



US005966032A

United States Patent [19]

[11] Patent Number: **5,966,032**

Elrabaa et al.

[45] Date of Patent: **Oct. 12, 1999**

[54] **BICMOS TRANSCEIVER (DRIVER AND RECEIVER) FOR GIGAHERTZ OPERATION**

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[57] ABSTRACT

[21] Appl. No.: **08/720,377**

Several low power, low voltage swing, BiCMOS circuits for used in high speed chip-to-chip communications are described. In particular a BiCMOS low voltage swing transceiver comprising a driver and a receiver with low on-chip power consumption is reported. Operating at 3.3.V, the universal transceiver can drive and receive low voltage swing signals with termination voltages ranging from 5V down to 2V, without using external reference voltages and at frequencies exceeding 1 GHz. On-chip power consumption is much lower than that of known CML/ECL type transceivers having comparable speeds.

[22] Filed: **Sep. 27, 1996**

[51] Int. Cl.⁶ **H03K 19/0175**

[52] U.S. Cl. **326/84; 326/64**

[58] Field of Search 326/84, 64, 65, 326/66, 67

[56] References Cited

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19 Claims, 10 Drawing Sheets

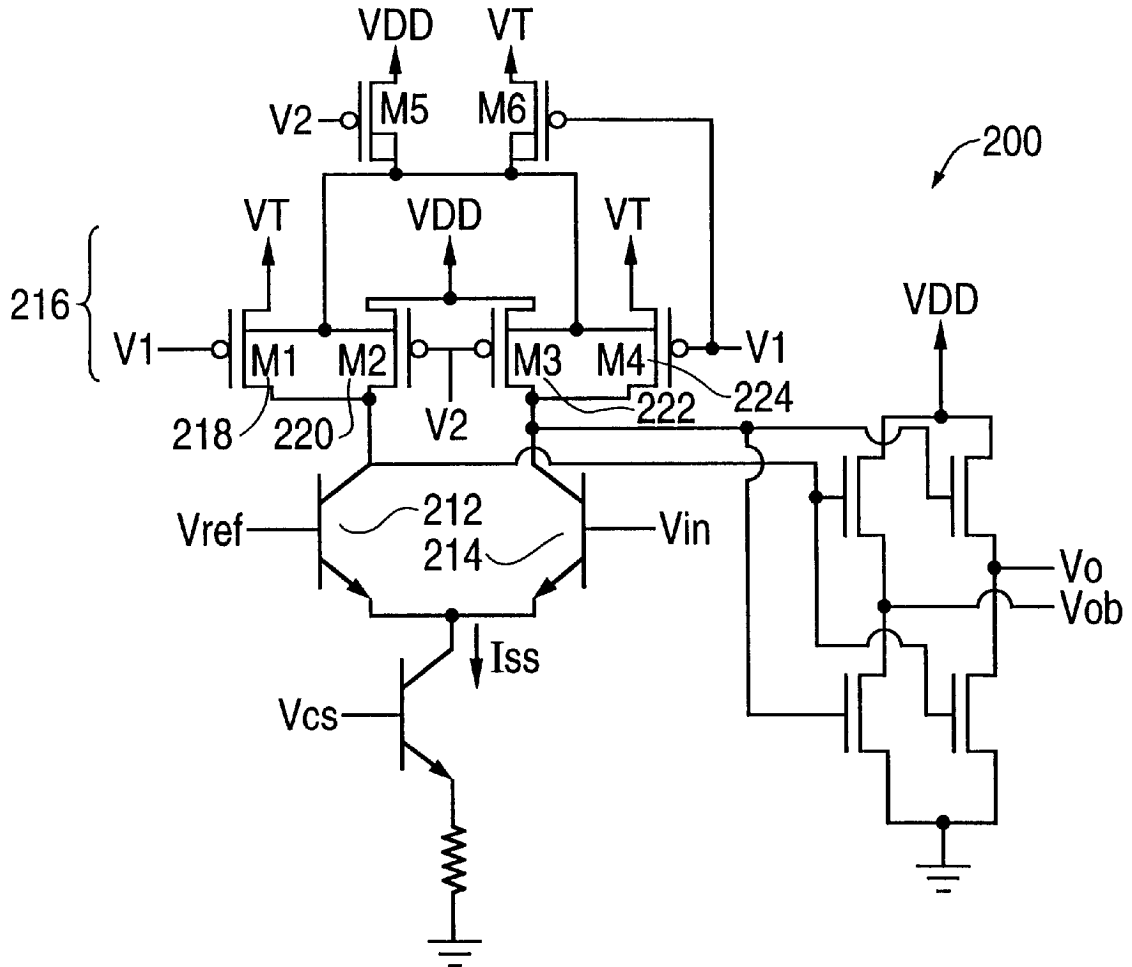


FIG. 1
(PRIOR ART)

