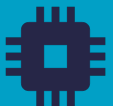
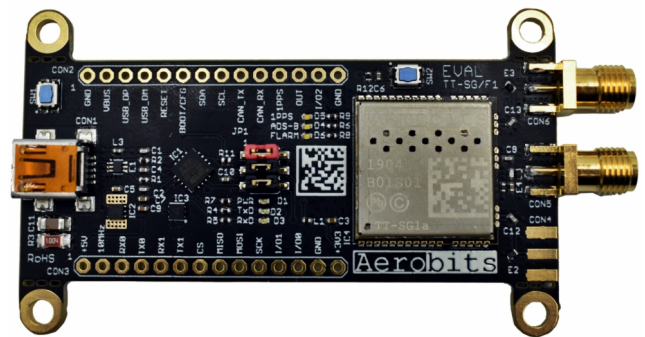




Subsystems for the
UAS intergration into
the airspace

EVAL TT-SG1

[Data sheet & User manual](#)



Introduction

The evaluation kit provides a quick introduction to the TT-SG1 module. It is a high quality 1090 MHz band receiver with an integrated ADS-B (Automatic Dependent Surveillance - Broadcast) decoder, conforming to MOPSS specified in TSO-C199. The TT-SG1 module contains also internal GNSS module (Ublox), to utilize concurrent reception of up to three GNSS systems (GPS / Galileo together with BeiDou or GLONASS).

EVAL-TT-SG1 with the dedicated software allows the user to discover the module properties within a short time, paving the way towards quick prototyping. The software allows simple configuration of the module and data visualization in various modes, from raw data, through tabular and 3D views.

[Check all our evaluation kits here](#)

For more information please contact: support@aerobits.pl.

Contents

1	Technical parameters	3
1.1	Hardware and layout	3
2	Electrical specification	4
2.1	Power supply	4
2.2	Most important components	4
2.3	Connectors and jumpers	4
2.4	LED indicators	5
2.5	Layout	6
2.6	Electrical diagram	7
3	Mechanical specification	8
3.1	Mechanical parameters	8
3.2	Dimensions	8

1 Technical parameters

General Technical Parameters				
Parameter	Min.	Typ.	Max.	Unit
Carrier frequency ADS-B	-	1090	-	MHz
RX sensitivity ADS-B	-	approx. -87	-	dBm
RX sensitivity GNSS	-	approx. -167	-	dBm
AERO (baud)	115200	921600	3000000	bps
Operation temperature	-30		+85	°C
Storage temperature	-5		+40	°C

Table 1: General technical parameters.

1.1 Hardware and layout

The EVAL TT-SG1 is designed around the OEM TT-SG1 module. It uses all I/Os, as well as custom I/Os (unused by the standard firmware). The top layer may be found in fig. 1.

