

TF-Luna

8 m Low-Cost Time-of-Flight LiDAR Module

Compact, lightweight, low-power single-point ranging sensor for embedded and intelligent systems



Parameter	Specification
Measurement range	0.2-8 m
Distance resolution	1 cm
Frame rate	1-250 Hz, adjustable
Accuracy	±6 cm (0.2-3 m); ±2% (3-8 m)
Field of view	2°
Supply voltage	3.7-5.2 V
Power consumption	≤0.35 W
Communication	UART / I2C
Dimensions	35 × 21.25 × 13.5 mm
Weight	<5 g

1. Product Overview

TF-Luna is a miniature single-point Time-of-Flight (ToF) laser ranging module designed for low-cost, low-power embedded distance measurement. The supplied product information emphasizes compact size, light weight, low power consumption, adjustable ranging frequency and integration flexibility. It is intended for applications that require stable distance measurement in a very small sensor package.

2. Key Selling Points & Features

- Up to 8 m measurement range with 90% reflectivity targets, including the stated 90 klux outdoor condition.
- Compact 35 × 21.25 × 13.5 mm package for space-constrained designs.
- Ultra-lightweight construction: less than 5 g.
- Low power consumption: ≤0.35 W, suitable for battery-powered and mobile systems.
- Adjustable 1-250 Hz frame rate for different control-loop and sensing requirements.
- 1 cm distance resolution.
- Narrow 2° field of view for focused single-point ranging.
- UART and I2C interfaces with 3.3 V LVTTTL communication level.
- 850 nm VCSEL optical source with Class 1 eye-safety classification per IEC 60825.
- 70 klux ambient-light tolerance.
- Wide 3.7-5.2 V supply range.
- Designed for easy embedded integration and configurable operating parameters.

3. Ranging Performance

Parameter	Specification
Range - 90% reflectivity, indoor 0 klux	0.2-8 m
Range - 10% reflectivity, indoor 0 klux	0.2-2.5 m
Range - 90% reflectivity, outdoor 90 klux	0.2-8 m
Range - 10% reflectivity, outdoor 90 klux	0.2-2.5 m
Accuracy, 0.2-3 m	±6 cm
Accuracy, 3-8 m	±2%
Distance resolution	1 cm
Frame rate	1-250 Hz, adjustable
Ambient-light capability	70 klux

4. Optical Specifications

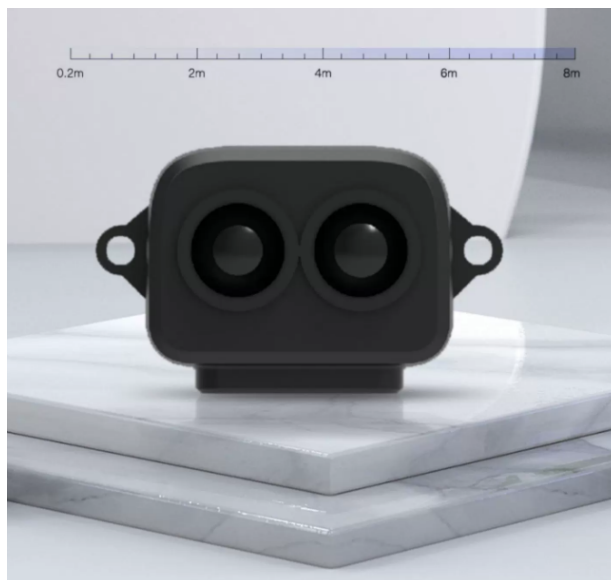
Parameter	Specification
Optical source	VCSEL
Center wavelength	850 nm
Eye safety	Class 1 (IEC 60825)
Field of view	2°

5. Electrical & Interface Specifications

Parameter	Specification
Supply voltage	3.7-5.2 V
Average current	≤70 mA
Power consumption	≤0.35 W
Peak current	150 mA
Communication logic level	LVTTL (3.3 V)
Communication interfaces	UART / I2C

6. Mechanical & Environmental Specifications

Parameter	Specification
Overall dimensions	35 × 21.25 × 13.5 mm (L × W × H)
Housing material	ABS / PC
Weight	<5 g
Operating temperature	-10°C to 60°C
Storage temperature	-20°C to 75°C
Protection rating	Not specified in supplied material



7. Mechanical Reference Dimensions

The supplied mechanical drawing provides the following dimensional references. The original drawing contains Chinese text and is intentionally not reproduced in this datasheet.

Parameter	Specification
Overall width	35 mm
Overall body height	21.25 mm
Overall depth / height dimension	13.5 mm
Front central width reference	30.5 mm
Optical-center spacing	10.5 mm
Optical opening diameter reference	Ø10.5 mm
Mounting-hole diameter	2 × Ø2.2 mm
Mounting-lug radius reference	2 × R2.25 mm
Rear-view width reference	19 mm
Connector width reference	10.5 mm
Additional front width reference	18 mm
Top-view width reference	26.65 mm

8. Functional Characteristics

The module performs non-contact distance measurement using Time-of-Flight laser ranging. A VCSEL emitter sends 850 nm near-infrared light toward the target, and the receiver measures the returned optical signal to calculate distance. The 2° field of view concentrates the sensing region, while the adjustable 1-250 Hz frame rate allows the module to be tuned for slower monitoring tasks or faster control applications.

9. Typical Applications

- Smart home and intelligent mirror systems
- Obstacle avoidance and proximity sensing
- Service robots
- UAV altitude / height measurement
- Material-level and bulk-material monitoring
- Traffic-flow counting and vehicle detection
- Compact embedded ranging systems
- Battery-powered intelligent equipment

10. Integration Guidance

- Provide a supply within the specified 3.7-5.2 V range.
- Observe the stated 3.3 V LVTTTL communication level when interfacing UART signals.
- Select UART or I2C according to the host-controller architecture.
- Choose the ranging frame rate according to system bandwidth, power and response-time requirements.
- Account for target reflectivity when estimating practical range; low-reflectivity targets are specified to a shorter maximum range.
- Keep the optical transmitter and receiver apertures unobstructed and mechanically aligned with the intended measurement direction.
- Consider strong ambient illumination in outdoor installations and validate performance in the final mechanical enclosure.

11. Source & Specification Notes

This datasheet was generated exclusively from the supplied product-image package. Chinese-language images were used only as technical source material and are not included in the final document. No unprovided electrical, mechanical, environmental or

certification values have been invented.