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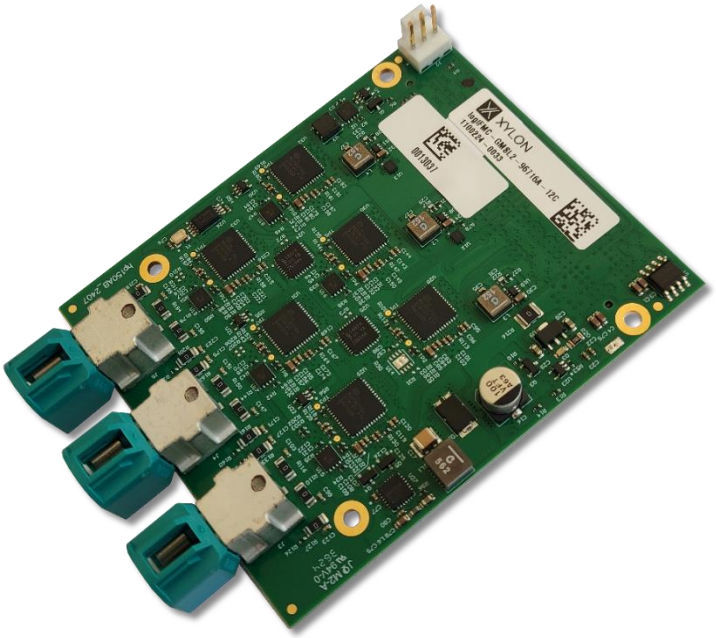

Figure 1: logiFMC-GMSL2 12-Ch GMSL2 FMC Daughter Card

Features

- FPGA Mezzanine Card (FMC+) with support for twelve[1] (12) video camera connections
- Twelve video channels are routed through three Rosenberger® HFM® (AMS29D-40MZ5-Z) connectors
- Compatible with Gigabit Multimedia Serial Link 2 (GMSL2) from Analog Devices
- Integrates six (6) MAX96716A GMSL2 deserializers (3 – 6 Gbps)
- Converts GMSL2 serial links to MIPI® CSI-2 parallel camera interfaces
- 6x four-Lane D-PHY MIPI CSI-2 v1.3 Video outputs. D-PHY v1.2 at 80Mbps - 2.5Gbps/lane
- Supports RAW8/10/12/14/16/20, RGB565/666/888,YUV422 8-/10-Bit, User-Defined, and Generic Long-Packet Data Types
- One multi-function (MFP) pin from each GMSL2 deserializer is routed via HSPC connector to the SoC to enable central time synchronization of all connected video cameras or similar design requirements
- Other MFP pins can be software controlled via the I2C expander
- Incorporates HSPC FMC connector (ASP-184330-01)
- Compatible with AMD® Versal™ AI Edge Series VEK280[2] Evaluation kit and other evaluation kits utilizing HSPC FMC connectors
- On-board I2C GPIO expander enables simple configuration and power supply control
- Programmable power supply supports cameras with different power requirements
- Info EEPROM contains card's identification and configuration data
- Board dimensions 85mm x 69mm

[1] *Due to different FPGA/SoC to FMC connection schemes applied on different hardware platforms, the number of supported GMSL2 channels on a specific platform may be lower than 12. Board users are advised to check the number of usable channels for the specific hardware setup.*

[2] *This product enables connection of 12 video cameras to the AMD VEK280 evaluation kit. Please ensure that you review AMD documentation for potential limitations related to your specific SoC and board configuration.*

Applications

The logiFMC-GMSL2-96716A-12C GMSL2 (hereafter referred to as the logiFMC+ GMSL2) Video FMC+ Daughter Card can be used in a broad range of video and vision AI applications, including machine vision, surveillance, endoscopy, UAV imaging, multi-camera ADAS, automated driving, and many other applications.

General Description

Xylon's logiFMC-GMSL2-96716A-12C GMSL2 12-Channel GMSL2 FMC+ mezzanine card supports Gigabit Multimedia Serial Link (GMSL2) from Analog Devices, which is one of the most popular automotive high-speed serial links for in-vehicle video, audio, and communication data stream transfer. The card is primarily designed to enable quick prototyping and evaluation of industrial, medical, defense, automotive and similar video and vision AI applications. It enables easy interfacing of up to twelve video cameras to hardware boards with the AMD FPGA and adaptive SoC based video and vision processors.

The logiFMC+ GMSL2 mezzanine card integrates six (6) MAX96716A deserializer chips (max. 6 Gbps per GMSL2 link). Each deserializer supports two GMSL2 inputs converting them into MIPI Camera Serial Interface (MIPI CSI-2) output of up to 4 MIPI lanes.

The logiFMC+ GMSL2 FMC mezzanine card is compatible, and can support all 12 video channels, with the existing AMD VEK280 evaluation platform that features FMC+ board-to-board connector. It may also be used with the other FMC+ compatible AMD and third-party evaluation platforms. In this case, however, the exact number of available channels may be smaller and depends on carrier board pinout and capabilities.

The logiFMC+ GMSL2 FMC mezzanine card uses a single HSPC FMC connector with 560 pins arranged in a 14x40 array.

The logiFMC+ GMSL2 is assembled with the Rosenberger quad HFM High-Speed FAKRA-mini connectors that saves installation space and enables four coax cable video connections per a single connector.

