ICCSC'02

1st IEEE International Conference on Circuits and Systems for Communications

Proceedings

26–28 June, 2002

St.Petersburg, Russia
Contents

Analog Circuits and Systems I

Fundamental Limitations in Precision Analog Circuits ..................................................16
S.G. Krutchisky

An Analog Bipolar-JFET Master Slice Array for Multichannel Front-End Electronics ........20
M.A. Baturitsky, O.V. Dvornikov, and V.A. Tchekhovsky

Method of Rising the Upper Level Frequency Limit of Wide-Band Amplifier .................24
N.N. Prokopenko and E.I. Starchenko

New Structures of Precision Sensors of Resistive Type ..............................................28
I.P. Scherbinin

D-units Gain Bandwidth Sensitivity Reducing ...............................................................32
D.A. Shchyokin

Law of Conservation of Energy in Modern Communication Circuits .............................36
M.G. Vitkov and A.A. Vitkova

Analog Circuits and Systems II

A 3.3V Linear Fully Balanced CMOS Operational Transconductance Amplifier
for High-Frequency Applications ......................................................................................38
S. Szczepanski and S. Koziel

A Fully Differential CMOS OTA for Continuous-Time Filter Applications ..................42
B. Pankiewicz, M. Solecki, and S. Szczepanski

A Low-Voltage Fully-Differential BiCMOS Op Amp for Polyphase Filter ....................46
G. Blakiewicz and J. Jakusz

A CMOS OTA-C Channel-Select Filter for Mobile Receiver ..........................................50
W. Jendernalik and S. Szczepanski

Sensitivity Properties of All-Pole Canonical Low-Pass Gm-C Filters ............................54
S. Koziel and S. Szczepanski

Nonlinear Distortion Analysis of Gm-C Filters in Frequency Domain ..........................58
A.S. Korotkov and D.V. Morozov

Analog and Mixed Circuits and Systems

New CMOS Configurations for Current-Controlled Conveyors (CCCIIs) ......................62
S. Minaei, D. Kaymak, M.A. Ibrahim, H. Kuntman

First-Order Allpass Filter Realisation Using a Modified Third Generation
Current Conveyor ............................................................................................................66
S. Ozoguz, H. Kuntman, O. Cicekoglu
New Current-Mode Integrator, All-Pass Section and Quadrature Oscillator Using Only Active Elements ..........................................................70
S. Minaei and O. Cicekoglu

A New Type of Universal Functional Block Suitable for Circuits Derived by Adjoint Transformation ..................................................74
O. Subrt and P. Martinek

Current Conveyor Based Switched-Capacitor Integrator with Reduced Parasitic Sensitivity .................................................................78
A.A. Tutyshkin and A.S. Korotkov

Analyzing the Impact of Substrate Noise on Embedded Analog-to-Digital Converters ....82
Y. Zinzius, G. Gielen, W. Sansen

Simulation of Second Order Comb Filter Based on Delta Modulation ........86
S.B. Makarov and Safaa Sh. Odda

Analog Circuits and Systems III

Analysis and Design of Feed-Forward Current Mode Amplifiers using Individual Suppression of Complex Harmonics .........................88
Y. Bruck, G.Burdo, M. Zelikson, A.Barger and L.Boreisha

Fast and Accurate Level Monitoring Circuitry for a Burst-Mode CMOS Laser Driver ...94
P. Ossieur, K. Noldus, X.Z. Qiu, J. Bauwelinc, Y. Martens, J. Vandewege E. Gilon, B. Stubbe

Comparison of Transistor-Based Power Amplifiers Amplitude Response Linearization methods ..........................................................98
V.B. Kozyrev and N.A. Krotov

A Comparison of Two Schemes for Peak-to-Average Power Ratio Reduction in a Multicarrier Transmission .......................................102
N. Ermolova

Multi-criterion Filter Design via Differential Evolution Method for Function Minimization ...............................................................106
J. Vondras and P. Martinek

Uninterruptible Power Supplies of Small Power with the Improved Shape of Output Voltage ..............................................................110
V.F. Dmitrikov and N.B. Dogadin

Digital Circuits and Systems I

Optimal Design and Parallel Implementation of Variable FIR Filters with Tuneable Magnitude and Non-integer Phase-Delay ..................114
Tian-Bo Deng and Eiji Okamoto

Design of Linear-Phase Variable 2-D FIR Filters Using Multidimensional Array Decomposition ......................................................118
Tian-Bo Deng
Direct Synthesis Procedure of Analog and Digital Low-Sensitivity Filters
V.P. Dovgun, P.A. Barybin, and V.V. Shuvaev

Quantization Effects in the First-Order Digital Recursive Filters With Round-Off
Y.A. Bryuhanov

Image Processing Based on Two-Dimensional First Order Digital Filters
A.L. Priorov and Y.A. Lukashevich

Method of High Reliability System Synthesis Using VHDL
B.G. Konoplev and V.G. Ivchenko

Digital Circuits and Systems II

OFDM Modem for ATM Based Point-Multipoint Systems
P. Altamura, G.C. Cardarilli, A. Del Re, and M. Re

