TACHY-SHIELD

Deeper-I

![Deeper-I logo]

Tachy-Shield

A deep-learning computation acceleration board compatible with Pi-type SBCs such as Raspberry Pi series (A, B, Zero, etc.) and Orange Pi.

Tachy-Shield supports a variety of camera inputs and can be used for a wide range of applications through various module expansions based on chip-to-chip communication.

Trion (FPGA)

Tachy-BS402

X2X: Chip-to-chip internal system bus connection between BS chip and FPGA

Trion(FPGA): Implementation of various interfaces

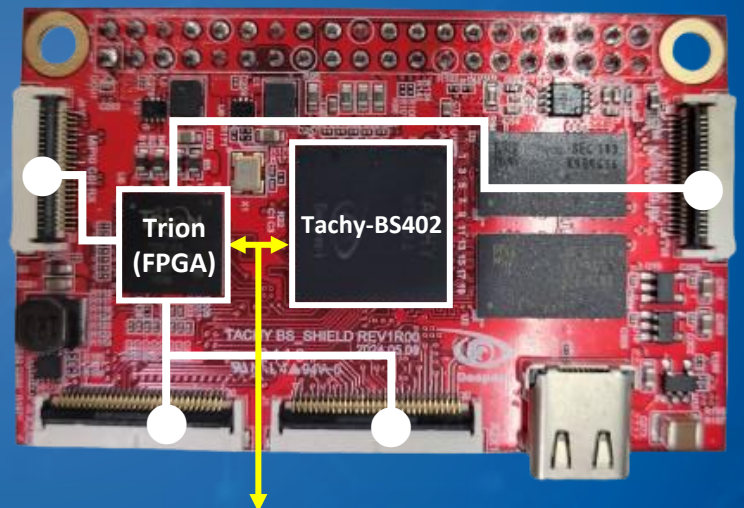# Key Features & Strength

Various SBC compatibility
Compatible with MIPI-enabled SBCs such as Raspberry Pi series(A, B, Zero, etc.), Orange Pi, etc.

Flexible camera input support
Capable of inputting and transmitting camera data of MIPI, BT.1120, and DVP specifications

Inter-module expansion support using X2X
Supports various expansion functions through X2X interface for inter-module communication and ensures high data transmission speed and safety

Accelerating deep-learning inference
Maximize performance by leveraging the built-in NPU to accelerate real-time inference of complex deep learning models

Self-designed Tachy-BS402 chip
Equipped with Deeper-I's unique Tachy-BS402 chip, it provides excellent performance and efficiency and can be applied to a variety of applications

High-performance, low-power inference acceleration module
Efficient data processing in various IoT and edge computing environments

Pin Communication Connect

Power

UART

GPIO

SPI

: Power
: UART
: GPIO
: SPI
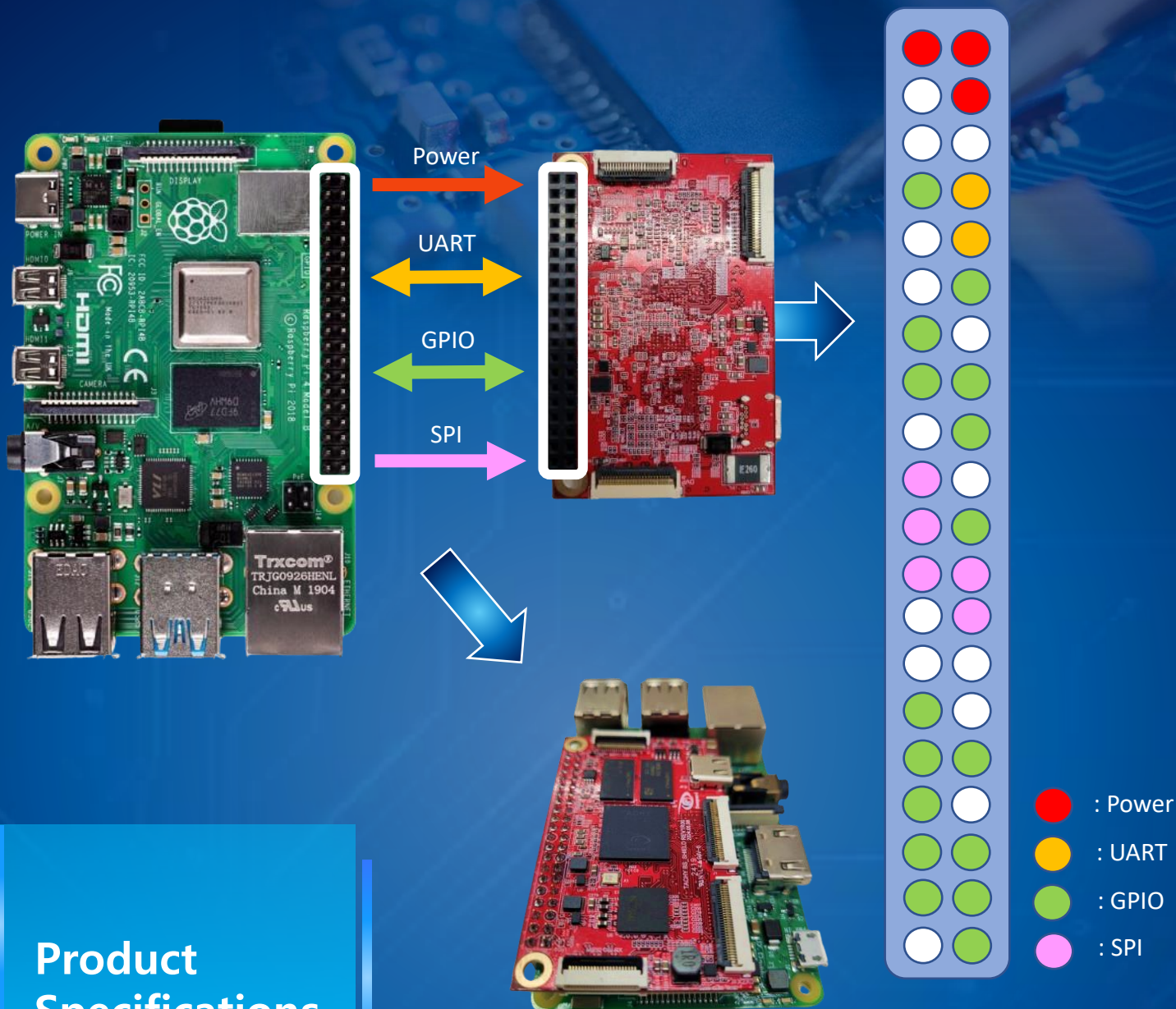
Product Specifications

