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Physical model of single-electron devices with spatial quantization on islands was proposed. It was shown that effect is important on IV-characteristics of devices not only for small islands but with increasing of islands quantity, applied voltages and decreasing of temperature.

Keywords: single-electron devices, spatial quantization

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The phenomenological model of phase transitions in thin films of a ferroelectric material with the account, both spatial inhomogeneous of polarization, and inhomogeneous of deformation, and also piezoelectric and electrostriction interactions of a film with a substrate is considered. Theoretical temperature dependences of spontaneous polarization, a polarizing profile and a heat capacity in a film, and also dependence of temperature of phase transition on a thickness of a film on a substrate are obtained. It is shown that theoretical dependences are in good agreement with experimental results for barium titanate thin films on a magnesium oxide substrate.

Keywords: phenomenological model, a thin film, spontaneous polarization, a heat capacity, barium titanate

Kozyreff A. A., Gorin D. A., Kosobudsky I. D., Mikaelyan G. T. *Perspectives of Polymer and Nanocomposite Material Using in the Solid State Optoelectronics*. 9

In the review is observed the application of nanostructured materials in solid state optoelectronics. It was demonstrated the possibility using a polymer matrix for active medium fabrication for dye laser and in other optical laser elements for example for creation of coatings with controllable optical parameters. These coatings can be applied as mirrors, optical filters etc. Examples of polyimide using as a passivation and protective coating for $A^{III}B^V$ semiconductors compared with chalcogenide passivation and possibility of multilayered coating formation based on various combinations of passivation and protective layers have been demonstrated. It was presented the results that demonstrated perspectives of nanocomposite material with embedded carbon nanotubes for creation of effective heat sinks for electronics application.

Keywords: chalcogenide and polyimide passivation, carbone nanotubes, polymer matrix, laser, nanocomposite

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Keywords: empirical formulas, concentration, nanoparticles, colloid solutions, laser-optical method

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The soldering temperature have crucial importance for quality soldering connections. In article the influence of length of a soldering core on temperature of the contact soldering are described.

Keywords: the electronic device, quality, the soldering, soldering temperature

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The application of reverse engineering process in modern electronic industry assumes the development of new investigation methods of microtechnics' objects and so adaptation of innovative technological and analytical techniques of preparation in order to control prototype systems' topology.

In this paper breaking preparation methods, such as mechanical dissection of microtechnics' items with the subsequent removal of cross-linking layers, are discussed as well as non-damaging investigation techniques, retainin's capacity for work for succeeding electrical testing.

Keywords: IC chip, topology, preparation, etching, chip

Voytsehovsky A. V., Nesmelov S. N., Kulchitsky N. A., Melnikov A. A. *Tendencies of Development of Infra-Red Detectors with Quantum Dot* 44

Tendencies of development of quantum dot infrared detectors on are considered. Advantages of such detectors in front of detectors on quantum well, namely sensitivity to normally falling radiation, the photoresponse in wider spectral range, smaller dark currents, high factor of strengthening of photoconductivity, higher values of sensitivity and detectivity, higher working temperatures, multispectral response are discussed.

Keywords: infrared detectors, quantum dots, quantum well

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It is obtained algorithms of shift in nano and micro structures.

Keywords: shift, field, signal, algorithm

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