New Imager Modules and Tools Enable Bringing High-Quality Vision Systems to Market Quickly

Ganesh Narayanaswamy
Sr Business Marketing Manager
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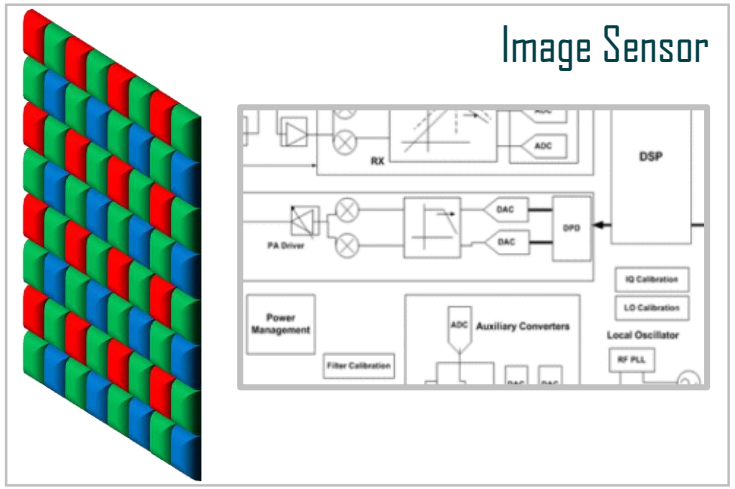
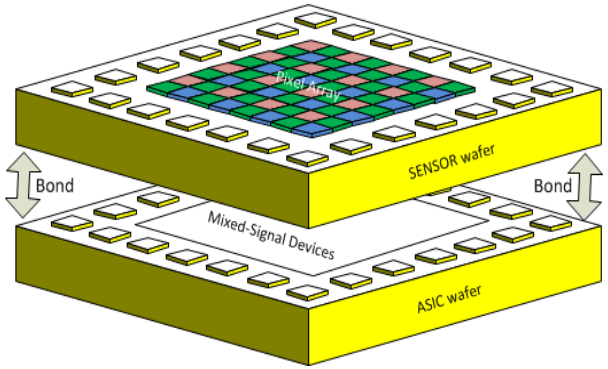
CMOS Image Sensors
Simple Function, Complex Edge Semiconductor



Connectivity



Typical CMOS Image Sensor Today

- An Intricate Optical + Electrical + Mechanical Datapath
- Complex Mixed Signal Silicon
- High-Speed Connectivity

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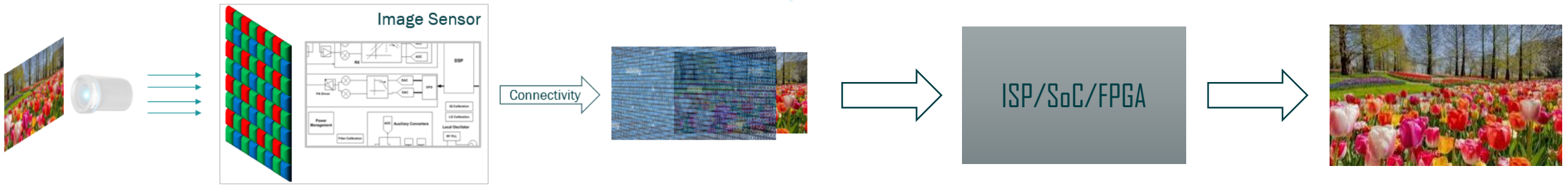
CMOS Image Sensors
Take Considerable Time to Integrate into the System



A Myriad of Issues

Hardware
- Lens Choice, Sensor CRA
- Connectivity, Connectors, Connection Distance
- .....

Software
- Configuration & Tuning – Setting Up the Sensor
- Pre-processing & Delivery

Vision System Development

Development Costs

Time To Market

What If.....

