SESSION 23 – TAPA III
UWB

Saturday, June 17, 8:30 a.m.
Chairpersons: B. Zhao, Skyworks
M. Ugajin, NTT Microsystem Integration Labs

23.1 – 8:30 a.m.
A 2.3mW Baseband Impulse-UWB Transceiver Front-end in CMOS, I.D. O'Donnell, R.W. Brodersen, University of California, Berkeley, CA

A highly integrated, flexible, baseband impulse-UWB transceiver front-end has been implemented in a standard 130nm CMOS process with power consumption of 1.8mW (RX) and 0.5mW (TX) at 10Mpulses/s with a 1.1V supply. This transceiver targets a sensor network application and comprises a 1-bit, 1.92 GSample/s A/D conversion, 50 Ohm input matching with 0dB -42dB variable gain, control logic, 60MHz oscillator, and a pulse transmitter. Pulse transmission and reception are demonstrated.

23.2 – 8:55 a.m.
A 1-V 299µW Flashing UWB Transceiver Based on Double Thresholding Scheme, A. Tamtrakarn, H. Ishikuro*, K. Ishida, M. Takamiya, T. Sakurai, University of Tokyo, Tokyo, Japan, *Toshiba Corp., Kawasaki, Japan

This paper presents an Ultra-Wide-Band transceiver based on a newly proposed double thresholding scheme. The scheme does not require any precise synchronization and thus is practical in ad-hoc networks. The proposed architecture has high noise and multi-path fading signal immunities. All analog blocks are activated in a short period called 'flashing' to suppress total average power. A tested chip is manufactured using 0.15µm FD-SOI CMOS technology. The measured average power is 299µW at 25kbps data-rate over the distance of 35cm.

23.3 – 9:20 a.m.
A Single-chip Gaussian Monocycle Pulse Transmitter using 0.18µm CMOS Technology for Intra/Interchip UWB Communication, P.K. Saha, N. Sasaki, T. Kikkawa, Hiroshima University, Hiroshima, Japan

An ultra short Gaussian monocycle pulse (GMP) of 280 ps duration, -20.2 dB ringing level and 3.6 GHz center frequency was generated in 0.18 micron CMOS technology for single chip implementation of impulse radio based ultra-wideband (IR-UWB) transceiver system. The transmission and reception of the generated GMP at 1 mm distance in Si substrate by integrated dipole antennas were successfully demonstrated at a pulse repetition rate of 1.16 Gbps for the first time.

23.4 – 9:45 a.m.
An 11-Band 3.4 to 10.3 GHz MB-OFDM UWB Receiver in 0.25µm SiGe BiCMOS, A. Valdes-Garcia, C. Mishra, F. Bahmani, J. Silva-Martinez, E. Sanchez-Sinencio, Texas A&M University, College Station, TX

An 11-band 3.4-10.3GHz direct conversion receiver for MB-OFDM UWB is implemented in a 0.25um BiCMOS process. It includes an RF front-end with interference rejection at 5.25GHz, a frequency synthesizer generating 11 carrier tones in quadrature with fast hopping, and a linear phase baseband section with 42dB of gain programmability. The packaged IC mounted on FR-4 substrate provides maximum gain of 67-78dB and NF of 5-10dB across all bands while consuming 114mA from a 2.5V supply.

23.5 – 10:10 a.m.
WITHDRAWN