GPS Evaluation Kit EVA1035-H

**A Description of the Evaluation Board
for Maestro's GPS Receiver / Smart Antenna Module A1035-H**

User's Manual

Version 1.1

Revision History

Rev.	Date	Description
0.1	12-30-08	Initial Draft, based on EVA1084-A and A1035-H manuals
1.0	01-26-09	First release
1.1	02-09-11	New style; moved to Maestro
	mm-dd-yy	

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1 Introduction

1.1 Purpose

The GPS Evaluation Kit EVA1035-H allows an easy evaluation of Maestro's GPS receiver /smart antenna module A1035-H by offering quick access to the ports of the module.

The EVA1035-H serves three major purposes:

- As a demonstration package of the module's capabilities
  Powering the A1035-H GPS receiver module via the USB connector with sufficient view to the sky (or using an external active antenna with sufficient view to the sky) will result in an NMEA output with position information.

- As an example how to integrate the module into a system
  The schematic in chapter "10 Board Schematics" is a basic example of how to integrate the GPS module into an application or system.

- To support an easy temporary design in
  The signals provided on the Evaluation Kit allow direct integration into a surrounding system making it an ideal development tool.

The EVA1035-H can especially demonstrate that the on-module GPS antenna and an external active GPS antenna connected to the External Antenna input will result in outstanding GPS performance. The user can switch between the two antennas with the ANT_SW signal provided by the DIP switch.

A Supercap is used to continue RTC operation and to back-up SRAM during power off periods. The firmware provided on the A1035-H delivered with the EVA1035-H is identical to the standard firmware delivered on single A1035-H GPS receiver modules.

1.2 Contents

The EVA1035-H includes the following components:

- Demonstration board (labeled EVA1035-H) with one A1035-H GPS receiver / smart antenna
- USB cable to connect to your PC
- CD with complete documentation and Maestro's GPS Cockpit software

Please check your package for completeness and connect the components properly.

2 Handling Precautions

The EVA1035-H contains components that are sensitive to electrostatic discharge (ESD). Please handle with appropriate care.

3 Quick Start (using USB connection)

(1) Connect the EVA1035-H with your PC using the included USB cable.

(2) When the PC asks for drivers select the folder "Tools\Drivers" on the included CD ROM. Note that two drivers need to be installed, the EVA1035-H FTDI driver and the USB serial driver.

Note: During the driver installation process your Windows system will probably notify you, that the driver did not pass Windows logo testing with a warning:
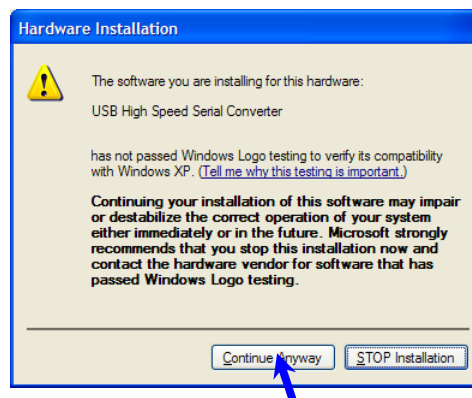

Figure 1: Windows driver installation warning

Note: After successful driver installation Windows might interpret the data coming over the serial interface as a serial ballpoint mouse! Your mouse pointer can start jumping around. To stop this, disable the according device using your device manager. Leave the EVA1035-H kit connected and press and keep pressing the reset button. You will find the device under "Mice and other pointing devices". Use a right click to open the sub-menu and disable the device.
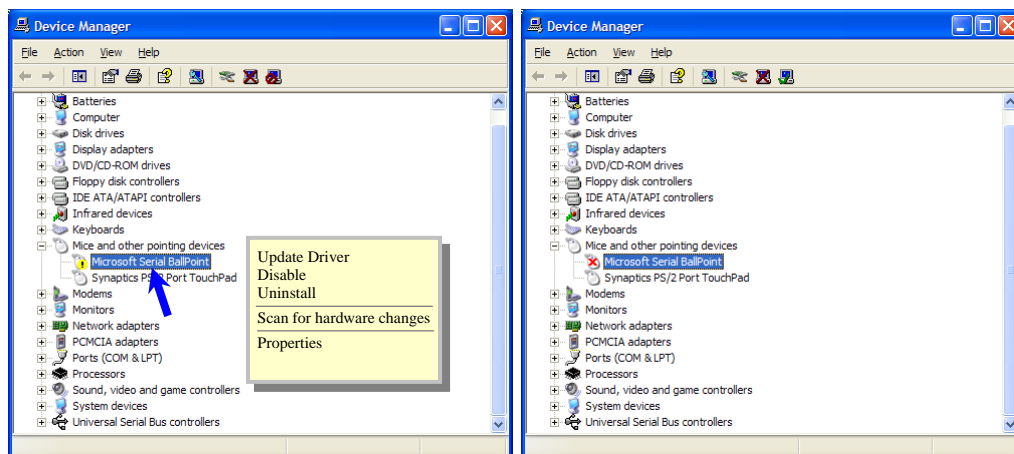