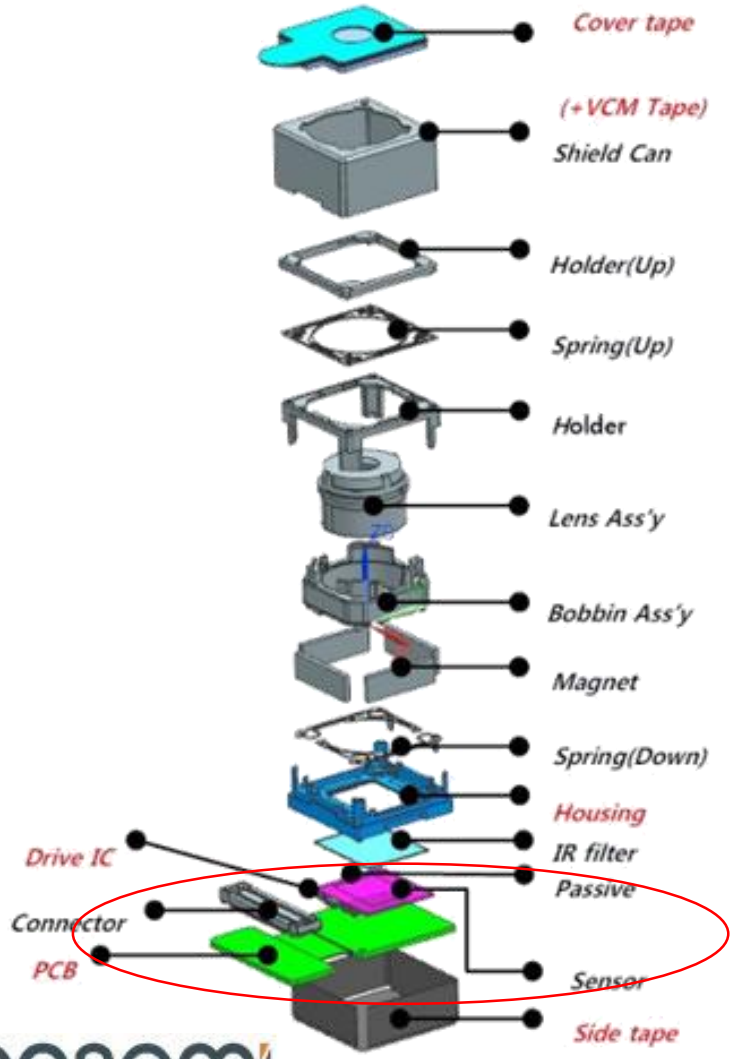
Optical Input → Electrical Output was available as a single entity?

A software system that provided sensor tuned Libraries?

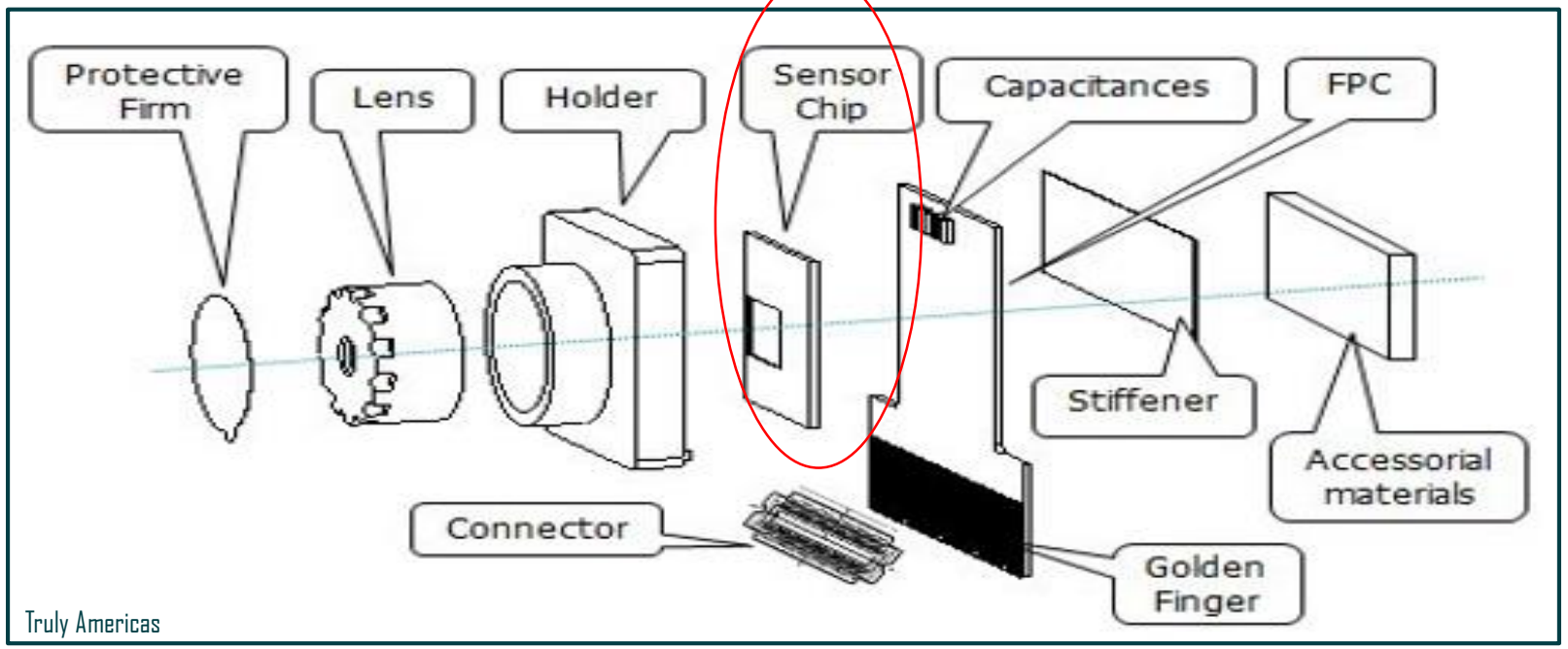
A system available to fine tune sensors quickly depending on applications?

