Two Transistor Ternary Random Access Memory

Tsaoussis, Simon

The limitation of the speed of a computer is the access speed of its Random Access Memory (RAM). The growing disparity between CPU speed and RAM access times in computation is known as the memory wall. The memory wall is the current frontier in computing. Two Transistor Ternary Random Access Memory (TTTRAM) was developed to overcome limitations imposed by the memory wall. TTTRAM is a new type of RAM that utilizes pseudomorphic heterojunction bipolar transistors to achieve exasperating switching speeds. TTTRAM was built on a circuit board and compared to SRAM and DRAM. TTTRAM's waveform was compared to the waveforms of DRAM, and SRAM at appx. 160 MHz. Power consumption was determined via a microammeter at the high state and low states of each bit of RAM. The required current for charging the bit of DRAM was determined. TTTRAM is shown to consume significantly less power per bit than DRAM or SRAM. TTTRAM uses considerably less current than competing technologies. Research shows that this technology can be implanted on Silicon-Germanium or Silicon-On-Insulator allowing for TTTRAM to be cost effective. This new technology has been proven to have ultra-low power consumption, high speed and low cost. Additional testing on a Silicon-Germanium wafer would further prove the hypothesis.

Awards Won:
Fourth Award of $500