Figure 2: Disabling of Microsoft Serial BallPoint

(3) Either assure that the on-module GPS antenna has good view to the sky or connect the included GPS antenna to the EVA1035-H via the external antenna connector and make sure this active antenna has a good view to the sky! Make sure the right antenna input is activated by setting the ANT_SW DIP to the "OFF" position fgor the on module antenna or to the "ON" position for the external antenna.

(4) To start the GPS Cockpit software which visualizes the NMEA output data coming from the GPS receiver, copy all files from the included CD ROM "Tools/GPS Cockpit" to a folder of you choice on your PC. Then double click the GPSC.exe file. The GPS cockpit software starts without additional software installation.

(5) Now you need to activate the correct port within GPS Cockpit. You can do this by selecting "COM port connection". A detailed description of the GPS Cockpit software is included on the CD ROM. In any case, the following window will appear:
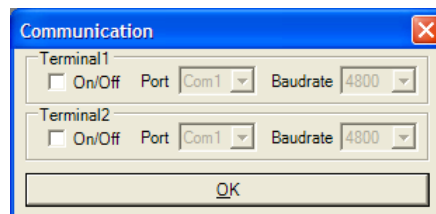

Figure 3: GPS Cockpit communication window - blank

Activate "Terminal 1", choose the COM port to which the GPS receiver is connected (verify in your system settings - device manager, which communication port is used for this USB serial connection), in our example COM2 at 4800 baud (default setting for the EVA1035-H), and click on "OK":
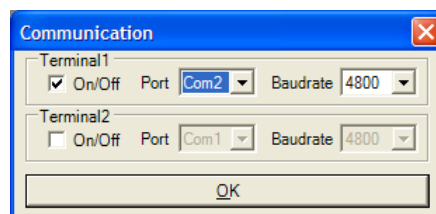

Figure 4: GPS Cockpit communication window – COM2

The connection is established now.

(6) Open a terminal window to see NMEA sentences by using the "NMEA Terminal" window button. You should then see messages like this:

Figure 5: GPS Cockpit NMEA terminal with NMEA data

Now you can start using all the other windows and features of GPS Cockpit. Please refer also to the GPS Cockpit manual and the online help within GPS Cockpit.

4 On-Board Peripherals

4.1 RESET and ON_OFF Push-Button

The EVA1035-H holds two push-buttons:

- nRST (RESET)
- ON_OFF

The nRST button is used to get a full reset of the GPS module. All parameters are stored in non-volatile memory. After pushing this button the module starts again from the beginning.

The ON_OFF button puts the A1035-H GPS receiver into Hibernate state if it is on and wake up if it is in sleep state. During sleep state the receiver draws 20µA typically and maintains RTC and SRAM.

Hibernate mode is supported by Firmware version 3.2.5 and later.

4.2 External Antenna Connector

The A1035-H supports two antenna inputs:

- The on-module antenna.
- The antenna connector "External Antenna" leads to pin 8 of the A1035-H GPS receiver which supports active GPS antennas.

It can be switched between the two antenna inputs by using the ANT_SW pin of the A1035-H connected to the DIP switch on board the EVA1035-H evaluation kit.

