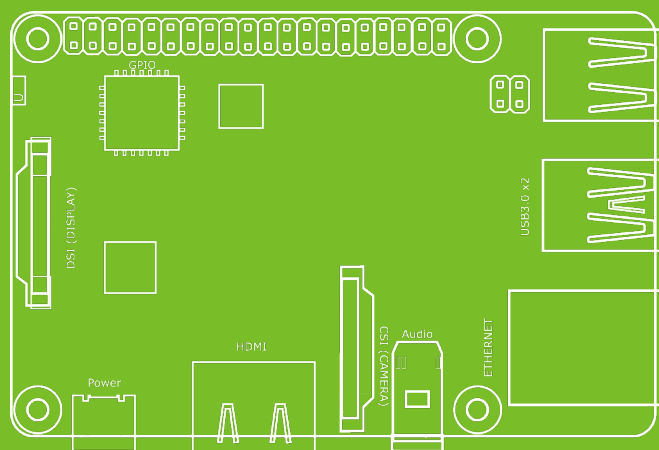

ROCK Pi 4 SE Product Brief

Single Board Computer

Revision 1.2



ROCKPi Trading Limited

2022-03-29

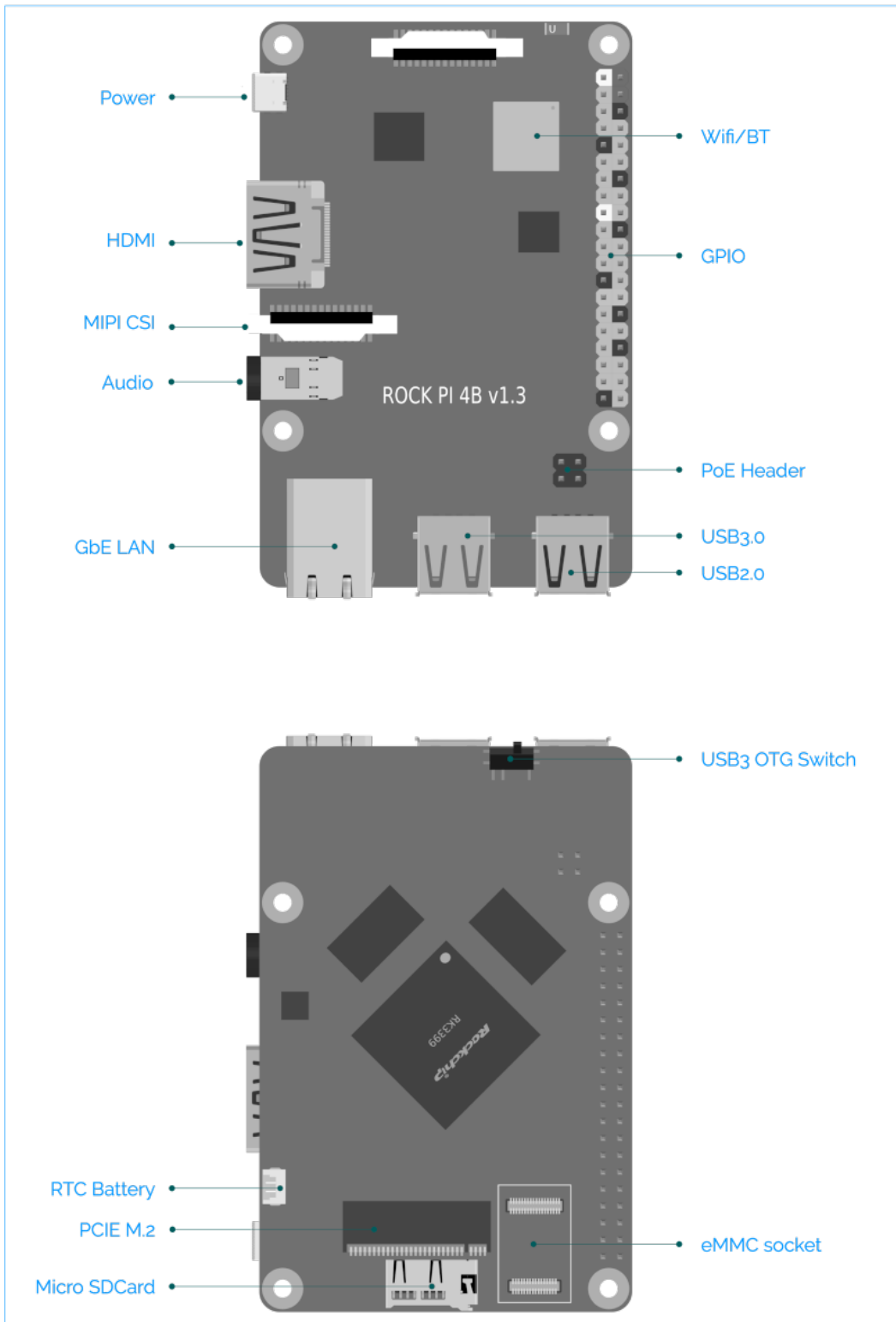
Contents

1	Introduction	2
2	Features	4
2.1	Hardware	4
2.2	Interfaces	4
2.3	Software	5
3	Mechanical Specification	5
4	Electrical Specification	5
4.1	Power Requirements	5
4.2	GPIO Voltage	6
5	Peripherals	6
5.1	GPIO Interface	6
5.1.1	GPIO Alternate Functions	6
5.2	eMMC Socket	7
5.3	Camera and Display Interfaces	7
5.4	USB	7
5.5	HDMI	7
5.6	Audio Jack	8
5.7	Temperature Range and Thermals	8
6	Availability	8
7	Support	8

