
Radxa Cubie A5E Product Brief

A Tiny, Portable and Powerful 4K SBC

Revision 1.1

2025-01-13



Radxa Computer



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1 Revision Control Table

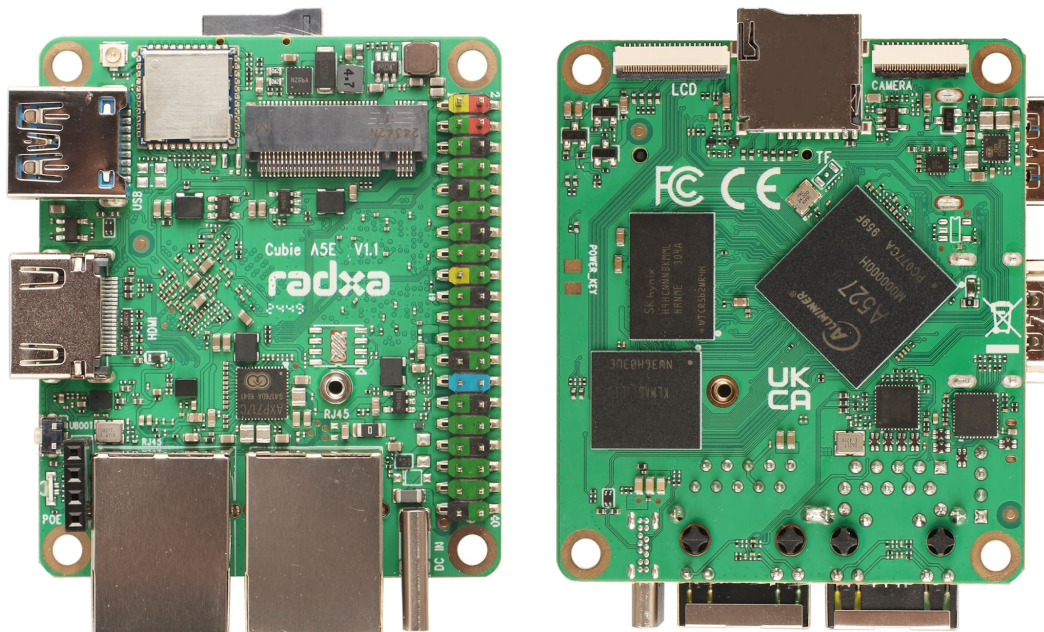
Version	Date	Changes from previous version
1.0	2025/01/06	First version
1.1	2025/01/09	- Added trademark and usage disclaimers - Included notes on PoE, PCIe/USB3.0 multiplexing - Minor edits for clarity

2 Introduction

The **Radxa Cubie A5E** represents a tiny and compact Single Board Computer (SBC) built upon two versatile SoCs: the Allwinner A527 and the industrial-grade T527 (which also supports an NPU). This combination provides outstanding performance and flexibility, ideally suited for makers, IoT enthusiasts, hobbyists, gamers, and PC users. With multiple **LPDDR4x RAM** options, the Cubie A5E builds a reliable and high-performance platform that can be deployed in various application scenarios.

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 manufacturing accessories or enclosures.



3 Features

3.1 Hardware

- **Allwinner A527 / T527 SoC**
- **Quad-core ARM® Cortex®-A55** at 1.8GHz and Quad-core ARM Cortex-A55 at 1.4GHz
- **RISC-V CPU**, up to 200MHz
- **NPU** computing power up to 2TOPS (T527 SoC; theoretical peak performance)
- **ARM Mali™ G57 MC1 GPU** supporting:
 - OpenGL® ES 3.2/2.0/1.1
 - Vulkan® 1.1/1.2/1.3
 - OpenCL™ 2.2
- **LPDDR4x RAM** options:
 - 1GB
 - 2GB
 - 4GB
- Onboard SPI Flash for bootloader
- Onboard eMMC options:
 - 8GB
 - 16GB
 - 32GB
- H.265MP/VP9 multivideo decoder up to 4K@60fps
- H.264BL/MP/HP multivideo decoder up to 4K@60fps
- H.264BP/MP/HP multivideo encoder up to 4K@25fps
- MJPEG encoder up to 4K@15fps, JPEG encoder up to 8K × 8K resolution
- Supports AES/DES/3DES/SM4 encryption and decryption algorithms

3.2 Interfaces

- **1× IEEE 802.11 a/b/g/n/ac/ax (Wi-Fi 6)** and **Bluetooth® 5.4** with BLE
- **1× External Antenna Connector**
- **1× M.2 M Key Connector** with PCIe® 2.1 (1-lane) for M.2 2230 NVMe SSD
 - > *Note:* M.2 SATA SSDs are **not** supported.
- **1× USB 3.0 HOST** Type-A Port
 - > *Note:* USB 3.0 HOST and PCIe 2.1 share some hardware resources; software-driven

multiplexing is required.

