



PAN62311DM Black



PAN62312DM White

All dimensions are in mm / inches

Issue: 1833

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For more information:

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15255 Innovation Drive #100
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Tel: 1-858-674-8100

Pulse/Larsen Antennas
18110 SE 34th St Bldg 2 Suite 250
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

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

Applications:

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



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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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 1518ft-lb (20-25Nm). |

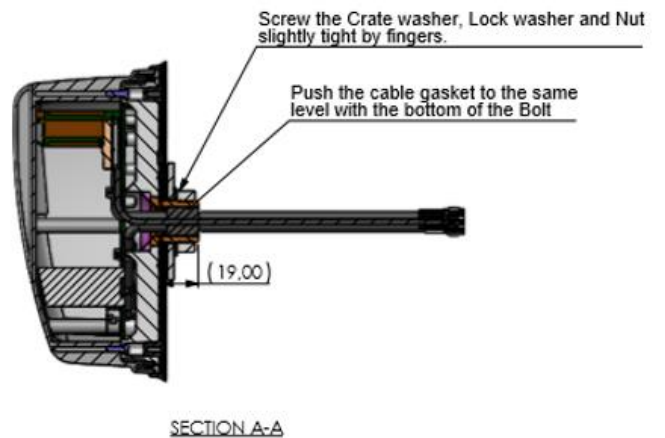
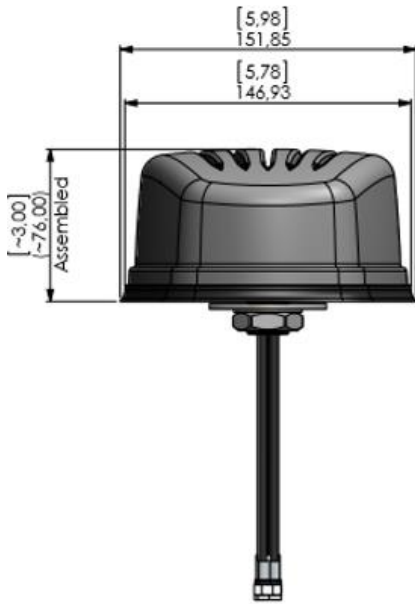
ENVIRONMENTAL SPECIFICATIONS

| | |
|-----------------------|---|
| 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 |

