

LEXI-R520 module



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

Ideal for slim designs requiring positioning and computation capabilities

- Customer applications can run with uCPU on the UBX-R52 chipset
- Guaranteed coverage with 23 dBm output power
- 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 × 16.0 × 2.0 mm



Product description

The LEXI-R520 IoT module in a compact 16 x 16 mm form factor is based on the u-blox UBX-R52 cellular chipset. LEXI-R520 occupies about 60% of SARA-R520's PCB space without affecting the overall LTE and positioning performance, making it ideal for size-constrained devices like personal/pet trackers, telematics, industrial automation and monitoring, smart city and smart building, payments, micromobility, and connected healthcare. LEXI-R520 supports power class 3 (PC3), with a maximum output power of 23 dBm across all the bands, ensuring robust connections and preventing data retransmission effects at cell edges.

Thanks to the full ownership of the hardware and software building blocks, u-blox can provide the longest device availability and lifetime support for the entire R5 platform, down to the chipset level.

The module supports 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.

Location information on LEXI-R520 is provided by SpotNow, the cost-optimized positioning feature running directly on the UBX-R52 chipset, which removes the need for a dedicated internal or external GNSS receiver. SpotNow is based on an Assisted GPS receiver solution, which is power-optimized for occasional tracking use cases. Alternatively, position can be estimated via LTE cell station signaling data using CellLocate, which also eliminates the need of a dedicated GNSS antenna. LEXI-R520 is compatible with u-blox's MQTT Anywhere and MQTT Flex communication services 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.

LEXI-R520

Grade	
Automotive	
Professional	•
Standard	
Regions	
	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 u-blox SpotNow receiver	•
Dedicated GNSS antenna interface	
External GNSS control	•
Compatible u-blox Services	
MQTT Anywhere, MQTT Flex	•
AssistNow™	•
CellLocate®	•
Interfaces	
UART	2
USB (for diagnostics)	1
DDC (I2C)	1
USIM	1
ADC	1
GPIO	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	•

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

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Features

LTE	3GPP Release 13, 14 (partial support), 15 (partial support) for LTE Cat M1 and LTE Cat NB2 Cat M1 Half-duplex, 375 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	Integrated u-blox SpotNow A-GPS receiver Dedicated GNSS antenna interface Direct access to external u-blox GNSS via module
Functionalities	Antenna dynamic tuning Last gasp Jamming detection Antenna and SIM detection
Firmware upgrade	Via UART uFOTA client/server solution (firmware upgrade over the air)

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

133-pin LGA: 16.0 x 16.0 x 2.0 mm

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

LEXI-R520 ¹	FCC, ISED, GCF, PTCRB, Verizon, AT&T, US Cell, T-Mobile, Telus, RED, UKCA, Vodafone, Deutsche Telekom, Giteki, RCM, Telstra, NCC
LEXI-R520	AWS IoT Core qualified Microsoft Azure certified

¹ = 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-LEXI- R520	Evaluation kit for LEXI-R520
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Product variants

LEXI-R520	LTE-M and NB-IoT module for global use
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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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