



US005602796A

United States Patent [19]

[11] Patent Number: **5,602,796**

Sugio

[45] Date of Patent: **Feb. 11, 1997**

[54] **WORD LINE DRIVER IN A SEMICONDUCTOR MEMORY DEVICE**

0551598 7/1993 European Pat. Off. .
63-113888 5/1988 Japan .

[75] Inventor: **Kenichiro Sugio**, Miyazaki, Japan

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[73] Assignee: **Oki Electric Industry Co., Ltd.**, Tokyo, Japan

“Cross-Coupled Level-Shifting Low-Voltage Wordline Driver For Dram,” *IBM Technical Disclosure Bulletin*, vol. 34, No. 4B, Sep. 1991, Armonk, NY, pp. 332-334.

[21] Appl. No.: **318,175**

Primary Examiner—P. Zarabian

[22] Filed: **Oct. 5, 1994**

Attorney, Agent, or Firm—Law Office of Steven M. Rabin, P.C.

[30] Foreign Application Priority Data

[57] ABSTRACT

Oct. 13, 1993 [JP] Japan 5-255424

[51] **Int. Cl.⁶** **G11C 8/00**

[52] **U.S. Cl.** **365/230.06; 365/230.08**

[58] **Field of Search** 365/230.06, 230.08, 365/189.09, 189.11; 326/80, 86

A word line driver has a decoder for outputting decode signals having first and second logic levels, level shifters for receiving the respective decode signals, each level shifter outputting drive signal having first and third logic levels in response to the received decode signal, the third logic level being higher than the second logic level; a pumping circuit for outputting word line activation signals, at least one of the word line activation signals having the third logic level; and groups of output circuits, each group having the output circuits connected to one of the level shifters and a word line, respectively, each of the output circuits outputting the word line activation signal to the respective word line in response to the decode signal and the drive signal.

