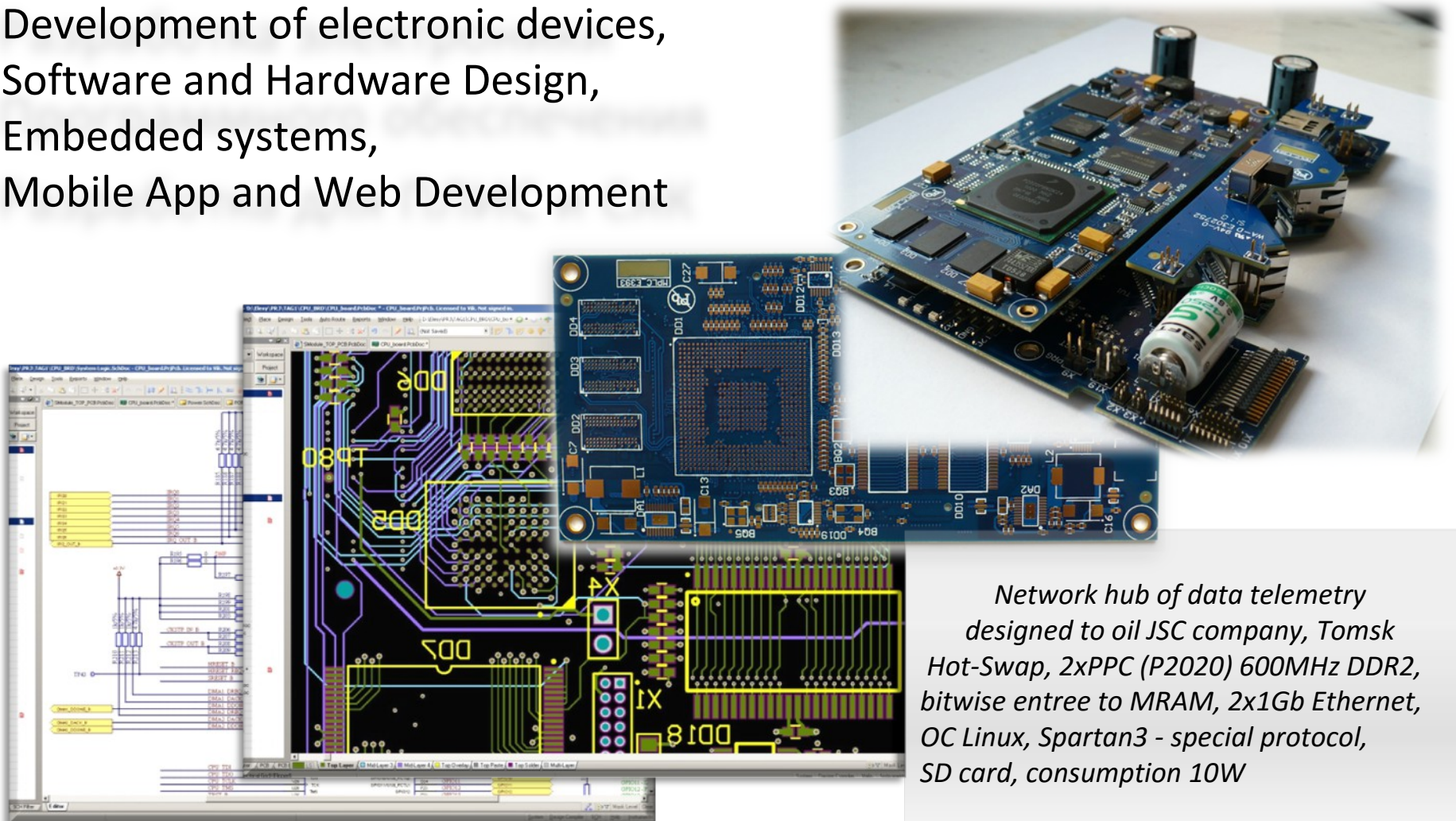# SpecForge

We design special solutions to your ideas!

www.specforge.com

Development of electronic devices,
Software and Hardware Design,
Embedded systems,
Mobile App and Web Development

Network hub of data telemetry designed to oil JSC company, Tomsk Hot-Swap, 2xPPC (P2020) 600MHz DDR2, bitwise entree to MRAM, 2x1Gb Ethernet, OC Linux, Spartan3 - special protocol, SD card, consumption 10W

Our company

Our company provides full circle services of development, testing, setting production and maintenance of electronic devices, hardware and software complexes as serial and piece production.

