Product summary

SARA-R4 series

LTE-M / NB-IoT / EGPRS modules with Secure Cloud

Standard

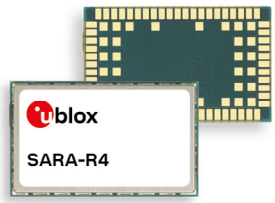
Professional

Automotive

Built-in foundation and end-to-end security with Root of Trust

- Always and everywhere location, integrated u-blox M8 GNSS receiver and CellLocate®
- Software-based configurability within each hardware design
- Simultaneous LTE communication with GNSS positioning
- Guaranteed best coverage with 23dBm output power
- Future-proof solutions via LWM2M and uFOTA

16.0 × 26.0 × 2.5 mm



Product description

The SARA-R4 series modules are ideal for mission-critical IoT solutions, as they include a unique and immutable root-of-trust. This provides the foundation for a trusted set of advanced security functionalities. The scalable, pre-shared key management system offers best-in-class data encryption and decryption, both on-device as well as from device-to-cloud. Utilizing the latest (D)TLS stack and cipher suites with hardware-based crypto acceleration provides robust, efficient and protected communication.

SARA-R422M8S is pre-integrated with the u-blox M8 GNSS receiver and separate GNSS antenna interface, which provides highly reliable, accurate positioning data simultaneously with LTE communication. In addition, the module offers unique hybrid positioning, in which the GNSS position is enhanced with u-blox CellLocate® data, providing location always and everywhere. Guaranteed best coverage is built in via 23dBm LTE output power, eliminating problems at cell edges and unwanted re-transmissions.

Customers can future-proof their solutions by means of the uFOTA client/server firmware updates, which utilizes LWM2M, a light and compact protocol ideal for IoT applications.

The ultra-compact 16 x 26 mm LGA modules offer the ability to make software-based configuration decisions for LTE bands, radio interface and system selection preference, as well as Mobile Network Operator within each hardware variant.

With many interface options and an integrated IP stack, the SARA-R4 modules are targeted to a wide range of data-centric IoT applications, such as smart metering, smart lighting, telematics, asset tracking, remote monitoring, alarm panels, and connected health. The SARA-R4 modules target long life, low-maintenance, cost-sensitive, lower power consumption, extended battery life applications.

Thanks to the u-blox nested design principle SARA modules are compatible with other u-blox product families, enabling easy migration from 2G, 3G and 4G. This maximizes the investments of customers, simplifies logistics, and enables very short time-to-market.

	SARA-R410M-63B	SARA-R410M-73B	SARA-R410M-83B	SARA-R422	SARA-R422S	SARA-R422M8S
Grade						
Automotive						
Professional	•	•	•	•	•	•
Standard						
Regions						
	Japan	Korea	Multi	Multi-region		
Access technology						
GSM/EGPRS bands					Q	
LTE bands	1, 8, 19	3, 5, 26	3, 5, 8, 20, 28	1, 2, 3, 4, 5, 8, 12, 13, 20, 25, 26, 28 NB-IoT only: 66, 71, 85		
LTE data rate	M1	M1	M1/ NB1	M1/NB2		
LTE power class	23 dBm			23 dBm		
Positioning						
Integrated GNSS receiver						•
GNSS antenna interface						•
Position via modem	•	•	•		•	
AssistNow software	•	•	•		•	•
CellLocate®	•	•	•		•	•
Interfaces						
UART	1	1	1	1	1	1
USB	1	1	1	D	D	D
DDC (I2C)	1	1	1	1	1	1
(U)SIM	1	1	1	1	1	1
GPIO	6	6	6	6	6	6
Audio						
Digital audio					□	□
Features						
Security Root of Trust	•	•	•	•	•	•
Secure Cloud Services	•	•	•		•	•
Last gasp	•	•	•		•	•
Antenna detection	•	•	•	•	•	•
Embedded TCP/UDP stack	•	•	•	•	•	•
Embedded HTTP, FTP	•	•	•		•	•
Embedded HTTPS, FTPS	•	•	•		•	•
Embedded TLS, DTLS	•	•	•		•	•
Power save mode Rel.12	•	•	•	•	•	•
eDRX	•	•	•	•	•	•
Deep sleep mode	•	•	•	•	•	•
uFOTA	•	•	•	•	•	•
FW update via serial	•	•	•	•	•	•
MQTT	•	•	•		•	•
LWM2M device mgmt	•	•	•	•	•	•

M1 = LTE Cat M1 (300 kb/s DL, 375-1200 kb/s UL)
NB1 = Cat NB1 (27.2 kb/s DL, 62.5 kb/s UL)
NB2 = Cat NB2 (125 kb/s DL, 140 kb/s UL)

