Imaging and Video Solution

Microsemi SmartFusion®2 SoC FPGA and IGLOO®2 FPGA

Infrared Camera

Head-up Display

Medical Imaging

Digital Signage

Drone Camera

Human Machine Interface

Machine Vision

Driver Assistance System

Microsemi

Power Matters.™

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 comprises of an IP suite with modular IP, a field programmable gate array (FPGA) mezzanine card (FMC) for the SmartFusion2 Advanced Development Kit, and a software GUI.

Key Features

- Modular IP suite
- Support for parallel, MIPI CSI-2, and HiSPi sensor interfaces
- Display interface for 7:1 LVDS
- Audio-processing
- Low-power, security, and reliability
- Easy-to-use software GUI for real-time audio and video configuration

Imaging and video FMC and SmartFusion2 Advanced Development Kit

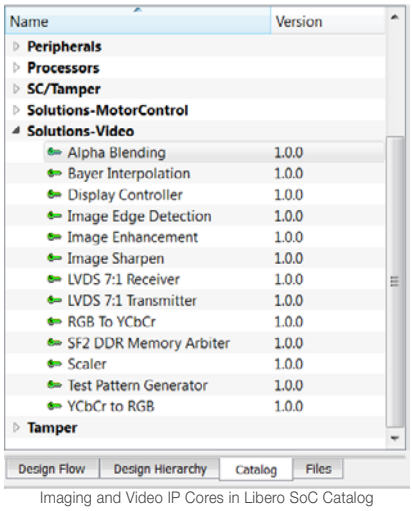
Solution Overview

Hardware

- Imaging and video FMC daughter card with camera module options
- SmartFusion2 Advanced Development Kit[1]

IP Suite

- Imaging and video processing IP cores in Libero® SoC[2]:
  - Sensor interface – Parallel, MIPI CSI-2, and HiSPi
  - Bayer conversion
  - Color-space conversion
  - Image-edge detection
  - Video scaler
  - Alpha blending and overlay
  - Image sharpening filter
  - Image de-noising filter
  - Display pattern generation
  - Display enhancements
  - Display control (LVDS and Parallel RGB-HDMI)
- Obfuscated IPs and reference design (provided for free)
- Source code in Verilog (licensing fee required)



Imaging and Video IP Cores in Libero SoC Catalog

Software GUI

- Enables video and audio configurations
- GUI communicates with IP blocks through SmartFusion2 ARM® Cortex®-M3 processor
- Supports the following demos:
  - Camera sensor to display
  - Image edge detection

Software GUI for Imaging and Video Kit

Drone Camera

ADAS[3]

Machine Vision

Thermal Imaging

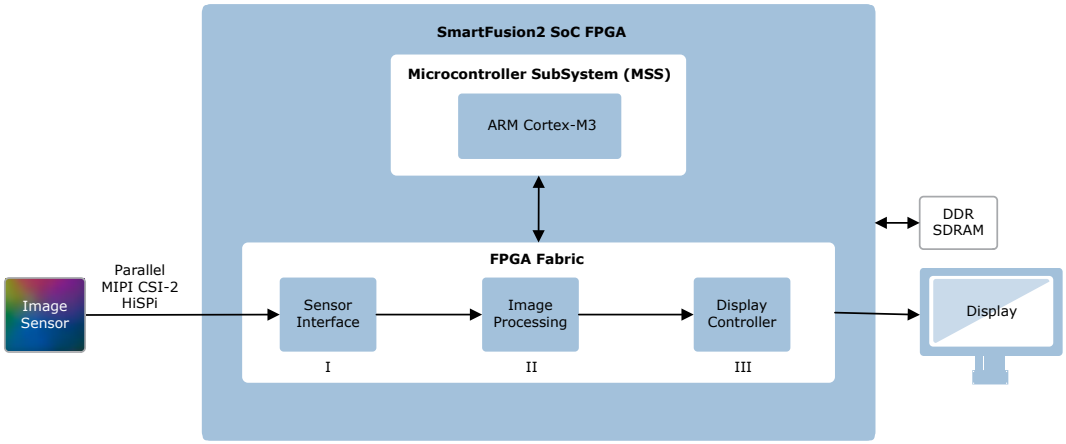
Surveillance

1 Advanced development kit must be purchased separately; it comes with one-year free platinum license for the Libero System on Chip (SoC) software
2 Microsemi Libero SoC is a comprehensive software toolset for designing with Microsemi FPGAs and SoC FPGAs
3 Advanced Driver Assistance Systems

Imaging and Video Solution with Microsemi FPGAs and SoCs

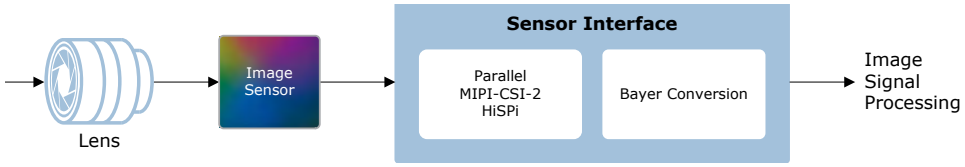
Camera/Display Signal Chain

Microsemi imaging and video solution provides IP cores and designs which are optimized for SmartFusion2 SoC FPGAs and IGLOO2 FPGAs. These IP cores and designs are production ready, and are used to implement the blocks which are essential to the Camera/Display Signal Chain architecture.



I. Sensor Interface Block

- Supports multiple sensor interface types
- On-chip programmability of image sensor



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)