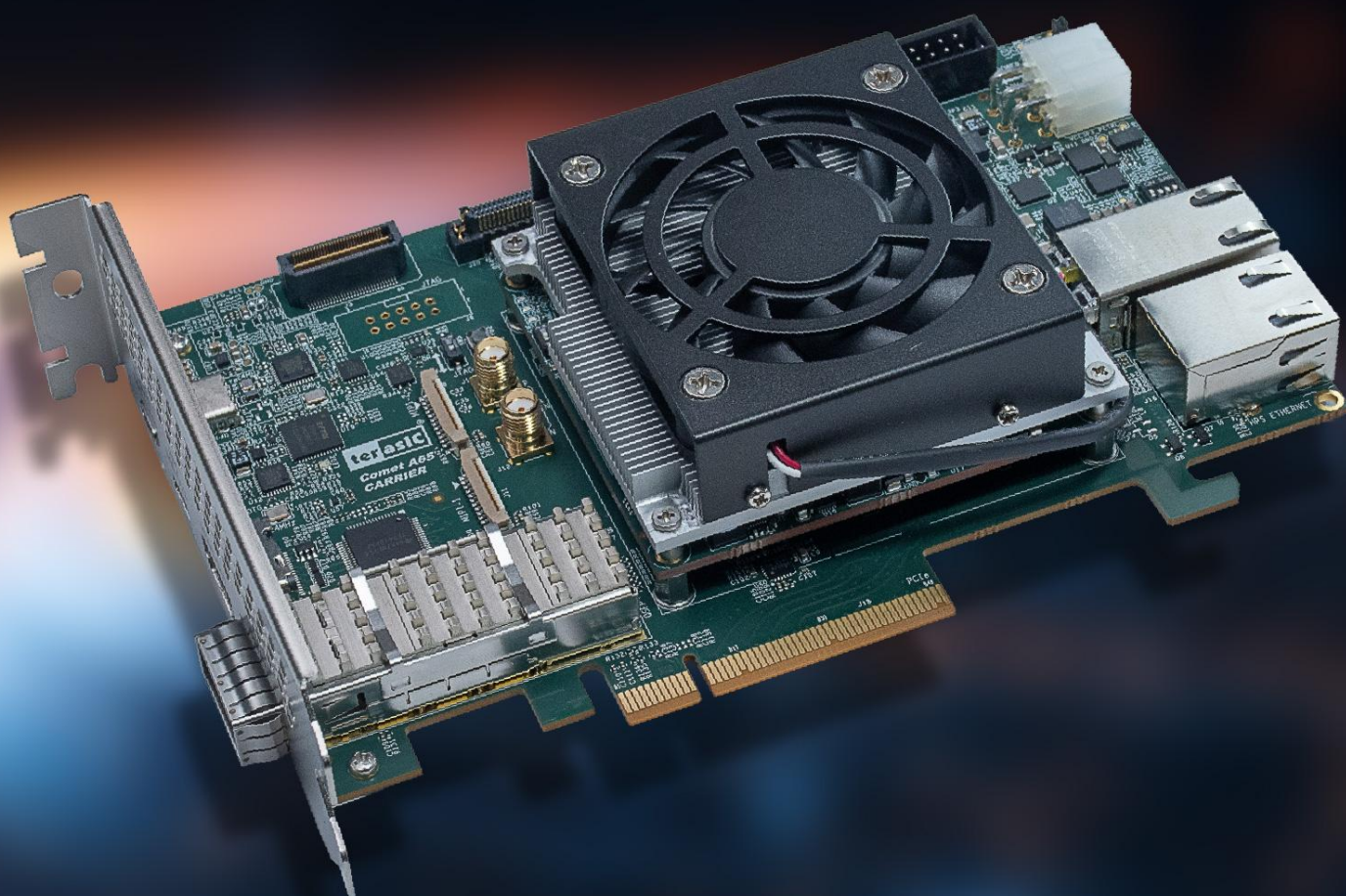


Comet-A65 SOM Evaluation Kit



Linux Booting Started Guide

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Chapter 1

Linux Booting on the board

1.1 Introduction

This guide describes how to boot the HPS on the board using the Micro SD Card and eMMC device with Linux image, and use the UART interface to allow the Host PC to communicate with the HPS of the board.

1.2 Required Hardware

To boot Linux on the board, the following hardware is required:

- Comet A65 Evaluation Kit (EVK)
- USB Type A to Type-C Cable
- MicroSD Card (At least 4GB capacity)

1.3 Install the MicroSD Card

This section describes how to create a bootable Linux MicroSD card and install it into the EVK. It also explains how to download the Linux image for the board and write it to the MicroSD card.

■ Download Linux image file

If users want to copy or reprogram the MicroSD card, they can download the Linux image file. (Find “*Linux BSP (Board Support Package): MicroSD Card Image*”) by referring to the link below:

<http://comet-a65.terasic.com/cd>

The downloaded image file is in ZIP format. Users need to extract the file before writing it to the SD

card.

