



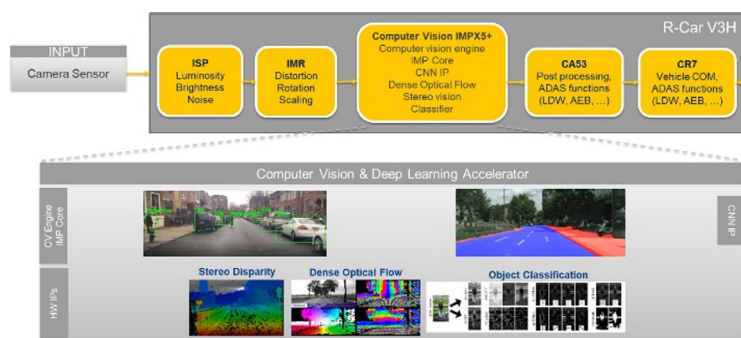
64-BIT SoC Family

RENESAS R-CAR V3H



Best-in-Class ASIL B/C System-on-Chip, 7,2 TOPS for Intelligent Camera Applications

R-Car V3H Delivers Best-in-Class TOPS/Watt for Cutting-Edge Computer Vision, Supports the latest NCAP 2020 requirements, including Driver Monitoring Systems and provide a migration path toward NCAP 2025. Building on the state-of-the-art recognition technology introduced with the R-Car V3H in February 2018, which includes integrated IP for convolutional neural networks (CNN), the updated R-Car V3H delivers 4 times the performance for CNN processing compared to the earlier version and is achieving up to overall 7.2 TOPS processing including all Computer Vision IPs – while maintaining low power consumption levels.



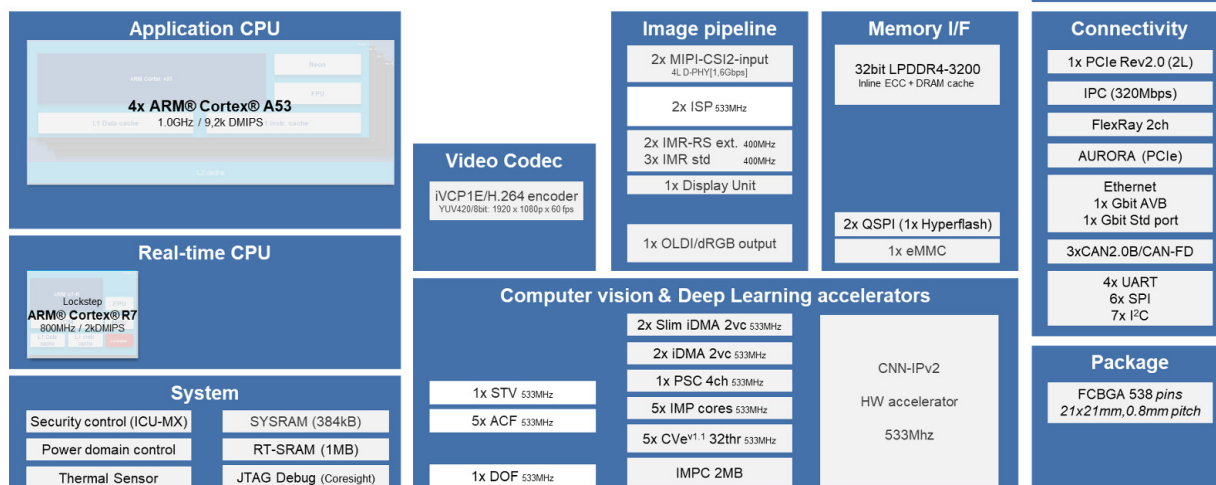
Target Applications

- Front Stereo Smart Camera for NCAP
- Surround View with 3D visualization
- Driver and Occupant Monitoring System
- Lidar System
- Intelligent Survey Camera
- Robotics
- Industrial Applications

Key Features

- 4 Arm® Cortex®-A53 : 9,2 kDMIPS
- Dual Cortex-R7 LockStep cores to run AUTOSAR : 2kDMIPS
- Overall Tops performance : 7,2 TOP :
 - CNN IP
 - Multi-Threading Computer Vision Engine
 - HW Accelerator: optical flow, object detection, ...
- Integrated ISP with up to 8 Mpixel sensors, RGB-IR support
- Automotive Interface; Ethernet AVB, CAN FD and FlexRay
- ASIL D devel. process for systemtic capability for the full SOC
- Supporting metric targets for ASIL B (sensor layer, application processors) and ASIL C (realtime Domain) safety goals

