

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

**Series:** RAZORBACK

**PART NUMBER:** RAZ32011DM, RAZ32012DM, RAZ42111DM,  
RAZ42112DM, RAZ52211DM, RAZ52212DM, RAZ62311DM, RAZ62312DM



RAZ52211DM (Black)



RAZ52212DM (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: 88.5 x 195.1 x 92.6mm  
3.48 x 7.68 x 3.65 in
- Power withstanding 45W
- Available Models
  - RAZ32011DM = 3 Cable, Black
  - RAZ32012DM = 3 Cable, White
  - RAZ42111DM = 4 Cable, Black
  - RAZ42112DM = 4 Cable, White
  - RAZ52211DM = 5 Cable, Black
  - RAZ52212DM = 5 Cable, White
  - RAZ62311DM = 6 Cable, Black
  - RAZ62312DM = 6 Cable, White

## Applications:

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

Issue: 1827

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Tel: 1-360-944-7551

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Pulse GmbH & Do, KG  
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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
Frequency (2x LTE)	644-960/1710-2700 MHz
Frequency (1x, 2x or 3x WiFi)	2400-2500/4900-5925 MHz
Nominal Impedance	50 $\Omega$
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, WiFi2/3 & 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 Vdc $\pm$ 0.5 V
Current Consumption	< 11 mA

## MECHANICAL SPECIFICATIONS

Length/Height/Width	195.1mm (7.68")/92.6 (3.65")/88.5mm (3.48")
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	Ø22.3mm (7/8") Hole required

## 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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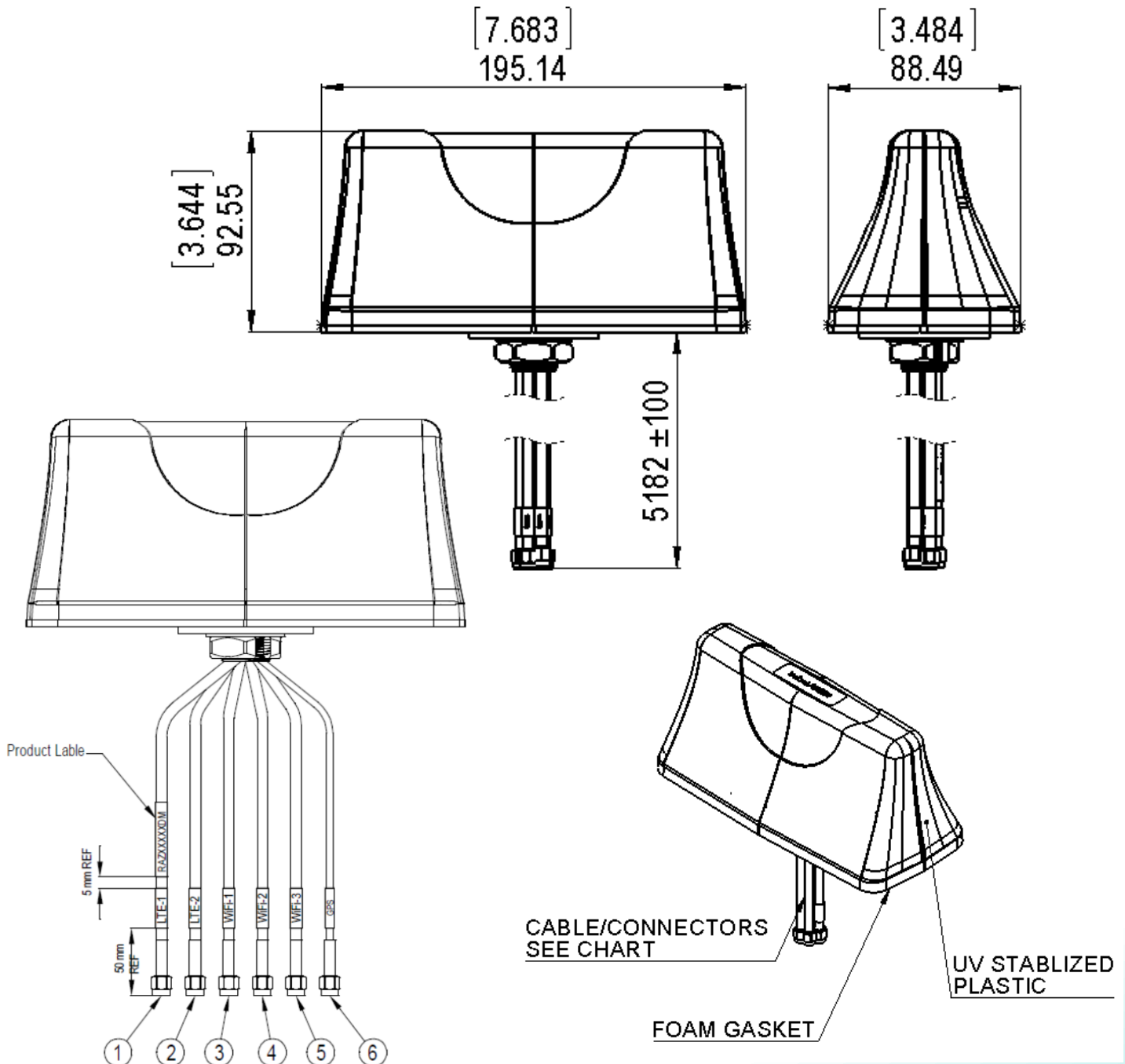
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## MECHANICAL DRAWING



All dimensions are in mm / inches

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## MECHANICAL DRAWING

### Vehicular Multiband Antenna with Direct Mount

(Part Number)

RAZ	X	X	X	X	X	DM
①	②	③	④	⑤	⑥	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 1=Black; 2= White
⑦	Mounting: Direct Mount; 7/8" Hole Required

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

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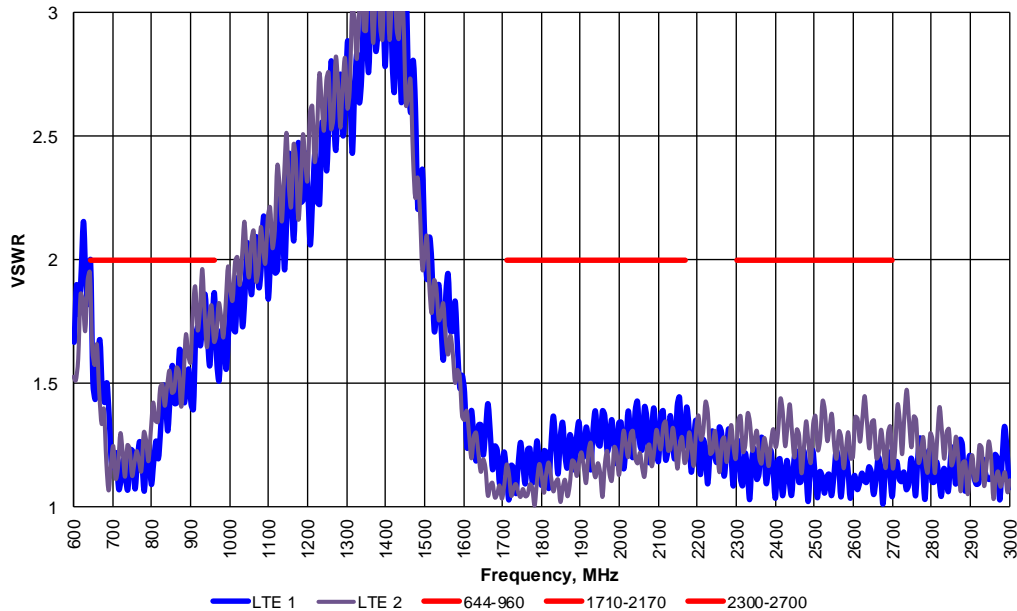
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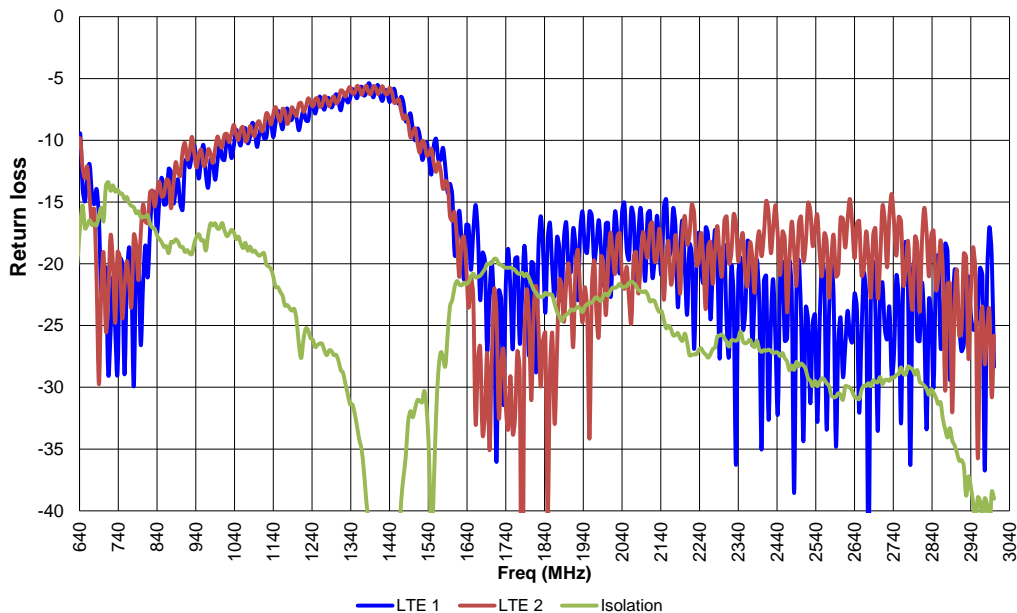
## CHARTS

