GNSS

STA, Teseo
Технические характеристики

Positioning

Overview

Our standalone Global Navigation Satellite System (GNSS) modules are designed for top performance in a minimal space and are optimized for cost-sensitive applications without compromising on quality.

Cost-competitive, ST's Teseo **GNSS modules** allow for easy integration and migration from existing product designs including trackers, telematics, portable, and tablets as well as marine and sports accessories.

Combining high positioning accuracy and indoor sensitivity with powerful processing capabilities, our tiny Teseo-LIV3x modules simultaneously support multiple global navigation systems including BeiDou, Galileo, GLONASS, GPS, and QZSS.

Addressing Industrial and Consumer applications, the Teseo-LIV3x family with its 9.7 x 10.1 mm compact size, offers superior accuracy thanks to its embedded temperature-compensated crystal oscillator (TCXO) and a reduced Time To First Fix (TTFF) using its dedicated real-time clock (RTC).

We provide a full development ecosystem including a complete standalone GNSS module evaluation and prototyping platform.

TESEO modules for a wide range of positioning applications

GNSS ICs

Overview

ST's Teseo family of Global Navigation Satellite System receiver ICs provide high positioning accuracy processing capabilities to simultaneously support multi-band and multiple global navigation systems (BeiDou, Galileo, GLONASS, GPS, Navic and QZSS).

The Teseo family of GNSS ICs includes ASIL-B compliant devices ideal for autonomous driving and advanced driver-assistance systems (ADAS) in addition to e-call and telematics systems, 5G base station timing, V2X and C-V2X as well as handheld, marine and in-car navigation systems.

Teseo GNSS receiver ICs can also provide carrier phase data to enable the use of RTK-PPP positioning algorithms on customer software or through solutions developed via the ST Partner Program.

Teseo V (STA8100GA) is the latest generation of GNSS receiver ICs, offering on-chip, multi-frequency (L1 and L5), multi-constellation, carrier-phase tracking for higher accuracy and precise positioning and autonomous position, velocity and time (PVT) calculations on a single chip.

Teseo V in conjunction with the fully integrated STA5635 RF front-end family devices adds L2 capability as well as dual- (L1 and L2) and triple-band (L1, L2 and L5) measurement engine solutions for automotive-grade and industrial applications. Thanks to its programmable and flexible RF-IF chain driven by a fractional PLL, this solution makes it possible to manage all the GNSS constellations currently available and those planned for the near future.

TeseoAPP (STA9100) is our first ASIL-B GNSS receiver measurement engine IC to address challenging safety-critical applications including autonomous driving and advanced driver-assistance systems (ADAS). When used with fully integrated STA5635S RF front-end, TeseoAPP is a complete multi-band ASIL-B GNSS receiver measurement engine solution.

Our Teseo III series of standalone GNSS-L1 receiver ICs (STA8090xx and STA8089xx) offers reduced power consumption, carrier-phase tracking for higher accuracy, and support for Read-only Memory (ROM).

In addition to a full development ecosystem including a complete standalone GNSS module evaluation and prototyping platform, developers will appreciate the user-friendly Teseo-Suite software tool, X-CUBE-GNSS1 expansion software for STM32Cube, and the AndroidHAL-Teseo HAL device driver for Android/Linux systems.

Teseo GNSS solutions come with different package options compatible with the Teseo Dead-reckoning Automotive Way (Teseo-DRAW) multi-sensor fusion firmware for automotive dead-reckoning and assisted navigation applications and Teseo Dead Reckoning Unplugged Mode (Teseo-DRUM) multi-sensor fusion firmware for dead-reckoning in industrial and IoT applications.

Moreover, members of the ST Partner Program offer a wide range of solutions to provide custom GNSS data correction, assisted GNSS and cloud-offloading services.

