

LTE-M / NB-IoT modules



	LTE-M / NB-IoT – global and regional coverage								LTE Cat NB2			
	SARA-R500E	SARA-R510S-61B		SARA-R510MS-61B		SARA-R510MS-71B		SARA-R422	SARA-R422S	SARA-R422M10S	LEXI-R422	SARA-N310 (ATEX module)
Grade												
Automotive	•	•	•	•	•	•	•	•	•	•	•	•
Professional												
Standard												
Physical												
Image												
Size [mm]	16.0 x 26.0 x 2.2		16.0 x 26.0 x 2.2		16.0 x 26.0 x 2.5		16 x 16 x 2		16.0 x 26.0 x 2.4			
Package and pins	96-pin LGA		96-pin LGA		96-pin LGA		133-pin LGA		96-pin LGA			
Regions	North America	Japan	Japan	Korea	Global		Global		Global			
Access technology												
LTE-M / NB-IoT bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85				1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85				3, 5, 8, 20, 28, +			
Main technology, data rate	M1		M1/NB2		M1/NB2		M1/NB2		M1/NB2		NB2	
GSM/GPRS bands					Q	Q	Q	Q				
Positioning												
Integrated u-blox GNSS receiver			■	■				■				
External GNSS control via modem	•	•						•				
Compatible u-blox services												
MQTT Anywhere™, MQTT Flex™	MQTT Anywhere only	•	•	•				•	•	•	•	•
AssistNow™ and CellLocate®	•	•	•	•				•	•	•	•	•
CloudLocate™			•	•				•				
Interfaces												
UART	2	2	2	2	2	2	2	2	2	2	2	3
USB (for diagnostics)	1	1	1	1	1	1	1	1	1	1	1	
I2C	1	1	1	1	1	1	1	1	1	1	1	1
USIM		1	1	1	1	1	1	1	1	1	1	1
GPIO	6	6	6	6	6	6	6	6	6	6	6	8
ADC	1	1	1	1								2
Features												
eSIM	•											
Open CPU (uCPU)		•	•	•								
CellTime™	•	•	•	•								
Secure boot and updates	•	•	•	•	•	•	•	•	•	•	•	•
Jamming detection	•	•	•	•	•	•	•	•	•	•	•	•
Last gasp	•	•	•	•	•	•	•	•	•	•	•	•
LwM2M	•	•	•	•	•	•	•	•	•	•	•	•
FW update via serial interface	•	•	•	•	•	•	•	•	•	•	•	•
FOTA	•	•	•	•	•	•	•	•	•	•	•	•
eDRX	•	•	•	•	•	•	•	•	•	•	•	•
PSM	•	•	•	•	•	•	•	•	•	•	•	•
Ultra-low / deep sleep mode	•	•	•	•	•	•	•	•	•	•	•	•
Dual stack IPv4/IPv6	•	•	•	•	•	•	•	•	•	•	•	•
MQTT, MQTT-SN	•	•	•	•	•	•	•	•	•	•	•	•
TCP/UDP stack	•	•	•	•	•	•	•	•	•	•	•	•
HTTPS, FTPS	•	•	•	•	•	•	•	•	•	•	•	•
TLS, DTLS	•	•	•	•	•	•	•	•	•	•	•	•
CoAP	•	•	•	•	•	•	•	•	•	•	•	•
Antenna dynamic tuning	•	•	•	•	•	•	•	•	•	•	•	•

M1 = LTE Cat M1, Rel 13 (300 kb/s DL, 375 kb/s UL)
 LTE Cat M1, Rel 14 (300 kb/s DL, 1200 kb/s UL)
 NB2 = Cat NB2 (125 kb/s DL, 140 kb/s UL)

+ = LTE bands 1, 2, 4, 12, 13, 18, 19, 26, 66, 71, 85 available in future firmware
 Q = quad-band

