

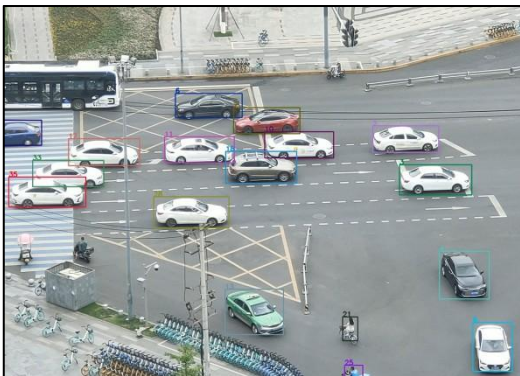
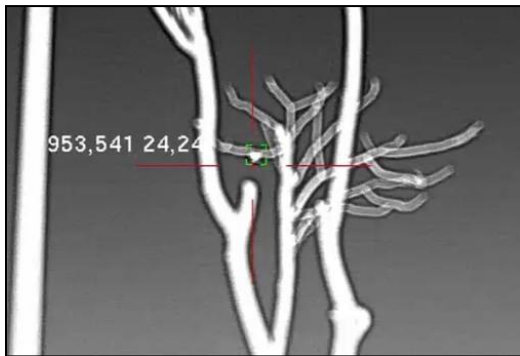
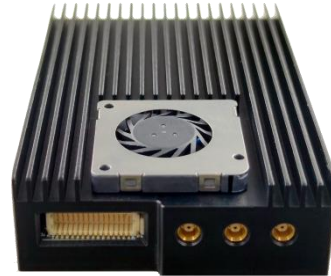


Video Tracking Board Product manual

Brief Introduction

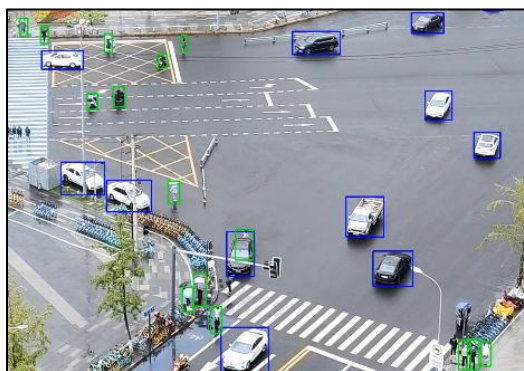
1. Core Functionality

This product employs a domestic intelligent AI chip integrated with proprietary intelligent image processing algorithms. Based on input visible light or infrared video streams, it enables real-time autonomous target detection/identification, supports both automatic and manual target locking/tracking, and outputs off-target deviation data relative to the FOV center.



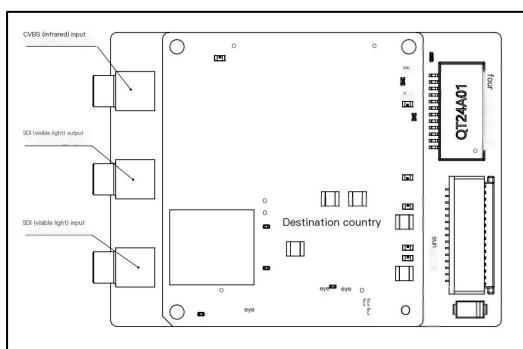
1.1 Target Tracking

- Support multiple tracking algorithms : centroid / shape-center tracking, correlation tracking, multi-target tracking, and AI-based tracking;
- Provides flexible target locking modes: manual / auto selection with click-select, box-select, image center, target ID options; locking strategies based on: center distance / confidence level;
- Advanced algorithm features:
 - ✧ Adaptive tracking gate adjustment;
 - ✧ Re-detection capability after target loss;
 - ✧ Robust anti-interference performance against: jitter, occlusion, deformation, illumination changes, deformation, and similar target interference.
- Supports real-time tracking gate adjustment during operation;
- Implements tracking status monitoring and feedback mechanism.



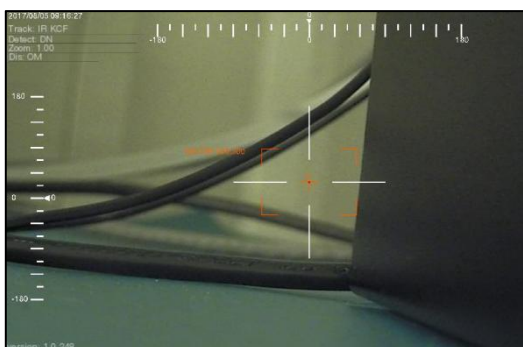
1.2 Object Detection & Recognition

- Support AI intelligent target recognition, default categories: person, vehicle, boat, aircraft (including UAVs);
- Integrated AI development platform (SpeedDP™) supporting:
 - ✧ data annotation with automated labeling and manual verification capabilities;
 - ✧ Custom dataset training;
 - ✧ One-click model deployment.



1.3 Comprehensive Interfaces

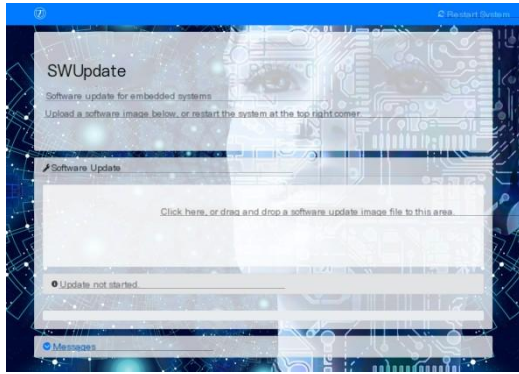
- Input: SDI, CVBS, RTSP, MIPI, DVP, LVDS, Cameralink, USB;
- Output: SDI, CVBS, RTSP, MIPI, Cameralink;
- Communication: RS422, RS485, RS232, TTL, USB.



1.4 Software Features

- OSD overlay with configurable elements:
 - ✧ Time/date, version info;
 - ✧ Target frame, reticle, scale ruler;
 - ✧ Compass, GPS coordinates;
 - ✧ Pan/tilt angles;
 - ✧ Customizable visibility / color settings;
 - ✧ Multi-channel PIP (Picture-in-Picture) output with main channel switching;
- Board IP address configuration / query
- Local storage supporting image capture / video recording
- FTP-accessible media management (view/download/delete)
- Hardware pass-through control for peripherals (cameras, servo PTZ, etc.).





