

**Description: MiMo LTE, GNSS Vehicle Mount
Antenna**

Series: Panther

**PART NUMBER: GPSMB301, GPSMB302, GPSMB301R,
GPSMB302R**



Features:

- Supports LTE 698-960/1695-2170/2300-2700/2900-3600MHz(MIMO)
- Supports Beidou, GPS, Galileo, GLONASS
- Direct Mount and optional Magnetic Mount features
- See GPSMBMM for magnetic mount details



Applications:

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

All dimensions are in mm / inches

Issue: 1823

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For more information:

Pulse Worldwide Headquarters
12220 World Trade Drive
San Diego, CA 92128
USA
Tel: 1-858-674-8100

Pulse/Larsen Antennas
18110 SE 34th St Bldg 2 Suite 250
Vancouver, WA 98683
USA
Tel: 1-360-944-7551

Europe Headquarters
Pulse GmbH & Co, KG
Zeppelinstrasse 15
Herrenberg, Germany
Tel: 49 7032 7806 0

Pulse (Suzhou) Wireless Products Co, Inc.
99 Huo Ju Road(#29 Bldg, 4th Phase
Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998



Description: MiMo LTE, GNSS Vehicle Mount Antenna

Series: Panther

PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

This document covers all product variants of the following product family

Model No.	Color	Remark
GPSMB301	Black	
GPSMB302	White	
GPSMB301R	Black	Compliant with EN 50155, EN 61373, EN45545-2, railroad application.
GPSMB302R	White	Compliant with EN 50155, EN 61373, EN45545-2, railroad application.

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Description: MiMo LTE, GNSS Vehicle Mount Antenna

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PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

ELECTRICAL SPECIFICATIONS

Frequency (LTE)	698 – 960 / 1695 - 2170 / 2300 – 2700 / 2900 - 3600	MHz
Frequency (Beidou, GPS, Galileo, Glonass)	1561.098 ± 2.046 / 1575.42 ± 1.023 / 1602.5625 ± 4	MHz
Nominal Impedance	50	Ω
VSWR (LTE)	< 1.5	
Gain* (LTE antenna, < 2170 MHz)	6	dBi ± 1 dB
Gain* (LTE antenna, > 2170 MHz)	5.5	dBi ± 1 dB
Isolation LTE to LTE**	15 or better	dB
GNSS antenna RHCP gain	1	dBic ± 2dB
LNA gain	30	dB ± 2 dB
Noise Figure	2.5 (cascade)	dB
Current	8	mA ± 2 mA
V _{dc}	3-5	V _{dc}
LNA and filter attenuation		
	@ 824 MHz	70 dB
	@ 960 MHz	65 dB
	@ 1710 MHz	60 dB
	@ 2170 MHz	65 dB
Connector type	SMA	
Cable type(s)	RG-58 (LTE) / RG-174 (GPS)	
Length	17	Feet

*Measured on 2ft GND plane and with 4 inch cables

**In free space with 17ft cables

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**Description: MiMo LTE, GNSS Vehicle Mount
Antenna****Series: Panther****PART NUMBER: GPSMB301, GPSMB302, GPSMB301R,
GPSMB302R****MECHANICAL SPECIFICATIONS**

Plastic radome for GPSMB301/GPSMB302	ABS/PC Material UV Stabilized, UL-94HB
for GPSMB301R/GPSMB302R	PC material, EN45545 R6 HL3 compliant
Color	Black, White
Ingress Protection	IP67
Weight	~940 g
Mounting	Direct or Magnetic options

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-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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Description: MiMo LTE, GNSS Vehicle Mount Antenna
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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	EN 50155	DD20170919002	PASS
2	12.2.4	Dry heat test			
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	12.2.11	Vibration	EN 61373		
		Shock, and bump test	EN 61373		
10	12.2.12	Watertightness test	EN 50155		
11	12.2.14	Low temperature storage test	EN 50155	TC 18 02 000528	HL1&HL2
12	/	fire & smoke	EN 45545-2 R15&R16		
			EN 45545-2 R15&R16	TC.18.04.001633	HL1&HL2&HL3

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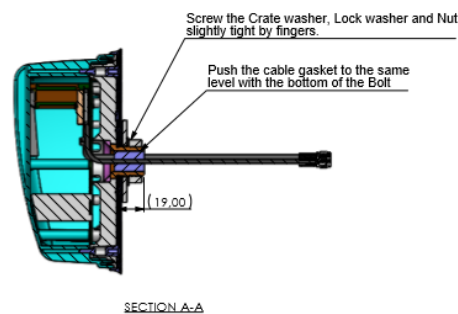
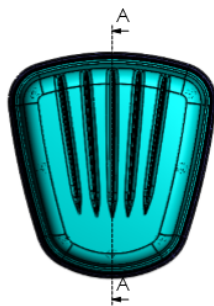
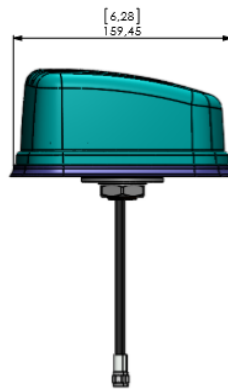
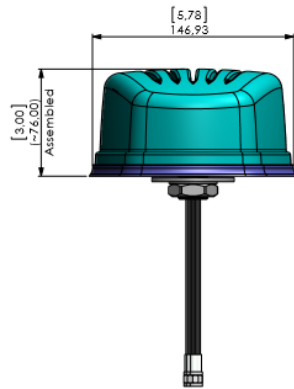
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MECHANICAL DRAWING



