

# R-Car V4H Sparrow Hawk Golden Material



Sparrow Hawk

RENESAS ELECTRONICS CORPORATION  
HIGH PERFORMANCE COMPUTING PRODUCT GROUP  
HPC SOC BUSINESS DIVISION  
SOC SOFTWARE ENABLEMENT

V1.0



スパローホーくん

# R-Car V4H Sparrow Hawk

R-Car V4H Sparrow Hawk is to show the unique capabilities of R-Car V4H to a broader audience of potential edge-AI developers, encompassing non-automotive use cases.

## POINT 01

### Easy to Buy

- Low-Cost board (\*)
- User can buy from Global Disty
- High volume production, large inventory

## POINT 02

### Easy to Start

- OSS based SW (supporting Yocto and Debian)
- Click through agreement (Quick contract)
- Distribution of all SW from website as Free of Charge

## POINT 03

### Easy to Use

- 30TOPS range AI execution
- Compatible with industry-standard accessories
- Single board and Compact size (146x90mm)

(\*) The DDR 8GB version is currently available from SHIMAFUJI Electric Incorporated at a campaign price of USD 299.

# CONCEPT OF SPARROW HAWK

- ✓ Leveraging automotive-grade R-Car technologies for **industrial applications**.
- ✓ The primary focus is to showcase the unique capabilities of the R-Car V4H for non-automotive edge-AI applications. A key target application is “**30 TOPS-range AI execution.**”

## Easy to buy

- Low Cost (Campaign price : \$299)
- User can buy from Global Disty
- High volume production, large inventory

## Easy to use/evaluate

- OSS(Linux and related SW) based
- Upstream-first development to enable the use of the latest software versions and security patches.
- No paper contract is required
- Distribution of all SW from website as FOC

## Concept

## Target customer

- Non-Auto (Robotics, smart-agriculture, smart-logistics, etc.) + Automotive (research, experiment) + etc..

