

#### **TECHNICAL DATA SHEET**

Description: MiMo LTE, WiFi, GNSS Vehicle

Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R





#### All dimensions are in mm / inches

# **Features:**

- Supports MIMO Cellular LTE 698-960/1695-2170/2300-2700/2900-3600MHz
- Supports WiFi and DSRC 2400-2500MHz/4900-5925MHz
- Supports Beidou, GPS, Galileo, GLONASS
- Direct Mount and optional Magnetic Mount features
- See GPSMBMM for magnetic mount details

# **Applications:**

- Telematics
- Location based services
- First Responders(Police, Ambulance, Fire)
- Government
- Energy(Utility Vehicles)
- Fleet Management
- Railroad

Issue: 1823

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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# This document covers all product variants of the following product family

Model No.	Color	Remark
GPSMB401	Black	
GPSMB402	White	
GPSMB401R	Black	Compliant with EN 50155, EN 61373, EN45545-2, railroad application.
GPSMB402R	White	Compliant with EN 50155, EN 61373, EN45545-2, railroad application.

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ROHS

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# **ELECTRICAL SPECIFICATIONS**

Frequency (LTE) 698-960/1695-2170/2300-

2700/2900-3600 MHz

Frequency (WiFi & DSRC) 2400-2500/4900-5925 MHz

Frequency (Beidou, GPS, Galileo, Glonass) 1561.098±2.046/

1575.42±1.023/

1602.5625±4MHz

Nominal Impedance 50  $\Omega$ 

VSWR\*\* (LTE) <1.5

VSWR\*\* (WiFi & DSRC) <1.4

Gain\* (LTE antenna, <2170MHz) 4 dBi ± 2.5 dB

Gain\* (LTE antenna, >2170MHz) 5 dBi ± 2 dB

Gain\* (WiFi antenna, <2500MHz)
4.5 dBi  $\pm$  1.5 dB

Gain\* (WiFi antenna, >4900MHz) 5 dBi  $\pm$  2 dB

Isolation LTE to LTE\*\*

15 dB or better

GNSS antenna RHCP gain 1 dBic ± 2 dB

LNA gain  $30 \text{ dB} \pm 2 \text{ dB}$ 

Noise Figure 2.5 (cascade) dB

Current  $9 \text{ mA} \pm 2 \text{ mA}$ 

Vdc 3-5Vdc

LNA and filter attenuation

@ 824 MHz 70 dB

@960 MHz 65 dB

@1710 MHz 60 dB

@2170 MHz 65 dB

<sup>\*\*</sup>In free space with 17ft cables



<sup>\*</sup>Measured on 2ft GND plane and with 4 inch cables



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# **ELECTRICAL SPECIFICATIONS**

Connector type(s)
Cable type(s)
Length

SMA (LTE and GPS) /SMA-RP (WiFi) RG-58 (LTE and WiFi) / RG-174 (GPS) 17 Feet



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## **MECHANICAL SPECIFICATIONS**

Plastic radome for GPSMB401/GPSMB402 ABS/PC Material UV

Stabilized, UL-94HB

for GPSMB401R/GPSMB402R PC material, EN45545

R6 HL3 compliant

Color Black, White

Ingress Protection IP67

Weight ~1340 g

Fixing system Roof mounting (Also

Magnet mounting accessory available,

GPSMBMM)

Recommended fastening torque 1518ft-lb (20-25Nm).

## **ENVIRONMENTAL SPECIFICATIONS**

Operating temperature MIL-STD 810G -40/+85° C

Humidity 95%RH @ +25°C for 12h and 55°C for 12h

Vibration MIL-STD 810G, section 514.6, 5-500 Hz, 60min/axis

Thermal Shocks MIL-STD 810G, section 503.5, -40 to +85°C, 3 cycles

Drop Test Minimum of one drop per axis – 4, 1 meter drops





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# Tests for railroad certification per EN50155, EN61373, EN45545-2