1.5 Additional Features

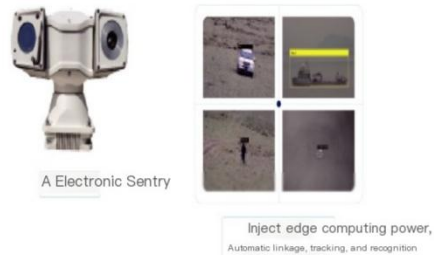
- OTA firmware upgrade capability;
- Operation log storage / retrieval;
- Configurable parameters with factory reset function;
- Provided test host software for rapid functional verification.

2. Application Scenarios

Application scenarios: airborne pods, electronic sentinels, border and coastal defense monitoring, intelligent perimeter, border and coastal defense monitoring systems, etc.



Airborne pod



Electronic Sentry



Perimeter intrusion monitoring system



Border and Coastal Defense Monitoring

3. Product Service

3.1 Customization: Application-specific R&D and hardware/software customization.

3.2 Warranty:

- 12-month warranty period (excluding non-manufacturing defects);
- Post-warranty technical support with reasonable repair fees.

3.3 Training: Remote/phone technical guidance and system operation training.

3.4 Upgrades: Remote firmware/software updates per technical agreement.

Product Line Overview

1. Trac-L Series Products

- Advantages:
 - ✧ Compact form factor;
 - ✧ Low power consumption;
 - ✧ Cost-effective solution.
- Limitations:
 - ✧ Limited hardware computing power;
 - ✧ Moderate stability in high-interference environments.

Table 1 Performance Specifications

Performance Index	
Tracking frame rate	30 Hz baseline (configurable up to 50Hz with compatible camera input)
Minimum trackable target	4 × 4 pixels (centroid tracking); 10 × 10 pixels (correlation tracking)
Tracking accuracy	≤ 1 pixel
Tracking speed	≥ 32 pixels/frame
Minimum target contrast (centroid)	≥ 5%
Multi-target capacity	≤ 32 concurrent targets
Recognition frame rate	25 Hz
Minimum recognizable target	20 × 20 pixels
Recognition performance (VisDrone2019-DET-test-dev benchmark)	0.472 mAP@0.5
Function Parameters	
Supported tracking algorithms	Centroid tracking, correlation tracking, multi-target tracking
Supported detection methods	AI-based recognition, centroid search
Video compression	H.264/H.265 encoding
Stream output protocols	RTSP, UDP, RTMP, HLS, etc
Configurable stream parameters	Bitrate, I-frame interval, QP value
Control interfaces	RS422/RS232/UDP/TCP
Environmental Compliance	
Operating temp	-40°C ~ +65°C
Storage temp	-55°C ~ +75°C

1.1 AI-Track-045 Video Tracking Board

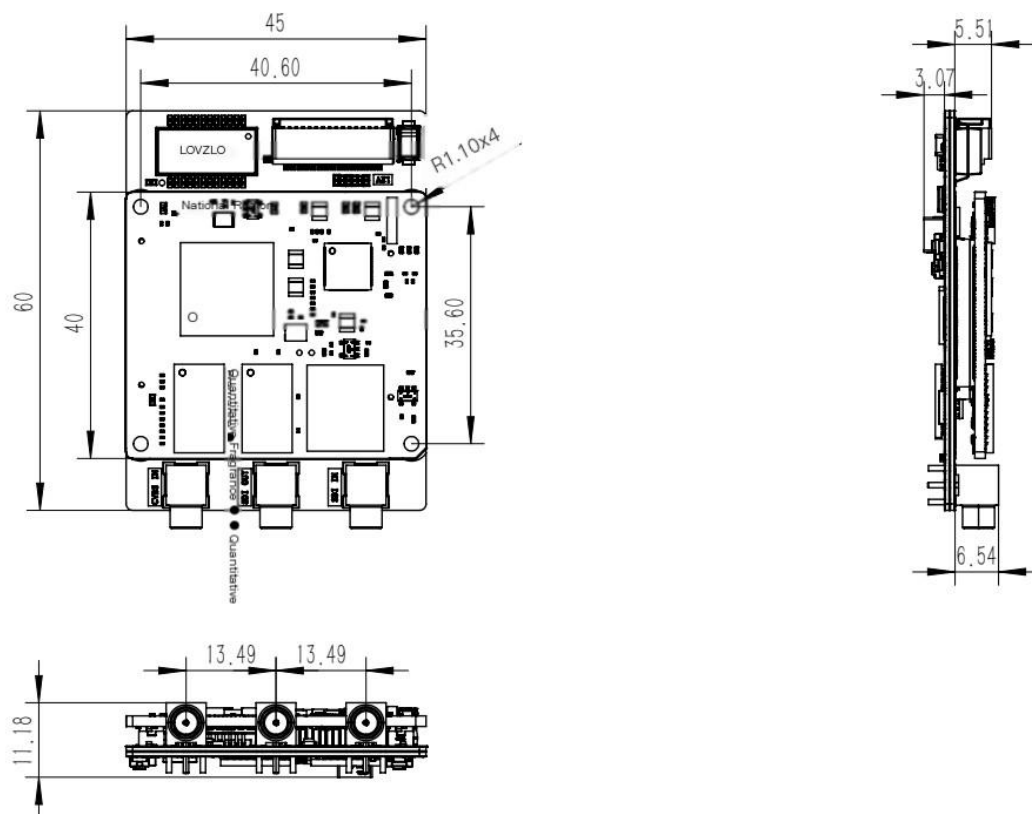
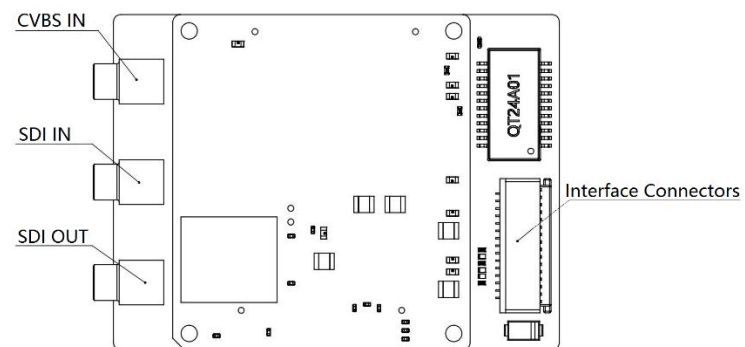
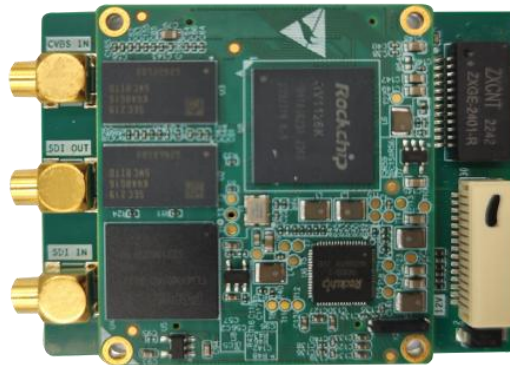


