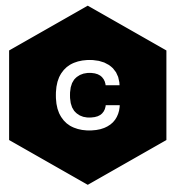


TOBY-R2 series



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

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



Standard

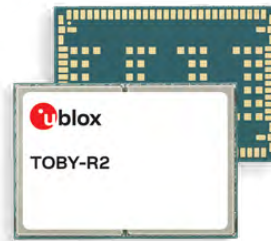


Professional



Automotive

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

Cat 1 = LTE Cat 1 (10 Mb/s DL, 5 Mb/s UL)
 § = external GNSS can be controlled via modem

H = Hardware-ready

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: 850, 900, 1900, 2100 – TOBY-R202: 850, 1900 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 (Firmware upgrade over the air) |

Interfaces

| | |
|--------|---|
| Serial | 1 UART 1 USB 2.0 (high-speed, 480 Mbit/s) 1 I ² C 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 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, T-Mobile ²

² = Voice service shall be disabled

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 LTE bands 2, 4, 5, 12 |
| TOBY-R202 | LTE Cat 1 module with 3G fallback LTE bands 2, 4, 5, 12 |

Band and frequency reference

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

Band 12 is a superset that includes Band 17

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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