



C-GPS Development Kit User Guide

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C-GPS Development Kit User Guide

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Document History

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1.0	October 2006	Creation	
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Overview

This document is a description of the C-GPS Development Kit.

This development kit needs to be plugged to a Q2686/7 development kit to work correctly. The Q2686/7 provides power supply and controls signals to the C-GPS development kit.

Technical information can be found on eRide Web Site: <http://www.eride-inc.com/>

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1 References

1.1 Reference Documents

- [1] Motherboard Development Kit Schematics and PCB, Release 3.0
(Ref. WM0402301-110-30).
- [2] Wireless CPU Quik Q2686 Product Technical Specification
(Ref. WM_PRJ_Q2686_PTS_001).
- [3] Wireless CPU Quik Q2686 Customer Design Guideline
(Ref. WM_PRJ_Q2686_PTS_003).
- [4] AT Commands Interface Guide for revision X61
(Ref. WM_DEV_OAT_UGD_014).

2 General Description

The C-GPS development kit has to be plugged into a Q2686/7 development kit, which provides the power supply and logical control signals.

3 Main Synoptic

This synoptic shows the main functionality of the board, and the connection between the Q2686/7 development kit and the C-GPS development kit.

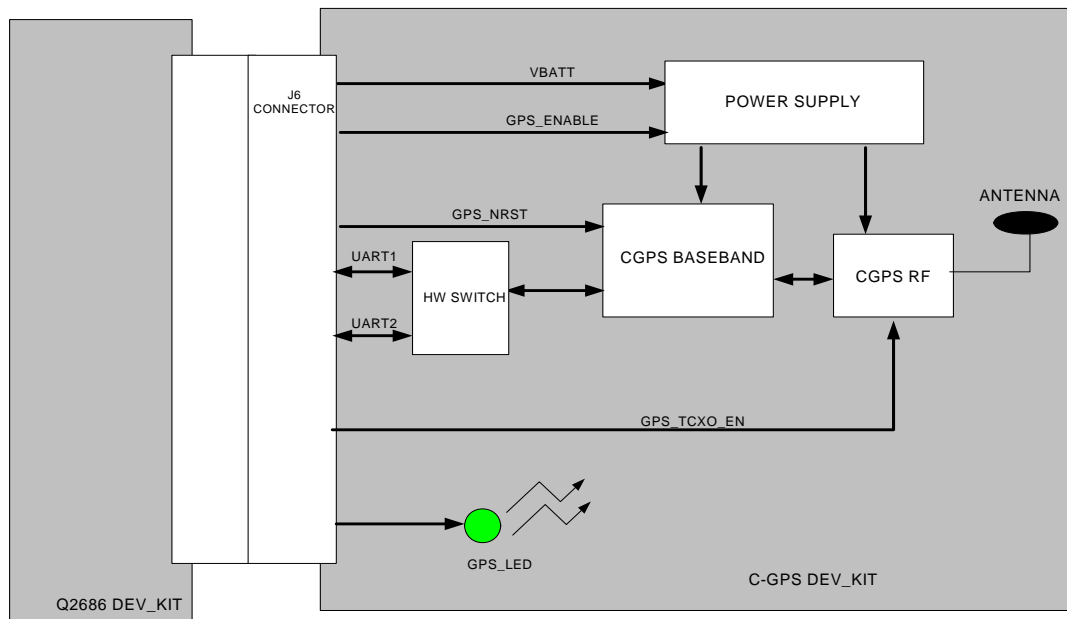


Figure 1: Main synoptic of C-GPS Development Kit

4 Photograph of the Q2686/7 and C-GPS Development Kit

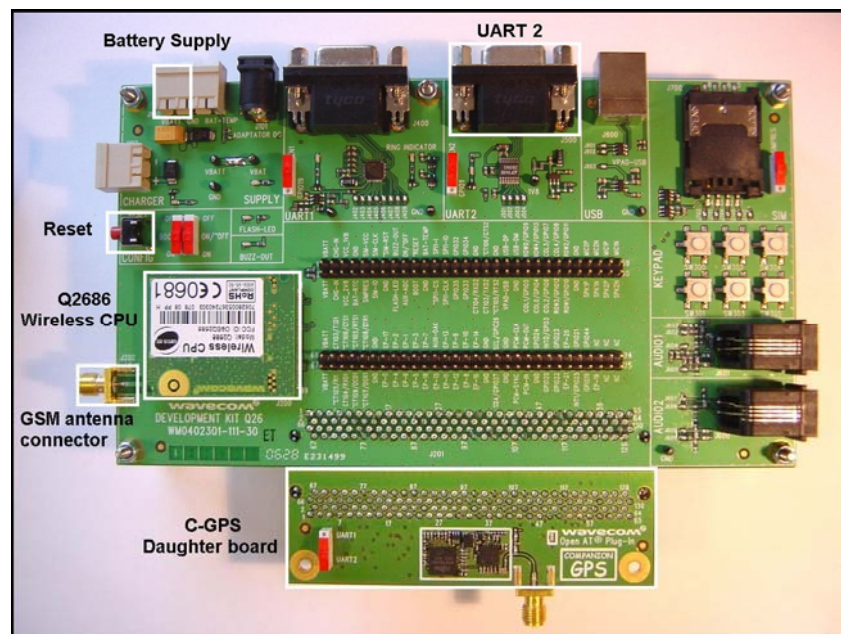


Figure 2: Q2686/7 Development Kit + C-GPS Development Kit

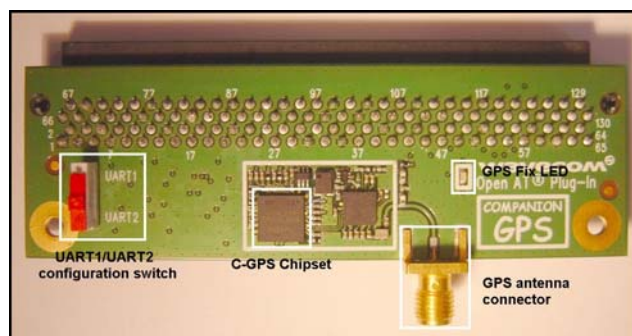


Figure 3: Single C-GPS DevKit

5 C-GPS Development Kit Hardware Description

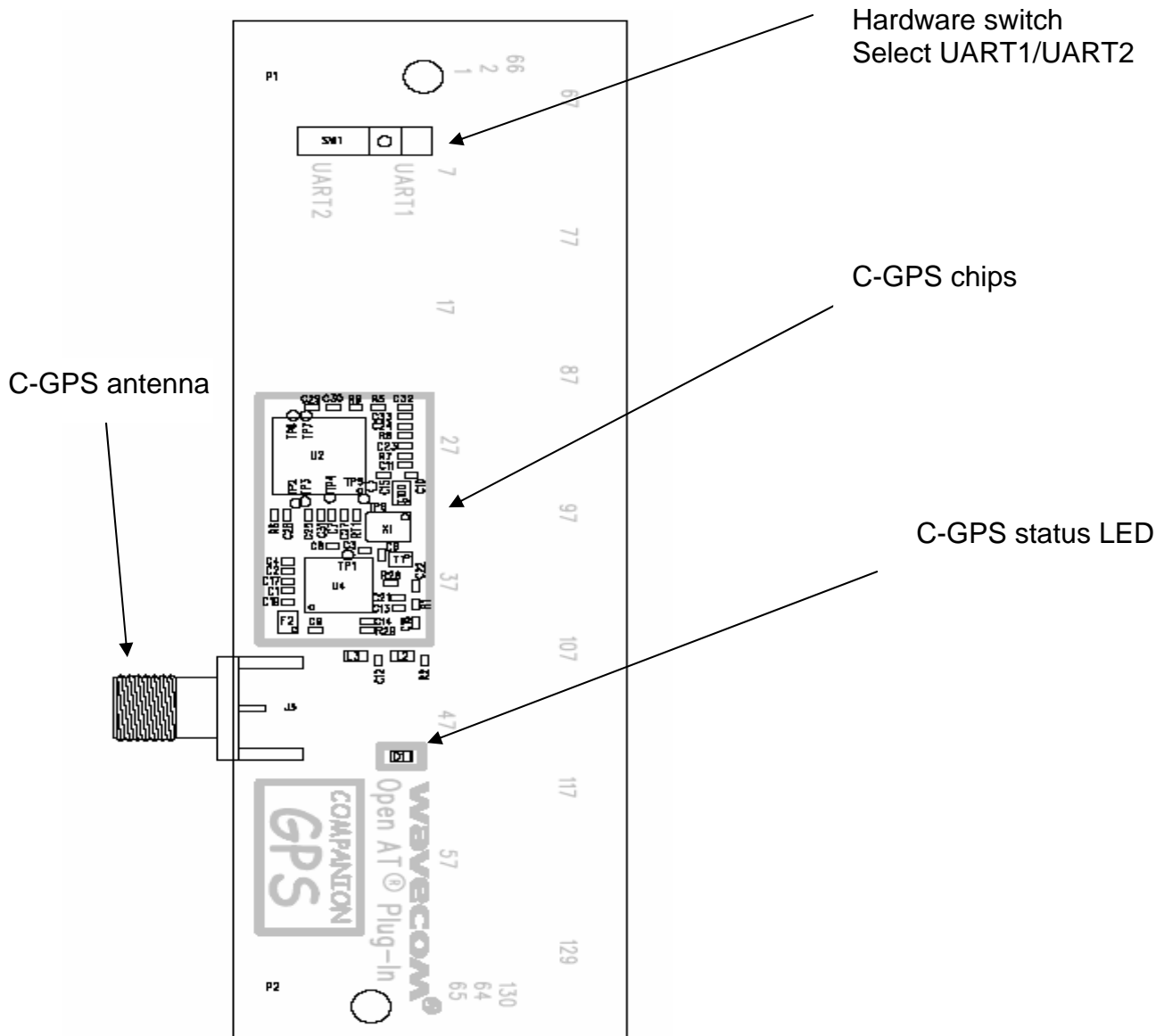


Figure 4: Hardware description

The main connector is on the bottom side.

