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HOPERF HPNI01 LoRa Transceiver Module

General Description of HPNI01

HPNI01 is an ultra-low-power, high-performance LoRa transceiver for various frequency of 868,915 MHz wireless applications.It is part of the SEMTECH RF product line, which includes complete transmitters, receivers and transceivers .The high integration of HPNI01 simplifies the peripheral materials needed in the system design. The sensitivity up to – 136 dBm which can optimize the link performance of applications. In addition, HPNI01 also supports Duty-Cycle operation mode, channel interception, high-precision RSSI, power-on reset, noise output and other more functions, which makes the application design more flexible thus to achieve product differentiation design. The working voltage of HPNI01 is 3.3V. When the sensitivity is reaching -136 dBm, it only consumes 12.5 mA current. Thisultra-low power mode can further reduce the power consumption of the chip.

Features

- Frequency Range: 868 915MHz
- Modulation: LoRa
- Data Rate: 0.018~37.5 kbps
- Sensitivity: -136 dBm , BW=125KHz, SF=12
- Voltage Range: 1.8~3.3V
- Receiving Current: 12.5 mA @ BW=125KHz
- BW: Supports a maximum of 500 KHz
- Supports Ultra Low Power Receiving Mode
- Sleeping Current:1.5ua
- 4-wire SPI Interface
- Supports Full-automatic Independent Working Mode

Applications

- Automatic meter Reading
- Home Security&Building automation
- ISM Band Data Communication
- Industrial Monitoring & C
- Security System ntrolling

- Remote Control Application
- Intelligent Instrument
- Supply Chain & Logistics
- Intelligent Agriculture
- Smart City
- Retailing
- Asset Following
- Smart Lighting System
- Smart Parking
- Environmental Monitoring
- Health Monitoring

