The RPi boards use the Broadcom BCM2835/BCM2836/BCM2837 processor. The different boards use slightly different processors that run between 700MHz and 1.2GHz and are based on ARMv6, ARMv7, ARMv11, and ARMv8 A53 processor cores.

The amount of system memory affects performance and the use of the RPi as a general-purpose computing device. Memory is shared between the CPU and GPU.

The RPi boards all boot from a micro-SD or SD card, with the exception of the Compute module. It has an on-board eMMC, which is effectively an SD card on a chip. The R3 uses a friction-fit slot, rather than a click-in/click-out slot.

There is over-current protection on this input. Be careful not to confuse the USB hub and USB power inputs on the RPi Zero.

40 pins that are multiplexed to provide access to the features listed on the following table rows. Not all functionality is available at the same time. These inputs and outputs are described in detail in Chapter 6 and Chapter 8.

General purpose inputs outputs that are used for reading or writing binary data. The maximum number of GPIOs is 26 on the 40 pin RPi models. All GPIOs are 3.3V tolerant. Using buses and other interfaces reduces the number of available GPIOs.

I 2C is a digital bus that allows you to connect several modules to each of the two-wire buses at the same time. One of these two buses is reserved for HAT support.

The RPi typically (except the RPi 3) has one UART device that is allocated by default to providing a serial console connection. There is at least one hardware PWM output on all RPi boards, and two on more recent boards.

General purpose clocks (GPCLK) allow you to establish accurate timing signals. GPCLK allows you to establish accurate timing signals.

There is an internal USB hub on RPi models with varying numbers of inputs. For example, the RPi 2/3 has five internal USB ports – one is connected to the Ethernet port and the other four are available for external connection.

Can be used as a reset button for the RPi. This topic is described later in Chapter 1.

This provides composite video and stereo audio on more recent boards.

The board is powered (not on the RPi Zero).

There is activity on the board (i.e., it flashes on SD card activity).

This IC provides a USB 2.0 hub and a 10/100 Ethernet Controller. The RPi boards connect to the Internet via USB rather than an on-board Ethernet controller within the SoC.

The RPi has a Mobile Industry Processor Interface (MIPI) Camera Serial Interface (CSI), a 15-pin connector that can be connected to a special-purpose camera. See Chapter 15.

This is an interface that is typically used by mobile phone vendors to interface to a screen display. There are few displays available that support this interface – one example is the 7” Raspberry Pi Touchscreen (800x480 display).