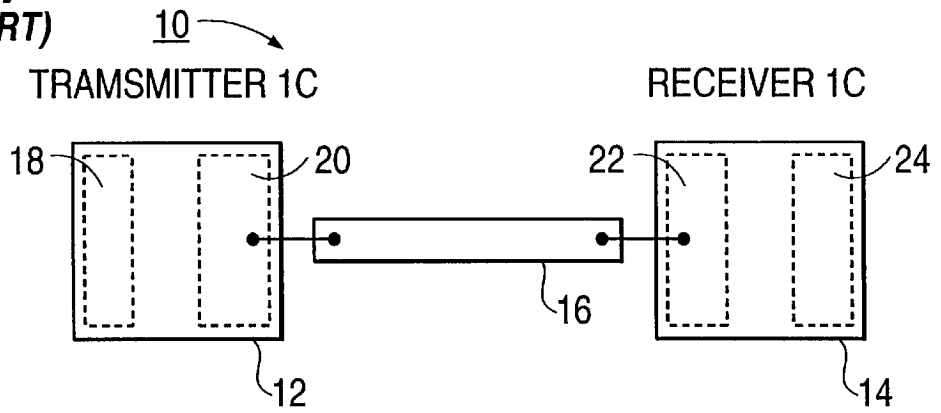


FIG. 2

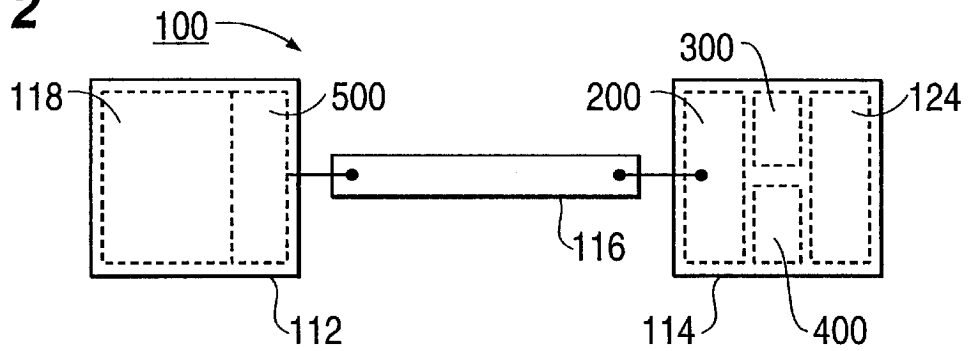


FIG. 6

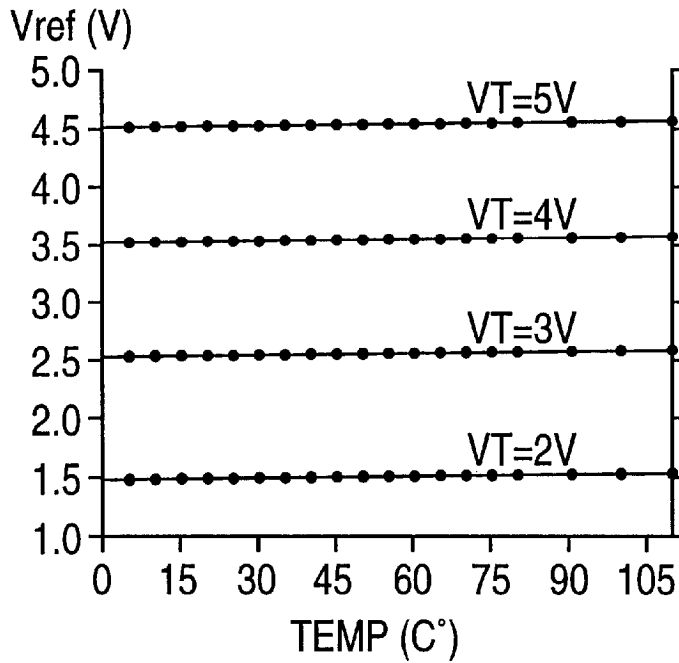


