Microsemi PolarFire® and SmartFusion®2/IGLOO®2 FPGAs

Infrared Camera

Head-Up Display

Medical Imaging

Digital Signage

Drone Camera

Human Machine Interface

Machine Vision

Driver Assistance System

Thermal Imaging

Microsemi.

a **Microchip** company

Imaging and Video Solution with Microsemi FPGAs and SoCs

Microsemi provides a complete, easy-to-use development environment for designing low-power and secure video processing applications. The solution includes an IP suite with modular IP, and FPGA mezzanine card (FMC) for the SmartFusion2 advanced development kit, and a software GUI. The IP suite currently supports PolarFire, SmartFusion2 SoC, and IGLOO2 FPGA product families.

Key Features

MIPI CSI-2 or Parallel Sensor FMC daughter card options
(AR330 Image Sensor Board included)

- Modular IP suite
- Support for MIPI CSI-2 or parallel sensor interfaces
- Display interface for 7:1 LVDS or HDMI
- The most secure FPGA to protect your design IP
- Easy-to-use software GUI for real-time audio and video configuration

Solution Overview

Hardware

- Imaging and video FMC daughter card with camera module options
- PolarFire evaluation kit (Sold separately and includes a one-year Gold license of Libero® SoC PolarFire software)
- SmartFusion2 advanced development kit (Sold separately and includes a one-year Gold license of Libero SoC software)

IP Suite

The following imaging and video processing IP cores are included in Libero SoC PolarFire and Libero SoC,a comprehensive software toolset for designing with Microsemi FPGAs and SoC FPGAs.
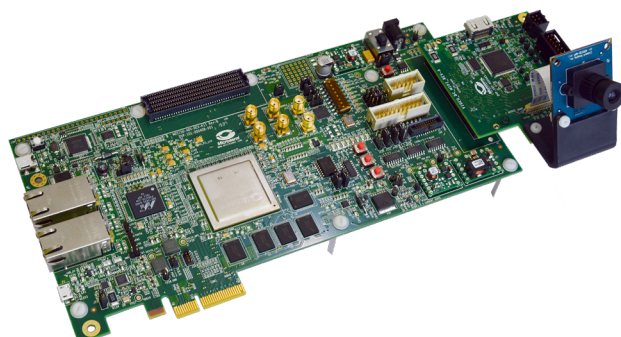
The IP suite supports PolarFire, SmartFusion2, IGLOO2, and RTG4 product families.

- Sensor interface—Parallel, MIPI CSI-2 (RX and TX)
- Bayer conversion
- Color-space conversion
- Image-edge detection
- Video scaler
- Alpha blending and overlay
- Image sharpening filter
- Image de-noising filter (under development)
- Display control (LVDS and parallel RGB-HDMI)
- Source code in Verilog (requires licensing fee)

Imaging and Video IP Cores in Libero SoC Catalog

Software GUI

Enables video and audio configurations. The GUI supports the following demos:

- Camera sensor to display
- Image edge detection
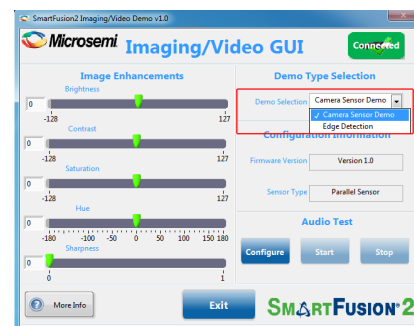

Software GUI for Imaging and Video Kit

Camera/Display Signal Chain

Microsemi imaging and video solutions provide IP cores and designs that are optimized for PolarFire, SmartFusion2 SoC FPGAs, and IGLOO2 FPGAs. These IP cores and designs are production-ready, and are used to implement the blocks that are essential to the camera/display signal chain architecture.
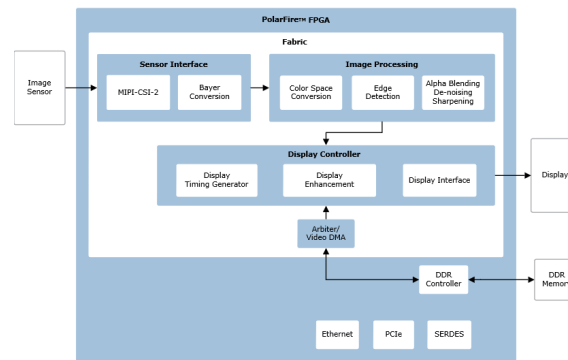
I. Sensor Interface Block

