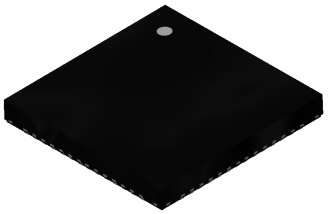
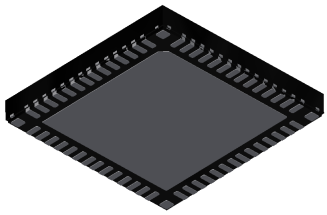
STA8600A

Data brief

TeseoVI single-die automotive quad-band GNSS receiver





VFQFPN56 (7 × 7 × 0.9 mm)
with wettable flanks

Product status link
STA8600A

Product summary		
Order code	**Packing**	**Secure**
STA8600A	Tray	No
STA8600AS		Yes
STA8600AE		No
STA8600AP		No
STA8600ASP		Yes
STA8600ATR	Tape and reel	No
STA8600ASTR		Yes
STA8600AETR		No
STA8600APTR		No
STA8600ASPTR		Yes

Features

Highlights

- *AEC*-Q100 qualified
- Arm® Cortex®-M7
- Embedded RAM/NVM/cache
- Dedicated ADC for antenna sensing
- *ESD*: 2 kV (*HBM*) and 500 V (*CDM*)
- Automotive grade 105°C

GNSS features

- STMicroelectronics' sixth generation positioning receiver with six constellations: *GPS*, *Galileo*, *GLONASS*, *BeiDou*, *QZSS*, *NAVIC* (former *IRNSS*)
- Standard *PVT* positioning supporting up to quad-band (dual-band on STA8600AE) for submeter accuracy applications
- Precise *PVT* positioning supporting up to quad-band for centimeter-level accuracy applications (STA8600AP and STA8600ASP only)
- TESEO-DRAW (dead reckoning automotive way) support
- Measurement engine with up to quad-band (dual-band on STA8600AE) to support precise positioning algorithms
- Code phase, carrier phase, doppler frequency measurement
- Support any *SBAS* systems
- Independent *GPS*/*QZSS* L5, *Galileo* E5a/b, *BeiDou* B2a acquisition & tracking
- 192 (96 data & 96 pilot) signal tracking channels

Security

- Cybersecurity (ISO21434) support (STA8600AS and STA8600ASP only)
- Chip integrity (secure boot, secure firmware update, secure link) due to an embedded hardware security module (*HSM*) (STA8600AS and STA8600ASP only)
- Signal integrity (antijamming/antispoofing)
- Interface integrity (on-the-fly decryptor engine) (STA8600AS and STA8600ASP only)

Communication interfaces

- Two *UART* ports for host communication supporting hardware flow control
- One synchronous serial port (*SSP*) for host communication
- One I²C port for sensor interfacing
- One *SPIQ* port for sensor interfacing
- Two *PPS* configurable I/Os

Core peripherals

- Embedded *DMA*
- 32 kHz oscillator real-time clock

- Watchdog timer
- One extended function timer

Power management unit

- Separate power supply domains:
  - Backup domain: 1.71 V to 3.63 V
  - Switchable domain: 1.71 V to 3.63 V
  - Optional external core supply voltage: 0.9 V to 1.0 V
- On-chip *LDO*s with high-voltage/low-voltage monitors

1 Introduction

1.1 Description

The STA8600A is a quad-band multiconstellation positioning receiver IC. It requires minimal external components since it embeds enough *MIPS*/memory resources for supporting up to quad-band (dual-band on STA8600AE) algorithms on chip (with submeter accuracy). It supports dead reckoning automotive way (TESEO-DRAW) and dead reckoning unplugged mode (Teseo-DRUM) to ensure high-accuracy positioning in harsh environments such as tunnels, garages, and deep urban areas.

