

2008 Proceedings of ESSCIRC

**Edinburgh, United Kingdom
15 – 19 September 2008**



IEEE Catalog Number: CFP08524-PRT
ISBN: 978-1-4244-2361-3

TABLE OF CONTENTS

JOINT PLENARY SESSION

Emerging Device Nanotechnology for Future High-Speed and Energy-Efficient VLSI: Challenges and Opportunities	1
<i>Robert Chau</i>	
Micropower Energy Scavenging	4
<i>Paolo Fiorini, Inge Doms, Chris Van Hoof, Ruud Vullers</i>	
Solving Issues of Integrated Circuits by 3D-Stacking Meeting with the Era of Power, Integrity Attackers and NRE Explosion and a Bit of Future	10
<i>Takayasu Sakurai</i>	
Printed Electronics for Low-Cost Electronic Systems: Technology Status and Application Development	17
<i>Vivek Subramanian, Josephine Chang, Alejandro Fuente Vornbrock, Daniel Huang, Lakshmi Jagannathan, Frank Liao, Brian Mattis, Steve Molesa, David Redinger, Daniel Soltman, Steven Volkman, Qintao Zhang</i>	

ESSCIRC PLENARY SESSION

SOI Design in Cell Processor and Beyond	25
<i>Yoshiaki Daimon Hagihara</i>	
Information, Energy, and Entropy: Design Principles for Adaptive, Therapeutic Modulation of Neural Circuits	32
<i>S. Jensen, G. Molnar, J. Giftakis, W. Santa, R. Jensen, D. Carlson, M. Lent, Timothy Denison</i>	
Audio at Low and High Power	40
<i>Marco Berkhout, Lucien Breems, Ed Van Tuijl</i>	

A2L-A PROCESS VARIABILITY AND YIELD

Experimental Assessment of Logic Circuit Performance Variability with Regular Fabrics at 90nm Technology Node	50
<i>Sungdae Choi, Katsuyuki Ikeuchi, Hyunkyung Kim, Kenichi Inagaki, Masami Murakata, Nobuyuki Nishiguchi, Makoto Takamiya, Takayasu Sakurai</i>	
Area/Yield Trade-Offs in Scaled CMOS SRAM Cell	54
<i>Vasudha Gupta, Mohab Anis</i>	

A2L-D ESSCIRC – Power Converters

A Monolithic Step-Down SC Power Converter with Frequency-Programmable Subthreshold Z-Domain DPWM Control for Ultra-Low Power Microsystems	58
<i>Ling Su, Dongsheng Ma, Paul Brokaw</i>	

A Fully-Integrated 130nm CMOS DC-DC Step-Down Converter, Regulated by a Constant On/Off-Time Control System	62
<i>Mike Wens, Michiel Steyaert</i>	
An On-Chip Dual Supply Charge Pump System for 45nm PD SOI eDRAM	66
<i>Jente Kuang, Abraham Mathews, John Barth, Fadi Gebara, Tuyet Nguyen, Jeremy Schaub, Kevin Nowka, Gary Carpenter, Donald Plass, Erik Nelson, Ivan Vo, William Reohr</i>	

A2L-E TEMPERATURE AND GAS SENSORS

A Time-Domain SAR Smart Temperature Sensor with -0.25~+0.35 C Inaccuracy for On-Chip Monitoring	70
<i>Poki Chen, Kai-Ming Wang, Yu-Han Peng, Yu-Shin Wang, Chun-Chi Chen</i>	
A Temperature-to-Digital Converter Based on an Optimized Electrothermal Filter	74
<i>Mahdi Kashmiri, Sha Xia, Kofi Makinwa</i>	
A Fully Integrated Interface Circuit for 1.5 C Accuracy Temperature Control and 130-dB Dynamic-Range Read-Out of MOX Gas Sensors	78
<i>Andrea Lombardi, Marco Grassi, Luca Bruno, Piero Malcovati, Andrea Baschiroto</i>	

A2L-F DELAY LOCKED LOOPS

A 0.17-1.4GHz Low-Jitter All Digital DLL with TDC-Based DCC Using Pulse Width Detection Scheme	82
<i>Dongsuk Shin, Won-Joo Yun, Hyun-Woo Lee, Young-Jung Choi, Suki Kim, Chulwoo Kim</i>	
A 2-GHz 7-mW Digital DLL-Based Frequency Multiplier in 90-nm CMOS	86
<i>Behzad Mesgarzadeh, Atila Alvandpour</i>	
A 15 MHz – 600 MHz, 20 mW, 0.38 mm², Fast Coarse Locking Digital DLL in 0.13μm CMOS	90
<i>Sebastian Hoyos, Cheongyuen Tsang, Johan Vanderhaegen, Yun Chiu, Yasutoshi Aibara, Haideh Khorramabadi, Borivoje Nikolic</i>	