Linux BSP (Board Support Package): MicroSD Card Image

Title	Version	Size	Date	Download
Linux Console boot from sdcard (Ubuntu 22.04.03 + kernel 6.12.11-lts; revB Board)	1.3		2026-02-10	 

Figure 1-1 BSP Download site

■ Download the programming tool

To program a MicroSD card Linux image you can use a free tool such as [Rufus](#) or [win32diskimager](#).

■ Program the MicroSD Card

The SD card image file needs to be programmed to a MicroSD card before it can be used.

The steps below present how to create MicroSD card on a windows machine using Rufus.

1. Connect the MicroSD card to a Windows PC
2. Execute **Rufus**
3. Select the image file for MicroSD card
4. Select the MicroSD card device
5. Click “**START**” to start writing the image file to the MicroSD card. Wait until the image is successfully written.

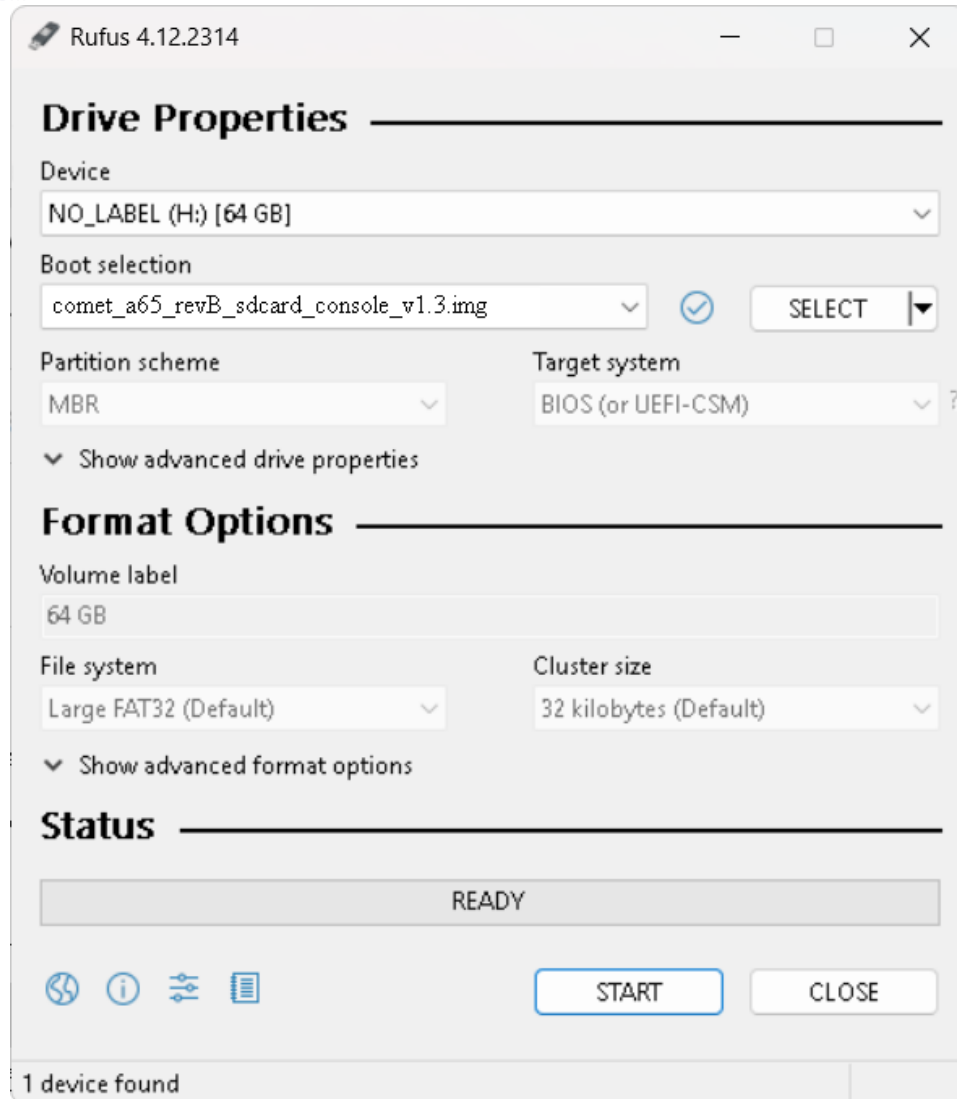


Figure 1-2 Rufus tool

■ Install the MicroSD Card to the Board

Users can install the Micro SD Card on the board by referring to **Figure 1-3**.