Tolerances of linear dimensions MEDIUM ISO 2768-m		
Dimension	Tolerance	
0.5 - 3	±0.1	
3 - 6	±0.1	
6 - 30	±0.2	
30 - 120	±0.3	
120 - 400	±0.5	
400 - 1000	±0.8	
1000 - 2000	±1.2	
2000 - 4000	±2	
Forming surface tolerance: 0.15 mm Surface texture: Ra 0.8 Hatched adjacent to the tolerance zone		
Tolerances of angular dimensions MEDIUM ISO 2768-m		
Dimension of shorter side (millimetre)	Tolerance	
up to 10	±1°	
10 - 30	±0.5°	
30 - 120	±0.2°	
120 - 400	±0.1°	
400 - 400	±0.05°	
Tolerances of radii and chamfers MEDIUM ISO 2768-m		
Radius or chamfer	Tolerance	
0.5 - 3	±0.2	
3 - 6	±0.3	
6 - 6	±1	
Forming surface tolerance: 0.15 mm Surface texture: Ra 0.8 Hatched adjacent to the tolerance zone		

No recycling plastics allowed to use

Functional Characteristic key:
 Process capability studies required, total 0 pts.
 Process capability studies required and ongoing statistical process control required, total 0 pts.

Please follow Pulse Limits of hazardous substances (RoHS, halogens)
in the document "Pulse Hazardous Substances (HS) Limits"
and "Vendor Survey Questionnaire, Material Composition (LCN-3A-00062)"

Mod	Explanation
P01	1 Cable Tie around GPS updated
A	A-Release.

 **Pulse**
Electronics

Pulse Finland Oy
Toskila 4
00440 Kempele, Finland
Tel: +358 207 935 800
Fax: +358 207 935 801
www.pulseelectronics.com/antenna

Product(s)	GPSMB301
Item Name	Antenna Assembly

Scale: 1:0

Document number
GPSM

Sheet number	2/2			
General Tolerance				
Customer number				
Drawn	Janka	12.09.2015		
Check				
Appro				
Part Version	Document Version	A	18.09.2015	Janka
B301	A	P.1	02.07.2015	Janka
		Mod	Date	Name

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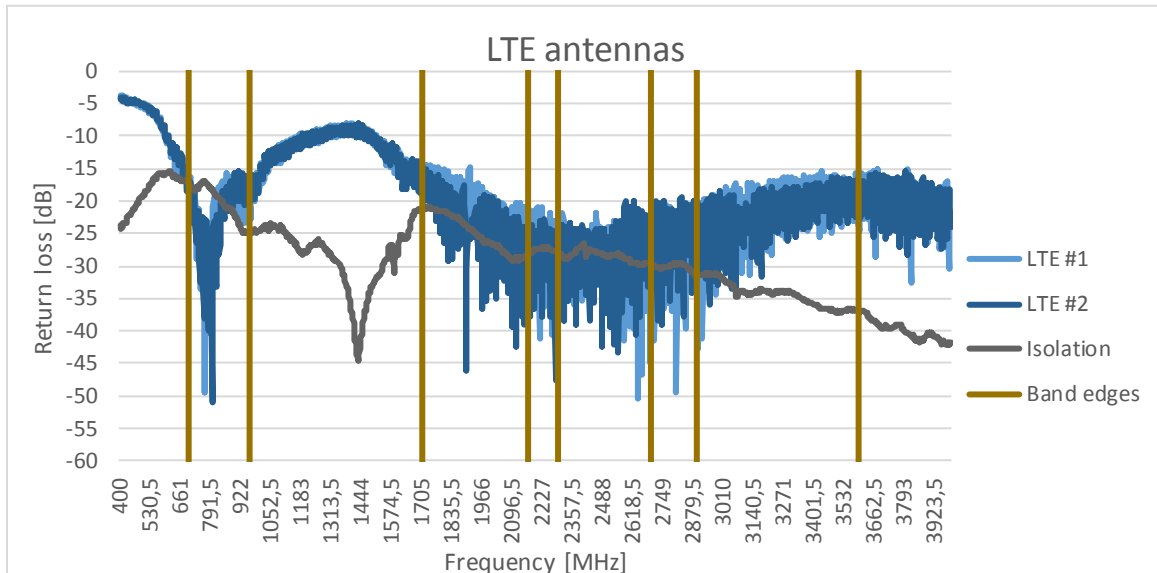
Description: MiMo LTE, GNSS Vehicle Mount Antenna

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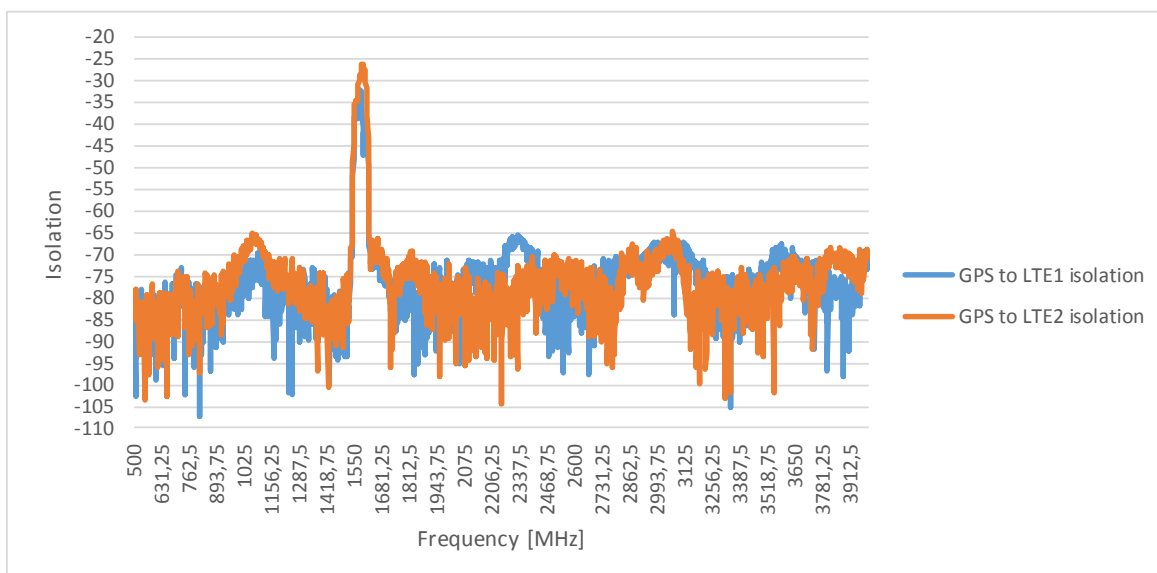
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

