

# Design and Implementation of Error Tolerant Adder in Braun Multiplier



**T. P. Karthik**

Karthiktp9@gmail.com  
Ph. No: 0 90086 66541

**Student's Name**      **T. P. Karthik**                      **VLSI (FT-2011)**

**Academic Supervisor(s)**      P. Chandramohan

**Industrial Supervisor(s)**

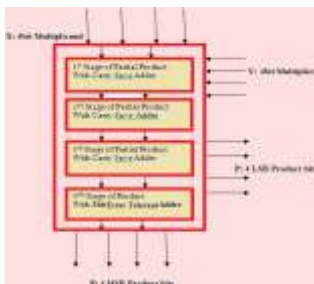
**Keywords:** Error Tolerant Adder, Ripple Carry Adder, Carry Look Ahead Adder, FPGA, ASIC

**Abstract:**

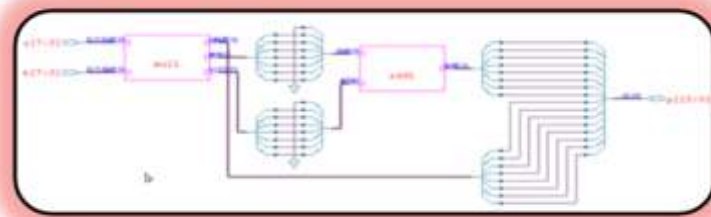
Computational complexities of algorithms used in image processing and Digital Signal Processors (DSPs) have gradually increased. This requires a parallel array multiplier to achieve high execution speed to meet the performance demands. A typical implementation of such an array multiplier is Braun design. Braun Multiplier is a type of parallel Array Multiplier. The architecture of Braun Multiplier mainly consists of Carry Save Adders, array of AND gates and Ripple Carry Adder.

In this work, a new design of modified Braun Multiplier is proposed which uses Error tolerant adder (ETA) in place of Ripple Carry Adder. The modified Braun Multiplier reduces the delay, power and area with compromising accuracy. The proposed design flow has been divided into three stages: identification of suitable adder and multiplier, design of Error Tolerant Adder and verifying its functionality, replacing the final stage ripple carry adder of Braun Multiplier by Error Tolerant Adder.

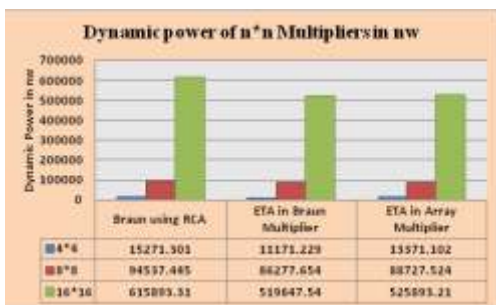
The experimental results shows the computational delay of Braun Multiplier with Error Tolerant Adder is achieved 15.001 ns for (8\*8) Multiplier on vertex-6 low power board. The dynamic power of 56277.400  $\mu$ W, area of 579  $\mu$ m<sup>2</sup> is measured in ASIC implementation of Error Tolerant Adder in Braun Multiplier. A comparative result shows the Error tolerant adder in Braun multiplier is effective in terms of area, power and delay as compared with Error Tolerant Adder in Array multiplier and Standard design.



**Proposed design**



**Architecture of error tolerant adder in braun multiplier**



**Comparison of power of multiplier**



**Comparison of ETA in array and Braun multiplier**