Table 2 Hardware Parameters of AI-Track-045 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × SDI (3G-SDI/HD-SDI), 1 × CVBS (PAL)
Output	1 × SDI (3G-SDI/HD-SDI)
Serial port	1 × RS422, 1 × RS232, 1 × TTL (3V logic)
Network	1 × Gigabit/Fast Ethernet auto-negotiation port (RTSP stream output by default)
Others	1 × USB 2.0, 1 × debug serial port (reserved)
Memory capacity	8GB/16GB configurable (supports custom expansion)
Video compression Storage	≥ 1 hour (at 4Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 4 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	60mm×45mm (L×W)
Weight	28.2g ± 5g (bare board without heat sink)

Physical Image:

1.2 AI-Track-064 Video Tracking Board

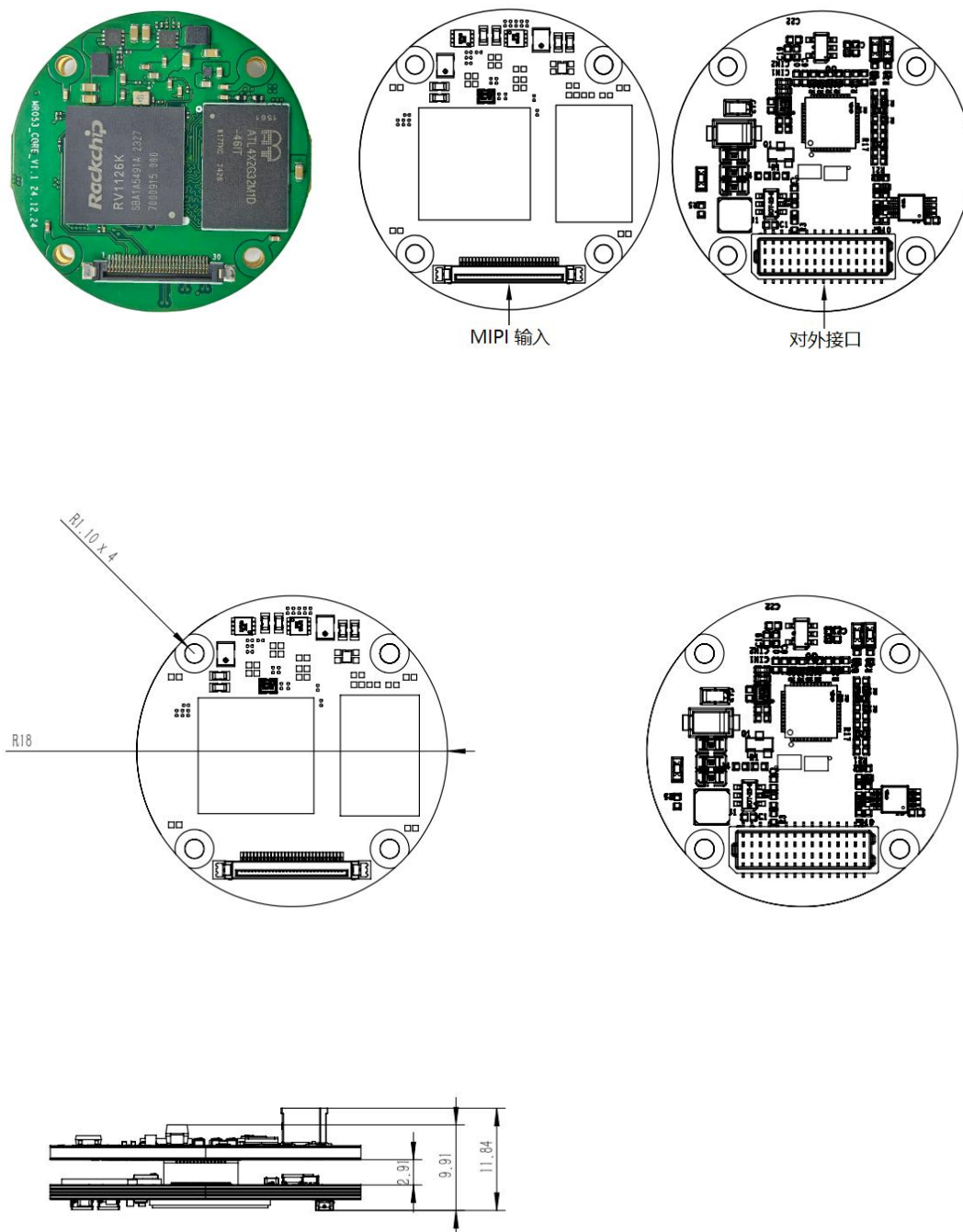


Table 3 Hardware Parameters of AI-Track-064 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × MIPI (Customized adaptation)
Output	1 × Network RTSP video stream
Serial port	1 × RS422
Network	2 × Fast Ethernet port (RTSP stream output by default)
Others	1 × USB 2.0, 1 × debug serial port (reserved)
Memory capacity	8GB (supports custom expansion)
Video compression Storage	≥ 0.5 hour (at 4Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 4 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	Φ36mm × 12mm
Weight	10g ± 5g (bare board without heat sink)

Physical Image:



2.Trac-S series Products

The product adopts the domestic intelligent AI chip RK3588S, which is a new generation of RockChip flagship AIoT processor. It is equipped with 8nm LP process and an 8-core 64-bit CPU with a main frequency up to 2.4GHz. The built-in AI accelerator NPU can provide 6Tops computing power and support mainstream deep learning frameworks.