Setting the DIP switch to "OFF" means the on-module is activated.
Setting the DIP switch to "ON" means the External Antenna input is activated.
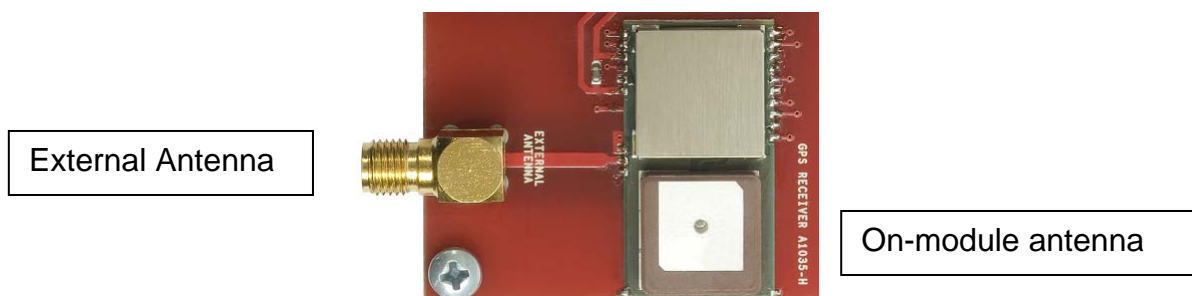

Figure 6: On-module antenna and External Antenna Connector

Further information is given in

- Chapter "6.2 DIP Switch Settings" and
- Maestro's GPS Receiver A1035-H Product Manual

4.2.1 Hints

If the external antenna input is not used it should be terminated with 50 $\Omega \pm 20\%$. Do not feed antenna supply voltage into terminated antenna inputs.

5 LED's

There are 6 LED's on the EVA1035-H that indicate different signals from the GPS receiver (order of LED's on EVA1035-H from left to right):

LED	Name	Function	Description
LD2	RX	Receive	Serial data traffic (into GPS receiver)
LD1	TX	Transmit	Serial data traffic (from GPS receiver)
LD4	ON_OFF	Hibernate	Toggle hibernate mode / position request during PTF cycle (the LED visualizes the ON_OFF pulse)
LD5	1PPS	Timing	1PPS signal at rising edge (1 pulse per second, duration 500ms typ.) Note: The original pulse width provided by the GPS receiver is 1µs typically. (see also AppNote 1PPS Pulse Width)
LD3	RFPWUP	RF/analog status	Status of analog section (LED on = ON, LED off = OFF) / controls power supply to the analog section of the A1035-H GPS receiver.
LD6	Power / VCC	POWER	Power on LED

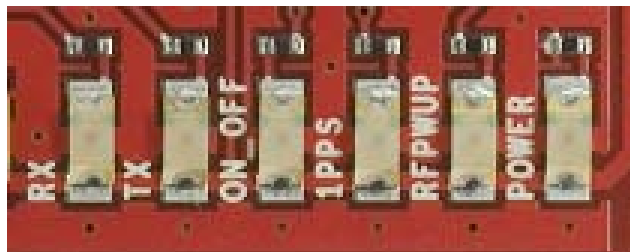Table 1: LED's function and description

Figure 7: EVA1035-H LED's

6 Design-in Support

The EVA1035-H demo board offers the possibility to implement the A1035-H GPS receiver module temporarily into your design by using the terminal block with 9 connections. To operate the EVA1035-H via this terminal block, please check "Table 3: Switch settings".

Please note:
- VCC power input is **not** protected against reversed polarity
- External supply has to be within the range of 3.3 to 3.6 VDC
- RTC backup: Supercap soldered to the board can be used (*1)

6.1 Terminal Block

The terminal block offers direct access to the A1035-H GPS receiver pins.

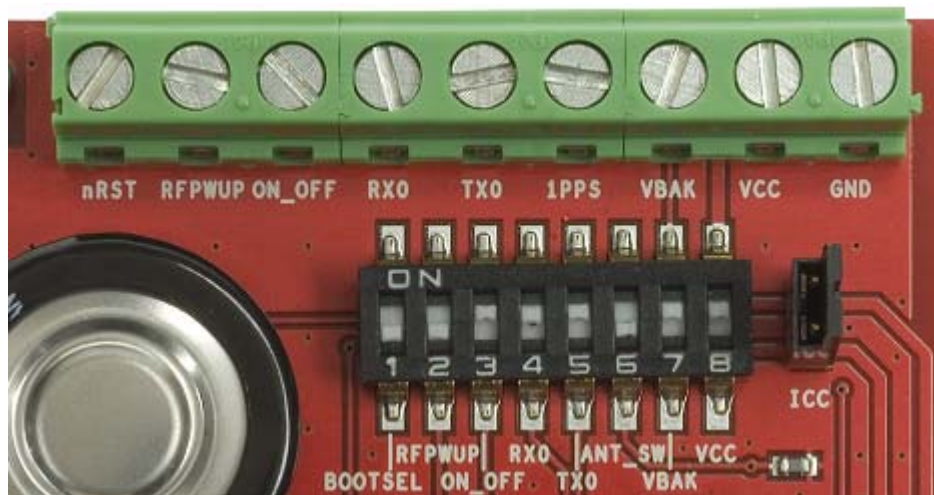| Pin	1	2	3	4	5	6	7	8	9
Port	nRST (reset)	RFPWUP (Status of analog section)	ON_OFF (hibernate mode / PTF mode)	RX0	TX0	1PPS (Pulse Per Second)	VBAK (backup supply)	VCC	GND

