



## SEMINAR

Room 1003 ETB

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### **An Agile Supply Modulator with Improved Transient Performance for Linear Power Amplifier Employing Envelope Tracking Techniques**

by

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**Abstract:** With exponential growth in high level integration and functional density in portable devices, battery run-time has become an instrumental deciding factor for the consumer electronics market. Due to its significant portion in power consumption, the power amplifier (PA) has become a critical component that determines battery run-time in portable devices. As a consequence, a PA is required to be power efficient in order to extend battery run-time. In order to improve power efficiency of power amplifier, envelope tracking (ET) techniques are favored for linear power amplifier. For the purpose of envelope tracking, an on-demand source module, the bang-bang transient performance enhancer (BBTPE) with dynamic buck regulator is proposed. Its objective is to follow rapid variations in input signal with reduced overshoot and settling time without deteriorating steady-state performance of the buck regulator. The proposed approach enables fast system response through the BBTPE, and accurate steady state output response through low switching ripple and power efficient dynamic buck regulator. Fast output response with the help of the added module induces a slower rise of inductor current in the buck converter that further helps the proposed system to reduce both overshoot and settling time. The proposed supply modulator shows 80% improvement in rise time along with 60% reduction in both overshoot and settling time compared to the conventional dynamic buck regulator based solution.

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**Suraj Prakash** received bachelor's degree in Electrical Engineering from Indian Institute of Technology, Roorkee, India. He worked as a senior design engineer at STMicroelectronics for five years. He is current pursuing PhD at Texas A&M University since 2012. He was with Cirrus logic as an intern during May-August 2013. He is recipient of Cirrus' Hackworth fellowship and departmental scholarships. He is holding several granted patents from USPTO. He also served as a teaching assistant during 2013 and as an editorial assistant of TCAS-II during 2014-2015. His area of interest includes RF power amplifier and its supply modulator.