## Other

- Compact size (146x90mm)
- Single board
- Equipped with 8 or 16GB DDR memory

# Sparrow Hawk Scope and Positioning

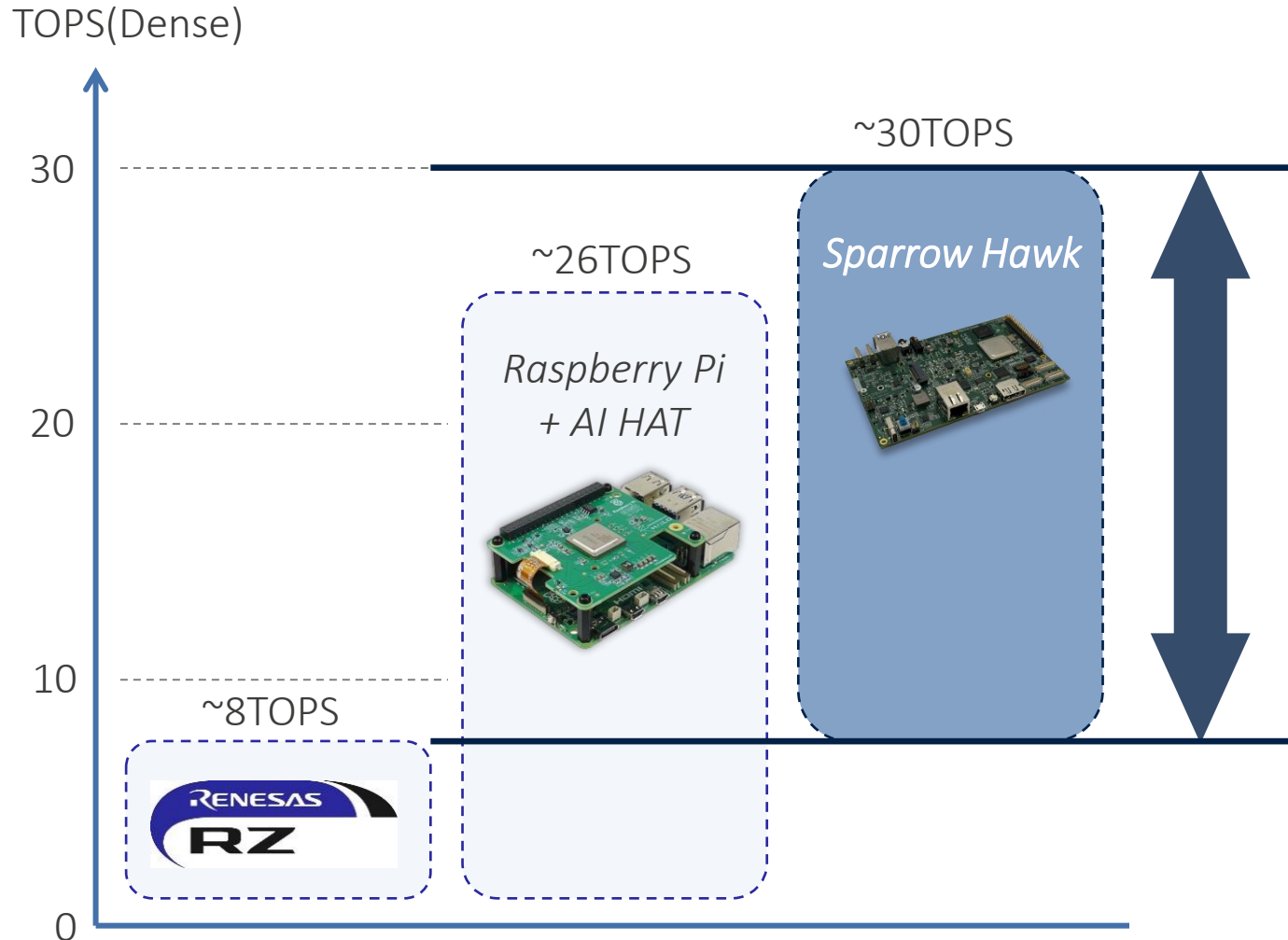
## Target applications and users

- Sparrow Hawk targets a wide range of Edge AI applications such as AI robot, AMR/AGV, Drone, Robotic arm, and so on.



- In addition to traditional customers, it is designed for a broad spectrum of users, including Startup companies, Academic and Students, as well as Hobbyists.

# Sparrow Hawk Scope and Positioning Performance coverage



- Sparrow Hawk targets higher-performance Edge AI domains beyond the scope of the RZ series.
- It focuses on higher-performance AI workloads, enabling Renesas to address more demanding Edge AI applications.
- By supporting advanced AI models including LLMs, VLMs, and VLAs, it enables more intelligent Edge AI use cases that require sophisticated perception and decision-making.











# Sparrow Hawk vs White Hawk



## Sparrow Hawk

\* Sparrow Hawk is a community board

## White Hawk

 Target	 Industrial (Non-Auto)	 Automotive
 Manufacturer	 <b>RETRONIX</b> The Solutions for Connected World	 <b>RENESAS</b>
 Board info.	<a href="http://Retronix.com.tw">Retronix.com.tw</a>	<a href="http://Renesas.com">Renesas.com</a>
 Software	Open source, <a href="#">Yocto BSP</a> or <a href="#">Debian based BSP</a> <i>* R-Car SDK does not support the Sparrow Hawk.</i>	R-Car SDK
 Support scheme	Community-based <a href="#">FAQ &amp; Q&amp;A</a> <i>* No support from Renesas FAE</i>	Renesas JIRA
 Where to buy	Online distributor :  <b>SHIMAFUJI</b>	via Renesas Sales channels

