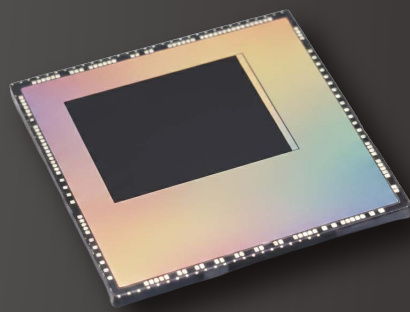


# 3D ToF Sensor *TPHT4040*



The TPHT4040 is a 3D time-of-flight (ToF) sensor that employs TOPPAN's unique pixel structure optimized for our short-pulse ToF sensing. It is fabricated in a back-illuminated CMOS process which enhances sensitivity in the near-infrared region. In addition, this sensor features TOPPAN's proprietary hybrid ToF™ technology which combines a short-pulse indirect ToF method and our patented multi-time window sensing technique. This combination ensures accurate 3D depth sensing without motion artifacts and blur, and offers high ambient light tolerance for outdoor use. It also supports a high dynamic range (HDR) operation mode and high-speed operation mode up to 120fps. The sensor output employs the MIPI CSI-2 high-speed interface widely used in back-end SoCs.

The TPHT4040 is well-suited for diverse 3D sensing applications, such as AGV/AMR, robotics, factory use, gaming devices, and security.

## Features

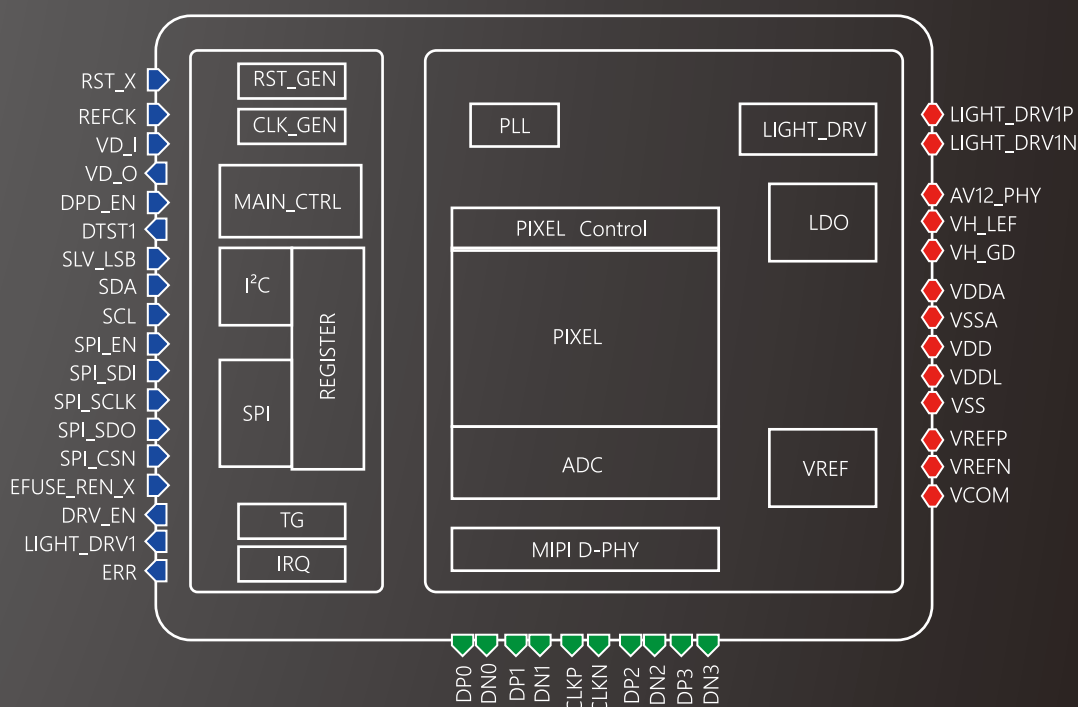
- Less motion artifacts and blur with TOPPAN's short-pulse indirect ToF method
- High ambient light tolerance (100,000 lx) for indoor and outdoor use
- Supports high frame rates up to 120 fps
- Avoids ToF signal interference between ToF cameras in the same environment with interference suppression function
- Available for signal HDR and 4×4 pixel binning functions to improve ranging performances with reduced temporal depth noise, and a region of interest (ROI) function

## Specification

These specifications may be changed in mass production for the purpose of performance and quality improvement.

3D ToF Sensing method	Short-pulse type	Optical format	1/4 Type
Die size	6.06mm × 5.87mm	Pixel size	5.6μm × 5.6μm
Active pixel area	640(H) × 480(V); VGA 160(H) × 120(V); 4x4 Binning	Temperature sensor	Yes
Framerate	30fps(Typ.) Max.120fps(3-tap, 4 lane); VGA	Shutter type	Global shutter
ADC resolution	12-bit on-chip	ROI	640(H) × 480(V); FULL(VGA) 640(H) × 240(V); HALF 640(H) × 40(V); SLICE
HDR mode	Yes	Register control I/F	I <sup>2</sup> C, SPI
Output data I/F	MIPI D-PHY CSI-2 2/4 data and 1 clock lanes	Output data format	RAW12
Output data rate	672Mbps / lane	Input clock frequency	24MHz
Operation temperature	-20°C to 70°C	Power supply voltage	3.3V / 1.2V
Power consumption	290mW @30fps 10mW @Deep power down state	Sensor I/O	99pins
Q.E.	30% @940nm	Chip delivery form	ASK(Delivery options and Qty.)

## TPHT4040 Sensor I/O Information



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