1 Introduction

ROCK Pi 4B SE is a Single Board Computer (SBC) in an ultra-small form factor that offers class-leading performance while leveraging outstanding mechanical compatibility. The ROCK Pi 4B SE offers makers, IoT enthusiasts, hobbyists, PC DIY enthusiasts and others a reliable and extremely capable platform for building and tinkering their ideas into reality.

ROCK Pi 4B SE offers only 4GB LPDDR4 ram options.



2 Features

2.1 Hardware

- RK3399-T, Dual Cortex-A72, frequency 1.5Ghz with quad Cortex-A53, frequency 1.0Ghz
- Mali T860MP4 gpu, supports OpenGL ES 1.1 /2.0 /3.0 /3.1 /3.2, Vulkan 1.0, Open CL 1.1 1.2, DX11.
- 1GB/2GB/4GB 64bits LPDDR4
- Dual display via HDMI/MIPI DSI
- H.265/VP9 (HEVC) hardware decode (up to 4Kp60)
- H.264 hardware decode (up to 1080p60)
- Support dual display with HDMI and MIPI DSI, mirror or extend mode

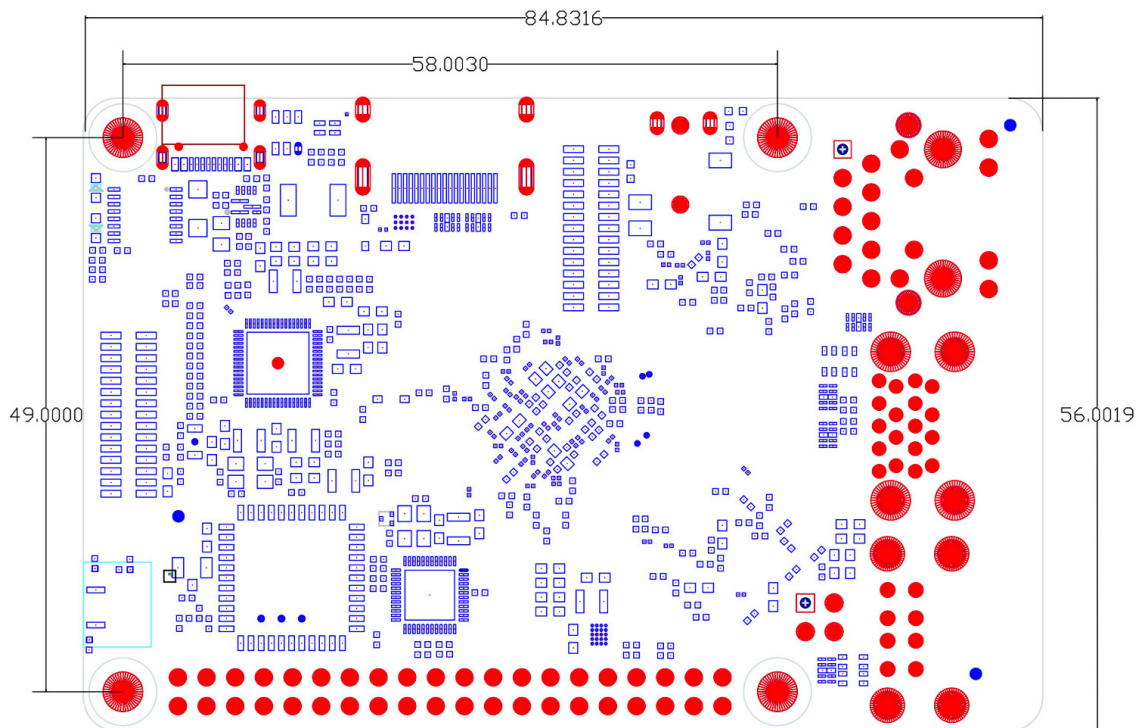
2.2 Interfaces

- 802.11 b/g/n/ac Wireless LAN
- Bluetooth 5.0 with BLE
- 1x SD Card
- 1x HDMI port supporting displays up to 4Kp60 resolution
- 2x USB2 HOST ports
- 1x USB3 HOST port, 1x USB3 OTG port
- 1x Gigabit Ethernet port (supports PoE with add-on PoE HAT)
- 1x camera port (2-lane MIPI CSI)
- 1x display port (2-lane MIPI DSI)
- 40x user GPIO supporting various interface options:
 - 1 x UART
 - 2 x SPI bus
 - 2 x I2C bus
 - 1 x PCM/I2S
 - 1 x SPDIF
 - 1 x PWM
 - 1 x ADC
 - 6 x GPIO
 - 2 x 5V DC power in
 - 2 x 3.3V power pin

