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# SmartCamera+ with AR1335 and AP1302

Public Information

# SmartCamera+ Demonstration Platform


ON Semiconductor AP1302
MIPI Image Signal Processor
13MP@30, 1080p@120
Bayer, JPEG, YUV, Gamma, Face Detection

ON Semiconductor AR1335
13MP Image Sensor
1/3" Progressive Scan
4208x3120, 30fps

eMMC 8GB

H.264/H.265/ MJPEG

microSD 2.0

Mini DP 1.2a Output

Ethernet
HTTP, RTSP, TCP/IP, UDP

USB 2.0

Audio Codec

DDR4,2400MT/s,64bit,4GB

Xilinx ZU4EV SoC

# AR1335 Image Sensor

# AR1335 : 13MP 1/3.2” CMOS Imaging Sensor

## Features

- 1/3.2” optical format
- 4208 (H) x 3120 (V) [4:3]
- 1.1µm BSI pixel
- RGB Bayer and Mono Options
- Electronic Rolling Shutter and GRR support
- 4-Lane D-Phy MIPI CSI-2 interface
- 270mW 13mp30 mode
- Onboard temperature sensor
- -30ºC to 70ºC operation
- 11 degree and 32 degree CRA options
- Bare Die and CSP Packages

## Key Applications

- 4K Video recording and streaming
- Body Cameras
- IoT Cameras
- Drones
- Sports Action Cameras
- High Resolution Imaging

## Key System Capabilities and Benefits

- 4-lane MIPI CSI 2 interface for high bandwidth transfers
- High Responsivity for excellent low light performance (82% Peak QE)
- High Linear Full Well (5300e-) for great dynamic range
- Support major professional video formats (4K 30fps, 1080P 60fps, 720P 120fps)
- 3D synchronization controls to enable stereo video capture

## Orderable Part Numbers

| Part Number | Product Desctiption | Orderable Product Attribute Description |
|---|---|---|
| AR1335CSSC32SMD20 | 13MP, 1/3.2", RGB Color, 32$^0$ CRA | Bare Die |
| AR1335CSSC11SMD20 | 13MP, 1/3.2", RGB Color, 11$^0$ CRA | Bare Die |
| AR1335CSSM32SMD20 | 13MP, 1/3.2", Mono, 32$^0$ CRA | Bare Die |
| AR1335CSSM11SMD20 | 13MP, 1/3.2", Mono, 11$^0$ CRA | Bare Die |
| AR1335CSSC11SMKA0-CP | 13MP, 1/3.2", RGB Color, 11$^0$ CRA | CSP with Protective Film |
| AR1335CSSC11SMKA0-CR | 13MP, 1/3.2", RGB Color, 11$^0$ CRA | CSP without protective film |
| AR1335CSSC32SMFAH3-GEVB | 13MP, 1/3.2", RGB Color, 32$^0$ CRA | Evaluation Headboard |
| AR1335CSSC11SMKAH3-GEVB | 13MP, 1/3.2", RGB Color, 11$^0$ CRA, CSP | Evaluation Headboard |
| AR1335CSSM32SMFAH3-GEVB | 13MP, 1/3.2", Mono, 32$^0$ CRA | Evaluation Headboard |

# AR1302 Image Coprocessor

# AP1302 – Advanced Image Coprocessor

## Features

- Supports Up To 13MP (4224 x 3156)
- Primary Camera I/F – 4-Lane MIPI (up to 1.2Gbps/lane)
- Secondary Camera I/F – 3-Lane MIPI (up to 1.2Gbps/lane)
- Control Plane – 2-wire I2C, supports up to 3.4Mbps; 4-wire Serial I/F (SPI Slave) for Register Access (up to 25Mbps)
- Output I/F – 4-Lane MIPI (up to 1.2Gbps/lane)
- Input Formats – RAW6/RAW8/RAW10/RAW12
- Output Formats – YUV422, YUV420, 888RGB, 565RGB, 555RGB, JPEG, MPEG, RAW8, RAW10, RAW12
- Max Frame Rate – 30fps @ 13MP, 120fps @ 1080p
- Onboard Temperature Sensor
- -40°C to +85°C (Tj) Operating Temp

