

# Copernicus GPS Receiver

*Ultra-Thin, Low Power, Surface Mount GPS Module*

## Key Features and Benefits

**THUMBNAIL-SIZED:**  
Just 2.54 mm THIN  
19 mm W x 19 mm L

**FAST MANUFACTURING**  
Tape & reel packaging;  
Pick & place assembly;  
Reflow solderable

**HIGH PERFORMANCE**  
Low power usage; 93.9 mW (typ)  
Highly sensitive; -152 dBm  
Fast TTFF (cold start): 39 sec

**FLEXIBLE**  
Supports active or  
passive antennas  
NMEA, TSIP, TAIP protocols

**TRIMBLE VALUE**  
High quality, low price  
RoHS compliant

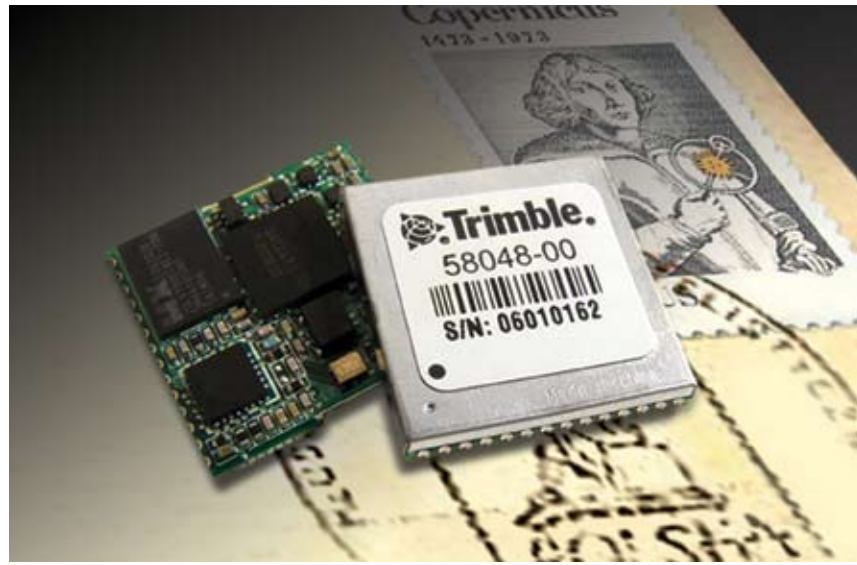
## Drop-in Performance

Trimble's Copernicus™ GPS receiver delivers proven performance and Trimble quality for a new generation of position-enabled products. It features the Trimble revolutionary TrimCore™ software technology for extremely fast startup times and high performance in foliage canopy and urban canyon environments.

Designed for the demands of automated, high-volume production processes, the Copernicus module is a complete 12-channel GPS receiver in a 19mm x 19mm x 2.54mm, thumbnail-sized shielded unit. The small, thin, single-sided module is packaged in tape and reel for pick-and-place manufacturing processes; 28 reflow-solderable edge castellations provide interface to your design without costly I/O and RF connectors. Each module is manufactured and factory tested to Trimble's highest quality standards.

The ultra-sensitive Copernicus GPS receiver can acquire GPS satellite signals and generate fast position fixes with high accuracy in extremely challenging environments and under poor signal conditions. The module consumes typically 93.9mW at full power with continuous tracking. The module is RoHS (lead-free) compliant.

The Copernicus GPS module is a complete drop-in, ready-to-go receiver that provides position,



*The Copernicus GPS Surface Mount Module and Shield*

velocity and time data in a user's choice of three protocols. Trimble's powerful TSIP protocol offers complete control over receiver operation and provides detailed satellite information. The TAIP protocol is an easy-to-use ASCII protocol designed specifically for track and trace applications. The bi-directional NMEA 0183 v3.0 protocol offers industry-standard data messages and a command set for easy interface to mapping software

## Applications

Compatible with active or passive antennas, the Copernicus GPS receiver is perfect for portable handheld, battery-powered applications. The receiver's small size and low power requirement make it ideal for use in Bluetooth appliances, sport accessories, personal navigators

or cameras and computer and communication peripherals, as well as vehicle tracking, navigation, and security applications.

## Copernicus Starter Kit

The Copernicus Starter Kit provides everything you need to get started integrating state-of-the-art GPS capability into your application. The kit includes the reference interface board, which gives designers a visual layout of the Copernicus module on a PCB including the RF signal trace and RF connector, as well as the I/O connections of the 28 signal pins. Also included are a power converter, power adapter, GPS antennas, and the software for you to readily check out how easy it is to add Copernicus GPS to your application.