The STA8600A provides measurement data with up to quad-band (dual-band on STA8600AE). Combined with the *PPP*/*RTK* algorithm, the device provides high positioning accuracy. It shows great flexibility due to the capability to handle all software configurations with a unique binary firmware component. It also supports a unique *PCB* design for safety and non-safety applications thanks to pin-to-pin compatibility with the STA9200MA (*ASIL* chip).

The STA8600AP and STA8600ASP support a *RTK* embedded precise positioning algorithm enabling centimeter-level accuracy application without the need for an external host. They are suitable for drones, robotic lawn mowers and agriculture.

The STA8600AS includes a hardware security module (*HSM*) to support secure boot. This module, with the signal and interface integrity mechanism, makes the STA8600A the ideal solution for applications where integrity is a key factor. It supports a highly evolved antijamming and antispoofing mechanism to mitigate attacks thanks to independent L5 acquisition and tracking, and to the *Galileo OSNMA* capability. The innovative RF architecture and *GNSS* baseband make it ready to support new emerging low Earth orbit (*LEO*) constellations. It is compliant with the ST automotive-grade qualification, which is included in addition to the AEC-Q100 requirements.

The usage of in-house manufacturing fabs combined with a set of production flow methodologies targeting zero defect per million, makes the STA8600A the ideal solution for stringent automotive quality and supply chain requirements.

The device is delivered in a QFN package.

arm

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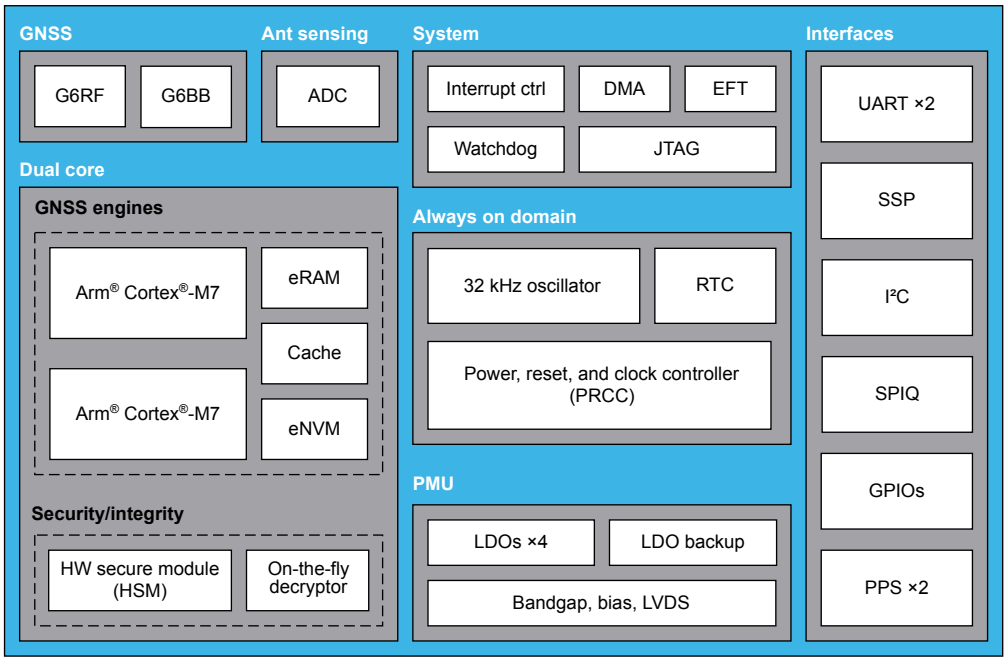
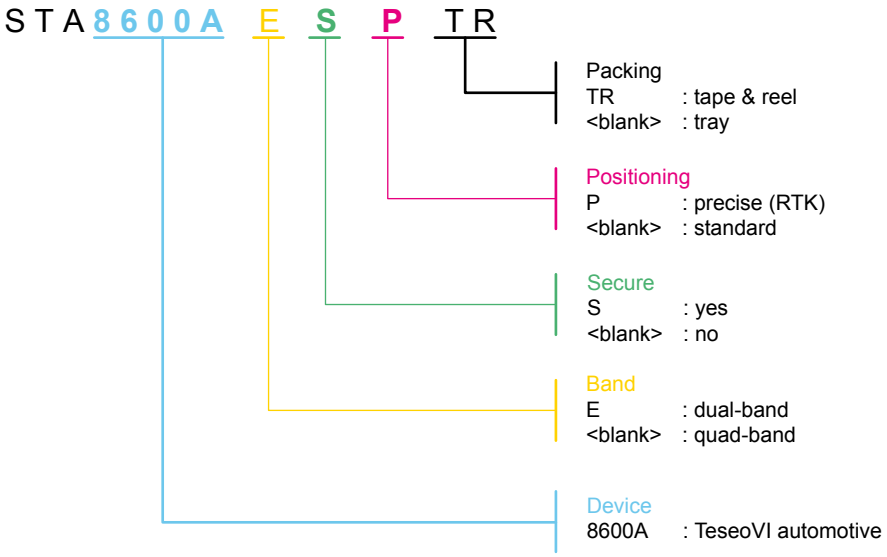
1.2 Block diagram