Return loss and isolation in free space, LTE antennas**



GNSS isolation to LTE 1 and LTE 2 antenna*



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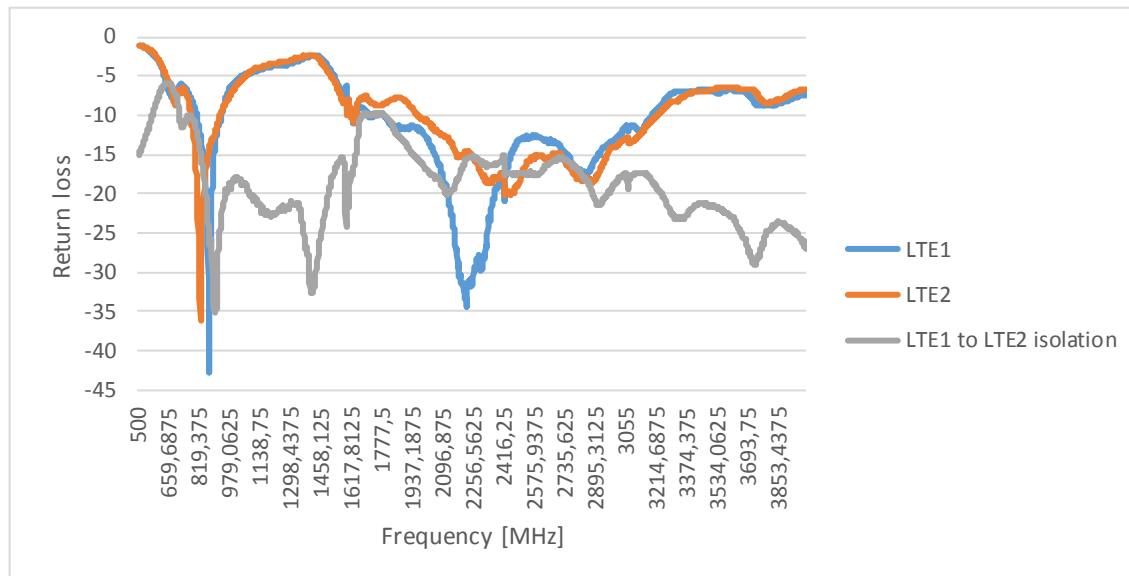
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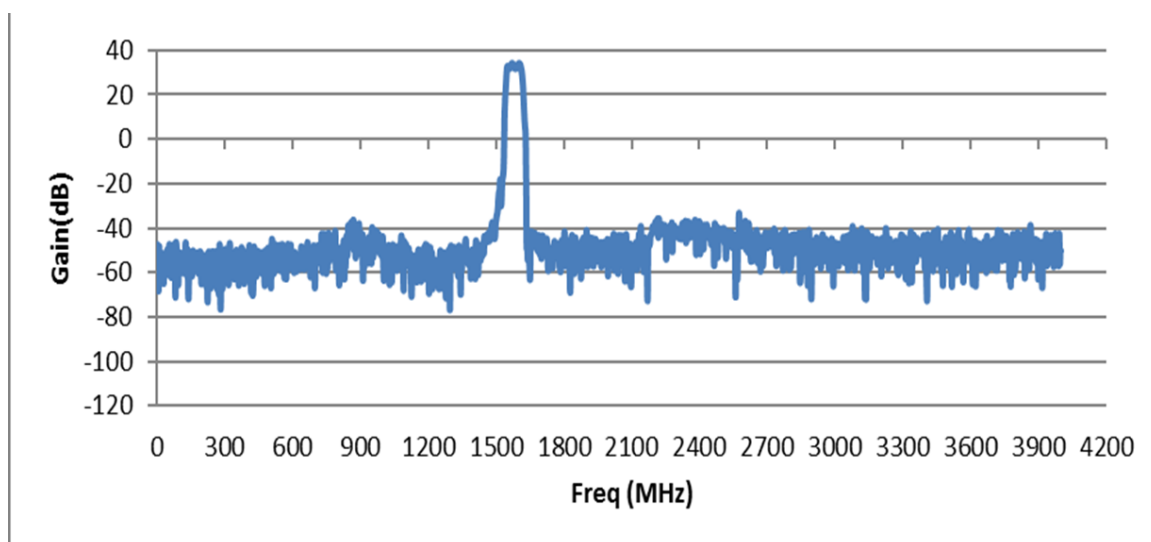
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CHARTS

