

**Description**: GNSS / 2x LTE / 0, 1x, 2x or 3x WiFi

Magnetic Mount

**Series: RAZORBACK** 

**PART NUMBER:** RAZ32011MM, RAZ32012MM, RAZ42111MM, RAZ42112MM, RAZ52211MM, RAZ52212MM, RAZ62311MM, RAZ62312MM



RAZ62311MM (Black)



RAZ62312MM (White)

### Features:

- 2x LTE 644-2700MHz (MiMo)
- 0, 1x, 2x or 3x WiFi 2.4/5GHz
- DSRC
- GNSS Active:
  - · Beidou, GPS, Glonass
  - RHCP polarization
  - · Amplifier Gain 30dBi
- Size: 89.2 x 195.1 x 94.7mm
   3.51 x 7.68 x 3.73 in
- Power withstanding 45W
- Available Models
   RAZ32011MM = 3 Cable, Black
   RAZ32012MM = 3 Cable, White
   RAZ42111MM = 4 Cable, Black
   RAZ42112MM = 4 Cable, White
   RAZ52211MM = 5 Cable, Black
   RAZ52212MM = 5 Cable, White
   RAZ62311MM = 6 Cable, Black
   RAZ62312MM = 6 Cable, White

## **Applications:**

- Vehicular use Telematics
- Fleet management
- Trucking
- Navigation, GIS and survey
- Public safety
- Search and Rescue
- Metering, Utility boxes

Issue: 1742

In the effort to improve our products, we reserve the right to make changes judged to be necessary. CONFIDENTIAL AND PROPRIETARY INFORMATION

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For more information:

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Pulse/Larsen Antennas 18110 SE 34<sup>th</sup> St Bldg 2 Suite 250 Vancouver, WA 98683 USA Tel: 1-360-944-7551 Europe Headquarters Pulse GmbH & Do, KG Zeppelinstrasse 15 Herrenberg, Germany Tel: 49 7032 7806 0 Pulse (Suzhou) Wireless Products Co, Inc. 99 Huo Ju Road(#29 Bldg,4<sup>th</sup> Phase Suzhou New District Jiangsu Province, Suzhou 215009 PR China Tel: 86 512 6807 9998



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### **ELECTRICAL SPECIFICATIONS**

| Antenna Type       | Monopole, measured on Ø1.02m (40°) ground plane |
|--------------------|---|
| Fraguenov (2v LTE) | 644 060/1710 2700 MHz                           |

Frequency (2x LTE) 644-960/1710-2700 MHz
Frequency (1x, 2x or 3x WiFi) 2400-2500/4900-5925 MHz

 Nominal Impedance
 50 Ω

 VSWR
 2:1

 Radiation Pattern
 Omni

 HPBW / Vertical Plane (LTE, 644-960)
 42°

 HPBW / Vertical Plane (LTE, 1710-2700)
 31°

 HPBW / Vertical Plane (WIFI, 2400-2500)
 25°

 HPBW / Vertical Plane (WIFI, 4900-5925)
 20°

Polarization Vertical

Average Peak Gain (LTE, 644-960) (LTE, 1710-2700) 4.6/4.9 dBi

Average Peak Gain (WIFI, 2400-2500) (WIFI, 4900-5925) 6/6.6 dBi

Isolation (LTE1 to LTE2) <-13
Isolation (WiFi1/2, WiF2/3 & WiFi1/3) <-13
Average Efficiency (LTE) 67 %

Average Efficiency (WiFi) 57 % Power Withstanding 45 W

GNSS Beidou-GPS-Glonass

Frequency 1561.098±2.046,1575.42±1.023,1602.5625±4 MHz

VSWR 2:1

Nominal Impedance 50  $\Omega$ 

Gain (Radiating element) 1 dBic +/- 1dB Gain (LNA gain) 30 dB +/- 2 dB

Polarization RHCP





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### **ELECTRICAL SPECIFICATIONS**

Out of Band Rejection 960MHz >65 dB, 1710MHz >60 dB, 2170MHz >65 dB, 2400MHz >65 dB

Noise Figure < 2.4dB

Operating Voltage  $3.3 - 5 \text{ Vdc} \pm 0.5 \text{ V}$ 

Current Consumption < 11 mA

### **MECHANICAL SPECIFICATIONS**

Length/Height/Width 195.1mm (7.68")/94.7 (3.73")/89.2mm (3.51")