All at an affordable development cost, fast TTM & less resources?

Imager Modules
A Complex System of Optical, Electrical & Mechanical Devices

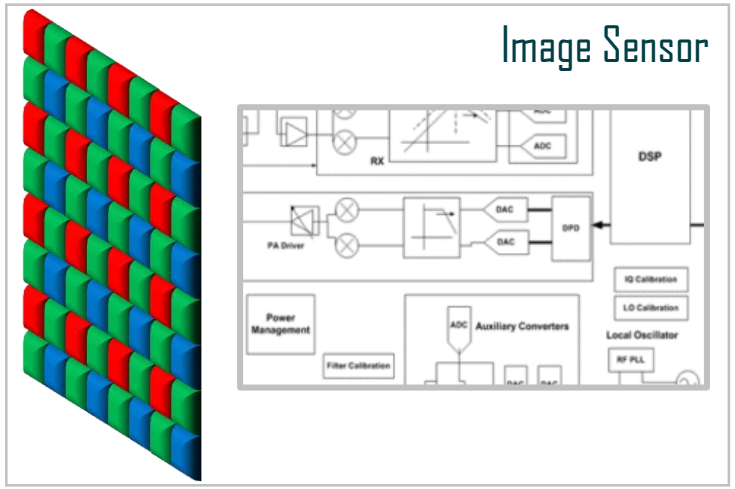


I.M

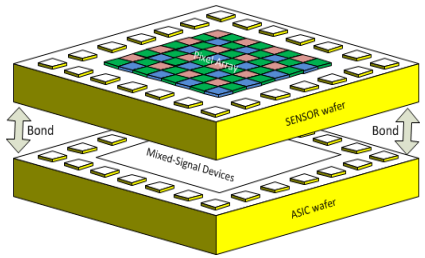


Absence of an Integrated Module Presents Significant Challenges

High-Speed Connectivity



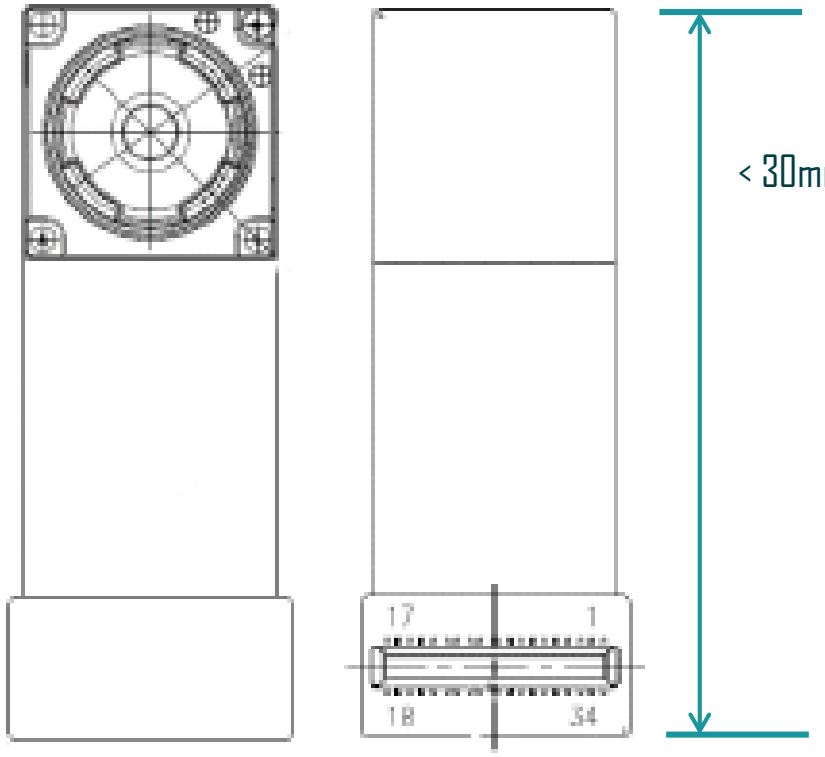
- 8MP/4K Sensor – 5 Gb/s @ 60 fps
- 13MP Sensor – 8 Gb/s @ 60 fps



