UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZTE (USA) Inc.,
Samsung Electronics Co., Ltd., and
Samsung Electronics America, Inc.,
Petitioner,

v.

Fundamental Innovation Systems International LLC,
Patent Owner.

Case IPR2018-00111
Patent No. 8,624,550

DECLARATION OF DR. KENNETH FERNALD IN SUPPORT OF PATENT OWNER'S PRELIMINARY RESPONSE

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I. Introduction

1. My name is Kenneth Fernald, Ph.D. My qualifications are summarized below and are addressed more fully in my CV attached as EXHIBIT A.

2. For 30-years I have been involved in the design of integrated circuits. A large portion of my work has involved the design of integrated circuits that involve power management, battery charging and USB control. I have designed USB controllers that have sold in the hundreds of millions of units, and I was intimately involved in this field during the time of the patents at issue in this case.

3. I earned my Bachelor of Science and Master of Science degrees in Electrical Engineering from North Carolina State University (NCSU) in 1985 and 1987. During this period I worked for the Space Electronics Group developing software for predicting the effects of radiation environments on integrated circuits. I also consulted for the Naval Research Laboratory (NRL). My services to NRL included the design of dosimetry instrumentation and the execution of radiation studies on electronic devices at various facilities around the United States. I joined NASA Langley Research Center in 1987 where I designed motor control instruments and firmware for ground and space station experiments.

4. I returned to NCSU in 1988 to earn my Ph.D. in Electrical

Engineering. My doctoral research efforts were funded by the National Science Foundation and focused on the development of medical systems utilizing wireless digital telemetry. My work included a thorough investigation of medical telemetry technology and design of a microprocessor-based system for the fast prototyping of implantable medical instruments. I also completed the design and testing of various components of this system, including a bidirectional digital telemetry integrated circuit (IC) and a general-purpose sensor interface and conversion IC. I completed my Ph.D. in 1992, after which I joined Intermedics Inc. in Angleton, Texas.

5. My responsibilities at Intermedics included system and circuit design of telemetry, signal-processing, and control ICs for medical devices. Examples include the design of a sensor acquisition, compression, and storage IC for implantable pacemakers and defibrillators. I also worked on advanced wireless digital telemetry technology, control ICs for therapy delivery in defibrillators, and software development for sensor waveform compression and recovery. I left Intermedics in 1998 to join Analog Devices Inc. in Greensboro, NC.

6. My work at Analog Devices included the design of advanced ICs for wireless digital communication devices. Specific projects included the design, debug, and testing of a base-band receiver IC for digital satellite systems. This IC performed QPSK demodulation, symbol recovery, and

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