



**Promotion guide of Russian  
Semiconductor Design  
Organisations**

## INTRODUCTION

**This is a promotion guide of Russian R&D organisations and companies eager to develop international cooperation in semiconductor design with European partners.**

The profile for each Russian organisation includes the following sections:

- 1) **Title, acronym and logo**
- 2) **Type** (R&D organisation, university, department, company...) and **size** (number of employees)
- 3) **Brief description of organisation** (general information about organisation, research and manufacturing activities; recent experience in international cooperation)
- 4) **R&D activities and competences in semiconductor design** (R&D areas and applications according to SEMIDEC classification)
- 5) **R&D competences suggested for international cooperation (optional)** (list of proposed R&D competences or project ideas for international collaboration, potential partners – type and requirements)
- 6) **Proposals (projects) for international collaboration** (title; project idea; FP7 ICT Work Program and Call Identification; potential partners – type and requirements) – *optional*
- 7) **Relevant publications and links** - *optional*
- 8) **Contact details** (address, web-site, head of organisation; contact person – title, first name, surname, position, e-mail, phone, fax, photo)

This promotion guide has been prepared under the EU funded FP7 SEMIDEC project as a result of mapping Russian semiconductor design organisations involved in research relevant to the EU's priorities concerning semiconductor design methods, tools and standardization. The main target groups for the catalogue are EU companies and R&D organisations looking for partners in Russia for joint R&D projects in the area of semiconductor design.

For more information, please visit the SEMIDEC web-portal (<http://www.semidec-ru.eu/>).

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## 1. OVERVIEW OF RUSSIAN SEMICONDUCTOR DESIGN

### 1.1. BACKGROUND TO THE RUSSIAN SEMICONDUCTOR SECTOR

Russia has a proud heritage in semiconductor components and electronics based miniaturized systems dating from the Soviet era. It is one of a few countries in the world to have in depth knowledge and capabilities spanning research, design and production of integrated circuits. This strong background forms a basis for Russia's interest to collaborate with Europe.

Following the collapse of the Soviet Union in 1991, the Russian electronics industry experienced a dramatic decline in investment and domestic demand. Nevertheless, the country still has a unique school system based on polytechnic education that trains and produces highly skilled professionals. Since the late 1990s, government support has grown for the domestic electronics industry, but Russian companies still struggle to compete against global competition.

Today, the Russian electronic industry comprises about 200 organisations - 121 industry organisations, 18 production organisations, and 61 scientific organisations. Amongst them there are 36 federal state unitary enterprises and 164 open joint stock companies. The majority (57%) of parts produced by the Russian electronics industry consist of electronics based components: microchips and semiconductor devices (23%), electronic discharge devices (19%), electro vacuum devices (14%), and optoelectronic devices (1%).

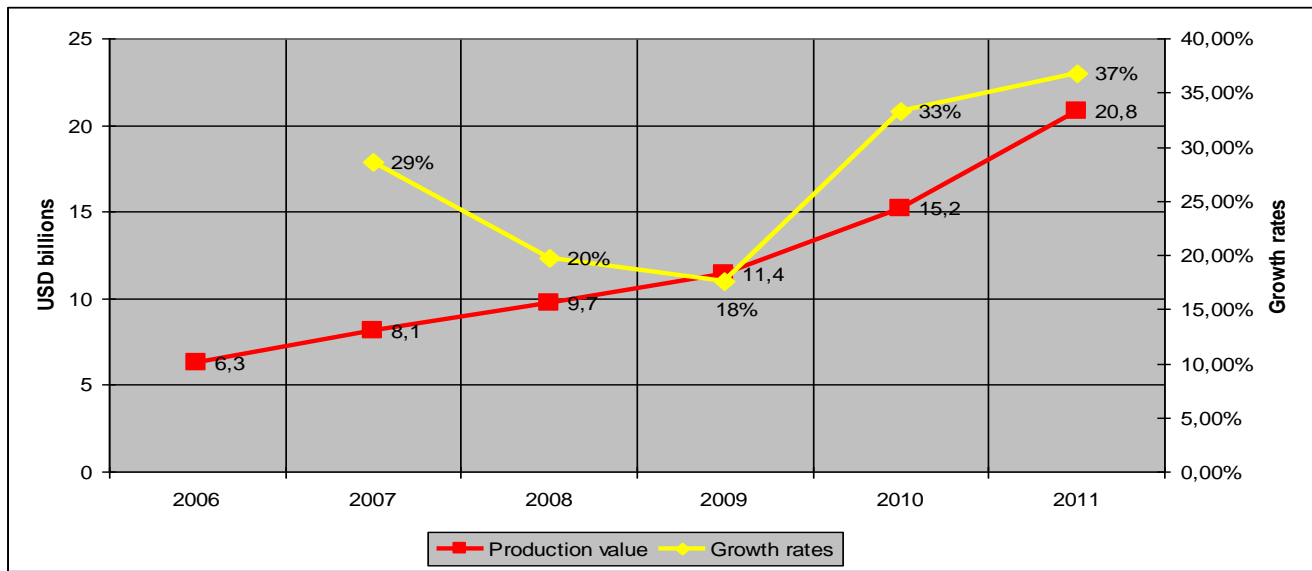
The main manufacturers of integrated circuits are Angstrom JSC and Mikron JSC, which are both based in Zelenograd near Moscow. Angstrom was established in 1963 as a specialized research and production complex for development and implementation of advanced IC chip manufacturing technologies. The company developed the country's first microprocessor, 4-Kbit DRAM ICs, single-chip microcomputer, 32-bit microprocessor. Today, the company's manufacturing facilities produce 1.5-2.0  $\mu\text{m}$  IC chips on 100 silicon wafers using CMOS, BiCMOS and MOS process technologies; and sub-micron (0.8 – 1.2  $\mu\text{m}$ ) CMOS and BiCMOS LSI and VLSI chips on 150 mm wafers using CMOS and BiCMOS technologies.

Meanwhile, Mikron designs and produces integrated circuits for various devices from electronic games, TV sets and watches to space apparatus, supercomputers and multi-dimension control systems. Mikron produces about 30,000 4" wafers monthly.

Several Russian universities and institutions have their own clean room facilities for producing parts and conducting research. Among them are MIET, MEPHI, LETI, Taganrog Institute of Technology and Ioffe Physical Technical Institute.

Today, the Russian electronics market is growing rapidly driven by national multibillion rouble projects in fields such as human healthcare, education, and construction. For example, the market size in 2008 was close to \$10 billion with two thirds dependent upon federal demand and the other third from private consumers.

### Market trends for the Russian electronics industry



The Russian government places strong emphasis on developing Russia’s R&D base in electronics and nanotechnology. For example, the government programme “Development electronic component base and radioelectronics for 2008-2015”<sup>1</sup> aims to create the industrial-technological basis for producing a new generation of competitive and knowledge-intensive technologies for air and sea transport, automotive transport, engineering and power equipment. The total programme budget is 187 billion roubles (approx 4.1 billion euro). Furthermore, the government has invested 130 billion roubles (approx 2.9 billion euro) in 2007 to establish the state corporation “RUSNANO”<sup>2</sup>. The mission of RUSNANO is to advance Russia to become a world leader in the field of nanotechnologies. The priority of RUSNANO is commercialization of nanotechnology projects with high business potential and/or social benefit.

<sup>1</sup> <http://fasi.gov.ru/fcp/electro/fzp.doc>

<sup>2</sup> [www.rusnano.ru](http://www.rusnano.ru)

## 1.2. STRENGTHS OF THE RUSSIAN SEMICONDUCTOR SECTOR

In general terms, the Russian semiconductor sector features a number of strengths, which makes it attractive for European microelectronics companies and research organisations:

<b>Russian Semiconductor Sector – Main Strengths</b>
S1. Good educational and theoretical basis of Russian experts
S2. Good contacts between Russian and European experts based on past cooperation projects
S3. Wide variety of nanoelectronics applications are being developed and introduced
S4. Comparative level of salaries of Russian experts is less than in Europe
S5. Strong Russian government support to microelectronics sector
S6. Strong growth in the Russian semiconductor market

In specific research terms, Russian organisations demonstrate strengths relevant to the semiconductor research priorities defined by the EU's ENIAC JTI and FP7 ICT programmes. The organisations and their research strengths are highlighted in the following table:

<b>European Research Priorities (ENIAC JTI and FP7 ICT)</b>	<b>Russian Organisation (Specific Research Topic)</b>
Design of energy efficient electronic systems, and thermal effect aware design	<ul style="list-style-type: none"> <li>St Petersburg State Polytechnical University, IC Design Lab (Design of Low Power Integrated Circuits)</li> </ul>
Integration of heterogeneous functions: 3D, System-in-Package, Network-on-Chip, wireless (microwave, mm-wave and THz) systems	<ul style="list-style-type: none"> <li>R&amp;D Institute of Electronic Engineering, Voronezh (RF-design).</li> <li>Ioffe Physical-Technical Institute, Russian Academy of Sciences, St.Petersburg (THz devices).</li> <li>Moscow State Institute of Electronic Technology has a network of Multi-Access Centres (MAC) covering the full cycle of electronic production.</li> <li>Institute of Semiconductor Physics of the Russian Academy of Sciences (self-forming precise 3D nanostructures for future nanoelectronic and nanomechanical devices).</li> </ul>
Methods for reuse of IP blocks, test and verification	<ul style="list-style-type: none"> <li>Institute of Design Problems in Microelectronics of the Russian Academy of Sciences (Test and verification).</li> <li>Scientific and Research Institute of Microelectronic Devices (design engineering on the basis of repeated use of IP-blocks, the complete SoC design methodology).</li> </ul>
Design solutions for moving the application boundary between hardware	<ul style="list-style-type: none"> <li>Research Centre "Microsystems &amp; Development Automation" (MicroStyle, Ltd.),</li> </ul>

and software to fit performance needs	<p>Moscow.</p> <ul style="list-style-type: none"> <li>• Research Centre "Elvees" SPC (Electronic Computer and Information Systems), Zelenograd, Moscow (High level integration, digital signal processing).</li> <li>• Platoform Ltd (software and hardware for various automated systems).</li> </ul>
Reliability-aware design including EMR/EMC requirements	<ul style="list-style-type: none"> <li>• St Petersburg State Polytechnical University, Department of Electrical Engineering Research (EMC analysis).</li> <li>• Moscow Energetics Institute (heuristic algorithm for designing multilayered commutation boards).</li> </ul>
Better modelling of devices at all design levels into circuit/system design	<ul style="list-style-type: none"> <li>• Institute of Design Problems in Microelectronics of the Russian Academy of Sciences (Models).</li> </ul>
Design platforms and interfaces for mixed/new technologies	<ul style="list-style-type: none"> <li>• IDM Ltd (multimedia computing platforms and hardware components).</li> </ul>
Design for manufacturability taking into account increased variability of new processes	<ul style="list-style-type: none"> <li>• Research and Production Complex "Technological Centre" (impact resistance testing of polysilicon MEMS accelerometers).</li> </ul>
Standardisation, including interoperability aspects	<ul style="list-style-type: none"> <li>• R&amp;D Institute "Electronstandard", St. Petersburg (standardisation).</li> </ul>

