Raspberry Pi RP-005013-UM Expansion Board Installation Guide

Installation Guide for
Raspberry Pi 5 – Module Integration
Document Number: RP-005013-UM

Contents

Executive Summary

The purpose of this document is to provide information on how to use a Raspberry Pi 4 Model B as a radio module when integrating into a host product. Warning: Incorrect integration or use may infringe compliance rules meaning recertification may be required.
This document pertains to variants:

- Raspberry Pi 5 1GB
- Raspberry Pi 5 2GB
- Raspberry Pi 5 4GB
- Raspberry Pi 5 8GB
- FCC ID: 2ABCB-RPI4B

- IC: 20953-RPI4B

Module Description

The Raspberry Pi 5 Single Board Computer (SBC) Module has an IEEE 802.11b/g/n/ac 1×1 WLAN, Bluetooth 5 and Bluetooth LE module based on the Cypress 43455 chip. The module is designed to be mounted, with appropriate screws, into an host product. The module must be placed in a suitable location to ensure WLAN performance is not compromised.

Integration into Products

4.1 Module & Antenna Placement

When locating the Raspberry Pi 5 within a product, a separation distance greater than 20cm must always be maintained between the antenna and any other radio transmitter if installed in the same product. The module is physically attached and held in place by screws.

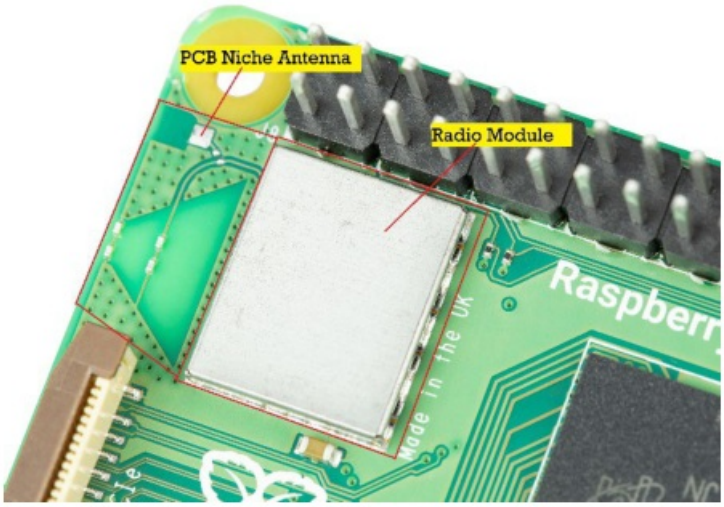

Figure 1 - Radio Circuitry

4.2 External Power Supply – USB Type C

The Raspberry Pi 5 may be powered by a compatible Power Supply Unit (PSU). The supply should be 5V DC minimum 3A. Any external power supply used with the Raspberry Pi 5 must comply with relevant regulations and standards applicable in the country of intended use.

Warning: it is the responsibility of the module integrator to select a suitable PSU. This is to be connected via the J1 connector:

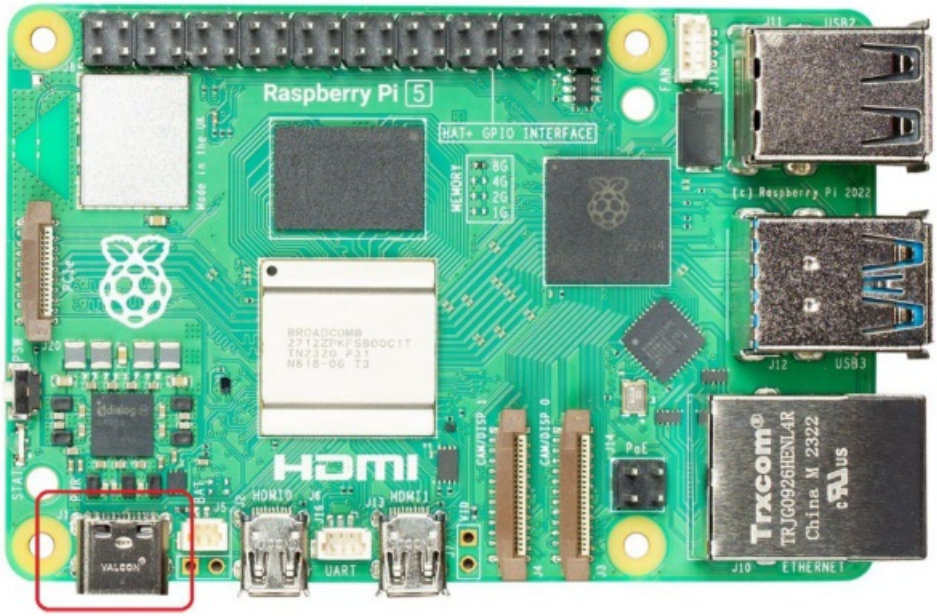

Figure 2 - USB-C Power Connector J1

4.3 External Power Supply – 40 Pin GPIO

The module integrator may choose to power the Raspberry Pi 5 via the 40 Pin General Purpose Input Output (GPIO) header (J8).