Table 4 Performance Parameters

Performance Index	
Tracking frame rate	60 Hz baseline (configurable up to 100Hz with compatible camera input)
Minimum trackable target	2 × 2 pixels (centroid tracking); 8 × 8 pixels (correlation tracking)
Tracking accuracy	≤ 1 pixel
Tracking speed	≥ 64 pixels/frame
Minimum target contrast (centroid)	≥ 3%
Multi-target capacity	≤ 64 concurrent targets
Recognition frame rate	25 Hz
Minimum recognizable target	10 × 10 pixels
Recognition performance (VisDrone2019-DET-test-dev benchmark)	0.616 mAP@0.5
Function Parameters	
Supported tracking algorithms	Centroid tracking, correlation tracking, multi-target tracking, AI-based tracking
Supported detection methods	AI-based recognition, centroid search, template matching, moving target detection
Video compression	H.264/H.265 encoding
Stream output protocols	RTSP, UDP, RTMP, HLS, etc
Configurable stream parameters	Bitrate, I-frame interval, QP value
Control interfaces	RS422/RS232/UDP/TCP

2.1 AI-Track-074 Video Tracking Board

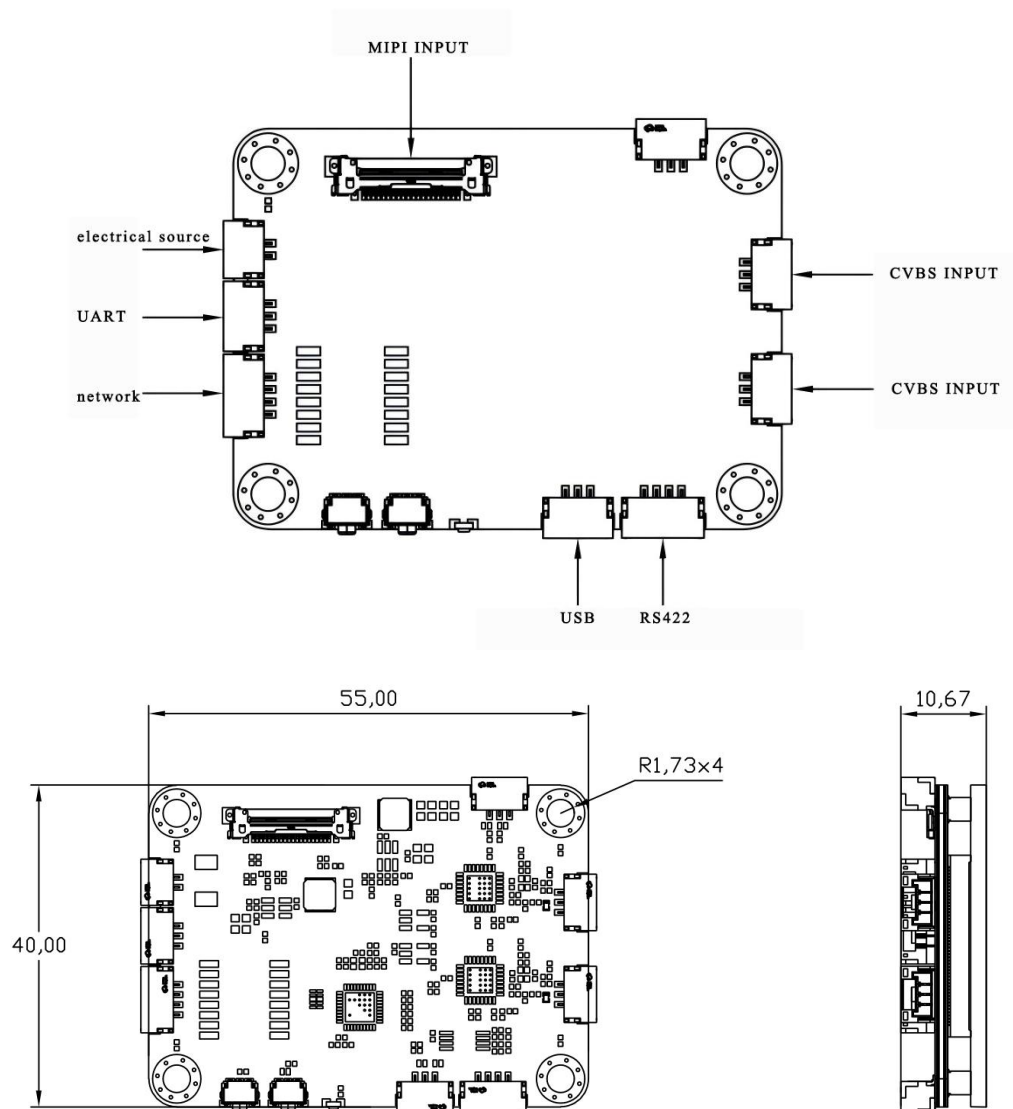
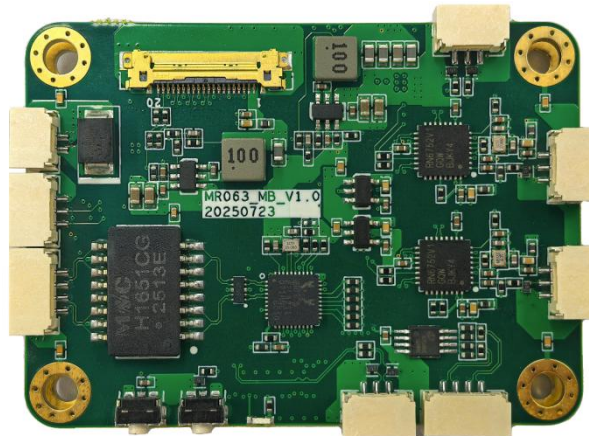
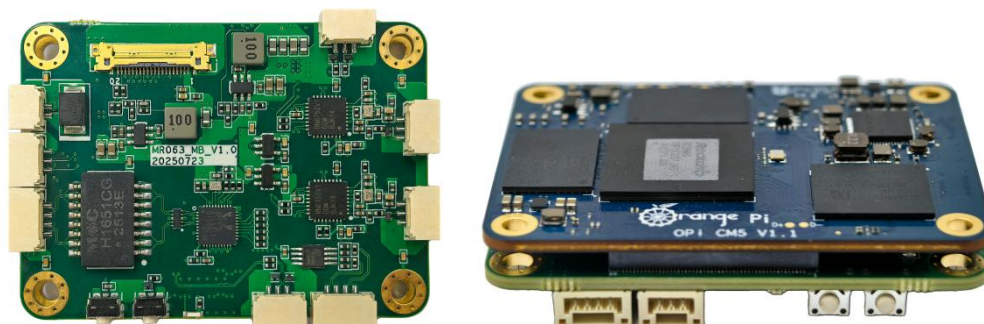


