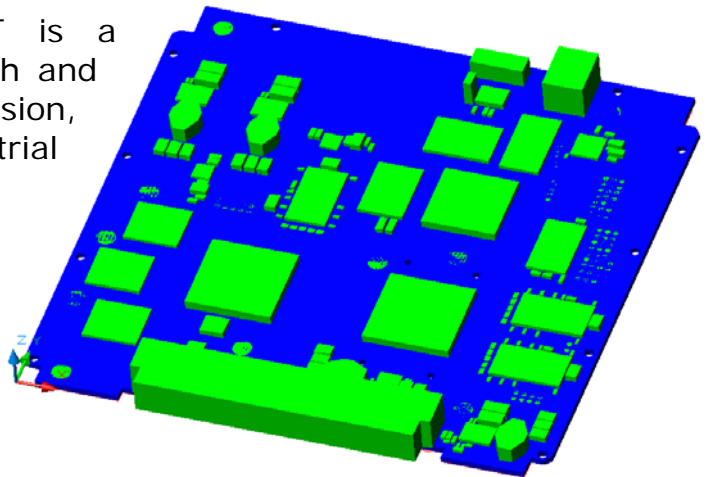


Customer

Digital Television Institute HORIZONT is a Belarusian company engaged in research and development activities for television, consumer electronics and industrial engineering.

Objective

To develop topology and PCB layout design for graphical processor unit.



Solution

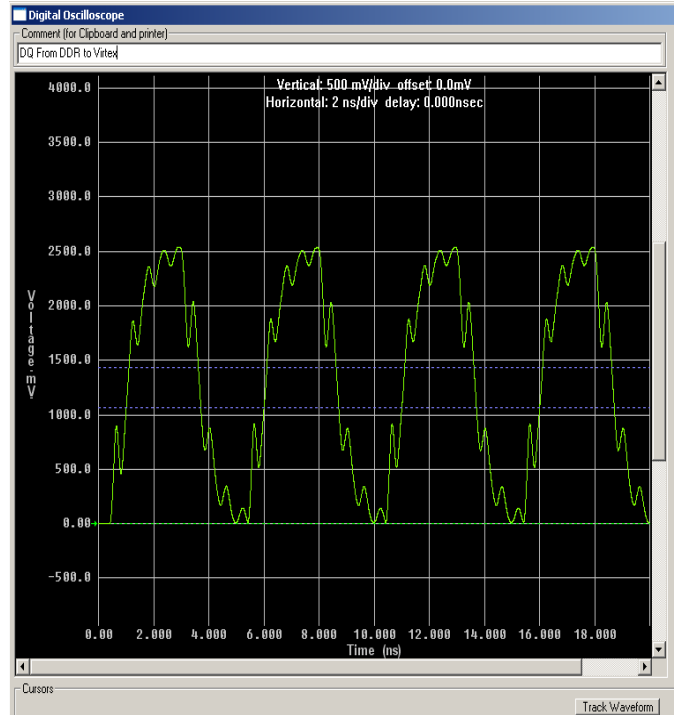
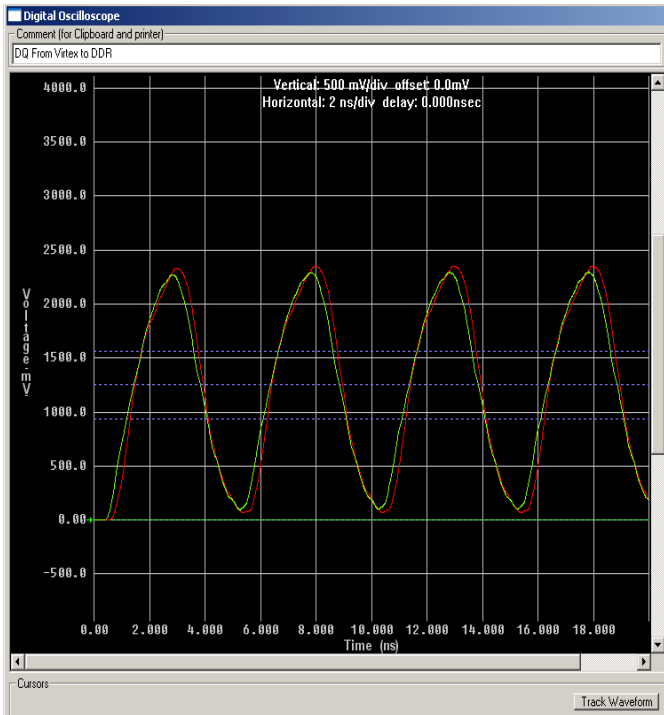
After project requirements investigation it was decided to use EXP2005 as a tool for printed circuit board layout design. Initial schematic circuit was converted from PCAD to the proper layout. Also there was performed project integrity for correct forward and back annotations.