FIG. 7

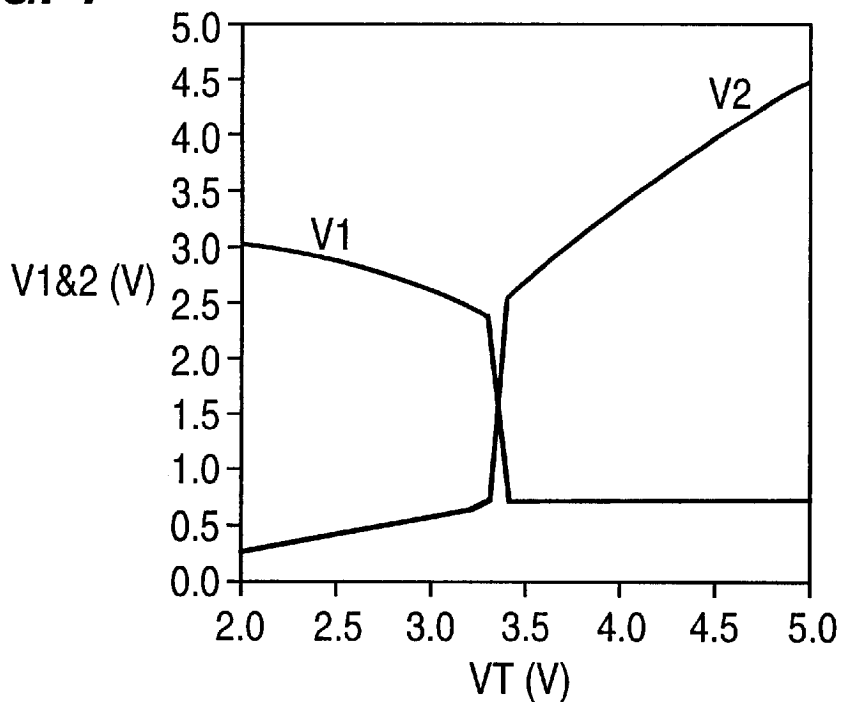


FIG. 8

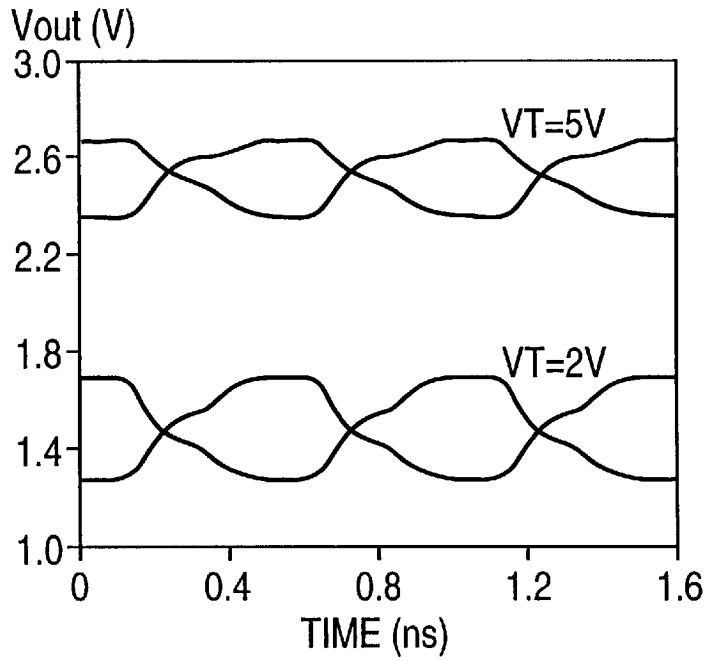


FIG. 9

