

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Intel Corporation
Petitioner

v.

Qualcomm Incorporated
Patent Owner

Case IPR2018-01240
Patent 8,698,558

DECLARATION OF DR. ARTHUR W. KELLEY

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

By:

Arthur W. Kelley 4/15/2019

Arthur W. Kelley, Ph.D.

TABLE OF CONTENTS

I.	PROFESSIONAL BACKGROUND.....	3
II.	RELEVANT LEGAL STANDARDS	5
III.	THE '558 PATENT	9
	A. Overview of the '558 Patent.....	9
	B. Prosecution History of the '558 Patent	15
	C. Level of Skill in the Art.....	18
	D. Claim Construction	19
	1. “Envelope Signal” (Claim 11)	19
	2. Means-Plus-Function Limitations (Claims 10 and 11).....	19
	3. Selective Boost Limitations (Claims 10 and 11)	20
IV.	OVERVIEW OF THE CITED REFERENCES	29
	A. Overview of Chu	29
	B. Overview of Choi 2010	33
	C. Overview of Hanington.....	36
	D. Overview of Myers.....	36
V.	GROUND I OF THE PETITION IS BASED ON AN UNSUPPORTABLE CLAIM INTERPRETATION	40
VI.	THE POSA WOULD NOT HAVE COMBINED CHU AND CHOI 2010 ..	41
VII.	THE POSA WOULD NOT HAVE COMBINED MYERS WITH CHU AND CHOI 2010	48
	A. A POSA Would Understand That Choi 2010 Teaches Away From “Selective Boost”	49
	B. A POSA Would Not Have Combined Myers With Chu And Choi 2010	51

1. I am making this declaration at the request of Qualcomm Incorporated (“Qualcomm” or “Patent Owner”) in the matter of the *Inter Partes* Review of U.S. Patent No. 8,698,558 (“the ’558 Patent”).

2. I am being compensated for my work in this matter at my standard hourly rate of \$450 for consulting services. My compensation in no way depends on the outcome of this proceeding.

3. In preparing this Declaration, I considered the following materials:

- a. The ’558 Patent (Ex. 1301) and its file history (Ex. 1302);
- b. Petition for *Inter Partes* Review of U.S. Patent No. 8,698,558, IPR2018-01240 (Paper 3) (“Petition” or “Paper 3”);
- c. The Declaration of Dr. Alyssa B. Apsel (Ex. 1303);
- d. Chu, W.Y., *et al.*, “A 10 MHz Bandwidth, 2 mV Ripple PA Regulator for CDMA Transmitters,” *IEEE Journal of Solid-State Circuits*: 2809-2819 (2008) (“Chu”) (Ex. 1304);
- e. Choi, J., *et al.*, “Envelope tracking power amplifier robust to battery depletion,” *Microwave Symposium Digest (MTT), 2010 IEEE MTT-S International*: 1332-36 (2010) (“Choi 2010”) (Ex. 1306);
- f. Blanken, P.G. *et al.*, “A 50MHz Bandwidth Multi-Mode PA Supply Modulator for GSM, EDGE and UMTS Application,” 2008 Radio Frequency Integrated Circuits Symposium (IEEE) 401-04 (2008) (“Blanken”) (Ex. 1310);
- g. Kwak, T.W., *et al.*, “A 2 W CMOS hybrid switching amplitude modulator for EDGE polar transmitters,” *IEEE Journal of Solid-State Circuits* 2666-76 (2007) (“Kwak”) (Ex. 1311);

- h. U.S. Patent No. 5,929,702, “Method and Apparatus for High Efficiency High Dynamic Range Power Amplification,” to Myers, *et al.* (“Myers”) (Ex. 1312);
- i. Kim, D. *et al.*, “*High Efficiency and Wideband Envelope Tracking Power Amplifier with Sweet Spot Tracking*,” Radio Frequency Integrated Circuits Symposium (RFIC): 255-258 (2010) (“Kim”) (Ex. 1313);
- j. U.S. Patent No. 6,300,826, “Apparatus and Method for Efficiently Amplifying Wideband Envelope Signals,” to Mathe, *et al.* (“Mathe”) (Ex. 1314);
- k. Maxim Integrated Products, Inc., *MAX9738 – 16VP-P Class G Amplifier with Inverting Boost Converter*, Datasheet 19-3700, Rev. 0 (March 2008) (“Maxim”) (Ex. 1315);
- l. Ertl *et al.*, “*Basic considerations and topologies of switched-mode assisted linear power amplifiers*,” IEEE Transactions On Industrial Electronics, Vol. 44, No. 1 at 116-123 (1997) (“Ertl”) (Ex. 1316);
- m. Kang, D. *et al.*, “*A Multimode/Multiband Power Amplifier With a Boosted Supply Modulator*,” IEEE Transactions on Microwave Theory and Techniques 58.10 (2010): 2598-2608 (“Kang”) (Ex. 1317);
- n. U.S. Patent No. 5,834,977, “Amplifying Circuit with Power Supply Switching Circuit,” to Maehara, *et al.* (“Maehara”) (Ex. 1318);
- o. U.S. Patent No. 5,870,340, “Multiplexer,” to Ohsawa (“Ohsawa”) (Ex. 1319);
- p. U.S. Patent No. 6,566,935, “Power Supply Circuit With a Voltage,” to Renous (“Renous”) (Ex. 1320);
- q. Certificate of Correction for the ’558 Patent (Ex. 1321);

- r. Qualcomm Initial Claim Construction Brief, *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, Investigation No. 337-TA-1065 (“Qualcomm Brief”) (Ex. 1322);
- s. Order No. 28: Construing Terms of the Asserted Patents, *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, Investigation No. 337-TA-1065 (“Markman Order”) (Ex. 1323);
- t. Erickson, Robert W.; Maksimovic, Dragan, “Fundamentals of Power Electronics,” (excerpts) (Ex. 1324);
- u. Hanington, Gary *et al.*, “High-Efficiency Power Amplifier Using Dynamic Power-Supply Voltage for CDMA Applications,” IEEE Transactions on Microwave Theory and Techniques 47:8 (1999) (“Hanington”) (Ex. 1325);
- v. Initial Determination and Recommended Determination, *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, Investigation No. 337-TA-1065 (“Initial Determination”) (Ex. 2001).

I. PROFESSIONAL BACKGROUND

4. I am an electrical and computer engineering consultant with over 35 years of expertise and experience consulting on semiconductor technologies, including power management integrated circuits. I have provided my opinions and/or testimony as an expert witness in topics relating to power electronics in matters before the International Trade Commission, U.S. district courts, and the U.S. Patent Trial and Appeals Board.

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.