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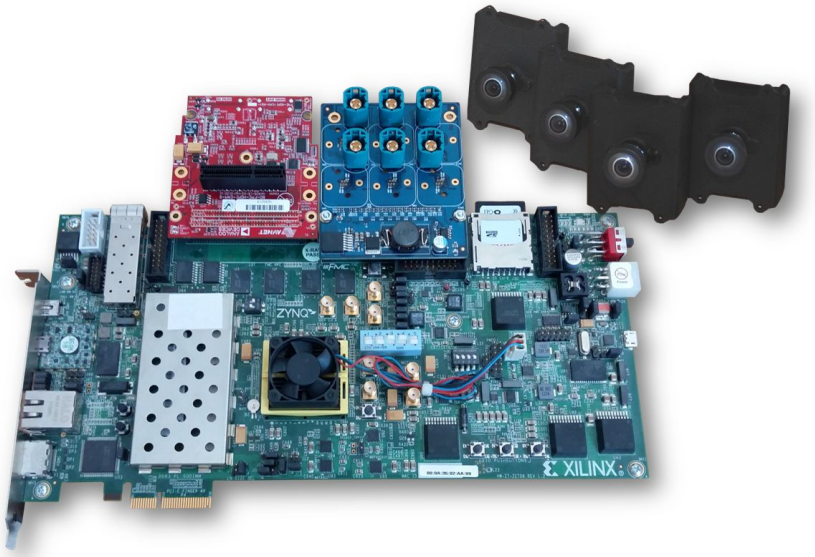

Figure 1: The logiVID-Z Vision Development Kit based on Xilinx Zynq-7000 AP SoC

Features

- Complete and flexible design platform for multi-camera vision applications
- Based on the Xilinx® Zynq®-7000 All Programmable System-on-Chip (SoC)
- Includes licensed reference SoC designs (logiADAK-VDF[1] Video Design Framework) with an integrated video processing block example:
  - video capture and display of four CAM inputs
  - capture/display of one HDMI or CAM input
- Resolutions: 1280x800 In and 1280x1024 Out
- The designs are prepared for both, hardware- and software-centric design environments:
  - Xilinx Vivado® Design Suite 2017.1, and
  - Xilinx SDSoC™ Development Environment
- Enables vision developers to quickly add their own algorithms in the provided infrastructure
- The SDSoC platform enables the complete embedded C/C++ development experience
- Runs on Linux OS and includes logicBRICKS software drivers and demo applications
- Complete hardware platform includes:
  - 1x Xilinx ZC706[2] Evaluation Kit
  - 1x Xylon LVDS receiver FMC card for up to six Xylon camera connections
  - 1x Avnet[3] HDMI Input/Output FMC module
  - 4x Xylon 1-Mpix video camera systems
  - Cables and Power Supply
- Documentation and Tech support (e-mail)

[1] *Included 1-year Xylon LVIP seat licenses*

[2] *OEM kit version without the Xilinx Vivado Design Suite.*

[3] *Avnet Part number AES-FMC-HDMI-CAM-G*

Applications

- AD/ADAS, guided robotics, drones, machine vision, AR/VR and other vision applications

General Description

The logiVID-Z Vision Development Kit provides system designers with everything they need to efficiently develop multi-camera vision applications on the Xilinx Zynq-7000 AP SoC devices. The complete hardware platform is based on the Xilinx ZC706 Evaluation Kit, which is expanded by two FMC boards to support video capturing either from the HDMI video source, or from up to four parallel Xylon video cameras. The processed video can be displayed on the HDMI monitor that connects directly to the ZC706 board.

Kit deliverables include the complete and licensed logiADAK-VDF Video Design Framework with pre-verified reference designs implemented by Xylon logicBRICKS IP cores. All IP cores are supplied with bare-metal and appropriate Linux software drivers. The provided video capture and display demo applications run in Linux operating system.

The logiVID-Z reference designs include Xylon logicBRICKS IP cores and design files prepared for the Xilinx Vivado Design Suite and the SDSoC Development environment. To provide the SDSoC users the complete embedded C/C++ development experience, the supplied SDSoC reference designs include the Sobel video filter example. This example shows kit users how to integrate their own vision processing logic between video input and video output IP cores, and how to implement it in software or in programmable logic.

The complete camera-to-display SoC designs use just a fraction of available programmable logic and significantly save the design time. Instead of starting from scratch and having to spend months designing and building a new design framework, the logiVID-Z users can immediately focus on specific vision-based parts of their next SoC design.

logiADAK-VDF Video Design Framework

The logiADAK-VDF framework includes four reference designs for use with the logiVID-Z Vision Developer Kit and the logiADAK Automotive Driver Assistance kits. To get more information about the framework, please read the datasheet: http://www.logicbricks.com/Documentation/Datasheets/IP/logiADAK-VDF_hds.pdf.

The fully functional evaluation version of the logiADAK-VDF Video Design Framework is available for download: http://www.logicbricks.com/logicBRICKS/Reference-logicBRICKS-Design/Video-Design-Framework.aspx

> The logiADAK-VDF users who do not have Xylon FMC board and cameras can evaluate the CAM-HDMI design with the Avnet HDMI Input/Output FMC board attached to the ZC706 evaluation kit.

Figures 2 and 3 show architectural details of reference designs prepared for the Xilinx SDSoC design environment.

The CAM-HDMI (Figure 2) reference design implements a single video input, which can be either the HDMI video input or the Xylon camera input, and the display output with the RGB graphic overlay. The video input can be sourced from the attached Xylon video camera, or through the HDMI video input. The Sobel filter is used as an example vision processing block that can be exchanged by the user-defined block. The filter can be implemented as software code executed on the processing system, or as an IP block implemented in programmable logic.