Weight 856 g (1.9 lbs)

Antenna Color / Material Black or White / PC/ABS, UV protected

Cable / Connector 2x LTE, 5.2m (17') LMR-195/SMA-Male

1x, 2x or 3x WiFi, 5.2m (17') LMR-195/RP-SMA-Male

GNSS, 5.2m (17') RG-174/SMA-Male

Mounting Configuration Magnetic Mount

### **ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature -40/+85° C

Ingress Protection IP67

RoHS Compliant Yes

### **OTHER SPECIFICATIONS**

| Total cable assembly loss for 5.2m (17') LMR-195 @ 850MHz  | 2.1 dB |
|--|--------|
| Total cable assembly loss for 5.2m (17') RG-174 @ 1575MHz  | 6.0 dB |
| Total cable assembly loss for 5.2m (17') LMR-195 @ 1930MHz | 3.2 dB |
| Total cable assembly loss for 5.2m (17') LMR-195 @ 2500MHz | 3.7 dB |
| Total cable assembly loss for 5.2m (17') LMR-195 @ 2450MHz | 3.6 dB |
| Total cable assembly loss for 5.2m (17') LMR-195 @ 5350MHz | 5.5 dB |





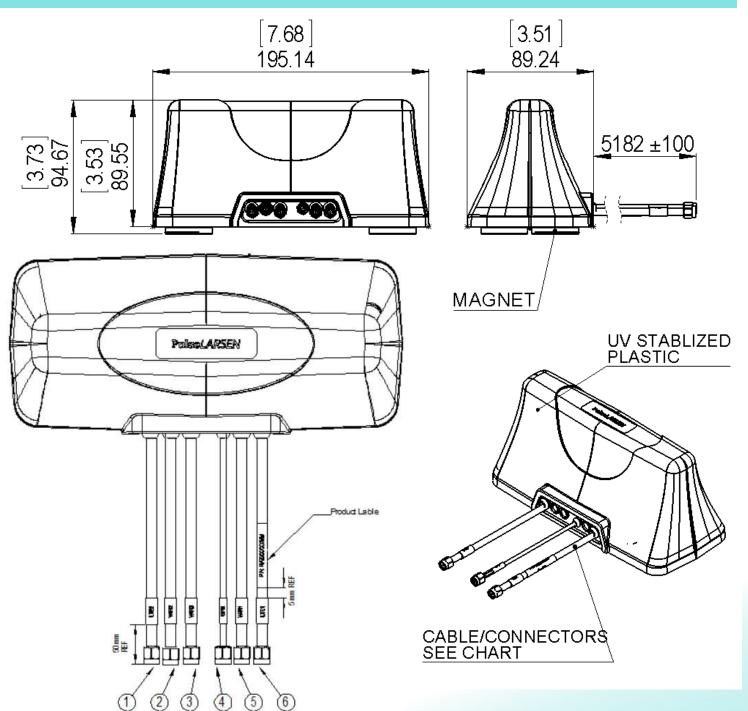
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## **MECHANICAL DRAWING**



All dimensions are in mm / inches

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## **MECHANICAL DRAWING**

# Vehicular Multiband Antenna with Magnet Mount

(Part Number)























7

| 1          | Product ID: RAZORBACK                                |  |  |  |
|------------|--|--|--|--|
| 2          | Total Number of Cable leads                          |  |  |  |
| 3          | Total Number of LTE Cable Leads                      |  |  |  |
| 4          | Total Number of WiFi Cable Leads                     |  |  |  |
| (5)        | Total Number of GPS Cable Leads                      |  |  |  |
| 6          | The Color of the Plastic Housing<br>1=Black; 2=White |  |  |  |
| <b>(7)</b> | Mounting:Magnet Mount                                |  |  |  |

|   | RAZXXXXMM         | CABLE  | CABLE LENGTH | CONNECTOR    |
|---|-------------------|--------|--------------|--------------|
| 1 | LTE-2 Cable Assy  |        | 5181 mm /    | SMA Male     |
| 2 | WiFi-2 Cable Assy | LMR195 |              | DB 0144 44 1 |
| 3 | WiFi-3 Cable Assy |        |              | RP-SMA Male  |
| 4 | GPS Cable Assy    | RG-174 | 204" /       | SMA Male     |
| 5 | WiFi-1Cable Assy  | LMR195 | 17 FT        | RP-SMA Male  |
| 6 | LTE1 Cable Assy   |        |              | SMA Male     |