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 |

MECHANICAL DRAWING



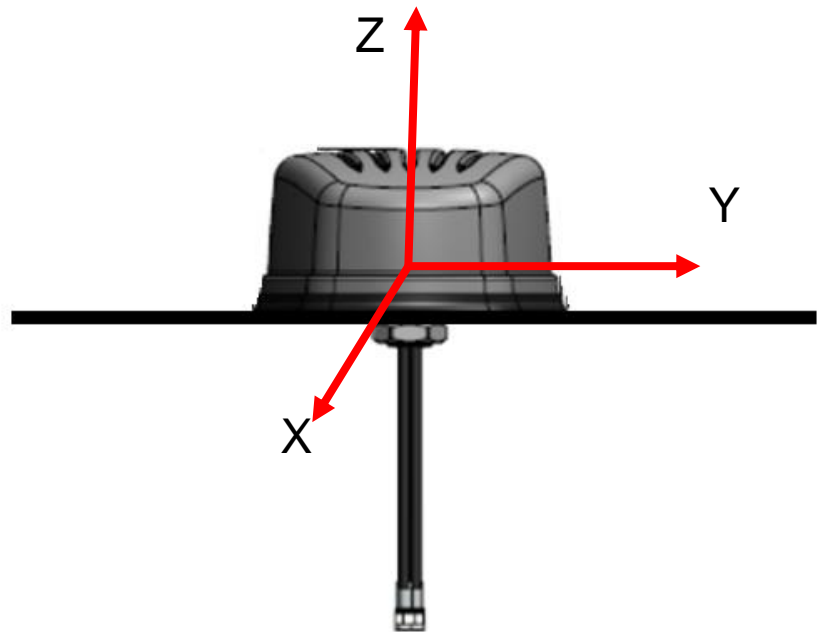
Series: Panther

TECHNICAL DATA SHEET

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

PART NUMBER: PAN62311DM, PAN62312DM,
PAN62311DMR, PAN62312DMR

TEST SETUP

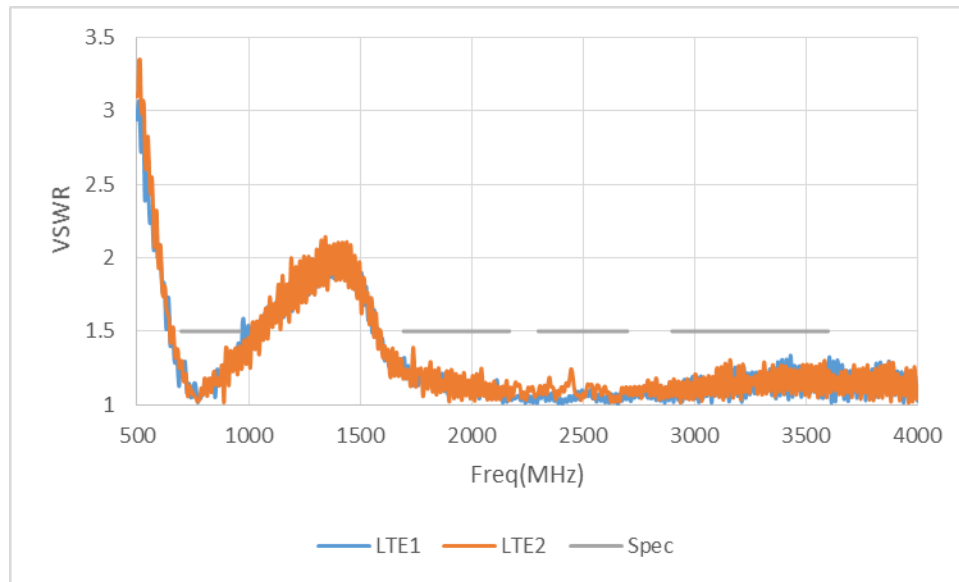


For VSWR, test in free space with 17ft cables

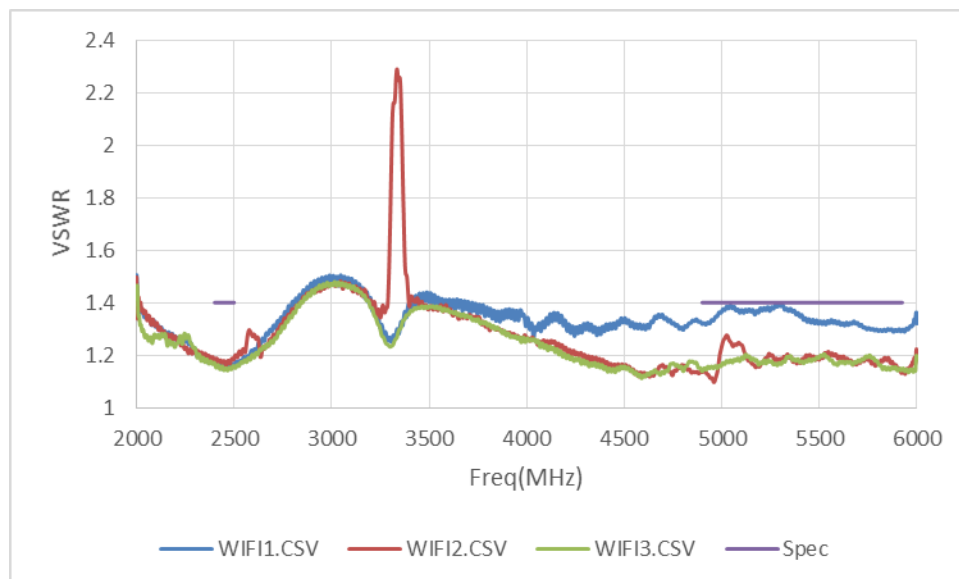
For radiation performance, test on 2ft GND plane with 4inch cables