The main specialization of the company is single-board and embedded processing units with various set of peripherals for such applications as automation, data transmission, multimedia, streaming media, video content analysis.

For more than 12-years work period, the list of designed by us devices is extensive: various software, single-board computers, load control devices, industrial controllers, DVB-S/DVB-T receivers, PoE IP-video cameras, SoC-based embedded systems, wired and wireless networking devices, smart home systems, frame grabbers, cloud storage systems and network video recorders (NVR)...

Design to «ENIN» JSC, Russia, printed circuit boards on schemes, submitted by customer: DSP controllers based on TMS320C64556, analog input and transmission.
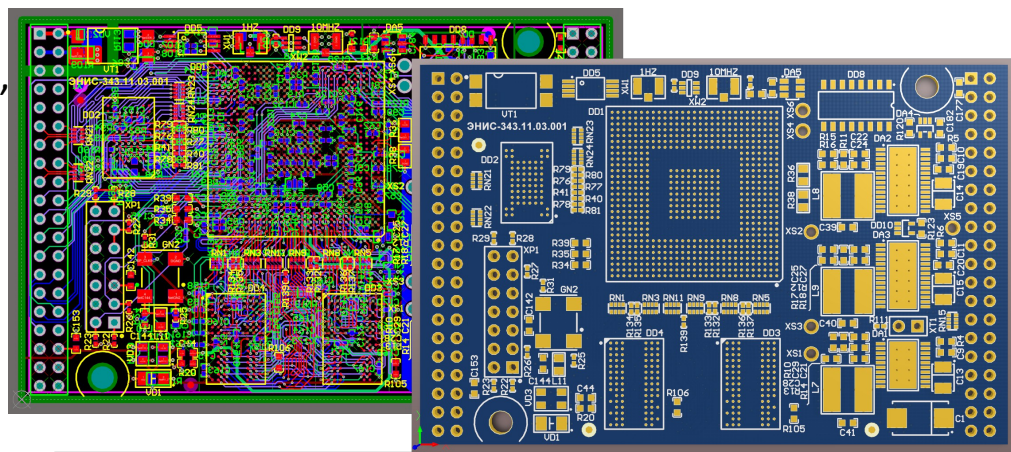
«ENIS» Primary processing unit and data registration for power station control, tracing in Altium Designer, full document package according to unified system of engineering drawings

Technologies and Tools

Our development team uses in their arsenal the latest technologies, by adapting in specific problem. We're trying to keep up with the times.

Electronics development

Design CAD: SolidWorks, ArtCAM, Mach3, AutoCAD

Circuit and PCB CAD: Altium Designer, LTspiceIV, CAM350, Si9000 (impedance), CadSoft EAGLE PCB Circuit

modeling/calculation: Spice, Micro-Cap

Software Development

DSPs/SoCs: i.MX 27 family, DaVinci series, OMAP, TI TMS320DM series, TriMedia

Microcontrollers: Atmel AVR, ARM, ARM Cortex famaly, PIC, MIPS, CPU: Inte, PowerPC

FPGA/CPLD: ISE WebPACK (Xilinx), Quartus Software (Altera), Active-HDL, Lattice Diamond

WEB development

Front-end:
Javascript: heavy use of ECMAScript2015 and later (transpile to ES5 using babel)
JS-frameworks/libraries: angular, angular2, jquery
CSS-frameworks: bootstrap, zurb foundation
CSS-preprocessors: less, sass
Used web technologies: AJAX, Websocket, Server-sent events, Media source extensions, Responsive design

Backend:
Python/Django, Ruby on Rails

Main development directions:
• Single paged applications
• Dashboard with various design
• Web services of varying complexity

Operating systems: Windows, Linux, uClinux, MacOS, iOS, Android
Software technology: Win32 API, DirectX, DirectShow, DDK, MFC, ATL, POSIX, WDM, CUDA/OpenCL/OpenGL, Qt, Gstreamer, QML
Languages: C/C++, Python3, Ruby, JavaScript, Verilog, VHDL
SQL: PostgreSQL, Sqlite.
IDE: VisualStudio, Qt Creator, Clion, Arduino IDE, AvrStudio, TI WEBENCH® Designer
SCM: Git, SVN

Why we?

