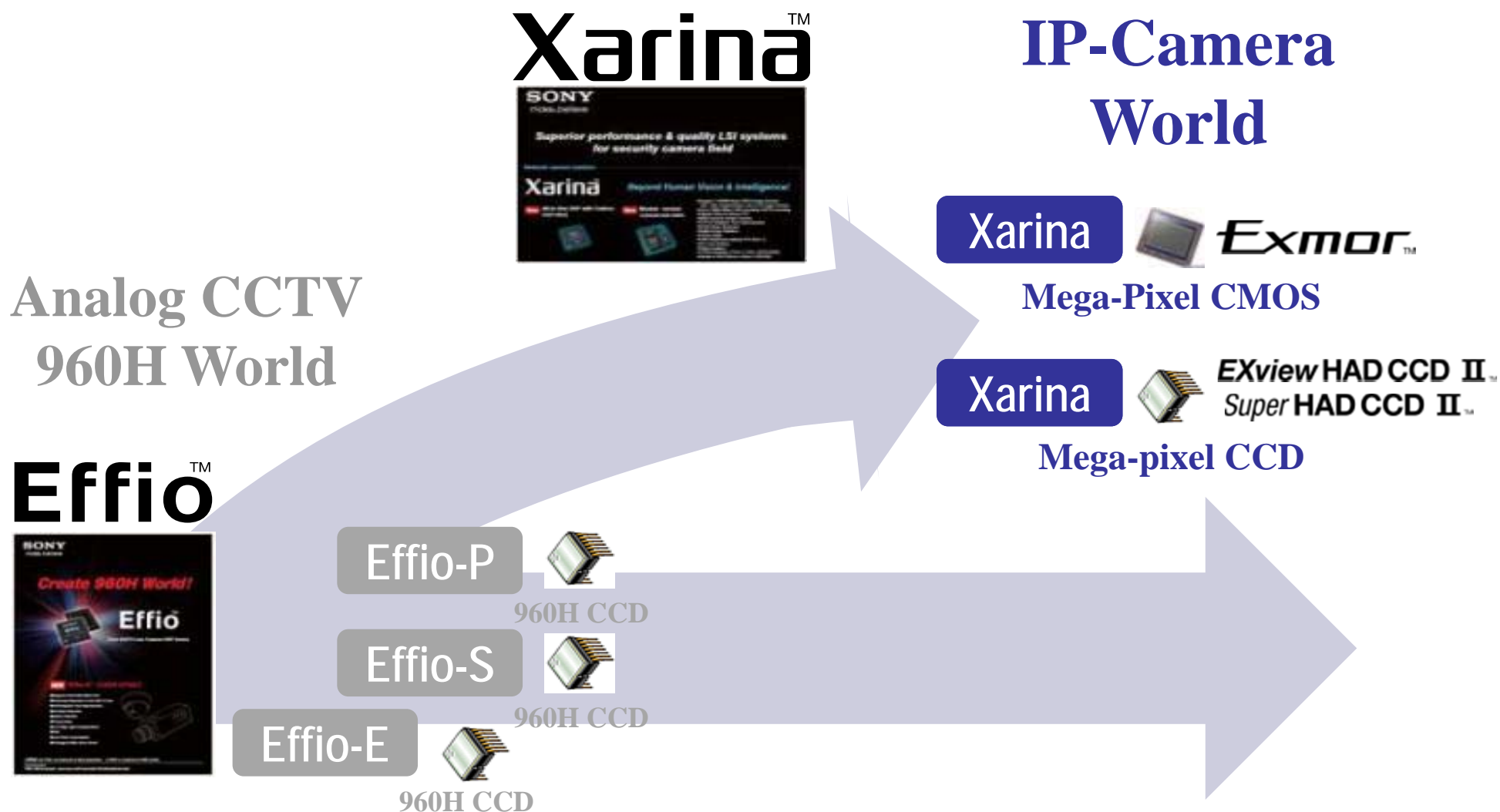


# Xarina<sup>TM</sup> Introduction

## Entry-level Model

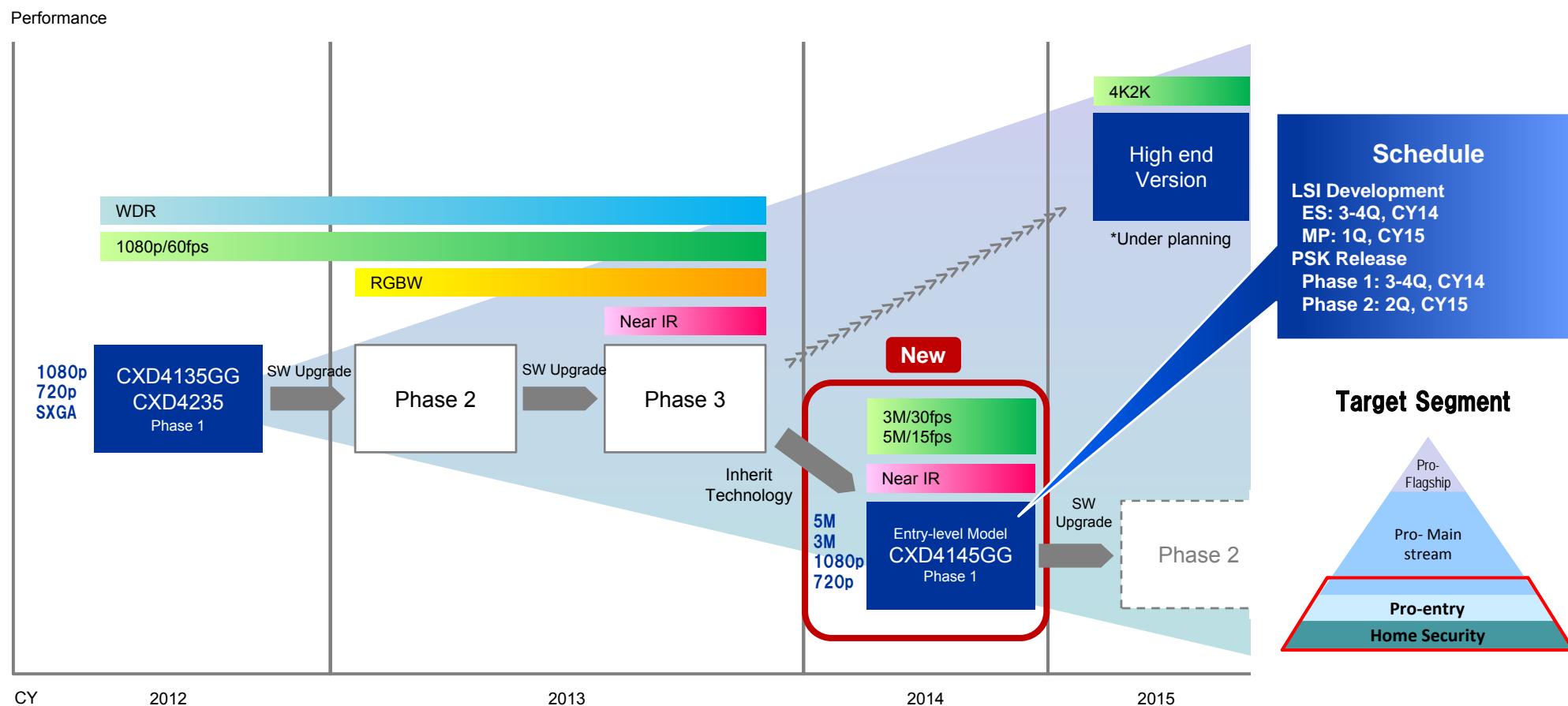
**May 16th, 2014**  
**Product Department 5**