Positioning/GNSS ICs

Part Number	General Description	Package	Channels tracked nom	SW features	Signal tracked	Interfaces	Supply Voltage (V) min	Supply Voltage (V) typ	Supply Voltage (V) max	Operating Temperature (°C) min	Operating Temperature (°C) max	Grade
STA5635A	GNSS Multifrequency Multiconstellation RF front-end	VFQFPN 5X5X1 32L P0.5	-	GNSS Raw-Measurement	BeiDou B1I,BeiDou B2I,BeiDou B2a,GPS,GPS L1,GPS L1C,GPS L2C,GPS L5,Galileo,Galileo E1,Galileo E5a,Galileo E5b,Glonass,Glonass L1OF,Glonass L2OF,L1OF,Navic L5,QZSS L1	SPI	1.62	1.8	3.6	-40	105	Automotive
STA5635S	ASIL Universal GNSS RF receiver	VFQFPN 5X5X1 32L P0.5	-	GNSS Raw-Measurement	BeiDou,BeiDou B1,BeiDou B2I,GPS,GPS L1,GPS L1C,GPS L2C,GPS L5,Galileo,Galileo E1,Galileo E5a,Galileo E5b,Glonass,Glonass L1OF,Glonass L2OF,Navic L5	SPI	3	3.3	3.6	-40	105	Automotive Safety
STA8089FG	Fully Integrated GPS/Galileo/Glonass/Beidou2/QZSS Receiver with embedded RF and in-package Flash	VFQFPN 56 7x7x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, Embedded-Flash, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou B1,GPS L1,Galileo E1,Glonass,QZSS L1,SBAS L1	UART, I2C, SD/MMC, USB	1.8	3.3	3.3	-40	85	Industrial
STA8089FGA	Fully Integrated GPS/Galileo/Glonass/Beidou2/QZSS Receiver with embedded RF and in-package Flash	VFQFPN 56 7x7x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, Embedded-Flash, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Galileo,Glonass,QZSS L1	UART, I2C, SD/MMC, USB	1.8	3.3	4.2	-40	85	Automotive
STA8089G	GPS/Galileo/Glonass/Beidou/QZSS receiver	VFQFPN 56 7x7x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,BeiDou B1,GPS,GPS L1,Galileo,Galileo E1,Glonass,Glonass L1OF,QZSS L1,SBAS,SBAS L1	-	1.8	3.3	3.3	-40	85	Industrial
STA8089GA	Automotive Grade GPS/Galileo/Glonass/Beidou/QZSS receiver	VFQFPN 56 7x7x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Glonass,QZSS L1	UART, SPI, SQI, I2C, USB, CAN, GPIOs	1.8	3.3	4.2	-40	85	Automotive
STA8089GAT	Automotive Grade GPS/Galileo/Glonass/QZSS receiver	VFQFPN 56 7x7x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Glonass,QZSS L1	UART, SPI, SQI, I2C, USB, CAN, GPIOs	1.8	3.3	4.2	-40	105	Automotive
STA8089GR	STA8089GR - GPS/Glonass/Beidou/QZSS receiver	VFQFPN 56 7x7x1.0	48	AGNSS Real-Time, GNSS, Odometer, Geofencing	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Glonass,Glonass L1OF,QZSS L1,SBAS,SBAS L1	UART, GPIOs	1.8	3.3	4.2	-40	85	Industrial
STA8090EXGA	Automotive GPS/Galileo/Glonass/QZSS Receiver with powerful processing capability	TFBGA 9SQ1.2 169 F13X13 P.65B.35	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Galileo,Glonass,QZSS L1	UART, SPI, SQI, I2C, USB, CAN, GPIOs	1.8	3.3	4.2	-40	85	Automotive
STA8090FG	Fully Integrated GPS/Galileo/Glonass/Beidou2/QZSS Receiver with embedded RF and in-package Flash	TFBGA 5X6X1.2 99 F9X11 P0.5 B0.3	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, Embedded-Flash, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Galileo,Glonass,QZSS L1	UART, I2C, USB, CAN, GPIOs	1.8	3.3	4.2	-40	85	Industrial
STA8090GA	Automotive Grade GPS/Galileo/Glonass/Beidou/QZSS receiver	VFQFPN2 56 8x8x1.0	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,Galileo,Glonass,QZSS L1	UART, SQI, I2C, USB, CAN, GPIOs	1.6	3.3	4.2	-40	85	Automotive
STA8090WG	STA8090WG - Fully Integrated GPS/Galileo/Glonass/QZSS Receiver with embedded RF	WLCSP MSL1	48	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,Glonass L1OF,QZSS L1,SBAS,SBAS L1	UART, I2C, USB	1.8	1.8	4.2	-40	85	Industrial
STA8090WGR	STA8090WGR - ROM-based GPS/Glonass/QZSS Receiver with embedded RF	WLCSP MSL1	48	AGNSS Real-Time, GNSS, RTCM SBAS v2.3, Odometer, Geofencing	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Glonass,Glonass L1OF,QZSS L1,SBAS,SBAS L1	UART, I2C	-	1.8	-	-40	85	Industrial
STA8100GA	Teseo V Multi frequency GNSS receiver	LFBGA 8X8X1.7 81 PITCH 0.8 BALL	80	AGNSS Autonomous, AGNSS Real-Time, GNSS, GNSS Timing, GNSS Raw-Measurement, GNSS Dead-Reckoning, RTCM SBAS v2.3, RTCM v3	BeiDou,BeiDou B1,BeiDou B1I,BeiDou B2I,GPS,GPS L1,GPS L1C,GPS L5,Galileo,Galileo E1,Galileo E5b,Navic L5,QZSS L1,SBAS,SBAS L1	-	1.71	3.3	3.6	-40	105	Automotive
STA8135GA	Teseo V family automotive triple-band multi-constellation GNSS precise engine receiver	TFBGA 7X11X1.2 160 F16X10 0.65P	80	AGNSS Autonomous, AGNSS Real-Time, GNSS, GNSS Timing, GNSS Raw-Measurement, GNSS Dead-Reckoning, RTCM SBAS v2.3, RTCM v3	BeiDou,BeiDou B1,BeiDou B1I,BeiDou B2I,BeiDou B2a,GPS,GPS L1,GPS L1C,GPS L2C,GPS L5,Galileo,Galileo E1,Galileo E5a,Galileo E5b,Glonass,Glonass L1OF,Glonass L2OF,L1OF,Navic L5,QZSS L1,SBAS,SBAS L1	-	1.71	3.3	3.6	-40	105	Automotive
STA9100MGA	Automotive TeseoAPP (ASIL Precise Positioning) Family Multi Band GNSS Precise Measurement Engine receiver	LFBGA 8X8X1.7 81 PITCH 0.8 BALL	80	GNSS Raw-Measurement, RTCM v3	BeiDou,BeiDou B1,BeiDou B1I,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,Glonass L1OF,QZSS L1	SPI	3	3.3	3.6	-40	85	Automotive Safety

