

2019 Austrochip Workshop on Microelectronics (Austrochip 2019)

**Vienna, Austria
24 October 2019**



**IEEE Catalog Number: CFP19AUS-POD
ISBN: 978-1-7281-1954-0**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19AUS-POD
ISBN (Print-On-Demand):	978-1-7281-1954-0
ISBN (Online):	978-1-7281-1953-3

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2019 Austrochip Workshop on Microelectronics (Austrochip) Austrochip 2019

Table of Contents

Message from the General Chair .viii.....	
Organizing Committee .ix.....	
Technical Program and Reviewing Committee .x.....	
Steering Committee .xi.....	
Sponsors .xii.....	
Acknowledgements .xiii.....	
Keynote .xiv.....	

Session I: Sensor & Microphone Interface Circuits

A Current-Feedback Amplifier with Programmable Gain for MEMS Microphone Read-Out Circuits .1.....	
<i>Luca Sant (Infineon Technologies Austria AG, Universita' degli Studi di Milano Bicocca), Elmar Bach (Infineon Technologies Austria AG), Richard Gaggl (Infineon Technologies Austria AG), and Andrea Baschiroto (Universita' degli Studi di Milano Bicocca)</i>	
A Time-Domain Temperature Sensor using Nwell Diodes on 820 μm^2 in 7nm FinFET .6.....	
<i>Matthias Eberlein (Intel Germany), Harald Pretl (Johannes Kepler University), and Tim Krebs (Intel Germany)</i>	
A Noise Analysis Based Design Approach of a Fully Differential Voltage Controlled Current Source for Fluxgate Sensor Excitation .10.....	
<i>Maximilian Scherzer (Institut für Elektronik TU Graz) and Mario Auer (Institut für Elektronik TU Graz)</i>	

Session II: Circuits for Mobile Communications

A Comparison of All-Digital Transmitter Architectures for Cellular Handsets .14.....	
<i>D. Hamidovic (Johannes Kepler University), J. Markovic (Johannes Kepler University), P. Preyler (Johannes Kepler University), C. Mayer (Danube Mobile Communications Engineering GmbH & Co KG), M. Huemer (Johannes Kepler University), and A. Springer (Johannes Kepler University)</i>	
Time-Delay Estimation for Self-Interference Cancellation in LTE-A/5G Transceivers .21.....	
<i>Thomas Paireder (Johannes Kepler University), Christian Motz (Johannes Kepler University), Oliver Lang (Johannes Kepler University), and Mario Huemer (Johannes Kepler University)</i>	

Session III: Digital Circuit Design and Memories

A Fast High-Resolution Time-to-Digital Converter Implemented in a Zynq 7010 SoC .29.....	
<i>Michel Adami (University of Ljubljana) and Andrej Trost (University of Ljubljana)</i>	

A Systematic Approach to Clock Failure Detection .35.....	<i>Andreas Steininger (TU Wien) and Martin Schwendinger (TU Wien)</i>
A Half-Rate Built-In Self-Test for High-Speed Serial Interface using a PRBS Generator and Checker .43....	<i>Ram Ratnaker Reddy Bodha (Carinthia University of Applied Sciences), Sahar Sarafi (Carinthia University of Applied Sciences), Ajinkya Kale (Silicon Austria Labs), Michael Koberle (Carinthia University of Applied Sciences), and Johannes Sturm (Carinthia University of Applied Sciences)</i>
Open-Source Crypto IP Cores for FPGAs – Overview and Evaluation .47.....	<i>M. Billmann (University of Applied Sciences Technikum Wien), S. Werner (University of Applied Sciences Technikum Wien), R. Höller (University of Applied Sciences Technikum Wien), F. Praus (University of Applied Sciences Technikum Wien), A. Puhm (University of Applied Sciences Technikum Wien), and N. Kerö (Oregano Systems Design & Consulting GmbH)</i>
Program Time Effects on Total Ionizing Dose Tolerance of Sidewall Spacer Memory Bit Cell .55.....	<i>Tommaso Vincenzi (ams AG), Gregor Schatzberger (ams AG), and A. Michalowska-Forsyth (Graz University of Technology)</i>

Session IV: Analog Circuit Design

A 16-nm FinFET Power- and Phase Noise-Scalable DCO using On-Chip Tapped Inductor .59.....	<i>Ehrentraud Hager (Johannes Kepler University Linz), Svetozar Broussev (Danube Mobile Communications Engineering GmbH & Co KG), and Harald Pretl (Johannes Kepler University Linz)</i>
Matching Considerations for Bidirectional Current Mirrors .65.....	<i>Inge Siegl (Graz University of Technology), Markus Haberler (Graz University of Technology), and Christoph Steffan (Infineon Technologies Austria AG)</i>
Analysis of Common-Mode Isolation on Transformer Based Balun .71.....	<i>Graciele Batistell (CUAS, TU Graz), Sina Mortezaazadeh Mahani (Silicon Austria Labs GmbH), Suchendranath Popuri (CUAS), Ajinkya Kale (Silicon Austria Labs GmbH), Johannes Sturm (CUAS, Silicon Austria Labs GmbH), and Wolfgang Bösch (TU Graz)</i>
A Single-to-Differential Transimpedance Amplifier for Low-Noise and High-Speed Optical Receivers .76...	<i>B. Mesgari (Vienna University of Technology), H. Mahmoudi (Vienna University of Technology), and H. Zimmermann (Vienna University of Technology)</i>

Poster Session

Implementation of a Cost-Efficient Passive Visible Light Sensing Approach for the Determination of Surface Colors .81.....	<i>Andreas P. Weiss (Joanneum Research), Kushal Madane (Joanneum Research), Saman Zahiri Rad (Joanneum Research), and Franz P. Wenzl (Joanneum Research)</i>
Survey and Comparison of Digital Logic Simulators .87.....	<i>Peter Roessler (University of Applied Sciences Technikum Wien), Roland Höller (University of Applied Sciences Technikum Wien), Christopher Reisner (University of Applied Sciences Technikum Wien), and Oliver Maischberger (Elektrobit Austria GmbH)</i>

Characterization of On-Chip Interconnects: Case Study in 28 nm CMOS Technology .93.....

Arash Ebrahimi Jarihani (University of Klagenfurt, Carinthia University of Applied Sciences), Sahar Sarafi (Carinthia University of Applied Sciences), Michael Köberle (Carinthia University of Applied Sciences), Johannes Sturm (Carinthia University of Applied Sciences, Silicon Austria Labs GmbH), and Andrea M. Tonello (University of Klagenfurt)

Author Index 101