YAGEO PULSE GROUP

Series: Panther

TECHNICAL DATA SHEET

Description: 2xMiMo LTE, 3xMiMo WiFi, GNSS Vehicle Mount Antenna

PART NUMBER: PAN62311DM, PAN62312DM, PAN62311DMR,PAN62312DMR

PAN62311DM Black

PAN62312DM White

All dimensions are in mm / inches

Features:

- Supports 2xMIMO Cellular LTE 698-960/1695-2170/2300-2700/2900-3600MHz
- Supports 3xMIMO WiFi and DSRC 2400-2500MHz/4900-5925MHz
- Supports Beidou, GPS, Galileo, GLONASS, Active Satellite Antenna
- Direct Mount and optional Magnetic Mount features
- See GPSMBMM for magnetic mount details
- R118 compliant

Applications:

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

Issue: 2519

RoHS COMPLIANT

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Pulse/Larsen Antennas
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Vancouver, WA 98683
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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,4th Phase
Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998

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TECHNICAL DATA SHEET

Description: 2xMiMo LTE, 3xMiMo WiFi, GNSS Vehicle Mount Antenna

Series: Panther

PART NUMBER: PAN62311DM, PAN62312DM, PAN62311DMR,PAN62312DMR

This document covers all product variants of the following product family

Model NO.	PAN62311DM	PAN62312DM	PAN62311DMR	PAN62312DMR
Color	Black	White	Black	White
Cable NO.	6	6	6	6
Operating Bands	2-LTE+ 3WiFi+ 1-GPS/GNSS	2-LTE+ 3WiFi+ 1-GPS/GNSS	2-LTE+ 3WiFi+ 1-GPS/GNSS	2-LTE+ 3WiFi+ 1-GPS/GNSS
LET/WiFi Cable Type	RG58(Black)	RG58(White)	RG58HT(Black)	RG58HT(White)
GPS Cable Type	RG174(Black)	RG174(White)	RG174HT(Black)	RG174HT(White)
Cable length	17FT	17FT	17FT	17FT
Connector	LTE: SMA(M) WiFi: RP-SMA(M) GPS: SMA(M)	LTE: SMA(M) WiFi: RP-SMA(M) GPS: SMA(M)	LTE: SMA(M) WiFi: RP-SMA(M) GPS: SMA(M)	LTE: SMA(M) WiFi: RP-SMA(M) GPS: SMA(M)
Assembly option	1.Assembly directly with nut 2.Magnetic mount base P/N:GPSMBMM			
Remark			Compliant with EN 50155, EN 61373, EN45545-2, Railroad application.	Compliant with EN 50155, EN 61373, EN45545-2, Railroad application.

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Description: 2xMiMo LTE, 3xMiMo WiFi, GNSS Vehicle Mount Antenna

Series: Panther

PART NUMBER: PAN62311DM, PAN62312DM, PAN62311DMR,PAN62312DMR

Frequency (2XLTE)	698 - 960 / 1695 – 2170 / 2300 - 2700 / 2900 – 3600	MHz
Frequency (3XWiFi&DSRC)	2400 – 2500/ 4900 – 5925	MHz
Frequency (1XGNSS)	1561.098±2.046/ 1575.42±1.023/ 1602.5625±4	MHz
Nominal Impedance	50	Ω
VSWR** (LTE)	< 1.5	
VSWR** (WiFi&DSRC)	< 1.4	
Gain* (LTE antenna, < 2170 MHz)	4	dBi ± 2.5 dB
Gain* (LTE antenna, > 2170 MHz)	5	dBi ± 2 dB
Gain* (WiFi antenna, < 2500 MHz)	4.5	dBi ± 1.5 dB
Gain* (WiFi antenna, > 4900 MHz)	5	dBi ± 2 dB
Isolation LTE to LTE **	15 or better	dB
Isolation WiFi to WiFi **	25 or better	dB
GNSS antenna RHCP gain	1	dBic ± 2 dB
LNA gain	30	dB ± 2 dB
Noise Figure	2.5 (cascade)	dB
Current	9	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

*Measured on 2ft GND plane and with 4 inch cables
**In free space with 17ft cables

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Series: Panther

PART NUMBER: PAN62311DM, PAN62312DM, PAN62311DMR,PAN62312DMR

MECHANICAL SPECIFICATIONS

Plastic radome for PAN62311DM/PAN62312DM	ABS/PC Material UV Stabilized, UL-94HB
for PAN62311DMR/PAN62312DMR	PC material, EN45545 R6 HL3 compliant
Color	Black, White
Ingress Protection	IP67
Weight	~1540 g
Fixing system	Roof mounting (Also Magnet mounting accessory available, GPSMBMM) Recommended fastening torque 15-18ft-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	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 storge test	EN 50155		
12	/	fire & smoke	EN 45545-2 R15&R16	TC 18 02 000528	HL1&HL2
			EN 45545-2 R15&R16	TC.18.04.001633	HL1&HL2&HL3

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RoHS COMPLIANT

Description: 2xMiMo LTE, 3xMiMo WiFi, GNSS Vehicle Mount Antenna

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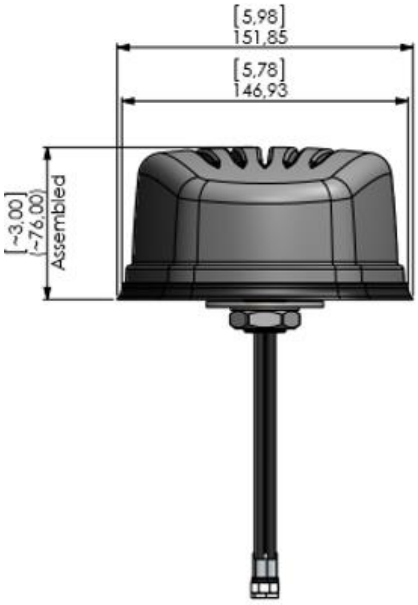
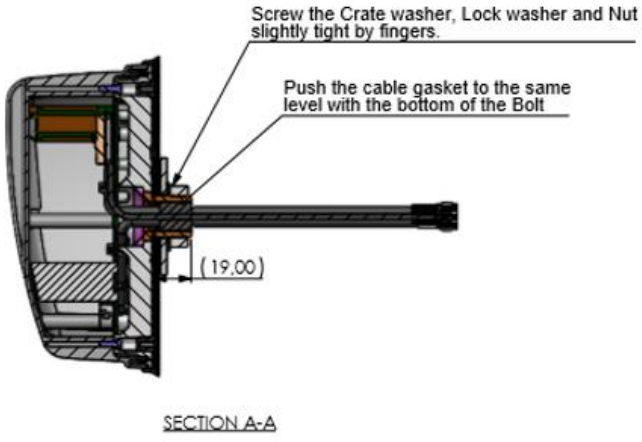
MECHANICAL DRAWING





SECTION A-A

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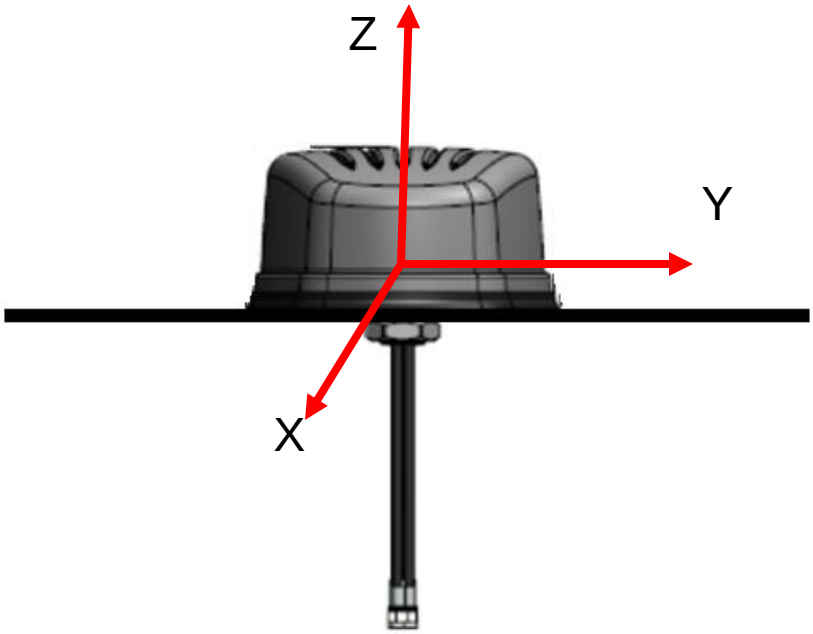
TEST SETUP



For VSWR, test in free space with 17ft cables

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

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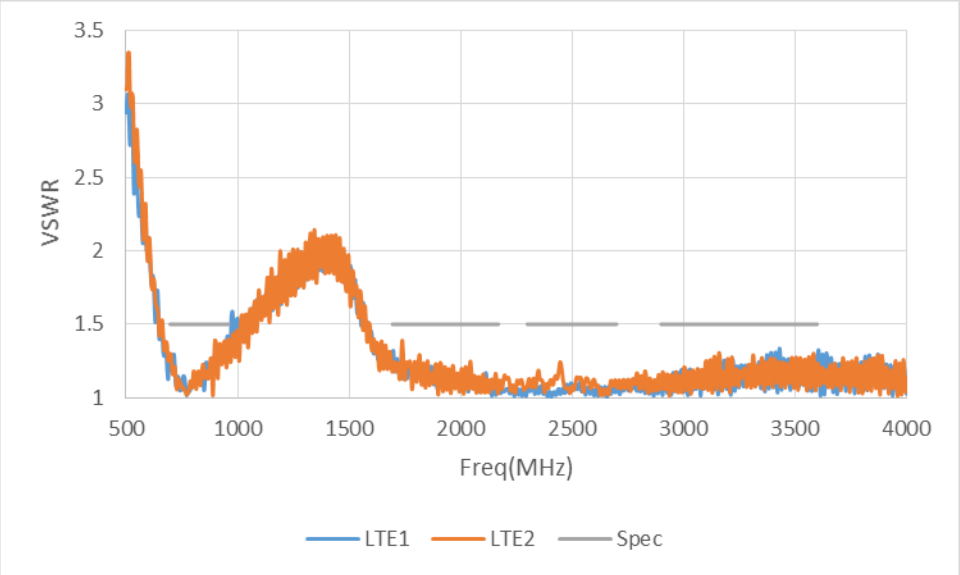
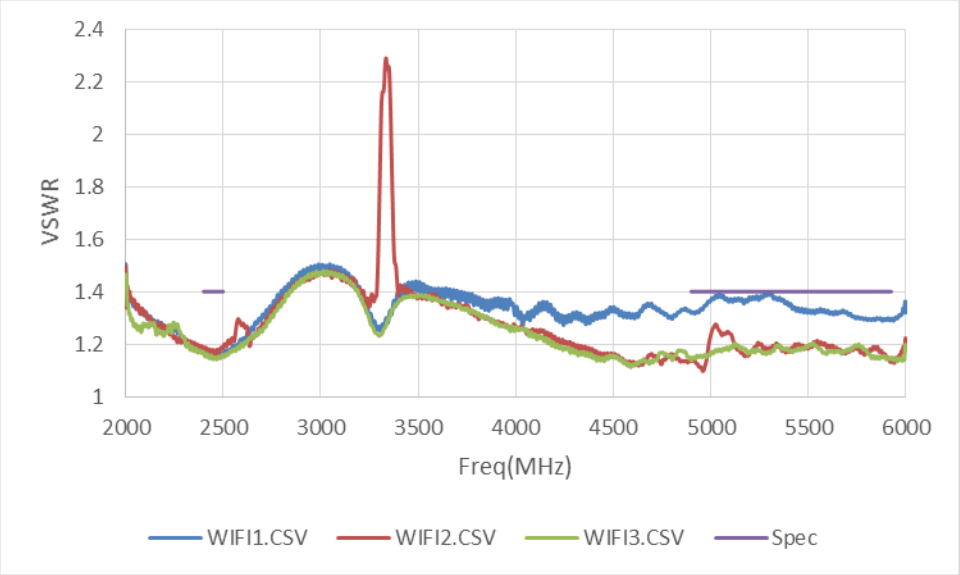
CHARTS