Demands

- High-Speed Serialized Traffic
- Robust
- Minimal Crosstalk
- Low Energy Loss

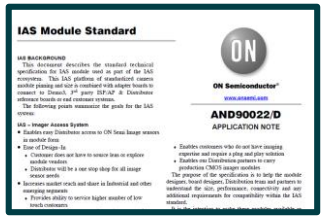
onsemi Imager Access System (IAS) with Imager Module & Connectivity



- Complete Imager Module

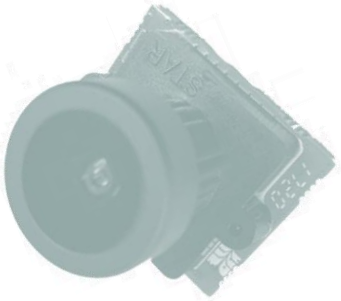
- 34-Pin Standardized Connector
- High-Speed MIPI Interface
- Small Footprint

HiRose Connector
BM20B-34DP-0.4V


IAS Module Standard

ON Semiconductor

AND90022/D
APPLICATION NOTE



Defined Product Development Ease, Increased Reliability

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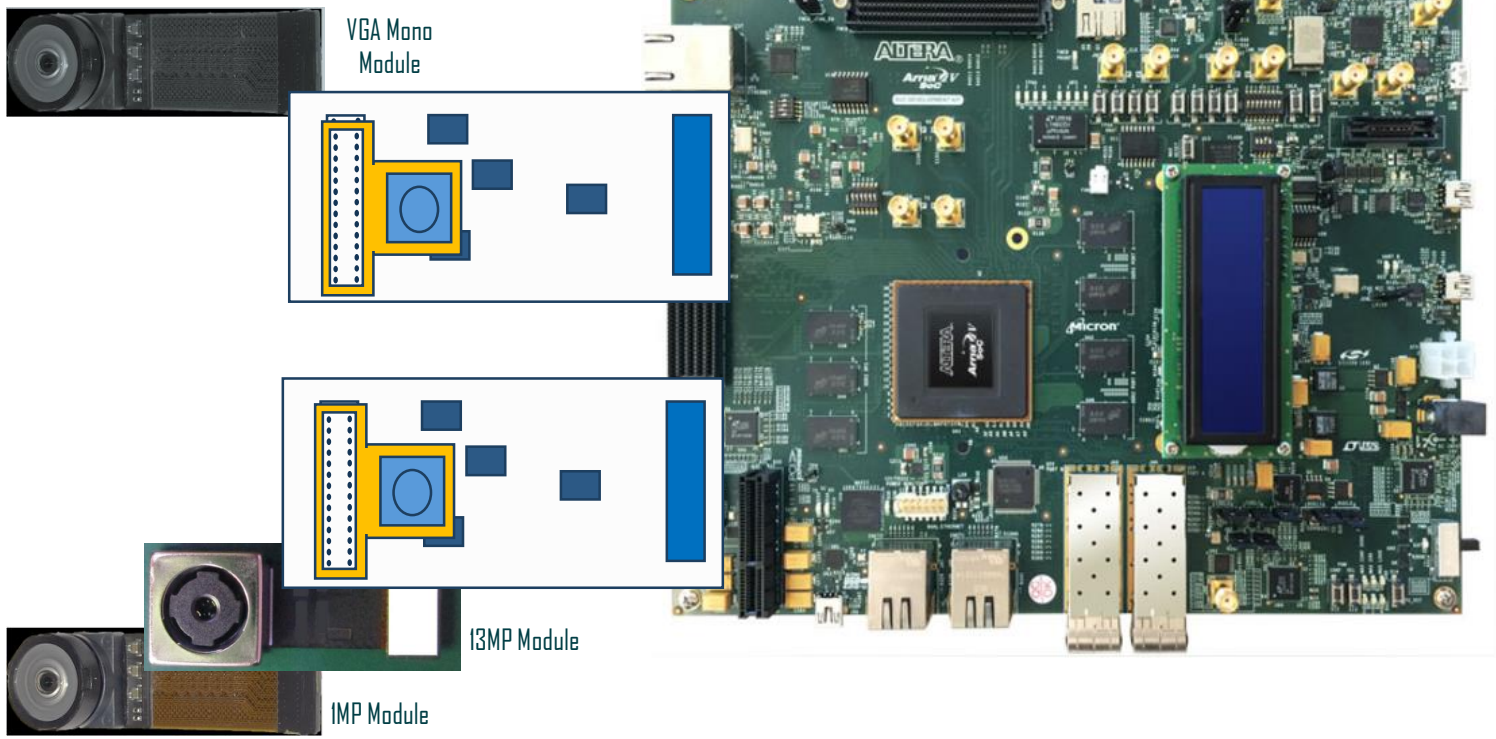
IAS Modules Enable Not Just One Product BUT a Platform



