



US007573068B2

(12) **United States Patent**
Shimoda et al.

(10) **Patent No.:** **US 7,573,068 B2**
(45) **Date of Patent:** **Aug. 11, 2009**

(54) **TRANSISTOR ARRAY SUBSTRATE AND DISPLAY PANEL**

6,864,639 B2	3/2005	Ito
6,933,533 B2	8/2005	Yamazaki et al.
7,317,429 B2	1/2008	Shirasaki et al.
2004/0108978 A1*	6/2004	Matsueda et al. 345/76

(75) Inventors: **Satoru Shimoda**, Fussa (JP); **Tomoyuki Shirasaki**, Higashiyamato (JP); **Jun Ogura**, Fussa (JP); **Minoru Kumagai**, Tokyo (JP)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **Casio Computer Co., Ltd.**, Tokyo (JP)

CN	1360350 A	7/2002
JP	8-330600 A	12/1996

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 769 days.

(Continued)

(21) Appl. No.: **11/232,368**

OTHER PUBLICATIONS

(22) Filed: **Sep. 21, 2005**

A Japanese Office Action (and English translation thereof) dated Apr. 30, 2008, issued in a counterpart Japanese Application.

(65) **Prior Publication Data**

US 2006/0098521 A1 May 11, 2006

Primary Examiner—Davienne Monbleau
Assistant Examiner—Shweta Mulcare
(74) *Attorney, Agent, or Firm*—Frishauf, Holtz, Goodman & Chick, P.C.

(30) **Foreign Application Priority Data**

Sep. 21, 2004	(JP)	2004-273532
Sep. 21, 2004	(JP)	2004-273580
Sep. 16, 2005	(JP)	2005-269434

(57) **ABSTRACT**

(51) **Int. Cl.**

H01L 33/00 (2006.01)
H01L 27/32 (2006.01)

(52) **U.S. Cl.** **257/72; 257/208; 257/E33.055**

(58) **Field of Classification Search** **257/59, 257/72, 79, 81, 83, E33.064, E33.077, E27.131, 257/E27.132, 208, E33.055; 313/500, 505; 349/42, 139, 149, 73, 74; 345/44, 45, 87-92**
See application file for complete search history.

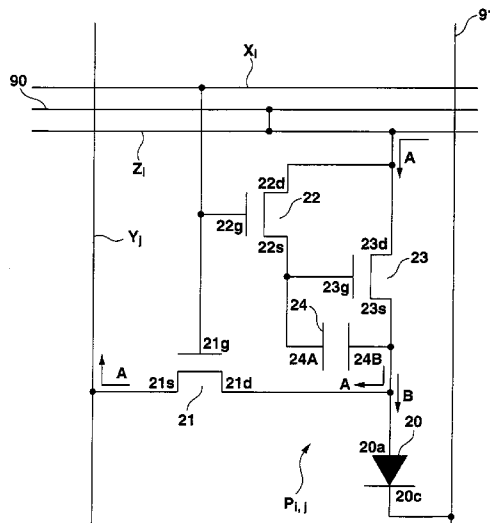
A transistor array substrate includes a plurality of driving transistors which are arrayed in a matrix on a substrate. The driving transistor has a gate, a source, a drain, and a gate insulating film inserted between the gate, and the source and drain. A plurality of signal lines are patterned together with the gates of the driving transistors and arrayed to run in a predetermined direction on the substrate. A plurality of supply lines are patterned together with the sources and drains of the driving transistors and arrayed to cross the signal lines via the gate insulating film. The supply line is electrically connected to one of the source and the drain of the driving transistor. A plurality of feed interconnections are formed on the supply lines along the supply lines, respectively.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,762,564 B2 7/2004 Noguchi et al.

17 Claims, 27 Drawing Sheets



FOREIGN PATENT DOCUMENTS		
JP	2000-349298 A	12/2000
JP	2003-133079 A	5/2003
JP	2003-195810 A	7/2003
JP	2003-330387 A	11/2003
JP	2004-101948 A	4/2004
WO	WO 2004/019314 A1	3/2004

