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Power Tunable Inductor Based on Active Capacitor with Negative Resistance

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**A Low Power Tunable Inductor Based on Active Capacitor with Negative Resistance****Title:****Power Tunable Inductor Based on Active Capacitor with Negative Resistance****Affiliations:**Mohammad Beigizadeh<sup>1</sup>, MSc, Rasoul Dehghani<sup>1</sup>, PhD, Abdolreza Nabavi<sup>2</sup>, PhD<sup>1</sup>Department of Electrical and Computer Engineering, Isfahan University of Technology, Isfahan

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A method to provide a low power tunable inductor is presented in which the inductance and its equivalent series resistance can be independently tuned. This equivalent series resistance can be also set to negative or zero value that is corresponding to inductor with ideal quality factor. In this method, a varactor is placed in parallel with a passive inductor and then, an active capacitor is placed in series with them. To this end, a low power Tunable Active Capacitor (TAC) is proposed which is capable of generating tunable capacitor and large negative resistance to compensate the loss of tunable inductor circuit. Also, the power consumption is low because of using a diode-

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