The power management is also on the bottom side.

6 Hardware Configuration

The switch SW1 is used to select between UART1 and UART2 of the Q2686/7, which is linked to the DTE.

When UART2 is selected on the C-GPS development kit, the link between the Q2686/7 and the C-GPS chipset is provided through UART1. The link between the DTE and the motherboard development kit is provided with UART2.

In this way, the UART2 is selected for the DTE (Data Terminal Equipment), so the unused UART interface is UART1, which is dedicated to the link between C-GPS and the Q2686/7.

The switch "UART2" shown below should be disabled, in order to enable the desired UART.

The UART2 function is the auxiliary RS232 serial link of the Wireless CPU in 1.8V.

This function should be electrically attached with a special solder point (from J501 to J504).

The UART2 is available on its dedicated connector J500 (J501 to J504 soldered).

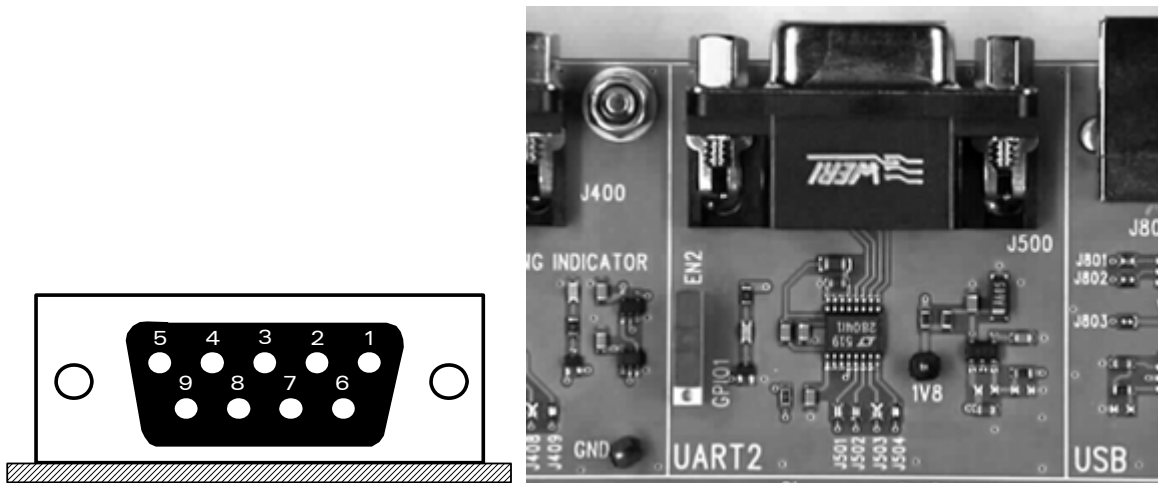


Figure 5: UART2 connector (J500) of Q2686/7 starter kit

When the UART1 is selected on the C-GPS development kit, the link between the Q2686/7 and the C-GPS chipset is provided through the UART2. The link between the DTE and the motherboard development kit is provided with the UART1.

In this way, the UART1 is selected for the DTE, so the unused UART interface is UART2, which is dedicated to the link between C-GPS and the Q2686/7.

The switch "UART1" shown below should be disabled, in order to enable the desired UART.

This function should be electrically attached with a special solder (from J402 to J409).

The UART1 is available on its dedicated connector J400 (J402 to J409 soldered).

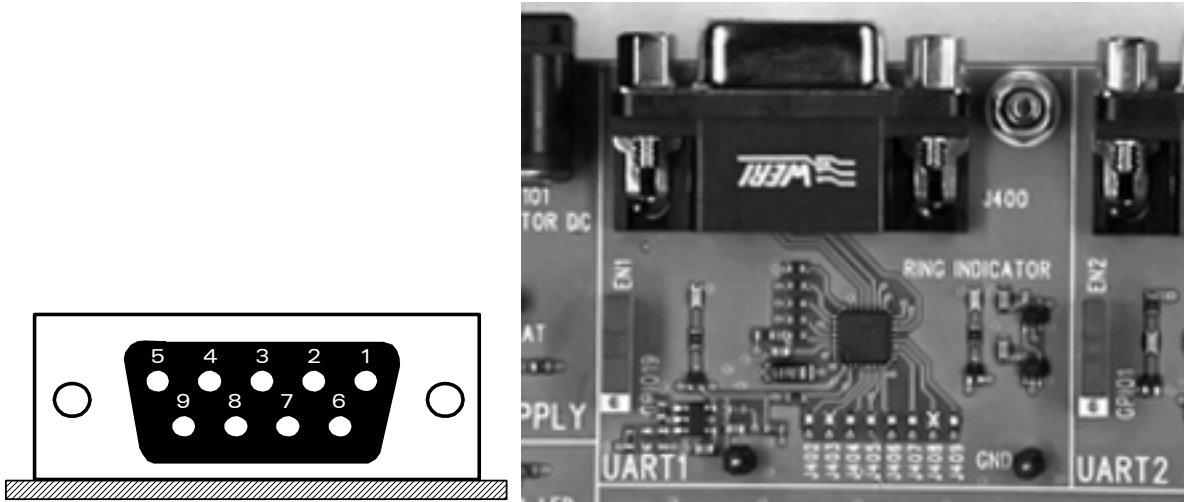


Figure 6: UART1 connector (J400) of Q2686/7 starter kit

7 External Board Connector (J6) Description

All signals available to be connected to this board are from the Q2686/7 development kit.

