

<b>Thesis Title</b>	Active BALUN Based on OTA Device
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## **ABSTRACT**

In modern communication systems, the signal splitter and combiner called BALUN (BALance to UNbalance) is required to interface a single ended device with a differential device. Most active BALUNs deploy passive elements which cannot be tuned and require large area in the integrated circuit. Though, there is the controllable BALUN based on BiCMOS CCCII, the implementing circuit is quite large in a transistor count and the cost of BiCMOS is very expensive. In this work, the new active BALUN based on CMOS OTA is proposed. By adjusting the transconductance of the composed OTAs, the characteristics of the BALUN can be tuned electronically. Normally, the size of the OTA is half of the size of the CCCII in the transistor count. Therefore, the size of the proposed structure is theoretically half of the CCCII counterpart. The design structure is simulated in the HSPICE based on the 90nm IBM RF-CMOS process parameters extracted by MOSIS. The result shows that the proposed structure can be a fair alternative in the BALUN design via adequate compatibility of the BALUN characteristics such as power-splitting, power-combination and phase inverting.

**Keywords:** Operational Transconductance Amplifier/ActiveBALUN/CMOS