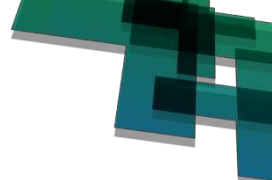




SPIDER (ORG447X) EVALUATION KIT

Datasheet



1. SCOPE

This document describes the features and specifications of Spider ORG447X evaluation kit.

2. DISCLAIMER

All trademarks are properties of their respective owners.

Performance characteristics listed in this document do not constitute a warranty or guarantee of product performance. OriginGPS assumes no liability or responsibility for any claims or damages arising out of the use of this document, or from the use of integrated circuits based on this document.

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OriginGPS reserves the right to make changes in its products, specifications and other information at any time without notice.

OriginGPS reserves the right to conduct, from time to time, and at its sole discretion, firmware upgrades.

As long as those FW improvements have no material change on end customers, PCN may not be issued.

OriginGPS navigation products are not recommended to use in life saving or life sustaining applications.

3. SAFETY INFORMATION

Improper handling and use can cause permanent damage to the product.

4. ESD SENSITIVITY

This product is ESD sensitive device and must be handled with care.



5. CONTACT INFORMATION

Support - support@origingps.com or [Online Form](#)

Marketing and sales - marketing@origingps.com

Web – www.origingps.com

6. RELATED DOCUMENTATION

Nº	DOCUMENT NAME
1	SiRFLive Installation_Initialization_troubleshooting
2	SiRFLive FAQ

TABLE 1 – RELATED DOCUMENTATION



7. REVISION HISTORY

REVISION	DATE	CHANGE DESCRIPTION
1.0	January 18 th , 2015	First release
2.0	March 27 th , 2016	Addition of setup, SiRFLive essentials, evaluation kit essentials

TABLE 2 – REVISION
HISTORY

8. DESCRIPTION

Evaluation Kit of the ORG447X Series GPS Module comprises the Demo Board, USB to UART adaptor cable and Disc On Key with GPS evaluation software and documentation.

The Demo Board is built of Main Board, incorporating 3.3V LDO regulator, UART connector, On-Off push-button switch.

The Demo Kit is equipped with miniature passive antenna assembly, connected to an ORG447X Interface Adaptor (via WFL connector).

An ORG447X Interface Adaptor is soldered onto the Main Board.

An Interface Adaptor includes miniature RF input connector, 1.8V regulator, single buffer for voltage level translation of TX line, and voltage supervisor for autonomous power on, among several assembly options:

Assembly Option	Description	Notes
Option 1	1.8V Supply by LDO Regulator	Default
Option 2	1.8V Supply by Switch Mode Regulator	
Option 3	ON Pulse Delay by Integrated Supervisor	Default
Option 4	ON Pulse Delay by Logic Gates	
Option 5	Active Antenna Bias Control Circuit	

Options 1 and 3 are populated by default.

Customers are encouraged to apply different assembly option.



9. SETUP

9.1 Plug in Disk On Key. Select “Software”->SiRFLive folder. Click in setup.exe file.

Follow on-screen instructions during SiRFLive setup process.

Uninstall any previous SiRFLive version before current setup attempt.

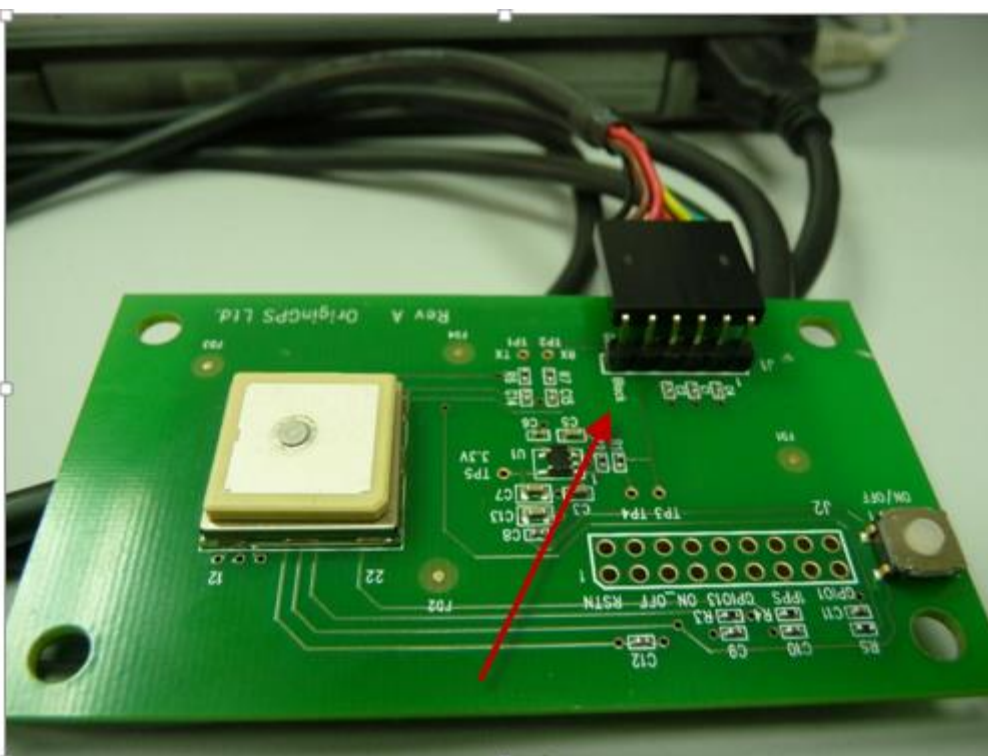
Wait till the installation completes.