**VSWR vs Frequency**  
RAZ62311DM Measured with 17' cables on Ø40" GP  
Measured at Pulse, USA - July 07, 2017



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

**Return loss vs Frequency**  
RAZ62311DM Measured with 17' cables on Ø40" GP  
Measured at Pulse, USA - July 07, 2017



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

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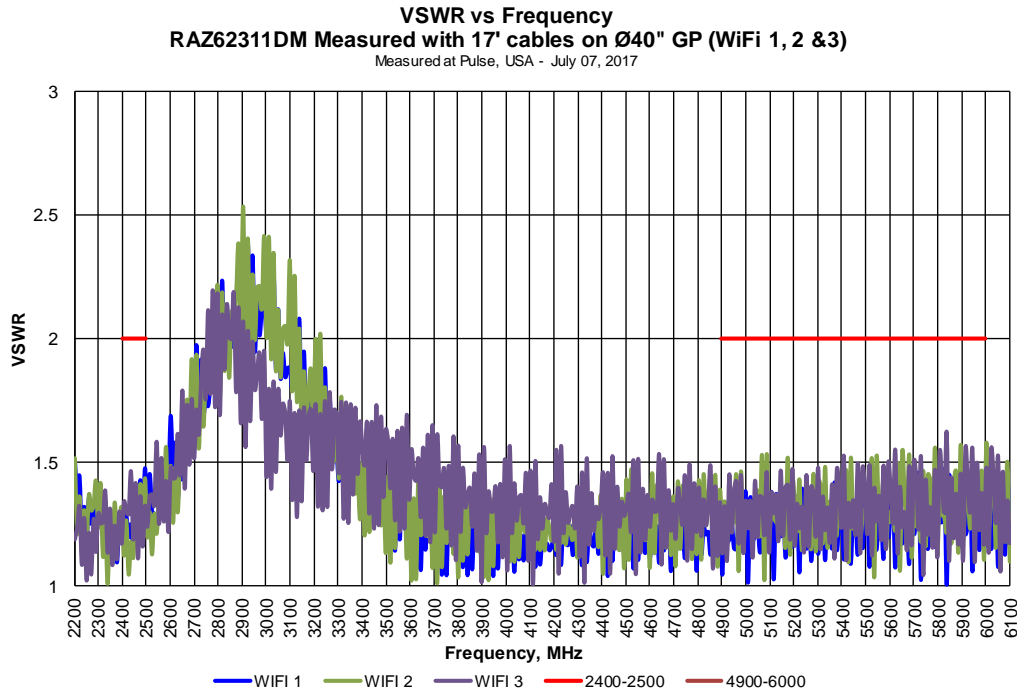
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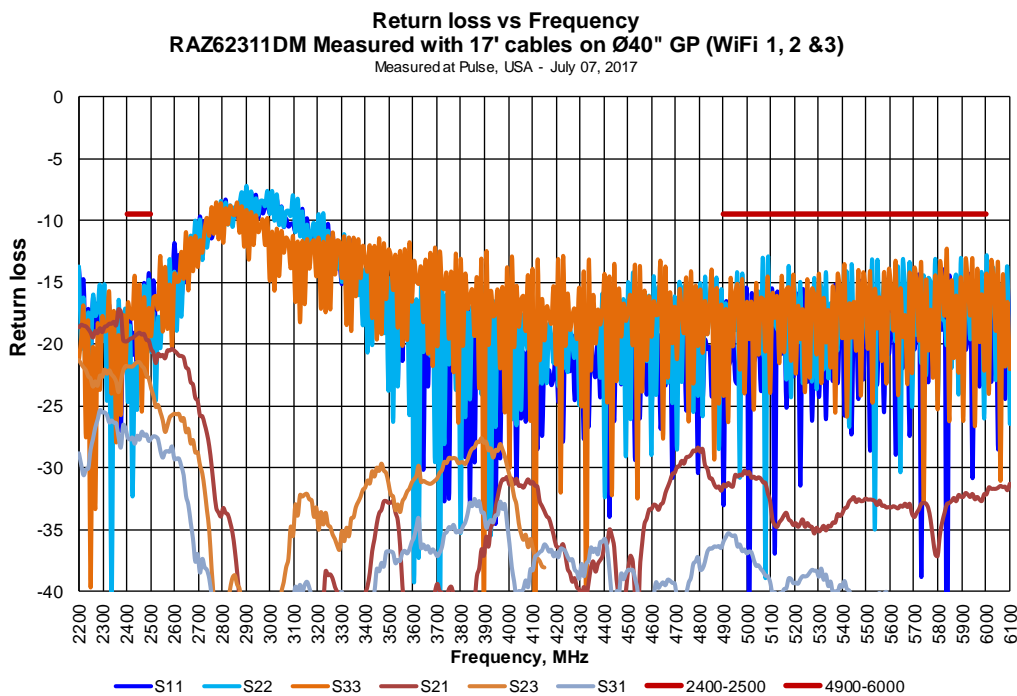
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## CHARTS

