

GPS L1

High Performance

Filtering Active Antenna

ORG9805 Data Sheet



1. Description

The ORG9805 External Active Antenna incorporates high-efficiency ceramic patch antenna element, high out-of-band rejection band-pass Surface Acoustic Wave (SAW) filter, low Noise Figure and high gain Low Noise Amplifier (LNA), enclosed in plastic case, with coaxial cable terminated by standard SMA-type plug.

The ORG9805 Active Antenna with highest GPS-band performance and notch filtering for out-of band signals provides exceptional sensitivity, high selectivity and noise immunity.

The ORG9805 Active Antenna is built of highest quality materials and components.

The ORG9805 Active Antenna is the perfect match to the OriginGPS GPS receiver modules.

2. Features

- Antenna element with high efficiency for excellent coverage of GPS satellites
- SAW filter for rejection of out-of-band signals
- LNA with low Noise Figure and high gain for high sensitivity
- Plastic case with magnetic base
- RG-174 flexible coaxial cable of 5m length
- SMA-type gold plated plug

3. Benefits

- High performance
- Compact size
- Easy integration

4. Block Diagram

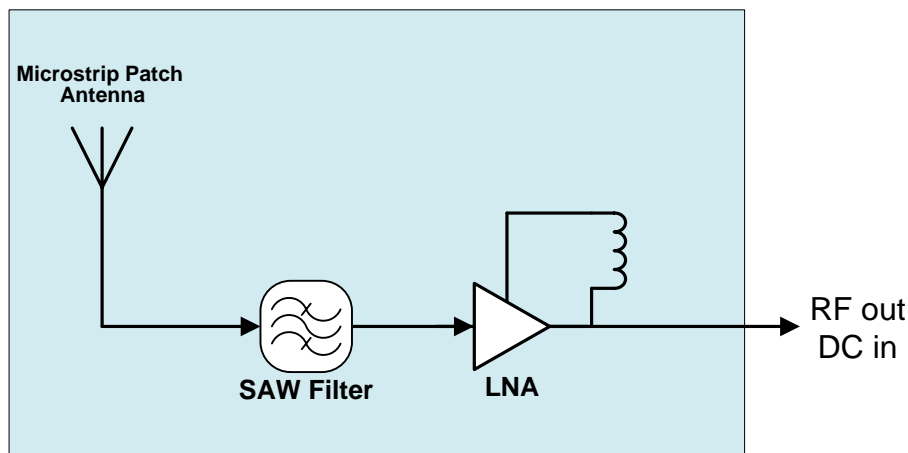


Figure 4-1: ORG9805 block diagram

5. Typical Application Circuit

ORG447X series

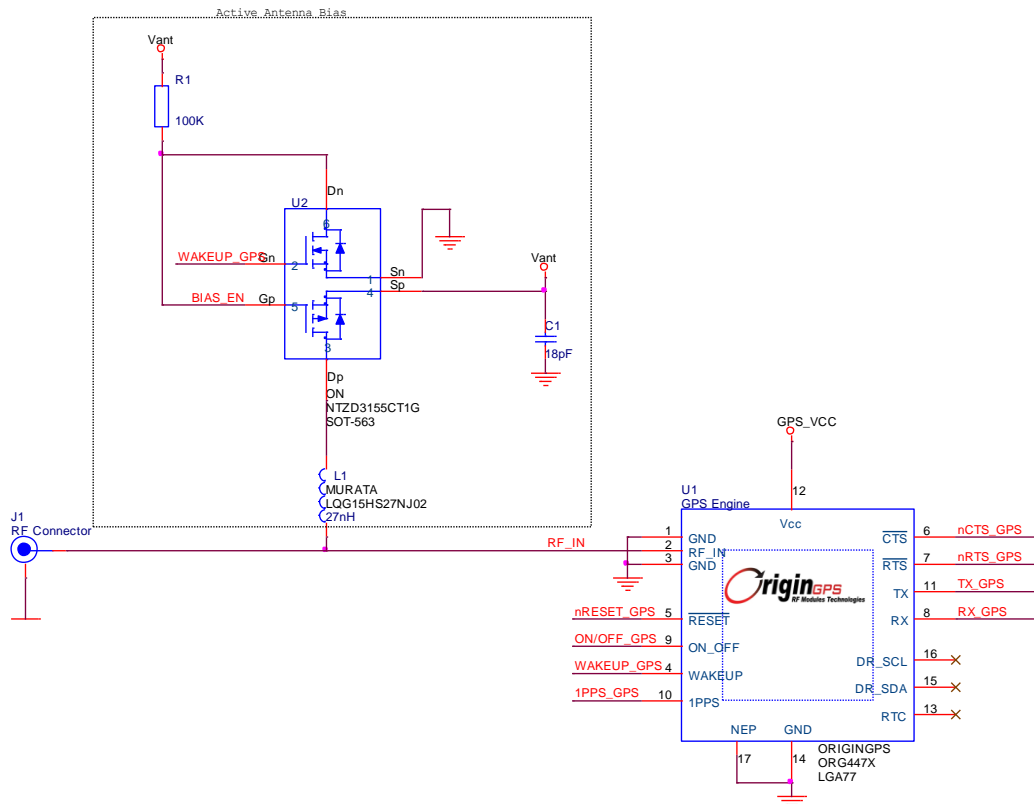


Figure 5-1: ORG447X series circuit

ORG1408

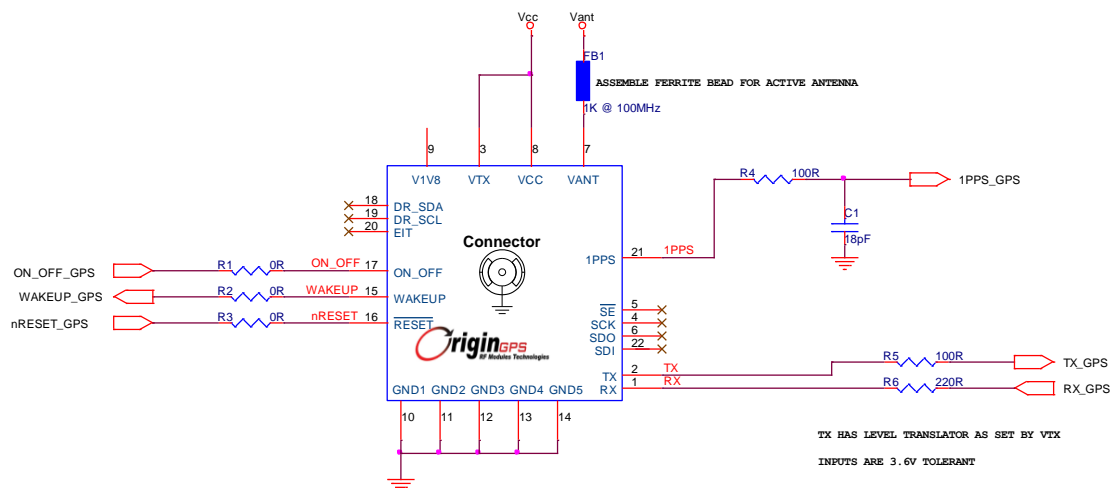


Figure 5-2: ORG1408 circuit

6. Electrical Specifications

6.1. Characteristic Data

Parameter	Value	Unit	Notes
Center Frequency (f_c)	1575 \pm 3	MHz	
Bandwidth (BW)	10 (min)	MHz	
Peak Gain	4 (min)	dBic	@ f_c , 70mm x 70mm GP
Gain Coverage	-4 (min)	dBic	@ f_c , $-90^\circ < \theta < 90^\circ$ (over 75% volume)
Axial Ratio (AR)	2.0 (max)	dB	
Polarization	R.H.C.P		
Filter Attenuation	7 (min) 20 (min) 25 (min) 40 (min)	dB	@ f_c + 20MHz, @ f_c - 20MHz @ f_c + 50MHz, @ f_c - 50MHz @ f_c + 100MHz @ f_c - 100MHz
Power Handling	30	dBm	out of band signal
LNA Gain	27 (typ)	dB	without cable loss
LNA Noise Figure	1.5 (max)	dB	
DC Voltage	3 - 5	V	supplied via coaxial cable
DC Current	8.5 (typ)	mA	@3.3V
Cable Insertion Loss	1.2 (typ)	dB/m	
VSWR	2.0 (max)		@output
Impedance	50 \pm 1	Ω	@output