NO	T SN IN STAND	TEST DESCRIPTION	REFER STANDARD	TEST REPORT NO	RESULT(PASS/FAIL)
1	12.2.3	Cooling test			
2	12.2.4	Dry heat test	EN 50155	DD20170919002	PASS
3	12.2.5	Damp heat test, cyclic			
4	12.2.6	Supply overvoltages	EN 50155	W01714200900E	PASS
5	12.2.7	Surges, electrostatic discharge and transient burst susceptibility tests	EN 50155	E1710056-01E	PASS
6	12.2.8	Radio interference			
7	12.2.9	Insulation test	EN 50155	E17110014-01E	PASS
8	12.2.10	Salt mist test	EN 50155	DD20170919002	PASS
9 12.2.	12 2 11	Vibration	EN 61373		
	12.2.11	Shock, and bump test	EN 61373		
10	12.2.12	Watertightness test	EN 50155		
11	12.2.14	Low temperature storge test	EN 50155		
12	/	fire & smoke	EN 45545-2 R15&R16	TC 18 02 000528	HL1&HL2
		ine a sinone	EN 45545-2 R15&R16	TC.18.04.001633	HL1&HL2&HL3





#### **TECHNICAL DATA SHEET**

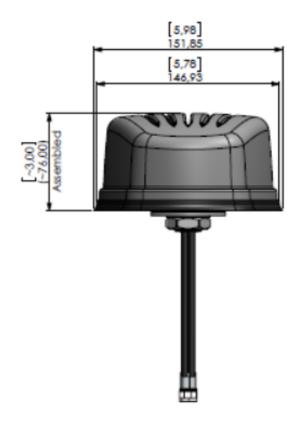
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# **MECHANICAL DRAWING**









#### **TECHNICAL DATA SHEET**

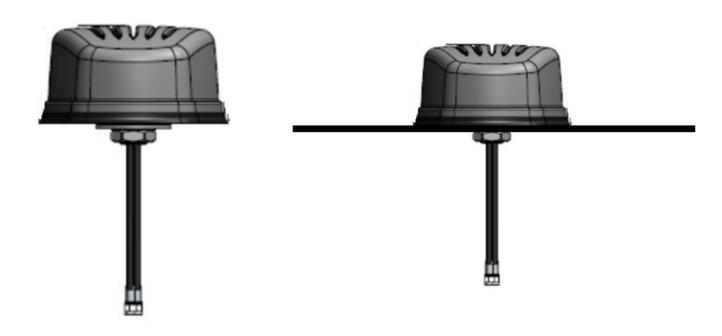
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# **TEST SETUP**



For VSWR, test in free space with 17ft cables

For radiation performance, test on 2ft GND plane with 4inch cables



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Description: MiMo LTE, WiFi, GNSS Vehicle

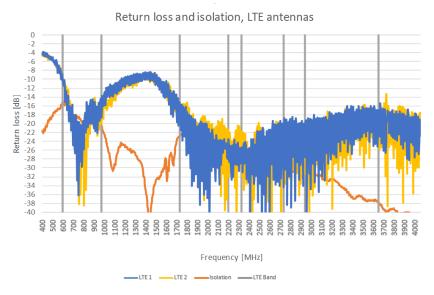
Mount Antenna

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## **CHARTS**

# Return Loss and isolation in free space, LTE antennas\*\*



# Return Loss in free space, WiFi antenna\*\*







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Description: MiMo LTE, WiFi, GNSS Vehicle

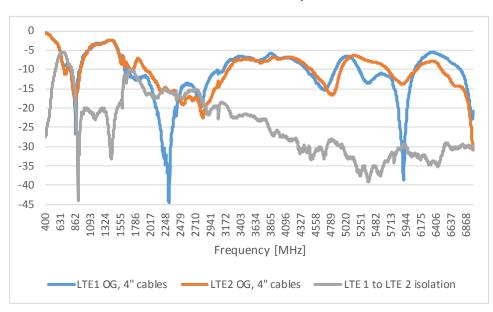
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

