LITEON®

NB-IoT Module
WNB303R

WNB303R(HV33): IO 3.3V

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*
- WAKEUP_IN / OUT Siganl

"*" means under development.

1.2. Pin Assignment

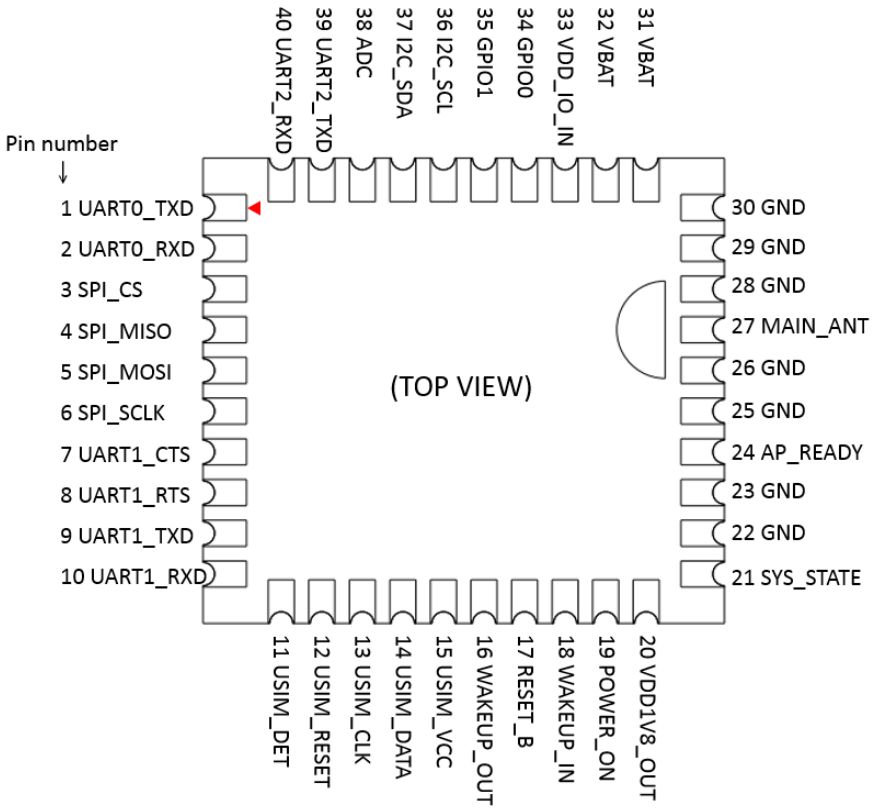

Figure.1 Pin Assignment

1.3. Pin Description

The following tables show the I/O parameters Definition of WNB303R. Please note all the adjustable I/O voltage of pins are under alignment.

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: 2.6～5.5V 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. (2.5V when PSM/Power off)
RESET_B	17	DI	Reset the module	3.3V power domain with Internally pulled up. Active low. (2.5V when PSM/Power off)
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	Adjustable from 1.8 ~3.3V power domain with external IO circuit design. If unused, keep this pin open.
UART Interface				
Pin Name	**Pin No.**	**I/O**	**Description**	**Comment**
UART0_RXD	2	DI	Receive data	Adjustable from 1.8 ~3.3V power domain with external IO circuit design.
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	Adjustable from 1.8 ~3.3V power domain with external IO circuit design. Pull-up with 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	Adjustable from 1.8 ~3.3V power domain with external IO circuit design. 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	Adjustable from 1.8 ~3.3V power domain with external IO circuit design. 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	Adjustable from 1.8 ~3.3V power domain with external IO circuit design. Used for module to wakeup MCU
WAKEUP_IN	18	DI	For external device to wakeup module	3.3V power domain (2.5V when PSM/Power off mode). Used for MCU to wakeup module. If module in PSM status, Falling

				edge can wakeup the module
AP_READY	24	DI	Reserved.	Keep these pins open
VDD_IO_IN	33	PI	Reserved.	Adjustable from 1.8 ~3.3V power domain with external IO circuit design.

"*" means under development.

1.4. Mechanical Information

The following figure shows the package outline drawing of WNB303R .

