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We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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

Magnetic Mount

Monopole, measured on Ø1.02m (40") ground plane

**Series: RAZORBACK** 

Antenna Type

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

## **ELECTRICAL SPECIFICATIONS**

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 i can cam	(LIL, 044 300) (LIL, 1710 2700)	4.0/4.5 db
Average Peak Gain	(WIFI, 2400-2500) (WIFI, 4900-5925)	6/6.6 dBi

3 , , , , , , , , , , , , , , , , , , ,	
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 1	561.098±2.046,1575.42±1.023,1602.5625±4 MHz
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VSWR	2:1
Nominal Impedance	50 Ω

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

Polarization RHCP





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

Magnetic Mount

**Series: RAZORBACK** 

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

## **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





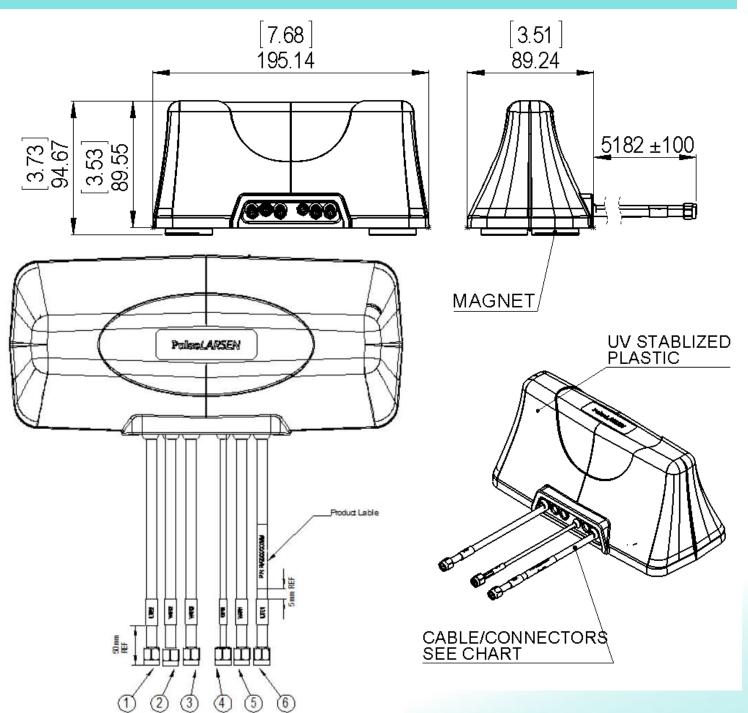
**Description**: GNSS / 2x LTE / 0, 1x, 2x or 3x WiFi

Magnetic Mount

**Series: RAZORBACK** 

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## **MECHANICAL DRAWING**



All dimensions are in mm / inches

Issue: 1742

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

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## **MECHANICAL DRAWING**

# Vehicular Multiband Antenna with Magnet Mount

(Part Number)























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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 1=Black; 2=White				
<b>①</b>	Mounting:Magnet Mount				

	RAZXXXXMM	CABLE	CABLE LENGTH	CONNECTOR
1	LTE-2 Cable Assy			SMA Male
2	WiFi-2 Cable Assy			DB 0144 44 1
3	WiFi-3 Cable Assy		5181 mm / 204" / 17 FT	RP-SMA Male
4	GPS Cable Assy	RG-174		SMA Male
5	WiFi-1Cable Assy	LMD405		RP-SMA Male
6	LTE1 Cable Assy	LMR195		SMA Male