A3L-D RF BUILDING BLOCK

A 0.042-mm² Fully Integrated Analog PLL with Stacked Capacitor-Inductor in 45nm CMOS	94
<i>Shih-An Yu, Peter Kinget</i>	
A 1.7-GHz 1.5-mW Digitally-Controlled FBAR Oscillator with 0.03-ppb Resolution	98
<i>Hiroyuki Ito, Hasnain Lakdawala, Ashoke Ravi, Stefano Pellerano, Rich Ruby, Krishnamurthy Soumyanath, Kazuya Masu</i>	
24-GHz 1-V Pseudo-Stacked Mixer with Gain-Boosting Technique	102
<i>Nobuhiro Shiramizu, Toru Masuda, Takahiro Nakamura, Katsuyoshi Washio</i>	
A 65-nm CMOS 8-GHz Injection Locked Oscillator for HDR UWB Applications	106
<i>Romarc Toupé, Yann Deval, Franck Badets, Jean-Baptiste Bégueret</i>	

A3L-E UNCONVENTIONAL IMAGE SENSORS AND CIRCUITS

A 600-GHz CMOS Focal-Plane Array for Terahertz Imaging Applications	110
<i>Ulrich Pfeiffer, Erik Öjefors</i>	
Single-Photon Synchronous Detection	114
<i>Cristiano Niclass, Claudio Favi, Theo Kluter, Frederic Monnier, Edoardo Charbon</i>	
Highly Sensitive UV-Enhanced Linear CMOS Photosensor	118
<i>Daniel Durini, Erol Özkan, Werner Brockherde, Bedrich Hosticka</i>	
A 3-TFT Hybrid Active-Passive Pixel with Correlated Double Sampling CMOS Readout Circuit for Real-Time Medical X-Ray Imaging	122
<i>Nader Safavian, Karim S Karim, Arokia Nathan, John A Rowlands</i>	

A3L-F ON-CHIP DIGITAL MONITORS AND REGULATORS

On-Chip Jitter and Oscilloscope Circuits Using an Asynchronous Sample Clock	126
<i>Jeremy Schaub, Fadi Gebara, Tuyet Nguyen, Ivan Vo, Jarom Peña, Dhruva Achayrra</i>	
CMOS Unclonable System for Secure Authentication Based on Device Variability	130
<i>Daniele Puntin, Stefano Stanzione, Giuseppe Iannaccone</i>	
Circuit Techniques for Suppression and Measurement of on-Chip Inductive Supply Noise	134
<i>Sanjay Pant, David Blaauw</i>	
A Fully Integrated Power Supply Unit for Fine Grain Power Management Application to Embedded Low Voltage SRAMs	138
<i>Edith Beigné, Fabien Clermidy, Sylvain Miermont, Alexandre Valentian, Pascal Vivet, Sebastien Barasinski, Fabrice Blisson, N. Kholi, S. Kumar</i>	

A6L-D TRANCEIVERS AND TUNERS

A Single-Chip 8-Band CMOS Transceiver for W-CDMA(HSPA) / GSM(GPRS) / EDGE with Digital Interface	142
<i>Hiroshi Yoshida, Takehiko Toyoda, T. Yasuda, Y. Ogasawara, M. Ishii, T. Murasaki, G. Takemura, M. Iwanaga, T. Takida, Yuta Araki, T. Hashimoto, K. Sami</i>	
A Low Power CMOS SAW-Less Quad Band WCDMA/HSPA/1X/EGPRS Transmitter	146
<i>Marco Cassia, Aristotele Hadjichristos, Hong Sun Kim, Jin-Su Ko, Jeongsik Yang, Sang-Oh Lee, Kamal Sahota</i>	
A 14-mW 2.4-GHz CMOS Transceiver for Short Range Wireless Sensor Applications	150
<i>Reza Yousefi, Ralph Mason</i>	
A Multi-Standard Mobile Digital Video Receiver in 0.18μm CMOS Process	154
<i>Kenneth Barnett, Harish Muthali, Susanta Sengupta, Yunfei Feng, Bo Yang, Zhije Xiong, Tae Wook Kim, James Jaffee, Cormac Conroy</i>	
On-Chip Auto-Calibrated RF Tracking Filter for Cable Silicon Tuner	158
<i>Olivier Jamin, Vincent Rambeau, Frederic Mercier, Insaf Meliane</i>	

