عنوان مقاله:
A low-voltage and enhanced swing differential CMOS Colpitts VCO

محل انتشار:
چهارمین کنفرانس بین المللی مهندسی برق ،الکترونیک و شبکه های هوشمند (سال: 1399)

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نویسندگان:
.Mohammad Jafar Hemmati - *Department of Electronic Engineering, Sirjan University of Technology, Sirjan, Iran*

.Sepehr Ebrahimi Mood - *Department of Computer Science, Yazd University, Yazd, Iran*

خلاصه مقاله:
In this work, a new differential swing enhanced Colpitts CMOS voltage-controlled oscillator (VCO) suitable for low-voltage applications is presented including a negative cancelation (NC) circuit to compensate the circuit parasites. The negative transconductance of the proposed VCO is analyzed for the startup condition of oscillation. Hence, the calculation result of the negative conductance seen by the resonator of the oscillator is ploted to show the circuit performance at the startup of oscillation. Due to the parasitic canceling property of the circuit, it can be allowed to oscillate at a high frequency with a relatively large tuning range. In order to improve the startup condition of oscillation, rank-based gravitational search algorithm (RB-GSA) is used. RB-GSA is a novel nature inspired optimization algorithm and determines the circuit parameters' values to improve the performance of the proposed method. The simulation results are presented to demonstrate the important features of the proposed VCO. The proposed VCO .designed at 5 GHz with the supply voltage of 0.6 V

کلمات کلیدی:
.low-voltage, negative capacitance, Colpitts VCO, transconductance, enhanced swing, optimization, Rank-Based GSA