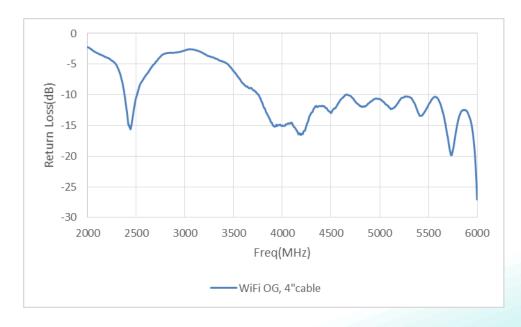
GPSMB402R

#### **CHARTS**

# Return Loss and isolation, LTE antennas\*



# Return Loss, WiFi antenna\*







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Description: MiMo LTE, WiFi, GNSS Vehicle

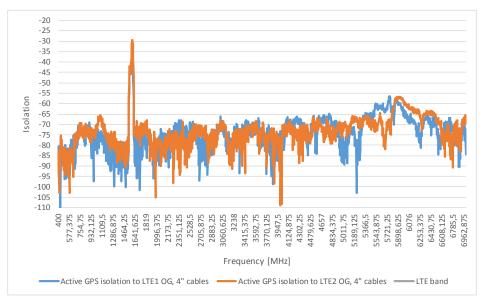
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

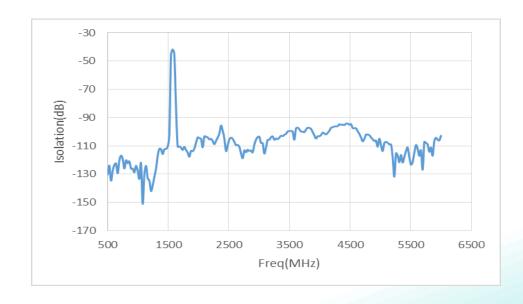
GPSMB402R

## **CHARTS**

# GPS isolation to LTE 1 and LTE 2 antenna\*



# GPS isolation to WiFi antenna\*





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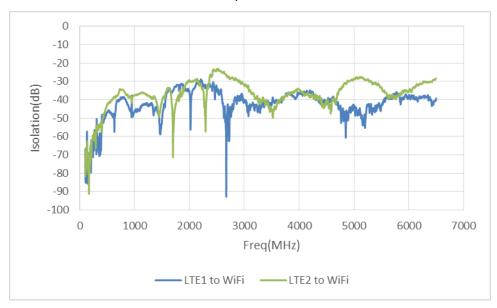
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

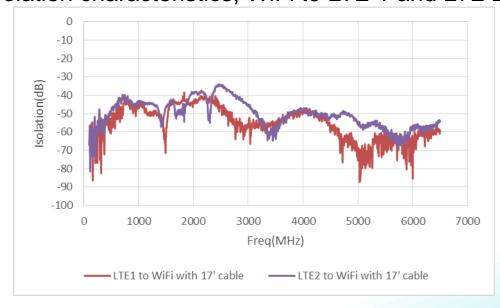
GPSMB402R

#### **CHARTS**

# Isolation characteristics, WiFi to LTE 1 and LTE 2\*



# Isolation characteristics, WiFi to LTE 1 and LTE 2\*\*





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Description: MiMo LTE, WiFi, GNSS Vehicle

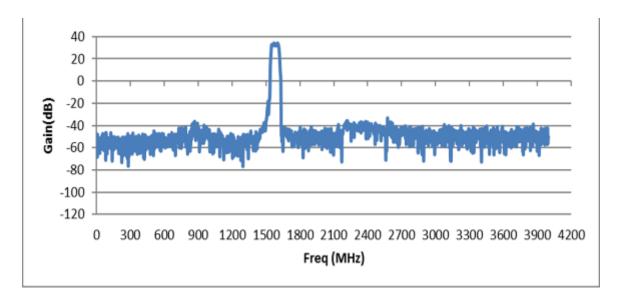
**Mount Antenna** 

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### **CHARTS**

# **GNSS LNA performance**





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### **CHARTS**

LTE antenna total efficiency with 2ft metal plate and 4inch cables



Maximum 3D gain, LTE antenna with 2ft metal plate and 4inch cables









#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

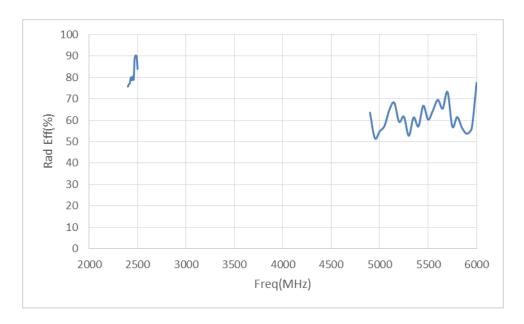
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