Select the right development platform base on the Target application

# WHITE HAWK VS SPARROW HAWK (SIZE)

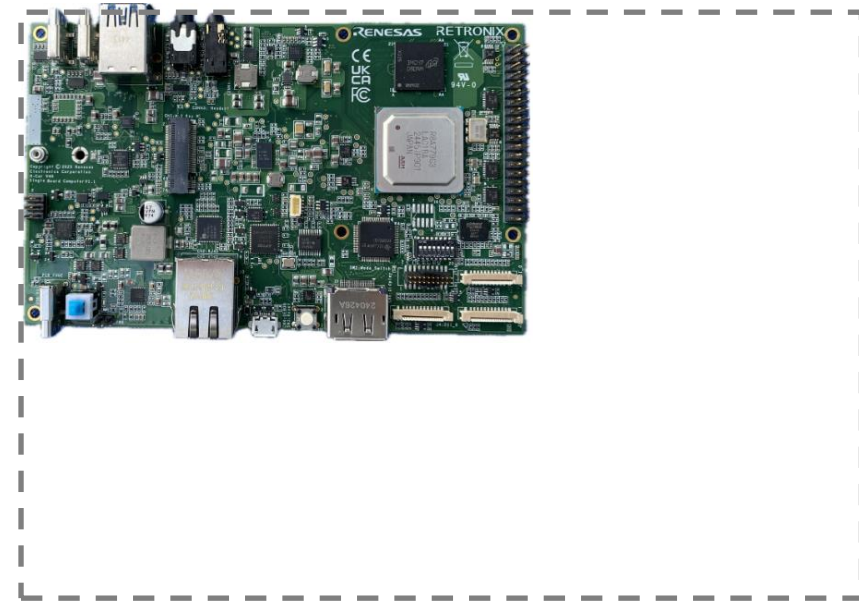
White Hawk board



290mm  
165mm



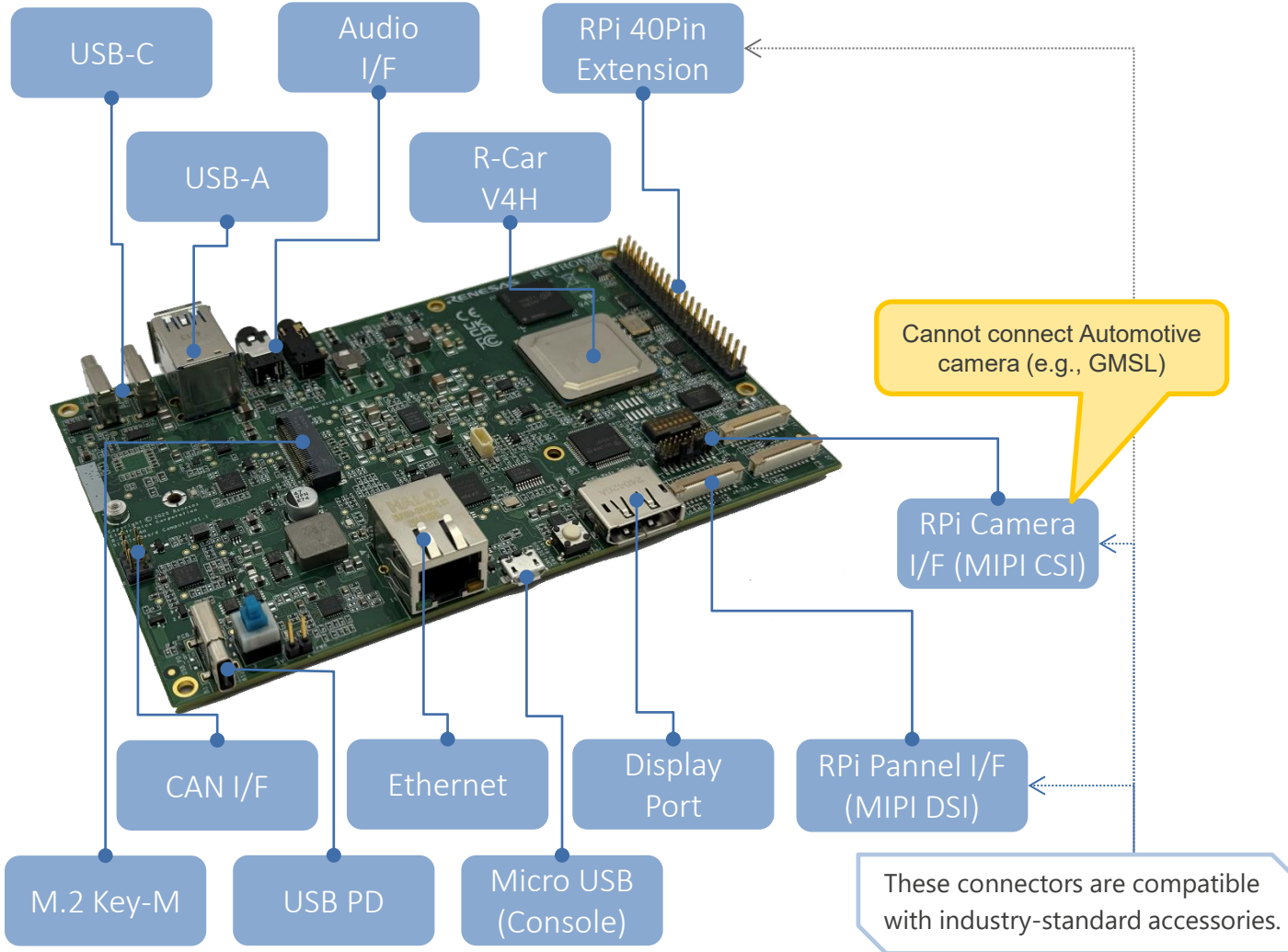
Sparrow Hawk board



146mm  
95mm

[RTP8A779G0ASKB0FS0SA000 - R-Car V4H System Evaluation Board Set/White Hawk | Renesas](#)

