Product summary
SARA-R52 series

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

C

Standard

Professional

Automotive

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
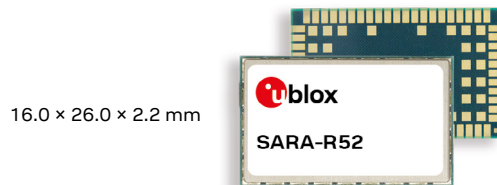
16.0 × 26.0 × 2.2 mm

SARA-R52

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)

SARA-R52 series

C
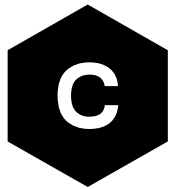
Features

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, Verizon, AT&T, US Cell, T-Mobile, Telus, RED, UKCA, Vodafone, 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.