Low Cost FPGAs

Schedule of Deliverables

1. Verifying ALTERA Chip soldered to board → Here make use of the Krypton Board. Take 6 jumper wires and connect the Krypton Board (not having the ALTERA Chip) to the PCB's berg pins. 4 wires would be for JTAG, and 2 wires for powering up the ALTERA Chip, 3.3 Volts and 1.8 Volts. We could check the output on the SV1 header which could be connected to the Krypton LEDs for instance.
Basic VHDL code to turn on / off LED using a switch is ready and added to this document. For soldering, use jumper wires for JTAG, pins 33-36. (Ground?) 2 jumper wires from SV1 pins (Altera PIN_13 and PIN_14) to PIN 48 (SWITCH1) and PIN 58 (LED1) of Krypton Board. Connect VCC_3_3 from PIN_9 to SV1. Connect VCC_1_8 from PIN_19 to connector. The Daughter card provided a feedback to the main board. Hence we shorted two ground pins on krypton board equivalent to this feedback. Now the circuit is working.

2. Learn the I2C protocol → Try to program a chip using I2C via an Arduino Board. Programmed two arduinos using I2C. Used I2C to program RTC using an Arduino Board. Now use the I2C to set the output frequencies.

3. Try to program the Krypton board using a microcontroller. (??) Think about the basic circuit designs that will be needed. (Might also make eagle files)

4. Verified the FT2232H circuit (verified with Krypton Board first, since it uses the same chip). Soldered the components. Supply the ALTERA Chip using the 5V coming from the USB end. The FT2232H output (pin 49) which will feed the 1.8 Volts voltage rail. An external circuit comprising of a voltage regulator for 3.3 Volts .

5. Verify the Power Circuit (TPS65400) - Procure / Calculate the resistor values and inductors. Solder the circuit and verify power supplies produces the four voltages expected, 1.8V, 3.3V, 2.2V and 1.2V.

6. Ordered the required components.

Datasheets

TPS65400 :- Buck Converter with 4 outputs .
FT2232H:- Dual high speed USB 2.0 to UART/I2C serial interface converter.
CDCE925:- Clock synthesizer.
Max V device handbook

Max V Board Design
Max V Pinout
Cyclone IV Datasheet :- FPGA
Cyclone IV

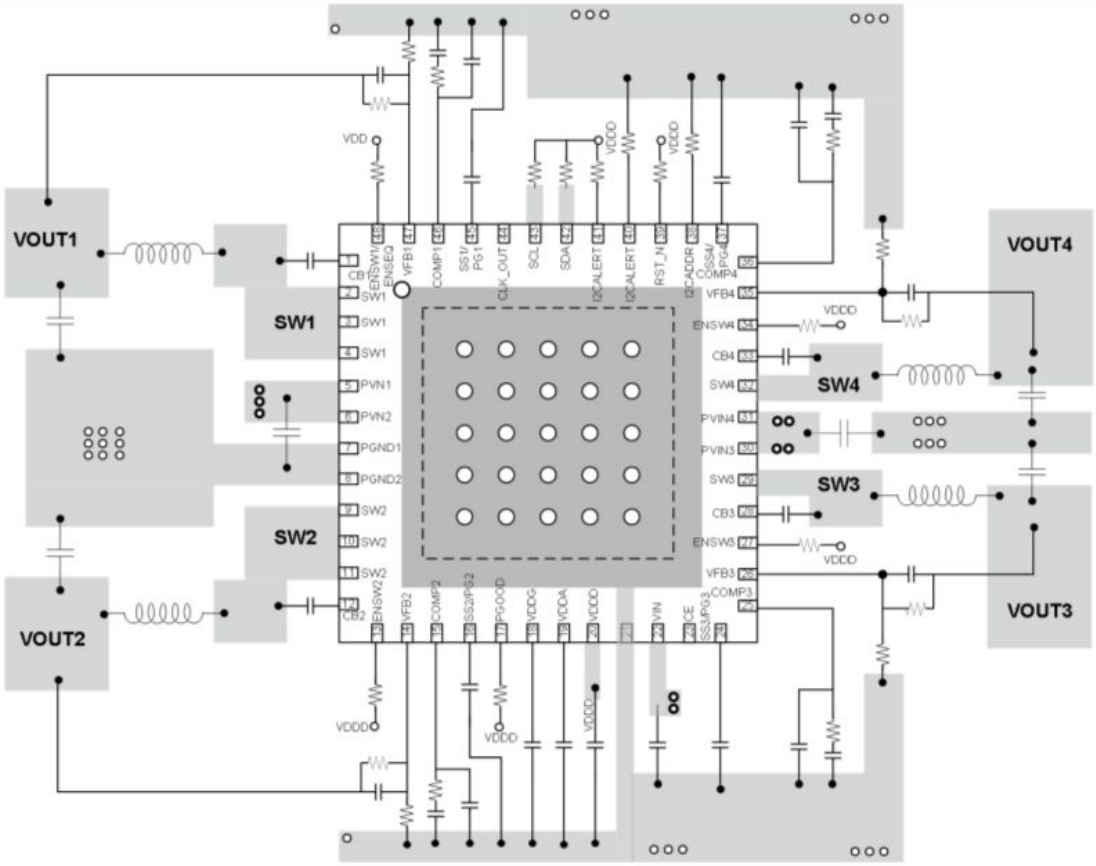
Eagle Files

1. Eagle files for motherboard part.
2. Eagle files for Krypton Board .

Files used for Testing

1. Basic VHDL code to turn LED on/off using switch

Layout for TPS65400 :-


VOUT1
VOUT2
VOUT3
VOUT4
SW1
SW2
SW3
SW4
VDD
VDDD
Connect to VIN
Connect to Ground