VSWR of LTE antenna



VSWR of WiFi antenna



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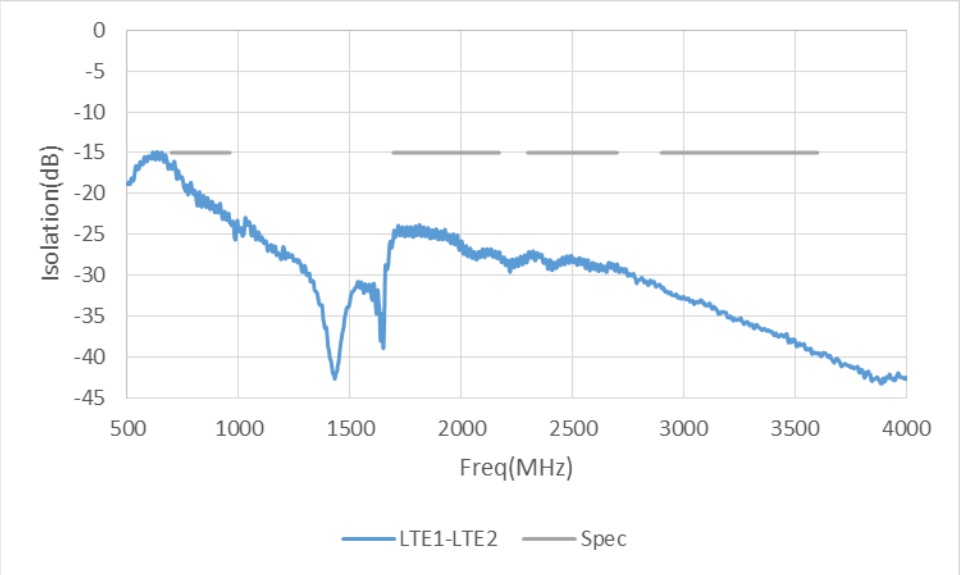
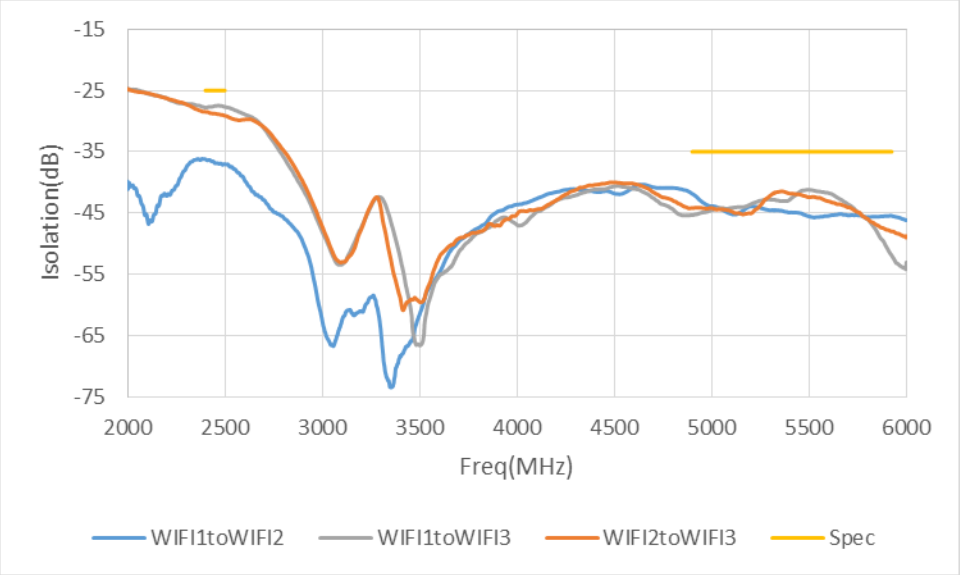
CHARTS

Isolation of LTE antenna



Isolation of WiFi antenna



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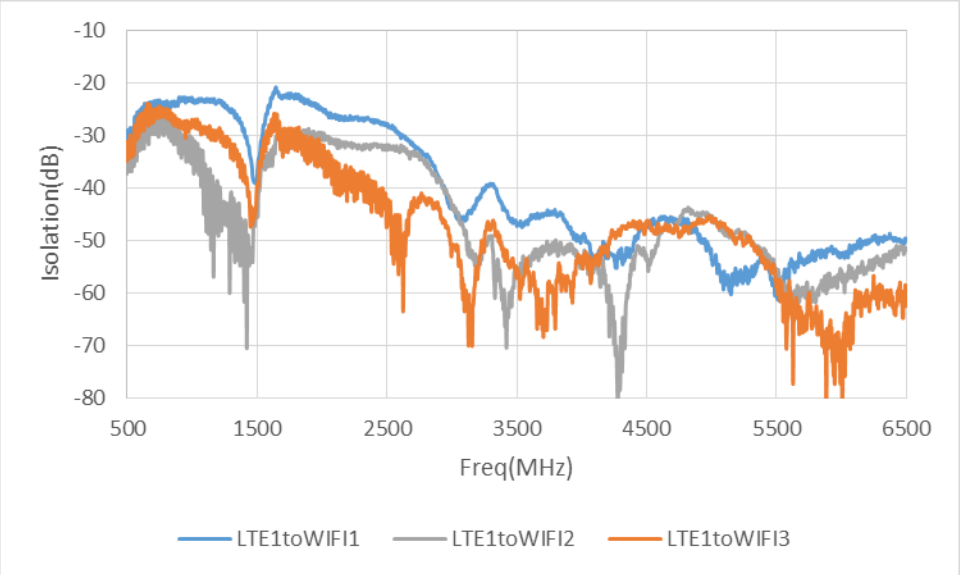
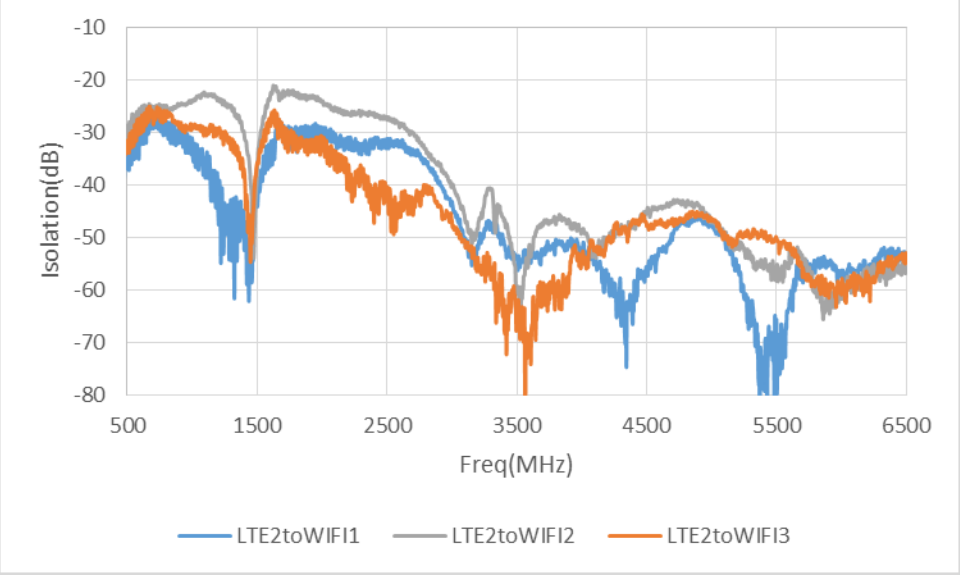
CHARTS

Isolation of LTE1 antenna to WiFi antenna



Isolation of LTE2 antenna to WiFi antenna



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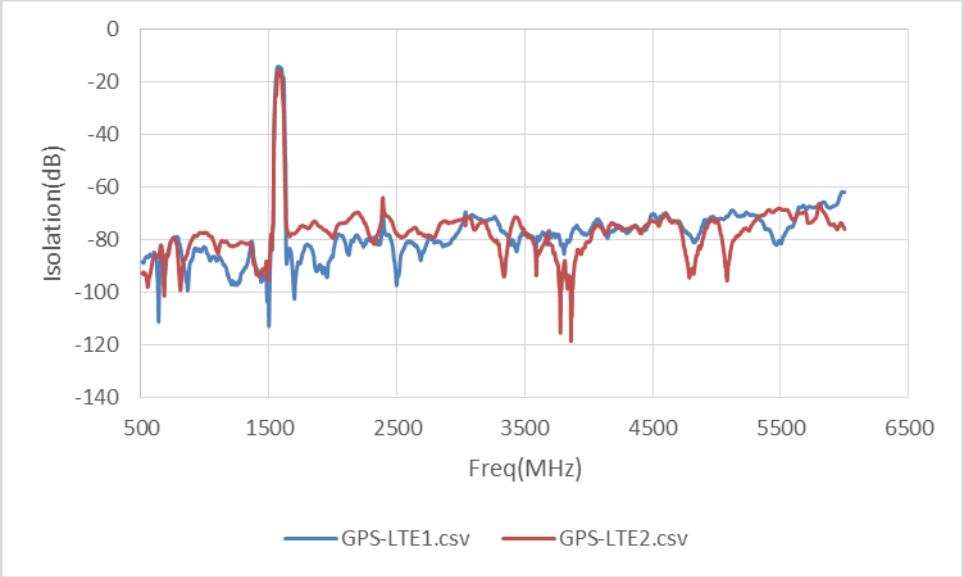
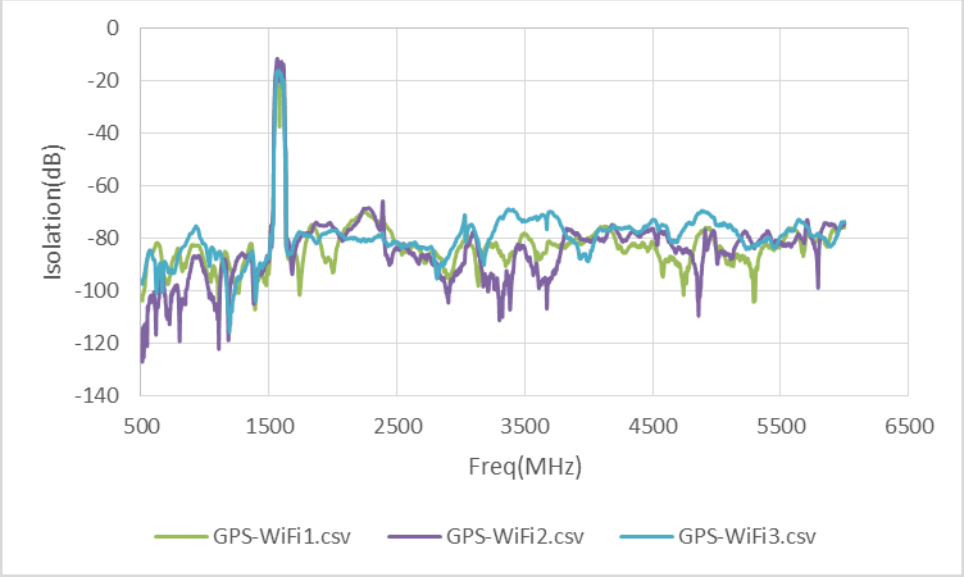
CHARTS