CHARTS

VSWR of LTE antenna

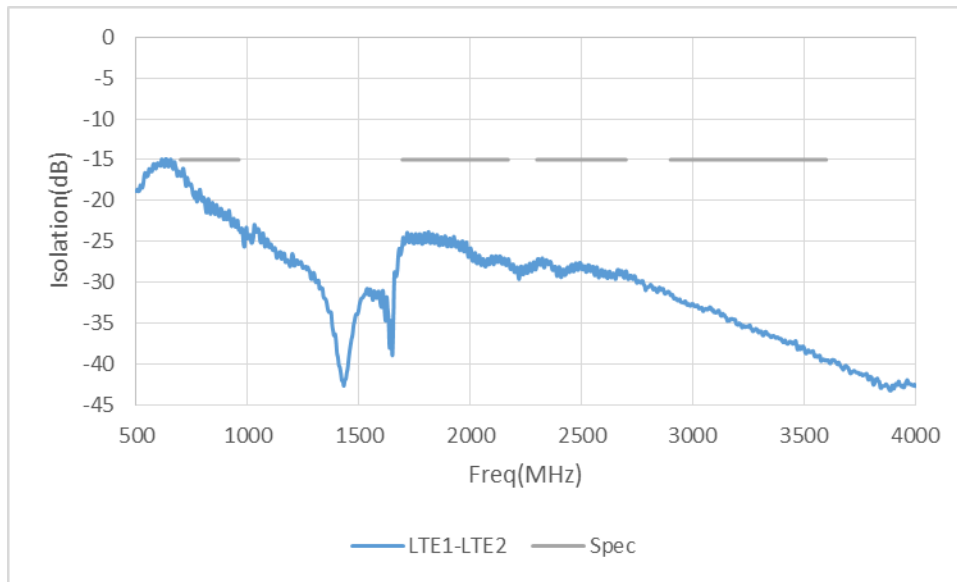


VSWR of WiFi antenna

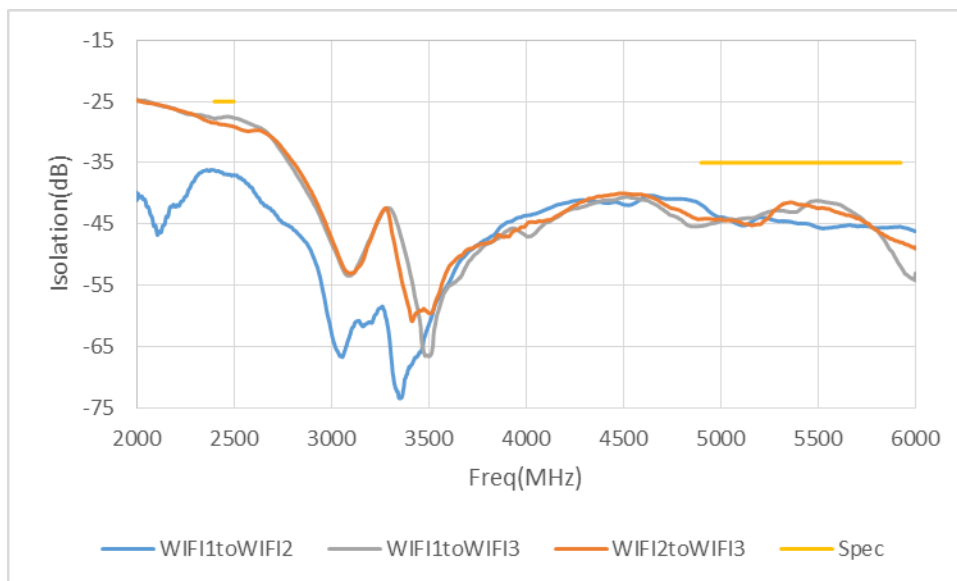


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Isolation of LTE antenna



Isolation of WiFi antenna