Item	Details
Board Model	Tachy-Shield
Compatible SBC	Raspberry Pi series (A, B, Zero, etc.), Orange Pi, Banana Pi
Camera Interface	MIPI Rx 2 ea / Tx 1 ea, DVP (In and Out)
Interface Expansion	X2X, SPI, I2C, etc.
Header	Compatible with 2 x 20 headers on SBC
Boot Mode	Default boot mode can be set to SRAM and changed via expansion board if necessary
Power Supply	2.54mm header 5V, 5V power input via Micro Type-C USB
Additional Expansion Board	NOR and SD cards accessible via 2x20 header

Applications & Use Cases

Tachy-shield

Automatic Number Plate Recognition

(ANPR)

Tachy-Shield

Supports high-resolution camera input to accurately recognize license plates of the vehicle

Process real-time video data through an industrial camera interface and run deep learning-based string recognition algorithms through a high-speed NPU

This can be used in parking management systems, road traffic management security systems, etc.

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# Thermal Imaging Surveillance System

Tachy-Shield

Tachy-Shield can build a perimeter surveillance system by receiving thermal camera data through various sensor interfaces

Using NPU, it can analyze thermal imaging data in real time, detect abnormalities, and send warnings

This can be applied to military security, night surveillance, industrial facility surveillance, etc.

# Vision Sensor Inspection System
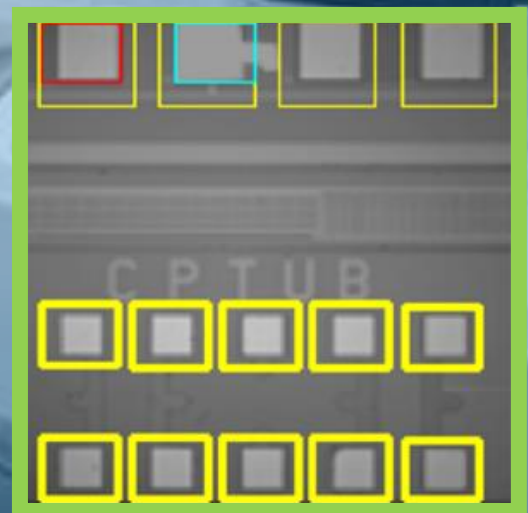
Tachy-Shield

Tachy-Shield can automate product inspection and quality control through high-speed vision sensors

Real-time image data can be collected through the vision sensor used in inspection equipment and defects can be detected through the built-in AI module

This can be used in manufacturing, electronics inspection, automated production lines, etc.

Self-driving system
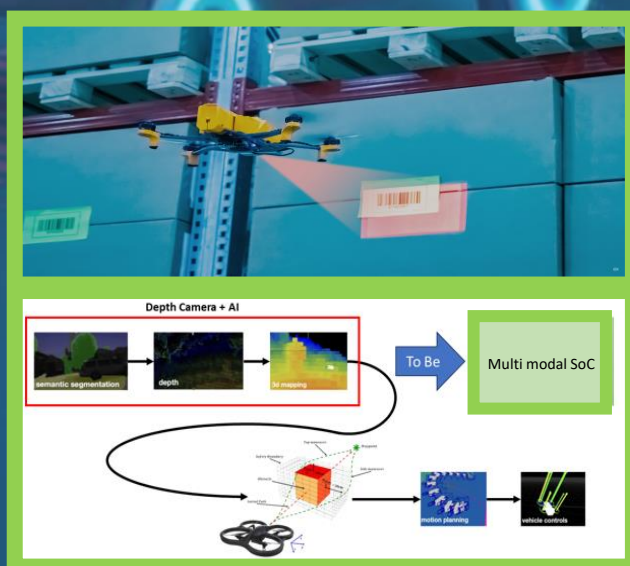
Tachy-Shield

Supports various sensor data processing for autonomous driving

LiDAR and depth sensors to recognize the environment and plan the robot's path by integrating various sensor data through SPI and I2C interfaces.

This can be used for logistics robots, service robots, industrial robots, etc.

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