Table 1: Pin out of the board connector (J6)

Pin #	Name	I/O(*)	I/O type	Description
1	VBATT	I	Supply	Battery Input
2	VBATT	I	Supply	Battery Input
3	NC			Not connected
4	NC			Not connected
5	VCC_1V8		Supply	1.8V digital supply output
6	VCC_2V8		Supply	2.8V digital supply output
7	GND			
8	NC			Not connected
9	NC			Not connected
10	NC			Not connected
11	NC			Not connected
12	NC			Not connected
13	NC			Not connected
14	GND			
15	NC			Not connected
16	NC			Not connected
17	NC			Not connected
18	NC			Not connected
19	NC			Not connected
20	NC			Not connected
21	NC			Not connected
22	GND			
23	NC			Not connected
24	NC			Not connected
25	NC			Not connected
26	NC			Not connected
27	NC			Not connected
28	NC			Not connected
29	NC			Not connected
30	NC			Not connected
31	GND			
32	CT104-RXD2	I	1V8	Auxiliary RS232 Receive Serial Data (According to PC view and Multiplexed)
33	NC			Not connected

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External Board Connector (J6) Description

Pin #	Name	I/O(*)	I/O type	Description
34	CT103-TXD2 / GPIO14	O	1V8	Auxiliary RS232 Transmit Serial Data (According to PC view and Multiplexed)
35	GND			
36	NC			Not connected
37	NC			Not connected
38	NC			Not connected
39	NC			Not connected
40	GND			
41	NC			Not connected
42	NC			Not connected
43	NC			Not connected
44	NC			Not connected
45	NC			Not connected
46	NC			Not connected
47	NC			Not connected
48	NC			Not connected
49	NC			Not connected
50	NC			Not connected
51	GND			
52	GND			
53	NC			Not connected
54	NC			Not connected
55	NC			Not connected
56	NC			Not connected
57	NC			Not connected
58	NC			Not connected
59	NC			Not connected
60	NC			Not connected
61	NC			Not connected
62	NC			Not connected
63	NC			Not connected
64	NC			Not connected
65	NC			Not connected
66	VBATT	I	Supply	Battery Input
67	VBATT	I	Supply	Battery Input
68	CT103-TXD1 / GPIO36	O	2V8	Main RS232 Transmit Serial Data (According to PC view and Multiplexed)
69	NC			Not connected
70	NC			Not connected
71	CT104-RXD1 / GPIO37	I	2V8	Main RS232 Receive Serial Data (According to PC view and Multiplexed)

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External Board Connector (J6) Description

Pin #	Name	I/O(*)	I/O type	Description
72	NC			Not connected
73	NC			Not connected
74	NC			Not connected
75	NC			Not connected
76	GND			
77	GND			
78	NC			Not connected
79	NC			Not connected
80	NC			Not connected
81	NC			Not connected
82	NC			Not connected
83	NC			Not connected
84	NC			Not connected
85	NC			Not connected
86	NC			Not connected
87	NC			Not connected
88	NC			Not connected
89	NC			Not connected
90	NC			Not connected
91	NC			Not connected
92	NC			Not connected
93	NC			Not connected
94	NC			Not connected
95	NC			Not connected
96	NC			Not connected
97	NC			Not connected
98	GND			
99	GND			
100	NC			Not connected
101	NC			Not connected
102	GND			
103	GND			
104	NC			Not connected
105	NC			Not connected
106	NC			Not connected
107	NC			Not connected
108	NC			Not connected
109	GND			
110	NC			Not connected
111	GPIO20	O	2V8	GPS STATUS LED
112	GPIO23	I	2V8	GPS_TCXO_ENABLE

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External Board Connector (J6) Description

Pin #	Name	I/O(*)	I/O type	Description
113	GPIO22	I	2V8	GPS_ENABLE
114	NC			Not connected
115	NC			Not connected
116	NC			Not connected
117	NC			Not connected
118	NC			Not connected
119	GPIO19	I	2V8	GPS_NRST
120	NC			Not connected
121	NC			Not connected
122	NC			Not connected
123	NC			Not connected
124	NC			Not connected
125	NC			Not connected
126	NC			Not connected
127	NC			Not connected
128	NC			Not connected
129	NC			Not connected
130	NC			Not connected

8 Power Supply

The main power supply (VBATT) is provided by the motherboard development kit of Q2686/7, which generates internal supply (1.2V and 3V) to GPS chips.

9 GPS Status LED

A green LED is used to show the GPS status.

This LED indicates whether GPS fix has been achieved or not. The behavior of this LED is as follows:

- If GPS fix has not been achieved, the LED keeps on glowing.
- As soon as GPS fix is achieved, the LED starts blinking. The LED blink frequency is the same as the one with which the NMEA frames are sent to the external application.
- If GPS fix is lost, then again, the LED stops blinking and keeps on glowing.

