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# Radxa ROCK 3 Compute Module

A feature rich embedded system-on-module

Revision 1.8

2022-02-14



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## 1 Revision Control Table

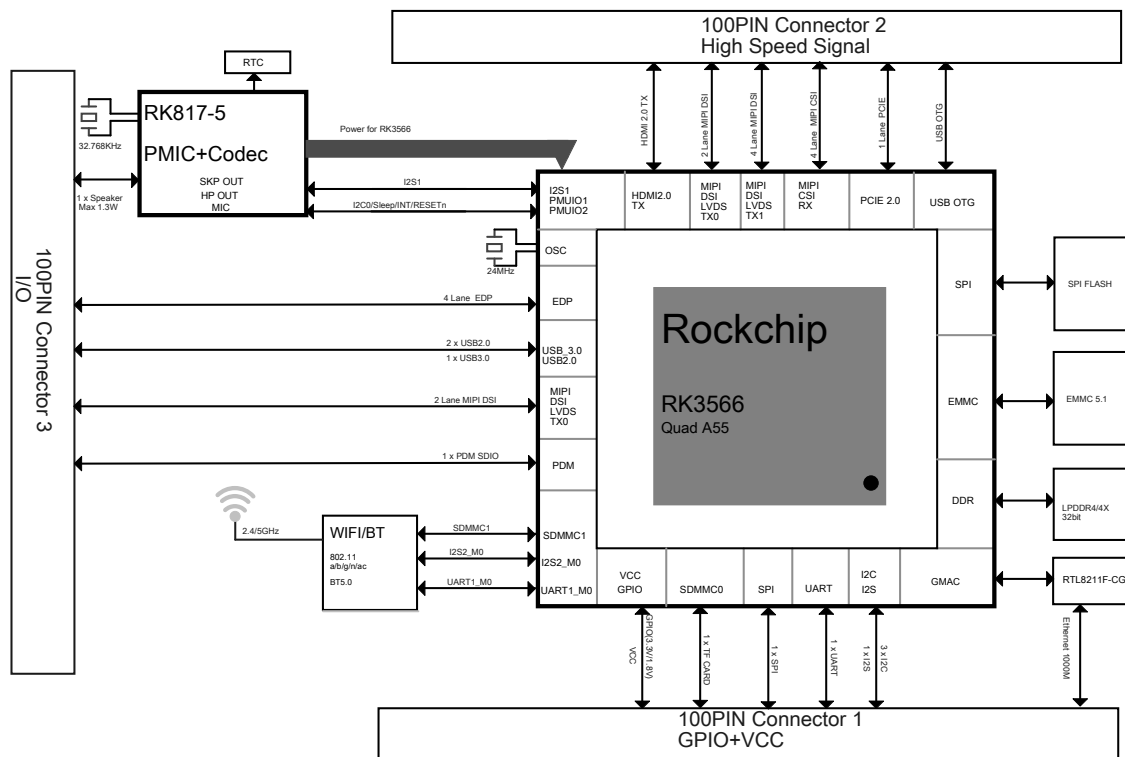
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Version	Date	Changes from previous version
1.0		
1.1		
1.2		
1.3	30/09/2022	Improve the grammar and readability
1.4	26/10/2022	Add compliance symbols
1.5	03/11/2022	Update CM3 picture
1.6	24/11/2022	Add HK compliance symbol
1.7	01/02/2023	Add JP compliance symbol
1.8	14/02/2023	Add operating conditions

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## 2 Introduction

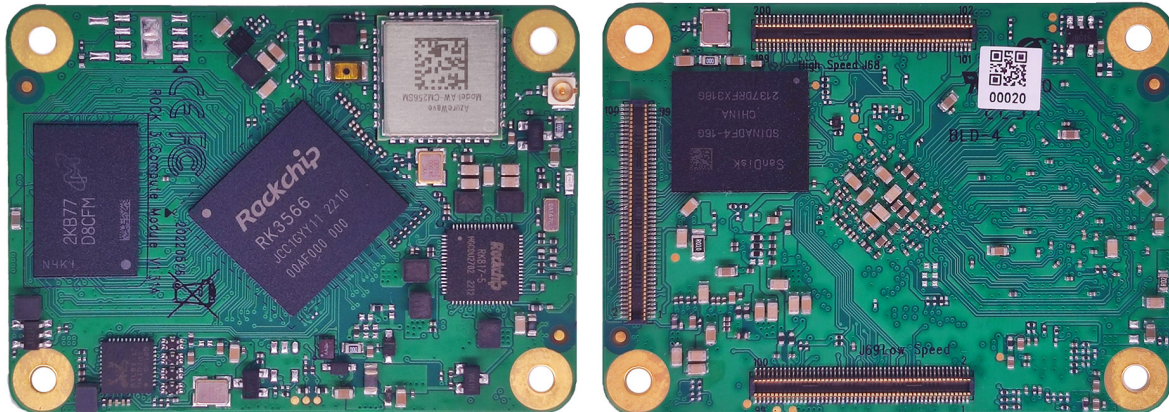
The Radxa ROCK 3 Compute Module (CM3) is a System on Module (SoM) based on a the Rockchip RK3566 System on Chip (SoC). The CM3 integrates the Central Process Unit (CPU), Power Management Unit (PMU), DRAM memory, flash storage and wireless connectivity (WiFi 5 and BT 5.0) in a small form factor of just 55mm x 40mm. The CM3 offers a cost-efficient solution out of the box for many different applications. The figure below shows the CM3 block diagram.



