SEL EXHIBIT NO. 2013

INNOLUX CORP. v. PATENT OF SEMICONDUCTOR ENERGY LABORATORY CO., LTD.

IPR2013-00038

IN THE UNITED STATES PATENT TRIAL AND APPEAL BOARD

In re *Inter Partes Review* of:		)	
		)	
U.S. Patent No.	8,068,204	)	
		)	
Issued:	Nov. 29, 2011	)	
		)	
Inventors:	Yoshiharu Hirakata	)	
	Shunpei Yamazaki	)	
		)	
Application No.:	13/009,980	)	
		)	
Filed:	Jan. 20, 2011	)	
		)	FILED ELECTRONICALLY
For: Semiconductor Energy		)	PER 37 C.F.R. § 42.6(b)
Laboratory Co., Ltd.		)	
		)	

Mail Stop *Patent Board* (37 C.F.R. § 42.6(b)(2))
Patent Trial and Appeal Board
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DECLARATION OF MILTIADIS HATALIS, Ph.D.

I. Background and Qualifications

(1) My name is Miltiadis Hatalis. I am currently a Professor at Lehigh University in the Department of Electrical and Computer Engineering. I have studied, taught, and practiced in the relevant flat panel display technology for over 25 years.

(2) I received my Doctor of Philosophy (Ph.D.) degree in the field of

Electrical and Computer Engineering from Carnegie Mellon University in 1987. The topic of my Ph.D. dissertation research was “Crystallization of Amorphous Silicon Films and its Application in Bipolar and Thin Film Transistors.” I received my Masters of Science (M.S.) degree in Electrical and Computer Engineering in 1984 from the State University of New York at Buffalo and my Bachelor of Science (B.S.) degree in Physics in 1982 from the Aristotle University of Thessaloniki in Greece.

(3) Upon receiving my Ph.D. degree, I joined the faculty of Lehigh University in the Department of Electrical and Computer Engineering as an Assistant Professor. I was promoted to the rank of Associate Professor with tenure in 1991 and to the rank of Professor in 1995. From 1987-1992, I served as Associate Director of Lehigh's “Microelectronics Research Laboratory.”

(4) In 1992, I founded and became Director of the “Display Research Laboratory,” which was the first academic laboratory in the United States dedicated to research and development of Thin Film Transistors (TFTs) for Active Matrix Liquid Crystal Displays (AMLCDs) and Active Matrix Organic Light Emitting Diode (AMOLEDs) displays. As Director of Lehigh's “Display Research Laboratory,” I have raised over $10 million through research contracts and grants to support the laboratory's research and development activities on thin film transistors and their application to flat panel displays. These contracts and grants

were funded by the Defense Advanced Research Program Agency (DARPA), the Army Research Laboratory (ARL), the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the State of Pennsylvania, and a variety of industrial companies including IBM, Kodak, Sharp, Northrop Grumman, and others.

(5) As a faculty member, I supervised the research of eighteen Ph.D. dissertations in the technical field of TFTs and, along with my graduate students, published over 150 technical publications in scientific journals or conferences in the field of thin film transistors and their applications in flat panel displays.[1] In addition to the aforementioned Ph.D. dissertations, I have also supervised a large number of graduate student master's theses and undergraduate research projects. I have taught a number of different undergraduate and graduate level courses in the Electrical and Computer Engineering department at the Lehigh University dealing with the physics, technology, and the design of solid-state devices and circuits. I have also introduced and regularly teach a course on "Semiconductor Material and Device Characterization," and I have also reorganized a course on "Introduction to Design of Very Large Scale Integration (VLSI)."

(6) As part of my research, I utilize much of the same equipment and many of the same microfabrication processes that are relevant to U.S. Patent No.

[1] More information on this subject can be found on my research group web pages: www.ece.lehigh.edu/DRL

8,068,204 (hereinafter referred to as the "'204 patent"), including: Plasma-Enhanced Chemical Vapor Deposition (PECVD) for intrinsic hydrogenated-amorphous silicon, silicon nitride and silicon dioxide films; sputter and e-beam deposition tools for aluminum, indium-tin-oxide, tantalum and other metallic thin films; photolithographic tools for spinning, exposure and developing photoresist patterns; as well as plasma or wet etching tools for removing various thin film materials from the substrate. Furthermore, I also utilize several tools for the characterization of the materials and structures used in thin film transistors including: optical microscopes, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Atomic Force Microscopy (AFM). I also utilize a variety of electrical characterization techniques and instruments for testing the electrical performance of completed TFT circuits and flat panel displays.

(7) As part of my research, I pioneered a technique for crystallizing amorphous silicon. The technique I pioneered has been used in the manufacture of small polysilicon TFT AMLCDs for over a dozen years, and, more recently, polysilicon TFTs have also been used for AMOLED displays. In addition, many industrial and academic laboratories have recently initiated R&D activities related to the fabrication of polysilicon thin film transistors on flexible metal foil substrates and their application to flexible displays. Such research flows from the

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