

"Table of contents," *2014 International Conference on Applied Electronics*, Pilsen, 2014, pp. vii-xii.

doi: 10.1109/AE.2014.7011653

Abstract: The following topics are dealt with: high-speed analog-to-digital converters; nanometer CMOS technology; pseudo random code regeneration; oscillation frequency value; oscillation-based tests; reconfigurable filter structure; universal embedded controller; matrix converter; continuous-time sigma-delta modulator; integrated LC filter; human-robot cooperation; seismic sensor system; MEMS accelerometer; memristor pinched hysteresis loops; PV panels; MPPT controller; PV power system modelling; PLP feature extraction optimization; LVCSR recognition; MP3 data; dead-time compensation strategy; adaptive harmonic compensator; Cartesian genetic programming; desktop based real time oxygen auto-ventilation; gas monitoring system; homecare respiratory application; subband optimization; EEG-based classification; HART compatible HART line powered communication module; interactive hybrid control-flow checking method; polyphase FIR filter structure; VHDL language; FPGA; B3C converter; heat transfer; electronic system; moving object searching; virtual instrumentation; ISO26262 motorbikes; nonlinear stabilization; state space energy error feedback; quadrature oscillator; operational transresistance amplifier; quantum computation system emulator; low noise amplifier; SVPWM algorithm; H-bridge power inverter; LCL filter; 3D machine vision system; contact strips inspection; railway vehicle current collectors; wrist cuff method; mean arterial pressure; dual-cuff blood pressure system; contactless electrical energy transfer; varying air gap; resonant converter; nonlinear inductance; programmable PWM modulator; OPWM test platform; 3D FEM simulation; EMC testing; input current harmonics; voltage-source active rectifier; motion detection system; NiTi pressure sensors; phase coupled oscillator; dissipation normal form; space vector pulse width modulation; RF circuits response; software defined radio system; adaptive mechanical model; cardiovascular system; RF network combiner; wireless multicom- munication system; smart households; graph method; SI circuit solution; M-FSK intrapulse modulation analysis; subspectral decomposition method; small loop antennas parameter measurement; GTEM cell; radio frequency energy harvesting system; boost power factor correction topology; average current control; critical conduction mode; EKF based position estimators; speed estimators; sensorless DTC; permanent magnet synchronous machines; E-D-Mode InAlN-GaN HFET inverter; low frequency amplifier; real-time multicore systems; genetic algorithm; runnable sequencing; bandgap voltage reference; high-order temperature compensation; two stepped system; train dynamic motion; wheel slip; CAN nodes health monitoring; ADS-B channel; electrical resistance measurement; contact resistance; sensor fusion; IR sensors; Kalman filter; CMOS class-AB amplifier; rendering moving sound source; headphone-based virtual acoustic reality; high spectral quality sinusoidal oscillator; energy based amplitude control; wireless electronic systems; physiological parameters measuring; hidden pacemaker pulses detection; wavelet transform; Hilbert transform; feedback control; electrospinning process; iterated maps; nonlinear dynamics generation; genetic reasoning; finger sign identification; forearm electromyogram; statistical multirate high-resolution signal reconstruction; empirical mode decomposition based denoising approach; RF signal denoising; OFDM system; AWGN channels; feedforward approach; DC cancellation; fully-differential instrumentation amplifiers; fuzzy expert systems; and human gait phase.