# Expansion of SONY Security Solution



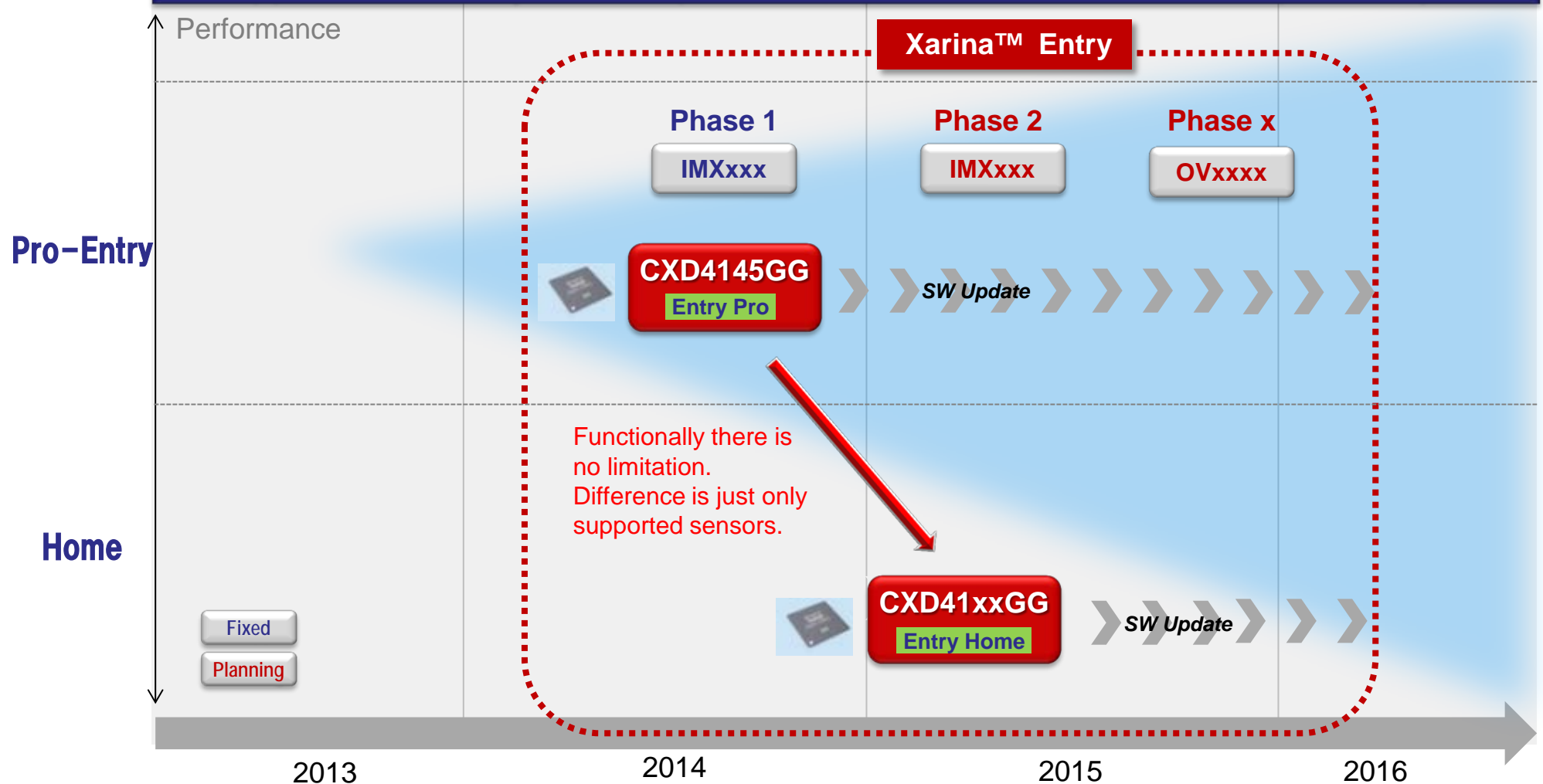
# Xarina Roadmap

## Newly release Entry-level Model, CXD4145GG

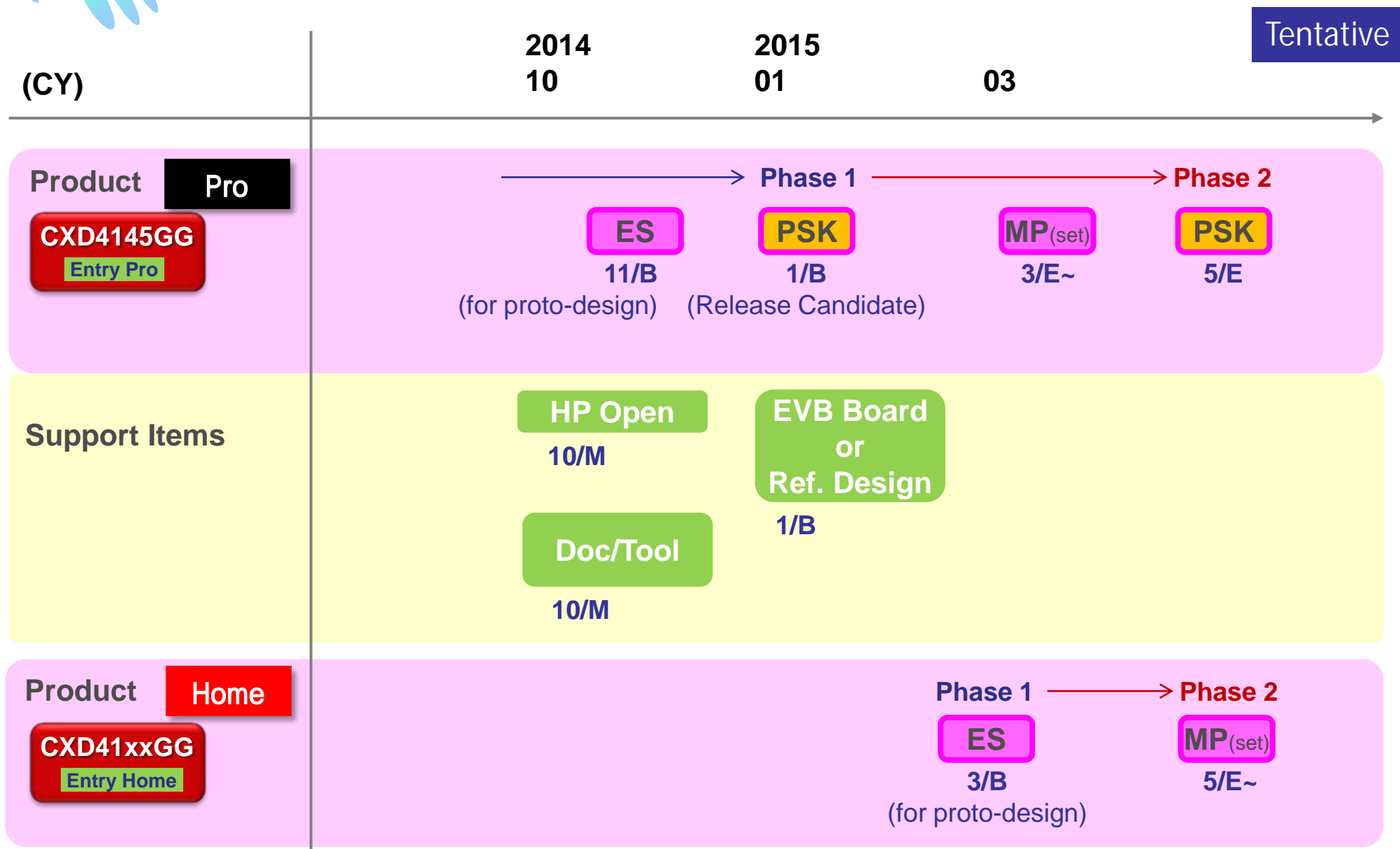


# Roadmap

- Enforce Entry lineup by “Home” LSI, CXD41xxGG, supporting cost-effective sensors
- Support latest Sony CIS first(Phase 1, 2), and other vendors' CIS(Phase x)



# Support Schedule



# Supported sensors for Xarina Entry **Pro**

## ● Phase 1

No.	Size	Res.	Type	I/F	Mode	Status	Note
1	1/3	720p	IMX238	S-sLVDS, CMOS	SXGA(1280x1024)@30fps	MP	Near IR
					SXGA(1280x1024)@25fps		
2	1/2.8	1080p	IMX222	CMOS	1080p(1920x1080)@30fps	MP	Near IR
					1080p(1920x1080)@25fps		
3	1/3	3M	IMX124	S-sLVDS	3M(2048x1536)@30fps	MP	
					3M(2048x1536)@25fps		
4	1/4	5M	IMX168	MIPI	3M(2048x1536)@30fps	MP	No support binning <b>IMX168 was dropped because it was removed from Sony imaging sensor lineup.</b>
					3M(2048x1536)@25fps		
					5M(2592x1944)@15fps		
					5M(2592x1944)@12.5fps		

## ● Phase 2

Tentative

No.	Size	Res.	Type	I/F	Mode	Status	Note
1	1/3"	1.23M	IMX225	MIPI	Quad-VGA(1280x960)@30fps	ES:'14/9 MP:'15/3	
					Quad-VGA(1280x960)@25fps		
2	1/2.8"	2.16M	IMX291	MIPI	1080p(1920x1080)@30fps	ES:'15/1 MP:'15/6	TS:'14/10
					1080p(1920x1080)@25fps		

\*Built in WD of IMX123 is under evaluating. If result of its performance is good or enough, it will be a candidate in phase 2 sensors.

# Supported sensors for Xarina Entry

[Home](#)

## ● Phase 1

[Tentative](#)

No.	Size	Res.	Type	I/F	Mode	Status	Note
1	1/3	720p	IMX238	S-sLVDS, CMOS	SXGA(1280x1024)@30fps	MP	Near IR
					SXGA(1280x1024)@25fps		

## ● Phase 2

[Tentative](#)

No.	Size	Res.	Type	I/F	Mode	Status	Note
1	1/3"	1.23M	IMX225	MIPI	Quad-VGA(1280x960)@30fps	ES:'14/9 MP:'15/3	
					Quad-VGA(1280x960)@25fps		
2	1/6	2M	IMX208	MIPI	1080p(1920x1080)@30fps	Plan	TBD <b>IMX208 is for home security use only.</b>
					1080p(1920x1080)@25fps		

# CXD4145GG Main Feature

## Video Input

- Supports various Primary Color CMOS Image Sensor up to 3M@30fps / 5M@15fps
- YUV Input: VGA / SXGA / 720p(SMPTE296M) / 1080p(BT1120) / QXGA(3M)

## Image Signal Processing (ISP)

- Digital Wide Dynamic-Range (ATR-EX)
- Improved fine 2D/3D Noise Reduction
- Added Defog, HLC, LDC(Simple-LDC)

## Video Encoder

- HD/Full-HD/3M@30fps, 5M@15fps H.264 encoding, and JPEG encoding simultaneously
- Performance: 1080P@30fps + D1@30fps + CIF@30fps + QVGA@30fps + 1080P JPEG Snapshot 2fps, up to 16 Threads \*Best effort
- Horizontal Mirror, Vertical Flip, 90 / 180 / 270 Rotation

## Audio Encoder

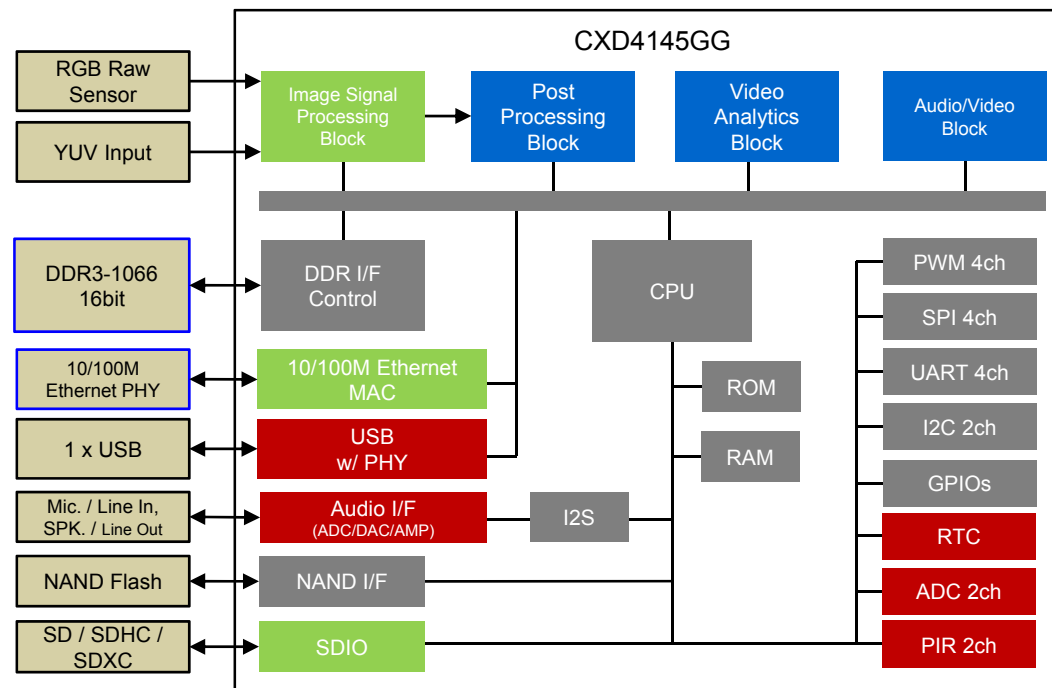
- Supports G.711 / G.726 / AMR-NB / AAC-LC

## Video Analytics

- Built-in Video Analytics for Object Detection and Tampering Alarm

## Others

- Reduced Power consumption by Stand-by mode
- Operating Temperature (T<sub>case</sub>): -20~95°C
- LFBGA 289pin 13x13mm package 0.65mm pitch



## Peripheral

- Host CPU: ARM1176JZF-S™(400MHz)
- Only needed SDRAM(DDR3-1066 16bit) 1ch
- Integrates peripheral devices: USB PHY, RTC, ADC, PIR
- Audio CODEC with Audio ADC and Micro phone AMP/ Line Inputs, and Audio DAC and Speaker AMP / Line Outputs
- 10/100M Ethernet PHY supports MII / RMII IF and EEE(Energy Efficient Ethernet = IEEE802.3az) for lower power consumption
- SDXC for high capacity recording, UHS-I for high speed access

