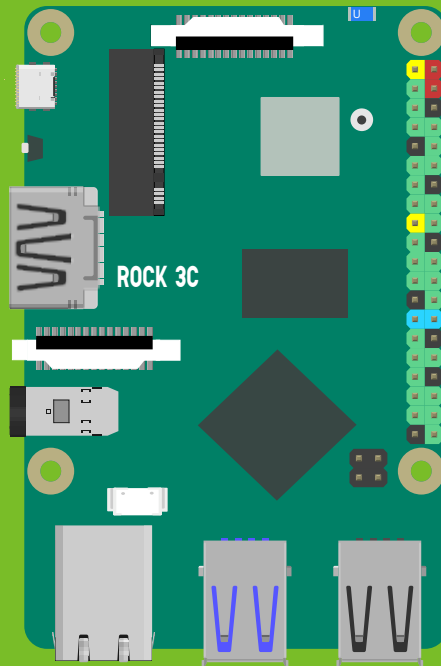

Radxa ROCK 3C Product Brief

Low Power 4K Single Board Computer

Preliminary v0.9



Radxa Computer

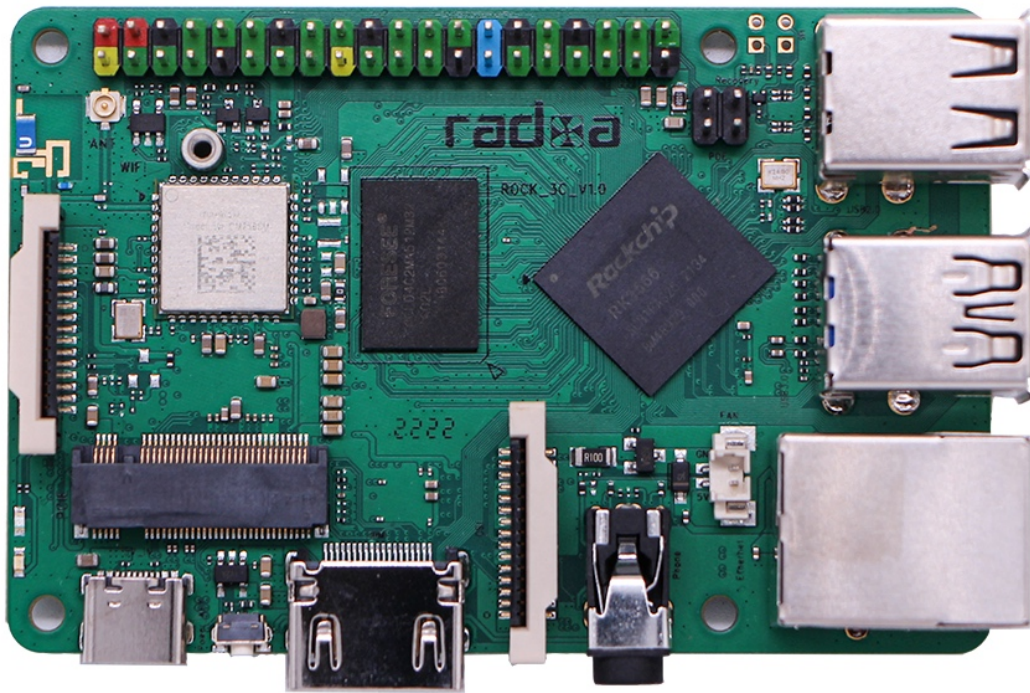
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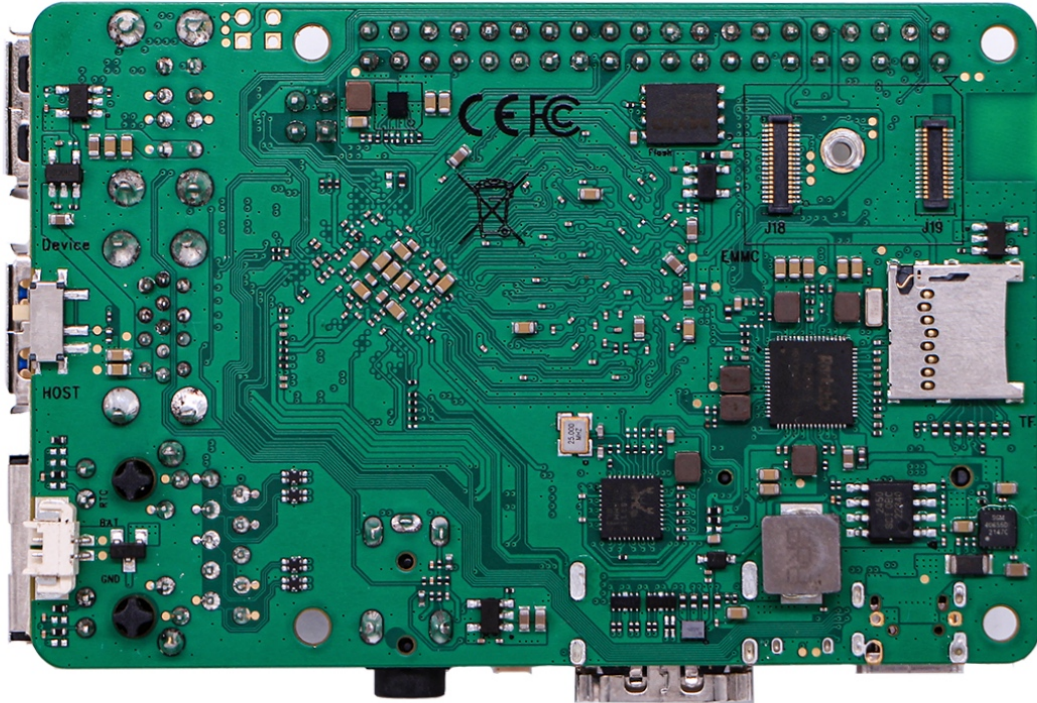
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1 Introduction

Radxa ROCK 3C is a Single Board Computer (SBC) in an ultra-small form factor that offers class-leading performance while leveraging outstanding mechanical compatibility. Radxa ROCK 3C offers makers, IoT enthusiasts, hobbyists, PC DIY enthusiasts and others a reliable and extremely capable platform for building and tinkering their ideas into reality.