A6L-E HIGH SPEED DATA LINKS

Power Efficient 4.5Gbit/s Optical Receiver in 130nm CMOS with Integrated Photodiode	162
<i>Filip Tavernier, Michiel Steyaert</i>	

5.75 to 44Gb/s Quarter Rate CDR with Data Rate Selection in 90nm Bulk CMOS	166
<i>George Von Bueren, Lucio Rodoni, Heinz Jaeckel, Alex Huber, Roland Brun, Daniel Holzer, Martin Schmatz</i>	

A Robust 1.5Gb/s + 3Gb/s Serial PHY with Feed-Forward Correction Clock and Data Recovery	170
<i>William Redman-White, Martin Bugbee, Steve Dobbs, Xinyan Wu, Richard Balmford, Jonah Nuttgens, Umer Kiani, Richard Clegg, Gerrit Den Besten</i>	

A Low-Jitter 1.5-GHz and 350-ppm Spread-Spectrum Serial ATA PHY Using Reference Clock with 400-ppm Production-Frequency Tolerance	174
<i>Takashi Kawamoto, Masaru Kokubo</i>	

An Adaptive 4-Tap Analog FIR Equalizer for 10-Gb/s Over Backplane Serial Link Receiver	178
<i>Ori Eshet, Adee Ran, Amir Mezer, Yaniv Hadar, Dror Lazar, Miki Moyal</i>	

A6L-F LOW POWER PROCESSORS AND MEMORY

A 2.9Tb/s 8W 64-Core Circuit-Switched Network-on-Chip in 45nm CMOS	182
<i>Mark Anders, Himanshu Kaul, Martin Hansson, Ram Krishnamurthy, Shekhar Borkar</i>	

Standby Power Reduction Techniques for Ultra-Low Power Processors	186
<i>Yoonmyung Lee, Mingoo Seok, Scott Hanson, David Blaauw, Dennis Sylvester</i>	

Low-Power 32-Bit Dual-MAC 120 μW/MHz 1.0 V icyflex DSP/MCU Core	190
<i>Claude Arm, Stève Gyger, Jean-Marc Masgonty, Marc Morgan, Jean-Luc Nagel, Christian Piguat, Flavio Rampogna, Patrick Volet</i>	

A 5.2Gb/p/s GDDR5 SDRAM with CML Clock Distribution Network	194
<i>Kyung Hoon Kim, Sangsic Yoon, Kichang Kwean, Daehan Kwon, Sunsuk Yang, Munphil Park, Yongki Kim, Byongtae Chung</i>	

Program Circuit for a Phase Change Memory Array with 2 MB/s Write Throughput for Embedded Applications	198
<i>Guido De Sandre, Luca Bettini, Emanuela Calvetti, Gianni Giacomi, Marco Pasotti, Massimo Borghi, Paola Zuliani, Roberto Annunziata, Innocenzo Tortorelli, Fabio Pellizzer, Roberto Bez</i>	

B3L-D OVERSAMPLED DATA CONVERTERS

A 3.6GHz, 16mW Sigma-Delta DAC for a 802.11n / 802.16e Transmitter with 30dB Digital Power Control in 90nm CMOS	202
<i>Parmoon Seddighrad, Ashoke Ravi, Masoud Sajadieh, Hasnain Lakdawala, Krishnamurthy Soumyanath</i>	

A 12-bit 3.125-MHz Bandwidth 0-3 MASH Delta-Sigma Modulator	206
<i>Ahmed Gharbiya, David Johns</i>	

A 20.7 mW Continuous-Time Delta Sigma Modulator with 15 MHz Bandwidth and 70dB Dynamic Range	210
<i>Karthikeyan Reddy, Shanthy Pavan</i>	

A 11 mW 68dB SFDR 100 MHz Bandwidth Delta-Sigma-DAC Based on a 5-Bit 1GS/s Core in 130nm	214
<i>Pieter Palmers, Michiel Steyaert</i>	

