Qualcomm
TECHNOLOGIES, INC

MSM8974 LTE Carrier Aggregation (LTE-CA) Power Consumption Data

Application Note

80-NK547-1 A

November 6, 2013

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

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Revision history

Revision	Date	Description
A	Nov 2013	Initial release

1 Introduction

1.1 Purpose

This document provides MSM8974 power measurement data during various LTE-CA scenarios. This document gives an overview of the power differences between Carrier Aggregation (CA) and non-CA-enabled devices.

1.2 Scope

This document is intended for engineers who are currently using or planning to use MSM8974 devices. All measurements are based on the MSM8974.LA.1.3 Release 1.3.30 for MSM8974 Devices (M8974AAAAANLYD1330).

1.3 Conventions

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

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 Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.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	*MSM8974 Linux Android™ Current Consumption Data*	80-NA437-7

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 Measurement Data

Table 2-1 CA and non-CA scenario measurements based on MSM8974

#	Use case	Band	Throughput (Mbps)	MSM8974 WTR1605 2x2x512 MB LPDDR3 720HD DSI (1280x768) measurements 1330.1 software release (mA)	CS goal (mA)
1	LTE FDD Cat 3 (LTE1E)	B13	68/23	248.00	270 to 290
2	LTE FDD Cat 3 in 10 MHz, 0 dBm Tx	B7	68/23	272.5	
3	LTE FDD Cat 3 in 20 MHz, 0 dBm Tx	B7	68/23	342	
4	LTE FDD Cat 3 max DL+UL in 20 MHz, 0 dBm Tx (LTE6E)	B7	100/50	403.00	400 to 430
5	LTE FDD Cat 4 max DL+UL in 20 MHz, 0 dBm Tx (LTE7E)	B7	150/50	430.00	440 to 470
6	LTE FDD Cat 3 CA, SCell configured, not activated +0 dbm	B13+B4	68/23	252.70	
7	LTE FDD Cat 3 CA, SCell configured, activated +0 dbm	B13+B4	68/23	364.00	
8	LTE FDD Cat 3 CA max DL+UL in 10+10 MHz, 0 dBm Tx (LTE8E)	B17+B4	100/25	389.00	430 to 460
9	LTE FDD Cat 3 10 MHz PDCCH only	B17	—	143.80	
10	LTE FDD CA 10+10 PDCCH only on PCell, SCell configured but not activated	B17+B4	—	147.40	
11	LTE FDD CA 10+10 PDCCH only on PCell, SCell configured and activated (no data grant)	B17+B4	—	227.00	
12	LTE FDD CDRx Standby (10 MHz, 320 ms) (CDRXS1)	B5	—	16.70	
13	LTE FDD CA 10+10 CDRx standby, SCell configured but not activated	B17+B4	—	20	

Notes:

- Only some of the use cases in Table 2-1 have CS goals. The remaining use cases do not have CS goals, as they are not part of MSM8974 standard dashboard use cases.
- CA configured, but SCell not activated penalty over CA not configured when first carrier is sending full data rate (#6 - #1) is ~4.7 mA.
- CA configured, but SCell not activated penalty over CA not configured in CDRx mode (#13 - #12) is 3.3 mA.

- CA configured, but SCell not activated penalty over CA not configured in PDCCH-only mode (#10 - #9) is 3.6 mA.
- In all modes, there is a significant power penalty when CA is configured and activated. QTI recommends UEs only be configured and activated when high bandwidth is required.
- The delta between 10 MHz vs 10+10 MHz (with SCell activated) (#7 - #1) is slightly higher than the delta between 10 MHz vs. 20 MHz (#2 - #3) for a given data rate.