Figure 1. **Block diagram**



2 Ordering information

Figure 2. Ordering information scheme



Not all combinations are allowed. For a complete list of supported order codes, refer to Product summary.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
03-Feb-2025	1	Initial release.
20-Jan-2026	2	Updated with new order codes.

Glossary

ADC Analog-to-digital converter

AEC Automotive Electronics Council. Also known as CDF-AEC for Chrysler-Delco-Ford Automotive Electronics Council. Shortened to AEC.

ASIL Automotive safety integrity level - a risk classification system defined by the ISO 26262 standard for the functional safety of road vehicles; there are four ASILs identified by ISO 26262 — A, B, C, and D, from the lowest to the highest degree of automotive hazard

BeiDou Chinese navigation satellite-based radio navigation system

CBC Cipher block chaining

CDM Charged device model

DMA Direct memory access

DRAW Dead reckoning automotive way

DRUM Dead reckoning unplugged mode

ESD Electrostatic discharge

Galileo EU´s global navigation satellite system

GLONASS Russian satellite navigation system. Acronym for GLObalnaya NAvigatsionnaya Sputnikovaya Sistema (Russian). The role of the GLONASS satellite navigation system is similar to the GPS of the United States, the Galileo satellite positioning system of Europe, and the BeiDou satellite navigation system of China.

GNSS Global navigation satellite system

GPIO General-purpose input/output

GPS Global positioning system

HBM Human body model

HSM Hardware security module

IRNSS Indian regional navigation satellite system, with the operational name of Navigation with Indian constellation (NAVIC).

ISO International Organization for Standardization

I²C Inter-integrated circuit

JTAG Joint Test Action Group

LDO Low-dropout regulator

LEO Low Earth orbit

LVDS Low-voltage differential signaling

MIPS Million instructions per second

NAVIC Navigation with Indian constellation. The Indian regional navigation satellite system (IRNSS) is an autonomous regional satellite navigation system that provides accurate real-time positioning and timing services.

NVM Nonvolatile memory - a memory that retains its contents even when powered down, such as flash memory or EEPROM

OSNMA Open service navigation message authentication

PCB Printed-circuit board

PPP Precise point positioning

PPS Pulse per second

PVT Position-velocity-time

QFN Quad-flat no-leads

QZSS Quasi-zenith satellite system.

A Japanese satellite positioning system composed mainly of satellites in quasi-zenith orbits (QZO), but also of satellites in geostationary orbits (GEO).

RAM Random access memory

RTK Real-time kinematic

SBAS Satellite-based augmentation system. It provides services for improving the accuracy, integrity, and availability of basic GNSS signals.

SPI Serial peripheral interface

SPIQ Queued serial peripheral interface

SSP Synchronous serial port

ST STMicroelectronics

UART Universal asynchronous receiver/transmitter

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