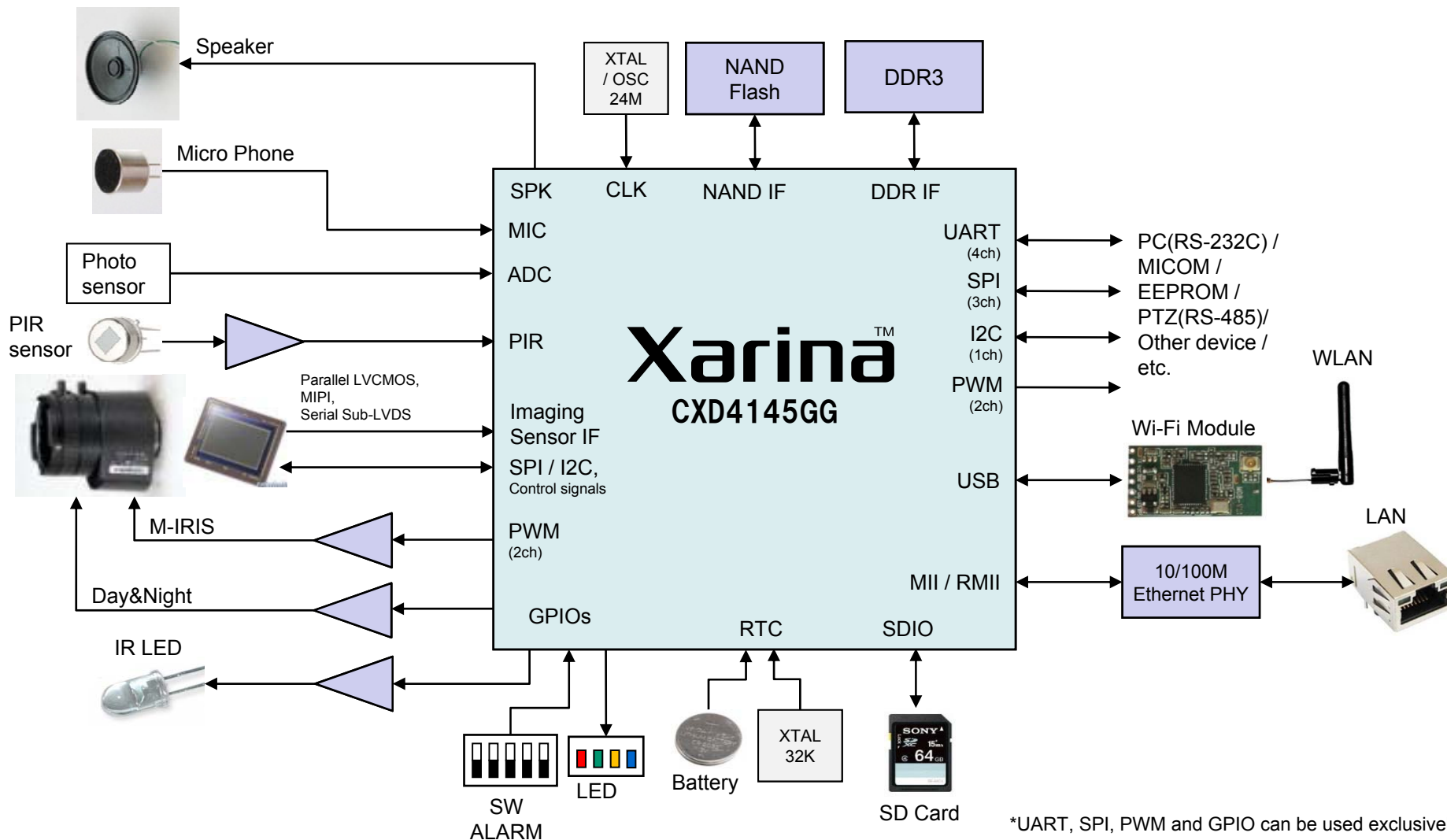


# CXD4145GG Camera Feature

Function	
Image Sensors	Primary color CMOS Image Sensors
Sensor I/F	Parallel LVCMOS 12bit MIPI 2Lane Serial Sub-LVDS 2Lane
Resolution (Max.)	2592x1944 (5M pixel)
Frame Rate (Max.)	up to 3M@30fps / 5M@15fps
AE	YES
Flicker less AE	YES
Auto IRIS	YES (PWM control)
Day/Night	YES
Slow Shutter	YES
AWB	YES
ATW	1800~10500K
Auto-Focus Detector	YES *Improved

Function	
Wide Dynamic-Range	ATR-EX (Adaptive Tone Reproduction)
Lens Shading Compensation	YES *improved
White pixel Compensation	Static(1024 points) & Dynamic
Noise Reduction	3D-NR *Improved, 2D-NR
Defog	YES
HLC	YES
LDC	YES (Simple-LDC)
IR-Optimizer	YES

# CXD4145GG System Configuration

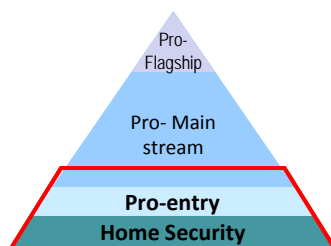


# One Security Platform to GO

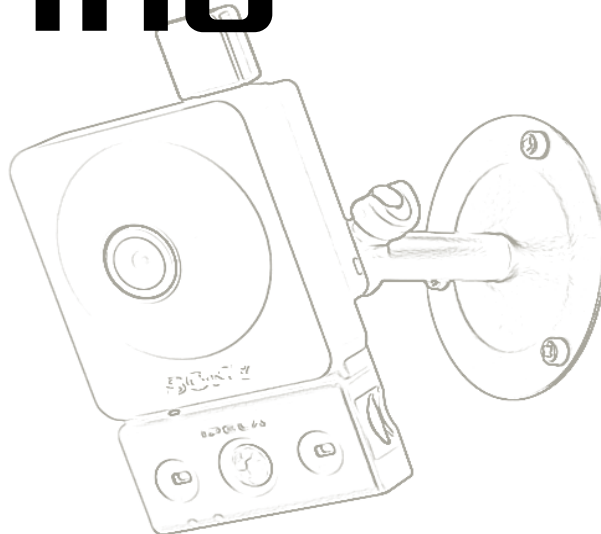
with CXD4145GG (Entry-level Model)

- **Basic spec**
  - Imager:** 720p / 1080p / 3M / 5M CMOS
  - Output:** H.264 / JPEG stream (1~16 threads) w/ audio
  - Features:** Covers from Pro-entry to Home security camera, and the SDK  
Integrated main-peripheral devices for reducing BOM cost
- **Wide variety of product portfolio with single "Xarina" CXD4145GG platform**
  - Low cost models (720p / 1080p)
  - High resolution models (3M / 5M)
  - Day&Night models (Supports IR LED and IRCF control)
  - Wide angle models (Supports LDC)

## Target Segment



# Xarina<sup>TM</sup>



- **Visibility**
- Intelligence
- User Friendly
- Scalability

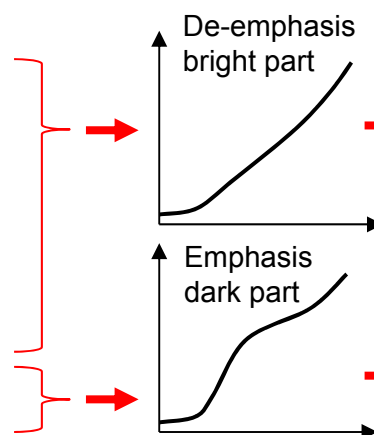
# ATR-EX

“Improve visibility” using “adaptive tone curve” depend on “local brightness”.

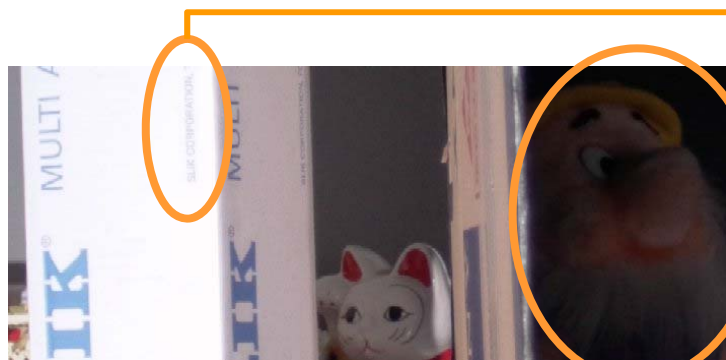
\*ATR-EX: Sony’s tone reproduction technology

Adaptive Multi Gamma

ATR-EX OFF



ATR-EX ON



Contrast is enhanced.

ATR-EX controls RGB gamma. ( not only Y gamma)  
Both Color+Luminance are enhanced.



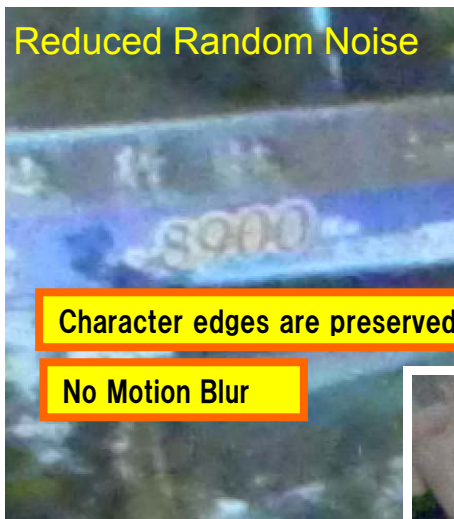
# 2D-NR

**“refined 2D-NR”** reduces random noise, also keeps outline of object sharp.

2D-NR OFF



2D-NR ON

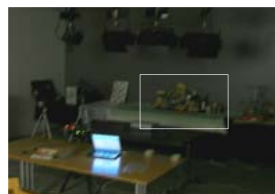
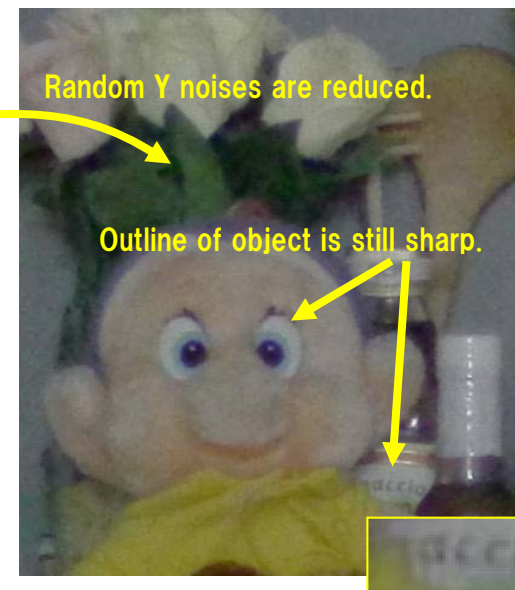


Medium Low Light Condition ( In Door dark )  
File Size ▲20% @JPEG Q=80

suppress OFF



suppress ON



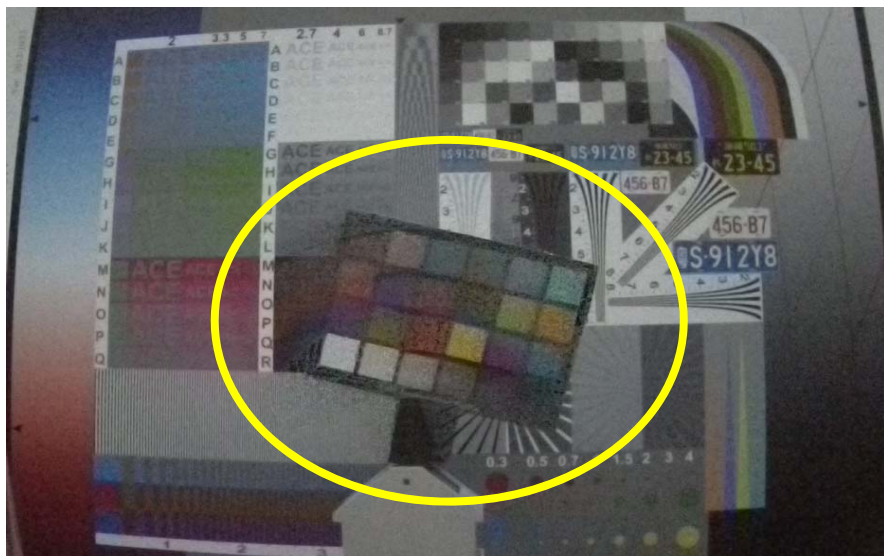
3.51x, F1.4, 1/30s



# 3D-NR

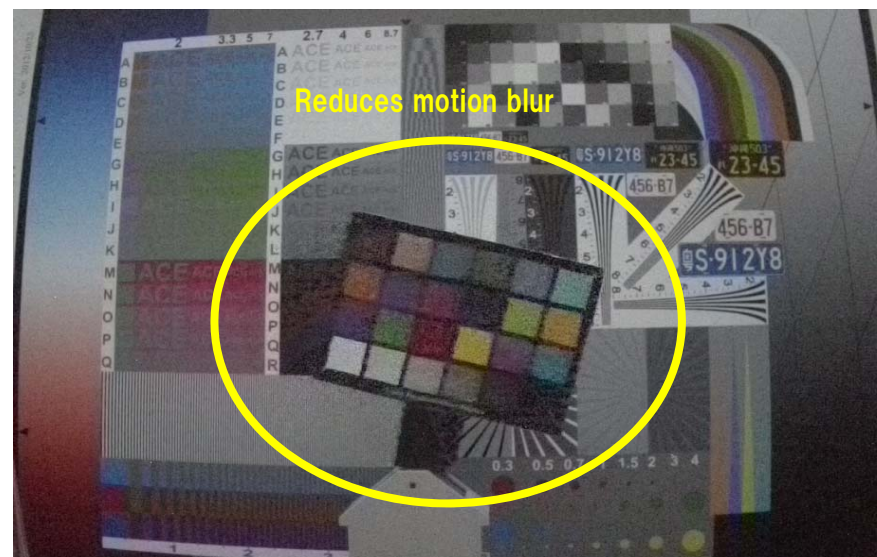
**“Improved 3D-NR”** reduces motion blur, also keeps color reproduction in low luminance.