Return loss and isolation, LTE antennas*



GNSS LNA performance



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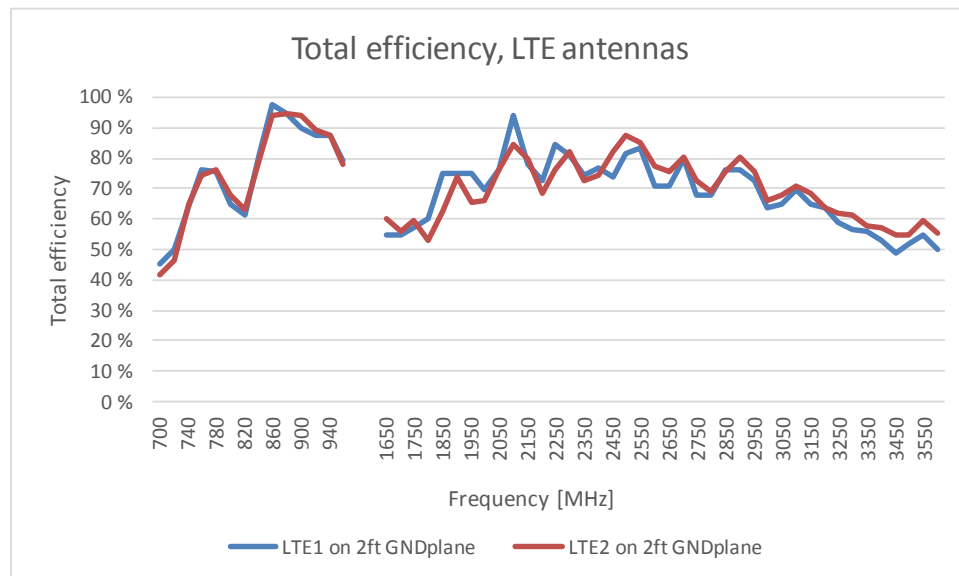
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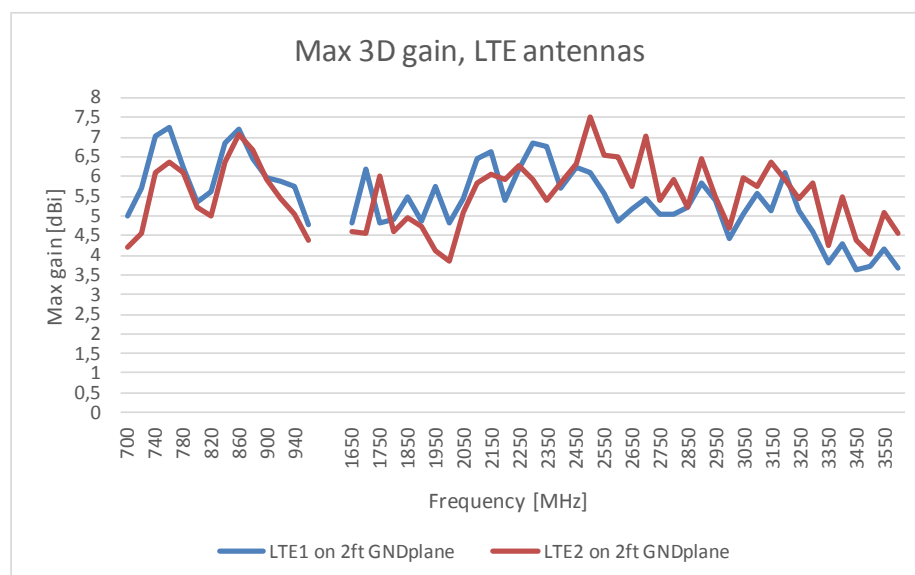
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

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



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



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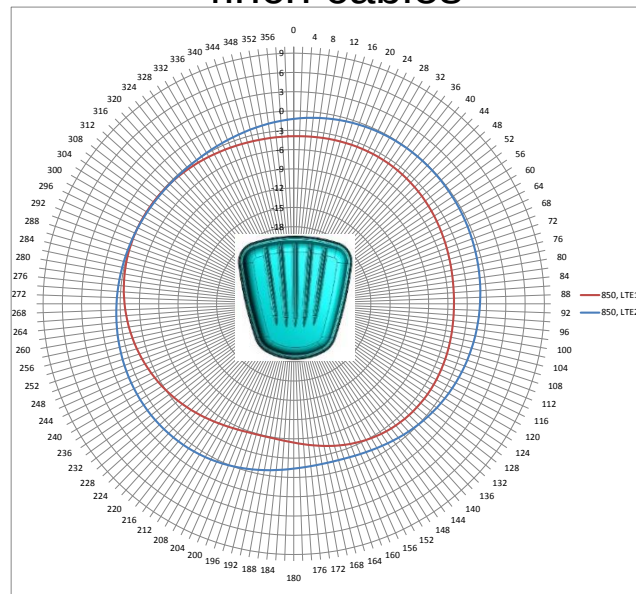
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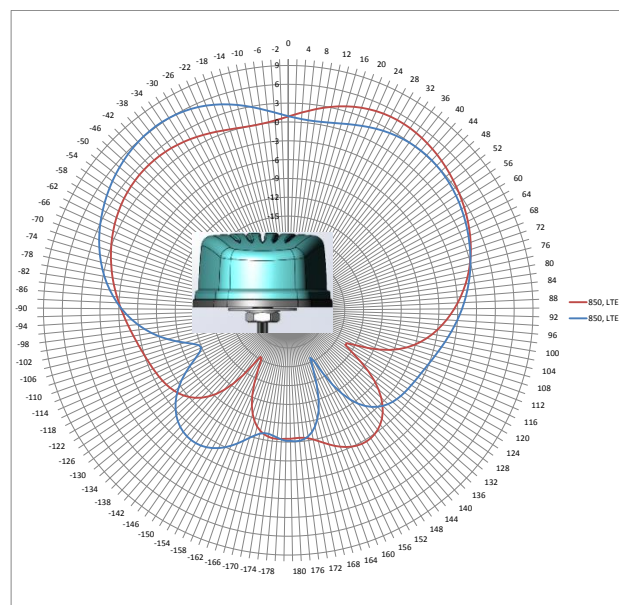
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

