HMS101-G Wireless Module

Hardware Specifications

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1. Overview

HMS101-G is a compact, low-power, long-range bidirectional wireless transceiver module designed based on HOPERF's CMT2300A high-performance wireless transceiver chip.

The HMS101-G wireless module adopts advanced wireless communication technology, providing outstanding anti-interference capability and stability, ensuring accurate and reliable data transmission. Meanwhile, its low-power characteristics enable the module to maintain good performance during long-term use, saving energy costs.

The module has a wide range of applications, whether in smart homes, industrial automation, or the Internet of Things (IoT) field. Its highly integrated design simplifies installation and deployment, saving you a significant amount of time and effort.

2. Main Technical Parameters

Technical Specifications	Parameters	Remarks
Voltage Range	2.7~3.6V	Typical 3.3V
Frequency Range	915. 25~927.50Mhz	
Output Power	16.94dBm	@915.25MHz
Wireless Rate	250Kbps	
Modulation Method	GFSK	
Crystal Frequency	26MHz	Passive crystal oscillator
Receive Sensitivity	-108dBm	
Receive Bandwidth	300KHz	
Transmit Current	110mA	
Receive Current	31mA	
Driver Interface	UART	
Antenna Characteristic Impedance	Single-ended 50Ω	
Antenna Connection Method	IPEX	
Storage Temperatur	-55° ~+125°	
Operating Temperature	-40° ~+85°	Industrial grade
Dimensions	27.95mmx17.96mmx2.87mm	LxWxH

