Microelectronic product development and manufacturing center

GS Nanotech is one of the leading enterprises in Eastern Europe in integrated circuits back-end developing, packaging and testing. The company specializes in designing and assembling chips for industrial and consumer devices.

GS Nanotech provides services to design and assemble hybrid integrated circuits and multi-chip units (System-in-Package) using advanced packaging technologies such as Flip Chip and Wire Bond.

- GS Nanotech production capacities allow packaging millions of multi-chip units and hybrid integrated circuits.
- Company is certified in compliance with ISO 9001:2008 standard.
- Clean rooms (class 7).

SERVICES:

- Microcircuit packages and substrates development. Design of complex hybrid modules;
- Assembling of microchips and multi-chip units in various types of BGA, LGA, QFN packages using Wire Bond and Flip Chip technologies;
- Integrated circuits automated functional testing services in compliance with JEDEC standards;
- Design, assembly and testing of integrated circuits and multi-chip units using System-in-Package technology;
- 3D TSV packaging in perspective.

MILESTONES

2012

August: GS Nanotech facility launch within Technopolis GS industrial area, Kaliningrad region, Russia.

September: Start of DDR2 memory chips assembly for the Russian Set Top Box vendor.

2013

June: Start of cryptoprocessors mass packaging for the latest satellite receivers models used by the broadcasting operators in Russia and worldwide.

December: Multichip unit designed using SiP (System-in-Package) technology.

Start of System-in-package (SiP) microcircuits design and assembly provides company competitive advantages. SiP technology is a combination of several active electronic components of various functions integrated into a single module. While combining elements in one package, the whole system becomes smaller, lighter, and gives bigger performance.

2014

August: Mass assembly launch of multi-chip module integrating central processor, cryptoprocessor, SDRAM DDR3 and NOR FLASH. Multi-chip module will be used in General Satellite set-top boxes in the Russian market, as well as in user equipment under the other brands in the foreign markets.

DEVELOPMENT PLANS:

Design and mass production of hybrid integrated circuits and multi-chip units for the holding, as well as for the external customers in Russia and abroad in the consumer and industrial markets.

GS Lanthanum chip

GS Lanthanum chip is the first Russian-made cryptoprocessor for consumer electronics. Processor became the core of the digital set-top box model GS U510 that GS Group holding brought to market in August 2013. This chip is a real breakthrough in the Russian microelectronics industry. It was developed within international cooperation among GS Group and foreign partners while GS Group was a key manufacturer and integrator of all development and business processes.

Andrey Gusev, CEO of GS Nanotech:

"It took us two years to develop a microprocessor and launch its mass production. GS Group had been fully controlling chip development process, while laboratories are located in Russia and abroad. Back-end packaging is implemented at GS Nanotech facility. The project is unique in terms of used technologies and experts involved".

- **NAME: GS Lanthanum**

The chip owes its name to the rare-earth chemical element *lanthanum*

- **WIRE BONDING ASSEMBLY TECHNOLOGY**
- **PACKAGE TFBGA97**
- **MICROPROCESSOR TOPOLOGY 40nm**
- **ARM CORE**
- **BUILT-IN RAM**

GS Nanotech capacities allow manufacturing up to **17 mln** of such microprocessors a year.

GS Lanthanum — the result of effective international cooperation

GS Group – the only enterprise in Russia, establishing the international cooperation for modern high-quality chips production.

Andrey Bezrukov, Director for Strategic Marketing, GS Group:

"GS Group has developed the first Russian 40 nm topology microprocessor, closely collaborating with foreign partners. Therewith, the holding has been supervising the GS Lanthanum development and assembly stages in all the companies participating in the process all around the world.

Today, the most effective way for high-tech developments in microelectronics industry is a broad international cooperation, which makes it possible to produce more complex and advanced products compared to many of those created by a single developer and / or manufacturer".