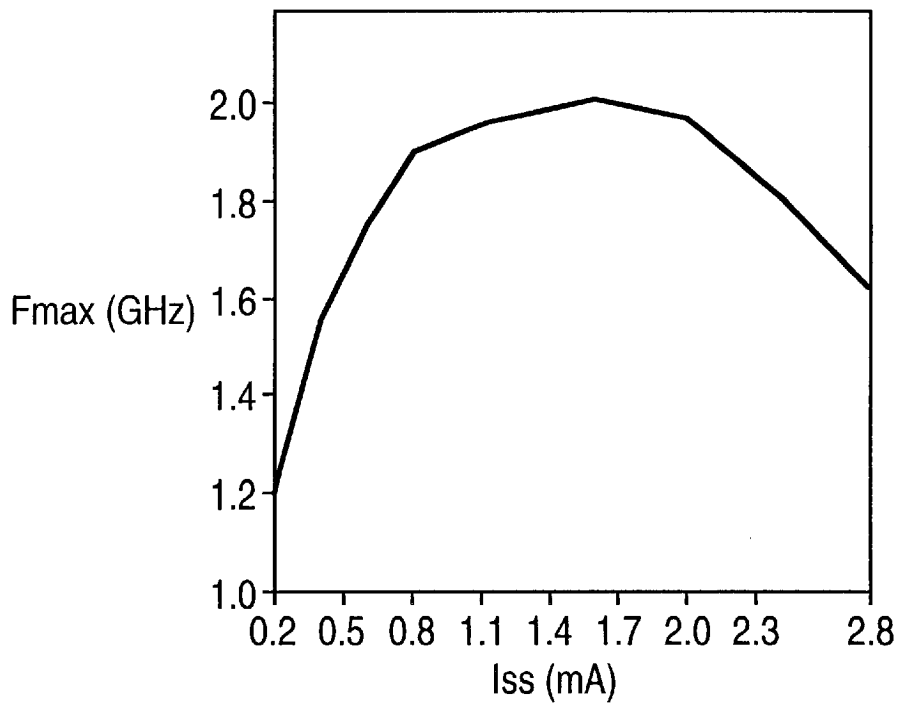


FIG. 10

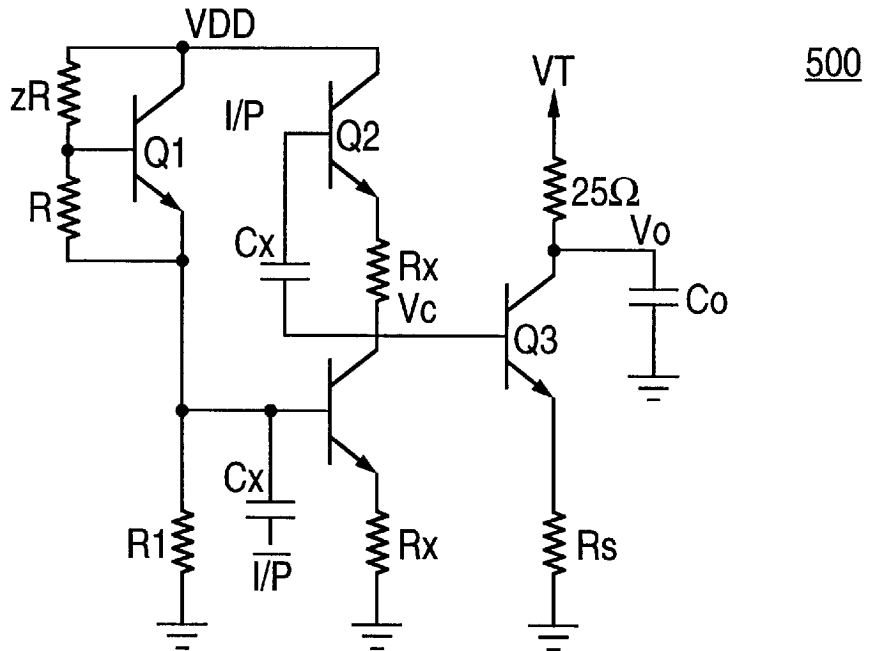


FIG. 11

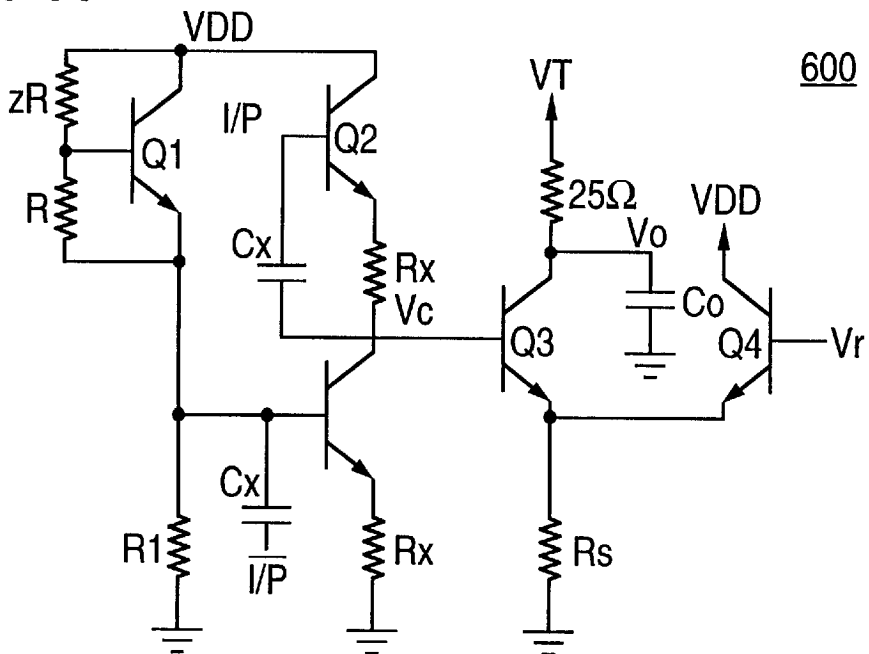


FIG. 12

