Radxa Dragon Q6A Product Brief

A High-Performance Low-Power AI SBC

Revision 1.5

2026-04-28

Radxa Computer

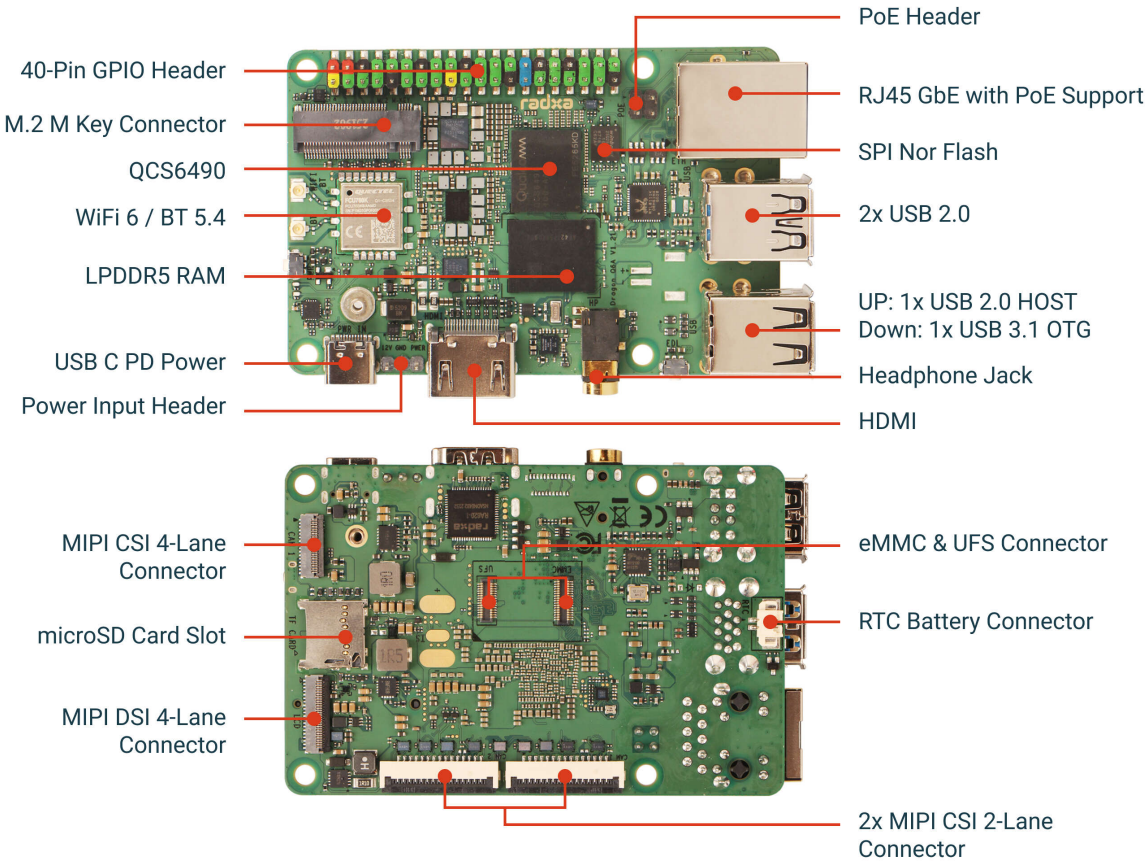
Contents

1 Revision Control Table

Version	Date	Changes from Previous Version
1.0	2025-01-06	First version
1.1	2025-04-25	Change PDF fonts to avoid CJK characters
1.2	2025-04-28	Some spec fixes
1.3	2025-09-26	Modify GPIO Alternate Functions and Power Requirements
1.4	2025-10-24	Modify Software support and HDMI resolution
1.5	2026-04-28	Add Wi-Fi frequency band details in Network section

2 Introduction

The Radxa Dragon Q6A is a high-performance, low-power embedded computing platform powered by the Qualcomm® Dragonwing™ QCS6490 processor. Designed for industrial IoT, edge AI, and smart terminals, it features advanced AI acceleration, high-speed interfaces, and comprehensive wireless capabilities. It supports multiple operating systems including embedded / desktop Linux and Windows IoT.