10 GPS Antenna Connection

A female SMA connector is available on C-GPS Development Kit in order to connect a GPS external antenna.

In order to guarantee system performances (regarding noise figure and sensitivity) an external active antenna must be used.

Antenna should be selected with a Voltage Stationary Wave Ratio (VSWR) of 2:1 in GPS band, in order to guarantee performances to global system.

Caution: The DC voltage (VBATT, i.e. around 3.8 Volts) is present on this connector. If you need to connect a non-active antenna, it is preferable to place a DC block connector between the C-GPS Development Kit and the external antenna.

11 GPS Antenna

A commercial GPS antenna is provided with the C-GPS Development Kit.

This antenna is a patch active antenna provided by Hirschman with the following reference:

602-349-001

The main characteristics of the antenna provided in the kit are listed below:

Frequency Band	1,57542 GHz +- 1,023 MHz (L1-band)
Impedance	50 Ohms
Gain	2 dBiC min
Amplification	26 dB +/- 2 dB
Noise Figure	< 1.4 dB
Power Supply	3 V - 5,5 V
Consumption	< 25 mA @ 5 V +- 0,1 V
Connector	Female SMB
Cable Length	1500 mm
Cable Type	RG 174

12 Power Consumption

The table below summarizes the power consumption of the C-GPS Development Kit depending on which mode the system is in.

Two C-GPS mode have been specially identified and analyzed:

- OFF Mode: the C-GPS Development Kit is power-supplied, but the C-GPS Development Kit chipsets have not yet been started.
- ON Mode: the C-GPS Development Kit is power-supplied and the C-GPS Development Kit chipsets have been started.

Two types of configuration have been identified:

- Without an active antenna: C-GPS is connected to an antenna which does not include any active part. There is no power supply delivered through antenna connection.
- With an active antenna: C-GPS is connected to an antenna which includes an active part (in order to reach sensitivity performances). Power supply is delivered to the antenna through the antenna connection.

	OFF Mode	ON Mode
Without active antenna	1 mA	Around 90 mA
With Active antenna	Around 20 mA	Around 110 mA

All measurements have been made with a DC power supply of 3.8 Volts delivered to the C-GPS Development Kit (VBATT).

All these values are given only for information and may vary with selected active antenna.

