lamaPLC: Raspberryes

The RP2040 is a small, specially engineered silicon chip developed by Raspberry Pi to serve as the central controller for electronic devices.

The Raspberry Pi Pico is a compact green circuit board centered on the RP2040 chip, featuring a USB port, storage memory, and pin connections. This design allows for easy connection to a computer, enabling programming to control electronics such as sensors, lights, and motors.

Feature	RP2040 (The Chip)	Pi Pico (Standard)	Pi Pico H	Pi Pico W	Pi Pico WH	RP2040-Zero	RP2040-ETH
Manufacturer	Raspberry Pi	Raspberry Pi	Raspberry Pi	Raspberry Pi	Raspberry Pi	Waveshare	Waveshare
Dimensions	7 × 7 mm	51 × 21 mm	51 × 21 mm	51 × 21 mm	51 × 21 mm	23.5 × 18 mm	51 × 21 mm
Flash Storage	0 MB	2 MB	2 MB	2 MB	2 MB	2 MB	4 MB
USB Connector	None	Micro-USB	Micro-USB	Micro-USB	Micro-USB	USB Type-C	USB Type-C
Wireless (Wi-Fi/BT)	None	None	None	2.4GHz Wi-Fi & BT 5.2	2.4GHz Wi-Fi & BT 5.2	None	None
Wired Network	None	None	None	None	None	None	RJ45 Ethernet Port
Header Pins	None	Unsoldered (Bare pads)	Pre-soldered	Unsoldered (Bare pads)	Pre-soldered	Unsoldered (Castellated)	Unsoldered
Debug Connector	None	None	3-pin JST-SH	None	3-pin JST-SH	None	None
Onboard Light	None	Green LED	Green LED	Green LED	Green LED	RGB NeoPixel	None
Usable GPIO Pins	30	26	26	26	26	29	14
Logic Voltage (GPIO)	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
Input Voltage (VBUS/VIN)	N/A (Requires exact 1.1V & 3.3V)	1.8V to 5.5V	1.8V to 5.5V	1.8V to 5.5V	1.8V to 5.5V	5.0V (via USB-C or 5V pin)	5.0V (via USB-C or 5V pin)
Software Support	C/C++, MicroPython, CircuitPython	C/C++, MicroPython, CircuitPython	C/C++, MicroPython, CircuitPython	C/C++, MicroPython, CircuitPython	C/C++, MicroPython, CircuitPython	C/C++, MicroPython, CircuitPython	C/C++, MicroPython (with special build)
Network Libraries	None	None	None	network (Wi-Fi), bluetooth	network (Wi-Fi), bluetooth	None	wiznet / custom CH9120 drivers
Primary Usage	Custom circuit design & commercial products	Learning code, DIY hobbies, basic automation	Prototyping without a soldering iron	Smart home, wireless IoT, web servers	Wireless IoT without a soldering iron	Tiny gadgets, wearable tech, macro pads	Hardwired network devices, industrial IoT

RP2040-Zero

The RP2040-Zero is an ultra-compact, low-cost microcontroller development board designed by Waveshare. It is built around the Raspberry Pi RP2040 silicon chip, squeezing the processing power of

a standard Raspberry Pi Pico into a tiny form factor roughly the size of a postage stamp.

Core Hardware Specifications

- **Processor:** Dual-core ARM Cortex-M0+ clocked at 133 MHz.
- **Memory:** 264 KB of internal SRAM and 2 MB of onboard Flash storage for code.
- **USB Interface:** Upgraded USB Type-C port for programming and power.
- **Onboard LED:** Features a single WS2812 RGB LED (NeoPixel) that can be programmed to any color.
- **Pins:** Breaks out 29 GPIO pins (20 via outer pin headers, and 9 via solder pads on the back).