## Key System Capabilities & Benefits

- Scalability
  - Single Device Supports a Wide Variety of ON Semiconductor's Sensors
- Clear Buffer between Sensor & Further Image Processing (if needed)
  - Takes Away the Complexities of Sensor Tuning, Enables Focus on the Application Value-Add
- Dual Sensor Mode with Concurrent Streaming
  - Enables Depth, Stereoscopic Vision
- Auto Focus, Auto Exposure, Auto White Balance, Flicker Detection & Mitigation, Local & Adaptive Tone Mapping
  - Control & adaptation to dynamic lighting conditions
- Corrections – Len Shading, Bad Pixel, Gamma; Demosaicing, Denoising, Sharpening
  - Pre-processed High Quality Image Outputs
- Supported by ON Semiconductor's DevSuite
  - Easy development of imaging system; Short TTM

# SmartCamera+ Demonstration Platform

ON Semiconductor®

*"We are entering an era where Artificial Intelligence (AI) is becoming an integral part of vision-based systems. ON Semiconductor, with its industry-leading range of Global Shutter and Rolling Shutter image sensors, is working hand-in-hand with Xilinx to provide our common customers solutions to support this new kind of intelligence."*

*Gianluca Colli, Vice President and General Manager,*
*Industrial and Consumer Solutions Division, Intelligent Sensor Group*

