

# Renesas LTE Cat-M1 Cellular IoT Module RYZ014A Pmod™ Expansion Board

## 1. Product Overview

This Pmod™ expansion board provides a quick and easy way to interface with the RYZ014A module.

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

[RYZ014A - LTE Cat-M1 Cellular IoT Module | Renesas](https://www.renesas.com/en/products/iot-modules/lte-cat-m1-cellular-iot-module-ryz014a)

## 2. Kit Contents

The following components are included in the kit:

1. RYZ014A Pmod™ expansion board
2. LTE Antenna (Taoglas: GSA.8830.A.201111) (SMA Male termination)
3. MVNO SIM Card (MicroAi SIM)



Figure 1. Kit Contents

## 3. Pmod™ Interface

### 3.1 Overview

The RYZ014A LTE Cat-M1 Cellular IoT Module Pmod™ expansion board provides an interface using a 12-pin Digilent Pmod™ compatible connector (CN1).

This provides access to:

- A high-speed UART interface (UART0)
- A reset pin (RESET)
- A PMOD\_RING pin (RING0)
- VDD and GND connections for module power

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

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

### 3.2 Pin Diagram

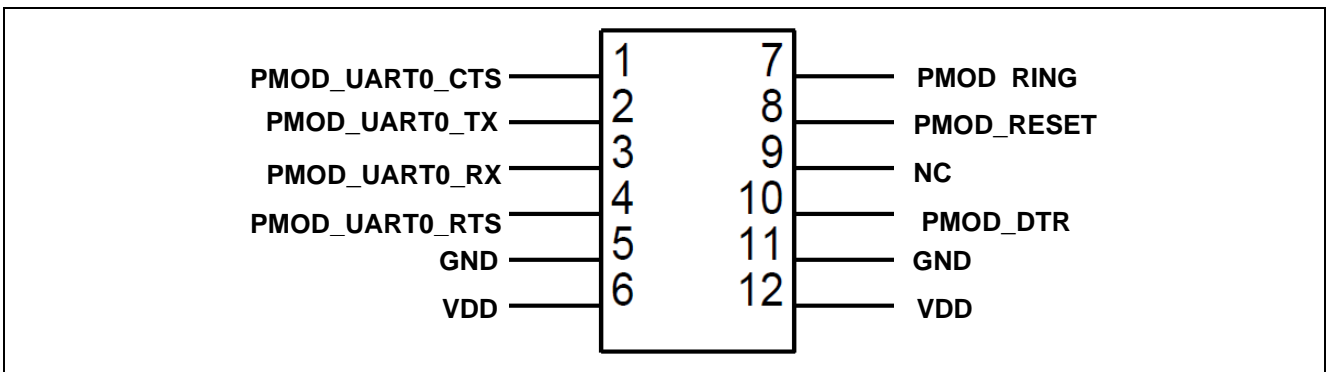


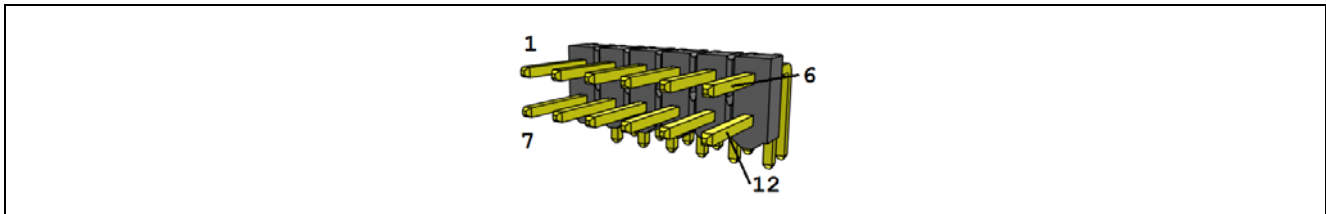
Figure 2. Pin Diagram

### 3.3 Pin Information

**Table 1. Pin Descriptions and Directions**

| Pin Number | Pin Name       | Description                              | Direction                 |
|------------|----------------|--|---------------------------|
| 1          | PMOD_UART0_CTS | UART CTS                                 | UART CTS output from PMOD |
| 2          | PMOD_UART0_TX  | UART TX                                  | TX Input to Pmod          |
| 3          | PMOD_UART0_RX  | UART RX                                  | RX Output from Pmod       |
| 4          | PMOD_UART0_RTS | UART RTS                                 | RTS input to Pmod         |
| 5          | GND            | GND                                      | NA                        |
| 6          | VDD            | 3.3 V                                    | NA                        |
| 7          | PMOD_RING      | RING0 (see module datasheet for details) | Output from PMOD          |
| 8          | PMOD_RESET     | RESET                                    | Input (Active High)       |
| 9          | NC             | Not connected                            |                           |
| 10         | PMOD_DTR       | Reserved for future use. Do not connect. |                           |
| 11         | GND            | GND                                      | NA                        |
| 12         | VDD            | 3.3 V                                    | NA                        |

### 3.4 Connector CN1 Pin Assignment



**Figure 3. Connector CN1 Pin Assignment**

### 3.5 Electrical Specification

**Table 2. Recommended Operating Conditions**

| Item              | Min. | Typ. | Max. | Units |
|-------------------|------|------|------|-------|
| VDD               | 1.8  | 3.3  | 3.6  | V     |
| I <sub>LOAD</sub> | -    |      | 480  | mA    |

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