All dimensions are in mm / inches





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

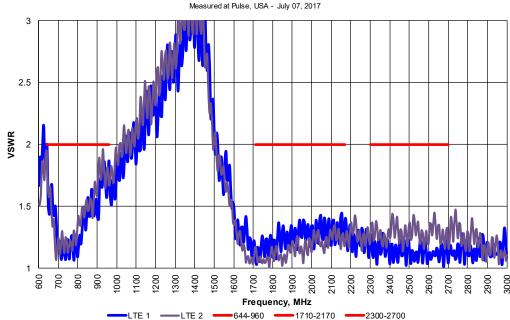
Magnetic Mount

Series: RAZORBACK

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

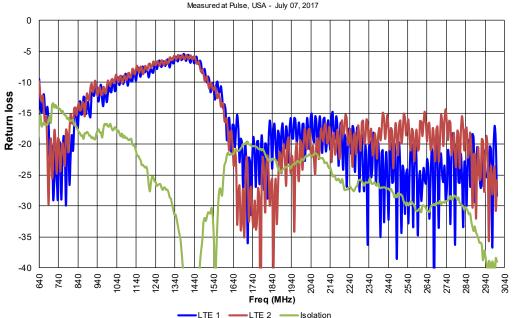
## **CHARTS**

#### **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



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

Magnetic Mount

Series: RAZORBACK

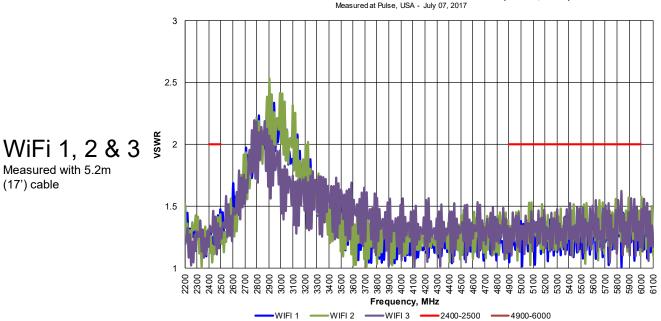
Measured with 5.2m

(17') cable

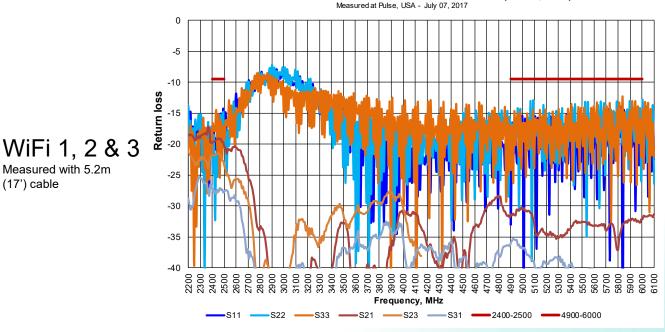
PART NUMBER: RAZ32011MM, RAZ32012MM, RAZ42111MM, RAZ42112MM, RAZ52211MM, RAZ52212MM, RAZ62311MM, RAZ62312MM

## **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



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

Magnetic Mount

Series: RAZORBACK

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

## **CHARTS**

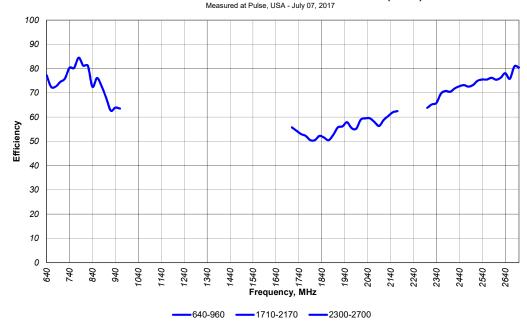
#### Peak Gain vs Frequency RAZ62311MM Measured with 3ft cables on Ø40" GP (LTE 1)

