

Preliminary Product Brief
August 2007
Ver. 0.9

DNMEG_cPCIe

DNPCIe_CBL-U, -D

Xilinx Virtex-5 Based PCIe Daughter Card with iPass Cable

Features

- FCI MEG-Array based daughter card enables 8-lane PCIe hosting of DINI ASIC Emulation products
 - Used in combination with the **DNPCIe_CBL-U** and **DNPCIe_CBL-D**
 - PCIe complaint iPASS connectors and cables
 - 3ft to 18ft cabling (1M to 6M)
- 8-lane PCI Express daughter card with Xilinx Virtex-5 FPGA
- PCIe hosting of DINI ASIC emulation products (with **DNPCIe_CBL-D**)
- PCIe peripherals to DINI ASIC emulation products (with **DNPCIe_CBL-U**)
- Emulation of PCIe to PCIe bridges
 - Dual 1/4/8-lane PCIe to 1/4/8-lane PCIe bridge
 - Triple 1/4/8-lane PCIe bridge
- Xilinx Virtex-5 LX110 (FF1513) with 670k+ ASIC gates (LSI measure)
 - 100% FPGA resources available for user application
 - PCIe controller
 - DDR2 interface
- Genesys Logic GL9714 PCI Express Physical Interface (PCIe GEN1 rev 1.1)
 - Standard 250MHz or 125MHz PIPE interface between PHY and FPGA
 - Support for emulation of power down states P0, P0s, P1, P2
- 400-pin MEG-Array (FCI)
 - 93 LVDS pairs + clocks (or 192 single-ended)
 - Host interconnect is single-ended or LVDS
 - 450MHz on all signals with LVDS (900Mb/s with DDR)
 - Reset, presence detect
 - Supplied power rails (fused):
 - +12V (24W max)
 - +5V (10W max)
 - +3.3V (10W max)
 - Reference designs for integrated I/O pad ISERDES/OSERDES
 - 10x pin multiplexing per LVDS pair
 - Source synchronous clocking
- DDR2 SODIMM (250MHz)
 - 64-bit data width, 250MHz operation

- PC2-5300
- Addressing/power to support 4GB
- DDR2 Verilog/VHDL reference design provided (no charge)
- DDR2 SODIMM data transfer rate: 32GB/s
- Alternate pin compatible memory cards available:
 - QDR SSRAM, Mictor, RLDRAM, SSRAM, DDR3, interconnect, SDRAM DRAM, FLASH, and others
- FPGA configuration via on-board FLASH
- RS232 port for embedded uP debug
- Mictor for logic analyzer debug
- Battery socket for configuration bitfile encryption
- Full support for embedded logic analyzers via JTAG interface
 - ChipScope, ChipScope Pro and other third-party debug tools
- Enough light from 16 status LED's to entertain children with shadow puppetry.

Description

Overview

The combination of the **DNMEG_cPCIe**, the **DNPCIe_CBL-U/D**, and two iPASS cables adds 1-lane, 4-lane, or 8-lane PCI Express (GEN1) to all DINI Group products that have FCI MEG-Array expansion connector. This enables any of the following functionality:

- Host a DN8000k10/DN9000k10 via PCIe

(PLACE HOLDER FOR BLOCK DIAGRAM)

- Add PCIe peripheral card to DN8000k10/DN9000k10

(PLACE HOLDER FOR BLOCK DIAGRAM)

- PCIe to PCIe bridge prototyping:
 - 1/4/8-lane to 1/4/8 lane (dual)
 - 1/4/8-lane to 1/4/8 lane to 1/4/8 lane (triple)

(PLACE HOLDER FOR BLOCK DIAGRAM)

- Prototype a PCIe controller with 32M gates of ASIC logic

(PLACE HOLDER FOR BLOCK DIAGRAM)

Virtex-5 LX110 FPGA from Xilinx

The **DNMEG_cPCIe** uses a Xilinx Virtex-5 LX110 in a FF1153 flip-chip BGA to host the PCIe controller. The LX110 has 69,120 flip-flops and 576 kbytes of block memory – plenty of resources for a feature packed 8-lane PCIe controller. Two Genesys Logic

GL9714 PHY devices provide the PCI Express cable interface. Virtex-5 GTP "RocketIO" is not used in this approach.

Memory

A single DDR2 SODIMM socket is connected to the LX110 FPGA. The socket is tested to 250MHz with a PC2-5300 DDR2 SODIMM. Standard, off-the-shelf DDR2 memory DIMM's (PC2-5300) work nicely and we can provide 512MB or 1GB versions for a small charge. The larger 2GB version is available, but not at a small charge. As with all DDR2 SODIMM sockets on DINI products, we have alternative SODIMM's that can be stuffed into these positions. Consult the factory for more details, but the list includes DDR3, FLASH, SSRAM, QDR SSRAM, RLDRAM, SDR SDRAM, mictors, interconnect, and others.

	FPGA	Speed Grades (slowest to fastest)	Slices or LE's	FF's	Gate Estimate		Max I/O's	FF's in I/O pad	Multipliers (25x18)	Memory		
					Max (100% util)* (1000's)	Practical (60% util)* (1000's)				Blocks (18kbits)	Total (kbits)	Total (kbytes)
Virtex-5	LX110	-1,-2,-3	17,280	69,120	1,110	670	800	10	64	256	4,608	576