Single Processing Board
Same Camera I/F

Significant Reduction of HW Development Costs
Faster Time To Market

Examples

AP-Vision-ARX3A0-55

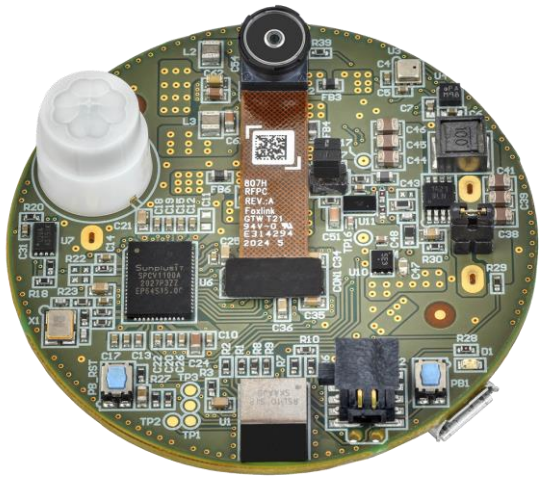
560 x 560 @ 360 fps
Fixed Focus F#2.0 49 deg FOV
Length 21.9 mm

AP-Vision-AR0430-54

2316 x 1746 @ 120 fps
Fixed Focus F#2.4 82 deg FOV
Length 23.5 mm

AP-Vision-AR1335-74

4208 x 3120 @ 30 fps
Fixed Focus F#2.0
AF 64 deg FOV



AR1335

AR0234

AR23ZWDR

System Level Challenges

Configuration

Register setup, etc.

Calibration

Dependent on Sensor + Lens + IRCut Filter + ISP

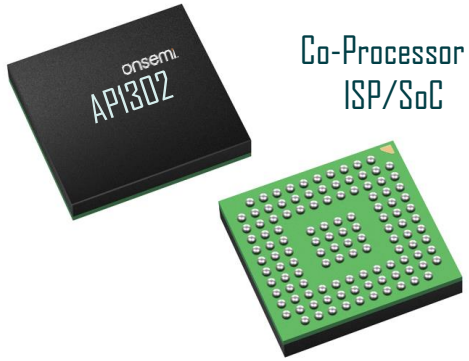
Tuning

Addressing Application/Scene requirements

How Can We Bring All These Together?