Table 5 Hardware Parameters of AI-Track-074 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × MIPI (Customized adaptation) , 2 × CVBS (PAL)
Output	1 × Network
Serial port	1× RS422, 1 × UART
Network	1 × Fast Ethernet port (default output RTSP video stream)
Memory capacity	32GB (supports custom expansion)
Video compression Storage	≥ 2 hour (at 4Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 6 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	55mm×40mm (L×W)
Environmental Compliance	
Operating temp	-20°C ~ +60°C
Storage temp	-20°C ~ +65°C

Physical Image:



3. Trac-H series Products

- Advantages:
 - ✧ High computing power;
 - ✧ Superior processing performance;
 - ✧ Enhanced system stability and advanced EMI immunity.
- Limitations:
 - ✧ Increased form factor;
 - ✧ Elevated power profile;
 - ✧ Cost considerations.

Table 6 Performance Parameters

Performance Index	
Tracking frame rate	60 Hz baseline (configurable up to 100Hz with compatible camera input)
Minimum trackable target	2 × 2 pixels (centroid tracking); 8 × 8 pixels (correlation tracking)
Tracking accuracy	≤ 1 pixel
Tracking speed	≥ 64 pixels/frame
Minimum target contrast (centroid)	≥ 3%
Multi-target capacity	≤ 64 concurrent targets
Recognition frame rate	25 Hz
Minimum recognizable target	10 × 10 pixels
Recognition performance (VisDrone2019-DET-test-dev benchmark)	0.616 mAP@0.5
Function Parameters	
Supported tracking algorithms	Centroid tracking, correlation tracking, multi-target tracking, AI-based tracking
Supported detection methods	AI-based recognition, centroid search, template matching, moving target detection
Video compression	H.264/H.265 encoding
Stream output protocols	RTSP, UDP, RTMP, HLS, etc
Configurable stream parameters	Bitrate, I-frame interval, QP value
Control interfaces	RS422/RS232/UDP/TCP
Environmental Compliance	
Operating temp	-40°C ~ +65°C
Storage temp	-55°C ~ +75°C

3.1 AI-Track-041 Video Tracking Board

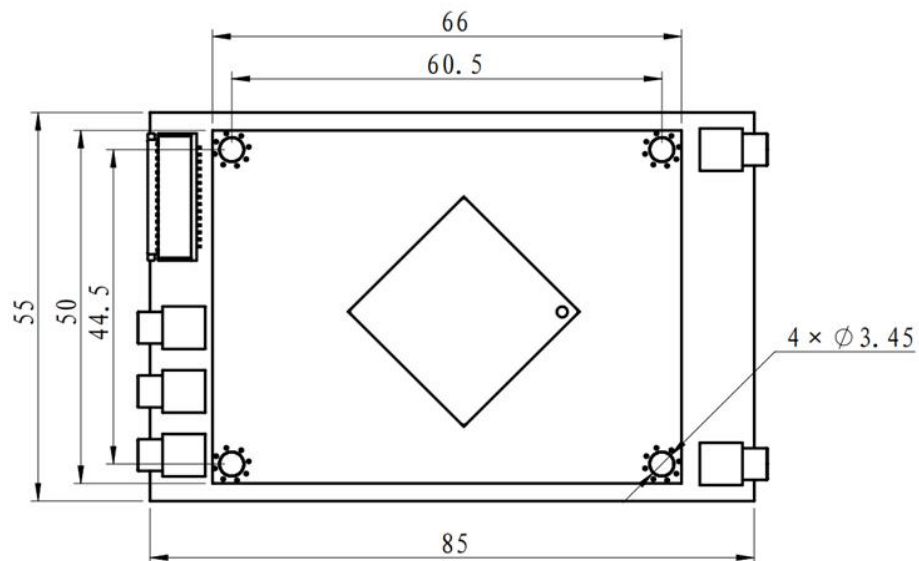
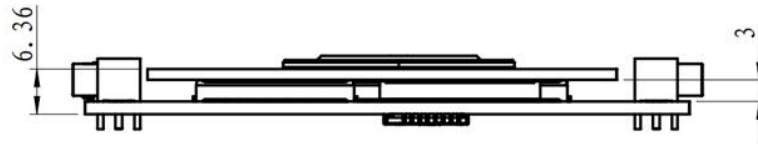
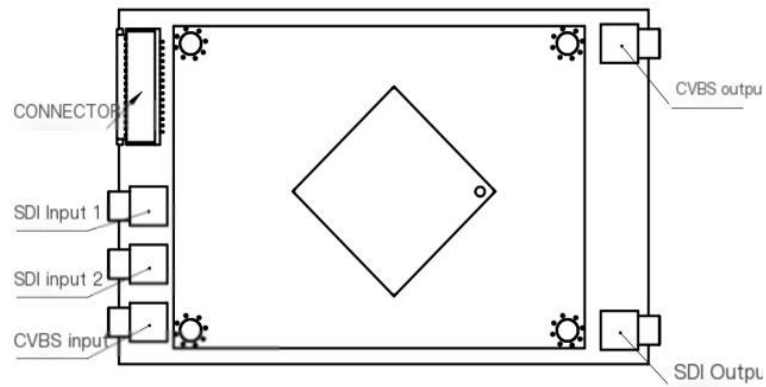
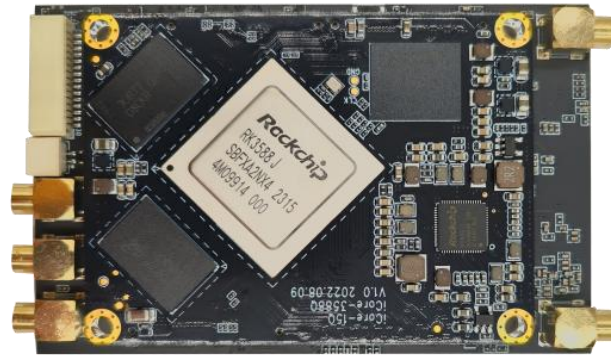
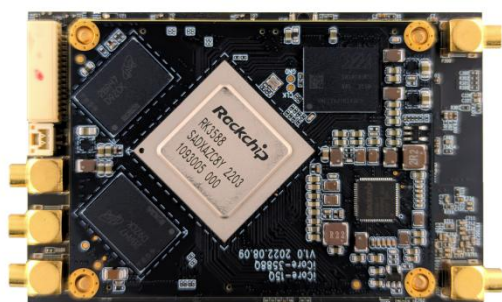


