Sony Corporation
1-7-1 Konan, Minato-ku, Tokyo
108-0075 Japan
Sony Semiconductor Solutions Corporation
4-14-1 Asahi-cho, Atsugi-shi, Kanagawa
243-0014 Japan

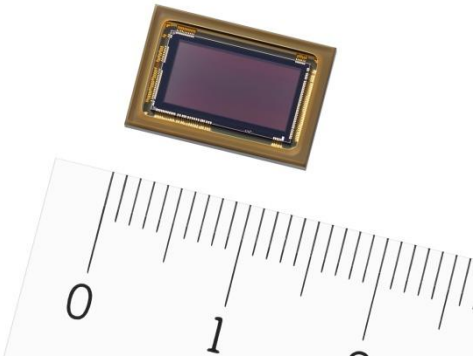
News & Information

October 23, 2017

New Product

Sony Releases the Industry's Highest Resolution[*1] 7.42 Effective Megapixel Stacked CMOS Image Sensor for Automotive Cameras

Sony today announced the release of the IMX324, a new 1/1.7-type stacked CMOS image sensor equipped with the industry's highest resolution[i] 7.42 effective megapixel RCCC filter[ii] for forward-sensing cameras in advanced driver-assistance systems (ADAS). Sony will begin shipping samples in November 2017.



IMX324 CMOS Image Sensor for Automotive Cameras

Model name	Sample shipment date	Mass-production shipment date (planned)	Sample price (excluding tax)
IMX324 type 1/1.7, 7.42 effective megapixel CMOS image sensor for automotive cameras	November 2017	June 2018	10,000 JPY

This image sensor is capable of approximately three times the horizontal resolution of conventional products,[iii] which enables high-definition image capture of distant road signs approximately 160 metres[iv] ahead of the camera. Furthermore, the sensor is equipped with a pixel binning mode[v] for further raising the sensitivity in low-light environments, achieving the high sensitivity of 2666 mV, making it possible to capture images of pedestrians and obstacles even in dark situations that are equivalent to the brightness of moonlight. Even in environments with uneven, mixed levels of brightness, due to headlights and streetlights when driving at night, the sensor is equipped with a function that alternately captures dark sections at high-sensitivity settings and bright sections at high resolution, enabling high-precision image recognition when combined with the signal processing of the latter stage.

This is the first time in the industry[vi] where a stacked configuration has been employed on an automotive grade sensor. This arranges the pixel array and signal processing circuit in layers

to allow for a compact size and low power consumption while still delivering high resolution.

This image sensor is expected to be compatible with the "EyeQ®4" and "EyeQ®5" image processors currently being developed by Mobileye, an Intel Company headquartered in Israel, for use in ADAS and autonomous vehicle technology.

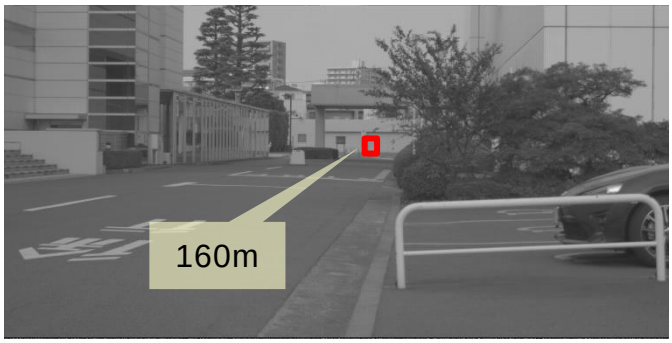
This sensor is planned to meet the AEC-Q100 Grade 2 reliability testing standards for automotive electronic components by June 2018. Sony has also introduced a development process compliant with ISO 26262 automobile functional safety standards, to ensure design quality that satisfies the functional safety requirements for an automotive product, and this has led to its supporting functional safety requirement level ASIL B(D)[vii] for failure detection, notification, and control. Moreover, the new sensor comes with a security feature that protects the output image from being altered, which is the industry's first[vi] application of such a function in an image sensor for automotive cameras.