Table 6-1: Electrical specifications

6.2. Characteristic Curves

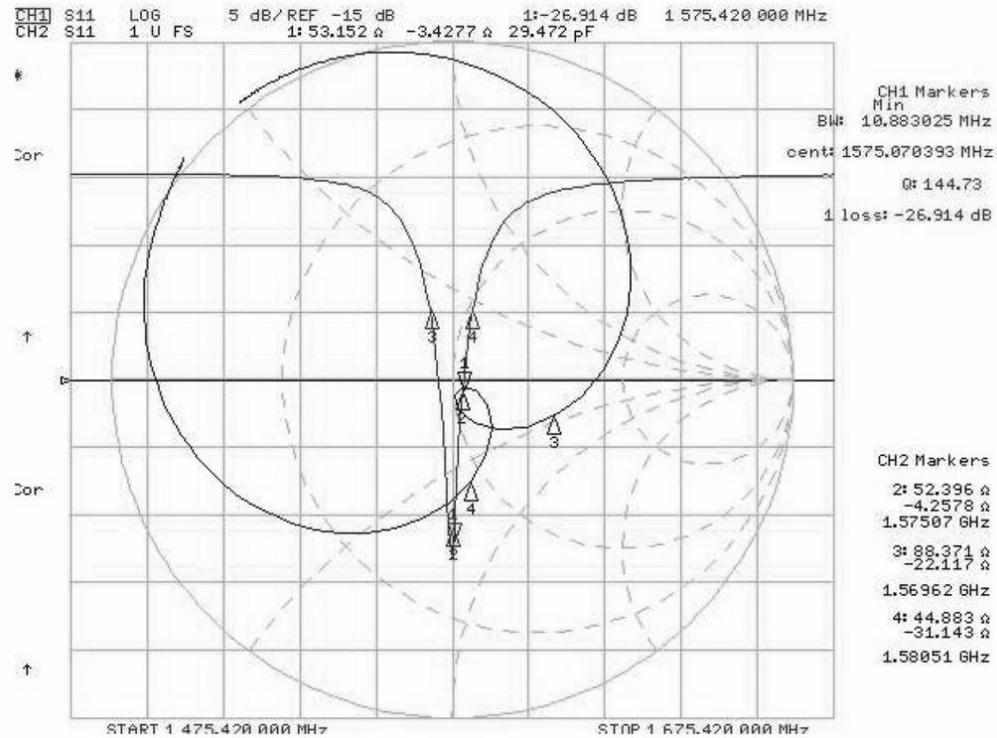


Figure 6-1: Antenna element

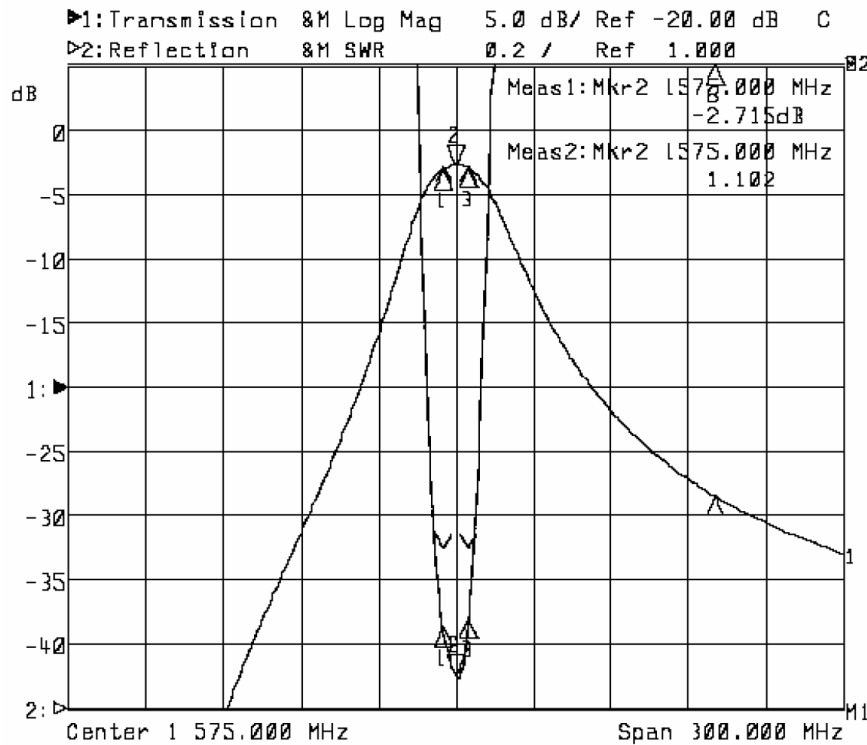


Figure 6-2: SAW filter

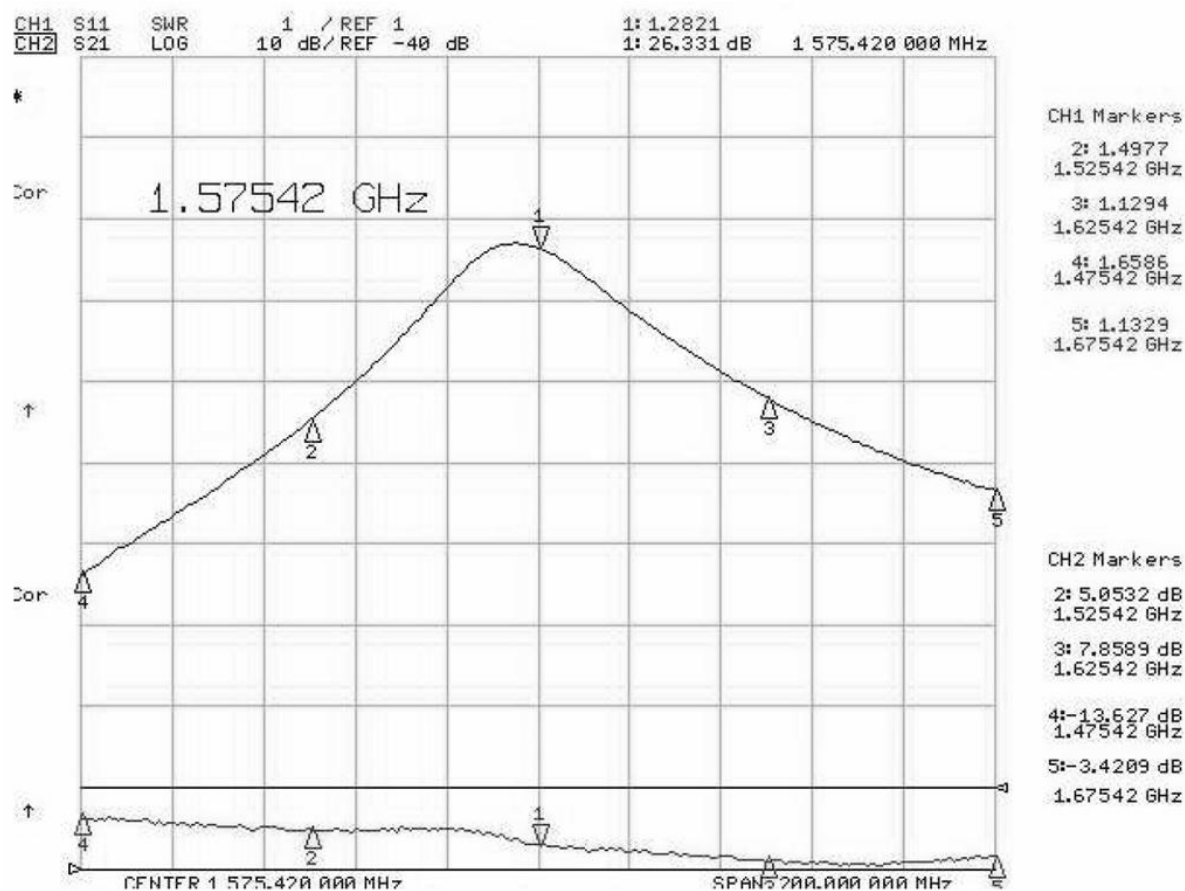


Figure 6-3: LNA

7. Mechanical Specifications

Parameter	Value	Unit	Notes
Size (L x W x T)	48.6 x 39.2 x 15.2	mm	tolerance: $\pm 0.5\text{mm}$
Weight	106 (approx.)	g	including cable
Housing	PC		
Color	Black		
Mounting	Magnetic base		
Orientation	Horizontal surface		
Cable Type	RG-174		diameter: $2.7 \pm 0.1\text{mm}$
Cable Length	5	m	
Connector Type	SMA Plug		Gold plated