**WiFi 1, 2 & 3**  
Measured with 5.2m  
(17') cable



**WiFi 1, 2 & 3**  
Measured with 5.2m  
(17') cable



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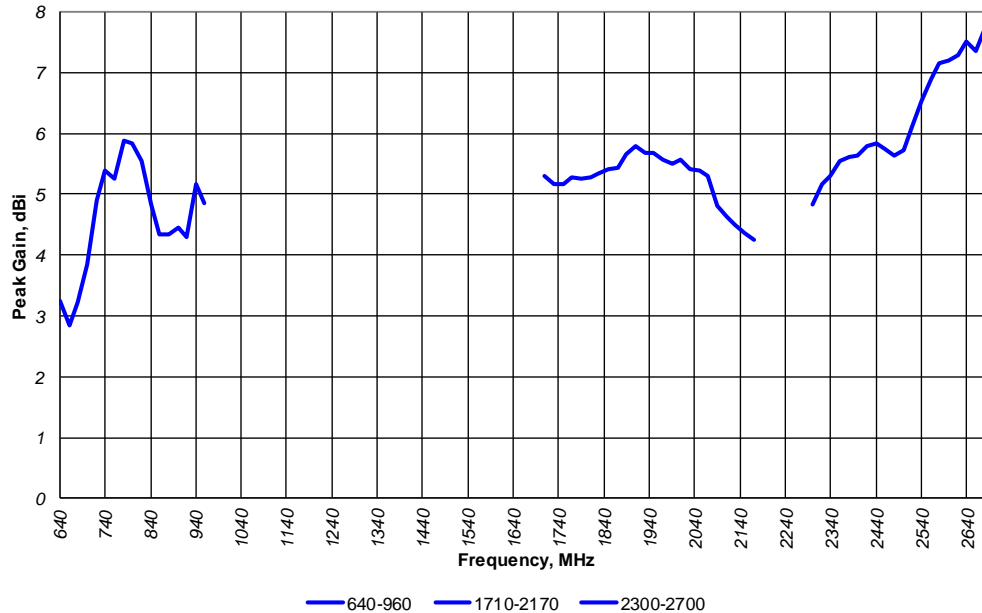
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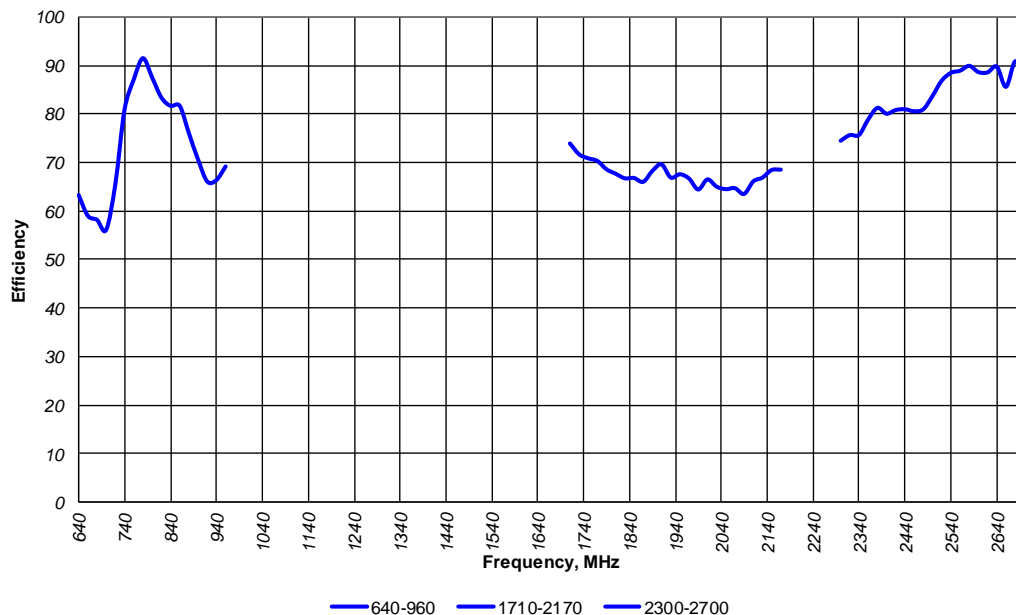
**Peak Gain vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (LTE 1)  
Measured at Pulse, USA - Aug 04, 2017



**LTE 1**

Measured with  
102mm (4") cable

**Efficiency vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (LTE 1)  
Measured at Pulse, USA - AUG 04, 2017



**LTE 1**

Measured with  
102mm (4") cable

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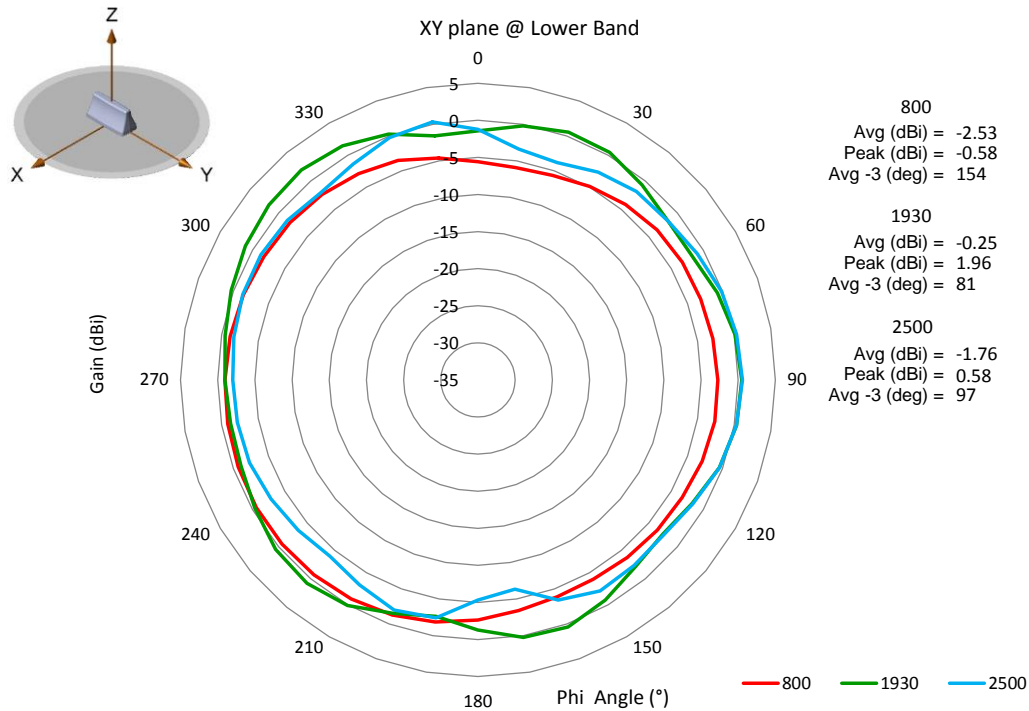
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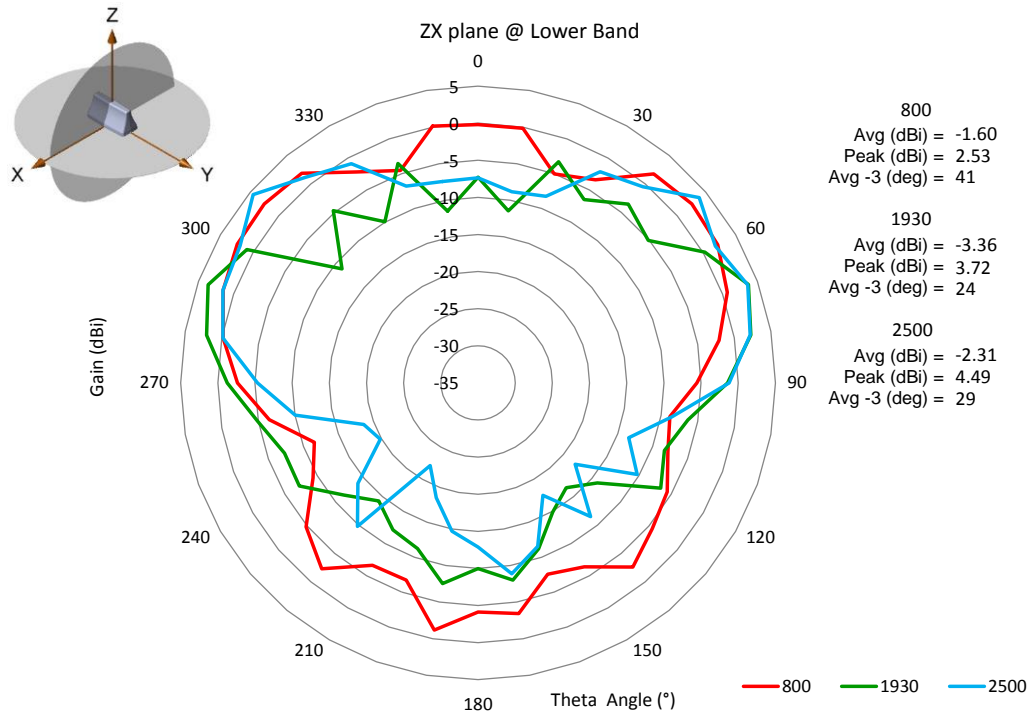
### LTE 1

