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(54) Active matrix electroluminescent display device and method for driving the same

(57) A semiconductor device including a pixel, the pixel comprising a light emitting element; a transistor including a micro-crystalline semiconductor film; a source electrode of the transistor electrically connected to one electrode of the light emitting element; a capacitor electrically connected between the source electrode and a gate electrode of the transistor; and a power source line electrically connected to a drain electrode of the transistor.

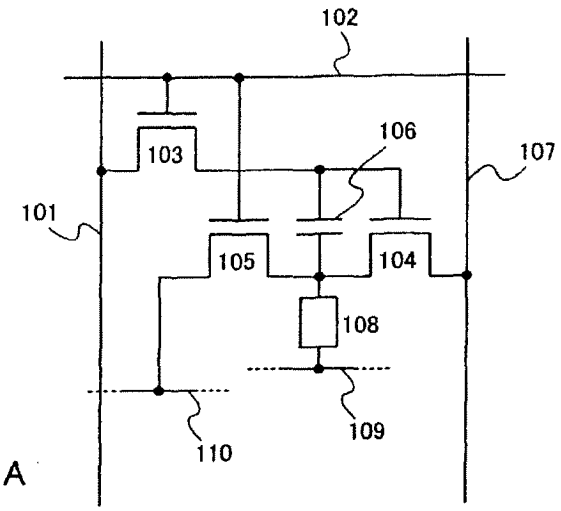

Fig. 1A

EP 2 309 479 A3

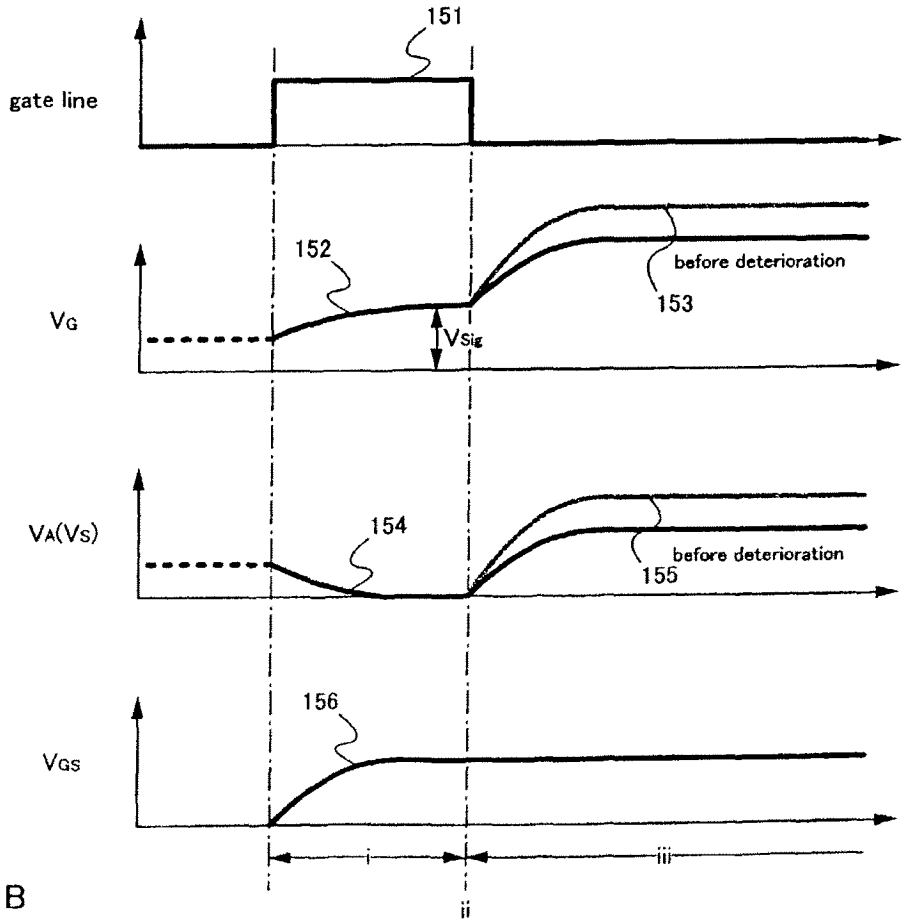
151
gate line
152
before deterioration
153
VG
VSig
VA(VS)
154
before deterioration
155
156
VGS
i
iii
ii