[56] References Cited

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13 Claims, 4 Drawing Sheets

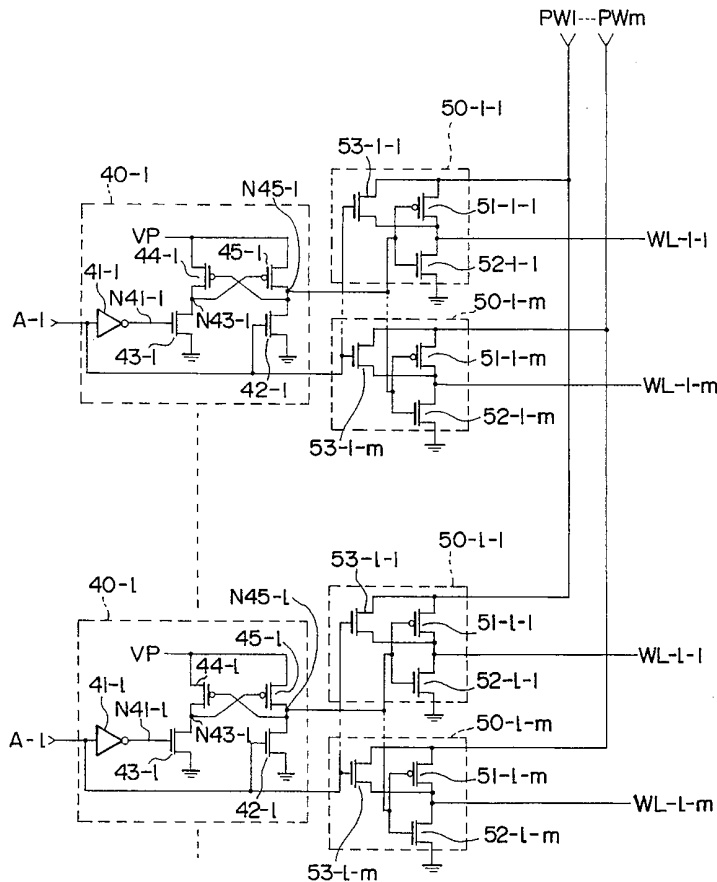