onsemi Development Platform Eases Camera System Design

onsemi CIS



Co-Processor / ISP/SoC

Configuration

Basic setup of specific registers & file handling

Calibration

Dependent on Sensor + Lens + IRCut Filter + ISP
Imager module specific functions

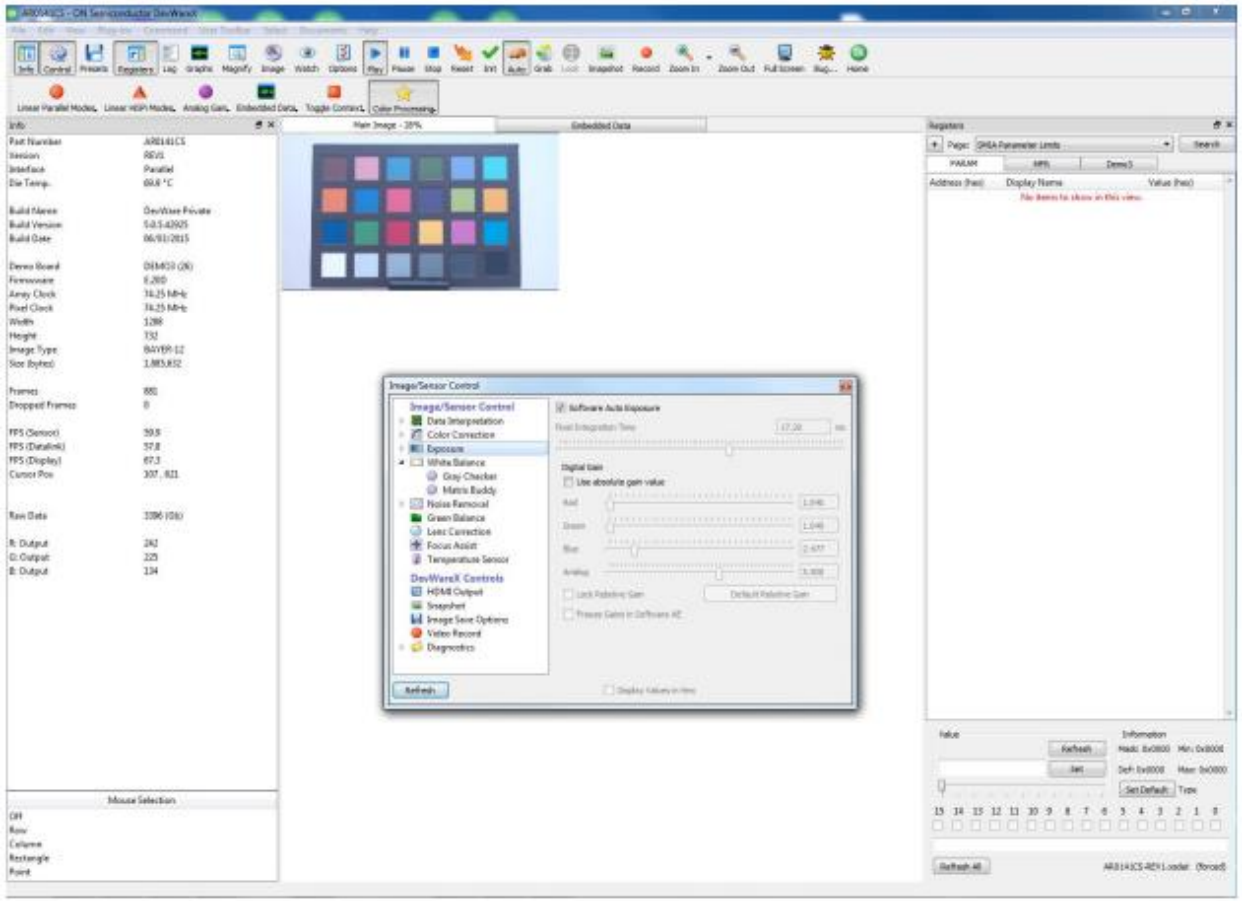
Tuning

Dependent on Application/Scene
Obtain a Baseline, tune as needed
Low-level sensor parameters

