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## Research output

### **A 0.13 THz Amplifier Integrated with a frequency doubler for a 0.26 THz 0 dBm output power**

Gao, H., Chen, J., Hong, W. & Baltus, P., Sep 2019, *IRMMW-THz 2019 - 44th International Conference on Infrared, Millimeter, and Terahertz Waves*. Piscataway: Institute of Electrical and Electronics Engineers, 2 p. 8874444

### **A 0.34-571nW all-dynamic versatile sensor interface for temperature, capacitance, and resistance sensing**

Xin, H., Andraud, M., Baltus, P. G. M., Cantatore, E. & Harpe, P. J. A., Sep 2019, *ESSCIRC 2019 - IEEE 45th European Solid State Circuits Conference*. Piscataway: Institute of Electrical and Electronics Engineers, p. 161-164 4 p. 8902918

### **A -81.6dBm sensitivity ultrasound transceiver in 65nm CMOS for symmetrical data-links**

Berkol, G., Baltus, P. G. M., Harpe, P. J. A. & Cantatore, E., Sep 2019, *ESSCIRC 2019 - IEEE 45th European Solid State Circuits Conference*. Piscataway: Institute of Electrical and Electronics Engineers, p. 145-148 4 p. 8902921

### **A 60 GHz phased array system analysis and its phase shifter in a 40 nm CMOS technology**

Gao, H., Ying, K. & Baltus, P., 1 Aug 2019, In : *Transactions of Nanjing University of Aeronautics and Astronautics*. 36, 4, p. 566-578 13 p.

### **30-GHz co-designed low-noise amplifier and antenna-on-chip for wireless applications**

Chen, Z., Liu, Q., Smolders, B., Baltus, P. & Gao, H., Aug 2019, *2019 IEEE International Symposium on Radio-Frequency Integration Technology (RFIT)*. Piscataway: Institute of Electrical and Electronics Engineers, 3 p. 8929159

### **A 0.1-nW-1-μ W energy-efficient all-dynamic versatile capacitance-to-digital converter**

Xin, H., Andraud, M., Baltus, P., Cantatore, E. & Harpe, P., 1 Jul 2019, In : *IEEE Journal of Solid-State Circuits*. 54, 7, p. 1841-1851 11 p., 8672469.

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

Gao, H., Song, Z., Chen, Z., Leenaerts, D. & Baltus, P., Jun 2019, *2019 IEEE Radio Frequency Integrated Circuits Symposium, RFIC 2019*. Piscataway: Institute of Electrical and Electronics Engineers, p. 3-6 4 p. 8701862

### **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., Jun 2019, *2019 IEEE MTT-S International Microwave Symposium, IMS 2019*. Piscataway: Institute of Electrical and Electronics Engineers, p. 1306-1308 3 p. 8700750

### **A 71 GHz 3-Stage Rectifier with 8% Efficiency**

Gao, H. & Baltus, P., 1 May 2019, *2019 IEEE MTT-S International Wireless Symposium, IWS 2019 - Proceedings*. Piscataway: Institute of Electrical and Electronics Engineers, 3 p. 8804129

### **An inductorless power-optimized dual-mode LNTA in a GNSS receiver for portable devices**

Hung, H-W., Baltus, P., Gao, H., Bruccoleri, F., van Hartingsveldt, K. & Kianush, K., 1 May 2019, *2019 IEEE MTT-S International Wireless Symposium, IWS 2019 - Proceedings*. Piscataway: Institute of Electrical and Electronics Engineers, 3 p. 8804007

### **Fully integrated tunable wideband true time delay for wireless sensor networks**

Mendes da Costa Junior, C., Wang, C., Ying, K., Chen, Z., Dhaens, M., Gao, H. & Baltus, P., 1 May 2019, *2019 IEEE International Symposium on Circuits and Systems, ISCAS 2019 - Proceedings*. Piscataway: Institute of Electrical and Electronics Engineers, 8702726

**Building 5G millimeter-wave wireless infrastructure: wide-scan focal plane arrays with broadband optical beamforming**  
Smolders, A., Dubok, A., Tessema, N. M., Chen, Z., Al-Rawi, A., Johannsen, U., Bressner, T., Milosevic, D., Gao, H., Tangdionga, E., Gerini, G., Baltus, P. G. M., Geurts, M. & Koonen, A. M. J. T., Apr 2019, In : IEEE Antennas and Propagation Magazine. 61, 2, p. 53-62 10 p., 8651278.