### 1.3. INTERNATIONAL COOPERATION IN SEMICONDUCTOR DESIGN

Russian semiconductor organisations are eager to develop their international cooperation in semiconductor design. Indeed, many already have collaboration experience in areas of research, design and production as the following examples illustrate:

#### Examples of cooperation with foreign partners:

- **Moscow Institute of Electronic Technology (MIET)** has the following partners: Agilent Technologies, Cadence Design Systems, Cisco Systems, Freescale Semiconductor, SolidWorks Corp, Synopsys, Mentor Graphics and Hewlett Packard.
- **Saint-Petersburg State Polytechnic University (SPbSPU)** has the following partners: Karlsruhe Research Center (Germany), CNES- Le Centre National d'Etudes Spaciales (France), «Forschungszentrum Julich» (Germany), National Institute of Agriculture Research (France), Mikkeli Polytechnic Research Center (Finland), Central Ostrobothnia University of Applied Science (Finland) and Istituto Nazionale di Fisica Nucleare (Italy).
- **Saint Petersburg State Electrotechnical University (LETI)** has cooperation agreements with more than 30 universities in the United Kingdom, United States, Sweden, Germany, Italy, Finland, Poland, France, China and other countries. The agreements cover student and teacher exchange, joint development of educational programmes and mutual implementation of research projects.
- **IDM Plus** has the following partners: Semiconductor Manufacturing International Corp (China), HHNEC Corp (China) and XFAB Semiconductor (Germany).

#### Examples of Russian participation in FP6 research projects:

- **FP6 DELILA - Development of Lithography Technology for Nanoscale Structuring of Materials Using Laser Beam Interference.** DELILA is a recently completed 3 year project that involved the Institute of Applied Physics of the Russian Academy of Sciences (IAP) and was funded under the EC's Sixth Framework Programme (FP6). The main aim of the 2m euro funded project was to research and develop a new production technology for the high resolution fabrication – better than 40nm - of 2D and 3D nanostructures and devices. In particular, DELILA aimed to enable low cost and large volume production of surface structures and patterns with nanometric resolution. The international project was led by Cardiff University (UK) and involved Tampere University of Technology (Finland), SILIOS Technologies SA (France) and Centro de Estudios e Investigaciones Técnicas de Gipuzkoa (Spain), as well as IAP. During the project, IAP had lead responsibility for the development of the multiple beam interference lithography technology. And, using the new system, the

DELIA team was able to successfully fabricate high resolution nanostructures with feature sizes of ~30nm for direct writing as well as modifications of ~5nm. See <http://www.delila.cf.ac.uk>

- **FP6 SEMINANO – Physics and Technology of Elemental, Alloy and Compound Semiconductor Nanocrystals: Materials and Devices.** The main aim of SEMINANO was to develop fundamental knowledge in production techniques, characterization and methods of application of semiconductor Nanocrystals to light emitting devices and floating gate memories. The project was broken down into 3 main areas: 1) Preparation of Is and Ge Nanocrystals in different media and processed by various techniques; 2) Production and characterisation of some alloy and compound semiconductor Nanocrystals; and 3) Application of the materials studied in the first two areas to the devices mentioned above. Led by the Middle East Technical University (Turkey), the project was implemented by a consortium of eleven international partners including the Moscow-based Surface Phenomena Research Group LLC (SPRG). SPRG was deeply involved in several research activities including optimisation of the annealing parameters and luminescence properties of P, B, N doped SiO<sub>2</sub>:Si nanocomposite and P, B doped Al<sub>2</sub>O<sub>3</sub>:Si nanocomposite.
- **FP6 DOMINO - Antimonide Quantum Dots for Mid-Infrared Nano-Photonic Devices.** The main objective of the DOMINO project was to demonstrate the feasibility of antimonide-based quantum-dots (QDs) in nano-photonic quantum-dot laser diodes (QDLs) operating continuous wave at room temperature in the 3-5μm wavelength range. Université Montpellier II (France) coordinated the project with the support of nine partners – from five countries – including the Ioffe Physical Technical Institute of the Russian Academy of Science. Ioffe was in charge of all in-depth scanning probe microscopy studies of QDs populations. Notably, Ioffe applied recently developed scanning kelvin probe microscopy (SKPM) and electric force microscopy (EFM) techniques whilst performing the studies.

#### **Current examples of Russian participation in FP7 Support Actions:**

- **FP7 EU-RU.NET - Linking R&D Strategies, Foresight and Stimulation of EU-Russia Cooperation in Nanoelectronics Technology.** EU-RU.NET aims to strengthen EU-Russia cooperation in nanoelectronics technology. The Russian partners involved are Moscow State University, Russian Academy of Sciences (RAS), St.Petersburg Electrotechnical University, Scientific Research Center for Molecular Electronics and Mikron Factory and State University – Higher School of Economics (Moscow).
- **FP7 NANORUCER - Mapping the NANOTEchnology innovation system of RUSSIA for preparing future Cooperation between the EU and Russia.** NANORUCER is surveying the main Russian research infrastructures active in nanotechnology and nano-structured materials as a basis for initiating future cooperation between the EU and Russia. The

Russian partner involved is the Institute for the Study of Science of RAS. See <http://nanorucer.de>

- **FP7 SEMIDEC – Stimulating Semiconductor Design Cooperation between Europe and Russia.** SEMIDEC aims to stimulate strategic cooperation in the design of semiconductor components and electronic based miniaturised systems between Europe and Russia. The Russian partners involved are Moscow Institute of Electronic Technology, St. Petersburg State Polytechnical University and the Russian Technology Transfer Network. See <http://www.semidec-ru.eu>

## 2. RUSSIAN SEMICONDUCTOR DESIGN ORGANISATIONS

The Russian organisations featured in this guide all participate in semiconductor design R&D activities and offer competencies and technologies for collaborative research projects. As can be seen from the following table, their main semiconductor R&D activities are in the areas of IC design, systems design and process modelling. The most popular types of circuits and systems design they are involved with are mixed IC, analogue IC and system-on-a-chip (SoC). Furthermore, the majority of Russian organisations work with semiconductor materials on the basis of silicon (Si) and with the following technologies: CMOS / BiCMOS, bipolar and silicon-on-insulator (SOI).

Areas of R&D Activities	Number of Russian semiconductor design organisations (Out of 29 respondents)
<b><i>Circuits and Systems Design/Testing</i></b>	
<b><i>Design areas</i></b>	
<i>System design</i>	17
<i>IC-Design</i>	22
<i>Process Modelling</i>	14
<i>Nanotechnology devices</i>	9
<b><i>Types</i></b>	
<i>Analogue IC</i>	19
<i>Digital IC</i>	16
<i>Mixed IC</i>	20
<i>SoC</i>	19
<i>FPGA</i>	12
<i>RF IC</i>	13
<b><i>Semiconductor Materials</i></b>	
<i>Si</i>	21
<i>Si/Ge</i>	10
<i>GaAs</i>	5
<i>GaN</i>	1
<i>Other</i>	5
<b><i>Technology</i></b>	
<i>CMOS/ BiCMOS</i>	21
<i>Bipolar</i>	16
<i>Flexible &amp; Hybrid Boards</i>	5
<i>SOI</i>	15
<i>Other</i>	8

In terms of application, the Russian organisations are mainly interested to offer their developments and competencies for collaborative projects in the following domains:

- Telecommunications,
- Transport, safety and security,
- Semiconductor manufacturing approaches, processes and tools.

<b>Areas of R&amp;D Activities</b>	<b>Number of Russian semiconductor design organisations (Out of 29 respondents)</b>
<b><i>Semiconductor manufacturing</i></b>	
<i>Increasing industrial process variability</i>	7
<b><i>Semiconductor manufacturing approaches, processes and tools</i></b>	<b>14</b>
<i>Novel process/metrology equipment and materials</i>	13
<i>Flexible, organic and large area electronics (sensors, RFID, TFTs and others)</i>	11
<i>Photonics</i>	7
<b><i>Energy</i></b>	
<i>Electro-magnetic interference, heat dissipation, energy consumption</i>	5
<i>Energy efficient electronic systems, thermal effect aware design</i>	12
<i>Autonomous energy efficient smart systems</i>	9
<b><i>Transport, safety and security</i></b>	<b>18</b>
<b><i>Telecommunications</i></b>	<b>20</b>
<b><i>Biomedical microsystems and smart miniaturised systems</i></b>	13
<b><i>Heterogeneous systems, integration of heterogeneous functions</i></b>	7

	<p style="margin: 0;"><b>IC DESIGN CENTRE “ALFA CRISTAL”</b></p> <p style="margin: 0;">Acronym: Alfa Cristal</p>
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**Type:** Company

**Size:** 10–30 employees

**Brief description of organisation:**

IC design Centre is a small fabless enterprise. The company mainly designs devices based on CMOS technology such as: amplifiers, filters, ADC, RF-circuits, low-power logic and memory. The company’s microelectronics research projects during recent years include “Low noise amplifier and tracking filter for DTV” LG Electronics, Korea, 2006; and “Switched-Capacitor channel filter” Federal Program START, 2006-2007.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> SOI
--

***Applications***

<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others) <input checked="" type="checkbox"/> Transport, safety and security <input checked="" type="checkbox"/> Telecommunications
---

**R&D competences and/or projects proposals for international cooperation:**


- Low power IC design
- RF IC design


**Contact details:**

Address: 196084, St. Petersburg, Moscovskiy Ave. 79 – A, off. 9H

*Head of organisation (director):* Dmitry Morozov

*Contact person:*

	<p>Dmitry Morozov, <i>Deputy Director</i> <i>Tel:</i> +7 921 339 67 21 <i>Fax:</i> <i>E-mail:</i> <a href="mailto:dvmorozov@inbox.ru">dvmorozov@inbox.ru</a></p>
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	<b>INTEL LABS ST. PETERSBURG (INTEL LABS DEPARTMENT IN RUSSIA)</b>
	<b>Acronym:</b> STM lab (SoC Tools and Methodology)