Measured with  
102mm (4") cable



### LTE 1

Measured with  
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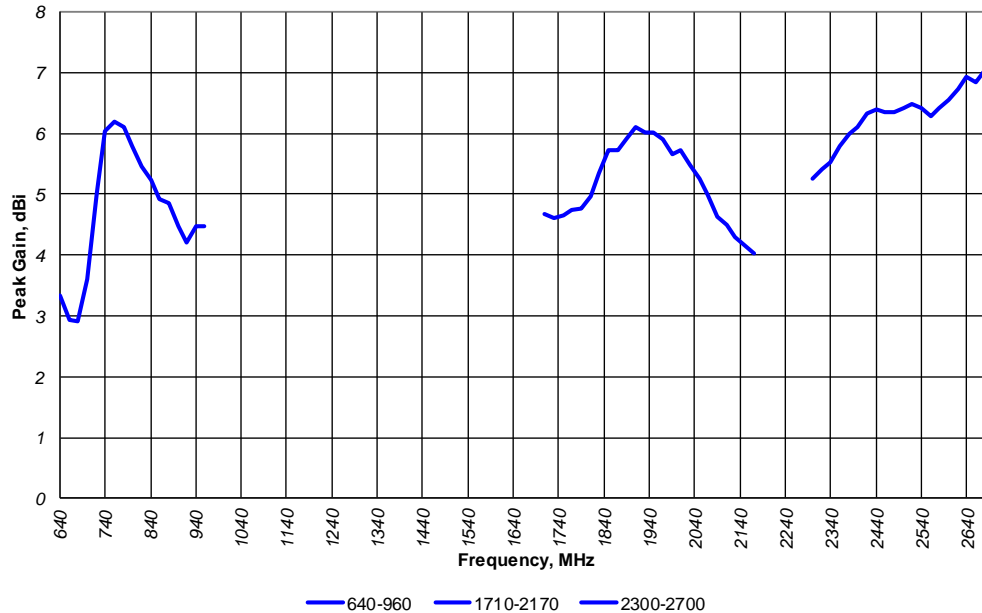
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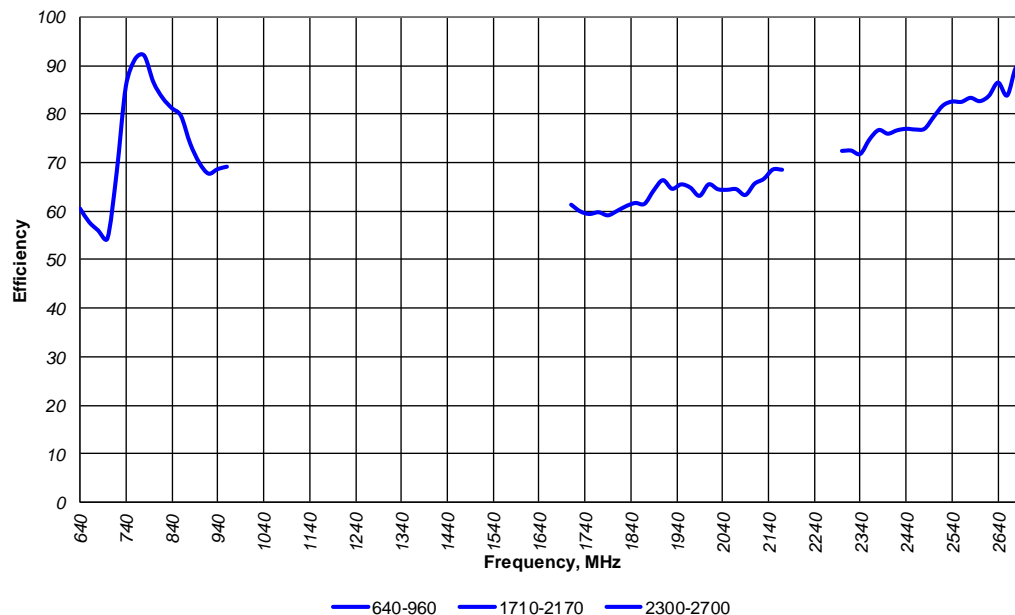
## CHARTS

**Peak Gain vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (LTE 2)  
Measured at Pulse, USA - Aug 04, 2017



**LTE 2**  
Measured with  
102mm (4") cable

**Efficiency vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (LTE 2)  
Measured at Pulse, USA - aUG 04, 2017



**LTE 2**  
Measured with  
102mm (4") cable

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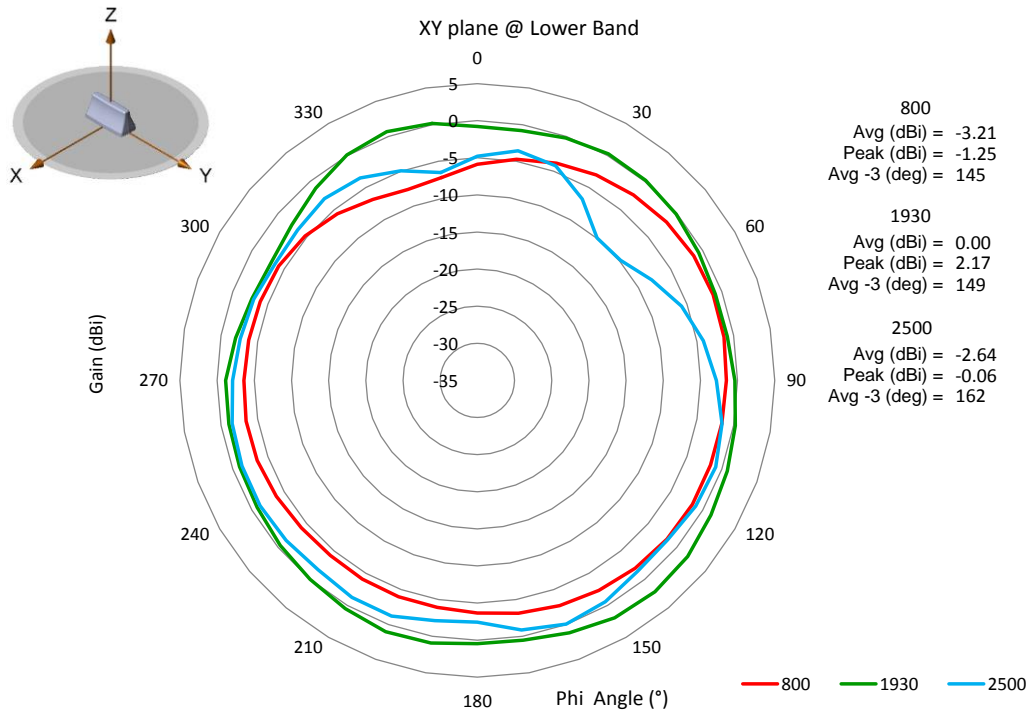
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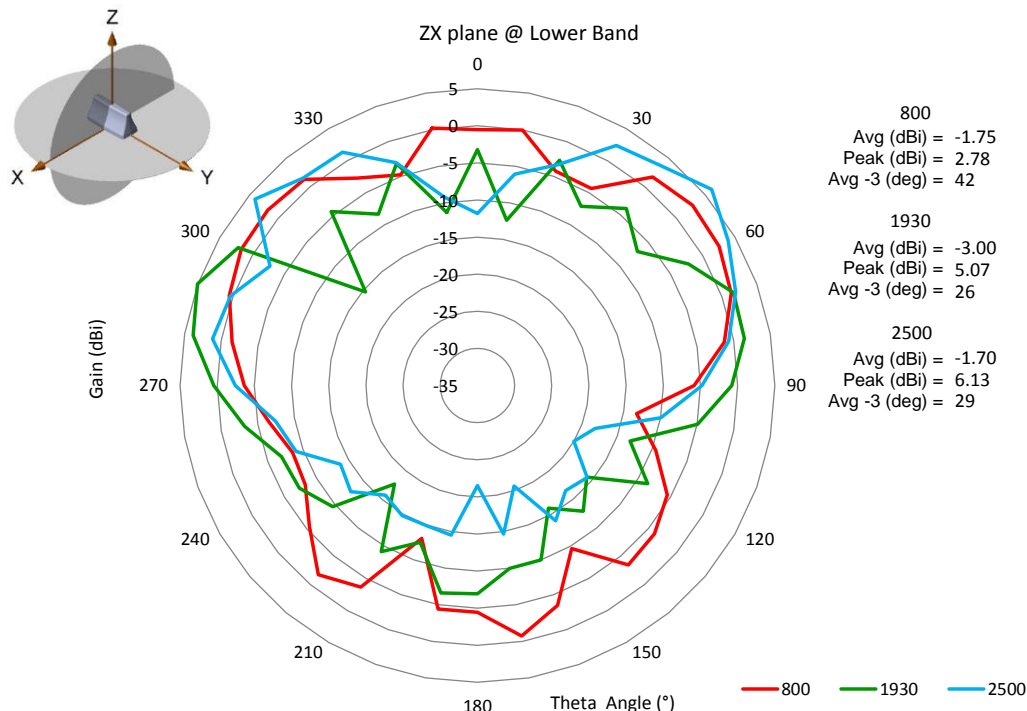
### LTE 2

