

# IMX322 / IMX323 Comparisons

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Device Solutions Business Group  
Sony Corporation

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Ver.0.2

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## Features

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## IMX323

## IMX322

*Slightly different*

Setting range of gain is different

*Same*

■ Number of recommended recording pixels: 1920 × 1080

■ Master clock (INCK): 37.125 MHz

■ Drive mode

– 1080p (10bit / 12bit: 30 frame/s)

– 720p (10bit: 60frame/s, 12bit: 30 frame/s)

■ 4-wire / I<sup>2</sup>C communication

■ Analog Gain: 0 – 21 dB (0.3 dB step)

■ Digital Gain: 0 – 24dB (0.3 dB step)

■ Total: 45dB

■ Analog Gain: 0 – 24 dB (0.3 dB step)

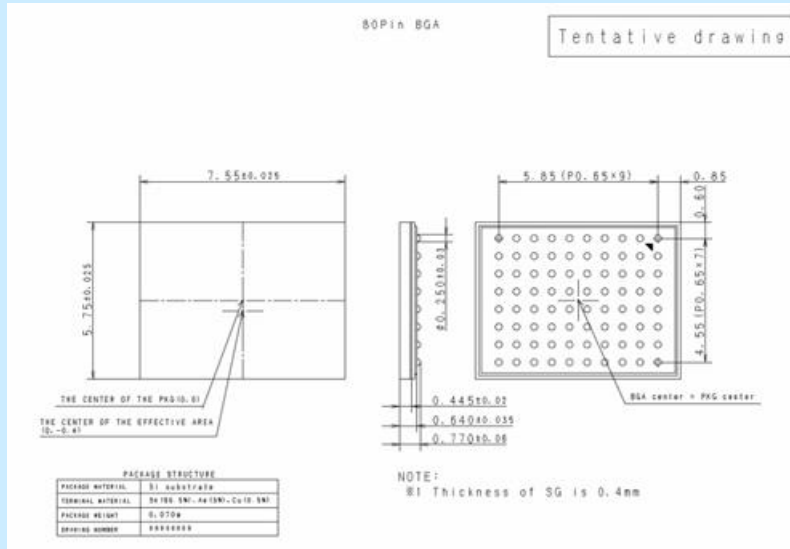
■ Digital Gain: 0 – 24 dB (0.3 dB step)

■ Total: 48dB

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## Hardware - Package

## IMX323



## WLCSP

## ■ Size

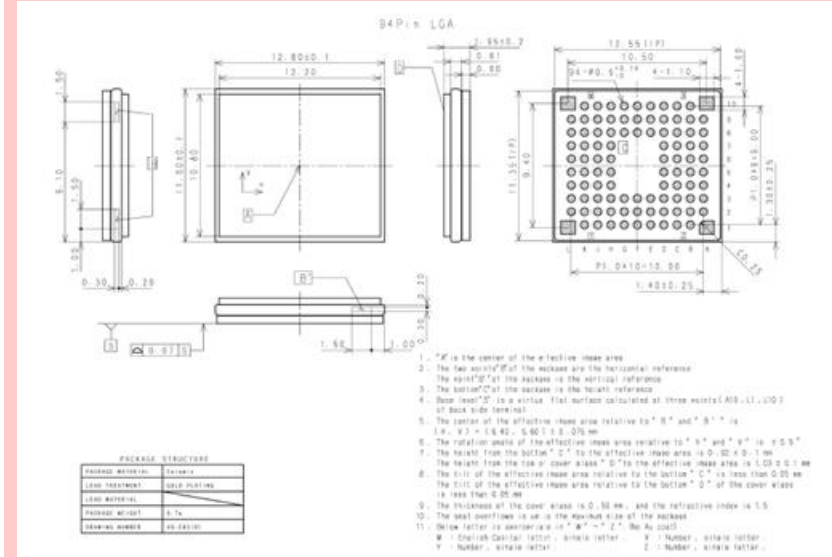
(H)7.55 mm × (V)5.75 mm × (t)0.64 mm \*

\* Without Solder ball

## ■ Number of pins: 80

## ■ Thickness of glass: 0.4 mm

## IMX322



## FFP (Ceramic LGA)

## ■ Size:

(H)12.80 mm × (V)11.60 mm × (t)1.95 mm

## ■ Number of pins: 98

## ■ Thickness of glass: 0.5 mm

## Hardware - Absolute Maximum Ratings

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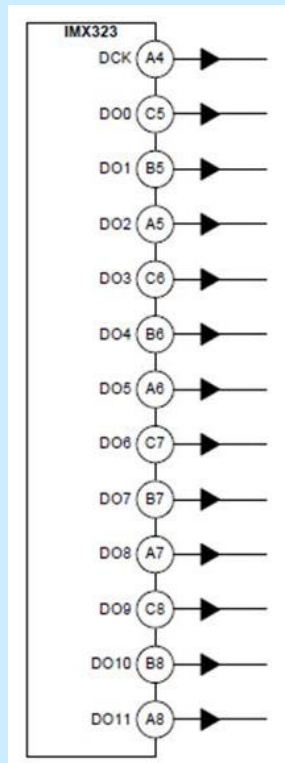
*Same in All*

