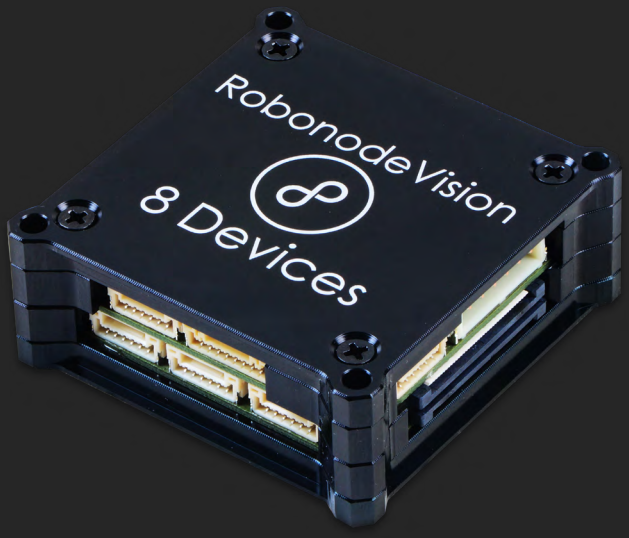

RobonodeVision - Compact, High-performance Vision & Wi-Fi 7 Connectivity Platform

RobonodeVision is a modular multi-PCB vision and connectivity platform built around the Qualcomm QCS6490 (Citron SoM). It integrates edge compute, AI acceleration, multi-camera MIPI interfaces, and high-power Wi-Fi 7 RF hardware in a compact stack optimized for drone onboard payloads and high-performance industrial applications.

Quick Specs

Feature	Description
Compute	Qualcomm QCS6490 (Citron SoM)
Memory / Storage	32 Gb LPDDR5 SDRAM, eMMC 5.1 32 GB
AI / DSP	Qualcomm Hexagon Processor (6th Gen AI Engine) with HVX and Tensor Accelerator
Wireless	Wi-Fi 7 (QCN9274) concurrent dual-band 2.4 GHz + 5 GHz or 2.4 GHz + 6 GHz (SKU dependent)
Camera	3× MIPI-CSI (4-lane each)
Display	1× MIPI-DSI (4-lane)
Video	4K decode / encode
Ethernet	2× 1 Gbps
USB	USB 3.1 and USB 2.0
Expansion	5× configurable UART / I2C / SPI / GPIO connectors
Debug	Debug UART
Architecture	4-board stack (RF Radio + I/O & Power + Carrier + SoM)
Variants	2.4 + 5 GHz or 2.4 + 6 GHz SKU
Power input	5.0–34.0 V

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Features

Software:

- Linux Kernel ≥ 6.12 with ath12k support;
- Qualcomm SNPE-based AI pipeline (Hexagon DSP / NPU inference);
- Web-based GUI (browser access) for live video, RF/network configuration, telemetry, and diagnostics;
- Firmware options: Standard and Premium feature sets;

Processor:

- Qualcomm® QCS6490 ;
- Kryo™ 670 octa-core CPU;
- Arm v8 architecture delivering balanced performance and power efficiency;

GPU:

- Supports OpenGL ES 3.2, Vulkan 1.x, OpenCL 2.0, and DirectX FL 12;
- Adreno 1075 DPU with HDR10+ and Wide Color Gamut support;

Memory:

- 32 Gb LPDDR5 SDRAM @ 6400 Mbps;
- 32 GB eMMC 5.1;

Interfaces:

- 3x MIPI CSI;
- 1x MIPI DSI;
- USB 3.1;
- USB 2.0;
- Debug UART;
- 5x configurable UART / I2C / SPI / GPIO connectors;
- 2x 1 Gbps Ethernet;

AI / DSP:

- Qualcomm Hexagon Processor (part of the 6th Gen Qualcomm AI Engine);
- Supports scalar, vector, and tensor acceleration for on-device AI operation;
- Optimized for real-time AI, computer-vision, and sensor-fusion workloads at the edge;

Wireless:

- Wi-Fi 7 (Qualcomm QCN9274), dual-band simultaneous;
- IEEE 802.11be, backward compatible with 802.11 b/g/n/ax;
- Band support (SKU dependent): 2.4 GHz + 5 GHz (or 2.4 GHz + 6 GHz);
- Dual-band simultaneous: supports 2×2 @2.4 GHz + 2×2 @5 GHz concurrently;
- 2×2 MU-MIMO (2.4 GHz), 20/40 MHz, 4096-QAM; up to 27 dBm per chain @ MCS0;
- 2×2 MU-MIMO (5 GHz), 20/40/80/160/240 MHz, 4096-QAM; up to 27 dBm per chain @ MCS0;
- 2×2 MU-MIMO (6 GHz), 20/40/80/160/240/320 MHz, 4096-QAM; up to 26 dBm per chain @ MCS0;

Camera:

