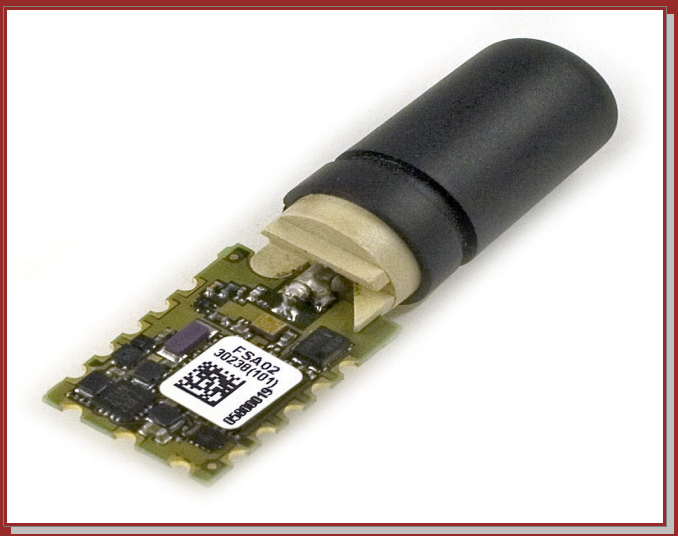
FALCOM
WIRELESS COMMUNICATIONS GMBH

Smart Antenna

FSA02

Pb LEAD FREE Lead-free products

Application Notes



Version: 1.0.6; Last Modified: Tuesday 5 May 2009

Table of contents

Version history:

This table provides a summary of the document revisions.

Version	Author	Changes	Modified
1.0.6	F. Beqiri	- Updated chapter "*Soldering method*" - ROM mode removed - No more available. - To run the internal firmware, connect DATA1 to Ground and leave DATA0 open.	05/05/2009
1.0.5	F. Beqiri	- Corrected operating voltage range to 3.0 V – 3.6 VDC. - In the hardware revision "3a", *the* ON/OFF pin is not pulled low internally through a 47KOhm resistor. This must by done by the user externally.	10/02/2009
1.0.4	F. Beqiri	- Added power consumption and temperature range. - FAS02 is RoHS compliant.	19/09/2008
1.0.3	F. Beqiri	- Added mechanical dimensions for the side view	19/08.2008
1.0.2	F. Beqiri	- The firmware version ROM is very early (engineering proof) and was never intended for production use.	23/05/2008
1.0.1	F. Beqiri	- The FSA02 is based on the JP18 receiver, for more technical details, refer to the manual **"JP18_hardware_manual.pdf"**.	09/05/2008
1.0.0	F. Beqiri	Initial version	18/02/2008

1 INTRODUCTION

This application note comprises a brief description of the operation of the FALCOM Smart Antenna FSA02, the Pad-Design and an application circuit.

1.1 General

The Smart Antenna can operate either from internal ROM or internal FLASH.

Important: *The firmware version ROM is very early (engineering proof) and was never intended for production use.*

1.2 Technical data (in brief)

- ***Power Consumption:***
  - *20 mA avarage in continuous mode*
  - *10 mA avarage in TricklePower mode (use of 300 ms, 1-second)*
- ***Temperature Range:***
  - *-20 to +70 °C (operation, transportation and storage).*
- ***Directive:***
  - *RoHS compliant.*
- ***FLASH:***
  - *Output NMEA messages.*
    - ✔ *Baudrate: 38400 bps,*
    - ✔ *RMC, GGA, GSA, GSV - (1 x 1 sec.)*
- ***BOOTMODE:***
  - *To load a new firmware into the internal FLASH use SiRFflash tool version 3.2 or higher .*

*The FSA02 is based on the JP18 receiver, please refer to the manual **"JP18_hardware_manual.pdf"** for more technical details.*

1.3 Flash Memory Operating Modes

	DATA 0	DATA 1
No-operation	Open	Open
FLASH	Open	Connect to GND
BOOTMODE	Connect to VIO	Open

Table 1: ROM and Flash Memory Operating Modes

1.4 Signal levels

The names and position of the pads can be seen from the Pad-Design, which is added in chapter 3, "Schematics".