13 Appendixes

13.1 GPS Development Kit Schematic

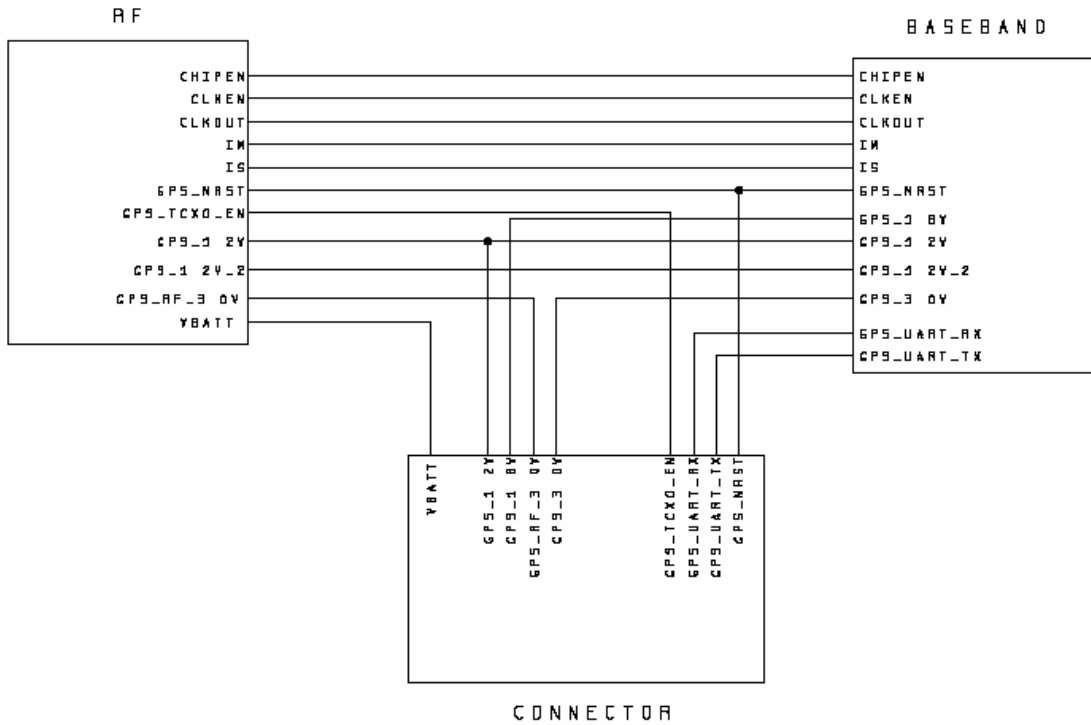


Figure 7: Main level

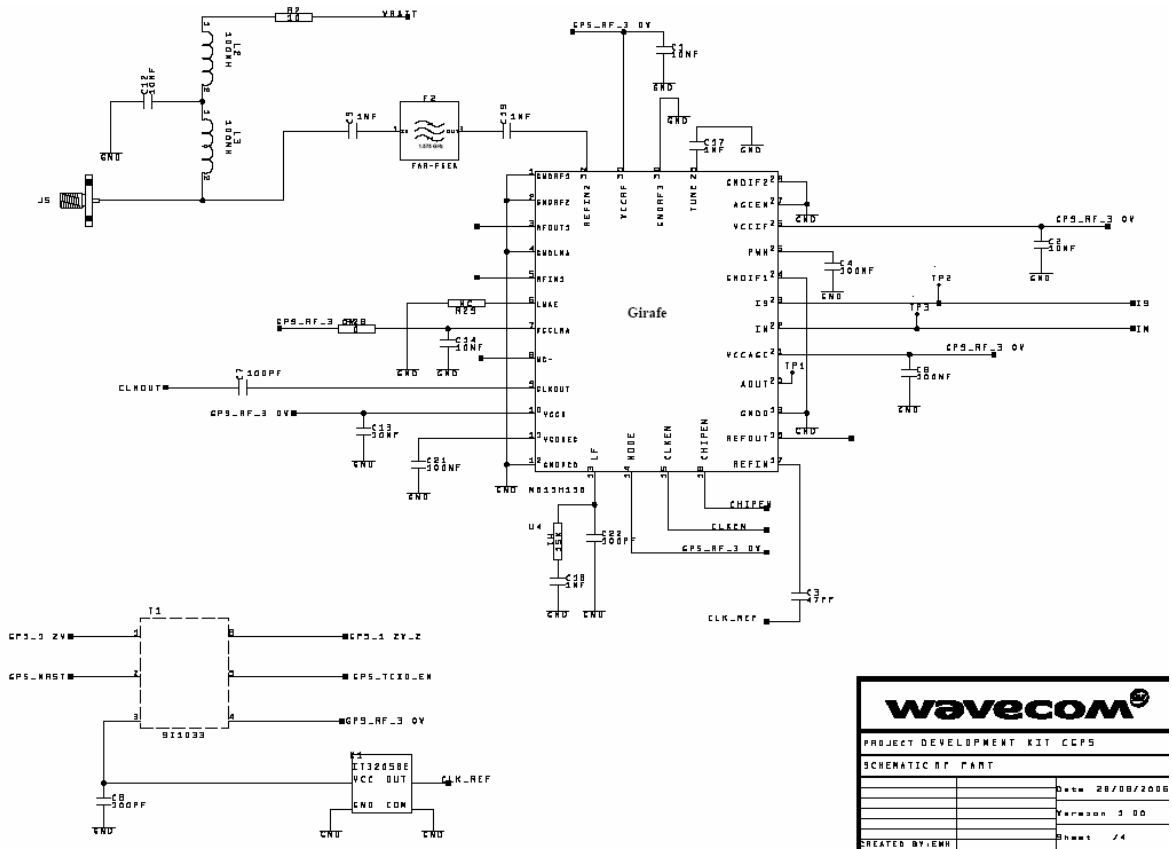


Figure 8: RF part

wavecom	
PROJECT DEVELOPMENT KIT C-GPS	
SCHEMATIC RF PART	
Date:	28/08/2006
Version:	3.00
Created by:	EWK
Sheet:	14

