

---

# Radxa ROCK 2F Product Brief

A Smart Multimedia SBC

Revision 1.0

2024-07-15



## Contents

- 1 Revision Control Table 2
- 2 Introduction 3
- 3 Features 3
  - 3.1 Hardware . . . . . 3
  - 3.2 Interface . . . . . 4
  - 3.3 Software . . . . . 4
- 4 Mechanical Specification 5
- 5 Electrical Specification 5
  - 5.1 Power Requirements . . . . . 5
  - 5.2 GPIO Voltage . . . . . 6
- 6 Operating Conditions 6
- 7 Peripherals 6
  - 7.1 GPIO Interface . . . . . 6
    - 7.1.1 GPIO Alternate Functions . . . . . 7
  - 7.2 USB . . . . . 7
  - 7.3 HDMI Output . . . . . 7
  - 7.4 AV Out . . . . . 7
  - 7.5 FPC Connector . . . . . 8
- 8 Availability 8
- 9 Support 8

# 1 Revision Control Table

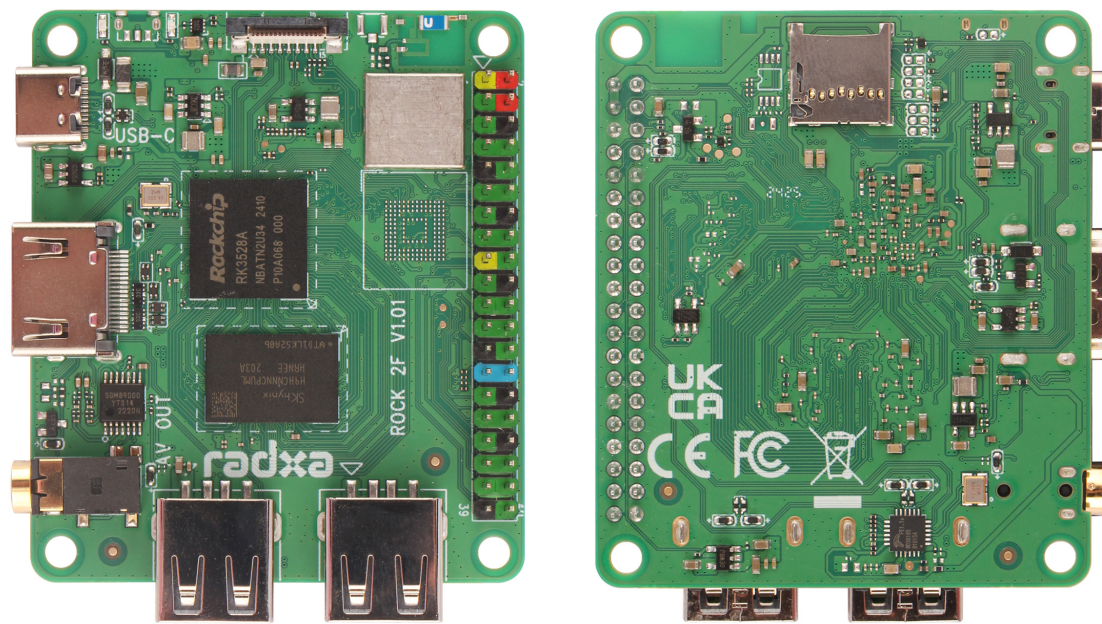
---

Version	Date	Changes from previous version
1.0	2024/07/15	First version

---

## 2 Introduction

ROCK 2F is a powerful and versatile single board computer (SBC). It offers exceptional performance and flexibility, making it suitable for various projects and applications. Whether you're a maker, IoT enthusiast, hobbyist, or PC user, ROCK 2F has you covered. With its compact form factor and high-performance processor, it excels at handling a wide range of tasks and delivers outstanding performance and reliability for your projects.



