UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO. LTD.;
SAMSUNG ELECTRONICS AMERICA, INC.;
SAMSUNG TELECOMMUNICATIONS AMERICA, LLC; AND
SAMSUNG AUSTIN SEMICONDUCTOR, LLC;
PETITIONER

V.

REMBRANDT WIRELESS TECHNOLOGIES, LP
PATENT OWNER

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CASE NO. IPR2014-00519
PATENT 8,023,580

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DECLARATION OF DR. PHILIP KOOPMAN, PH.D.

TABLE OF CONTENTS

I. INTRODUCTION AND QUALIFICATIONS

1.   I have been retained by counsel for Patent Owner, Rembrandt Wireless Technologies, LP ("Patentee") to provide opinions in connection with *Inter Partes* Review No. IPR2013-00519 of U.S. Patent No. 8,023,580 (Ex. 1301, "the '580 patent"). I have been asked to render an opinion of whether certain grounds on which a trial was instituted in this proceeding render the claims at issue invalid. Specifically, I have been asked to render an opinion as to whether one of skill in the art would be motivated to combine the alleged Admitted Prior Art ("APA") with U.S. Patent No. 5,706,428 based on the alleged APA's disclosure of master/slave communication systems.[1]

2.   I am a tenured Associate Professor in the Electrical and Computer Engineering Department at Carnegie Mellon University. I have a B.S. (1982), M.Eng. (1982) and Ph.D. (1989) in Computer Engineering. I have been a professor at Carnegie Mellon since 1996. Prior to that time, I spent several years in the military and in industry working as a computer engineer and an embedded system engineer, including significant experience in the area of embedded networks. I am a named inventor on twenty-six patents, and an author or co-

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[1] The scope of my opinions expressed in this Declaration address the obviousness combination only as it relates to master/slave configurations. I understand Patentee relies on the opinions in the Declaration of Christopher Jones, submitted herewith, relating to additional aspects of the alleged obviousness grounds.

author of over 100 non-patent publications in a wide variety of fields within electrical engineering and computer science, including many in the technological area of embedded system networks. I have been working in computer engineering since approximately 1980. A current copy of my curriculum vitae is attached hereto as Exhibit A.

3.   I have extensive experience in the field of embedded communication networks. For example, I have been the instructor of the course "Distributed Embedded Systems," taught to Carnegie Mellon seniors and graduate students almost every year since the Fall semester of 1999. This course includes several lectures dedicated to embedded network operation and performance, including a lecture derived from the tutorial based on the 1993 and 1994 articles I co-authored with Bharghav Upender. Additional lectures in that course cover more generalized embedded networking topics, including real-time scheduling, reliability, and system safety

4.   I am also the instructor of the course "Embedded System Engineering" which covers a number of embedded network protocols, including various master slave polling arrangements.

5.   I have supervised a number of student independent projects and thesis projects involving embedded networks. As part of this work, my lab has owned

and operated increasingly sophisticated hardware Controller Area Network

(CAN) test-beds since approximately 1997.

6.   Starting in 1999, I have been an external reviewer for more than 100

design reviews of products for industry clients, many of which have included

review of the use of embedded network protocols. I have further been involved

in the network protocol selection process and related system architecture

selection process for several companies in which network protocols were

considered. I taught seminars on protocol selection to attendees of the Embedded

Systems Conference in 1993 and 1994.

7.   I served as the Guest Editor of a special edition of the magazine IEEE

Micro titled "Critical Embedded Automotive Networks" in July-August 2002,

which included embedded network content.

8.   I have industry experience in network protocol use and selection,

specifically including embedded networks in elevators (Otis Elevator, circa 1991-

1995), and jet aircraft engines (Pratt & Whitney, circa 1992-1995), as well as in

heating/ventilation/cooling systems (Carrier, circa 1995).

9.   I have extensive experience in evaluating, selecting and using

embedded network protocols in safety-critical systems. For example, I am a co-

author of the Federal Aviation Administration's Data Network Evaluation

Criteria Handbook, (Driscoll, K., Hall, B., Koopman, P., Ray, J., DeWalt, M.,

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