Isolation of GNSS antenna to LTE antenna



Isolation of GNSS antenna to WiFi antenna



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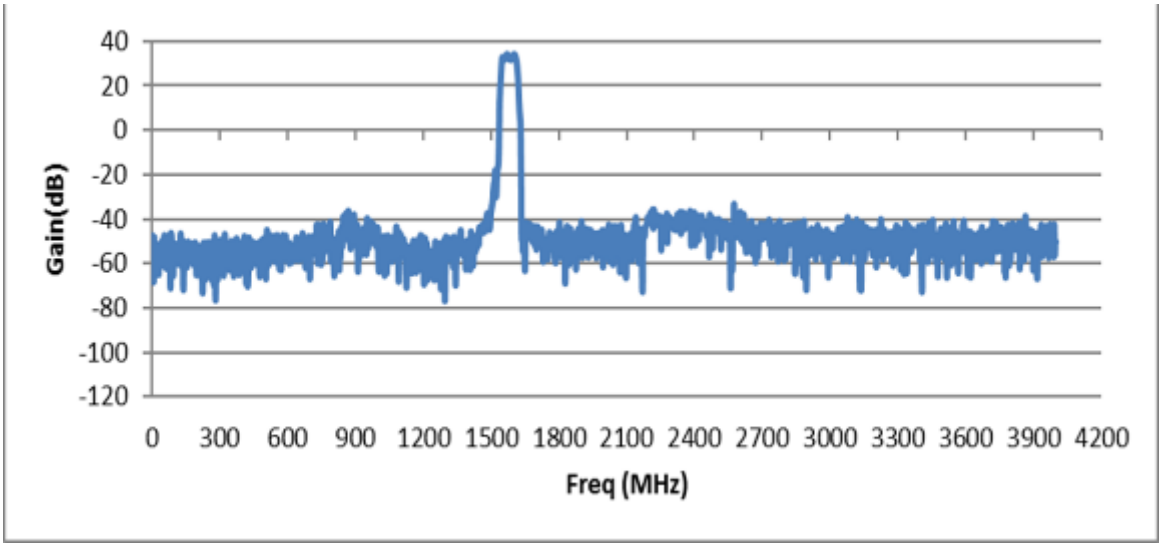
CHARTS

GNSS LNA performance



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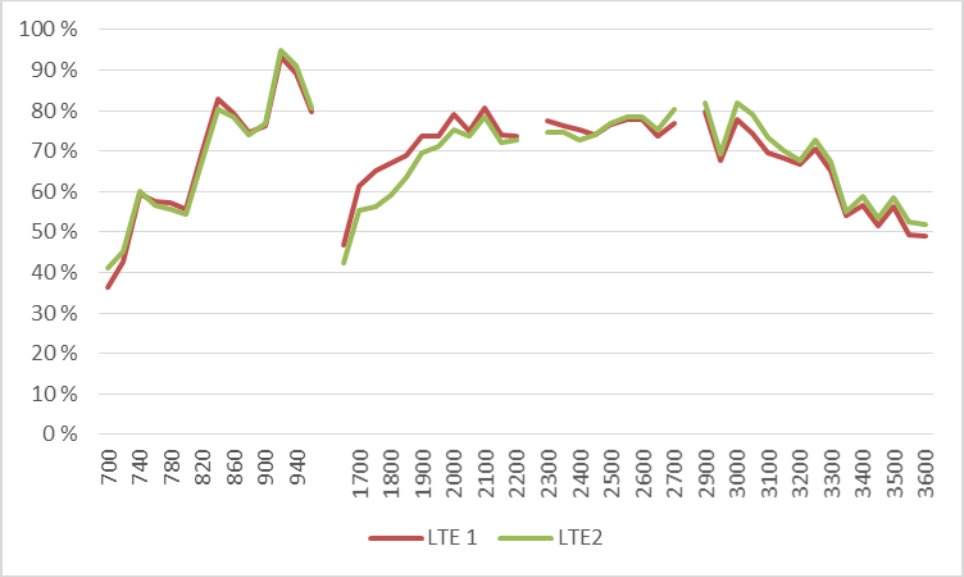
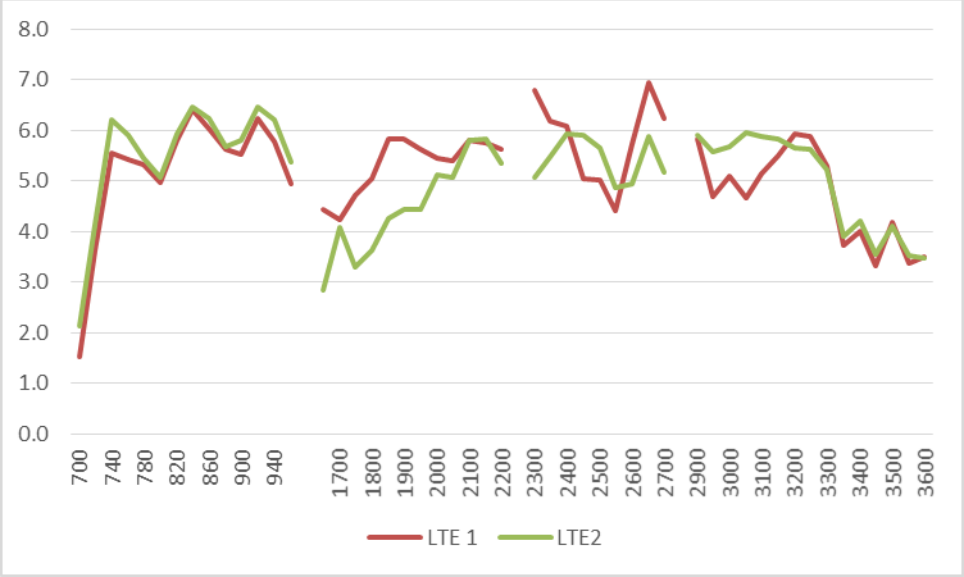
CHARTS

LTE antenna total efficiency on ground plane**



Maximum 3D gain, LTE antenna on ground plane**



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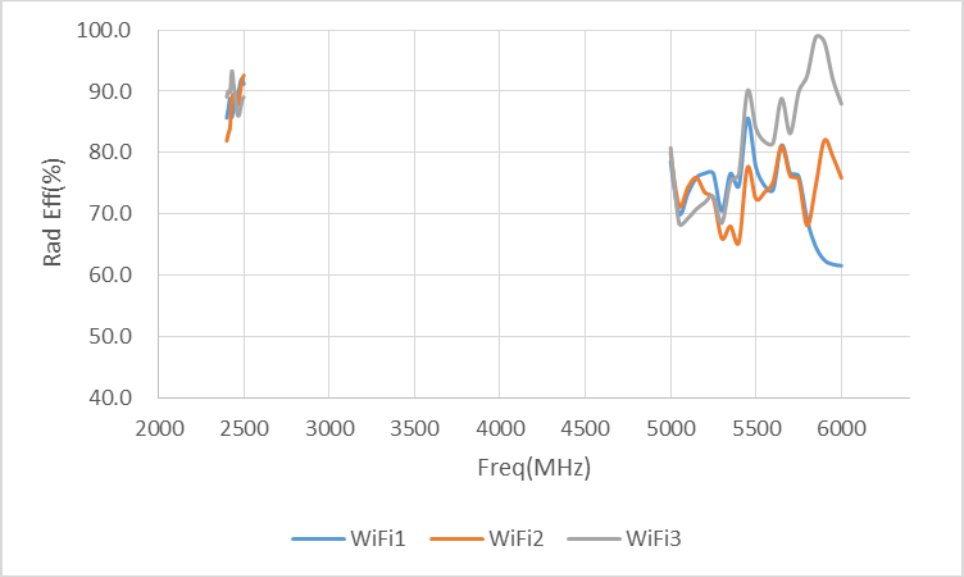
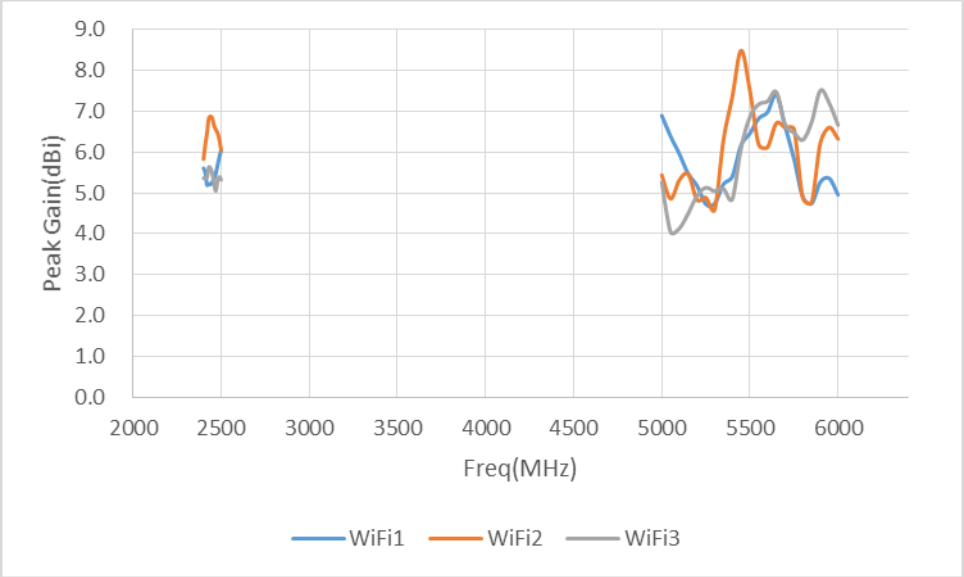
WiFi antenna total efficiency on ground plane**