Table 7-1: Mechanical data

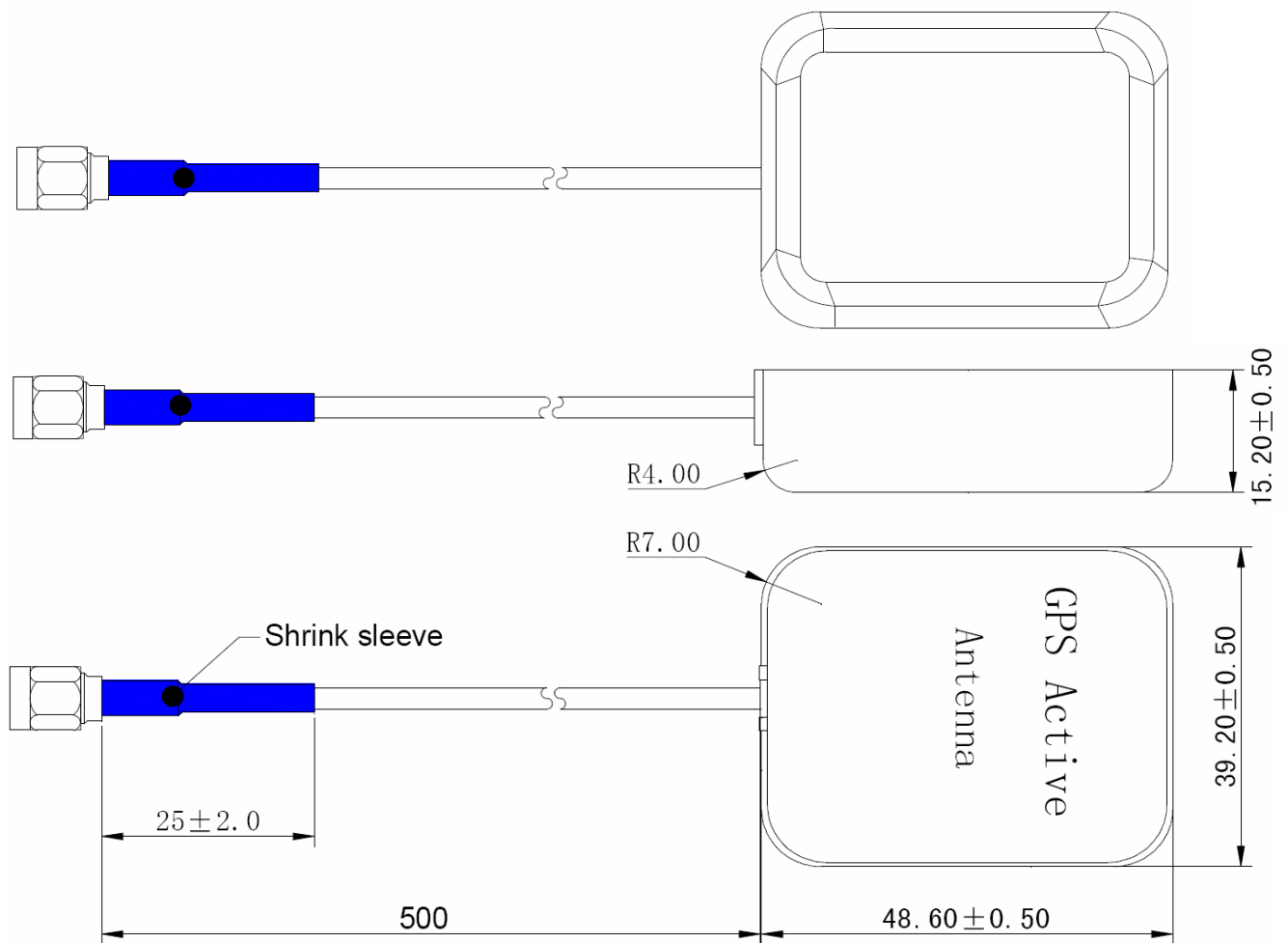


Figure 7-1: Mechanical data

8. Environmental Specifications

Parameter	Value	Notes
Operating Temperature	-40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Humidity	5% ~ 95% RH	@ operating temp.
Weatherproof	IP66	dustproof and waterproof

Table 8-1: Environmental data

9. Compliance

The ORG9805 External Active Antennas are manufactured and handled to comply with and according to Pb-Free/RoHS Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



The ORG9805 Active Antennas are manufactured in ISO 9001:2000 accredited facilities.
The ORG9805 Active Antennas are manufactured in ISO 14001:2004 accredited facilities.
The ORG9805 Active Antennas comply with the following EMC standards:

- EU CE EN55022:06+A1(07), Class B
- US FCC 47CFR Part 15:09, Subpart B, Class B



10. Reliability

Parameter	Description	Pass Criteria
Drop Test	Place antenna on set 1.5m height Drop 5 times	1. No visible damage 2. Electrical perf. is satisfying
Vibration Test	Sine sweep 5 – 55 – 5 Hz, 1 octave/min Amplitude = 1.5mm, Acceleration = 2g Crossover freq. = 18Hz Hold time = 2hr.	1. No visible damage 2. Electrical perf. is satisfying
Humidity	60°C, 95% RH, 96hr.	1. No visible damage 2. Electrical perf. is satisfying
Thermal Shock	+80°C (30 min) → 5 min → -40°C (30 min) 10 cycles	1. No visible damage 2. Electrical perf. is satisfying
High Temperature Resistance	+85°C, 96hr.	1. No visible damage 2. Electrical perf. is satisfying
Low Temperature Resistance	- 40°C, 96hr.	1. No visible damage 2. Electrical perf. is satisfying

Table 10-1: Reliability data

11. Safety Information

Improper handling or use can cause permanent damage to the device.

There is also the possible risk of personal injury from mechanical trauma or shocking hazard.

12. Disposal Information

The product should not be treated as household waste.

For more detailed information about recycling electronic components, please contact your local waste management authority.



13. Product Labeling



Figure 13-1: Labeling information