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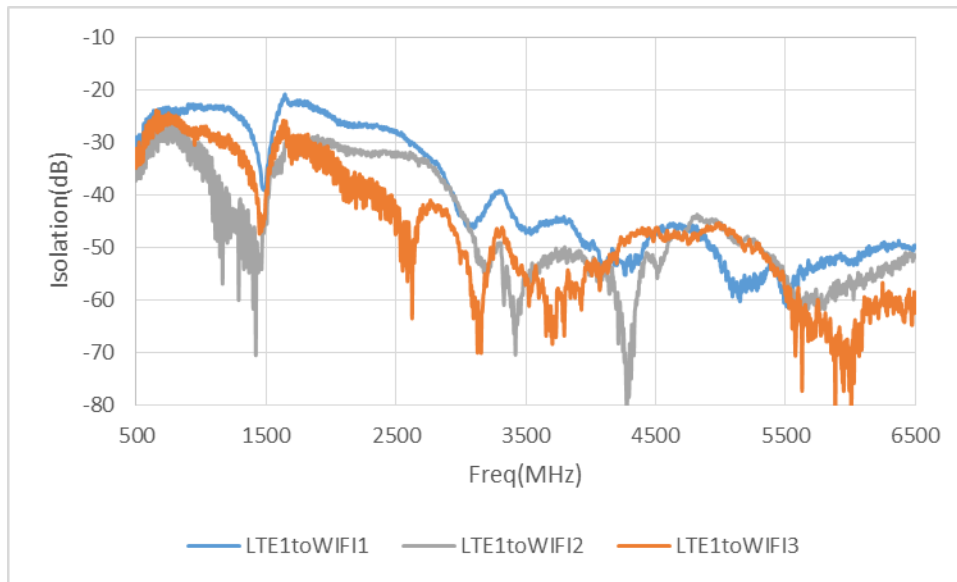
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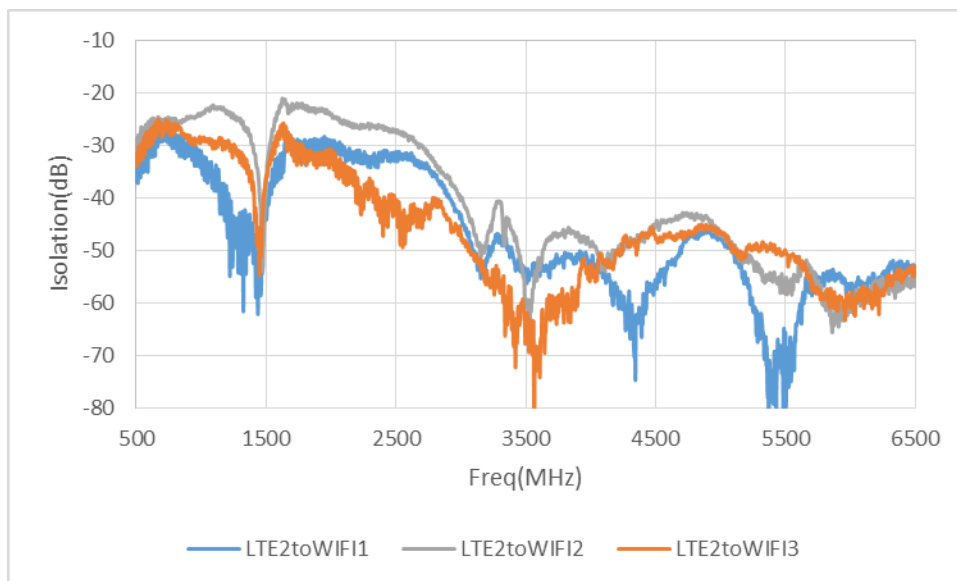
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Isolation of LTE1 antenna to WiFi antenna