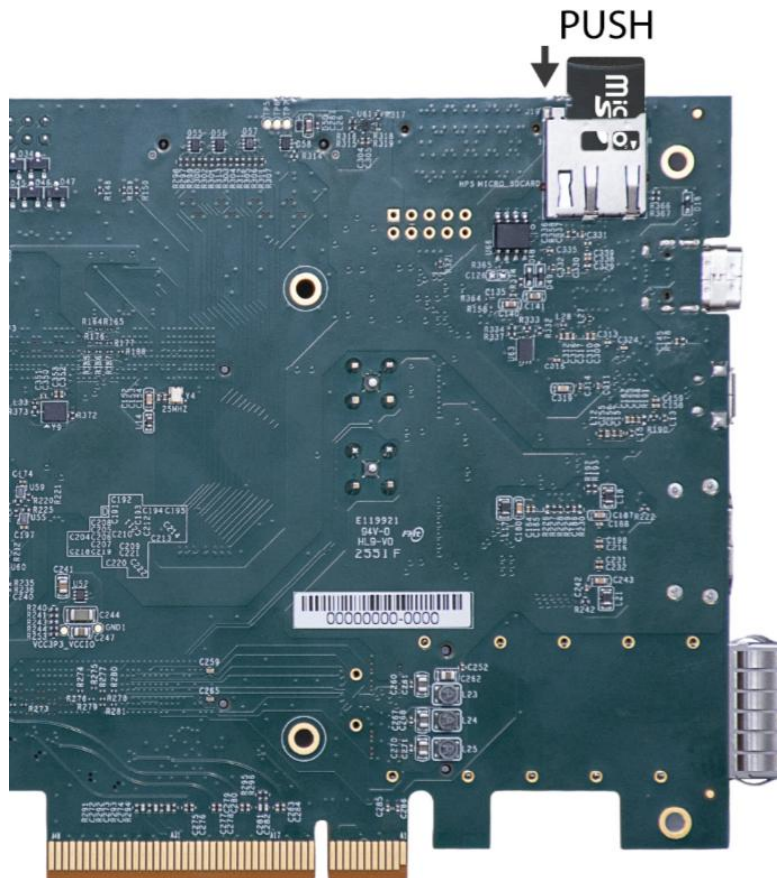


Figure 1-3 Installing MicroSD card

1.4 Boot Media Selection and Hardware Switch Setup (SD Card / eMMC)

This part explains how to configure the onboard physical switches to select your preferred boot device and FPGA configuration mode.

■ Selecting the Boot Media (MicroSD Card or eMMC)

The HPS on the Comet A65 EVK supports two primary storage and boot devices: MicroSD card (via the carrier board socket) and an onboard 8GB eMMC flash. Choosing which device to boot Linux from depends on the SW1 switch on the SoM module (See **Figure 1-4**). The settings are as follows:

- SD Card Boot Mode: Set SW1[1] to the "ON" position.
- eMMC Boot Mode: Set SW1[1] to the "OFF" position.

Therefore, if you want to use a MicroSD card as the boot source, please set SW1[1] to the "ON" position.

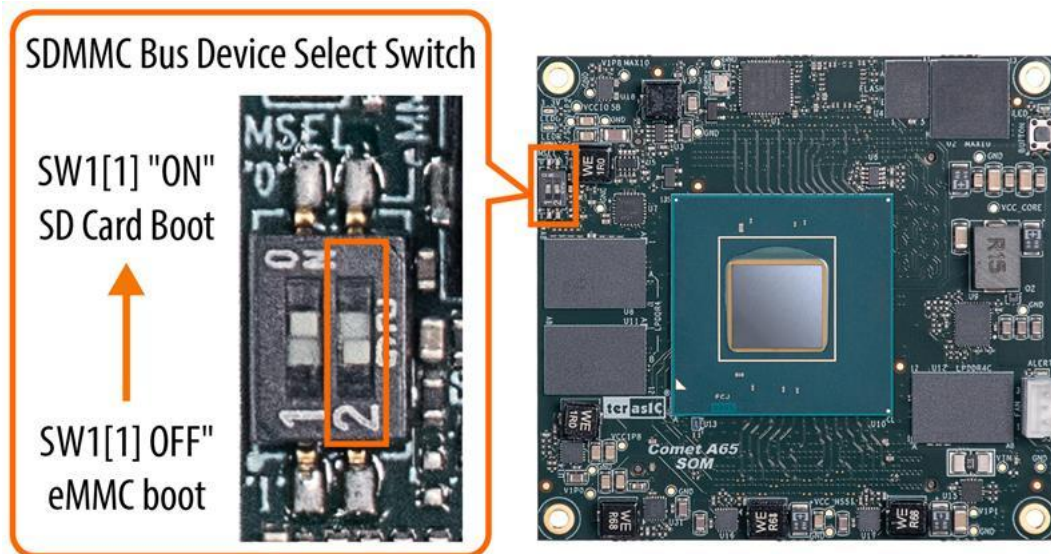


Figure 1-4 Position of slide switches SW1[1]

■ Selecting FPGA Configuration Mode

The Comet A65 SoM uses the "FPGA Boot First" mode by default. In AS mode, the SDM first reads the configuration from the QSPI flash to complete the initialization, and then loads the FSBL from the QSPI flash into the on-chip RAM of the HPS.

Therefore, users need to set the FPGA Configuration Mode to AS mode. As shown in the figure below, please set SW1[0] on the SoM module to the "ON" position.