> **Note** The actual board layout or component locations may change over time, but the main connector types and locations will remain the same. Always refer to the latest documentation before designing accessories or enclosures.

3 Features

3.1 Hardware

- **Dragonwing QCS6490 SoC**
  - 1 × Kryo Prime @ 2.7 GHz + 3 × Kryo Gold @ 2.4 GHz + 4 × Kryo Silver @ 1.9 GHz
- **GPU: Qualcomm Adreno™ 643** supporting:
  - OpenGL® ES 3.2/2.0/1.1
  - Vulkan® 1.1/1.2/1.3
  - OpenCL™ 2.2
  - DirectX Feature Level 12
- **DSP and AI Engine**
  - Compute Qualcomm Hexagon™ DSP with dual Hexagon Vector eXtensions (HVX)
  - Additional Hexagon coprocessor 2.0 that complements the main CPU and DSP
  - Hexagon Tensor Accelerator
- **RAM: LPDDR5 RAM** 5500MT/s options:
  - 4GB
  - 6GB
  - 8GB
  - 12GB
  - 16GB
- Onboard SPI Flash for bootloader
- eMMC & UFS Module support with following options:
  - 16GB / 32GB / 64GB eMMC Module
  - 128GB / 256GB / 512GB UFS Module
- **VPU: Adreno video processing unit 633**
  - Video decode up to 4K60 for H.264/H.265/VP9
  - Video encode: Up to 4K30 for H.264/H.265
  - Video concurrency: 1080p60 decode and 1080p60 encode/ 4K30 decode + 1080p30 encode
  - HDR playback: Support for HDR10 and HDR10+
  - HFR capture: 720p at 480 fps or 1080p at 240 fps
- Display:
  - dual display up to HDMI 4K and FHD+

