VENUSLAB
OPTOELECTRONICS

Precision Meets Simplicity

VL Mini640-13510X High-Resolution Lightweight Thermal Imaging Core

An industrial-grade, lightweight 640×512 high-resolution thermal imaging core engineered for strict SWaP constraints

- Ultra-Lightweight, Breaking SWaP Limits
- High-Definition & Fluid Thermal Rendering
- Professional Optics, Enhanced Long-Range Detection
- Seamless Integration, Accelerating R&D

One Platform Many Possibilities

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Get a Quote

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Overview

Product Overview

The Venuslab Mini640-13510X is an ultra-compact uncooled thermal imaging core component. It seamlessly integrates a 640×512 high resolution into an exceptionally small form factor while maintaining superior thermal sensitivity (NETD <50mK) and ultra-low power consumption.

This module is specifically designed for light UAV payloads, portable night vision devices, and various electro-optical system integrations with strict size and weight requirements. Paired with professional image processing algorithms, it provides stable and reliable core thermal imaging support for industrial automation, security monitoring, and high-end vision equipment.

Key Features

- 640×512 High-Definition Resolution: Utilizes a 12μm Wafer-Level Packaging (WLP) VOx uncooled detector to deliver delicate, high-quality thermal imagery.
- Ultimate SWaP-Optimized Design: Ultra-miniature form factor (core measuring only approx. 28×28×22mm) and weighing under 28g, with a typical power draw of just 0.6W. Purpose-built for payload-heavy and space-constrained systems.
- 50Hz High Frame Rate Output: Ensures fluid, real-time video feeds during high-speed movement or dynamic monitoring, completely eliminating stutter and motion blur.
- High Thermal Sensitivity (NETD <50mK): Exceptional temperature resolution capability, accurately capturing minute temperature differentials and fine target details.
- Advanced Image Processing Algorithms: Features built-in Shutterless NUC (Non-Uniformity Correction), 3D Digital Noise Reduction (3D DNR), and DDE (Digital Detail Enhancement) technologies.
- 13510X Dedicated Optical Configuration: Comes standard with a custom-grade, high-transmittance infrared lens assembly, significantly enhancing long-range detection and recognition performance in complex industrial environments.
- Highly Compatible Integration Interfaces: Provides comprehensive digital and analog video outputs (DVP, BT.656, LVCMOS, PAL/NTSC) alongside standard control interfaces (UART, I2C, RS232), perfectly aligning with the low-level secondary development needs of diverse electro-optical systems.

Typical Applications

- UAVs and Electro-Optical Pods: Lightweight UAV industrial inspection systems, FPV racing night vision, and miniature gimbal payloads.
- Portable Vision Devices: Miniature thermal imaging monoculars, security helmets, and handheld detectors.
- Electro-Optical System Integration: Auxiliary optical path monitoring for multispectral cameras, automated production line equipment integration, and machine vision diagnostic systems.

Specifications

Technical Specifications

Parameter	Specification Details
Detector Type	Vanadium Oxide (VOx) Uncooled Infrared Focal Plane Detector (WLP)
Resolution	640 × 512 pixels
Pixel Pitch	12μm
Spectral Range	8 ~ 14μm
Thermal Sensitivity (NETD)	< 50mK (Typical)
Frame Rate	25Hz / 50Hz
Typical Power Consumption	Approx. 0.60W
Image Processing	Shutterless NUC / Digital Noise Reduction / DDE (Digital Detail Enhancement) / Image Flip
Video Output	Analog: PAL / NTSC / Digital: DVP / BT.656 / LVCMOS

Control Interface	UART / I2C / RS232
Dimensions	Approx. 28mm × 28mm × 22mm (Core body)
Weight	< 28g (Core body, excluding custom lens)
Operating Temperature	-40°C ~ +80°C
Optical Configuration	13510X Dedicated Lens Assembly (Please verify specific focal length)

Serivce & Support

We are dedicated to delivering exceptional optoelectronic solutions to every client. From precision manufacturing and secure delivery to full-lifecycle technical support, we are here to ensure a seamless and reliable experience at every step.

1. Warranty Policy

Quality First, Worry-Free Operation

Warranty Period: We offer a **two-year** warranty service for all of our core optoelectronic products, effective from the date of shipment.

Coverage: We provide free repair or replacement services for malfunctions caused by material defects or workmanship errors under normal operating conditions.

Rapid Response: Upon receiving a warranty claim, we guarantee to initiate the assessment process within **24 hours** to minimize your equipment downtime.

2. Technical Support

Expert Team, Full-Process Guidance

Technical Consultation: Our team of senior optical engineers provides **24/7 online support** to assist with installation, commissioning, optical path alignment, and parameter optimization.

Scheduled Maintenance: We offer full-lifecycle maintenance recommendations, including firmware upgrades, optical component cleaning guidelines, and precision calibration services.

Training Services: We provide customized remote or on-site operational and safety training to ensure your team can operate the equipment efficiently and safely.

3. Logistics & Delivery

Precision Packaging, Global Reach

Professional Packaging: Given the fragile nature of optical instruments, we utilize industrial-grade shockproof, anti-static, and moisture-proof vacuum packaging to ensure zero damage during transit.

Logistics Partners: We partner with top-tier global logistics providers **(DHL / FedEx / UPS / SF Express)** to offer reliable shipping with real-time tracking.

Shipping Insurance: All shipments are fully insured to eliminate logistics risks.

4. Compliance & Certification

Strict Standards, Total Compliance

Quality Certification: Our manufacturing process is **ISO 9001 certified**, and our products comply with international standards such as **CE** and **RoHS.**

Export Compliance: "Committed to environmental responsibility, all our products comply with **RoHS 2.0** and **REACH** standards, ensuring safety and global compliance."

Explore Series

Model	Pixel Pitch	Thermal Time Constant	IR Wavelength	Resolution
VL-MC640	12μm	<12ms	8~14μm	640x512
VL-MC384	12μm	<12ms	8~14μm	384x288

📩 Get in touch with our team to explore configurations,request a quote,or learn more about customized solutions tailored to your needs.

Let us help you moves cience forward—faster and smarter.