Measured with  
102mm (4") cable



### LTE 2

Measured with  
102mm (4") cable



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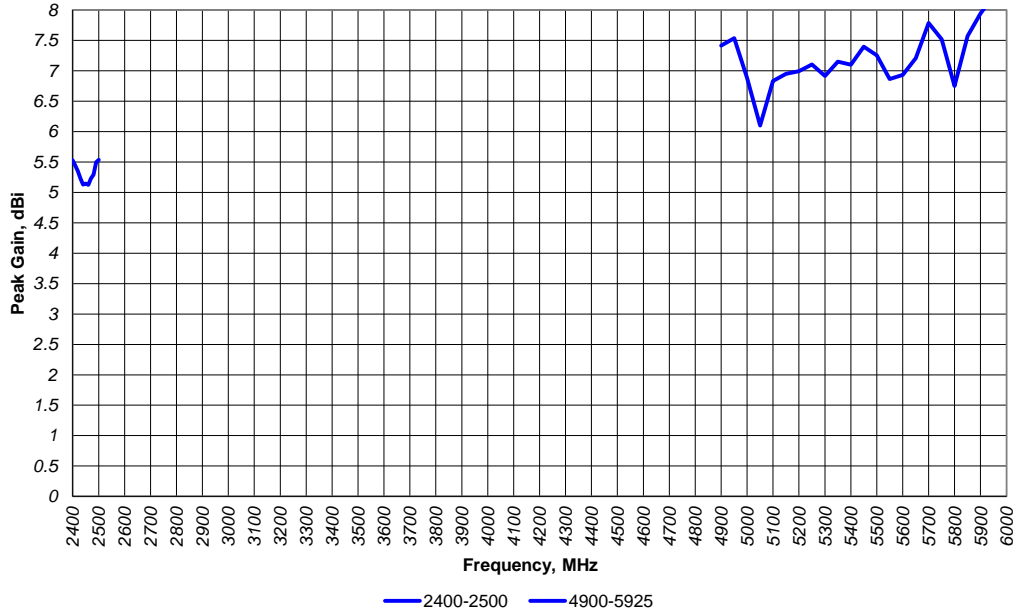
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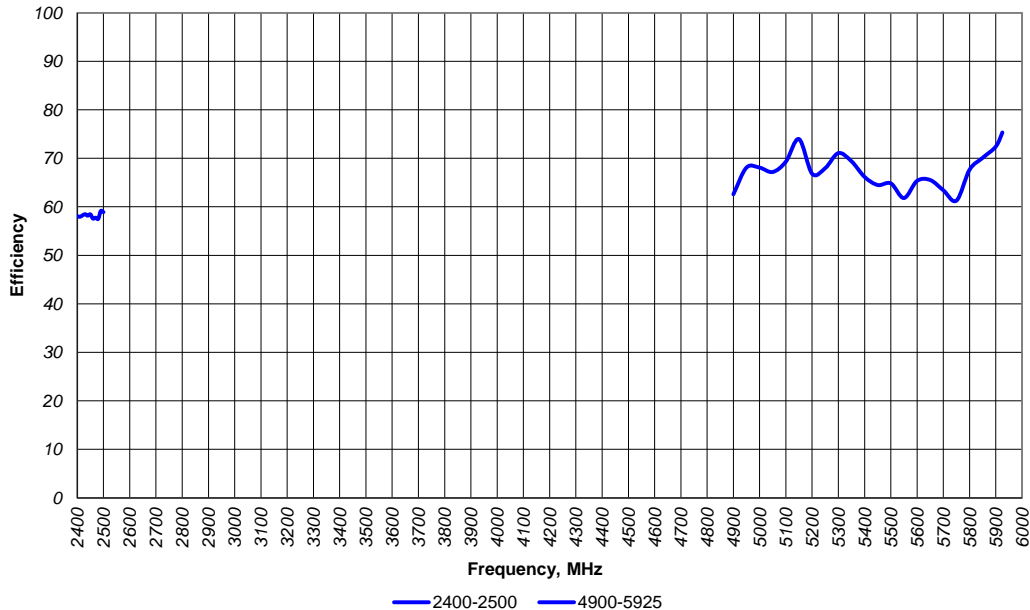
**Peak Gain vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 1)  
Measured at Pulse, USA - Aug 04, 2017



**WiFi 1**

Measured with  
102mm (4") cable

**Efficiency vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 1)  
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**WiFi 1**

Measured with  
102mm (4") cable

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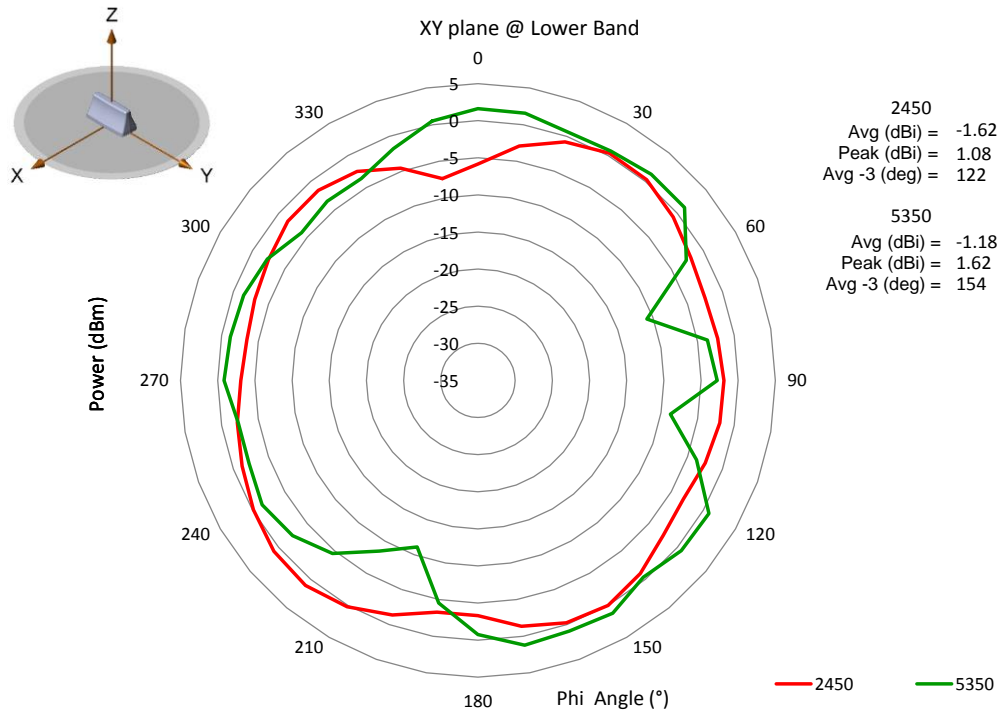
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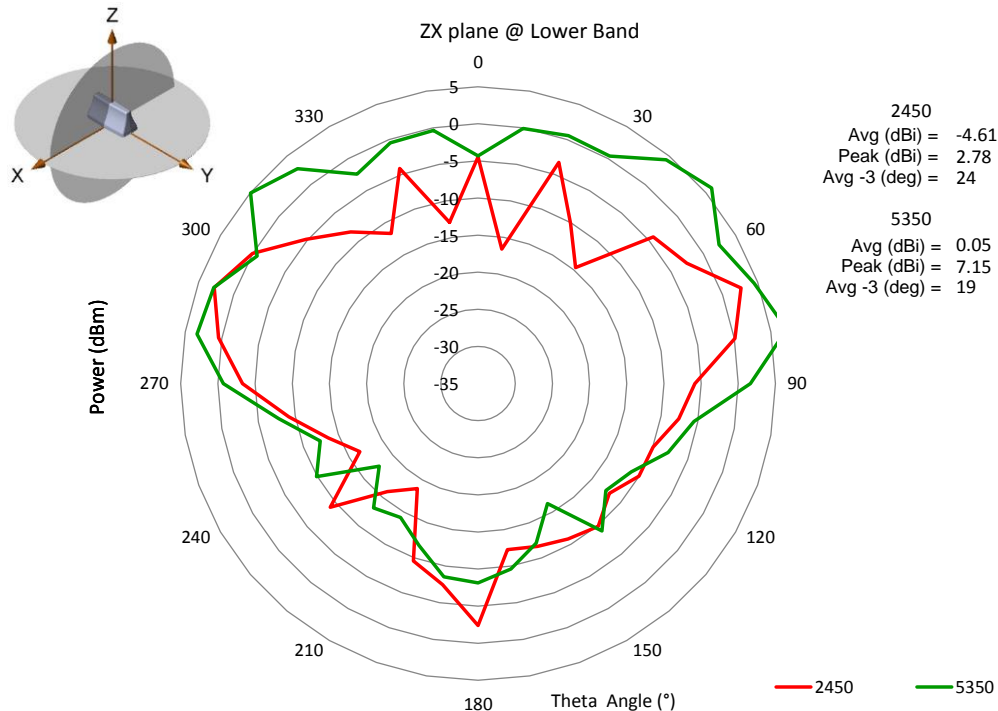
### WiFi 1