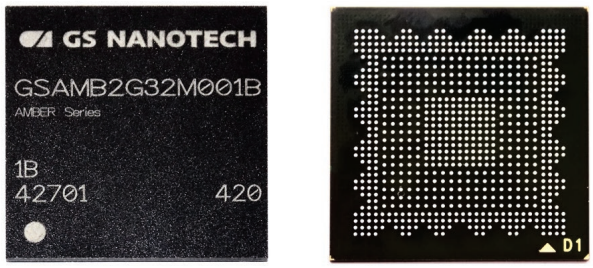
GS Nanotech SiP Amber S2

THE FIRST COMMERCIAL MULTI-CHIP MICROPROCESSOR MASS-PRODUCED IN RUSSIA

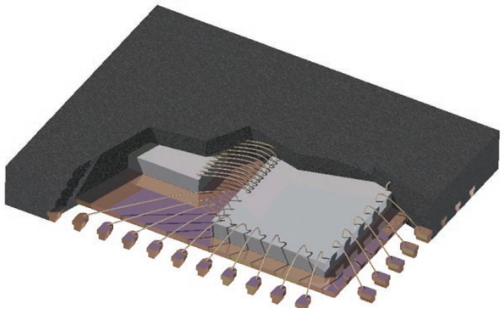
GS Nanotech SiP Amber S2 – the first microcircuit fully developed at GS Nanotech under SiP Technology (System-in-Package). This release is attributed to the essential results gained by GS Nanotech R&D Department's work and transformational company development. So far GS Nanotech is the only enterprise in Russia that mass-produces in-house commercial microprocessors under SiP technology.

The GS Nanotech SiP Amber S2 comprises four dies:

- central processor ST H206;
- cryptoprocessor GS Lanthanum;
- SDRAM DDR3;
- NOR Flash.



Package PBGA
Number of pins – 761
Package size – 31*31 mm



Microcircuits designed under SiP technology are a combination of several active electronic components with different functions in one module.

MULTI-CHIP MODULES ADVANTAGES:

- compact size;
- better performance;
- high security;
- low cost.

GS Nanotech SiP Amber S2 microcircuit is the core of modern satellite receivers designed to receive HD channels amongst others.

Within this project, the main wafer suppliers and technological partners of GS Nanotech are STMicroelectronics and Winbond Electronics companies.

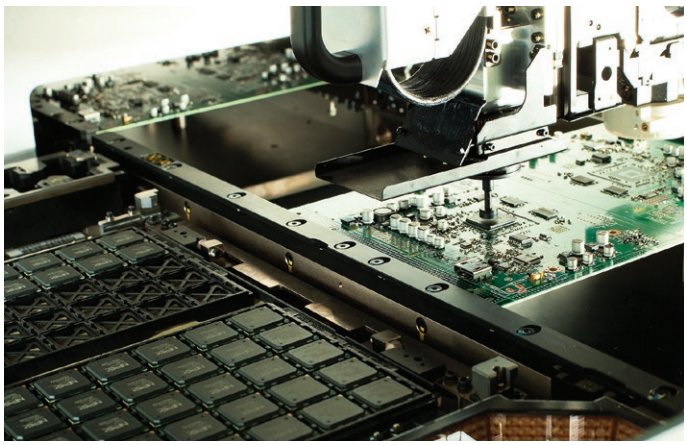
PROJECT MILESTONES

- **September 2013** – Start-up;

- **February 2014** – Successful validation of the first prototype in cooperation with STMicroelectronics company, product presentation, first orders;

- **August 2014** – Mass production of GS Nanotech SiP Amber S2 microcircuits.

As of 2014, GS Nanotech will produce more than 850 thousand chips of this type; production growth up to 2 million chips is expected to the end of 2015.



SiP Based Products Advantages

- Compact size of printed circuit board
- Simplified PCB process development
- Lower cost
- High data security

Multi-chip modules packaged under SiP technology at the GS Nanotech production facility can be used with any consumer and industrial electronic equipment.

Andrey Gusev, CEO of GS Nanotech:

"We were the first ones in Russia to develop SiP technology using in-house technological processes. One of the main technological advantages we have is our security which is a crucial component when using these microcircuits in telecommunications, security systems, medicinal and military industries."

Evgeny Shelegeda, Project Manager:

"GS Nanotech is able to efficiently organize the entire work cycle to launch demanded products in short term. These characteristics have gained interest from foreign partners seeking collaboration. Currently, GS Nanotech is the only project in Russia that uses advanced technology and produces at such significant production volumes."

PRODUCTS POWERED BY GS NANOTECH SIP AMBER S2 MICROCIRCUIT

Mass-production of three new models of digital set-top boxes under the General Satellite brand, which is powered by the in-house GS Nanotech SiP Amber S2 microchip, is due in November 2014.

Digital devices that are designed to receive HD and SDTV channels have intuitive user-friendly interfaces as well as sets of integrated media services and applications. Use of the GS Nanotech SiP Amber S2 microprocessor in different devices allows for increased security, reliability and overall performance of set-top boxes, which in return decreases the price for the end consumer.