All dimensions are in mm / inches





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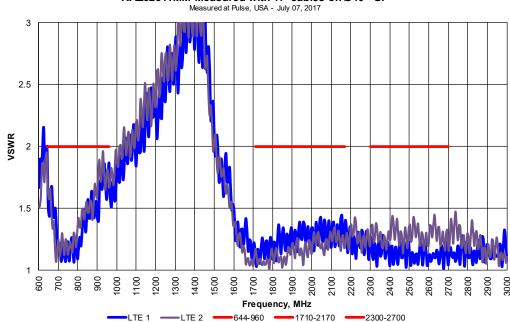
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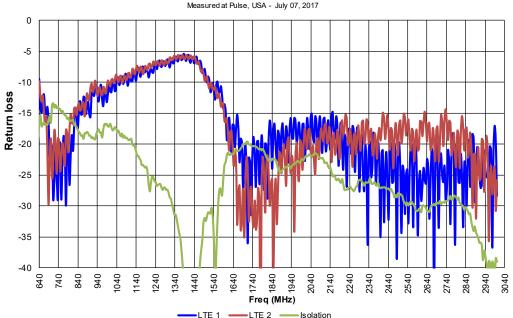
### **CHARTS**

### **VSWR vs Frequency** RAZ62311MM Measured with 17' cables on Ø40" GP



LTE 1 & 2 Measured with 5.2m (17') cable

### Return loss vs Frequency RAZ62311MM Measured with 17' cables on Ø40" GP



LTE 1 & 2 Measured with 5.2m (17') cable



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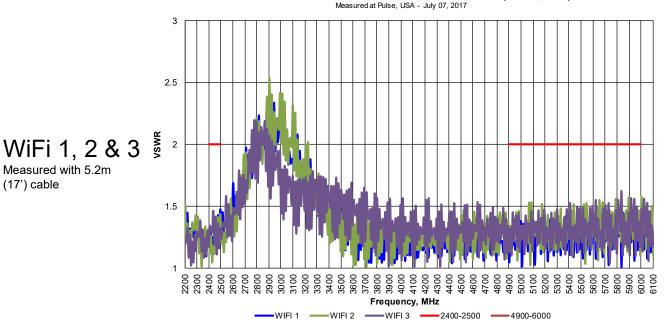
Measured with 5.2m

(17') cable

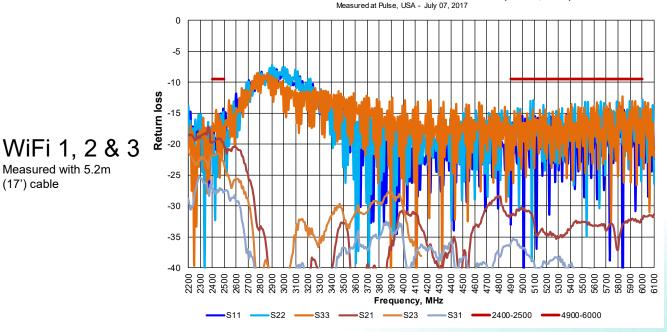
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### **CHARTS**

#### **VSWR vs Frequency** RAZ62311MM Measured with 17' cables on Ø40" GP (WiFi 1, 2 &3)



### Return loss vs Frequency RAZ62311MM Measured with 17' cables on Ø40" GP (WiFi 1, 2 &3)



Issue: 1742

Measured with 5.2m

(17') cable



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### **CHARTS**

### Peak Gain vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (LTE 1)

8 7 6 Peak Gain, dBi 2 740 Frequency, MHz **-**1710-2170 **--**2300-2700

1 TF 1 Measured with 914mm (36") cable

### Efficiency vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (LTE 1)

**-640-960 --**

Measured at Pulse, USA - July 07, 2017 100 90 80 70 60 Efficiency 50 30 20 10 640 Frequency, MHz **-640-960 ——1710-2170 ——2300-2700** 

