

NORA-W30 series



Stand-alone dual-band Wi-Fi modules with Bluetooth Low Energy

Compact dual-band Wi-Fi modules with embedded MCU

- Dual-band Wi-Fi 4 and Bluetooth Low Energy 5.3
- Dual-core Arm® Cortex®-M33 and -M23 compatible MCU
- Powerful open CPU for advanced customer applications
- Small footprint, multiple antenna options, pin compatible with other NORA modules
- Global certification



10.4 × 14.3 × 1.9 mm



Product description

NORA-W3 series are small, stand-alone dual-band Wi-Fi and Bluetooth Low Energy microcontroller unit (MCU) modules, perfect for integrating wireless connectivity in end products.

With Wi-Fi 4 (802.11a/b/g/n) in the 2.4 and 5 GHz bands it can be a Wi-Fi station connecting to a remote access point or act as an access point. NORA-W30 is Bluetooth 5.3 qualified and can assume peripheral or central roles, or both simultaneously. It can be a GATT client or server.

The module embeds a dual-core MCU with a powerful Arm Cortex-M33 compatible processor for the main application and an Arm Cortex-M23 compatible core for low power operation.

The NORA-W30 series include hardware security features like secure boot, trusted execution environment with Arm TrustZone™, encrypted flash, protection of debug port, and a crypto acceleration engine. Wireless communication is secure with WPA2/WPA3 authentication, TLS 1.2/1.3 encryption, Bluetooth LE secure connection pairing, and HTTPS.

The modules are suited to a wide range of applications, including industrial automation, smart buildings, smart city, medical and health devices, telematics, and point-of-sales.

NORA-W306 comes with an internal PCB antenna to provide a robust low-profile solution with high performance and an extensive range, while NORA-W301 has a module pin to connect to an external antenna of choice. The NORA-W30 series will be globally certified for use with the internal antenna or a range of external antennas, which reduces time, cost and effort for customers integrating Wi-Fi and Bluetooth Low Energy in their designs.

NORA-W30 modules have the same size and position of critical pads and interfaces as other NORA modules. This offers maximum flexibility for the development of similar end-devices with different radio technologies. The modules support operation in an extended temperature range of -40°C to +105°C and are qualified for professional grade applications.

	NORA-W301	NORA-W306
Grade		
Automotive		
Professional	•	•
Standard		
Radio		
Chip inside	Realtek RTL8720DF	
Bluetooth qualification	v5.3	v5.3
Bluetooth Low Energy	•	•
Bluetooth output power EIRP [dBm]	TBD	TBD
Antenna type (see footnotes)	pin	pcb
Wi-Fi 2.4 / 5 [GHz]	2.4 and 5	2.4 and 5
Wi-Fi IEEE 802.11 standards	a/b/g/n	a/b/g/n
Wi-Fi output power EIRP [dBm]	TBD	TBD
Max Wi-Fi range [meters]	TBD	TBD
Application software		
Open CPU for embedded applications	•	•
Interfaces		
UART	◆	◆
USB	◆	◆
SDIO	◆	◆
SPI	◆	◆
I2C	◆	◆
I2S	◆	◆
GPIO pins	21	21
AD converters [number of bits]	12	12
Features		
MCU - main core	Arm Cortex-M33, 200 MHz	
MCU - low power core	Arm Cortex-M23, 20 MHz	
RAM [kB] - main core	512	512
RAM [kB] - low power core	64	64
Flash [MB]	4	4
FOTA	◆	◆
Arm TrustZone	•	•
Secure boot	•	•
WPA2/WPA3	◆	◆

pin = Antenna pin
pcb = Internal PCB antenna

◆ = Feature enabled by HW. Support depends on the open CPU app SW.

Features

Wi-Fi standards	802.11a/b/g/n	
Wi-Fi channels	2.4 GHz: 1-13 (depending on region) 5 GHz: 36-165, U-NII Band 1, 2, 2e, 3 (depending on region)	
Wi-Fi maximum transfer rates	802.11a/g: 54 Mbit/s	802.11b: 11 Mbit/s
	802.11n: 150 Mbit/s	
Output power (conducted)	Wi-Fi 2.4 GHz:	18 dBm
	Wi-Fi 5 GHz:	16 dBm
	Bluetooth Low Energy:	10 dBm
Sensitivity (conducted)	Wi-Fi 2.4 GHz:	-98 dBm
	Wi-Fi 5 GHz:	-93 dBm
	Bluetooth Low Energy:	-97 dBm
Bluetooth	5.3 Bluetooth Low Energy	
Bluetooth PHY rate	1 Mbit/s, 2 Mbit/s	
Antenna	Internal PCB antenna or antenna pin for connecting to an external antenna	

Electrical data

Power supply	3.3 V ($\pm 10\%$)
Power consumption	TBD

Open CPU for customer applications

Customers develop and embed their own application using the Realtek SDK on the NORA-W30 modules (open CPU concept). This section describes the hardware features enabled by the NORA-W30 modules. The SDK environment for the RTL8720DF chip is required to develop connectivity and application software.

MCU system	Main core:	Arm Cortex-M33 compatible, 200 MHz
	Low-power core:	Arm Cortex-M23 compatible, 20 MHz
HW interfaces *	UART USB SDIO SPI I2C I2S ADC GPIO	
Security	Arm TrustZone-M Cryptographic accelerator Secure bootloader Secure debug interface Flash encryption	
Development environment	Realtek Ameba D SDK Arduino IDE	

* Not all simultaneously

Package

Dimensions	10.4 x 14.3 x 1.9 mm
Weight	< 1 g
Mounting	Machine mountable solder pads

Environmental data, quality & reliability

Operating temperature	-40 °C to +105 °C
Storage temperature	-40 °C to +105 °C
Humidity	RH 5-90% non-condensing
RoHS directive	RoHS 2 and RoHS 3

Certifications and approvals¹

Type approvals	Europe (ETSI RED), Great Britain (UKCA), US (FCC/CFR 47, part 15 unlicensed modular transmitter approval), Canada (IC RSS), Japan (MIC), Taiwan (NCC), South Korea (KCC), Australia (ACMA), New Zealand, Brazil (Anatel), South Africa (ICASA)
Health and safety	EN 62479, EN 62368-1, IEC 62311
Medical Electrical Equipment	IEC 60601-1-2
Bluetooth qualification	Low Energy 5.3, qualification pending

¹ = All certifications are pending

Support products

EVK-NORA-W301	Evaluation kit for NORA-W301 module with antenna pin
EVK-NORA-W306	Evaluation kit for NORA-W306 module with internal PCB antenna

Product variants

NORA-W301	Multiradio wireless MCU module, open CPU, with antenna pin
NORA-W306	Multiradio wireless MCU module, open CPU, with internal PCB antenna

Further information

For contact information, see www.u-blox.com/contact-u-blox.

For more product details and ordering information, see the product data sheet.

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