GPS RADIONOVA® RF Antenna Module

Part No. M10214-A1

Product Specification

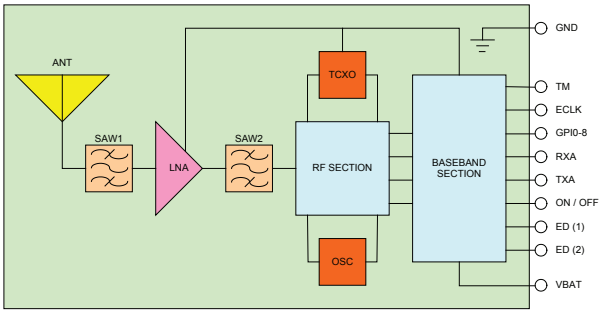
Applications

- **Personal Navigation Devics (PNDs)**
- **Portable Media Players (PMPs)**
- **Personal Digital Assitants (PDAs)**
- **Feature phones / Smart phones**
- **Ultra Mobile Devices (UMDs)**
- **Asset Tracking / Personal Safety**

Features

- Low cost single package GPS RF antenna module
- SiRF Star III GPS Chipset Architecture
- Low current consumption
- Easy to use 'drop-in solution'
- Built in filter allows co-existence with GSM / CDMA / UMTS / WLAN / BT
- Resistant to de-tuning

Functional Block Diagram



Product Description

GPS RADIONOVA M10214-A1 is a Flash based, highly integrated GPS RF Antenna Module suitable for L1-band GPS and A-GPS systems. The device is based on the high performance SiRF Star III GPS architecture combined with Antenova's high efficiency complementary antenna technology.

All front-end components are contained in a single package laminate base module for optimum performance. M10214-A1 operates on a single 3.6V positive bias supply with low power consumption and available low power modes for further power savings.

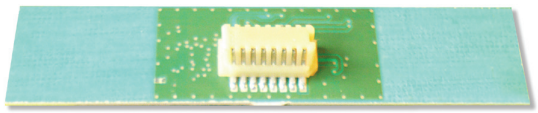
M10214-A1 is supported by SiRF stand alone software and uses a UART as the host processor interface.

Package Style

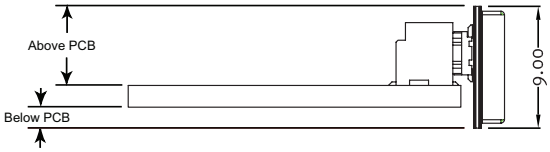
43 x 9 x 4mm RF Antenna Module

Top View (without shielding can)

Bottom View



Typical Mount (side view)



Integrated Antenna Solutions

Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
Vbat	Supply Voltage		5.5	V
RFin	RF Input Power		10	dBm
ESD	Electrostatic Discharge Immunity (HBM)		TBD	kV
T_{STG}	Storage Temperature	-40	+85	°C

*Exposure to absolute ratings may adversely affect reliability and may cause permanent damage.

Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Unit
Ta	Ambient Temperature	-20	25	+85	°C
Vbat	Main Supply Voltage	3.3	3.6	5.5	V
Fref	Reference Frequency		16.369		MHz

DC Electrical Characteristics

Conditions: Vbat = 3.6V, Ta = 25 °C

Symbol	Parameter	Typ	Unit
Icc_{ACQ}	Total Supply Current (Acquisition Mode)	50	mA
Icc_{TRK}	Track Mode	33	mA
$Icc_{(CLK)}$	Clock Only	16	mA
$Icc_{(STAND\ BY)}$	Stand By Mode	7	mA
$Icc_{(HIBERNATE)}$	Hibernate Mode	30	µA

*Power Management modes above are automatically accessed and managed through SiRF software/Firmware.