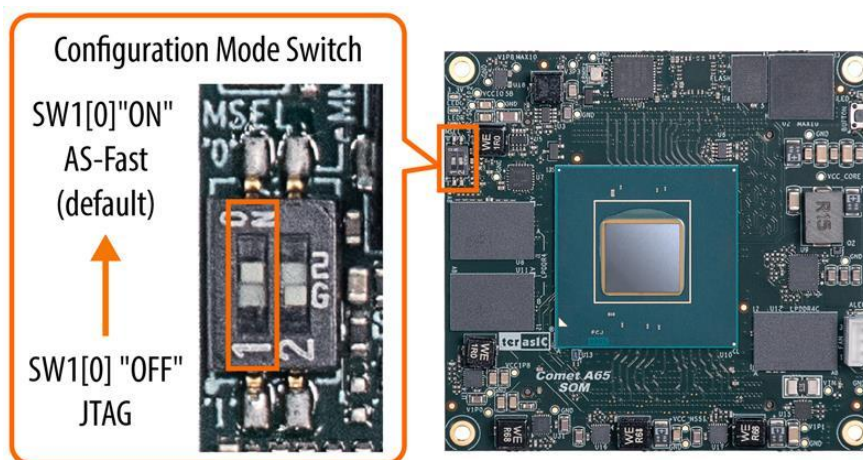


Figure 1-5 Position of slide switches SW1[0]

1.5 Power On the Board

To power up the board, user need to connect a ATX 12V power supply to the board, then turn on the power switch on the board to power on the board (See **Figure 1-6**).

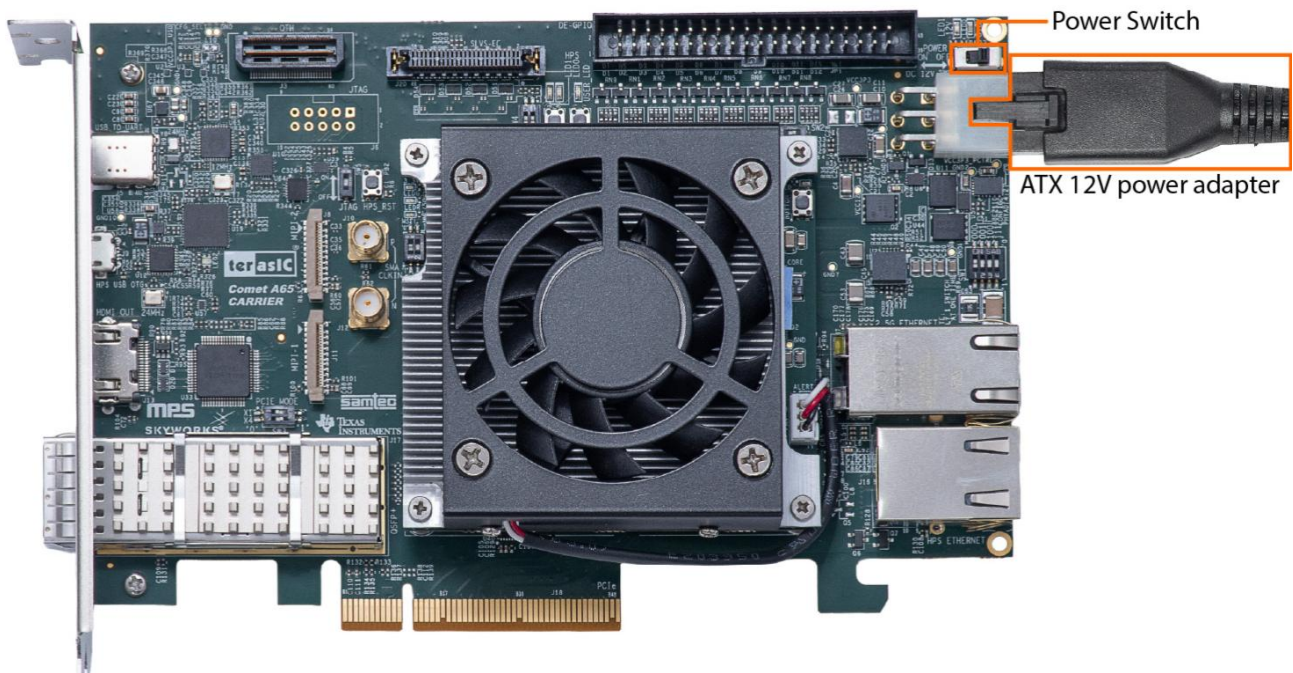


Figure 1-6 Power on the board

1.6 Setting Up UART Terminal

The Comet A65 Carrier Board provides a UART interface primarily used for communicating with the HPS (Hard Processor System) on the SOM. It allows users to access the HPS console, view boot messages, and execute Linux commands.