9.2 Connect the UART cable to your PC (while board is not connected).

The driver of the cable will be installed in silent mode. The driver is taken from the internet. If your PC is not connected to the internet – be sure to keep the disc on key connected to PC.

The presence of the Virtual COM port can be verified via Control Panel-System-Device Manager.

9.3 Connect FTDI USB to UART cable between the Demo Board and the PC.



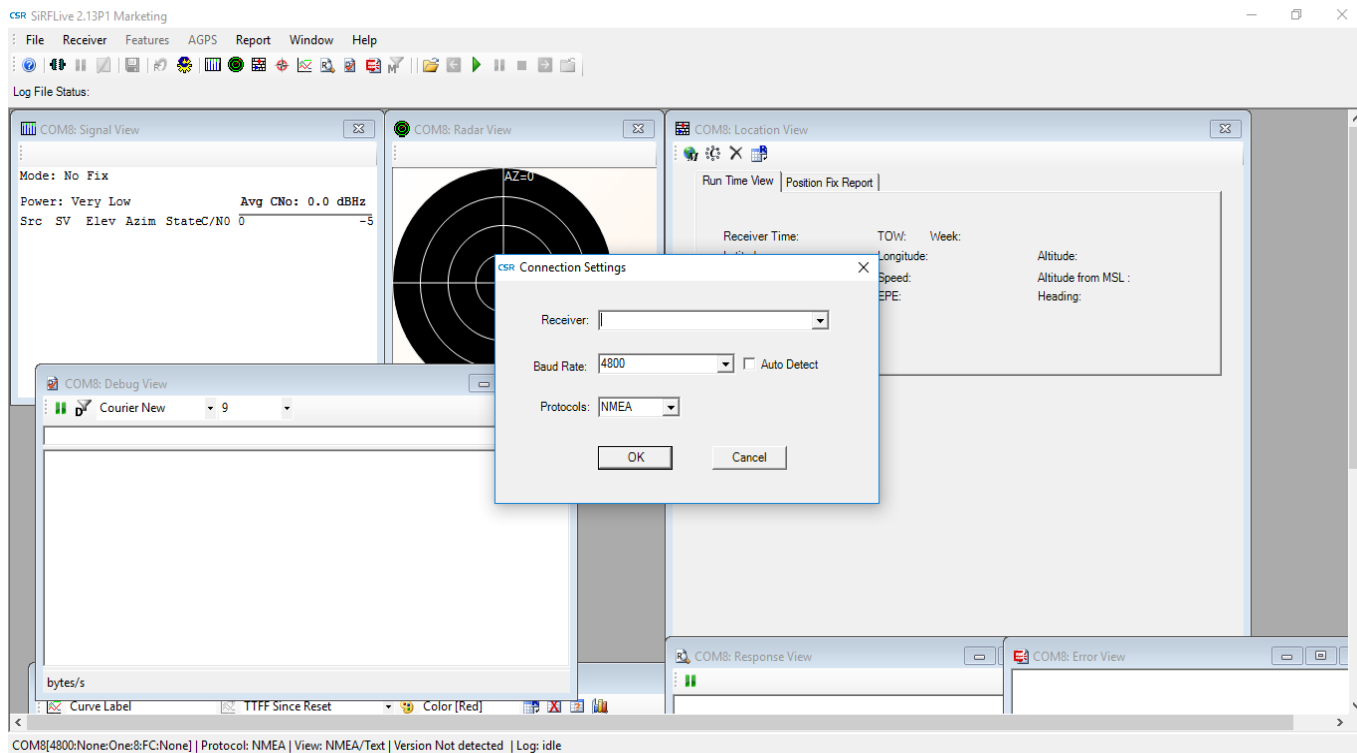
Please notice: The ground pin in UART connector is signed with a “black” writing. The orientation of the UART connector must be such that the black wire of UART will be connected to the “black” ground pin.