Table 7 Hardware Parameters of AI-Track-041 Video Tracking Board

Hardware Interface/Parameters	
Input	2 × SDI (3G-SDI/HD-SDI), 1 × CVBS (PAL)
Output	1 × SDI (3G-SDI/HD-SDI), 1 × CVBS (PAL)
Serial port	1 × RS422, 1 × RS232, 1 × TTL (3V logic)
Network	1 × Gigabit/Fast Ethernet auto-negotiation port (RTSP stream output by default)
Others	1 × USB 2.0, 1 × debug serial port (reserved)
Memory capacity	64GB (supports custom expansion)
Video compression Storage	≥ 3 hour (at 6Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 10 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	85mm×55mm (L×W)
Weight	50.3g ±10g (bare board without heat sink) 108g ±10g (including radiator)

Physical Image:



Bare board, without heat sink



Including radiator

3.2 AI-Track-058 Video Tracking Board

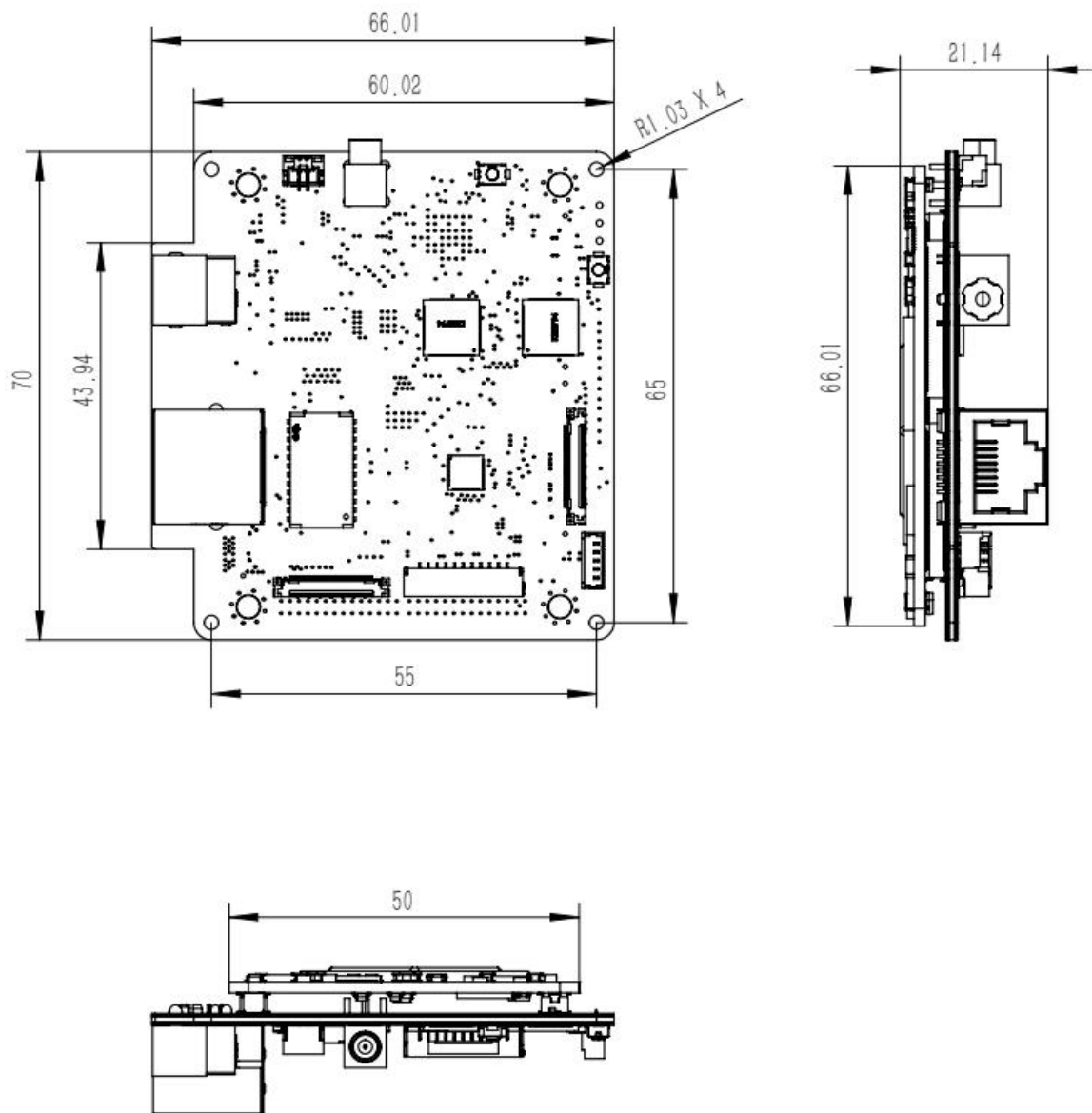
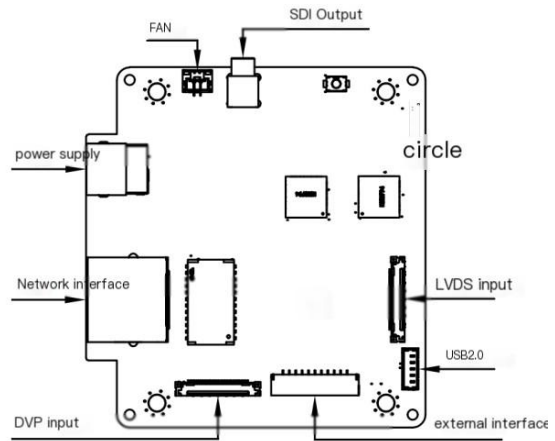
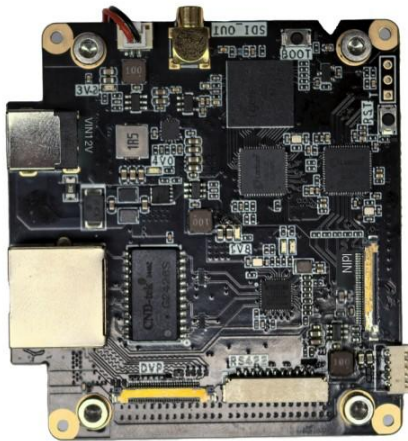