Table 2: Terminal block description

Figure 8: Terminal block

6.2 DIP Switch Settings

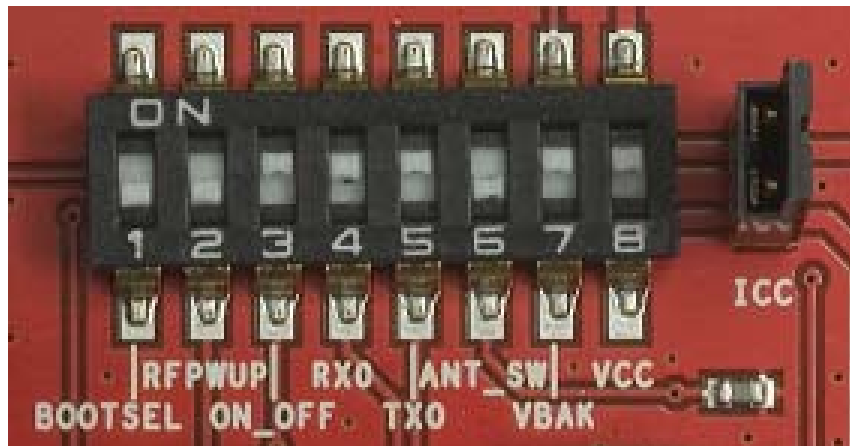The following picture shows the DIP switches of the EVA1035-H.

Figure 9: DIP switches

Switch	Function	Operation via USB connector (default settings)	Operation via terminal block
S1	BOOTSEL	OFF	OFF (*2)
S2	RFPWUP	ON	OFF
S3	ON_OFF	ON	OFF
S4	RX0	ON	OFF
S5	TX0	ON	OFF
S6	ANT_SW	ON = high (A1035-H pin 8, external active antenna)	not applicable
		OFF = low (A1035-H on-module antenna)	
S7	VBAK	ON	OFF (*1)
S8	VCC	ON	OFF

Table 3: Switch settings

*1: S7 has to be OFF to use an external VBAK supply.
   S7 has to be ON to use the onboard Supercap.

*2: The BOOT switch can be set to flash Firmware to the A1035-H GPS receiver.
   Switch the BOOTSEL switch to "ON", press and release the nRST button. The
   A1035-H is now waiting to receive new firmware data via UART.

   After upgrading the firmware switch the BOOTSEL switch to "OFF" and press
   and release the nRST button for restarting normal GPS receiver operation.

   Related software tool and documentation: SIRF_Flash
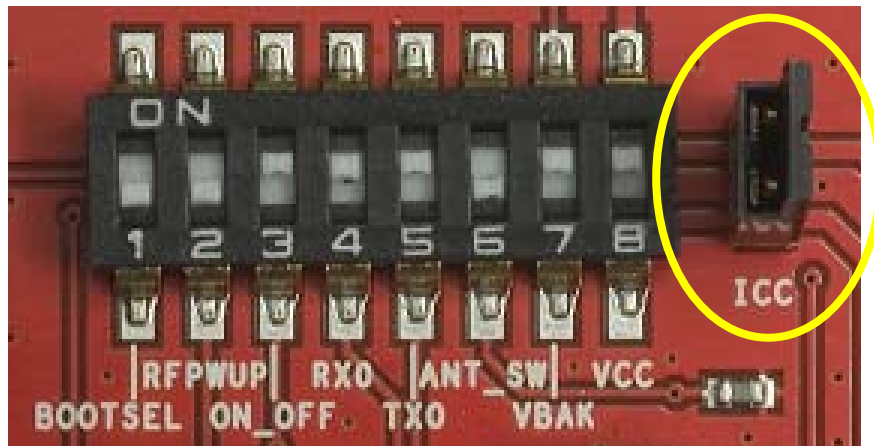
6.3 ICC Jumper

Figure 10: ICC jumper

As long as the VCC DIP switch is "ON" the ICC jumper is bridged. By switching off the VCC switch the current draw of the A1035-H GPS receiver can be measured directly by connecting a low resistance measurement device to the ICC jumper.

