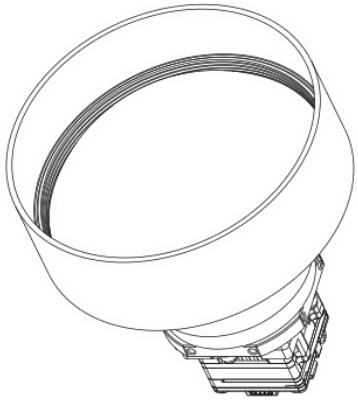
TYNI-640-50U

Ultra-Compact 640×512 Uncooled LWIR Module

Overview

The TYNI-640 series packs a complete 640×512/12μm uncooled LWIR imaging chain into a 17.3×17.3mm core — among the smallest footprints in its class. The TYNI-640-50U pairs a 50mm F1.0 athermalized lens (8.6°×7° FOV) for extended-range surveillance with USB 2.0 digital video with UART control over a compact 4-pin connection. At just 145.3 g with ≤40mK NETD, an IP67 front element and a ≥500,000-cycle shutter, it drops straight into drones, robots and embedded vision systems.



17.3×17.3 mm	640×512	≤40 mK	145.3 g
CORE SIZE	RESOLUTION	NETD	WEIGHT

Key Features

Ultra-Compact 17.3×17.3 mm Core

- One of the smallest 640×512 LWIR cores in its class, built for space- and weight-critical integrations
- 8× M1.6 mounting points for flexible mechanical integration

Digital Video, Ready to Integrate

- USB 2.0 digital video with UART control over a compact 4-pin connection
- UART control channel for configuration and command control

Low Power, Field-Rugged

- ≤750 mW class power consumption extends battery life on mobile platforms
- -40℃~+60℃ operating range, IP67 lens front element, ≥500,000-cycle shutter

Typical Applications



UAV & Low-Altitude Platforms



Smart Equipment Integration



Security & Surveillance

Technical Specifications

Detector Performance

Sensitive Material	Vanadium Oxide (VOx)
Detector Package	Wafer-level package (WLP)
Resolution	640×512
Pixel Pitch	12 µm
Spectral Band	8~14 µm
NETD	≤40 mK @25℃, F1.0

Optics

Focal Length	50 mm
Field of View	8.6°(H) × 7°(V)
IFOV	0.24 mrad
F-number	F1.0
Minimum Focus Distance	32 m
Focus	Fixed athermalized

Interface & Electrical

Video Output	USB 2.0 + UART
Frame Rate	50 Hz
Connector	4-pin (POWER/GND/DP/DM)
Supply Voltage	5V ±5%
Inrush Current	≤500 mA @5V
Power Consumption	≤750 mW

Physical

Core PCB Size	17.3×17.3 mm
Weight	145.3 g (±5%)
Mounting	8× M1.6 threaded holes (2.5 mm depth)
Ingress Protection	Lens front element IP67; other areas IP5X
Shutter Life	≥500,000 cycles

Environmental

Operating Temperature	-40℃~+60℃
Storage Temperature	-40℃~+85℃
Humidity	5%~95% RH, non-condensing
Shock	Half-sine, 30 g / 11 ms, 6 axes
Vibration (Random)	50~2000 Hz, PSD 0.02 G^2/Hz, 3 axes

Specifications subject to change without notice.
Rev. 1.0 · October 2026