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> TUOPUONE Core3566 Module: Rockchip RK3566 Quad-Core Processor User Manual

TUOPUONE Core3566002000

TUOPUONE Core3566 Module User Manual

Model: Core3566002000

1. INTRODUCTION

The TUOPUONE Core3566 Module is a compact single-board computer equipped with the Rockchip RK3566 quad-core processor. This module is designed for various applications including IoT devices, smart audio, smart displays, industrial control, and educational devices. It integrates a dual-core architecture GPU and a high-performance NPU, offering robust computing and graphics processing capabilities.

Key features include:

- RK3566 Quad-core 64-bit Cortex-A55 processor, operating up to 1.8GHz, built on a 22nm process for low power consumption and high performance.
- Integrated dual-core ARM G52 GPU, high-performance VPU, and high-efficiency NPU.
- GPU supports OpenGL ES3.2/2.0/1.1 and Vulkan1.1.
- VPU supports 4K 60fps H.265/H.264/VP9 video decoding and 1080P 60fps H.265/H.264 video encoding.
- NPU provides 0.8 TOPS computing power and supports mainstream frameworks like Caffe/TensorFlow.

Core3566

A compact module which incorporates Rockchip RK3566 quad-core processor with quad-core A55 CPU, dual-core ARM G52 GPU, VPU, NPU, supports video output, PCIe, CSI and other interfaces, suitable for embedded applications. Available in different options for RAM, eMMC Flash and wireless module.

Highly Integrated, Powerful Performance

Integrated With CPU, GPU, VPU, NPU, Etc.



- RK3566 Quad-core 64-bit Cortex-A55 processor, frequency up to 1.8GHz, with 22nm process, features low power consumption and high performance
- Integrated dual-core architecture ARM G52 GPU, high performance VPU and high efficiency NPU
- The GPU supports OpenGL ES3.2/2.0/1.1 and Vulkan1.1
- The VPU can support 4K 60fps H.265/H.264/VP9 video decoding and 1080P 60fps H.265/ H.264 video encoding
- The NPU with computing power of 0.8Tops supports one-click switching of mainstream frameworks like Caffe/TensorFlow

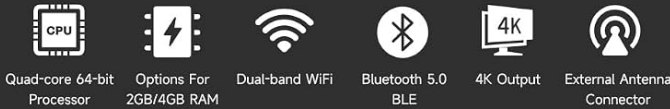


Figure 1: TUOPUONE Core3566 Module overview with highlighted features.

2. EQUIPMENT PREPARATION AND SETUP

Before beginning, ensure you have the following components:

- Core3566 module (Core3566002000)
- Waveshare CM4-IO-BASE-B baseboard (or compatible CM4 IO board)
- USB Type-A to Type-C data cable
- 5V/3A Type-C power adapter (essential for sufficient power supply)
- Display or TV with HDMI interface, and an HDMI cable
- 100M/1000M Ethernet cable and router (for network connectivity)
- USB wireless/wired mouse and keyboard
- USB to Serial Module (recommended: CH343, FT232, CP2102; avoid PL2303, CH340 due to baud rate compatibility issues. Default baud rate for Core3566 is 1500000.)
- USB card reader and TF card (minimum 8GB capacity)

2.1 Initial Connection

1. **Mount the Core3566 Module:** Carefully align and insert the Core3566 module onto the CM4-IO-BASE-B baseboard's SODIMM connector. Ensure it is seated firmly.

2. **Connect Peripherals:**

- Connect your display to the HDMI port on the baseboard using an HDMI cable.
- Connect the USB mouse and keyboard to the USB ports on the baseboard.
- For network access, connect an Ethernet cable from your router to the Ethernet port on the baseboard.

- If using a serial console, connect the USB to Serial Module to the appropriate pins on the baseboard and to your computer.

3. **Insert TF Card:** If booting from a TF card, insert the prepared TF card into the card slot on the baseboard.

4. **Apply Power:** Connect the 5V/3A Type-C power adapter to the power input port on the baseboard. The module should power on.