Product Pin

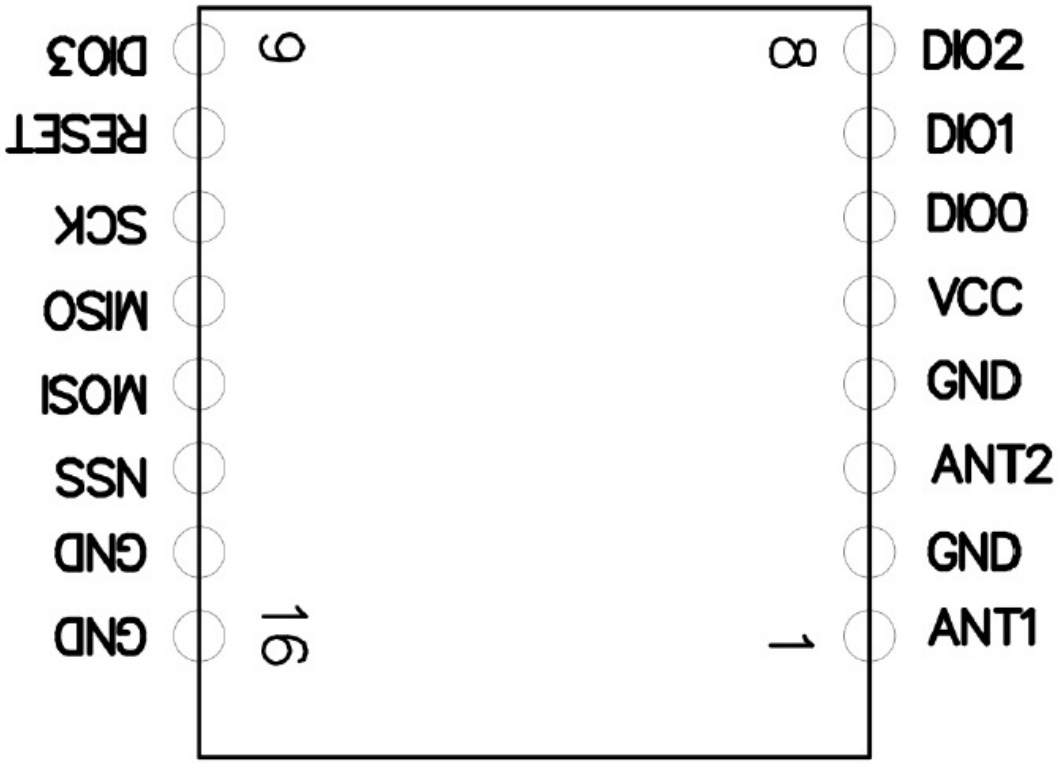


Table1. Module Pin Definition of HPNI01

Pin No.	Pin Name	Description
1	ANT1	Antenna Input &Output TX:14dbm

2,4,15,16	GND	Digital Ground
3	ANT2	Antenna Output TX:20dbm
5	VCC	Voltage 3.3V
6	DIO0	Data Input & Output, Software Configuration
7	DIO1	Data Input & Output, Software Configuration
8	DIO2	Data Input & Output,Receiving Data Output
9	DIO3	Data Input & Output, Software Configuration
10	RESET	Reset, Active Low
11	SCK	SPI clock Input
12	MISO	SPI Data Output
13	MOSI	SPI Data Input
14	NSS	SPI slave Input

Electrical parameters

Testing conditions: Power supply 3.3V, temperature 25℃

Parameter	Symbol	Conditions	Minimum	Typical Value	Maximum	Unit
Supply Voltage	VDD		1.8	3.3	3.7	V
Operating Temperature	T		-40		85	℃

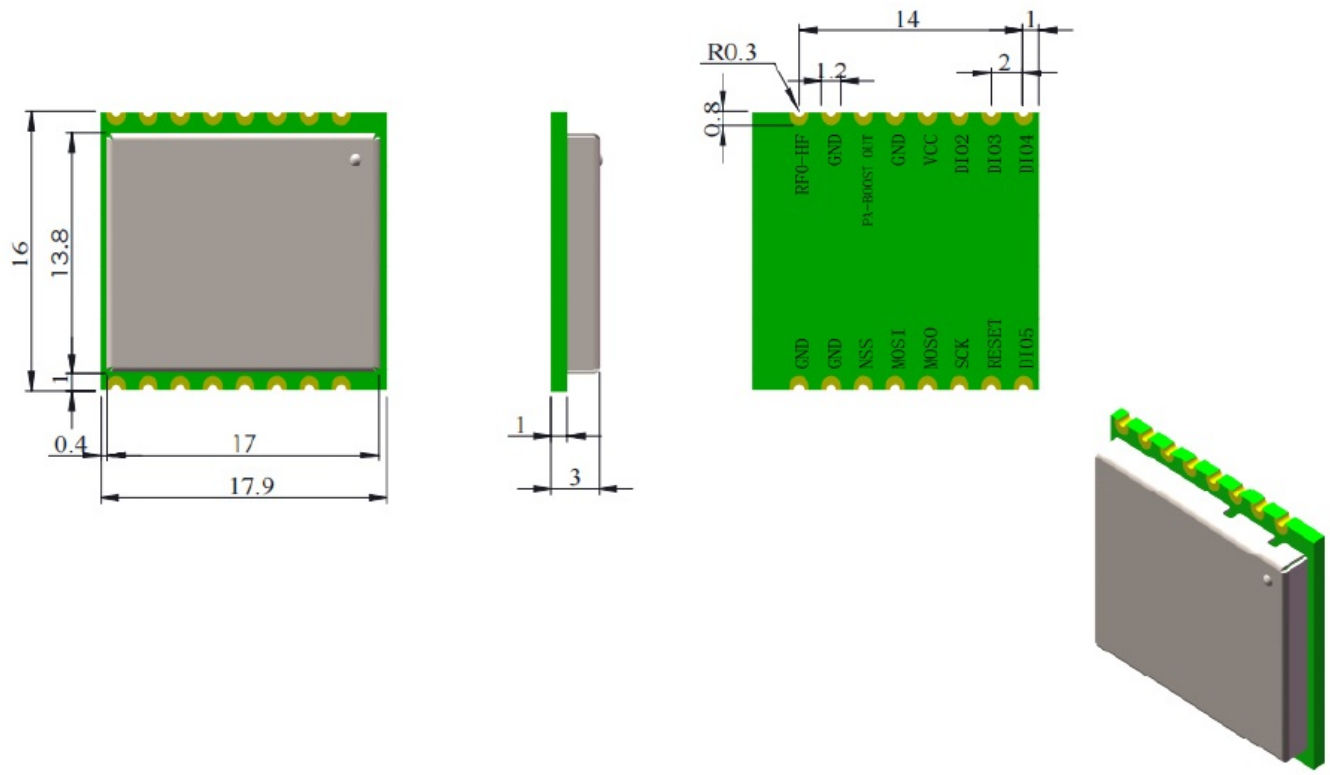
Power Supply Voltage Slope			1			mV/us

Parameter	Symbol	Conditions	Minimum	Maximum	Unit
Supply Voltage	VDD		-0.5	3.9	V
Interface Voltage	VIN		-0.3	3.3	V
JunctionTemperature	TJ		-40	125	℃
Storage Temperature	TSTG		-50	150	℃
Soldering Temperature	TSDR	Last for at least 30s		255	℃
ESD Level[2]	HBM		-2	2	kV