CXD4135GG (1<sup>st</sup> Xarina)



1/30s, 30dB

CXD4145GG (Entry-level Model)



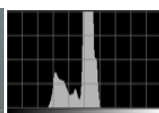
1/30s, 30dB

# Defog

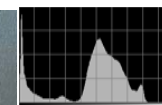
“Defog” detects foggy condition automatically, also provides high contrast picture.

Foggy day

Defog OFF



Defog ON



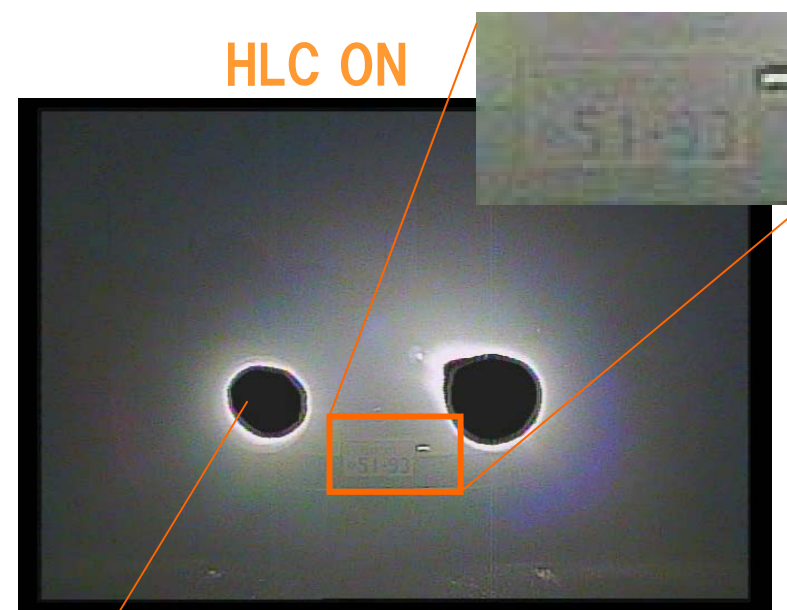
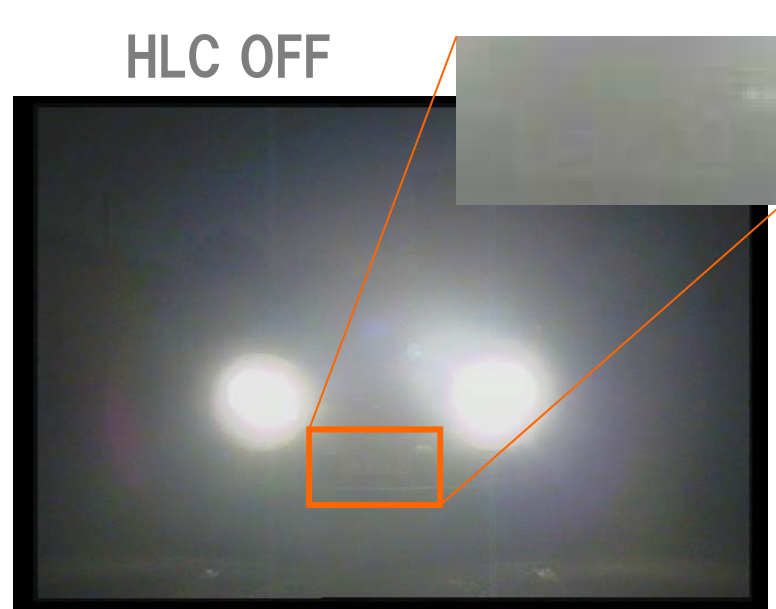
Rainy day





# HLC

**“HLC”** masks high luminance in black because of Y level exceeding threshold, then adjusts brightness in dark side to clear except masked in black.

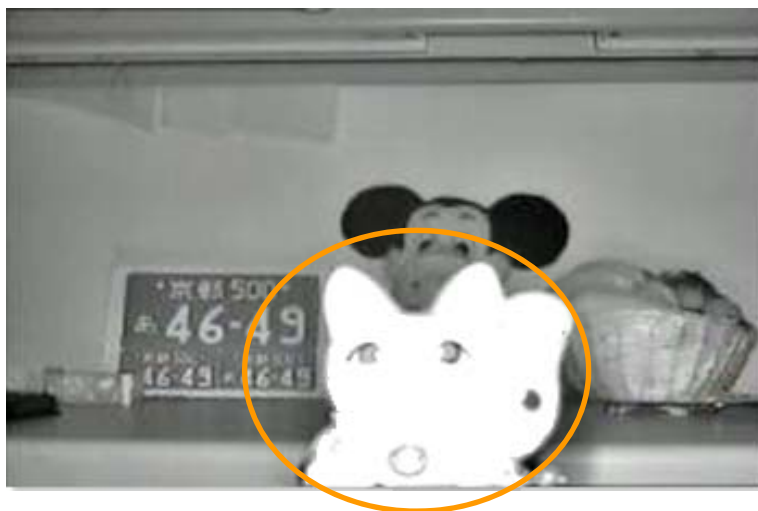


Headlights are masked in black  
(Remaining in white also possible)

# IR-Optimizer

**“IR-Optimizer”** is the function to adjust over exposure automatically that is interlocked with day/night mode if IR-LED is turned on in the night mode.

IR-Optimizer OFF



Over exposure

IR-Optimizer ON



# LDC(Simple-LDC)

**“LDC(Simple-Lens Distortion Correction)”** transforms the picture captured by wide angle lens to natural.

\*LDC(Simple-LDC) can correct distortion of vertical direction only, not correct horizontal direction.

LDC OFF

LDC ON

150 degrees



Fish eye



Fish eye



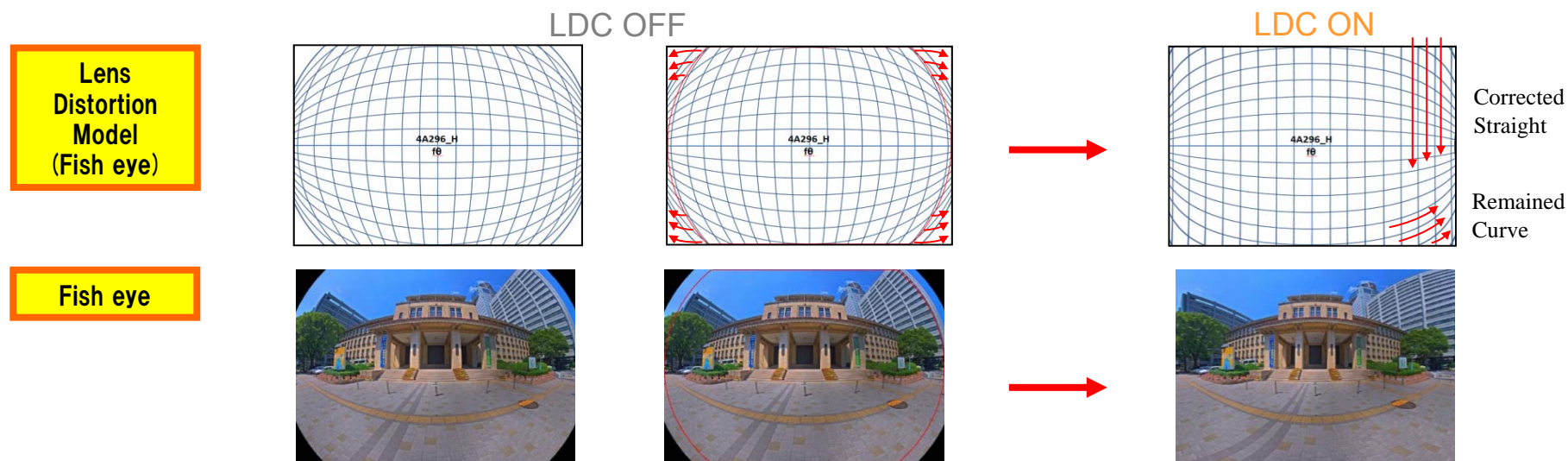
\*Red line shows correcting area.

\*Although vertical direction becomes straight, horizontal direction is remained distortion curve.

# LDC(Simple-LDC)

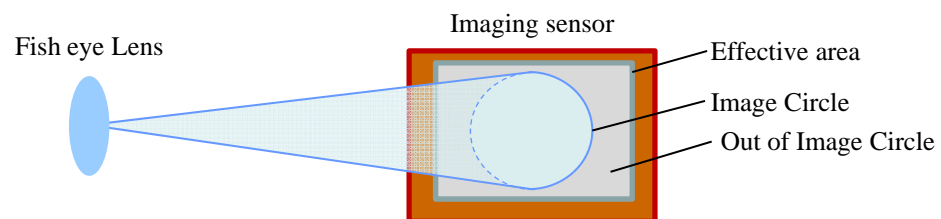
## What's Simple-LDC?

\*Simple-LDC can correct distortion of vertical direction only, not correct horizontal direction. So it means simple correction for lens distortion.

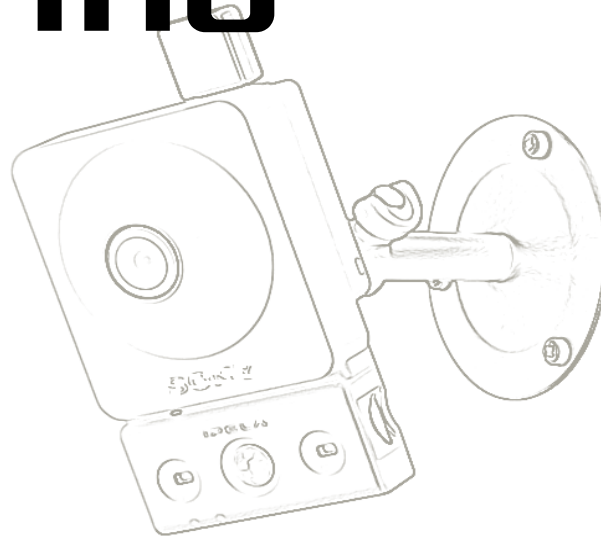


\*Red line shows correcting area.

