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Stratix IV GX FPGA Development Kits

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The Altera ® Stratix ® IV GX FPGA Development Kits deliver a complete system -level design environment that includes both the hardware and software needed to immediately begin developing FPGA designs. With a PCI - SIG ®-compliant board and a 1 -year license for Quartus ® II design software, you can:

- Develop and test PCI Express ® 2.0 (up to x8 lane) endpoint and root port designs
- Develop and test memory subsystems consisting of DDR3 and QDR II+ memory
- Build designs capable of migrating to Altera's low -cost HardCopy ® IV ASICs
- Add other Stratix IV GX FPGA -supported protocol interfaces such as 10 - Gbps Ethernet, CPRI, OBSAI, SAS/SATA, Serial RapidIO ®, and many others by taking advantage of the modular capability of these boards through the high -speed mezzanine connectors and over 30 different high -speed mezzanine cards (HSMCs) available through Altera partners

Ordering Information

Table 1. Altera's Stratix IV GX FPGA Development Kits Ordering Information (2)

Ordering Code	Price	Ordering Information
DK - DEV - 4SGX230N	The **Stratix IV GX FPGA Development Kit** features an EP4SGX230N -C2 (fast) speed grade production silicon device and includes a 1 -year license for the Quartus II design software. Buy Now Buy online via Altera's eStore or contact your local Altera distributor to place your order.	
DK - DEV - 4SGX530N	The **Stratix IV GX FPGA Development Kit, 530 Edition** features an EP4SGX530N -C2 (fast) speed grade production silicon device and includes a 1 -year license for the Quartus II design software. Buy Now Buy online **via Altera's eStore or contact** your local Altera distributor to place your order.	

Note:

1. You can purchase optional high -speed mezzanine connector interface -compatible daughtercards adapters, or cables to use with your development kit.

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Development Kit Contents

The Stratix IV GX FPGA Development Kits feature the following:

- Stratix IV GX FPGA development board (see Figure 1)
  - Featured devices
    - Stratix IV GX EP4SGX230KF40C2N FPGA or,
    - Stratix IV GX EP4SGX530KH40C2N FPGA
  - Configuration status and set -up elements
    - Fast passive parallel (FPP) configuration via a MAX ® II EPM2210 CPLD and flash memory
    - On-board USB -Blaster ™ download cable using Quartus II Programmer
  - Clocks
    - On-board clock oscillators: 50 MHz, 100 MHz, 125 MHz, 148.5 MHz, 155.52 MHz, and 156.25 MHz
    - SMA connectors for external clock input
    - SMA connectors for clock output
  - General user input/output
    - LEDs
    - LCD display
    - Push-button and dual in -line package (DIP) switches
  - Memory devices
    - 512 -MB DDR3 SDRAM with a 64 -bit data bus
    - 128 -MB DDR3 SDRAM with a 16 -bit data bus
    - Two 4 -MB QDR II+ SRAMs with 18 -bit data buses
    - 64 -MB sync flash and 2 -MB SSRAM
  - Component and interfaces
    - PCI Express x8 edge connector
    - 10/100/1000BASE -T Ethernet PHY with RJ -45 connector
    - Two HSMC connectors
    - HDMI video output
    - 3G-SDI video input and output
    - Power measurement circuitry
    - Temperature measurement circuitry
  - Power
    - Laptop DC input
    - PCI Express edge connector power
    - Power measurement circuitry
  - Other features
    - PCI Express half -length, full -height (6.6" x 4.376") board format
    - RoHS compliant
- Stratix IV GX FPGA Development Kit soft content (download from Table 2)
  - Design examples
    - Board Update Portal featuring the Nios ® II processor web server and remote system update
    - Board Test System
  - Complete documentation
- Altera's Complete Design Suite (download from Altera Download Center)
  - Quartus II software includes support for Stratix IV FPGAs and HardCopy IV ASICs
    - 1-year license included
  - Nios II Embedded Design Suite
  - MegaCore ® intellectual property (IP) library includes PCI Express, Triple -Speed Ethernet, SDI, and DDR3 High -Performance Controller MegaCore IP cores
    - IP evaluation available through OpenCore Plus
- Loopback and debug HSMCs
- Power adapter and cables