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



Horizontal plot



Vertical plot front view

Issue: 1823

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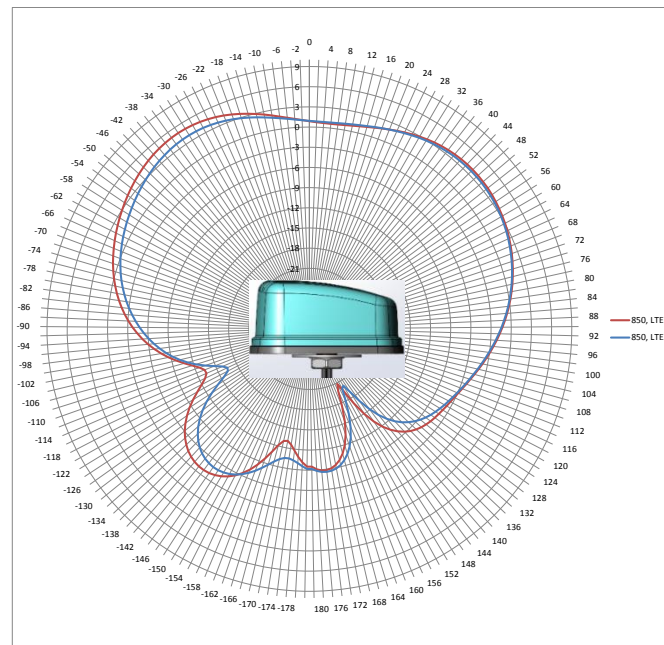
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CHARTS

LTE antenna radiation pattern at 850MHz with 2ft metal plate and
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Vertical plot side view

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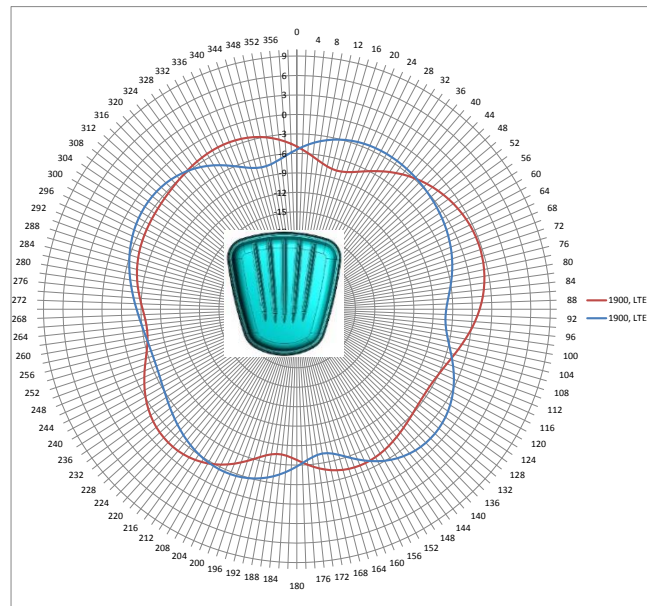
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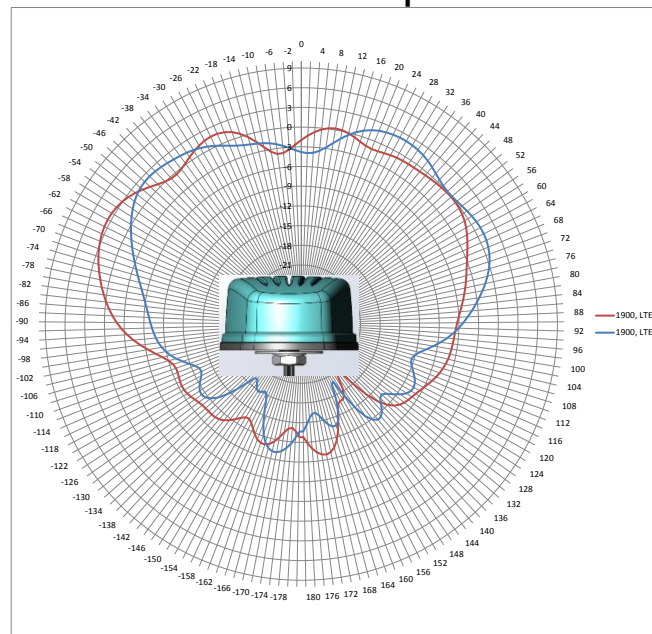
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