The low resistance measurement device should be connected before VCC is switched off!

7 NMEA Port

- Default setting: 4800 baud, 8 data bits, no parity, 1 stop bit, no flow control!
- Standard NMEA-0183 output on NMEA, baud rate selectable.
- Standard USB connectors

8 EVA1035-H Firmware and NMEA Sentences

See separate document **GPS Firmware** for a detailed description of the standard firmware loaded onto the modules delivered with the EVA1035-H.
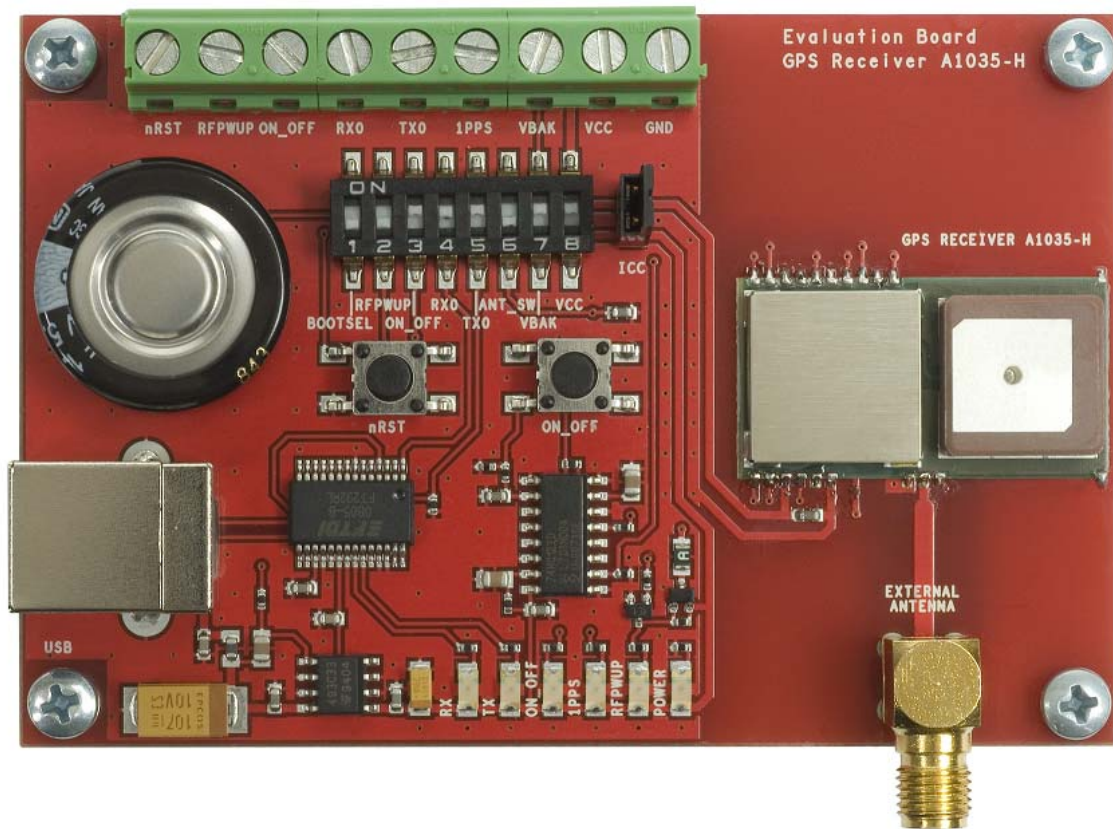
9 Board Overview