**If you experience problems during installation, please refer to
“SiRFLive Installation_Initialization_troubleshooting.pdf” document.



10. SiRFLive ESSENTIALS

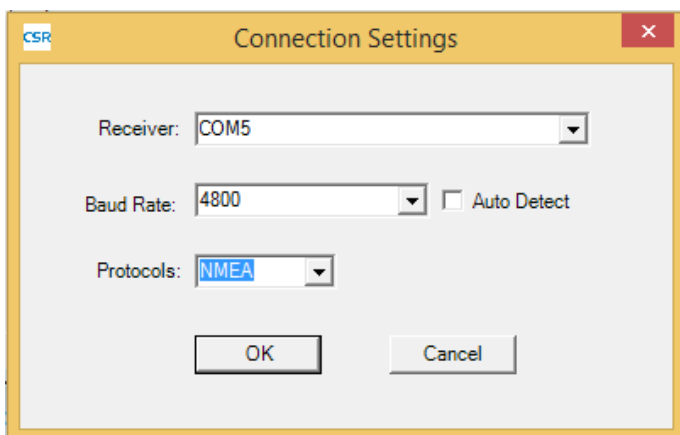
10.1 Open SiRFLive by clicking desktop icon.



10.2 Select the relevant COM port.

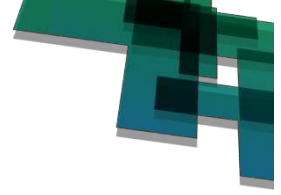
The default baud rate for CSR based modules is 4800.

Select NMEA protocol.



Press OK button.

For further information, please refer to "SiRFLive FAQ.pdf" document.



