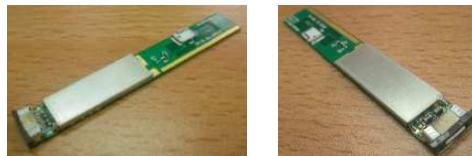# GM-660, Ultra Thin, Easy to Use GPS Smart Antenna Module

RoHS
Compliant

Overview

GM-660 is equipped with -161dBm engine and the ultra-thin module's height is just 2.7 (mm). The slim design allows it to be used in thickness demanding devices such as tablet, notebook PC etc.

Our experienced design provides not only fast acquisitions and excellent tracking performance but also quality and delivery assurance.

Applications

- Notebook PC / Netbook, Tablet PC
- Smart phone, MID, UMPC, PND
- Digital camera
- Personal/pet tracker

Features

- Slim: 60 (L) x 9.5 (W) x 2.7 (H) (mm)
- Built-in chip antenna
- Low power consumption by low voltage power/1.8V
- Software power saving control
- Sleep current less than 450uA
- Easy to use 8-pin FFC connector
- High performance: -161dBm tracking sensitivity[+]
- A-GPS support
- Excellent EMI protection

Technical Specifications

Receiver Performance Data[+]

Receiver Type	50-channel, L1 frequency, C/A code

Horizontal Position Accuracy	< 2.5m (Autonomous) < 2.0m (WAAS) (CEP,50%,24-hour static, -130dBm)
Velocity Accuracy	<0.1 m/s (speed) <0.5° (heading) (50% @ 30 m/s)
Time To First Fix	Autonomous (All at -130dBm)
Hot start	1sec
Warm start	27sec
Cold start	27sec
Sensitivity (Autonomous)	-147dBm (acquisition) -161dBm (tracking & navigation)
Max. Update Rate	5Hz
Max. Altitude	< 50,000 m
Max. Velocity	< 1,852 km/hr
Protocol Support	NMEA 0183 v2.3 UART: 4800bps N,8,1; GGA, GSA, GSV, RMC, TXT
SBAS Support	WAAS, EGNOS, MSAS
Dynamics	< 4g

[+] Note. According to IC Spec

Electrical Data

Power Supply	3.3 / 1.8 V
Power Consumption	62 mA / average tracking
TTL I/O	V_{IH}: 1.26~1.8V, V_{IL}: 0~0.36V V_{OH}: >1.4V, V_{OL}< 0.4V
Protocols	NMEA, u-blox Binary

Environmental Data

Operating temperature	-40 ~ 85℃
Storage temperature	-40 ~ 85℃

Mechanical Data – 60 x 9.5 x 2.7 (mm)
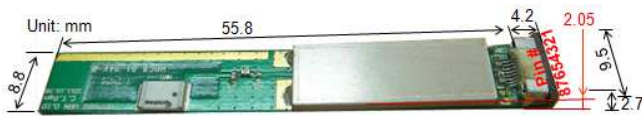
8-pin FFC Interface

Pin	Name	Function	I/O
1	RXD	Serial data input (to GPS)	Input
2	TXD	Serial data output (from GPS)	Output
3	VCC18	1.8 V power supply	Input
4	VCC33	3.3 V power supply	Input
5	NC	No connection	-
6	1PPS	1 Pulse per second signal	Output
7	nRESET	Active low reset	Input
8	GND	Ground	Input

Handheld Device Application

1. Large ground plane below GM-660 boots its performance. As shown in following picture, GM-660 mounts on top of EVB and the shielding case of GM-660 is connected to the ground plane of EVB.
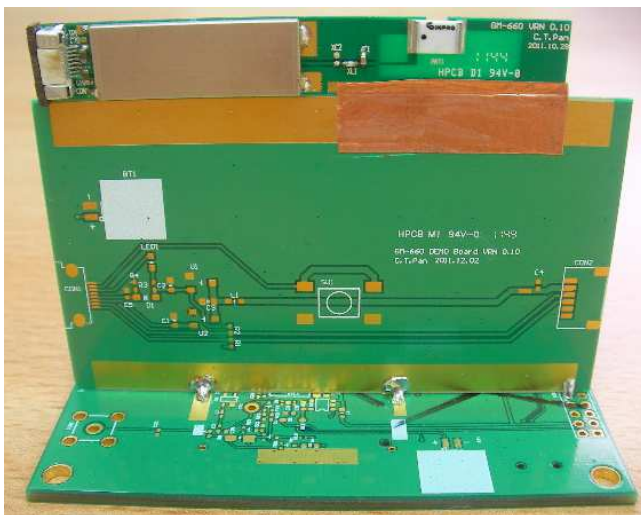
2. Typically, there is a big ground plane inside main board PCB or LCM. In this case, place the GM-660 body on top side of the PCB or LCM and solder GM-660 copper shielding pad to the PCB or LCM

for better antenna performance.

3. Connect 8-pin interface to main board.

4. To save power, turn off the GPS module via u-blox software command.

Ordering Information
GM-660X

X=T	UART interface, 9600bps, N-8-1
	RMC, VTG, GGA, GSA, GSV, GLL

*This document is subject to change without notice.