

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

---

**Intel Corporation**  
Petitioner

v.

**Qualcomm Incorporated**  
Patent Owner

---

Case IPR2019-00049  
Patent 9,154,356

---

**DECLARATION OF DR. DANIEL FOTY**

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:   

---

Daniel Foty, Ph.D.

## TABLE OF CONTENTS

I.	Professional Background .....	1
II.	Relevant Legal Standards .....	2
III.	Summary of Conclusions.....	7
IV.	Technology Background.....	8
	A. Overview of the Physics and Mathematics of Bandwidth .....	8
	B. Overview of Wireless Network Architecture and Carrier Aggregation .....	18
V.	THE '356 PATENT .....	21
	A. Overview of the '356 Patent.....	21
	B. Prosecution History of the '356 Patent .....	32
VI.	Level of Skill in the Art.....	42
VII.	Claim Construction.....	43
	A. The Patent Owner's Construction Is The Ordinary And Customary Meaning, As Would Be Understood By A Skilled Artisan In The Context Of The Entire Disclosure.....	43
	1. The Specification Supports The Patent Owner's Proposed Construction .....	44
	2. The File History Supports Patent Owner's Proposed Construction .....	47
	3. Extrinsic Evidence Supports Patent Owner's Proposed Construction .....	54
	B. The Petitioner's Proposed Construction Should Be Rejected.....	68
	1. The Petitioner's Proposed Construction Is Unreasonably Broad .....	68
	2. The Amendment To Add "Carrier Aggregation" To Overcome Hirose Precludes The Petitioner's Proposed Construction .....	69
	3. Petitioner's Proposed Construction Is Not Indicative Of How A Skilled Artisan Understood The Term.....	72
VIII.	Overview Of The Cited References.....	78
	A. Overview of Jeon.....	78
	B. Overview of Xiong.....	80
	C. Overview of "The Feasibility Study" .....	90
IX.	GROUND 1: JEON AND XIONG DO NOT RENDER OBVIOUS CLAIMS 1, 17, OR 18.....	92
	A. <b>Claim 1</b> .....	93

1.	“a first amplifier stage configured to be independently enabled or disabled” / “a second amplifier stage configured to be independently enabled or disabled” .....	94
2.	“the first amplifier stage further configured to receive and amplify an input radio frequency (RF) signal and provide a first output RF signal to a first load circuit when the first amplifier stage is enabled”/ “the second amplifier stage further configured to receive and amplify the input RF signal and provide a second output RF signal to a second load circuit when the second amplifier stage is enabled” .....	105
3.	“the input RF signal employing carrier aggregation comprising transmissions sent on multiple carriers at different frequencies to a wireless device” .....	106
B.	Claims 2-8 and 11.....	108
1.	Claim 3 .....	109
2.	Claims 7 and 8.....	111
X.	GROUND 2: JEON, XIONG, AND THE FEASIBILITY STUDY DO NOT RENDER OBVIOUS CLAIMS 2–8 OR 11 .....	112
C.	Petitioner Fails To Sufficiently Articulate A Motivation To Combine .....	113
D.	A Person Of Ordinary Skill Would Not Have Been Motivated To Select And Combine Jeon, Xiong, And The Feasibility Study.....	114
XI.	Conclusion .....	117

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. 9,154,356 (“the ’356 Patent”).

2. I am being compensated for my work in this matter at my standard hourly rate of \$475 for consulting services. My compensation in no way depends on the outcome of this proceeding.

3. In preparing this Declaration, I considered all materials cited in the body of this Declaration, which includes but is not limited to the following:

- a. The ’356 Patent (Ex. 1101) and its file history;
- b. Petition for *Inter Partes* Review of U.S. Patent No. 9,154,356, IPR2019-00128 (Paper 3) (“Petition”) and materials cited therein;
- c. The Declaration of Dr. Patrick Fay (Ex. 1102) and materials cited therein;
- d. A Scalable 6-to-18 GHz Concurrent Dual-Band Quad-Beam Phased-Array Receiver in CMOS (Ex. 1105) (“Jeon”);
- e. U.S. Patent Pub. No. 2010/0237947 A1 (Ex. 1106) (“Xiong”);
- f. Feasibility Study for Further Advancements for E-UTRA (LTE-Advanced) (3GPP TR 36.912 version 9.1.0 Release 9) (Ex. 1104) (“Feasibility Study”)

## **I. PROFESSIONAL BACKGROUND**

4. I have thirty years of experience as an engineer, scientist, and consultant in the electronics industry, including in the areas of integrated circuit (IC) design, layout, structure, and operation, in RF technology for wireless communications, in

technology development, and in technical and business development. I have authored or co-authored four books and some sixty papers (published in refereed journals and refereed conference proceedings), mostly on various aspects of integrated circuit technology and RF/wireless technology. I have also given some eighty lectures and presentations (many of them invited) at various conferences and other similar fora, and have given a number of invited keynote talks on next-generation wireless technologies at a variety of conferences and events throughout the world. I have also served extensively as an expert witness in a wide variety of matters over the past 15+ years.

5. My qualifications to testify as an expert in the field of integrated circuit technology and RF/wireless technology, including my expertise in the structure and operation of RF transceivers and related structures, are described in my *curriculum vitae*, which is attached at Appendix A.

## II. RELEVANT LEGAL STANDARDS

6. I have been asked to provide my opinion as to whether claims 2–8, and 11 of the '356 Patent are anticipated by the alleged prior art or would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention, in view of the alleged prior art.

7. I am an engineer and scientist by education and profession. The opinions I am expressing in this Declaration involve the application of my

# 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.