BIODES AND TRANSRATIOMETERS

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ABSTRACT. This paper discusses how the introduction of 'Biodes' and 'Transratiometers' could potentially change how computer chips are made. These two new components reduce some simple processes in size drastically, and allow for greater fidelity in current, as well as recycling current more efficiently in some circuits. The Biode is a single-input, two output diode that allows a single signal to be split into two signals. The Transratiometer is a two-input, two-output transistor that functions individually as its own logic gate, and can also be used to proportionalize or split current output values. These devices help to better recycle current and simplify circuits in computer chips and transistor chips, using less wattage.

BIODES AND TRANSRATIOMETERS BLOCK DIAGRAM

The Biode and Transratiometer are two logical processing devices that can simplify, make more efficient, and lessen the size of modern computing circuits. They are CMOS compatible and will be designed to prevent current sharing and thermal runaway (Or at least have increased emmitter resistance to prevent current sharing and still save power and space). They function better than multiple-emitter transistors in classic TTL logic, and are faster.

Biodes and Transratiometers and Their Function in Modern Circuits

Modern computing architecture is subdivided into logical processing components called logic gates, common to silicon chips and other computational mechanisms. They often consist of transistors, resistors, capacitors and other small components that can be used to make complex computations, and are the basis of modern computational technology.

How they work is essentially based on the directions of current, placement of values, and the many various logic gates that decide how that current is handled, and what signals are computed, how they interact with resistance, and in conjunction. Reversible computing and a few other types of data interpretation change the way data is ran, but the computing relies on the same basic principles.

When transistors overfill and release power, they put out more energy than what's put onto one terminal, more than is necessary for a signal, and often resistor pairs or other types of power recycling methods are used to compensate for that. However, the biode and transratiometer simplify the chip process greatly.

The biode is a two output diode, easily sketched by wafer etching machines as basically a reverse-in-current transistor. What it does, is serves to reduce the current of input and irreversibly and non-interchangeably give two distinct currents to two lines from the output of a transistor.

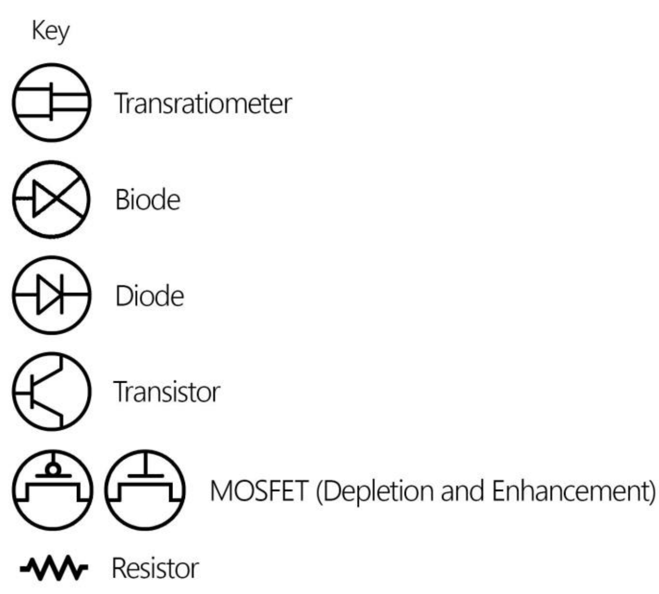
This is a more effective way to recycle energy from transistors, but not only that; the biode is capable of sending duplicate signals and interlinking simultaneous computing processes together, to check many logical samples from one output at once against the output, or interrelate number values together on the chips.

The transratiometer is basically a two-output transistor, capable of shedding half or a ratio of its current instantaneously in a chip without the use of two transistors, and effectively works as a single component AND gate.

Proportions of current can be serialized through the ratio of conduction from either contact to the two outputs, so data can be processed linearly through the transratiometer as well. It effectively simplifies single-transistor outputs into regular currents that are normal to the system as well as possessing the ability to divert serial/output streams.

The biode may replace the resistor and eliminate the function of the transratiometer in the process of fixing currents for long serialized streams or numbers of transistors, but the transratiometer eliminates the need for resistors and diodes and can coordinate complex current levels in multiple directions for the serial streams, as well as make XOR and NOT gates much more efficient spatially and in wattage.