Main Features

1. 7.42 megapixels — the industry's highest resolution[i] for image sensors for automotive cameras

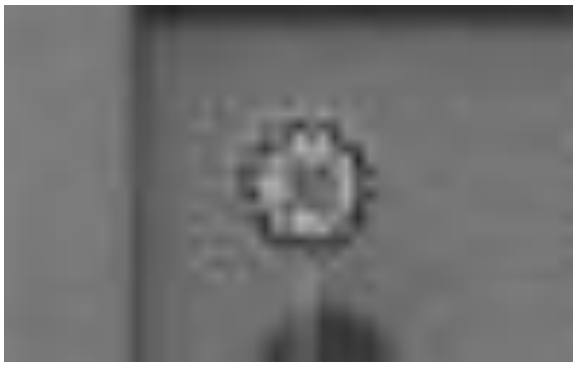
   The new image sensor is capable of approximately three times the horizontal resolution of conventional products,[iii] which enables high-definition image capture of distant road signs approximately 160 metres[iv] ahead of the camera.

   - Distant sample image comparison



IMX324 sample image

IMX324 (7.42 Megapixel)
magnified image



IMX224 (1.27 Megapixel)
magnified image

2. High sensitivity of 2666 mV (Standard value F5.6, when using pixel binning mode)

   The sensor is equipped with a pixel binning mode for raising the sensitivity in low-light environments. The pixel binning mode on this sensor adds data from a total of four pixels and processes it as a single pixel to raise the sensitivity when reading image data. The pixel binning mode and RCCC filter[ii] together achieve the high sensitivity of 2666 mV, making it possible to capture images of distant obstacles and people even in low-light environments as low as 0.1 lux, equivalent to the brightness of moonlight. Also, by switching between pixel binning mode and full pixel mode for each frame it is possible to capture bright sections illuminated by the headlights in high resolution, and dark sections not illuminated by headlights at high sensitivity, thereby enabling high-precision image recognition when combined with the signal processing of the latter stage.

- Low-light (0.1 lux) image comparison

IMX324 (pixel binning mode)
sample image

IMX224 sample image

3. Industry's first[vi] automotive grade stacked image sensor delivers compact size and low power consumption

   A stacked configuration has been implemented on the image sensor, arranging the pixel array and signal processing circuits in different layers to achieve compact size and low power consumption while delivering high resolution.

4. Meets quality standards and functions required for automotive applications
・Set to meet the requirements of the AEC-Q100 Grade 2 automotive electronic component reliability tests by June 2018.
・Development process compliant with ISO 26262 automobile functional safety standards results in a high level of design quality that satisfies the functional safety requirements for an automotive product.
・Supports functional safety requirement level ASIL B (D)[vii].
・Equipped with an industry-first[vi] security feature that protects the output image from being altered.

Key Specifications

Model name		IMX324
Number of effective pixels		3849 (H) x 1929 (V) 7.42 megapixels
Image size		Diagonal 9.69mm (type 1/1.7)
Unit cell size		2.25μm (H) x 2.25μm (V)
Frame rate	Full pixel reading	Max. 40 fps
Sensitivity (F5.6 standard value, 1/30 second exposure time)		784 mV (Clear Pixel), 2666 mV (pixel binning mode)
Dynamic range (EMVA1288 standard)		120dB
Saturation signal (minimum value)		800mV
Power supply	Analog	2.9V
	Digital	1.1V
	Interface	1.8V
Interface		MIPI CSI-2 serial output (4 lane / 2 lane)
Package		108pin plastic BGA
Package size		13.23mm x 8.97mm

For more information, please contact your local PR manager or:
David Edwards, Corporate Communications, Sony Europe
+44 (0)1932 817022 / david.edwards@eu.sony.com

About Sony Corporation

Sony Corporation is a leading manufacturer of audio, video, imaging, game, communications, key device and information technology products for the consumer and professional markets. With its music, pictures, interactive entertainment and online businesses, Sony is uniquely positioned to be the leading electronics and entertainment company in the world. Sony recorded consolidated annual sales of approximately $76 billion for the fiscal year ended March 31, 2017. Sony Global Web Site: http://www.sony.net/

[i] As of announcement on October 23, 2017, according to Sony research.

[ii] A colour filter that combines R (red) and C (clear).

[iii] When compared to IMX224MQV

[iv] With a FOV 32° lens on the camera

[v] Reading mode that adds multiple pixel data to further raise sensitivity

[vi] As of October 2017, according to Sony research

[vii] This image sensor supports ASIL B (safety goal of the system is ASIL D) requirements.