William H. Manning (*pro hac vice*)
E-mail: WHManning@rkmc.com
Brad P. Engdahl (*pro hac vice*)
E-mail: BPEngdahl@rkmc.com
Jacob S. Zimmerman (*pro hac vice*)
E-mail: JSZimmerman@rkmc.com
Aaron R. Fahrenkrog (*pro hac vice*)
E-mail: ARFahrenkrog@rkmc.com
Robins, Kaplan, Miller & Ciresi L.L.P.
2800 LaSalle Plaza
800 LaSalle Avenue
Minneapolis, MN 55402
Telephone: 612-349-8500
Facsimile: 612-339-4181

David E. Marder (*pro hac vice*)
E-mail: DEMarder@rkmc.com
Robins, Kaplan, Miller & Ciresi L.L.P.
800 Boylston Street, 25th Floor
Boston, MA 02199
Telephone: 617-267-2300
Facsimile: 617-267-8288

John P. Bovich (SBN 150688)
E-mail: JBovich@reedsmith.com
Reed Smith LLP
Two Embarcadero Center, Suite 2000
San Francisco, CA 94111
Telephone: 415-543-8700

Attorneys for Plaintiffs Advanced Micro Devices, Inc. and ATI Technologies ULC

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

ADVANCED MICRO DEVICES, INC., et al.,

Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD., et al.,

Case No. CV-08-0986-SI

SUPPLEMENTAL DECLARATION OF EBY G. FRIEDMAN, PH.D. IN SUPPORT OF PLAINTIFFS' REPLY CLAIM CONSTRUCTION BRIEF

I, Eby G. Friedman, do hereby declare as follows:

I. INTRODUCTION

1. My name is Eby G. Friedman, Ph.D. I am currently a Distinguished Professor in the Department of Electrical and Computer Engineering at the University of Rochester. I previously submitted a Declaration in this case dated March 13, 2009 ("Original Declaration"). I have been retained by the plaintiffs in connection with this litigation to provide a supplemental declaration addressing issues raised by Samsung in its Responsive Claim Construction Brief ("Responsive Brief") relating to construction of the claims of U.S. Patent No. 4,737,830 ("'830 Patent"). I make all of the statements in this Supplemental Declaration of my own personal knowledge and in accord with 28 U.S.C. § 1746.

II. MATERIALS REVIEWED

2. In Paragraph 2 of my Original Declaration, I summarized certain materials that I had reviewed. I have now reviewed certain additional materials, including Samsung's Responsive Brief and the corresponding March 30, 2009 Declaration of Dr. Hassoun in support of that brief ("Hassoun Declaration").

III. BACKGROUND ON EDUCATION AND EXPERIENCE

3. My background is summarized in paragraphs 3-8 of my Original Declaration.

IV. REPLY TO SAMSUNG'S RESPONSIVE BRIEF

4. I offer this testimony to rebut several incorrect statements made by Samsung and Dr. Hassoun in connection with the Responsive Brief and the Hassoun Declaration. In this declaration, I use the term "PHOSITA" to refer to a person having ordinary skill in the art at the time the application for the patent was filed.

A. Electrically Connected Directly

5. Samsung has argued that the presence of any device between two points, including a resistor, means that the two points are not "electrically connected directly." Before addressing this argument, I would like to define certain terms. First, in the context of integrated circuits, the term "active device" refers to a transistor. In integrated circuits, transistors can be used to turn off or redirect the flow of current, so they can interfere with a direct connection. The term "device"

is usually used as shorthand for "active device," so PHOSITAs sometimes use those terms interchangeably. However, I understand that Dr. Hassoun and Samsung use the term "device" to include resistors. Resistors are referred to by PHOSITAs as "passive" because they do not stop or redirect current.

6. Dr. Hassoun equates the phrase "point-to-point connection" with a "direct connection." The phrase "point-to-point" is a colloquial phrase. It could mean many different things to a PHOSITA. A PHOSITA would not have understood that "direct" and "point to point" were synonyms or that a "point to point" connection necessarily precludes an intermediate resistor. In any event, the term "point to point" is not used in the patent. Rather, the patent refers to "direct" connections, and that is the term to which I address my comments.

7. Dr. Hassoun concludes that the presence of any "passive device, such as a resistor" between two points on a chip precludes the connection between those points from being "direct." Hassoun Decl., ¶ 32. This statement is not correct. Every conductor that connects two points electrically necessarily has some resistance and could be thought of as a resistor. According to Dr. Hassoun, therefore, every electrical connection between two points would necessarily include a "passive device" (in the form of a resistor) between the two points. It follows that, were Dr. Hassoun's declaration accepted, no connection could ever be direct.

8. A PHOSITA would never find that an intermediate resistor renders a connection between A and B "indirect." A resistor merely causes a drop in voltage. If point A and point B have a resistor between them, current will still flow between them, although the voltage at point B will be lower than at point A. Such a connection would still be "direct" because the resistor does not stop or redirect the current, like transistors can.

B. Vcc Current Bus

9. Samsung proposes using the term "current" in place of AMD's term "charge." "Current" is merely charge over time.

C. Independently Connected Electrically

10. The `830 Patent describes several types of defects that can be overcome by a

segmented gate design. `830 Patent, at 5:33-43. Samsung focuses on one such defect. In its Responsive Brief, it depicts on the top of p. 30 a structure where segmented capacitor gates are directly connected to one another at the level of the gates themselves. It argues that a defect in the gate oxide underneath top plate 1 would cause a failure of the capacitor that includes top plate 2 (thus interfering with the goal of redundancy).

11. Samsung ignores the fact that defects other than defects in the gate oxide are described in the section of the specification corresponding to claim 5. Specifically, the specification explains that defects in the oxide layer above the gate could also be isolated by the segmented design, and that such a design would allow the other capacitors associated with the other segmented gates to continue to operate. *Id.* at 5:35 (discussing defect in "oxide layer 50"). This result could be achieved even where the gate segments are connected to each other at the level of the gate. For example, in the design reflected in the figure at the top of p. 30 of the Responsive Brief, a defect in the oxide above top plate 1 could cause a short between top plate 1 and a layer of metal between the top plate 1 and the Vcc bus (for example a ground line). This short could cause excessive current to flow from Vcc through top plate 1 into the ground line. This current could cause the connection between Vcc and top plate 1 to sever due to electromigration. Excess current could then flow from Vcc, through top plate 2, to top plate 1 and then to the connection between top plate 1 and ground, causing this connection to sever as well. In that circumstance, the capacitors with top plates 1 and 2 would continue to operate.

12. In addition, the patent makes clear that the two types of defects listed at 5:33-35 are merely examples of the types of defects that can be addressed by the segmentation technique. Other types of defects could occur where the other gate segments and associated capacitors would continue to operate, even if the gate segments of those capacitors were connected in the manner shown in the figure at the top of p. 30 of the Responsive Brief. For example, if there were a

manufacturing defect that caused there to be no connection between the Vcc bus and top plate 1, the capacitor containing top plate 2 would still operate.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 8th day of April, 2009.

Eby G. Friedman, Ph.D.

80703206.1