These HPS UART interfaces are enabled by an on-board Silicon Labs CP2105 USB-to-Dual-UART Bridge Controller (see **Figure 1-7**). To ensure a proper connection, please follow these setup instructions:

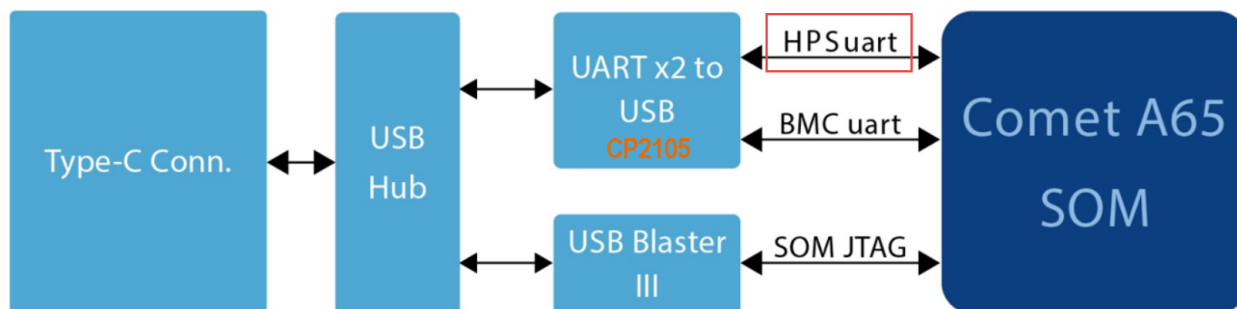


Figure 1-7 Block diagram of the HPS UART interface

■ Hardware Connection

Use a USB Type-C cable to connect the Type-C port (J4) on the Comet A65 carrier board to your host PC (See **Figure 1-8**). Once connected, this port enables both the USB Blaster III and HPS UART functionalities simultaneously

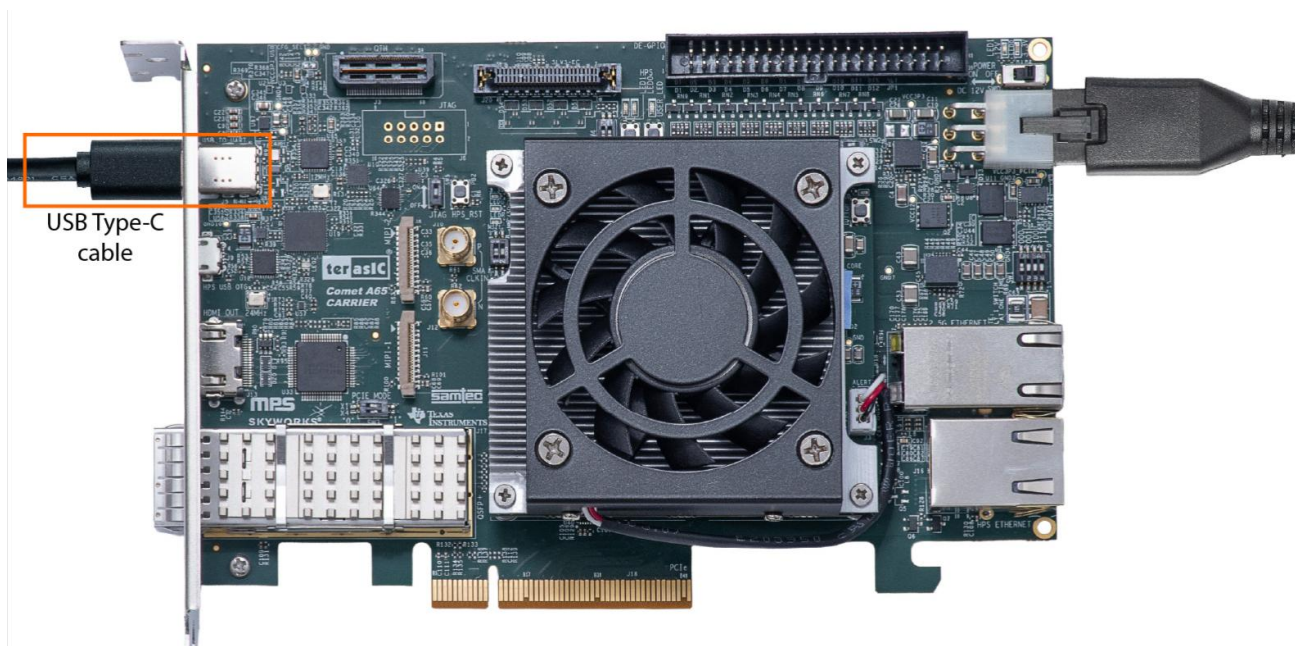


Figure 1-8 Connect USB Cable

■ Driver Installation

Please refer to the [The CP2105 \(USB to UART\) Driver Installation Instructions](#) to install the USB to UART driver for HPS fabric.

■ Identify the COM Ports:

When the development board is connected to a computer via the USB Type-C cable, two virtual COM ports will appear in the computer's Device Manager. Open the "Device Manager" on your Windows PC and check the "Ports (COM & LPT)" tab to find them: (see **Figure 1-9**).

