Radxa Cubie A7S Product Brief

Pocket-sized Power for AI

Revision 1.2

2026-02-04

Contents

1 Revision Control Table

Version	Date	Changes from previous version
1.0	2025-12-29	First version
1.1	2026-02-04	Updated hardware interface picture
1.2	2026-02-04	Updated hardware interface picture and USB-C port description

2 Introduction

Radxa Cubie A7S is a compact single-board computer based on the Allwinner A733 SoC, combining an integrated GPU and up to 3 TOPS NPU for AI and multimedia applications.

It supports up to 16GB LPDDR5 and optional onboard eMMC storage, with Gigabit Ethernet and Wi-Fi 6 / Bluetooth 5.4 connectivity.

For I/O and expansion, Cubie A7S provides USB, MIPI CSI, PCIe (via FPC), a fan header, and GPIO headers, with software support for Debian Linux and Android 13.

15-Pin GPIO Header

WiFi6 & BT 5.4 Module

Antenna Connector

FPC Connector
PCIe 3.0 x1

USB BOOT Button

30-Pin GPIO Header

Gigabit Ethernet Port

USB 2.0 Type-A

USB-C 2
USB 3.2, DP Alt Mode & OTG

USB-C 1
USB 2.0, 5V Power & OTG

Onboard eMMC

FAN Connector
microSD Card slot

Allwinner A733

MIPI CSI (4-lane)
FAN Connector
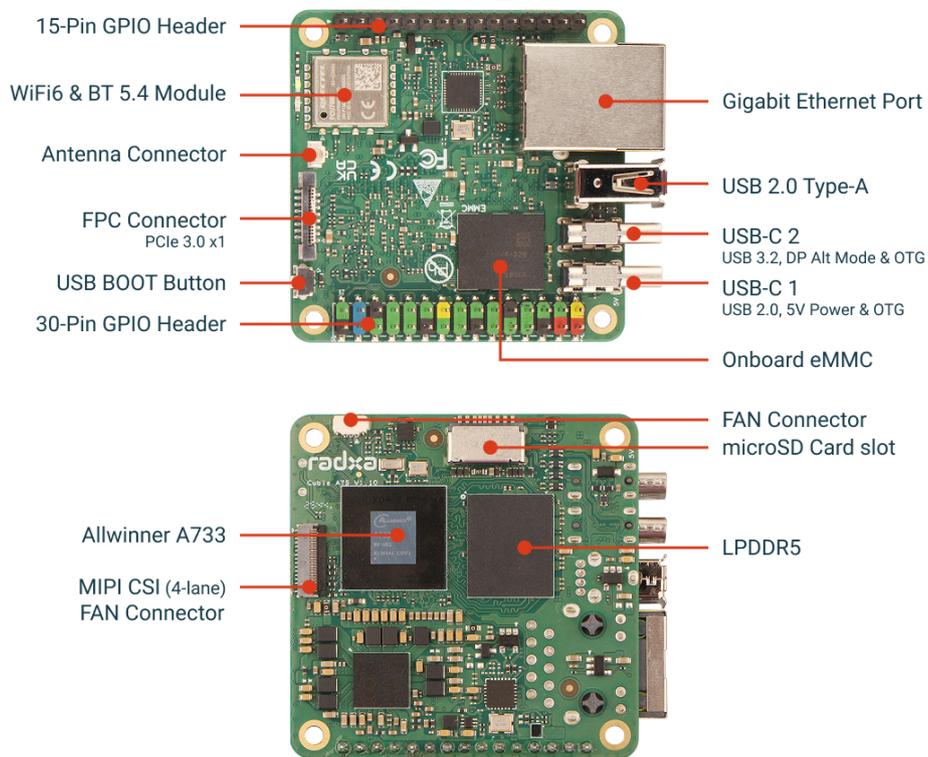
LPDDR5

3 Key Features

3.1 Hardware

- **Processor:** Allwinner A733 (Dual-core Cortex-A76 up to 2.0GHz + Hexa-core Cortex-A55 up to 1.8GHz)
- **GPU:** Imagination BXM-4-64 MC1 (supports OpenGL ES 3.2, OpenCL 3.0, Vulkan 1.3)
- **NPU:** Up to 3 TOPS AI acceleration
- **Memory:** Up to 16GB LPDDR5
- **Storage:** Optional onboard eMMC, up to 256GB
- **Wireless:** Wi-Fi 6 & Bluetooth 5.4 with external antenna
- **Display:** 4K output via USB Type-C with DisplayPort Alt Mode
- **Video Decode:** H.265 / VP9 / AVS2 (up to 8Kp24)
- **Video Encode:** H.264 / H.265 (up to 4Kp30)

3.2 Interfaces

- 1× microSD Card Slot
- 1× Gigabit Ethernet
- 1× Antenna connector for external antenna
- 1× MIPI CSI (4-lane) for camera
- 1× USB Type-C (USB 3.2, DisplayPort Alt Mode & OTG)
- 1× USB Type-C (USB 2.0, 5V Power & OTG)
- 1× USB Type-A (USB 2.0, Host)
- 1× FPC Connector (PCIe 3.0 x1)
- 1× FAN Connector
- 1× USB BOOT Button
- 1× 15-Pin GPIO Header
- 1× 30-Pin GPIO Header

3.3 Software

- **Debian Linux®** support
- **Android™ 13** support
- Hardware access/control library for Linux/Android

Combined with support for both Android 13 and Debian Linux, the Cubie A7S enables a flexible software environment for prototyping and deployment across diverse use cases.

