

## **SPECIFICATION**

Model No. : MA.501.C.A301111.C305151

Product Name : Heavy Duty Screw Mount Antenna - GPS/Dual-

Band 2.4~5.2GHz

Description : 2.4GHz~5.2GHz suitable for

ISM Bands/ZigBee/WLAN/Bluetooth

IEEE.802.11/IEEE.802.15

UV and vandal resistant ABS housing

IP69K compliance

Height 29mm Diameter 49mm

**RoHS Compliant** 





### I. Scope

MA.501 is a combination of high performance GPS and dual band Wi-Fi (2.4~2.5/5.2GHz) antenna solution for reliable location information with localised data transfer via WLAN, Zigbee or Wi-Fi. This product incorporates the industry's most advanced GPS active ceramic patch technology (XtremeGain™) allowing for gains of up to 300% in accuracy compared to traditional antennas. Time to first fix is under 1 minute with all of the industry leading GPS receivers. XtremeGain technology means the antenna has been tuned for the Hercules environment giving you the optimum antenna solution to enable elimination of data gaps.

The 2.4/5.2GHz antenna inside has also been tuned for this enclosure; hence performance is excellent at all bands meaning the antenna works worldwide.

It was designed mainly for commercial vehicle and outdoor equipment installations, with extra thick threads, with the cables exiting through the bottom for ease of install. Durable and robust UV resistant PVC housing is resistant to vandalism and direct attack. It is designed for covert mounting as it is only 3cm high when mounted, thus complies with the latest EU directives for height restrictions.

#### II. Features

#### **GPS**

- High LNA Gain up to 32 dB ± 2 dB
- Miniaturized diameter 49mm
- Low Noise (1.5 dB max)
- Resides in its own chamber and is tuned for the Hercules environment to enhance performance

#### WLAN / Wi-Fi

- Advanced dual-band antenna for worldwide application
- Tuned for the Hercules environment to enhance performance

#### Other

- Weather-proof (IP69K) with robust foam seal
- Quality textured covert and low profile design
- UV and Vandal resistant PVC housing
- Convenient integrated cable routing system
- Optional cables and connectors



# **III. Specifications**

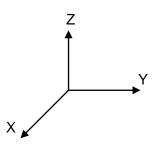
		GPS						
Frequency		1575.42MHz						
Average Gain		32dB typ.						
Gain @ Zenith		2.0dBi min.						
Gain @ 10 o Elevation		-4.0dBi min.						
Axial Ratio		3.0dB max.						
Polarization		Right Hand Circular						
VSWR		<=2.0:1						
Impedance		50Ω						
Noise Figure		1.5dB max.						
Bandwidth		10Mhz min.						
LNA Out-band Attenuation	fo = $1575.42$ MHz fo $\pm$ 30 MHz 5dB Min. fo $\pm$ 50 MHz 20dB Min. fo $\pm$ 100 MHz 25dB Min.							
Input Voltage	Min:1.8V		Typ. 3.0V			Max: 5.5V		
Total Gain @ Zenith	25dBic		30dBic			32dBic		
Current Consumption	6m	A	12mA			30mA		
Noise Figure	2.7dB		3.0dB			3.7dB		
Cable	3m RG174 standard, fully customizable							
Connector	SI	SMA(M) standard, standard, fully customizable						
		WiFi						
Frequency (GHz)	2.40	2.45	2.50	5.15	5.	.25	5.35	
Average Gain (dBi)	-2.24	-2.06	-2.19	-3.74	-4	.26	-3.84	
Peak Gain (dBi)	3.05	4.05	4.11	4.74	4.	.37	4.71	
Efficiency	63.3%	68.9%	66.4%	50.0%	41.6%		47.5%	
Return Loss (dB)	-14.5	-12.1	-12.7	-11.4	-1	5.3	-14.2	
VSWR		<=1.8:1						
Impedance		50Ω						
Polarization		Linear - Horizontal						
Radiation Pattern		Omni						
Cable	3m CFD-200 standard, fully customizable							
Connector	RP-SMA(M) standard, standard, fully customizable							
MECHANICAL								
Dimensions		Height 29mm x Diameter 49mm						
Casing		UV resistant PVC						
Base and thread		Nickel plated steel						
Thread diameter		18mm						



Weather proof gasket	CR4305 foam with 3M9448B double-side adhesive			
Cable pull	8 Kgf			
Recommended Mounting Torque	95Nm			
Maximum Mounting Torque	135Nm			
ENVIRONMENTAL				
Waterproof	IP-69K			
Corrosion	5% NaCl for 96hrs - Nickel plated steel base and thread			
Temperature Range	-40°C to +85°C			
Thermal Shock	100 cycles -40°C to +80°C			
Humidity	Non-condensing 65°C 95% RH			
Shock (drop test)	1m drop on concrete 6 axes			

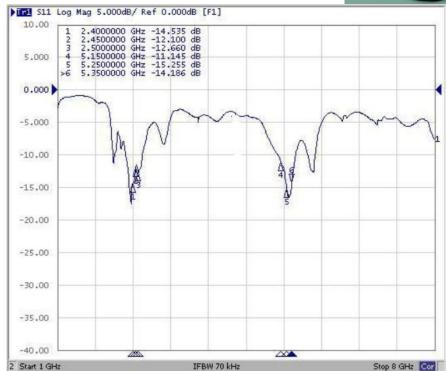


## IV.S11 Return Loss management (Wi-Fi / WLAN)



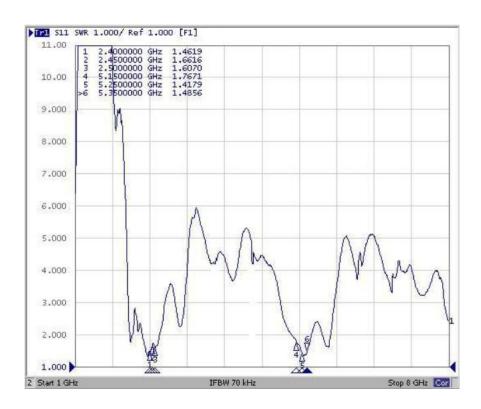
Note: 1. The upper of the PCB is X direction. 2. Connector is toward Z direction.