Note: This Pmod has a maximum operating current of 480 mA dependent upon the LTE band, Tx/Rx settings, and network coverage. Please ensure that the host board can supply sufficient power or provide supplemental USB power via CN4 to avoid RF instability.

### 3.6 Module Control

The high-speed UART interface can be used to communicate with the module using the AT Commands or by using Renesas FSP if you are using an RA MCU. These commands are explained in the following document:

[RYZ014 Modules User's Manual: AT Command \(renesas.com\)](https://www.renesas.com/en/products/iot-modules/ryz014-modules-user-manual-at-command)

Note: This PMOD uses a level shifter NTB0104. The input drive current of this level shifter requires ±2 mA (min). If the MCU cannot communicate with the RYZ014A with the UART, check the current drive capacity of the port on the MCU.

### 3.7 CN2 Connector

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

### 3.8 CN4 Micro USB Connector

CN4 is a Micro USB connector which is used to connect to UART2 of the Module. See the module datasheet for more details on UART2 usage.

You may need to download the FT230xs driver from the FTDI website to communicate with the PMOD through this connector.

### 3.9 CN6 SIM Connector

CN6 is the standard Micro SIM connector.

## 4. Support

For further information about this product and for access to further resources such as Application Notes and software from Renesas please go to: [RYZ014A - LTE Cat-M1 Cellular IoT Module | Renesas](#).

## 5. Note

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

## 6. Regulatory Information

This section contains general regulatory information. For a full list of requirements and integration guidelines please refer to the RYZ014A User's Manual.

### 6.1 FCC Statement



FCC-ID: 2AU6XRZ014A

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.

### 6.2 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 required to take adequate measures to correct this interference.

### 6.3 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.

## 6.4 Japanese Radio Law



003-200328

D200247003

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.”)

## 7. 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.

RYZ014A Resources

RYZ014A Module Integration Guide

LTE Cat-M1 Cellular IoT Modules

Product Support Forum

Renesas Support

[RYZ014A - LTE Cat-M1 Cellular IoT Module | Renesas](#)

[RYZ014A Module Integration Guide Rev.1.00](#)

[Cellular IoT Modules | Renesas](#)

[Wireless Modules | Renesas Customer Hub](#)

[renesas.com/support](https://renesas.com/support)

## Revision History

| Rev. | Date       | Description |   |
|------|------------|-------------|---|
|      |            | Page        | Summary   |
| 1.00 | Mar.31.22  | —           | Initial release   |
| 1.10 | Nov 09. 22 | 2           | In section 3.6, Module Control, added notes about current drive of associated MCU UART pins.<br>In section 3.8, CN4 Micro USB Connector, added notes on need to download FTDI driver for USB device used. |