

## MEMS Sensors

### TDK expands SmartSound™ family of performance MEMS microphones at 2022 Consumer Electronics Show

- T5837 and T5838 PDM microphones offer 68dBA SNR consuming only 130uA in always-on mode & 330uA in high performance mode
- T5848 extends the highest dynamic range I2S Digital MEMS microphone offering direct audio connectivity to a wide variety of SoCs, MCUs and IoT processors

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TDK Corporation (TSE: 6762) introduces three new digital MEMS microphones as part of the SmartSound™ family of products for mobile, TWS, IoT and other consumer devices. Each of these high-performance microphones push the boundaries of microphone acoustic performance, providing advanced feature sets in small package footprints.

The T5837/38 PDM MEMS microphones offer high acoustic overload point (AOP) of 133dB SPL, high signal-to-noise ratio (SNR) 68dBA and wide dynamic range ideal for environments that shift from very quiet to very loud, such as far field voice pickup for Smart Speaker to ANC TWS applications. The T5848 SmartSound I2S MEMS microphone offers high acoustic overload point (AOP) of 133dB SPL, high signal-to-noise ratio (SNR) 68dBA and wide dynamic range ideal for applications such as smartwatches and wearables, which need to offer high acoustic performance under dynamic noisy environments.

- T5837, a very low power wide dynamic range PDM digital microphone with industry standard features:
  - Multiple modes of operation such as High Quality, Low-Power (Always On), Ultrasonic and Sleep Mode.
  - High Quality Mode offer sensitivity of -37dB FS, LPM -21dB FS
  - Targeted to smartphones, TWS earbuds, tablets, cameras, Bluetooth headsets, smart speakers, notebook PCs, security and surveillance markets
- T5838, a very low power wide dynamic range PDM digital microphone with new Acoustic Activity Detect (AAD) features:
  - Industry-leading acoustic performance and modes of operations seen on the T5837
  - Acoustic Activity Detect, a new ultra-low power edge processing feature where the microphone monitors the acoustic environment and wakes up the SoC or application processor when activity is detected. Available with three modes of operation starting at just 20  $\mu$ A, it provides user programmability to apply various filters and thresholds for optimized performance for each application.
  - High Quality Mode offer sensitivity of -41dB FS, LPM -26dB FS
  - Targeted to smartphones, TWS earbuds, tablets, cameras, Bluetooth headsets, smart speakers, notebook PCs, security and surveillance markets

- T5848, a very low power wide dynamic range PDM Digital microphone with industry standard features:
  - I2S output provides high quality 24-bit PCM audio, removing the requirement of a codec between the microphone and SoC/system processor, or the requirement of the SoC having native PDM input/decimation.
  - The Acoustic Activity Detect (AAD), a new ultra-low power edge processing feature where the microphone monitors the acoustic environment and wakes up the SoC or application processor when activity is detected. Available with three modes of operation starting at just 20  $\mu$ A, it provides user programmability to apply various filters and thresholds for optimized performance for each application.
  - Includes multiple modes of operation such as High Quality, Low-Power (Always On) and Sleep Mode.
  - High Quality Mode offer sensitivity of -37dB FS, LPM -26dB FS
  - Targeted to smartwatches/wearables, smart speakers, cameras, Bluetooth headsets, voice activated TV remote controls, notebook PCs, security and surveillance markets

“TDK continues to expand its innovative SmartSound performance solutions with Acoustic Activity Detect functionality, positioning these new MEMS microphones as a step forward compared to the competition,” said Ritesh Tyagi, Vice President of Product Management at InvenSense, a TDK group company. “The new T5848 has 68dBA SNR, 133dB AOP, which are improvements of 3dB and 13dB respectively to the next best I2S microphone available in the market. While the T5837/38 add a very high level of acoustic performance by consuming only 2uA/dB SNR in the Always-On mode, compared to 4-5uA/dB SNR by other competing devices.”

Each product is available in small 3.5 x 2.65 x 0.98 mm bottom port packaging. The T5837/38 and T5848 are available for sampling. For samples and additional information, please contact [sales@invensense.com](mailto:sales@invensense.com) or visit <https://invensense.tdk.com/smartsound/>. TDK will be introducing the T5837/38, and the T5848 during the 2022 CES Virtual Press Conference for more information contact [pr@invensense.com](mailto:pr@invensense.com).

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#### Glossary

- TWS: True Wireless Stereo
- HQM: High Quality Mode
- LPM: Low Power Mode
- AOP: Acoustic Overload Point
- SNR: Signal to Noise Ratio
- SPL: Sound Pressure Level
- AAD: Acoustic Activity Detect

#### Key applications

- Smartwatches/Wearables
- Voice Activate TV Remote Controls
- Smartphones
- TWS earbuds
- Tablets

- Cameras
- Bluetooth Headsets
- Smart Speakers
- Notebook PCs
- Security and Surveillance

## Key data

Product	Packaging Dimensions (mm)	SNR dBA (HQM / LPM)	Acoustic Overload Point dB SPL (HQM / LPM)	Power $\mu$ A (HQM / LPM)	Sensitivity dB FS (HQM / LPM)	LFRO, Hz	Interface
<b>T5837</b>	3.50 × 2.65 × 0.98	68 / 65	133 / 117	330 / 130	-37 / -21	28	PDM
<b>T5838</b>	3.50 × 2.65 × 0.98	68 / 65	133 / 119	330 / 130	-41 / -26	28	PDM
<b>T5848</b>	3.50 × 2.65 × 0.98	68 / 65	133 / 119	330 / 130	-37 / -26	28	I2S

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## About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately “Attracting Tomorrow.” It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK’s comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2021, TDK posted total sales of USD 13.3 billion and employed about 129,000 people worldwide.

## About InvenSense

InvenSense, Inc., a TDK Group company, is a world leading provider of performance MEMS sensor platforms. InvenSense’s vision of Sensing Everything® targets the consumer electronics and industrial areas with integrated Motion, Sound, and Ultrasonic solutions. InvenSense’s solutions combine MEMS (micro electrical mechanical systems) sensors, such as accelerometers, gyroscopes, compasses, microphones, and ultrasonic 3D-sensing with proprietary algorithms and firmware that intelligently process, synthesize, and calibrate the output of sensors, maximizing performance and accuracy. InvenSense’s motion tracking, ultrasonic, audio, fingerprint, location platforms and services can be found in Mobile, Wearables, Smart Home, Industrial, Automotive, and IoT products. InvenSense became part of the MEMS Sensors Business Group within the newly formed Sensor Systems Business Company of TDK Corporation in 2017. In February of 2018, Chirp Microsystems joined the

InvenSense family through its acquisition by TDK. InvenSense is headquartered in San Jose, California and has offices worldwide. For more information, go to [invensense.tdk.com](https://www.tdk.com/en/news_center/press/20220106_03.html).

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