Work experience:

Since the company foundation in 2004 and as of today, has implemented more than 50 projects in various fields:

- automation
- data transmission system
- multimedia
- digital signal processing
- image / video processing and analysis
- cloud technologies

Professional developers:

Our company employs a number of professional developers with extensive knowledge and vast experience in the field of commercial and scientific development.

We support you, even if the project has already done:

We do not leave our customers, even if the project has already been made and is functioning successfully, you can always turn to us for help.

Quality and reliability:

We accompany the product throughout its life cycle.
We produce testing software and hardware parts.

Transparent work-flow

Despite the fact, that our customers can be in another city or continent, we are always in touch and try to make our work process as transparent as possible in all phases of the project. It is very important to have time to make the necessary adjustments in time, which could have a positive impact on the final cost of development.

The customer has the opportunity to:

- control working process in every stage
- trace the efficiency and quality of the product
- make comments, that arise during the product life-cycle
- receive a weekly (daily) report of done work by e-mail, Skype or other available ways
- support constant communication with us on:

Phone: +7 (3822)-266-364

Email: info@specforge.com
specforge@gmail.com

Skype: specforge

The main stages of prototype development

● Conception and Circuit design - from discussion the idea of general structural scheme of the device to the concept, development of methods of testing devices. At the same stage, the choice of platform, which is determined by factors such as consumption, capacity, data signaling rate, as well as software development tools.

  Important factors for the software are: functionality, available libraries and OS to selected platform. Features functional capacity, taking into account the stock performance of the platform.

● Constructing - case design, mechanic parts, rigging, ergonomics device

● PCB Design

● Order and production

● Software development, elaboration of test plan

● Assembling, setting and general testing

● Testing of experimental batch (in the case of mass production)

   Sometimes, part of stages is performed by the customer, and then these stages are excluded from our development cycle and we use the materials, provided by the customer.
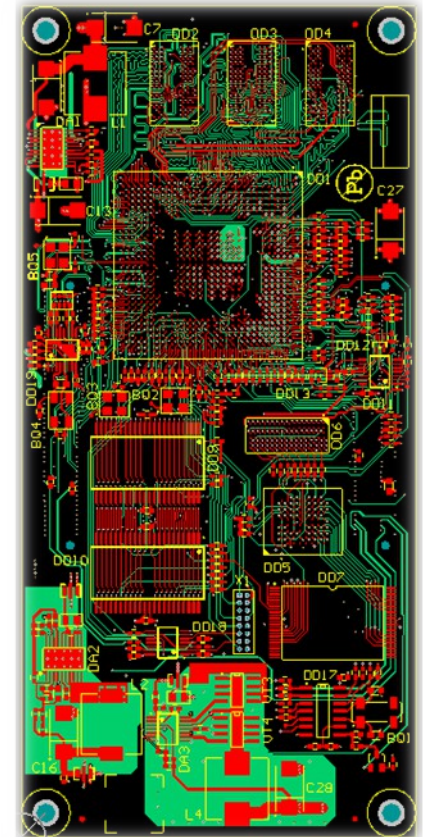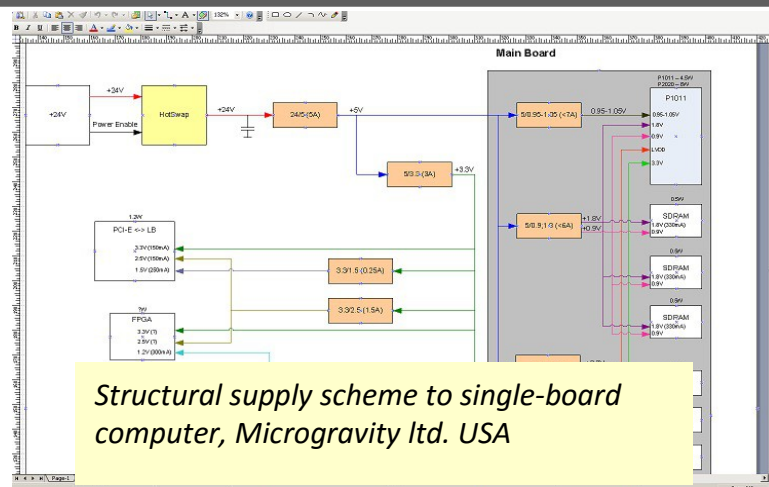

