

NB-IoT Module WNB303R

Compact-sized Multi-band
With Ultra-low Power Consumption



NB-IoT Support



B1, B3, B5, B8, B20, B28



AT Commands



Extended Temperature
Range: -40°C to +85°C



Ultra-Low Power
Consumption

Advanced Solutions

WNB303R is high performance NB-IoT module with extremely low power consumption for long battery life up to 10 years. The ultra-low power design is applied at system level, in the different 3GPP modes of operation.

WNB303R supports various interfaces such as UART, I2C, SPI and so on. The module provides customer high flexibility for different kind of applications.

Due to the compact form factor, ultra-low power consumption and good performance, WNB303R is the best choice to be embedded to the design or solution for SmartX applications, ex. smart cities, smart metering and grid, security and asset tracking, environmental monitoring and control, health care monitoring, etc.

1.1. General Description

WNB303R is equipped with 40-pin 1.25mm pitch Stamp Pad of LCC package for PCB SMT mounting. The following chapters provide detailed descriptions of these pins:

- Power supply
- Reset interface
- UART interfaces
- USIM interface
- ADC interface
- I2C interface
- Status indication*
- RF interface
- GPIO / SPI Interface*

“**” means under development.

1.2. Pin Assignment

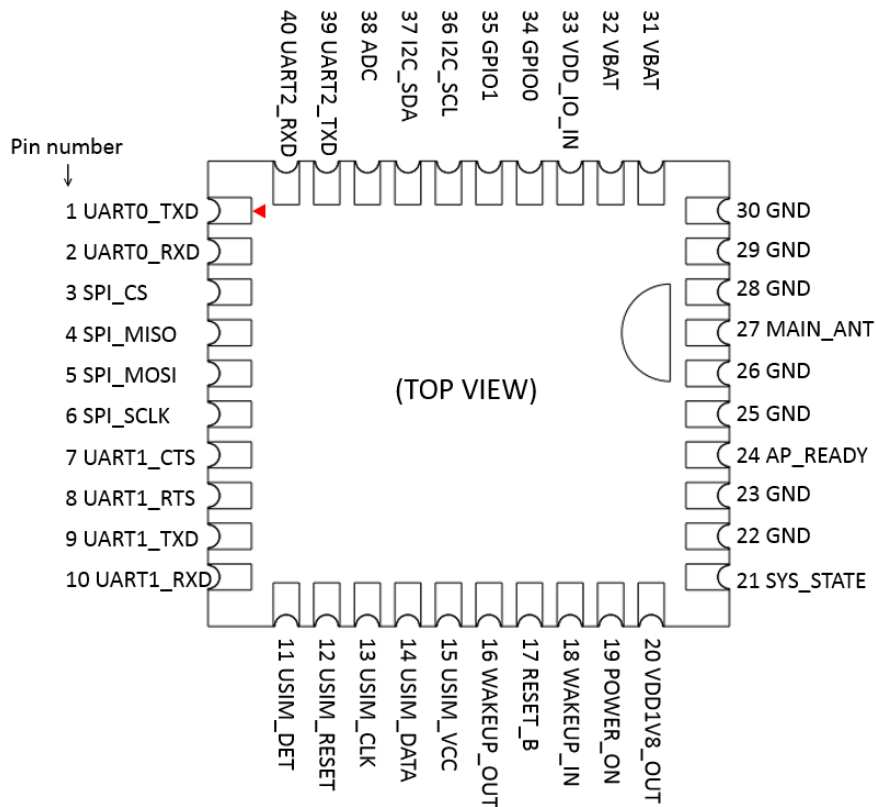


Figure.1 Pin Assignment

1.3. Pin Description

The following tables show the I/O parameters Definition of WNB303R.

Table 1: I/O Parameters Definition

Type	Description
IO	Bidirectional Input / Output
DI	Digital Input
DO	Digital Output
PI	Power Input
PO	Power Output
AI	Analog Input
AIO	Analog Input / Output
GND	Ground

Table 2: Pin Description

Power Supply				
Pin Name	Pin No.	I/O	Description	Comment
VBAT	31, 32	PI	Power supply, Voltage range: 3.3~ 5.0V Typ.: 3.8V	For lower supply voltage as 2.1~3.63V, please contact LITE-ON for WNB302R NB-IoT module.
VDD1V8_OUT	20	PO	Supply voltage for external circuit. VDD1V8_OUT = default 1.8V Io MAX.=TBD	Only used for level match, left unconnected when not used. The VDD1V8_OUT would be off as working at PSM mode
GND	22,23, 25, 26, 28, 29,30	GND	Ground	
Power On/Off				
Pin Name	Pin No.	I/O	Description	Comment