Table 8 Hardware Parameters of AI-Track-058 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × LVDS (Sony standard), 1 × DVP (Customized)
Output	1 × SDI (3G-SDI/HD-SDI)
Serial port	2 × RS422, 1 × UART
Network	1 × Gigabit/Fast Ethernet auto-negotiation port (RTSP stream output by default)
Others	1 × USB 2.0
Memory capacity	64GB (supports custom expansion)
Video compression Storage	≥ 3 hour (at 6Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 10 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	70mm × 66mm (L × W)
Weight	47.5g ± 10g (bare board without heat sink) 100g ± 10g (including radiator)

Physical Image:



Bare board, without heat sink



Including radiator

3.3 AI-Track-063 Video Tracking Board

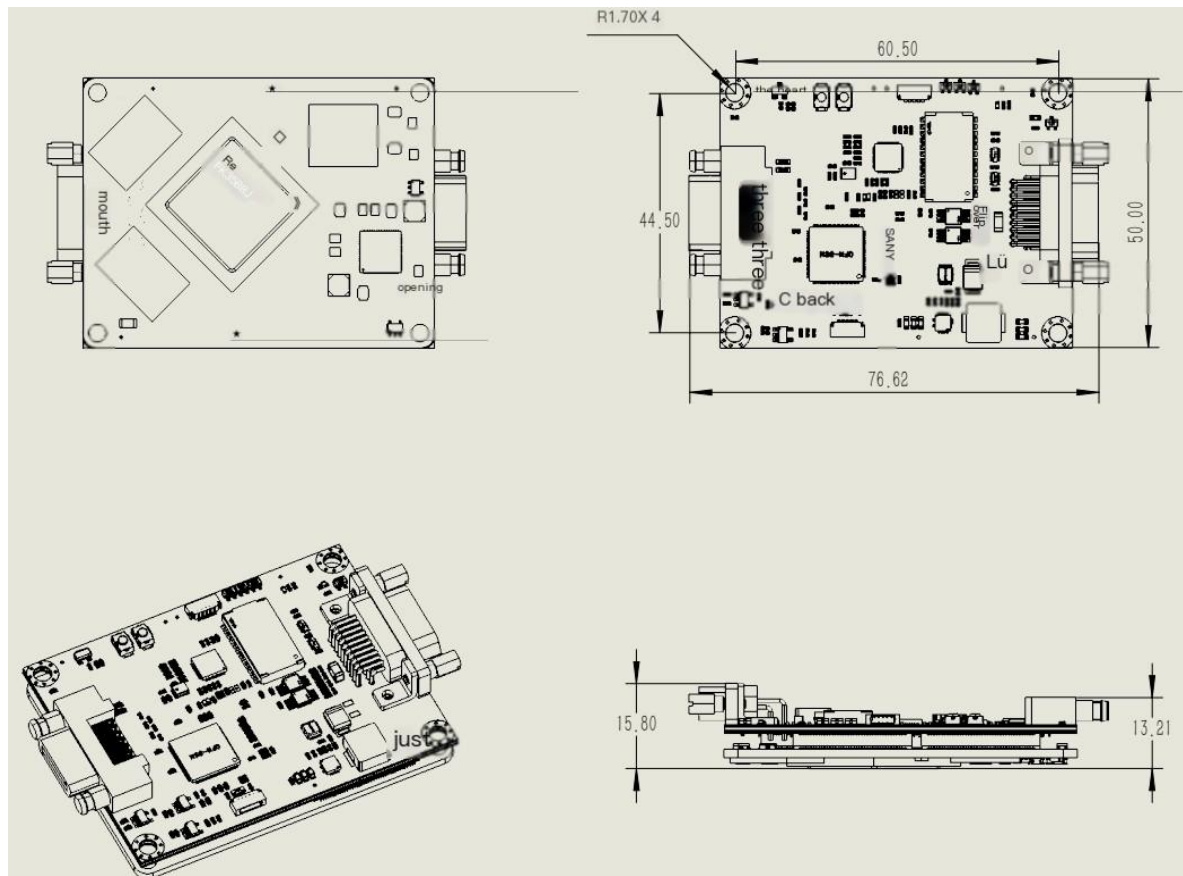
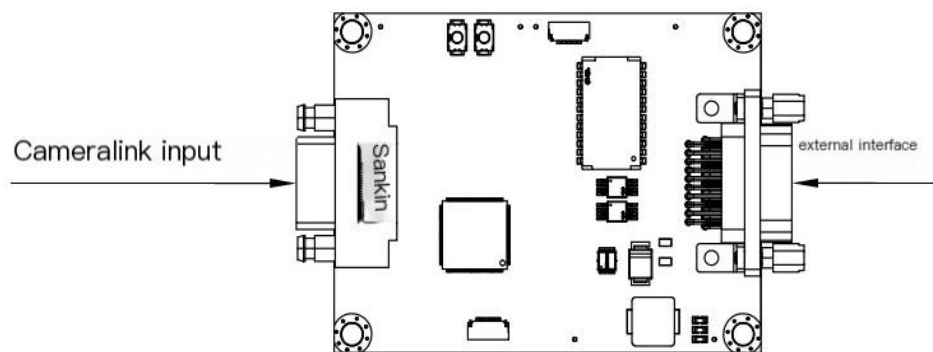
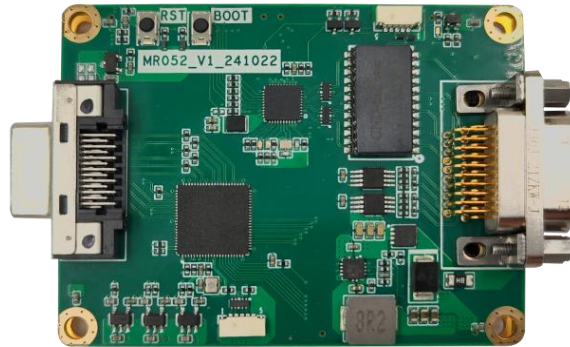


