UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INC. AND QUALCOMM TECHNOLOGIES, INC.,

Petitioners

v.

APPLE INC.,

Patent Owner

U.S. PATENT NO. 8,271,812

TITLE: HARDWARE AUTOMATIC PERFORMANCE STATE TRANSITIONS IN SYSTEM ON PROCESSOR SLEEP AND WAKE EVENTS

Issue Date: September 18, 2012

PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. § 312

TABLE OF CONTENTS

Page

I. Introduction 1

II. Mandatory Notices 3

A. Real Party in Interest (37 C.F.R. § 42.8(b)(1)) 3

B. Related Matters (37 C.F.R. § 42.8(b)(2)) 4

C. Lead and Back-Up Counsel and Service Information (37 C.F.R. § 42.8(b)(3) and (b)(4)) 4

D. Fees (37 C.F.R. § 42.103) 5

III. Grounds for Standing Pursuant to 37 C.F.R. § 104(a) 5

IV. Statement of Precise Relief Requested for Each Challenged Claim 6

A. 37 C.F.R. § 42.104(b)(1): Claims for Which Review Is Requested 6

B. 37 C.F.R. § 42.104(b)(2): Statutory Grounds and Prior Art on Which the Challenge is Based 6

V. Reasons for the Relief Requested Under 37 C.F.R. §§ 42.22(a)(2) and 42.104(b)(4) 7

A. Overview of the '812 Patent and its Technology 7

B. The Prosecution History of the '812 Patent 12

C. 37 C.F.R. § 42.104(b)(3): Claim Construction 14

1. A Person of Ordinary Skill in the Art 14

2. Construction of Claim Terms 14

D. Overview of the Prior Art 18

E. 37 C.F.R. § 42.104(b)(4): How the Construed Claims are Unpatentable 31

F. 37 C.F.R. § 42.104(b)(5): Supporting Evidence 31

VI. Claims 8 and 9 of the '812 Patent Are Unpatentable 32

A. Ground 1: Claims 8 and 9 are Anticipated by Mandelblat 32

1. Independent Claim 8 32

2. Dependent Claim 9 42

TABLE OF CONTENTS
(continued)

Page

B. Ground 2: Claims 8 and 9 are Rendered Obvious by Mandelblat in View of Kurts 43

1. Independent Claim 8 47

2. Dependent Claim 9 57

C. Ground 3: Claim 9 is Rendered Obvious by Mandelblat in view of Lint 57

1. Dependent Claim 9 60

D. Ground 4: Claims 8 and 9 Are Rendered Obvious by Kurts in view of Kang 61

1. Independent Claim 8 64

2. Dependent Claim 9 71

VII. Conclusion 71

I. Introduction

Pursuant to 35 U.S.C. § 312 and 37 C.F.R. § 42.100 *et seq.*, Qualcomm Inc. and Qualcomm Technologies, Inc. (collectively, "Petitioners" or "Qualcomm") request *inter partes* review of claims 8 and 9 (the "Challenged Claims") of U.S. Patent No. 8,271,812 ("the '812 Patent," Ex. 1001), which is assigned to Apple, Inc. ("Patent Owner" or "Apple").

The '812 Patent relates to an integrated circuit, such as a system on chip ("SoC"), which includes one or more performance domains, with each domain having one or more components. Ex. 1001 Abstract, 2:31–34, 3:29–47 and Fig. 1. Among these components are processors, which can have "awake" and "sleep" performance states. *Id.* at 1:35–47, 6:37–50. When a processor is awake, it is supplied with a voltage and a clock signal, and can process instructions. *Id.*; *see also* Ex. 1002 (Declaration of Vijay K. Madisetti, Ph.D), ¶ 40. "In the sleep state, the processor is idle (not executing instructions)," and power is conserved. Ex. 1001, 6:38–39; *see also id.* at 1:35–47 (discussing clock and power gating); Ex. 1002, ¶ 41.

Components can have performance states that are related to whether a processor is awake or asleep. As the '812 Patent explains:

> When the processors are in the sleep state, these other components need not be operating at such a high performance level. Similarly, when the processors are awakened from the sleep state, the performance level at

> which the processors and other components need to operate to support the activities being performed by the system may be different than the performance level prior to the processor entering the sleep state.

Ex. 1001, 1:40–47. Accordingly, processors, other non-processor components, and their performance domains may transition between "wake" and "sleep" performance states depending on whether a processor is awake or asleep. *Id.*; Ex. 1002, ¶¶ 42–48. The '812 Patent further explains that in the prior art, "[t]he sleep/wake transitions of the processors and other components are changed under software control." Ex. 1001, 1:48–49. However, software control of power management and sleep/wake transitions had purported drawbacks that limited the amount of power conserved and performance of the device. *Id.* at 1:49–58.

The '812 Patent is directed to "a power management unit (PMU) [that] may automatically transition (in hardware) the performance states of one or more performance domains in a system." Ex. 1001, Abstract, 1:62–65. According to the specification, "the power management unit may monitor the processor to detect that the processor is entering the sleep state or has entered the sleep state," and transition performance domains to their "sleep" performance states. *Id.* at 2:3–5, 5:44–49, 9:39–10:2 and Fig. 3 (steps 40, 42, and 44). "[T]he power management unit may [also] be programmable with a second set of target performance states to which the performance domains are to transition when the processor exits the sleep state," when

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.