\*Although vertical direction becomes straight, horizontal direction is remained distortion curve.



# Xarina<sup>TM</sup>



- Visibility
- Intelligence
- User Friendly
- Scalability



# CXD4145GG Integrates Video Analytics

- **OD** (Object Detection)
  - Moving Objects, Left Objects, Crossing, Intrusion, etc.
- **TA** (Tampering Alarm)
  - Angle Change, Painting, Covering, Defocus , etc.

## CXD4145GG Supports Another

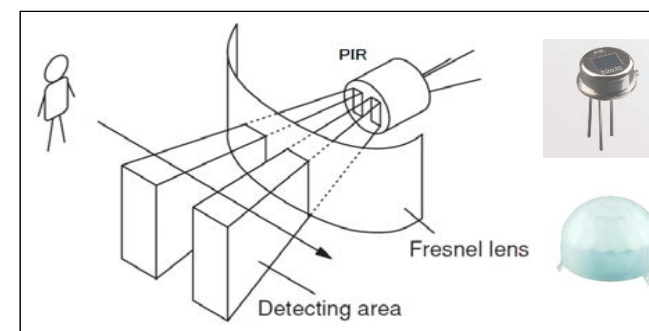
- **PIR** (Pyroelectric Infrared Radial Sensor)
  - Moving Object Detection, Wake-up from stand-by, etc.



OD(Object Detection)

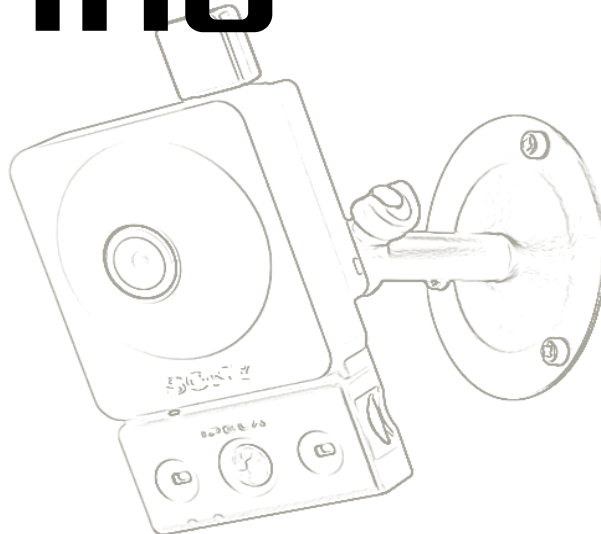


TA(Tampering Alarm)



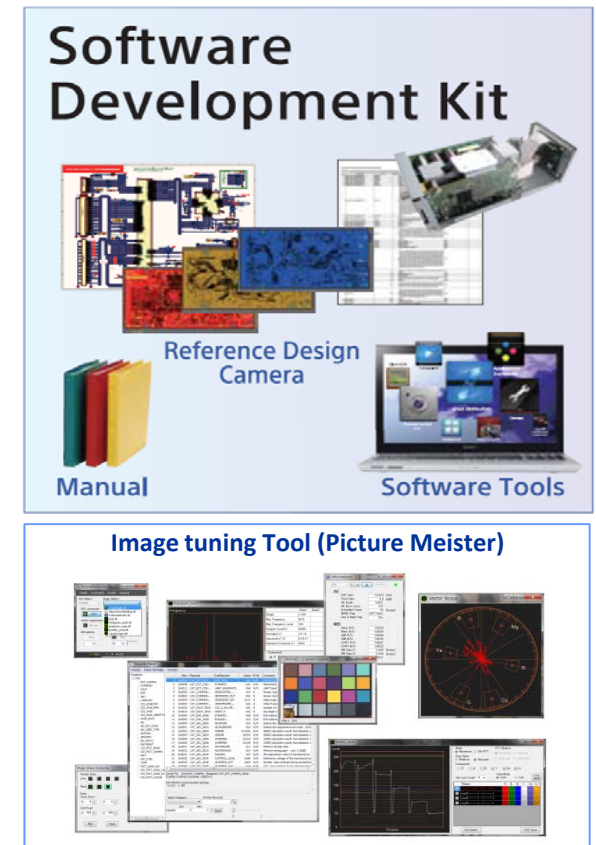
e.g. Human Detection by PIR

# Xarina<sup>TM</sup>



- Visibility
- Intelligence
- **User Friendly**
- Scalability

- H/W tools
  - Evaluation-board (schematic-data, etc.)
  - Reference-design (schematic-data, PCB-layout, BOM-list, etc.)
- S/W tools
  - Linux distribution
  - Drivers, camera-FW
  - Middleware
  - Application framework
  - Reference application
  - Linux S/W development environment
  - Camera control and Picture tuning S/W
  - Client S/W (PC Streaming viewer, Image tuning Tool, Other PC Tools, etc.)
- Various Documentation
  - Data sheet, Application note, Programmer's manual
  - Users guide, Software guide, some Specification, etc.





# Turnkey RD Kit

## Provided Turnkey RD (Reference Design Camera) Kit for Home Security

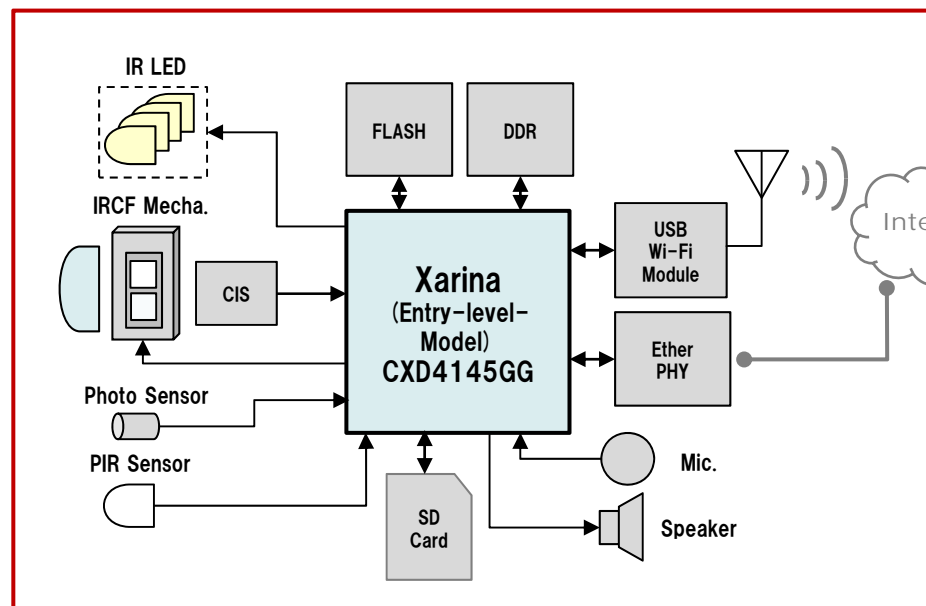
- HW: RD Camera for Cube type
- SW: PC Viewer, VMS in SDK

### Turnkey RD Kit

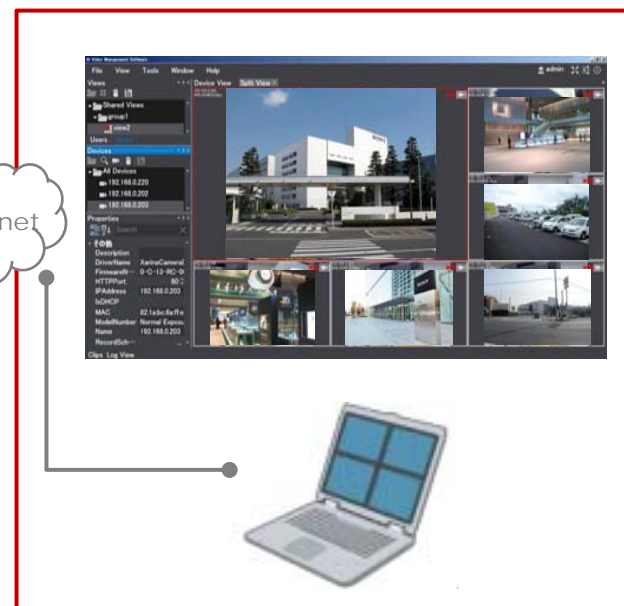
Cube Type



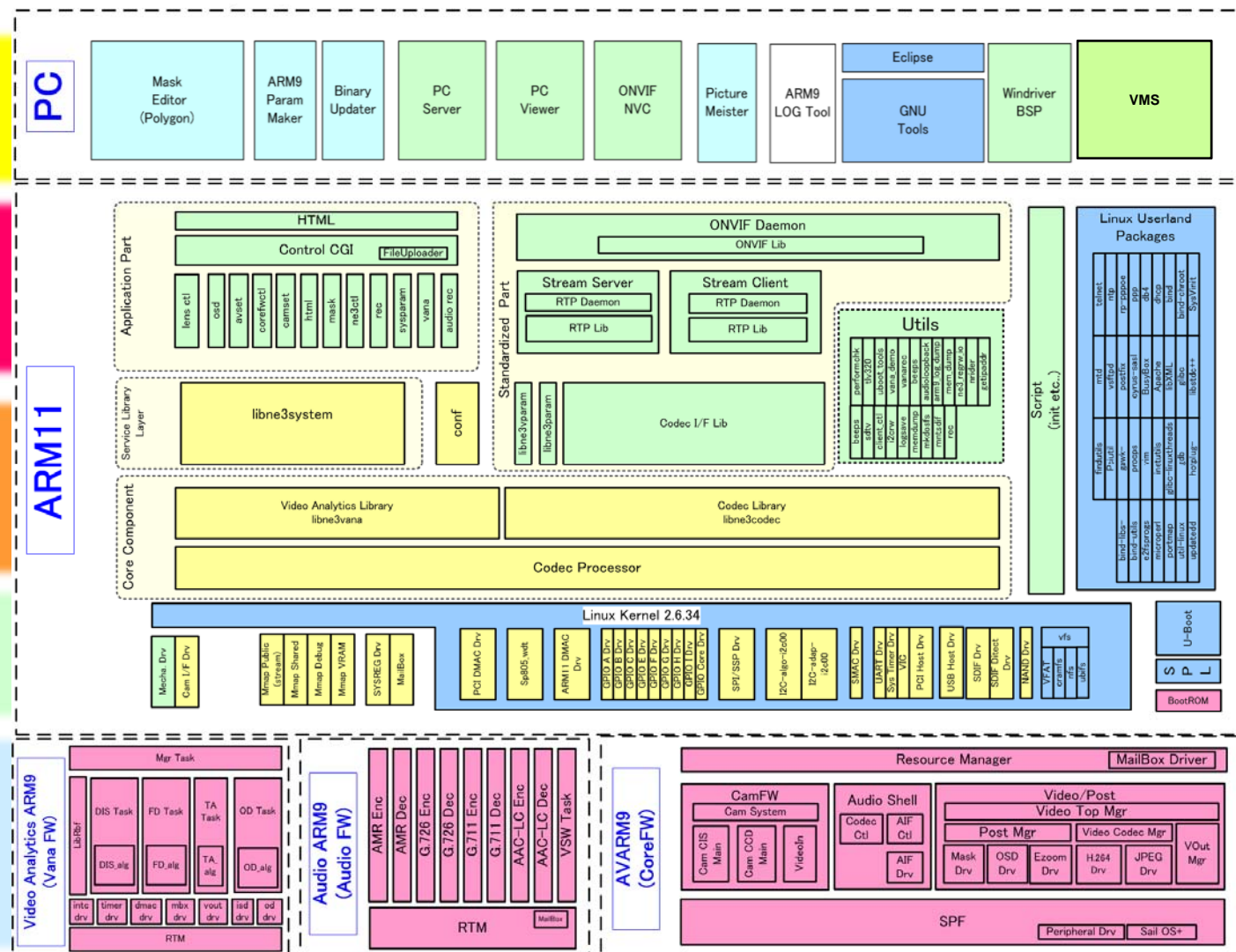
RD (Reference Design) Camera Block diagram