- **Enhanced COM Port:** Find the COM number of the "**Enhanced COM port**", as it represents the HPS UART Port.
- **Standard COM Port:** The other interface is the BMC UART, which is used for communication with the BMC (Board Management Controller) to monitor and manage the board's hardware status, such as power, temperature, and fan speed.

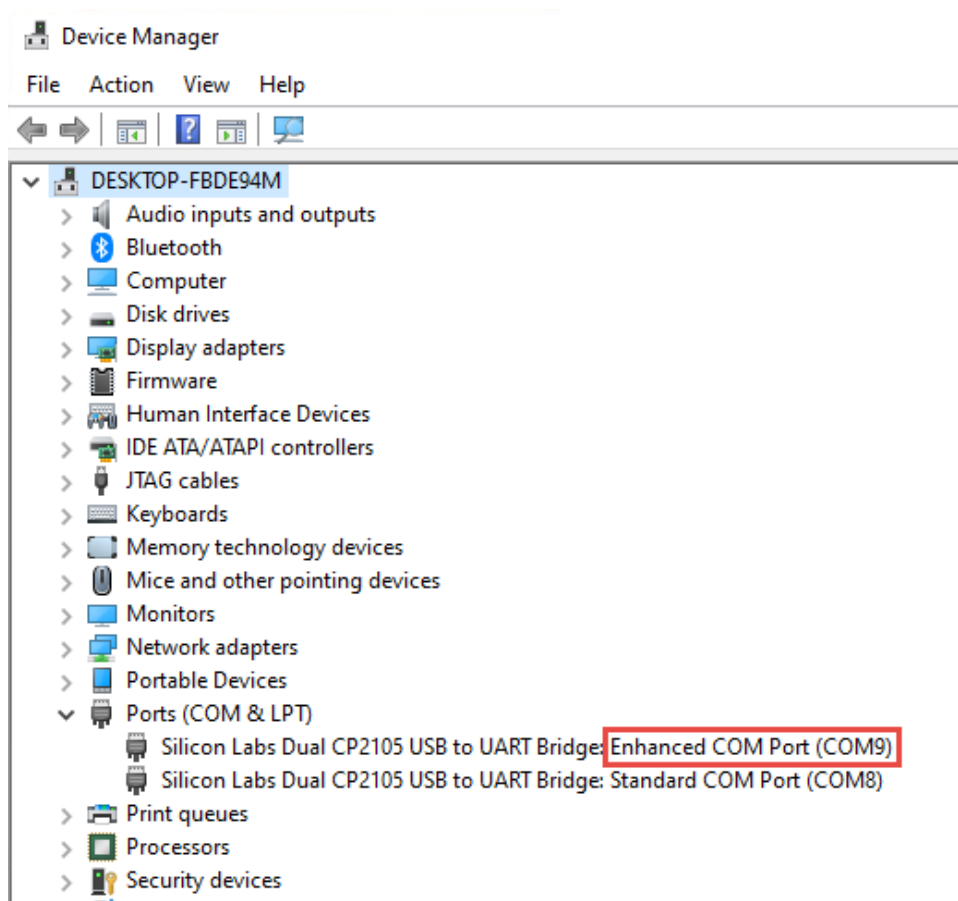


Figure 1-9 Device Manager

■ Configure UART terminal UART terminal spec

Open a terminal window (such as PuTTY) and specify the COM number of the "**Enhanced COM port**" (PuTTY can be downloaded from the link:

<http://the.earth.li/~sgtatham/putty/latest/x86/putty.exe>)

1. See **Figure 1-9**, the COM number of this Host is COM9. *Note that the "COM9" on the Serial Line column needs to be modified according to the actual com port on the user's computer.*
2. Open putty.exe, click Serial go to a serial configure interface.
3. Configure the window like the flowing picture and click "save" button to save the setting and click "Open" to open the terminal window (see **Figure 1-10**).