Maximum 3D gain, WiFi antenna on ground plane**



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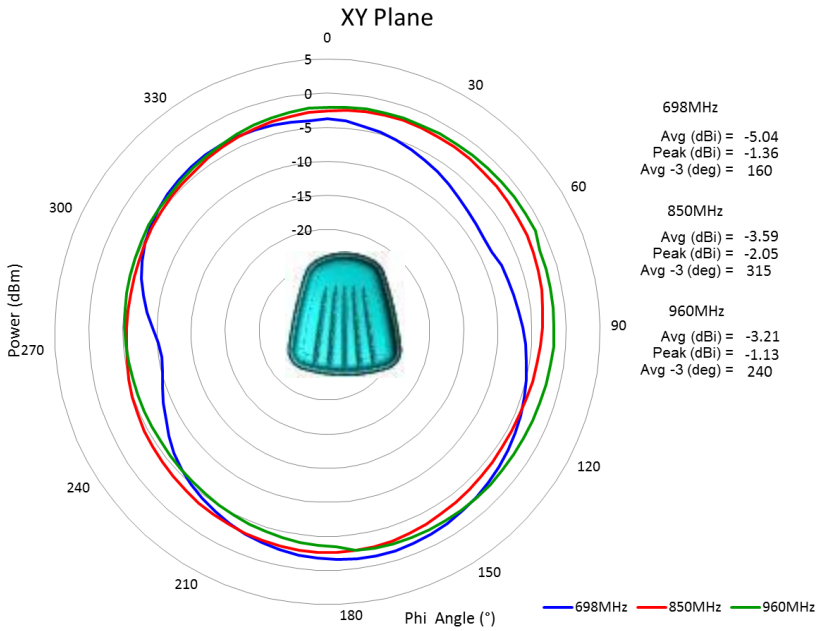
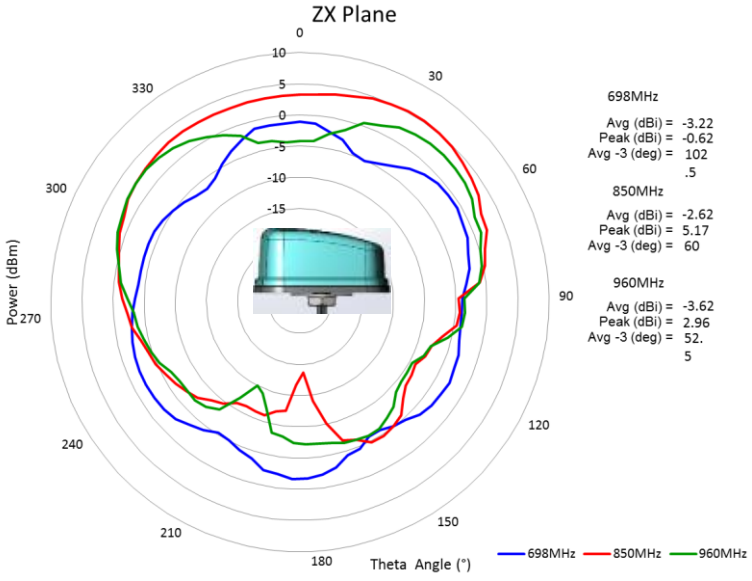
CHARTS

LTE1 antenna X-Y plane radiation pattern at LTE low band**



LTE1 antenna Z-X plane radiation pattern at LTE low band**



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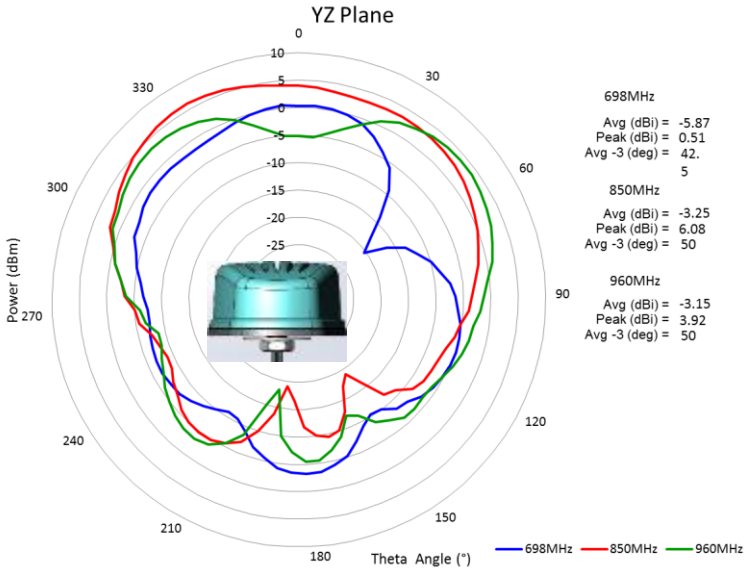
CHARTS

LTE1 antenna Y-Z plane radiation pattern at LTE low band**



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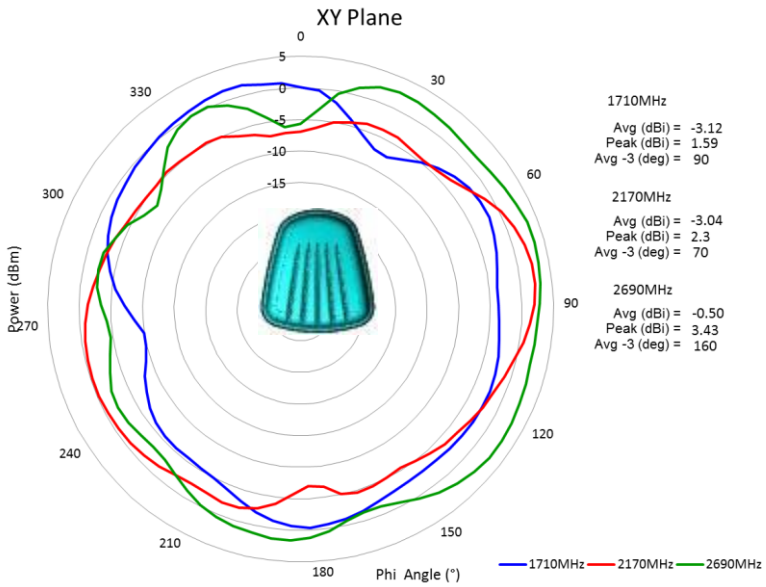
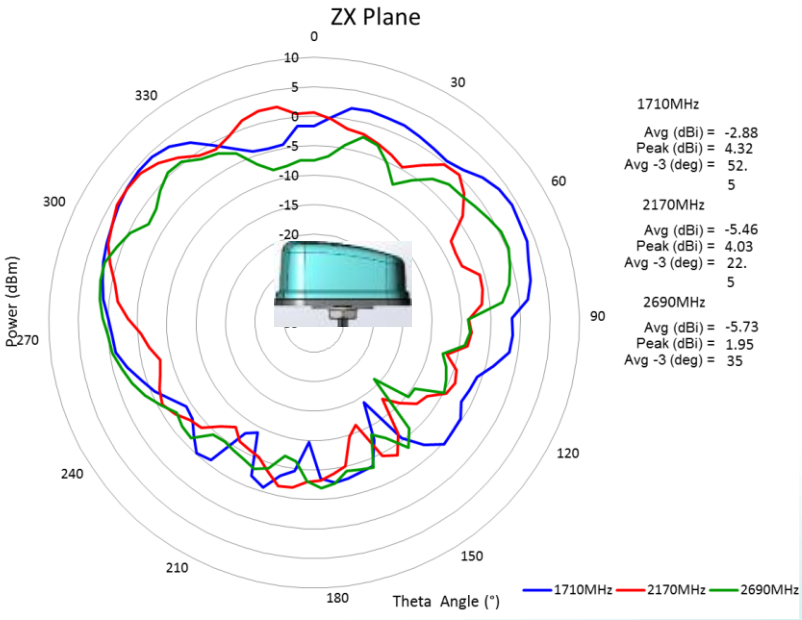
CHARTS

LTE1 antenna X-Y plane radiation pattern at LTE high band**



LTE1 antenna Z-X plane radiation pattern at LTE high band**



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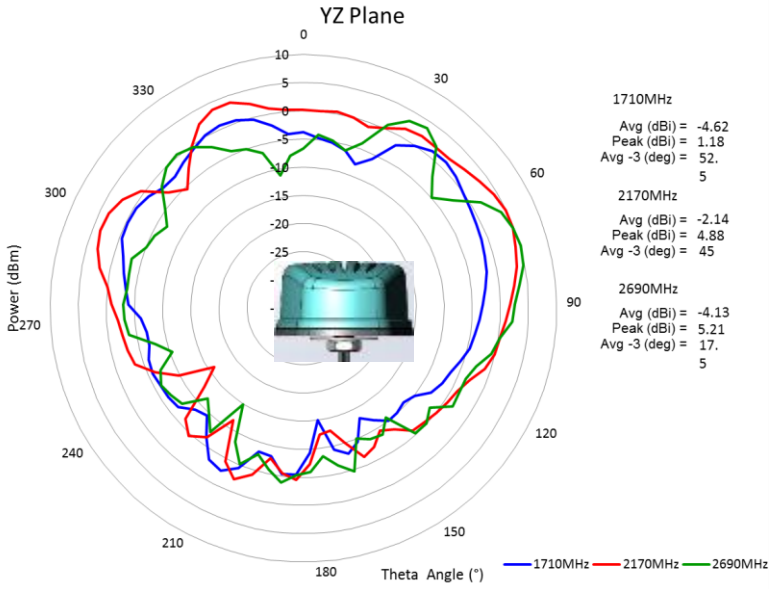
CHARTS

LTE1 antenna Y-Z plane radiation pattern at LTE high band**



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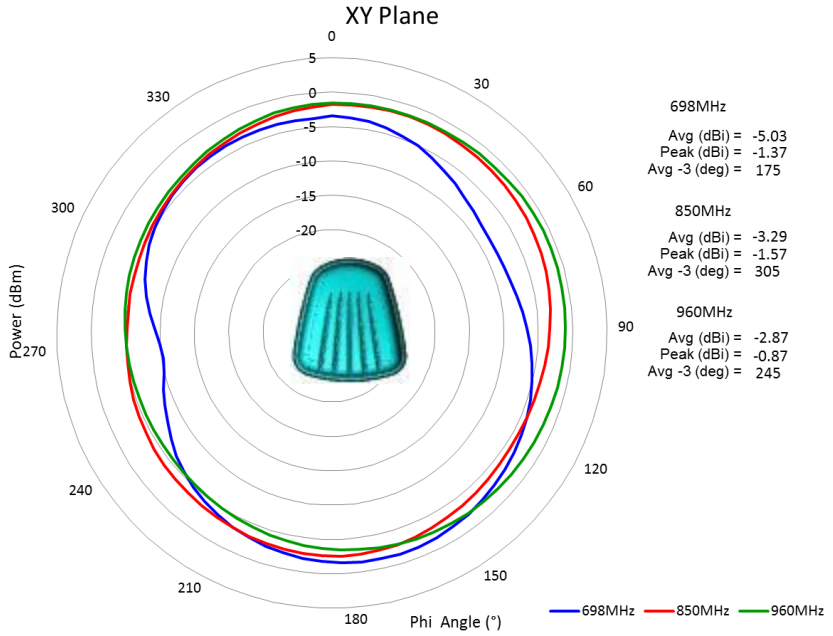
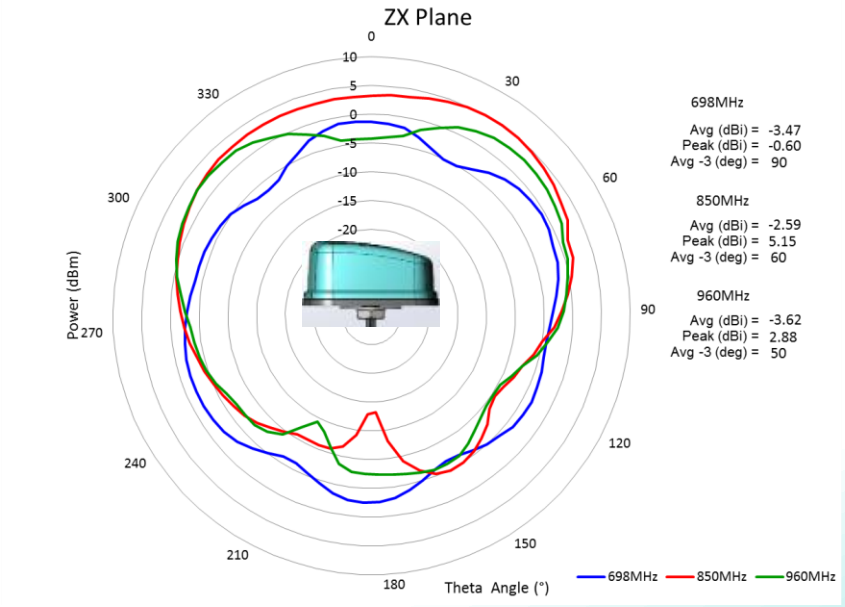
CHARTS