**Type:** Company

**Size:** 10-30 employees

**Brief description of organisation:**

Intel Labs St. Petersburg (SoC Tools and Methodology Lab) has been working on research and development of tools for SoC design, programmable devices (accelerators) using the methodology of high level synthesis (HLS) and algorithms for telecommunications, video processing and compression as applications for mapping of future SoC. The methodology for design of complex SoC uses a so-called workload-driven (or application driven) approach when the given application (or set of applications) jointly with a template of future SOC device are inputs for Design Tools and expected outputs are RTL (as input for further using 3<sup>rd</sup> party EDA tools to get gate-level and layout chip design), Simulator(s), Firmware, retargetable programmable tools and testbench for future SoC.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> SoC	<input checked="" type="checkbox"/> Si

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS,
---

***Applications***

<input checked="" type="checkbox"/> Telecommunications
<input checked="" type="checkbox"/> Heterogeneous systems, integration of heterogeneous functions

**R&D competences and/or projects proposals for international cooperation:**


- high level synthesis (HLS) and algorithms for telecommunications
- video processing and compression

**Contact details:**

Address: ZAO "Intel A/O", 160, Leninsky prospect, St. Petersburg, 196247, Russia

Head of organisation (director): Oleg Semenov

*Contact person:*

	<p>Oleg Semenov, Research Director <i>Tel:</i> +7-812-3319476 <i>Fax:</i> +7-812-3319431 <i>E-mail:</i> oleg.semenov@intel.com</p>
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	<p><b>JOINT-STOCK COMPANY RESEARCH INSTITUTE OF SEMICONDUCTOR DEVICES</b></p> <p><b>Acronym: JSC RISD</b></p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The Research Institute of Semiconductor Devices was founded in Tomsk in 1964 as a company of the electronics industry for the development and mass production of electronic devices based on AIII BV semiconductor technology. JSC RISD's materials research and development of methods for producing epitaxial structures of micron and submicron thicknesses with complex doping profiles has allowed the creation of a variety of discrete devices and integrated circuits on GaAs. Since 2004, growth rates ranged from 130 to 180 percent a year on areas of solid-state microwave electronics, lighting, solar energy and optoelectronics. JSC RISD contributed scientific and technical expertise to the project "Organisation of semiconductor light sources production for industrial applications". Three LED companies will be created in Moscow, St. Petersburg and Tomsk. The Institute has been involved as an active contributor to a number of projects together with universities and institutions of Russian Academy of Science to develop materials, technologies and integrated circuits for:

- matrixes of X-ray sensors,
- matrixes of LED light sources,
- transceiver modules of diagnostic systems,
- medical equipment for physiotherapy, telemedicine and gynaecology,
- microfluidic chips, micromembranes and sensors,
- solar grade materials and batteries based on it,

Complex functional products have been designed (including systems-on-a-chip) in the centimetre and millimetre-wave bands based on the company's own development and manufacturing integrated circuits.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design <input checked="" type="checkbox"/> IC-Design, <input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> GaAs

***Technology***

<input checked="" type="checkbox"/> Other
---

***Applications***

<input checked="" type="checkbox"/> Increasing industrial process variability <input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
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- Novel process/metrology equipment and materials
- Photonics
- Energy efficient electronic systems, thermal effect aware design
- Autonomous energy efficient smart systems
- Biomedical microsystems and smart miniaturised systems

**R&D competences and/or projects proposals for international cooperation:**

- RF circuit design
- Sensor design

**Contact details:**


Address: 634034, Russia, Tomsk, Krasnoarmeyskaya st., 99a

Web: [www.niipp.ru](http://www.niipp.ru)

Head of organisation (director): Eduard Yauk

*Contact person:*

	<p><i>Vasily Yurchenko, Deputy Director responsible for R&amp;D</i></p> <p><i>Tel: +7 3822-558296</i></p> <p><i>Fax:</i></p> <p><i>E-mail: <a href="mailto:niipp@inbox.ru">niipp@inbox.ru</a></i></p>
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	<p align="center"><b>ST PETERSBURG STATE POLYTECHNICAL UNIVERSITY, DEPARTMENT OF TELEMATICS</b></p>
	<p>Acronym: SPbSPU</p>

**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The Department of Telematics, established in 2000, is engaged in research in the field of network technologies for data and information processing and acquisition for measuring and computing systems, virtual instruments, devices, information security and tools of space robotics. The department has developed a telematics platform for creating clusters of virtual instruments with a reconfigurable architecture based on FPGA technology. These instruments are used at electronic industry enterprises of St. Petersburg. The department has also established and applied a hardware and software platform for network processors used in security systems for high-speed computer networks. The Department takes part in research programmes and space experiments of the Russian segment of the International Space Station in long-term projects concerning remotely controlled reconfigurable robotic systems and space vehicles development. The research work is carried out in cooperation with the Institute of Mechatronics and Robotics DLR, Germany.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
	<input checked="" type="checkbox"/> FPGA	

***Technology***

<input checked="" type="checkbox"/> Other
---

***Applications***

<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Autonomous energy efficient smart systems
<input checked="" type="checkbox"/> Transport, safety and security
<input checked="" type="checkbox"/> Telecommunications

**R&D competences and/or projects proposals for international cooperation:**

- Measuring devices
- High-speed communication network

**Contact details:**


Address: 29 Polytechnicheskaya st., St. Petersburg, 195251 Russia

Web: [www.spbstu.ru](http://www.spbstu.ru)

Head of organisation (rector): Mikhail Fedorov

*Contact person:*

	<p>Vladimir Zaborovskiy, Head of the Department, Professor Tel: +7 812 5529246 Fax: E-mail: <a href="mailto:vlad@neva.ru">vlad@neva.ru</a></p>
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	<p><b>ST PETERSBURG STATE POLYTECHNICAL UNIVERSITY, DEPT OF ELECTRICAL ENGINEERING &amp; TELECOMMUNICATIONS</b></p>
	<p>Acronym: SPbSPU</p>

**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The main activities of the Department are focused on microelectronic and nanoelectronic IC design. Methods of synthesis, design, and computer simulation of analogue, discrete time, mixed, and digital circuits - including Switched-Capacitor (SC) and Continuous Time Amplifiers and Filters, RF circuits, Analogue-to-Digital Converters (ADCs), and digital logic blocks with low power consumption - have been developed. The design of circuits is mainly oriented to applications in wireless and wireline communication systems. Research projects with the following partners have been realized in the area of microelectronics during recent years by staff of the Department: LG Electronics, Korea, 2006; West Bengal University of technology, India, 2006; and Fraunhofer Institute, Germany, 2003, 2007-08. Research has been supported by Deutsche Forschungsgemeinschaft (DFG) and the Russian Foundation for Basic Research. The Department is a member of EURO PRACTICE and has a license to use Cadence software.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> FPGA <input checked="" type="checkbox"/> RF IC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> SOI
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***Applications***

<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others) <input checked="" type="checkbox"/> Transport, safety and security <input checked="" type="checkbox"/> Telecommunications
---

**R&D competences and/or projects proposals for international cooperation:**

- Low power IC design, analogue and digital
- Ternary coding circuits
- Numerical and symbolic methods of circuit simulations
- Sensor networks
- FRID
- SOI


**Contact details:**

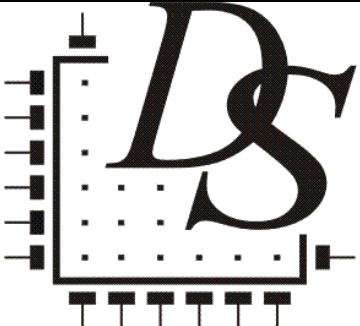
Address: 29 Polytechnicheskaya st., St. Petersburg, 195251 Russia

Web:

Head of organisation (rector): Mikhail Fedorov

*Contact person:*

	<p>Alexander Korotkov, Professor Tel: +7 812 5527639 Fax: +7 812 2909993 E-mail: korotkov@rphf.spbstu.ru</p>
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	<p><b>DIGITAL SOLUTIONS, LLC, SPE</b>  <b>Acronym:</b> Digital Solutions, LLC, SPE</p>
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**Type:** Company

**Size:** 10-30 employees

**Brief description of organisation:**

LLC, SPE Digital Solutions was founded in 2003 for algorithm design and signal processor tasks solution on modern element base. The company’s core cooperation activities are:

- Development of radioelectronic systems and devices;
- VLSI development, including “systems-on-chip, according submicron design rules;
- Development of algorithms for digital signals and images processing (demodulation, detection and recognition, neuro algorithm);
- Development of LED information display system;
- Development and delivery of data transmitting system on radio-channels, cable channel and fibre-optic line.

LLC, SPE Digital Solutions develops and offers digital hardware platforms, for special-purpose control modules and automation system modules, system verification on PLD and VLSI.

The company develops custom chips with technology based standard of 0.25 μm and 0.18 μm, 0.13 μm. Currently, the company is working towards design cycles based on 0.09 μm standard. ARM9 and SPARC v.8 processors cores have been developed and a range of our own original complex functional units and their testing has been implemented “in silicon”.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design <input checked="" type="checkbox"/> IC-Design, <input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> FPGA	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar <input checked="" type="checkbox"/> Flexible & Hybrid boards
--

- SOI
- Other

#### **Applications**

- Semiconductor manufacturing approaches, processes and tools
- Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
- Energy efficient electronic systems, thermal effect aware design
- Autonomous energy efficient smart systems
- Transport, safety and security
- Telecommunications

#### **R&D competences and/or projects proposals for international cooperation:**

- ASIC and IP design (digital, analogue, mixed-signal);
- FPGA verification board design;
- controllers for industrial automation, robotics and process control and measurement
- R&D in electronics, signal and image processing and neuro-algorithms realization.