Third-Order Sigma-Delta Modulator with 61-dB SNR and 6-MHz Bandwidth Consuming 6 mW	218
<i>Edoardo Bonizzoni, Aldo Peña Perez, Franco Maloberti, Miguel Garcia-Andrade</i>	

B3L-E MEMORY DESIGN TECHNIQUES

Parallel Double Error Correcting Code Design to Mitigate Multi-Bit Upsets in SRAMs	222
<i>Riaz Naseer, Jeff Draper</i>	
A Multiword Based High Speed ECC Scheme for Low-Voltage Embedded SRAMs	226
<i>Shah Jahinuzzaman, Tahseen Shakir, Sumanjit Lubana, Jaspal Shah, Manoj Sachdev</i>	
Importance Sampling Monte Carlo Simulations for Accurate Estimation of SRAM Yield	230
<i>Toby Doorn, Jan Ter Maten, Jeroen Croon, Alessandro Di Bucchianico, Olaf Wittich</i>	
A Robust Single Supply Voltage SRAM Read Assist Technique Using Selective Precharge	234
<i>Mohamed Abu-Rahma, Mohab Anis, Sei Seung Yoon</i>	

B3L-F 60 GHz AND BEYOND

A 90nm CMOS mm-Wave VCO Using an LC Tank with Inductive Division	238
<i>Lianming Li, Patrick Reynaert, Michiel Steyaert</i>	
A Fully Integrated 60 GHz Transmitter Front-End with a PLL, an Image-Rejection Filter and a PA in SiGe	242
<i>Srdjan Glisic, Yaoming Sun, Frank Herzel, Maxim Piz, Eckhard Grass, Christoph Scheytt, Wolfgang Winkler</i>	
60GHz Quadrature Doppler Radar Transceiver in a 0.25μm SiGe BiCMOS Technology	246
<i>Hugo Veenstra, Marc Notten, Xiongchuan Huang, John Long</i>	
A 60GHz Digitally Controlled Phase Shifter in CMOS	250
<i>Yikun Yu, Peter Baltus, Arthur Van Roermund, Dennis Jeurissen, Anton De Graauw, Edwin Van Der Heijden, Ralf Pijper</i>	
A 71-73 GHz Voltage-Controlled Standing-Wave Oscillator in 90 nm CMOS Technology	254
<i>Francesco De Paola, Raffaella Genesi, Danilo Manstretta</i>	

B5L-A PROCESS STABILITY

On-Chip Leakage Monitor Circuit to Scan Optimal Reverse Bias Voltage for Adaptive Body-Bias Circuit Under Gate Induced Drain Leakage Effect	258
<i>Masako Fujii, Hiroaki Suzuki, Hiromi Notani, Hiroshi Makino, Hirofumi Shinohara</i>	

B5L-D NYQUIST RATE DATA CONVERTERS

A 1.5V 13bit 130-300MS/s Self-calibrated DAC with Active Output Stage and 50MHz Signal Bandwidth in 0.13μm CMOS	262
<i>Martin Clara, Wolfgang Klatzer, Daniel Gruber, Arnold Marak, Berthold Seger, Wolfgang Pribyl</i>	
A 90nm 8b 120Ms/s-250Ms/s Pipeline ADC	266
<i>Luca Picolli, Piero Malcovati, Lorenzo Crespi, Faouzi Chaahoub, Andrea Baschirotto</i>	

A 1.2V 56mW 10 Bit 165Ms/s Pipeline-ADC for HD-Video Applications	270
<i>Martin Trojer, Mauro Cleris, Ulrich Gaier, Thomas Hebein, Peter Pridnig, Bernhard Kuttin, Bernhard Tschuden, Christian Krassnitzer, Christian Kuttin, Wolfgang Pribyl</i>	

An 8-Bit Flash Analog-to-Digital Converter in Standard CMOS Technology Functional in Ultra Wide Temperature Range from 4.2 K to 300 K	274
<i>Ybe Creten, Patrick Merken, Robert Mertens, Willy Sansen, Chris Van Hoof</i>	

B5L-E LOW POWER SRAM

A 3.6pJ/Access 480MHz, 128Kbit on-Chip SRAM with 850MHz Boost Mode in 90nm CMOS with Tunable Sense Amplifiers to Cope with Variability	278
<i>Stefan Cosemans, Wim Dehaene, Francky Catthoor</i>	

A Reconfigurable 65nm SRAM Achieving Voltage Scalability from 0.25-1.2V and Performance Scalability from 20kHz-200MHz	282
<i>Mahmut Sinangil, Naveen Verma, Anantha Chandrakasan</i>	