□ = available in future firmware
 ■ = and dedicated GNSS antenna interface



LTE-M / NB-IoT / SAT IoT – global coverage						
	LEXI-R520	SARA-R520	SARA-R520M10	SARA-S520BM10	SARA-R510AWS AWS IoT ExpressLink	SARA-R540S
Grade						
Automotive	•	•	•	•	•	•
Professional						
Standard						
Physical						
Image						
Size [mm]	16 x 16 x 2	16.0 x 26.0 x 2.2				
Package and pins	133-pin LGA	96-pin LGA				
Regions	Global	Global	Global	Global	Global	
Access technology						
LTE-M / NB-IoT bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85					*
Main technology, data rate	M1/NB2	M1/NB2		M1	M1	M1/NB2
Satellite protocol / band				IDP / L-band		
410 MHz spectrum power class						23 dBm
450 MHz spectrum power class						26 dBm
Positioning						
Integrated u-blox GNSS receiver			■	■		
External GNSS control via modem	•	•				•
SpotNow	■	■				
Compatible u-blox services						
MQTT Anywhere™, MQTT Flex™	•	•	•	•		•
AssistNow™ and CellLocate®	•	•	•	•	□	•
CloudLocate™			•	•		
Interfaces						
UART	2	2	2	2	1	2
USB (for diagnostics)	1	1	1	1	1	1
I2C	1	1	1	1		1
USIM	1	1	1	1	1	1
GPIO	6	6	6	6	2	6
ADC	1	1	1			
Features						
Smart Connection Manager	•	•	•			
Open CPU (uCPU)	•	•	•			
CellTime™	•	•	•	•		•
Secure boot and updates	•	•	•	•	•	•
Jamming detection	•	•	•	•		•
Last gasp	•	•	•	•		•
LwM2M	•	•	•	•		•
FW update via serial interface	•	•	•	•	•	•
FOTA	•	•	•	•	•	•
eDRX	•	•	•	•	•	•
PSM	•	•	•	•	•	•
Ultra-low / deep sleep mode	•	•	•		•	•
Dual stack IPv4/IPv6	•	•	•	•		•
MQTT, MQTT-SN	•	•	•	•	MQTT only	•
TCP/UDP stack	•	•	•	•		•
HTTPS, FTPS	•	•	•			•
TLS, DTLS	•	•	•	•		•
CoAP	•	•	•	•		•
Antenna dynamic tuning	•	•	•			•

M1 = LTE Cat M1, Rel 13 (300 kb/s DL, 375 kb/s UL)
 LTE Cat M1, Rel 14 (300 kb/s DL, 1200 kb/s UL)
 NB2 = Cat NB2 (125 kb/s DL, 140 kb/s UL)

* = LTE bands 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 31, 66, 71, 72, 73, 85, 87, 88

□ = CellLocate available in future firmware
 ■ = and dedicated GNSS antenna interface

LTE Cat 1bis modules



	LTE Cat 1bis							
	SARA-R10001D		LEXI-R10001D			LEXI-R10401D		
	SARA-R10001D	SARA-R10001M10D	LEXI-R10001D	LEXI-R10401D	LEXI-R10801D	LEXI-R10801D	LENA-R8001	LENA-R8001M10
Grade								
Automotive								
Professional	•	•	•	•	•			
Standard							•	•
Physical								
Image								
Size [mm]	16 x 26 x 2.2		16 x 16 x 2.0			27 x 30 x 2.7		
Package and pins	96-pin LGA		133-pin LGA			100-pin LGA		
Regions	Global	Global	Global	Americas	EMEA, APAC	Global	Global	
Access technology								
LTE FDD bands	1, 2, 3, 4, 5, 7, 8, 12, 13, 20, 28, 66		1, 2, 3, 4, 5, 7, 8, 12, 13, 20, 28, 66		2, 4, 5, 12, 13, 14, 66, 71	1, 3, 5, 7, 8, 20, 28	1, 2, 3, 4, 5, 7, 8, 12, 20, 28, 66	
LTE TDD bands	34, 38, 39, 40, 41		34, 38, 39, 40, 41			38, 40, 41		
GSM/GPRS bands	Q							
Main technology, data rate	Cat 1bis		Cat 1bis	Cat 1bis	Cat 1bis	Cat 1bis		
Positioning								
External GNSS control via modem							•	
Integrated u-blox GNSS receiver	•					•		
Dedicated GNSS antenna interface	•					•		
Compatible u-blox Services								
MQTT Anywhere™, MQTT Flex™							•	•
AssistNow™	•					•		
CellLocate®	•	•	•	•	•	•	•	
Interfaces								
UART	2	2	2	2	2	3	3	
USB	1	1	1	1	1	1	1	
I2C			1	1	1	1	1	
GPIO	6	6	10	10	10	5	5	
Features								
eSIM	o	o	o					
Secure boot and updates	•	•	•	•	•	•	•	
Jamming detection							•	•
SNTP	•	•	•	•	•			
Wi-Fi scan	•	•	•	•	•			
Backup/restore	•	•	•	•	•			
FW update via serial interface							•	•
FOTA	•	•	•	•	•	•	•	
eDRX	•	•	•	•	•	•	•	
PSM	•	•	•	•	•	•	•	
Deep sleep mode	•	•	•	•	•			
Dual stack IPv4/IPv6	•	•	•	•	•			
MQTT, MQTT-SN	MQTT only			MQTT only			•	•
TCP/UDP stack	•	•	•	•	•	•	•	
HTTPS, FTPS	HTTPS only			HTTPS only			•	•
TLS, DTLS	•	•	•	•	•	•	•	
VoLTE, CSFB							•	•
Antenna dynamic tuning	•	•	•	•	•	•	•	

