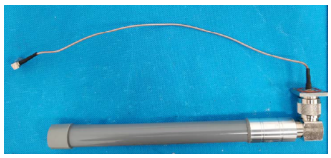
LITIOT MSN00 Wi-SUN Module

The LITIOT MSN00 Wi-SUN module is a low power and high performance RF module based on Wi-SUN chipset. MSN00 complying with Wi-SUN FAN 1.0 support protocols such as CoAP, UDP, TCP, ICMPv6, RPL, 6LoWPAN.

The LITIoT MSN00 is able to carry high-speed and high-bandwidth utilities application, such as advanced metering infrastructure (AMI), distribution automation (DA), integration of distributed energy resources (DER), as street lighting, smart parking, and other smart city applications.

System Components and Product Features



- Comply with IEEE 802.15.4 g/e, certified by Wi-SUN Alliance.
- Support Sub-G band 915MHz, 50kbps/150kbps.
- Provide PKI authentication to ensure device security authentication
- Support OTA upgrade, easy to manage Wi-SUN FAN network.
- With Pin-To-Pin packaging, easy to develop and design.
- External antenna offers enhanced signal strength and flexible layout design

LITIOT MSN00 Wi-SUN Module Specifications

Model / Item		Wi-SUN MSN00 R139
Voltage		4V
Frequency		902-928MHz
Temperature（℃）		-40～85
Power	**Transmitting(mA)**	700
	Receiving(mA)	38
Transmitting Signal(dBm)		For speed 50kbps mode: maximum 27.84 dBm For speed 150kbps mode: maximum 27.78 dBm
Receiving Sensitivity(dBm)		-110dBm@50kbps, -97dBm@150kbps
Speed		50kbps, 150kbps
Modulations		OOK/FSK
Interface Type		Stamp Hole
Communication Protocol		SPI/UART/IIC
Size		28*22*3.1mm
Wi-SUN		Wi-SUN FAN 1.0
Supported Standards		IEEE802.15.4g/e、IPv6、IPv4、6LoWPAN、UDP、TCP、CoAP
Electrostatic Grade		±1KV
Flash		2M Byte
PSRAM		2M Byte/8M Byte, Optional
Certification		Wi-SUN FAN 1.0
Antenna type		Dipole antenna
Antenna gain(Max)		3dBi

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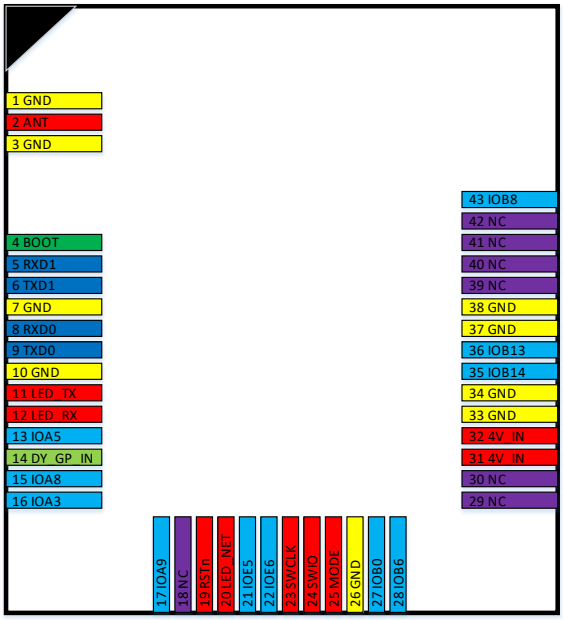
Pin-Out Definition



Pin No.	Name	Note	Pin No.	Name	Note
1	GND	Module GND	24	SWIO	SWD data signal
2	ANT	Module RF interface	25	MODE	Module internal pull-up
3	GND	Module GND	26	GND	Module GND
4	BOOT	Module internal drop-down	27	IOB0	GPIO
5	RXD1	Debug serial port	28	IOB6	GPIO
6	TXD1		29	NC	Not Connected
7	GND	Module GND	30	NC	Not Connected
8	UART_RXD0	Data serial port	31	4V_IN	Module power supply pin
9	UART_TXD0		32	4V_IN	
10	GND	Module GND	33	GND	Module GND
11	LED_TX	Communication LED	34	GND	Module GND
12	LED_RX		35	IOB14	GPIO
13	IOA5	GPIO	36	IOB13	
14	DY_GP_IN	Power failure detection	37	GND	Module GND
15	IOA8	GPIO	38	GND	Module GND
16	IOA3	GPIO	39	NC	Not Connected
17	IOA9	GPIO	40	NC	Not Connected
18	NC	Not Connected	41	NC	Not Connected
19	RSTn	Module internal pull-up	42	NC	Not Connected
20	LED_NET	Network LED	43	IOB8	GPIO
21	IOE5	GPIO			
22	IOE6				
23	SWCLK	SWD clock signal			

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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.

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: 2AWSFMSN00R139".
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.

OEM Guidance

- **Applicable FCC rules**

This device complies with part 15.247 of the FCC Rules.

- **The specific operational use conditions**

This module can be used in IoT devices. The input voltage to the module is nominally 4V DC. The operational ambient temperature of the module is -40 °C ~ 85 °C. the external antenna is allowed, such as dipole antenna.

- **Limited module procedures**

N/A

- **Trace antenna designs**

N/A

- **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.

- **Antennas**

Antenna type: Dipole antenna; Peak antenna gain : 3dBi

- **Label and compliance information**

An exterior label on OEM's end product can use wording such as the following:
"Contains Transmitter Module FCC ID: 2AWSFMSN00R139" or "Contains FCC ID: 2AWSFMSN00R139"

- **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.
The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

- **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 duty cycle, such as by sending a file or streaming some media content.