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

Wang, B., Gao, H., van Dommele, A. R., Matters-Kammerer, M. K. & Baltus, P. G. M., Feb 2019, In : IEEE Transactions on Microwave Theory and Techniques. 67, 2, p. 518-532 15 p., 8605520.

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

Kaul, P., Aljarosha, A., Smolders, A. B., Baltus, P. G. M., Matters - Kammerer, M. & Maaskant, R., 16 Jan 2019, 2018 IEEE Asia-Pacific Microwave Conference, APMC. Piscataway: Institute of Electrical and Electronics Engineers, p. 1528-1530 3 p. 8617206

**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

**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

**Efficient wideband phased antenna array using true time delays and interpolation**

Baltus, P. G. M., Matters - Kammerer, M., Koonen, A. M. J. & Wang, B., 29 Nov 2018, Patent No. WO2018215647, Priority No. US201762510945P 20170525

**A 0.1nW-1μW all-dynamic capacitance-to-digital converter with power/speed/capacitance scalability**

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

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**65/30 GHz dual-frequency wirelessly powered monolithic 1.83 mm<sup>2</sup> wireless temperature sensor using a 3-stage inductor-peaked rectifier with on-chip antenna in 65-nm CMOS**

Gao, H., Matters-Kammerer, M. K. & Baltus, P., 17 Aug 2018, Proceedings of the 2018 IEEE/MTT-S International Microwave Symposium, IMS 2018. Piscataway: Institute of Electrical and Electronics Engineers, p. 1275-1277 3 p. 8439152

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

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

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

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

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

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**A 1.9 mW 250 MHz Bandwidth Continuous-Time  $\Sigma\Delta$  Modulator for Ultra-Wideband Applications**

Neofytou, M., Zhou, M., Bolatkale, M., Liu, Q., Zhang, C., Radulov, G., Baltus, P. & Breems, L., 26 Apr 2018, *2018 IEEE International Symposium on Circuits and Systems, ISCAS 2018 - Proceedings*. Piscataway: Institute of Electrical and Electronics Engineers, 5 p. 8351046

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

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

Xin, H., Andraud, M. N., Baltus, P. G. M., Cantatore, E. & Harpe, P. J. A., 17 Apr 2018, In : *IEEE Solid-State Circuits Letters*. 1, 3, p. 70-73 4 p.

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Gao, H., Matters-Kammerer, M. & Baltus, P. G. M., Jan 2018, In : *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*. 8, 2, p. 240-250 11 p., 08278164.

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#### **Power reduced monolithic wireless sensor**

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#### **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**

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

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

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#### **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**

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**A 50-60 GHz mm-wave rectifier with bulk voltage bias in 65-nm CMOS**

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

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

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**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**

Gao, H., Matters - Kammerer, M., Harpe, P. J. A., Milosevic, D., Roermund, van, A. H. M., Linnartz, J. P. M. G. & Baltus, P. G. M., 2014, *Proceedings of the International Symposium on Circuits and Systems (ISCAS2014)*, 1-5 June 2014, Melbourne, Australia. Piscataway: Institute of Electrical and Electronics Engineers, p. 1640-1643

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

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

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**Differential 60 GHz Antenna-on-Chip in mainstream 65 nm CMOS technology**

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**Feasibility study on analogue cancellation of local interference in multimode transceivers**

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

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

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

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

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**Adaptive nonlinear interference suppressor for cognitive radio applications**

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

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

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#### **Put your power into SOA LNAs!**

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## **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