FPGA-selection:

# Technical feasibility:

# Schedule:

# Cost:

FPGA-cost with taxes: 39,58$

**Below 200$ full BOM**

around 150 dollars BOM if possible

# What do I want?

An FPGA that’s reprogrammable easily for the end-user, to allow for simple re-flashing of VBIOS to tinker with performance.

## What external interfaces do I need?

### Required:

PCI (3.0 64-bit) ()

VGA (x2 – exp header)(9 x 2 = 18 I/O)

### Nice-to-haves:

USB-C (3.2 gen 2)

DVI-I (dual-link)

HDMI (2.1)

DP (2.0)

## How many pins do I need?

196 I/O pins

Possibly more for voltage and Ground.

##### Single-ended?

##### Differential?

HDMI: 4

##### SERDES (serializer / deserializer)?

## What I/O-standards are required?

LVCMOS 2.5V?

HSTL I?

LVDS?

## What functionality do I need to achieve?

Multiple forms of video-out, with a focus on supporting all of the old standards. A few newer standards if possible, to make the design as useful as possible.

## What Frequenc(ies) do I need to run the design?

33 mhz, 50mhz, 66 mhz, 135 mhz, 144 mhz, 250 mhz, 340 mhz

# Requirement groupings:

## # of LUT/LE’s:

## # of Flip-Flops:

## DSP Blocks:

## RAM bits:

## # of I/O’s for voltage levels:

### 5v:

### 3.3v:

### 2.5v:

### 1.8v:

### 1.2v:

### 1.1v:

## # of Clock- :

### Pins:

### PLL’s:

### DLL’s:

### DCM’s:

### Clock buffers:

#### Regional:

#### Global:

## Hard Macro’s:

### Must have’s:

#### PCIe

Potentially in order to connect to PCI?

#### # of SERDES

#### Processors

No CPU’s required.

Video?

Encoding? (hevc et c)

### Nice-to-Haves:

#### HDMI

#### DP

#### USB-C

#### Ethernet MAC

None.

# Candidate devices:

## Rules:

2-4 different ones.

Keep room for future EXPANSION such as:

-Feature creep

-Bug Fixes

Keep **utilization below 80%** - makes timing-requirements much likelier to be met.

(102000 LE’s)

## Comparison-rules:

Compare based on:

### Support

Open Source

### ECC/Parity-protection on Ram

### Number of PSU’s required

### Resource-utilization

#### Logic Elements

#### Flip-Flop’s

#### RAM

#### I/O

#### Hard Macro

### I/O-banks

Available vs # of Voltage levels required

### Frequency

### Power Usage

### Package size / space on pcb

### Cost

### Available IP blocks

## Candidates:

Lattice

### LFE3-95EA-7FN672I

## LFE5U-85F-8BG381I

### Resource-utilization

#### Logic Elements

83,6k

#### Flip-Flop’s

#### RAM

#### I/O

201 lines

#### Hard Macro

### I/O-banks

Available vs # of Voltage levels required

### Frequency

400 MHz

### Power Usage

### Package size / space on pcb

### Cost

# Information on the selected Device:

Go with the newest device possible – longer support.

Ask for Characterization-data for Critical Interfaces and IP’s.