11.EVALUATION KIT ESSENTIALS

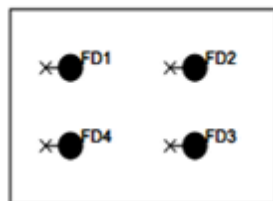
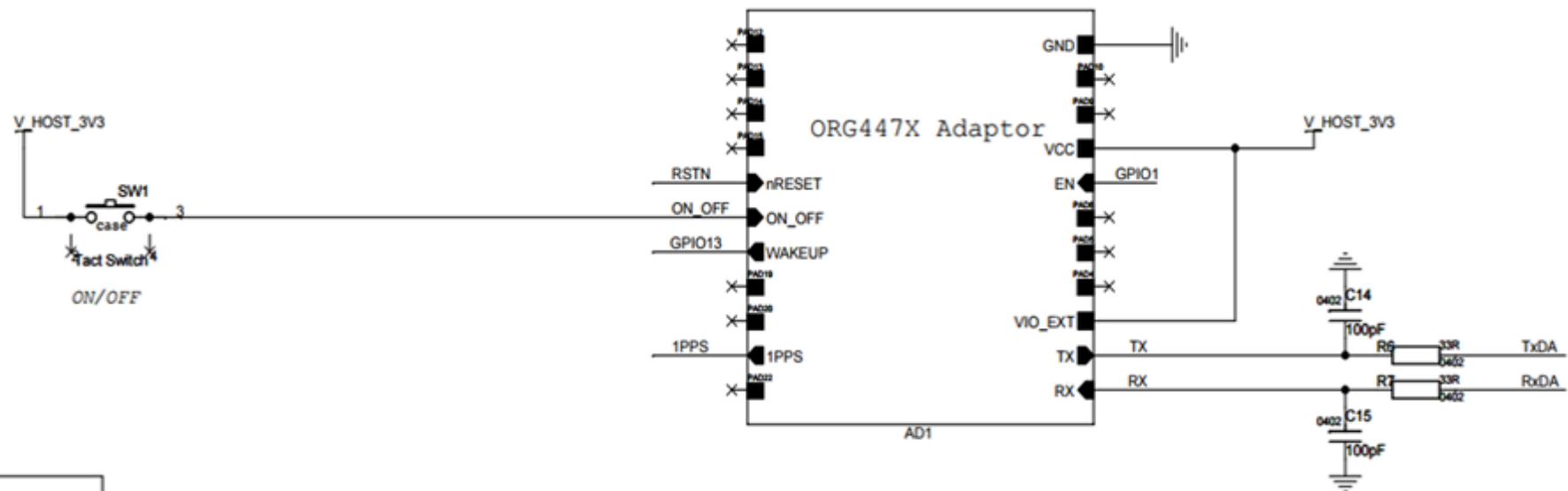
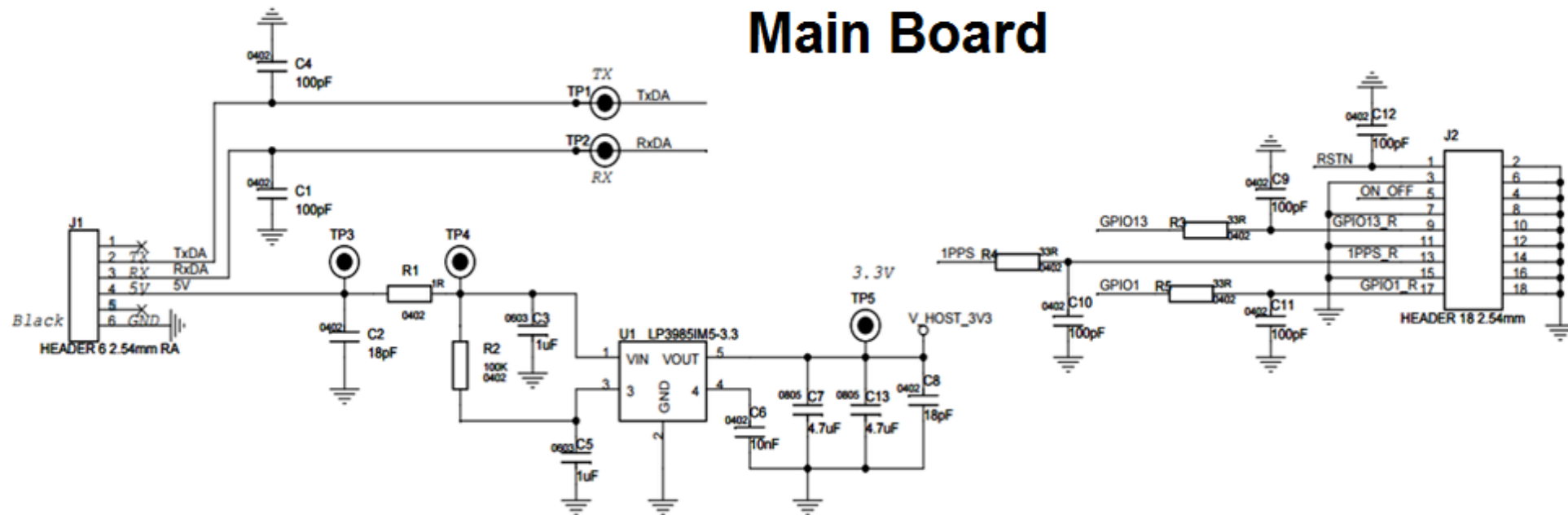
11.1 PATCH ANTENA

GPS antenna upper surface should be placed up towards the sky to keep GPS satellites in view.