Cat 1bis = LTE Cat 1 (10 Mb/s DL, 5 Mb/s UL)
Q = quad-band


* = Data-only variant o = Optional

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LTE Cat 1 and LTE Cat 4 modules



	LTE Cat 1			LTE Cat 4	
	LARA-R6001 LARA-R6001D*	LARA-R6401 LARA-R6401D*	LARA-R6801 LARA-R6801D*	LARA-L6004 LARA-L6004D*	LARA-L6804D*
Grade					
Automotive					
Professional	•	•	•	•	•
Standard					
Physical					
Image					
Size [mm]	24 x 26 x 2.6			24 x 26 x 2.6	
Package and pins	100-pin LGA			100-pin LGA	
Regions	Global	North America	EMEA, APAC, Japan, LATAM	Global	Multi-region
Access technology					
LTE FDD bands	1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28	2, 4, 5, 12, 13, 14, 66, 71	1, 2, 3, 4, 5, 7, 8, 18, 19, 20, 26, 28	1, 2, 3, 4, 5, 7, 8, 12, 13, 18, 19, 20, 26, 28	1, 2, 3, 4, 5, 7, 8, 18, 19, 20, 26, 28
LTE TDD bands	38, 39, 40, 41			38, 39, 40, 41	
UMTS/HSPA [MHz]	850, 900, 1900, 2100		850, 900, 1900, 2100	850, 900, 1900, 2100	
GSM/GPRS bands	Q		Q	Q	Q
Main technology, data rate	Cat 1	Cat 1	Cat 1	Cat 4	Cat 4
Positioning					
External GNSS control via modem	•	•	•	•	•
Integrated u-blox GNSS receiver					
Compatible u-blox Services					
MQTT Anywhere™, MQTT Flex™	•	•	•		
AssistNow™	•	•	•	•	•
CellLocate®	•	•	•	•	•
Interfaces					
UART	2	2	2	2	2
USB	1	1	1	1	1
I2C	1	1	1	1	1
I2S	1	1	1	1	
GPIO	9	9	9	9	9
Features					
Secure boot and updates	•	•	•	•	•
Jamming detection	•	•	•	•	•
Last gasp	•	•	•	•	•
LwM2M	•	•	•	•	•
FW update via serial interface	•	•	•	•	•
FOTA	•	•	•	•	•
eDRX	•	•	•	•	•
PSM	•	•	•	•	•
Rx Diversity	•	•	•	•	•
Dual stack IPv4/IPv6	•	•	•	•	•
MQTT, MQTT-SN	•	•	•		
TCP/UDP stack	•	•	•	•	•
HTTPS, FTPS	•	•	•	•	•
TLS, DTLS	•	•	•	•	•
VoLTE, CSFB (not for data-only variants)	•	VoLTE only	•	•	•
Antenna dynamic tuning	•	•	•	•	•

Cat 4 = LTE Cat 4 (150 Mb/s download, 50 Mb/s upload)
Cat 1 = LTE Cat 1 (10 Mb/s DL, 5 Mb/s UL)

Q = quad-band

* = Data-only variant