4 Electrical Specifications

4.1 Power Requirements

Radxa Cubie A7S supports DC +5V input:

- 5V / 1A power adapter via USB Type-C power port
- 5V power supplied through GPIO pins 2 & 4

4.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
All GPIO	3.3V	3.63V

5 Peripherals

5.1 GPIO Interface

Radxa Cubie A7S provides 30-pin and 15-pin GPIO headers for expansion, compatible with a wide range of accessories.

5.1.1 GPIO Alternate Functions

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.

5.1.2 30-Pin Header Functions

Pin#	FUNC1	FUNC2	FUNC3	FUNC4	FUNC5	FUNC6	FUNC7
1	3.3V						
3	PJ23	PWM1-5	UART3-RX	UART2-CTS	TWI7-SDA	TWI3-SDA	TWI11-SDA
5	PJ22	PWM1-4	UART3-TX	UART2-RTS	TWI7-SCK	TWI3-SCK	TWI11-SCK
7	PB0	UART2-TX	UART0-TX	DSI-TRIG-LCD-TE1	LCD0-D0	JTAG-MS	PB-EINT0
9	GND						
11	PB1	UART2-RX	UART0-RX	LCD0-D1	JTAG-CK	PB-EINT1	
13	PL6	S-JTAG-DO	S-UART0-TX	S-IR-RX	S-PWM0-4	PL-EINT6	
15	PL7	S-JTAG-DI	S-UART0-RX	S-PWM0-5	PL-EINT7		
17	3.3V						
19	PD12	PD-EINT12	PWM1-2	SPI1-MOSI <DBI-SDO>	EINK-D12	DSI1-D1P	LVDS1-D1P
21	PD13	PD-EINT13	PWM1-3	SPI1-MISO <DBI-SDI/DBI-TE/DBI-DCX>	EINK-D13	DSI1-D1N	LVDS1-D1N
23	PD11	PD-EINT11	PWM1-1	SPI1-CLK <DBI-SCLK>	EINK-D11	DSI1-D0N	LVDS1-D0N
25	GND						
27	PD17	PD-EINT17	UART3-RX	TWI2-SDA	EINK-LEH	DSI1-D2N	LVDS1-CKN
29	PB2	PB-EINT2	TWI0-SCK	JTAG-DO	LCD0-D8	HDMI-SCL	UART2-RTS

Pin#	FUNC1	FUNC2	FUNC3	FUNC4	FUNC5	FUNC6	FUNC7	FUNC8
2	+5.0V							
4	+5.0V							
6	GND							
8	PB9	UART0-TX	PWM1-1	WATCHDOG-SIG	LCD0-D16	TWI8-SCK	TWI0-SCK	PB-EINT9
10	PB10	UART0-RX	PWM1-2	PLL-LOCK-DBG	LCD0-D17	TWI8-SDA	TWI0-SDA	PB-EINT10
12	PB5	PWM0-1	LCD0-D17	TRACE-DATA0	PB-EINT5			
14	GND							
16	PJ24	PWM1-6	UART4-TX	TWI4-SCK	PJ-EINT24			
18	PJ25	PWM1-7	UART4-RX	TWI4-SDA	PJ-EINT25			
20	GND							
22	PL5	S-JTAG-CK	S-PWM0-3	PL-EINT5				
24	PD10	LCD0-D14	LVDS1-D0P	DSI1-D0P	EINK-D10	SPI1-CS0<DBI-CSX>	PWM1-0	PD-EINT10
26	PD14	LCD0-D20	EINK-D14	SPI1-HOLD<DBI-DCX/DBI-WRX>	UART3-RTS	PD-EINT14		
28	PD16	LCD0-D22	LVDS1-CKP	DSI1-D2P	EINK-OEH	TWI2-SCK	UART3-TX	PD-EINT16
30	GND							