Implementation of DVB-RCS Turbo Decoder for Satellite On-board Processing
A. Bartolazzi, G. Cardarilli, A. Del Re, D. Giancristofaro, and M. Re

Design and Implementation of High-Speed Reed-Solomon Decoder
You Yu-Xin, Wang Jin-Xiang, Lai Feng-Chang, and Ye Yi-Zheng

Fast SUBMAP decoders for duo-binary turbo-codes
Y. Saouter and C. Berrou

Turbo Codes in Satellite Modems
Y.A. Brusin and Y.Y. Scherbakov

Reconfigurable Hardware Accelerator for a Universal Reed Solomon Codec
S. Roy, M. Bucker, W. Wilhelm, B.S. Panwar

DCT Processor Architecture Based on Computation Sharing
S. Kwon, J. Park, and K. Roy

Digital Modulator Architectures for Satellite and Space Applications
G. Cardarilli, A. Del Re, D. Giancristofaro, M. Re, and L. Simone

Analysis and Implementation of a multilevel Coded Modulation Scheme
M. Albanese, I. Rinaldi, and A. Spalvieri

The Synthesis of Digital Frequency and Phase Detectors
E.B. Solovieva

Current Mode Digital Gates for Mixed Mode Reprogrammable Integrated System
P. Pawlowski

Design the Prototype of the Spartan II FPGA Slice with the Current-Mode Gates
O. Maslennikow, R. Berezowski, P. Soltan, and M. Rajewska
Digital Circuits and Systems IV

Class-D Audio Amplifiers with Separated Baseband for Low-Power Mobile Applications
M. Streitenberger, F. Felgenhauer, H. Bresch, and W. Mathis

Analysis of reconfigurable and heterogeneous architectures in the communication domain
H.T. Feldkamper, T. Gemmeke, H. Blume, T.G. Noll

Architecture of a Fault Tolerant System for Real Time embedded applications
A. Sinha, A. Karmakar, B. Bhattacharya, S. Bhattacharya, S. Ray

Method Coding of QAM Signals for Transmission Fractional Number Bit per Symbol
V.A. Egorov and M.A. Mendelson

Quantization of Wavelet Coefficients
A.N. Ganin and A.L. Priorov

Communication Systems and Applications

An overview of Bluetooth Wireless Technology™ and Some Competing LAN Standards
A.C. Davies

MIMO Eigenbeamforming in Correlated Fading
M.T. Ivrlac and J.A. Nossek

Smart Low-Power CMOS Cameras for 3G Mobile Communicators

A Low Access Latency Video Portal
Ebroul Izquierdo

Ultra-Wideband (UWB) Interference Resistant System for Secure Radio Communication with High Data Rate
I.J. Immoreev and A.A. Sudakov

Suggestions for Availability Improvement of Optical Cables
I. Rados, T. Sunaric, P. Turalija

Modeling Network Embedded Systems with NS-2 and SystemC
N. Drago, F. Fummi, and M. Poncino

Radio Electronic Devices Control and Monitoring via Internet
V.A. Sorotsky

Dynamic DC Offset Impact on the 802.11a Receiver Performance
O.V. Popov

Performance of WCDMA Spreading in Downlink for FDD Mode
Hassan Moradi, Masumeh Nasiri Kenari, Mahmoud Ahmadian, and Ahmad Salahi
Neural Networks

On Pattern Formation in a Class of Cellular Neural Networks ........................................258
L. Goras, T.D. Teodorescu, R. Ghinea, and E. David

System for Mation Algorithm of Communication Network Quality Factors Using
Artificial Neural Networks ..........................................................263
I.B. Paraschuk

Cellular Neural Network in Image Filtration Tasks .........................................................267
V.V. Khryasshyov, E.Y. Sautov, and E.A. Sokolenko

Chaos in Communication Circuits and Systems I

Self-Parametric Chaotic Oscillators for Secure Communication Systems ....................271
V.P. Tepin

Adaptive Robustified Synchronization Methods for Chaos-Based
Information Transmission ..............................................................275
A.L. Fradkov and B.R. Andrievsky

Phase Locked Loops for Array Processors .........................................................281
G.A. Leonov and S.M. Seledzhi

Performance Analysis of Adaptive Controllers on Chaotic Parameter Modulation
and Variant Channel Gain ..............................................................283
Mustafa Turk and Fikret Ata

Chaos in Communication Circuits and Systems II

Modified Log-Domain Oscillator for Chaos .........................................................287
S. Ozoguz and N.S. Sengor

Wideband and Ultra Wideband Direct Chaotic Communications .............................291

Wideband Microwave Chaotic Oscillators .........................................................296
B.E. Kyarginsky, N.A. Maximov, A.I. Panas, and S.O. Starkov

Broadband RC Chaotic Oscillators ..............................................................300
E.V. Efremova and L.V. Kuzmin

RF Circuits Theory and Design I

Flexible Configurable Single Chip Receiver for Low Power Radio Module
in 868 MHz Band .................................................................304
B. Bieske and H. Weissleder