#### **Contact details:**

Address: 127254, Moscow, Ogorodny proezd, 5/7

Web: <http://www.dsol.ru>

Head of organisation (director): Alexander Rutkevich

#### **Contact person:**

	<p>Alexander Rutkevich, CEO Tel: +7(495) 728-97-06 Fax: +7 (495) 745 – 42-18 E-mail: <a href="mailto:rutk@dsol.ru">rutk@dsol.ru</a></p>
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	<b>FEDERAL STATE</b> <b>"MICROELECTRONIC</b> <b>"PROGRESS"</b> <b>Acronym: MRI PROGRESS</b>	<b>UNITARY</b> <b>RESEARCH</b>	<b>ENTERPRISE</b> <b>INSTITUTE</b>
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**Type:** R&D organisation/University

**Size:** 30-80 employees

**Brief description of organisation:**

Federal State Unitary Enterprise "[Microelectronic Research Institute "Progress"](#) was founded in 1987. At present there are about 80 high-qualified employees. MRI "Progress" is focused on the development of SOC/ASIC, mixed signal and RF IC in the field of communication, digital TV, navigation, radar system and car electronics. Our engineers are experienced with the EDA software Cadence. MRI "Progress" has used CMOS/BiCMOS 0.5 - 0.13um and SiGe 0.25 – 0.13um manufacturing technology and successfully completed many ICs. MRI "Progress" has established a long-term and stable cooperative relationship with many well-known manufacturing companies like TSMC, UMC, X-FAB, and IHP. We always open to cooperation in ASIC design and development service.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design <input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> Si <input checked="" type="checkbox"/> Si / Ge

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar <input checked="" type="checkbox"/> SOI
---

***Applications***

<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others) <input checked="" type="checkbox"/> Energy efficient electronic systems, thermal effect aware design <input checked="" type="checkbox"/> Autonomous energy efficient smart systems <input checked="" type="checkbox"/> Transport, safety and security <input checked="" type="checkbox"/> Telecommunications <input checked="" type="checkbox"/> Biomedical microsystems and smart miniaturised systems
--

**Contact details:**

Address: 125183, Moscow, Cherepanov passway,54

Site : [www.mri-progress.ru](http://www.mri-progress.ru)

*Head of organisation (director):* Vladimir Nemudrov

*Contact person:*



*Alexey Aleksandrov, Digital IC Development Department Head*

*Tel: +7 499 153 - 0341*

*Fax: +7 499 153-0361*

*E-mail: [lex@mriprogress.msk.ru](mailto:lex@mriprogress.msk.ru)*

	<p><b>IDM LTD</b> Acronym: IDM Ltd</p>
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**Type:** Private company  
**Size:** 10-30 employees

**Brief description of organisation:**

IDM Ltd was founded in 1991 as a private company to accumulate the design skills of a group of experienced world-class specialists in the field of IC design. IDM offers services in the field of digital, mixed-signal, analogue and RF – IP and IC design.

In the framework of international cooperation IDM design team has demonstrated the ability to provide cost-effective and high-quality design services for well-known foreign companies:

- Mietec-Alcatel, Belgium (1994)
- GEC Plessey Semiconductors, UK (1996-1998)
- Mitel Semiconductor, UK-Canada (1998-2000)
- Zarlink Semiconductor, UK-Canada (2001-2005)
- Intel, USA/UK (2005-2009)



Analogue/Mixed-signal/RF design experience: Developed analogue and RF blocks for various RF ICs, including LNAs, VCOs, AGC, VGAs, harmonic rejection mixers, RSSI, RF power amplifiers, RF detectors, modulators, crystal oscillators, filters, ADCs, DACs, bandgap references, etc. and more complex modules such as receiver and transmitter paths.

Having a highly-experienced design team in conjunction with smart project management has enabled IDM to achieve first silicon success in all projects.

IDM's R&D in the field of advanced high-performance computing architectures is targeted to implementation on nanoscale technologies:

- Development of high-performance programmable and dynamically reconfigurable heteroprocessor SoC platform based on configurable multi-architecture processing element.
- Development of high-abstraction level design environment for heteroprocessor SoC HW/SW co-design and co-simulation.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si

<input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> Si / Ge
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### Technology

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar <input checked="" type="checkbox"/> SOI
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### Applications

<input checked="" type="checkbox"/> Telecommunications <input checked="" type="checkbox"/> Autonomous energy efficient smart systems <input checked="" type="checkbox"/> Heterogeneous systems, integration of heterogeneous functions <input checked="" type="checkbox"/> Biomedical microsystems and smart miniaturised systems
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Advantages for long-term partnership:

- Highly qualified, productive and cost-effective IDM design team provides of innovative leading-edge solutions for the analogue and RF ICs
- Fully equipped design Centre and stable business environment
- Many years' experience in international cooperation and the ability to work in distributed international design teams on the basis of international industry design standards

### R&D competences and/or projects proposals for international cooperation:

*IDM is looking for foreign partner/customer to provide high-quality and cost-effective design services in the field of mixed-signal, analogue and RF IP and IC design.*

*IDM is looking for foreign partner for joint developments in the field of multi-purpose high- performance computing and development of multi- and hetero-processors SOC and appropriate system-level design environment.*


### Contact details:

Address: stage 4A, building 23, construction 5, passage 4806 Zelenograd Moscow 124498 Russia

Web: <http://www.idm.ru>

Head of organisation (director): Vladimir Kozlov

Contact person:

	<p><i>Sergey Artamonov, Chief Technical Officer</i>          Tel: +7(499)7344221          Fax: +7(499)7102275          E-mail: <a href="mailto:sergey.artamonov@idm.ru">sergey.artamonov@idm.ru</a></p>
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## IDM-PLUS

Acronym: IDM-PLUS

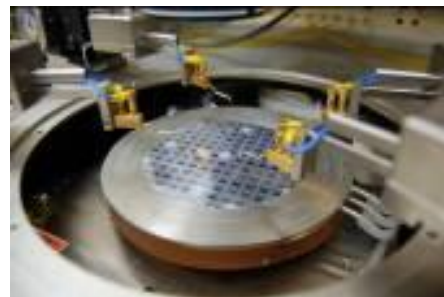
**Type:** Company

**Size:** 30-80 employees

**Brief description of organisation:**

IDM-PLUS design centre was founded in 2004. Its main areas of activity are:

- Development and contract manufacturing of microelectronic element base;
- Development and manufacturing of integral solutions for final consumers;
- Development of integrated chips with design rules of 0,18  $\mu\text{m}$ ;
- Layout analysis of ready-made structures with elements' size of 18  $\mu\text{m}$ , obtaining VLSI layers slices, systems-on-chip reverse engineering, electrical circuits recovery;
- Organisation of measurements and tests of national and foreign microchips;
- Elaboration of developed items at the scientific and technological level;
- Company integration to world service level according IP design;
- Training of high-skilled specialists.



**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC	<input checked="" type="checkbox"/> Si / Ge
	<input checked="" type="checkbox"/> Mixed IC;	
	<input checked="" type="checkbox"/> SoC	
	<input checked="" type="checkbox"/> RF IC	

***Technology***

- CMOS/ BiCMOS,
- Bipolar
- Flexible & Hybrid boards
- SOI

***Applications***

- Semiconductor manufacturing approaches, processes and tools
- Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
- Electro-magnetic interference, heat dissipation, energy consumption
- Energy efficient electronic systems, thermal effect aware design
- Autonomous energy efficient smart systems
- Transport, safety and security

- Telecommunications
- Biomedical microsystems and smart miniaturised systems

**R&D competences and/or projects proposals for international cooperation:**

- Low power IC design, analogue and digital
- RF circuit design
- Front-End and Back-End ICs design
- Turnkey service
- IP-blocks design and their integration into single-chip ICs
- Analogue blocks design (ADC, DAC, transceivers: USB1.1, RS-232, RS-485, LVDS; power supplies circuits, POR, BOR, LDO, DC-DC, etc)
- VLSI prototypes creation on FPGA (Altera, Actel, Xilinx)
- Models verification and testing of completed ICs on the wafer
- Layout analysis of integrated structures, System-on-Chip reverse engineering
- Development of System-on-Chip analogue-digital devices

**Contact details:**

Address: 124498 Moscow, Zelenograd, Proezd 4806, bld.5/20 (MIEE) Russia

Web: <http://www.idm-plus.ru>

Head of organisation (director): Veniamin Stakhin

*Contact person:*




*Anton Obednin, Engineering Director*

*Tel: +7(499) 720-6972*

*Fax:*

*E-mail: [obednin@idm-plus.ru](mailto:obednin@idm-plus.ru)*

	<p><b>EPIEL JOINT STOCK COMPANY</b> Acronym: Epiel JSC</p>
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**Type:** Company

**Size:** 80-100 employees

**Brief description of organisation:**

Epiel JSC is a Moscow-based medium-sized company specializing on silicon epitaxy and a provider of silicon epi deposition services for semiconductor device producers in the whole of Russia and CIS countries. Epiel is the largest supplier of silicon epitaxial wafers and epitaxial services for the Microelectronics Industry in Russia and the CIS and the partner of leading Russian electronic device manufacturers.

At our production facility in Zelenograd - in the suburbs of Moscow - we manufacture 3"-6" silicon epitaxial wafers for various applications including discrete devices and integrated circuits. We also produce 4" and 6" Silicon on Sapphire epi wafers.

Apart from manufacturing activity we are doing a lot of R&D covering various applications of silicon epitaxy.

Epiel production facility houses over 1000 square meters of class 10-1000 clean rooms. The facility is equipped with field proven high throughput Epi Reactors capable of processing 3 to 6 inch wafers. The Quality Management System is certified to ISO 9001:2008.



**R&D activities and competences in semiconductor design:**

**Circuits and Systems Design/Testing**

Design areas	Types	Semiconductor Materials
		<input checked="" type="checkbox"/> Si <input checked="" type="checkbox"/> Si / Ge <input checked="" type="checkbox"/> Si on Sapphire

**Technology**

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar <input checked="" type="checkbox"/> Si on Sapphire <input checked="" type="checkbox"/> Other
---

### **Applications**

- Increasing industrial process variability
- Semiconductor manufacturing approaches, processes and tools
- Novel process/metrology equipment and materials
- Photonics

### **R&D competences and/or projects proposals for international cooperation: Silicon epi-layer-based solar cell manufacturing technology**

One of the major current R&D projects at Epiel is focused on the application of epitaxial deposition to produce silicon solar cells. The project aims to develop a technology to produce solar cells based on low-cost structures with silicon epi-layers. One of the objectives is to enable the use of low cost materials, other than mono- and multicrystalline silicon, as substrates. With this aim in view Epiel JSC is developing a specialized epi technology that could be implemented in solar cell manufacturing.