# Trimble

# Copernicus GPS Receiver

## Ultra-Thin, Low Power, Surface Mount GPS Module

### PERFORMANCE SPECIFICATIONS

<b>General</b>	L1 (1575.42 MHz) frequency, C/A code, 12-channel, continuous tracking receiver
<b>Update Rate</b>	TSIP @ 1 Hz; NMEA @ 1 Hz; TAIP @ 1 Hz
<b>Accuracy</b>	Horizontal: <3 meters (50%), <8 meters (90%) Altitude: <10 meters (50%), <16 meters (90%) Velocity: 0.06 m/sec PPS (static): ±50 nanoseconds
<b>Acquisition (Autonomous Operation)</b>	Reacquisition: 2 sec Hot Start: 9 sec Warm Start: 35 sec Cold Start: 39 sec Out of the Box: 41 sec
<b>Sensitivity</b>	Tracking: -152 dBm Acquisition: -142 dBm
<b>Operational (COCOM) Limits Velocity</b>	515 m/s

### INTERFACE CHARACTERISTICS

<b>Connectors</b>	28 surface-mount edge castellations
<b>Serial Port</b>	2 serial ports
<b>PPS</b>	3.0 V CMOS-compatible, TTL-level pulse, once per second
<b>Protocols</b>	TSIP, TAIP, NMEA 0183 v3.0 Bi-directional NMEA messages Messages selectable by NMEA commands Selection stored in flash memory

### ELECTRICAL CHARACTERISTICS

<b>Prime Power</b>	+2.7 VDC to 3.3 VDC
<b>Power Consumption</b>	(typ.) 30.7 mA (82.9 mW) @ 2.7 V (typ.) 31.3 mA (93.9 mW) @ 3.0 V
<b>Backup Power</b>	+2.7 VDC to +3.3 VDC
<b>Ripple Noise</b>	Max 50 mV, peak-to-peak from 1 Hz to 1 MHz

### ENVIRONMENTAL SPECIFICATIONS

<b>Operating Temperature</b>	-40° C to +85° C
<b>Storage Temperature</b>	-55° C to +105° C
<b>Vibration</b>	0.008 g <sup>2</sup> /Hz 5 Hz to 20 Hz 0.05 g <sup>2</sup> /Hz 20 Hz to 100 Hz -3 dB/octave 100 Hz to 900 Hz
<b>Operating Humidity</b>	5% to 95% R.H. non-condensing, at +60° C

### PHYSICAL CHARACTERISTICS

<b>Enclosure</b>	Metal shield
<b>Dimensions</b>	19 mm W x 19 mm L x 2.54 mm H (0.75" W x 0.75" L x 0.1" H)
<b>Weight</b>	1.7 grams (0.06 ounce) including shield

### PINOUT ASSIGNMENTS

GND	1	28	GND
GND	2	27	GND
RF-IN	3	26	Reserved
GND	4	25	Reserved
LNA	5	24	TXD-B
Reserved	6	23	TXD-A
Open	7	22	Reserved
Short	8	21	RXD-A
Reserved	9	20	RXD-B
Boot	10	19	PPS
Xreset	11	18	Reserved
Vcc	12	17	Reserved
GND	13	16	Xstandby
GND	14	15	GND

### ORDERING INFORMATION & ACCESSORIES

<b>Module</b>	Copernicus GPS Receiver Module, in metal enclosure Single modules Tape on reel (100 pieces) Tape on reel (500 pieces)
<b>Reference Board</b>	Copernicus GPS module mounted on a carrier board with I/O and RF connectors, including the RF circuitry with the antenna open detection, as well as antenna short detection and protection.
<b>Starter Kit</b>	Includes Copernicus Reference Board mounted on interface motherboard in a durable metal enclosure, AC/DC power converter, compact magnetic-mount GPS antenna, ultra-compact embedded antenna, serial interface cable, cigarette lighter adapter, TSIP, NMEA, and TAIP protocols, software toolkit and manual on CD-ROM

#### Ultra-Compact Embedded Antenna



3.3V active miniature unpackaged antenna  
Cable length: 8 cm  
Dim: 22 mm W x 21 mm L x 7.5 mm H  
(0.866" x 0.827" x 0.295")  
Connector: HFL

#### Compact Magnetic-Mount Antenna, MCX or SMA



3V active micropatch antenna with magnetic mount  
Cable length: 5 m  
Dim: 30.4 mm W x 35.5 mm L x 11.7 mm H  
(1.197" x 1.398" x 0.461")  
Connectors: MCX or SMA,

*Parts of this product are patent protected.*

*Specifications subject to change without notice.*

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