- Qualcomm® Spectra™ 570 L ISP;
- Three 4-lane MIPI CSI interfaces;
- Supports D-PHY 1.2 (2.5 Gbps/lane) and C-PHY 1.2 (10.26 Gbps/T);
- Designed for multi-camera operation (up to three concurrent camera inputs);
- Expandable via GMSL-to-CSI adapter (TBD);
- Supports 36 MP + 22 MP @ 30 fps, or 3 x 22 MP ZSL;
- Real-time sensor input up to 22 + 22 + 22 MP;
- Slow-motion capture up to 720p @ 480 fps;

Video:

- Decode up to 4K @ 60 fps (H.264 / H.265 / VP9);
- Encode up to 4K @ 30 fps (H.264 / H.265);
- HDR10 and HDR10+ playback support;

System architecture:

- Modular 4-board stack: RF Radio Board + I/O & Power Board + I/O & Carrier Board + Citron SoM (QCS6490);

Form factor:

- 54.5×54.5×20.3mm;

Operating temperature:

- Industrial;

Display:

- One 4-lane MIPI DSI interface (D-PHY / C-PHY);

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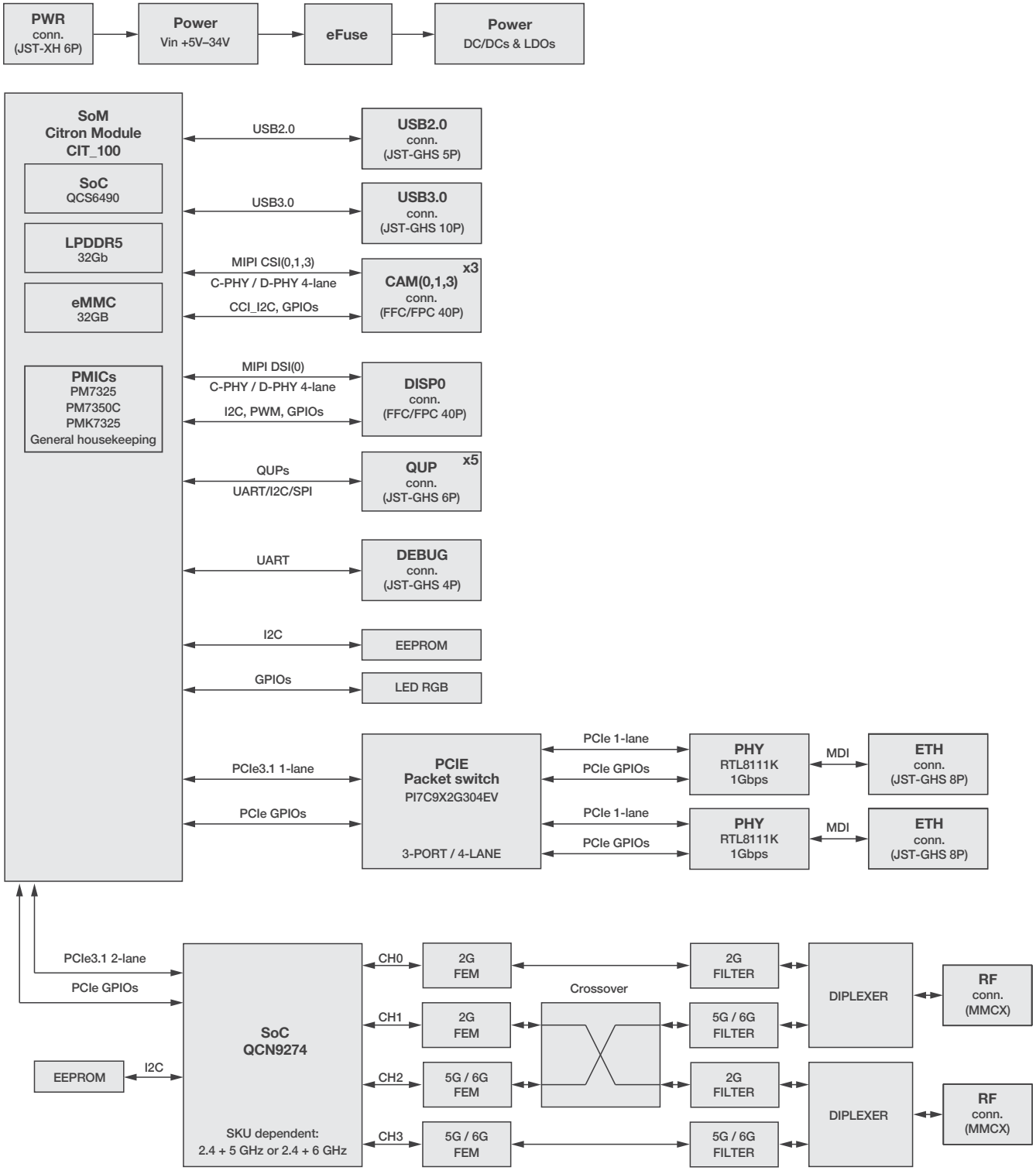
Block Diagram



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