

SARA-R52 series



LTE-M / NB-IoT modules based on u-blox chipset

Designed to provide top performance in both communication and positioning

- Customer applications can run with uCPU on the UBX-R52 chipset
- Delivers accurate and reliable positioning with the u-blox M10 GNSS receiver, concurrent with LTE
- Power optimized and cost-effective positioning with SpotNow receiver
- Cost-effective, power efficient, end-to-end IoT communication with MQTT Anywhere and MQTT Flex



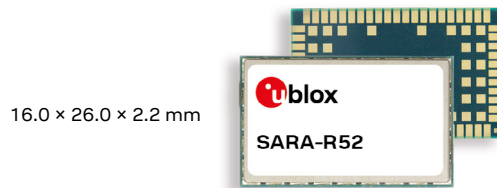
Standard



Professional



Automotive



Product description

The SARA-R52 series is the second generation of SARA-R5 modules based on u-blox's UBX-R52 cellular chipset and the u-blox M10 GNSS receiver chip. By bringing all technology building blocks in house and having full hardware and software ownership, u-blox provides long-term device availability and lifetime support of the entire platform, down to the chipset level. The modules support LTE Cat M1 and LTE Cat NB2 technologies based on a comprehensive set of 3GPP Rel. 14 and Rel. 15 features that are relevant for IoT applications, including improvements on power consumption, coverage, data rate, and mobility. With the integrated uCPU, customers can run their applications on the UBX-R52 chipset, and thus omit need for an external MCU.

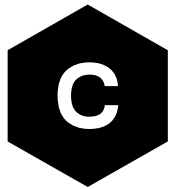
The SARA-R52 series includes a variant for general purpose LTE connectivity and a variant with an additional GNSS receiver. SARA-R520M10 is pre-integrated with the u-blox M10 GNSS receiver to deliver best-in-class positioning data concurrent with the LTE communication, making it the ideal solution for continuous or cyclic tracking applications. On SARA-R520, SpotNow provides location information. It is a new cost-optimized positioning feature running directly on the UBX-R52 chipset to remove the need for a dedicated internal or external GNSS receiver. SpotNow is based on a power-optimized assisted GPS receiver solution, for occasional tracking use cases.

The SARA-R52 modules deliver state-of-the-art security thanks to their secure boot, secure updates, and secure production implementations.

All versions support u-blox's communication services – MQTT Anywhere or MQTT Flex – by which data overhead, time spent on-the-air, and energy consumption can be reduced, thus enabling users to extend device life cycles, lower costs, and improve ROI. SARA-R52 is AWS IoT Core qualified and Microsoft Azure certified.

| | SARA-R520 | SARA-R520M10 |
|--------------------------------------|--|--------------|
| Grade | | |
| Automotive | | |
| Professional | • | • |
| Standard | | |
| Regions | | |
| | Global | Global |
| Access technology | | |
| LTE bands | 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85 | |
| Data rate | M1/NB2 | |
| LTE Power class | 23 dBm | |
| Positioning | | |
| Integrated GNSS receiver | | • |
| Integrated u-blox SpotNow receiver | • | |
| Dedicated GNSS antenna interface | • | • |
| External GNSS control | • | |
| Compatible u-blox Services | | |
| MQTT Anywhere, MQTT Flex | • | • |
| AssistNow™ | • | • |
| CellLocate® | • | • |
| Interfaces | | |
| UART | 2 | 2 |
| USB (for diagnostics) | 1 | 1 |
| DDC (I2C) | 1 | 1 |
| USIM | 1 | 1 |
| ADC | 1 | 1 |
| GPIO | 6 | 6 |
| Features | | |
| Open CPU (uCPU) | • | • |
| Secure boot, updates, and production | • | • |
| u-blox Smart Connection Manager | • | • |
| Antenna dynamic tuning | • | • |
| Ultra low PSM | • | • |
| HTTP, FTP | • | • |
| TCP/UDP | • | • |
| TLS/DTLS | • | • |
| MQTT, MQTT-SN | • | • |
| CoAP and LwM2M | • | • |
| FW update via serial (FOAT) | • | • |
| uFOTA | • | • |
| Last gasp | • | • |
| Jamming detection | • | • |
| Antenna and SIM detection | • | • |
| CellTime | • | • |