Functional Description

The Figure 2 presents the FMC card’s internal structure. The main functional blocks are:

- GMSL2 deserializers
- I2C GPIOs
- Info EEPROM
- Protection EEPROM
- Mode selection DAC
- FMC connector
- Video connectors
- Power supply

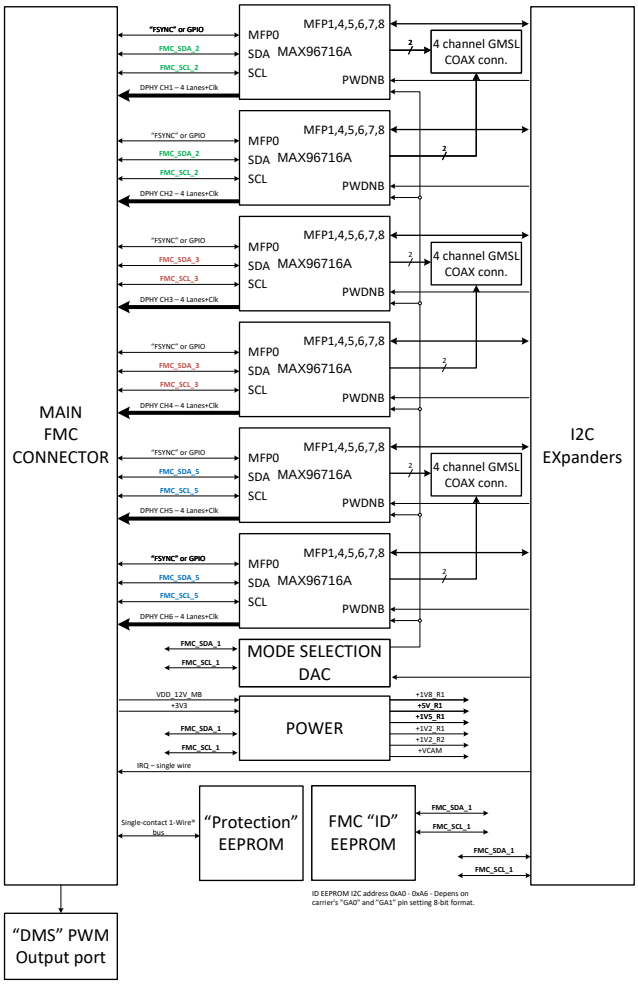

Figure 2: logiFMC+ GMSL2 Block Diagram

GMSL2 Deserializers

The logiFMC+ GMSL2 board integrates six GMSL2 deserializer chips, which must be initialized before the use.

I2C GPIOs

I2C General Purpose IOs enable easy programming of the GMSL2 deserializer chips, mode selection DAC and the power supply controls.

Info EEPROM

Programmed by card's identification and configuration data in accordance to the IPMI format, the on-board non-volatile EEPROM memory assures full compliance with the VITA 57.1 standard.

Protection EEPROM

Non-volatile EEPROM memory with unique 64-bit ROM registration number. Contains 512-bit SHA-1 engine for computing message authentication codes and generation of secrets. Directly connected to the FMC connector giving the user an ability to protect their IP cores.

Mode Selection DAC

On-board Digital-to-Analog Converter (DAC) can be programmed to define different power up GMSL2 deserializers' operation modes.

FMC Connector

The logiFMC+ GMSL2 mezzanine card utilizes a single HSPC FMC connector (ASP-184330-01)

Video Connectors

The assembled Rosenberger quad HFM High-Speed FAKRA-mini connectors save installation space and enables four coax cable video connections per a single connector.

Power Supply

Provides all voltages necessary for a proper FMC card's operation. Integrated regulated power supply enables software controller powering of different camera types.

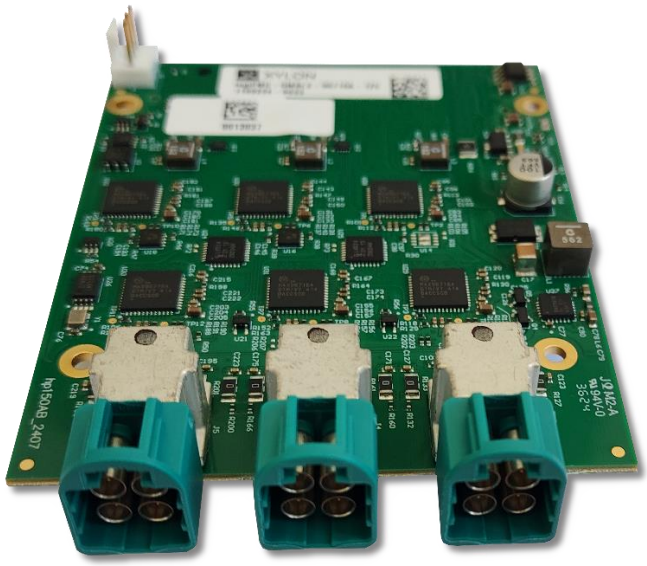

Figure 3: Xylon FMC+ Card with the Rosenberger Quad HFM High-Speed FAKRA-mini Connectors

Available Support Products

Xylon provides the complete AI framework kit based on the AMD Versal AI Edge Series VEK280 SoC evaluation board expanded by Xylon logiFMC+ card and Xylon video cameras. This complete framework enables system designers to jumpstart their next edge AI design and to focus on vision application's specific parts. To find out how to quickly utilize the logiFMC+ GMSL2 FMC card, please contact Xylon or visit the web:

Email: sales@logicbricks.com
URL: https://www.logicbricks.com/Solutions/Xylon-AI.aspx

Ordering Information

This product is available directly from Xylon. Please visit our web shop or contact Xylon for pricing and additional information:

Email: sales@logicbricks.com
URL: https://www.logicbricks.com/Products/logiFMC-GMSL2-96716A.aspx

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Related Information

AMD

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

Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
Phone: +1 408-559-7778
Fax: +1 408-559-7114
URL: www.amd.com

Analog Devices

For information on video high-speed serial links from Analog Devices:

Analog Devices
One Analog Way
Wilmington, MA 01887
URL: www.analog.com

Revision History

Version	Date	Note
1.0	01.10.2024.	Initial internal release.