Supply voltage (analog 2.7 V)		AVDD	-0.3 to +3.3 V
Supply voltage (digital 1.2 V)		DVDD	-0.3 to +2.0 V
Supply voltage (digital 1.8 V)		OVDD	-0.3 to +3.3 V
Input voltage (digital)	VI		-0.3 to OVDD +0.3 V
Output voltage (digital)	VO		-0.3 to OVDD +0.3 V
Guaranteed Operating temperature	Topr		-30 to +75 ° C
Guaranteed storage temperature	Tstg		-40 to +80 ° C
Guaranteed performance temperature		Tspc	-10 to +60 ° C

***Different***

## Hardware - Interface

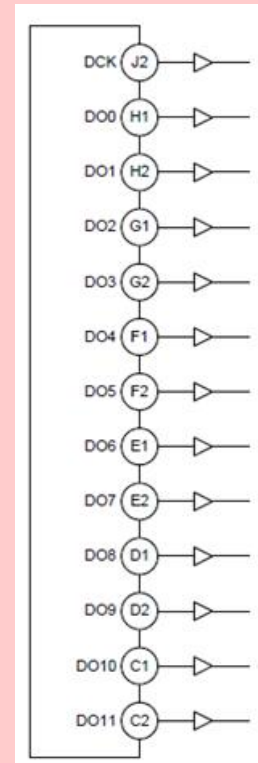
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Parallel CMOS-SDR output

*Same in All*  
(Pin assignment is different.)

## IMX322



Parallel CMOS-SDR output

Hardware - Lens

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Same in All

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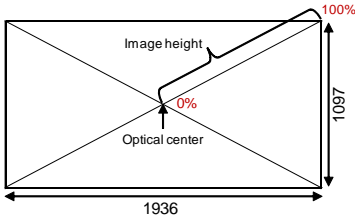
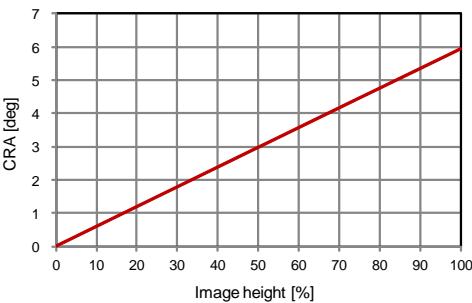
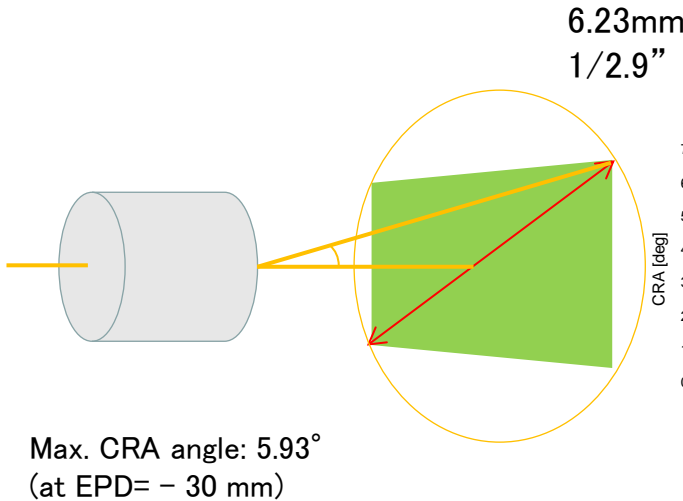


Image height		CRA (deg)
(%)	(mm)	
0	0.00	0.00
5	0.16	0.30
10	0.31	0.59
15	0.47	0.89
20	0.62	1.19
25	0.78	1.49
30	0.93	1.78
35	1.09	2.08
40	1.25	2.38
45	1.40	2.68
50	1.56	2.97
55	1.71	3.27
60	1.87	3.57
65	2.02	3.86
70	2.18	4.16
75	2.34	4.45
80	2.49	4.75
85	2.65	5.04
90	2.80	5.34
95	2.96	5.63
100	3.12	5.93