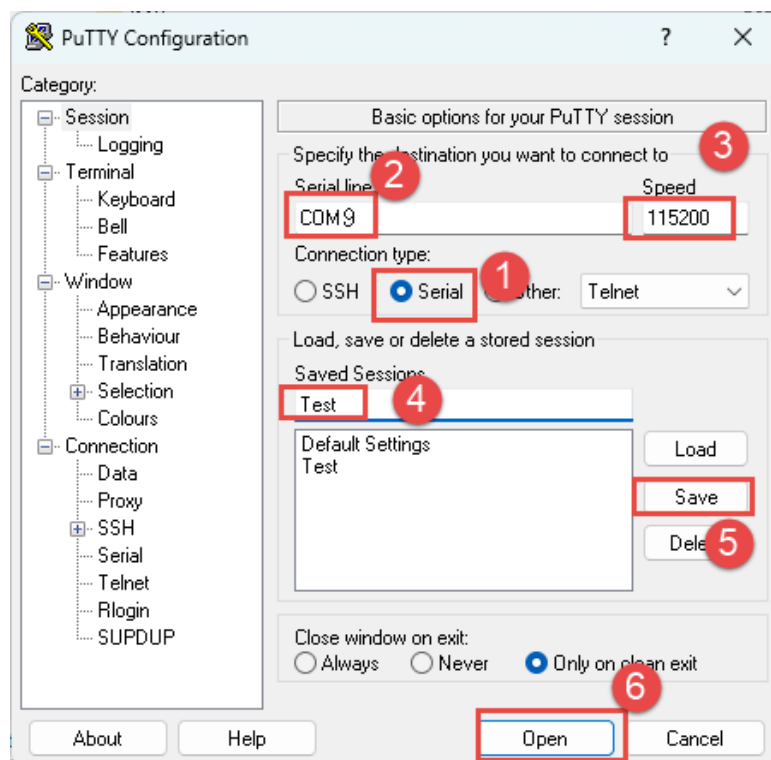


Figure 1-10 Putty Window

4. After Linux has successfully completed the boot process, please type "**terasic**" for account name and "123" for the password to login Ubuntu(See **Figure 1-11**).

Note : If the UART terminal does not respond, please refer to Appendix 1.7 to troubleshoot the issue.

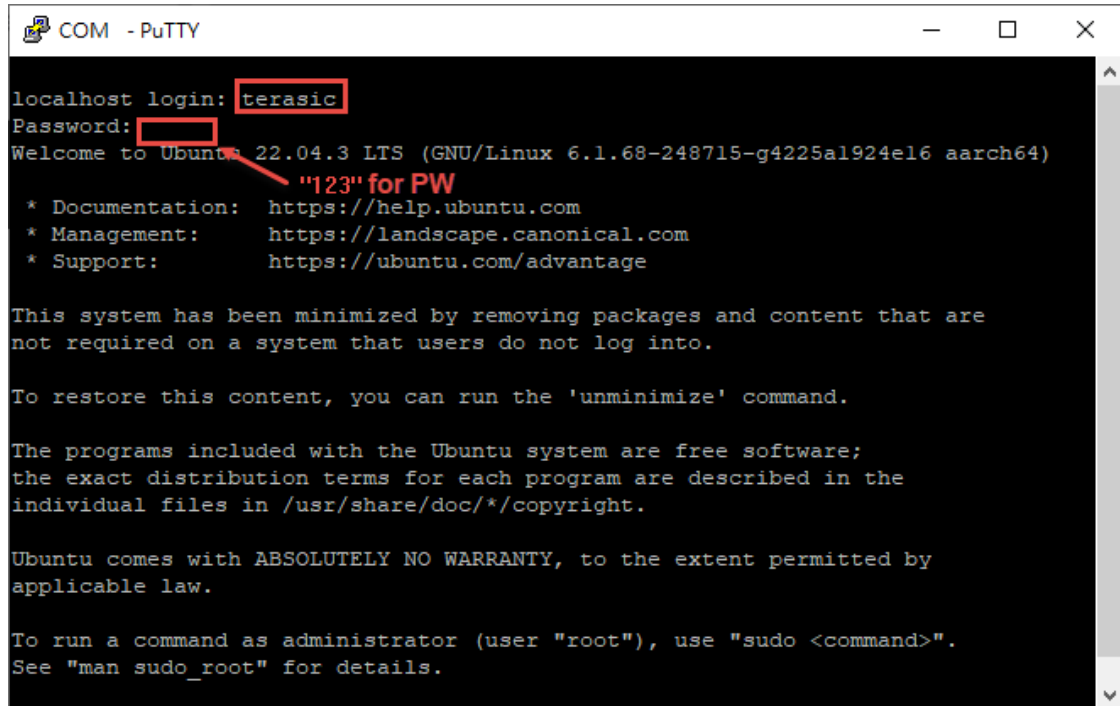


Figure 1-11 Putty Window

1.7 Programming eMMC with USB Flash Disk

For instructions on how to program the Comet A65 eMMC by booting the system from a USB flash disk and copying a prepared Linux image to the onboard eMMC storage, please refer to the link below for more details : [Programming eMMC with USB Flash Disk](#)

1.8 Build Linux image from scratch

For instructions on how to build a complete Linux boot image for the Comet A65 platform from scratch, covering the toolchain, bootloader, kernel, and root filesystem preparation, please refer to the link below : [Build Linux image from scratch](#)

1.9 Appendix

This section will introduce what check items can be done if Linux cannot be boot and the putty window does not print any messages.

1. Check if the USB Serial Port shows on the device manager on the computer and the Silicon Labs CP2105 driver is installed.

