

## Article Abstract

<b>Title:</b>	<b>Single electron based binary multipliers with overflow detection</b>
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<b>Abstract:</b>	Low power consumption, high operating speed and high integration density equipment(s) are financially indispensable in modern Electronics. Single Electron Device (SED) is one such equipment. Single Electron Devices are capable of controlling the transport of only an electron. A single electron is sufficient to store information in the SED. This paper presents the approach for designing multipliers by using single-electron based device. Multipliers with overflow detection based on serial and parallel prefix computation algorithm are elaborately discussed analytically and designed. The overflow detection circuits works in parallel with a simplified multiplier to reduce the overall area and to increase the speed compared to the classical digital circuits. Power consumption in the single electron circuit is low irrespective of Bipolar junction transistor (BJT) or Complimentary Metal Oxide Semiconductor (CMOS) circuits. Power consumption can be drastically reduced by reducing the nodes. The processing speed of SED will be nearly close to electronic speed. Noise during processing becomes ultra-low when the mode built with SEDs is in operation.
<b>Keywords:</b>	Single-electron, Binary multiplier, overflow detection, binary decision diagram