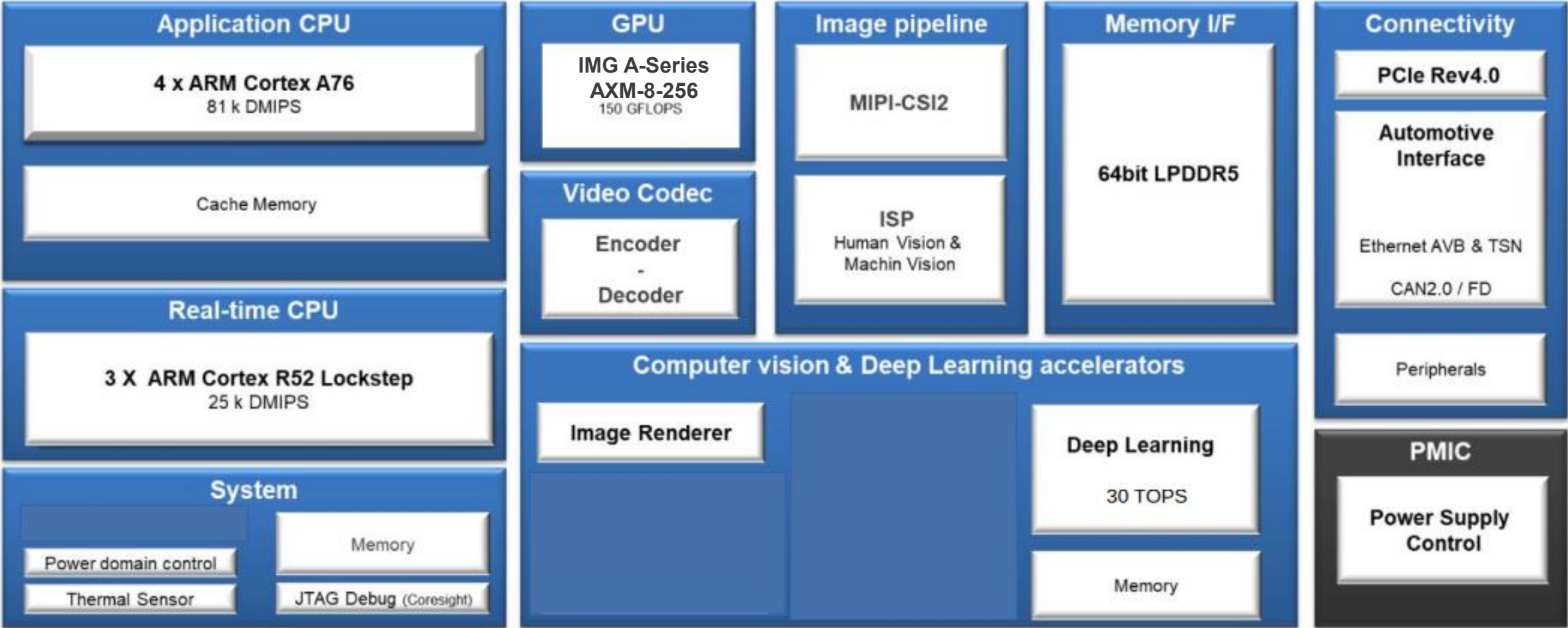
# HW SPECIFICATION



Function	V4H Sparrow Hawk
CPU	4x Arm® Cortex®-A76 (81K DMIPS) 3x Arm® Cortex®-R52 (25K DMIPS)
CNN-IP	30 TOPS DENSE
GPU	IMG A-Series AXM-8-256 (150 GFLOPS)
DRAM	LPDDR5 6400Mbps 8GB / 5500Mbps 16GB
Flash Memory	64MB QSPI
Camera I/F	2x MIPI CSI Camera
Display	1x DP, 1x DSI
Ethernet AVB	1 Port (1Gbps)
Debug Serial	2 Port
Audio	In/Out, In
PCIe	1x M.2 Key-M (x2 lane)
USB	2x USB type-A, 2x USB type-C
CAN-FD	2 Port
PWM	1 Port
JTAG	1 Port
Removal Media	1x MicroSD
Extensions	Raspberry Pi® 40-Pin GPIO header
Power	USB PD 20V

