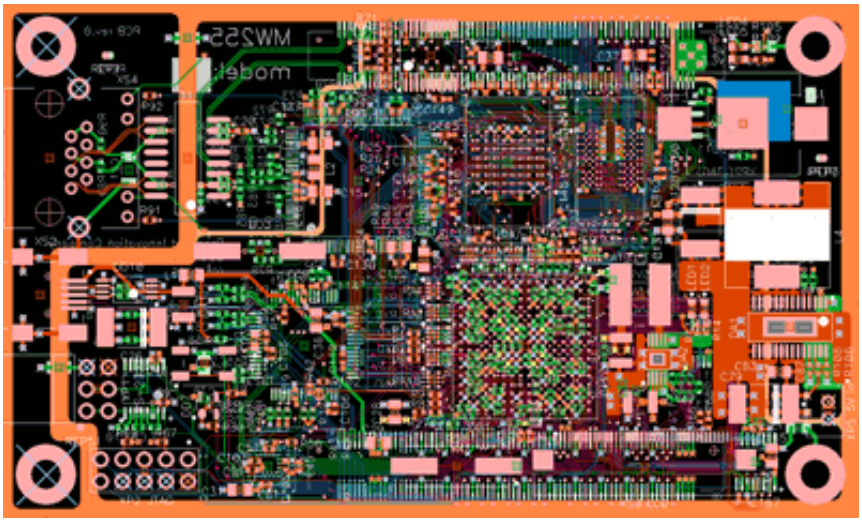
Universal Intel XScale PXA255 Based Module

Completed project - March 2006

Customer

The project is made by an internal Promwad request.

Objective



The objective was to develop an OEM-module on the basis of the Intel PXA255 microcontroller to further employ in low-consuming mobile devices with integrated high-resolution screens. The following interfaces should be implemented on the module: Ethernet, Full-speed USB OTG, RS-232, TFT LCD with a Touch Screen controller, system extension bus, real-time clock with an independent power supply.

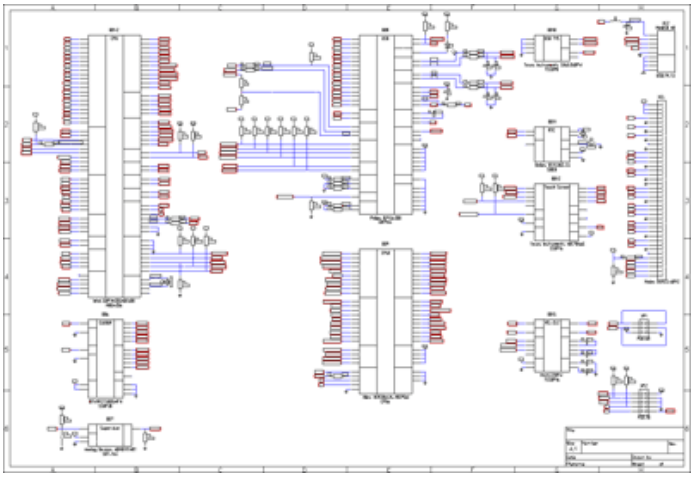
The module design should ensure secure placement in the target system, shock and vibration resistance, electrical connection with the chassis of the target system. The key requirement to development was to minimize the module size (to the size of a cigarette pack).

Solution

A number of current solutions were analyzed for advantages and disadvantages. The comparison data helped elaborate requirements to the module and develop a schematic diagram. Low power consumption, industrial temperature range and balanced cost are ensured by the Ethernet controller SMC LAN91C111I-NE, USB Host/OTG Philips ISP1362 controller, StrataFlash Intel PC28F256J3C125, and SDRAM Micron MT48LC16M16A2FG.

The non-standard design had to model the integrity of system bus signals beforehand. The results of such modeling became the basis for a concept of board tracing. A small size and high density of the components required using the High Density Interconnect (HDI) technology, blind&buried microvia in particular. During the stage of components placement we paid special attention to convenience of control and commutation elements, separation of signal paths, and uniform

distribution of the released heat. After the tracing had finished, a complete modeling of the printed circuit board layout was done to ensure signal integrity, crosstalk, and electromagnetic compatibility.



Benefits and features

- No need to develop additional devices. The module is functionally complete;
- Small size (100x60 mm);
- Flexible control of power consumption;
- Expansion slot for additional devices and OEM modules;
- Interface for a color LCD with Touch Screen;
- Support of a model range with various prices and functionality depending on the set of integrated chips;
- On-board programming and testing with JTAG.

Design tools	P-CAD, HyperLynx, CAM350
Technologies	Signal Integrity & EMC analysis High Density Interconnect (HDI) Blind & buried microvia Design For Manufacture (DFM)
Interfaces	USB Host/OTG, Ethernet, LCD TFT/STN
Project management tools	dotProject, MSProject
Efforts	100 man-days
Duration	2 months