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



Horizontal plot



Vertical plot front view

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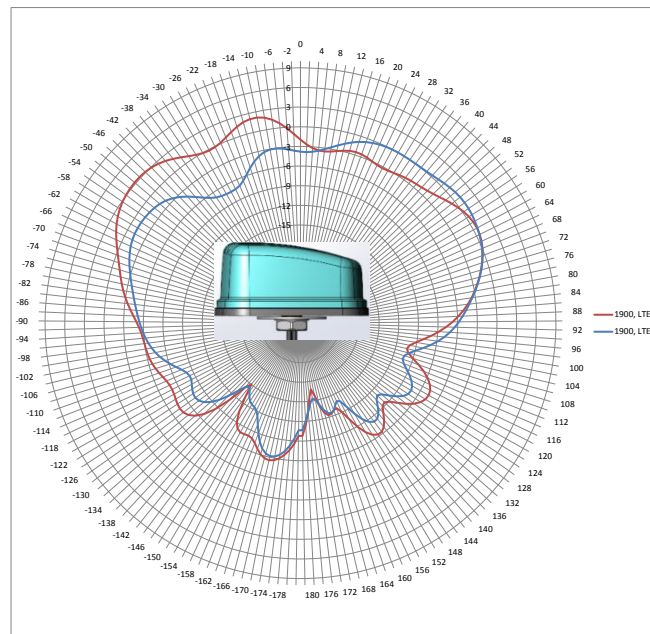
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CHARTS

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



Vertical plot side view

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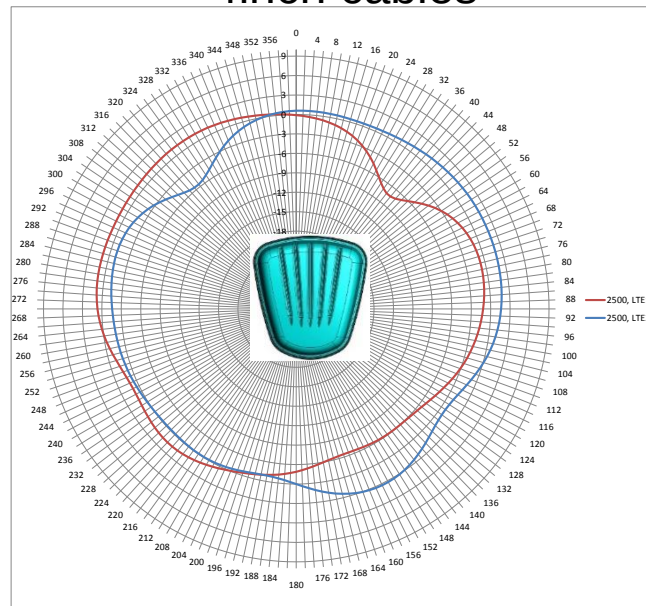
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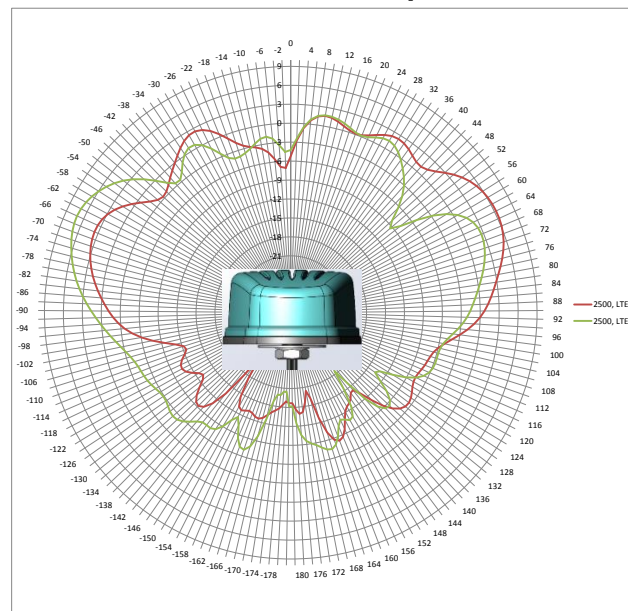
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

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



Horizontal plot



Vertical plot front view

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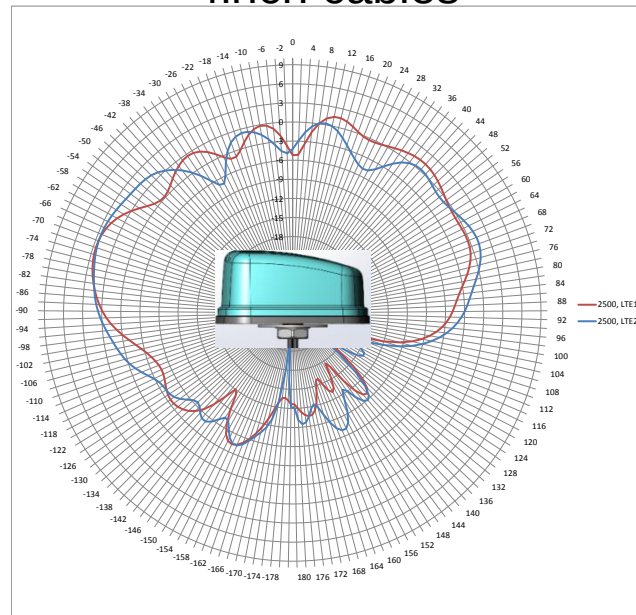
**Description: MiMo LTE, GNSS Vehicle Mount
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Series: Panther