*Note:* The actual board layout or components location may change during the time but the main connectors type and location will remain the same

## 3 Features

### 3.1 Hardware

- Rockchip RK3528A SoC
- Quad-core ARM Cortex-A53

- ARM Mali-450 GPU:
  - OpenGL<sup>®</sup> ES1.1, ES2.0
  - OpenVG<sup>®</sup> 1.1
- LPDDR4 RAM options:
  - 1GB
  - 2GB
  - 4GB
- Onboard eMMC
- H.264, H.265 and AVS2 decoder by 4Kx2K@60fps
- H.264 and H.265 encoder by 1920x1080@60fps

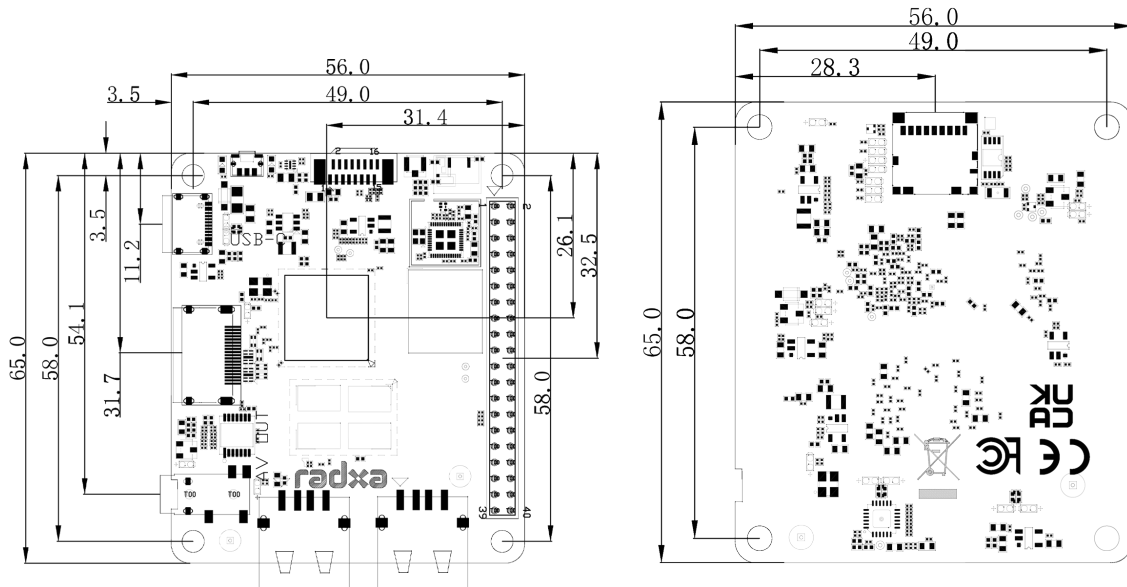
### 3.2 Interface

- IEEE 802.11 a/b/g/n/ac/ax (WiFi 6) and BT 5.4 with BLE
- Onboard Antenna or External Antenna Connector Optional
- 1x microSD Card Slot
- 1x AV Out supporting video output up to 720x576@60Hz
- 1x HDMI 2.0 supporting up to 4Kp60
- 2x USB 2.0 Type-A HOST ports
- 1x USB 2.0 Type-A OTG / HOST port for data and power
- 1x FPC Connector with PCIe 2.0 1-lane
- 40-Pin 0.1” (2.54mm) header supporting a wide range of interface options:
  - 2 x I2C
  - 4 x UART
  - 1 x SPI
  - 5 x PWM
  - 1 x ADC
  - 2 x 5V DC power in/out
  - 2 x 3.3V power out

### 3.3 Software

- ArmV8 Instruction Set
- Debian/Ubuntu Linux support
- Hardware access/control library for Linux/Android

## 4 Mechanical Specification



## 5 Electrical Specification

### 5.1 Power Requirements

The ROCK 2F supports various power supply technologies including smart power adapter as well as fixed voltage:

- Power adapter with fixed voltage in 5V range on the USB Type-C port
- 5V Power applied to the GPIO PIN 2 & 4

The recommended power source should be able to produce, at least, 10W with full USB ports and PCIe 2.1 load.

## 5.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
All GPIO	3.3V	3.63V
SARADC_IN5	3.3V	3.3V

## 6 Operating Conditions

The ROCK 2F has been designed to operate between 0°C to 50°C.

This temperature range was defined based on typical usage where the efficient use of Arm big.LITTLE technology can automatically select which processor core to utilise for a given task, the result of which is minimal heat generation and responsive user experience.

The ROCK 2F is built on a high-performance mobile chipset which is designed to operate for extended durations on batteries with efficiency at its core. As with all electronic devices heat is a by-product of operation which increases with performance and workload; during basic use cases such as web browsing, editing text or listening to music the SoC will automatically select the smallest processors available or dedicated hardware accelerators to reduce heat generation thus reserving the higher performance processors and thermal window for demanding tasks as and when required.

