



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 107 220 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
28.08.2002 Bulletin 2002/35

(51) Int Cl.⁷: **G09G 3/30, G09G 3/32**

(43) Date of publication A2:
13.06.2001 Bulletin 2001/24

(21) Application number: **00126217.9**

(22) Date of filing: **30.11.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **SEL SEMICONDUCTOR ENERGY
LABORATORY CO., LTD.**
Atsugi-shi, Kanagawa-ken 243-0036 (JP)

(72) Inventor: **Koyama, Jun**
Atsugi-shi, Kanagawa-ken 243-0036 (JP)

(30) Priority: **30.11.1999 JP 34127299**
30.08.2000 JP 2000260061

(74) Representative: **Grünecker, Kinkeldey,
Stockmair & Schwanhäusser Anwaltssozietät**
Maximilianstrasse 58
80538 München (DE)

(54) **Gradation control for an active matrix EL display**

(57) There is provided an electric device which can prevent a deterioration in a frequency characteristic due to a large electric power external switch connected to an opposite electrode and can prevent a decrease in the number of gradations. The electric device includes a plurality of source signal lines, a plurality of gate signal

lines, a plurality of power source supply lines, a plurality of power source control lines, and a plurality of pixels. Each of the plurality of pixels includes a switching TFT, an EL driving TFT, a power source controlling TFT, and an EL element, and the power source controlling TFT controls a potential difference between a cathode and an anode of the EL element.

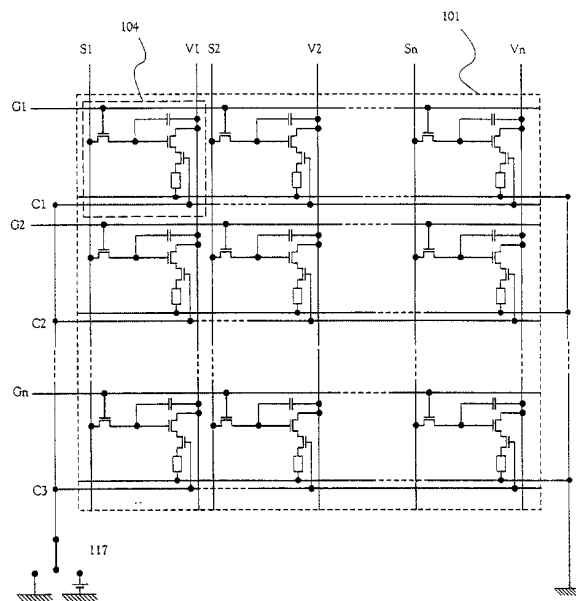


FIG. 2

EP 1 107 220 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 12 6217

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 98 48403 A (SARNOFF CORP) 29 October 1998 (1998-10-29)	1,4,6	G09G3/30 G09G3/32
Y	* page 6, line 20 - page 8, line 2 * * figure 3 * ---	2,3,7-9, 17-19, 27-29	
E	US 6 246 384 B1 (SANO KEIICHI) 12 June 2001 (2001-06-12) * column 4, line 45 - column 6, line 6 * * figures 2,3 *	1	
X	& JP 11 272235 A (SANYO ELECTRIC CO LTD) 8 October 1999 (1999-10-08) ---	1	
Y	EP 0 778 556 A (SARNOFF DAVID RES CENTER) 11 June 1997 (1997-06-11) * column 4, line 39 - column 5, line 8 * ---	2,3	
Y	WO 99 53472 A (BURROUGHES JEREMY HENLEY ;CAMBRIDGE DISPLAY TECH (GB); FRIEND RICH) 21 October 1999 (1999-10-21) * page 3, paragraph 5 - page 4, paragraph 1 * ---	7-9, 17-19, 27-29	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G09G H01L
A	WO 99 42983 A (BURROUGHES JEREMY HENLEY ;CAMBRIDGE DISPLAY TECH (GB); FRIEND RICH) 26 August 1999 (1999-08-26) * page 1, paragraph 2 - paragraph 3 * * page 5, paragraph 5 * ---	7-9, 17-19, 27-29	
A	WO 99 49989 A (UNIV OHIO) 7 October 1999 (1999-10-07) * page 4, paragraph 3 - page 5, paragraph 1 * * page 5, paragraph 3 * --- -/--	9,19,29	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 28 June 2002	Examiner Farricella, L
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)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 12 6217

