Product Summary
UBX-R5

Multi-band LTE-M / NB-IoT chipset

C

IoT security redefined in a 5G-ready LTE-M and NB-IoT chipset

- First Common Criteria EAL5+ High certified cellular IoT Secure Element provides best-in-class hardware-based security
- 5G-ready, software-configurable cellular modem to last an IoT lifetime
- Service-on-chip architecture captures signal deep inside hardware for improved positioning and energy efficiency
- Easy integration with u-blox GNSS products and operation of LTE-based positioning
- Powerful edge computing platform provides a hosted application environment

8.5 × 9.0 × 1.0 mm

Product description

The UBX-R5 is a 5G-ready, multi-band LTE-M / NB-IoT chipset that provides industry-leading hardware-based security to a wide range of low-power wide-area (LPWA) IoT devices. It includes the first Common Criteria (CC) EAL5+ High certified IoT Secure Element with a hardware Root of Trust, enabling the strongest protection against attacks on mission-critical IoT assets or devices that transmit sensitive information.

Due to the high degree of software configurability within the third generation in-house VSP-based modem processor, the UBX-R5 chipset is 5G-ready and offers platform stability and longevity to customer devices.

UBX-R5 is based on a service-on-chip architecture, which offers low-level insights and data points from deep within the hardware, such as event-based energy consumption monitoring and smart antenna tuning, among others.

The chipset can be easily combined with any u-blox GNSS product.

The UBX-R5 chipset includes integrated RF, baseband, power management and RAM and supports several power-saving functionalities, such as PSM and eDRX. Further, it supports enhanced LTE coverage via CE Mode A and B for LTE-M, and ECL1 and ECL2 for NB-IoT, achieving deeper penetration inside buildings and underground.

	UBX-R5
Grade	
Automotive	
Professional	•
Standard	
Regions	
	Multi-region
Access Technology	
LTE bands	*
Data rate	M1/NB2
Interfaces	
UART	•
USB	•
DDC (I²C)	•
SDIO (host) 4-bit	•
ADC	•
PWM	•
I²S	•
GPIO	•
Features	
EAL5+ High secure element	•
Hardware Root of Trust	•
Application CPU	•
Coverage Enhancement Mode A and B	•
PSM and eDRX	•
Dynamic antenna tuning	•

* = All bands within the 450 MHz to 2.46 GHz range

NB2 = Cat NB2 (125 kbit/s DL, 140 kbit/s UL)
M1 = LTE Cat M1 (375 kbit/s DL, 1200 kbit/s UL)

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UBX-R5

Features

LTE standards	**3GPP Release 13 LTE Cat M1 and NB1** **3GPP Release 14 LTE Cat M1**: Coverage Enhancement Mode B, Uplink TBS of 2984b **3GPP Release 14 LTE Cat NB2**: Higher data rate (TBS of 2536b), Mobility enhancement (RRC connection re-establishment), E-Cell ID, Lower power class PC6 (14 dBm), two HARQ processes, Release Assistant, Random access on Non-Anchor Carrier Cat M1 Half-duplex, 375 kbit/s DL, 1200 kbit/s UL Cat NB2 Half-duplex, 125 kbit/s DL, 140 kbit/s UL
LTE channels	375 kb/s UL/DL HD-FDD PDSCH modes (TM) 1, 2 MPDCCH SMS over SGS RAN overload control for MTC – extended access barring R11 Coverage extension A, B I-DRX, C-DRX, PSM
Security	Root of Trust - Embedded Secure Element EAL5+ High
GNSS	External
Bands	Software selectable HD-FDD band configurations enables single hardware SKU supporting all 3GPP bands from 450 MHz to 2.46 GHz, depending on external components
Application CPU	Industrial grade

Interfaces

Serial	UART USB SPI DDC (I²C) SDIO (host) 4-bit ADC PWM I²S
GPIO	Up to 15 GPIOs, configurable
SIM	ISO 7816-3
GNSS	1 Time sync

Package

FCBGA package	8.5 x 9.0 x 1.0 mm 395 pins
Pitch	0.4 mm

Environmental data, quality & reliability

Operating temperature	–40 °C to +85 °C (AEC-Q100 certified)
Storage temperature	TBD
RoHS compliant (lead-free) and green (no halogens)	
Manufactured in ISO/TS 16949 certified production sites	

Certifications and approvals

Module dependent	

Electrical data

Power supply	Range 3.3 V to 4.4 V
Power consumption	TBD

Product variants

UBX-R5	u-blox LTE-M and NB-IoT chipset 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.

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