The FOUR-CAM (Figure 3) design implements four parallel video inputs from Xylon cameras and the display output with the RGB graphic overlay. Video inputs are stored in the video memory, and by mean of the on-board push buttons, the design user can select each of them for the single camera or all cameras full screen display output.

Designs prepared for the Xilinx Vivado Design Suite do not include the Sobel filter example and implements hardware controlled synchronization between the video input and the display output.

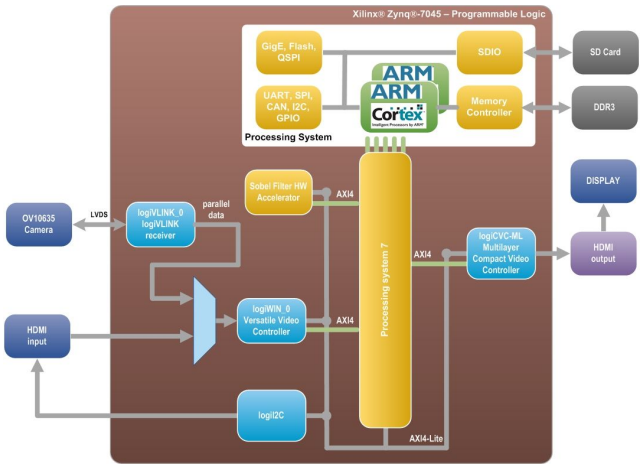

Figure 2: CAM-HDMI SoC Design

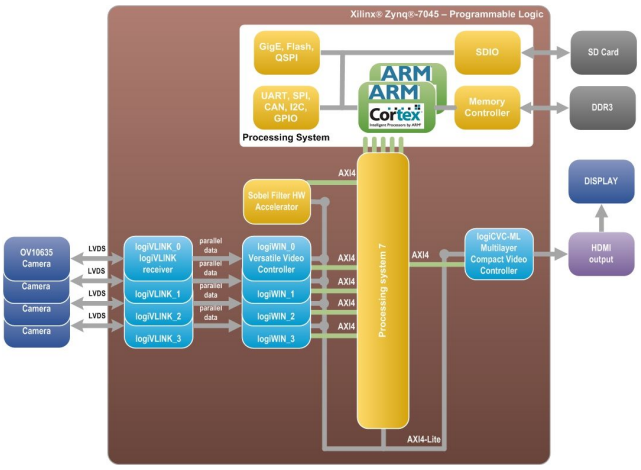

Figure 3: FOUR-CAM SoC Design

Xylon logicBRICKS IP core used in the logiADAK-VDF reference designs are licensed through the Xylon Low-Volume IP Program: http://www.logicbricks.com/logicBRICKS/Low-Volume-IP-Program.aspx.

Xylon Video Camera

Xylon video cameras, which are provided with the logiVID-Z kit, include OmniVision OV10635 1-megapixel camera sensor that combines high-definition 1280x800p30 WXGA (HD) video with the color high dynamic range (HDR) functionality, LVDS serializer (transmitter) board, the Sunex DSL219 miniature fish-eye Wide FOV lens and a short cable lead with a connector.

All camera parts are enclosed in the waterproof aluminum housing. The housing is sealed with rubber gaskets to ensure a weather-proof rating of IP67. Its rugged metal construction provides excellent lens and imager module protection and enables safe and easy installations on different vehicles (cars, robots…).

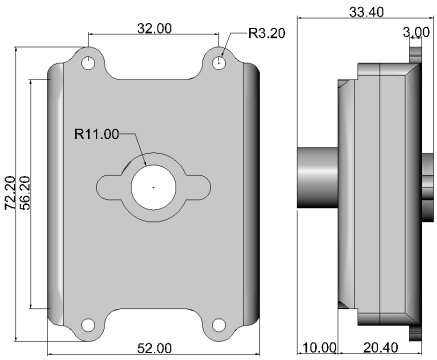

Figure 4: Xylon Video Camera Housing – All Dimensions in Millimeters

Related Design Services

Design services are available to customers interested in customization and enhancement developments based on the presented hardware and software products. For more info, please contact info@logicbricks.com

Related Xylon Products

The logiADAK is a great programmable platform for upcoming automotive driver assistance applications that require intensive real-time video processing, parallel execution of multiple advanced algorithms and versatile interfacing with sensors and vehicle's communication backbones. The abundant performance and

reprogrammability of the Zynq-7000 AP SoC enables ADAS designers to design DA/ADAS systems that outperform competing solutions and achieve a new level of system differentiation. To learn more about this product, please contact Xylon or visit our website:

Email: support@logicbricks.com
URL: http://www.logicbricks.com/Products/logiADAK.aspx

Computer vision applications require quality video input. Xylon's logiISP-UHD Image Signal Processing Pipeline IP core is a full high-definition ISP pipeline designed for digital processing and image quality enhancements of an input video stream in Smarter Vision embedded designs based on Xilinx All Programmable devices. The logiISP-UHD ISP pipeline IP core can be supplemented with the logiHDR High Dynamic Range (HDR) Pipeline. To learn more about these IP cores, please visit our website:

URL: http://www.logicbricks.com/Products/logiISP.aspx
URL: http://www.logicbricks.com/Products/logiHDR.aspx

Ordering Information

Products are available directly from Xylon. Please visit our web shop or contact Xylon for pricing and additional information:

Email: sales@logicbricks.com
URL: http://www.logicbricks.com/Products/logiVID-Z.aspx

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Related Information

Xilinx Programmable Logic

For information on Xilinx programmable logic or development system software, contact your local Xilinx sales office, or:

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Revision History

Version	Date	Note
1.00	14.10.2016.	Initial release.
1.10	19.10.2017.	Updated the logiADAK-VDF deliverables: the latest Xilinx tools, logiVIOF library, new four camera stitching feature.