RF Specifications

Conditions: Vbat = 3.6V, Ta = 25 °C

Symbol	Parameter	Typ	Unit
G_{LNA}	LNA Gain	18	dB
NF_{LNA}	LNA Noise Figure	1.1	dB
P_{1dB}	1dB Compression Point	-65	dBm
ANT_{RL}	Antenna Return Loss	-12	dB
ANT_{EFF}	Antenna Efficiency	50	%

Band Rejection

Frequency	Standard	Typ	Unit
824-849	Cellular CDMA	89	dBc
869-894	GSM850	89	dBc
880-915	GSM900	89	dBc
1710-1785	DCS	74	dBc
1850-1910	PCS	84	dBc
1920-1980	WCDMA	84	dBc
2400	WLAN, BT and WiMAX	80	dBc

System Performance

Parameter	Specification
Data Output Protocol[1]	SiRF Binary, NMEA 0183
Host Interface	UART
Baud Rate[1]	SiRF Binary (57600), NMEA (4800\9600)
Power Consumption[2]	
Acquisition Mode	150 mW
Tracking Mode	110 mW
Trickle Power Mode	50 mW
Position Accuracy	
Autonomous	2.5m
Sensitivity	
Acquisition	-142dBm
Tracking	-159dBm
TTFF	
Hot Start	<1s
Warm Start	<35s
Cold Start	<35s

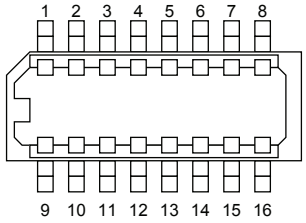
[1] Must use SiRF software to switch between output protocols.

[2] Vbat=3.3V

Pin out Description

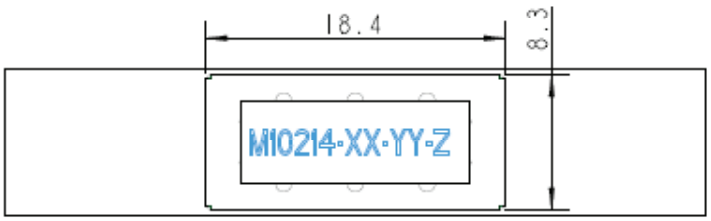
Pin	Name	Description
1	TM	OUTPUT - Time Mark (1.8V) (Mobile Phone A-GPS application, otherwise tie to GND)
2	GND	Ground connection
3	GND	Ground connection
4	GND	Ground connection
5	GND	Ground connection
6	GND	Ground connection
7	GND	Ground connection
8	GND	Ground connection
9	ECLK	INPUT - External clock for Frequency Aiding (1.8V) (Mobile Phone A-GPS application, otherwise tie to GND)
10	GPIO-8	INPUT - Time Aiding (1.8V) (Mobile Phone A-GPS application, otherwise tie to GND)
11	RXA	SERIAL INPUT - UART Receive Input (1.8V) (Main message connection to host CPU)
12	TXA	SERIAL OUTPUT - UART Transmit Output (1.8V) (Main message connection to host CPU)
13	ON / OFF	INPUT - Power ON/OFF control line (1.2V). Momentary high pulse to turn on and off the device. Pulse duration >70µs with minimum inter-pulse interval of 1s
14	VBAT	POWER SUPPLY (3.6V)
15	ED (1)	INPUT - Memory Boot mode Configuration (1.8V). External Bus Signal #1 (See table below)
16	ED (0)	INPUT - Memory Boot mode Configuration (1.8V). External Bus Signal #0 (See table below)

Program Memory Bootstrap Selection		
	ED (1)	ED (0)
Flash Mode	0	0
Reserved	0	1
Flash Loader Mode	1	1
ROM Mode (default)	1	0

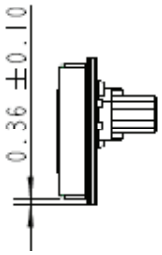


Mechanical Drawing

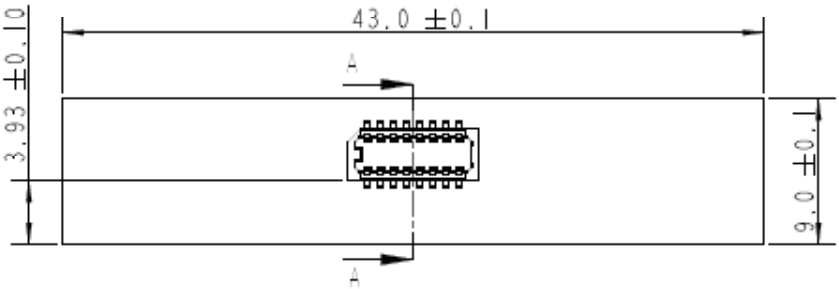
Front View (Component Side)