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	KAWAHARA I ET AL: "SIMULATION OF MOTION PICTURE DISTURBANCE FOR AC-PDP MODELING VIRTUAL PIXEL ON RETINA" IEICE TRANSACTIONS ON ELECTRONICS, INSTITUTE OF ELECTRONICS INFORMATION AND COMM. ENG. TOKYO, JP, vol. E81-C, no. 11, November 1998 (1998-11), pages 1733-1739, XP000875145 ISSN: 0916-8524 * figure 1 *	2,3	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	--- KANAGU S ET AL: "A 31-IN.-DIAGONAL FULL-COLOR SURFACE-DISCHARGE AC PLASMA DISPLAY PANEL" SID INTERNATIONAL SYMPOSIUM DIGEST OF PAPERS. BOSTON, MAY 17 - 22, 1992, PLAYA DEL REY, SID, US, vol. 23, 17 May 1992 (1992-05-17), pages 713-716, XP000479110 ISSN: 0097-966X * figure 3 *	2,3	
A	--- GB 2 336 459 A (FUJI ELECTRIC CO LTD) 20 October 1999 (1999-10-20) * page 4, paragraph 2 - page 6, paragraph 1; figure 14 *	2,3	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 28 June 2002	Examiner Farricella, L
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)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 12 6217

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-06-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9848403 A	29-10-1998	US 6229506 B1 EP 0978114 A1 JP 2002514320 T WO 9848403 A1	08-05-2001 09-02-2000 14-05-2002 29-10-1998
US 6246384 B1	12-06-2001	JP 11272235 A	08-10-1999
EP 0778556 A	11-06-1997	US 5302966 A EP 0778556 A2 DE 69320956 D1 DE 69320956 T2 EP 0643865 A1 FI 945548 A JP 7507403 T WO 9324921 A1	12-04-1994 11-06-1997 15-10-1998 22-04-1999 22-03-1995 25-11-1994 10-08-1995 09-12-1993
WO 9953472 A	21-10-1999	EP 1072033 A1 WO 9953472 A1 JP 2002511608 T	31-01-2001 21-10-1999 16-04-2002
WO 9942983 A	26-08-1999	AU 2529099 A CN 1291321 T EP 1057167 A1 WO 9942983 A1 JP 2002504717 T	06-09-1999 11-04-2001 06-12-2000 26-08-1999 12-02-2002
WO 9949989 A	07-10-1999	AU 3360899 A CA 2326156 A1 EP 1068030 A1 WO 9949989 A1	18-10-1999 07-10-1999 17-01-2001 07-10-1999
GB 2336459 A	20-10-1999	JP 11296131 A	29-10-1999

专利名称(译)	有源矩阵EL显示器的渐变控制		
公开(公告)号	EP1107220A3	公开(公告)日	2002-08-28
申请号	EP2000126217	申请日	2000-11-30
[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)	SEL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	KOYAMA JUN		
发明人	KOYAMA, JUN		
IPC分类号	G09G3/30 G09G3/20 G09G3/32 H01L27/32		
CPC分类号	G09G3/3291 G09G3/2018 G09G3/2022 G09G3/3275 G09G2300/0417 G09G2300/0426 G09G2300/0809 G09G2300/0842 G09G2300/0861 G09G2320/0233 H01L27/12 H01L27/1214 H01L27/124 H01L27/3244 H01L51/5231 H01L51/5253		
优先权	1999341272 1999-11-30 JP 2000260061 2000-08-30 JP		
其他公开文献	EP1107220B1 EP1107220A2		
外部链接	Espacenet		

摘要(译)

提供一种电气设备，其能够防止由于连接到相对电极的大电力外部开关引起的频率特性的劣化，并且能够防止灰度数量的减少。电子设备包括多个源信号线，多个栅极信号线，多个电源线，多个电源控制线和多个像素。多个像素中的每一个包括开关TFT，EL驱动TFT，电源控制TFT和EL元件，并且电源控制TFT控制EL元件的阴极和阳极之间的电位差。

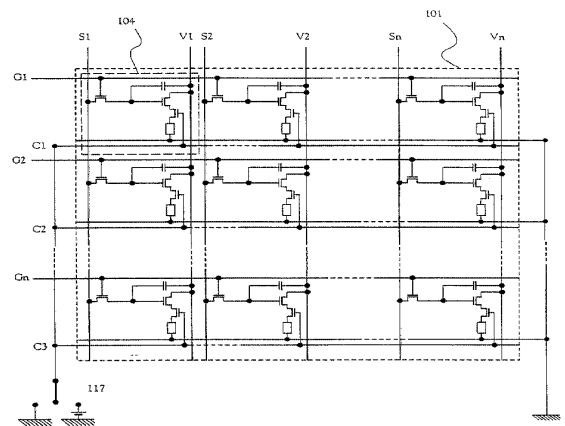


FIG. 2