Because this uses less space than the models with resistors, diodes, and more transistors, and also because power can be stacked into biodes and split with transratiometers, the biode and transratiometer are good at operating after, or in the case of the transratiometer, in place of transistor outputs in AND, NOR, XOR gates, as well as complex systems such as adders and subtractors, and addressors and registers.



AND Gates

Fig. 1

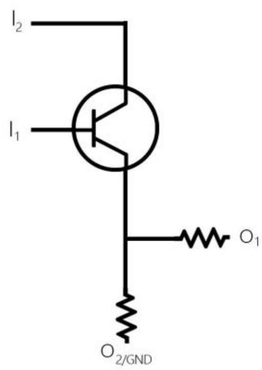


Fig. 2

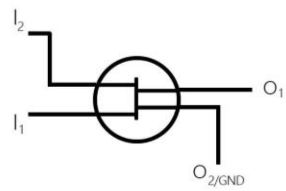


Fig. 1 Represents a traditional AND gate, a total of 3 components. Fig. 2 Represents an AND gate utilizing the Transratiometer component, for 1 component in total. The first circuit has a higher current than I(2) or I(1) for output, necessitating the resistor, the second circuit has a mean of the two current inputs as outputs.

OR Gates

Fig. 3

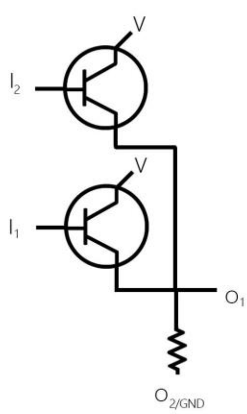


Fig. 4

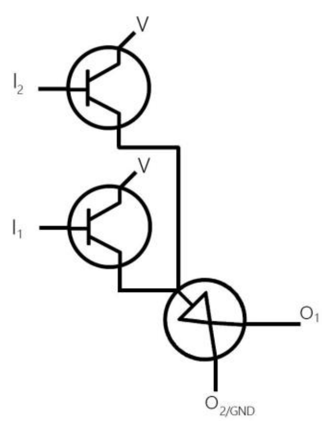
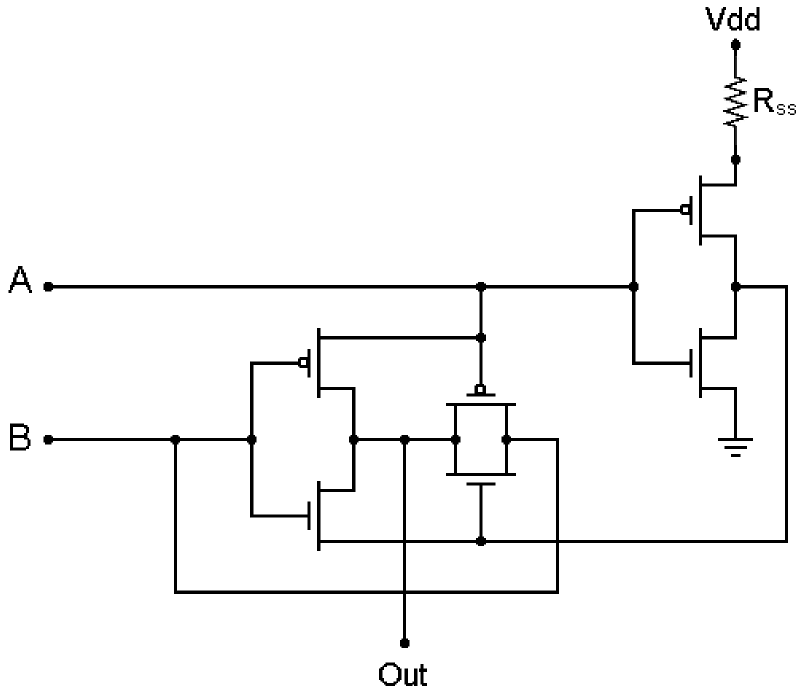


Fig. 3 Represents a tradtional OR gate, using a resistor due to excess wattage at the output. Fig. 4 Represents a similar OR gate using a biode component, reducing overall wattage.



[https://en.wikipedia.org/wiki/XOR_gate] Image depicting an XOR gate, for a total of 7 components.

