

SESSION 9 – HONOLULU SUITE
RF and New Wireless Transceivers

Thursday, June 17, 8:30 a.m.

Chairperson: C.M. Hung, Texas Instruments, Inc.
S. Mutoh, NTT Corporation

9.1 - 8:30 a.m.

A Quad-Band GSM/GPRS/EDGE SoC in 65nm CMOS, H. Darabi, P. Chang, H. Jensen, A. Zolfaghari, J. Leete, B. Mohammadi, J. Chiu, T. Li, X. Chen, Z. Zhou, M. Vadipour, C. Chen, Y. Chang, A. Mirzaei, A. Yazdi, M. Narima, A. Hadji, P. Lettieri, E. Chang, B. Zhao, K. Juan, P. Suri, C. Guan, L. Serrano, J. Leung, J. Shin, J. Kim, H. Tran, P. Kilcoyne, H. Vinh, E. Raith, M. Koscal, A. Hukkoo, C. Hayek, V. Rakhshani, C. Wilcoxson, M. Rofougaran, A. Rofougaran, Broadcom Corporation, USA

A quad-band 2.5G SoC integrates all the RF, DSP, ARM, audio and other baseband processing functions into a single 65nm CMOS die. The radio draws a battery current of 49mA in the receiver-mode, and 86mA in the GMSK transmit-mode. The low-IF receiver achieves a sensitivity of -110dBm at the antenna, corresponding to a noise figure of 2.4dB at the device input. The 8PSK ± 400 kHz modulation mask is -64.1/62.7dBc for high/low bands, with an RMS EVM of 2.45/1.95%.

9.2 - 8:55 a.m.

A Carrier Leakage Auto-Calibration Circuit with a Direct DC-Offset Comparison Technique for a WiMAX Transmitter, H. Nakamoto, M. Kudo, H. Ito*, D. Yamazaki*, Fujitsu Microelectronics Ltd. Japan, *Fujitsu Laboratories Ltd

We propose an RF-detector-less carrier leakage suppressor for a WiMAX transmitter. The proposed circuit directly detects the DC offset of a transmitter path and minimizes it, thus reducing carrier leakage. The correct DC-offset feedback is achieved by performing an absolute offset comparison after the general binary search technique. The suppressor is integrated in the direct-conversion transceiver fabricated in 90-nm technology. The measured carrier leakage is better than -32 dBc over the complete transmitter power range.

9.3 - 9:20 a.m.

1Gbps/ch 60GHz CMOS Multichannel Millimeter-Wave Repeater, A. Oncu, S. Ohashi*, K. Takano*, T. Takada**, J. Shimizu**, M. Fujishima, Hiroshima University, *The University of Tokyo, **Silicon Library Inc, Japan

A 60GHz CMOS multichannel wireless repeater, which converts digital data and millimeter-wave pulses without applying signal processing, is proposed for high-speed communication. A chip containing three repeaters operating at 60.48GHz, 62.64GHz and 64.8GHz frequency bands is fabricated using a 90nm CMOS process. Each channel has a 1Gbps data rate with power consumptions of 51mW and 116mW in the transmitter and receiver modules, respectively.

9.4 - 9:45 a.m.

A 60-GHz FSK Transceiver with Automatically-Calibrated Demodulator in 90-nm CMOS, H. Wang, M.-H. Hung, Y.-C. Yeh, J. Lee, National Taiwan University, Taiwan

A fully-integrated 60-GHz transceiver utilizing analog FSK modulation/demodulation to replace baseband processor has been demonstrated. Employing a discriminator with automatic adjustment and a folded dipole antenna pair (5-dBi gain for each), the transceiver achieves > 1Gb/s data transmission over 1 meter with BER < 10^{-12} while consuming a total power of 500 mW.