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STMicroelectronics enables quieter cabins for the electric-vehicle age with advanced vibration sensor to eliminate road noise

Optimized for sensing road noise and related vibration, AIS25BA is best-in-class automotive MEMS accelerometer for accuracy in controlling and quieting in-cabin acoustic environment

Geneva, October 3, 2022 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, is enabling more acoustically comfortable cars, with its new sensor for road-noise cancellation (RNC) through active noise-control (ANC) techniques. Cars have traditionally been defined by engine performance, exterior design, and powertrains, but drivers and passengers are increasingly focused on comfort.

Indeed, while Electric Vehicles (EV) are intrinsically less noisy than internal combustion engine cars (ICE), car makers are focused on further lowering in-cabin noise due to wheel or vibration. These efforts aim to allow passenger to better enjoy the journey in a quieter ambient environment.

Noise cancellation algorithms, working with an array of sensors installed throughout the vehicle, measure the ambient sounds, and eliminate vibration using noise-cancelling waveforms that act as anti-vibration (cancelling) sounds.

"*In today's digital age, canceling – not deadening – unwanted sounds is the smart way to ensure a quieter cabin for safer, more enjoyable journeys*," said Simone Ferri, MEMS Sub-Group General Manager of Marketing, Analog, MEMS and Sensors Group, STMicroelectronics. "*With the transition to hybrid and electric vehicles, which can be strongly affected by road noise, our AIS25BA accelerometer delivers superior value for system designers*."

ST has leveraged its competencies in micro electro-mechanical system (MEMS) ICs to give the AIS25BA superior characteristics for enhancing RNC system accuracy. The sensor has the lowest electrical noise in the market, which helps vehicle engineers achieve the calmest possible in-car environment. On the other hand, it has the fast response/low latency needed by the RNC system to calculate corrective waveforms in real-time as well as wide bandwidth to capture disturbances across the full spectrum of sound frequency relevant for the application. Its wide temperature range and mechanical robustness allows placement in the harshest places of today's vehicles: near the engine or electric drive as well as close to wheels and suspension.

Further technical information:

ST's AIS25BA 3-axis accelerometer is engineered to prioritize RNC system accuracy. At 30µg/√Hz in X and Y axes and 50µg/√Hz in the Z axis, it has extremely low noise density, which is up to 58% better than the closest competing alternative.

With this outstanding noise performance, frequency response extends to 2 and hence covers all the spectrum relevant for in-car noise cancellation. Similarly, the total sensor latency of 266µs is engineered for leaving the system plenty of time to generate noise-cancellation signals in real-time.

In addition, the sensor has a time-division multiplex (TDM) digital interface that enables the system to synchronize the outputs from multiple accelerometers installed to measure vibrations throughout the vehicle. This audio-friendly interface also allows easy connection to other types of data buses widely adopted in automotive. The full-scale measurement range is selectable up to ±7.7g, giving plenty of margin with respect to the intense vibrations typical of the application. The supply-voltage range is 1.71V to 1.99V.

The AIS25BA is compliant with AEC-Q100 and is available now in a 14-lead 2.5mm x 2.5mm x 0.86mm LGA package, priced from $3.90 for orders of 1000 pieces. Please contact your local ST sales representative for sample requests.

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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