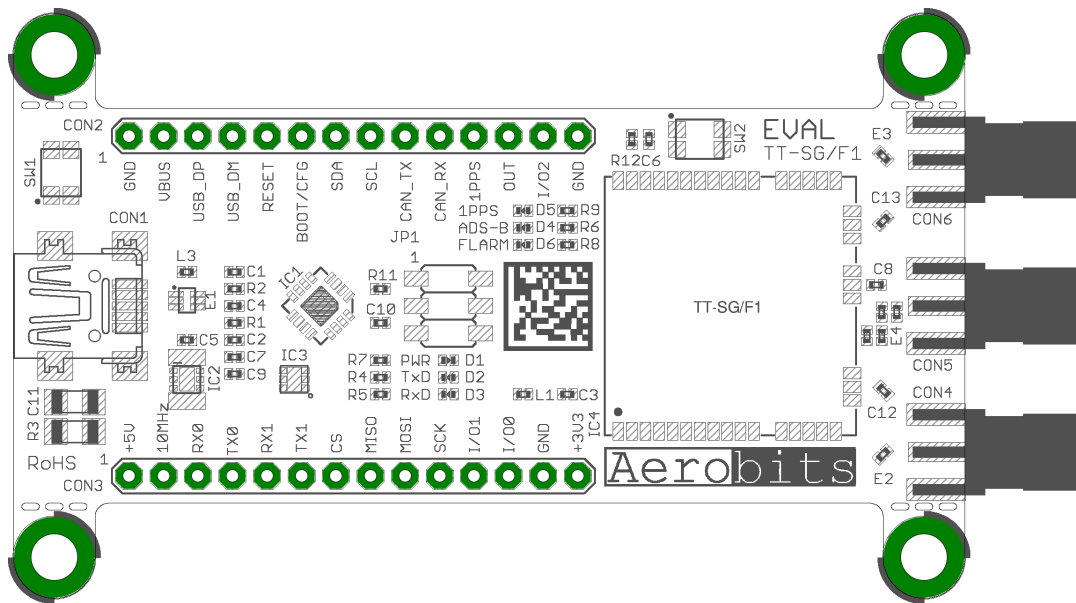


Figure 1: Top view of EVAL TT-SG1.

NOTE: CON4 only for TT-SF1 evaluation available.

2 Electrical specification

2.1 Power supply

Parameter	Value
Power connector	Standard mini USB connector
Power consumption	240 mA
Power supply	3.3V 5V(RF) (recommend mini USB Supply)

Table 2: Power supply of EVAL TT-SG1

2.2 Most important components

RefNo	Description
CON1	Mini USB connector
CON2	Extensions connector I
CON3	Extensions connector II
CON4	—
CON5	GNSS RF Input
CON6	ADS-B RF Input
JP1	Jumper group
SW1(C)	BOOT/CONFIG switch
SW2(R)	RESET switch
D1	POWER LED
D2	UART TX LED
D3	UART RX LED
D4	SYSTEM/ADS-B LED
D5	1PPS LED
IC4	OEM TT-SG1

Table 3: Most important components. See fig. 1

2.3 Connectors and jumpers


CON2	No.	Marking	Function
	1	GND	Ground
	2	VUSB	Power supply of USB
	3	USB_DP	USB: D+ line
	4	USB_DM	USB: D- line
	5	RESET	Reset signal
	6	BOOT/CFG	BOOT/CONFIG signal
	7	SDA	I2C: data line
	8	SCL	I2C: clock line
	9	CAN_TX	CAN: transmit line
	10	CAN_RX	CAN: receive line
	11	1PPS	GNSS: 1 pulse per second input (time reference)
	12	OUT	SYSTEM/ADS-B LED
	13	I/O2	LED
	14	GND	Ground

Table 4: Connector CON2 description.


CON3	No.	Marking	Function
	1	+5V	5V Power supply
	2	+10MHz	Reserved
	3	RX0	UART0 – Receive line
	4	TX0	UART0 – Transmit line
	5	RX1	UART1 – Receive line
	6	TX1	UART1 – Transmit line
	7	CS	SPI – Chip select
	8	MISO	SPI – MISO signal
	9	MOSI	SPI – MOSI signal
	10	SCK	SPI – Serial clock
	11	I/O0	Reserved
	12	I/O1	Reserved
	13	GND	Ground
	14	+3V3	3.3V Power supply

Table 5: Connector CON3 description.

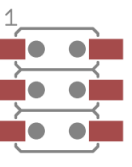
JP1	No.	State	Function
	1	Closed	3.3V power supply provided by on-board regulator (default)
		Open	3.3V power supply provided by CON3 (PIN14)
	2	Closed	UART TX via USB (default)
		Open	UART TX via CON3 (PIN4)
	3	Closed	UART RX via USB (default)
		Open	UART RX via CON3 (PIN3)

Table 6: Jumper group JP1 description.