Side View

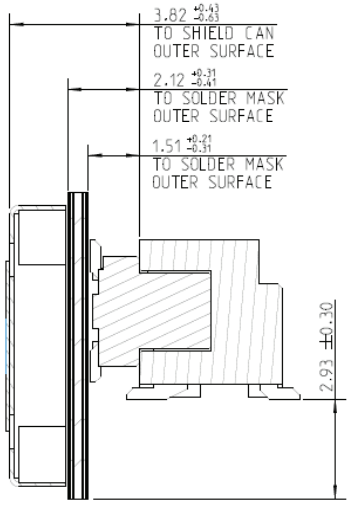


Back View (Connector Side)



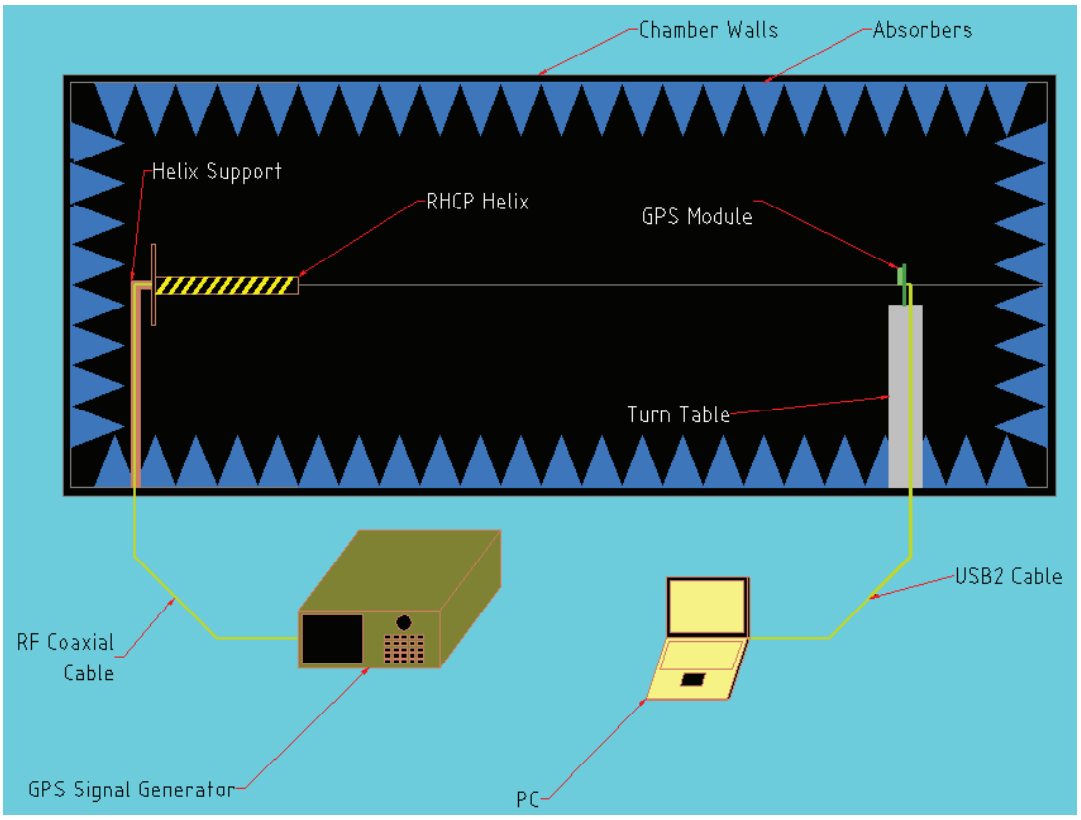
Side View

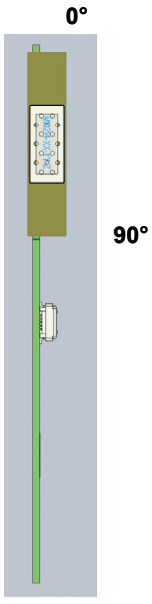
(Mated with Female Connector)

