

Altera Cyclone IV GX Transceiver Starter Kit

1. Overview



Altera's Cyclone[®] IV GX Transceiver Starter Kit provides a low-cost platform for developing transceiver I/O-based FPGA designs. This kit includes the complete hardware and software for you to:

- Develop your FPGA design for cost-sensitive applications
- Measure the FPGA's low power consumption
- Test signal quality of the FPGA transceiver I/O pins (up to 2.5 Gbps)
- Develop and test PCI Express[®] (PCIe[®]) 1.0 endpoint x1 lane designs (~250 MBps transfer rate)

2. Specification

Featured device

- Cyclone IV GX EP4CGX15BF14C8N FPGA

Configuration status and set-up elements

- MAX[®] II CPLD EPM2210 System Controller enabling passive serial (PS) configuration from flash
- Embedded USB-Blaster[™] for using the Quartus II Programmer
- JTAG header for external USB-Blaster
- Altera serial configuration device

Clocks

- FPGA clock sources: 50 MHz, 125 MHz, and SMA clock input
- Other on-board oscillators: 6 MHz, 24 MHz, and 25 MHz

General user input/output

- **Company: Terasic**
- **Tel: +886-3-5750880**
- **Fax: +886-3-5726690**
- **Add: 9F., No.176, Sec.2, Gongdao 5th Rd, East Dist, Hsinchu City, 30070. Taiwa**

- LEDs
- Two-line character LCD display
- Push-buttons

Memory devices

- 16 MB of flash memory
- 2 MB of synchronous SRAM

Component and interfaces

- PCIe edge connector
- 10/100/1000BASE-T Ethernet PHY with RJ-45 connector or one transceiver to SMA connectors (requires a minor board modification)
- On-board power measurement circuitry

Power

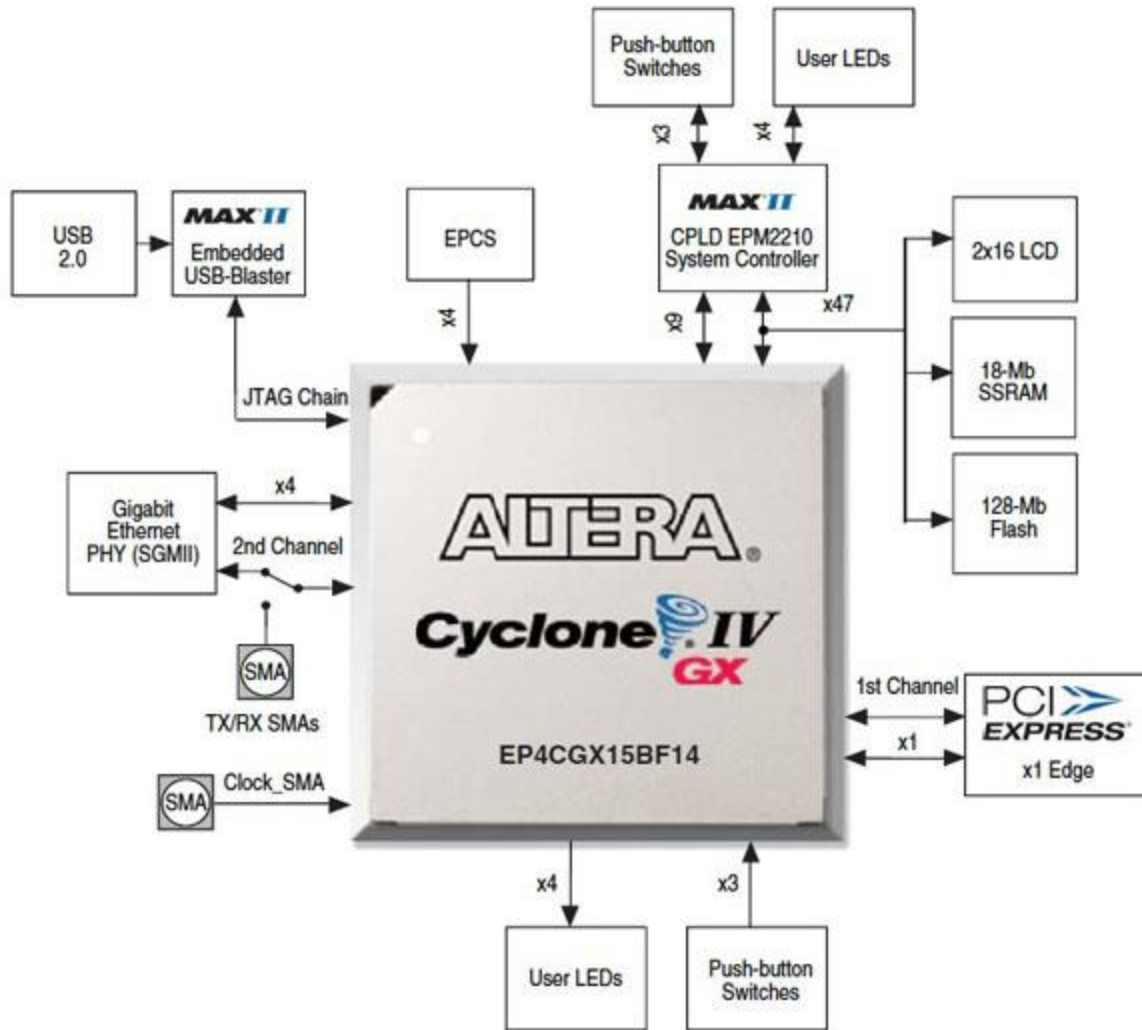
- Laptop DC input
- PCIe edge connector
- Power management solution from [Linear Technology](#)
 - Power regulators: [LT3027](#) and [LT3023](#)
 - Step-down switching regulator: [LT3510](#)
 - ADC: [LTC2418](#)

