



Citron High-Performance Embedded Module

Citron SoM is a compact, high-performance embedded module based on the Qualcomm® QCS6490 SoC. It is optimized for robotics, drones, and intelligent vision platforms, combining advanced AI acceleration, efficient power management, and multi-camera support in a 47 × 35 mm form factor.

The Citron SoM is specifically designed with power efficiency as one of its core characteristics, making it ideal for high-end consumer, enterprise, and industrial IoT applications that require sustained compute performance at the edge.

Quick Specs

Feature	Description
CPU	Kryo 670 octa-core (1 × 2.7 GHz + 3 × 2.4 GHz + 4 × 1.9 GHz)
AI/DSP	Qualcomm Hexagon Processor (6th Gen AI Engine) with HVX and Tensor Accelerator
GPU	Adreno 643 GPU @ 812 MHz
Memory	32 Gb LPDDR5 SDRAM @ 6400 Mbps
Storage	eMMC 5.1 32 GB
Camera	5 × 4-lane MIPI CSI (D-/C-PHY 1.2), up to 36 MP + 22 MP @ 30 fps
Display	1 × 4-lane MIPI DSI (D-/C-PHY), DisplayPort over USB 3.1, eDP 1.4
Video	4K encode @ 30 fps / 4K decode @ 60 fps (H.264 / H.265 / VP9)
Audio	LPASS with SoundWire + MI ² S interfaces
Interfaces	2 × PCIe Gen3 (1-lane and 2-lane), USB 3.1, USB 2.0, SD 3.0, UART, SPI, I ² C, I ³ C, GPIO
Power	2.7 – 4.8 V input (3.8 V nominal)
Operating Temp.	Commercial / Industrial
Form factor	47 × 35 mm LGA module

Features

Processor:

- Qualcomm® QCS6490 SoC;
- Kryo™ 670 octa-core CPU (1 × 2.7 GHz Prime + 3 × 2.4 GHz Gold + 4 × 1.9 GHz Silver);
- Arm v8 architecture delivering balanced performance and power efficiency;

AI / DSP:

- Qualcomm® Hexagon™ Processor;
- Part of the 6th Generation Qualcomm® AI Engine;
- Integrated Hexagon Processor supporting scalar, vector (HVX), and tensor operations;
- Includes the Hexagon Tensor Accelerator (HTA) for efficient neural-network inference;
- Optimized for real-time AI, computer-vision, and sensor-fusion workloads at the edge;

Video:

- Adreno™ VPU 633
- 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;

GPU:

- Adreno™ 643 GPU @ 812 MHz;
- 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;

Display:

- One 4-lane MIPI DSI interface (D-PHY/C-PHY);
- DisplayPort over USB 3.1 and dedicated eDP 1.4 support;
- FHD+ output up to 144 Hz with HDR10+ and wide color gamut;
- DSI and eDP are mutually exclusive and cannot be used concurrently;

Interfaces:

- 2 × PCIe Gen3 interfaces (1-lane and 2-lane), USB 3.1 (Type-C + DisplayPort v1.4), USB 2.0, SD 3.0, UART, SPI, I²C, I³C, GPIO;
- Power input: 2.7 – 4.8 V (3.8 V nominal);
- Operating temperature: Commercial / Industrial options;
- Form factor: 47 × 35 mm LGA;

Camera:

- Qualcomm® Spectra™ 570 L ISP;
- Five 4-lane MIPI CSI interfaces supporting both D-PHY 1.2 (2.5 Gbps/lane) and C-PHY 1.2 (10.26 Gbps/T);
- Up to five cameras operating concurrently;
- Supports 36 MP + 22 MP @ 30 fps, or 3 × 22 MP ZSL;
- Real-time sensor input up to 22 + 22 + 22 MP;
- Slow-motion capture up to 720p @ 480 fps;

Operating systems:

- Windows-based development;
- Linux Android environment;
- Ubuntu on Qualcomm IoT;
- Qualcomm Linux compatibility;

Audio:

- Low-power audio and sensor subsystem (LPASS);
- Digital codec, SoundWire, and MI²S interfaces;
- Supports voice activation and voice UI processing;

Memory:

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

Block Diagram



