



Radxa Zero 2

A ultra tiny high performance Single Board Computer

Preliminary v0.9

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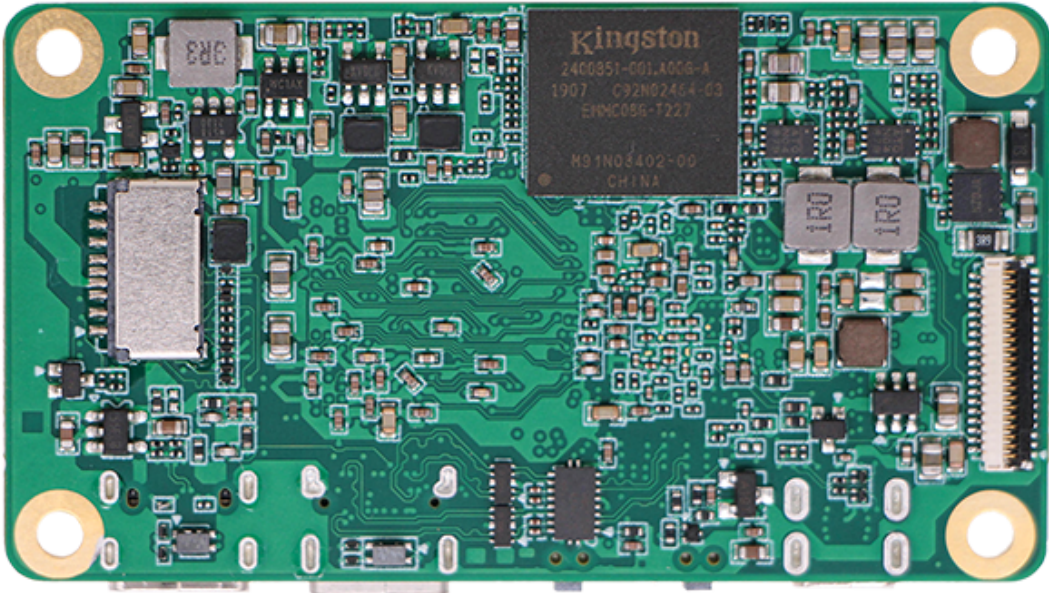
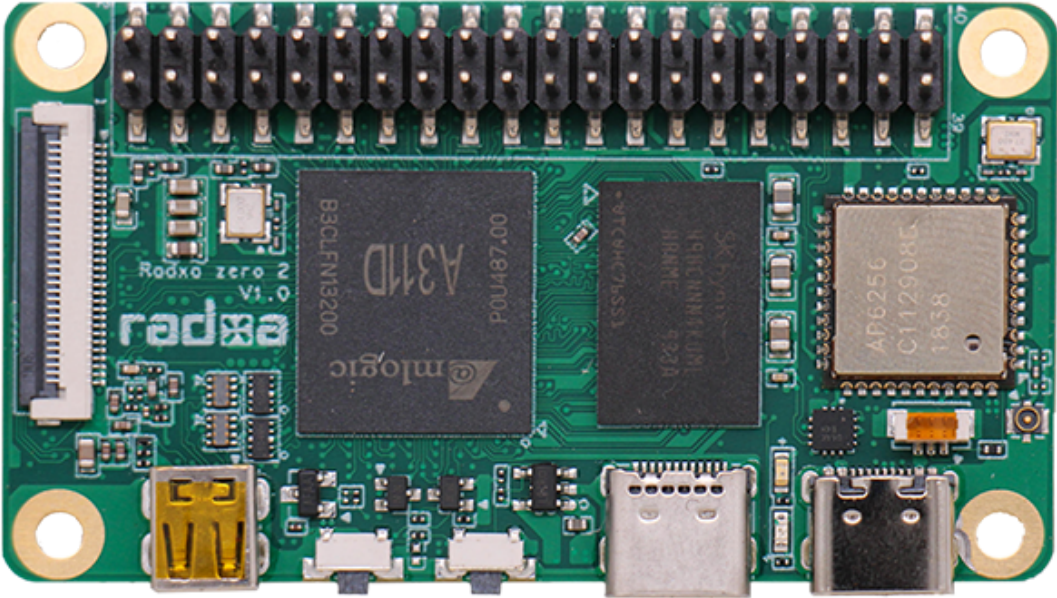


Contents

- 1 Introduction 2
- 2 Features 4
 - 2.1 Hardware 4
 - 2.2 Interfaces 4
 - 2.3 Software 4
- 3 Electrical Specification 5
 - 3.1 Power Requirements 5
- 4 Peripherals 5
 - 4.1 GPIO Interface 5
 - 4.1.1 GPIO Alternate Functions 5
 - 4.2 USB 6
 - 4.3 HDMI 6
 - 4.4 Temperature Range and Thermals 6
- 5 Availability 6
- 6 Support 6