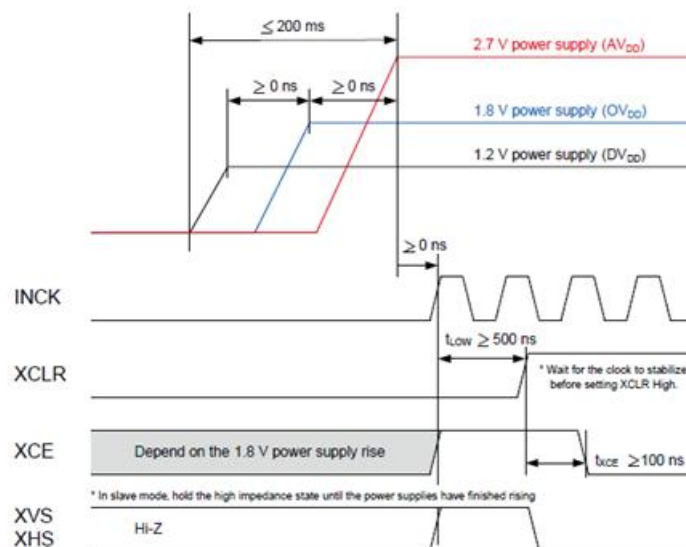


# Hardware - Power ON/OFF Sequence

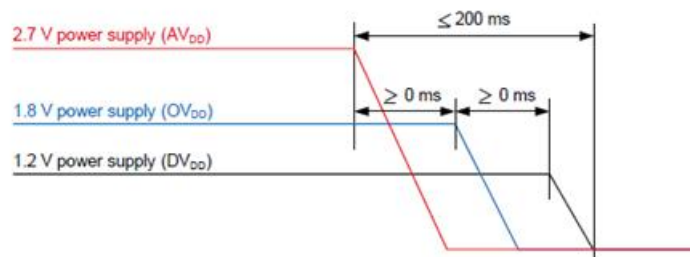
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*Same in All*

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Power-on Sequence



Power-off Sequence

## Software - Operating mode

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*Same in All*

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Drive mode	Imaging conditions								
	INCK [MHz]	Frame rate [frame/s]	Output Resolution [bit]	Data Rate [Mpixel/s]	Number of effective pixels		Data width*1		1H period [μs]
					H [pixels]	V [lines]	H [INCK]	V [lines]	
HD1080 p	37.125	15.00	10/12	37.125	1984	1105	2200	1125	59.26
		25.00	10/12	74.25			1320		35.56
		30.00	10/12	74.25			1100		29.63
HD720 p		30.00	10/12	37.125	1344	745	1650	750	44.44
		60.00	10	74.25			825		22.22

# Software - Register setting

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*Almost same*

IMX322

*All registers in both IMX323 and IMX322 have assigned a same addresses.*

Add the initial setting register in IMX323.

(Chip ID: 02h/Address 3Fh IMX322: 00h / IMX323: 0Ah)

IMX323 datasheet is included registers for each function which is described on application note of IMX322.

(e.g. Sync2 mode, H-inverted drive.)

## Specification - Spectral Sensitivity

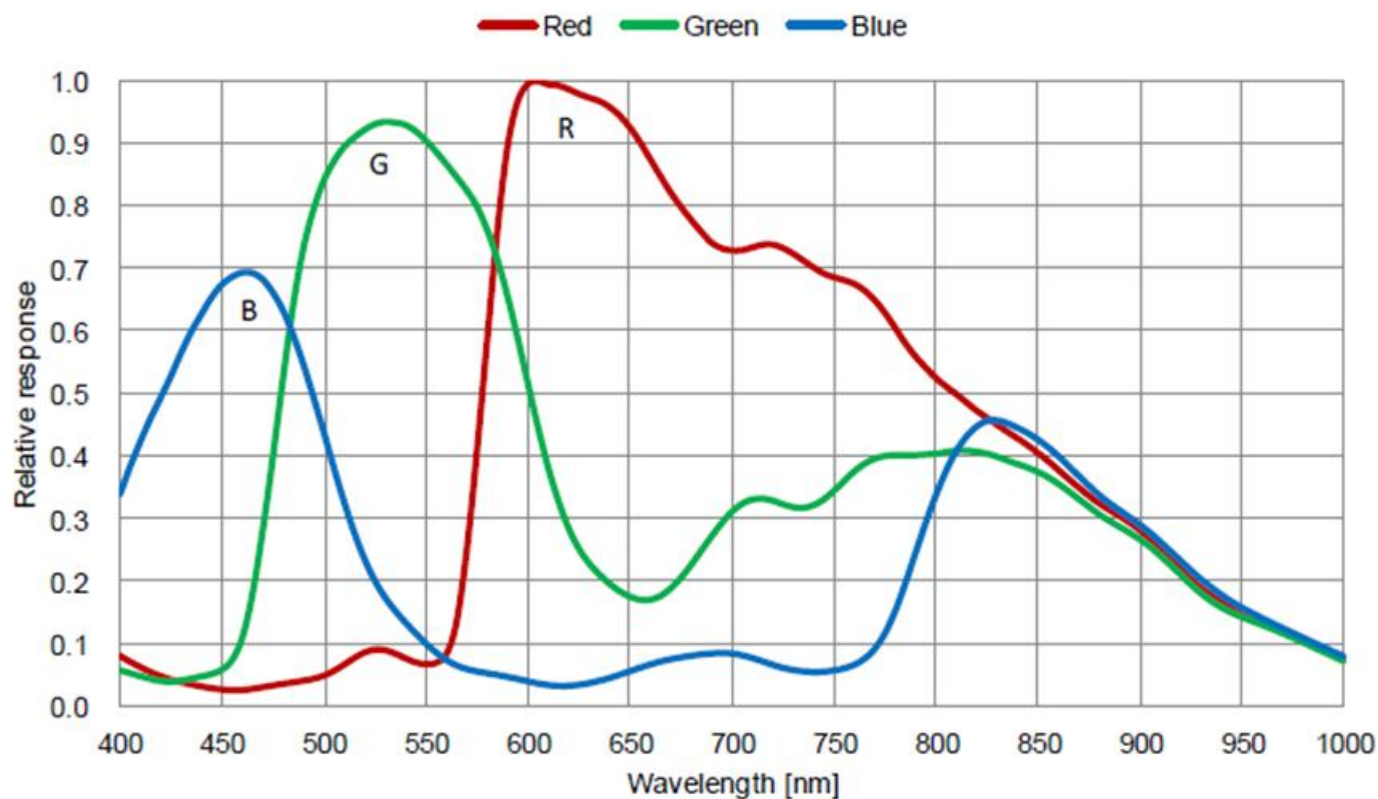
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*Same in All*

