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Panfilov Yu. V. *Nanotechnology Research and Development in Northern Europe State of the Art. Analytical Review* 2

The analytical review of theses of "Nanotech — Northern Europe 2008" congress with themes about energy, electronics, construction, biology and health, water, food, safety and investments is represented. More interesting results of the nanotechnology modern research represented in the exhibition and conference are shown. The conclusions about commercial using of the nanotechnology research and development results are represented.

Keywords: nanotechnology, electronics, power engineering, nanomaterials, nanocomposites.

Lisov O. I., Makhalov A. A. *Influence of Cache Geometry on its Performance* 5

The research into efficiency of cache memory with different its properties. The search for optimal cache geometry of Orchid architecture processor for certain set of tasks.

Keywords: cache, cache line, cache performance, cache geometry, tag, simulator, microprocessor, Orchid, modelling, research, efficiency, direct map, associative way.

Ogorodnikova O. M., Panin O. A. *Computer Simulation of Microsystems Elements* 12

The thermoelectric microdrive setting the mirror in micro-opto-electromechanical system (MOEMS) is simulated with aid of ANSYS multiphysics tool. The calculations of rotation angle for mirror depending on voltage difference across the pads of thermal actuators are verified. The difference of calculated results and experimental data does not exceed 10 %.

Keywords: MOEMS, micro-opto-electromechanical system, ANSYS, simulation, verification, mirror, thermal actuator.

Shtennikov V. N. *Estimation of Time and Temperature of the Soldering of Electronic Devices* 15

In article the estimation of duration of the soldering of electronic components depending on the set temperature of the soldering is given.

Keywords: the device, quality, the soldering, temperature, time.

Gornev E. S. *Sensors are Getting Smaller, More Functional and Smart* 18

High level of industrial automation needs great number of different sensors to control the process, to state deviations and to manage it. The trends of research development, manufacture and market of sensors are given on the basis of leading international consulting companies analysis. MEMSs and sensors also need twenty five year cycle of work from the very beginning till commercialization. The definite infrastructure is created due to sensors, which supports their effective use. Their evolution passed the following stages: monofunctional, multifunctional, wireless and nonvolatile sensors. At the same time the work for to build-in sensors to management systems is carried out. At first sensors were developed for control systems, for measurement, for transport; today they are widely used in consumer goods, in life-support systems. In its turn this process demanded sensors for

smart systems. The principles of modern sensors development are listed. In sensors on the base of MEMS it is important to take into consideration solid-state physics, resistance of material, hydraulics, aerodynamics and so on. The proposals on creation of domestic programme of MEMS and sensors development are presented. For development of MEMS and their main part-sensors it is necessary to make significant improvements: in organization and coordination work, marketing, standards, foundation of life-support system to get investments, profits.

Keywords: sensors, MEMS, microsystem technique, technology, domestic road map.

Prosyanyuk V. V., Sigeikin G. I., Suvorov I. S., Koledinskiy G. M. *Miniature Reserve Automatic Means Based on High-Temperature Galvanic Elements* 29

Perspective special techniques are needed in miniature reserve automatic means based on high-temperature galvanic elements with high specific energy density, which electrodes are made of heterogeneous low-gas energy condensed systems. On their base automatic high precision decelerating apparatus are projected as well as programming electronic switchers. They provide qualitatively new level of microelectromechanical systems intended for measuring movement parameters of mobile objects, declination from the vertical, stabilization, acceleration and vibration measuring, etc. (microaccelerometers, microgiroscopes and other inertial micromechanical sensing elements).

Keywords: high-temperature galvanic elements, sensing elements, automatic means, specific density.

Agafonov V. M., Bugaev A. S., Oryol A. A. *Nonlinear Effects in Molecular-Electronic Cell of a Planar Type* . . . 32

Nonlinear effects occurred in molecular-electronic cell of a planar type are being investigated by using numerical methods. Mathematical problem definition, graphical computation results of concentration approximations and numerical results of harmonic components of a differential cathodic current as a function of a frequency and cell's geometry are given and discussed.

Keywords: nonlinear effects, convective diffusion, molecular-electronic cell.

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