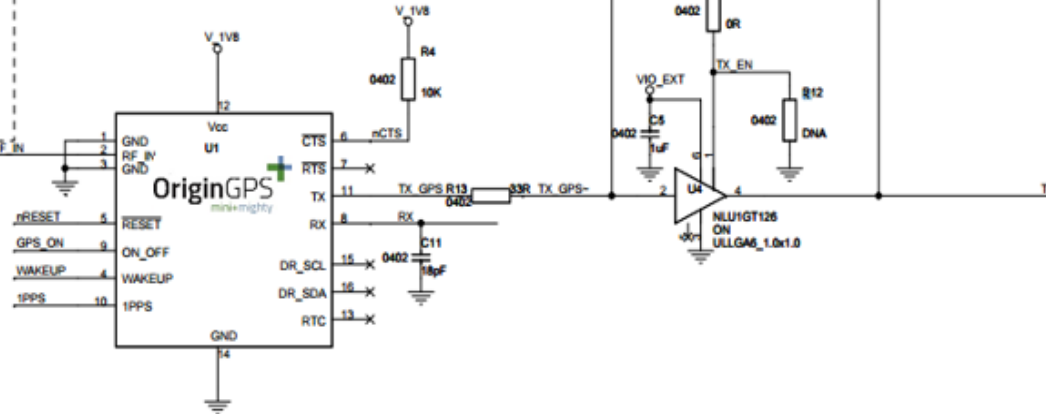
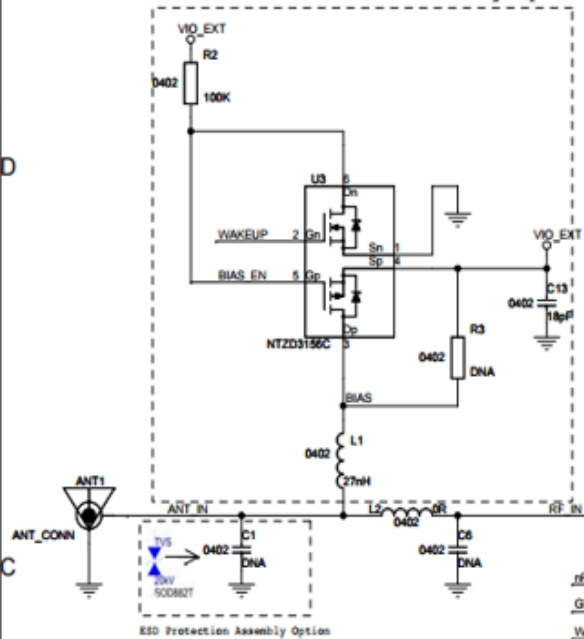
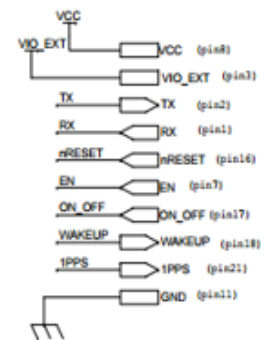
11.2 ON/OFF SWITCH FUNCTION

The On / Off switch is used to wake up GPS module from Hibernate state into Full Power state.

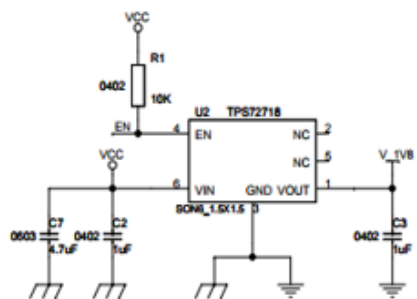
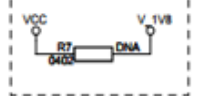
Main Board



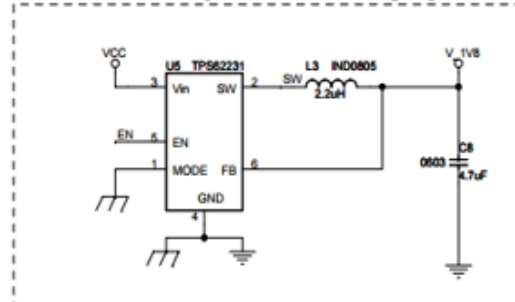
ORG4472 Adaptor



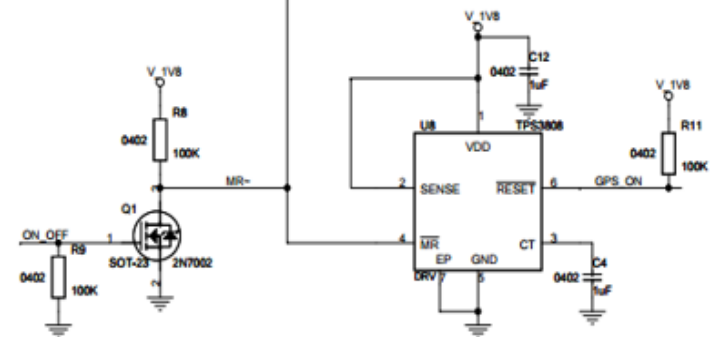
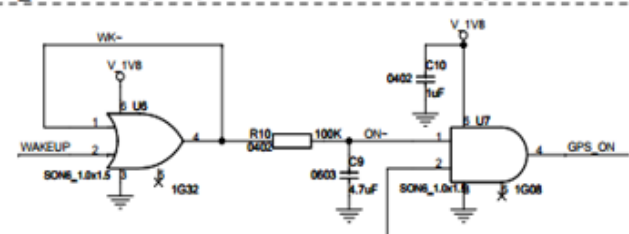
Do Not Assembly



