Product summary

NORA-W10 series

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Stand-alone multiradio modules

Standard

Professional

Automotive

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
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]	8	8
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]	18	18
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.

NORA-W10 series

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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 (20 MHz channel bandwidth) 150 Mbit/s (40 MHz channel bandwidth)
Output power	Wi-Fi: 18 dBm EIRP Bluetooth low energy: 8 dBm EIRP
Sensitivity (conducted)	Wi-Fi: –96 dBm Bluetooth low energy: –88 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 16 dBm: 190 mA Bluetooth low energy 0 dBm: 130 mA Light-sleep mode: 0.8 mA Hibernate mode: 5 µA

Interfaces

All variants	UART, USB OTG, SPI, I2C, I2S, CAN, SDIO host, DVP, LCD, PMW, GPIO, ADC

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[1]

Type approvals	Europe (ETSI RED), 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	v5.0, qualification pending

1 = All 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-us.

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