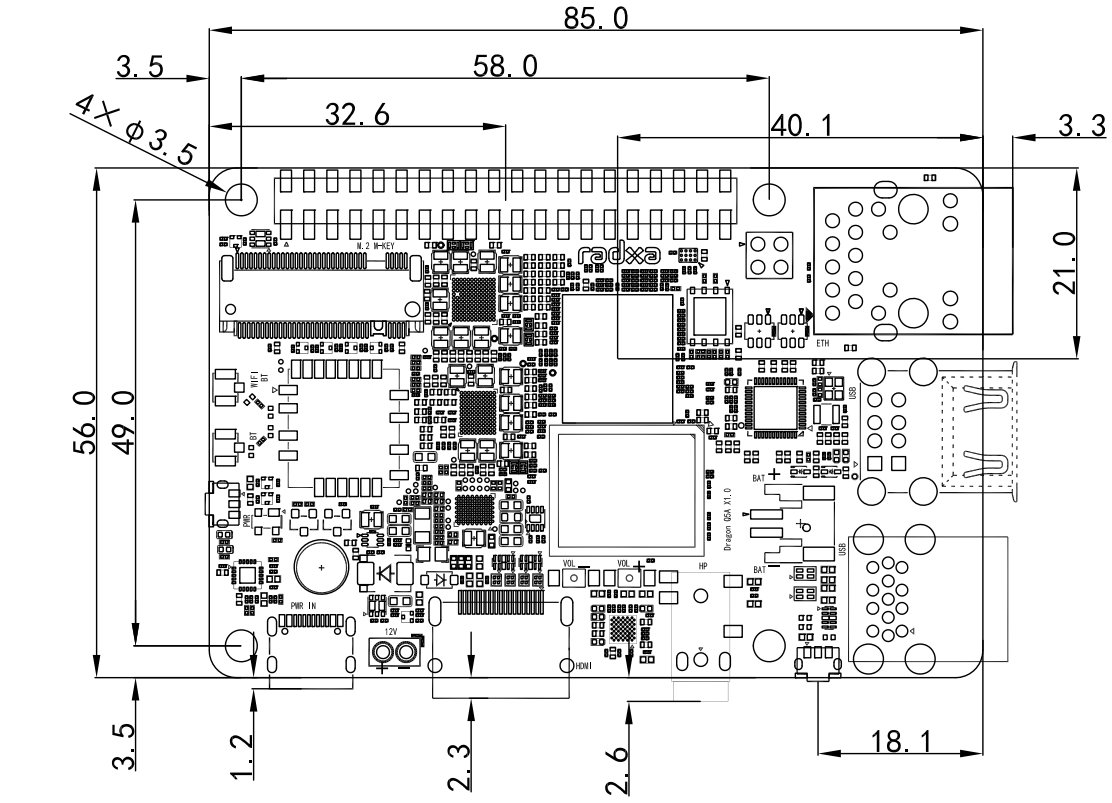
3.2 Interfaces

- **1× IEEE 802.11 a/b/g/n/ac/ax (Wi-Fi 6)** and **Bluetooth® 5.4** with BLE
- **2× External Antenna Connector**
- **1× M.2 M Key Connector** with PCIe® Gen3 (2-lane) for M.2 2230 NVMe SSD
- **1× USB 3.1 OTG** Type-A Port
- **3× USB 2.0 HOST** Type-A Port
- **1× Micro SD Card** slot
- **1× Gigabit Ethernet Port** supporting PoE (additional PoE HAT required)
- **1× HDMI® Output** Interface, supporting up to 4Kp30 resolution
- **3× Camera Interface** (1× four-lane MIPI CSI and 2× two-lane MIPI CSI)
- **1× MIPI DSI** Interface (four-lane MIPI DSI)
- 1× emergency download Button
- 1× Power Button
- 1× 3.5mm Audio Jack
- 1× eMMC & UFS Module Combo Connector
- 1× 12V External Power Connector
- 1× RTC Battery Connector
- **40-pin 0.1" (2.54mm) header** supporting:
  - UART, I2C, SPI, GPIO, PWM
  - 2 × 5V DC power in/out
  - 2 × 3.3V power out

3.3 Software

- Supports Radxa OS, Ubuntu Linux, Deepin Linux, Armbian, Arch Linux, Qualcomm Linux (Yocto-based), and Windows on Arm.
- Includes hardware access libraries for Linux and Android platforms.

4 Mechanical Specification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2.3
2.6
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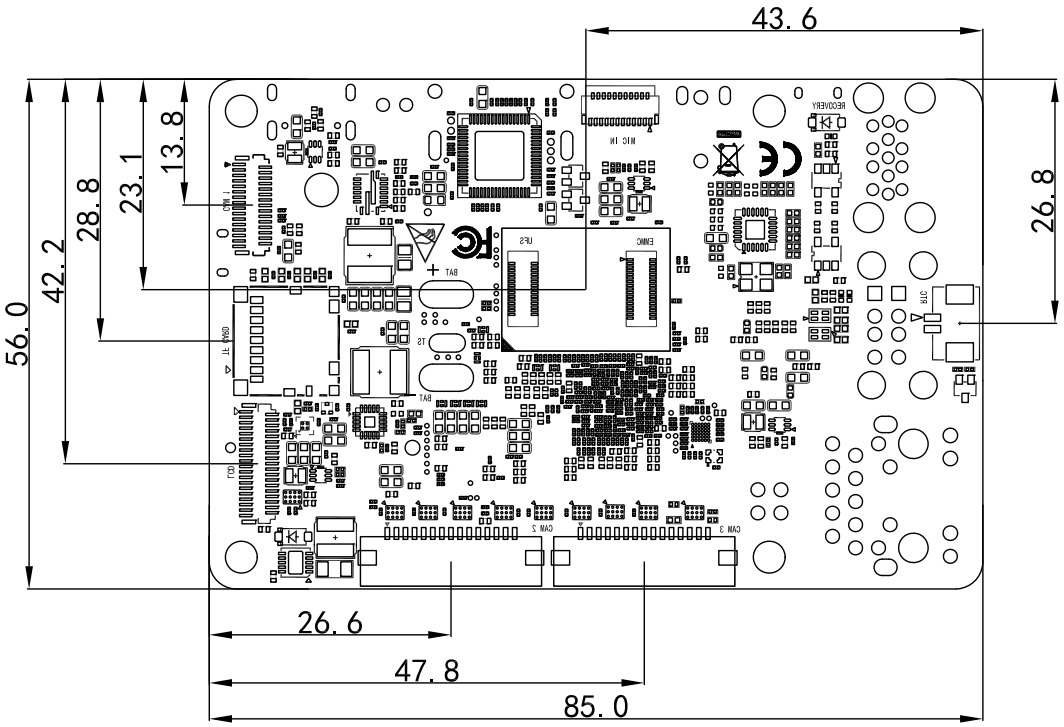
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56.0
26.8
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47.8
85.0