LTE2 antenna X-Y plane radiation pattern at LTE low band**



LTE2 antenna Z-X plane radiation pattern at LTE low band**



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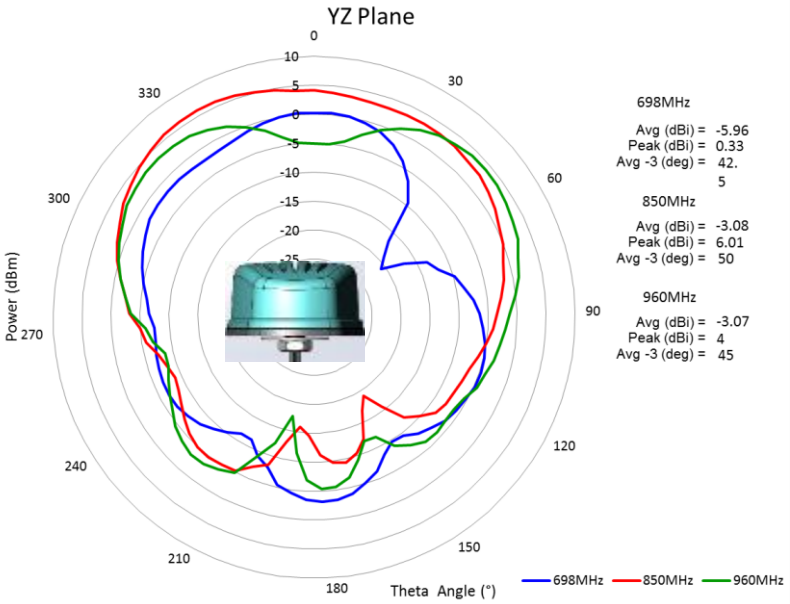
Description: 2xMiMo LTE, 3xMiMo WiFi, GNSS Vehicle Mount Antenna

Series: Panther

PART NUMBER: PAN62311DM, PAN62312DM, PAN62311DMR,PAN62312DMR

CHARTS

LTE2 antenna Y-Z plane radiation pattern at LTE low band**



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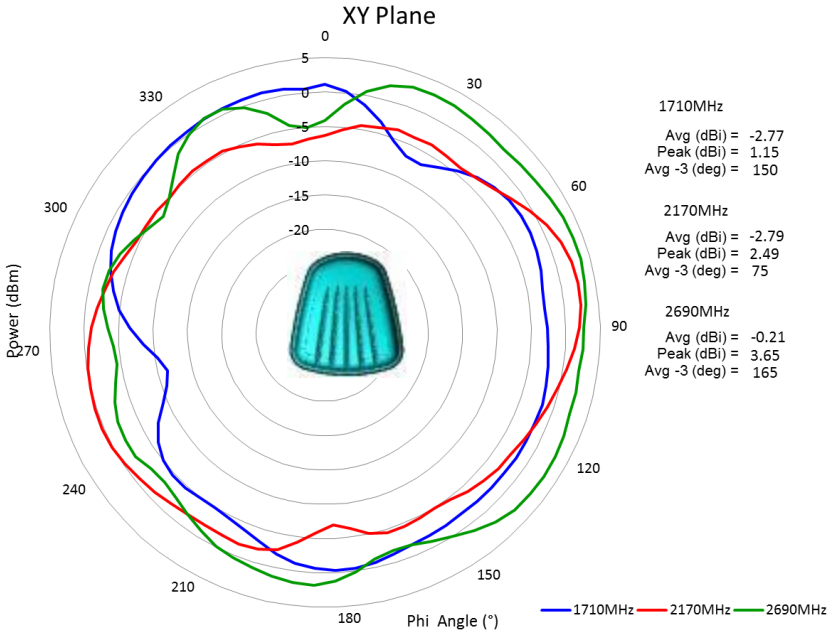
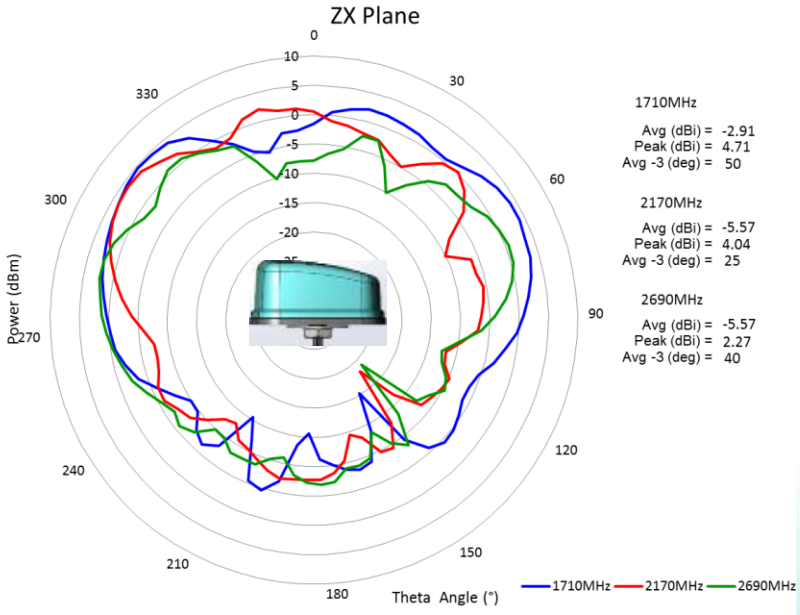
LTE2 antenna X-Y plane radiation pattern at LTE high band**



LTE2 antenna Z-X plane radiation pattern at LTE high band**



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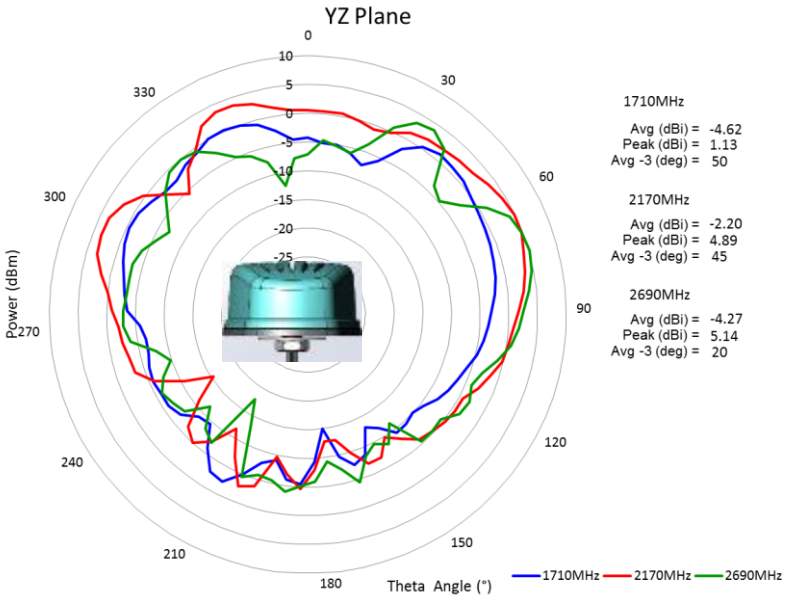

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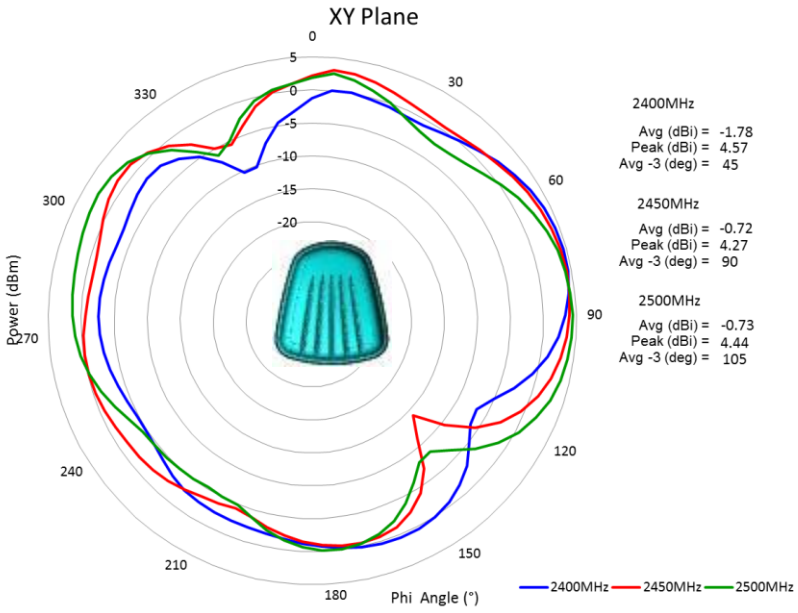
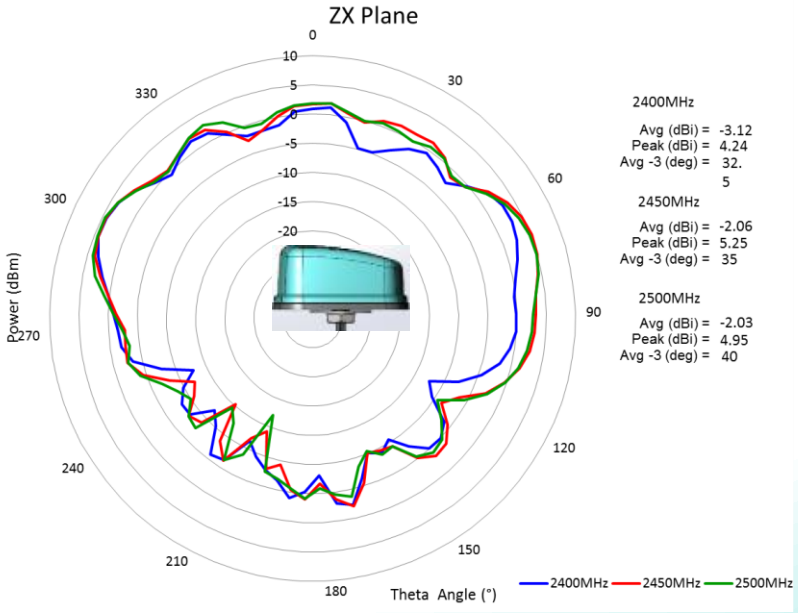
CHARTS