2 Features

2.1 Hardware

- Rockchip RK3566 with Quad core Cortex-A55 (ARM v8) 64-bit SoC @ 2.0GHz
- Mali G52 gpu, supports OpenGL ES 3.2/OpenCL 2.0/Vulkan 1.1
- 1GB/2GB LPDDR4
- Display via HDMI or MIPI DSI
- H.265/VP9 (HEVC) hardware decode (up to 4Kp60)
- H.264 hardware decode (up to 1080p60)

2.2 Interfaces

- 802.11 b/g/n/ac Wireless LAN
- Bluetooth 5.0 with BLE

- 1x HDMI ports supporting displays up to 4Kp60 resolution
- 1x SD Card
- 2x USB2 HOST ports, 1x USB2 OTG port(middle upper port)
- 1x USB3 HOST port(middle lower port)
- 1x Gigabit Ethernet port (supports PoE with add-on PoE HAT)
- 1x M.2 M Key connector for NVMe SSD or SATA SSD
- 1x camera port (2-lane MIPI CSI)
- 1x display port (2-lane MIPI DSI)
- 40x user GPIO supporting various interface options:
 - 5 x UART
 - 1 x SPI bus
 - 2 x I2C bus
 - 1 x PCM/I2S
 - 1 x CAN
 - 6 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 11 support
- Hardware access/control library for Linux/Android

3 Electrical Specification

3.1 Power Requirements

Radxa ROCK 3C can only be powered by +5V.

- USB C 5V
- 5V Power from the GPIO PIN 2 & 4

The recommended power source capacity is at least 5V/2.5A without M.2 SSD or 5V/4A using with M.2 SSD.

3.2 GPIO Voltage

GPIO	Voltage Level	Tolerance
GPIO3_C0	3.3V	3.63V
ADC_IN5	1.8V	1.98V

4 Peripherals

4.1 GPIO Interface

Radxa ROCK 3C offers 40P GPIO expansion which is compatible with most accessories on the market.

4.1.1 GPIO Alternate Functions

Function5	Function4	Function3	Function2	Function1	Pin#	Pin#	Function1	Function2	Function3	Function4	Function5
				+3.3V	1	2	+5.0V				
CAN1_RX_M0	UART3_RX_M0	I2C3_SDA_M0	I2C3_SDA_M0	GPIO1_A0	3	4	+5.0V				
	CAN1_TX_M0	UART3_TX_M0	I2C3_SCL_M0	GPIO1_A1	5	6	GND				
			PWM12_M0	GPIO3_C4	7	8	GPIO0_D1	UART2_TXD			
				GND	9	10	GPIO0_D0	UART2_RXD			
		UART7_TX_M1	PWM14_M0	GPIO3_A1	11	12	GPIO3_A3				
		UART7_RX_M1	PWM15_IR_M0	GPIO3_A2	13	14	GND				
			PWM1_M0	GPIO3_B0	15	16	GPIO3_B1	UART4_RX_M1	PWM8_M0		
				+3.3V	17	18	GPIO3_B2	UART4_TX_M1	PWM9_M0		
	PWM15_IR_M1	SPI3_MOSI_M1	I2S3_SCLK_M1	GPIO4_C3	19	20	GND				
		SPI3_MISO_M1	I2S3_SDO_M1	GPIO4_C5	21	22	GPIO3_C1				
		SPI3_CLK_M1	I2S3_MCLK_M1	GPIO4_C2	23	24	GPIO4_C6	SPI3_CS0_M1	PWM13_M1		
				GND	25	26	GPIO4_D1	SPI3_CS1_M1			
		PWM2_M1	I2C2_SDA_M0	GPIO2_A0	27	28	GPIO4_B3				
			I2C5_SCL_M0	GPIO3_B3	29	30	GND				
			I2C5_SDA_M0	GPIO3_B4	31	32	GPIO3_C2				
			PWM15_IR_M0	GPIO3_C3	33	34	GND				
				GPIO3_A4	35	36	GPIO3_A7				
				GPIO1_A4	37	38	GPIO3_A6	I2S3_SDI_M0			
				GND	39	40	GPIO3_A5	I2S3_SDO_M0			

4.2 eMMC Socket

Radxa ROCK 3C 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.

4.3 Camera and Display Interfaces

Radxa ROCK 3C 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.

4.4 USB

Radxa ROCK 3C has 2x USB2 HOST, 1x USB3 HOST and 1x USB2 OTG type-A sockets. Downstream USB current is limited to approximately 2.4A in aggregate over the four sockets.

4.5 HDMI

Radxa ROCK 3C has 1x HDMI port, which support CEC and HDMI 2.0 with resolutions up to 4Kp60.

4.6 Audio Jack

Radxa ROCK 3C 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.

4.7 M.2 Connector

Radxa ROCK 3C offers a M.2 M Key SSD socket with PCIe 2.1 1-lane and SATA 3.0 combo interfaces, providing high speed storage access. The M.2 M Key can be configured either to support NVMe SSD or SATA SSD.

4.8 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, Radxa ROCK 3C 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.

Radxa ROCK 3C 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.

5 Availability

Radxa guarantees availability of the ROCK 3C until at least September 2032.

6 Support

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