Measured with  
102mm (4") cable



### WiFi 1

Measured with  
102mm (4") cable



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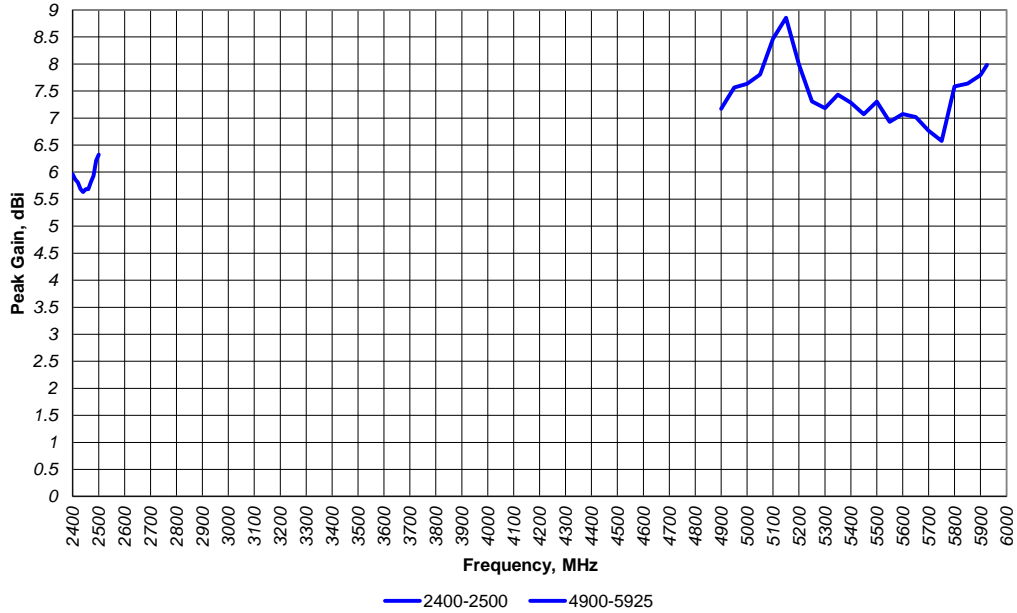
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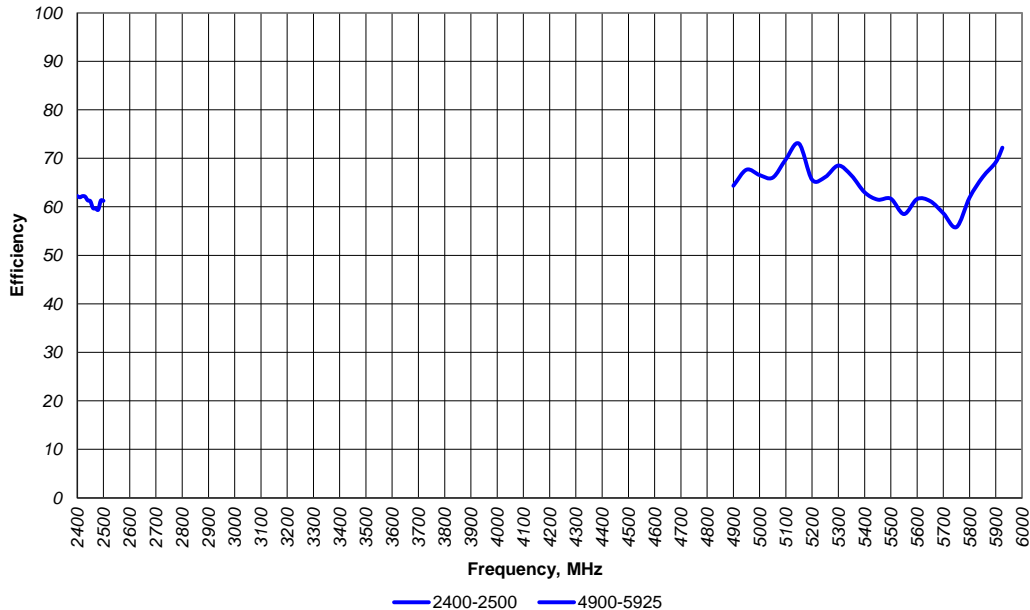
**Peak Gain vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 2)  
Measured at Pulse, USA - Aug 04, 2017



**WiFi 2**

Measured with  
102mm (4") cable

**Efficiency vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 2)  
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**WiFi 2**

Measured with  
102mm (4") cable

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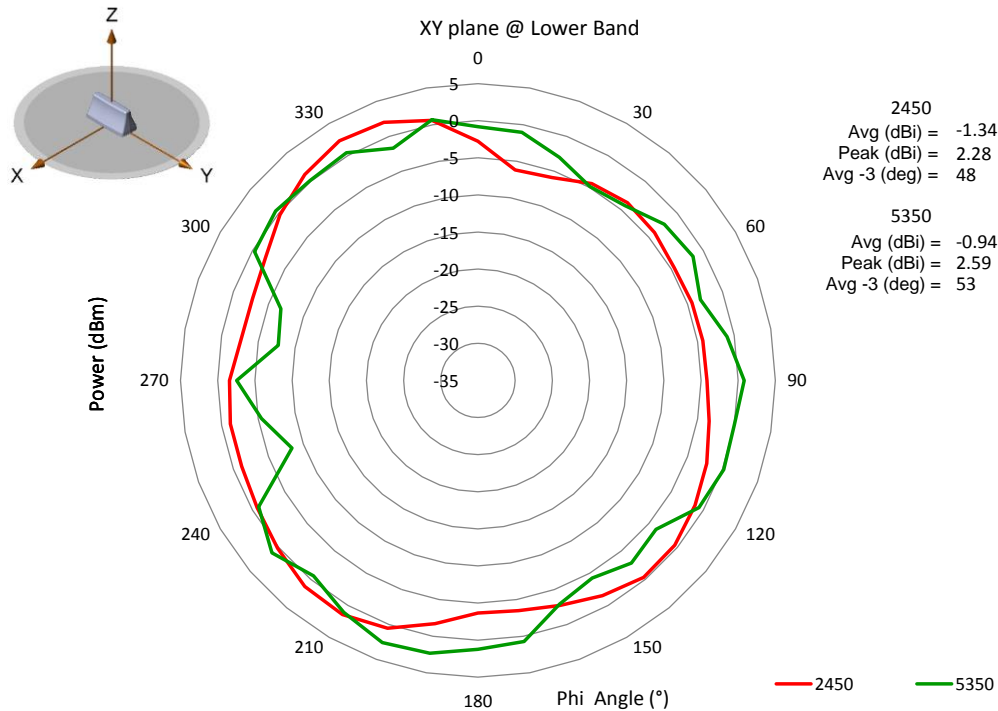
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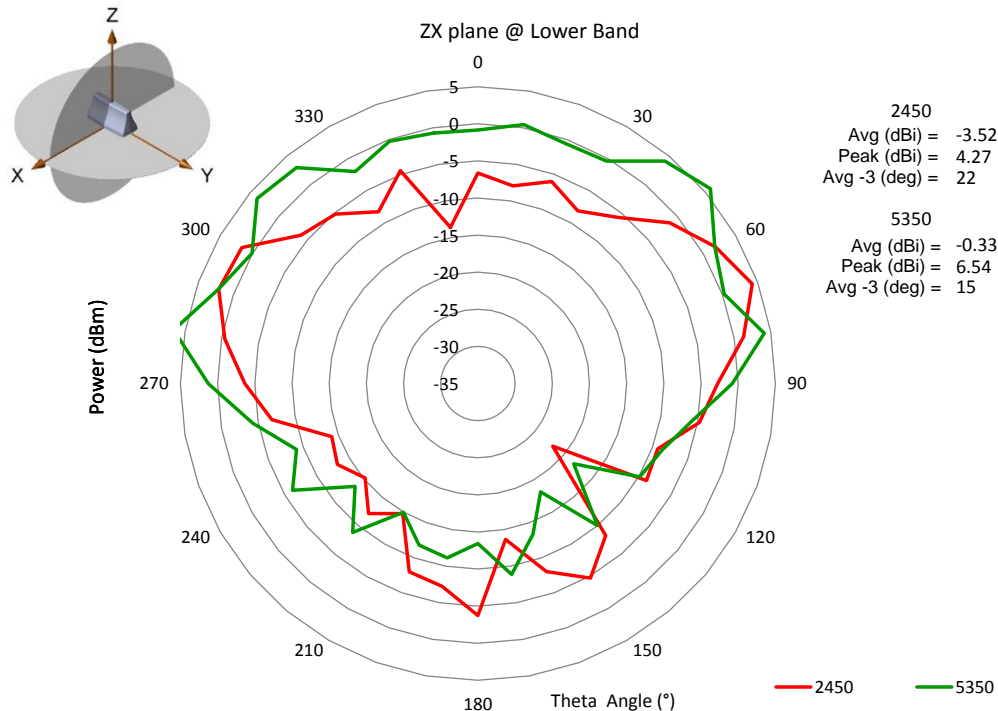
### WiFi 2