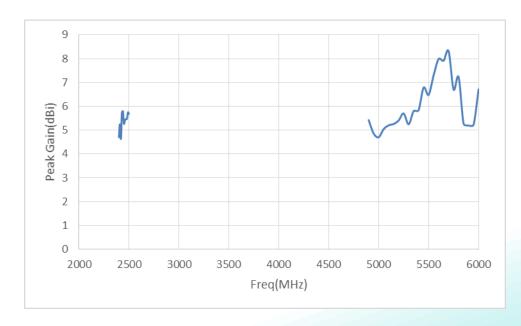
GPSMB402R

### **CHARTS**

WiFi antenna total efficiency with 2ft metal plate and 4inch cables



# Maximum 3D gain, WiFi antenna with 2ft metal plate and 4inch cables



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#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

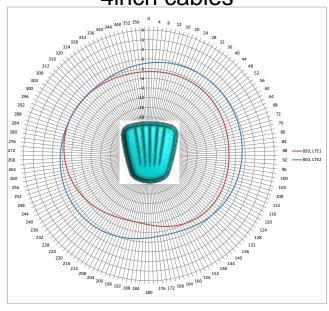
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PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

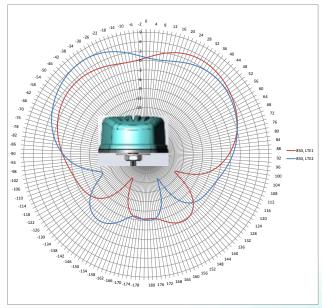
GPSMB402R

# **CHARTS**

LTE antenna radiation pattern at 850MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view



ROHS



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Description: MiMo LTE, WiFi, GNSS Vehicle

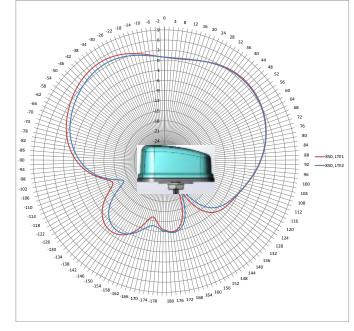
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 850MHz with 2ft metal plate and







#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

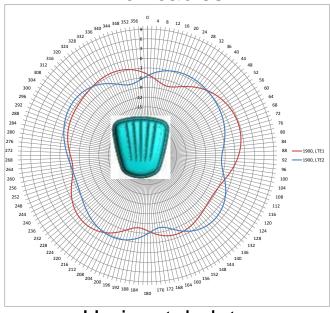
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

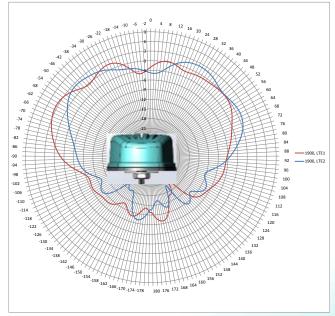
GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 1900MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view

Issue: 1823

ROHS



#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

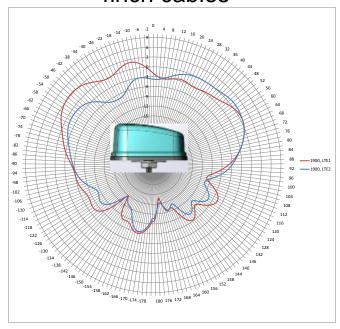
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 1900MHz with 2ft metal plate and 4inch cables



Vertical plot side view





#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

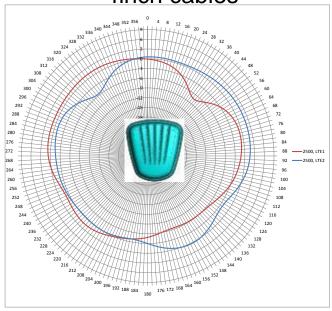
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