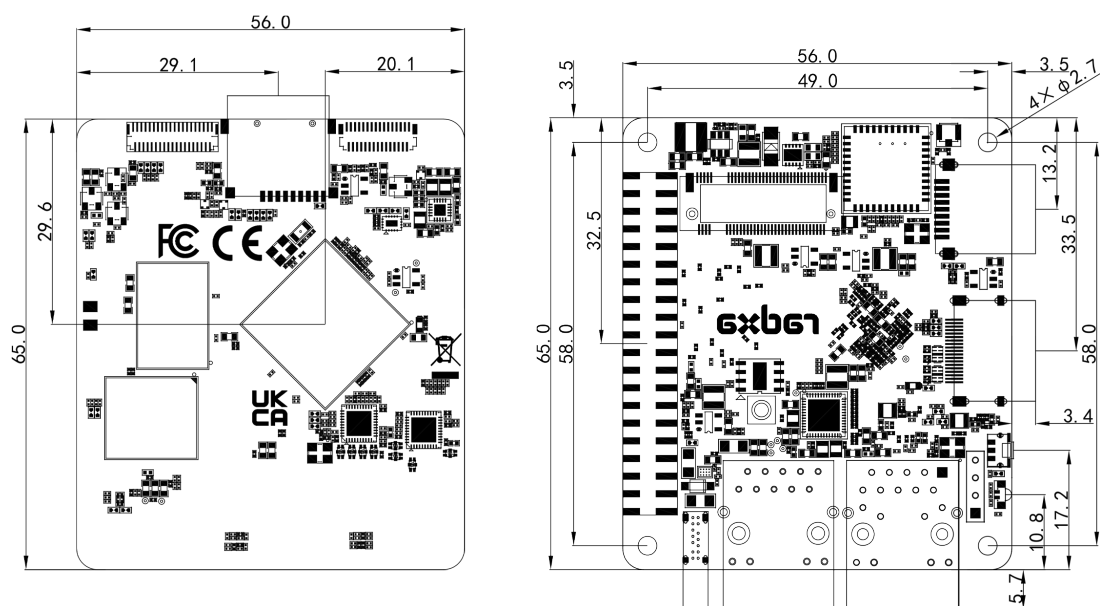
- **1× USB 2.0 OTG / HOST** Type-C® Port for Data and Power
- **1× Micro SD Card** slot
- **2× Gigabit Ethernet Ports**, one supporting PoE (additional PoE HAT required)
- **1× HDMI® Output** Interface, supporting up to 4Kp60 resolution
- **1× Camera Interface** (1× four-lane MIPI CSI or 2× two-lane MIPI CSI)
- **1× MIPI DSI** Interface (four-lane MIPI DSI)
- **1× Power Button**
- **1× Maskrom Button**
- **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