According to technical requirements we have to

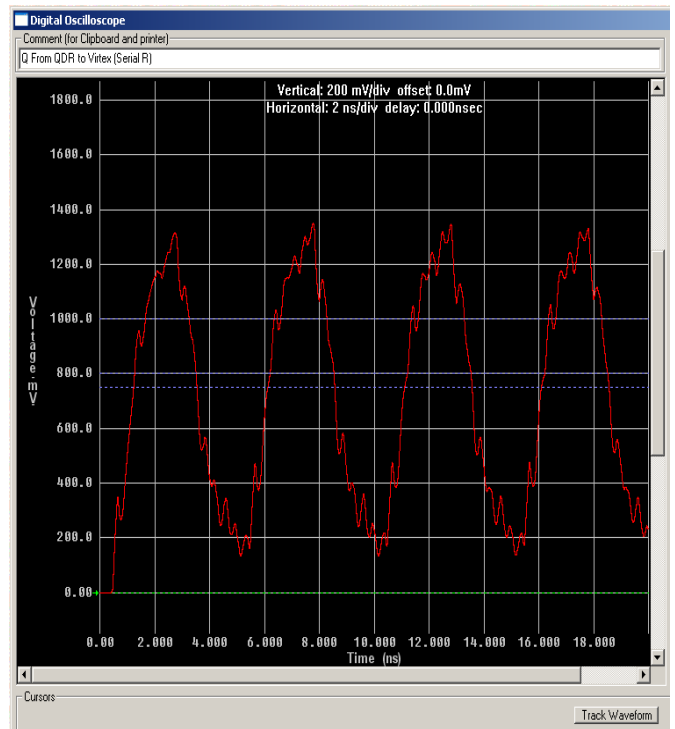
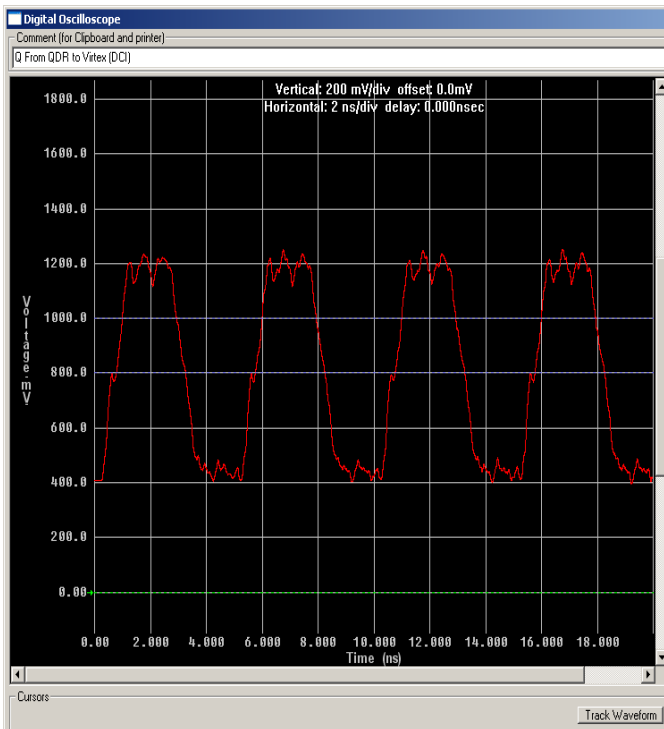
- provide necessary characteristic and differential impedances,
- perform integrity of high-speed DDR, QDR-II and LVDS signals,
- implement electromagnetic compatibility (EMC).