2.3 Software

- ARMv8 Instruction Set
- Debian/Ubuntu Linux support
- Android 7.1/Android 9.0/Android 10/Android 11 support
- GPU enabled AI stack such as Caffe
- Hardware access/control library for Linux/Android

3 Mechanical Specification



4 Electrical Specification

4.1 Power Requirements

The ROCK Pi 4B SE supports various way of powering, smart power adapter as well as fixed voltage:

- USB PD 2.0 Support USB Type C PD 2.0, 9V/2A, 12V/2A, 15V/2A, 20V/2A

- Qualcomm® Quick Charge™ 2.0 Support QC3.0/2.0 adapter, 9V/2A, 12V/1.5A
- Power adapter with fixed voltage from 6V to 24V on the USB C power port
- 5V Power from the GPIO PIN 2 & 4

4.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
GPIO3_C0	3.3V	3.465V
ADC_IN0	1.8V	1.98V
Other GPIO	3.0V	3.14V

5 Peripherals

5.1 GPIO Interface

ROCK Pi 4B SE offers 40P GPIO expansion which is compatible with most accessories on the market.

5.1.1 GPIO Alternate Functions

Function2	Function1	GPIO	Pin#	Pin#	GPIO	Function1	Function2
	+3.3V		1	2		+5.0V	
	I2C7_SDA	GPIO2_A7	3	4		+5.0V	
	I2C7_SCL	GPIO2_B0	5	6		GND	
	SPI2_CLK	GPIO2_B3	7	8	GPIO4_C4	UART2_TXD	
	GND		9	10	GPIO4_C3	UART2_RXD	
	PWM0	GPIO4_C2	11	12	GPIO4_A3	I2S1_SCLK	
	PWM1	GPIO4_C6	13	14		GND	
	SPDIF_TX	GPIO4_C5	15	16	GPIO4_D2		
	+3.3V		17	18	GPIO4_D4		
UART4_TXD	SPI1_TXD	GPIO1_B0	19	20		GND	

Function2	Function1	GPIO	Pin#	Pin#	GPIO	Function1	Function2
UART4_RXD	SPI1_RXD	GPIO1_A7	21	22	GPIO4_D5		
	SPI1_CLK	GPIO1_B1	23	24	GPIO1_B2	SPI1_CS _n	
	GND		25	26		ADC_IN0	
	I2C2_SDA	GPIO2_A0	27	28	GPIO2_A1	I2C2_CLK	
I2C6_SCL	SPI2_TXD	GPIO2_B2	29	30		GND	
I2C6_SDA	SPI2_RXD	GPIO2_B1	31	32	GPIO3_C0	SPDIF_TX	UART3_CTS _n
	SPI2_CS _n	GPIO2_B4	33	34		GND	
	I2S1_LRCK_TX	GPIO4_A5	35	36	GPIO4_A4	I2S1_LRCK_RX	
		GPIO4_D6	37	38	GPIO4_A6	I2S1_SDI	
	GND		39	40	GPIO4_A7	I2S1_SDO	

5.2 eMMC Socket

ROCK Pi 4B SE offers a high speed eMMC socket for eMMC modules as OS and data storage. The eMMC socket is compatible with industrial common used pinout and form factor.

5.3 Camera and Display Interfaces

The ROCK Pi 4B SE has 1x 2-lane MIPI CSI Camera and 1x 2-lane MIPI DSI Display connector. These connectors are backwards compatible with other industrial common used camera and display peripherals.

5.4 USB

The ROCK Pi 4B SE has 2x USB2 HOST, 1x USB3 HOST and 1x USB3 OTG type-A sockets. Downstream USB current is limited to approximately 2.8A in aggregate over the four sockets.

A hardware switch is available for upper USB3 HOST/Device status change.

5.5 HDMI

The ROCK Pi 4B SE has 1x HDMI port, which support CEC and HDMI 2.0 with resolutions up to 4Kp60.

5.6 Audio Jack

The ROCK Pi 4B SE supports near-CD-quality analogue audio output via a 4-ring 3.5mm headphone jack.

The analog audio output can drive 32 Ohm headphones directly.

5.7 Temperature Range and Thermals

The recommended ambient operating temperature range is 0 to 50 degrees Celcius.

To reduce thermal output when idling or under light load, the ROCK Pi 4B SE reduces the CPU clock speed and voltage. During heavier load the speed and voltage (and hence thermal output) are increased. The internal governor will throttle back both the CPU speed and voltage to make sure the CPU temperature never exceeds 85 degrees C.

The ROCK Pi 4B SE will operate perfectly well without any extra cooling and is designed for sprint performance - expecting a light use case on average and ramping up the CPU speed when needed (e.g. when loading a webpage). If a user wishes to load the system continually or operate it at a high temperature at full performance, further cooling may be needed.

6 Availability

ROCK Pi guarantee availability ROCK Pi 4B SE until at least September 2029.

7 Support

For support please see the hardware documentation section of the [Radxa Wiki](#) website and post questions to the [Radxa forum](#).