

NORA-W10 series



Stand-alone multiradio modules

Powerful wireless MCU with enhanced security

- Wi-Fi 4 (802.11b/g/n) and Bluetooth Low Energy v5.0
- Powerful open CPU for advanced customer applications
- Small footprint and multiple antenna options with superior RF performance
- AI support for speech and face recognition
- Enhanced security features
- Global certification



10.4 × 14.3 × 1.8 mm



Product description

The NORA-W1 series of stand-alone multiradio modules integrate a powerful 32-bit, dual core microcontroller unit (MCU) and a radio for wireless communication. The radio provides support for 802.11b/g/n Wi-Fi in the 2.4 GHz ISM band and Bluetooth Low Energy (LE) v5.0 communications. The Bluetooth LE subsystem supports advertisement extensions and long range through coded PHY.

The modules come in a host-less, open CPU configuration that allows customer applications to run on the module itself – without any need for a supporting host MCU.

NORA-W10 offers a wireless MCU, flash memory, crystal, and antenna – together with all of the other components required for matching, filtering, and decoupling – in a compact stand-alone multiradio module. It also supports a wide range of IO interfaces, such as GPIO, UART, USB OTG, SPI, I2S, I2C, PWM, RMT, CAN and SD/MMC host.

The modules can be used to design solutions with top-grade security, thanks to integrated cryptographic hardware accelerators, RSA-based secure boot, digital signature, flash encryption, HMAC, and support for running a fully trusted execution environment.

With integral support for neural network inference on the MCU using accelerated vector instructions, NORA-W10 is an ideal candidate for voice- and face-recognition applications.

Device design is simplified, as developers can choose to use an external antenna (NORA-W101) or take advantage of the internal antenna (NORA-W106). Pin-compatible with all other NORA modules, NORA-W10 also provides maximum flexibility for the development of similar devices offering different radio technologies.

As NORA-W10 modules are globally pre-certified, less time is needed for test and validation, thus reducing product time to market. The professional grade modules support an extended temperature range of –40 °C to +85 °C. They are qualified according to u-blox Qualification Policy, based on AEC-Q104.

NORA-W101

NORA-W106

	NORA-W101	NORA-W106
Grade		
Automotive		
Professional	•	•
Standard		
Radio		
Chip inside	ESP32-S3	ESP32-S3
Bluetooth qualification	v5.0	v5.0
Bluetooth low energy	•	•
Bluetooth output power EIRP [dBm]	10	10
Antenna type (see footnotes)	pin	pcb
Wi-Fi 2.4 / 5 [GHz]	2.4	2.4
Wi-Fi IEEE 802.11 standards	b/g/n	b/g/n
Wi-Fi output power EIRP [dBm]	20	20
Max Wi-Fi range [meters]	500	500
Application software		
Open CPU for embedded applications	•	•
Interfaces		
USB OTG	◆	◆
UART - 3x	◆	◆
SPI - 4x	◆	◆
I2C - 2x	◆	◆
I2S - 2x	◆	◆
TWAI® (CAN specification 2.0)	◆	◆
SDIO host controller	◆	◆
DVP camera interface	◆	◆
LCD	◆	◆
PWM	◆	◆
GPIO pins (user available)	38	38
AD converters [number of bits]	12	12
Features		
AI acceleration [bits]	8/16	8/16
Bluetooth mesh	◆	◆
Wi-Fi and Bluetooth co-existence	◆	◆
MCU (see footnotes)	LX7	LX7
RAM [kB]	512	512
Flash [MB]	8	8
Max Wi-Fi data rate [Mbit/s]	150	150
Secure boot	◆	◆
Flash encryption	◆	◆
Isolated execution environment support	◆	◆
Cryptographic hardware acceleration	◆	◆
OTP	◆	◆

pin = Antenna pin
pcb = Internal PCB antenna

LX7 = 240 MHz dual-core Xtensa LX7
◆ = Feature enabled by HW. Support depends on the open CPU app SW.

Features

Wi-Fi standards	802.11b/g/n
Wi-Fi channels	2.4 GHz channels 1-13
Wi-Fi maximum transfer rates	802.11b: 11 Mbit/s 802.11g: 54 Mbit/s 802.11n: 72 Mbit/s (Max, HT20) 150 Mbit/s (Max, HT40)
Output power	Wi-Fi: 20 dBm EIRP Bluetooth low energy: 10 dBm EIRP
Sensitivity (conducted)	Wi-Fi: -97 dBm Bluetooth low energy: -98 dBm
Bluetooth	v5.0 Bluetooth Low Energy
Antenna	Internal antenna or antenna pin for connecting to the external antenna

Electrical data

Power supply	3.0 V to 3.6 V
Power consumption	Wi-Fi Tx 802.11n HT20 16.5 dBm: 286 mA (100% duty cycle) Bluetooth Low Energy 0 dBm: 220 mA (100% duty cycle) Light-sleep mode: 240 µA Deep-sleep mode: 7 µA

Interfaces

All variants	UART USB OTG SPI I2C I2S JTAG TWAI (CAN 2.0 specification) SDIO host DVP LCD PWM GPIO ADC
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Package

Dimensions	10.4 x 14.3 x 1.8 mm
Weight	< 1 g
Mounting	Machine mountable Solder pins

Environmental data, quality & reliability

Operating temperature	-40 °C to +85 °C
Storage temperature	-40 °C to +85 °C
Humidity	RH 5-90% non-condensing

Certifications and approvals

Type approvals	Europe (ETSI RED), United Kingdom (UKCA), US (FCC/CFR 47 part 15 unlicensed modular transmitter approval), Canada (IC RSS), Japan (MIC), Taiwan (NCC) ¹ , South Korea (KCC) ¹ , Australia (ACMA), New Zealand, Brazil (Anatel) ¹ , South Africa (ICASA) ¹
Health and safety	EN 62479, EN 62368-1, IEC 62311
Medical Electrical Equipment	IEC 60601-1-2
Bluetooth qualification	v5.0

¹ = Certifications are pending

Support products

EVK-NORA-W101	Evaluation kit for NORA-W101 module with antenna pin
EVK-NORA-W106	Evaluation kit for NORA-W106 module with internal PCB antenna
USB-NORA-W106	Evaluation kit for NORA-W106 module with internal PCB antenna; USB-stick format

Product variants

NORA-W101	Multiradio wireless MCU module with antenna pin
NORA-W106	Multiradio wireless MCU module 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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