For this matter the team of design engineers has considered trace parameters and PCB structure. 6 BGA cases with 165 to 672 pins also predetermined the total number of PCB layers.

Promwad engineers have performed preliminary modeling of high-speed signals by IBIS-models to define the way of signals termination. After modeling PCB designers have defined optimal solution for signals termination.



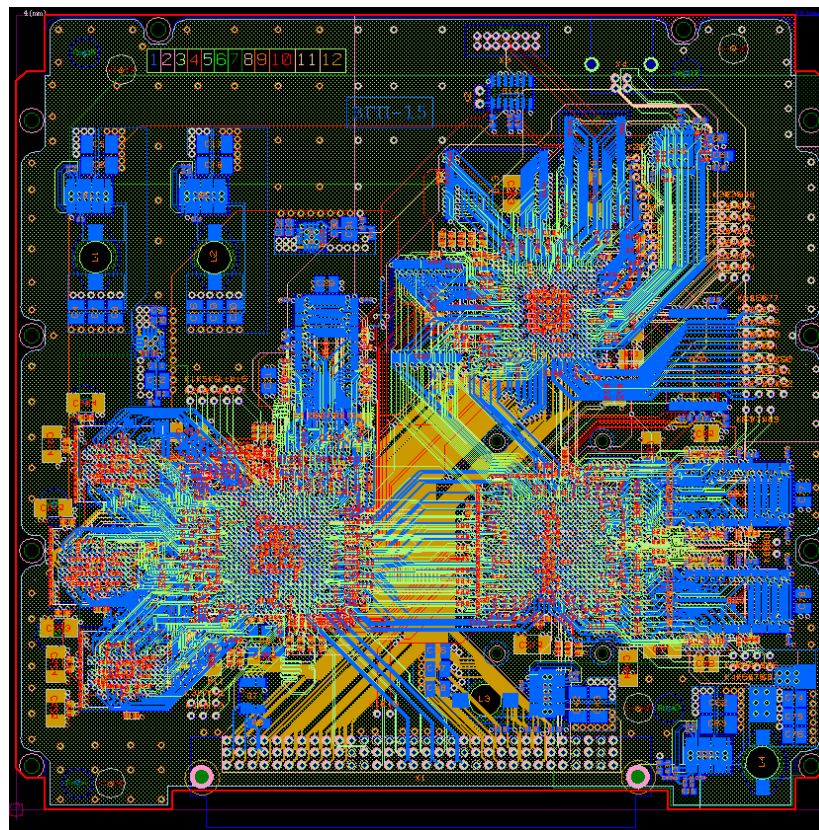
Waveforms DDR - Virtex4



Waveforms QDR11 - Virtex4

PCB layout was performed according to trace lengths and skews. Special attention was paid to power supply and ground layout.

After finishing PCB the team has developed design documentation for PCB manufacturing and assembling.



Graphical Processor Unit PCB

Characteristics

Board type	Digital
Number of layers	12
BGA cases	6 BGA
Dimensions, mm	165x163
Number of connections	3485
Differential pairs	19 (USB, LVDS, HSTL)
Number of components	804
Features	<ul style="list-style-type: none">• XC4VLX25-11FF668I• XC4VFX20-11FF672I• XC3S1000-4FG456I• DDR MT46V8M16• QDR-II CY7C1512V18• System frequency• LVDS video interface• USB host (high-speed)
Design tools	Expedition PCB, HyperLinx 7.7, ICX
Labor input	55 man-days
PCB development time	3 months