The project requires participation of companies in the field of solar cell manufacturing, especially those researching the potential of silicon epitaxy in solar cell production. We would also be happy to cooperate with manufacturers of semiconductor material processing equipment, especially epitaxial equipment, in order to design and create a prototype epi reactor for solar applications.

#### **Contact details:**


Address: 124460, 1-st Zapadny Proezd 12, bld.2, Zelenograd, Moscow, Russia

Web: <http://www.epiel.ru>

Head of organisation (director): Vladimir Statsenko

#### **Contact person:**

	<p><i>Andrey Babaev</i>, Head of Marketing and Business Development Department <i>Tel:</i> +7 495 229 73 03 <i>Fax:</i> +7 495 229 73 02 <i>E-mail:</i> <a href="mailto:babaeff@gmail.com">babaeff@gmail.com</a></p>
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	<p><b>PKK MILANDR JSC</b> Acronym: Milandr</p>
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**Type:** Company  
**Size:** > 80 employees

**Brief description of organisation:**

JSC PKK Milandr company is focused on design and production of various type of modern IC for industrial applications. Milandr is a fabless company with its own test house and assembling house for metal-ceramic packages.

JSC PKK Milandr has experience in the design of 8-bit, 32-bit microcontrollers, memory circuits, wired interfaces transceivers and radio frequency circuits. IP blocks' base was created. The company has experience of working with cores developed by ARM company. It has its own IP set for the design of ICs with CAN and LIN interfaces.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> Si

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar <input checked="" type="checkbox"/> SOI
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***Applications***

**R&D competences and/or projects proposals for international cooperation:**

List of available IPs:

8-bit microcontroller core

16-bit DSP core, fixed point

CAN 2.0B hardware

USART, SPI, LIN, I2C, USB OTG, SRAM blocks, PLLs, ADCs, DES cryptoblock, Ethernet interface

Transceivers RS-232, RS-485, CAN, LIN, LVDS

Experience with application of ARM Cortex M3 and M0 cores, experience in analogue design


**Contact details:**

Address: Building 6, Proezd 4806, Zelenograd, Moscow, 124498, Russia

Web: <http://milandr.ru>

Head of organisation (director): Mikhail Pavlyuk

*Contact person:*

	<p><i>Alexey Novoselov, Deputy Director of Marketing</i> <i>Tel: +7 (495)601-95-45</i> <i>Fax:+7 (495)739-02-81</i> <i>E-mail: novoselov@ic-design.ru</i></p>
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	<p><b>RESEARCH AND PRODUCTION COMPANY "SENSOR IS", LLC</b></p> <p>Acronym: Erreur ! Source du renvoi introuvable.Error! Reference source not found. SensorIS</p>
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**Type:** Limited Liability Company

**Size:** 100 employees

**Brief description of organisation:**

LLC "NPK SensorIS" was established in 2008, combining advanced scientists from Moscow Institute of Electronic Technology and Moscow Institute of Physics and Technology, whose creative potential and scientific experience work for world level design of custom ICs.

We are working in CMOS 0,25-0,09 technologies, and our strong position for analogue and mix-signal IPs design gives leading solution for high-speed ADC/DAC, different types of CMOS photoreceivers and other sensors, multimedia and specialized controllers and systems-on-chips.

LLC "NPK SensorIS" is a leading Russian CMOS sensor developer and manufacturer.

**R&D activities and competences in semiconductor design**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC,	<input checked="" type="checkbox"/> Si / Ge
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Mixed IC;	<input checked="" type="checkbox"/> GaAs
	<input checked="" type="checkbox"/> SoC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS,
<input checked="" type="checkbox"/> Bipolar
<input checked="" type="checkbox"/> SOI

***Applications***

<input checked="" type="checkbox"/> Increasing industrial process variability
<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
<input checked="" type="checkbox"/> Photonics
<input checked="" type="checkbox"/> Transport, safety and security
<input checked="" type="checkbox"/> Telecommunications
<input checked="" type="checkbox"/> Heterogeneous systems, integration of heterogeneous functions

**R&D competences and/or projects proposals for international cooperation :**

- R&D of digital IC;
- R&D SoC;
- CAD of IC

**Contact details:**

Address: **Erreur ! Source du renvoi introuvable.****Error! Reference source not found.**Web:

[www.sensoris.ru](http://www.sensoris.ru), [www.uniqueics.com](http://www.uniqueics.com), [www.omics.ru](http://www.omics.ru)

Head of organisation (director): Yury Tishin

*Contact person:*



*Denis Adamov, R&D and Production Director*

*Tel: +7 **Erreur ! Source du renvoi introuvable.****Error! Reference source not found.***

*Fax: +7 (499) 734-4043*

*E-mail: [mail@sensoris.ru](mailto:mail@sensoris.ru)*

	<p><b>NATIONAL RESEARCH NUCLEAR UNIVERSITY MEPHI, DEPARTMENT OF MICRO- AND NANOELECTRONICS</b></p> <p><b>Acronym: MEPhI</b></p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

Nowadays MEPhI is a Federal research university. It cooperates with Federal Nuclear centres, specialized institutes and enterprises of the Russian Federal Atomic Energy Agency, for the purpose of professional, scientific and innovative development provision in the nuclear sphere and other high technology sectors of Russia economy. In particular, MEPhI deals with the nanotech industry, information technologies, biological systems and provides elite executive training and analyst experts including international activity in the sphere of nuclear power.

The Department of Nano- and Microelectronics MEPhI is one of the oldest in Russia. The department is specialized in educating specialists for research centres and industry involved in nanotechnology, microelectronics, and electronics. The essential part of the research activities of the department is exploration physics of ionizing radiation effects in IC.

International research and design projects for the microelectronics industry have been realized during recent years by department staff with the following countries: South Korea, Taiwan, China, USA and France. The department is already working on the EU-Russia 7th Framework Program project “Surface ionization and novel concepts in nano-MOX gas sensors with increased selectivity, sensitivity and stability for detection of low concentrations of toxic and explosive agents”.. MEPhI’s manufacturing and design activities are present in following directions:

- Prototypes of SAW filters;
- MOSFET gas sensors;
- Sensor based on ceramic MEMS platform (Al<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>) for applications with harsh working conditions;
- Matrices for IR and X-ray detection devices;
- Production small series of microelectronics devices by non-standard technological process;
- Design IC of digital microcontroller and software for one;
- Production controller and safety microelectronic devices for radiation accelerator tools by request such customers as CERN and DESY.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC,	<input checked="" type="checkbox"/> GaAs
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Mixed IC;	<input checked="" type="checkbox"/> Other

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Nanotechnology devices | <input checked="" type="checkbox"/> SoC<br><input checked="" type="checkbox"/> FPGA |
|--|---|

### Technology

- CMOS/ BiCMOS,
- Bipolar
- Other

### Applications

- Increasing industrial process variability
- Semiconductor manufacturing approaches, processes and tools
- Novel process/metrology equipment and materials
- Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
- Photonics
- Electro-magnetic interference, heat dissipation, energy consumption
- Energy efficient electronic systems, thermal effect aware design
- Autonomous energy efficient smart systems
- Transport, safety and security
- Telecommunications
- Biomedical microsystems and smart miniaturised systems
- Heterogeneous systems, integration of heterogeneous functions

### R&D competences and/or projects proposals for international cooperation:

- Low power MEMS sensors based on semiconductors and ceramics materials.
- MOSFIT gas sensors
- Design IC

### Contact details:

Address: 115409, Moscow, Kashirskoe shosse, 31

Web: <http://www.mephi.ru/>

Head of organisation (director): Mikhail Strikhanov

### Contact person:



*Nikolay Samotaev*, Associate Professor of Micro- and Nanoelectronics Department  
 Tel: +7 (495) 585-8273  
 Fax: +7 (495) 324-8356  
 E-mail: samotaev@mail.ru



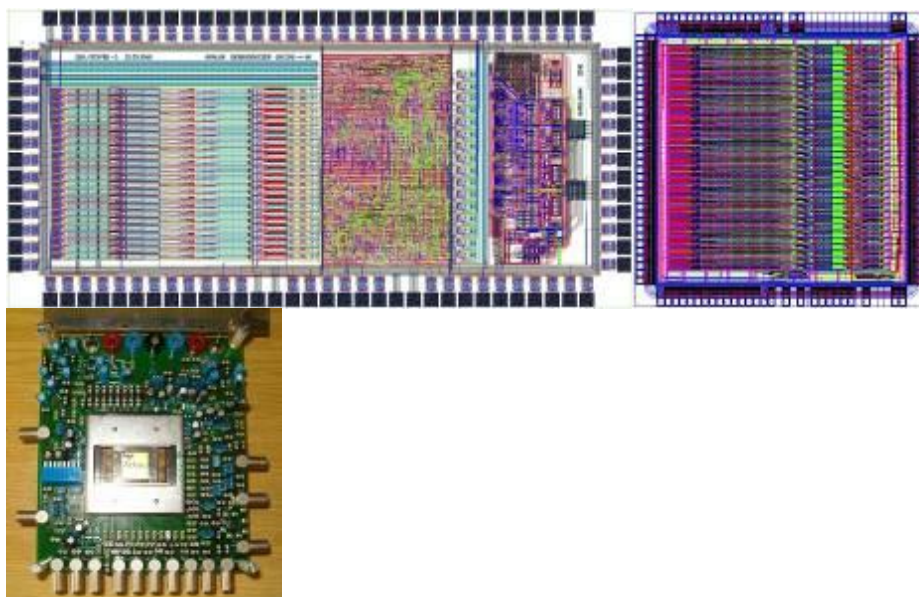
**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The Department of Electronics is one of the largest departments in the University (the staff of lecturers and tutors amounts to 37 persons). It also conducts scientific research in a number of branches: nanometer electronics, equipment for physical experiments, VLSI design, radiation hardness of electronic units, microwave electronics and many others.

An important activity of the department is the design of analogue and mixed-signal ASICs for experimental physics installations. Important prerequisites for that are the direct long-term university license agreements with Cadence, Mentor Graphics, Synopsis and full membership of Europractice. The designed ASICs are implemented through Europractice by CMOS/BiCMOS submicron processes. Now MEPhI is the leader among Russian customers of Europractice in terms of the number of ASIC projects, manufactured via its IC service. Examples of current projects are: data-driven read-out chips for microstrip detectors of CBM experiment at GSI/FAIR (Darmstadt) and ones for the “Nucleon” project of the Russian space agency.



