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STMicroelectronics sets the scene for advanced in-car safety and comfort with new hybrid sensor for full interior monitoring

- *Hybrid rolling and global-shutter image sensor extends basic driver monitoring to enable more adaptive and convenient vehicles for all occupants*
- *Driver monitoring market is growing at more than 10% per year*

Geneva, September 8, 2022 – As leading automotive markets start to mandate driver-monitoring systems (DMS), **STMicroelectronics (NYSE: STM)**, a global semiconductor leader serving customers across the spectrum of electronics applications, is already equipping carmakers with the required technologies. While DMS promises greater road safety by assessing driver alertness, the next-generation dual image sensor ST announced today monitors the full vehicle interior covering both the driver and all passengers. New applications enabled by ST's new image sensor include passenger safety-belt checks, vital-sign monitoring, child-left detection, gesture recognition, and high-quality video/picture recording.

"*The DMS market is growing at a double-digit pace. ST's new image sensor is set to push that forward by enabling brands to create new services and deliver even greater value for vehicle users, leveraging complete in-cabin monitoring that covers multiple occupants,*" said Eric Aussedat, Executive Vice President, Imaging Sub-Group General Manager, STMicroelectronics. "*Our market-leading DMS sensor provided the perfect launchpad to take the technology further and empower new innovations*."

The new sensor, the VD/VB1940, delivers a cost-effective solution that combines the sensitivity and high resolution of infrared sensing with high dynamic range (HDR) color imaging in a single component. It can capture frames alternatively in rolling-shutter and global-shutter modes. With 5.1-megapixels, it captures the high-dynamic-range (HDR) color images needed for an occupant monitoring system (OMS) in addition to the high-quality near-infrared (NIR) images typically captured by standard DMS sensors. DMS uses NIR imaging to analyze driver head and eye movements in all lighting conditions.

Offered in both bare wafers (VDB1940) and packaged in BGAs (VB1940), samples are available now and mass production is planned to meet demand for the model-year 2024 vehicles being designed now. Please contact your local ST sales office for pricing information.

Further Technical Information

The new automotive image sensor uses ST's second-generation 3D-stacked back-side illuminated (BSI) wafer technology, which maximizes the optical area and on-chip processing in relation to die size. This lets the sensor perform sophisticated algorithms locally for optimal performance in both color and NIR imaging, saving power and relieving demand for an external co-processor.

Algorithms performed on-chip include Bayer conversion and HDR merging for optimal image-quality and frame rate. On-chip Bayerization processing enables the user to reshuffle the color pixels of the RGB NIR 4X4 pattern into RGGB format compatible with a wide range of SoCs. In addition, local processing also handles independent color and NIR pixel-exposure optimization for optimum image quality in both modes, as well as smart upscaling to maximize NIR image resolution by capturing extra NIR information from RGB pixels.

The embedded processor also manages enhanced cybersecurity to ensure privacy in connected-vehicle applications, including mutual authentication and pairing of camera and electronic control unit (ECU), as well as video-stream authentication.

The sensor captures NIR images in global-shutter mode, which permits synchronizing with the infrared LED emitter to capture fast-moving scenes without motion blur. By also supporting rolling-shutter mode, which reads pixel data row by row, the VD/VB1940 provides optimum color-imaging performance. Leveraging the on-chip HDR-merge feature in rolling-shutter mode, the VB/VD1940 produces a 100dB full-resolution color image.

Qualified to AEC-Q100, the VD/VB1940 is ISO 26262 compliant to facilitate use in functional-safety systems up to ASIL-B.

About STMicroelectronics

At ST, we are 48,000 creators and makers of semiconductor technologies mastering the semiconductor supply chain with state-of-the-art manufacturing facilities. An integrated device manufacturer, we work with more than 200,000 customers and thousands of partners to design and build products, solutions, and ecosystems that address their challenges and opportunities, and the need to support a more sustainable world. Our technologies enable smarter mobility, more efficient power and energy management, and the wide-scale deployment of the Internet of Things and connectivity. ST is committed to becoming carbon neutral by 2027. Further information can be found at www.st.com.

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