WiFi1 antenna X-Y plane radiation pattern at WiFi low band**



WiFi1 antenna Z-X plane radiation pattern at WiFi low band**



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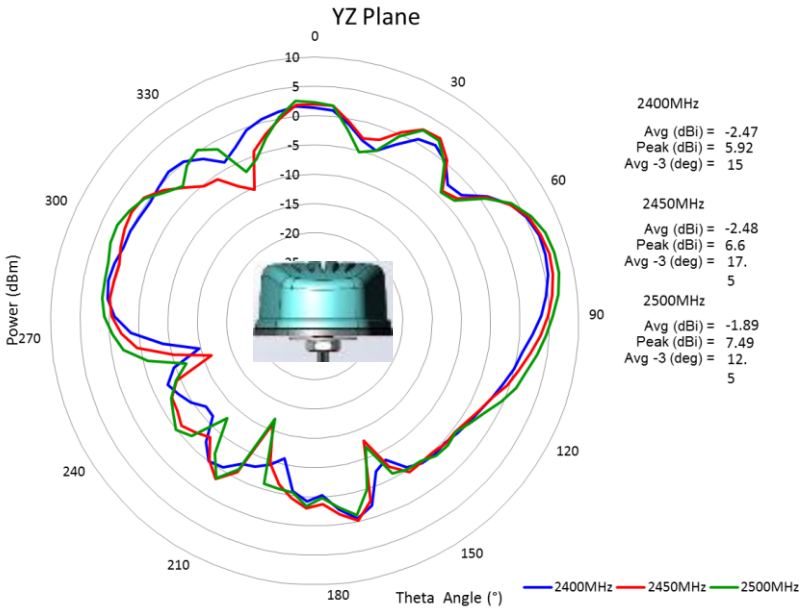

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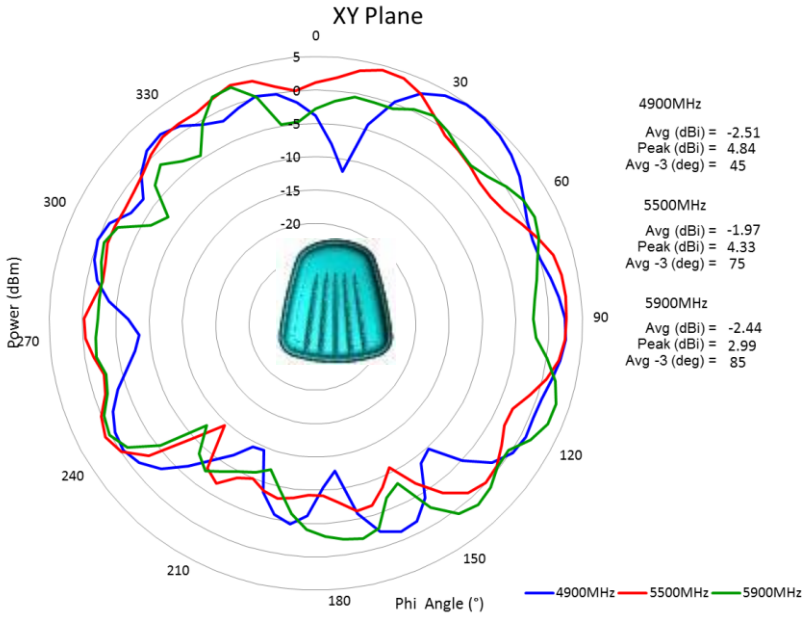
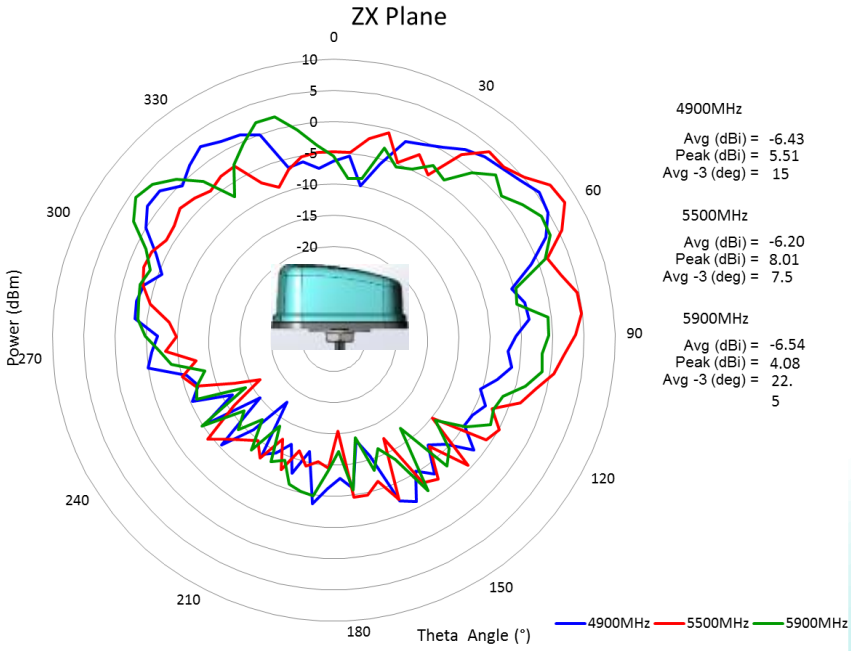
WiFi1 antenna X-Y plane radiation pattern at WiFi high band**



WiFi1 antenna Z-X plane radiation pattern at WiFi high band**



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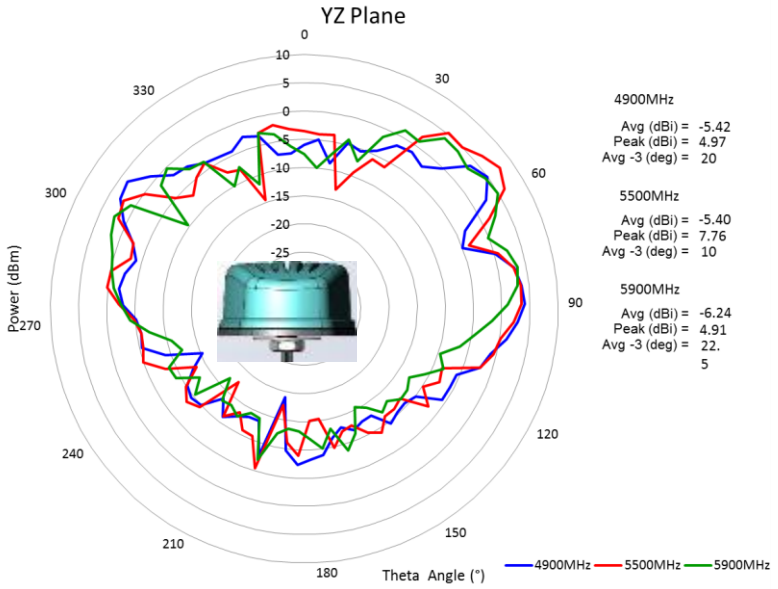
WiFi1 antenna Y-Z plane radiation pattern at WiFi high band**



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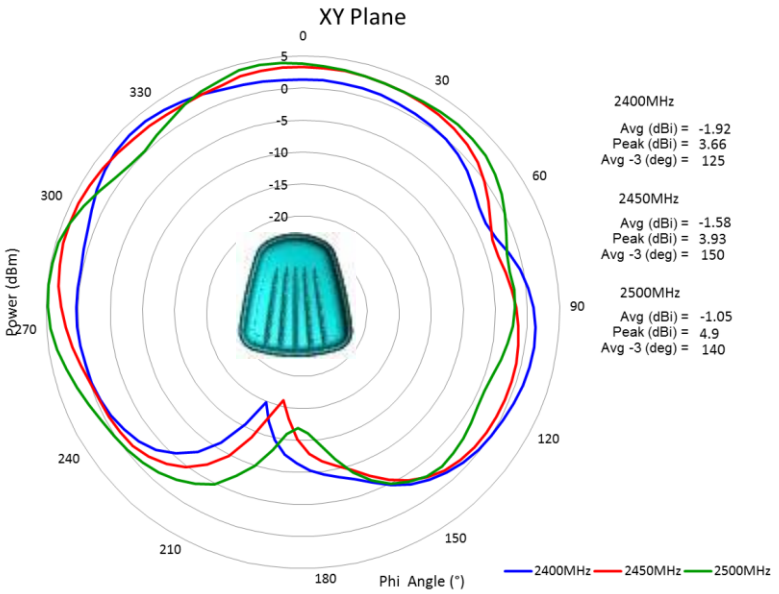
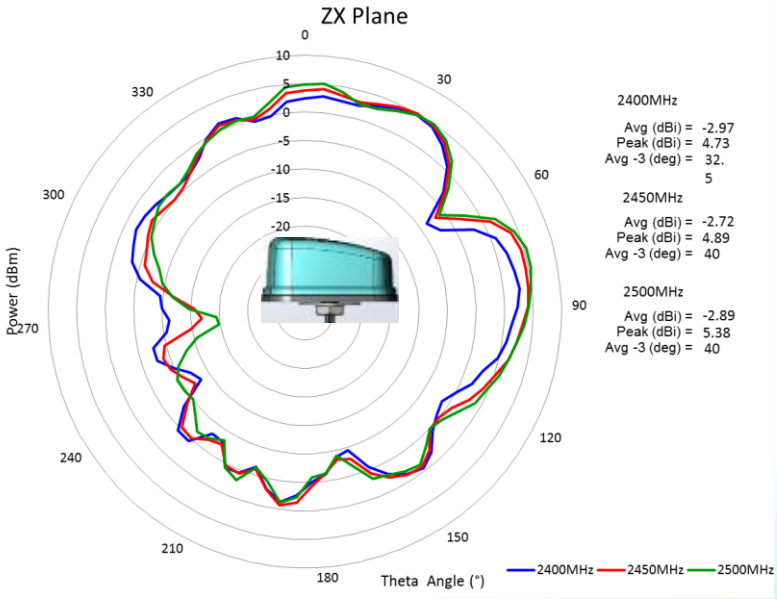
CHARTS

