

## MEMS Sensors

### **TDK announces worldwide availability of MEMS-based “sonar on a silicon chip” ultrasonic time-of-flight sensors**

- Immediate worldwide availability of the Chirp CH-101 ultrasonic sensor
- CH-101 supports a maximum sensing range of 1 meter
- Enabling ultra-wide field-of-view, the device provides range-sensing with millimeter-precision at the industry’s lowest power consumption

June 25, 2019

TDK Corporation’s (TSE:6762) announces the immediate worldwide availability of the Chirp CH-101 MEMS-based ultrasonic Time-of-Flight (ToF) sensor. This ToF sensor utilizes a tiny ultrasonic transducer chip to send out a pulse of ultrasound and then listen for echoes returning from targets in the sensor’s field-of-view. By calculating the ToF, the sensor can determine the location of an object relative to a device and trigger a programmed behavior.

TDK’s MEMS ultrasonic technology leverages a proprietary ToF sensor in a 3.5 mm x 3.5 mm package that combines a MEMS ultrasonic transducer with a power-efficient digital signal processor (DSP) on a custom low-power mixed-signal CMOS ASIC. The sensor handles a variety of ultrasonic signal-processing functions, enabling customers flexible industrial design options for a broad range of use-case scenarios, including range-finding, presence/proximity sensing, object-detection/avoidance, and position-tracking.

CH-101 is the first commercially available MEMS-based ultrasonic ToF sensor intended for consumer electronics, AR/VR, robotics, drones, IoT, automotive, and industrial market segments. TDK’s MEMS ultrasonic product portfolio also includes the CH-201 ultrasonic ToF sensor for room-scale sensing applications, and Chirp SonicTrack™, a complete hardware-software system solution enabling inside-out 6-DoF controller tracking for AR/VR/MR systems.

TDK’s MEMS ultrasonic ToF sensor solutions offer numerous advantages over optical ToF sensors:

- Accurate range measurement regardless of target size or color; even optically transparent targets are accurately detected
- Immunity to ambient noise
- Ability to operate in all lighting conditions — unlike IR sensors, which do not work in direct sunlight
- Ensures eye-safety — contrasting with laser-based IR ToF sensors - and yet not perceivable by house pets
- Detects objects over a field-of-view up to 180° — enabling a single sensor to support room-scale sensing

“The CH-101 sensor is the culmination of years of development based on a breakthrough innovation in piezoelectric-MEMS technology and low-power ASIC design, resulting in high-performance, low-power ultrasonic sensing in a tiny package,” said Michelle Kiang, CEO,

Chirp Microsystems, a TDK Group Company. “For the first time, product designers have available a new ToF sensor option to enable new functionalities and improve user experience in a broad range of consumer products. CH-101-based Chirp SonicTrack™ provides 6DoF controller tracking in HTC’s new Vive Focus Plus All-in-One VR system, which is in mass production today, and both CH-101 and CH-201 sensors are being designed-in by leading consumer brands in smart speakers, robotic vacuum cleaners, PCs, and many more products. We expect to see several additional product launches powered by TDK’s MEMS ultrasonic products in the next 12 months.”

The CH-101 is in mass production now and Chirp’s CH-201 is currently shipping to select customers. TDK will showcase the Chirp CH-101 and CH-201 products, along with TDK’s comprehensive portfolio of sensors, electronic components and solutions for mobile, wearables, AR/VR, automotive, IoT and industrial applications at the Sensors Expo 2019 in San Jose, California, June 25-27, 2019. Come see us at the San Jose McEnergy Convention Center, Booth #416. Please visit: [www.chirpmicro.com](http://www.chirpmicro.com) or contact Chirp Sales at [sales@chirpmicro.com](mailto:sales@chirpmicro.com) for more .

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## Glossary

- 6-DoF: 6 Degrees of Freedom
- 3D: 3 dimensional
- AR/VR: Augmented Reality / Virtual Reality
- MR/XR: Mixed Reality / Extended Reality
- Ultrasonic: Utilizing, produced by, or relating to ultrasonic waves or vibrations.

## Main applications

- AR/VR
- Smart home
- Drone and robotics
- Connected IoT devices
- Mobile and wearable
- Automotive

## Main features and benefits:

- Ultralow power
- Accurate range measurement regardless of target size
- Detects objects of any color, including optically transparent ones
- Immunity to ambient noise
- Works under any lighting condition
- Expanded field of view (FoV)

## Key data

Product	Packaging Dimensions (mm)	Range	Range Noise	Interface	Field of View
CH-101	3.5 mm x 3.5 mm x 1.25 mm	Up to 1 m	1mm RMS (typical)	I2C	Up to 180

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## About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's comprehensive 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, Chirp, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2019, TDK posted total sales of USD 12.5 billion and employed about 105,000 people worldwide.

## About Chirp Microsystems

Chirp Microsystems is bringing ultrasonics to everyday products. Founded in 2013 based on pioneering research performed at the University of California, Chirp's piezoelectric MEMS ultrasonic transducers offer long range and low power in a tiny package, enabling products that accurately perceive the three-dimensional world in which we live. Combined with Chirp's embedded software library, these sensors advance user experiences with VR/AR, wearables, robotics, drones and occupancy detection. For more information, please visit: [www.chirpmicro.com](http://www.chirpmicro.com).

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