1 Introduction

Radxa Zero2 is a Single Board Computer (SBC) in an ultra-tiny form factor that offers high performance while leveraging outstanding mechanical compatibility. The Radxa Zero2 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

- Amlogic A311D with Quad core Cortex-A73 (ARM v8) 64-bit SoC @ 2.2GHz and Dual core Cortex-A53 (ARM v8) 64-bit SoC @ 1.8GHz
- ARM G52 MP4 GPU, supporting OpenGL ES 3.2, Vulkan 1.0, and OpenCL 2.0.
- 4GB LPDDR4
- 32GB/64GB/128GB high performance eMMC
- WiFi5/BT5 with external antenna
- 4K display via micro HDMI
- H.265/VP9 (HEVC) hardware decode (up to 4Kp60)
- H.264 hardware decode (up to 4Kp60)

2.2 Interfaces

- 1x micro SD Card
- 1x micro HDMI ports supporting displays up to 4Kp60 resolution
- 1x USB2 type C OTG port for power and data
- 1x USB3 type C HOST port
- 1x MIPI CSI
- 1x MIPI DSI
- 40x user GPIO supporting various interface options:
 - 3 x UART
 - 2 x SPI bus
 - 3 x I2C bus
 - 3 x PWM
 - 2 x ADC
 - up to 22 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 9 support
- Hardware access/control library for Linux/Android

3 Electrical Specification

3.1 Power Requirements

The Radxa Zero2 support DC +5V voltage:

- Power adapter with 5V/3A on the USB C power port without LCD, 5V/4A with LCD.
- 5V Power from the GPIO PIN 2 & 4

4 Peripherals

4.1 GPIO Interface

Radxa Zero2 offers a 40P GPIO expansion header which provides extensive compatibility with a wide range of accessories developed for the SBC market.

4.1.1 GPIO Alternate Functions

Function4	Function3	Function2	Function1	Pin#	Pin#	Function1	Function2	Function3	Function4
			+3.3V	1	2	+5.0V			
		I2C_EE_M3_SDA	GPIOA_14	3	4	+5.0V			
		I2C_EE_M3_SCL	GPIOA_15	5	6	GND			
I2C_AO_S0_SDA	UART_AO_B_RX	I2C_AO_M0_SDA	GPIOAO_3	7	8	GPIOAO_0	UART_AO_A_TXD		
			GND	9	10	GPIOAO_1	UART_AO_A_RXD		
I2C_AO_S0_SCL	UART_AO_B_TX	I2C_AO_M0_SCL	GPIOAO_2	11	12	GPIOX_9	SPI_A_MISO		
	I2C_EE_M1_SCL	SPI_A_SCLK	GPIOX_11	13	14	GND			
			SARADC_CH1	15	16	GPIOX_10	SPI_A_SS0	I2C_EE_M1_SDA	
			+3.3V	17	18	GPIOX_8	SPI_A_MOSI	PWM_C	
	SPI_B_MOSI	UART_EE_C_RTS	GPIOH_4	19	20	GND			
PWM_F	SPI_B_MISO	UART_EE_C_CTS	GPIOH_5	21	22	GPIOC_7	-		
I2C_EE_M1_SCL	SPI_B_SCLK	UART_EE_C_TX	GPIOH_7	23	24	GPIOH_6	UART_EE_C_RX	SPI_B_SS0	I2C_EE_M1_SDA
			GND	25	26	SARADC_CH2			
I2C_AO_S0_SDA	UART_AO_B_RX	I2C_AO_M0_SDA	GPIOAO_3	27	28	GPIOAO_2	I2C_AO_M0_SCL	UART_AO_B_TX	I2C_AO_S0_SCL
			NC	29	30	GND			
			NC	31	32	GPIOAO_4	PWMAO_C		
			NC	33	34	GND			
		UART_AO_B_TX	GPIOAO_8	35	36	GPIOH_8	-		
		UART_AO_B_RX	GPIOAO_9	37	38	GPIOAO_10	PWMAO_D		

Function4	Function3	Function2	Function1	Pin#	Pin#	Function1	Function2	Function3	Function4
			GND	39	40	GPIOAO_11	PWMAO_A		

4.2 USB

The Radxa Zero2 has 1x USB3 HOST in type-C socket. Downstream USB current is limited to approximately 1A. The Radxa Zero2 also has 1x USB2 OTG in type-C socket, which can be powered by 5V PSU or PC/Laptop USB port with data access.

4.3 HDMI

The Radxa Zero2 has 1x HDMI port in type D socket, which support CEC and HDMI 2.0 with resolutions up to 4Kp60.

4.4 Temperature Range and Thermals

The recommended ambient operating temperature range is 0°C to 50°C.

To reduce thermal output when idling or under light load, the Radxa Zero2 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 Radxa Zero2 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 Radxa Zero2 until at least September 2029.

6 Support

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