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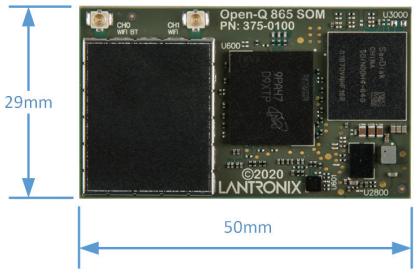
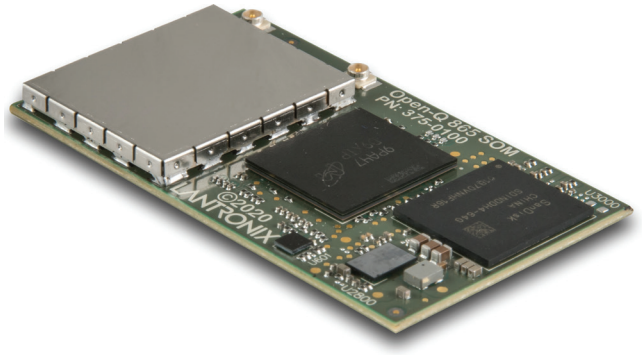
Open-Q™ 5165RB SOM (System on Module)

Based on Qualcomm® Dragonwing™ QRB5165 System-on-Chip with Ubuntu Linux OS





Advanced Robotics SOM in Ultra-compact Size

- SOM with powerful specialized processing cores
- On-device Qualcomm® AI Engine for machine vision, neural networks, deep learning
- Power-efficient edge AI computing solution pushing 15 TOPS
- Ubuntu 18.04 Linux with support for Robot Operating System 2.0
- Container and accelerator APIs - Docker, TensorFlow Lite, NNAPI and others

The Open-Q™ 5165RB SOM is an ultra-compact (50mm x 29mm) production-ready computing module based on the powerful Qualcomm® Dragonwing™ QRB5165 System-on-Chip. The QRB5165 utilizes Qualcomm Technologies' heterogenous compute expertise to provide an SoC with multiple specialized processing cores such as the 5th generation AI Engine, hardware video analytics engine, Qualcomm Spectra™ ISP, Qualcomm Adreno™ GPU, and Qualcomm Hexagon™ DSP. Coupled with the latest Wi-Fi 6 connectivity, advanced camera features, and high-speed interfaces, the 5165RB SOM creates the perfect computing core for a variety of leading-edge robotics applications. Along with the companion development kit, advanced robotics-focused OS and SDKs, and available accessories, it will accelerate your time to market for innovative new products requiring the highest AI processing performance in low-power embedded situations.

Key Features

- Qualcomm® Dragonwing™ QRB5165 SoC – long life IIoT chipset
- 8GB LPDDR5 RAM + 128GB UFS Flash
- Ubuntu 18.04 Linux
- On-device AI Engine up to 15 TOPS
- Dedicated Computer Vision Engine
- Multiple MIPI camera and display ports
- Multiple high speed connectivity options
- Ultra-compact 50 x 29 mm form factor

Applications

- Advanced Robotics – consumer/industrial/defense
- AI-enabled Drones and UAVs
- Machine vision platforms
- AI processing gateways
- Face detection and recognition
- Deep learning and neural network processing
- Autonomous systems

Engineering Services:

We provide a full solution – our unparalleled engineering expertise and product development skills deliver innovative products that are cost-effective and can jumpstart your go-to-market timeline.

Our business model offers turnkey product development services, or we can augment your team in specific areas of development. The choice is yours.

Key development expertise in:

- Camera development and tuning
- Voice control
- Machine learning
- Mechanical & RF design
- Thermal & power optimization.

IoT product development made easy.