Processor board 2xPPC
*600MHz, ECC DDR2*

Circuit design

- Development of the structural scheme device
- Development of the supply circuit, calculation of the currents, electromagnetic compatibility (EMC)
- Selection and approval of component base
- Development of complete concept and the list of constituents
- Simulation work knots in Pspice

Structural supply scheme to single-board computer, Microgravity ltd. USA

Calculation of parameters, modeling of wideband amplifier at OA by Pspice, development to ISPMS SB RAS, Russia.
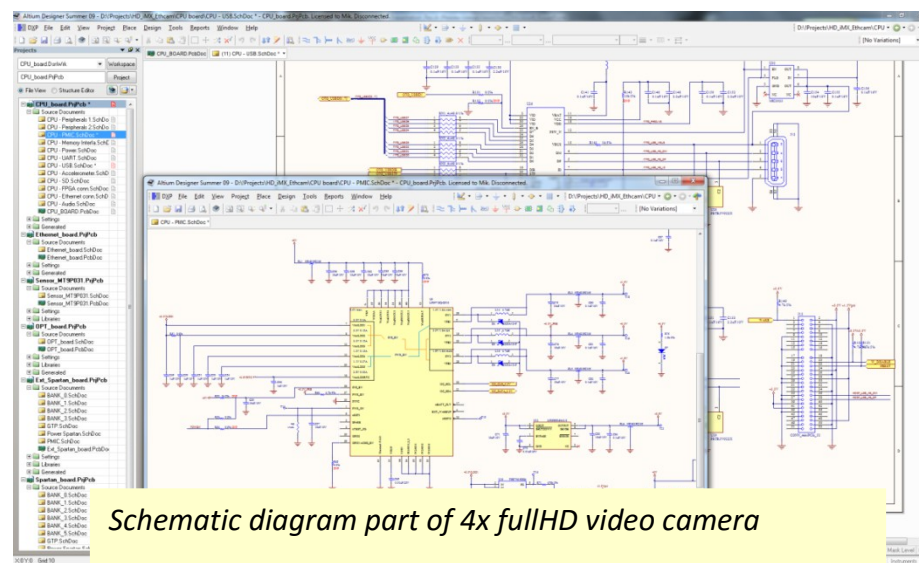
Schematic diagram part of 4x fullHD video camera

Constructing

- Case design in drawings and 3D models
- Drawings and 3D PCB models based on case design and method of attachment
- Drawings and 3D models of mechanical construction components

3D model of network telemetry data hub, designed to «Elesy» JSC, Russia

3D model, HDMI/CVBS transmitter drawings at twisted pair, development to KeyDigital Ltd. USA
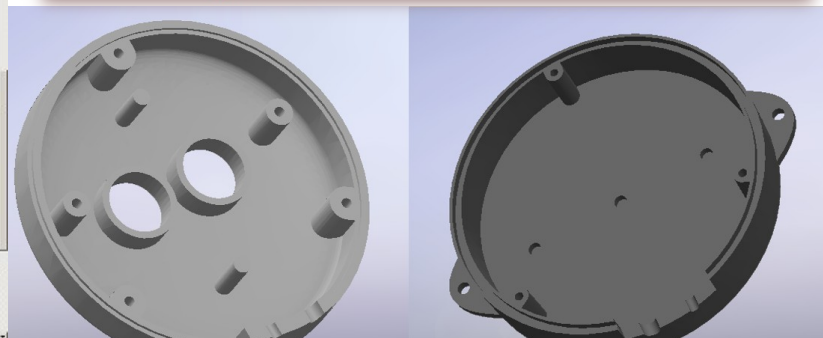
3D model, plastic case of car parking sensor, 3D printer training