The CM3 is available in various LPDDR4 RAM and eMMC size configurations, check the Order Info section for the specific models.

The CM3 accelerates the customer’ s product development by providing a powerful SoM in a very small form factor. The customer can quickly put the prototype into production by developing a simple carrier board.

Notice that the carrier board reference design files are provided at [Radxa Github](#). In addition, Radxa offers a CM3 IO board to help customers to quickly show a basic use of the SoM.

**Note:**

The image above shows a CM3 specific model. This model has certain features like wireless communication capabilities or eMMC. Depending on the purchased SKU there might be variations to the populated components.

## 3 Features

### 3.1 Hardware

The CM3 is based on a Rockchip RK3566 SoC with 64-bit Quad Core low power cores up to 2.0GHz.

- CPU: Quad-core Arm® Cortex®-A55 (ARMv8) 64-bit @ 2.0GHz
- GPU: Arm Mali™-G52-2EE, OpenGL® ES1.1/2.0/3.0/3.1/3.2, Vulkan® 1.1, OpenCL™ 2.1
- NPU: 1 TOPs@INT8, support INT8, INT16, FP16, BFP16, support deep learning frameworks such as TensorFlow, Caffe, Tflite, Pytorch, Onnx, Android™ NN, etc
- Memory: 32bit LPDDR4X up to 8GB
- Storage: eMMC 5.1 up to 512GB
- Display: Single display engine, HDMI2.0, eDP 1.3, Dual MIPI-DSI, combo with single LVDS, 24bit RGB/BT1120 and EBC interface
- Multi-Media: 4K H.265/H.264/VP9 video decoder and 1080p@60fps H.264/H.265 video encoder
- Video input: 8M Pixel ISP and 1 x 4 lanes or 2 x 2 lanes MIPI CSI-2 and DVP interface
- Audio interface: I2S0/I2S1 with 8 channels, IS2/I2S3 with 2 channels, SPDIF0, PDM0 with 8 channels, TDM) with 8 channels and Voice Activity Detection (VAD)

- High Speed Interface: One USB 3.0 host, two SATA 3.0, one PCIe 2.1, two SerDes (serialiser / deserialiser)lanes, dual USB 2.0 host and one USB 2.0 OTG
- Ethernet: 1000M ethernet phy(RTL8211F)
- Security: Arm TrustZone® security extension, Secure Video Path, Secure JTAG to debug, Secure boot, OTP and Crypto (AES/TDES/SM4/SM3/SHA256/SHA512/RSA)

## 3.2 Interfaces

- 802.11 b/g/n/ac Wireless LAN (Wi-Fi 5)
- BT 5.0 with BLE
- 8 x I2C
- 4 x SPI
- 8 x UART
- 9 x PWM
- 50 x GPIO
- 2 x ADC
- 1 x Gigabit Ethernet PHY
- 1 x PDM with microphone array support
- 1 x I2S
- 2 x SATA
- 1 x PCIe 2.0, 1 lane host (5Gbps)
- 1 x USB 2.0
- 1 x USB 2.0 OTG
- 1 x USB 3.0 (5Gbps)
- 1 x SDIO 3.0
- 1 x HDMI up to 4K x 2k@60Hz
- 1 x eDP four lanes (2.7 Gbps per lane)
- 2 x MIPI DSI @ 1.6Gbps per lane
- 2 x 2 lane or 1 x 4 lane MIPI CSI camera port
- 1 x LVDS combo four lanes, mux with MIPI DSIO
- 3 x 100 pins 0.4mm pitch B2B connector

## 3.3 Software

- Debian/Ubuntu Linux support
- Android 11/12 support

Please check [Radxa Download](#) for third party images support.

