



DTS6005

Single-Photon dToF Module

Description

DTS6005 is a single-channel dToF miniature module integrating PolarisIC's high-performance SoC and VCSEL, delivering ultra-precision ranging within 100 cm at 120 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, DTS6005 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 4.4 mm × 2.4 mm × 1.0 mm.
- Time-gated photon threshold and narrowband filter ensure superior sunlight immunity.
- <2 ms power-loss recovery; I²C address factory-programmable.
- Compact package compatible with reflow soldering.
- Cover-glass crosstalk calibration supported.
- On-board NVRAM and RISC-V MCU hold factory reflectance and offset calibrations.
- High-precision TDC delivers ±5 mm accuracy from 10 mm to 500 mm on any surface.
- Employs histogram-based super-resolution for high-precision ranging.
- Integrates an in-house co-processor with tunable parameters for application-specific tuning.

Application

- Cliff, ceiling, and wall sensing for robotic vacuums

Parameter

Feature	Detail
Package Type	SiP Miniaturized Module Packaging
Package Size	4.4mm×2.4mm×1.0mm
Number of Connector Pins	12
Interface Type	I ² C
Operating Voltage	Typical: 3.3V
FoI (D86)	21°±3°
Laser Wavelength	940nm
Frame Rate	Typical: 120 fps (slaved to host interrupt)
Reflectivity Correction	Yes
Temperature Compensation	Yes
Sleep Mode	Yes
Operating Temperature	-20°~75°

Feature	Condition	Detail	Unit
Range ^[1]	Indoor, 3%/18%/88%/3M target	1000	mm
	Outdoor overcast, 5KLux, 18%/88% target	800	mm
	100KLux, 18%/88% target	200	mm
Accuracy ^[2]	Indoor, 3%/18%/88%/3M target, 10~500 mm	±5	mm
	Indoor, 3%/18%/88%/3M target, >500 mm	±1	%
Temperature Drift	-20 °C to 75 °C, referenced to 25 °C	±5	mm

[1]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 %.

[2]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.