Own proficient manufacturing

- Preparation of CP to CNC machine
- Preparation of rigging to manufacture parts
- Production of design elements device
- Production of motorized mechanical modules
- 3D printing design elements
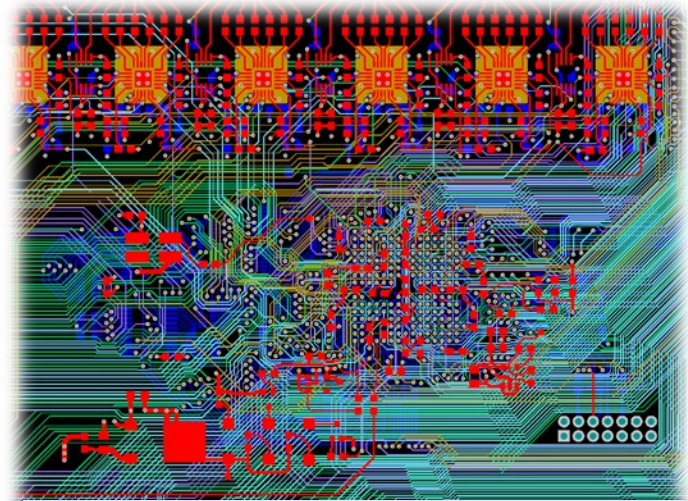- Assembling and design testing
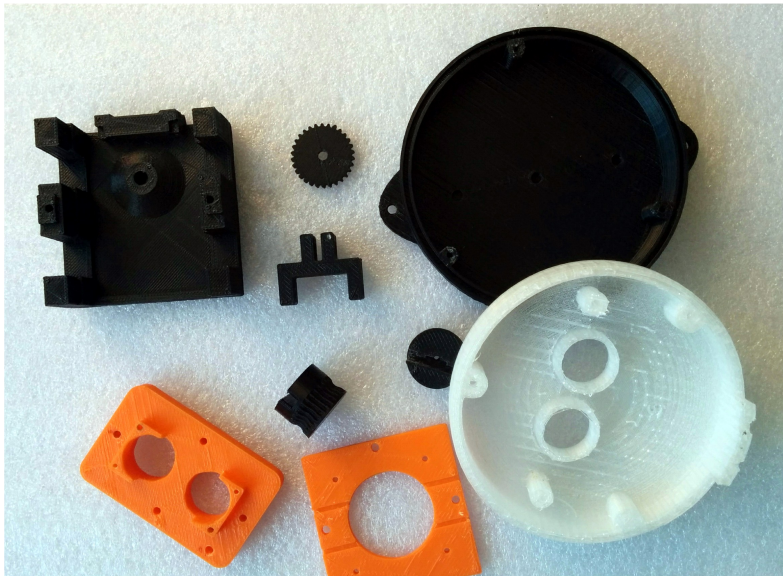
Work with plastic details
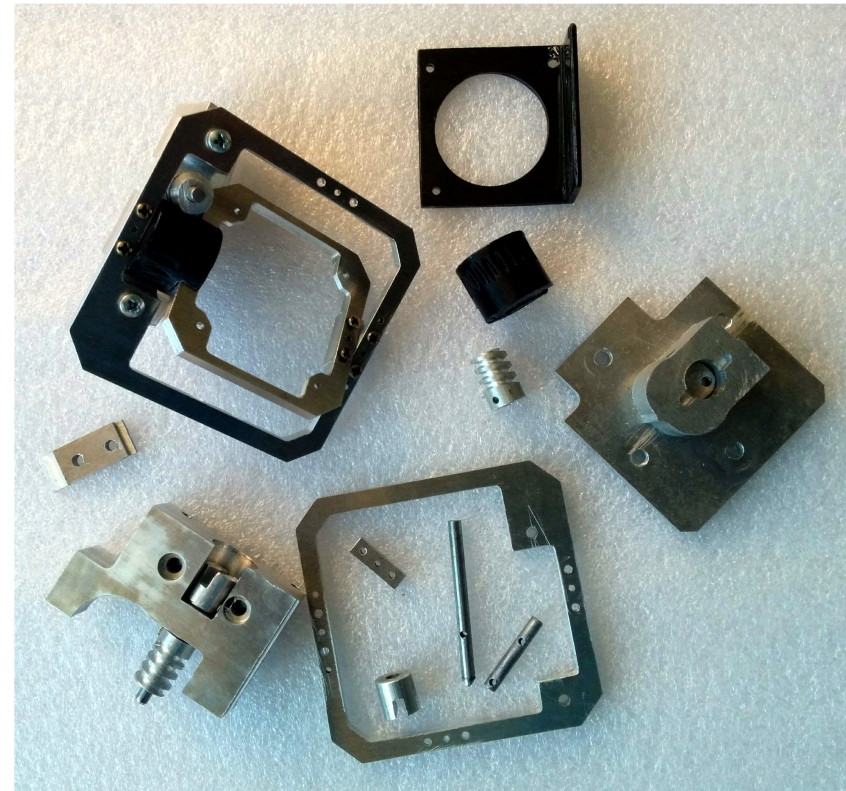
Manufacture of details from nonferrous metal