* cited by examiner

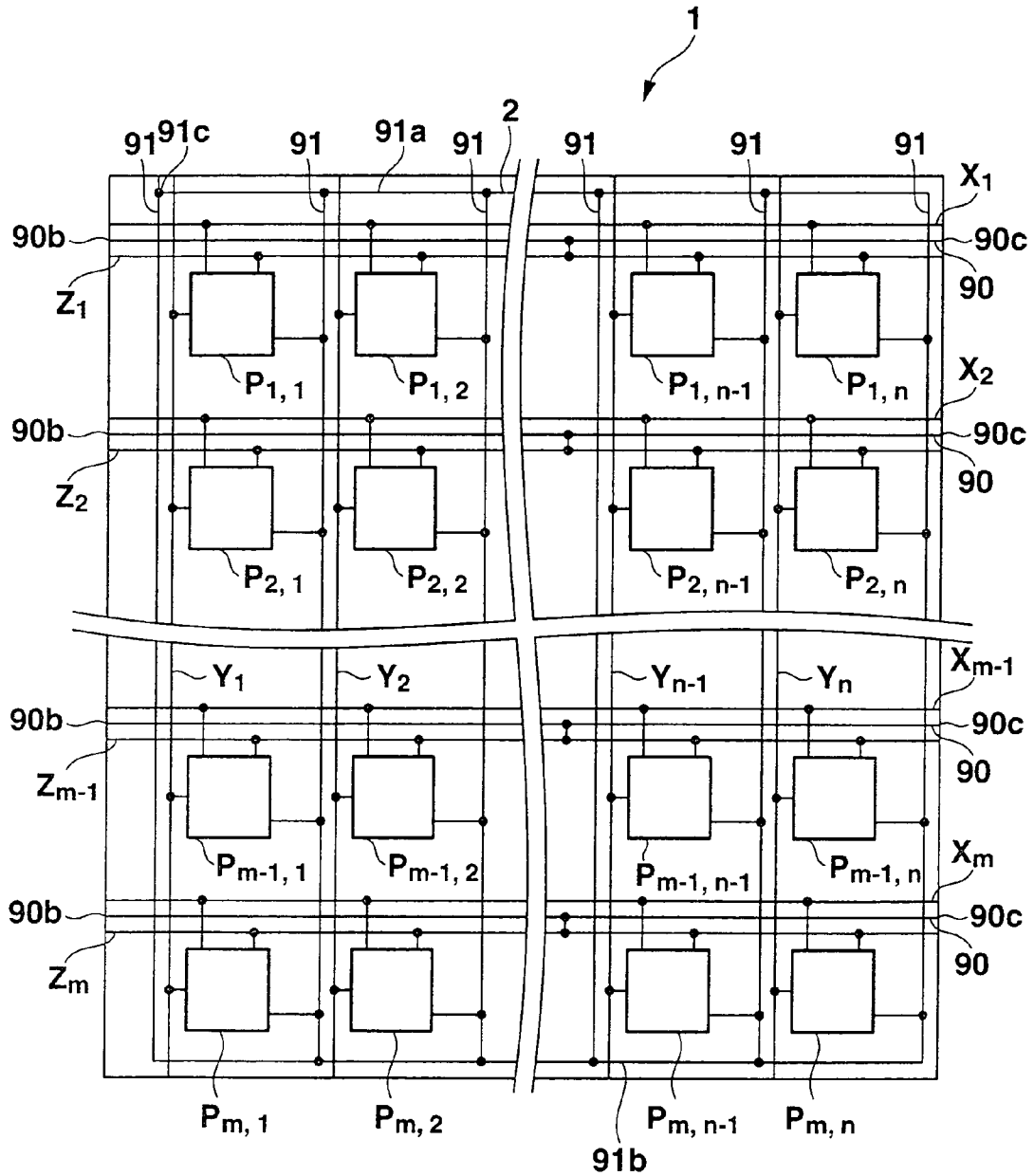


FIG. 1

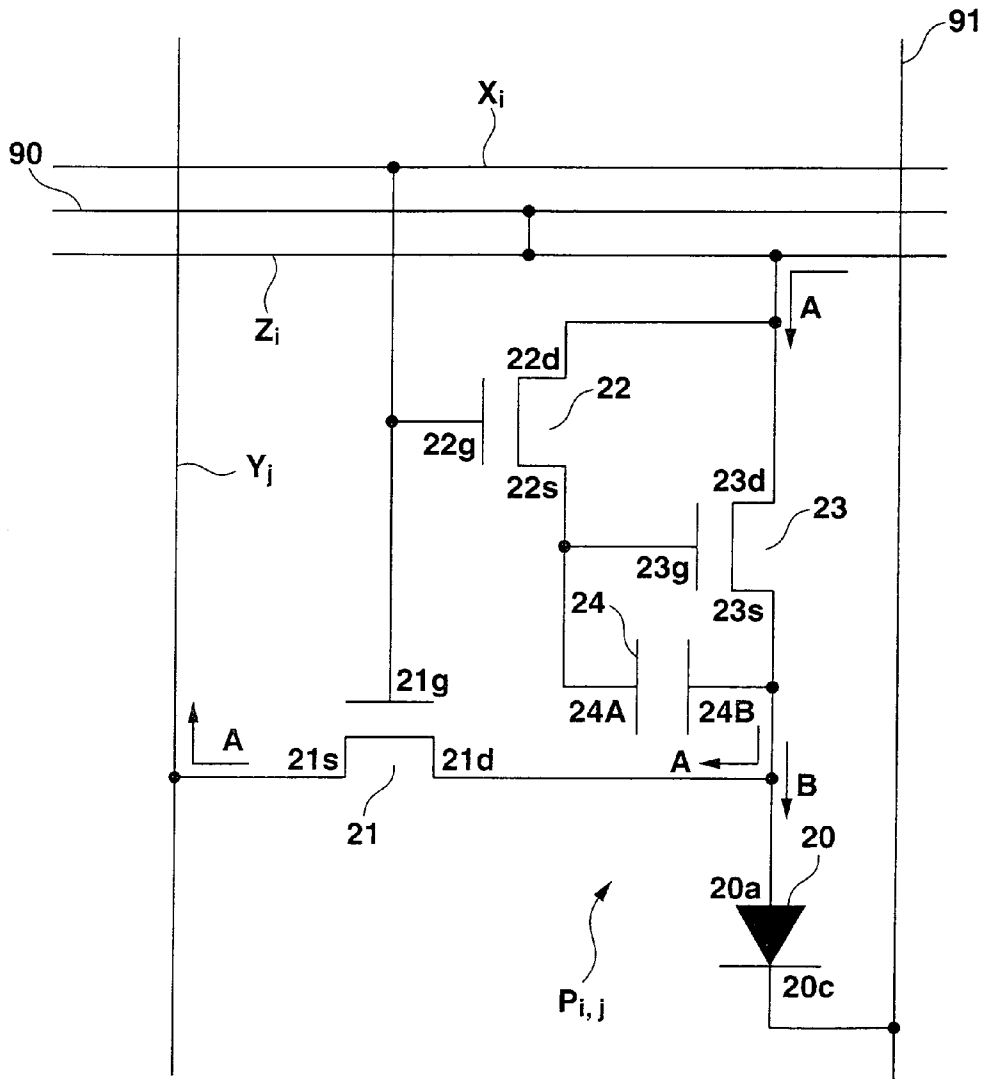


FIG.2

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.