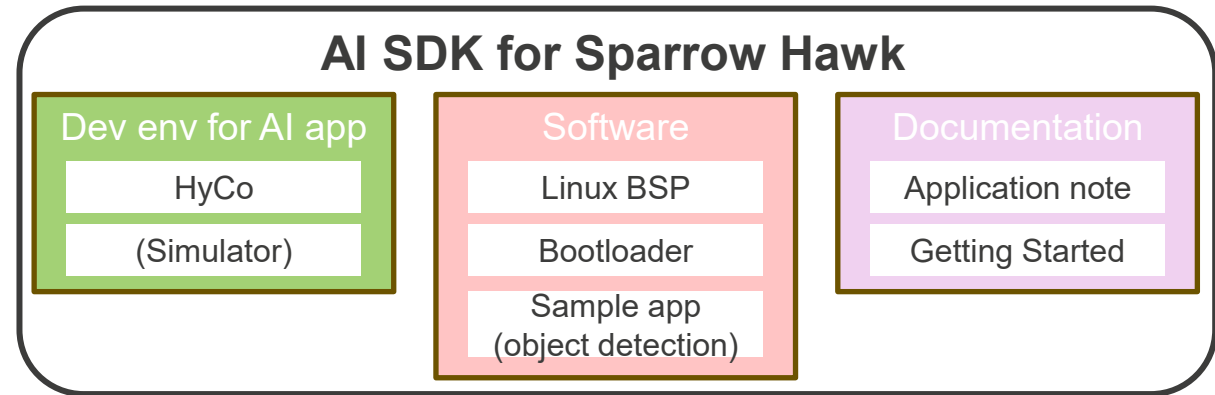
See : [https://www.retronix.com.tw/en/product\\_sbc.html](https://www.retronix.com.tw/en/product_sbc.html)

