

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INNOLUX CORPORATION
Petitioner

v.

PATENT OF SEMICONDUCTOR ENERGY LABORATORY CO., LTD.
Patent Owner

CASE IPR2013-00065
PATENT 7,923,311

RESPONSE OF THE PATENT OWNER

TABLE OF CONTENTS

I. Background.....1

II. Summary of Arguments2

A. Claims 23, 24, 26-40, 42-44, 46, 49, 50, 53, and 54 of the '311 patent are patentable over Taniguchi, Mori, and Van Zant2

III. The '311 Patent.....8

A. Claims of the '311 patent8

B. The invention of the '311 patent.....11

IV. Taniguchi15

A. Taniguchi does not disclose a method for forming a step-like structure as recited in the claims of the '311 patent15

B. Taniguchi teaches using the first conductive layer (d1) as a hard mask to etch the N-type semiconductor layer (d0)17

C. Inherent overetch of the first conducting layer (d1) will not create the claimed step-like structure in Taniguchi21

D. A person of ordinary skill in the art would not create a step between the source/drain electrode and the N-type semiconductor layer of Taniguchi24

E. Taniguchi solves the increased capacitance problem.....26

V. Mori28

A. It is not clear that the teaching of Mori would have any impact on displays at the low frequency (60 Hz) at which they operate.....29

B. The Mori structure increases resistance and reduces ON current.....31

VI. Claims 23, 24, 26-40, 42-44, 46, 49, 50, 53, and 54 are patentable over Taniguchi, Mori, and Van Zant.....33

A. Creating a step-like structure in Taniguchi is not obvious.....36

B. There is no suggestion to those skilled in the art to combine Taniguchi with Mori37

1. Taniguchi solves the parasitic capacitance problem.....38

2. Reducing the size of the electrode layer above the N-type semiconductor layer has little effect on parasitic capacitance.....40

3. A person of ordinary skill in the art would likely not combine Taniguchi with Mori because the combined structure would have higher resistance and lower ON current.....	41
4. There is no reasonable expectation of success if Taniguchi were modified as detailed by Dr. Kanicki.....	44
a. The modified Taniguchi process does not connect the third conductive layer d3 to the first conductive layer d1.....	46
b. The modified Taniguchi process has an undercut problem	49
c. Because of its complexity, the modified Taniguchi process would not have been obvious	52
d. The modified Taniguchi process would change the principles of operation.....	53
5. Dr. Kanicki’s preference for tapering the TFT layers of Taniguchi is further evidence that the claimed step-like structure was not obvious	56
C. Taniguchi, Mori, and Van Zant fail to teach claim element (c) in each of independent claims 27, 35, and 43	58
VII. CONCLUSION	60

EXHIBIT LIST

Previously filed

Exhibit 2001 – Complaint, *Semiconductor Energy Laboratory Co., Ltd. v. Chimei Innolux Corp., et al.*, Case No. SACV 12-0021-JST (C.D. Cal).

Exhibit 2002 – Defendants’ Motion to Stay Litigation Pending Outcome of Inter Partes Review, *Semiconductor Energy Laboratory Co., Ltd. v. Chimei Innolux Corp., et al.*

Exhibit 2003 – Supplemental Declaration of Gregory S. Cordrey in Support of Defendants’ Motion for Stay, *Semiconductor Energy Laboratory Co., Ltd. v. Chimei Innolux Corp., et al.*

Exhibit 2004 – Defendants’ Reply in Support of their Motion to Stay, *Semiconductor Energy Laboratory Co., Ltd. v. Chimei Innolux Corp., et al.*

Exhibit 2005 – Defendant Westinghouse Digital’s Notice of Joinder, *Semiconductor Energy Laboratory Co., Ltd. v. Chimei Innolux Corp., et al.*

Exhibit 2006 – ’311 Patent Prosecution History Excerpt - Prior Art considered by the Office

Currently filed

Exhibit 2007 – Blank

Exhibit 2008 – Chun-sung Chiang, Chun-ying Chen, and Jerzy Kanicki, “Investigation of Intrinsic Channel Characteristics of Hydrogenated Amorphous Silicon Thin-Film Transistors by Gated-Four-Probe Structure,” *Applied Physics Letters*, Vol. 72, No. 22, pp. 2874-2876 (1998)

Exhibit 2009 –U.S. Patent No. 5,270,567 to Mori annotated by Dr. Kanicki

Exhibit 2010 – Chun-ying Chen and Jerzy Kancicki, “High Field-Effect-Mobility a-Si:H TFT Based on High Deposition-Rate PECVD Materials,” *IEEE Electron Device Letters*, Vol. 17, No. 9, pp. 437-439 (1996)

Exhibit 2011 – Declaration of Alex Z. Kattamis, Ph.D.

Exhibit 2012 - Willem den Boer, “Active Matrix Liquid Crystal Displays,” Elsevier, Chapter 2, pp. 23-48 (2005).

...

- Exhibit 2013 - Wang et al., “Cu/CuMg Gate Electrode for the Application of Hydrogenated Amorphous Silicon Thin-Film Transistors,” *Electrochem. Solid-State Lett.* Vol. 10 No. 8, pp. J83-J85 (2007).
- Exhibit 2014 - Zou, “Anisotropic Si Deep Beam Etching with Profile Control using SF₆/O₂ Plasma,” *Microsystem Technologies*, Vol. 10, pp. 603–607 (2004)
- Exhibit 2015 - Choi et al., “Simple Process for Making New Self-Aligned TFT with Improved On-Current,” *Electrochemical Society Proceedings*, Vol. 96-23, pp. 129-137, 1997
- Exhibit 2016 - Uchikoga et al., “The Effect of Contact Overlap Distance on a-Si TFT Performance,” *Mat. Res. Soc. Symp. Proc.*, Vol. 258, pp. 1025-1030, 1992
- Exhibit 2017 - Kuo et al., “Advanced Multilayer Amorphous Silicon Thin-Film Transistor Structure: Film Thickness Effect on Its Electrical Performance and Contact Resistance,” *Jpn. J. Appl. Phys.* Vol. 47, No. 5, pp. 3362–3367 (2008)
- Exhibit 2018 – C. van Berkel, “Amorphous-Silicon Thin-Film Transistors: Physics and Properties, in *Amorphous and Microcrystalline Semiconductor Devices*,” Vol. 2 edited by J. Kanicki, Artech House, pp. 397-447(1992).
- Exhibit 2019 – Chiang et al., “Electrical Instability of Hydrogenated Amorphous Silicon Thin-Film Transistors for Active-Matrix Liquid-Crystal Displays,” *Jpn. J. Appl. Phys.* Vol. 37 pp. 4704-4710 (1998)
- Exhibit 2020 – Transcript of Videotaped Deposition of Jerzy Kanicki
- Exhibit 2021 – U.S. Patent No. 6,104,042 to Wen-Jyh Sah

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.