5 Electrical Specification

5.1 Power Requirements

The Dragon Q6A supports both fixed-voltage power adapters and USB-C PD power adapters. Typical power supply scenarios include:

- USB-C PD power supply with 12V capable or accepts 12V DC input via the USB-C port
- DC 12V Power supplied from the external 12V power connector

A minimum 18W(12V/1.5A) power source is recommended without power-consuming USB or PCIe devices, and at least 24W(12V/2A) if fully loading USB 3.1 and PCIe peripherals.

5.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
All GPIO	3.3V	3.63V

6 Peripherals

6.1 GPIO Interface

The Dragon Q6A offers a 40-pin GPIO expansion header, similar to many popular SBCs, ensuring compatibility with a wide range of accessories.

6.1.1 GPIO Alternate Functions

Pin#	FUNC1	FUNC2	FUNC3	FUNC4	FUNC5
1	3V3				
3	GPIO-24	UART6-CTS	I2C6-SDA	SPI6-MISO	QDSS-GPIO-TRACEDATA-LOCAL[10]
5	GPIO-25	UART6-RTS	I2C6-SCL	SPI6-MOSI	
7	GPIO-96	PRI-MI2S-MCL			
9	GND				
11	GPIO-29	UART7-RFR	I2C7-SCL	SPI7-MOSI	QDSS-GPIO-TRACEDATA-LOCAL[15]
13	GPIO-0	UART0-CTS	I2C0-SDA	SPI0-MISO	I3C0-SDA
15	GPIO-1	UART0-RFR	I2C0-SCL	SPI0-MOSI	I3C0-SCL
17	3.3V				
19	GPIO-49	UART12-RFR	I2C12-SCL	SPI12-MOSI	
21	GPIO-48	UART12-CTS	I2C12-SDA	SPI12-MISO	
23	GPIO-50	UART12-TX		SPI12-SCLK	SPI12-CS-3
25	GND				
27	GPIO-8	UART2-CTS	I2C2-SDA	SPI2-MISO	QDSS-GPIO-TRACEDATA-LOCAL
29	GPIO-31	UART7-RX		SPI7-CS-0	
31	GPIO-28	UART7-CTS	I2C7-SDA	SPI7-MISO	QDSS-GPIO-TRACEDATA-LOCAL
33	GPIO-56	UART14-CTS	I2C14-SDA	SPI14-MISO	
35	GPIO-100				MI2S0-WS
37	GPIO-58		UART14-TX	SPI14-SCLK	QDSS-GPIO-TRACECTL-LOCB
39	GND				