# R-CAR V4H HW BLOCK

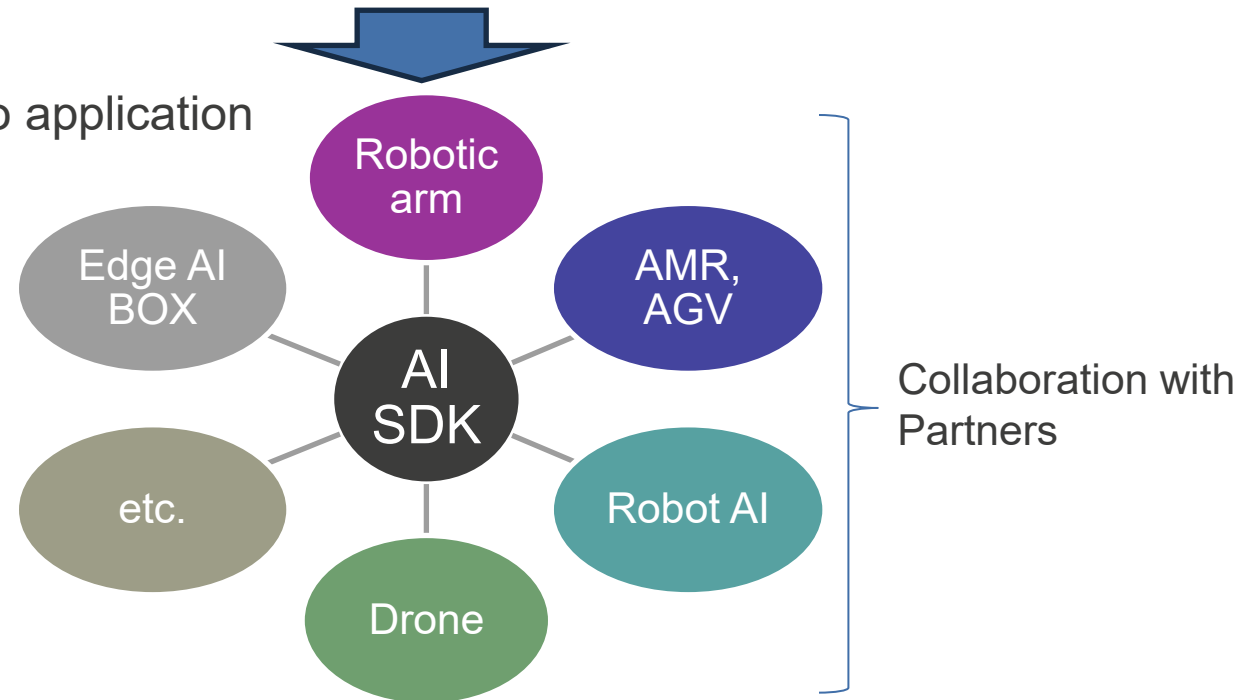


# SOFTWARE / APPLICATION

OS	Linux (CA76) – Yocto or Debian Zephyr(CR52) – Under considering <span style="background-color: #FFD700; padding: 2px;">Not supported yet</span>
	Upstream-first development for Sparrow Hawk. This enables the use of the latest software versions and security patches.
Embed ded AI	Hybrid Compiler (Out of scope with CEVA DSP)
<span style="background-color: #FFD700; padding: 2px;">Not supported yet</span>	Sample App Robot, Object Detection, VLM etc.
GFX	OpenGL ES
	OpenCL <span style="background-color: #FFD700; padding: 2px;">Not supported yet</span>
	Vulkan <span style="background-color: #FFD700; padding: 2px;">Not supported yet</span>
Camera	Raspberry Pi Camera v2/v3 driver
	ISP Control (libcamera)
Etc.	PCIe driver Audio driver Display driver ...



## AI demo application



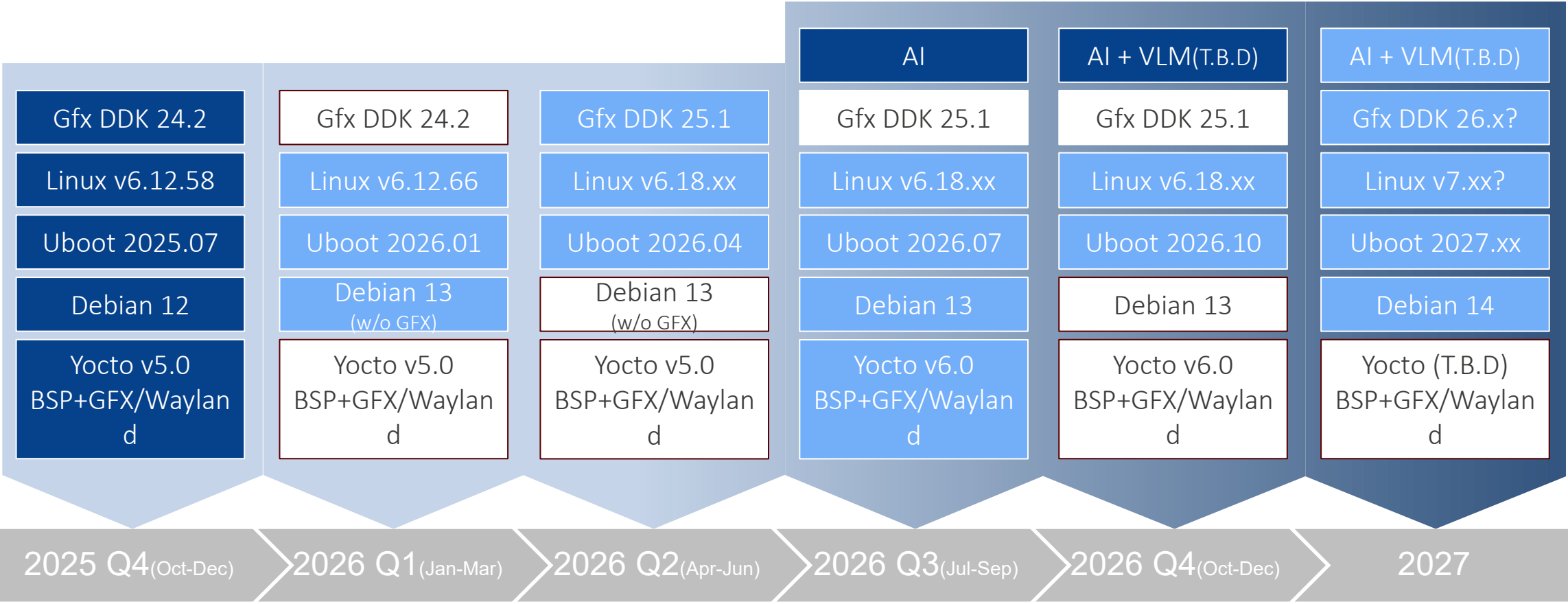
See : <https://rcar-community.github.io/Sparrow-Hawk/index.html>

