

Product Summary

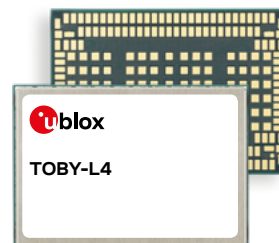
TOBY-L4 uCPU series

LTE Advanced (Cat 6) modules with uCPU Linux application programming



Most powerful application CPU in the industry

- uCPU embedded Linux programming capability with 19000 DMIPS total processing power
- Very comprehensive set of interfaces including RGMII/RMII and analog audio
- State of the art security implementation
- Pre-integrated u-blox GNSS and Wi-Fi components
- Temperature range -40 °C to +85 °C, with eCall setup up to +95 °C



24.8 × 35.6 × 2.6 mm

Product description

The TOBY-L4 series supports LTE Cat 6 TDD, LTE Cat 6 FDD, UMTS and GSM connectivity in a compact LGA package. Developers can host their applications directly in the module in a configurable Linux OS, enabling customers to save the cost of an external CPU, memory and peripherals in order to optimize the total cost. Customer application development in a standard Linux/Yocto environment based on HW virtualization benefits from the flexible open source Linux community.

The extremely powerful embedded CPU has 19000 DMIPS, allowing the development of complex and demanding applications, such as Cat 6 Wi-Fi hot spotting and in-car telephony. With no processor bottleneck, the application can be scaled up as needed. The module comes with an extremely comprehensive set of HW interfaces (including RGMII/RMII for Ethernet and analog audio) so that applications do not need expensive external components, such as serial to Ethernet bridges or audio codecs.

With 3GPP Rel. 10 and LTE Cat 6 supporting carrier aggregation, which provides data throughput up to 300 Mbit/s, the modules are the perfect choice for applications requiring the highest data rates.

The -40 °C to +85 °C temperature range supports the establishment of an eCall at +95 °C for at least 2 minutes. Complemented by a set of state-of-the-art security features, TOBY-L4 modules are the ideal product for the development of all kinds of automotive devices, such as smart antennas and in-dash telematics/infotainment devices.

TOBY-L4 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.

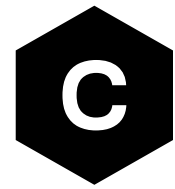
Product selector

Model	Region	Access Technology	Positioning	Interfaces	Audio	Features	Grade		
		LTE FDD bands LTE TDD bands UMTS bands GSM/GPRS	GNSS via modem AssistNow software CellLocate®	UART* USB 2.0/3.0 SDIO/eMMC SPI RGMII/RMII DDC (fC) GPIO	Analog audio Digital audio	Network indication Antenna supervisor Rx diversity MIMO Jamming detection Embedded TCP/UDP stack Embedded HTTP, SSL FOTA Dual stack IPv4/IPv6	Standard Professional Automotive		
TOBY-L4006-00	North America	2, 4, 5, 7, 12, 13, 29	2, 4, 5	2, 5	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4 1 2 1 1 2 8	1 2	• • • • • <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> •	•
TOBY-L4106-00	EMEA	1, 3, 7, 8, 20	38	1, 8 3, 8	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4 1 2 1 1 2 8	1 2	• • • • • <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> •	•
TOBY-L4206-00	APAC/Brazil	1, 3, 5, 7, 8, 9, 19, 28	1, 5, 8	quad	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4 1 2 1 1 2 8	1 2	• • • • • <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> •	•
TOBY-L4906-00	China	1, 3 39, 40, 41	1, 8	3, 8	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4 1 2 1 1 2 8	1 2	• • • • • <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> •	•

* = UART can be configured as SPI (for all variants) / = Available with uCPU, AT commands available in future firmware