Pin name	Level	Function
RES	1.2 V CMOS	Input
GPIO 0	1.8 V CMOS	Input/Output
ON/OFF*	1.2 V CMOS	Input. Under all operating conditions, including when ON/OFF is not used, this pin should be pulled low through a ~47 kΩ resistor.
TM	1.8 V CMOS	Output
VBATT	1.5 V – 5.5 VDC	Input. A backup battery (e.g. 3.0 VDC) can be connected.
GND	0 V	-
VCC	3.0 V – 3.6 VDC	Input. Operating voltage.
GND	0 V	-
DATA 0	1.8 V CMOS	Input at startup
DATA 1	1.8 V CMOS	Input at startup
VIO	1.8 V CMOS	Output
TX	3.3 V CMOS** (if VCC = 3.3 V)	Output
RX	3.3 V CMOS** (if VCC = 3.3 V)	Input

* *For more technical details regarding the ON/OFF pin, please refer to the "JP18_hardware_manual.pdf" manual, chapter **6.2**.*

* * *The voltage on both pins depends on the supply voltage (VCC).*

Table 2: Signal levels and their function

2 SECURITY

This chapter contains important information for the safe and reliable use of the GPS receiver. Please read this chapter carefully before starting to use this GPS receiver.

2.1 Electrostatic Discharge (ESD)

The FSA02 Smart Antenna contains class 1 devices. The FSA02 Smart Antenna contains components that can be damaged or destroyed by electrostatic discharge. When handling the module, observe the necessary safety precautions against electrostatic discharge (ESD), in accordance with EN 61340-5-1 and the following. The following Electrostatic Discharge (ESD) precautions are recommended:

- *Protective outer garments.*
- *Handle device in ESD safeguarded work area.*
- *Transport device in ESD shielded containers.*
- *Monitor and test all ESD protection equipment.*
- *Treat the FSA02 Smart Antenna as extremely sensitive to ESD.*

2.2 Soldering method

The FSA02 Smart Antenna must be soldered only manually with a soldering iron. The soldered connection / pad design should be in accordance with IPC-A-610D - Chapter 8.2.4.