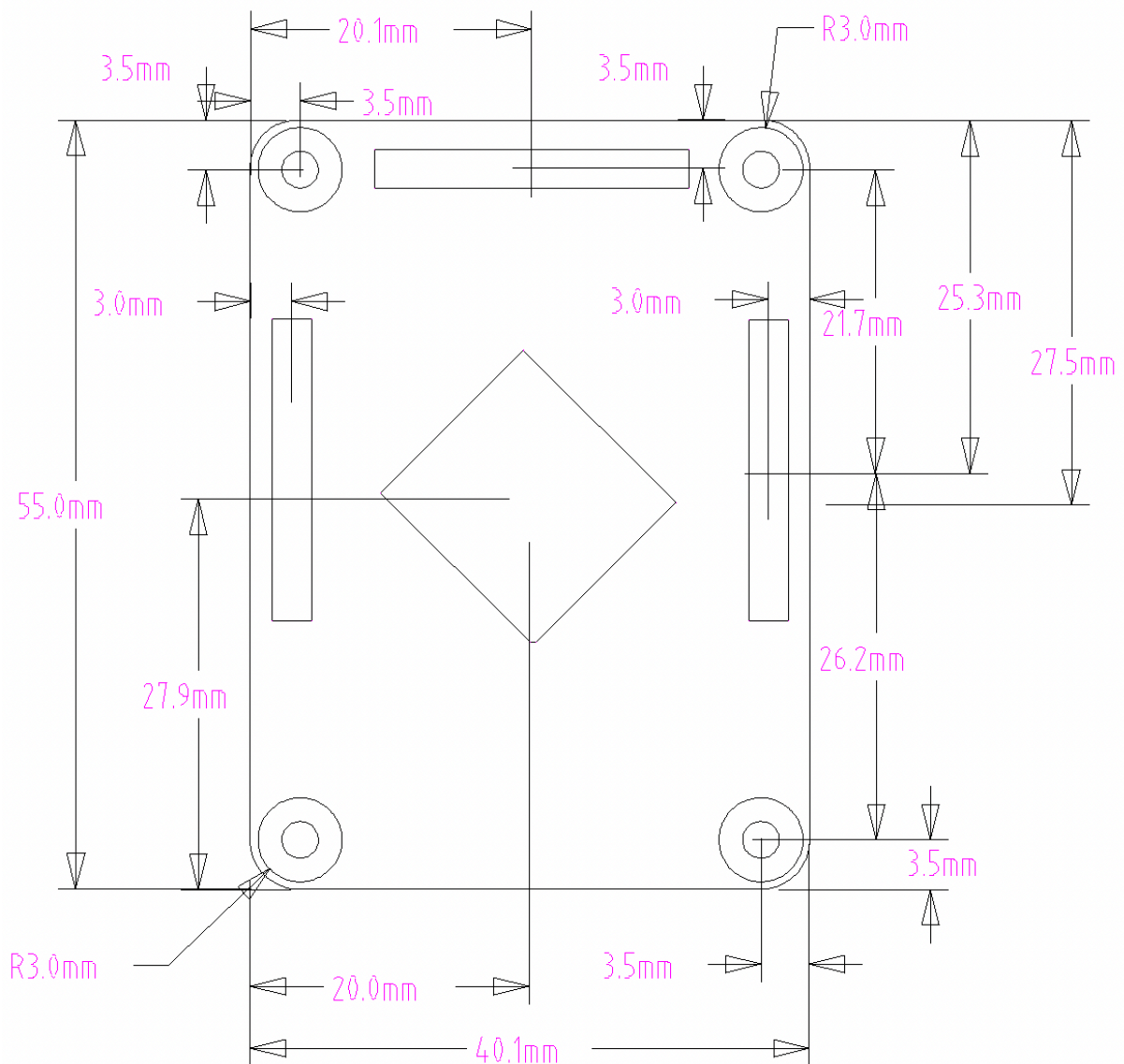
## 4 Operating Conditions

The CM3 has been designed to operate between 0C° to 60C°.

The CM3 is built on a high-performance mobile chipset which is designed to operate for extended durations on batteries with efficiency at its core.

The SoC (RK3566) recommended operating temperature is 0C° to 80C°. If the CM3 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 below its recommended 80°C.

### 5 Dimension



## 6 Availability

Radxa guarantees availability of the CM3 until at least September 2029.

## 7 Order Info

Wireless	RAM	eMMC	SKU
No	1G	N/A	RM116-D1E0W0
		8G	RM116-D1E8W0
		16G	RM116-D1E16W0
		32G	RM116-D1E32W0
No	2G	N/A	RM116-D2E0W0
		8G	RM116-D2E8W0
		16G	RM116-D2E16W0
		32G	RM116-D2E32W0
No	4G	N/A	RM116-D4E0W0
		8G	RM116-D4E8W0
		16G	RM116-D4E16W0
		32G	RM116-D4E32W0
		64G	RM116-D4E64W0
		128G	RM116-D4E128W0
No	8G	N/A	RM116-D8E0W0
		8G	RM116-D8E8W0
		16G	RM116-D8E16W0
		32G	RM116-D8E32W0
		64G	RM116-D8E64W0
		128G	RM116-D8E128W0



Wireless	RAM	eMMC	SKU
Yes	1G	N/A	RM116-D1E0W2
		8G	RM116-D1E8W2
		16G	RM116-D1E16W2
		32G	RM116-D1E32W2
Yes	2G	N/A	RM116-D2E0W2
		8G	RM116-D2E8W2
		16G	RM116-D2E16W2
		32G	RM116-D2E32W2
Yes	4G	N/A	RM116-D4E0W2
		8G	RM116-D4E8W2
		16G	RM116-D4E16W2
		32G	RM116-D4E32W2
		64G	RM116-D4E64W2
		128G	RM116-D4E128W2
Yes	8G	N/A	RM116-D8E0W2
		8G	RM116-D8E8W2
		16G	RM116-D8E16W2
		32G	RM116-D8E32W2
		64G	RM116-D8E64W2
		128G	RM116-D8E128W2

## 8 Support

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



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