(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 265 215 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
29.10.2003 Bulletin 2003/44

(43) Date of publication A2:
11.12.2002 Bulletin 2002/50

(21) Application number: **02012194.3**

(22) Date of filing: **03.06.2002**

(51) Int Cl.[7]: **G09G 3/36**

(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

(30) Priority: **04.06.2001 JP 2001168520**

(71) Applicant: **SEIKO EPSON CORPORATION**
Tokyo 160-0811 (JP)

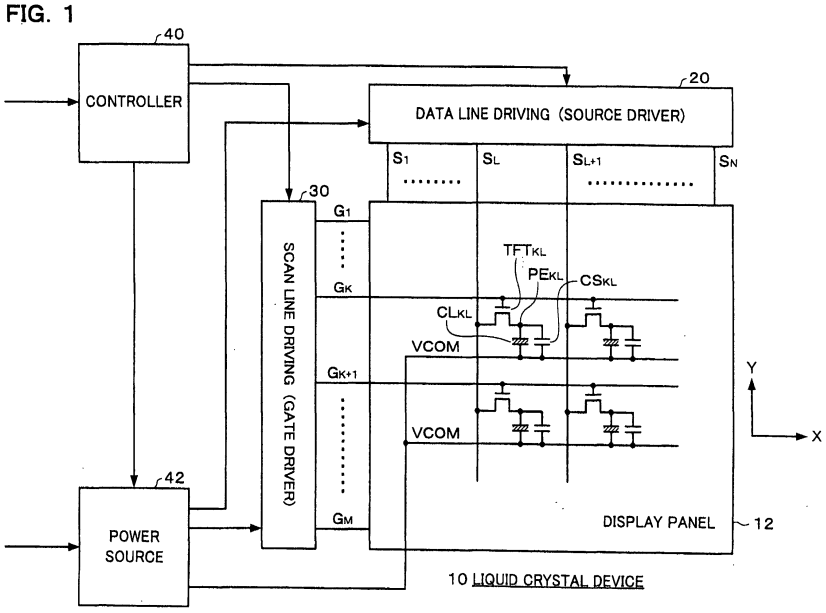
(72) Inventor: **Ishiyama, Hisanobu**
Suwa-shi, Nagano-ken 392-8502 (JP)

(74) Representative: **Hoffmann, Eckart, Dipl.-Ing.**
Patentanwalt,
Bahnhofstrasse 103
82166 Gräfelfing (DE)

(54) Circuit for and method of driving the counter electrode of a liquid crystal display panel

(57) A liquid crystal display panel is driven by scan line inversion driving. Here, a virtual scanning period is provided between an Mth scanning period and a first scanning period which constitutes a frame next to the Mth scanning period. In the virtual period, the display panel is driven by setting a voltage level of a counter electrode VCOM to a voltage level different from VCOM during the Mth and the first scanning periods. During the period T1 in which VCOM becomes VC1, data line is driven using a P-type operational amplifier OP1 having a P-type driving transistor, while during the period T2 in which VCOM becomes VC2, the data line is driven using an N-type operational amplifier OP2 having an N-type driving transistor. The data line is set to the high impedance state when the periods T1, T2 are changed over and the voltage level of the data line is preliminarily changed to the VDD side or the VSS side before driving by positively utilizing the parasitic capacitance between the counter electrode and the data line.

FIG. 1



EP 1 265 215 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 01 2194

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	GB 2 188 471 A (SHARP KK) 30 September 1987 (1987-09-30) * page 2, line 128 - line 130; figures 1,9 * * page 3, line 38 - line 46 * -----	1-5,7-10	G09G3/36

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G09G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	5 September 2003	Gundlach, H

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 02 01 2194

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.

05-09-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2188471 A	30-09-1987	JP 5002208 B	12-01-1993
		JP 62218943 A	26-09-1987
		DE 3709086 A1	24-09-1987
		US 4906984 A	06-03-1990

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)	用于驱动液晶显示板的对电极的电路和方法		
公开(公告)号	EP1265215A3	公开(公告)日	2003-10-29
申请号	EP2002012194	申请日	2002-06-03
[标]申请(专利权)人(译)	精工爱普生株式会社		
申请(专利权)人(译)	SEIKO EPSON CORPORATION		
当前申请(专利权)人(译)	SEIKO EPSON CORPORATION		
[标]发明人	ISHIYAMA HISANOBU		
发明人	ISHIYAMA, HISANOBU		
IPC分类号	G02F1/133 G09G3/00 G09G3/20 G09G3/30 G09G3/36		
CPC分类号	G09G3/3655 G09G3/3614 G09G2330/021		
优先权	2001168520 2001-06-04 JP		
其他公开文献	EP1265215A2		
外部链接	Espacenet		

摘要(译)

通过扫描线反转驱动来驱动液晶显示面板。这里，在第M扫描时段和第一扫描时段之间提供虚拟扫描时段，第一扫描时段构成紧邻第M扫描时段的帧。在虚拟时段中，通过在第M和第一扫描时段期间将对电极VCOM的电压电平设置为与VCOM不同的电压电平来驱动显示面板。在VCOM变为VC1的时段T1期间，使用具有P型驱动晶体管的P型运算放大器OP1驱动数据线，而在VCOM变为VC2的时段T2期间，使用N驱动数据线。类型运算放大器OP2具有N型驱动晶体管。当周期T1，T2被切换并且数据线的电压电平在驱动之前通过积极地利用对电极之间的寄生电容而预先改变到VDD侧或VSS侧时，数据线被设置为高阻抗状态。和数据线。

FIG. 1