Qualcomm

Qualcomm Dragonwing

ubuntu

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Lantronix Open-Q™ 5165RB SOM

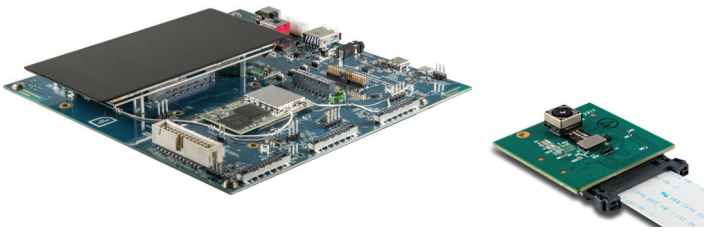
Production Ready
Computing Module

Hardware Specifications:

• **Processors**	Qualcomm® Dragonwing™ QRB5165 SoC built on 7nm technology: Kryo™ 585 Octa-core CPU: 1 Kryo Gold prime @ 2.84 GHz + 3 Kryo Gold @ 2.42 GHz + 4 Kryo Silver @ 1.81 GHz Hexagon™ 698 DSP with quad Hexagon Vector eXtensions	
	Adreno™ 650 GPU @ Fmax = 587 MHz Spectra™ 480 Image Signal Processor Adreno™ 665 Video Processing unit	Adreno™ 995 Display Processing unit NPU230 Neural Processing unit SPU240 Secure Processing unit
• **Memory/Storage**	8GB LPDDR5 @ 2750MHz, 128GB UFS	
• **Wireless**	802.11ax 2x2 MU-MIMO + Bluetooth 5.1, Bluetooth Milan ready	
• **Display Interfaces**	Up to three 4K displays (1 internal display through DSI and 2 external displays through DisplayPort) 2x 4-lane MIPI DSI D-PHY 1.2, up to 5040 × 2160 @ 60 fps (or 120 Hz in VR mode) + touchscreen support DisplayPort v1.4 on USB Type-C, at 8.1 Gbps/lane, with USB3 and USB2 data concurrency	
• **Camera Interfaces**	3x 4-lane MIPI CSI camera ports + CCI I2C control	Spectra 480 ISP supporting multiple concurrent cameras 64 MP 30 fps ZSL with a dual ISP
• **Video Performance**	Decode up to 4K240/8K60, Encode up to 4K120/8K30	Concurrent 4K60 decode & 4K30 encode for wireless display
• **Audio**	Supports WCD938x high fidelity audio codec and WSA881x speaker amp on carrier board Dedicated Hexagon™ audio DSP, SoundWire, MI2S, DMIC, TDM/PCM interfaces for audio devices on carrier board	
• **High Speed Connectivity**	1x PCIe Gen3 2-lane 1x USB3.1 with support for Type-C + DisplayPort v1.4 with USB SS data concurrency, 1x USB 3.1 Type-A	
• **I/O Interfaces**	4-bit SD 3.0, UART, I2C, I3C, SPI, configurable GPIOs, sensor I/O to dedicated Hexagon™ sensor DSP	
• **Power/Battery**	Power management and battery charging solution on SOM	
• **Operating Environment**	Input voltage: 3.7V nominal Operating Temperature: -25°C to +85°C	
• **Form Factor**	50mm x 29mm with 2x 100-pin + 1x 120-pin board to board connectors	

Software:

• **Ubuntu Linux OS**	Ubuntu 18.04, kernel v4.19, Wayland/Xorg display manager, apt pkg manager, ALSA sound, GStreamer, Video4Linux (V4L2), USB UVC camera support, Docker support
• **On-device Dev Tools**	LLVM compiler, Python v2.7.5, Git, Perl, GCC, GDB
• **Artificial Intelligence**	Support for TensorFlow Lite, Qualcomm Neural Processing SDK, Computer Vision SDK, Neural Networks API
• **Robotics Specific**	Robot Operating System (ROS2) support



Companion Development Kit, display and camera accessories available separately

Purchasing Information:

• **Open-Q™ 5165RB SOM (8+128GB)**	PN: QRB5165-SOM-A
• **Open-Q™ 865 Dev Kit** (Bundle includes 5165RB SOM (8GB/128GB), camera, display and power supply)	PN: LOQ-5165-EVK

Alternate SOM configurations available by special order (minimum order quantities apply) - e.g. different memory size, etc. Contact sales to discuss your specific needs today.

Certifications

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Learn more at lantronix.com/open-q-5165rb

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