DC-DC Buck Regulator Assembly Option 2



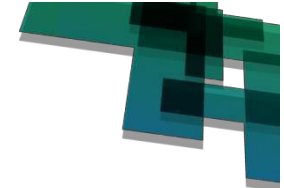
ON OFF Rising Edge Generator Assembly Option 4





12. MAIN BOARD ASSEMBLY BILL OF MATERIALS

Item	Quantity	Reference	Value	Description	P/N	MFG
1	8	C1,C4,C9,C10,C11,C12,C14,C15	100pF	CAP SMT 100pF 50V 5% COG	GRM1555C1H101JA01D	MURATA
2	2	C2,C8	18pF	CAP SMT 18pF 50V 5% COG 0402	GRM1555C1H180JZ01D	MURATA
3	1	C3,C5	1uF	CAP SMT 1uF 6.3V 10% X5R 0603	GRM188R60J105KA01D	MURATA
4	1	C6	10nF	CAP SMT 10nF 25V 10% X7R	GRM155R71E103KA01D	MURATA
5	2	C7,C13	4.7uF	CAP SMT 4.7uF 6.3V 10% X5R	GRM21BR61C475KA88B	MURATA
6	1	J1	HEADER 6	CONN. 6P TH RA	2211S-06G-F1	NELTRON
7	1	R1	1R	RESISTOR CHIP METAL FILM	CRCW04021RFRT1	VISHAY
8	1	R2	100K	RESISTOR CHIP METAL FILM	CRCW0402100KFRT1	VISHAY
9	5	R3,R4,R5,R6,R7	33R	RESISTOR CHIP METAL FILM	CRCW040233RFRT1	VISHAY
10	1	SW1	Tact Switch	SMD TACT SWITCH	TJ-532-V-T/R	DIPTRONICS
11	1	U1	LP3985IM5-3.3	3.3V LDO REGULATOR 200mA	LP3985IM5-3.3	NATIONAL



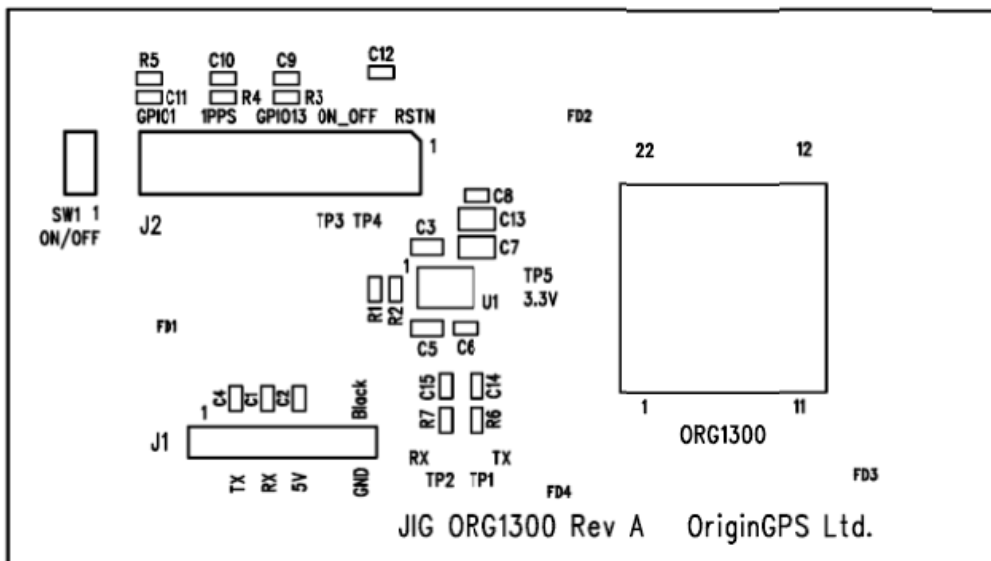
13. ORG447X ADAPTOR ASSEMBLY BILL OF MATERIALS