Initialization

Pre-defined Presets, sets the entire camera module ready

onsemi DevSuite – Comprehensive Software



DevWare GUI

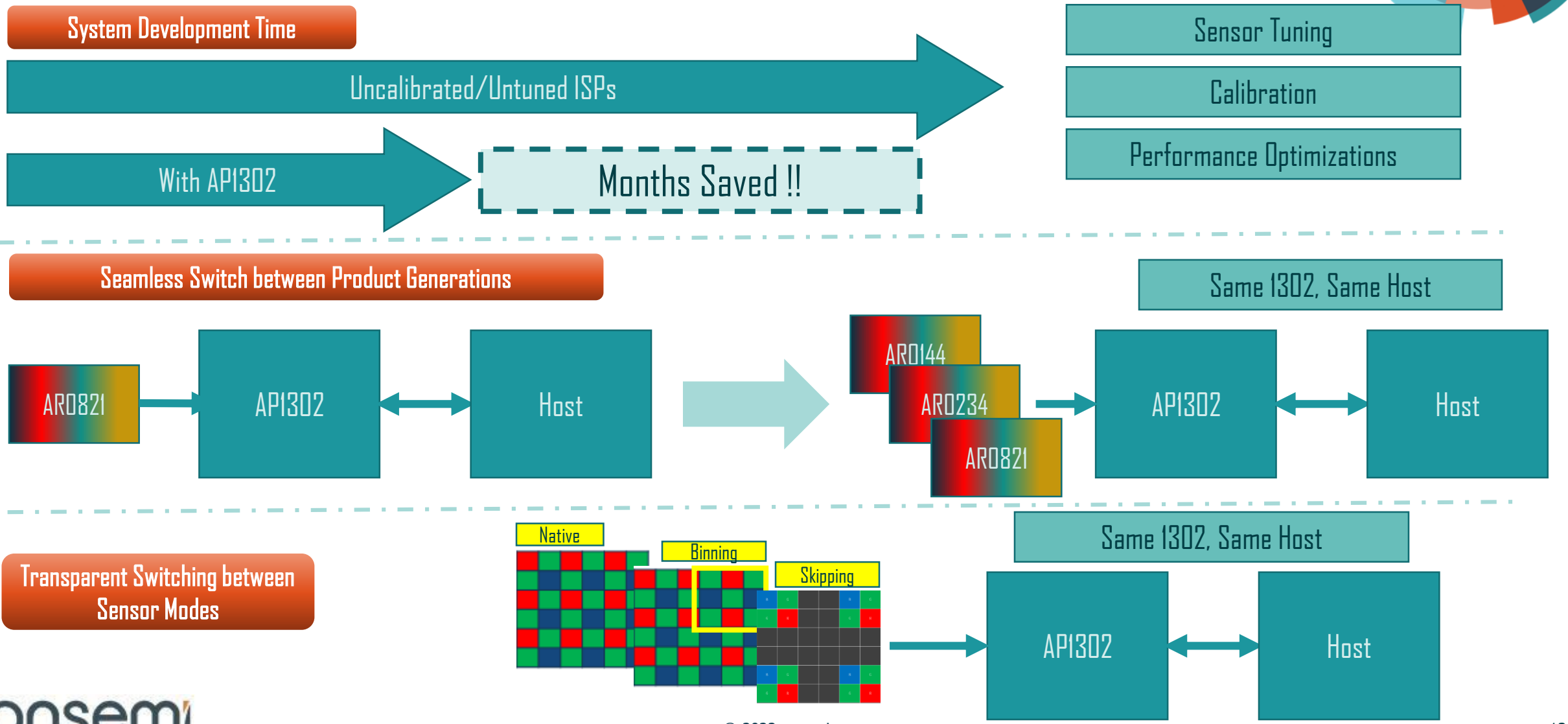
Libraries

Tools

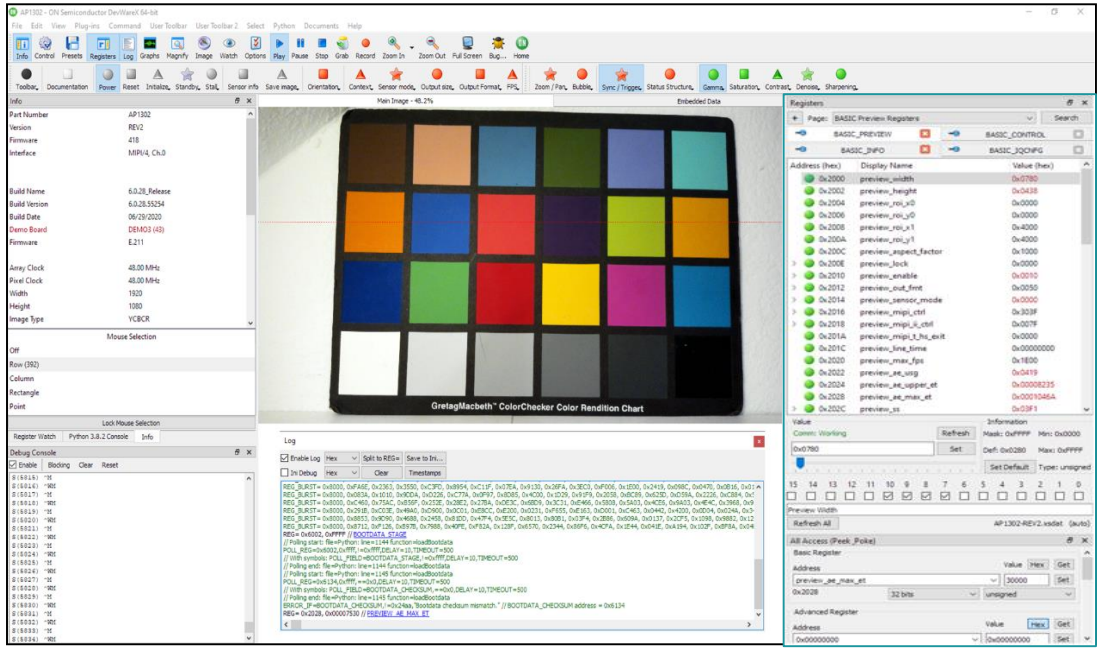
Hardware Interface

IAS Modules are Delivered with Calibrated & Tuned Libraries

ARXXXXCS + AP1302 – A Powerful Combination for Camera System



Integrated Imager Development Environment



✓ Configured

✓ Calibrated

✓ Tuned

```
[========== Demo Presets ==========]
[Hidde
FIELD_                                    eam,1
[Hidde
FIELD_                                    eam,0
[Reset]
FIELD_WR= reset_register, reset_register_reset, 1
FIELD_                                    eam,0
STATE=
DELAY=
STATE=
XMCLK=
[Demo Initialization]
PROMPT= "Select DEMO mode :", "Linear 8Mpix - 30FPS",
[]
```

Development Hardware Kit
- AGBINOCS-GEVK (Demo3 Board)
- AP1302CSSL00SMGAH3-GEVB (AP1302 Board)
- IASI-ADPTR-DM3D2-GEVB (IAS Adaptor Board)
- AP-Vision-ARX3A0-55 (ARX3A0 IAS Module)

