Product summary

TOBY-R2 series

Multi-mode LTE Cat 1 modules with positioning capability

Standard

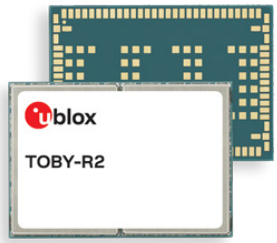
Professional

Automotive

Global LTE Cat 1 modules with 2G and 3G fallback

- LTE bands for global coverage (TOBY-R200-82B)
- Voice support via VoLTE or CSFB
- Cellular location service and hybrid positioning
- The separate power supply on TOBY-R200 extends its battery life
- Easy migration between u-blox 2G, 3G, and 4G modules

24.8 × 35.6 × 2.6 mm



Product description

The TOBY-R2 module series supports multi-band LTE-FDD along with 3G (UMTS) and 2G (GSM) fallback in a very small LGA package.

The modules are ideal for applications requiring global coverage, and especially those that are transitioning to LTE from 2G and 3G, due to the long term availability and scalability of LTE networks. At the same time in areas with marginal LTE coverage, they also provide global 2G and 3G fallback.

With a range of interface options and an integrated IP stack, the module is designed to support a wide range of data-centric applications. The unique combination of performance, flexibility, and global coverage make the module ideally suited for medium speed M2M applications, such as smart energy gateways, remote access video cameras, digital signage, telehealth and telematics.

When power saving mode is enabled, it reduces energy consumption and allows battery-powered modules a longer operation time.

The temperature range of –40 °C to +85 °C guarantees operation in harsh environments and in very compact designs.

It supports Voice over LTE (VoLTE) and 3G voice service (CSFB) for applications where voice is required, such as in security and surveillance systems. Transport Layer Security (TLS) provides privacy and data integrity.

The compact LGA package enables straightforward automated manufacturing. Easy migration from u-blox GSM/GPRS, CDMA, and UMTS/HSPA maximizes the investments of customers, simplifies logistics, and enables very short time-to-market.

TOBY-R2 modules are manufactured in ISO/TS 16949 certified sites, with the highest production standards and the highest quality and reliability. Each module is fully tested and inspected during production. Modules are qualified according to ISO 16750 – for systems installed in vehicles.

USB drivers and RIL software for Android are free of charge.

	TOBY-R200-02B	TOBY-R200-82B	TOBY-R202
Grade			
Automotive			
Professional	•	•	•
Standard			
Regions			
	North America	Global	North America
Access Technology			
GSM/GPRS bands	Q	Q	
UMTS/HSPA [MHz]	850, 900, 1900, 2100	850, 900, 1900, 2100	850, 1900
LTE bands	2, 4, 5, 12	1, 2, 4, 5, 8, 12	2, 4, 5, 12
Data rate	Cat 1	Cat 1	Cat 1
Positioning			
GNSS via modem §	•	•	•
AssistNow Software	•	•	•
CellLocate®	•	•	•
Interfaces			
UART	1	1	1
USB	1	1	1
DDC (I2C)	1	1	1
SDIO (master)	H	H	H
GPIO	9	9	9
Audio			
Digital audio	1	1	1
Features			
VoLTE	v	v	v
Antenna detection	•	•	•
Embedded TCP/UDP	•	•	•
Embedded FTP/HTTP	•	•	•
Embedded TLS 1.2	•	•	•
FW update via serial	•	•	•
FOTA	•	•	•
Rx diversity	•	•	•
Dual stack IPv4/IPv6	•	•	•

v = VoLTE available and AT&T certified
§ = external GNSS can be controlled via modem

Cat 1 = LTE Cat 1 (10 Mb/s DL, 5 Mb/s UL)
H = Hardware-ready

TOBY-R2 series

C

Features

LTE	Cat 1 (10 Mbit/s DL, 5 Mbit/s UL) 3GPP Release 9 FDD bands: – TOBY-R200-02B: 2, 4, 5, 12 – TOBY-R200-82B: 1, 2, 4, 5, 8, 12 – TOBY-R202: 2, 4, 5, 12 All channel bandwidths: 1.4 - 20 MHz Rx Diversity
UMTS	HSDPA category 8, HSUPA category 6 Bands (in MHz): – TOBY-R200-02B: 850, 900, 1900, 2100 – TOBY-R200-82B: 850, 900, 1900, 2100 – TOBY-R202: 850, 1900 Rx Diversity
GSM	GPRS/EDGE multi-slot class 12 Bands (in MHz): – TOBY-R200-02B: quad band – TOBY-R200-82B: quad band
SMS	MT/MO PDU/Text mode SMS over IMS and via SMS-C
Voice	VoLTE or CSFB Codec: HR/FR/EFR/AMR/AMR-WB Echo cancelation & noise reduction

Software features

Protocols	Dual stack IPv4 / IPv6 Embedded TCP/IP, UDP/IP HTTP/FTP/SSL (Secure Socket Layer) eSIM and Bearer Independent Protocol
GNSS Interfaces	Direct access to u-blox M8 via TOBY-R2 AssistNow software for fastest GNSS Time-To-First-Fix CellLocate® & Hybrid Positioning
Firmware upgrade	Via UART and USB FOTA (Firmware upgrade over the air)

Interfaces

Serial	1 UART 1 USB 2.0 (high-speed, 480 Mbit/s) 1 I2C 1 SDIO [1]
GPIO	Up to 9 configurable GPIOs
(U)SIM	Supports 1.8 V and 3 V, SIM toolkit
Audio	1 digital

Package

152 pin LGA (Land Grid Array): 24.8 x 35.6 x 2.6 mm, < 5 g

Electrical data

Power supply	3.8 V nominal, range 3.3 V to 4.4 V Extended range 3.0 V to 4.5 V

Environmental data, quality & reliability

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

Security

Transport Layer Security (TLS 1.2)
Jamming detection [1]

1 = Available in future FW version

Certifications and approvals

TOBY-R200-02B	PTCRB, FCC, RED, ISED, AT&T [2], T-Mobile
TOBY-R200-82B	PTCRB, FCC, RED, ISED, AT&T [2], U.S. Cellular, T-Mobile
TOBY-R202	PTCRB, FCC, ISED, AT&T [2], U.S. Cellular, T-Mobile

2 = VoLTE is available and AT&T certified

Support products

EVK-R200	Evaluation Kit for TOBY-R200
EVK-R202	Evaluation Kit for TOBY-R202
RIL software	Available for Android 9.0 and previous versions
USB driver	Available for Windows 7, 8, 10 and for Embedded Windows 7.x, 8.x, 10.x

Product variants

TOBY-R200-02B	LTE Cat 1 module with global 2G and 3G fallback LTE bands 2, 4, 5, 12
TOBY-R200-82B	Global LTE Cat 1 module with 2G and 3G fallback LTE bands 1, 2, 4, 5, 8, 12
TOBY-R202	LTE Cat 1 module with 3G fallback LTE bands 2, 4, 5, 12

Further information

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

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