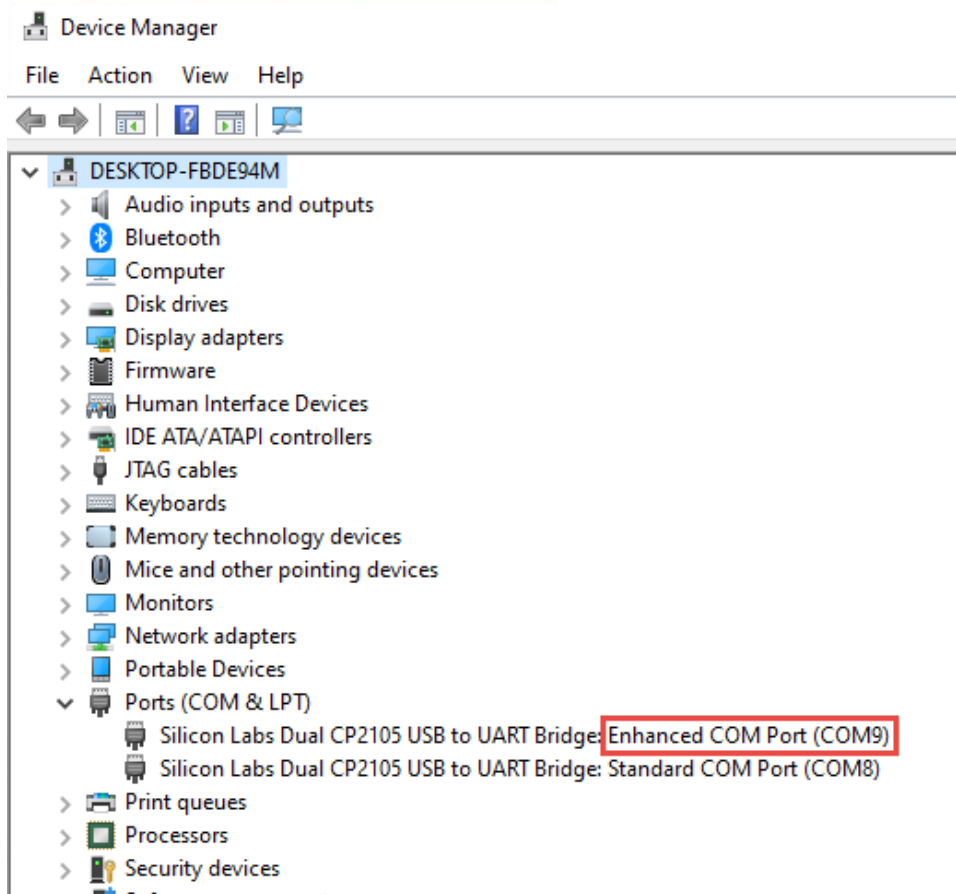


Figure 1-12 Hardware Setup for UART Terminal

2. Make sure the Configure mode switch is set to AS mode.

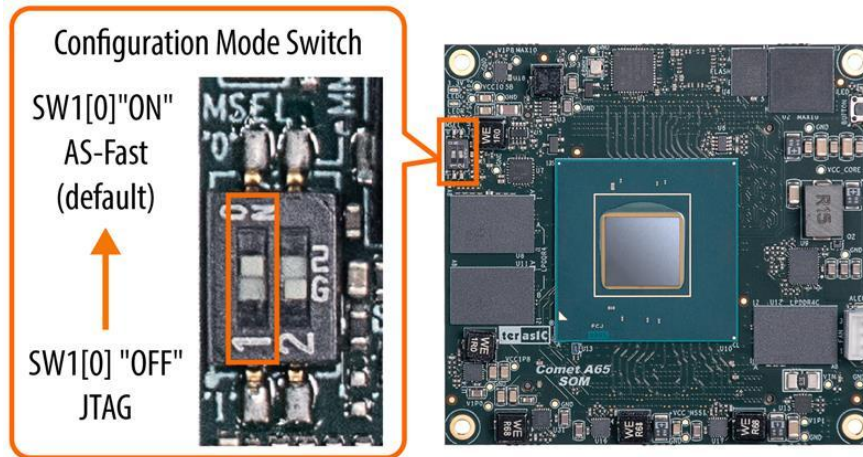


Figure 1-13 Position of slide switches SW1[0]

3. The QSPI flash on the Board had programmed the boot file when shipped.
After power on, user can check if the user LEDR is flashing, and after 10 seconds of booting.
If not, please refer to following steps to re-program the QSPI flash with the factory code.
 - Connect the USB cable to USB blaster III connector of the Board.
 - Copy the factory code from the path :
Resource Package/Demonstration/SoC_FPGA/GHRD/output_files/program_qspi_flash/
 - Execute “flash_program.bat” to erase and program the QSPI flash.
4. Please also confirm which boot device you intend to use, either MicroSD card or eMMC. If you are booting from the MicroSD card, please ensure that SW1[1] on the SOM is set to the "ON" position.

Additional Information

Contact Terasic

Here are the addresses where you can get help if you encounter problems:

■ Terasic Technologies

No.80, Fenggong Rd., Hukou Township, Hsinchu County 303035. Taiwan

Email: support@terasic.com

Web: www.terasic.com

■ Revision History

Date	Version	Changes
2026.05	First publication	