skipped at step 4 and 7.

**NOTE:** RRC does not update the preferred frequency list EFS file.

Additional changes are made with CR 928284: If there is no carrier\_policy.xml present or CPFL is not indicated in the carrier\_policy.xml file, then CPFL will be indicated during power on and remain in effect.

# A References

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## A.1 Related documents

Title	Number
Qualcomm Technologies, Inc.	
<i>LTE band scan prioritization</i>	80-N7351-1

## A.2 Acronyms and terms

Acronym or term	Definition
ACQ_DB	Acquisition database
CPFL	Carrier-preferred frequency list
EARFCN	E-UTRA absolute radio frequency channel number
EFS	Embedded file system
FFS	Full frequency scan
HPLMN	Home private land mobile network
LFS	List frequency scan
LTE	Long term evolution
MCC	Mobile country code
OOS	Out of service
PM	Policy manager