POWER_ON	19	DI	Turn on/off the module	3.3V power domain with Internally pulled up. Active low.
RESET_B	17	DI	Reset the module	3.3V power domain with Internally pulled up. Active low.
Status indication*				
Pin Name	Pin No.	I/O	Description	Comment
SYS_STATE	21	DO	LED control output as network status indication. There are 4 frequency status: 1. (Light OFF) Power OFF 2. (10Hz) Module is powering on or SIM card is not available. 3. (5Hz) SIM card is available and searching the network 4. (1Hz) Online	1.8V power domain If unused, keep this pin open.
UART Interface				
Pin Name	Pin No.	I/O	Description	Comment
UART0_RXD	2	DI	Receive data	3.3V power domain (Please contact LITE-ON for optional IO voltage domain)
UART0_TXD	1	DO	Transmit data	
UART1_RXD	10	DI	Receive data	
UART1_TXD	9	DO	Transmit data	
UART1_RTS	8	DO	Request to send	
UART1_CTS	7	DI	Clear to send	
UART2_RXD	40	DI	Receive data	
UART2_TXD	39	DO	Transmit data	
(U)SIM Interface				
Pin Name	Pin No.	I/O	Description	Comment

USIM_VCC	15	PO	Power output for USIM card. Both 1.8V and 3V SIM Card is support. Output Voltage depends on SIM card types. Automatically switched.	All lines of USIM interface should be protected with ESD component.
USIM_RESET	12	DO	USIM card reset	
USIM_DATA	14	IO	USIM Card data I/O with Internal pulled up	
USIM_CLK	13	DO	USIM card clock	
USIM_DET	11	DI	USIM card detecting input	
ADC Interface				
Pin Name	Pin No.	I/O	Description	Comment
ADC	38	AI	Analog to digital converter input. Voltage range: 0~1.4V.	External analog/sensor signal detection with 10bit accuracy. If unused, keep this Pin open.
I2C Interface				
Pin Name	Pin No.	I/O	Description	Comment
I2C_SDA	37	IO	I2C data input/output	Pull-up to 1.8V through external 2.2K resistance. If not used, keep them open.
I2C_SCL	36	DO	I2C clock output	
RF Interface				
Pin Name	Pin No.	I/O	Description	Comment
MAIN_ANT	27	AIO	Main Antenna PAD	Layout the 50ohm RF trace to Antenna as short as possible.
SPI interface				
Pin Name	Pin No.	I/O	Description	Comment

SPI_CS	3	DO	SPI segment	1.8V power domain (Please contact LITE-ON for optional IO voltage domain) If unused, keep these pins open.
SPI_MOSI	5	DO	SPI main output slave input	
SPI_SCLK	6	DO	SPI clock	
SPI_MISO	4	DI	SPI main input slave output	
GPIO interface				
Pin Name	Pin No.	I/O	Description	Comment
GPIO0	34	IO	General purpose input output	1.8V power domain (Please contact LITE-ON for optional IO voltage domain) If unused, keep these pins open.
GPIO1	35	IO	General purpose input output	
Other Pins				
Pin Name	Pin No.	I/O	Description	Comment
WAKEUP_OUT	16	DO	Output wakeup signal, wake up the external devices	1.8V power domain. Used for module to wakeup MCU (such as this pin will give signal when there is downlink data)
WAKEUP_IN	18	DI	For external device to wakeup module	3.3V power domain. Used for MCU to wakeup module. If module in PSM status, Falling edge can wakeup the module
AP_READY	24	DI	Reserved.	
VDD_IO_IN	33	PI	Reserved.	Do not connect. Please contact LITE-ON for optional IO voltage domain

“*” means under development.

1.4. Mechanical Information

The following figure shows the package outline drawing of WNB303R .