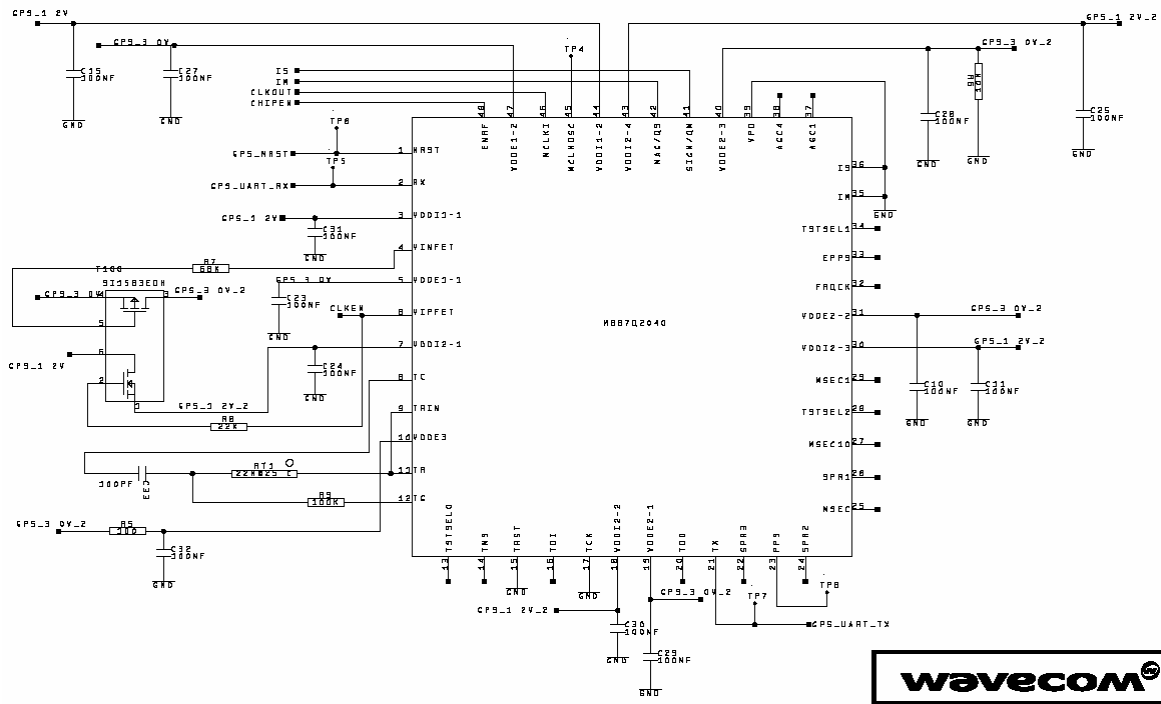


Figure 9: Baseband part

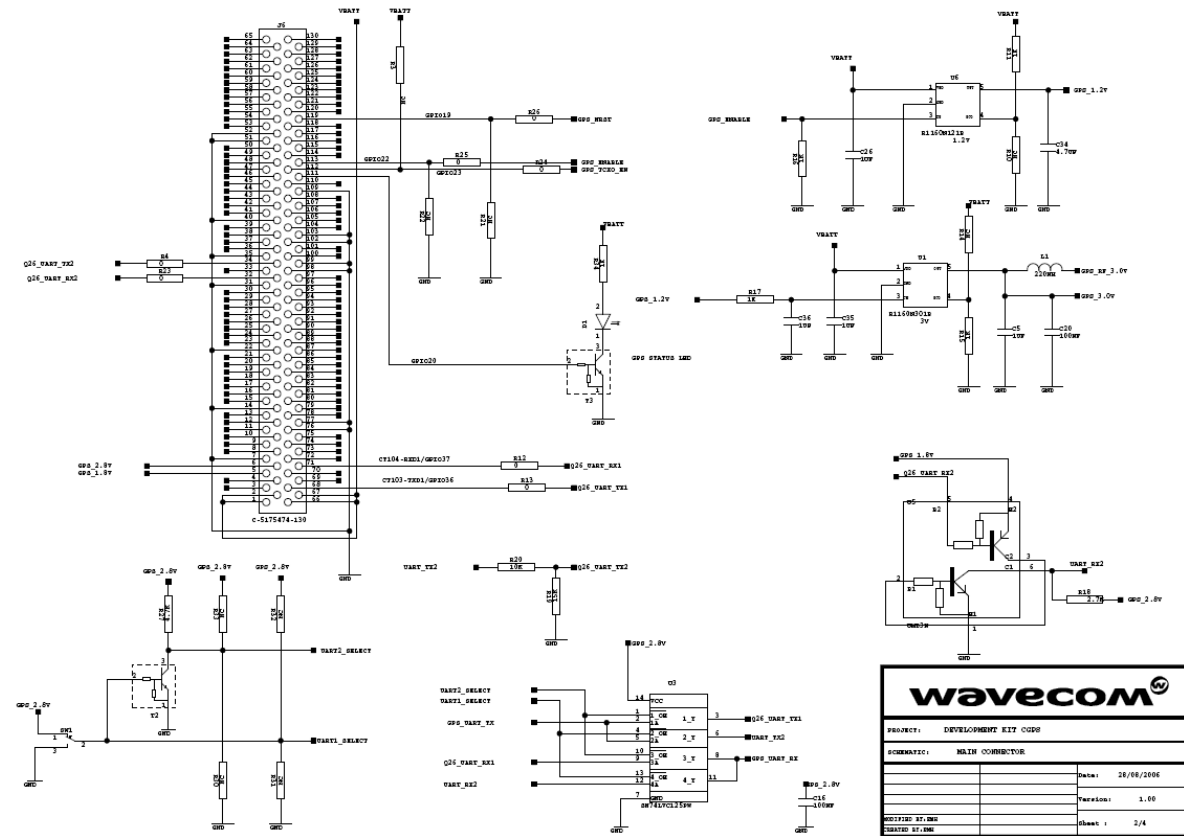


Figure 10: GPS connector

13.2 GPS Development Kit Drawing

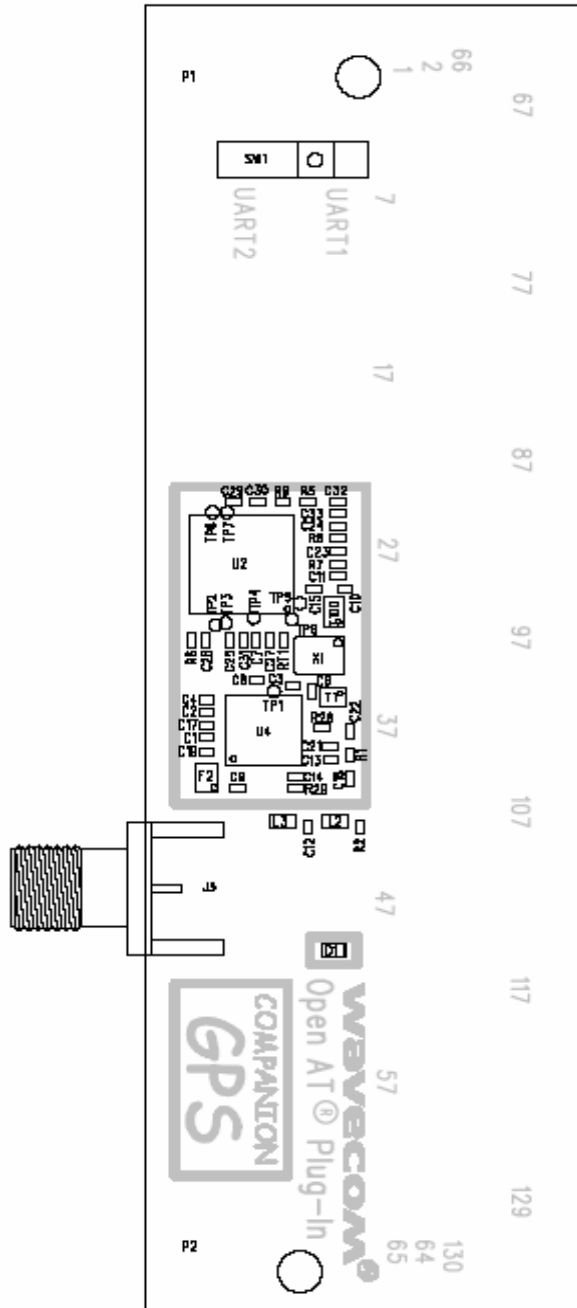