Measured with  
102mm (4") cable



### WiFi 2

Measured with  
102mm (4") cable



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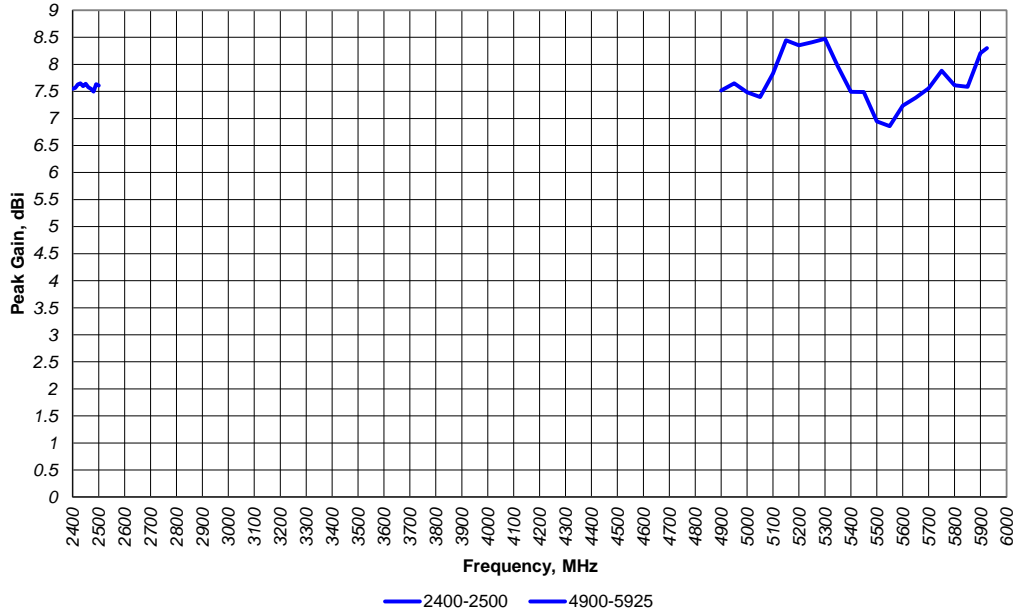
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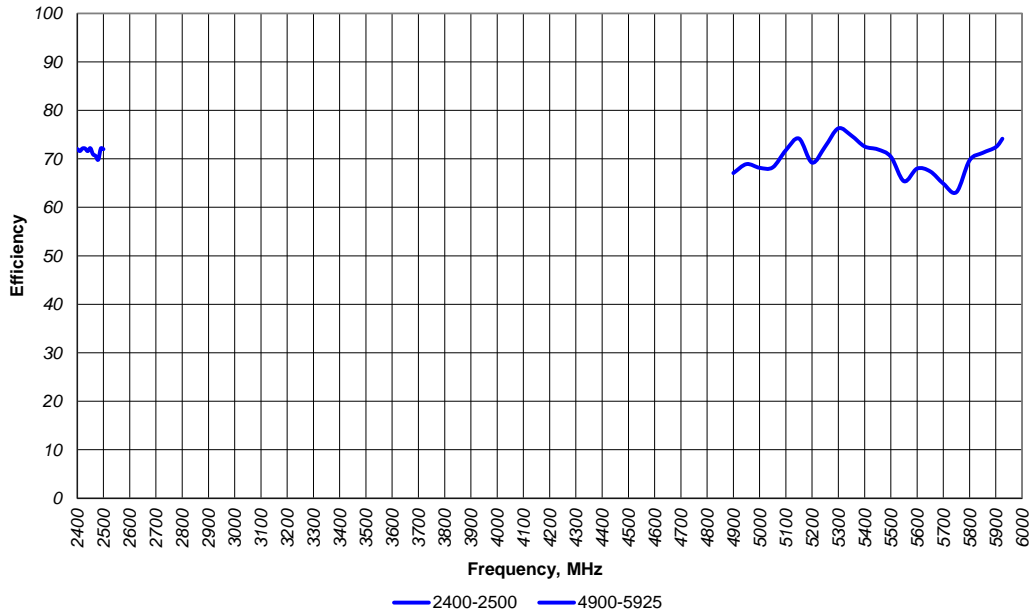
**Peak Gain vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 3)  
Measured at Pulse, USA - Aug 04, 2017



**WiFi 3**

Measured with  
102mm (4") cable

**Efficiency vs Frequency**  
RAZ62311DM Measured with 4" cables on Ø40" GP (WiFi 3)  
Measured at Pulse, USA - Aug 04, 2017