Fig. 1B

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EUROPEAN SEARCH REPORT

Application Number
EP 10 17 8957

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CHEN S-L ET AL: "CURRENT PROGRAMMED PIXEL STRUCTURES FOR OLED", ASIA DISPLAY / IDW'01. PROCEEDINGS OF THE 21ST INTERNATIONAL DISPLAY RESEARCH CONFERENCE IN CONJUCTION WITH THE 8TH INTERNATIONAL DISPLAY WORKSHOPS. NAGOYA, JAPAN, OCT. 16 - 19, 2001; [INTERNATIONAL DISPLAY RESEARCH CONFERENCE. IDRC], SAN JOSE, CA :, vol. CONF. 21 / 8, 16 October 2001 (2001-10-16), pages 399-402, XP001134221,	1,2,4-6, 9	INV. G09G3/30
Y	Introduction; * abstract; figure 1 *	7,8	
Y	EP 1 150 273 A2 (SEMICONDUCTOR ENERGY LAB [JP]) 31 October 2001 (2001-10-31) * paragraphs [0195], [0196] *	8	
Y	US 2001/035863 A1 (KIMURA HAJIME [JP]) 1 November 2001 (2001-11-01) * paragraph [0155] *	7	TECHNICAL FIELDS SEARCHED (IPC) G09G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 May 2011	Fulcheri, Alessandro

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

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Application Number
EP 10 17 8957

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 10 17 8957

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-6, 9

   Semiconductor device.
   The circuit comprises a transistor having a bottom gate structure.

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2. claim: 7

   Semiconductor device.
   The wiring connected to the source electrode or drain electrode of the transistors is a three-layer laminated film consisting of a Ti film, a Al film, and a Ti film.

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3. claim: 8

   Semiconductor device.
   The gate electrode of the first transistor comprises molybdenum.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 17 8957

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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19-05-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1150273 A2	31-10-2001	CN 1322015 A	14-11-2001
		TW 531901 B	11-05-2003
		US 2002047120 A1	25-04-2002
US 2001035863 A1	01-11-2001	KR 20060038412 A	03-05-2006

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	有源矩阵电致发光显示装置及其驱动方法		
公开(公告)号	EP2309479A3	公开(公告)日	2011-06-29
申请号	EP2010178957	申请日	2002-11-13
[标]申请(专利权)人(译)	株式会社半导体能源研究所		
申请(专利权)人(译)	半导体能源研究所有限公司.		
当前申请(专利权)人(译)	半导体能源研究所有限公司.		
[标]发明人	KIMURA HAJIME		
发明人	KIMURA, HAJIME		
IPC分类号	G09G3/30 G09G3/20 G09G3/32 H01L27/32 H04M1/73		
CPC分类号	G09G3/2022 G09G3/3233 G09G3/3266 G09G3/3291 G09G2300/0426 G09G2300/0842 G09G2310/0251 G09G2310/0256 G09G2310/027 G09G2310/061 G09G2320/043 G09G2330/08 G09G2330/10 H01L27/3244 H04W52/027 Y02D70/00 H01L27/1255		
优先权	2001348032 2001-11-13 JP		
其他公开文献	EP2309479A2 EP2309479B1		
外部链接	Espacenet		

摘要(译)

一种半导体器件，包括像素，所述像素包括发光元件;包括微晶半导体膜的晶体管;晶体管的源极电连接到发光元件的一个电极;电容器，其电连接在源电极和晶体管的栅电极之间;电源线电连接到晶体管的漏电极。

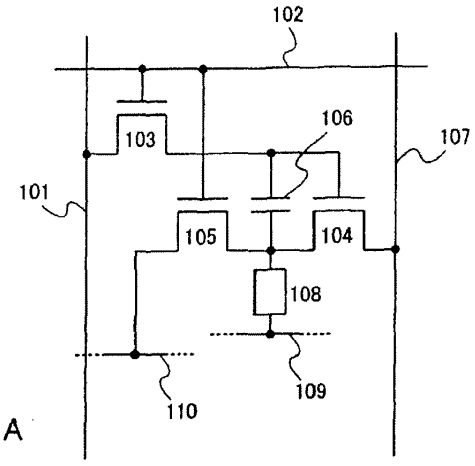

Fig. 1A