Prototype 128 channel chip for CBM (0.18  $\mu\text{m}$  MMRF CMOS of UMC) 32 channel chip and test board for Nucleon (0.35  $\mu\text{m}$  CMOS of AMIS)

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> Si <input checked="" type="checkbox"/> Si / Ge

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar
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***Applications***

<input checked="" type="checkbox"/> Read-out ASICs for different multichannel detectors <input checked="" type="checkbox"/> Chips for data-driven systems
--

**R&D competences and/or projects proposals for international cooperation:**

- University design Centre. Computer-aided design of analogue and mixed signal ASICs
- ASIC prototyping (both at chip and board level)

**Contact details:**

Address: 115409, Moscow, Kashirskoe shosse, 31

Web: <http://www.mephi.ru>

Head of organisation (director): Mikhail Strikhanov

Head of department: Vladimir Stenin

**Contact person:**

	<p><i>Eduard Atkin</i>, Associate Professor, Department of Electronics, Director of University Design Centre for Analogue and Mixed Signal ASICs Tel: +7 (495)-324-25-97 Fax: +7 (495)-21-11 E-mail: <a href="mailto:atkin@eldep.mephi.ru">atkin@eldep.mephi.ru</a></p>
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	<p><b>MIKRON JOINT STOCK COMPANY</b>  <b>Acronym:</b> Mikron JSC</p>
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**Type:** Company

**Size:** > 80 employees

**Brief description of organisation:**

JSC Mikron is the largest manufacturer of integrated circuits in Russia and CIS and is implementing an investment programme aimed at the modernization of ICs production up to the level of 180–90 nm. The company is the winner of the tender for the development of ICs for the State Programme "Electronic Passport of Russia", is the largest Russian exporter of ICs, and the winner of state and international awards. JSC Mikron's devices are delivered across almost all Russian regions, CIS countries, China and South-East Asia countries. The enterprise produces more than 500 types of electronic components. JSC Mikron's production systems are certified under ISO 9000 and ISO 14001.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC,	<input checked="" type="checkbox"/> Si / Ge
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Mixed IC;	
<input checked="" type="checkbox"/> Nanotechnology	<input checked="" type="checkbox"/> SoC	
devices	<input checked="" type="checkbox"/> FPGA	
	<input checked="" type="checkbox"/> RF IC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS,
<input checked="" type="checkbox"/> Bipolar
<input checked="" type="checkbox"/> SOI
<input checked="" type="checkbox"/> Other

***Applications***

<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Energy efficient electronic systems, thermal effect aware design
<input checked="" type="checkbox"/> Autonomous energy efficient smart systems
<input checked="" type="checkbox"/> Transport, safety and security
<input checked="" type="checkbox"/> Telecommunications
<input checked="" type="checkbox"/> Biomedical microsystems and smart miniaturised systems


**Contact details:**


Address: 124460, Moscow, Zelenograd, 1st Zapadny proezd 12/1

Web: <http://www.mikron.ru/>

Head of organisation (director): Gennady Krasnikov

*Contact person:*

	<p><i>Nikolay Shelepin</i>, Deputy General Director for R&amp;D, Chief Designer <i>Tel:</i> +7 (495) 229-7107 <i>Fax:</i> +7 (495) 229-7141 <i>E-mail:</i> <a href="mailto:nchelepin@sitronics.com">nchelepin@sitronics.com</a></p>
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	<p><b>RESEARCH CENTRE "MODULE" JSC</b>  <b>Acronym: RC "Module"</b></p>
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**Type:** Company  
**Size:** > 80 employees

**Brief description of organisation:**

Research Centre "Module" (RC "Module") is an innovative Russian development company designing high-end RISC/DSP processors, mixed-signal ASICs and real-time video-image processing systems.

RC "Module" has successful experience in specialized digital and analogue-to-digital VLSI and systems-on-chip based on processor cores ARM11 RISC and NeuroMatrix® RISC/DSP and uses the well known electronic design software packages Cadence and Synopsys. RC "Module" engineers have received extensive training with the Cadence and Synopsys companies and have appropriate certificates. Besides, RC "Module" implements a full cycle of element base design, manufacture and testing:

- processor core NeuroMatrix® Core (NMC) was developed in 1996, which was used in digital signal processing L1879BM1 (NM6403),
- VLSI 1879BM3, system-on-chip – fast programmable controller with built in fast-acting analogue-to-digital convertor 600 MBC and digital-to-analogue convertor 300 MBC were developed and manufactured in 2002. VLSI 1879BM3 is a prototype of Software Defined Radio (SDR)
- LSI 1879BA1T - Universal connected machine (terminal) multi integrated input-output channel according State Standard P 52070-2003(State Standard 26765.52-87) / MIL-STD-1553B was developed and manufactured in 2004,
- VLSI 1879BM2 (NM6404) – digital signals processing making, which is which is a further development of Л1879BM1 processor on the core NMC2 was developed and manufactured in 2006,
- Prototypes of NeuroMatrix® VLSI 1879BM4 (NM6405) processors of third generation on the core NMC3 were received in 2009.

Nowadays RC "Module" designs systems-on-chip for navigation application and digital TV. RC "Module" is one of the first Russian high-tech companies to offer a wide range of IP-modules for licensing. RC "Module" has licensed its processor IP-module NMC to a leading foreign semiconductor company.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design <input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS,
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SOI

**Applications**

- Transport, safety and security
- Telecommunications

**Contact details:**

Address: JSC Research Centre "Module", 3 Eight March 4Th Street Box: 166, Moscow, 125190 Russia

Web: <http://www.module.ru/>

Head of organisation (director): Andrey Adamov

*Contact person:*

	<p><i>Dmitriy Fomin, Deputy Director</i> Tel: + 7 499 152 46 61 Fax: + 7 499 152 46 61 E-mail: <a href="mailto:rusales@module.ru">rusales@module.ru</a> <a href="mailto:sales@module.ru">sales@module.ru</a></p>
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	<p><b>RESEARCH INSTITUTE OF MATERIAL SCIENCE AND TECHNOLOGY</b>  <b>Acronym: RIMST</b></p>
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**Type:** R&D organisation/University  
**Size:** > 80 employees

**Brief description of organisation:**

Principal directions of RIMST’s activities are basic research, application development and industrial engineering of materials for military and civil electronics technology:

- single crystals and plates for large-band-gap semiconductors for lasers, displays medium, ionizing-radiation detectors
- laser active elements basis on garnet single crystals for laser systems of various application
- garnet epystuctures for magneto-optical, ultra-high frequency and extremely-high frequency
- silicon particle radiation detectors for high-energy physics usage, high-resolution spectroscopy, tomography
- quartz and glass plates for photomasks



**R&D activities and competences in semiconductor design:**  
***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
		<input checked="" type="checkbox"/> Si <input checked="" type="checkbox"/> Other

***Technology***

<input checked="" type="checkbox"/> SOI, <input checked="" type="checkbox"/> Other
---

***Applications***

<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools <input checked="" type="checkbox"/> Novel process/metrology equipment and materials <input checked="" type="checkbox"/> Photonics <input checked="" type="checkbox"/> Electro-magnetic interference, heat dissipation, energy consumption
--

- Energy efficient electronic systems, thermal effect aware design
- Transport, safety and security
- Telecommunications
- Biomedical microsystems and smart miniaturised systems

**Contact details:**

Address: RIMST, Building 4/2, pr. 4806, Zelenograd, Moscow, 124460 Russia

Web: <http://www.niimv.ru/>

Head of organisation (director): Igor Ivanov

*Contact person:*

	<p><i>Nikolai Zhavoronkov, Deputy Director in Science</i> <i>Tel: +7 (499) 720-83-64</i> <i>Fax:</i> <i>E-mail: <a href="mailto:info@niimv.ru">info@niimv.ru</a></i></p>
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 <p>Welcome to Silicon Detector Laboratory Skobeltsyn Institute of Nuclear Physics Lomonosov Moscow State University</p>	<h2>SKOBELTSYN INSTITUTE OF NUCLEAR PHYSICS LOMONOSOV MOSCOW STATE UNIVERSITY</h2> <p>Acronym: SINP MSU</p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

Nowadays SINP MSU carries out investigations in the spheres of cosmic-ray astrophysics, space physics, high-energy physics, material radiation interaction, nuclear physics, information technology and telecommunication development and nanostructure research. Silicon sensors for registration of charged particles for application in cosmic ray physics, high-energy physics and nuclear physics have been developed in SINP MSU for more than 20 years. Also integral and discrete multichannel electronics for semiconductor detector readings are also being developed. SINP MSU is a member of EURO PRACTICE and has a CADENCE license.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC,	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> Digital IC,	<input checked="" type="checkbox"/> Si / Ge
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Mixed IC;	
	<input checked="" type="checkbox"/> SoC	
	<input checked="" type="checkbox"/> FPGA	
	<input checked="" type="checkbox"/> RF IC	

***Technology***

- CMOS/ BiCMOS,
- Bipolar
- Flexible & Hybrid boards

***Applications***

- Semiconductor manufacturing approaches, processes and tools
- Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
- Biomedical microsystems and smart miniaturised systems

**Contact details:**

Address: Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Leninskie Gory, Moscow 119991, Russia

Web: <http://silab.sinp.msu.ru>

Head of organisation (director): Michail Panasyuk

*Contact person:*



*Michail Merkin, Head of Laboratory*  
*Tel: +7 495 932 9216*  
*Fax: +7 495 939 5948*  
*E-mail: merkinm@silab.sinp.msu.ru*



## SMC "TECHNOLOGICAL CENTRE" OF MOSCOW STATE INSTITUTE OF ELECTRONIC TECHNOLOGY

Acronym: SMC "TECHNOLOGICAL CENTRE" MIET

**Type:** R&D organisation/University

**Size:** > 80 employees

### Brief description of organisation:

Scientific and Manufacturing Complex (SMC) "Technological Centre" was founded as a University Research Centre at the Moscow Institute of Electronic Engineering in June, 1988. In the middle of 1989 the main set of equipment was put into operation and at the beginning of 1990 the first chips were manufactured on the full CMOS technological route. The Institute is situated in Russia's "Silicon Valley" - in Zelenograd, a town 40 km from Moscow.



There are about 400 high-qualified employees in SMC "Technological Centre", including 8 Professors and 44 Doctors of Sciences. The average age of the staff is less than 40 years.