LTE 1 Measured with 914mm (36") cable

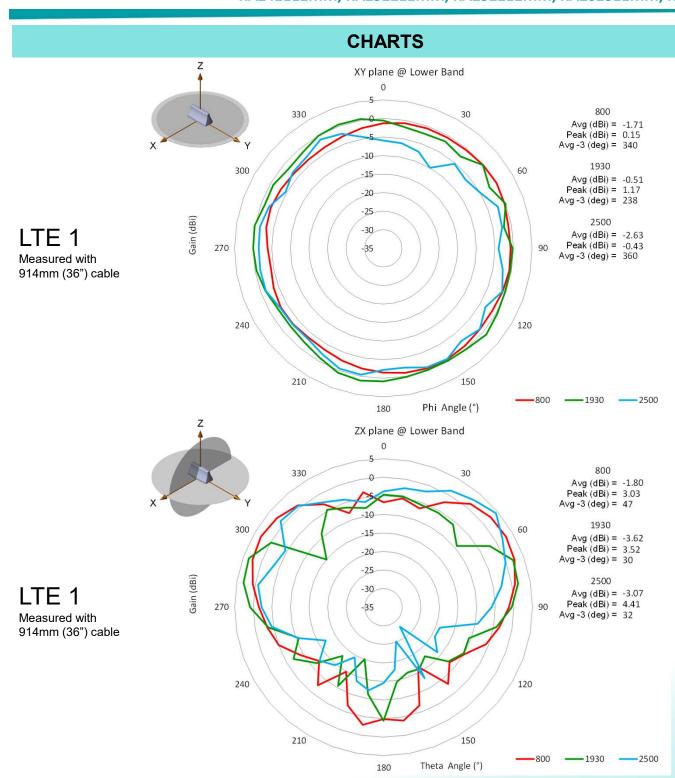


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### **CHARTS**

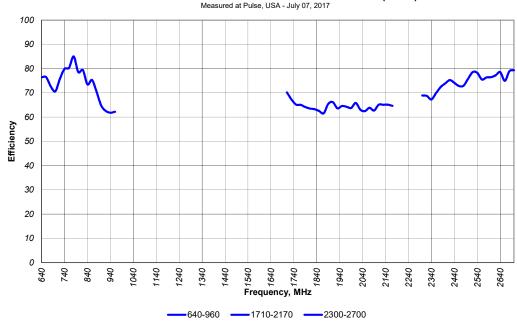
### Peak Gain vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (LTE 2)

LTE 2
Measured with
914mm (36") cable

# Efficiency vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (LTE 2)

**-640-960 --**

**-**1710-2170 **--**2300-2700



LTE 2
Measured with
914mm (36") cable

Issue: 1742

ROHS

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Description: GNSS / 2x LTE / 0, 1x, 2x or 3x WiFi

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#### **CHARTS** XY plane @ Lower Band 800 330 $A \vee g (dBi) = -1.78$ Peak (dBi) = 0.24 $A \vee g - 3 (deg) = 346$ 1930 300 Avg(dBi) = -0.29Peak (dBi) = 1.14 -20 Avg - 3 (deg) = 360Gain (dBi) 2500 Avg (dBi) = -1.52 Peak (dBi) = 0.93 LTE 2 -30 270 Avg - 3 (deg) = 282Measured with 914mm (36") cable 240 120 210 150 2500 800 -1930 Phi Angle (°) 180 ZX plane @ Lower Band 0 330 800 30 Avg(dBi) = -1.66Peak (dBi) = 3.02 Avg - 3 (deg) = 50300 Avg (dBi) = -4.03Peak (dBi) = 3.03 -20 Avg - 3 (deg) = 28Sain (dBi) 2500 -30 LTE 2 Avg (dBi) = -3.66Peak (dBi) = 2.86 270 Avg - 3 (deg) = 43Measured with 914mm (36") cable 240 120 210 150 800 -1930 2500