Q = Quad-band
□ = Available in future FW
D = for diagnostics

SARA-R4 series

C

Features

LTE	**3GPP Release 13 LTE Cat M1 and NB1**[1] Cat M1 half-duplex, 300 kbit/s DL, 375 kbit/s UL Cat NB1 half duplex, 27.2 kb/s DL, 62.5 kb/s UL Coverage enhancement mode A Cat M1 connected mode mobility Rel 12 LTE power save mode, PSM Rel 13 e-DRX **3GPP Release 14 LTE Cat M1 and NB2**[2] NB-IoT Release Assistant Cat M1 half-duplex, 375 kbit/s DL, 1200 kbit/s UL Cat NB2 half-duplex, 125 kbit/s DL, 140 kbit/s UL
GSM	3GPP Release 12 EGPRS MSC12[2]
SMS	MT/MO PDU / text mode SMS over SG/NAS

Security

Foundation	Security Root of Trust Secure boot Secure updates Secure production Anticloning Detection & Rejection
Design	Local authenticated encryption/decryption[3]
End-to-end	Secure communication (D)TLS[3] Pre-shared keys (PSK) provisioning[3] E2E data protection[3]

Software features

Protocols	Dual stack IPv4 and IPv6 Embedded TCP/IP, UDP/IP, FTP, HTTP Embedded secure MQTT[3] Embedded HTTPS, FTPS, TLS, DTLS[3]
Device Management	OMA LWM2M
GNSS Interfaces	Integrated u-blox M8 chip with concurrent GNSS (GPS, GLONASS, BeiDou, Galileo)[4] Dedicated GNSS antenna interface[4] Direct access to u-blox GNSS via module AssistNow software for fastest GNSS TTFF[3] CellLocate & hybrid positioning[3]
Firmware upgrade	Via USB[1] Via UART[2] uFOTA client/server solution (Firmware upgrade over the air)

Electrical data

Power supply	3.8 V nominal, range 3.2 V to 4.2 V[1] 3.8 V nominal, range 3.2 V to 4.5 V[2]		
Power consumption		**SARA-R41x**	**SARA-R42x**
	Power save mode:	8 µA	3 µA
	Active idle mode:	2 mA	TBD

1 = on SARA-R41x variants
2 = on SARA-R42x variants
3 = except for SARA-R422
4 = on SARA-R422M8S

Package

96 pin LGA: 16.0 x 26.0 x 2.5 mm, < 3 g

Environmental data, quality & reliability

Operating temperature	–40 °C to +85 °C
RoHS compliant (lead-free)	
Qualification according to ISO 16750	
Manufactured in ISO/TS 16949 certified production sites	

Certifications and approvals – planned

SARA-R410M-63B	GITEKI, Softbank, NTT DoCoMo
SARA-R410M-73B	KC, SK Telecom
SARA-R410M-83B	NCC, RCM, RED, Telstra
SARA-R422 series	ANATEL, FCC, IFETEL, ISED, NCC, RCM, RED, GCF, PTCRB, AT&T, Deutsche Telekom, T-Mobile USA, Verizon, Vodafone

Interfaces

Serial	1 UART 1 USB 2.0 (high-speed, 480 Mbit/s)[1] 1 USB, for diagnostics[2] 1 DDC (I2C)
GPIO	Up to 6 GPIOs, configurable
(U)SIM	Supports 1.8 V and 3.0 V, SIM toolkit

Support products

EVK-R410M-6	Evaluation kit for SARA-R410M-63B
EVK-R410M-7	Evaluation kit for SARA-R410M-73B
EVK-R410M-8	Evaluation kit for SARA-R410M-83B
EVK-R422	Evaluation kit for SARA-R422
EVK-R422S	Evaluation kit for SARA-R422S
EVK-R422M8S	Evaluation kit for SARA-R422M8S

Product variants

SARA-R410M-63B	Secure Cloud LTE module for Japan. Cat M1 bands: 1, 8, 19
SARA-R410M-73B	Secure Cloud LTE module for Korea. Cat M1 bands: 3, 5, 26
SARA-R410M-83B	Secure Cloud LTE module for multi-regional use. Cat M1, NB1 bands: 3, 5, 8, 20, 28
SARA-R422	LTE-M, NB-IoT and EGPRS module for multi-regional use
SARA-R422S	Secure Cloud LTE-M, NB-IoT and EGPRS module for multi-regional use
SARA-R422M8S	Secure Cloud LTE-M, NB-IoT and EGPRS module with integrated M8 GNSS receiver for multi-regional use

Further information

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

For more product details and ordering information, see the product data sheet.