M1 = LTE Cat M1 (588 kb/s DL, 1200 kb/s UL)
 NB2 = Cat NB2 (125 kb/s DL, 140 kb/s UL)



Features

| | |
|-----|---|
| LTE | 3GPP Release 13, 14 (partial support), 15 (partial support) for LTE Cat M1 and LTE Cat NB2 Cat M1 Half-duplex, 588 kb/s DL, 1200 kb/s UL Cat NB2 Half-duplex, 125 kb/s DL, 140 kb/s UL |
| SMS | MT/MO PDU / text mode SMS over SG/NAS |

Compatible u-blox services

| | |
|---------------|----------------------------|
| Communication | MQTT Anywhere MQTT Flex |
| Location | AssistNow CellLocate |

Software features

| | |
|------------------|--|
| Protocols | Dual stack IPv4 and IPv6 PPP over IPv4 and IPv6 Embedded TCP/IP, UDP/IP, FTP, HTTP, DNS Embedded MQTT and MQTT-SN Embedded CoAP and LwM2M Embedded TLS/DTLS SIM provisioning (BIP) |
| Positioning | Dedicated GNSS antenna interface Integrated u-blox M10 chip with concurrent GNSS ¹ (GPS, BeiDou, Galileo) Integrated u-blox SpotNow A-GPS receiver ² Direct access to external u-blox GNSS via module ² |
| Functionalities | Antenna dynamic tuning CellTime for robust and accurate timing reference Last gasp Jamming detection Antenna and SIM detection |
| Firmware upgrade | Via UART uFOTA client/server solution (firmware upgrade over the air) |

1 = On SARA-R520M10
2 = On SARA-R520

Interfaces

| | |
|--------|---|
| Serial | 8-wire UART, configurable as 2x 4-wire UART with ring indication DDC (I2C) USB for diagnostics |
| GPIO | Up to 6 GPIOs, configurable |
| (U)SIM | Supports 1.8 V and 3.0 V |

Package

96 pin LGA: 16.0 x 26.0 x 2.2 mm, < 3 g

Environmental data, quality & reliability

| | |
|---|------------------|
| Operating temperature | -40 °C to +85 °C |
| RoHS compliant (lead-free) | |
| Qualification according to AEC-Q104 | |
| Manufactured in ISO/TS 16949 certified production sites | |

Certifications and approvals

| | |
|------------------------------|---|
| SARA-R52 series ³ | FCC, ISED, GCF, PTCRB, AT&T with FirstNet, Verizon, T-Mobile, Telus, RED, Orange, Deutsche Telekom, Giteki, RCM, Telstra, NCC |
| SARA-R52 series | AWS IoT Core qualified Microsoft Azure certified |

3 = Planned certifications

Electrical data

| | |
|--|-------------------------------------|
| Power supply | 3.8 V nominal, range 3.0 V to 4.5 V |
| PSM current consumption | 0.5 µA |
| eDRX current consumption | 200 µA |
| LTE Cat M1 Connected mode current consumption | 195 mA (at 23 dBm) |
| LTE Cat NB2 Connected mode current consumption | 135 mA (at 23 dBm) |

Support products

| | |
|------------------|---------------------------------|
| EVK-SARA-R520 | Evaluation kit for SARA-R520 |
| EVK-SARA-R520M10 | Evaluation kit for SARA-R520M10 |

Product variants

| | |
|--------------|--|
| SARA-R520 | LTE-M and NB-IoT module for global use |
| SARA-R520M10 | LTE-M and NB-IoT module with integrated u-blox M10 GNSS receiver for global use |

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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