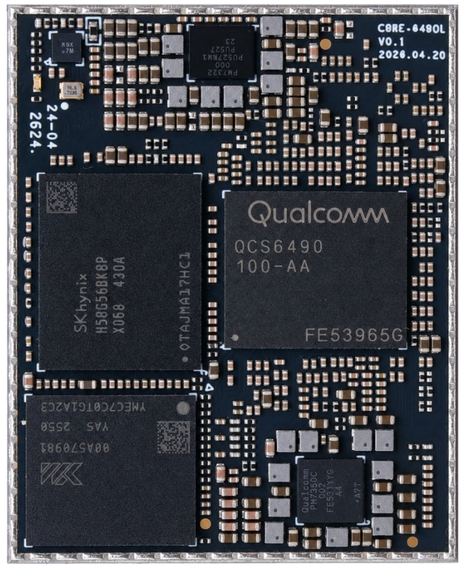
CORE-6490L

Qualcomm QCS6490 SoM



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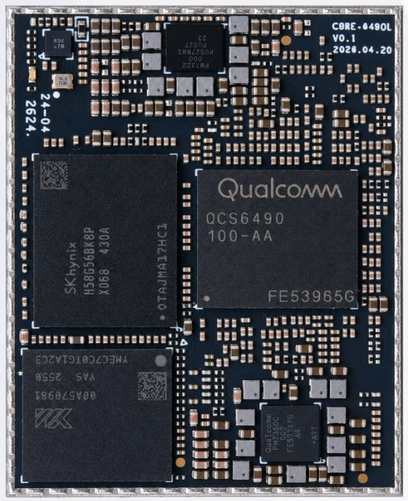
FIREFLY TECHNOLOGY

Product features



Octa-core Heterogeneous Processor QCS6490

Adopts Qualcomm QCS6490 octa-core 64-bit heterogeneous processor, built on ARM architecture with advanced 6nm process technology and a clock frequency up to 2.7 GHz, delivering powerful support for high-performance computing and multi-task processing.

4K Video Encoding and Decoding

Supports 4K@60fps H.265/H.264/VP9 video decoding, 4K@30fps H.265/H.264 video encoding, and concurrent processing of 4K decoding and 1080P encoding.

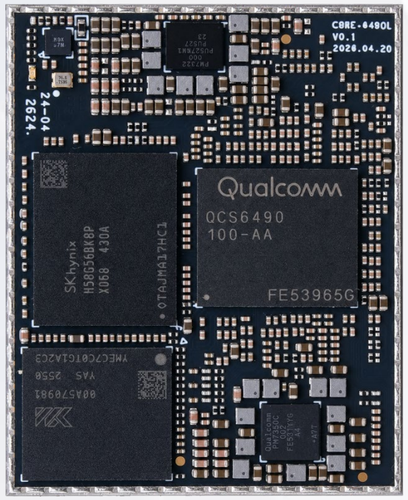
Integrated Adreno 643 GPU

Comes with integrated Adreno 643 GPU, supporting OpenGL ES 3.2, Vulkan 1.x, OpenCL 2.0 and DX FL12 graphics APIs. It efficiently handles tasks such as graphics rendering and image processing to meet visualization display requirements for edge scenarios.

Built-in 12 TOPS NPU

Comes with built-in 12 TOPS NPU, supporting mixed computation of INT4/INT8/INT16/FP16. It enables intelligent data processing, speech recognition and image analysis to satisfy edge computing AI application requirements for most terminal devices.

Product features



Supports 5-Channel Camera Input

On-board 5-channel MIPI-CSI enables simultaneous acquisition from 5 cameras. Equipped with MIPI-DSI, DP and eDP display interfaces, it supports dual-screen different-display / same-display.

463-Pin LGA Package

The SoM adopts a 463-Pin LGA package for enhanced signal transmission and stability. Boasting compact dimensions of only 43 × 35 mm, it can be easily embedded into various complete devices for fast product integration.

Rich Expansion Interfaces

It features expansion interfaces including PCIe 3.0, USB 3.0, MIPI-CSI, MIPI-DSI, DP, SDIO 3.0, SPI, I2C and UART to meet peripheral expansion requirements for diverse scenarios.