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(Excludes lens characteristics and light source characteristics.)



# Specification - Image Sensor Characteristics

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	IMX323	IMX322	Remarks
G sensitivity (Min.)	510 mV (3239 digit *)	510 mV (2293 digit *)	1/30 s Gain: 0dB
Saturation signal (Min.)	645 mV (4095 digit *)	812 mV (3651 digit *)	Gain: 0dB
Sensitivity ratio	TBD	0.46 – 0.61	R/G
	TBD	0.34 – 0.49	B/G
Video signal shading	TBD	25 %	Zone 0 – II'
* 1 digit	0.1575 mV	0.2224 mV	AD = 12bit

Specification - Spot Pixel Specification

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TBD

IMX322

(AV<sub>DD</sub> = 2.7 V, OV<sub>DD</sub> = 1.8 V, DV<sub>DD</sub> = 1.2 V, T<sub>j</sub> = 60 °C, 30 frame/s, Gain: 0 dB)

Type of distortion	Level	Maximum distorted pixels in each zone				Measurement method	Remarks
		0 to II'	Effective OB	III	Ineffective OB		
Black or white pixels at high light	30 % ≤ D	17	No evaluation criteria applied			1	
White pixels in the dark	5.6 mV ≤ D	400		No evaluation criteria applied		2	T <sub>j</sub> = 60 °C 1/30 s integration
Black pixels at signal saturated	D ≤ 639 mV	0	No evaluation criteria applied			3	

No.	Pattern	White pixel / Black pixel / Bright pixel
1		Rejected
2		Allowed
3		
4		
5		

Note) 1. ● Black circles indicate the positions of spot pixels. The patterns are specified separately for white pixels, black pixels and bright spots.  
(Example: Even when a black pixel and a white pixel are arranged as shown by pattern No. 1, this is not judged as a defect (Allowed).)  
2. Sensors exhibiting one or more patterns indicated as "Rejected" are sorted and removed.  
3. Sensors exhibiting patterns indicated as "Allowed" are not subject to sorting and removal, and these pixels are instead counted in the number of allowable spot pixels by zone.  
4. White pixels and black pixels other than the patterns noted in the table above are all counted in the number of allowable spot pixels by zone.

# Specification - Occurrence Rate of White Pixels

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White Pixel Level (in case of integration time = 1/30 s)	Occurrence rate per week
5.6 mV or higher	TBD %
10.0 mV or higher	TBD %
24.0 mV or higher	TBD %
50.0 mV or higher	TBD %
72.0 mV or higher	TBD %

## IMX322

White Pixel Level (in case of integration time = 1/30 s)	Occurrence rate per week
5.6 mV or higher	27.8 %
10.0 mV or higher	15.9 %
24.0 mV or higher	6.9 %
50.0 mV or higher	3.4 %
72.0 mV or higher	2.4 %

# Revision History

2015/9/15

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Date	Ver.	Description
Jun. 08. 2015	0.1	First edition
Aug. 10. 2015	0.2	Update (Gain on P.3, Application circuit on P.6, Sensitivity on P.13).



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