PCB design

- Definition of high-speed, power, special circuits, the requirements for wiring these circuits
- Complete placement of component
- Board layout, based on requirements or circuits
- Impedance and frequency control circuit
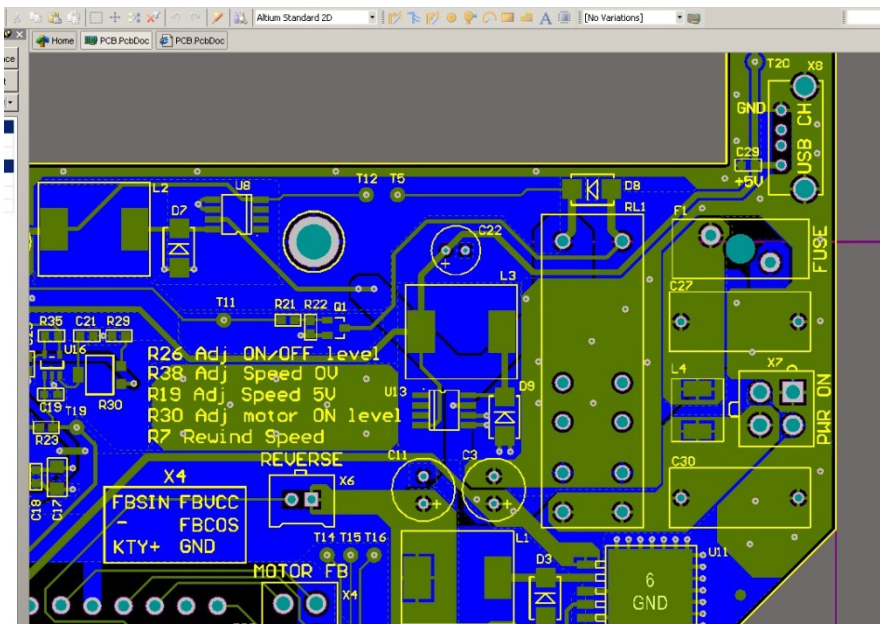
8x8 HDWI switch-processor, high complexity board, Design to KeyDigital ltd. USA

The logic control board of winch system: powerful electric motor with continuously variable rotational speed, common parameters, emergency knife, controlled by radio channel. Design to Exofix Development ltd. Denmark
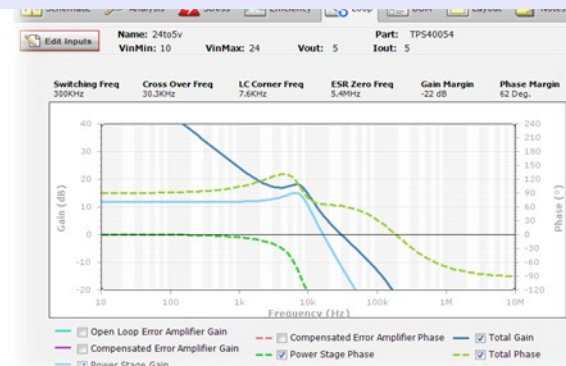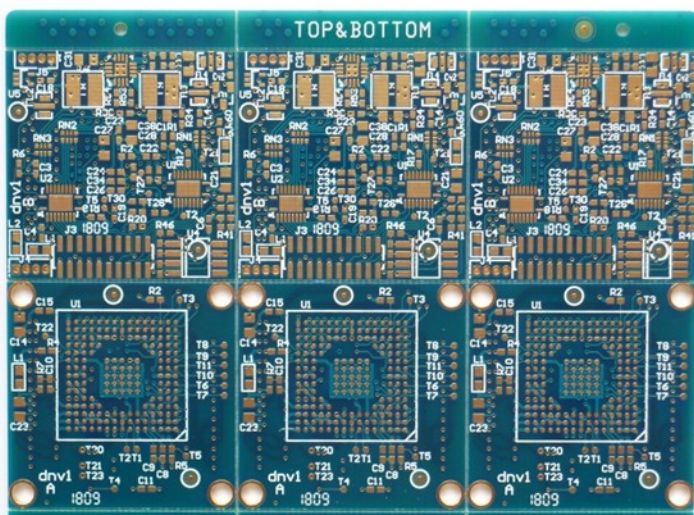
Order and manufacture of PCB, PCBA