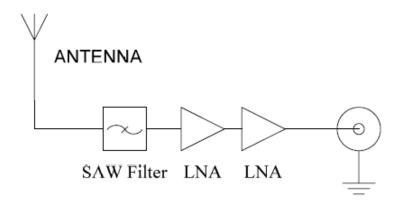




## V. VSWR (Wi-Fi / WLAN)

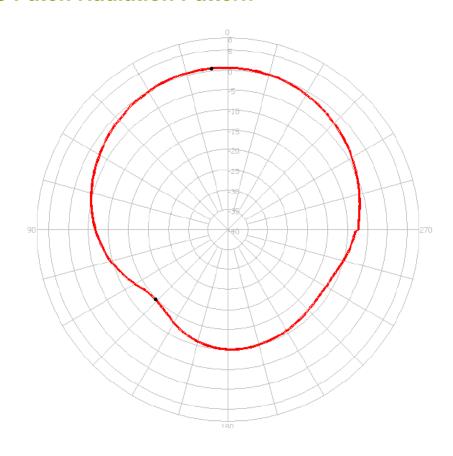


## **VI. System Block Diagram**





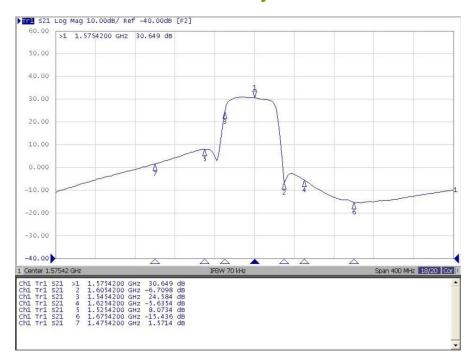
## VII. GPS Patch Radiation Pattern



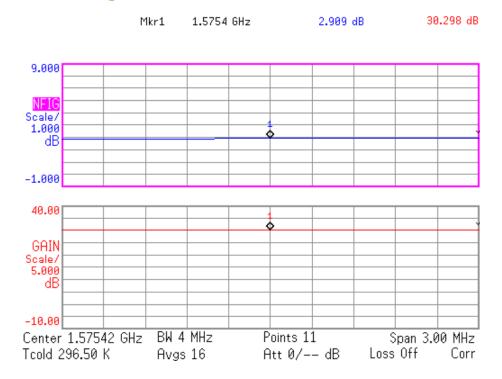


## **VIII. LNA Properties**

### VIII.1. LNA Gain and Out-band Rejection @ 3.0V

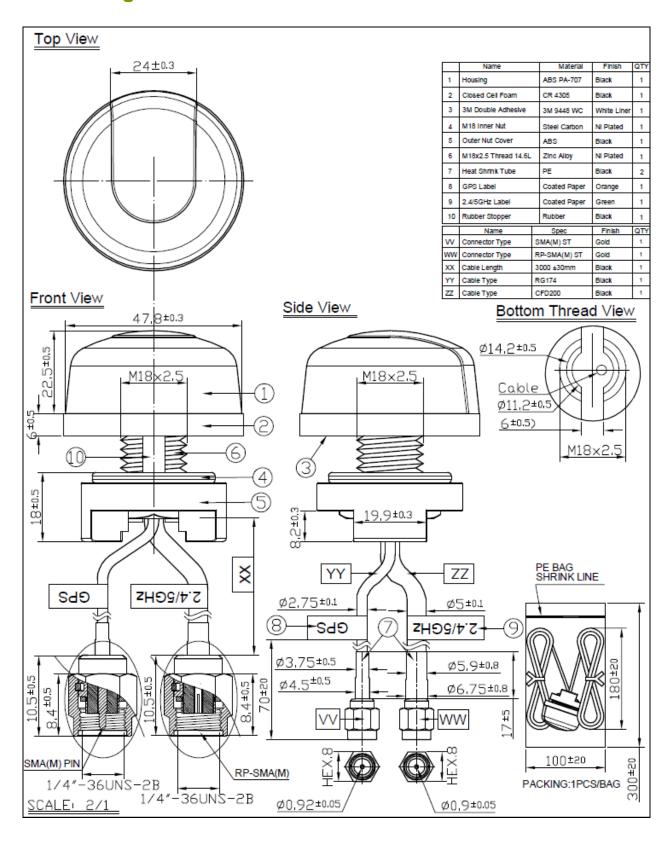


## VIII.2. Noise Figure



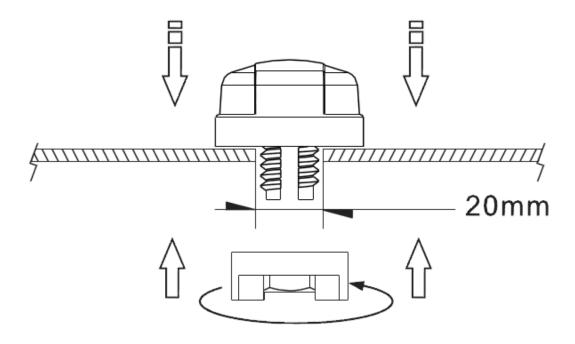


## IX. Drawings





### X. Installation



Recommended torque for mounting is 95Nm or 70ftlbs Maximum torque for mounting is 135.6Nm or 100ft lbs