TOBY-L4 uCPU series



Features

LTE	Cat 6 (300 Mbit/s DL, 50 Mbit/s UL) 3GPP Release 10 FDD and TDD bands: – TOBY-L4006: 2, 4, 5, 7, 12, 13, 29 (N. America) – TOBY-L4106: 1, 3, 7, 8, 20, 38 (EMEA) – TOBY-L4206: 1, 3, 5, 7, 8, 9, 19, 28 (APAC/Brazil) – TOBY-L4906: 1, 3, 39, 40, 41 (China) Carrier aggregation All channel bandwidths: 1.4 - 20 MHz MIMO 2x2, Rx diversity
UMTS/DC-HSPA+	Bands: – TOBY-L4006: 2, 4, 5 (N. America) – TOBY-L4106: 1, 8 (EMEA) – TOBY-L4206: 1, 5, 8 (APAC/Brazil) – TOBY-L4906: 1, 8 (China) 42 Mbit/s downlink, 11.5 Mbit/s uplink
GSM	Bands: – TOBY-L4006: 2, 5 (N. America) – TOBY-L4106: 3, 8 (EMEA) – TOBY-L4206: 2, 3, 5, 8 (APAC/Brazil) – TOBY-L4906: 3, 8 (China) GPRS & EDGE Class 12
SMS	MT/MO PDU / Text mode SMS over IMS and via SMS-C
Voice	VoLTE and CSFB Codec: HR/FR/EFR/AMR/AMR-WB Echo cancelation & noise reduction

Software features

uCPU embedding programming (Linux/Yocto) Full modem / customer application separation through HW virtualization	
Protocols	Dual stack IPv4 / IPv6 Embedded TCP/IP, UDP/IP ¹ HTTP/FTP/SSL (Secure Socket Layer) ¹ eSIM and Bearer Independent Protocol
Network	Jamming detection
eCall / ERA Glonass SW pre-integration of GNSS and Wi-Fi ¹ AssistNow software for fastest Time-To-First-Fix ¹ CellLocate® & Hybrid Positioning ¹	
Firmware upgrade	Via USB Via FOTA ¹

Security features

Secure boot and secure update	
Crypto HW accelerator / true random number generator	
Secure debugging	
Secure file system	
Secure services provided by dedicated Security Virtual Machine / Trusted Execution Environment	

¹ = Available with uCPU, AT commands available in future firmware

Further information

For contact information, see www.u-blox.com/contact-us.
For more product details and ordering information, see the [product data sheet](#).

Package

248-pin LGA (Land Grid Array): 24.8 x 35.6 x 2.6 mm, 4.8 g

Electrical data

Power supply 3.8 V nominal, range 3.3 V to 4.4 V

Environmental data, quality & reliability

Operating temperature –40 °C to +85 °C (extended range)
eCall at +95 °C for at least 2 minutes

RoHS compliant (lead-free)

Automotive qualification

Manufactured in ISO-TS 16949 certified production sites

Planned certifications and approvals

TOBY-L4006-00	FCC, ISED (formerly known as IC), PTCRB, GCF, AT&T
TOBY-L4106-00	RED (formerly known as R&TTE), GCF
TOBY-L4206-00	PTCRB, GCF, Anatel
TOBY-L4906-00	CCC, SRRC

Contact your nearest u-blox office for a full list of certifications.

Interfaces

Serial	4 UART (1 can be configured to SPI) 1 USB 3.0/2.0 1 SDIO (Wi-Fi interface) 1 SPI 1 RGMII / RMII 2 I ² C / DDC
GPIO ²	Up to 8 GPIOs, configurable
Audio	2 digital and 1 analog
(U)SIM	2 SIM supporting 1.8 V and 3 V, SIM toolkit
Other	14-bit MMC (eMMC/SD memory) 2 ADC

² = Other interfaces can be configured as GPIO if primary function not used

Support products

EVK-L4x	Evaluation kits for TOBY-L4 series
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Product variants

TOBY-L4006-00	LTE Cat 6 / DC-HSPA+ / GSM modules for North America; LTE bands 2, 4, 5, 7, 12, 13, 29
TOBY-L4106-00	LTE Cat 6 / DC-HSPA+ / GSM modules for Europe, Asia; LTE bands 1, 3, 7, 8, 20, 38
TOBY-L4206-00	LTE Cat 6 / DC-HSPA+ / GSM modules for APAC; LTE bands 1, 3, 5, 7, 8, 9, 19, 28
TOBY-L4906-00	LTE Cat 6 FDD / LTE Cat 6 TDD / UMTS FDD / GSM modules for China; LTE bands 1, 3, 39, 40, 41

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