Sony Semiconductor Solutions Unveils Advanced CMOS Sensor for Mobile Devices, Delivering Superior Imaging and High Dynamic Range Even While Zooming

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Sony Semiconductor Solutions Corporation (SSS) has announced the launch of the LYT-828, a new 50-megapixel* CMOS image sensor. Part of the LYTIA brand-a new lineup of mobile image sensors-the LYT-828 offers an impressive dynamic range of over 100 dB, effectively reducing blowout in bright areas while minimizing noise and blackout in darker regions.

A successor to the LYT-818, this 1/1.28-type sensor is primarily designed for both main and sub-cameras in smartphones. While retaining the core features of its predecessor, it introduces the newly developed Hybrid Frame-HDR (HF-HDR) technology for enhanced image quality. HF-HDR is an advanced HDR solution that integrates multiple HDR techniques-combining traditional single-frame HDR using dual conversion gain (DCG) with multi-frame HDR that merges short-exposure frames and DCG data at the application processor stage. This fusion results in an industry-leading dynamic range of over 100dB among Sony Semiconductor Solutions' mobile CMOS sensors. The sensor effectively reduces highlight blowout in bright areas and minimizes blackout in dark scenes, producing visuals that more closely match human visual perception. Additionally, the integration of Loss-Less Exposure (LLE) technology allows greater flexibility in

exposure control, optimizing light utilization and improving the signal-to-noise ratio (SNR). Notably, HF-HDR retains its full capabilities even during zoom, ensuring consistent high-quality imaging throughout.

The LYT-828 also features a proprietary circuit developed by Sony Semiconductor Solutions (SSS) that efficiently converts the charge from photodiodes into voltage, significantly reducing random noise (RN). This allows for the capture of highly detailed images even in low-light environments, with minimal grain caused by noise. Additionally, the sensor is designed for lower power consumption, particularly within its logic circuits, enabling continuous HDR functionality-even during preview mode and video recording. As a result, users can shoot HDR images and videos that closely match what was displayed during the preview on their smartphone screens.

New HDR technology that delivers over 100 dB of dynamic range performance

HF-HDR is an advanced HDR technology that enhances dynamic range by combining composite data from single-frame HDR-captured using dual conversion gain at different gain levels-with short-exposure frames on the application processor at a later stage. This innovative approach significantly boosts dynamic range performance to over 100 dB, surpassing that of conventional HDR methods. The inclusion of Loss-Less Exposure (LLE) technology further enhances image quality by allowing greater flexibility in exposure control, leading to improved signal-to-noise ratio (SNR). Notably, HF-HDR maintains its high dynamic range even during zoom operations by switching to full resolution, ensuring consistent, high-quality imaging even in scenes with strong contrast.

Ultra-high conversion gain (UHCG) technology minimizes random noise in low light, enabling vivid imaging

UHCG is a circuit technology that efficiently converts electrical charge to voltage, significantly reducing random noise and graininess in low-light conditions. This enhances

image clarity and improves color gradation, ensuring better reproduction in dark environments.

Low-power design for constant use of HDR
Typically, showing HDR previews on a smartphone screen increases power consumption and can lead to device heating, which may limit the availability of HDR preview. However, this sensor is designed with low-power logic circuits, enabling continuous HDR functionality without overheating. As a result, users can preview images and videos in true HDR quality and capture them exactly as seen on screen, enhancing the overall shooting experience.

Key Specifications

Model name	LYT-828
Image size	1/1.28-type (diagonal 12.49 mm)
Effective pixels	Approx. 50 megapixels
Unit cell size	1.22Microns 1.22Microns (H V)
Color filter	Quad Bayer Coding

Frame rate	**All pixels (4:3)**	30 fps (all pixel AF)
	12.5 megapixels (4:3)	120fps (all pixel AF)
	4K2K	120fps (all pixel AF)
	12.5 megapixels (Multi-frame HDR)	60fps (2 digital overlap, all pixel AF)
	12.5 megapixels (Single-frame HDR)	60fps (DCG-HDR, all pixel AF) 30fps (UHCG with 3HDR, all pixel AF)
	4K2K (Multi/single-frame HDR)	60fps (HF-HDR with LLE 6% AF, DCG-HDR all pixel AF)
Power supply	**Analog**	2.8v/1.8v
	Digital	0.81v
	Interface	1.8v or 1.2v
Output interface		MIPI C-PHY 2/3 trio, Max. 6.0Gsps/trio MIPI D-PHY 2/4 lane, Max. 2.5Gbps/lane

For more information on LYTIA, the SSS's mobile image sensor brand, please visit the LYTIA brand site:

www.sony-semicon.com/en/products/is/mobile/index.html.

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