WiFi2 antenna X-Y plane radiation pattern at WiFi low band**



WiFi2 antenna Z-X plane radiation pattern at WiFi low band**



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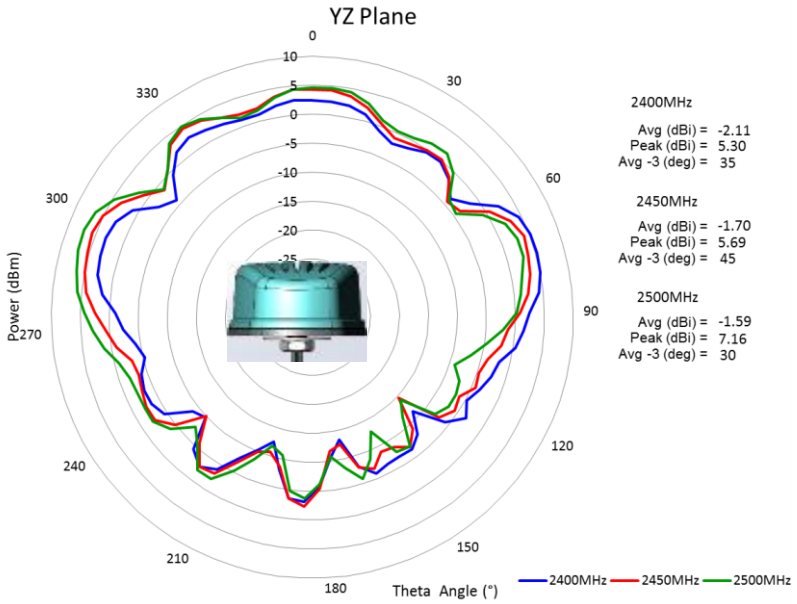

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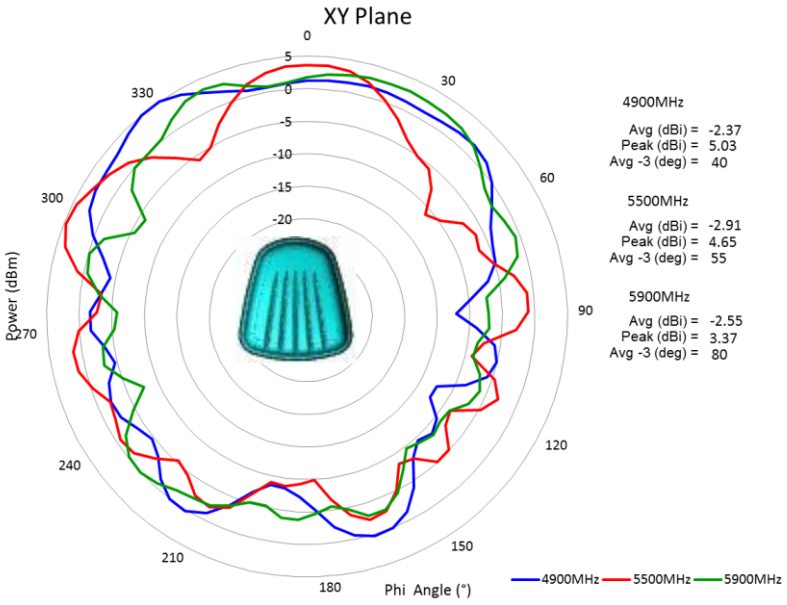
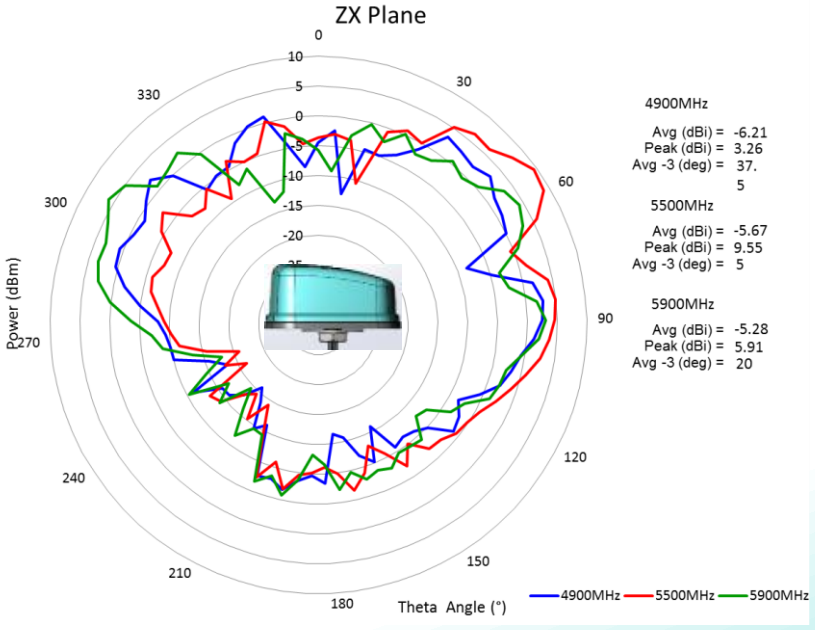
WiFi2 antenna X-Y plane radiation pattern at WiFi high band**



WiFi2 antenna Z-X plane radiation pattern at WiFi high band**



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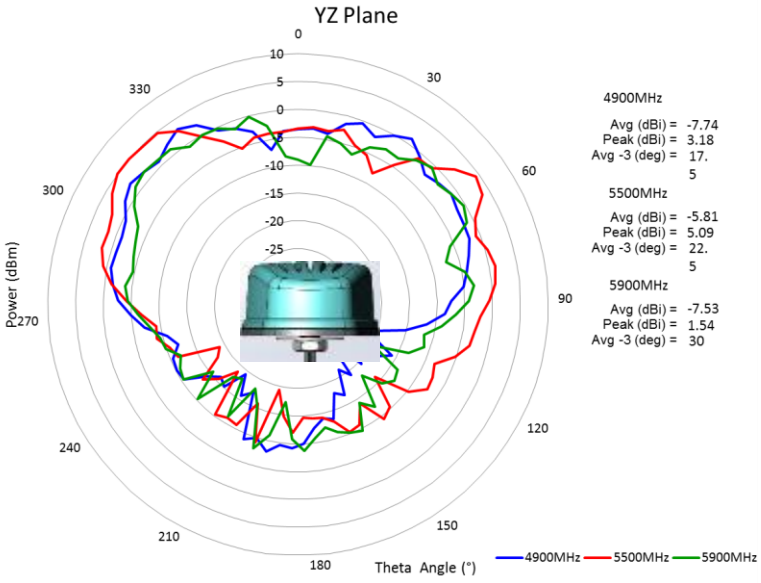

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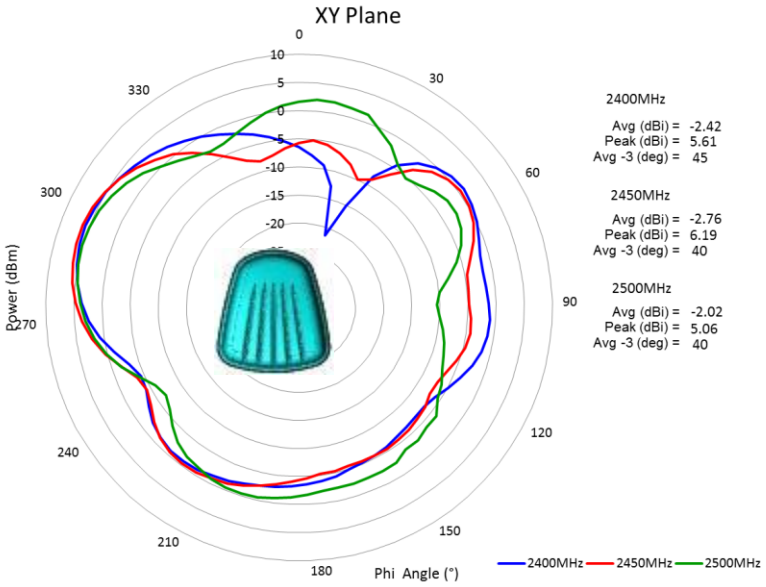
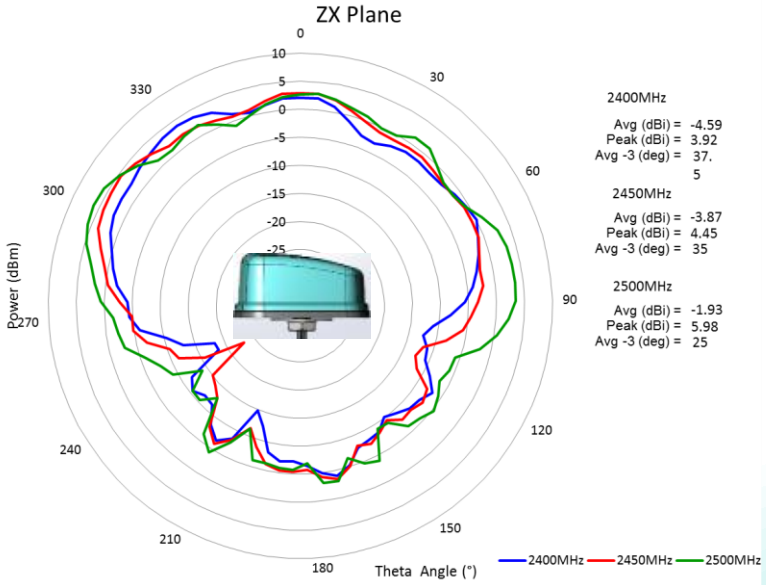
CHARTS

WiFi3 antenna X-Y plane radiation pattern at WiFi low band**



WiFi3 antenna Z-X plane radiation pattern at WiFi low band**



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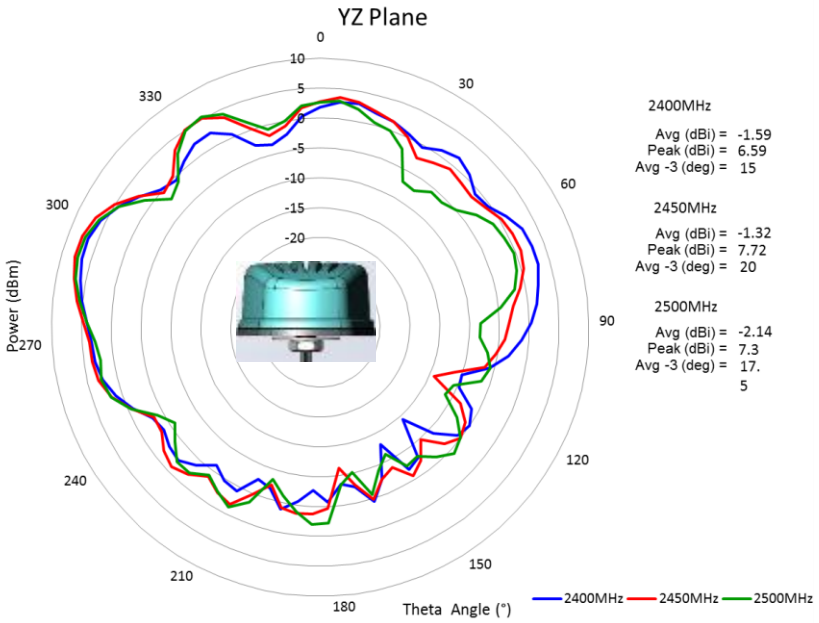
WiFi3 antenna Y-Z plane radiation pattern at WiFi low band**