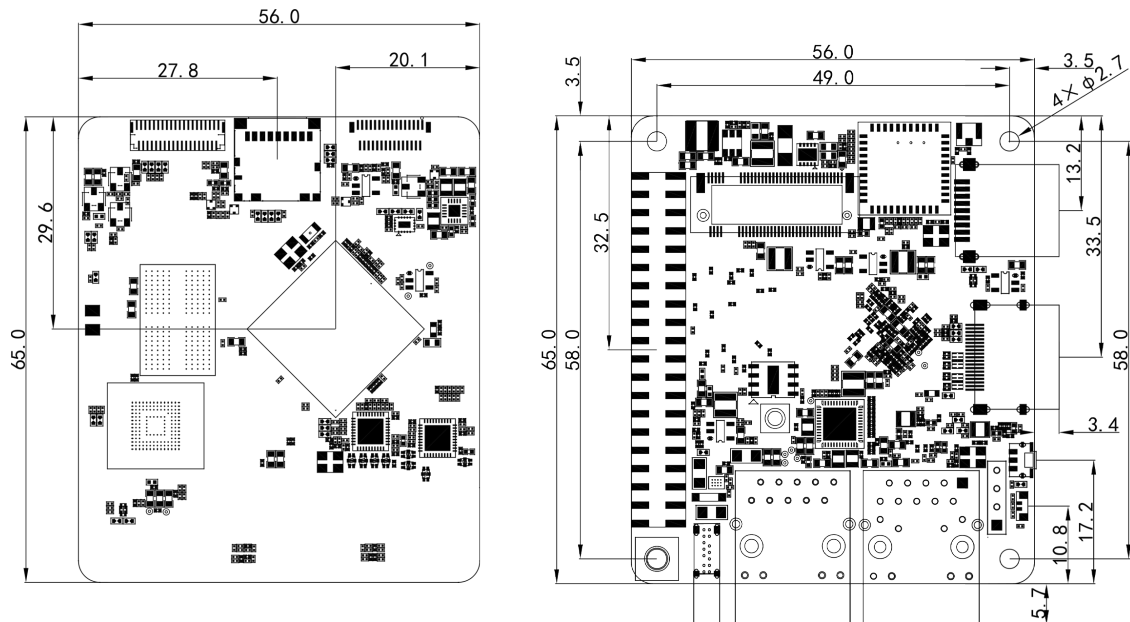
- **Debian Linux®** support
- **Android™ 13** support
 - > *Note:* Android 13 support requires the official BSP or vendor-provided SDK. Actual feature set may depend on further validation and licensing.
- Hardware access/control library for Linux/Android

4 Mechanical Specification

4.1 V1.1



4.2 V1.2

**Note:**

The V1.1 and V1.2 board dimensions may vary slightly, but major connectors remain in consistent locations. For final mechanical design (e.g., enclosures), please verify with the latest production files.

5 Electrical Specification

5.1 Power Requirements

The Cubie A5E supports both a fixed-voltage power adapter and a smart power adapter. Typical scenarios:

- **5V Power** supplied via USB Type-C port
- **5V Power** supplied to the GPIO pin (Pins 2 & 4)

A minimum 10W power source is recommended without power-consuming USB or PCIe devices, and at least 15W if fully loading USB 3.0 and PCIe 2.1 peripherals.

5.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
All GPIO	3.3V	3.63V

6 Peripherals

6.1 GPIO Interface

The Cubie A5E 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#	Function1	Function2	Function3	Function4	Function5	Function6	Function7	GPIO number
1	+3.3V							
2	+5.0V							
3	PB5	TWI1-SDA	I2S0-BCLK	TRACE-CLK	PWM0-9	HDMI-SDA	PB-EINT5	37
4	+5.0V							
5	PB4	TWI1-SCK	I2S0-MCLK	TRACE-DATA2	PWM0-8	HDMI-SCL	PB-EINT4	36
6	GND							
7	PI7	UART6-RX	UART4-CTS	PWM0-8	SPI2-CLK	PI-EINT7		263
8	PB9	UART0-TX	TWIO-SCK	TRACE-DATA1	I2S0-DIN2	I2S0-DOUBT2	PB-EINT9	41
9	GND							
10	PB10	UART0-RX	TWIO-SDA	PWM0-1	I2S0-DIN3	I2S0-DOUBT3	PB-EINT10	42
11	PI9	TWI5-SDA	DMIC-DATA2	PWM0-10	PI-EINT9			265
12	PI2	UART5-TX	SPI1-CSO	PWM0-3	I2S2-BCLK	I2S2-BCLK	PI-EINT2	258
13	PI10	OWA-OUT	DMIC-DATA1	PWM0-11	I2S2-MCLK	PI-EINT10		266
14	GND							
15	PL12	S-TWI2-SCK	MCU-PWM0-6	S-UART0-TX	DMIC-DATA2	S-SPI0-MOSI	S-PL-EINT12	12
16	PI11	UART3-TX	DMIC-DATA0	PWM0-12	PI-EINT11			267
17	+3.3V							
18	PI14	UART6-RTS	DMIC-CLK	PWM0-15	PI-EINT14			270
19	PB13	TWI4-SCK	UART7-TX	PWM0-4	PI-EINT13			45
20	GND							
21	PB14	TWI4-SDA	UART7-RX	SPI1-MOSI	PWM0-5	SPI1-MISO	PB-EINT14	46
22	PL13	S-TWI2-SDA	MCU-PWM0-7	S-UART0-RX	DMIC-DATA3	S-SPI-MISO	S-PL-EINT13	13
23	PB12	TWI5-SDA	UART7-CTS	SPI1-CLK	PWM0-3	PB-EINT12		44
24	PB11	TWI5-SCK	UART7-RTS	PWM0-2	SPI1-CSO	PB-EINT11		43
25	GND							
26	PI0	TWI4-SCK	UART4-TX	PWM0-1	I2S2-DIN3	I2S2-DOUBT3	PI-EINT0	256