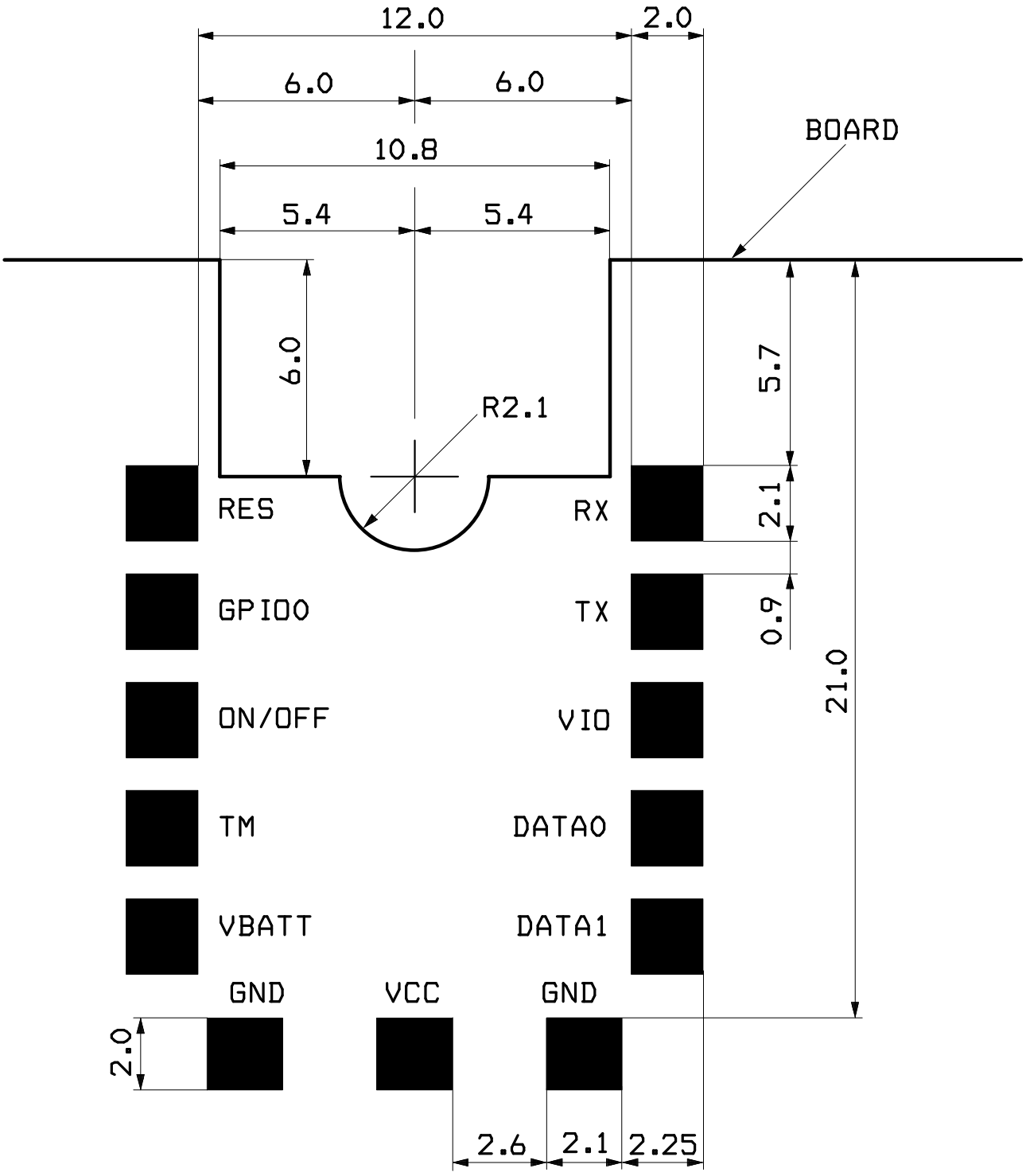
References

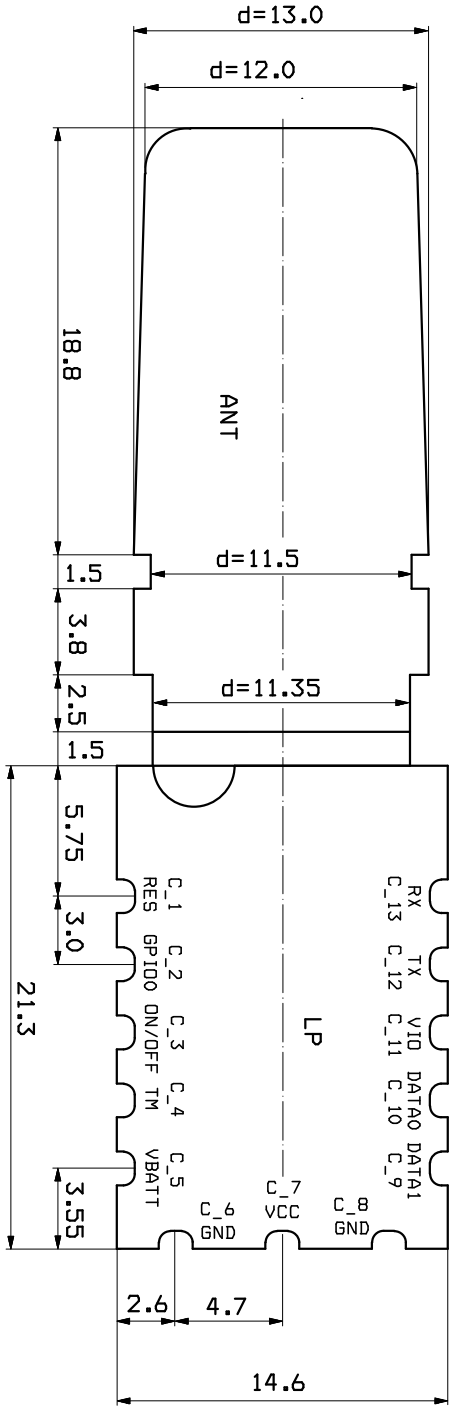
Customers may refer to following IPC standard for more details:

- IPC-A-610D *chapter 8.2.4 "Castellated Terminations"*.