A Cell-Activation-Time Controlled SRAM for Low-Voltage Operation in DVFS SoCs Using Dynamic Stability Analysis	286
<i>Masanao Yamaoka, Kenichi Osada, Takayuki Kawahara</i>	

A Dual Port Dual Width 90nm SRAM with Guaranteed Data Retention at Minimal Standby Supply Voltage	290
<i>Peter Geens, Wim Dehaene</i>	

B5L-F CIRCUIT TECHNIQUES FOR UWB

Current Reuse CMOS LNA for UWB Applications	294
<i>Thierry Taris, Yann Deaal, Jean Baptiste Bégueret</i>	

A UWB Transformer-C Orthonormal State Space Band-Reject Filter in 0.13 μm CMOS	298
<i>Sumit Bagga, Zoubir Irahauten, Sandro Haddad, Wouter Serdijn, John Long, John Pekarik</i>	

A 9mW High Band FM-UWB Receiver Front-End	302
<i>Yunzhi Dong, Yi Zhao, John Gerrits, Gerrit Veenendaal, John Long</i>	

A Low-Voltage Mobility-Based Frequency Reference for Crystal-Less ULP Radios	306
<i>Fabio Sebastiano, Lucien Breems, Kofi Makinwa, Salvatore Drago, Domine Leenaerts, Bram Nauta</i>	

B6L-D AMPLIFIERS

A 36V Precision Programmable Gain Amplifier with CMRR Exceeding 120dB in All Gains	310
<i>Viola Schaffer, Martijn Snoeij, Misha Ivanov</i>	

A 65-nm 84-dB-Gain 200-MHz-UGB CMOS Fully-Differential Three-Stage Amplifier with a Novel Common Mode Control	314
<i>Ivonne Di San Carlo, Dario Giotta, Andrea Baschiroto, Richard Gaggl</i>	

A CMOS Source-Buffered Differential Input Stage with High EMI Suppression	318
<i>Jean-Michel Redouté, Michiel Steyaert</i>	

Analog Signal Processing for a Class D Audio Amplifier in 65 nm CMOS Technology	322
<i>Willem Groeneweg</i>	

B6L-E COMPONENTS IN HIGH FREQUENCY CIRCUITS

Reduction of VCO Phase Noise Through Forward Substrate Biasing of Switched MOSFETs	326
<i>Domagoj Siprak, Marc Tiebout, Peter Baumgartner</i>	

B6L-F UWB TX SYNTHESIZERS

A WiMedia UWB Receiver with a Synthesizer	330
<i>Mikko Kalliokallio, Ville Saari, Tapio Rapinoja, Kari Stadius, Jussi Rynnänen, Saska Lindfors, Kari Halonen</i>	
An Ultra Low Power and High Efficiency UWB Transmitter for WPAN Applications	334
<i>Shengxi Diao, Yuan Jin Zheng</i>	
A 3-10 GHz Flexible CMOS LO Generator for MB-OFDM UWB Application Using Wide Tunable VCOs	338
<i>Eun-Chul Park, Inhyo Ryu, Jeongwook Koh, Chun-Deok Suh</i>	
0.13 μm CMOS Cartesian Loop Transmitter IC with Fast Calibration and Switching Scheme from Opened to Closed Loop	342
<i>Shoji Otaka, Masahiro Hosoya, Hiroaki Ishihara, Toru Hashimoto, Yuta Araki</i>	

C2L-D REGULATORS AND DRIVERS

Low Drop-Out Voltage Regulator with Full on-Chip Capacitance for Slot-Based Operation	346
<i>Wim Kruiskamp, René Beumer</i>	
High-Performance Low-Dropout Regulator Achieved by Fast Transient Mechanism	350
<i>Hong-Wei Huang, Chia-Hsiang Lin, Ke-Horn Chen</i>	
A High-Power-Led Driver with Power-Efficient Led-Current Sensing Circuit	354
<i>Wing Yan Leung, Tsz Yin Man, Mansun Chan</i>	
Boost DC-DC Converter with Charge-Recycling (CR) and Fast Reference Tracking (FRT) Techniques for High-Efficiency and Low-Cost Led Driver	358
<i>Chun-Yu Hsieh, Ke-Horn Chen</i>	