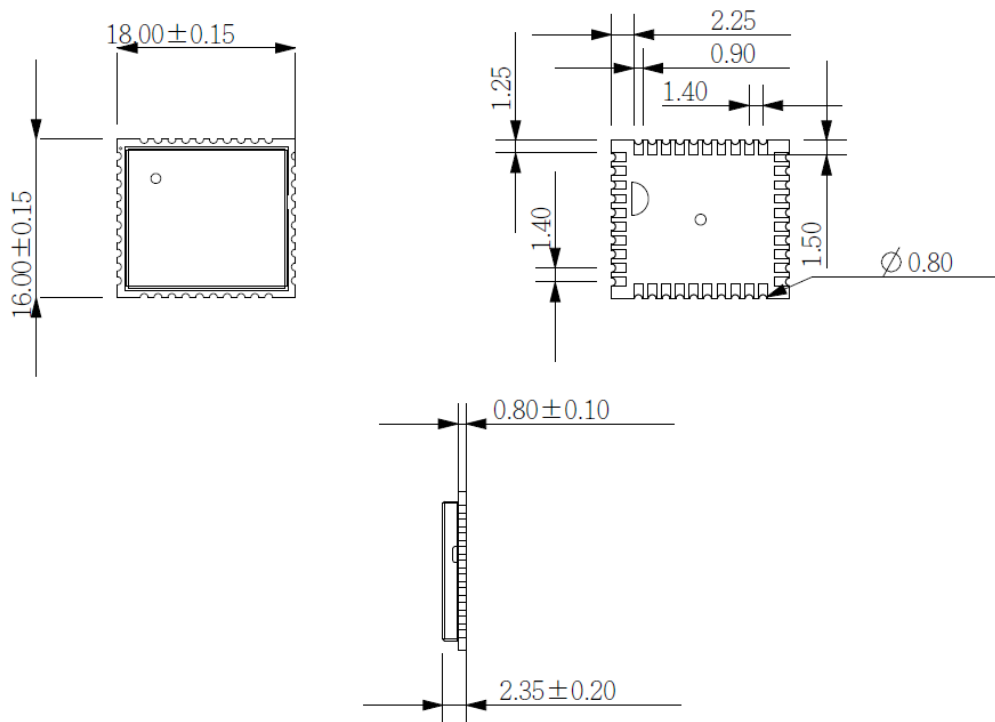


Figure.2 Dimensions (Unit: mm)

1.5. Recommended Footprint

The following figure shows the recommended Footprint of WNB303R.

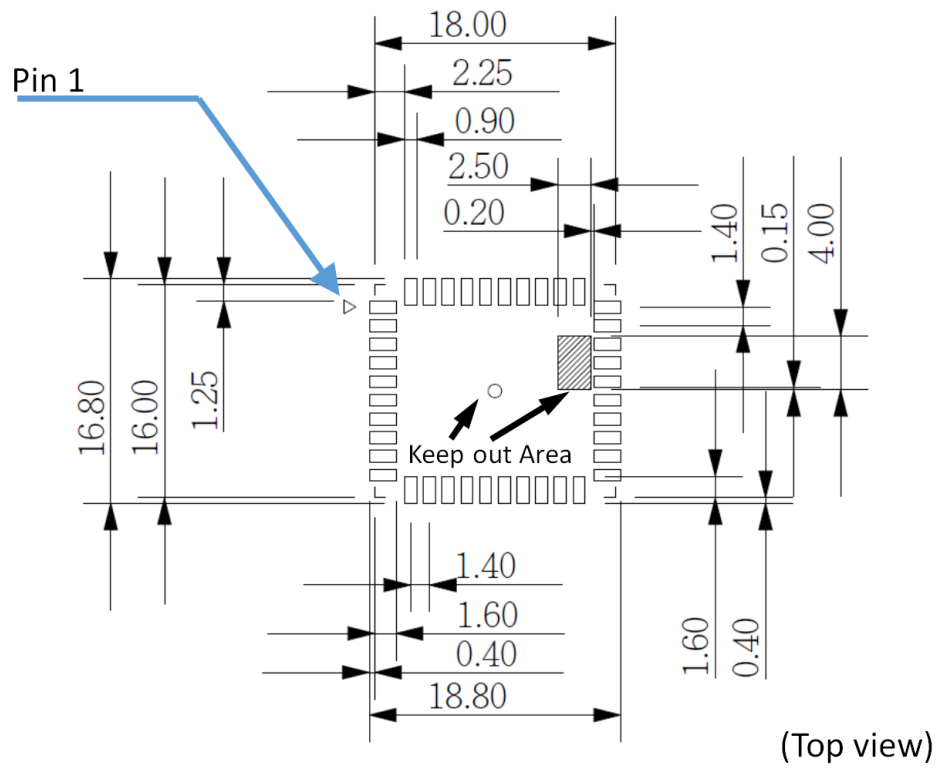


Figure3: Footprint recommendation (Unit: mm)

WNB303R *Under development or planning

■ General Features

- Support 3GPP Rel14 NB-IoT air interfaces and protocols
- Support Band: B1, B3, B5, B8, B20, B28
- Output power: 23 dBm±2dB@ Class 3
- Sensitivity: -115dBm±1dBm @ QPSK
- Control Via AT Commands
- Temperature range: -40°C to +85°C
- Supply voltage: 3.3V to 5V, Typ.:3.8V
- IO voltage: 1.8V(default) or adjustable with externally supplied I/O voltage
- Power consumption:
 - 3.3uA @ PSM
 - TBD@ Idle Mode
 - TBD@ Radio Transmission, 23dBm

■ Other Features

- Support firmware update via UART and FOTA
- Support DRX/eDRX/PSM in the different 3GPP modes of operation

■ Interface

3xUART | I2C | SPI | USIM with 1.8V/3V operation | ADC | GPIO

■ Protocol Stacks

IPv4 | IPv6 | NON-IP | UDP | TCP | CoAP | (D)TLS | LWM2M | MQTT | HTTP(S)

■ Certifications

CE* | FCC* | CCC* | CTA* | GCF* | RoHS Compliant

■ Package

- Low profile and Compact Form Factor: 18.0 x 16.0 x 2.35 mm
- Weight: 1.3g
- 40 Pin Stamp Pad of LCC package



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