Pad-design FSA02

Note: no ground under the component

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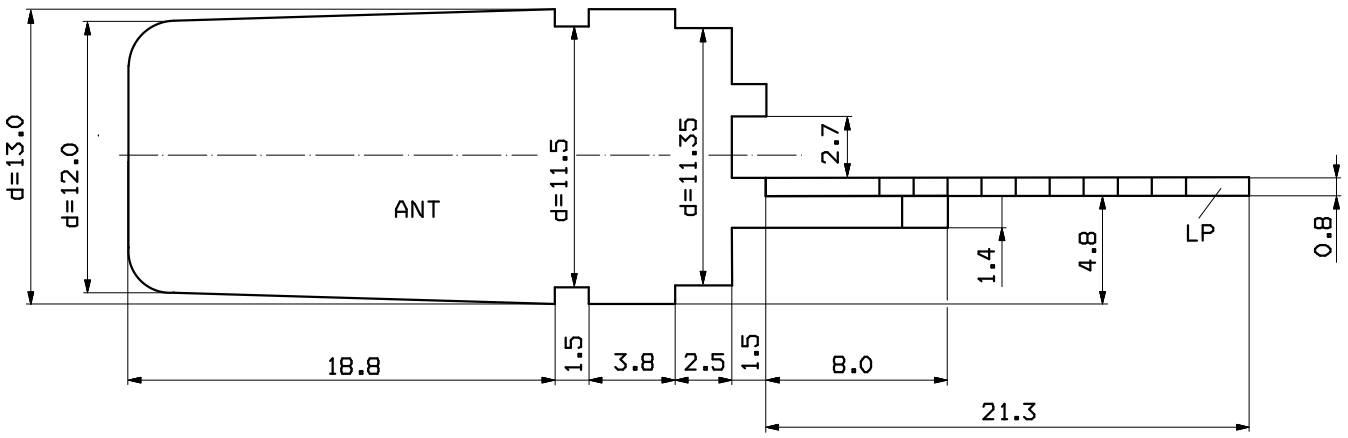
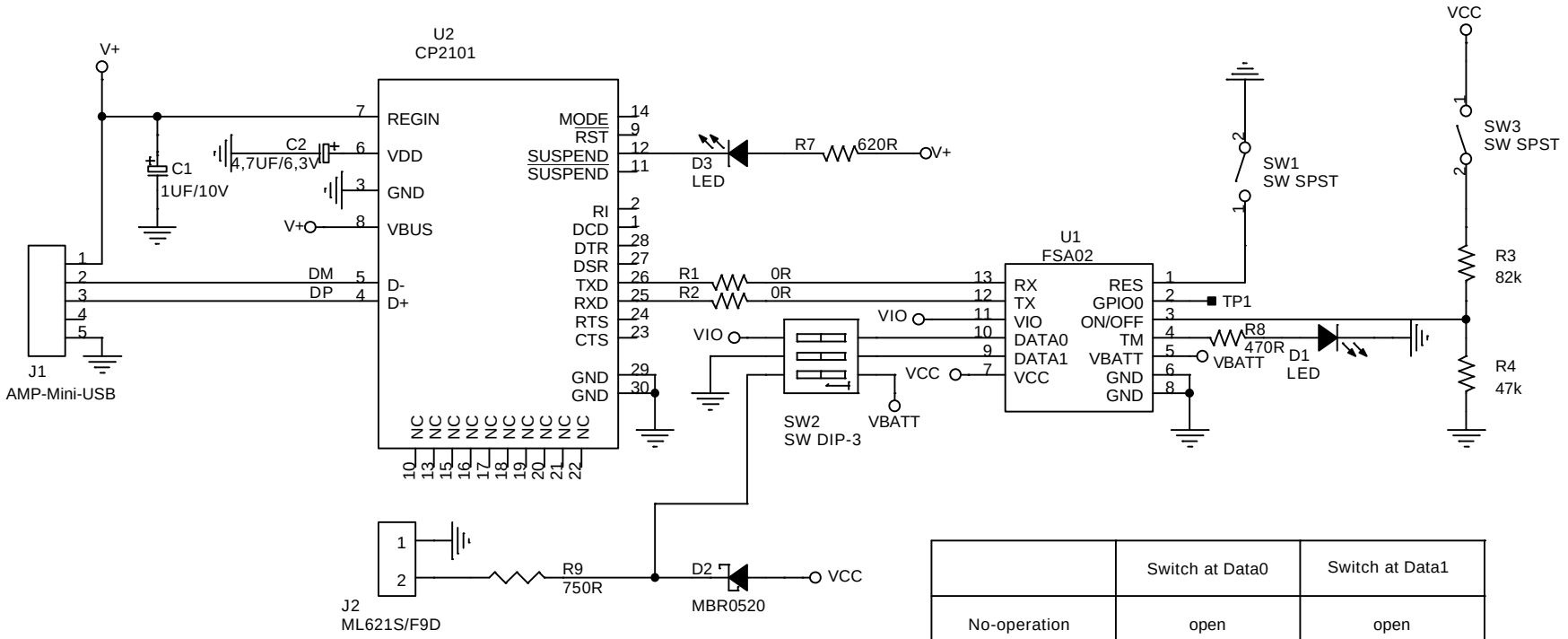
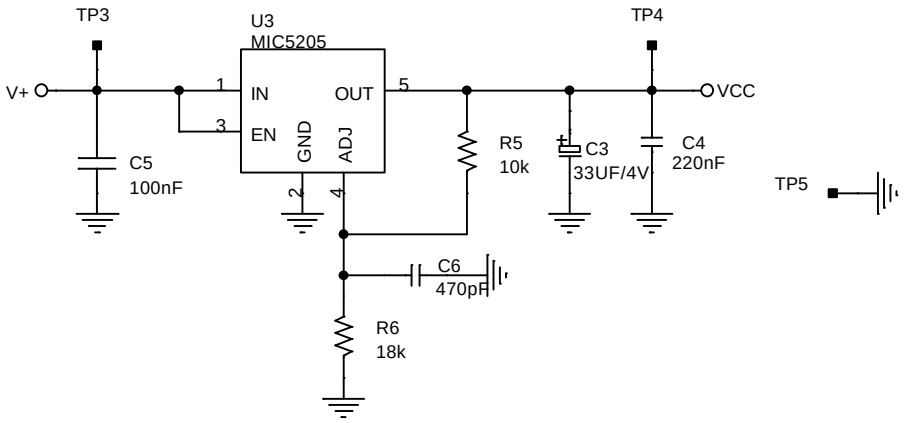
d=12.0
18.8
ANT
1.5
d=11.5
3.8
2.5
d=11.35
1.5
5.75
3.0
21.3
3.55
C_1
RES
C_2
GPIO0
C_3
ON/OFF
C_4
TM
C_5
VBATT
C_6
GND
C_7
VCC
C_8
GND
C_13
RX
C_12
TX
C_11
VIO
C_10
DATA0
C_9
DATA1
LP
2.6
4.7
14.6



Tolerances: +/- 0.1mm



	Switch at Data0	Switch at Data1
No-operation	open	open
run from Flash	open	connect to GND
Bootmode	connect to VIO	open



Note: The dimensions of R3/R4 are for VCC=3.3V

ON/OFF-Level is 1.2V!

Justiermarken

JUST1

JUST2

TP_N1

FALCOM

Gewerbering 6

98704 Langewiesen

Title: FSA02 - Application-Circuitry

Size: A | Document Number | Rev: 01a

Date: Wednesday, December 12, 2007 | Sheet 1 of 1