Latch Current	@ 85 ℃		-100	100	mA

Parameter	Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Tolerance	HPNI01		868		MHz
			915		
Transmitting Power	ANT1 VCC=3.3v	–	13	—	dBm
	ANT2 VCC=3.3v	–	18		
Transmitting Current	868MHz ANT1	–	35	60	mA
	868MHz ANT2	–	120	140	
	915MHz ANT1	–	35	60	
	915MHz ANT2	–	120	140	
Receiving Current	868/915MHz	–	12.5	18	mA

Receiving Sensitivity (Lora) SF12, BW 125KHz CR4/5	868/915MHz	–	-136	–	dBm



Pic2. Module Size(Unit:mm)

Revision History

Version	Update date	Update content
V1.0	2024.12.20	Initial release

FCC Statement

1. 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.

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

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.

The device has been evaluated to meet general RF exposure requirements. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.
The Module is designed to comply with the FCC statement. FCC ID is 2ASEO-

HPNI01. The host system using the Module should have a label indicating it contains the modular's FCC ID: 2ASEO-HPNI01. This radio module must not installed to co-locate and operating simultaneously with other radios in host system additional testing and equipment authorization may be required to operating simultaneously with other radio. The Module and its antenna must not be co-located or operating in conjunction with any other transmitter or antenna within a host device.
The modular must be installed in the host that is assigned by Company name: Shenzhen HOPE Microelectronics Co., Ltd, Model no.: HPNI01. If other host types used would need further evaluation and possible C2PC if they are not significantly similar to the one

tested The Module is designed for a compact PCB design. It should be installed and operated with host or other minimum distance of 20 centimeters between the radiator and your body.” To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 2.15 dBi in the 902.0 MHz to 928.0 MHz. The module uses an External Antenna interface and ping angle interface antenna, this antenna is sold with the module.

Notice to OEM integrator

The end user manual shall include all required regulatory information/warning as shown in this manual. The OEM integrator is responsible for testing their end product for any additional compliance requirements required with this module installed. If the final product contains circuits of other FCC PART 15 Subparts, the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. The intended use is generally not for the general public, it is generally for industry/commercial use. The connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter that is not normally required, the user has no access to the connector. Installation must be controlled. Installation requires special training.

This device complies with Part 15 of the FCC Rules

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

ISED Statement

The Module is designed to comply with the ISED statement. ISED Certification Number is 24999-HPNI01. The host system using the Module should have a label indicating it contains the modular’s IC: 24999-HPNI01. This radio module must not installed to co-locate and operating simultaneously with other radios in host system additional testing and equipment authorization may be required to operating simultaneously with other radio. The Module and its antenna must not be co-located or operating in conjunction with any other transmitter or antenna within a host device.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada’s licence-exempt RSS(s).

Operation is subject to the following two conditions:

The max antenna gain (in dBi): 2.15 dBi
Antenna type: External Antenna

Contact Information

- Shenzhen HOPE Microelectronics Co., Ltd.
- Address: 30/F, Building 8, Zone C, Vanke Cloud City, Liuxin 4th Street, Xili, Nanshan, Shenzhen 518055, China
- Tel: +86-755-82973805
- Sales: sales@hoperf.com
- Website: www.hoperf.com

FAQ

- **What is the maximum RF output power of the HPNI01 module?**
  The maximum RF output power of the HPNI01 module is 60dBm.
- **What is the antenna type used with the HPNI01 module?**
  The HPNI01 module uses an External Antenna for operation.

Documents / Resources

	HOPERF HPNI01 LoRa Transceiver Module [pdf] Owner's Manual 2ASEO-HPNI01, 2ASEOHPNI01, hpni01, HPNI01 LoRa Transceiver Module, HPNI01, LoRa Transceiver Module, Transceiver Module, Module

References

- User Manual

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2ASEO-HPNI01, 2ASEOHPNI01, HOPERF, hpni01, HPNI01 LoRa Transceiver Module, LoRa Transceiver Module, Module, Transceiver Module

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