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ROHS

11

180



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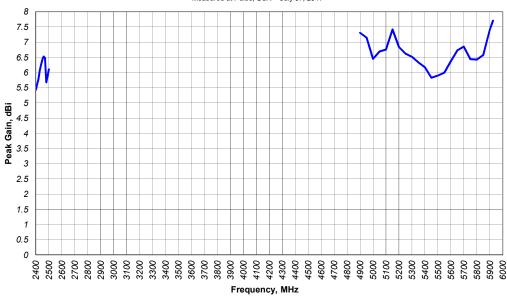
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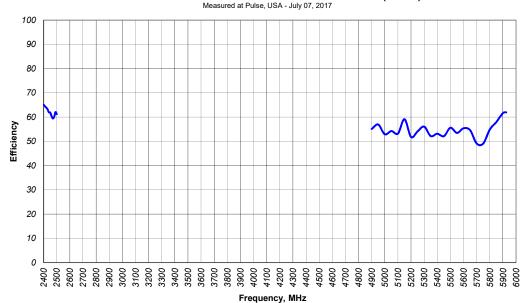
#### **Peak Gain vs Frequency** RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 1)



WiFi 1 Measured with 914mm (36") cable

> Efficiency vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 1)

**-**2400-2500 **---**4900-5925



WiFi 1 Measured with 914mm (36") cable

Issue: 1742

2400-2500 ----4900-5925



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### **CHARTS** XY plane @ Lower Band 2450 330 30 Avg (dBi) = Peak (dBi) = 0.61 $A \vee g - 3 (deg) = 62$ 5350 300 $A \lor g (dBi) = -1.68$ Peak (dBi) = 3.94 -20 Avg - 3 (deg) = 86Power (dBm) WiFi 1 -30 270 90 Measured with 914mm (36") cable 240 120 210 150 2450 -5350 Phi Angle (°) 180 ZX plane @ Lower Band 330 2450 30 Avg (dBi) = Peak (dBi) = Avg - 3 (deg) = 265350 300 -15 Avg (dBi) = -0.65Peak (dBi) = 5.70 -20 Avg - 3 (deg) = 17Power (dBm) -30 WiFi 1 270 Measured with 914mm (36") cable 240 210 150

Issue: 1742

ROHS

-5350

2450

13

180



**Description**: GNSS / 2x LTE / 0, 1x, 2x or 3x WiFi

Magnetic Mount

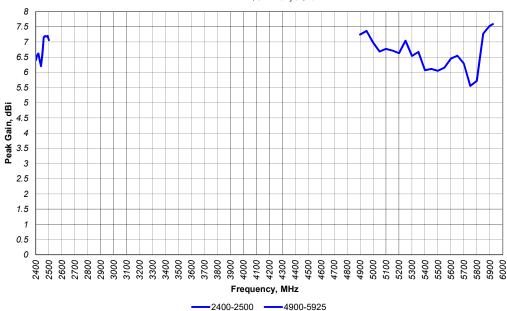
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### **CHARTS**

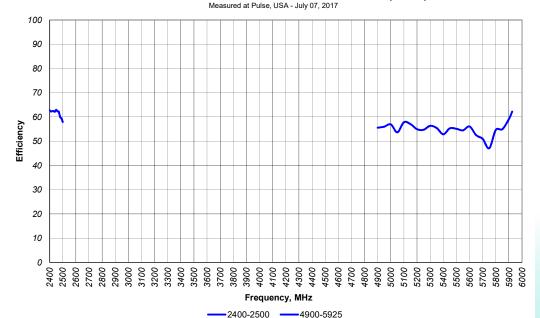
#### Peak Gain vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 2)

Measured at Pulse, USA - July 07, 2017



WiFi 2 Measured with 914mm (36") cable

Efficiency vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 2)



WiFi 2 Measured with 914mm (36") cable

Issue: 1742

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### **CHARTS** XY plane @ Lower Band 2450 330 30 Avg (dBi) = Peak (dBi) = 2.27 $A \vee g - 3 (deg) = 49$ 5350 300 -15 $A \lor g (dBi) = -2.83$ Peak (dBi) = 0.65 -20 Avg - 3 (deg) = 63Power (dBm) -30 WiFi 2 270 90 Measured with 914mm (36") cable 240 120 210 150 -5350 2450 Phi Angle (°) 180 ZX plane @ Lower Band 330 2450 30 A∨g (dBi) = Peak (dBi) = 5.38 $A \vee g - 3 (deg) = 21$ 5350 300 $A \lor g (dBi) = -2.53$ Peak (dBi) = 5.59-20 $A \vee g - 3 (deg) = 15$ Power (dBm) -30 WiFi 2 270 90 Measured with 914mm (36") cable 240 210 150 2450 -5350