5.2 15-Pin GPIO Functions

#PIN	Function1	Function2	Function3	Function4	Function5	Function6
1	PB3	HDMI-SDA	LCD0-D9	PB-EINT3		
2	PM3	S-UART0-RX	S-UART1-RX	S-PWM0-5	PM-EINT3	
3	PM4	S-UART0-TX	S-UART1-TX	S-PWM0-0	S-IR-RX	PM-EINT4
4	GND					
5	PB6	CLK-FANOUT1	PWM0-2	PWM0-8	TRACE-DATA1	PB-EINT6
6	PB4	PWM0-0	HDMI-CEC	LCD0-D16	TRACE-CLK	PB-EINT4
7	PB8	CLK-FANOUT3	PWM1-0	OWA0-OUT	TRACE-DATA3	PB-EINT8
8	PB7	CLK-FANOUT2	PWM0-9	OWA0-IN	TRACE-DATA2	PB-EINT7
9	GND					
10	PG0	SDC1-CLK	LCD0-D0	PWM1-1	LPC-LAD0	PG-EINT0
11	PG1	SDC1-CMD	LCD0-D1	PWM1-2	LPC-LPME	PG-EINT1
12	PG2	SDC1-D0	LCD0-D8	PWM1-3	LPC-LPCPD	PG-EINT2
13	PG3	SDC1-D1	LCD0-D9	PWM1-4	LPC-LFRAME	PG-EINT3
14	PG4	SDC1-D2	LCD0-D16	PWM1-5	LPC-LSMI	PG-EINT4
15	PG5	SDC1-D3	LCD0-D17	PWM1-6	LPC-LCLK	PG-EINT5

5.3 USB

The Cubie A7S features the following USB ports:

- **1× USB Type-C** (USB 3.2, DisplayPort Alt Mode & OTG)
- **1× USB Type-C** (USB 2.0, 5V Power & OTG)
- **1× USB Type-A** (USB 2.0, Host)

5.4 Display

The Cubie A7S supports **4K display output via USB Type-C** with **DisplayPort Alt Mode**.

5.5 Camera

The Cubie A7S includes one four-lane MIPI CSI camera connector, designed for Radxa camera accessories and compatible with many industrial cameras using Radxa adapter FPC cables.

5.6 FPC Connector

The Cubie A7S offers a FPC connector providing PCIe 3.0 one-lane signal, supporting expansion of NVMe SSD and other PCIe devices. This requires an additional expansion board / HAT.

5.7 FAN Connector

The Cubie A7S includes a FAN connector for cooling solutions, supporting 3-pin fans for thermal management under heavy workloads or high-temperature environments.

6 Mechanical Specification

- Unit: millimeters (mm)
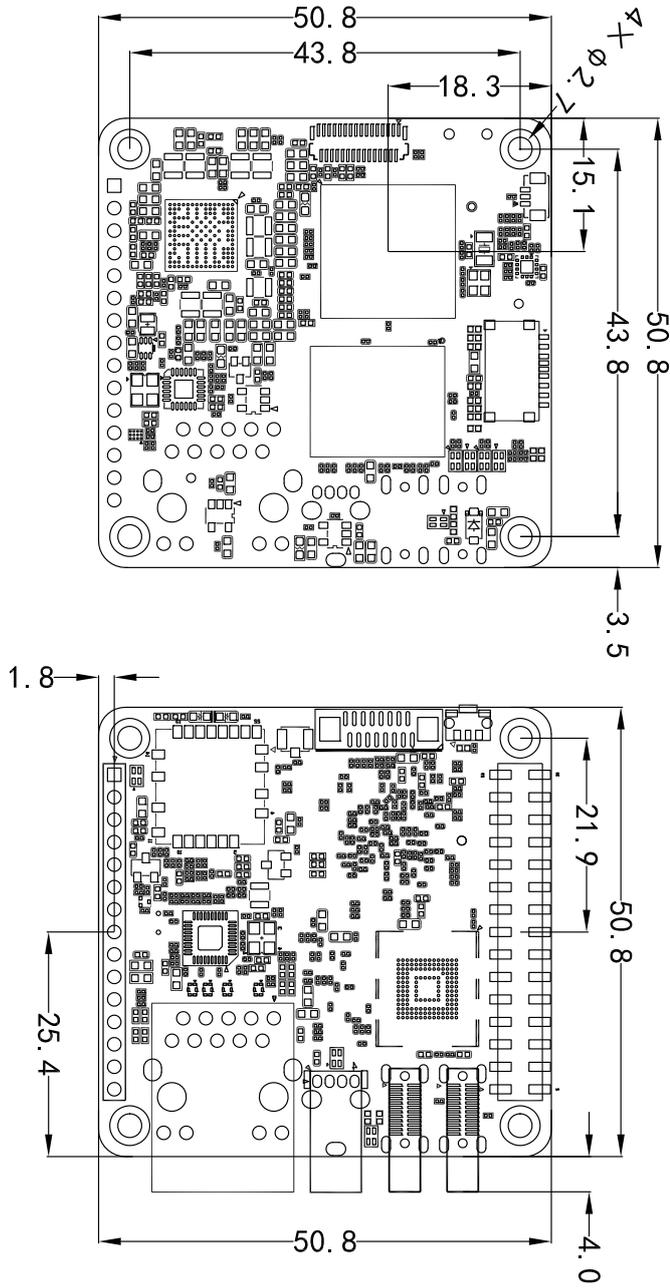
7 Models and SKUs

Refer to the Radxa online store and distributor listings for the latest models and SKUs.

8 Availability

Radxa guarantees availability of the Radxa Cubie A7S until at least December 2030.

9 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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