# SOFTWARE RELEASE SCHEDULE



Latest Version, Always

First Release

Update



# WEB INFORMATION

Contents		Notes
HW info.	<a href="#">Sparrow Hawk HW info.</a>	Retronix's website (Board info., Schematic, Board manual, etc)
	<a href="#">R-Car V4H SoC info.</a>	Renesas R-Car V4H product page
SW info.	<a href="#">Sparrow Hawk SW info.</a>	Top page of SW info. (github pages) 
	→ Getting Started for <a href="#">Yocto BSP</a>	How to build the Yocto BSP、 How to boot, etc.
	→ Getting Started for <a href="#">Debian based BSP</a>	How to build the Debian based BSP, How to boot, etc.
Support	Community-based <a href="#">FAQ</a>	(github discussion)
	Community-based <a href="#">Q&amp;A</a>	(github discussion)
Where to buy	<b>Online distributor</b> ✓ <a href="#">Shimafuji</a>	* In discussions with other distributors 

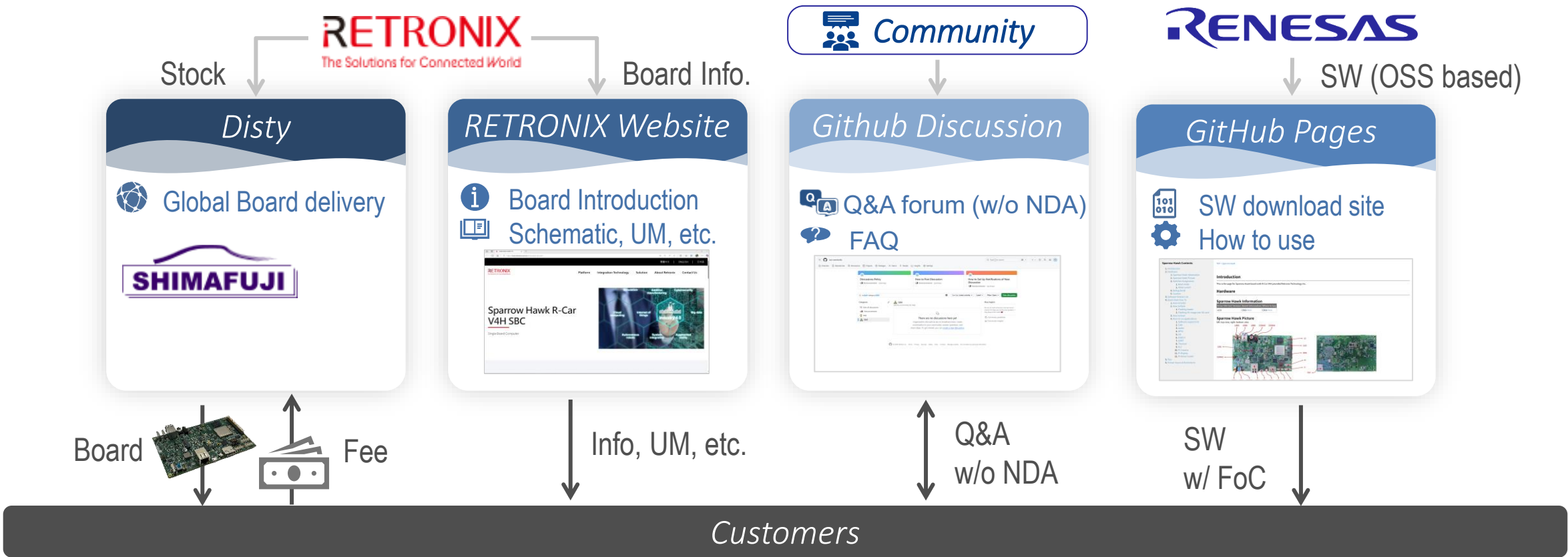
# Delivery flow (HW/SW) & QA support scheme

Where to buy : [SHIMAFUJI Electric Incorporated](#)

Board Info. : Retronix provides the board documentations on their [Web](#) page

SW : User can download from github pages ([Yocto BSP](#) , [Debian based BSP](#))



Q & A : Let's work together as the Sparrow Hawk user community to resolve questions and issues.