Other features

- PCIe low-profile (6.6" x 2.713") board form factor
- Restriction of hazardous substances (RoHS) compliance

Altera Cyclone IV GX Transceiver Starter Kit Block Diagram

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3. Kit content

The Cyclone IV GX Transceiver Starter Kit design examples and documentation can be downloaded from Resources. Included are the following:

- Design examples
 - Board Update Portal featuring the Nios[®] II processor and remote system update
 - Board Test System (BTS)
- Complete documentation
 - User guide
 - Reference manual
 - Board schematic and layout

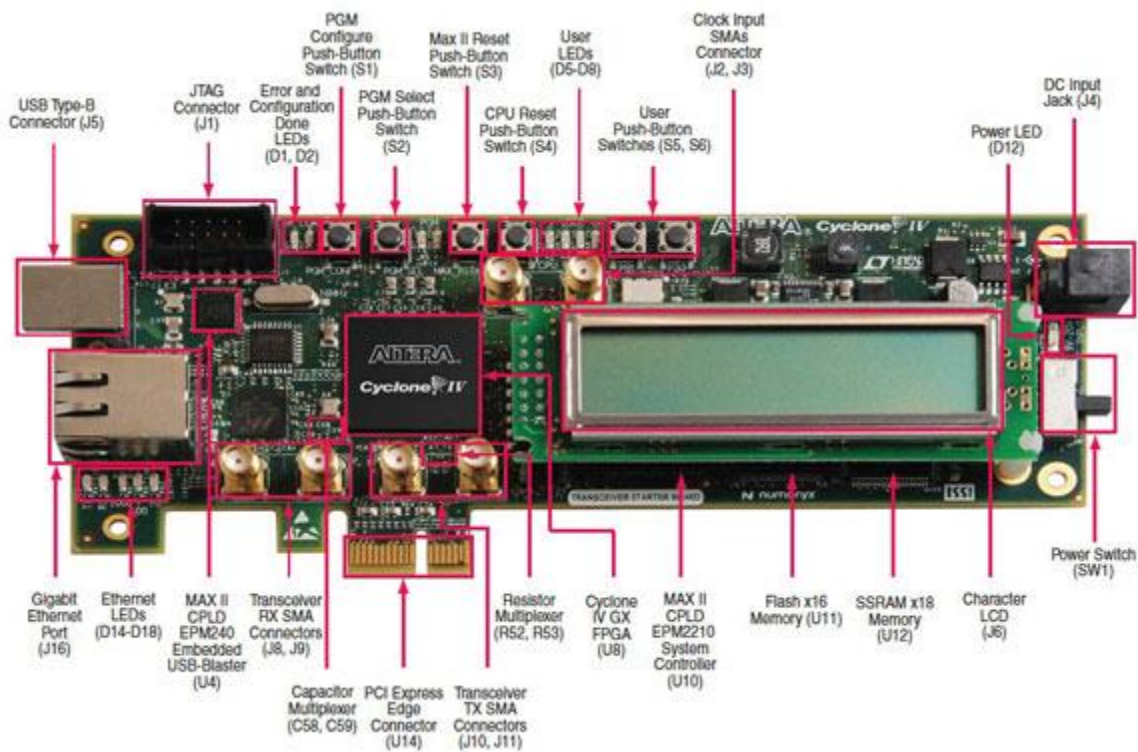
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- Bill of material

Quartus II software is required in order to create designs for the Cyclone IV GX device on this board. Cyclone IV GX devices are supported by both the subscription edition and the "no license required" web edition software, which can be downloaded by following [this link](#) . The following tools are included:

- Quartus II Software Web Edition (Windows only)
 - MegaCore[®] IP Library including PCI Express, Triple Speed Ethernet, and the Nios II processor MegaCore function (IP evaluation available through OpenCore Plus)
- ModelSim[®] -Altera Starter Edition
- Nios II Embedded Design Suite

4. Layout



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