PIN#	Function1	Function2	Function3	Function4	Function5	Function6	Function7	GPIO number
27	PI16	UART3-CTS	TWI2-SDA	PWM1-1	PI-EINT16			272
28	PI15	TWI2-SCK	UART3-RTS	PWM1-0	USB2-DM	PI-EINT15		271
29	PI8	TWI5-SCK	IR-RX	PWM0-9	SPI2-MOSI	PI-EINT8		264
30	GND							
31	PI12	UART3-RX	PWM0-13	SPI2-MISO	PI-EINT12			268
32	PI1	TWI4-SDA	UART4-RX	PWM0-2	I2S2-DIN2	I2S2-DOUBT2	PI-EINT1	257
33	PI6	UART4-RTS	UART6-TX	PWM0-7	SPI2-CSO	PI-EINT6		262
34	GND							
35	PI13	UART6-CTS	DMIC-DATA3	PWM0-14	I2S2-MCLK	PI-EINT13		269
36	PI3		UART5-RX	PWM0-4	I2S2-LRCK	SPI1-CLK	PI-EINT3	259
37	GPADC2							
38	PI5	UART5-CTS	SPI1-MISO	PWM0-6	I2S2-DINO	I2S2-DOUBT1	PI-EINT5	261
39	GND							
40	PI4	UART5-RTS	SPI1-MOSI	PWM0-5	I2S2-DOUBT0	I2S2-DIN1	PI-EINT4	260

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

Equipped with **two 10/100/1000 Mbps RJ45** connectors, the Cubie A5E offers reliable wired networking. One of the Gigabit ports (the one nearest the PoE header) supports **Power over Ethernet**. To use PoE, an additional **PoE HAT** (compliant with IEEE 802.3af/at) is required.

6.3 USB

- **1× USB 3.0 HOST** (Type-A)
- **1× USB 2.0 OTG/HOST** (Type-C for Data/Power)

Note:

USB 3.0 HOST and PCIe 2.1 share some internal SoC resources; a software switch or reboot may be required to toggle between USB 3.0 and PCIe functionality.

6.4 Camera and Display Interfaces

The Cubie A5E includes:

- **One four-lane MIPI CSI** camera connector (capable of splitting into 2× two-lane)
- **One 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@60fps) for 2D displays and 4K@30fps for 3D displays. This port also supports CEC and HDCP 1.4. Actual HDCP usage may require appropriate licensing and firmware support.

6.6 M.2 Connector

The Cubie A5E features an **M.2 M Key** connector on the front, supporting **PCIe 2.1 (1-lane)** for 2230 NVMe SSD modules. **M.2 SATA SSDs are not supported.**

7 Order Info and SKU

Radxa provides multiple customization options to meet diverse user needs. Below is an example SKU format:

RS500-D1E0J0R38S16

SKU Code Explanation:

D	DRAM	D1	1GB RAM
		D2	2GB RAM
		D4	4GB RAM
E	eMMC	E0	eMMC chip not soldered
		E8	8GB eMMC
		E16	16GB eMMC
		E32	32GB eMMC
J	Industrial Grade	J0	Commercial Grade (0 °C ~ 60 °C)
		J1	Industrial Grade (-40 °C ~ 85 °C)
R	SoC	R38	A527 SoC
		R41	T527 SoC
S	SPI Flash	S0	No SPI Flash
		S16	16MB SPI Flash

Note:

Some customization options may have Minimum Order Quantity (MOQ) requirements. For details on pricing, availability, and lead times, please contact Radxa directly.

8 Availability

Radxa guarantees availability of the **Radxa Cubie A5E** until at least **September 2032**. However, certain component shortages or EOL announcements from third-party suppliers may affect lead times. Please check with Radxa for the latest updates.

9 Support

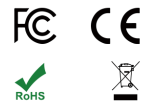
For support, please refer to:

- The hardware documentation section of the [Radxa Website](#)
- [Radxa forum](#) for community discussions and official Q&A

9.1 Trademark Acknowledgments

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