PC Viewer, VMS



# Software Stack



PC tools

Application

Middleware

Linux

Firmware

Quality :

Product

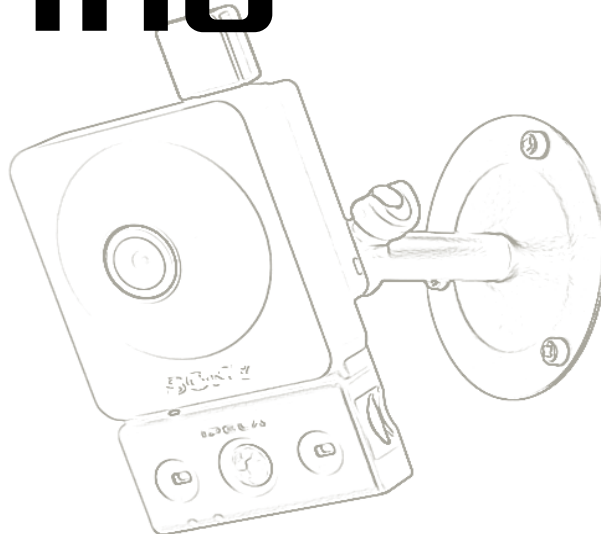
Platform

Open source

Tools

Sample

# Xarina<sup>TM</sup>

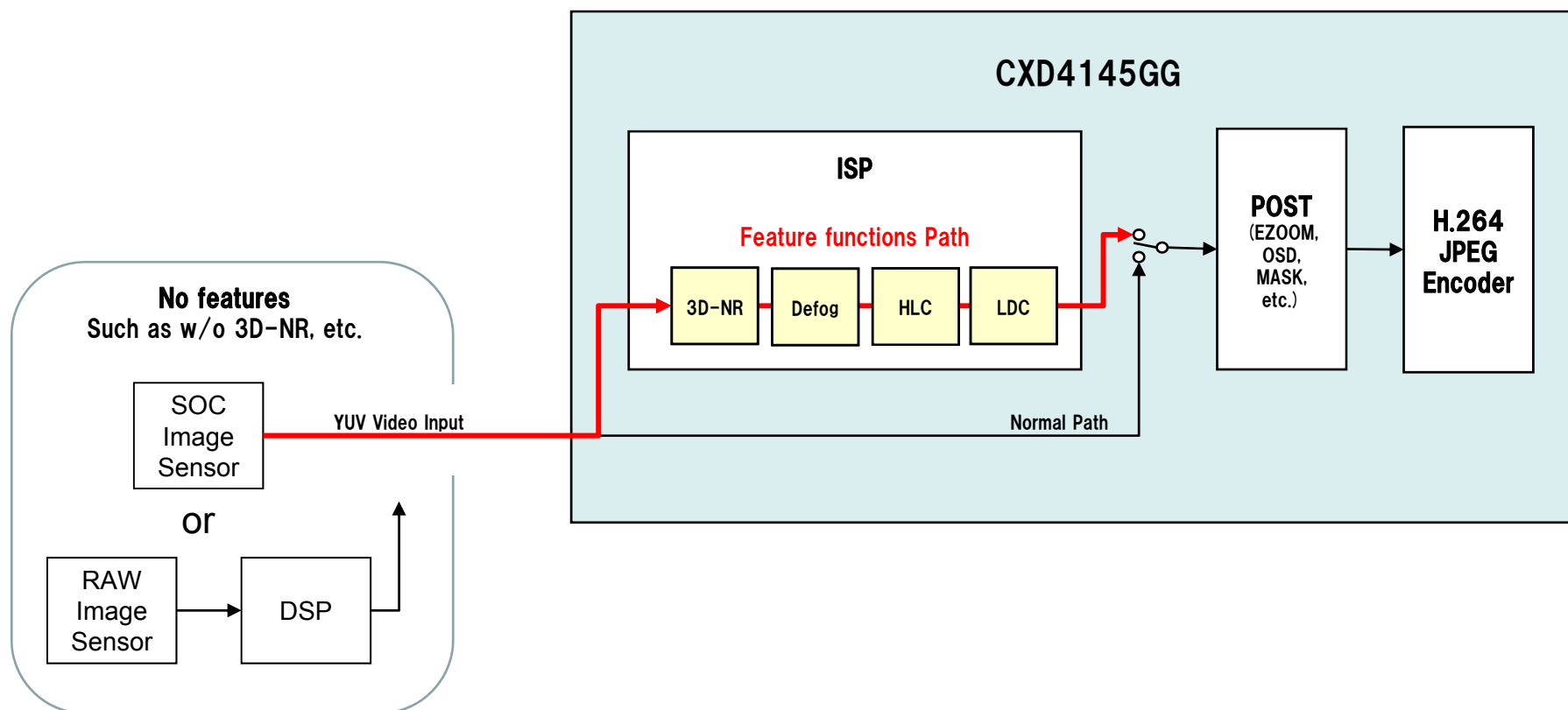


- Visibility
- Intelligence
- User Friendly
- **Scalability**

# YUV Video Input

YUV Video Input is possible to utilize ISP's feature functions (3D-NR, Defog, HLC, LDC, etc.) too.

Even if the device which outputs YUV data doesn't have ISP's features, it'll be able to realize more high value added camera by connecting with CXD4145GG only!

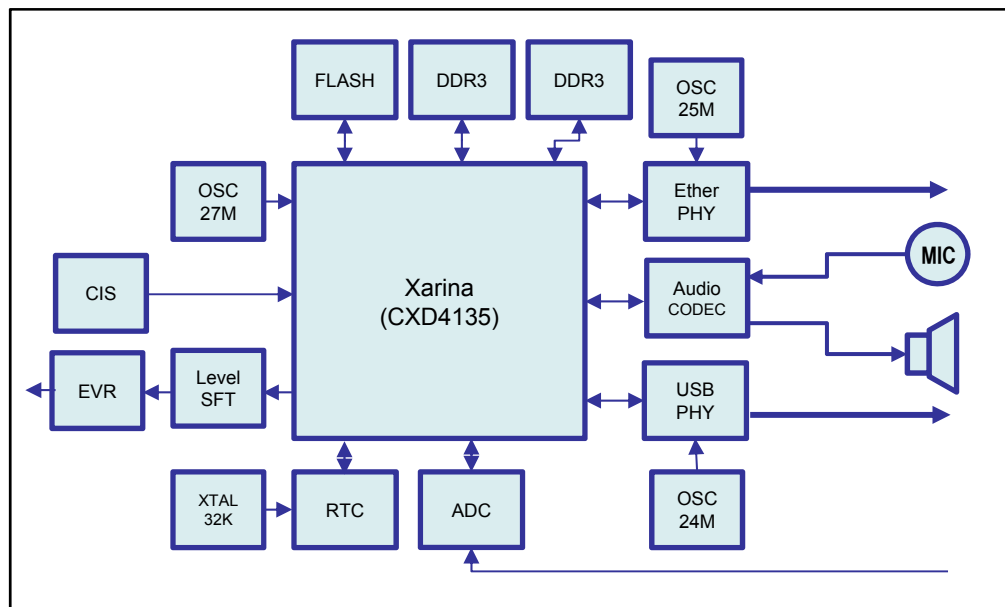


# End of Presentation

# Appendix

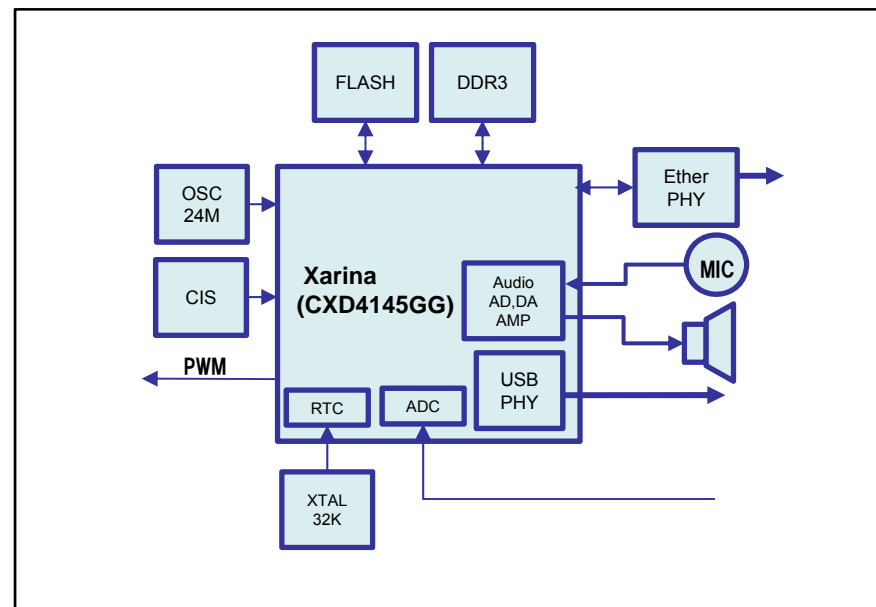
# Xarina Spec Comparison

Xarina CXD4135GG



Package: LFBGA 480pin (17mm□)  
Power: 1.1/1.5/1.8/2.5/3.3V  
CIS IF: CMOS 12bit, MIPI 4lane  
OSC: 27MHz \*Ether PHY 25M, USB PHY 24M  
SDRAM: DDR3 (1G / 2G) x 2  
FLASH: 8bit SLC NAND (1 to 16Gbit) x 2  
Ethernet: 1000 (RGMII), 10/100 (MII)  
USB: W/O PHY  
Audio: W/O ADC,DAC,AMP  
ADC: W/O  
RTC: W/O  
EVR: W/O  
SDIO: SD/SDHC  
PCIe: Support

Xarina CXD4145GG



Package: LFBGA 289pin (13mm□)  
Power: 1.1/1.5/1.8/3.3V  
CIS IF: CMOS 12bit, MIPI 2lane, Serial sLVDS 2lane  
OSC: 24MHz  
SDRAM: DDR3 (1G / 2G / 4G) x 1  
FLASH: 8bit SLC NAND (1 to 16Gbit) x 1  
Ethernet: 10/100 (MII, RMII) \*Supports EEE  
USB: W/ PHY  
Audio: W/ ADC,DAC,AMP  
ADC: W/  
RTC: W/  
EVR: No need (PWM)  
SDIO: SD/SDHC/SDXC  
PCIe: No support  
PIR: Support