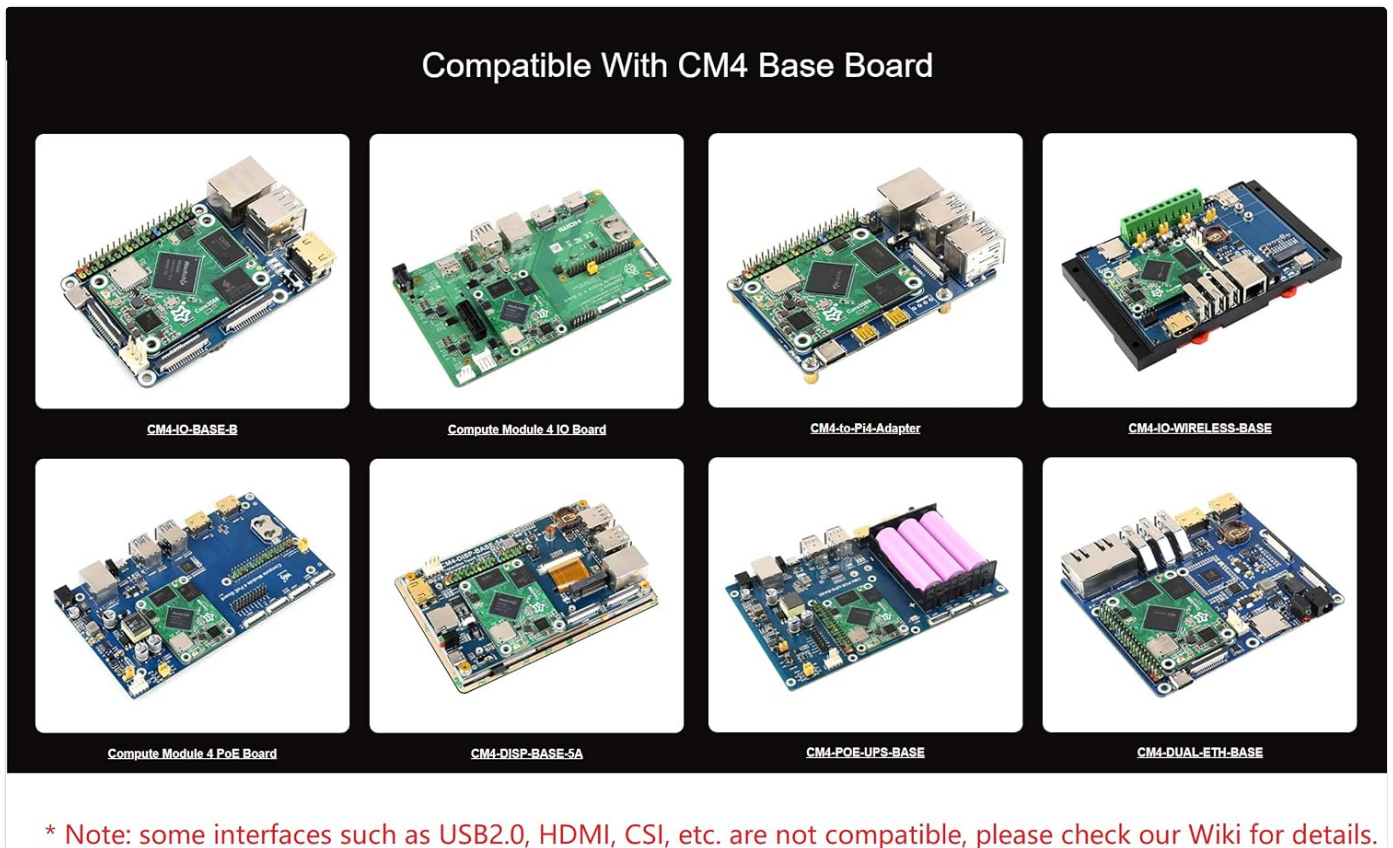


Figure 2: The Core3566 Module is compatible with various CM4 baseboards, illustrating its flexible integration.

3. OPERATING INSTRUCTIONS

Once the Core3566 module is properly set up and powered, it will begin its boot sequence. The operating system (OS) will load from either the eMMC flash (if present and configured) or the inserted TF card.

3.1 Booting and Initial Access

- **Display Output:** The boot process and OS desktop (if a graphical OS is installed) will be displayed on the connected HDMI monitor.
- **Keyboard and Mouse:** Use the connected USB keyboard and mouse to interact with the operating system.
- **Serial Console:** For headless operation or debugging, access the serial console via your computer using a terminal emulator (e.g., PuTTY, minicom) configured with the correct baud rate (1500000).
- **Network Access:** If an Ethernet cable is connected, the module should obtain an IP address automatically (DHCP). You can then access it via SSH or other network services.

3.2 Software and Development

The Core3566 module supports various operating systems, typically Linux distributions optimized for ARM processors. Refer to the official TUOPUONE documentation or community resources for specific OS images and development guides.