**PART NUMBER: GPSMB301, GPSMB302, GPSMB301R,
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CHARTS

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



Vertical plot side view

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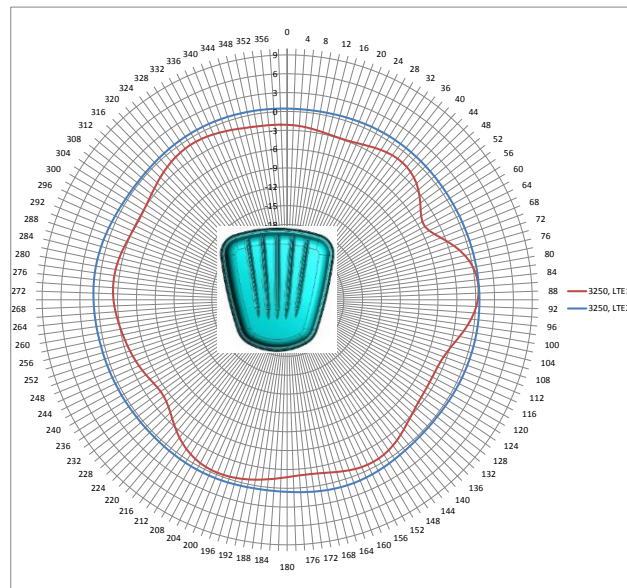
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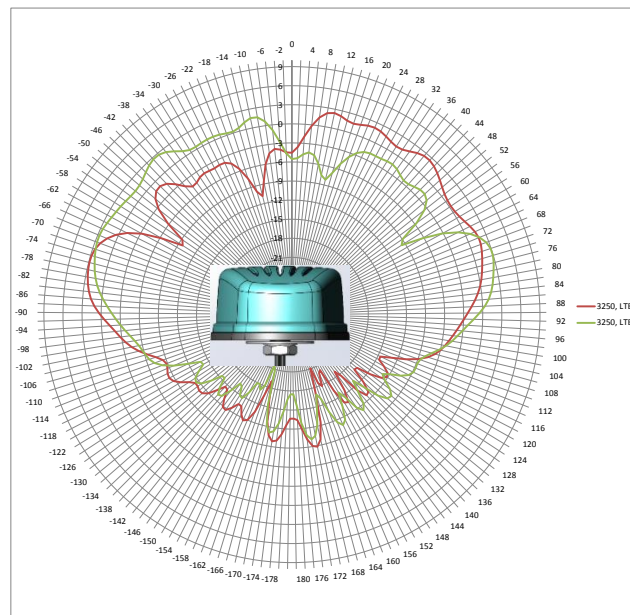
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

CHARTS

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



Horizontal plot



Vertical plot front view

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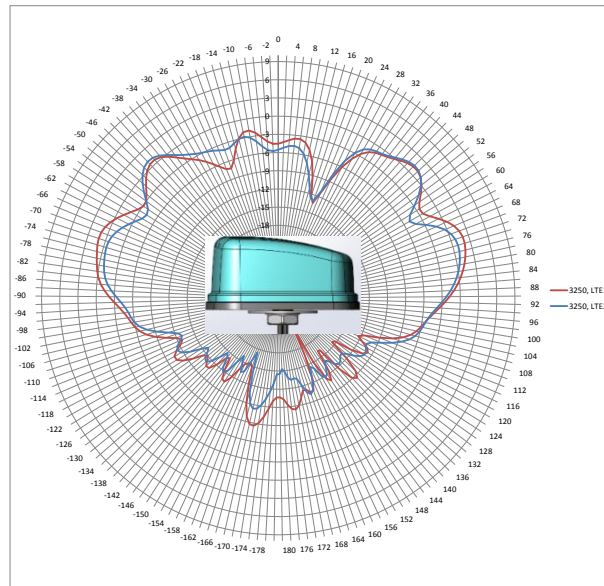
**Description: MiMo LTE, GNSS Vehicle Mount
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GPSMB302R**

CHARTS

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



Vertical plot side view

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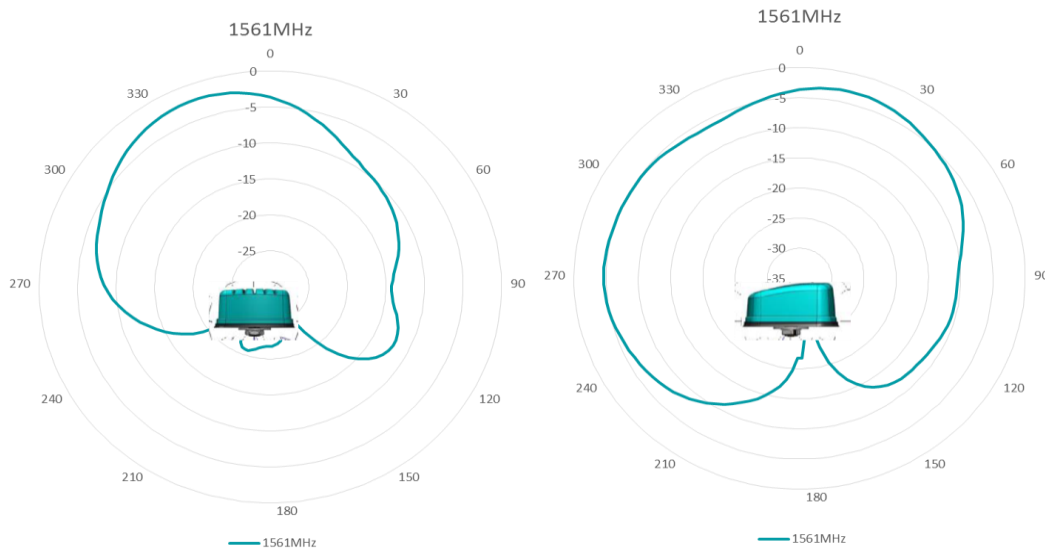
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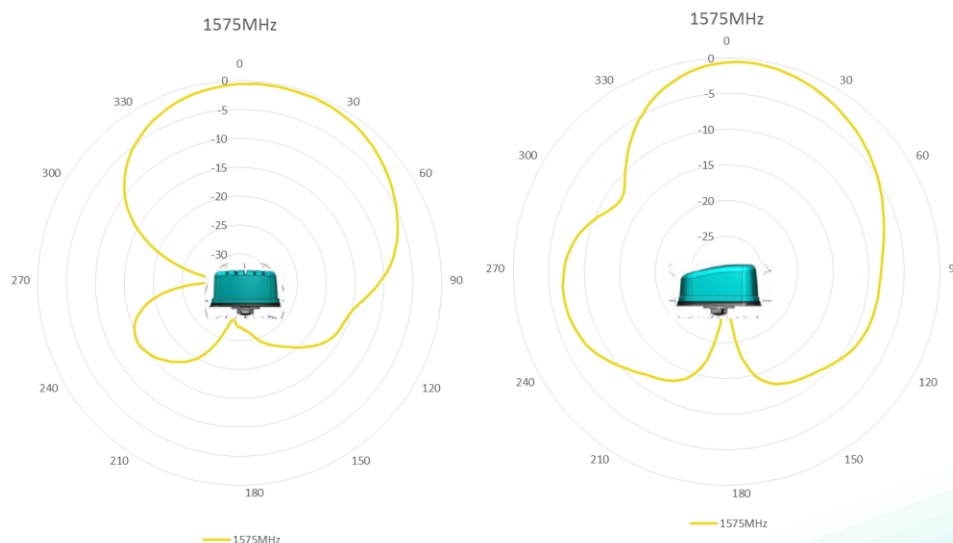
PART NUMBER: GPSMB301, GPSMB302, GPSMB301R, GPSMB302R