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 --**



LTE 1 Measured with 914mm (36") cable

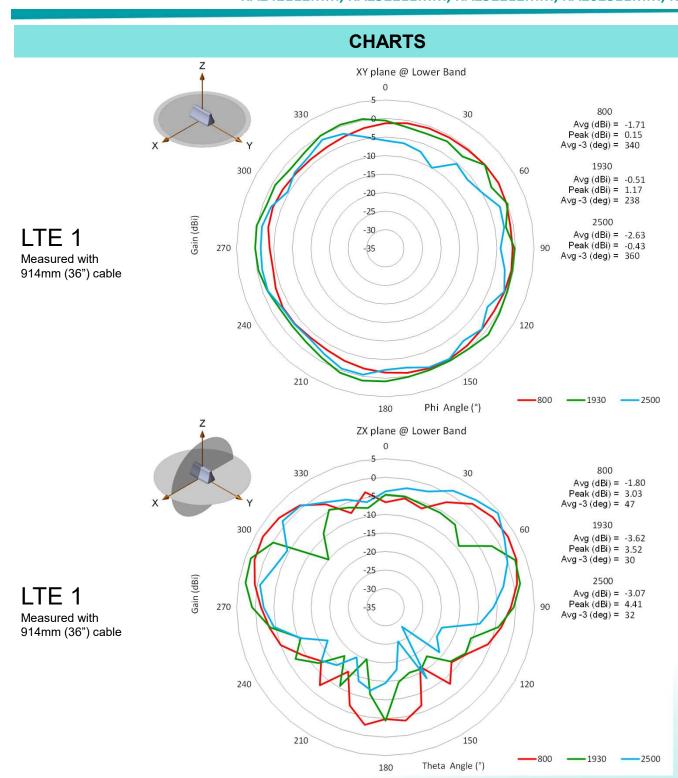


Description: GNSS / 2x LTE / 0, 1x, 2x or 3x WiFi

Magnetic Mount

**Series: RAZORBACK** 

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



Issue: 1742

ROHS



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

Magnetic Mount

Series: RAZORBACK

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

## **CHARTS**

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

8 7 6 Peak Gain, dBi 2 740 2340 Frequency, MHz

ITF 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

Measured at Pulse, USA - July 07, 2017 100 90 80 70 60 Efficiency 50 20 10 040 640 Frequency, MHz **-640-960 ——1710-2170 ——2300-2700** 