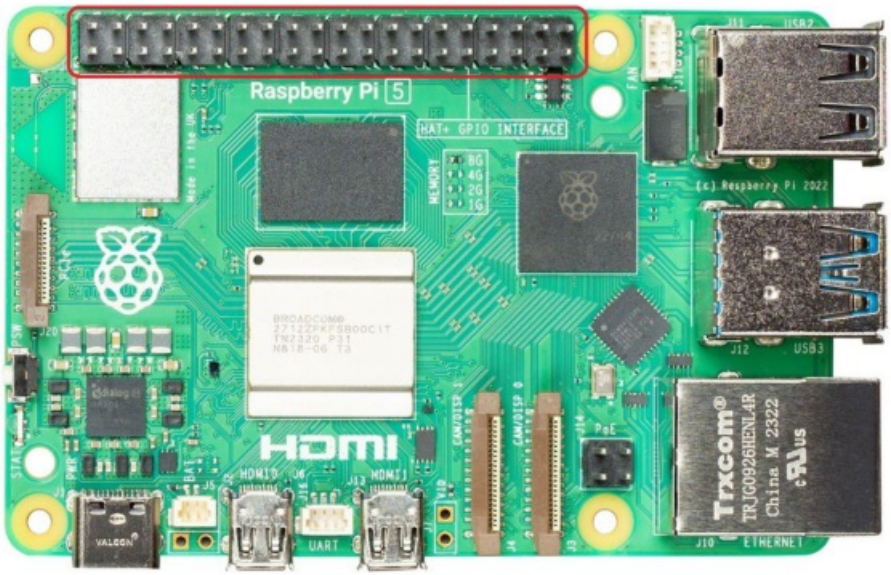

Figure 3 - 40 Pin GPIO Header J8

Connection via this method is at the discretion of the module integrator. Power must be delivered by a suitable power supply. Any external power supply used with the Raspberry Pi 5 shall comply with relevant regulations and standards applicable in the country of intended use.

Warning: it is the responsibility of the module integrator to select a suitable alternative power source and to ensure it is connected adequately. Pins 1 + 3 connected to 5V and pin 5 to GND.

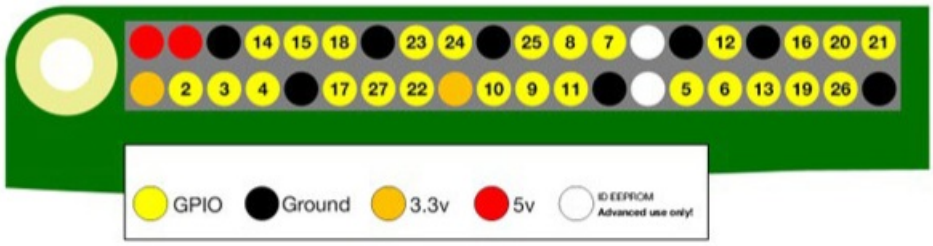

Figure 4 - 40 Pin GPIO Power Supply Example

4.4 Peripheral Connection
Dependent on intended use, the following ports are available to the module integrator;

- Micro HDMI
- Ethernet
- USB2.0 and USB3.0 ports
- DSI Display (for use with Official Raspberry Pi display, sold separately)
- CSI Camera (for use with Official Raspberry Pi Camera module, sold separately)