FIG. 1

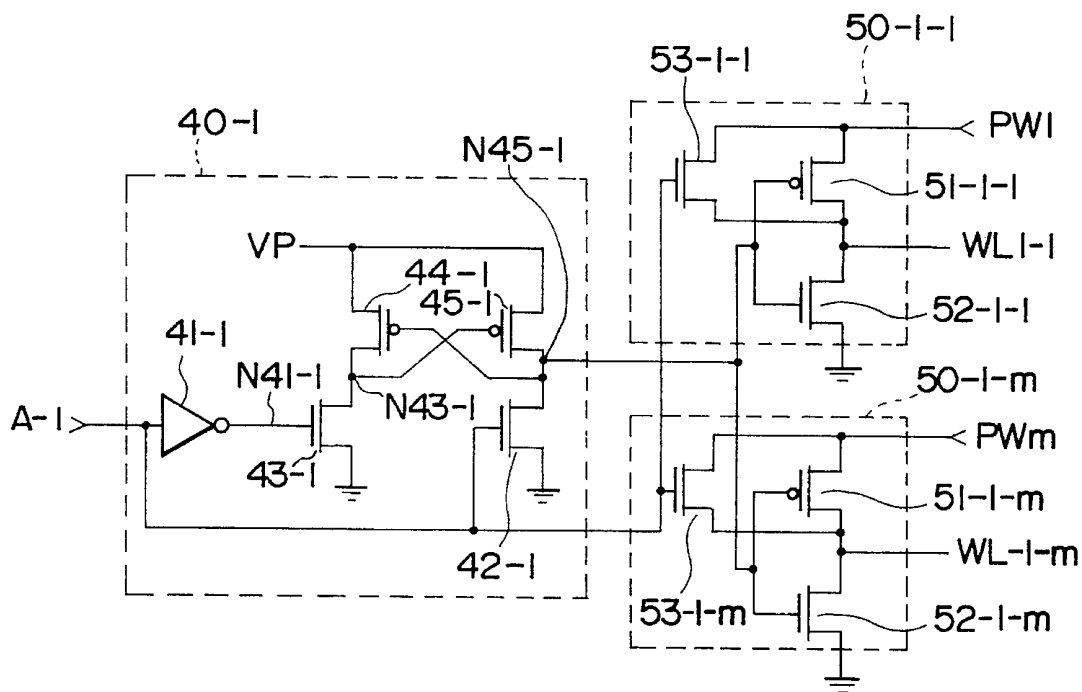


FIG. 2

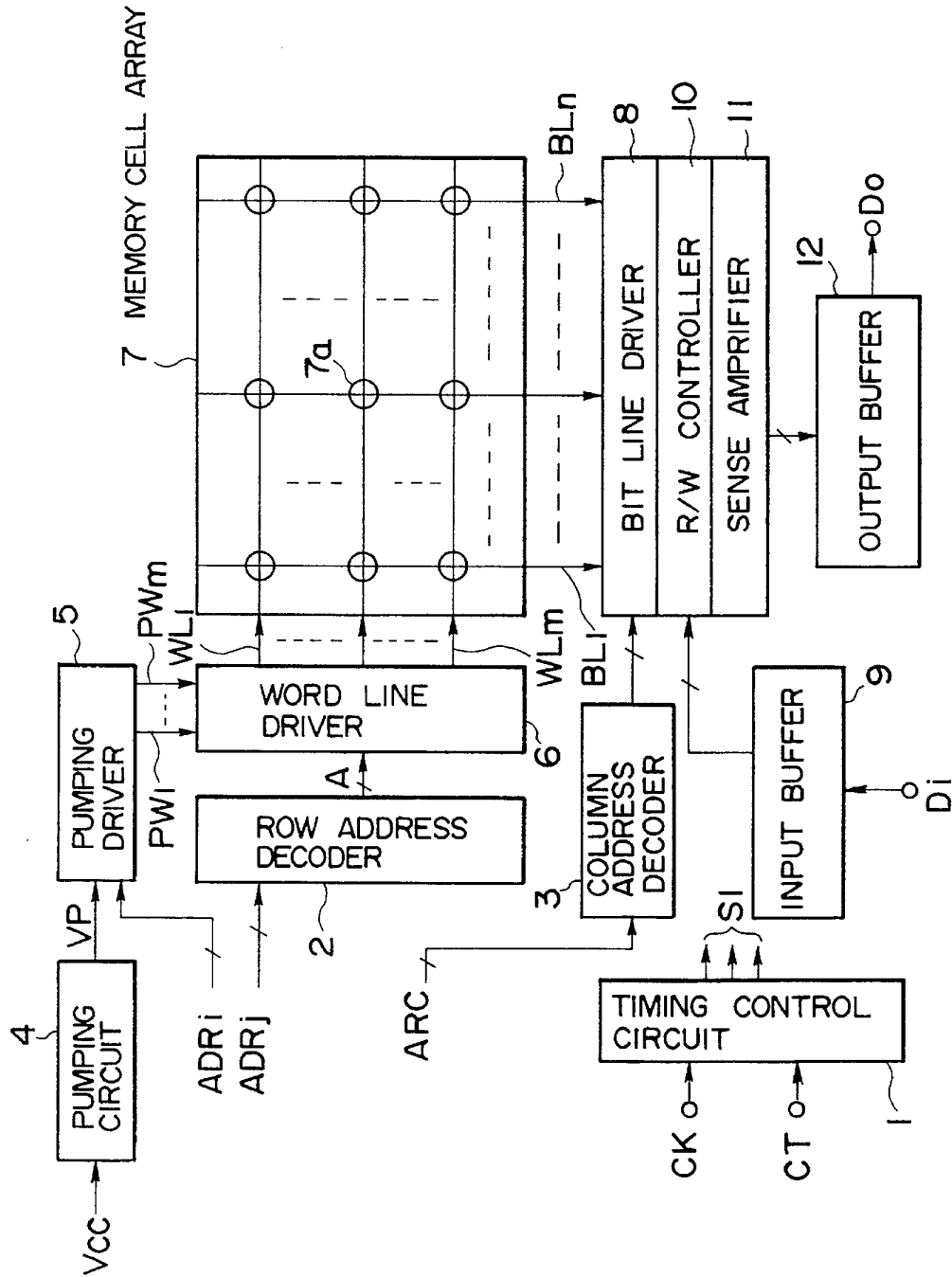


FIG. 3