2.4 LED indicators

LED	Color	Description
D1	Green	ON: Power supply
D2	Red	ON: OEM TT-SG1 transmitting data
D3	Yellow	ON: OEM TT-SG1 receiving data
D4	White	In BOOTLOADER state: continuous on In CONFIGURATION state: blinking at 5Hz In RUN state: 1 blink for every ADS-B frame received
D5	White	Blink when GNSS is fixed (1Hz)

2.5 Layout

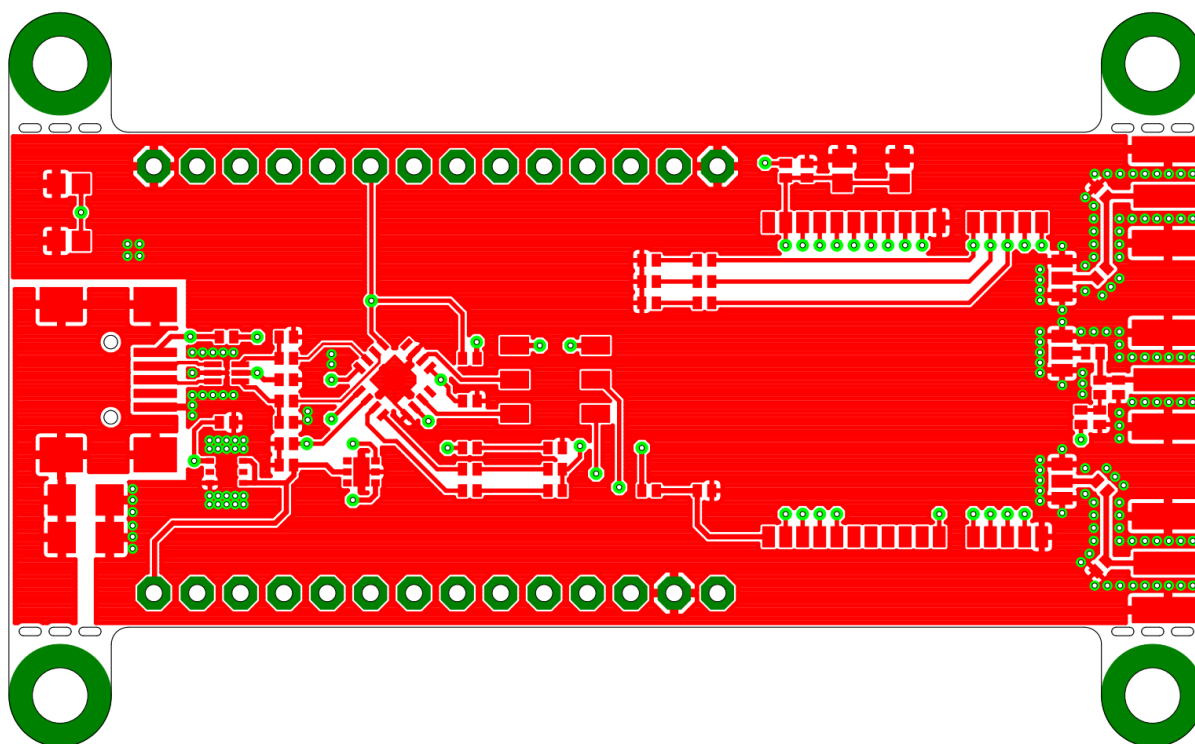


Figure 2: Top copper layer of EVAL TT-SG1

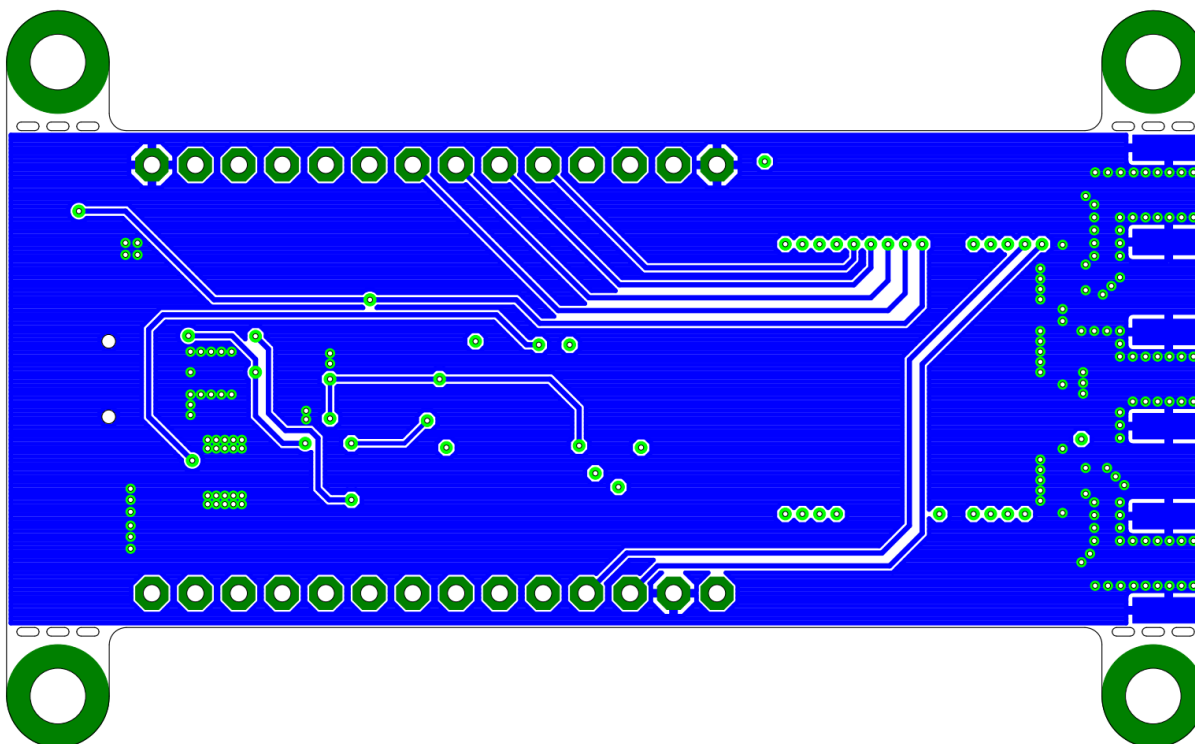


Figure 3: Bottom copper layer of EVAL TT-SG1

2.6 Electrical diagram

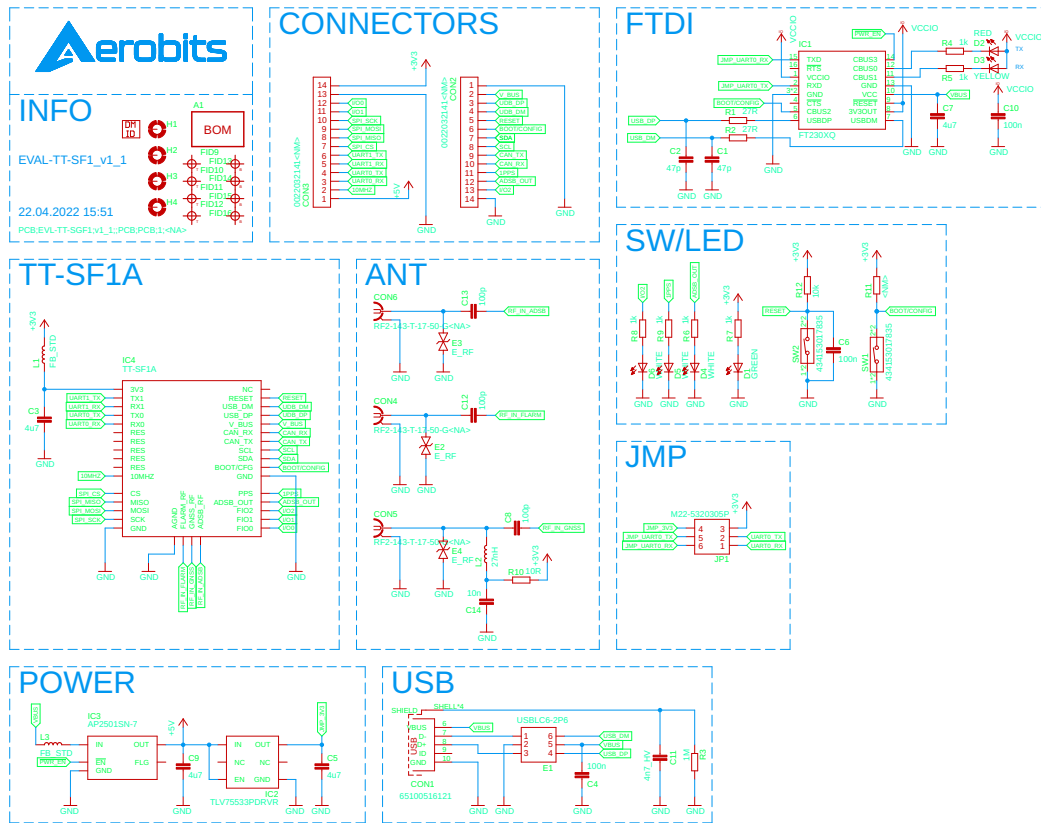


Figure 4: Electrical diagram of EVAL TT-SG1

3 Mechanical specification

3.1 Mechanical parameters