XOR GATES

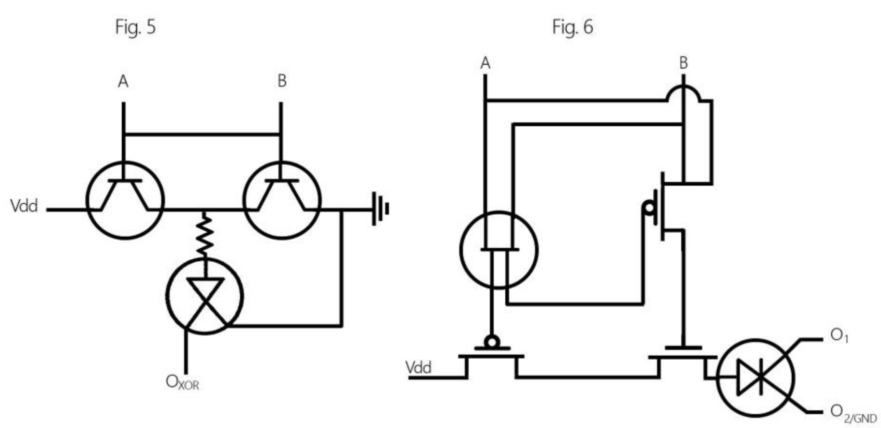


Fig. 5 and Fig. 6 represent XOR Gates that use less components and perform virtually the same function, Fig. 5 using a Biode, and Fig. 6 using a Transratiometer.

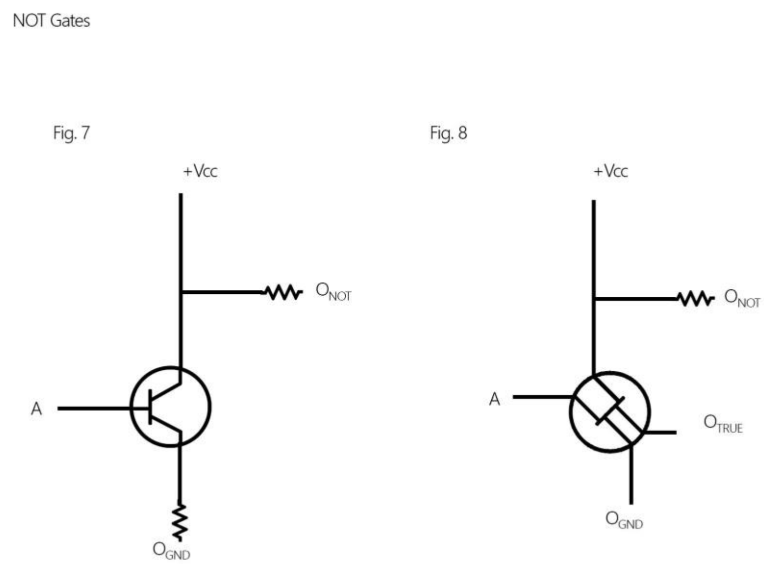


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Fig.6 Represents a traditional NOT gate. Fig.7 Represents a NOT gate using a transratiometer, which can also be used to supply an additional TRUE signal, and does not require an additional resistor to ground.