Educational activities: training of personnel of higher qualification in the field of microelectronics, dissemination in Russia methodology of design of the radio electronic equipment on the basis of special element base with the purpose to create consumer market of native microelectronic goods.

Scientific and research activities in microelectronics, microsystem technologies and microelectronic equipment.

Manufacturing activities:

- Production of prototypes and specialized LSI, integral sensors and MEMS of small series;
- Production of prototypes and semi-conductor devices of small series according to non-standard process flow;
- Photomasks production.

### R&D activities and competences in semiconductor design:

#### *Circuits and Systems Design/Testing*

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design, <input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC;	<input checked="" type="checkbox"/> Si

#### *Technology*

- CMOS/ BiCMOS,
- SOI

#### *Applications*

- Transport, safety and security
- Biomedical microsystems and smart miniaturised systems
- Heterogeneous systems, integration of heterogeneous functions


**Contact details:**


Address: Zelenograd, Moscow, 124498 Russia

Web: <http://www.tcen.ru/>

Head of organisation (director): Alexander Saurov

*Contact person:*

	<p><i>Andrei Efimov, Head of Department</i> <i>Tel: +7 499 7344521</i> <i>Fax: +7 495 9132192</i> <i>E-mail: ae@tcen.ru</i></p>
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	<b>VORONEZH INNOVATION &amp; TECHNOLOGY CENTRE</b> <b>Acronym: VITC</b>
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**Type:** Company

**Size:** 10-30 employees

**Brief description of organisation:**

System-on-chip design-centre (VITC) is specialised in analogue ICs for various applications. The design-centre provides solutions for VLSI from technological request to fully verified and characterized microchips. The following subdivisions exist in the Centre:

- Marketing service and project management;
- Analogue and mixed ICs design laboratory;
- Layout development and verification laboratory;
- Quality management service.

Analogue and digital functional packages development is made on the basis of modern technical processes according to standard design cycle:

- CMOS technology: 0.13, 0.18, 0.25, 0,35, 0.5, 0.8 micron;
- Bipolar 25 V, 45 V;
- BCD 25 V.

Universal sheet-oriented and layout tasks solutions in accordance with modern development trends of submicron CMOS technology are offered. A fully qualified team provides design realization and project implementation to a set date and at an advanced technology level.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design, <input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> RF IC	

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS, <input checked="" type="checkbox"/> Bipolar
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***Applications***

<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others) <input checked="" type="checkbox"/> Energy efficient electronic systems, thermal effect aware design <input checked="" type="checkbox"/> Autonomous energy efficient smart systems <input checked="" type="checkbox"/> Transport, safety and security
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- Telecommunications
- Biomedical microsystems and smart miniaturised systems

**R&D competences and/or projects proposals for international cooperation:**

- A/D and D/A converters;
- Frequency synthesizers.


**Contact details:**

Address: 394063, Voronezh, Leninskiy prospect, 160a

Web:

Executive director: Vyacheslav Tupikin

*Contact person:*

	<p><i>Olga Zinchenko, Head of the Centre</i> <i>Tel: +7 910 3451539</i> <i>Fax:</i> <i>E-mail: zinchenkovitc@rambler.ru</i></p>
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	<p><b>VLADIMIR STATE UNIVERSITY</b>  <b>Training and Competence Centre at VSU</b>  <b>Acronym: VSU</b></p>
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**Type:** R&D organisation/University  
**Size:** > 80 employees

**Brief description of organisation:**

Vladimir State University is a public institution of higher-vocational education. The University is situated in Vladimir, a town 180 km east from Moscow. Staff consists of more than 900 highly-qualified employees, including 100 PhD and more than 500 candidates of science. Over 20,000 students are taught at the university. There are 49 Science Education Centres operating at the university. One of them is the Microelectronics Training and Competence Centre (MTCC), created in 1997 by the Computer Engineering department in the frame of European Project SYTIC CP 96 0170.

There are about 20 high-qualified employees in MTCC including 2 Professors, 6 Ph.D. and 5 Ph.D. students. The average age of the staff is less than 38 years.

Main activities of the Centre are focused on microelectronic and deep-submicron IC design, SoC and IP design. There is successful experience in design and realization of IC with design rules of CMOS 0,35  $\mu\text{m}$ , 0,18  $\mu\text{m}$  and 0,13  $\mu\text{m}$ . The MTCC realizes front-end design of electronics systems including RF, telecommunication and DSP. The following CAD tools are used in research and development: ADS of Agilent Technologies, Mentor Graphics, CADENCE, Xilinx, etc.

The Centre has extensive experience in participating in international projects, for instance, EURORACTICE, Copernicus, FP5, and TEMPUS, national projects of Ministry of Education and Science of Russian Federation and also R&D contracts with industrial enterprises.



**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design, <input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC; <input checked="" type="checkbox"/> SoC <input checked="" type="checkbox"/> FPGA	<input checked="" type="checkbox"/> Si

### **Technology**

- CMOS/ BiCMOS,

### **Applications**

- Telecommunications
- Heterogeneous systems, integration of heterogeneous functions
- Transport, safety and security

### **R&D competences and/or projects proposals for international cooperation:**

- Low power IC design: analogue, digital and mixed-signal
- Low power transmitting systems, analogue and RF devices
- Telecommunication systems: 3G – 4G
- Front-end design of electronics systems
- New design methodologies of microelectronic devices and systems
- Design-for-testability approaches and tools
- Digital signal processing
- Sensor networks


### **Contact details:**


Address: Gorky Str., 87, Vladimir, 600000, Russia, Computer Engineering Department, Microelectronics Training and Competence Centre

Web: <http://cmpo.vlsu.ru>

Head of organisation (director): Valentin Morozov

### **Contact person:**

	<p>Vladimir Lantsov, Pro-rector for Research Tel: +7 (4922) 533342 Fax: E-mail: lantsov@vlsu.ru; smosin@ieee.org</p>
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	<p><b>MOSCOW STATE INSTITUTE OF ELECTRONICS AND MATHEMATICS</b></p> <p>Department of Electronics and Electrical Engineering</p> <p><b>Acronym: MIEM</b></p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The main scope of the department is computer simulation and modelling of ICs. It was established during the 1990s. The department has good contacts with Motorola, Mentor Graphics, Synopsis, and Oracle. The department has licenses to use the software of these companies. A laboratory based on XILINX FPGA products has been created in 2005.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> Analogue IC, <input checked="" type="checkbox"/> Digital IC, <input checked="" type="checkbox"/> Mixed IC;	<input checked="" type="checkbox"/> Si <input checked="" type="checkbox"/> Other

***Technology***

- SOI

***Applications***

- Novel process/metrology equipment and materials
- Electro-magnetic interference, heat dissipation, energy consumption
- Energy efficient electronic systems, thermal effect aware design

**R&D competences and/or projects proposals for international cooperation:**

- Computer simulations and modelling of the semiconductor devices

**Contact details:**

Address: 109028 Moscow, Trehsvetitelskiy St., 3/12

Web: <http://avt.miem.edu.ru>

Head of organisation (director): Vladimir Kulagin

Contact person:

	<p>Prof. K.O.Petrosyants, Head of Electronics and Electrical Engineering Department Tel: +7 495 2355042 Fax: +7 495 9162807 E-mail: <a href="mailto:eande@miem.edu.ru">eande@miem.edu.ru</a></p>
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	<p><b>ELECTRONIC VLSI ENGINEERING AND EMBEDDED SYSTEMS RESEARCH AND DEVELOPMENT CENTER OF MICROELECTRONICS</b></p> <p>Acronym: ELVEES R&amp;D Center</p>
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**Type:** R&D Company  
**Size:** > 80 employees

**Brief description of organisation:**

“ELVEES” R&D Center of Microelectronics ([www.multicore.ru](http://www.multicore.ru); [www.elvees.ru](http://www.elvees.ru)) was founded in 1990. Main directions of the company activities are systems on chip design and security technology solutions. “ELVEES” RnD Center is a leading Russian ASIC design house, number one in the Multicore digital signal processors and «systems on a chip (SOC)» with SpaceWire links: routers, adapters, controllers – the largest chipset in Russia for the space and telecommunications, navigation and embedded systems.

ELVEES has its own innovative MULTICORE IC design platform which includes a great 0.25 - 0.65u silicon proven IP - cores library (RISC, DSP and peripherals), based on the commercial 0.25-u CMOS RadHard/temperature stability libraries suitable for space. “MULTICORE” platform developed by “ELVEES” R&D Center of Microelectronics includes all necessary hardware and software tools for SoC design and for developing different signal processing applications on that base: library of IP-cores (RISC, DSP, analoge/RF and peripherals), family of “MULTICORE” chips (MC-xx family), evaluation boards, developer tools (“MCStudio”), and application libraries.



ELVEES provides for its chips the Tools and Application Software for image compression, adaptive signal processing, optical and radar monitoring, artificial vision, telecommunications and navigation applications. ELVEES specialists worked out absolutely new security technologies, unique algorithms of artificial vision, biometric and radiometric identification.

**R&D activities and competences in semiconductor design**  
***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> VLSI Design	<input checked="" type="checkbox"/> Digital ICI	
<input checked="" type="checkbox"/> Process simulation	<input checked="" type="checkbox"/> Mixed signal IC	
<input checked="" type="checkbox"/> Nanotechnology devices	<input checked="" type="checkbox"/> SoC	
	<input checked="" type="checkbox"/> Microwave IC	

***Technology***

- CMOS/ BiCMOS, 65-250nm

***Applications***

- ASIC (SoC & SiP, FPGA & IP) design
- Navigation and telecommunications
- Rad Hard IC design for Space
- Transport, safety and security

**R&D competences and/or projects proposals for international cooperation:**

- ASIC, SoC, FPGA & IP Design
- Mixed signal IC design
- Rad Hard IC design for Space
- Navigation and telecommunications
- Digital signal processing design
- Video signal processing design
- Adaptive signal processing design
- Design of intelligent products for high risk security applications


**Contact details:**

Address: «ELVEES» R&D CENTER, 124460, Yuzhnaya promzona, proezd 4922, stroenie 2 , Moscow, Zelenograd, Russia.