Block Diagram



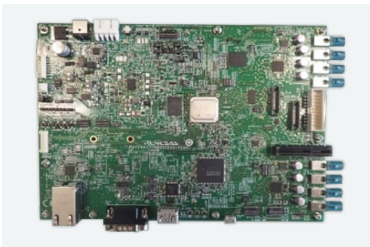
RENESAS R-CAR V3H

Benefits

- R-Car V3H is tailored for the Intelligent Camera System use case, balancing Innovation and automotive constraint
- Overall performance of 7,2 TOPS, capable of handling any state-of-the-art neural networks
- Integrated ISP supporting majors Sensor Vendors ICs drastically reduce system BOM. 8 Mpixel Sensor enable V3H to be use for Level 3 while support of the latest RGB-IR standard make V3H ideal for Driver Monitoring system
- ASIL certified SOC reduce SW development effort and remove the need additional redundant SOC
- Real time ASIL C CPU core avoiding the need of external MCU to handle Realtime task and Autosar
- Integrated development environment enables fast time-to-market for computer vision & deep learning-based solutions
- Renesas Provide PMIC specially developed for R-Car V3H allowing optimized power management in ASIL environment
- Wide Partners Ecosystem, providing HW tools, Perception System for Camera, Lidar and Sensor Fusion with Radar

Condor Development board

- NOR flash memory
- LPDDR4-SDRAM for DBSC4
- DMI output connector for LVDS
- Camera input connectors
- eMMC memory for MMC
- PCIE x 4 connectors (2 lanes) for PCIE
- Ethernet n CAN, FklexRay
- Power supply : 12.0-V DC input
- **Packages include**
 - Evaluation Board
 - Power Supply
 - CD with User’s Manual
- **Software**
 - Linux BSP (Linux.Org)
 - Boot SW

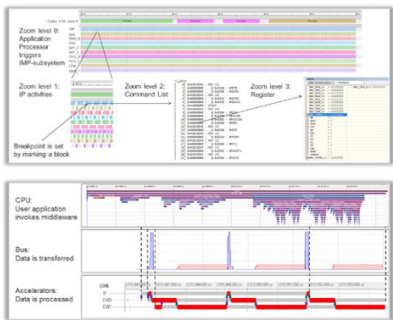
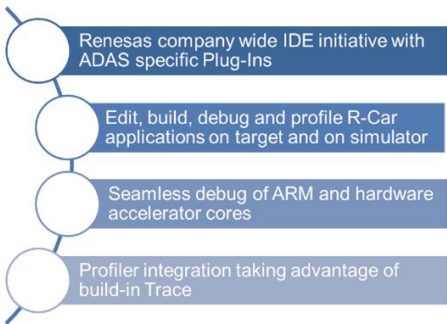


V3H Starter Kit

- 2 GBytes DDR3L-1600
- 64 Mbytes Hyper Flash & 64 Mbytes QSPI Flash
- 16 GBytes eMMC
- HDMI, RGB, LVDS, MipiCSI2, EthernetAVB, CAN
- JTAG, Debug Interface
- On board Connector with SOC signals
- **Packages include**
 - Starter Kit
 - Power Supply
 - USB & HDMI Cable
- **Software**
 - Linux BSP (Linux.Org)
 - Configuration tools
 - Mimi Monitor



SW Development Environment



HW Ordering Reference

Renesas Board	Product Name	Reference	Comment
	Condor Evaluation Board	RTP6A77980ASKB0CW0SA001#WS	Japan Order Code
		Y-RCAR-V\$HCONDOR-I-BRD-WS20	Europe Order Code
	V3H Starter Kit	Y-ASK-RCAR-V3H-WS20	Global Order Code
Partner Board	Product Name	Description	Company
	eCube	Development Platform for V3H & V3H2 Intelligent camera application	eST
	VIDEOBOX (MINIPLUS)	Development Platform for V3H Intelligent camera application	Cogent