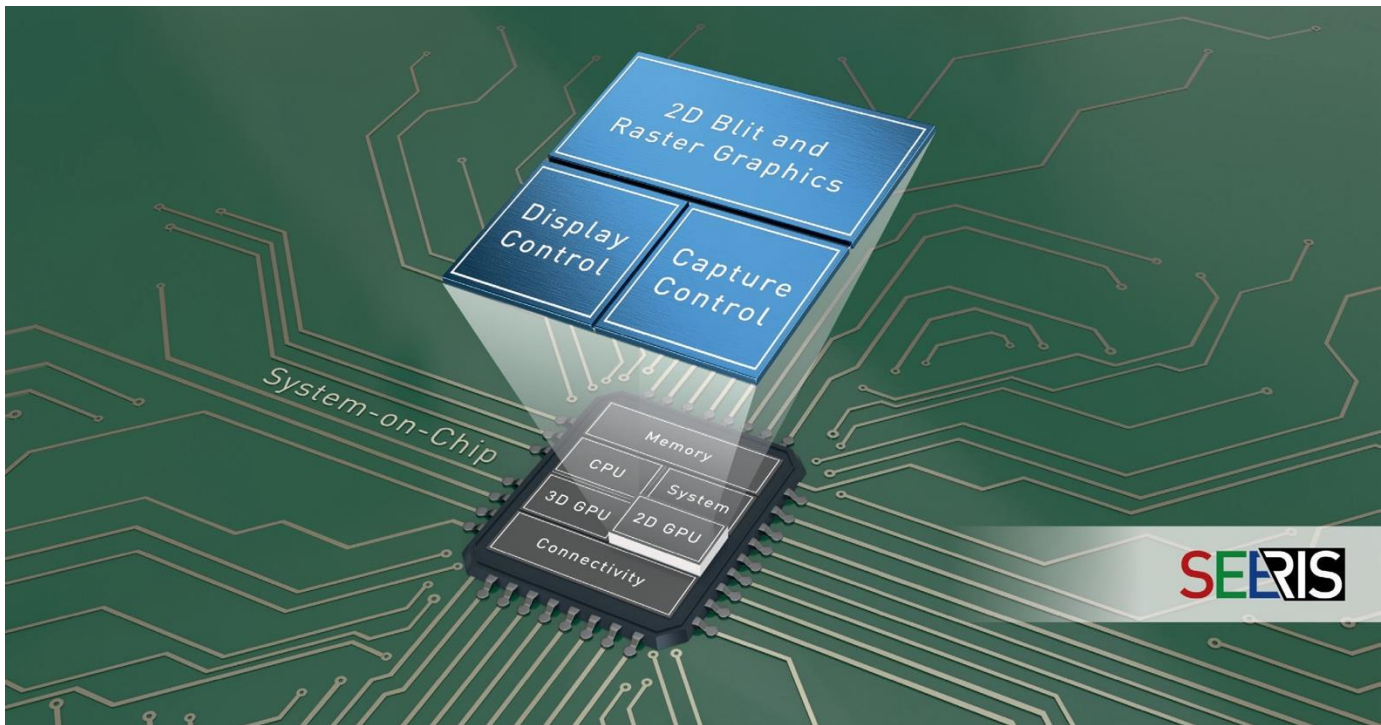


# SEERIS™ Graphics IP

## Scalable Building Block Concept



### ■ Unified Engines for Graphics, Display and Capture

The SEERIS™ 2D Graphics IP is a building block concept combining a collection of graphics processing units with focus on 2D operations, display control and video capture which can be combined on a system level to a more complex graphic subsystem. Implemented as a high-quality, synthesizable Soft IP, it allows an easy adaption to existing semiconductor technologies.

With its generic, flexible and silicon-proven concept it is made for a wide range of System-on-Chips (SoCs) and is of working with different types, sizes and resolutions. In total over 10 different variants for application processors, GPUs, MCUs, Codecs and GDCs are used for in-house and several external customer projects. Initially developed for automotive applications with additional features to support safety critical use cases, it is used and suitable for many other applications. Therefore, the SEERIS™ 2D Graphics Engine IP is continuously updated with new technologies and features.

### ■ Applications:



#### Automotive

- Cluster and HUD
- Multimedia and Infotainment
- Driver Assistance Systems



#### Consumer

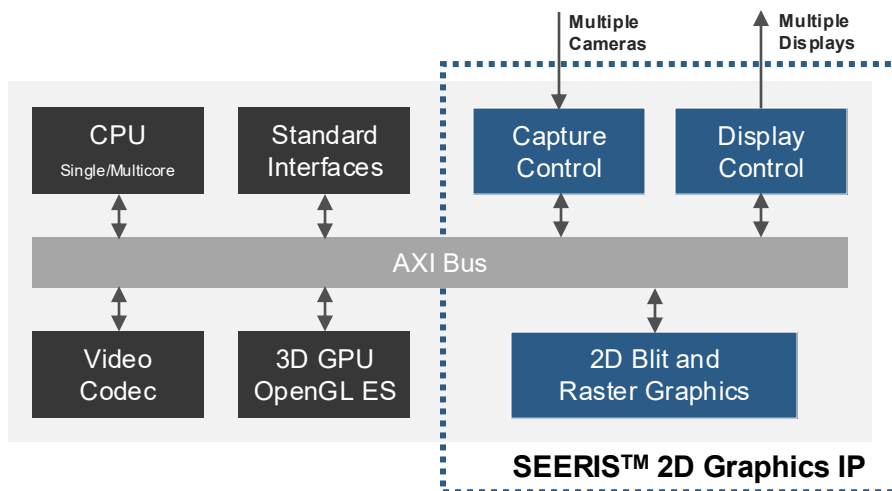
- Smart Devices
- Digital Cameras
- Internet of Things



#### Embedded

- Connected Home
- Healthcare
- Home Electronics

## ■ SoC Design Architecture



## ■ Architecture

- All buffer formats 100% compatible
- Flexible pixel formats (1 to 32 bpp; any bit width per channel)
- YUV support (packed, planar, 4:4:4, 4:2:2, 4:2:0, progressive, interlaced)
- Dynamic re-configuration of processing units
- Ready to support standards (i.e. OpenWF)
- Command sequencer included

## ■ Display

- Scan directions: 90/180/270° rotation, horizontal/vertical flip
- Multiple layers (alpha blend) with configurable mapping
- Scaling and warping on-the-fly (e.g. windshield correction)
- Image compression and decompression on-the-fly
- Special safety features
- Dual display modes and programmable timing generators

## ■ Blit

- Fast single pass blit operations
- Scaling & rotation
- Perspective warping (simple 3D effects = "2.5D")
- Arbitrary warping (e.g. for lens distortion removal or HuD)
- High quality re-sampling (super-sampling, anisotropic)
- Image compression and decompression
- Programmable FIR filter (blurring, sharpening, etc)

## ■ Capture

- All common input capture formats supported (e.g. ITU656)
- Down-scaling, de-interlacing, histogram measurement and color correction unit
- Support for fractional ring buffer size (optimized memory layout)