The SoC (RK3528A) is specified to limit its maximum internal temperature to 80°C before throttling the clock speeds to maintain reliability within the allowed temperature range. If the ROCK 2F is intended to be used continuously in high performance applications, it may be necessary to use external cooling methods (for example, heat sink, fan, etc.) which will allow the SoC to continue running at maximum clock speed indefinitely below its predefined 80°C peak temperature limiter.

## 7 Peripherals

### 7.1 GPIO Interface

The ROCK 2F offers a 40 pin GPIO expansion header which provides extensive compatibility with a wide range of accessories developed for the SBC market.

### 7.1.1 GPIO Alternate Functions

GPIO number	Function4	Function3	Function2	Function1	PIN#	PIN#	Function1	Function2	Function3	Function4	GPIO number
				+3.3V	1	2	+5.0V				
128		I2C0_SDA_M1	SPIDIF_TX_M0	GPIO4_A0	3	4	+5.0V				
129			I2C0_SCL_M1	GPIO4_A1	5	6	GND				
134		UART1_TX_M0	I2S1_LRCK	GPIO4_A6	7	8	GPIO4_D0	UART0_TX_M0			152
				GND	9	10	GPIO4_C7	UART0_RX_M0			151
143		PWM4_M0	UART3_RX_M1	GPIO4_B7	11	12	GPIO1_B5	I2S0_SCLK_M1			45
144		PWM5_M0	UART3_TX_M1	GPIO4_C0	13	14	GND				
150	PWM3_M0	UART1_RX_M1	I2C1_SDA_M1	GPIO4_C6	15	16	GPIO4_B0	I2S1_SDO1	UART3_RX_M0		136
				+3.3V	17	18	GPIO4_B1	I2S1_SDO2	PDM_SDI1	UART3_TX_M0	137
138	SPI0_MOSI	PDM_SDI0	I2S1_SDO3	GPIO4_B2	19	20	GND				
139	SPI0_MISO	PDM_SDI2	I2S1_SDI1	GPIO4_B3	21	22	GPIO1_B2	UART2_RTSN_M1	I2C5_SCL_M0	UART7_TX_M1	142
140		SPI0_CLK	I2S1_SDI0	GPIO4_B4	23	24	GPIO4_B6	SPI0_CSNO			142
				GND	25	26	GPIO4_C1	PDM_SDI3	SPI0_CSNI	PWM6_M0	145
130	I2C1_SDA_M0	UART3_RTSN	I2S1_SDI3	GPIO4_A2	27	28	GPIO4_A3	I2S1_SDI2	UART3_CTSN	I2C1_SCL_M0	131
141			PDM_CLK0	GPIO4_B5	29	30	GND				
40		UART7_CTSN_M1	UART2_RX_M1	GPIO1_B0	31	32	GPIO4_C3	I2C0_SDA_M0	PWM0_M0		147
41		UART7_RTSN_M1	UART2_TX_M1	GPIO1_B1	33	34	GND				
46		SPI1_CLK	I2S0_LRCK_M1	GPIO1_B6	35	36	GPIO1_B4	I2S0_MCLK_M1			44
				SARADC_IN3	37	38	GPIO1_B7	I2S0_SDI_M1	SPI1_MOSI		47
				GND	39	40	GPIO1_C0	I2S0_SDO_M1	SPI1_MISO		48

### 7.2 USB

The ROCK 2F has two USB2 HOST Type-A ports and one USB2 OTG / HOST type-C port. The power output across these ports is 2.8A in aggregate over the four connectors.

### 7.3 HDMI Output

The ROCK 2F has one Standard HDMI output ports with resolutions of 4Kp60.

### 7.4 AV Out

The ROCK 2F is equipped with an AVOUT interface that supports both audio and video output. The video output delivers a resolution of 720x576 at 60Hz, providing clear and smooth visuals. Additionally, the audio output functionality ensures high-quality sound, making this interface ideal for integrated multimedia applications.



### 7.5 FPC Connector

The ROCK 2F offers a FPC connector providing PCIe 2.0 one-lane signal, supporting expansion of SSD, SATA, 2.5G Ethernet ports and other devices, This requires additional expansion board / HAT.

## 8 Availability

Radxa guarantees availability of the ROCK 2F until at least September 2033.

## 9 Support

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

