

NANO-S100



Power-optimized RPMA module for the Machine Network™



Industry-leading range, capacity and total cost of ownership

- Ultra low power consumption yielding 10+ years battery life
- Robust and reliable operation supporting quality of service (QoS)
- Separate broadcast channel for rapid FOTA updates
- Excellent extended range in buildings and underground
- Global coverage with a single SKU



22.9 × 33.0 × 3.6 mm

Product description

The u-blox NANO-S100 module is the first generation of u-blox RPMA® modules for the Machine Network™. The LGA form factor and the industry standard 7-wire Serial Peripheral Interface (SPI) allow for easy integration with various host processors.

With -133 dBm sensitivity and with its secured design (meeting NERC CIP and industry mandated critical infrastructure requirements), the NANO-S100 module is ideal to service multiple applications across urban, suburban, below ground, and indoor environments, all on a single network. Furthermore NANO-S100 offers unique advantages, such as a separate FOTA broadcast channel that can rapidly provide critical updates to millions of devices at the same time.

The NANO-S100 module, with only 50 μW (typ.) power consumption in sleep mode, is designed for ultra-low power performance with more than 10 years of battery life for many applications. The end-to-end secure design ensures confidential data transport, as well as secure authenticated device firmware upgrades.

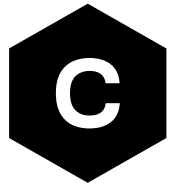
RPMA (Random Phase Multiple Access) technology makes possible a wireless network that represents a breakthrough in wide-area communications for IoT and M2M applications. An RPMA network can cover thousands of miles (each Access Point can support 64 k devices), encompassing entire cities or countries while supporting millions of sensors. Operating in the unlicensed 2.4 GHz ISM (Industrial, Scientific and Medical) band, the Machine Network™ features demonstrated 177 dB of link budget (FCC/IC) for superior connectivity delivering unprecedented range, capacity, robustness and low power consumption, even in the most demanding of environments.

The Machine Network™ includes:

- Access Points communicating in a simple star topology with RPMA-enabled devices.
- Back office software enabling network management and field area data visualization.
- Device and back office integration enabled via industry-standard interfaces.

Product selector

| Model | Region | Access Technology | Interfaces | Features | Grade |
|-----------|--------|-------------------|---------------------------------------|---|--|
| | | RPMA® | UART USB 2.0 7-wire SPI GPIO | FOTA Full hand-over Global roaming Ext. GNSS interface AssistNow software CellLocate® Integrated GNSS Embedded programming | Standard Professional Automotive |
| NANO-S100 | Global | 2.4 GHz | • | • • • | • |



Features

| | |
|------------------------|--|
| Wireless Frequency | 2.4 GHz ISM |
| Radio Spectrum | 80 MHz |
| Occupied Bandwidth | 1 MHz |
| Modulation | Dynamic-Direct Sequence Spread Spectrum (D-SSSS) |
| Multiple Access Scheme | Random Phase Multiple Access (RPMA®) |
| Transmit Power | +23 dBm |
| Receive Sensitivity | -133 dBm |
| Data Throughput | 100 kB per day |
| Link budget | 177 dB (FCC/IC) |

Software features

| | |
|------|--|
| FOTA | Separate broadcast channel for module FW update over the Air. Possibility to also update the application FW. |
|------|--|

Electrical data

| | | |
|-------------------|----------------------------|---------------|
| Power supply | 2.2 V – 5.5 V (3.3 V typ.) | |
| Power consumption | Power off | 0.1 µA (typ.) |
| | Deep sleep mode | 15 µA (typ.) |
| | Idle mode | 15 mA (typ.) |
| | Active mode RX | 85 mA (typ.) |
| | Active mode TX | 245 mA (typ.) |

Interfaces

| | |
|----------------|---|
| Host interface | 7-wire SPI that includes handshaking for deep sleep modes |
|----------------|---|

Package

30 pin LGA (Land Grid Array), 22.9 mm x 33.0 mm x 3.6 mm

Environmental data, quality & reliability

Operating temperature -40 °C to +85 °C

Certifications and approvals

FCC, ISED (formerly known as IC), RED (formerly known as R&TTE), and additional countries as deployed (pending)

Support products

EVK-S10NANO Development kit for NANO-S100

Product variants

NANO-S100 RPMA module, 2.4 GHz

Further information

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

For more product details and ordering information, see the [product data sheet](#).

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