CAD of RF and Microwave Filters for Wireless Communications ..........................308
D. Budimir, G. Shen, and G. Goussetis
RF Circuits Theory and Design II

A Lumped, Large-Signal Dynamic Model of the MOSFET for RF Circuit Simulation
Chen Zaiman, Lai Jinmei, Omar Wing, and Ren Junyan

A Non-Quasi-Static Small-Signal Model of the Four-Terminal MOSFET
for Radio and Microwave Frequencies
W.J. Kordalski and T. Stefanski

Synthesis of High-Frequency Wave Filters and Transformers for Communications
Systems
B.A. Lapshin

Antennas in Communications

Novel Internal Antenna for Cellular Phones
V.P. Akimov, D.V. Shannikov

Dynamic Behavior of Dielectric Antennas at High Communication Rates
B.V. Lvov and V.Y. Petrunkin

Optimization of the Spherically Stratified Microwave Lens Antenna
D.V. Shannikov and S.V. Kuzmin

Perspectives of Use of Three-Layer Ferrite-Dielectric Waveguides
for Creation of Integrated Antennas with Narrow Beam
E.F. Zaitsev, A.B. Guskov, A.S. Cherepanov, and K.V. Guzenko

VCO Theory and Design

Low Phase Noise Low Power 4.3 GHz VCO in Standard 0.35 μm CMOS
M. Peter, H. Hein, F. Oehler, P. Baureis

Theory of Cross-Coupled Oscillator System for RF Quadrature Generation
Jian Wang, Jun Tan, and Omar Wing
Settling Time Minimization in PLL Frequency Synthesizers
M. Min, V. Mannama, and T. Paavle

Behavioural modelling of phase noise and jitter in Voltage-Controlled Oscillators with VHDL-AMS

Parametric Synthesis of Microwave FET Oscillators
V.V. Bochkov, V.N. Dubrovsky, and A.S. Karasev

Limited Signals Forming with the Given Accuracy in the Systems under Disturbances
V.N. Pilishkin and I. Tollet

Microelectronic Realization and Manufacturing I

A Design Environment using C for Effective Layout Synthesis and Development of Reusable Libraries
W. Schardein and R. Wittmann

Application of Hybrid Evolutionary Partitioning Algorithm for Heat Transfer Enhancement in VLSI Circuits
S. Koziel and W. Szczesniak

Low-loss High Power Microwave Switching Using Novel Nitride Based MOS Heterostructure Field-Effect Transistors
G. Simin, A. Koudymov, X. Hu, J. Zhang, M. Ali, and M. Asif Khan

About Multi-Stable Bipolar Structure Approximation by System of Virtual Bistable Semiconductor Elements

Microelectronic Realization and Manufacturing II

Nonequilibrium 1/f Noise and Hardware Reliability
G.M. Balim, M.G. Levina, and S.S. Smakhtin

Nonequilibrium 1/f Noise and Problems of Submicron Technology of High Reliability Microcircuits
G.M. Balim and S.S. Smakhtin

Static-Induction Transistor for Very-High-Speed Ics
B.G. Konoplev and E.A. Ryndin

On Compensation of Coulomb Interaction of Charges by Beam’s Self-Consistent Field (Model of isothermal equilibrium with homogeneous temperature)
V.G. Sapogin

Radiation Induced Current in Coaxial Cables
P.R. Gilvanov
Signal Processing I

Estimation of Channel Matrix Rank for Multielement Antenna Arrays Working in Multipath Fading Environment .........................................................416
V.T. Ermolayev, A.G. Flaksman, and E.A. Mavrichev

Signal Processing in Wireless Communication Systems Using Multielement Antenna Arrays in Rayleigh Fading Environment ..........................420
V.T. Ermolayev, A.G. Flaksman, and E.A. Mavrichev

The Statistical Detection Method of Unauthorized Intrusions in the Rayleigh Fading Channel ...............................................................424
I.M. Oroshchuk

Extended Block-Adaptive Fourier Analyser ........................................428
A. Ronk

Synthesis of Spectral-Effective Modulation Techniques for Digital Communication Systems .................................................................432
D.G. Waldman and S.B. Makarov

The Combination of Binaural Processing with Adaptive Beamforming for Dual Microphones in Speech Communications .......................436
Fa-Long Luo and B. Uvacek

Signal Processing II

Synchronization and Secure Communication Using Non-Linear State Observers ..........440
M. Boutayeb, M. Darouach, and Rafaralahy H.

Bit-Wise Demodulation For 16-QAM with BICM ........................................444
Wei Fu, Jian Liu, and Guangxi Zhu

Performance Analysis of Augmented RAC Codes Under Memoryless Conditions ..........450
Lami Kaya

Generalized DMT/OFDM with High Performance .........................................454
N.J. Fliege and S. Trautmann

A Reconfigurable Data-Flow Architecture for a Class of Image Processing Applications .................................................................460
A. Sinha, S. Neogi, and K. Maiti

An Approach to the Design of ELIN (Externally Linear Internally Nonlinear) Signal Processors ...............................................................464
R.J.P. de Figueiredo and Jun Yao

15