Web: [www.multicore.ru](http://www.multicore.ru); [www.elvees.ru](http://www.elvees.ru)

Head of organisation (director): Dr. Jaroslav J. Petrichkovich

Contact person:

	<p>Dr. Tatiana V. Solokhina            Tel: +7-495-913-3188, 8-903-139-2391            Fax: +7-495-913-3188            E-mail: <a href="mailto:tanya@elnet.msk.ru">tanya@elnet.msk.ru</a></p>
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	<p><b>IOFFE PHYSICAL TECHNICAL INSTITUTE OF RUSSIAN ACADEMY OF SCIENCE</b> Acronym: PhTI</p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The Institute is a world known leader in semiconductor physics, devices, and technologies. The structure of the Institute includes the following units: Centre of Nanoheterostructure Physics, [Division of Solid State Electronics](#), Division of Solid State Physics, Division of Plasma Physics, Atomic Physics and Astrophysics, and Division of Physics of Dielectric and Semiconductors.

**R&D activities and competences in semiconductor design**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> Nanotechnology devices		<input checked="" type="checkbox"/> Si / Ge <input checked="" type="checkbox"/> GaAs

***Technology***

***Applications***

- Semiconductor manufacturing approaches, processes and tools
- Novel process/metrology equipment and materials
- Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
- Photonics
- Telecommunications

**R&D competences and/or projects proposals for international cooperation:**

The Institute competences and project proposals correspond to main areas of its structural units.

**Contact details:**

Address: 194021 St. Petersburg, Polytechnicheskaya St., 26

Web: <http://www.ioffe.ru>

Head of organisation (director): Prof. Andrei G. Zbrodskii

*Contact person:*

	<p>Dr. Grigorii S. Sokolovskii, Senior Research Fellow <i>Tel:</i> +7 (812) 2927914 <i>Fax:</i> +7 (812) 2973620 <i>E-mail:</i> <a href="mailto:gs@mail.ioffe.ru">gs@mail.ioffe.ru</a></p>
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**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

SPbETU is one of the largest education and research centres in electrical engineering, electronics and computer science in Russia. The university's faculties are involved in the following semiconductor areas: Electrical Engineering and Telecommunications, Electronics, Computer Science and Informatics, and Control and Automation.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> FPGA	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> Nanotechnology devices	<input checked="" type="checkbox"/> RF IC	

***Technology***

<input checked="" type="checkbox"/> Bipolar
<input checked="" type="checkbox"/> Flexible & Hybrid boards

***Applications***

<input checked="" type="checkbox"/> Increasing industrial process variability
<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Transport, safety and security
<input checked="" type="checkbox"/> Telecommunications

**R&D competences and/or projects proposals for international cooperation:**

- Digital signal processing
- RF circuit design

**Contact details:**

Address: RUSSIA 197376, St.Petersburg, Professor Popov str., 5

Web: <http://www.eltech.ru>

Head of organisation (rector): Prof. Vladimir M. Kutuzov

*Contact person:*



Dr. Alexey S. Ivanov, Director of International Projects Office  
*Tel:* +7 (812) 234 00 72  
*Fax:* +7 (812) 234 05 80  
*E-mail:* [ASivanov@eltech.ru](mailto:ASivanov@eltech.ru)

	<p><b>TAGANROG INSTITUTE OF TECHNOLOGY (SOUTHERN FEDERAL UNIVERSITY), CENTRE "NANOTECHNOLOGIES"</b></p>
<p><b>Acronym: TIT</b></p>	

**Type:** R&D organisation/University

**Size:** > 80 employees

**Brief description of organisation:**

The Centre consists of the following labs: micro- and nanosystems (MEMS), material science and technology, and optoelectronics. The centre's equipment is located in a clean room over 400 sq. meters in size. Measurements are done using a number of microscopes: Nova NanoLab 600 including Ntegra Vita, Solver P47, and "NanoEducator".

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design	<input checked="" type="checkbox"/> Analogue IC	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> IC-Design	<input checked="" type="checkbox"/> FPGA	
<input checked="" type="checkbox"/> Process Modeling		
<input checked="" type="checkbox"/> Nanotechnology devices		

***Technology***

<input checked="" type="checkbox"/> Bipolar
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***Applications***

<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Energy efficient electronic systems, thermal effect aware design
<input checked="" type="checkbox"/> Transport, safety and security

**R&D competences and/or projects proposals for international cooperation:**

- MEMS design


**Contact details:**

Address: 347928, Russia, Rostov Region, Taganrog, Nekrasovskiy St., 44

Web: <http://fep-tti-sfedu.ru>

Head of organisation (rector): Prof. Alexander I. Sukhinov

Contact person:

	<p>Prof. Boris G. Konoplev, Director of the Centre Tel: +7 (8634) 31-15-84 Fax: +7 (8634) 36-15-00 E-mail: <a href="mailto:ckp@fep.tti.sfedu.ru">ckp@fep.tti.sfedu.ru</a></p>
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	<b>"LABORATORY OF INNOVATION TECHNOLOGY" LTD</b> <b>Acronym: LIT</b>
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**Type:** Company

**Size:** <10 employees

**Brief description of organisation:**

The priority directions of the organisation are:

- Development of microsystem elements constructions and microsystem technology equipment.
- Technology of silicon-on-insulator structure creation for micro electromechanical systems (MEMS) elements.
- Development and production of micro accelerometers, spin-rate meters, (micro gyroscopes) inclination compass, inertial measuring cells, pressure sensors, systems on the MEMS.

The organisation conducts research in the following perspective directions:

- assembling of micro equipment elements, including flexible medium.
- development of new application of pressure sensors and creation systems on their base.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> System design,	<input checked="" type="checkbox"/> Mixed IC;	<input checked="" type="checkbox"/> Si
<input checked="" type="checkbox"/> Process Modelling	<input checked="" type="checkbox"/> SoC	<input checked="" type="checkbox"/> Si / Ge
<input checked="" type="checkbox"/> Nanotechnology devices		

***Technology***

<input checked="" type="checkbox"/> Bipolar
<input checked="" type="checkbox"/> Flexible & Hybrid boards
<input checked="" type="checkbox"/> SOI

***Applications***

<input checked="" type="checkbox"/> Increasing industrial process variability
<input checked="" type="checkbox"/> Semiconductor manufacturing approaches, processes and tools
<input checked="" type="checkbox"/> Novel process/metrology equipment and materials
<input checked="" type="checkbox"/> Flexible, organic and large area electronics (sensors, RFID, TFTs and others)
<input checked="" type="checkbox"/> Energy efficient electronic systems, thermal effect aware design
<input checked="" type="checkbox"/> Autonomous energy efficient smart systems
<input checked="" type="checkbox"/> Transport, safety and security

- Telecommunications
- Biomedical microsystems and smart miniaturised systems
- Heterogeneous systems, integration of heterogeneous functions


**Contact details:**

Address: Moscow, Zelenograd, road 4806, bld. 5

Web:

Head of organisation (director): Sergey Timoshenkov

Contact person:

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	<p><b>ELNAS</b> Acronym: ELNAS</p>
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**Type:** Company

**Size:** > 80 employees

**Brief description of organisation:**

The technology centre ELNAS is involved in the three-dimensional (3D) assembly of integrated circuits based on electrochemical nanomaterials. 3D packaging is performed by stacking chips and using wirebonding or through silicon vias (TSV) to assemble telecommunication systems (especially, SiP with DVB IC), satellite navigation SiP (more particular, GPS/Glonass/Galileo), FPGA (for example, high logic capacity with >500k logic gates), MEMS (such as smart RFID), et al. Electrochemical nanomaterials are used to perform 3D assembly by using through silicon vias filled with Cu and interconnected by Sn microbumps as well as for damascene copper metallization of integrated circuits and Ni/Cu metallization of solar cells.

**R&D activities and competences in semiconductor design:**

***Circuits and Systems Design/Testing***

Design areas	Types	Semiconductor Materials
<input checked="" type="checkbox"/> IC-Design,	<input checked="" type="checkbox"/> FPGA <input checked="" type="checkbox"/> RF IC	<input checked="" type="checkbox"/> Si

***Technology***

<input checked="" type="checkbox"/> CMOS/ BiCMOS and RF CMOS
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***Applications***

<input checked="" type="checkbox"/> Telecommunications (DVB H/T)
<input checked="" type="checkbox"/> Satellite navigation (Glonass/GPS)
<input checked="" type="checkbox"/> Logic and Memory SiP (FPGA/Flash)
<input checked="" type="checkbox"/> MEMS (Smart RFID)
<input checked="" type="checkbox"/> Novel electrochemical nanomaterials (for IC, 3D TSV and Solar Cells)

**R&D competences and/or projects proposals for international cooperation:**

- Formulation of specialty electrochemical nanomaterials, their characterization, qualification and production for metallization of IC, 3D TSV and Solar Cells
- FPGA and RF CMOS SiP design, fabrication, assembly and testing


**Contact details:**

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Head of organisation (director): Valery Dubin

*Contact person:*

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### 3. ANNEX – TABLE OF SEMICONDUCTOR R&D COMPETENCIES

	R&D ACTIVITIES													APPLICATIONS																			
	1. Circuits and Systems Design/Testing											2. Technology		3. Semiconductor manufacturing			4. Energy		5. Transport, safety and security	6. Telecommunications	7. Biomedical microsystems and smart miniaturised systems	8. Heterogeneous systems, integration of heterogeneous											
	1.1. Design areas				1.2. Types				1.3. Semiconductor Materials			2.1 CMOS/ BiCMOS	2.2 Bipolar	2.3 Flexible&Hybrid boards		2.4 SOI	2.5 Other	3.1 Increasing industrial process variability					3.2 Semiconductor manufacturing approaches,	3.3 Novel process/metrology equipment and	3.4 Flexible, organic and large area electronics	3.5 Photonics	4.1 Electro-magnetic interference, heat dissipation,	4.2 Energy efficient electronic systems, thermal effect	4.3 Autonomous energy efficient smart systems				
	58,6%	75,9%	48,3%	31,0%	65,5%	55,2%	69,0%	65,5%	41,4%	44,8%	72,4%			34,5%	17,2%				3,4%	17,2%	72,4%	55,2%								17,2%	51,7%	27,6%	24,1%
Alfa Cristal (Saint-Petersburg)		1			1		1	1				1			1					1								1	1				
Intel Labs (Saint-Petersburg )	1							1			1				1															1		1	
Research Institute of Semiconductor Devices, JSC (Tomsk)	1	1	1		1					1			1							1	1	1	1		1		1				1		
Saint-Petersburg Politechnic University (Telematic department)	1	1	1	1					1							1				1	1	1				1	1	1					
Saint-Petersburg Politechnic University (Department of Electrical Eng and Telecomm)		1			1	1	1	1	1	1					1				1					1			1	1					

