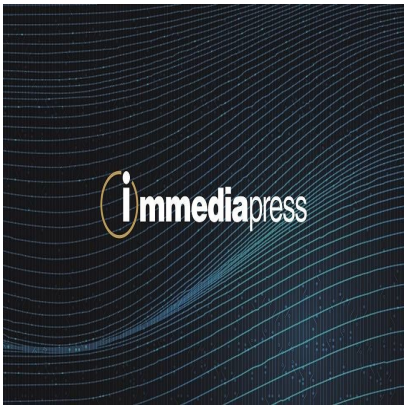

Sony Semiconductor Solutions to Release X-ray CMOS Sensor with Industryâ??s Fastest*Â¹ Imaging and Low-Noise Performance for Inspection and Measurement Instrumentation

Descrizione

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High-accuracy energy measurements and photon-level data acquisition on a single chip

ATSUGI, Japan, June 9, 2026 /PRNewswire/ â?? Sony Semiconductor Solutions Corporation (Sony) today announced the upcoming release, mass-production, and shipment of the IMX711 direct conversion charge-integrating X-ray CMOS image sensor.

The IMX711 is an X-ray image sensor for inspection and measurement instrumentation which directly detects X-rays and outputs signals proportional to their energy. The new sensor offers the industryâ??s fastest*1 maximum 26,100 fps high-speed imaging, achieved thanks to Sonyâ??s proprietary circuit technology, suppressing charge saturation for accurate measurements. It also significantly reduces noise to enable improved signal detection precision in low-flux conditions, detecting differences in photon energy. It provides both high-accuracy measurements of integrated X-ray energy at a wide dynamic range and energy information acquisition at the photon level on a single sensor, a feat that has been difficult with conventional sensors. This unique feature will contribute to the advancement and diversification of X-ray inspection and measurement technologies, which are used in a wide variety of applications, from cutting-edge device inspection to scientific measurements.

*1Among charge-integrating X-ray CMOS image sensors. According to Sony research (as of announcement on June 9, 2026).

Examples of Potential Applications

Main Features

This product achieves the industryâ??s fastest*1 maximum frame rate of 26,100 fps thanks to Sonyâ??s proprietary circuit technology. Lowering the amount of accumulated charge per frame enables superior saturation characteristics compared to conventional sensors. At the same time, random noise, which is a technical challenge on charge-integrating sensors, has been reduced to 34 e- rms*3 so that even faint X-ray signals are not obscured by noise and can be reliably detected. This improves measurement precision under low-flux conditions, offering photon level detection. These features enable accurate measurement of integrated X-ray energy for all pixels across low- to high-flux conditions, supporting inspection and measurement with significant differences in brightness on a single sensor, contributing to improved device throughput and an expanded dynamic range.

The new sensor uses the charge-integrating method, which makes it possible to acquire photon energy information without the need to set a threshold in advance. Furthermore, noise and signal variation are suppressed during reading to achieve high energy resolution for clear identification of differences in photon energy. Enabling acquisition of highly reliable data via high energy resolution will contribute to streamlining and improving precision in advanced inspection and measurement, which previously required several measurements in applications such as detecting differences in constituent elements at the element level and structural and material analysis to quantitatively evaluate minute state changes. It also enables post-processing under various conditions such as collecting the measurement data for all pixels, combining it with spatial information, and extracting specific energy data contributes to multifunctional inspection and measurement.

The IMX711 was developed with the collaboration between Sony Semiconductor Solutions Corporation and RIKEN. Based on a pixel structure invented by Dr. Takaki Hatsui of RIKEN, the two parties worked together on the technological development required to make it viable as a practical X-ray image sensor, including improving sensitivity and achieving high resistance to X-ray irradiation and high-voltage tolerance. Sony developed its circuit technology, manufacturing processes and packaging technology for mass production.

Related LinkIMX711 product page: https://www.sony-semicon.com/en/products/is/scientific/x-ray.html

Please check the official website for specifications and other details.https://www.sony-semicon.com/en/news/2026/2026060901.html

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