**WiFi 3**

Measured with  
102mm (4") cable

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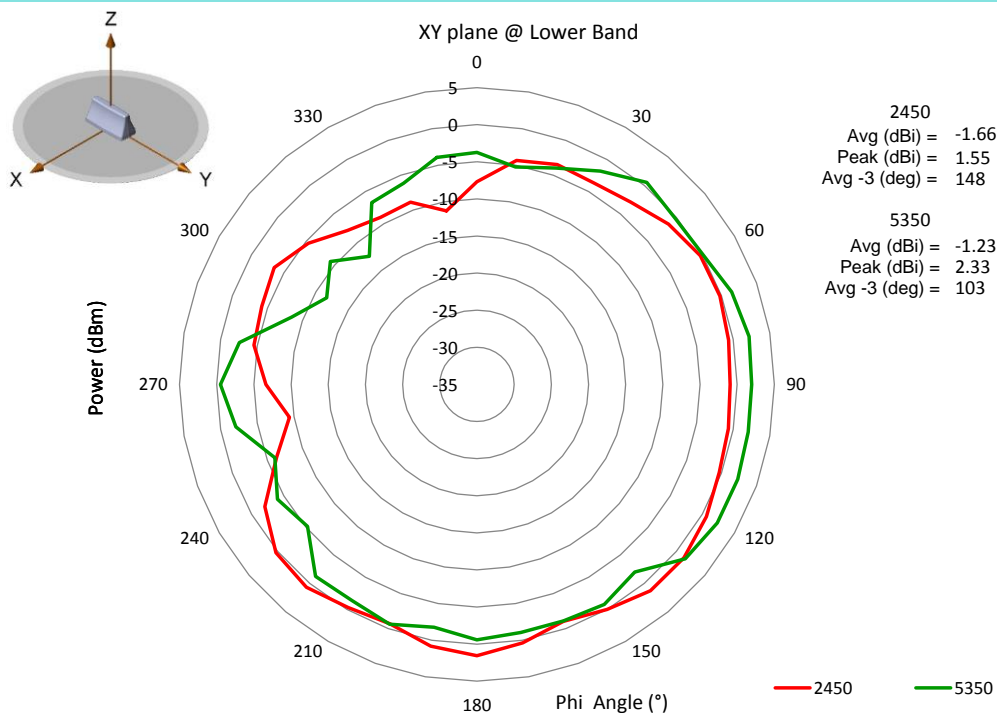
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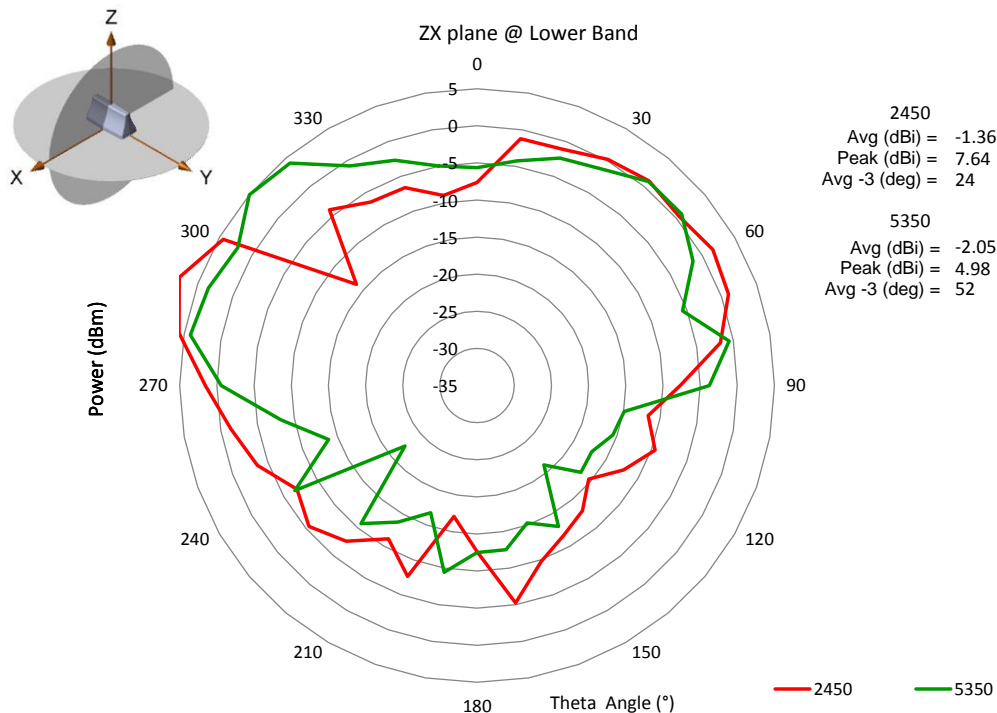
### WiFi 3

Measured with  
102mm (4") cable



### WiFi 3

Measured with  
102mm (4") cable



Issue: 1827

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

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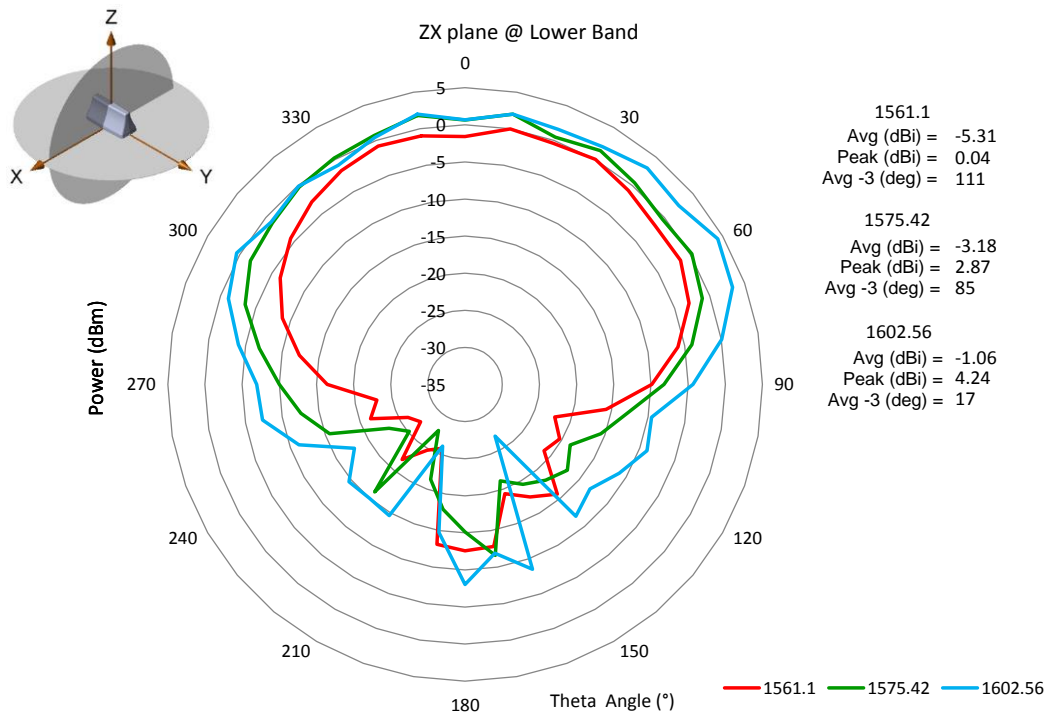
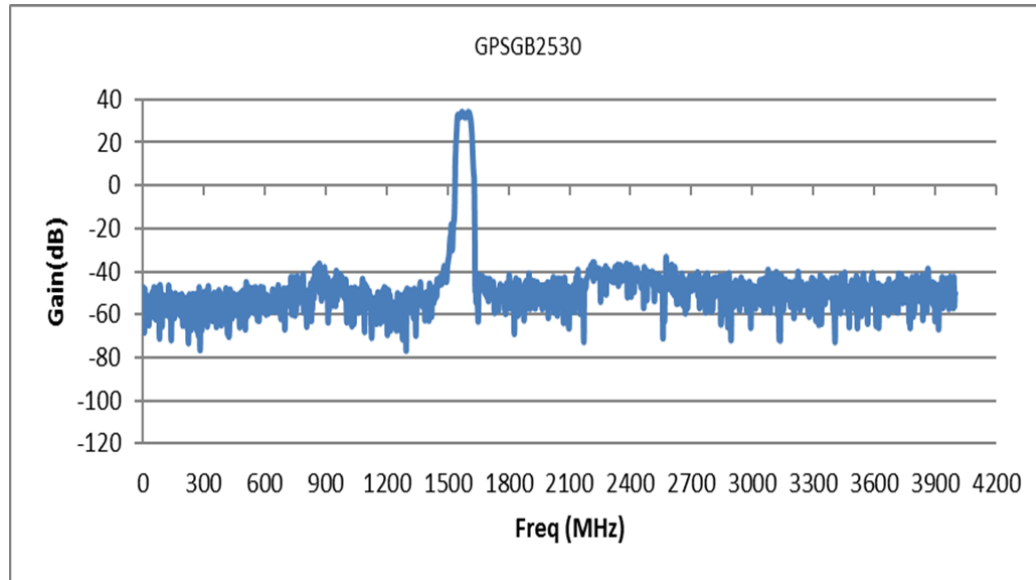
**Description:** GNSS/2x LTE/0, 1x, 2x or 3x WiFi  
Direct Mount

**Series:** RAZORBACK

**PART NUMBER:** RAZ32011DM, RAZ32012DM, RAZ42111DM,  
RAZ42112DM, RAZ52211DM, RAZ52212DM, RAZ62311DM, RAZ62312DM

## CHARTS

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



## GNSS

Passive  
Measurement  
Measured with  
152mm (6") cable

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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:

[RAZ42111DM](#) [RAZ32012DM](#) [RAZ52212DM](#) [RAZ62312DM](#) [RAZ52211DM](#) [RAZ62311DM](#) [RAZ42112DM](#)  
[RAZ32011DM](#)