keywords: {AWGN channels; CMOS integrated circuits; FIR filters; Hilbert transforms; Kalman filters; OFDM modulation; PWM invertors; TEM cells; carrier transmission on power lines; compensation; computer vision; contact resistance; electric current control; electric resistance measurement; electroencephalography; electromagnetic compatibility; electromyography; electrospinning; energy harvesting; expert systems; feature extraction; field programmable gate arrays; fingerprint identification; finite element analysis; frequency shift keying; gait analysis; genetic algorithms; graph theory; high electron mobility transistors; human-robot interaction; infrared detectors; instrumentation amplifiers; loop antennas; low noise amplifiers; matrix convertors; maximum power point trackers; memristors; microsensors; motorcycles; multiprocessing systems; operational amplifiers; oscillators; permanent magnet machines; photovoltaic power systems; power factor correction; pressure sensors; random number generation; rectifiers; resonant power convertors; sensor fusion; sensorless machine control; sigma-delta modulation; signal denoising; signal reconstruction; software radio; synchronous machines; traction current collection; ventilation; virtual instrumentation; virtual reality; wavelet transforms; 3D FEM simulation; 3D machine vision system; ADS-B channel; AWGN channels; B3C converter; CAN nodes health monitoring; CMOS class-AB amplifier; Cartesian genetic programming; DC cancellation; E-D-Mode InAlN-GaN HFET inverter; EEG-based classification; EKF based position estimators; EMC testing; FPGA; GTEM cell; H-bridge power inverter; HART compatible HART line powered communication module; Hilbert transform; IR sensors; ISO26262 motorbikes; Kalman filter; LCL filter; LVCSR recognition; M-FSK intrapulse modulation analysis; MEMS accelerometer; MP3 data; MPPT controller; NiTi pressure sensors; OFDM system; OPWM test platform; PLP feature extraction optimization; PV panels; PV power system modelling; RF circuits response; RF network combiner; RF signal denoising; SI circuit solution; SVPWM algorithm; VHDL language; adaptive harmonic compensator; adaptive mechanical model; average current control; bandgap voltage reference; boost power factor correction topology; cardiovascular system; contact resistance; contact strips inspection; contactless electrical energy transfer; continuous-time sigma-delta modulator; critical conduction mode; dead-time compensation strategy; desktop based real time oxygen auto-ventilation; dissipation normal form; dual-cuff blood pressure system; electrical resistance measurement; electrospinning process; empirical mode decomposition based denoising approach; energy based amplitude control; feedback control; feedforward approach; finger sign identification; forearm electromyogram; fully-differential instrumentation amplifiers; fuzzy expert systems; gas monitoring system; genetic algorithm; genetic reasoning; graph method; headphone-based virtual acoustic reality; heat transfer; hidden pacemaker pulses detection; high spectral quality sinusoidal oscillator; high-order temperature compensation; high-speed analog-to-digital converters; homecare respiratory application; human gait phase; human-robot cooperation; input current harmonics; integrated LC filter; interactive hybrid control-flow checking method; iterated maps; low frequency amplifier; low noise amplifier; matrix converter; mean arterial pressure; memristor pinched hysteresis loops; motion detection system; moving object searching; nanometer CMOS technology; nonlinear dynamics generation; nonlinear inductance; nonlinear stabilization; operational transresistance amplifier; oscillation frequency value; oscillation-based tests; permanent magnet synchronous machines; phase coupled oscillator; physiological parameters measuring; polyphase FIR filter structure; programmable PWM modulator; pseudo random code regeneration; quadrature oscillator; quantum computation system emulator; radio frequency energy harvesting system; railway vehicle current collectors; real-time multicore systems; reconfigurable filter structure; rendering moving sound source; resonant converter; runnable sequencing; seismic sensor system; sensor fusion; sensorless DTC; small loop antennas parameter measurement; smart households; software defined radio system; space vector pulse width modulation; speed estimators; state space energy error feedback; statistical multirate high-resolution signal reconstruction; subband optimization; subspectral decomposition method; train dynamic motion; two stepped system; universal embedded controller; varying air gap; virtual instrumentation; voltage-source active rectifier; wavelet transform; wheel slip; wireless electronic systems; wireless multicom- munication system; wrist cuff method},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7011653&isnumber=7011649>

B. Vaisband, I. Savidis and E. G. Friedman, "Thermal conduction path analysis in 3-D ICs," *2014 IEEE International Symposium on Circuits and Systems (ISCAS)*, Melbourne VIC, 2014, pp. 594-597.

doi: 10.1109/ISCAS.2014.6865205

Abstract: The on-going effort of integrating heterogeneous circuits as well as the increasing length of global interconnect are driving the semiconductor community towards 3-D integrated circuits. In this work, thermal paths within a 3-D stack are investigated using the HotSpot simulator, and the results are compared to experimental data of a fabricated two layer stack with a single back metal layer. Resistive heaters and sensors measure the heat flow in both the horizontal and vertical dimensions. The dependence of the thermal conductivity on temperature is integrated into the thermal simulation process. At high temperatures ($\sim 80^{\circ}\text{C}$), this effect is responsible for inaccuracies in the temperature and thermal resistance of up to, respectively, 20% and 28%. As confirmed by simulation, those horizontal paths that lie mostly within the silicon layer conduct more heat as compared to the vertical paths, since the thermal conductivity of silicon dioxide is ~ 200 times smaller than the thermal conductivity of silicon.