Table 9 Hardware Parameters of AI-Track-063 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × Cameralink Base (To be adapted)
Output	1 × Network RTSP video streaming
Serial port	2 × RS422
Network	1 × Gigabit/Fast Ethernet auto-negotiation port (RTSP stream output by default)
Memory capacity	64GB (supports custom expansion)
Video compression Storage	≥ 3 hour (at 6Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 10 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	77mm × 50mm (L × W), including connector
Weight	42.8g ± 10g (bare board without heat sink) 112g ± 10g (including radiator)

Physical Image:



Bare board, without heat sink



Including radiator

3.4 AI-Track-068 Video Tracking Board

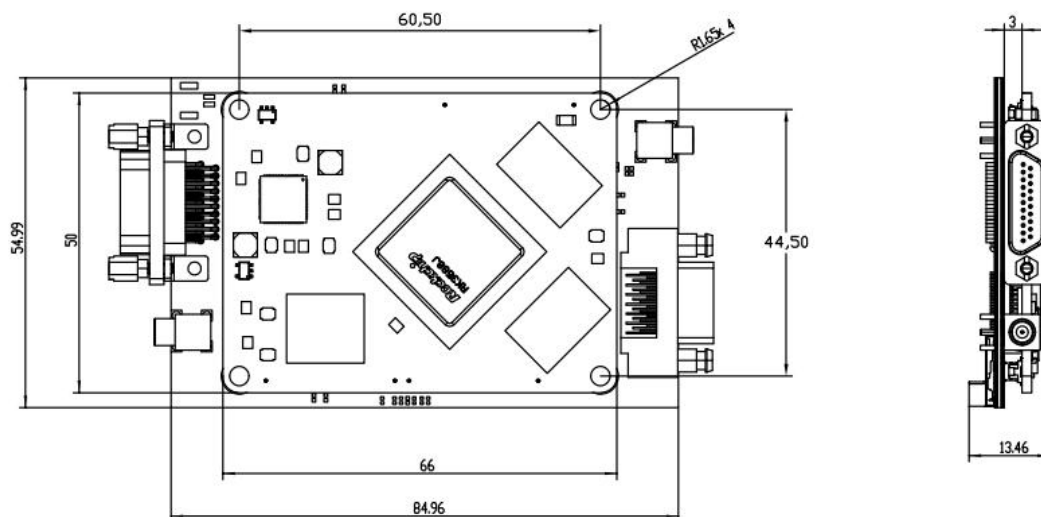
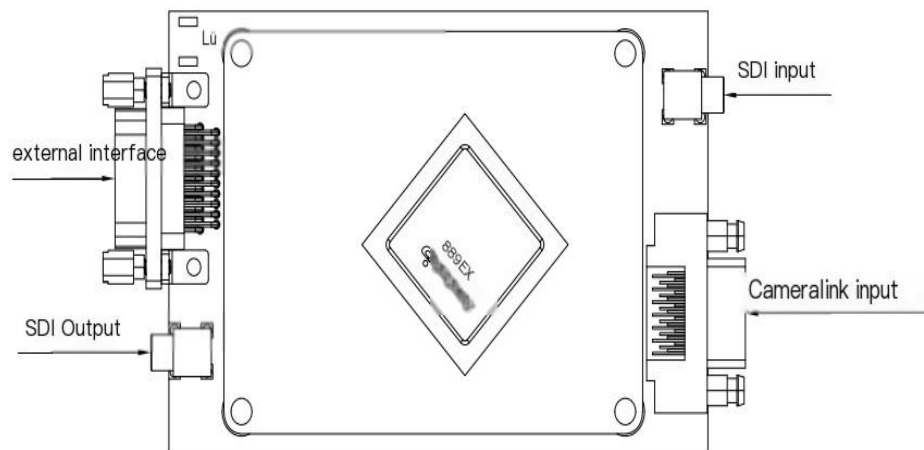


Table 10 Hardware Parameters of AI-Trac-068 Video Tracking Board

Hardware Interface/Parameters	
Input	1 × Cameralink Base (To be adapted), 1 × SDI (3G-SDI/HD-SDI)
Output	1 × SDI (3G-SDI/HD-SDI)
Serial port	2 × RS422
Network	1 × Gigabit/Fast Ethernet auto-negotiation port (RTSP stream output by default)
Memory capacity	64GB (supports custom expansion)
Video compression Storage	≥ 3 hour (at 6Mbps bitrate)
Mechanical/Electrical Specifications	
Power consumption	< 10 W (typical)
Operating voltage	12V DC ± 2V
Dimensions	85mm × 55mm (L × W)
Weight	51.6g ± 10g (bare board without heat sink) 109.3g ± 10g (including radiator)

Physical Image:



Bare board, without heat
sink



Including radiator