C2L-E SYNTHESIZERS AND PLLS

An 11-Bit 8.6GHz Direct Digital Synthesizer MMIC with 10-Bit Segmented Nonlinear DAC	362
<i>Xueyang Geng, Xuefeng Yu, Fa Foster Dai, J David Irwin, Richard Jaeger</i>	
Fully Integrated, High Performance Triple SD PLL (2.2GHz to 4.4GHz) with Minimized Interaction	366
<i>Stefano Cipriani, Eric Duvivier, Gianni Puccio, Lorenzo Carpineto, Biagio Bisanti, Francesco Coppola, Martin Alderton, Jeremy Goldblatt</i>	
A Low-Power Programmable Dynamic Frequency Divider	370
<i>J�r�mie Chabloz, David Ruffieux, Christian Enz</i>	
Supply-Noise Mitigation Techniques in Phase-Locked Loops	374
<i>Abhijith Arakali, Nema Talebbeydokhti, Srikanth Gondi, Pavan Kumar Hanumolu</i>	

C2L-F IMPULSE UWB RECIEVERS

A 46pJ/Pulse Analog Front-End in 130nm CMOS for UWB Impulse Radio Receivers	378
<i>Nick Van Helleputte, Georges Gielen</i>	
A 7.5mA 500 MHz UWB Receiver Based on Super-Regenerative Principle	382
<i>Prakash Egambaram Thoppay, Catherine Dehollain, Michel Declercq</i>	
Low-Power CMOS RF Front-End for Non-Coherent IR-UWB Receiver	386
<i>Yuan Gao, Yuan Jin Zheng, Chun-Huat Heng</i>	
Super-Regenerative UWB Impulse Detector with Synchronized Quenching Mechanism	390
<i>Muhammad Anis, Rienhard Tielert, Norbert Wehn</i>	

C3L-D LOW-POWER ANALOGUE

A Fully-Integrated Wienbridge Topology for Ultra-Low-Power 86ppm/ C 65nm CMOS 6MHz Clock Reference with Amplitude Regulation	394
<i>Valentijn De Smedt, Pieter De Wit, Wim Vereecken, Michiel Steyaert</i>	
A 0.3- μW, 7 ppm/ C CMOS Voltage Reference Circuit for on-Chip Process Monitoring in Analog Circuits	398
<i>Ken Ueno, Tetsuya Hirose, Tetsuya Asai, Yoshihito Amemiya</i>	
Electronic Interface for Piezoelectric Energy Scavenging System	402
<i>Enrico Dallago, Daniele Miatton, Giuseppe Venchi, Valeria Bottarel, Giovanni Frattini, Giulio Ricotti, Monica Schipani</i>	
A 0.2V-1.2V Converter for Power Harvesting Applications	406
<i>Anna Richelli, Luigi Colalongo, Silvia Tonoli, Zsolt Miklos Kovacs Vajna</i>	

C3L-E MULTI-STANDARD RF

A Low-Complexity, Low Phase Noise, Low-Voltage Phase-Aligned Ring Oscillator in 90 nm Digital CMOS	410
<i>Jonathan Borremans, Julien Ryckaert, Piet Wambacq, Maarten Kuijk, Jan Craninckx</i>	
A 1.2V Receiver Front-End for Multi-Standard Wireless Applications in 65 nm CMOS LP	414
<i>Maja Vidojkovic, Mihai Sanduleanu, Vojkan Vidojkovic, Johan van der Tang, Peter Baltus, Arthur Van Roermund</i>	
A 1.2 GHz Semi-Digital Reconfigurable FIR Bandpass Filter with Passive Power Combiner	418
<i>Axel Flament, Antoine Frappé, Andreas Kaiser, Bruno Stefanelli, Andreia Cathelin, Hilal Ezzeddine</i>	
A Fractional Spur Reduction Technique for RF TDC-Based All Digital PLLs	422
<i>Ping-Ying Wang, Hsiang-Hui Chang, Jing-Hong Conan Zhan</i>	

C3L-F SHORT RANGE LOW DATA RATE WIRELESS COMMUNICATIONS

An Ultra Low Power SoC for 2.4GHz IEEE802.15.4 Wireless Communications	426
<i>Carolynn Bernier, Frédéric Hameau, Gérard Billiot, Emeric de Foucauld, Stéphanie Robinet, Didier Lattard, Jean Durupt, François Dehmas, Laurent Ouvry, Pierre Vincent</i>	
A 0.23Mm² Free Coil ZigBee Receiver Based on a Bond-Wire Self-Oscillating Mixer	430
<i>Marika Tedeschi, Antonio Liscidini, Rinaldo Castello</i>	