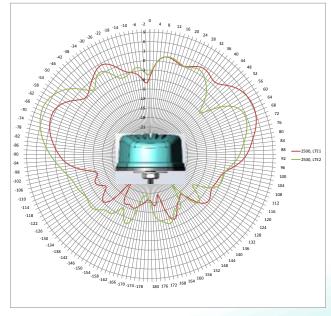
GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 2500MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view







#### **TECHNICAL DATA SHEET**

Description: MiMo LTE, WiFi, GNSS Vehicle

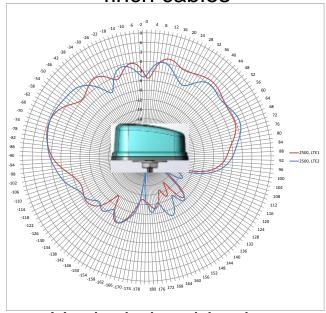
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 2500MHz with 2ft metal plate and 4inch cables



Vertical plot side view





#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

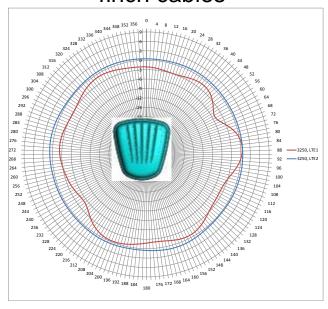
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

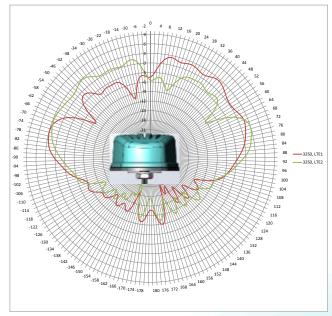
GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 3250MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view







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Description: MiMo LTE, WiFi, GNSS Vehicle

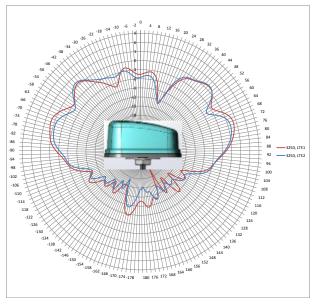
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R

## **CHARTS**

LTE antenna radiation pattern at 3250MHz with 2ft metal plate and 4inch cables



Vertical plot side view





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Description: MiMo LTE, WiFi, GNSS Vehicle

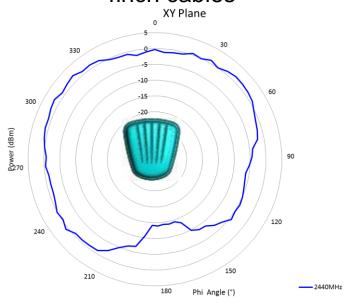
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

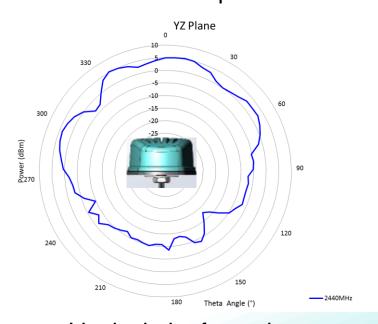
GPSMB402R

## **CHARTS**

WiFi antenna radiation pattern at 2440MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view

Issue: 1823

ROHS



#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

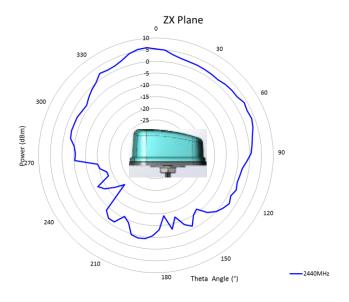
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

GPSMB402R

## **CHARTS**

WiFi antenna radiation pattern at 2440MHz with 2ft metal plate and 4inch cables



Vertical plot side view





#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

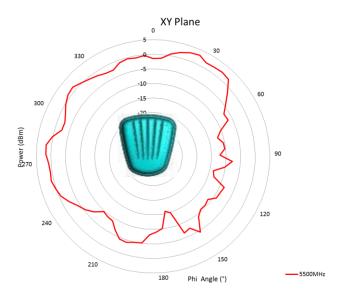
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

