

CH-101 Product Brief
GENERAL INFORMATION

The CH-101 is a miniature, ultra-low power ultrasonic Time-of-Flight (ToF) range sensor. Based on Chirp’s patented MEMS technology, the CH-101 is a system-in-package that integrates a PMUT (piezoelectric micromachined ultrasonic transducer) together with an ultra-low power SoC (system on chip) in a miniature, reflowable package. The SoC runs Chirp’s advanced ultrasonic DSP algorithms and includes an integrated microcontroller that provides digital range readings via I2C.

Complementing Chirp’s other ultrasonic ToF sensor products, the CH-101 provides accurate range measurements to targets at distances up to 1.2 m. Based on ultrasonic pulse-echo measurements, the sensor works in any lighting conditions, including full sunlight, and provides millimeter-accurate range measurements independent of the target’s color and optical transparency. The sensor’s wide field-of-view (FOV) enables simultaneous range measurements to multiple objects in the FOV.

DEVICE INFORMATION

PART NUMBER	PACKAGE	LID OPENING
CH-101	3.5 x 3.5 x 1.26mm LGA	1-Hole

RoHS and Green-Compliant Package


APPLICATIONS

- Augmented and Virtual Reality
- Drones and Robotics
- Mobile and Computing Devices
- Obstacle avoidance
- Printers and Scanners
- Proximity sensing
- Presence detection: always-on sensing to lock/unlock and power on/off notebooks, tablets, white goods, etc.
- Smart Home

FEATURES

- Fast, accurate range-finding
 - Operating range from 4 cm to 1.2 m
 - Sample rate up to 100 samples/sec
 - 1.0 mm RMS range noise at 30 cm range
 - Programmable modes optimized for medium and short-range sensing applications
 - Customizable field of view (FoV) up to 180°
 - Multi-object detection
 - Works in sunlight and any other lighting
 - Insensitive to object color, detects optically transparent surfaces like glass windows
- Easy to integrate
 - Single sensor for receive and transmit
 - Single 1.8V supply
 - I²C Fast Mode compatible interface, data-rates up to 400 kHz
 - Dedicated programmable range interrupt pin
 - Platform-independent software driver enables turnkey range-finding
- Miniature integrated module
 - Compatible with standard SMD reflow
 - Low-power micro-controller running advanced ultrasound firmware
 - Operating temperature range: -40° to 85°C
- Ultra-low supply current
 - 1 sample/s:
 - 13 μ A (10 cm max range)
 - 15 μ A (1.0 m max range)
 - 30 samples/s:
 - 33 μ A (10 cm max range)
 - 130 μ A (1.0 m max range)