Renesas Bluetooth Low Energy Modules

RYZ012A1 Pmod™ Expansion Board

1. Product Overview

This Pmod™ expansion board provides a quick and easy way to interface with the RYZ012A1 module.

More information about this module can be found on the Renesas website:

https://www.renesas.com/eu/en/products/interface-connectivity/wireless-communications/bluetooth-low-energy-modules/ryz012x1-bluetooth-le-module

2. Pmod™ Interface

2.1 Overview

The RYZ012A1 Bluetooth Low Energy Pmod™ Expansion Board provides an interface using a 12-pin Digilent Pmod™ compatible connector (CN1).

This provides access to:

- A high-speed UART interface (MSTR_CTS)
- An SPI interface (MSTR_SS)
- A mode reset pin (NRST)
- VDD and GND connections for module power

Pmod™ is registered to Digilent Inc. and its specification can be found at the link below:

https://digilent.com/reference/pmod/start

2.2 Pin Diagram

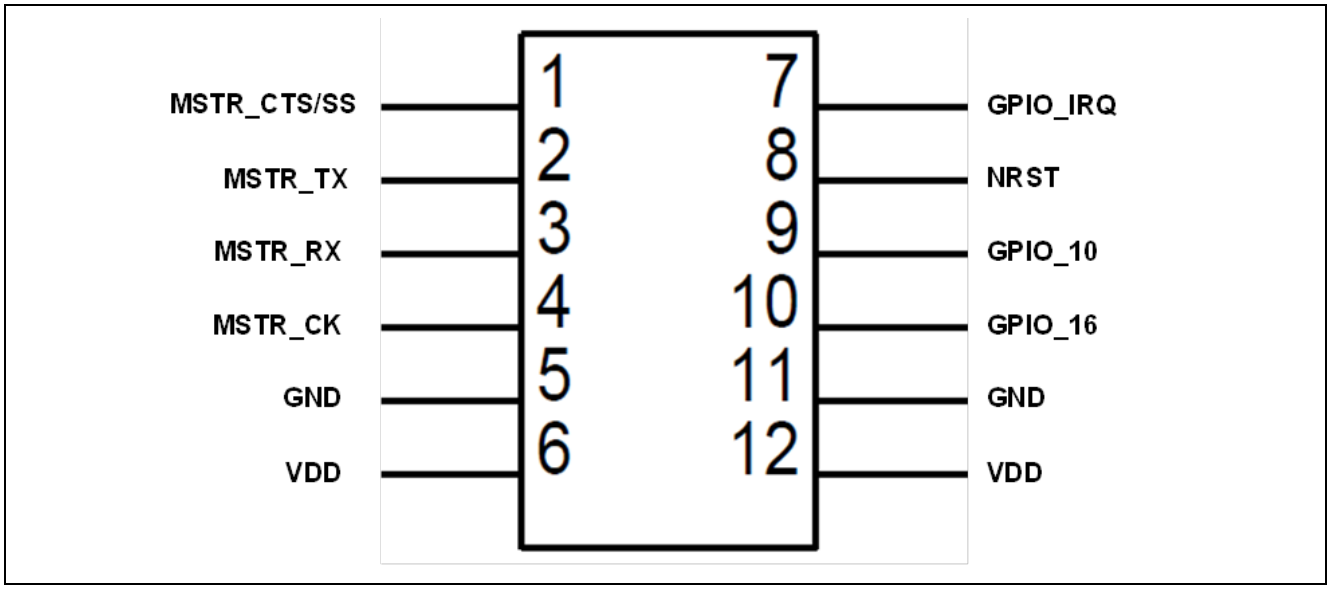

Figure 1. Pin Diagram

2.3 Pin Descriptions and Directions

Table 1. Pin Descriptions and Directions

Pin Number	Pin Name	Description	Direction
1	MSTR_CTS/SS	SPI SS / UART CTS	UART CTS output, or SPI SS output
2	MSTR_TX	SPI DI / UART RX	TX Input to Pmod
3	MSTR_RX	SPI DO / UART TX	RX Output from Pmod
4	MSTR_CK	SPI CK / UART RTS	CLK input to Pmod
5	GND	GND	NA

Pin Number	Pin Name	Description	Direction
6	VDD	3.3 V	NA
7	GPIO_IRQ	INTERRUPT	Input
8	NRST	RESET	Input
9	GPIO_10	UART / SPI Select	Low = UART High = SPI
10	GPIO_16	GPIO	Input/Output
11	GND	GND	NA
12	VDD	3.3 V	NA

Note: RTS/CTS are not supported by the RYZ012A1 Pmod™ Expansion Board.

2.4 Connector CN1 Pin Assignment

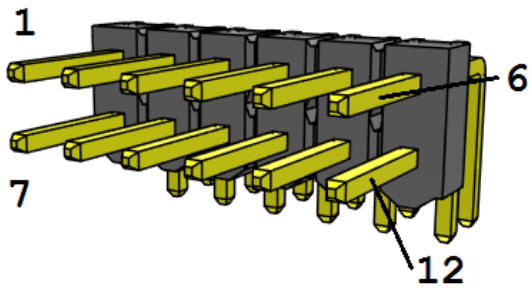

Figure 2. Connector CN1 Pin Assignment

2.5 Electrical Specification

Table 2. Recommended Operating Conditions

Item	Min.	Typ.	Max.
VDD	+1.8 V	+3.3 V	+3.6 V

Please refer to the module data sheet for full electrical specifications.

2.6 Module Control

The high-speed UART or SPI interface can be used to communicate with the module using the Renesas SPP Bluetooth LE Commands.

Software resources are available here:
RTKYZ012A1B00000BE - PMOD Expansion Board for RYZ012x1

2.7 CN2 Connector

CN2 is not fitted, this connector is for programming the module and is not used.

3. Support

For further information about this product and to access further resources such as Application Notes and software from Renesas, please go to: renesas.com/pmod_ryz012a1

4. Note

Third party links in this document may change at any time and are the responsibility of the third party, not Renesas.

5. Regulatory Information

This section contains general regulatory information. For a full list of requirements and integration guidelines please refer to the RYZ012A1 User's Manual.

5.1 FCC Statement

FCC-ID: COR-RYZ012A1

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with 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 an industrial or residential installation. This equipment generates and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference. 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:

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

Caution: Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must be co-located or operating in conjunction with any other antenna and transmitter.

5.2 EU Declaration of Conformity

This device complies with the essential requirements and other relevant provisions of Directive 2014/53/EU. A copy of the Declaration of Conformity is available on request.

Warning – This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be requried to take adequate measures to correct this interference.

5.3 UKCA Declaration of Conformity

This device is in conformity with the following relevant UK Statutory Instrument(s) (and their amendments); No.1206 Radio Equipment Regulations 2017. A copy of the Declaration of Conformity is available on request.

Warning – This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct this interference.

5.4 Japanese Radio Law

R 202-SMJ030

This device is granted pursuant to the Japanese Radio Law (電波法).
This device should not be modified (otherwise the granted designation number will become invalid)
The host product should provide the statement below on its housing:

当該機器には電波法に基づく、技術基準適合証明等を受けた特定無線設備を装着している

(Translation: "This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Radio Law.")

6. Website and Support

Visit the following URLs to learn about the kit and the RA family of microcontrollers, download tools and documentation, and get support.

RYZ012A1 Resources	renesas.com/pmod_ryz012a1
Bluetooth Low Energy Modules	renesas.com/bluetooth-low-energy-modules
Product Support Forum	renesas.com/bluetooth/forum
Renesas Support	renesas.com/support