3. Pin Location Diagram

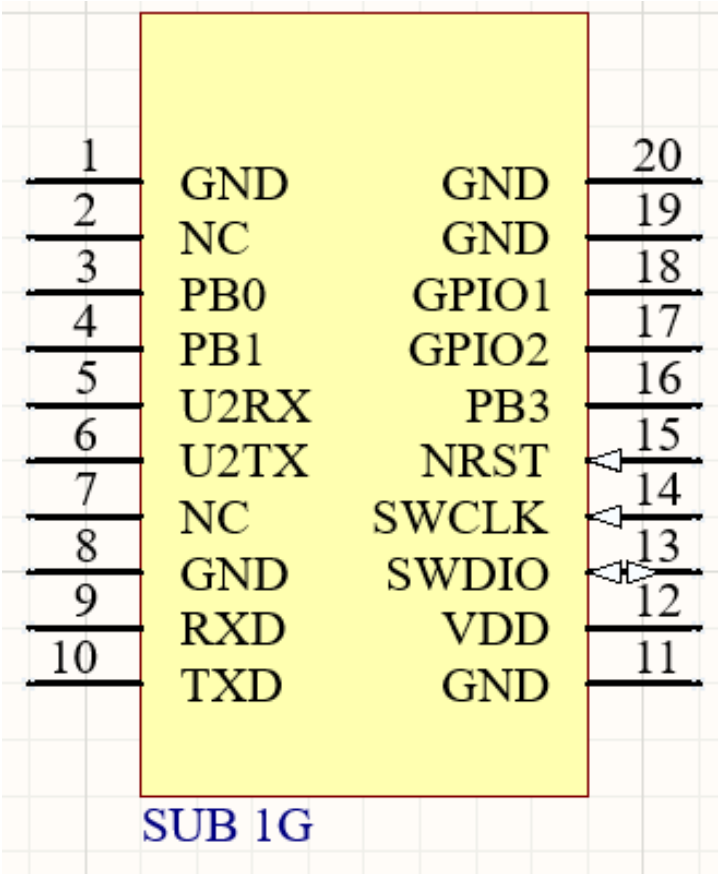

Figure 3-1: Top View Pinout Diagram

4. Pin Descriptions

No	Pin	Type	Description
1	GND	Power Supply	Ground
2	NC	--	
3	GPIOB PB0	O	485_EN
4	GPIOB PB1	I	Module Mode Recognition
5	USART2 RX	I	Reserved for Serial Port
6	USART2 TX	O	Reserved for Serial Port
7	NC	--	
8	GND	Power Supply	Ground
9	USART1 RX	I	Serial Port Data Input
10	USART1 TX	O	Serial Port Data Output
11	GND	Power Supply	Ground
12	VCC	Power Supply	Positive Power Supply
13	SWDIO	I/O	Programming SWD Interface DIO
14	SWCLK	I	Programming SWD Interface CLK
15	NRST	I	Module Reset Pin
16	GPIOB PB3	I/O	General Purpose Input Output Port
17	GPIO2	I/O	Receive Sensitivity Monitoring
18	GPIO1	I/O	General Purpose Input Output Port
19	GND	Power Supply	Ground
20	GND	Power Supply	Ground

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

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

Note: 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 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:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and 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.

RF Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

FCC Label Instructions
If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2ARNB-HMS101V1".
Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement.

ISED RSS Warning/ISED RF Exposure Statement
ISED RSS Warning:
This device complies with Innovation, Science and Economic Development Canada licence-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.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence.L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

An exterior label on OEM's end product can use wording such as the following: "Contains Transmitter Module IC: 24490-HMS101V1" or "Contains IC: 24490-HMS101V1"
L'étiquette externe sur le produit final OEM peut être rédigée comme suit: "contient le module émetteur IC: 24490-HMS101V1" ou "contient le module émetteur IC: 24490-HMS101V1".

ISED RF exposure statement:
This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Le rayonnement de la classe b repecte ISED fixaient un environnement non contrôlés.Installation et mise en œuvre de ce matériel devrait avec échangeur distance minimale entre 20 cm ton corps.Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.

This radio transmitter IC: 24490-HMS101V1 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device

Antenna
Part name: A6040390; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.93 dBi
Part name: A6040414; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.82 dBi
Part name: A6040294; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.13 dBi
Part name: A6040411; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.3 dBi
Part name: A6040286; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.13 dBi
Part name: A6040311 Antenna type: External omnidirectional antenna; Peak antenna gain: -0.84 dBi

OEM Guidance

1. Applicable FCC rules

This device complies with part 15.247 of the FCC Rules.

2. The specific operational use conditions

This module can be used in IoT devices. The input voltage to the module is nominally 3.3V DC. The operational ambient temperature of the module is -40 °C ~ 85 °C. the external antenna is allowed, such as External omnidirectional antenna .

3. Limited module procedures

N/A

4. Trace antenna design

N/A

5. RF exposure considerations

The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. If the equipment built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by 2.1093.

6. Antenna

Part Number: A6040390; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.93 dBi

Part Number: A6040414; Antenna type: External omnidirectional antenna; Peak antenna gain: 0.82 dBi

Part Number: A6040294; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.13 dBi

Part Number: A6040411; Antenna type: External omnidirectional antenna; Peak antenna gain: 0.3 dBi

Part Number: A6040286; Antenna type: External omnidirectional antenna; Peak antenna gain: -0.13 dBi

Part Number: A6040311 Antenna type: External omnidirectional antenna; Peak antenna gain: 0.84 dBi

7. Label and compliance information

An exterior label on OEM's end product can use wording such as the following: "Contains Transmitter Module FCC ID: 2ARNB-HMS101V1" or "Contains FCC ID: 2ARNB-HMS101V1"

8. Information on test modes and additional testing requirements

The modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).

The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.

If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference have been corrected .

9. Additional testing, Part 15 Sub part B disclaimer

The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369. For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation.

When testing the host product, all the transmitters must be operating. The transmitters can be enabled by using publicly-available drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory 50 devices or drivers are not available. When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled. Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 for further general testing details.

The product under test is set into a link/association with a partnering device, as per the normal intended use of the product. To ease testing, the product under test is set to transmit at a high duty cycle, such as by sending a file or streaming some media content.