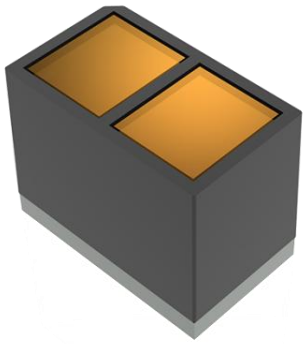

DTS6010D

Single-Photond dToF Module

Description

DTS6010D is a single-channel dToF miniature module integrating PolarisIC's high-performance SoC and VCSEL, delivering high-precision ranging within 15 m at 50 fps. Built-in histogram algorithms resist ambient light and enable compensation for contamination and reflectivity, plus cover-glass crosstalk calibration.

Operating with a 940 nm Class 1 eye-safe laser, DTS6010D runs from a single-supply voltage and communicates via I²C for effortless integration.

Visit the official website of PolarisIC at www.polarisic.com for more product information.

Features

- Highly integrated miniature dToF SiP built on a high-performance SPAD sensor, measuring only 8.1 mm × 4.9 mm × 5.86 mm
- Proprietary optical design delivers exceptional ambient-light immunity, achieving 8 m range outdoors under 100 KLux sunlight at 88 % reflectance.
- <2 ms power-loss recovery; I ² C address factory-programmable
- Employs histogram-based super-resolution for high-precision ranging
- High-precision TDC delivers ± 20 mm from 0.05–1 m and ±2 % beyond 1 m
- On-board NVRAM and RISC-V MCU come factory-calibrated for reflectance and offset
- Integrates an in-house co-processor with tunable parameters for application-specific tuning
- Cover-glass crosstalk calibration supported
- Compact package compatible with reflow soldering

Application

- Drone altitude hold
- Action-cam autofocus
- Optical switch

Parameter

Feature	Detail
Package Type	SiP Miniaturized Module Packaging
Package Size	8.1mm×4.9mm×5.86mm
Number of Connector Pins	17
Interface Type	I²C
Operating Voltage	Typical: 3.3V
FoI	1.15°
FoV	1.15° [1]
Laser Wavelength	940nm
Frame Rate	Typical: 50 fps
Reflectivity Correction	Yes
Temperature Compensation	Yes

[1] Theoretical Value.

Feature	Condition	Detail	Unit
Range	Indoor, 88% white target/18% gray target	15	m
	Indoor, 3% black target	10	m
	Overcast outdoor, 5KLux, 88% white target	15	m
	Overcast outdoor, 5KLux, 18% gray target	15	m
	Sunny outdoor, 100KLux, 88% white target	8	m
	Sunny outdoor, 100KLux, 18% gray target	6	m
Accuracy	Indoor, 3%/18%/88%/3m target, 0.05m~1m	±20	mm
	Indoor, 3%/18%/88%/3m target, > 1m	±2	%

Test conditions: room temperature, 3.3 V supply, no cover glass, typical configuration, target fully covering FoV.

Range is determined as the maximum distance at which the effective detection rate exceeds 99.7 %.

Accuracy = measured distance – target distance.

Power Consumption

- Hardware standby mode: current ranges from 5 μA (min) to 10 μA (max);
- Software standby mode: current ranges from 19 mA (min) to 22 mA (max);
- Active ranging mode: average current consumption at 3.3 V, typical 30 mA.