Development Software
- DevWareX Based Package (SW Platform)
- AP1302 SW Package

Modifiable Default Inputs, Customized Outputs

Output
AP1302 Init File (XML)
Usable in System Design

Eases Camera System Development, Saves Significant Time & Effort

Fully Tested with Industry Leading Processors
Provides Complete Development Tools with Drivers

Arrow's CCMs on Shiratech Mezzanine Board
Includes onsemi AP1302 ISP

+

Multiple Processor Platforms with 96 Boards Specifications
Compatible Mezzanine Boards Enable Rapid Development & Optimization

Qualcomm

intel.

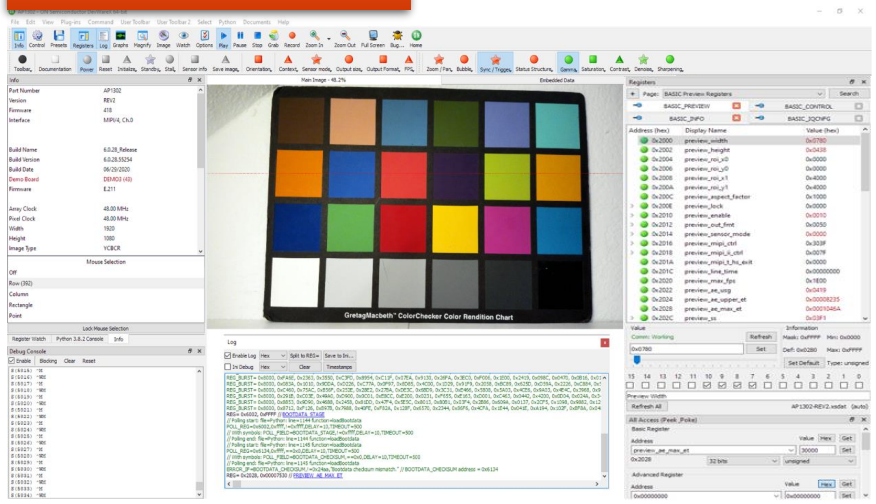
Summary

IAS Imager Module

HW Dev Platform

ISP & Co-Processors

Comprehensive SW



An Environment to Support Development & Delivery of Vision Systems with Quick TTM

Resources

onsemi Image Sensors

https://www.onsemi.com/products/sensors

onsemi DevSuite

https://aptina.atlassian.net/wiki/spaces/DEVS/overview?homepageId=3244098

onsemi IAS Image Sensor Modules (multiple sources)

https://www.arrow.com/en