GNSS Modules

Overview

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Cost-competitive, ST's Teseo GNSS modules allow for easy integration and migration from existing product designs including trackers, telematics, portable, and tablets as well as marine and sports accessories.

Combining high positioning accuracy and indoor sensitivity with powerful processing capabilities, our tiny Teseo-LIV3x modules simultaneously support multiple global navigation systems including BeiDou, Galileo, GLONASS, GPS, and QZSS.

Addressing Industrial and Consumer applications, the Teseo-LIV3x family with its 9.7 x 10.1 mm compact size, offers superior accuracy thanks to its embedded temperature-compensated crystal oscillator (TCXO) and a reduced Time To First Fix (TTFF) using its dedicated real-time clock (RTC).

Addressing Dead-Reckoning and Automotive applications, the Teseo-VIC3x family with its 16 x 12.2 mm size, offers built-in sensor fusion able to guarantee PVT solution also in absence of satellites signal thanks to its on-board ST 6-axis sensor.

We provide a full development ecosystem including a complete standalone GNSS module evaluation and prototyping platform.

In addition to our powerful Teseo-Suite PC tool, we also provide STM32 function packs and expansion software as well as a flexible firmware solution that makes it easy to download new firmware and updates.

Positioning/GNSS Modules

Part Number	General Description	Package size (mm)	Channels tracked nom	SW features	Signal tracked	Interfaces	Supply Voltage (V) min	Supply Voltage (V) typ	Supply Voltage (V) max	Operating Temperature (°C) min	Operating Temperature (°C) max	Grade
Teseo-LIV3F	Tiny GNSS module	9.7x10.1	32	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,QZSS L1,SBAS,SBAS L1	UART, I2C	2.1	3.3	4.3	-40	85	Industrial
Teseo-LIV3FL	Tiny GNSS low power module	9.7x10.1	32	AGNSS Autonomous, AGNSS Predictive, AGNSS Real-Time, GNSS, GNSS Raw-Measurement, GNSS Timing, RTCM SBAS v2.3, RTCM v3, Datalogging, Odometer, Geofencing	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,QZSS L1,SBAS,SBAS L1	UART, I2C	1.71	1.8	3.3	-40	85	Industrial
Teseo-LIV3R	Teseo ROM GNSS module	9.7x10.1	32	AGNSS Real-Time, GNSS, Odometer, Geofencing	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Glonass,QZSS L1,SBAS,SBAS L1	UART, I2C	2.1	3.3	4.3	-40	85	Industrial
Teseo-LIV4F	Tiny GNSS dual-bands low power module	9.7x10.1	-	AGNSS Real-Time, GNSS	BeiDou B1,BeiDou B1I,GPS L1,GPS L5,Galileo E1,Galileo E5a,Glonass L1OF,QZSS L1	UART, I2C	1.8	3.3	3.6	-40	85	Industrial
Teseo-LIV4FM	Tiny dual-band GNSS measurement engine module	9.7x10.1	-	AGNSS Real-Time, GNSS, GNSS Raw-Measurement, RTCM SBAS v2.3, RTCM v3	BeiDou B1,BeiDou B1I,GPS L1,GPS L5,Galileo E1,Galileo E5a,Glonass L1OF,Navic L5,QZSS L1	UART, I2C	3	3.3	3.6	-40	85	Industrial
Teseo-VIC3D	Industrial GNSS dead reckoning module with 6-axis IMU	9.7x10.1	32	AGNSS Autonomous, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, RTCM SBAS v2.3, RTCM v3	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,QZSS L1,SBAS,SBAS L1	UART, I2C	3	3.3	3.6	-40	85	Industrial
Teseo-VIC3DA	Automotive GNSS dead reckoning module with 6-axis IMU	9.7x10.1	32	AGNSS Autonomous, AGNSS Real-Time, GNSS, GNSS Dead-Reckoning, RTCM SBAS v2.3, RTCM v3	BeiDou,BeiDou B1,GPS,GPS L1,GPS L1C,Galileo,Galileo E1,Glonass,Glonass L1OF,QZSS L1,SBAS,SBAS L1	UART, I2C	3	3.3	3.6	-40	85	Automotive