An Ultra Low Power GFSK Demodulator for Wireless Body Area Network	434
<i>Dong Han, Yuan Jin Zheng</i>	
A 3-5 GHz Low-Complexity Ultra-Wideband CMOS RF Front-End for Low Data-Rate WPANs	438
<i>Marco Cavallaro, Alessandro Italia, Giuseppina Sapone, Giuseppe Palmisano</i>	

C6L-D SENSOR INTERFACE CIRCUITS

A 828μW 1.8V 80dB Dynamic-Range Readout Interface for a MEMS Capacitive Microphone	442
<i>Syed Arsalan Jawed, Davide Cattin, Massimo Gottardi, Nicola Massari, Andrea Baschiroto, Andrea Simoni</i>	
A Low-Power Capacitance to Pulse Width Converter for MEMS Interfacing	446
<i>Paolo Bruschi, Nicolo Nizza, Michele Dei</i>	
A 14 - Bit Micro-Watt Power Scalable Automotive MEMS Pressure Sensor Interface	450
<i>Akram Nafee, David Johns</i>	
A High Gain-Bandwidth Product Transimpedance Amplifier for MEMS-Based Oscillators	454
<i>Frederic Nabki, Mourad El-Gamal</i>	
A Synchronous Chopping Technique and Implementation for High-Frequency Precision Sensing	458
<i>Mohamad Rahal, Andreas Demosthenous</i>	

C6L-E HIGH-SPEED DIGITAL CIRCUITS AND SYSTEMS

A 211 GOPS/W Dual-Mode Real-Time Object Recognition Processor with Network-on-Chip	462
<i>Kwanho Kim, Joo-Young Kim, Seungjin Lee, Minsu Kim, Hoi-Jun Yoo</i>	
A Fully Programmable 40 GOPS SDR Single Chip Baseband for LTE/WiMAX Terminals	466
<i>Torsten Limberg, Markus Winter, Marcel Bimberg, Reimund Klemm, Emil Matus, Marcos Tavares, Gerhard Fettweis, Hendrik Ahlendorf, Pablo Robelly</i>	
2.6 Gb/s Over a Four-Drop Bus Using an Adaptive 12-Tap DFE	470
<i>Henrik Fredriksson, Christer Svensson</i>	
An 8Gbps 2.5mW on-Chip Pulsed-Current-Mode Transmission Line Interconnect with a Stacked-Switch Tx	474
<i>Tomoaki Maekawa, Hiroyuki Ito, Kazuya Masu</i>	
Implementation of a Phase-Encoding Signalling Prototype Chip	478
<i>Crescenzo D'Alessandro, Alex Bystrov, Alex Yakovlev</i>	

C6L-F RF POWER AMPLIFIERS AND RADAR

A High-Resolution 24-dBm Digitally-Controlled CMOS PA for Multi-Standard RF Polar Transmitters	482
<i>Calogero Davide Presti, Francesco Carrara, Giuseppe Palmisano, Antonino Scuderi</i>	
A 1.2V, 17dBm Digital Polar CMOS PA with Transformer-Based Power Interpolating	486
<i>Xin He, Manel Collados, Nenad Pavlovic, Jan van Sinderen</i>	

A 2.4-GHz +25dBm P-1dB Linear Power Amplifier with Dynamic Bias Control in a 65-nm CMOS Process	490
<i>Po-Chih Wang, Kai-Yi Huang, Yu-Fu Kuo, Ming-Chong Huang, Chao-Hua Lu, Tzung-Ming Chen, Chia-Jun Chang, Ka-Un Chan, Ta-Hsun Yeh, Wen-Shan Wang, Ying-Hsi Lin, Chao-Cheng Lee</i>	
0.13-μm SiGe BiCMOS Radio Front-End Circuits for 24-GHz Automotive Short-Range Radar Sensors	494
<i>Angelo Scuderi, Egidio Ragonese, Giuseppe Palmisano</i>	
A 24GHz FMCW Radar Transmitter in 0.13 μm CMOS	498
<i>Yiqun Cao, Marc Tiebout, Vadim Issakov</i>	
A 45nm Single Power Supply SRAM Supporting Low Voltage Operation Down to 0.6V	502
<i>Sebastien Barasinski, Ludovic Camus, Sylvain Clerc</i>	
Author Index	