

## Product Summary

# TOBY-R2 series

## Multi-mode LTE Cat 1 modules with 2G / 3G fallback



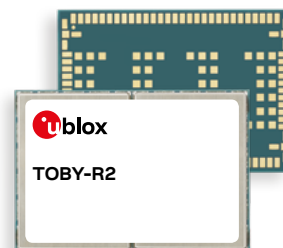
Standard



Professional



Automotive



24.8 × 35.6 × 2.6 mm

### Voice support via VoLTE or CSFB

- Compact TOBY LGA form factor for easy manufacturing
- LTE Cat 1 with 3G fallback (and 2G fallback for TOBY-R200)
- Easy migration between u-blox 2G, 3G, and 4G modules
- Separate power supply on TOBY-R200 extends battery life
- Critical firmware updates delivered via u-blox uFOTA engine

### 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 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.

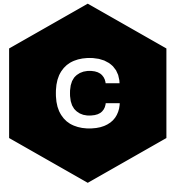
USB drivers and RIL software for Android are free of charge.

### Product selector

Model	Region	Access Technology	Positioning	Interfaces	Audio	Features	Grade
		LTE bands UMTS/HSPA bands GPRS/EDGE bands	GNSS via Modem AssistNow software CellLocate®	UART USB2.0 SDIO * DDC (I <sup>2</sup> C) GPIO	Analog audio Digital audio	VoLTE Network indication Antenna supervisor Rx Diversity Jamming detection Embedded TCP/UDP stack Embedded HTTP, FTP, SSL FOTA Dual stack IPv4/IPv6	Standard Professional Automotive
TOBY-R200	N. America: AT&T, T-Mobile	2, 4, 5, 12    1, 2, 5, 8    quad	• • •	1   1   1   1   9	1	• • • • □ • • • •	•
TOBY-R202	N. America: AT&T, T-Mobile, U.S. Cellular	2, 4, 5, 12    2, 5	• • •	1   1   1   1   9	1	• • • • □ • • • •	•

Band 12 is a superset that includes Band 17    \* = Hardware ready    □ = Available in future firmware

# TOBY-R2 series



## Features

LTE	Cat 1 (10 Mbit/s DL, 5 Mbit/s UL) 3GPP Release 9 FDD bands: – TOBY-R200: 2, 4, 5, 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: 1, 2, 5, 8 – TOBY-R202: 2, 5 Rx Diversity
GSM	GPRS/EDGE multi-slot class 12 Bands (in MHz): – TOBY-R200: 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 client (Firmware upgrade over the air)

## Interfaces

Serial	1 UART 1 USB 2.0 (high-speed, 480 Mbit/s) 1 I <sup>2</sup> C 1 SDIO <sup>1</sup>
GPIO	Up to 9 configurable GPIOs
(U)SIM	Supports 1.8 V and 3 V, SIM toolkit
Audio	1 digital

## Band and frequency reference

Frequency in MHz	2100	1900	1800	1700	850	900	700
LTE/UMTS Band	1	2	3	4	5	8	12, 17
GSM Band		PCS 1900	DCS 1800		GSM 850	E-GSM 900	

Band 12 is a superset that includes Band 17

## 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 <sup>1</sup>

<sup>1</sup> = Available in future FW version

## Certifications and approvals

TOBY-R200 PTCRB, FCC, RED (formerly known as R&TTE),  
ISED (formerly known as IC), AT&T

TOBY-R202 PTCRB, FCC, ISED (formerly known as IC),  
AT&T, U.S. Cellular

## Support products

EVK-R200	Evaluation Kit for TOBY-R200
EVK-R202	Evaluation Kit for TOBY-R202
RIL software	Available for Android 6.0
USB driver	Available for Windows 7, 8, 10 and for Embedded Windows 7.x, 8.x, 10.x

## Product variants

TOBY-R200	LTE Cat 1 module with global 2G and 3G fallback for AT&T and T-Mobile; LTE bands 2, 4, 5, 12
TOBY-R202	LTE Cat 1 module with 3G fallback for AT&T, T-Mobile and U.S. Cellular; LTE bands 2, 4, 5, 12

## Further information

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).

For more product details and ordering information, see the [product data sheet](#).

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