Item	Quantity	Reference	Value	Description	P/N	MFG	Assembly Notes
1	1	ANT1	ANT CONN	Ultra Small SMD Coaxial Conn.	W.FL	HIROSE	MAIN
2	1	C1	ESD1	Ceramic ESD protection device	LXES15AAA1-017	MURATA	Option 5
3	3	C2,C3,C5	1uF	CAP SMT 1uF 10V 10% X5R 0402	GRM155R61A105KE15	MURATA	MAIN
4	2	C4,C12	1uF	CAP SMT 1uF 10V 10% X5R 0402	GRM155R61A105KE15	MURATA	Option 3
5	1	C10	1uF	CAP SMT 1uF 10V 10% X5R 0402	GRM155R61A105KE15	MURATA	Option 4
6	1	C6	DNA	CAP SMT 1pF 50V 5% COG 0402	GRM1555C1H1RWZ01D	MURATA	Do Not Assembly
7	2	C7,C8	4.7uF	CAP SMT 4.7uF 6.3V 10% X5R 0603	GRM155R60G475ME87D	MURATA	MAIN
8	1	C9	4.7uF	CAP SMT 4.7uF 6.3V 10% X5R 0603	GRM155R60G475ME87D	MURATA	Option 4
9	1	C11	18pF	CAP SMT 18pF 50V 5% COG 0402	GRM1555C1H180JZ01D	MURATA	MAIN
10	1	C13	18pF	CAP SMT 18pF 50V 5% COG 0402	GRM1555C1H180JZ01D	MURATA	Option 5
11	1	L1	27nH	IND SMT 27nH 0402	LQG15HS27NJ02	MURATA	Option 5
12	2	L2,R6	0R	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW04020RJ0K	VISHAY	MAIN
13	1	L3	2.2uH	SMD IND 2.2uH 0.74A DSR=0.1Ohm	LQM21PN2R2MC0	MURATA	Option 2
14	1	Q1	2N7002	N-CH 0.38A 60V SOT23 Power MOSFET	2N7002KT1G	ON	MAIN
15	3	R8,R9,R11	100K	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW0402100KJK	VISHAY	MAIN
16	1	R2	100K	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW0402100KJK	VISHAY	Option 5
17	1	R10	100K	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW0402100KJK	VISHAY	Option 4
18	4	R3,R5,R7,R12	DNA	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW0402100KJK	VISHAY	Do Not Assembly
19	2	R1,R4	10K	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW040210KJK	VISHAY	MAIN
20	1	R13	33R	RESISTOR CHIP METAL FILM 0402 0.063W	CRCW040233RFRT1	VISHAY	MAIN
21	1	U1	ORG447X	Minuature GPS Engine Module	ORG447X	ORIGINGPS	MAIN
22	1	U2	TPS72718	1.8V Low Iq Low N RF LDO Regulator 200mA	TPS72718DSER	TI	Option 1
23	1	U3	NTZD3156C	Compl. N- P-Ch. MOSFET w Integr PUR PDR ESD Protection	NTZD3156CT1G	ON	Option 5
24	1	U4	NLU1GT125	Single Buffer W. 3-STATE	NLU1GT126CMX1TCG	ON	MAIN
25	1	U5	TPS62231	1.8V High Efficiency DC-DC Buck Converter	TPS62231DRYR	TI	Option 2
26	1	U6	1G32	Low Power Single OR Gate	SN74AUP1G32DRY	TI	Option 4
27	1	U7	1G08	Low Power Single AND Gate	SN74AUP1G08DRY	TI	Option 4
28	1	U8	TPS3808	Low Iq Programmable Delay Supervisor	TPS3808G18DRVR	TI	Option 3