keywords: {integrated circuit interconnections;silicon;silicon compounds;thermal conductivity;thermal management (packaging);thermal resistance;three-dimensional integrated circuits;3D integrated circuits;3D stack;HotSpot simulator;global interconnect;heat flow;heterogeneous circuits;resistive heaters;single back metal layer;thermal conduction path analysis;thermal conductivity;thermal resistance;thermal simulation;Conductivity;Heating;Silicon;Temperature dependence;Temperature measurement;Thermal conductivity;Thermal resistance},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6865205&isnumber=6865048>

M. Adamek, J. Prasek, P. Melichar, I. Szendiuch and L. Jakubka, "Sensor for lowest flows measurement," *28th International Spring Seminar on Electronics Technology: Meeting the Challenges of Electronics Technology Progress, 2005.*, Wiener Neustadt, 2005, pp. 45-49.

doi: 10.1109/ISSE.2005.1490996

Abstract: This work covers one of the possible variants of noninvasive low mass flow measurement of homogenous fluids or gases using the calorimetric method. The principle is based on measurement of the temperature difference caused by convection and conduction. The flowmeter can measure the flow in both directions. The advantage of presented solution is very high sensitivity in low flows, proportional output response to the flow rates in specific range and independence on operating position

keywords: {calorimetry;convection;flow measurement;flow sensors;flowmeters;heat conduction;calorimetric method;conduction;convection;flow sensors;flowmeter;homogenous fluids;noninvasive low mass flow measurement;temperature difference measurement;Bridge circuits;Diodes;Electrical resistance measurement;Fluid flow measurement;Gases;Position measurement;Temperature distribution;Temperature measurement;Temperature sensors;Time measurement},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=1490996&isnumber=32057>

D. Agonafer and S. Furkay, "Numerical and experimental investigation of heat transfer phenomena over an electronic module," *Sixth Annual IEEE Proceedings Semiconductor Thermal and Temperature Measurement Symposium*, Phoenix, AZ, USA, 1990, pp. 103-.

doi: 10.1109/STHERM.1990.68498

Abstract: Summary form only given. In the numerical approach, the time-averaged equations depicting the turbulent flow field were integrated using a commercial finite-difference code (PHOENICS). The card-mounted electronic module was represented as a conducting solid. The resulting heat transfer coefficient data were used as boundary conditions for subsequent conduction analyses of the package. The CAEDS program, a commercially available finite-element simulation system, was used to perform the conduction simulation. Heat-transfer coefficient, surface temperature, pressure drop and overall thermal resistance (external and internal) data are presented as a function of fluid velocity. Experimental data were acquired for individual components surface-mounted to small sections of epoxy circuit card. Custom thermal chips were used to simulate power dissipation and sense bulk chip temperature. The test vehicles were placed in individual rectangular channels and exposed to uniform air flow over a Reynolds number range from 300 to 11000. Component surface temperatures, air temperature, and chip temperature were measured, and the results were compared with those of the simulations.<

keywords: {cooling;finite element analysis;modules;numerical methods;packaging;CAEDS program;PHOENICS;Reynolds number range;air temperature;boundary conditions;card-mounted electronic module;chip temperature;commercial finite-difference code;electronic module;experimental investigation;finite-element simulation system;fluid velocity;heat transfer coefficient data;heat transfer phenomena;module represented as conducting solid;overall thermal resistance;pressure drop;surface temperature;surface-mounted;test vehicles;time-averaged equations;turbulent flow field;uniform air flow;Circuit simulation;Electronic packaging thermal management;Equations;Finite difference methods;Heat transfer;Solids;Surface resistance;Temperature measurement;Temperature sensors;Thermal resistance},

URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=68498&isnumber=2434>