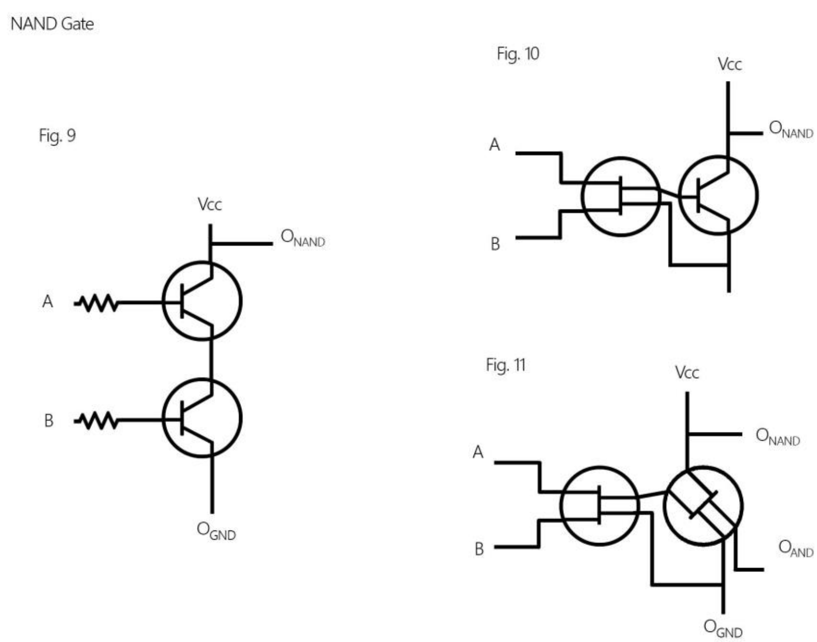

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Fig. 8 Represents a traditional NAND gate. Fig. 9 Represents a NAND gate using a transratiometer, which splits the total value of the combined inputs A and B, removing the need for resistors. Fig. 10 represents a similar circuit where the transistor component is replaced with a transratiometer, allowing the gate to save an additional AND value.

XNOR Gate

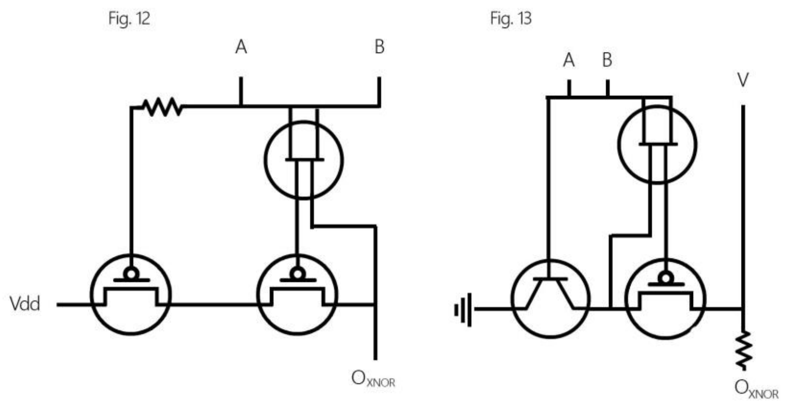
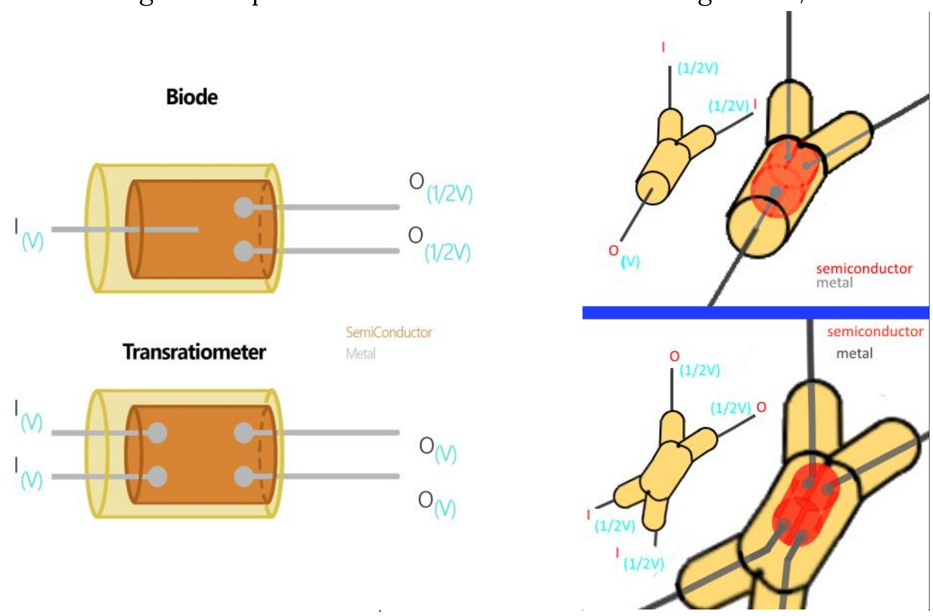


Fig. 12 and Fig. 13 represent 2 XNOR gates, showing how transratiometers can be used in different ways as an AND signal component to solve a circuit. Here are figures 13, 14:



13, left, and 14 at right, serves to demonstrate a possible construction of biodes and transratiometers, which with an analogously designed one-output, two-input transistor, can potentially be made from Electrum, a theoretical ~16.5% Boron to ~83.5% Silicon molar ratio alloy. It is suggested this P-doped semiconductor alloy may have a electrical behavior that lets current through at thresholds by kinetic disequillibriums across a single semiconductor junction.

Alternatively, this page now contains basic diagrams of more traditionally designed biodes and transratiometers: