Research output

Building 5G millimeter-wave wireless infrastructure: wide-scan focal plane arrays with broadband optical beamforming

60-GHz low-noise VGA and interpolation-based gain cell in a 40-nm CMOS technology

An E-band silicon-IC-to-waveguide contactless transition incorporating a low-loss spatial power combiner

125 kHz wireless energy and 25 kbps data transfer for wearable device
Gao, D., Zhai, R., Baltus, P., Visser, H. & Gao, H., 2019, (Accepted/In press) IEEE MTT-S Wireless Power Transfer Conference (WPTC). Institute of Electrical and Electronics Engineers (IEEE)

A 1.2-2.8 GHz tunable low-noise amplifier with 0.8-1.6 dB noise figure

A 58-64 GHz Transformer-based Differential Rectifier in 40 nm CMOS with -12 dBm Sensitivity for 1 V at 64 GHz
Gao, H., Leenaerts, D. & Baltus, P., 2019, (Accepted/In press) IEEE International Microwave Symposium (IMS). Piscataway: Institute of Electrical and Electronics Engineers (IEEE)

A 71 GHz 3-Stage Rectifier with 8% Efficiency

An inductorless power-optimized dual-mode LNTA for a portable GNSS receiver in a 40-nm CMOS technology

Comparison of tunnel diode and Schottky diode in rectifier at 2.4 GHz for low input power region
Manev, V., Visser, H., Baltus, P. & Gao, H., 2019, (Accepted/In press) IEEE MTT-S Wireless Power Transfer Conference (WPTC). Institute of Electrical and Electronics Engineers (IEEE)

Fully integrated tunable wideband true time delay for wireless sensor networks

Efficient wideband phased antenna array using true time delays and interpolation

Peter G.M. Baltus
Full Professor
Integrated Circuits
Integrated Circuits
Email: p.g.m.baltus@tue.nl
A 0.1nW-1μW all-dynamic capacitance-to-digital converter with power/speed/capacitance scalability

A reconfigurable receiver with 38 dB frequency-independent blocker suppression and enhanced linearity and power efficiency

65/30 GHz dual-frequency wirelessly powered monolithic 1.83 mm² wireless temperature sensor using a 3-stage inductor-peaked rectifier with on-chip antenna in 65-nm CMOS

Design of a low-power ultrasound transceiver for underwater Sensor networks

A 29-37 GHz BiCMOS low-noise amplifier with 28.5 dB peak gain and 3.1-4.1 dB NF

A 60 GHz 360° phase shifter with 2.7° phase resolution and 1.4° RMS phase error in a 40-nm CMOS technology

A 60 GHz low noise variable gain amplifier with small noise figure and IIP3 variation in a 40-nm CMOS technology

Characterization of damper-to-damper wireless channel in small cars

Immunity analysis of an LDO using identification of operating region transitions

A 1.9 mW 250 MHz Bandwidth Continuous-Time ΣΔ Modulator for Ultra-Wideband Applications

A 2 GHz 0.98 mW 4-bit SAR-based quantizer with ELD compensation in an UWB CT ΣΔ modulator
A wideband envelope detector with low ripple and high detection speed

An UWB, low-noise, low-power quadrature VCO using delay-locked loop in 40-nm CMOS for image-rejection receivers

Analysis of the effect of PFD sampling on charge-pump PLL stability

A 174 pW–488.3 nW 1 S/s–100 kS/s all-dynamic resistive temperature sensor with speed/resolution/resistance adaptability

Damper-to-damper path loss characterization for Intra-vehicular wireless sensor networks

A 60 GHz low power self-mixing receiver in 65-nm CMOS for a radio-triggered battery-less monolithic wireless sensor

A design approach for SiGe low-noise amplifiers using wideband input matching

Batteryless mm-wave wireless sensors

Power reduced monolithic wireless sensor

Damper-to-damper path loss characterization for intra-vehicular wireless sensor networks

A 900 MHz RF energy harvesting system in 40 nm CMOS technology with efficiency peaking at 47% and higher than 30% over a 22dB wide input power range
Interpolation based wideband beamforming architecture

Noise analysis of a BJT-based charge pump for low-noise PLL applications

Identifying EMC-critical devices by monitoring and classifying operating region transitions

Exploring the unknown through successive generations of low power and low resource versatile agents

A nonlinear transfer function based receiver for wideband interference suppression

An active Ka-band shared aperture antenna with 50 dB Isolation for satellite communication

Bi-directional 35-Gbit/s 2D beam steered optical wireless downlink and 5-Gbit/s localized 60-GHz communication uplink for hybrid indoor wireless systems

Bi-directional 35-Gbit/s 2D beam steered optical wireless downlink and 5-Gbit/s localized 60-GHz communication uplink for hybrid indoor wireless systems

A 60 GHz phased array system evaluation based on a 5-bit phase shifter in CMOS technology

A 60 GHz phased array system evaluation based on a 5-bit phase shifter in CMOS technology

Poster : Design consideration of 60 GHz low power low-noise amplifier in 65 nm CMOS

A 18-43 GHz low-noise amplifier with 2.5-4.0 dB noise figure

A 60 GHz 5-bit digital controlled phase shifter in a digital 40-nm CMOS technology without ultra-thick metals
A 50–60 GHz mm-wave rectifier with bulk voltage bias in 65-nm CMOS

A 48–61 GHz LNA in 40-nm CMOS with 3.6 dB minimum NF employing a metal slotting method

Silicon-based true-time-delay phased-array front-ends at ka-band

System study on nonlinear suppression of varying-envelope local interference in multimode transceivers

Analysis of an adaptive nonlinear interference suppressor for wireless multimode transceivers

A 20 GHz 1.9 dB NF LNA with distributed notch filtering for VSAT applications

A 50 – 60 GHz rectifier with −7dBm sensitivity for 1 V DC output voltage and 8% efficiency in 65-nm CMOS

A 60-GHz energy harvesting module with on-chip antenna and switch for co-integration with ULP radios in 65-nm CMOS with fully wireless mm-wave power transfer measurement

A 60-GHz injection locked oscillator for self-demodulation ultra-low power radio in 65-nm CMOS

A millimeter-wave tunable transformer-based dual-antenna duplexer with 50 dB isolation

A scalable baseband phase shifter with 12 GHz I/Q mixers in 40-nm CMOS for 60 GHz applications

Differential 60 GHz Antenna-on-Chip in mainstream 65 nm CMOS technology
Feasibility study on analogue cancellation of local interference in multimode transceivers

Front end power dissipation minimization and optimal transmission rate for wireless receivers

A 48 GHz 6-bit LO-Path Phase Shifter in 40-nm CMOS for 60 GHz Applications

A 60-GHz rectenna for monolithic wireless sensor tags

A 62GHz inductor-peaked rectifier with 7% efficiency

A 71GHz RF energy harvesting tag with 8% efficiency for wireless temperature sensors in 65nm CMOS

A design of 2.4GHz rectifier in 65nm CMOS with 31% efficiency

A design of 60GHz LNA with 3.6dB NF and 17dB Gain in 40nm CMOS

A design of 60GHz LNA with 4.8dB NF, 15dB gain and 5mW in 65nm CMOS
Chen, Z., Gao, H., Li, X., Baltus, P. G. M. & Roermund, van, A., 2013

Adaptive nonlinear interference suppressor for cognitive radio applications

Closed-loop adaptation of a nonlinear interference suppressor for local interference in multimode transceivers

Co-integration of an RF energy harverster into a 2.4 GHz transceiver
Experimental evaluation of an adaptive nonlinear interference suppressor for multimode transceivers

High resolution phase shifter for a mm-wave adaptive null-forming array

Modeling of RF energy scavenging for batteryless wireless sensors with low input power

Nonlinear interference suppressor for varying-envelope local interference in multimode transceivers

Robust null-forming in a mm-wave adaptive array with discrete phase shifting schemes

Smart self-interference suppression by exploiting a nonlinearity

Suppression of constant modulus interference in multimode transceivers using an adaptive nonlinear circuit

System analysis and energy model for radio-triggered battery-less monolithic wireless sensor receiver

System analysis and energy model of 60GHz radio-triggered wireless sensor receiver

Frequency-independent smart interference suppression for multi-standard transceivers

A 1.8GHz amplifier with 39dB frequency-independent smart self-interference blocker suppression
A broadband frontend design for UHF RFID tag  

A mm-wave analog adaptive array with genetic algorithm for interference mitigation  

An RF energy harvester with supply manangement for co-integration into a 2.4 GHz transceiver  

An RF-to-DC energy harvester for co-integration in a low-power 2.4 GHz transceiver frontend  

Digital hardware resources for steering a nonlinear interference suppressor  

Full MIMO spatial filtering approach for dynamic range reduction in wideband cognitive radios  

Suppression of constant modulus interference in multimode transceivers by closed-loop tuning of a nonlinear circuit  

System study of a wireless-powered sensor system  

Ultra-low power 60 GHz low noise amplifier design  

2.4GHz energy harvesting for ultra low power radio  

2.4GHz energy harvesting for wireless sensor network  
A 107 GHz LNA in 65nm CMOS with inductive neutralization and slow-wave transmission lines

A 60 GHz ultra low-power wake-up radio

A 73 to 83 GHz, 9-mW injection-locked oscillator in 65-nm CMOS technology

A broadband and high-sensitivity frontend design for UHF RFID tag
Ma, Q., El Waffaoui, R., Baltus, P. G. M. & Roermund, van, A. H. M., 2011, Technische Universiteit Eindhoven

Antenna coupling reduction between co-located radios
Janssen, E. J. G., Milosevic, D. & Baltus, P. G. M., 2011, p. 1-

Full MIMO Spatial Filtering Approach for Dynamic Range Reduction in Wideband Cognitive Radios

Increasing isolation between co-located antennas using a spatial notch

Integrated 60GHz RF Beamforming in CMOS

Low power LNA for 60GHz asynchronous wake-up radio

Modeling and analysis of nonlinearities and bandwidth limitations in RF receivers

System study of a 60 GHz wireless-powered monolithic sensor system

The Effect of RMS Delay Spread on Spatial Filtering

2.4GHz energy harvesting for ultra low power radio
2GSPS 6-bit ADC for UWB receivers

A 60-GHz low power LNA

A 60GHz phase shifter integrated with LNA and PA in 65 nm CMOS for phased array systems

A 70 GHz 10.2 mW self-demodulator for OOK modulation in 65-nm CMOS technology

An EFOM for cross-layer optimization towards low-power and high-performance wireless networks

Analytical passive mixer power gain models

Low voltage comparator for High speed ADC

Measuring RF circuits exhibiting nonlinear responses combined with short and long term memory effects

Optimal transmission rate for ultra low-power receivers.

Optimizing throughput for limited receiver circuit power.

Power dissipation minimization in RF front ends
System concept for a wireless sensor system with monolithic sensors.

Technologies for smart environment
Baltus, P. G. M. & Mohammadi, M., 2010

Theoretical model for maximum throughput of a radio receiver with limited battery power

A 60GHz Digitally Controlled RF-Beamforming Receiver Front-end in 65nm CMOS

A 60GHz Miller effect based VCO in 65nm CMOS with 10.5% tuning range

A lower-power, high-sensitivity injection-locked oscillator for 60 GHz WPAN applications

An EFOM for cross-layer optimization of low-power wireless networks

Analytical models for the wake-up receiver power budget for wireless sensor networks

Flip-chip integration of differential CMOS power amplifier and antenna in PCB technology for the 60-GHz frequency band

Low power multi-radio coexistence using digital compensation

Smart front-ends, from vision to design

Wake-up receiver for wireless sensor networks
Wireless wire - the 60 GHz ultra-low power radio system

60 GHz ultra-low power radio

A 1.2V Inductorless Receiver Front-End for Multi-Standard Wireless Applications

A 1.2V Receiver Front-End for Multi-Standard Wireless Applications in 65nm CMOS LP

A 60 GHz Digitally Controlled Phase Shifter in CMOS

An integral shannon-based view on smart front-ends

Impact and digital estimation of nonlinear impairments in analog baseband processing stages

No strings attached: the complexity of omissions

Phase noise in frequency divider circuits

Systems and architectures for very high frequency radio links

A 1.2V, Inductorless, Broadband LNA in 90nm CMOS LP

A Broadband Inductorless LNA for Multi-Standard Applications
A first analysis of MIMO communication as a basis for low power wireless

Systems and architectures for very high frequency radio links

Impact of GHz disturbances on DC parametric measurements

A Gilbert Cell Mixer with Digitally Controlled Performance Space

Adaptive Mixers with a Discretely and a Continuously Adjustable Performance Space

Design of Flexible RF Building Blocks : A Method for Implementing Configurable RF Transceiver Architectures

Platform-Based RF System Design for Re-use

Platform-based RF-system Design

Receiver Planning for a Multi-standard Front-end

RF Transceiver Front Ends

RF Transceivers Front Ends

A Gilbert Cell Mixer with Digitally Controlled Performance Space

Minimum power design of RF front ends

Linearization Transmitter Using Asynchronous Sigma Delta Modulation for UMTS Handsets
RF Platform, A Case Study on Mixers

Substrate transfer for RF technologies

Design considerations for RF power amplifiers demonstrated through a GSM/EDGE power amplifier module

Efficient Design Methods for 5GHz and beyond

How fast can you go? Efficient design methods for RF transceivers at 5 GHz and beyond

Multi-Staged Frequency Conversion with Single Local Oscillator (6-Mixer Single LO Dual Image Cancelation Receiver)

Diode Mixer Circuit (Schottky Ring Mixer)

Design considerations for RF power amplifiers demonstrated through a GSM/EDGE power amplifier module

RF power amplifier fundamentals

Device with Circuit Element and Transmission Line Formed by a Dielectric between Facing Conductor Strips (Flip Chip Transmission Line)

Optimizing RF front ends for low power

Differential Amplifier, an Integrated Circuit, and a Telephone (Class A/B differential pair)

Radio Transmission Systems and a Radio Apparatus for use Therein (Angle Scanning Diversity Principle)

Radio Transmission System and a Radio Apparatus for Use in such a System (Angle Scanning Diversity Implementation)

Receiver and Demodulator for Phase or Frequency Modulated Signals (Reconstruction of Data in Limited ZIF FSK Receiver)
A 3.5mW 2.5GHz Diversity Receiver and a 1.2mW 3.6GHz VCO in Silicon-On-Anything

A 3.5-mW, 2.5-GHz diversity receiver and a 1.2-mW, 3.6-GHz VCO in silicon on anything

Put your Powder into SOA LNA's

Put your power into SOA LNAs!

An 8-bit 100-Mhz full-Nyquist analog-to-digital converter

The design of an 8-bit folding analog-to-digital converter

Activities
Mikrocentrum Seminar Smart Environment, High Tech Campus, Eindhoven, the Netherlands
Peter Baltus (Keynote speaker)
8 Jun 2010

CICC 2001, San Diego U.S.A.
Peter Baltus (Organiser)
6 May 2001

Projects