- **OS Installation:** OS images can be flashed to the eMMC or TF card using standard imaging tools.
- **Development:** Leverage the RK3566's capabilities for embedded development, AI applications (using the NPU),

and multimedia projects.

4. MAINTENANCE

To ensure the longevity and optimal performance of your Core3566 module, follow these general maintenance guidelines:

- **Environmental Conditions:** Operate the module within its specified temperature range (-10°C to 80°C). Avoid extreme temperatures, high humidity, and direct sunlight.
- **Cleaning:** Keep the module free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Do not use liquid cleaners.
- **Handling:** Handle the module by its edges to avoid touching sensitive components. Static electricity can damage electronic components, so use anti-static precautions when handling.
- **Power Supply:** Always use a stable 5V/3A Type-C power adapter to prevent power-related issues.
- **Firmware/Software Updates:** Regularly check for and apply firmware and operating system updates to ensure security and performance improvements.

5. TROUBLESHOOTING

If you encounter issues with your Core3566 module, consider the following troubleshooting steps:

- **No Power/No Boot:**
 - Verify the 5V/3A Type-C power adapter is correctly connected and functioning.
 - Ensure the Core3566 module is securely seated on the baseboard.
 - Check if the TF card (if used for booting) is properly inserted and contains a valid OS image.
- **No Display Output:**
 - Confirm the HDMI cable is securely connected to both the module's baseboard and the display.
 - Ensure the display is powered on and set to the correct input source.
 - Try a different HDMI cable or display if available.
- **Network Connectivity Issues:**
 - Check the Ethernet cable connection to both the baseboard and the router.
 - Verify your router is functioning correctly and providing DHCP services.
 - If using a wireless variant (not this model), ensure Wi-Fi drivers are installed and configured.
- **Peripheral (Keyboard/Mouse) Not Responding:**
 - Try connecting the peripherals to different USB ports.
 - Test the peripherals on another computer to ensure they are functional.

6. SPECIFICATIONS

Detailed technical specifications for the Core3566 Module:

Feature	Description
Processor	Rockchip RK3566 Quad-core ARM Cortex-A55 @ 1.8GHz
Memory	2GB LPDDR4 SDRAM (Options for 2GB/4GB LPDDR4)

Feature	Description
Storage	0GB (Lite) eMMC Flash (Options for 0GB or 32GB eMMC Flash)
NPU	0.8 TOPS @INT8
GPU	ARM Mali-G52 2EE
Connectivity	Optional dual-band (2.4GHz/5.0GHz) IEEE 802.11b/g/n/ac wireless WiFi, Bluetooth 5.0, BLE (requires external antenna for WiFi) Supports IEEE 802.3 Gigabit Ethernet USB 2.0 × 1 PCIe Gen 2 × 1 28 GPIO signals SD card interface (booted from eMMC first)
Video	HDMI interface (4Kp60 supported) 2-lane MIPI DSI display interface × 2 2-lane MIPI CSI camera interface × 2
Multimedia	4Kp60 H.264/H.265/VP9 (decode), 1080p60 H.264/H.265 (encode)
Operating Voltage	5V DC
Operating Temperature	-10°C ~ 80°C ambient
Dimensions	55 × 40 × 4.7mm
Item Weight	1.41 ounces

Specifications

Processor	Quad-core Arm Cortex-A55 @1.8GHz
Memory	Options for 2GB/4GB LPDDR4 SDRAM memory
Storage	Options for 0GB (Lite) or 32GB eMMC Flash
NPU	0.8 TOPS @INT8
GPU	Arm Mali-G52 2EE
Connectivity	Optional dual-band (2.4GHz/5.0GHz) IEEE 802.11b/g/n/ac wireless WiFi, Bluetooth 5.0, BLE, supports external antenna
	Supports IEEE 802.3 Gigabit Ethernet.
	USB 2.0 × 1
	PCIe Gen 2 × 1
	28 GPIO signals
	SD card interface (booted from eMMC first)
Video	HDMI interface (4Kp60 supported)
	2-lane MIPI DSI display interface × 2
	2-lane MIPI CSI camera interface × 2
Multimedia	4Kp60 H.264/H.265/VP9 (decode), 1080p60 H.264/H.265 (encode)
Operating Voltage	5V DC
Operating Temp.	-10°C ~ 80°C ambient
Dimensions	55 × 40 × 4.7mm

Figure 3: Visual representation of the Core3566 Module's specifications.

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For further support, please visit the official TUOPUONE website.