Editorial

The 2008 September Special Issue of the Journal of Semiconductor Technology and Science covers various areas of wireless and wireline communication circuits. Communication circuits are a central topic of integrated circuit design and continuously pose various challenges for higher bandwidth and lower power consumption to meet systems requirements. In this special issue, five excellent papers present state-of-the-art circuit design technology directly related to industrial applications.

The first paper, by Zuow-Zun Chen and Tai-Cheng Lee, presents a multiphase compensation method for very low phase noise in the fractional-N frequyency synthesizers. A mismatch linearization technique using a dynamic element matching is described with excellent measurement results. The second paper by J. Lee et al., describes a new architecture for clock and data recovery circuit that can cancel the data-dependent jitter in digital domain. The paper analyzes and discusses various design parameters for the design of an all-digital PLL. The third paper, by Woogeun Rhee et al., shows a bandwidth linearization technique in the LC-VCO-based PLL. Implemented in the 90-nm CMOS technology, the circuit demonstrates bandwidth regulation suitable for PCI Express Gen2. The fourth paper, by Nan Sun et al., examines and reviews three cases of circuit design and shows that design trade-offs typically done with two parameters can actually be circumvented and separated. The new design concept can help circuit designers bring in a new perspective in trading off various performance parameters. The last paper N.B.Balamurugan et al., describes a new modeling technique for Surrounding Gate (DMSG) nanoscale MOSFET which is one of the most promising devices for ultimate scaling of CMOS technology. Circuit designers will benefit by using the simple and accurate analytical expressions for the threshold voltage and subthreshold swing derived in this model.

I hope this special issue, albeit including only a limited number of papers, will inspire researchers and convey useful information in the field of communication integrated circuits.

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