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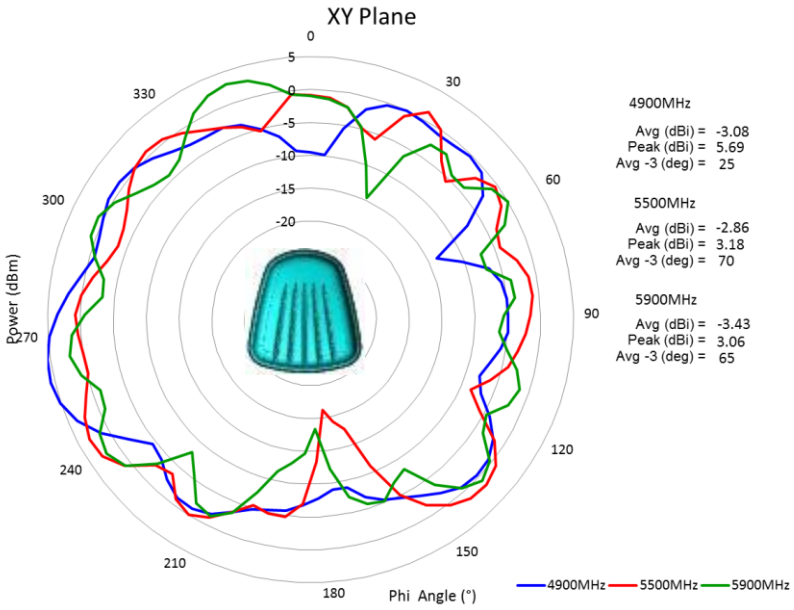
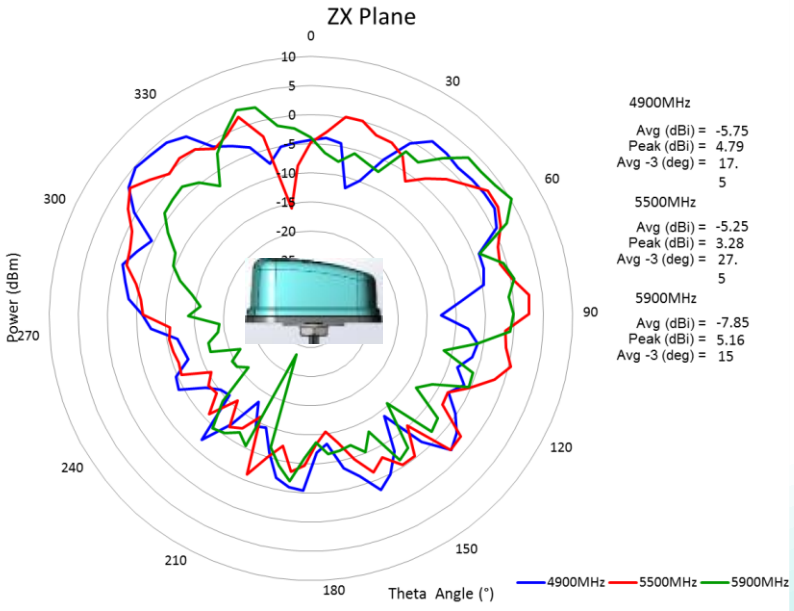
WiFi3 antenna X-Y plane radiation pattern at WiFi high band**



WiFi3 antenna Z-X plane radiation pattern at WiFi high band**



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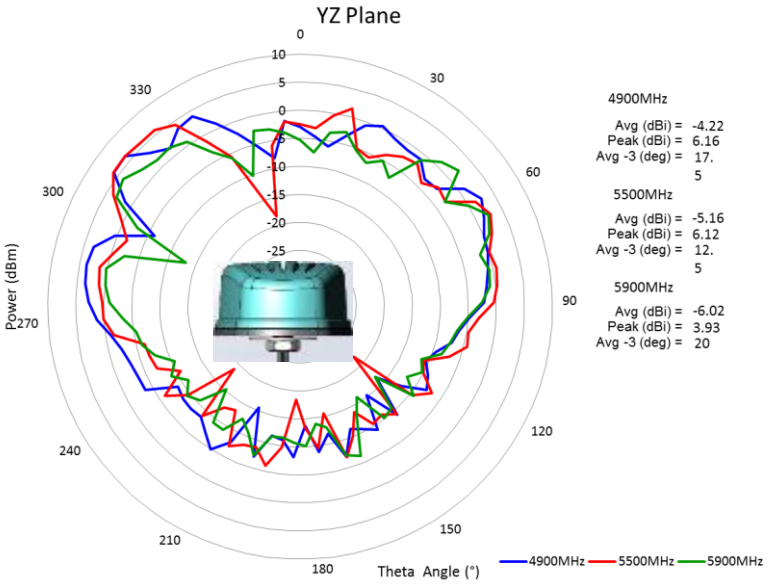
WiFi3 antenna Y-Z plane radiation pattern at WiFi high band**



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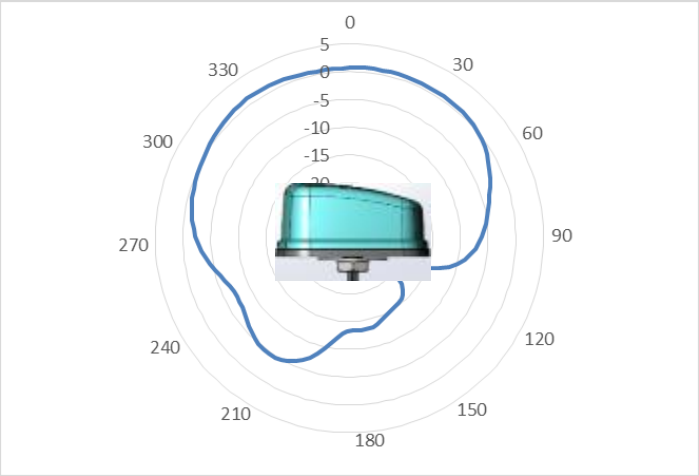
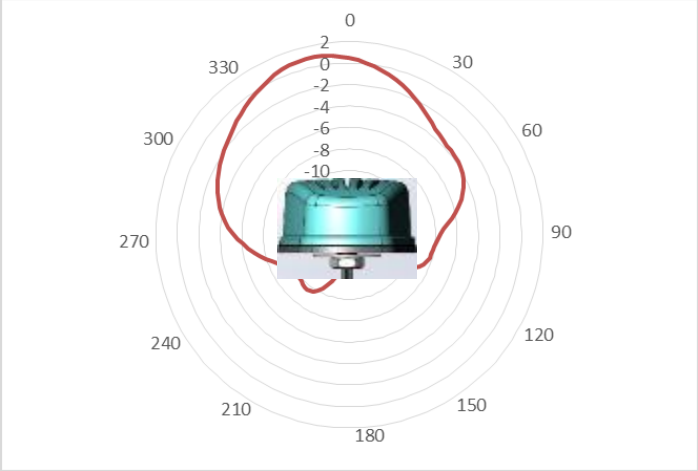
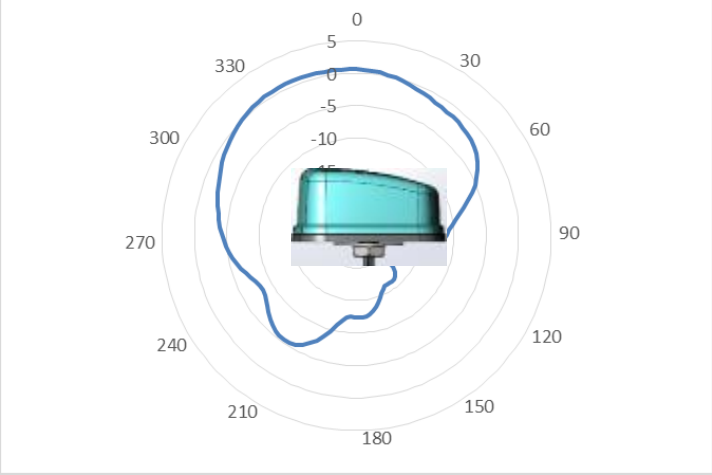
CHARTS

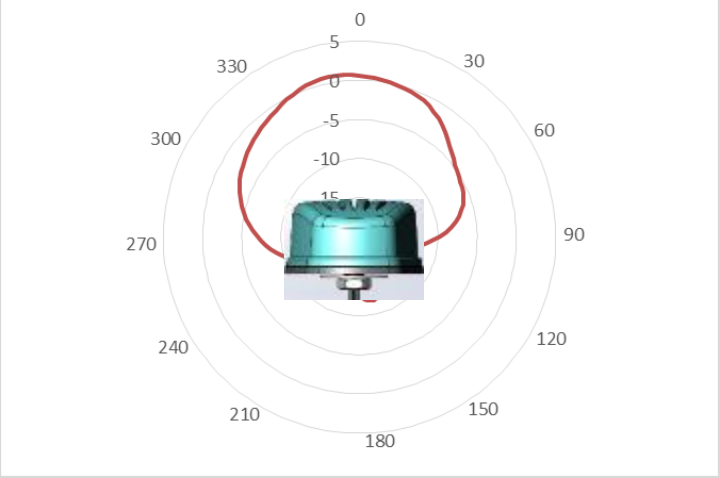
GNSS antenna, BD2 RHCP patterns, in free space*





GNSS antenna, GPS & Galileo RHCP patterns, in free space*





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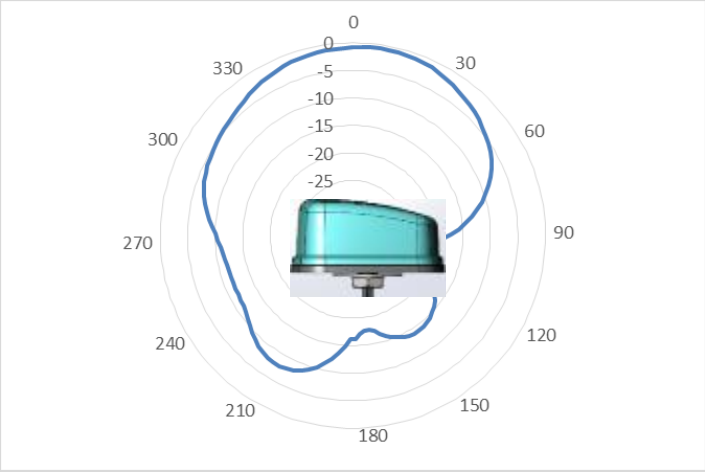
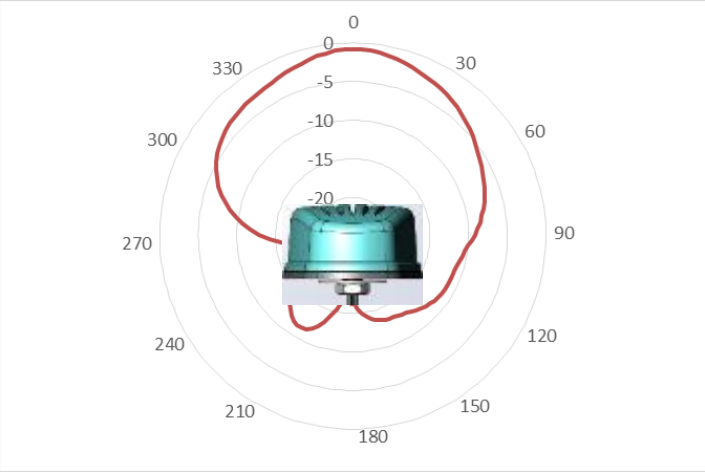
CHARTS

GNSS antenna, GLONASS RHCP patterns, in free space*





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PACKAGING

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

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