Figure 11: Top side drawing

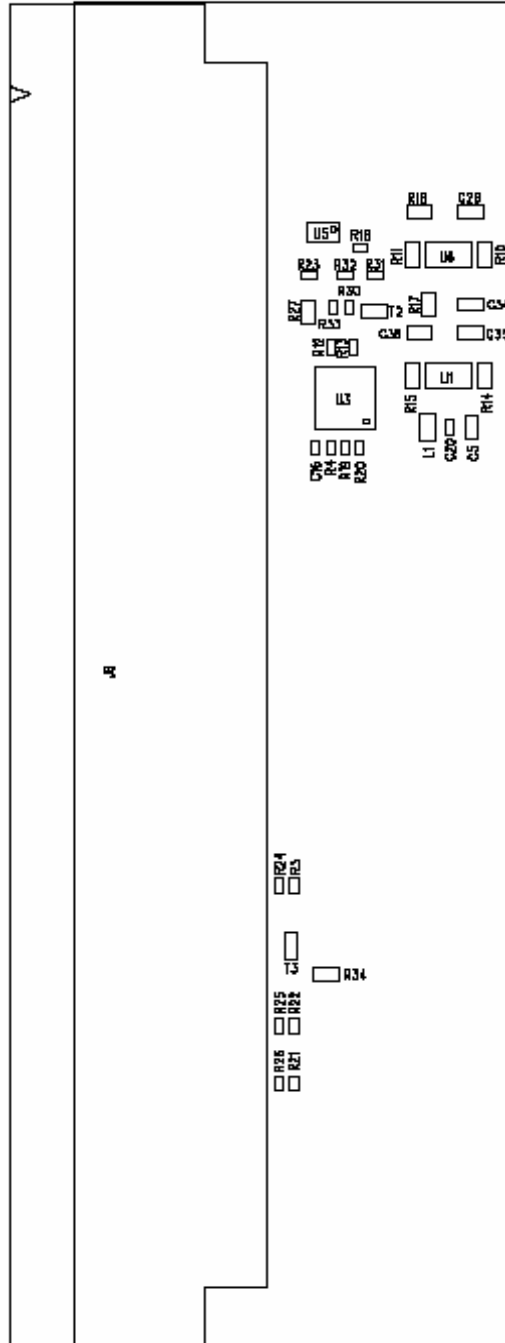
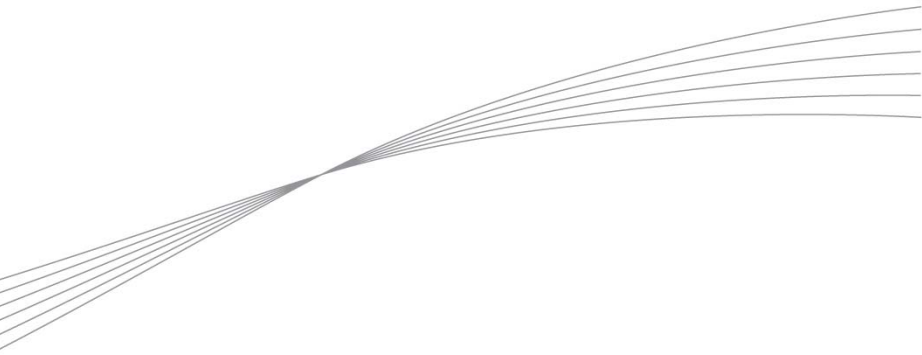


Figure 12: Bottom side drawing



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