

# SARA-R500E



## LTE-M module with integrated SIM and bundled connectivity

### Designed to last an IoT lifetime: 5G-ready with the u-blox UBX-R5 chipset

- Integrated SIM with various connectivity plans
- No need for external SIM, SIM holder, or related components
- Enhanced robustness and reliability
- Cost-effective, power efficient, reduced total solution footprint



### Product description

The SARA-R500E module is based on u-blox's UBX-R5 cellular chipset, and is the first module with an onboard integrated SIM and bundled LTE-M connectivity.

The integrated SIM contains all the attributes and features needed to connect the module to the cellular network. Like a standard SIM card, which it replaces, the integrated SIM inside the SARA-R500E allows the module to connect to the LTE-M network, and is specifically intended for the North American market. The SIM profile and settings are preconfigured, requiring no customer intervention, thus providing a real out-of-the-box connectivity experience.

SARA-R500E supports a comprehensive set of 3GPP Rel. 14 features that are relevant for IoT applications, like improvements to power consumption, coverage, data rate, mobility, and positioning. It is 5G-ready, meaning customers will be able to (software) upgrade their deployed devices, once 5G LTE has been rolled out by mobile operators, greatly improving end-product scalability and lifetime.

The module is designed for customer applications with strong robustness, security, and compactness requirements. The integrated SIM cannot be stolen or removed, thus meeting the requirements of sealed devices.

The integrated SIM saves costs and board space, since the SIM card holder and related circuitry are not required. It also eliminates the need to separately source a SIM card and a connectivity plan, as both are offered by u-blox with the SARA-R500E; customers only need to activate it by using the u-blox Thingstream Platform and then choose their preferred data plan.

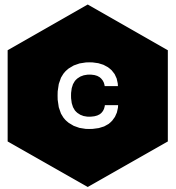
The SARA-R500E gives the option to subscribe for a general purpose connectivity plan or the u-blox MQTT Anywhere communication service.

SARA-R500E

Grade	
Automotive	
Professional	•
Standard	
Regions	North America
Access technology	
LTE bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85
Data rate	M1
LTE Power class	23 dBm
Positioning	
External GNSS control	•
Compatible u-blox Services	
MQTT Anywhere	•
AssistNow™	•
CellLocate®	•
Interfaces	
UART	2
USB (for diagnostics)	1
DDC (I2C)	1
GPIO	6
Features	
Integrated SIM	•
Secure boot, updates, and production	•
MQTT, MQTT-SN	•
Antenna dynamic tuning	•
HTTP, FTP	•
TCP/UDP	•
TLS/DTLS	•
FW update via serial (FOAT)	•
uFOTA	•
CoAP and LwM2M	•
Last gasp	•
Jamming detection	•
Antenna and SIM detection	•
CellTime	•

M1 = LTE Cat M1 (375 kb/s DL, 1200 kb/s UL)

□ = Available in future FW version



## Features

LTE	<b>3GPP Release 13 LTE Cat M1</b> <b>3GPP Release 14 LTE Cat M1</b> : Coverage enhancement mode B, Uplink TBS of 2984b, Clot optimizations, and Release Assistance Indication (RAI) Cat M1 Half-duplex, 375 kb/s DL, 1200 kb/s UL
SMS	MT/MO PDU / text mode SMS over SG/NAS

## Compatible u-blox services

Communication	MQTT Anywhere
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	Direct access to u-blox GNSS via module
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)

## 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-R500E	FCC, ISED, PTCRB, AT&T, RED
SARA-R500E	AWS IoT Core qualified Microsoft Azure certified

## Electrical data

Power supply	3.8 V nominal, range 3.0 V to 4.5 V
PSM current consumption	62 µA
eDRX current consumption	180 µA
LTE Cat M1 Connected mode current consumption	195 mA (at 23 dBm)

## 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

## Support products

EVK-R500E	Evaluation kit for SARA-R500E
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## Product variants

SARA-R500E	LTE-M module with integrated SIM and connectivity for North America
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## Further information

For contact information, see [www.u-blox.com/contact-u-blox](http://www.u-blox.com/contact-u-blox).

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

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