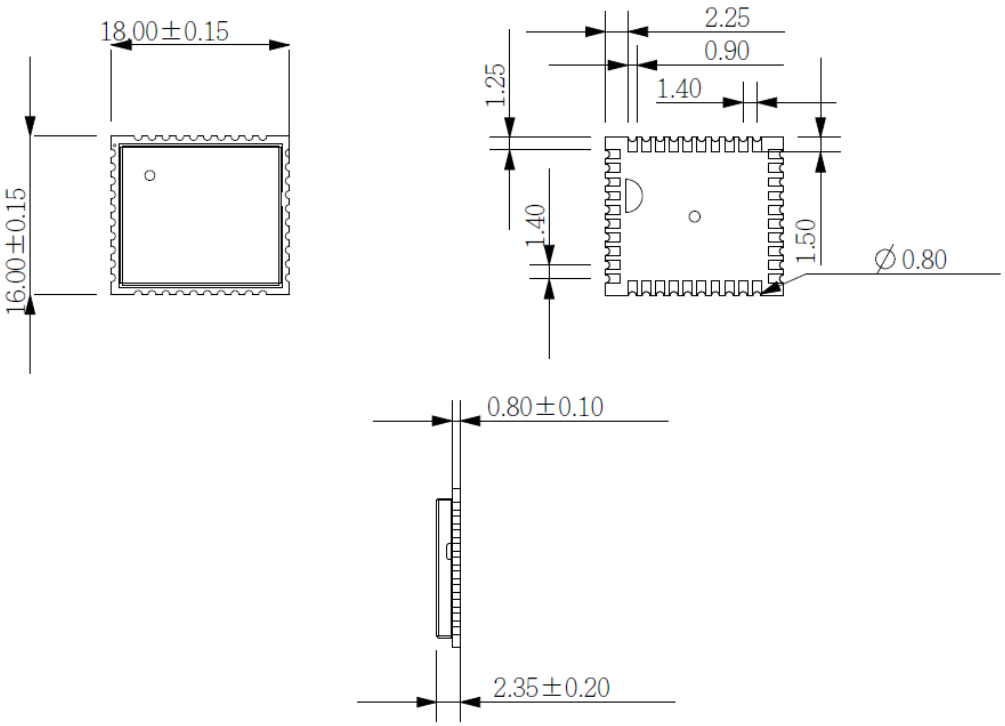

Figure.2 Dimensions (Unit: mm)

1.5. Recommended Footprint

The following figure shows the recommended Footprint of WNB303R.

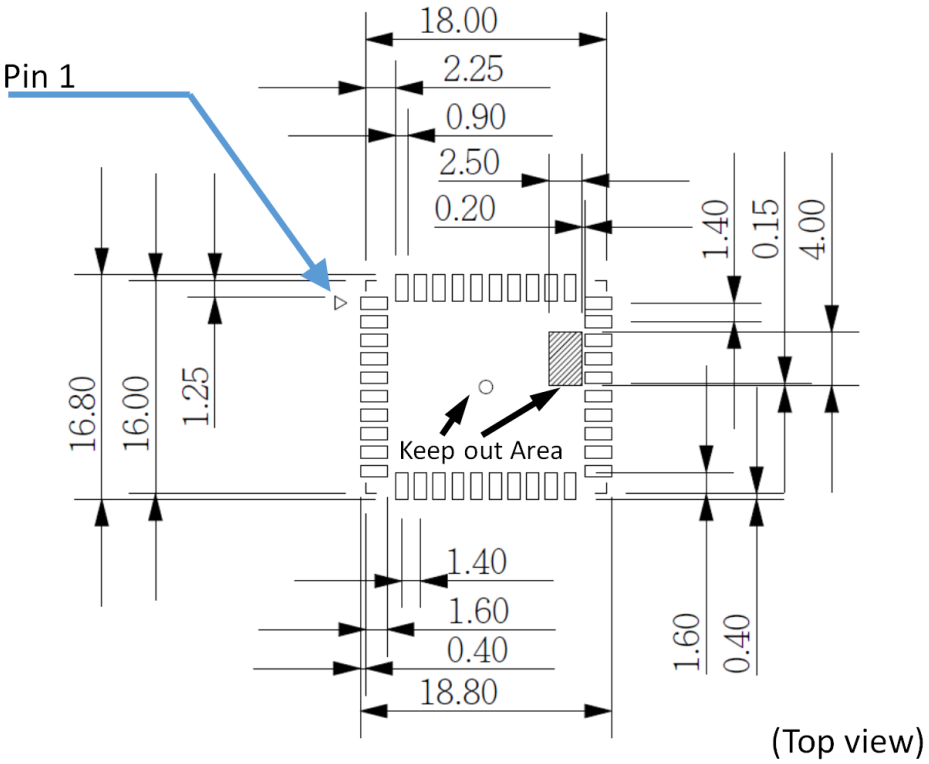

Figure3: Footprint recommendation (Unit: mm)

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: 2.6V to 5.5V, Typ.:3.8V
- IO voltage: 1.8V(default) or adjustable with externally supplied I/O voltage
- Power consumption: 2.8uA @ PSM

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* | TELEC | JATE | NCC |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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