# Xarina Spec Comparison

	CXD4135GG	CXD4145GG
<b>Image Sensors</b>		
Image Sensors	Primary color CMOS Image Sensors RGBW coding Image sensors Complimentary color CCD Image sensors	Primary color CMOS Image Sensors
Sensor I/F	Parallel LVCMOS 12bit MIPI 4Lane -	Parallel LVCMOS 12bit MIPI 2Lane Serial Sub-LVDS 2Lane
<b>Camera Features</b>		
Resolution (Max.)	1920x1080 (Full-HD)	2592x1944 (5M pixel)
Frame Rate (Max.)	60fps	up to 3M@30fps / 5M@15fps
Auto-Focus Detector	YES	YES *Improved
AE	YES	YES
Slow Shutter	YES	YES
AWB	YES	YES
ATW	1800~10500K	1800~10500K
Auto IRIS	YES (Needs EVR)	YES (PWM control)
Day/Night	YES	YES
Wide Dynamic-Range	Multiple exposure (Suimon, True WD) ATR-EX (Adaptive Tone Reproduction)	- ATR-EX (Adaptive Tone Reproduction)
Image Demosaicing	RGB / CMY / RGBW	RGB
Noise Reduction	3D-NR , 2D-NR	3D-NR *Improved, 2D-NR
Shading Compensation	YES	YES *improved
Defog	No	YES



# Xarina Spec Comparison

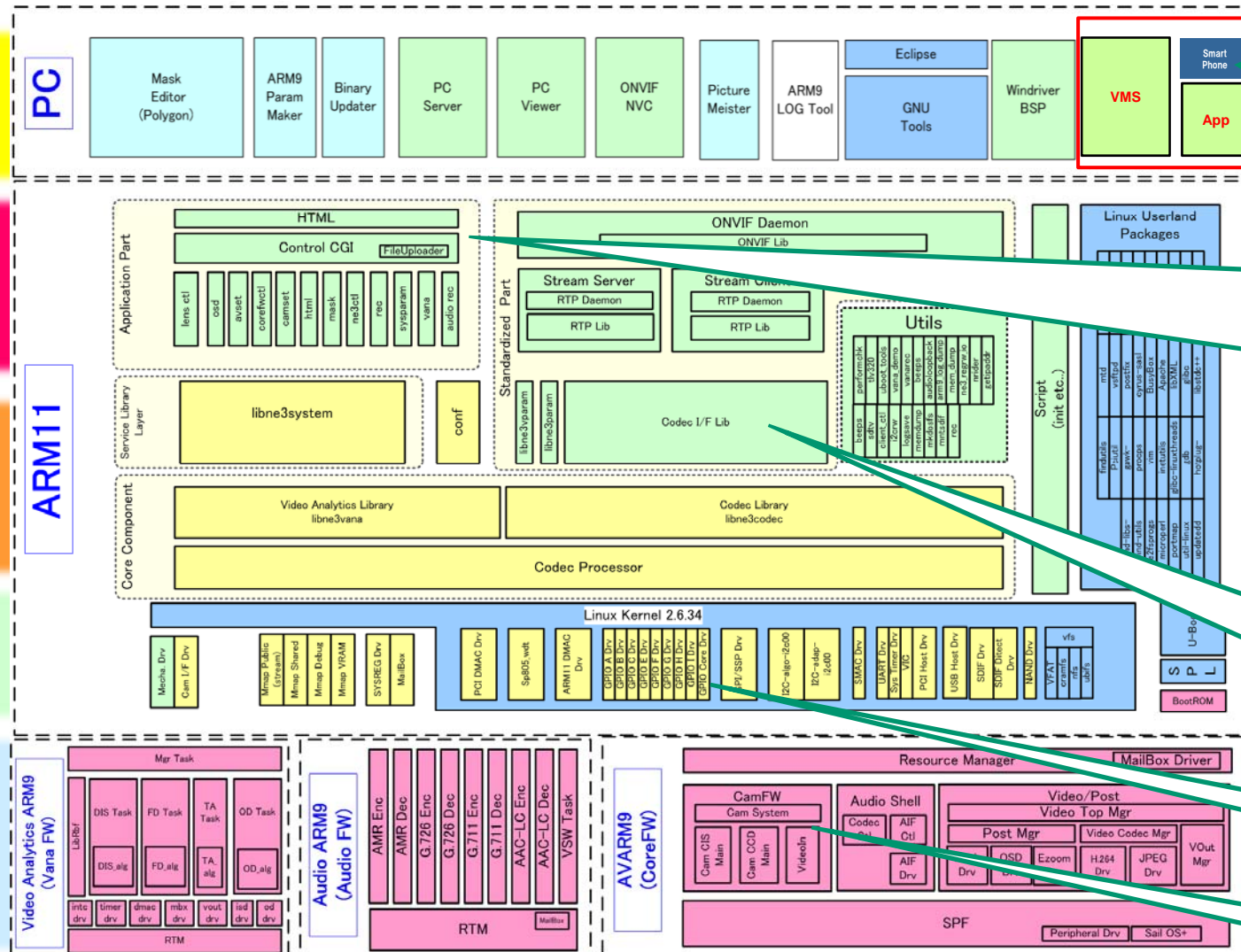
	CXD4135GG	CXD4145GG
HLC	No	YES
LDC	No	YES (Simple-LDC)
IR-Optimizer	No	YES
<b>Video Features</b>		
Electronic Zoom	x1/8 ~ x16	x1/8 ~ x16
Rotate Image	Horizontal Mirror , Vertical Flip 90 / 180 / 270 degree rotation	Horizontal Mirror , Vertical Flip 90 / 180 / 270 degree rotation
Privacy Mask	YES *Polygon	YES *Square
OSD	YES	YES
Video Compression	JPEG , H.264 (BP / MP / HP)	JPEG , H.264 (BP / MP / HP)
Code Performance	H.264: 1080p@60fps JPEG: 1080p@30fps	H.264: 3M@30fps *More than 3M@15fps JPEG: 3M@15fps *More than 3M@7.5fps
Multi Thread	4 Threads *Best effort	16 Threads *Best effort
<b>Video Input</b>		
Video Format	NTSC,PAL (BT656) / 720p(SMPTE296M) / 1080p(BT1120) / QXGA(3M)	VGA / SXGA / 720p(SMPTE296M) / 1080p(BT1120) / QXGA(3M)
<b>Video Analytics</b>		
Object Detection	YES	YES
Tampering Alarm	YES	YES
Face Detection	YES	No
Digital Imaging Stabilizer	YES	No

# Xarina Spec Comparison

	CXD4135GG	CXD4145GG
<b>Audio Features</b>		
Digital Audio I/F	I2S x 1ch	I2S x 1ch
Analog Audio IN	-	Micro phone Input(Mono.) / Line Input (Stereo)
Analog Audio OUT	-	Speaker Output (Mono.) / Line Output (Stereo)
Audio Streaming	G.711 / G.726 / AMR-NB / AAC-LC	G.711 / G.726 / AMR-NB / AAC-LC
<b>CPU &amp; Peripherals</b>		
Host CPU	ARM1176JZF-S™ (400MHz)	ARM1176JZF-S™ (400MHz)
SDRAM I/F	16bit DDR3-800 x 2ch (1 to 2Gbit)	16bit DDR3-1066 x 1ch (1 to 4Gbit)
NAND FLASH I/F	8bit SLC NAND (1 to 16Gbit)	8bit SLC NAND (1 to 16Gbit)
Ethernet PHY I/F	10/100 (MII) / 1000(GMII)	10/100 (MII / RMII) *EEE(IEEE802.3az)
USB	High Speed Host w/o PHY	High Speed Host with PHY
PCI-Express	1.1 with Link/PHY, 1Lane	No
SD I/F	1CH. (SD / SDHC / SD-IO), 25MB/s	1CH. (SD / SDHC / SDXC / SD-IO), 50MB/s
Support Peripherals	UART , I2C , SPI , PWM , GPIO	UART , I2C , SPI , PWM , GPIO , RTC , ADC, PIR
<b>Physical</b>		
Operating Temperature (Tcase)	-20 ~ 95℃	-20 ~ 95℃
Supply Voltage	1.1V (Core), 1.1, 1.5, 1.8, 2.5V, 3.3V (I/O)	1.1V (Core), 1.1, 1.5, 1.8, 3.3V (I/O)
Package	480pin plastic, LFBGA (17x17mm, 0.65mm pitch )	289pin plastic, LFBGA (13x13mm, 0.65mm pitch )

## Most of the same as Xarina (CXD4135/4235) SW stack

## Mainly added new functions



### PC tools:

- VMS for home or retail or small office \*TBD

### Smart Phone: \*TBD

- Viewing & Recording & etc. App
- iPhone/Android

### Apps:

- Wi-Fi WPS: PIN/One Push
- Event E-mail with Snap-shot
- SD Record with Time stamp, Event information & Play back with variable speed & Export (Movie and Snap-shot)
- NAS Record
- Standby & Event/Scheduled Wake-up Record

### Streaming:

- 3GPP (3GP2) \*TBD
- Changes Encode Performance to Best effort type for Enhancing flexibility

### Network Protocol:

- UPnP, LDAP, etc.

### FW:

- New Imaging sensors

Quality :

Product

Platform

Open source

Tools

Sample

# Competitor Spec Comparison

		Xarina CXD4145GG	Ambarella A5S	TI DM368
Sensor I/F		Parallel CMOS 12bit MIPI 2Lane Serial LVDS 2Lane	Parallel LVCMOS 14bit Serial LVDS 2,4,8 Lane, MIPI (240Mpix/sec)	Parallel LVCMOS 16bit (Max:120MHz), CCD support
	Resolution (max.)	5M Pixel(2592x1944)	32M pixel	Max. H-width: 2176 pixel
Camera Features	Auto-Focus Detector	YES	YES	YES
	Auto IRIS	YES	YES	YES
	Wide Dynamic-Range	ATR-EX	Gamma-WD	NO
	Demosaic	Bayer	Bayer	Bayer, RGB-stripe
	Noise Reduction	3D-NR/2D-NR	3D-NR/2D-NR	2D-NR
	Flicker Suppression	YES	YES	YES
	Lens Dist. Correction	YES	NO	YES
Video Features	Electronic Zoom	x1 ~ x16   x1/8 ~ x1	YES	x1 ~ x16   x1/16 ~ x1
	Image Stabilizer	NO	YES	YES
	Privacy Masking	YES	YES	YES
	OSD	YES	YES	YES
	Video Compression	JPEG/H.264(BP/MP/HP)	JPEG/H.264(BP/MP/HP)	JPEG/MPEG4(SP)/H.264(BP/MP/HP)
	Codec Performance	H264:3M@30fps, 5M@15fps JPEG:3M@15fps, 5M@7.5fps	H264: 5M@12fps, 3M@20fps 1920x1080p@30fps JPEG:1920x1080@30fps	H264:1920x1080p@30fps MPEG4:1280x1024@30fps MJPEG:3Mpix@?
	Multi Streaming	16 streams + JPEG	H264+MJPEG or H264*2	H264*2+MJPEG*1
Audio Features	Video Analytics	MD, Tamperig alarm	MD, Face	MD, Face
	Video Output	NO	BT656, BT1120	BT656, BT1120
	Audio I/F	NO	I2S x 1	I2S x 1
	Audio Input/Output	Mic AMP, Speaker AMP	NO	Mic AMP, Speaker AMP
Host CPU Peripherals External I/F	Audio Streaming	G.711/G.726/AAC/AMR	G.711/G.726/AAC/MP3/AC3	G.711/G.726/AAC/MP3/AC3
	CPU	ARM1176JZF-S@400MHz ARM924EJ-S@200MHz	ARM1136JS@528MHz	ARM926EJ-S@432MHz
	Memory I/F	16bit DDR3-1066	16bit DDR2/DDR3/LPDDR2/m-DDR	16bit DDR2-667/m-DDR-333
	Ether MAC	10/100 (MII/RMII) *Supports EEE	10/100 (MII/RMII)	10/100 (MII)
	USB	High Speed with PHY(Host/Device)	High Speed with PHY(Device)	High Speed with PHY, OTG
	PCI-Ex	NO	NO	NO
	SD I/F	1 slot (SDHC/SDIO/SDXC)	2 slots	2 slots
	HDMI	NO	YES	NO
	CVBS	NO	YES	YES
	Others	NAND-Flash, UART, I2C, SPI, PWM, GPIO, ADC, RTC, PIR	NAND-Flash, Serial-Flash, UART, SPI, PWM, GPIO	NAND-Flash, Serial-Flash, UART, I2C, SPI, PWM, GPIO, ADC,RTC
Package		289pin LFBGA 14x14 0.6pitch	404pin TFBGA 15x15 0.65pitch	338pin NFBGA 13x13 0.65pitch

