VC707 Ethernet Design

October 2012
# Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
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<tr>
<td>10/23/12</td>
<td>4.0</td>
<td>Regenerated for 14.3.</td>
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<tr>
<td>07/25/12</td>
<td>3.0</td>
<td>Regenerated for 14.2. Used content from AR46384.</td>
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<tr>
<td>05/08/12</td>
<td>2.0</td>
<td>Updated for 14.1</td>
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<tr>
<td>04/12/12</td>
<td>1.1</td>
<td>Minor updates.</td>
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<tr>
<td>03/09/12</td>
<td>1.0</td>
<td>Initial version for 13.4.</td>
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Overview

- VC707 Board
- VC707 Setup
- Run SGMII Ethernet Example Design
- References

Note: This presentation applies to the VC707
Virtex-7 Ethernet Capability

» VC707 Supports SGMII Capability
  - Board TX to Host

» LogiCORE Ethernet Example Design
  - RDF0164.zip
  - Available through http://www.xilinx.com/vc707
  - Content generated using AR46384

» LogiCORE IP Tri-Mode Ethernet MAC
  - See UG777 for details

Note: Presentation applies to the VC707
Xilinx VC707 Board

Note: Presentation applies to the VC707
ISE Software Requirements

» Xilinx ISE 14.3 software

Note: Presentation applies to the VC707
ChipScope Pro Software Requirement

- Xilinx ChipScope Pro 14.3 software

Note: Presentation applies to the VC707
ChipScope Pro Software Requirement

Wireshark Protocol Analyzer available at http://www.wireshark.org/

Note: Presentation applies to the VC707
Download VC707 Ethernet Design

- Unzip the VC707 Ethernet Design Files (14.3 CES)
  - Available through http://www.xilinx.com/vc707

Note: Presentation applies to the VC707
VC707 Setup

Connect a USB Type-A to Micro-B cable to the USB JTAG (Digilent) connector on the VC707 board

- Connect this cable to your PC
VC707 Setup

Connect an Ethernet cable to the VC707
- Connect this cable to your PC
- Power on the VC707 board
VC707 Setup

- Set SW2 to 01000000 (1 = on, Position 1 → Position 8)
- This sets the device to 1 Gbps and turns off the packet generator
Run Ethernet Example Design

- Open ChipScope Pro and select JTAG Chain → Digilent USB Cable… (1)
- Verify 30 MHz operation and click OK (2)

Note: Presentation applies to the VC707
Run Ethernet Example Design

➢ Click OK (1)

Note: Presentation applies to the VC707
Run Ethernet Example Design

- Right-click DEV:0 MyDevice0 (XC7VX485T) and select Configure…
- Select <Design Path>\ready_for_download\vc707_sgmii.bit

Note: Presentation applies to the VC707
Run Ethernet Example Design

- Open Wireshark and select Capture → Options…
Run Ethernet Example Design

- Select your PC’s Gigabit Ethernet connection; click on Capture filter
Run Ethernet Example Design

Type in the following filter and click OK:

Ethernet address da:01:02:03:04:05
ether host da:01:02:03:04:05

Note: Presentation applies to the VC707
Run Ethernet Example Design

» Click Start

Note: Presentation applies to the VC707
Run Ethernet Example Design

- Open your Network Connections control panel
- Right click on the Gigabit network connection and select Status
- The status dialog will show you the speed and number of packets

Note: Presentation applies to the VC707
Run Ethernet Example Design

» Wireshark should show no packets
Run Ethernet Example Design

The status dialog shows a few packets received

Note: Presentation applies to the VC707
Run Ethernet Example Design

- Set SW2 to 01100000 (1 = on, Position 1 → Position 8) for a moment to run the packet generator
- Set SW2 back to 01000000
Run Ethernet Example Design

Wireshark captures and displays the actual packets
Run Ethernet Example Design

» Select a packet in the upper panel
Run Ethernet Example Design

Use the arrow keys to move to the next packet
Run Ethernet Example Design

Viewing several packets, you can see a simple changing pattern
References
References

Tri-Mode Ethernet Media Access Controller

- Tri-Mode Ethernet MAC Product Overview
- Tri-Mode Ethernet MAC Data Sheet – DS818
  - [http://www.xilinx.com/support/documentation/ip_documentation/tri_mode_eth_mac/v5_2/ds818_tri_mode_eth_mac.pdf](http://www.xilinx.com/support/documentation/ip_documentation/tri_mode_eth_mac/v5_2/ds818_tri_mode_eth_mac.pdf)
  - [http://www.xilinx.com/support/documentation/ip_documentation/tri_mode_eth_mac/v5_2/ug777_tri_mode_eth_mac.pdf](http://www.xilinx.com/support/documentation/ip_documentation/tri_mode_eth_mac/v5_2/ug777_tri_mode_eth_mac.pdf)
Documentation

➤ Virtex-7
  – Virtex-7 FPGA Family

➤ VC707 Documentation
  – Virtex-7 FPGA VC707 Evaluation Kit
  – VC707 User Guide