- Generation of gerber files
- Creation of assembly drawings
- Generation of automatic component placement files
- Generation of solder stencils for automatic soldering lines
- Several files test phases before production
- Production support

Upper and lower module boards on basis of optic sensor and video processor PIXIM company. Performed on the single workpiece, after assembling the board is separated from the workpiece along the lines of fracture.
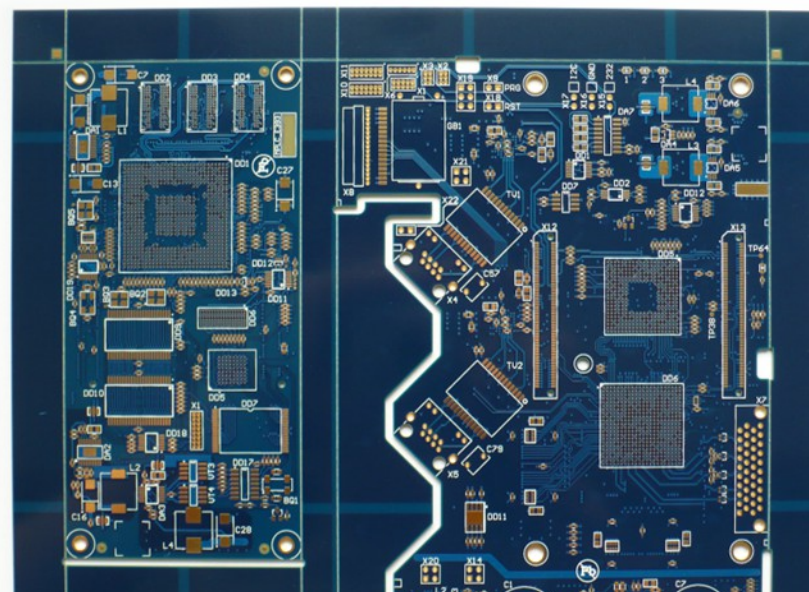

Boards after layout, placed on a workpiece so that the automatic assembly line executed once for all boards, after assembly the boards are separated from the workpiece fault line.