# Competitor Spec Comparison

		Xarina CXD4145GG	Hisilicon Hi3516C	Grain Media GM8128
Sensor I/F		Parallel CMOS 12bit MIPI 2Lane Serial LVDS 2Lane	Parallel CMOS 12bit	Parallel CMOS 12bit x 2ch
	Resolution (max.)	5M Pixel(2592x1944)	2M pixel	5M Pixel(2592x1944)
Camera Features	Auto-Focus Detector	YES	YES	YES
	Auto IRIS	YES	YES	NO
	Wide Dynamic-Range	ATR-EX	Digital WDR	NO
	Demosaic	Bayer	Bayer, CYMG	Bayer
	Noise Reduction	3D-NR/2D-NR	3D-NR/2D-NR	3D-NR/2D-NR
	Flicker Suppression	YES	YES	YES
	Lens Dist. Correction	YES	YES	NO
Video Features	Electronic Zoom	x1 ~ x16   x1/8 ~ x1	x1 ~ x8   x1/16 ~ x1	x1 ~ x2   x1/128 ~ x1
	Image Stabilizer	NO	YES	NO
	Privacy Masking	YES	YES	YES
	OSD	YES	YES	YES
	Video Compression	JPEG/H.264(BP/MP/HP)	JPEG/H.264(BP)/MJPEG	JPEG/MPEG4(SP)/H.264(BP)
	Codec Performance	H264:3M@30fps, 5M@15fps JPEG:3M@15fps, 5M@7.5fps	H264:1920x1080@30fps MJPEG: JPEG:	H264:1920x1080p@30fps MPEG4:1280x720@30fps MJPEG:?
	Multi Streaming	16 streams + JPEG	2 streams + JPEG	?
Audio Features	Video Analytics	MD, Tamperig alarm	MD, Boundary guard, Video diagnosis	MD
	Video Output	NO	BT1120	BT1120
	Audio I/F	NO	I2S x 1	I2S x 1
	Audio Input/Output	Mic AMP, Speaker AMP	Mic AMP, DA only w/o Speaker AMP	Mic AMP, DA out w/o Speaker AMP
Host CPU Peripherals External I/F	Audio Streaming	G.711/G.726/AAC/AMR	G.711/G.726/ADPCM	?
	CPU	ARM1176JZF-S@400MHz ARM924EJ-S@200MHz	ARM926@440MHz	FA626TE ARM9 V5TE@540MHz
	Memory I/F	16bit DDR3-1066	16bit DDR2/DDR3-440	16bit DDR2-800
	Ether MAC	10/100 (MII/RMII) *Supports EEE	10/100 (MII/RMII)	802.3 MAC with PHY
	USB	High Speed with PHY(Host/Device)	High Speed with PHY(Host)	High Speed with PHY, OTG
	PCI-Ex	NO	NO	NO
	SD I/F	1 slot (SDHC/SDIO/SDXC)	1 slot(SDHC/SDIO)	1 slot(SDHC/SDIO)
	HDMI	NO	NO	NO
	CVBS	NO	YES	YES
Package	Others	NAND-Flash, UART, I2C, SPI, PWM, GPIO, ADC, RTC, PIR	NAND-Flash, Serial-Flash, UART, I2C, SPI, PWM, GPIO, ADC, RTC	NAND-Flash, Serial-Flash, UART, I2C, SPI, PWM, GPIO, ADC, RTC
		289pin LFBGA 14x14 0.6pitch	293pin TFBGA 13x13 0.65pitch	176 TQFP 20x20, 256 TFBGA 12x12



# Performance of Bulit-in WDR

●Xarina Entry + IMX222: Normal



●Xarina Entry + IMX222: ATR=on



●Xarina Entry + IMX236: Built-in WDR=on



●Xarina + IMX140: 2WDR (Multi exposers) =on



# Performance of Bulit-in WDR

●Xarina Entry + IMX236: Normal



●Xarina Entry + IMX236: ATR=on



●Xarina Entry + IMX236: Built-in WDR=on



\*Artifact and false color on Built-in WDR=on  
Xarina Entry doesn't have these compensation function.

# Backup time of RTC

## Evaluated result of RTC in Xarina Entry

●Backup power source: Electric double layer capacitor 0.4F/3.3V (ELNA: DCK404E)

Manufacture	Type	Backup Volt (min)	Backup Current (typ)	Backup Time	Note
MAXIM	DS1339U-33+	1.3V~	0.40uA	23days 3hours	Using external RTC chip
Sony	Xarina Entry	1.36V~	2.7uA	3days 10hours	Using RTC in Xarina Entry

\*Ta=25°C(Typ. Condition)

\*\*Backup time is calculated based on backup volt and current

●Backup power source: Lithium-ion rechargeable battery 3V/1mAh (SII: MS412FE)

Manufacture	Type	Backup Volt (min)	Backup Current (typ)	Backup Time	Note
MAXIM	DS1339U-33+	1.3V~	0.40uA	93days 18hours	Using external RTC chip
Sony	Xarina Entry	1.36V~	2.7uA	13days 21hours	Using RTC in Xarina Entry

\*Ta=25°C(Typ. Condition)

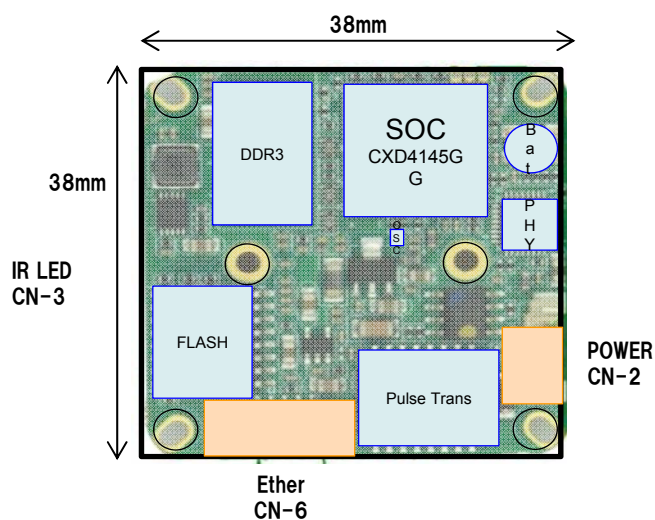
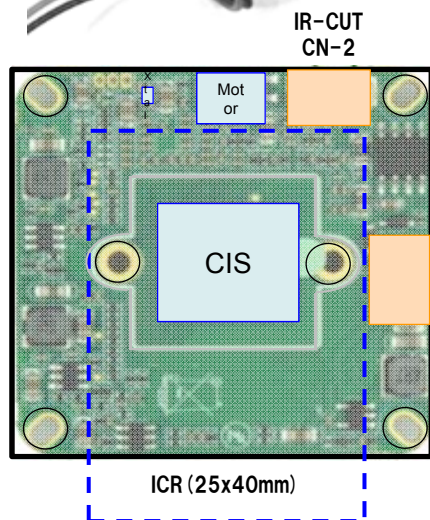
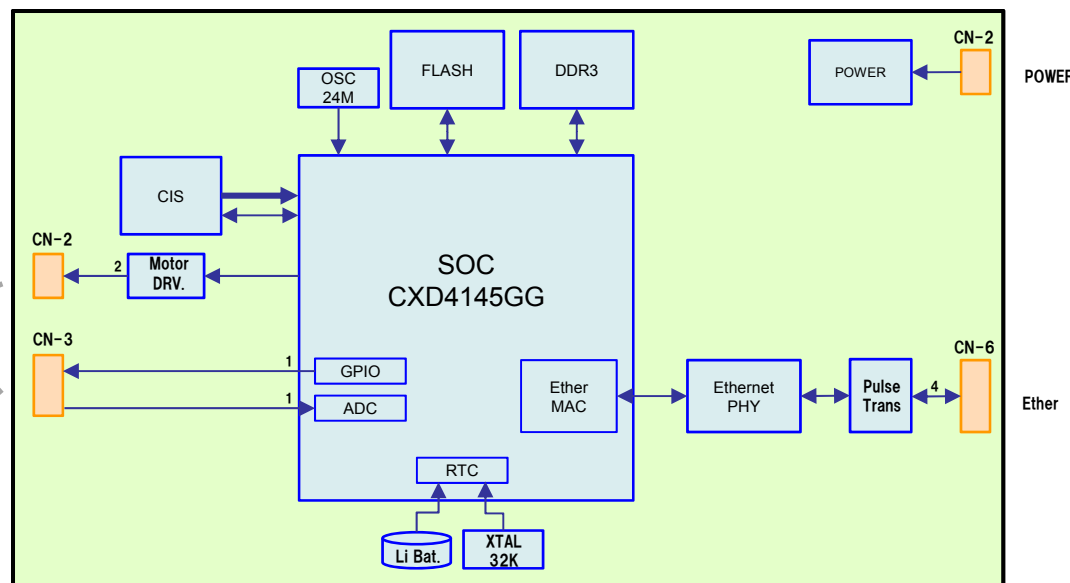
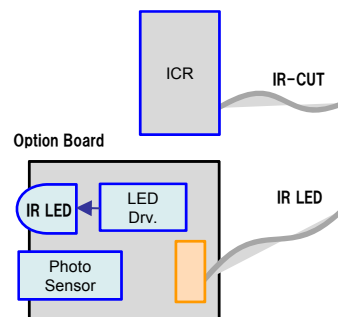
\*\*Backup time is calculated based on backup volt and current



# Xarina Entry-level Model for Board Camera (One board composition)

SOC: Sony CXD4145GG  
Sensor: 1/3" Sony IMX222LQJ  
Spec: 1080p@30fps H.264 encoding  
Day/Nigh

e.g. ICR (25x40mm)



Type	Maker	Parts No.	Package	Size [mm]
CIS	Sony	IMX222LQJ	LGA-94	12.8 x 11.6
SOC	Sony	CXD4145GG	LFBGA-298	13 x 13
OSC	KDS	DSO1612AR 24MHz	SMT	1.6 x 1.2
FLASH	Spansion	S34ML04G1	BGA-63	11 x 9
DDR3	SK Hynix	H5TQ1G63DFR-G7C	FBGA-96	9 x 14
Ether PHY	Micrel	KSZ8091MNX	QFN-32	5 x 5
Pluse Trans	Maconics	HS2213	SMT	12.7 x 9.4
Motor Drv.	ROHM	BA6287F	SOP-8	6.2 x 5
Xtal	KDS	DST1610A 32KHz	SMT	1.6 x 1.0
Li Battery	SII	MS412FE	SMT	φ4.8

# Xarina Entry-level Model for Board camera (Two boards composition)

SOC: Sony CXD4145GG  
Sensor: 1/3" Sony IMX222LQJ  
Spec: 1080p@30fps H.264 encoding  
Day/Night, PIR, Audio  
GPIO, USB, SDIO

e.g. ICR (25x40mm)

