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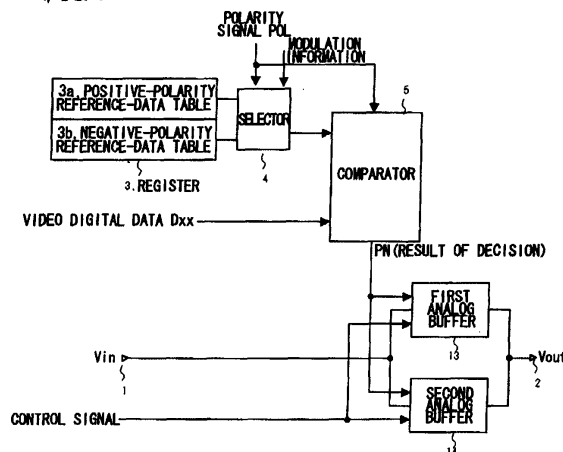
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(54) **Driver circuit and liquid crystal display device**

(57) Disclosed is a driver circuit, as well as a LCD device having the driver circuit, in which changeover between first and second buffer circuits the operating ranges of which extend to high- and low-potential power supply voltages can be performed reliably within the drive changeover range. The driver circuit includes first and second buffer circuits(13 and 14) having their input terminals connected in common with one input terminal(1) to which an input signal voltage(V_{in}) is input and having their output terminals connected in common with an output terminal(2), the first and second buffer circuits having operating ranges that extend to high- and low-potential power supply voltages, respectively; first and second storage units(3a and 3b) for storing respectively positive- and negative-polarity reference data, which correspond to voltages within a range in which both of the first and second buffer circuits(13 and 14) are operable, with regard to each of a standard state and modulated state of a gamma characteristic; a selector(4) for selecting either of the storage units based upon a polarity signal, and selectively outputting reference data corresponding to the standard or modulated state based upon modulation information that specifies modulation; and a comparator(5) for comparing entered data and the reference data output from the selector. Activation and deactivation of the first and second buffer circuits(13 and 14) is controlled based upon an output signal from the comparator(5) and a control signal.

FIG. 1





EUROPEAN SEARCH REPORT

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EP 02 01 4807

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,A	TSUCHI H ET AL: "12.3: A New Low-Power TFT-LCD Driver for Portable Devices" 2000 SID INTERNATIONAL SYMPOSIUM - MAY 16-18, 2000, LONG BEACH, CALIFORNIA, vol. XXXI, 16 May 2000 (2000-05-16), page 146, XP007007348 * figure 3 * *section 3.1*	1-46	INV. G09G3/36
A	----- JP 2001 004974 A (SANYO ELECTRIC CO) 12 January 2001 (2001-01-12) * figures 1-4 * * abstract *	1-46	
D,A	----- JP 2000 338461 A (NIPPON ELECTRIC CO) 8 December 2000 (2000-12-08) * figures 1-9,16 *	1-46	
A	----- JP 2001 175214 A (WINBOND ELECTRON CORP) 29 June 2001 (2001-06-29) * the whole document *	1-46	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 January 2009	Examiner Lochhead, Steven
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	

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

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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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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2001004974	A	12-01-2001	NONE	

JP 2000338461	A	08-12-2000	EP 1056070 A2	29-11-2000
			JP 3482908 B2	06-01-2004
			KR 20010020913 A	15-03-2001
			TW 525126 B	21-03-2003
			US 6624669 B1	23-09-2003

JP 2001175214	A	29-06-2001	CN 1300046 A	20-06-2001
			KR 20010067146 A	12-07-2001
			TW 508556 B	01-11-2002
			US 6344814 B1	05-02-2002

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外部链接	Espacenet		

摘要(译)

本发明公开了一种驱动电路，以及具有该驱动电路的LCD装置，其中在驱动转换期间可以可靠地执行工作范围扩展到高电位和低电位电压的第一和第二缓冲电路之间的转换。范围。驱动电路包括第一和第二缓冲电路（13和14），它们的输入端子与输入端子（1）共同连接，输入信号电压（ V_{in} ）输入到输入端子（1），输出端子与输出端共同连接端子（2），第一和第二缓冲电路的工作范围分别延伸到高和低电位电源电压；第一和第二存储单元（3a和3b）用于存储对于标准状态和伽马特性的调制状态中的每一个，分别对应于第一和第二缓冲电路（13和14）都可操作的范围内的电压的正极性和负极性参考数据；选择器（4），用于根据极性信号选择任一个存储单元，并根据指定调制的调制信息选择性地输出对应于标准或调制状态的参考数据；和比较器（5），用于比较输入数据和从选择器输出的参考数据。基于来自比较器（5）的输出信号和控制来控制第一和第二缓冲电路（13和14）的激活和去激活信号。

FIG. 1