Assembly and adjustment

- The parameters check with help of modern measuring instruments
- Performance testing on the basis of inspection and test plans
- Preparation of documents / requirements for diagnostics and scheduled maintenance
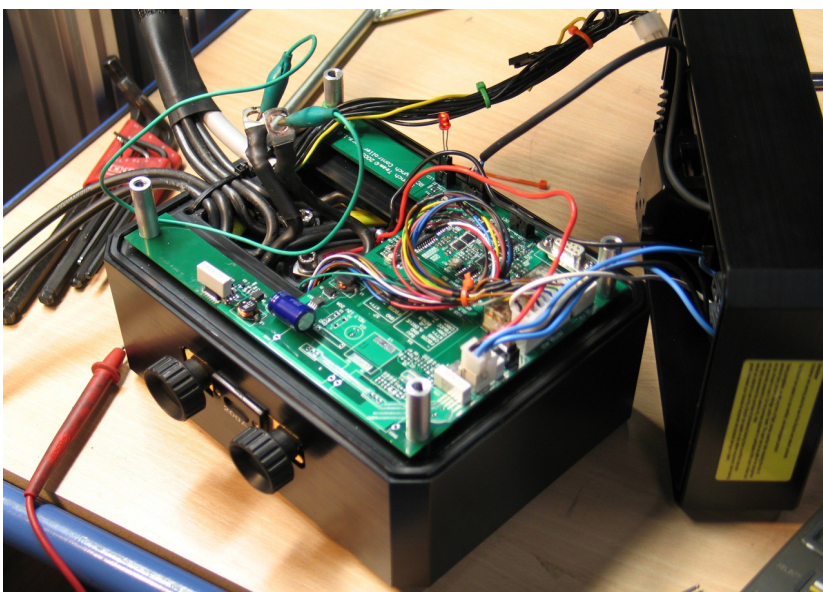
The logic control board of winch system: powerful electric motor with continuously variable rotational speed, common parameters, emergency knife, controlled by radio channel. Design to Exofix Development ltd. Denmark
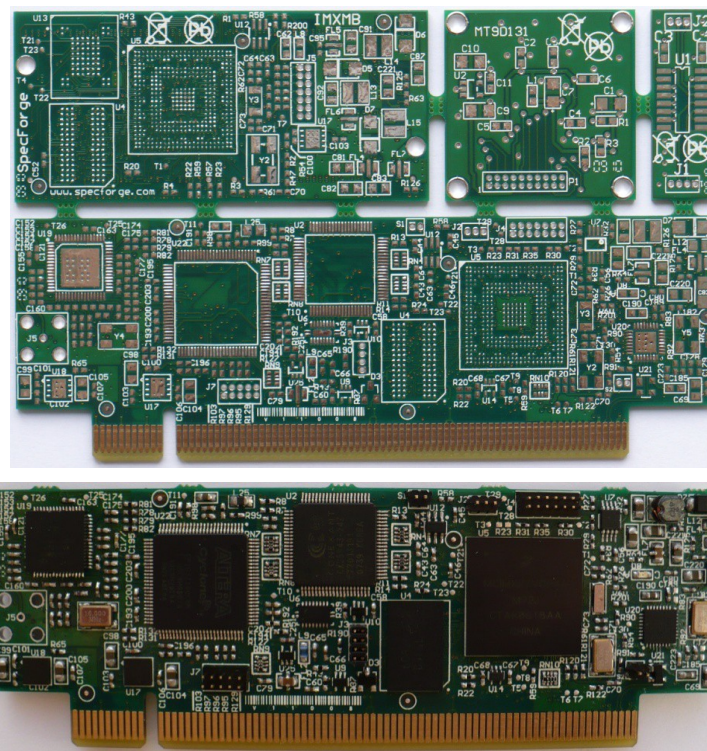
DVB-S/DVB-T receiver board (assembling, assembled module board)
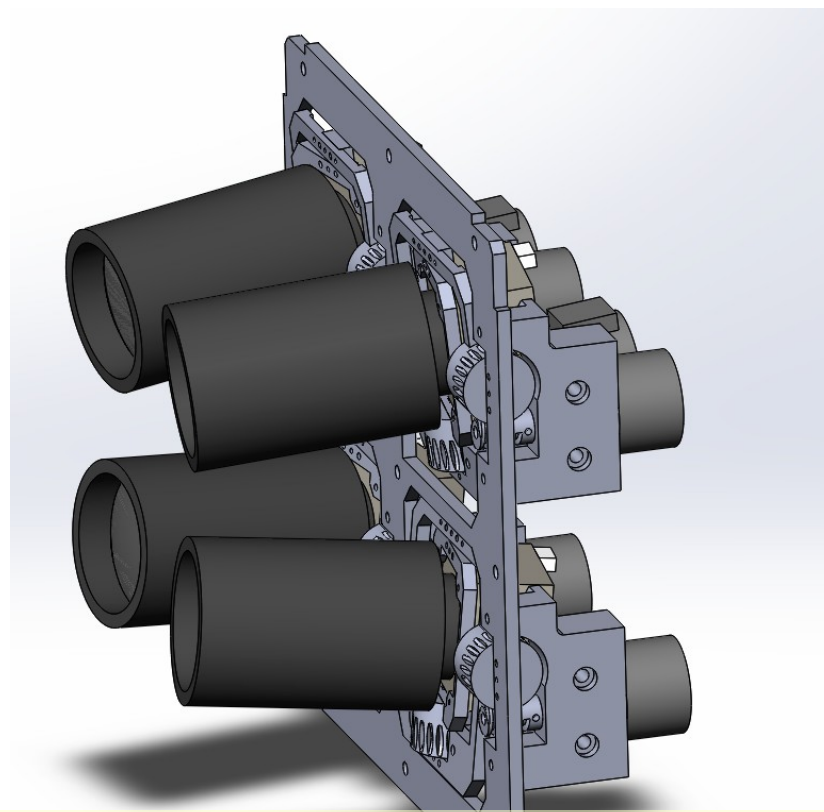
Our contacts

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3D modeling in SolidWorks motorized multyfocal IP video camera with the ability to adapt to areas of interest in the different modes 4k / zone, own advanced development with the implementation of efficient algorithms for video analytic