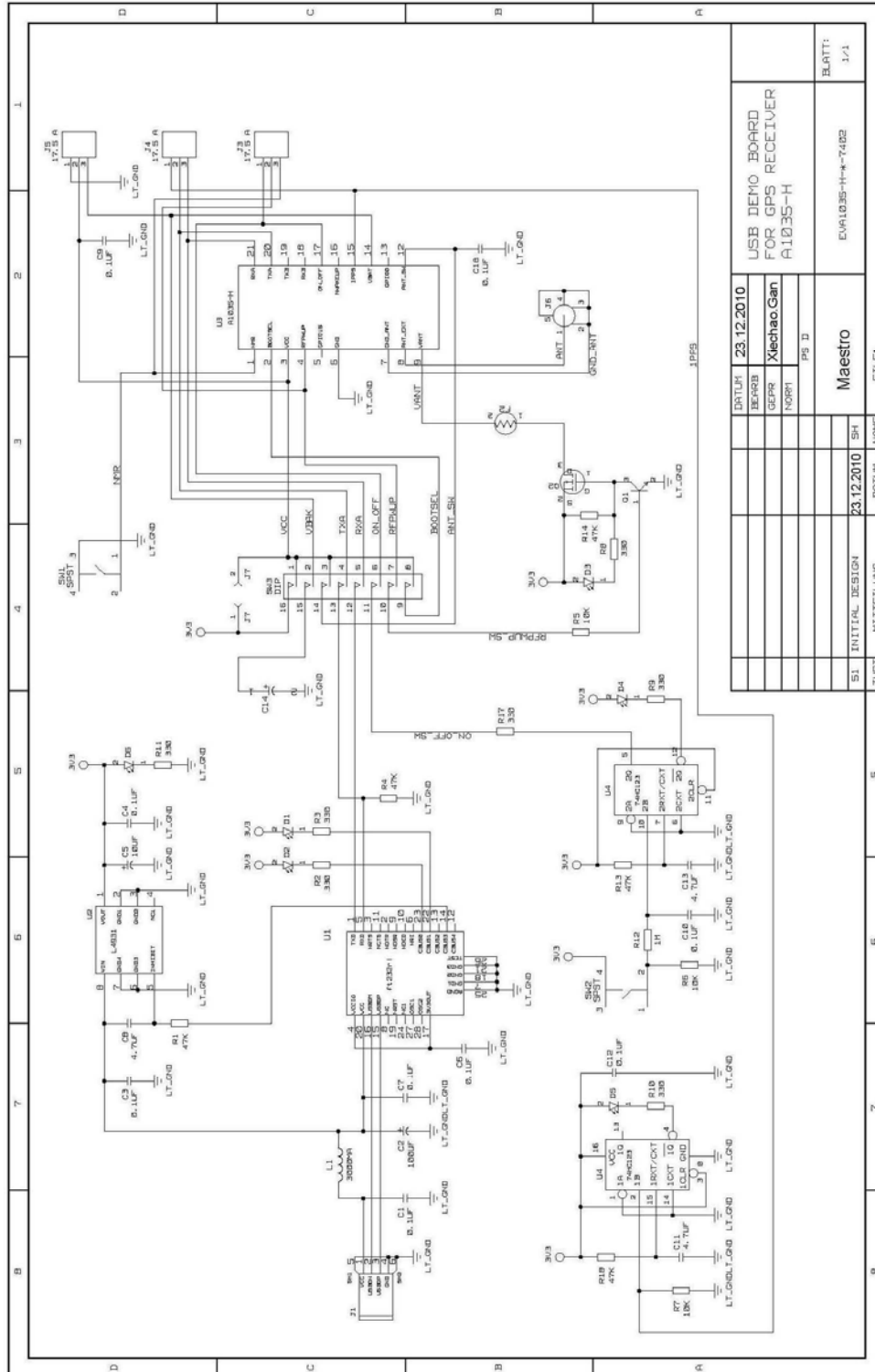Figure 11: Board overview

10 Board Schematics

Figure 12: EVA1035-H board schematics

11 Related Information

11.1 Contact

This manual was created with due diligence. We hope that it will be helpful to the user to get the most out of the GPS module.

Inputs regarding errors or mistaken verbalizations and comments or proposals to Maestro, HongKong, for further improvements are highly appreciated.

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11.2 Related Documents

- GPS Receiver A1035-H (Maestro)
- GPS Firmware A1080 (Maestro)
- GPS AppNote EDLC-Backup A1080 (Maestro)
- GPS AppNote Backup A1080 (Maestro)
- GPS AppNote Firmware A1080 (Maestro)
- GPS AppNote nRST A1080 (Maestro)
- GPS AppNote 1PPS Pulse Width (Maestro)
- GPS AppNote ResetControl A1080 (Maestro)

11.3 Related Tools

- GPS Cockpit (Maestro)
- SiRF Demo
- SiRF Flash

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