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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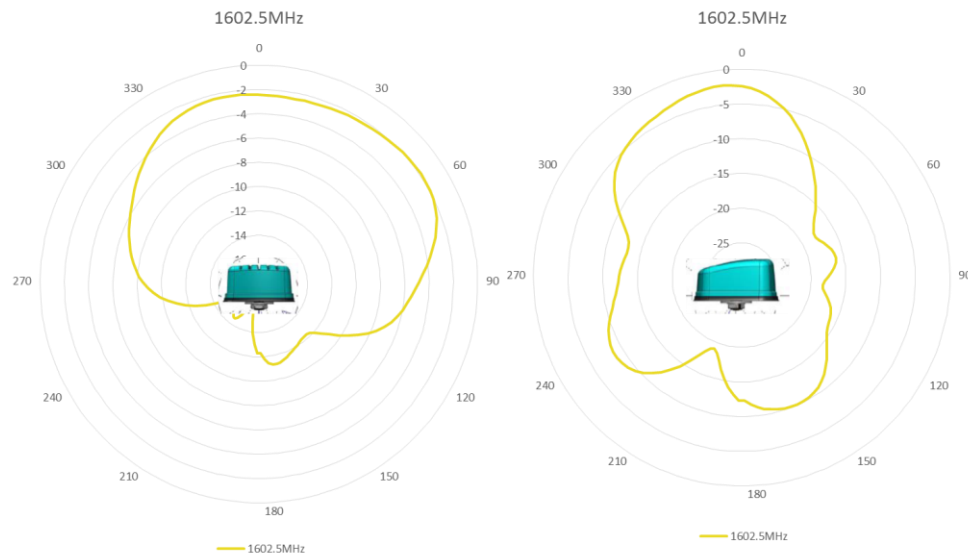
**Description: MiMo LTE, GNSS Vehicle Mount
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Series: Panther

**PART NUMBER: GPSMB301, GPSMB302, GPSMB301R,
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CHARTS

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



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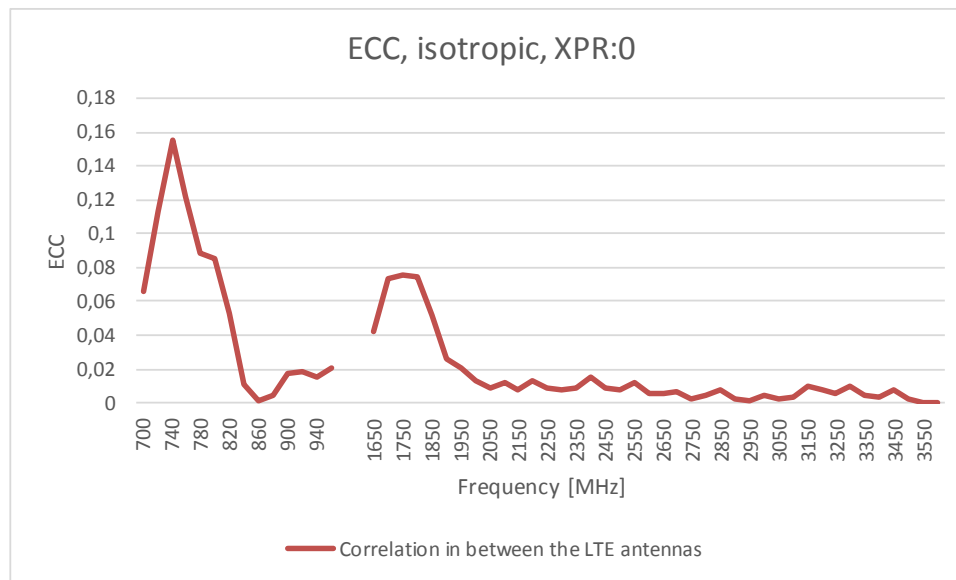
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CHARTS

Envelope correlation coefficient - LTE 1 to LTE 2



Issue: 1823

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**Description: MiMo LTE, GNSS Vehicle Mount
Antenna**

Series: Panther

**PART NUMBER: GPSMB301, GPSMB302, GPSMB301R,
GPSMB302R**

PACKAGING

One antenna pack in one PE bag, 6 antennae in one box

Issue: 1823

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