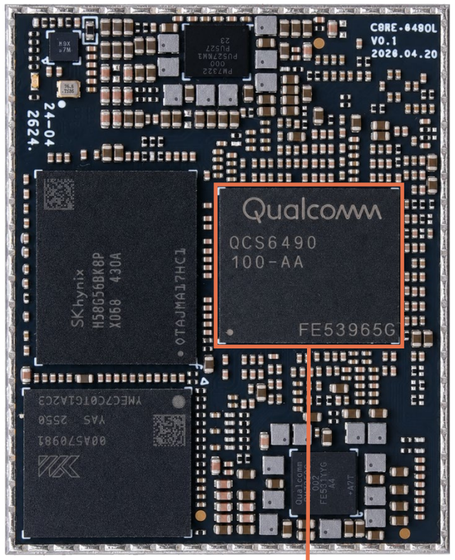
Wide Range of Application Scenarios

Widely applicable to edge computing, private deployment of end-side large models, robots, industrial visual inspection, intelligent security, vehicle multi-camera perception, smart retail and other industry sectors.

Specifications

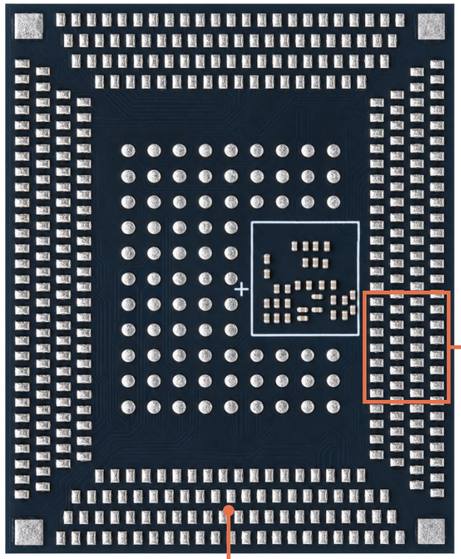
Specifications		
Basic Specifications	SOC	Qualcomm QCS6490
	CPU	Qualcomm Kryo CPU: Octa-core 64-bit processor (1×Kryo Prime 2.7GHz + 3×Kryo Gold 2.4GHz + 4×Kryo Silver 1.9GHz), built on advanced 6nm process, max frequency up to 2.7GHz
	GPU	Adreno 643 GPU, supports OpenGL ES 3.2, Vulkan 1.x, OpenCL 2.0, DX FL12
	NPU	Hexagon 770 NPU, 12 Dense TOPS
	ISP	Spectra 570L ISP, Zero Shutter Lag (ZSL) mode: 64MP / 36MP+22MP / 3×22MP @30fps, Non-Zero Shutter Lag (non-ZSL) mode: 192MP
	Codec	Video Decoding: 1×4K@60fps/2×4K@30fps/4×1080P@60fps (H.265/HEVC, H.264/AVC, VP9) Video Encoding: 1×4K@30fps/4×1080P@60fps (H.265/HEVC, H.264/AVC) Video Concurrency: 1080P@60fps decoding + 1080P@60fps encoding / 4K@30fps decoding + 1080P@30fps encoding
	RAM	4GB/8GB LPDDR5
	Storage	64GB eMMC
	Power Supply	DC 3.8V
	Power Consumption	Normal: 0.532W(3.8V/140mA), Max: 6.08W(3.8V/1600mA), Min(Sleep): 0.133W(3.8V/35mA)
	OS	Qualcomm Linux, Ubuntu
	Software Support	Supports private deployment of ultra-large-parameter models under Transformer architecture, including large language models such as Deepseek-R1, Gemma, Llama, Qwen and Phi series. Supports QNN AI inference framework and multiple deep-learning frameworks: TensorFlow, TensorFlow Lite, PyTorch, MXNet, Keras, Caffe.
	Interface Type	LGA package, total 463-Pin, 14-layer PCB design; Pad size: 1mm × 0.6mm; Module flatness control: 0.15mm
	Dimension	43.0mm × 35.0mm × 2.33mm
	Weight	≈7g
	Environment	Operating Temperature: -20℃ ~ 60℃, Storage Temperature: -20℃ ~ 70℃, Operating Humidity: 10% ~ 90%RH (No condensation)
Interface Specifications	Network	Ethernet, Wi-Fi / Bluetooth expandable via PCIe and USB interfaces
	Video Input	5 × 4-Lane MIPI-CSI, supports D-PHY v1.2 / C-PHY v1.2, enables simultaneous acquisition from 5 cameras
	Video Output	1 × MIPI-DSI (D-PHY 1.2 or C-PHY 1.2, 4-Lane, max resolution 4K@30Hz) 1 × USB DisplayPort 1.4 (max resolution 4K@30Hz) 1 × eDP 1.4 (max resolution 4K@30Hz) Supports dual-screen different-display / dual-screen same-display
	Audio	2 × SoundWire, 3 × DMIC, 5 × MI2S (each group with 2 data channels, supporting full-duplex stereo or up to 4-channel transmit-receive), 1 × MI2S (4 data channels, supporting up to 8-channel transmit-receive)
	PCIe	1 × PCIe Gen3x1, 1 × PCIe Gen3 x2 (NVMe-capable)
	USB	1 × USB3.0 Gen1 (5Gbps, DP video output supported), 1 × USB2.0
	SDIO	2 × SDIO3.0
	Other Interfaces	16 × QUPv3 Bus (QUPv3 can be flexibly configured as UART, SPI or I2C. Signals are multiplexed and cannot be used simultaneously; allocate resources according to practical application)