- Supports multiple sensor interface types
- On-chip image sensor programmability
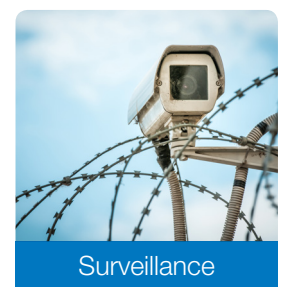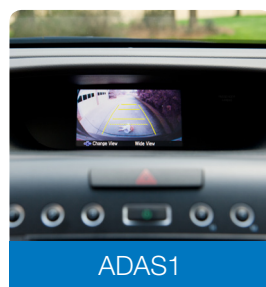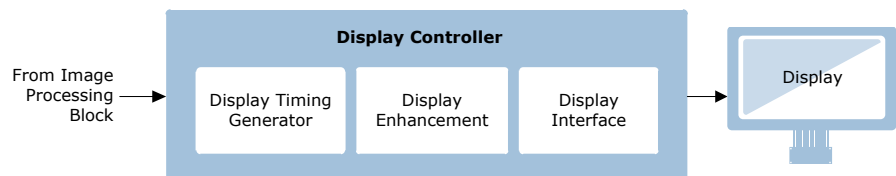- CSI-2 receiver decoder IP supports multiple lanes 1, 2, and 4
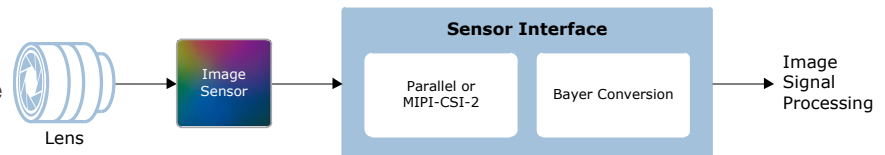
II. Image Processing Block

- Per-pixel alpha blending (overlay) and global alpha
- 8, 10, 12, and 16 bits-per-color component input and output
- Supports 3 × 3 2D median filtering
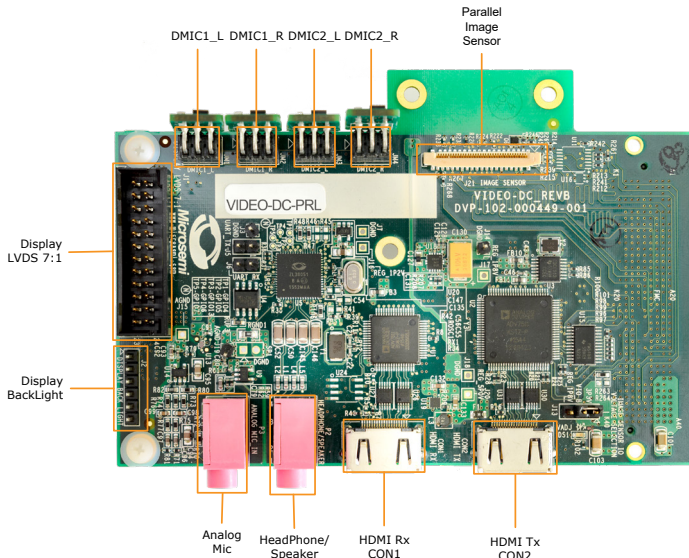- Programmable gain for edge directions

III. Display Interface Block

- Supports LVDS 7:1
- LVDS transmit clock automatically aligned to data
- User-configurable display enhancement IP block
- Embedded and separate sync signals
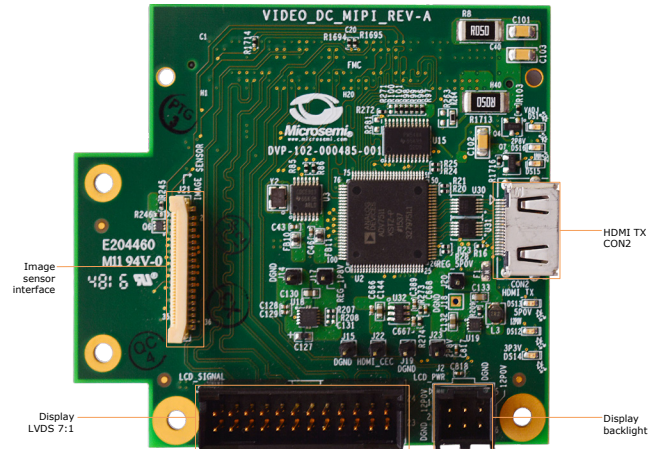- Supports RGB parallel and YUV (444 and 442 formats)

Drone Camera   ADAS1   Machine Vision   Thermal Imaging   Surveillance

1. Advanced Driver Assistance Systems (ADAS).

Imaging and Video Solutions with Microsemi FPGAs and SoCs

Imaging and Video FMC Cards

Imaging and Video FMC for Parallel Camera sensor

Imaging and Video FMC for MIPI CSI-2 Camera Sensor

- Flexible image-sensor interface supporting multiple camera-sensor options to connect to the kit
- On-board LVDS 7:1 connector and HDMI interface for display connectivity
- FMC connector compatible with PolarFire evaluation kit and SmartFusion2 advanced development kit

Description	Ordering Information
Imaging and video FMC with parallel sensor interface camera module	VIDEO-DC-PRL
Imaging and video FMC with MIPI CSI-2 sensor interface camera module	VIDEO-DC-MIPI
PolarFire evaluation kit	MPF300-EVAL-KIT-ES
SmartFusion2 advanced development kit	M2S150-ADV-DEV-KIT
Imaging and video IP suite, RTL source	VDSOLCores-RM (node-locked license) VDSOLCores-RMFL (floating license)

For more information about imaging and video solutions, visit: http://www.microsemi.com/products/fpga-soc/imaging
Send your queries and comments to: imaging@microsemi.com

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