Parameter	Value
Dimensions	70.0 x 29.0 x 1.5 mm
Weight	15.0 g

Table 7: Mechanical parameters of EVAL TT-SG1

3.2 Dimensions

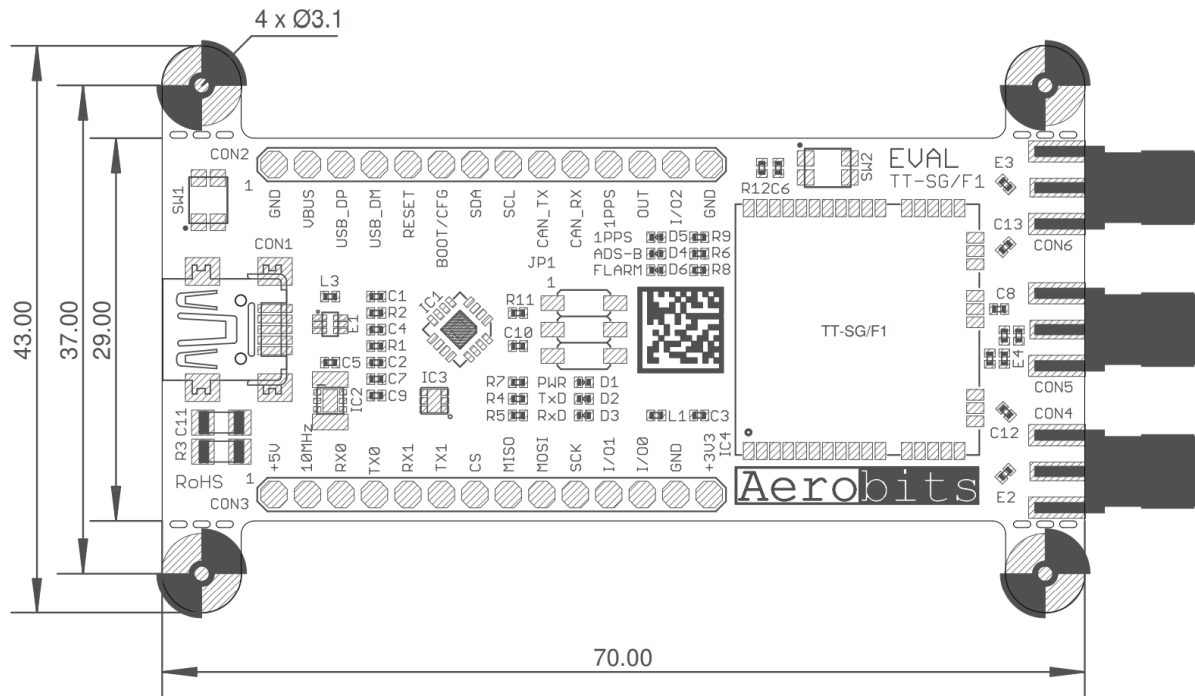


Figure 5: Dimensions of EVAL TT-SG1

NOTE: For more specific information see [ADS-B/GNSS receiver: TT-SG1](#)

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