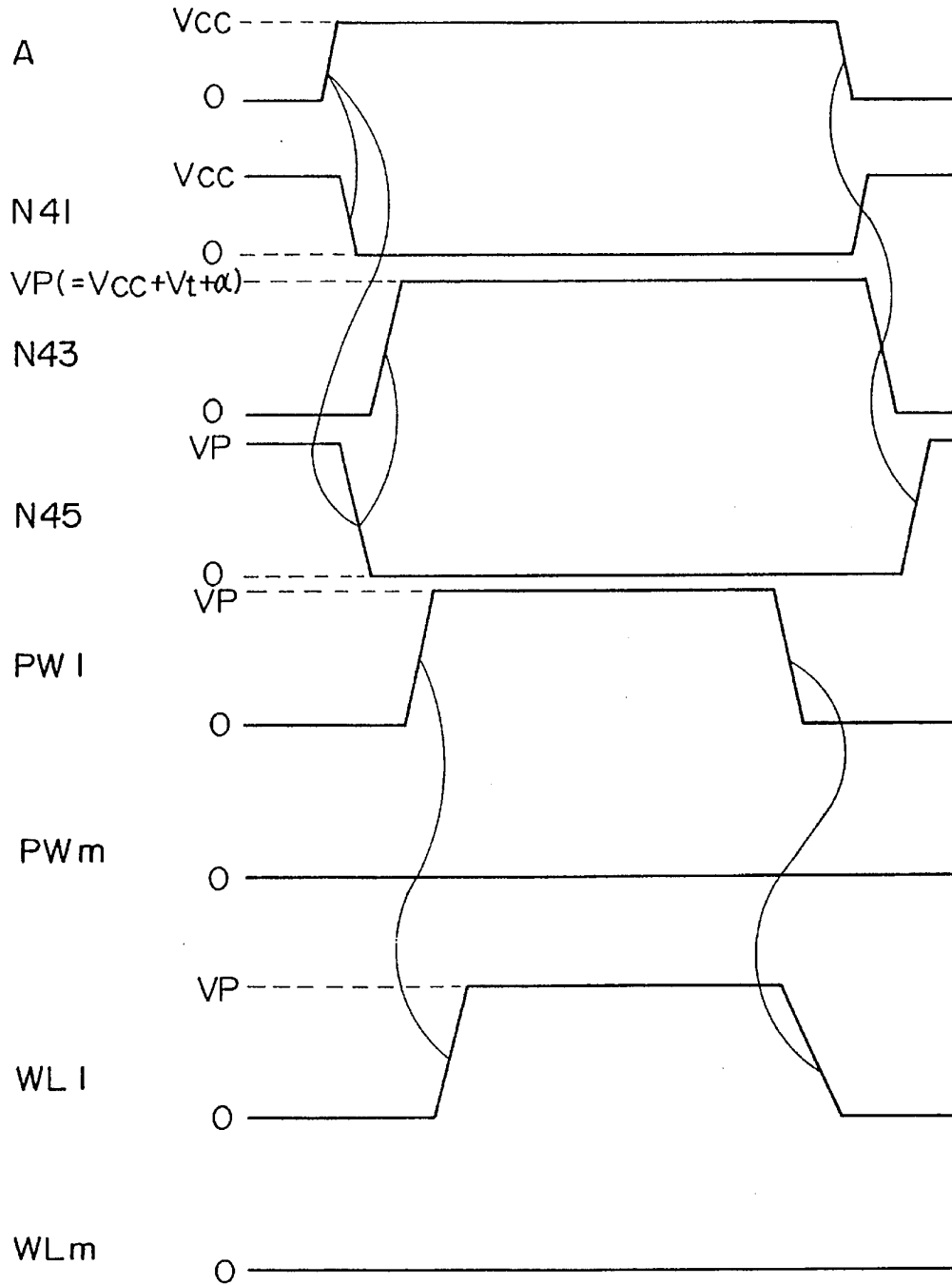
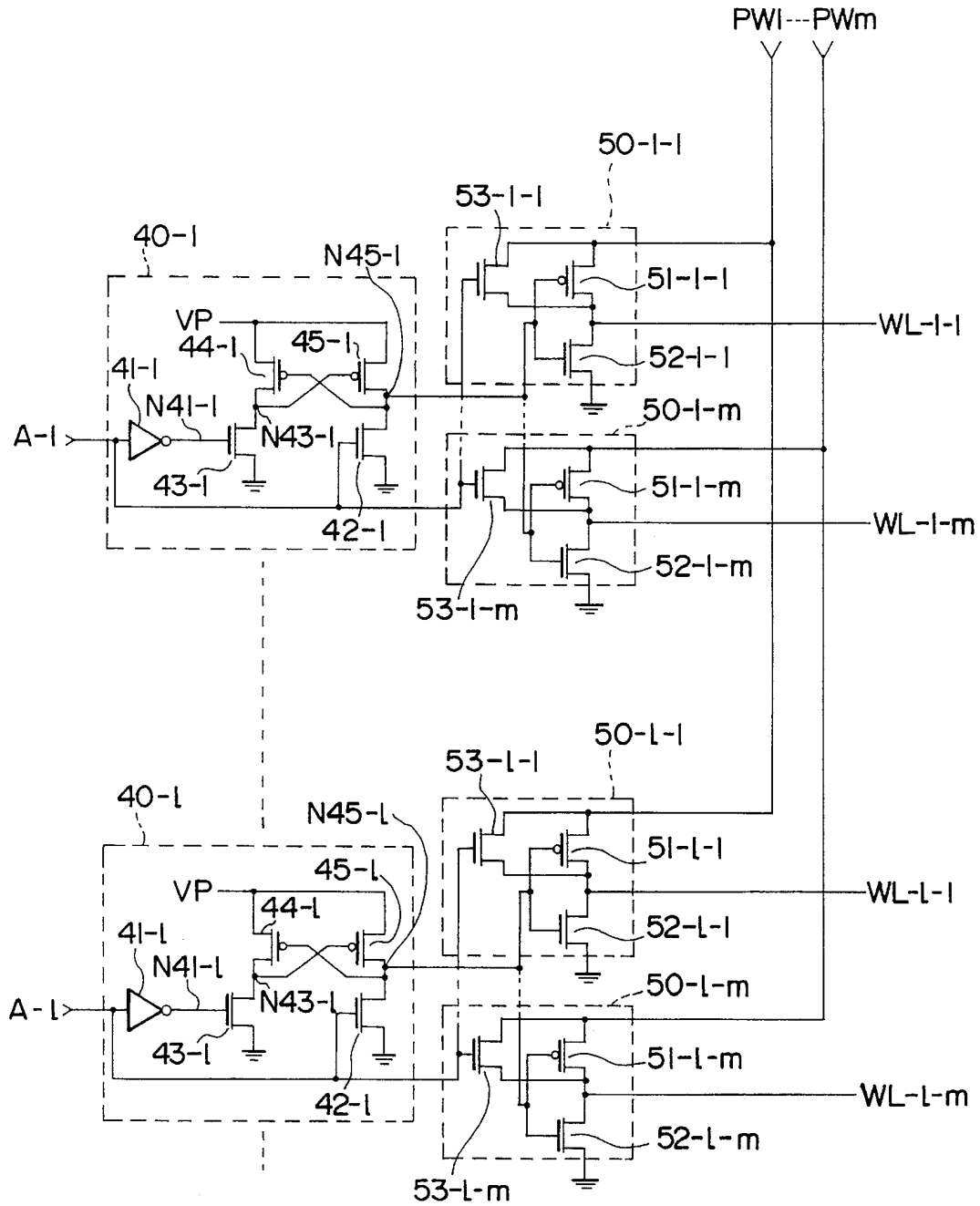


FIG. 4



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