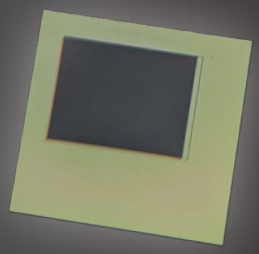
TOPPAN

TPHT4040

1/4 Type, VGA, 3D ToF Sensor

Engineering Sample



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 high sensitivity in the near-infrared region. In addition, this sensor features TOPPAN's proprietary hybrid ToF technology which combines a short pulse ToF method and our patented multi-time window sensing technique. This combination ensures accurate 3D depth sensing without motion artifacts and blurs, 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. Furthermore, it offers the deep power-down mode that can dramatically reduce power consumption in standby state, enabling long-lasting operation of battery-powered devices. 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 blurs with TOPPAN's short pulse ToF sensing method
- High ambient light tolerance (100,000lx) for indoor and outdoor use
- Supports high frame rates up to 120fps
- Features a deep power-down mode that significantly reduces the power consumption in standby state
- Avoids ToF signal interference between ToF cameras in the same environment with smart interference cancellation 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

Application

- Small mobility devices (AGV / AMR, drones, ...etc.)
- Robotics and Factory Automation
- Gaming devices
- Smart Glasses (VR/AR)
- Security and Surveillance

TPHT4040

Engineering Sample

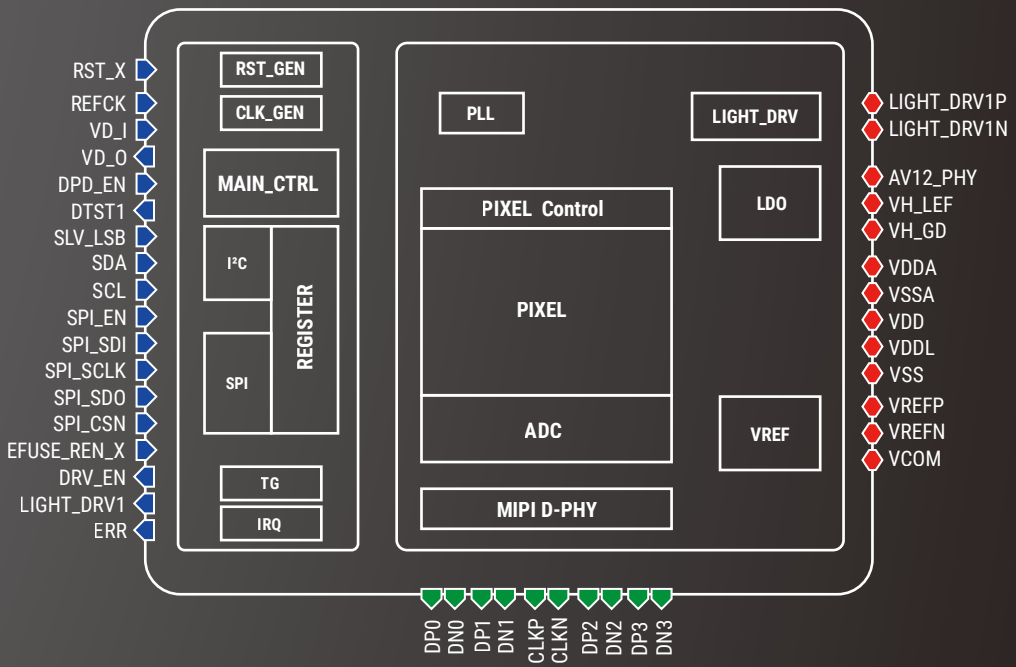
Specifications

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
Tempareture 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	I²C, SPI
Output data I/F	MIPI D-PHY CSI-2 2/4 data and 1 clock lanes
Output data format	RAW12
Output datarate	672Mbps / lane
Input clock frequency	24MHz
Operation temareture	-20℃ ~ 70℃
Power supply voltage	3.3V / 1.2V
Power consumption	290mW @30fps 5mW @Deep power down state
Sensor I/O	99pins
Q.E.	30% @940nm
Chip delivery form	Wafer (or Bare chip) 100pin-CQFP (for Evaluation sample)

TPHT4040 Sensor I/O Information



TOPPAN ToF Sensing BLOG
Latest Activity and Technology Updates

TOPPAN ELECTRONICS WEBSITE
ToF Camera Product Information and Inquiries

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https://www.holdings.toppan.com/en/