# TYNI-640-13M

## 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-640-13M pairs a wide-angle 13mm F1.0 athermalized lens (32.7°×26.4° FOV) for general-purpose observation with 2-lane MIPI video with UART control on a 50-pin board-to-board connector. At just 16 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 | 16 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

- 2-lane MIPI video with UART control on a 50-pin board-to-board connector
- 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** | 13 mm |
| **Field of View** | 32.7°(H) × 26.4°(V) |
| **IFOV** | 0.9 mrad |
| **F-number** | F1.0 |
| **Minimum Focus Distance** | 2.2 m |
| **Focus** | Fixed athermalized |

## Interface & Electrical

| | |
|---|---|
| **Video Output** | 2-lane MIPI + UART |
| **Frame Rate** | 50 Hz |
| **Connector** | 50-pin board-to-board DF40C-50DP-0.4V(51) |
| **Supply Voltage** | 5V ±5% |
| **Inrush Current** | ≤1000 mA @5V |
| **Power Consumption** | ≤700 mW |

## Physical

| | |
|---|---|
| **Core PCB Size** | 17.3×17.3 mm |
| **Weight** | 16 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