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Figure 1. Stratix IV GX FPGA Development Board with an EP4SGX230N FPGA Device

Available Documentation

Table 2. Collateral for the Stratix IV GX FPGA Development Kits

Kit Name (Ordering Code)	Document	Description	Version
Stratix IV GX FPGA Development Kit **(DK - DEV - 4SGX230N)**	User Guide	Information about setting up the Stratix IV GX FPGA development board and using the included software	9.1.0
	Reference Manual	Detailed information about board components and interfaces	9.1.0
	Kit Installation (*Boards with EP4SGX230N Engineering Sample Silicon*)	Full installation of all files including reference manual, user guide, quick -start guide, BOM, layout, PCB, schematics, Board Update Portal example file, Board Test System example file, etc.	9.1.0 (1),
	Kit Installation (*Boards with EP4SGX230N Production Silicon*)	Full installation of all files including reference manual, user guide, quick -start guide, BOM, layout, PCB, schematics, Board Update Portal example file, Board Test System example file, etc.	9.1.2 (2),
	Kit Installation (*Boards with EP4SGX230N Production Silicon*)	Same description as above, but uses a later version of Quartus II software.	10.1.0 (4),
Stratix IV GX FPGA Development Kit, 530 Edition **(DK - DEV - 4SGX530N)**	User Guide	Information about setting up the Stratix IV GX FPGA development board, 530 edition and using the included software	10.0.1
	Reference Manual	Detailed information about board components and interfaces	10.0.1
	Kit Installation (*Boards with EP4SGX530N Production Silicon*)	Full installation of all files including reference manual, user guide, quick -start guide, BOM, layout, PCB, schematics, Board Update Portal example file, Board Test System example file, etc.	10.0.1 (3),

Note:

1. This kit installation works with Quartus II software version 9.1.
2. This kit installation works with Quartus II software version 9.1 service pack 2.
3. This kit installation works with Quartus II software version 10.0 service pack 1.
4. This kit installation works with Quartus II software version 10.1.

Reference Designs and Design Examples

Table 3 provides a list of Stratix IV GX designs, not delivered with the kits, but available for download.

Note: Some of the following designs may have only been tested to run on kits that have EP4SGX230N engineering sample silicon.

Table 3. Designs for the Stratix IV GX FPGA Development Kits

Design Name	Other Software Requirements (1)	Other Hardware Requirements	Availability
Serial RapidIO to TI 6488 DSP Reference Design	- Altera Nios II Embedded Design Suite - TI Code Composer Studio Software	- HSMC- to- AMC adapter - Spectrum Digital Inc. Dual TMS320TCI6488 AMC mezzanine board	Now
PCI Express High -Performance Reference Design	- Jungo WinDriver (included as part of this reference design)	- PCI Express x4 -to- x1 lane converter - Two computers, one with a PCI Express x8/x4/x1 slot	Now
POS-PHY L4 SPI -4.2 Loopback Design Example	- None	- None	Now
PCI Express to External Memory Reference Design	- Jungo WinDriver (included as part of this reference design)	- Two computers, one with a PCI Express x8/x4/x1 slot	Now
10 - Gbps Ethernet Hardware Demonstration Reference Design	- Altera Nios II Embedded Design Suite - Altera 10 -Gbps Ethernet Reference Design	- Two HSMC -to -X2 adapters - Or, two HSMC -to -CX4 adapters	Now

Note:

1. Quartus II software and the MegaCore IP library are standard software requirements for these designs.

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Related Links

- Literature for Stratix IV FPGAs
- Stratix IV Design Guidelines (PDF) application note
- Stratix IV GX Transceiver Protocols
- Partner High -Speed Mezzanine Connector Cards
- Other Stratix IV FPGA -Based Development Kits
- Jungo PCI Express WinDriver (30 -day evaluation)

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