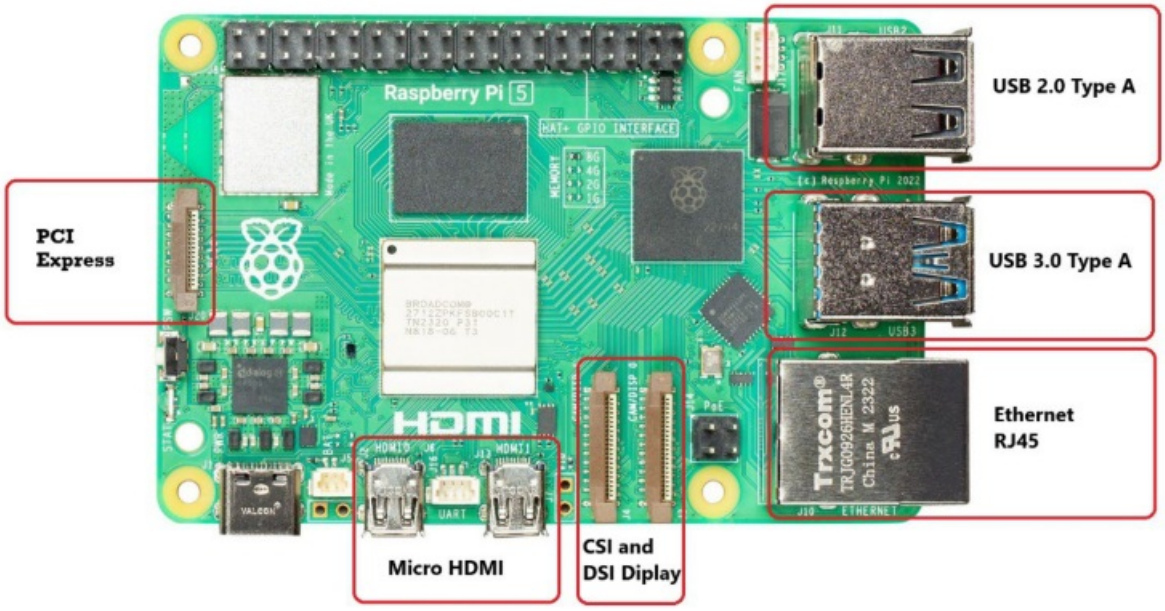

Figure 5 - Peripheral Connections

4.5 Warning to Module Integrators
At no point should any part of the board be altered as this will invalidate any existing compliance work.
Always consult professional compliance experts about integrating this module into a product to ensure that all certifications are retained.
For further information please contact **complaince@raspberrypi.com**
4.6 Antenna Information
The antenna on board is a Dual Band (2.4GHz and 5GHz) PCB niche antenna design licensed from Profant with Peak Gain: 2.4GHz 3.5dBi, 5GHz 2.5dBi. It is important that the antenna is placed suitably inside the product to ensure optimal operation. Do not place close to metal casing. For application specific guidance please contact **applications@raspberrypi.com**.

End Product Labelling

A label is to be fitted to the exterior of all products containing the Raspberry Pi 5. The label must contain the

words “Contains FCC ID: 2ABCB-RPI5” (for FCC) and “Contains IC: 20953-RPI5” (for ISED).

5.1 Federal Communications Commission (FCC) Labelling

Upon integration of the Raspberry Pi 5 the following information must the communicated to the customer of the end product be means of product labelling.

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received including interference that cause undesired operation.

Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user s authority to operate the equipment.

This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a different circuit from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

For products available on the USA/Canada market, only channels 1 to 11 are available for 2.4GHz WLAN

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with

FCC’s multi-transmitter procedures.

This device operates in the 5.15~5.25GHz frequency range and is restricted to in indoor use only.

IMPORTANT NOTE: FCC Radiation Exposure Statement; Co-location of this module with other transmitter that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The device contains an integral antenna hence, the device must be installed to so that a separation distance of at least 20cm from all persons.

5.2 Innovation, Science and Economic Development Canada (ISED) Labelling

Upon integration of the Raspberry Pi 5 the following information must the communicated to the customer of the end product be means of product labelling.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

For products available on the USA/Canada market, only channels 1 to 11 are available for 2.4GHz WLAN Selection of other channels is not possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This

equipment should be installed and operated with minimum separation distance of 20cm between the device and all persons.

Information for the Module Integrator as Original Equipment Manufacturer (OEM)

It is the responsibility of the OEM / Host product manufacturer to ensure continued compliance to FCC and ISED Canada certification requirements once the module is integrated in to the Host product. Please refer to FCC KDB 996369 D04 for additional information. The module is subject to the following FCC rule parts: 15.207, 15.209, 15.247, 15.403 and 15.407. The FCC

Part 15 text must go on the Host product unless the product is too small to support a label with the text on it. It is not acceptable just to place the text in the user guide.

6.1 E-Labelling

It is possible for the Host product to use e-labelling providing the Host product supports the requirements of FCC KDB 784748 D02 e labelling and ISED Canada RSS-Gen, section 4.4. Ela belling would be applicable for the FCC ID, ISED Canada certification number and the FCC Part 15 text.

6.2 Changes in Usage Conditions of this Module

This device has been approved as a Mobile device in accordance with FCC and ISED Canada requirement. This means that there must be a minimum separation distance of 20cm between the Module's antenna and any persons.

A change in use that involves a separation distance ≤20cm (Portable usage) between the Module's antenna and any persons is a change in the RF exposure of the module and, hence, is subject to a FCC Class 2 Permissive Change and a ISED Canada Class 4 Permissive Change policy in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100.

As noted above in this document, this device and its antenna(s) must not be co-located with any other transmitters except in accordance with ISED multi-transmitter product procedures. If the device is co-located with multiple antennas, the module could be subject to a FCC Class 2 Permissive Change and a ISED Canada Class 4 Permissive Change policy in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100. In accordance with FCC KDB 996369 D03, section 2.9, test mode configuration information is available from the Module manufacturer for the Host (OEM) product manufacturer.

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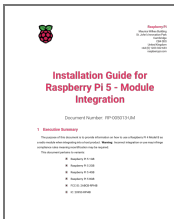
Documents / Resources

	Raspberry Pi RP-005013-UM Expansion Board [pdf] Installation Guide 1GB, 2GB, 4GB, 8GB, RP-005013-UM, RP-005013-UM Expansion Board, Expansion Board, Board

References

- Raspberry Pi