# LEAFLET

<https://rcar-community.github.io/Sparrow-Hawk/index.html#leaflet>

- Benefits for Sparrow Hawk
- Hardware spec
- Support software version
- Board variants
- Website links (Sparrow Hawk Official website, Retronix website, Where to buy(Shimafuji))

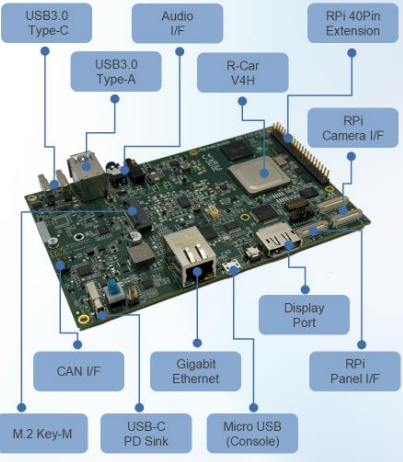
Integrated development environment for AI services and low-cost compact board

## R-Car V4H Sparrow Hawk

Core benefits

- **Ready to run OSS based software and start development**
  - Get started instantly with OSS based SW supporting Yocto & Debian, available FoC (Free Of Charge) with just Click though agreement
- **Unleash 30TOPS AI power in a compact board design**
  - Experience up to 30 TOPS range AI performance on a compact board (146 × 90 mm) and fully compatible with Raspberry Pi® HAT.
- **Affordable and accessible hardware for everyone**
  - Low-cost board available through global distributors and High-volume production ensuring stable supply and large inventory


HW Features





SW Features


Supported


Not supported yet


Debian 13  



Yocto v5.0  



Zephyr (Dom0)  


Linux (DomD/U)  


Android (DomA)  


Linux 6.18  


Xen Hypervisor  


u-boot 2026.04  


Renesas Electronics  
[www.renesas.com](http://www.renesas.com)

Board variants	Basic Kit		Complete Kit	
	8G	16G	8G	16G
Sparrow Hawk	✓	✓	✓	✓
Argon FAN			✓	✓
Micro USB cable			✓	✓
32GB Micro SD card			✓	✓

HW Features


CPU	4x Arm® Cortex®-A76 (81K DMIPS) 3x Arm® Cortex®-R52 (25K DMIPS)
CNN-IP	30 TOPS DENSE
GPU	IMG A-Series AXM-8-256 (150 GFLOPS)
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Ethernet AVB	1 Port (1Gbps)
Debug Serial	2 Port
Audio	In/Out, In
PCIe	1x M.2 Key-M (x2 lane)
USB3.0	2x USB type-A, 2x USB type-C
CAN-FD	2 Port
Removal Media	1x MicroSD
Extensions	Raspberry Pi® 40-Pin GPIO header
Power	USB PD 20V

SW Features

Yocto BSP	Yocto Project 5.0.16
Debian based BSP	Debian 13
Linux kernel	V6.18.20
u-boot	2026.04
Trusted Firmware-A	V2.14.0


Please see the details here :  
<https://rcar-community.github.io/Sparrow-Hawk/>

- Board / SW info
- Getting started
- Get the board




Please see the details here :  
[https://www.retronix.com.tw/en/product\\_sbc.html](https://www.retronix.com.tw/en/product_sbc.html)


- Web page of Retronix Technology Inc.
- Board info
- Board UM




Where to buy :  
<http://www.shimafuji.co.jp/en/products/2207>

- Web page of Shimafuji Electric Incorporated
- Contact : [info@shimafuji.co.jp](mailto:info@shimafuji.co.jp)





スバローホークン



V1.02

# SPARROW HAWK VARIANTS

Sparrow Hawk is available in four kit variants with different memory options and included accessories, allowing customers to choose the configuration that best fits their development needs.

Board variants	Basic Kit		Complete Kit	
	8GB	16GB	8GB	16GB
Sparrow Hawk board	✓	✓	✓	✓
Argon FAN HAT			✓	✓
Micro USB cable			✓	✓
32GB Micro SD card			✓	✓

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[Renesas.com](https://www.renesas.com)

# NOTIFICATION

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- The Sparrow Hawk board supports camera input via MIPI-CSI only; therefore, automotive cameras such as GMSL cameras cannot be connected.
- The Sparrow Hawk board does not support secure boot.