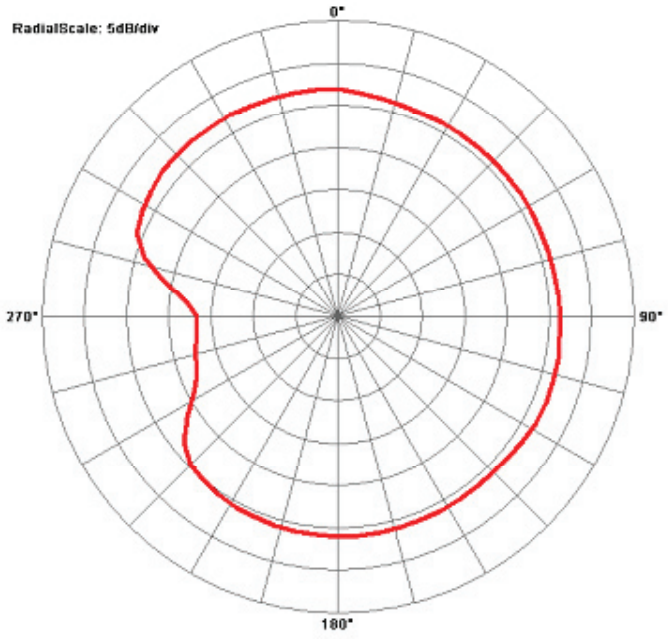


Notes: Units = mm

Typical Chamber Performance

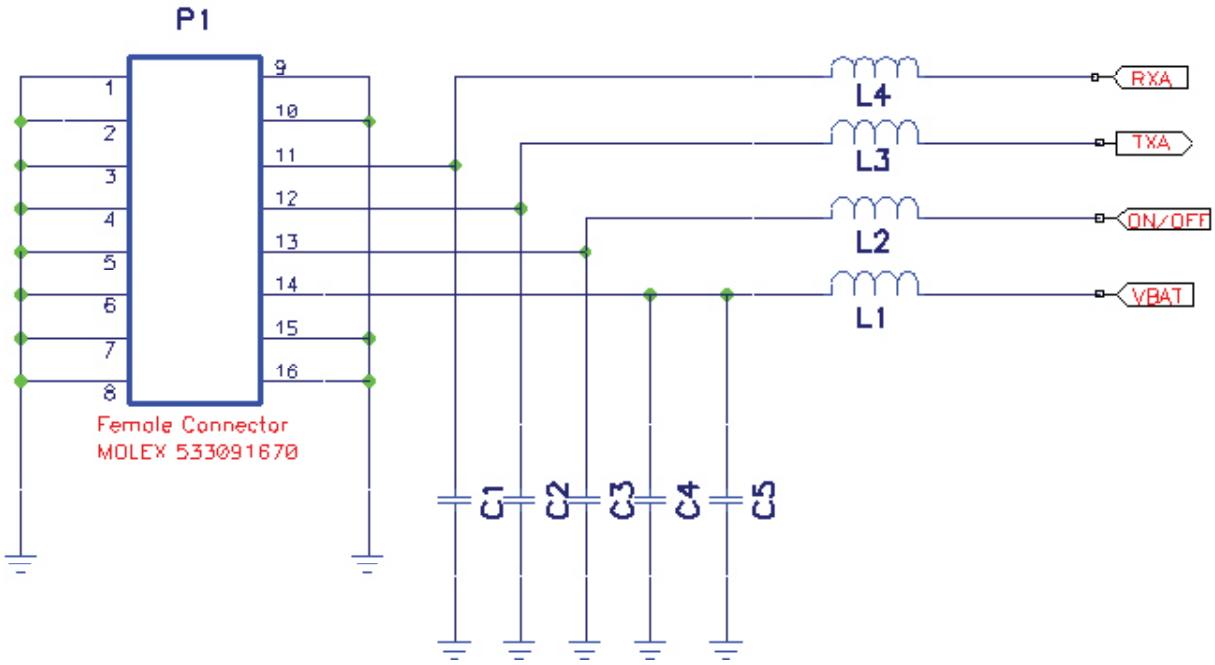






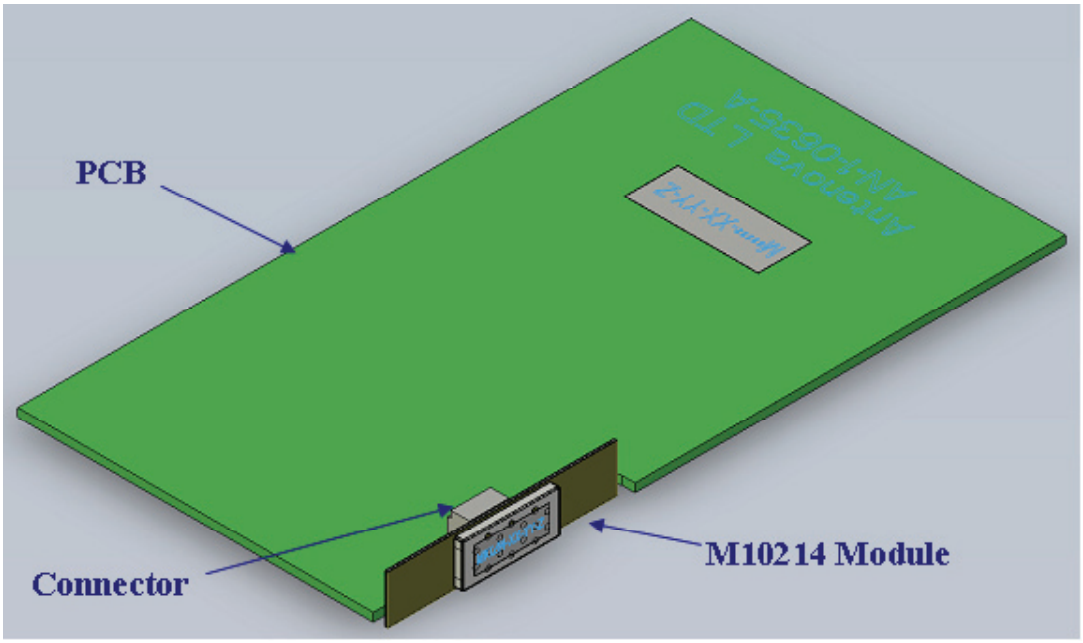
Note: Radiation pattern measured on Antenova's standard test board. Tuning may be needed in product integration to adjust radiation pattern.

Recommended Application Schematic

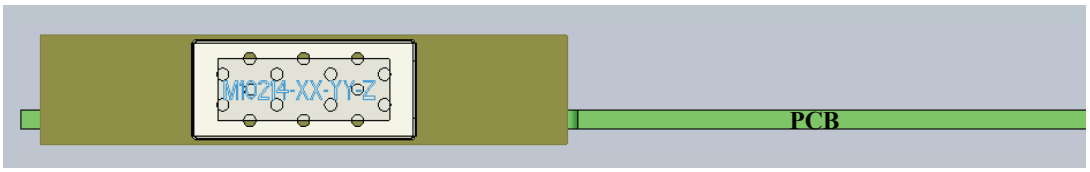


REFERENCE DESIGNATOR	VALUES	QTY	NOTES
C1,C2,C3,C4	15pF	4	0402 size components
C5	2.2uF	1	0402 size components
L1,L2,L3,4	47nH	4	0402 size components
P1	16 Pin	1	Molex 533091670

Typical RF Antenna Module Placement



Front View



Back View

Side View

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