Pin#	FUNC1	FUNC2	FUNC3	FUNC4	FUNC5
2	5V				
4	5V				
6	GND				
8	GPIO-22	UART5-TX		SPI5-SCLK	QDSS-GPIO-TRACEDATA-LOCAL
10	GPIO-23	UART5-RX		SPI-5CS-0	QDSS-GPIO-TRACEDATA-LOCAL
12	GPIO-97				MI2S0-SCK
14	GND				
16	GPIO-26	UART6-TX		SPI6-SCLK	QDSS-GPIO-TRACEDATA-LOCAL
18	GPIO-27	UART6-RX		SPI6-CS-0	QDSS-GPIO-TRACEDATA-LOCAL
20	GND				
22	GPIO-57	UART14-RFR	I2C14-SCL	SPI14-MOSI	
24	GPIO-51	UART12-RX		SPI12-CS-0	
26	GPIO-55	UART13-RX		SPI13-CS-0	SPI13-CS-1
28	GPIO-9	UART2-RFR	I2C2-SCL	SPI2-MOSI	QDSS-GPIO-TRACEDATA-LOCAL
30	GND				
32	GPIO-30	UART7-TX		SPI7-SCLK	
34	GND				
36	GPIO-59	UART14-RX		SPI14-CS-0	QDSS-GPIO-TRACECLK-LOCB
38	GPIO-98			MI2S0-DATA0	
40	GPIO-99			MI2S0-DATA1	

> **Note:** Certain pin functions (SPI, I2C, UART, PWM, etc.) might be mutually exclusive depending on software Device Tree configurations. Users should verify the required pin multiplexer settings.

6.2 Network

6.2.1 Wired

Equipped with **one 10/100/1000 Mbps RJ45** connector, the Dragon Q6A offers reliable wired networking. The Gigabit Ethernet port supports **Power over Ethernet**. To use PoE,

an additional **PoE HAT** (compliant with IEEE 802.3af/at) is required.

6.2.2 Wireless

- **Wi-Fi:** IEEE 802.11 a/b/g/n/ac/ax (Wi-Fi 6)
  - 2.4 GHz: 2400–2483.5 MHz (Channels 1–13)
  - 5 GHz (UNII-1): 5180–5240 MHz (Channels 36/40/44/48)
  - 5 GHz (UNII-2): 5260–5320 MHz (Channels 52/56/60/64)
  - 5 GHz (UNII-2e): 5500–5720 MHz (Channels 100–144)
  - 5 GHz (UNII-3): 5745–5825 MHz (Channels 149/153/157/161/165)
  - **Note:** Supported channels vary by regional radio certification.
- **Bluetooth:** Bluetooth 5.4 with BLE

6.3 USB

- **1× USB 3.1 OTG** (Type-A)
- **3× USB 2.0 HOST** (Type-A)

6.4 Camera and Display Interfaces

The Dragon Q6A includes:

- **1× four-lane MIPI CSI** camera connector (capable of splitting into 2× two-lane)
- **2× two-lane MIPI CSI** camera connectors
- **1× four-lane MIPI DSI** display connector

These connectors are designed for Radxa camera and display accessories and are also compatible with many industrial cameras and displays using Radxa adapter FPC cables.

6.5 HDMI Output

An **HDMI Type-A** port (HDMI 2.0) is available, supporting resolutions up to 3840×2160 (4K@30fps) for displays. HDMI CEC is not supported.

6.6 M.2 Connector

The Dragon Q6A features an **M.2 M Key** connector on the top, supporting **PCIe Gen3 (2-lane)** for 2230 NVMe SSD modules. **M.2 SATA SSDs are not supported.**

7 Availability

Radxa guarantees availability of the **Radxa Dragon Q6A** until at least **September 2035**. However, certain component shortages or EOL announcements from third-party suppliers may affect lead times. Please check with Radxa for the latest updates.

8 Support

For support, please refer to the hardware documentation section of the Radxa Documentation Center and post questions to the Radxa Forum.

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