Issue: 1742

ROHS

180



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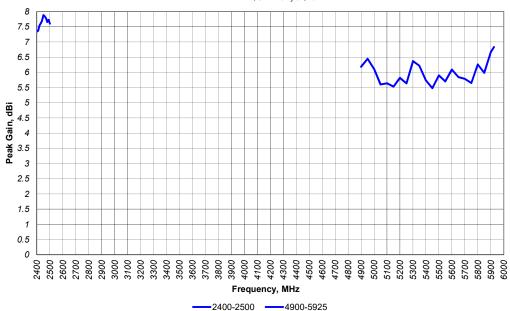
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### **CHARTS**

# Peak Gain vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 3)

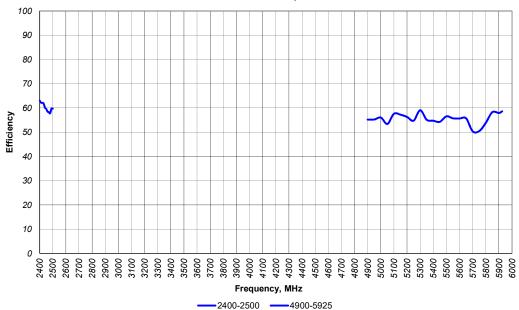
Measured at Pulse, USA - July 07, 2017



WiFi 3
Measured with
914mm (36") cable

# Efficiency vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (WiFi 3)

Measured at Pulse, USA - July 07, 2017



WiFi 3 Measured with 914mm (36") cable

Issue: 1742

RoHS



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### **CHARTS** XY plane @ Lower Band 0 2450 330 30 A∨g (dBi) = -2.03 Peak (dBi) = 2.04 Avg - 3 (deg) = 1705350 300 $A \lor g (dBi) = -3.17$ Peak (dBi) = 0.55 -20 Avg - 3 (deg) = 184Power (dBm) WiFi 3 -30 270 Measured with 914mm (36") cable 240 210 150 -5350 2450 Phi Angle (°) 180 ZX plane @ Lower Band 330 2450 30 Avg (dBi) = Peak (dBi) = 7.63 $A \vee g - 3 (deg) = 23$ 5350 300 Avg (dBi) = -3.30Peak (dBi) = 4.49 -20 Avg - 3 (deg) = 23Power (dBm) -30 WiFi 3 270 90 Measured with 914mm (36") cable 240 210 150

Issue: 1742



-5350

2450

180



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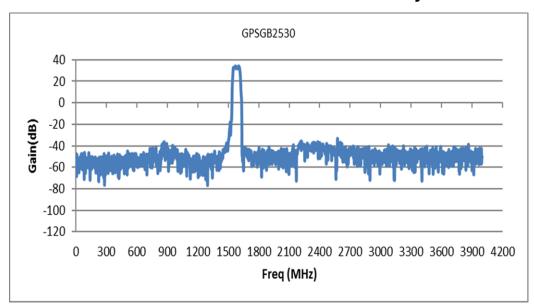
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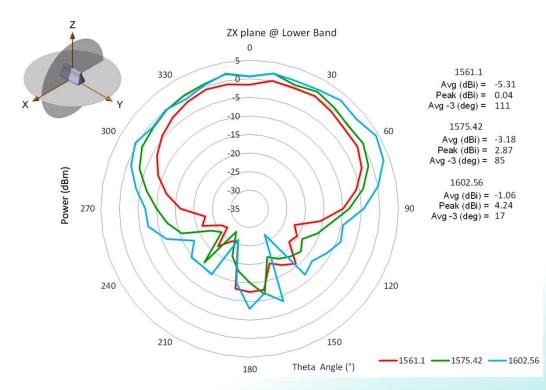
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### **CHARTS**

## GNSS LNA Gain and out-of-band rejection





**GNSS** 

Passive Measurement Measured with 152mm (6") cable

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ROHS



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## **PACKAGING**

1pcs antennas per foam bag

6pcs antennas per package box

Total 6pcs antenna per package box

Package box: 558mm\*386mm\*210mm

## **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Pulse:

<u>RAZ32011MM</u> <u>RAZ32012MM</u> <u>RAZ42112MM</u> <u>RAZ42111MM</u> <u>RAZ52211MM</u> <u>RAZ62312MM</u> <u>RAZ62311MM</u> <u>RAZ62311MM</u>