Interface description



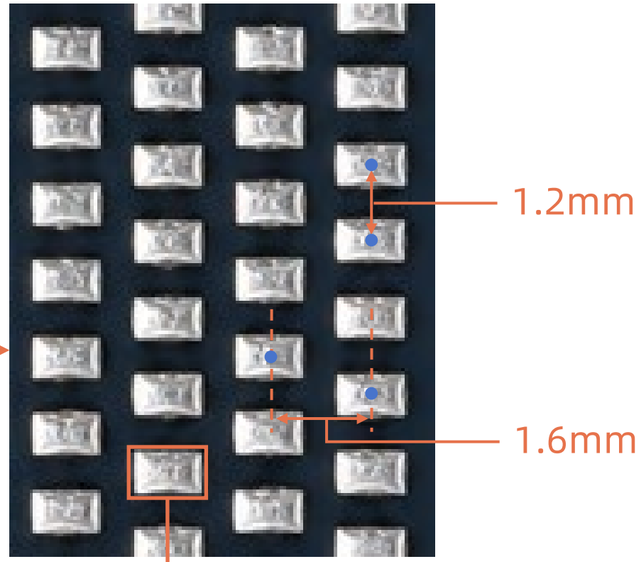
Qualcomm QCS6490

Up to 2.7GHz



LGA Package

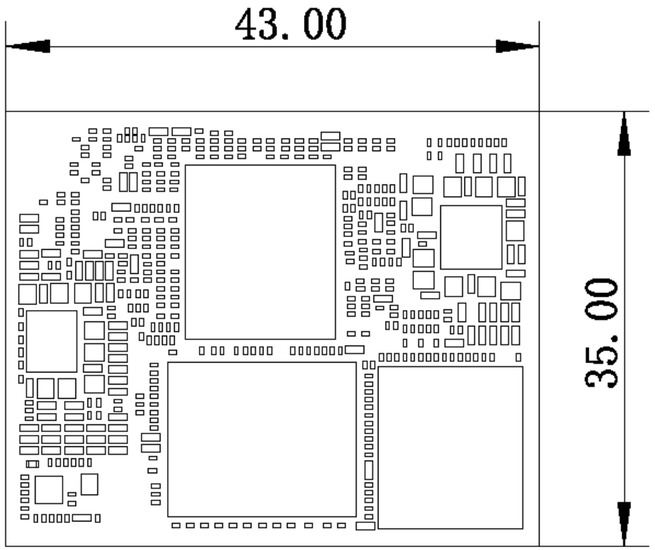
463Pin, Module flatness control: 0.15 mm

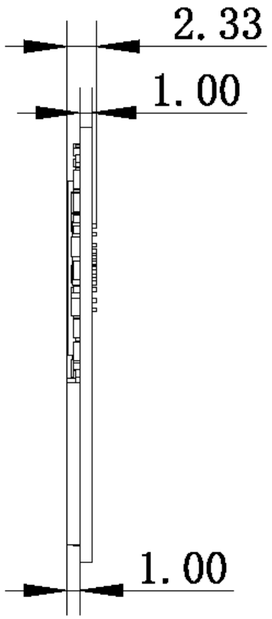


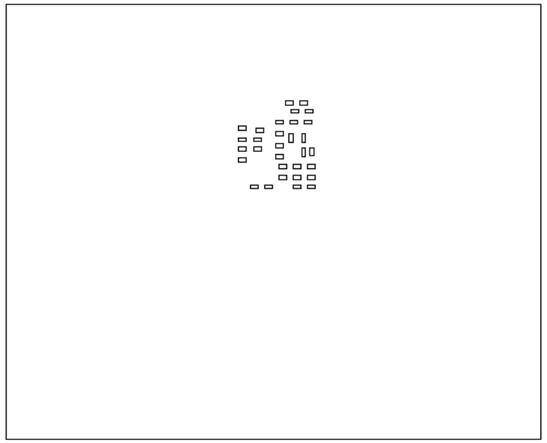
Pad Size

1mm × 0.6mm

Dimension







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