14. MAIN BOARD PCB LAYOUT

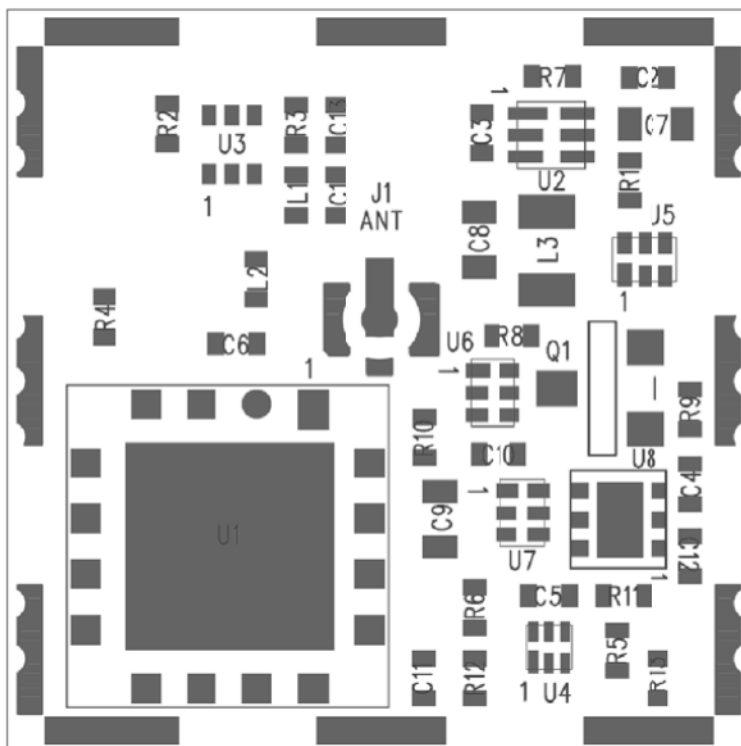
UART Main Board for ORG447x Series Module Adaptor is 2 layers 1.6mm thickness FR4 PCB.



COMPONENTS PLACEMENT

15. ORG447X ADAPTOR PCB LAYOUT

Adaptor Board for ORG447x Series Modules is 4 layers 0.6mm thickness FR4 PCB.



COMPONENTS PLACEMENT



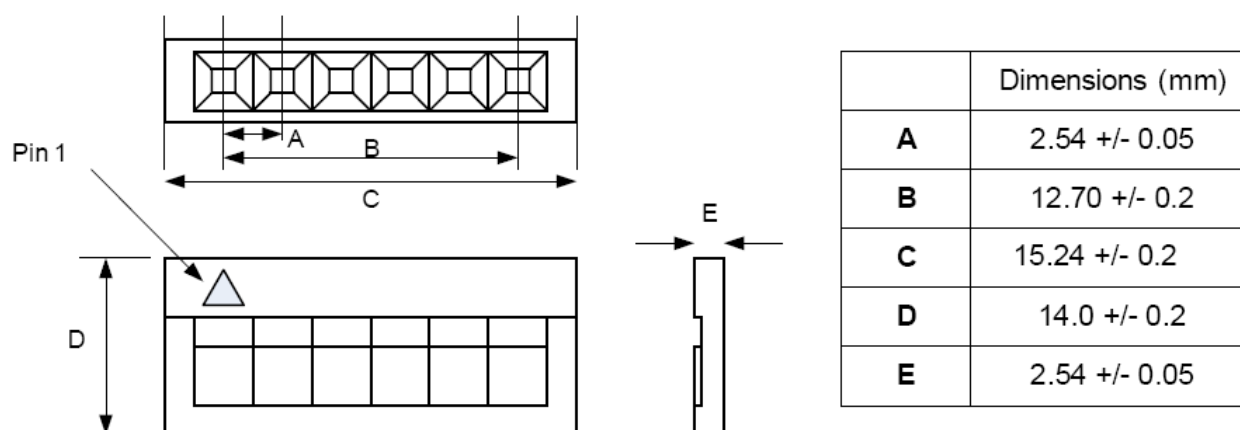
16. TTL-232R-3V3 USB-SERIAL CONVERTER

The TTL-232R-3V3 is a USB to Serial (TTL level) converter cable which allows for a simple way to connect TTL interface devices to USB.

The TTL-232R-3V3 uses an FTDI FT232RQ IC which is housed inside the USB 'A' connector and is terminated at the end of a 1.8 meter cable (6 ft.) with a 0.1" pitch header socket which provided access to transmit (Tx), receive (Rx), RTS# and CTS#. These lines all operate at 3.3V levels.

Also brought out on the header are VCC (5V) and GND.

The mechanical details of the 6 way connector are shown in the following diagram



Header Pin Number	Name	Type	Colour	Description
1	GND	GND	Black	Device ground supply pin.
2	CTS#	Input	Brown	Clear to Send Control input / Handshake signal.
3	VCC	Output	Red	+5V output,

Header Pin Number	Name	Type	Colour	Description
4	TXD	Output	Orange	Transmit Asynchronous Data output.
5	RXD	Input	Yellow	Receive Asynchronous Data input.
6	RTS#	Output	Green	Request To Send Control Output / Handshake signal.