*ON Semiconductor*

# Ultra-Low Latency Face Detection Demo


Smart Camera

RTSP over Ethernet

Notebook Decode & Display

Laptop

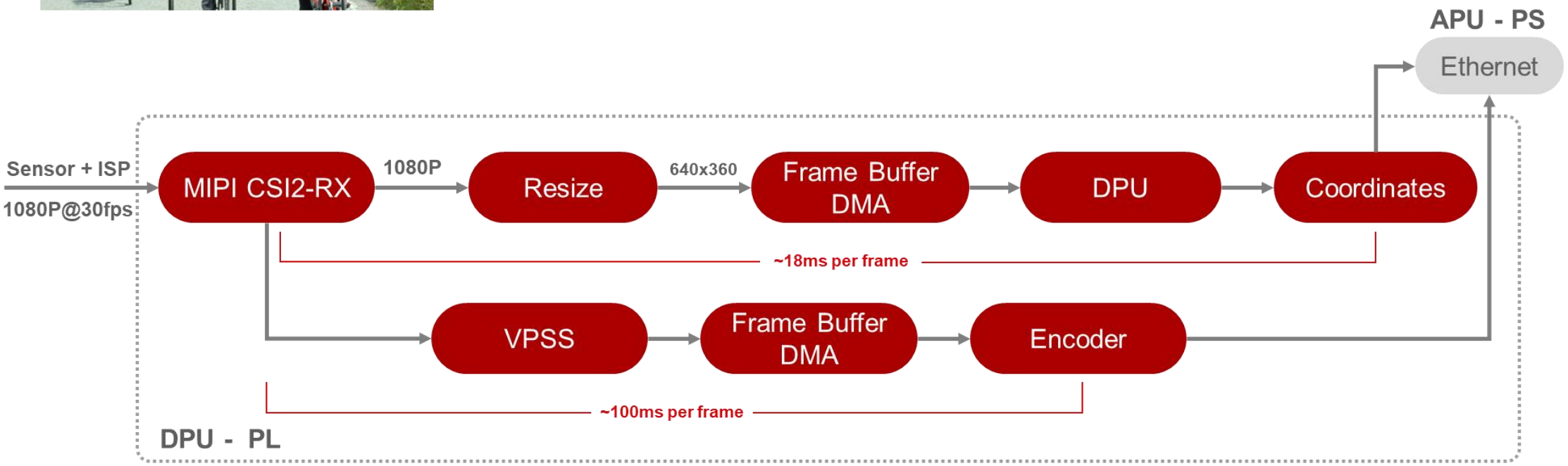




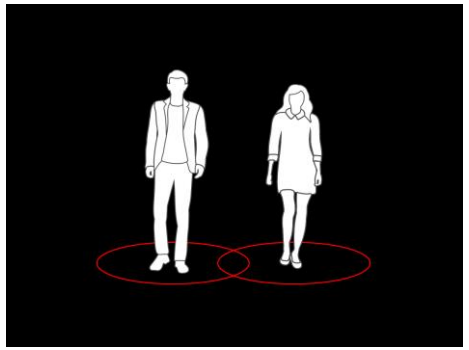



Image courtesy : Xilinx Inc.

# SmartCamera+ Use Cases

# Smart Building

- People counting
  - Office space rentals based on occupancy
  - Crowd / flow control



- Social Distancing monitoring
  - Assist in COVID distancing

- Surveillance
  - Intruder detection
  - Restricted area access control

# Retail

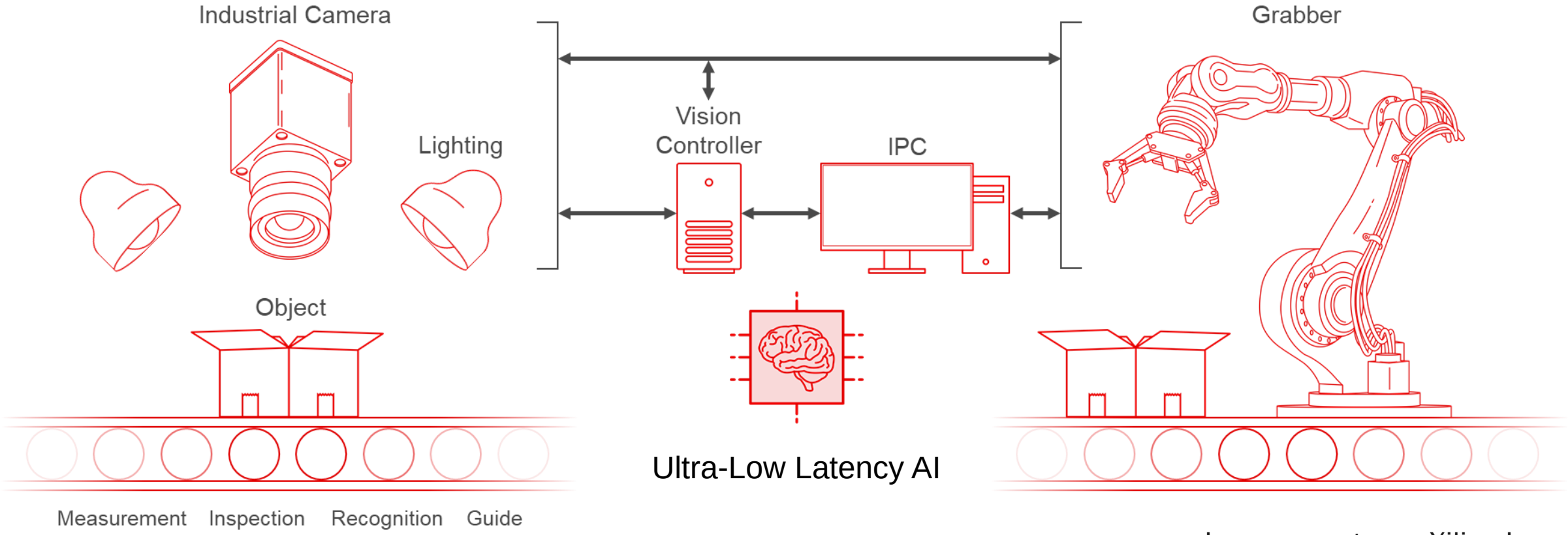
Theft Detection

Precision Marketing

Face Payment

Inventory Management

# Machine Vision




Ultra-Low Latency AI

Image courtesy : Xilinx Inc.