LTE 2 Measured with 914mm (36") cable

Issue: 1742

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

Magnetic Mount

**Series: RAZORBACK** 

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

#### **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

Issue: 1742

ROHS

180



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

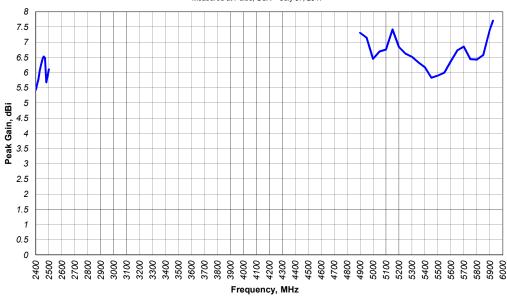
Magnetic Mount

Series: RAZORBACK

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

## **CHARTS**

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



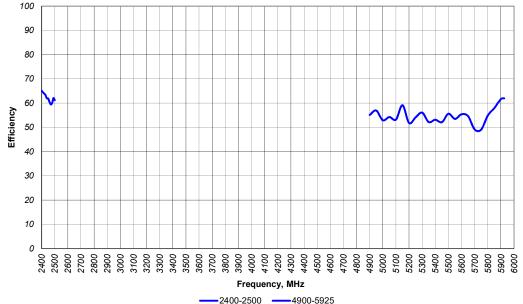
WiFi 1 Measured with 914mm (36") cable

Efficiency vs Frequency



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

WiFi 1 Measured with 914mm (36") cable





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

Magnetic Mount

**Series: RAZORBACK** 

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

## **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

180



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

Magnetic Mount

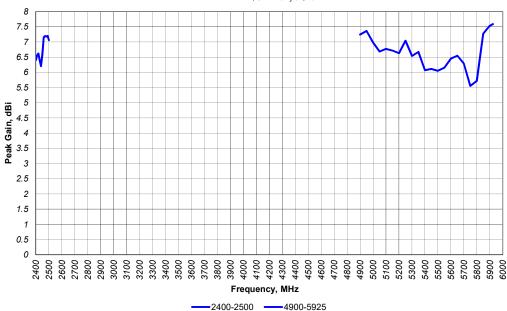
**Series: RAZORBACK** 

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

## **CHARTS**

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

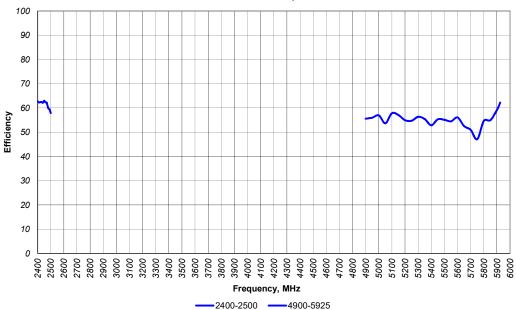
Measured at Pulse, USA - July 07, 2017



WiFi 2
Measured with
914mm (36") cable

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

Measured at Pulse, USA - July 07, 2017



WiFi 2 Measured with 914mm (36") cable

Issue: 1742

ROHS



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

Magnetic Mount

**Series: RAZORBACK** 

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

#### **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

Issue: 1742

ROHS

-5350

2450

15

180



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

Magnetic Mount

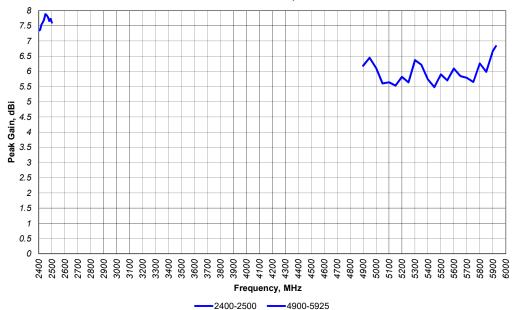
Series: RAZORBACK

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

## **CHARTS**

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

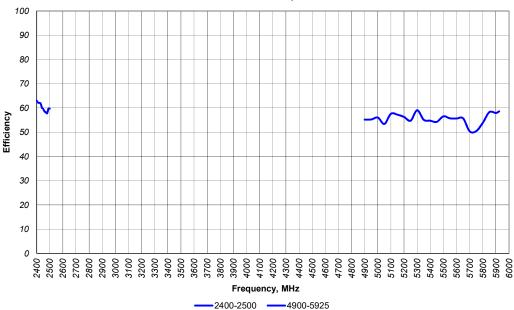
Measured at Pulse, USA - July 07, 2017



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

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

Magnetic Mount

**Series: RAZORBACK** 

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

## **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

ROHS

-5350

2450

180



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

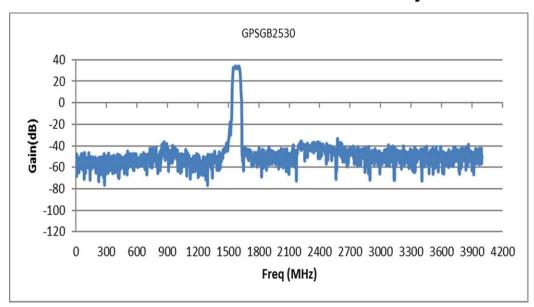
Magnetic Mount

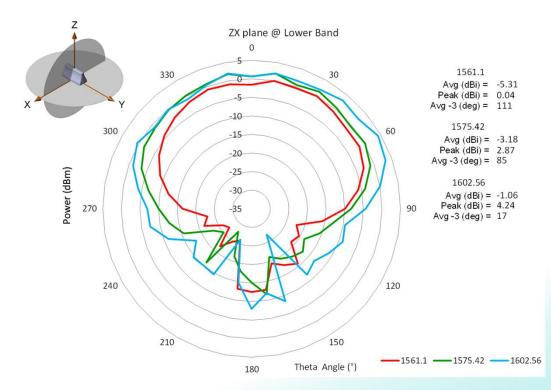
**Series: RAZORBACK** 

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

## **CHARTS**

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





**GNSS** 

Passive Measurement Measured with 152mm (6") cable

Issue: 1742

ROHS





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

Magnetic Mount

**Series: RAZORBACK** 

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

## **PACKAGING**

1pcs antennas per foam bag

6pcs antennas per package box

Total 6pcs antenna per package box

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