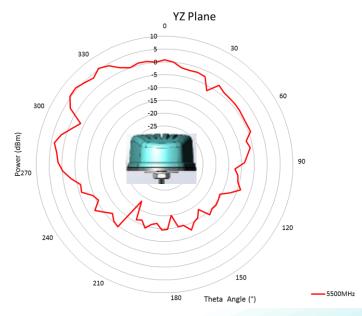
GPSMB402R

## **CHARTS**

WiFi antenna radiation pattern at 5500MHz with 2ft metal plate and 4inch cables



# Horizontal plot



Vertical plot front view



ROHS



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Description: MiMo LTE, WiFi, GNSS Vehicle

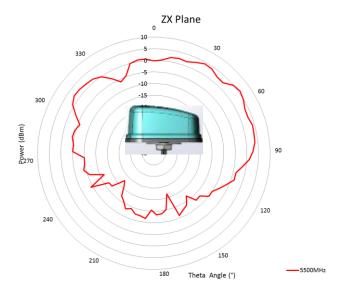
**Mount Antenna** 

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

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## **CHARTS**

WiFi antenna radiation pattern at 5500MHz with 2ft metal plate and 4inch cables



Vertical plot side view





#### TECHNICAL DATA SHEET

Description: MiMo LTE, WiFi, GNSS Vehicle

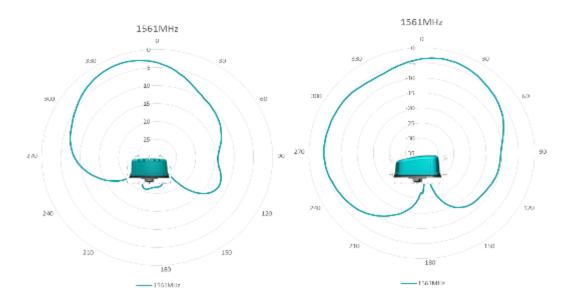
Mount Antenna

PART NUMBER: GPSMB401, GPSMB402,GPSMB401R,

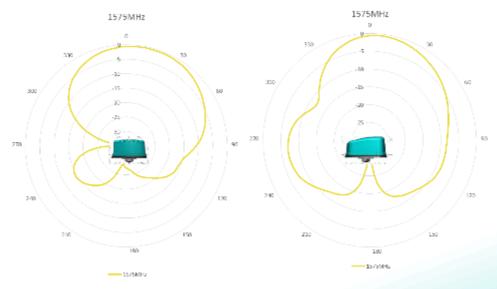
GPSMB402R

## **CHARTS**

# BD2 RHCP patterns, measured with 4inch cables in free space



# GPS & Galileo RHCP patterns, measured with 4inch cables in free space







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Description: MiMo LTE, WiFi, GNSS Vehicle

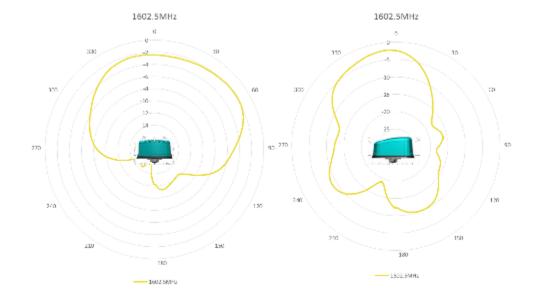
**Mount Antenna** 

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## **CHARTS**

GLONASS RHCP patterns, measured with 4inch cables in free space









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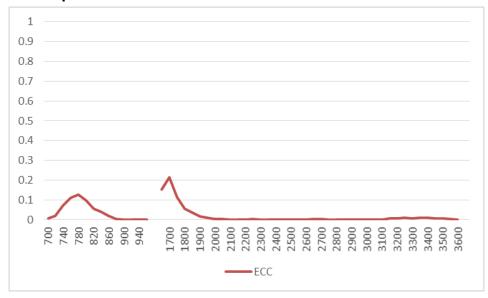
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## **CHARTS**

# Envelope correlation coefficient – LTE 1 to LTE 2







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## **PACKAGING**

One antenna pack in one PE bag, 6 pcs antennas in one box

# **Mouser Electronics**

**Authorized Distributor** 

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GPSMB401