UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Intel Corporation
Petitioner

v.

Qualcomm Incorporated
Patent Owner

U.S. Patent No. 8,698,558
Claims 15-20

Case IPR2018-01154

DECLARATION OF ALYSSA APSEL, PH.D.
ON BEHALF OF PETITIONER

INTEL 1202

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

TABLE OF CONTENTS

I. BACKGROUND 1
II. MATERIALS CONSIDERED 4
III. LEGAL PRINCIPLES 6
A. Claim Construction 6
B. Anticipation 7
C. Obviousness 7
IV. SUMMARY OF OPINION 10
V. BRIEF DESCRIPTION OF THE TECHNOLOGY 10
A. Radio Frequency (RF) Power Amplifiers 10
B. Power Supply Generators/Modulators for Power Amplifiers 12
1. Envelope Amplifiers 13
2. Switchers 14
3. Hybrid Supply Generators 15
4. Boost Converters 20
C. Multiplexers 22
VI. OVERVIEW OF THE ’558 PATENT 24
A. Summary of the Alleged Invention of the ’558 Patent 24
B. Prosecution History 29
VII. OVERVIEW OF THE PRIOR ART REFERENCES 30
A. Kwak 31
B. Choi 2010 34
VIII. CLAIM CONSTRUCTION 36
A. “current sense amplifier” (claim 15) 37
B. “envelope signal” (claim 18) 38
IX. LEVEL OF ORDINARY SKILL IN THE ART 39
X. SPECIFIC GROUNDS FOR CHALLENGE 40
A. Ground I: Claims 15, 17-18, and 20 are anticipated by Kwak 40
1. Claim 15 40
2. Claim 17 54

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

3. Claim 18 56
4. Claim 20 58
B. Ground II: Claim 16 is obvious in view of Kwak 70
1. Claim 16 70
C. Ground III: Claim 19 is obvious in view of Kwak combined with Choi 2010 73
1. Claim 19 73
XI. AVAILABILITY FOR CROSS-EXAMINATION 82
XII. RIGHT TO SUPPLEMENT 82
XIII. JURAT 82

DOCKET ALARM
Find authenticated court documents without watermarks at docketalarm.com.

I, Alyssa Apsel, declare as follows:

I. BACKGROUND

1. I am currently a professor of electrical and computer engineering at Cornell University in Ithaca, New York, and a visiting professor at Imperial College in London, England.

2. I have also been the Chief Technology Officer for AlphaWave IP Corporation, a multinational private equity-backed company that provides high-end analog silicon IP related to high-end Multi Standard SerDes (MSS) and Multi Standard Radio (MSR) solutions for a wide range of markets.

3. My qualifications are stated more fully in my curriculum vitae, which is attached as Appendix A. I briefly summarize my education, work experience, and other qualifications below.

4. I received a Bachelor of Science degree in Electrical Engineering from Swarthmore College in 1995. I then earned a Master of Science degree in Electrical Engineering from the California Institute of Technology in 1996. I received my Ph.D. in Electrical Engineering from the Johns Hopkins University in 2002, where the focus of my program was electrical and computer engineering. My doctoral studies included analog and mixed signal circuit design for optoelectronic and highspeed communication systems. My dissertation, titled "Optoelectronic Receivers in Silicon on Sapphire CMOS: Architecture and Design

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

for Efficient Parallel Interconnects," included the study of integrated interface circuits for high-speed chip-to-chip communications.

5. By 2000, I had completed all of my coursework at Johns Hopkins, including approximately 2-3 years of graduate courses in circuits and devices, passed the Ph.D. Comprehensive Exam (required to advance in the Ph.D. program and equivalent of a Master Degree), completed significant independent research on optical receiver circuits in CMOS, and published six conference papers.

6. By 2002, I had completed my Ph.D. at Johns Hopkins, published 3 journal papers, 10 conference papers, and had 5 years of experience in wireless communications that included working at the Army Research Laboratory.

7. I was a consultant for Intel Research from January 2009 to June 2009. In that role, I developed process invariant calibration blocks for high speed I/O circuits. These circuits were designed to monitor and maintain good operating conditions, despite imperfections and flaws in the manufacturing process, of the high-speed receivers and transmitters that enable computers to send and receive data over long wires.

8. From June 2008 to October 2015, I was an Associate Professor of Electrical and Computer Engineering at Cornell University. During that time, I worked on research regarding low-power radio design and networking, systems and circuit co-design for efficient low power networks, design in presence of

DOCKET ALARM Find authenticated court documents without watermarks at docketalarm.com.

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.