Isolation of LTE2 antenna to WiFi antenna



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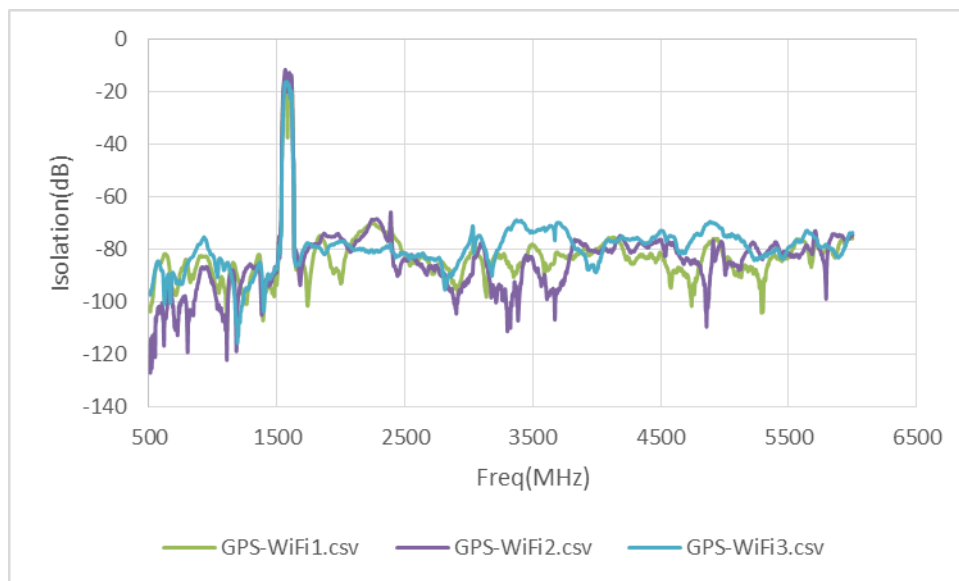
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Isolation of GNSS antenna to LTE antenna



Isolation of GNSS antenna to WiFi antenna



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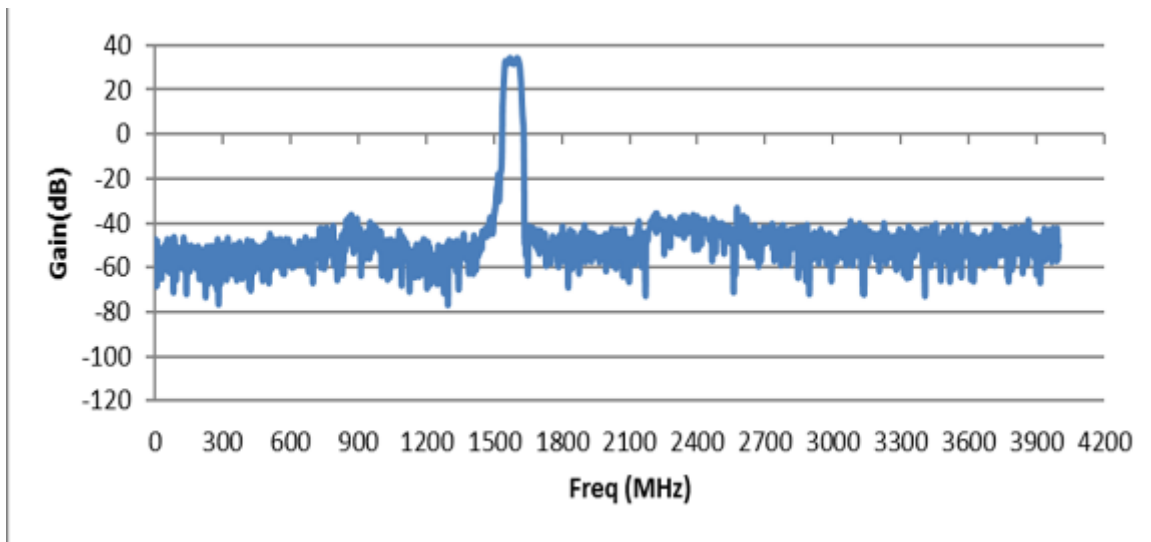
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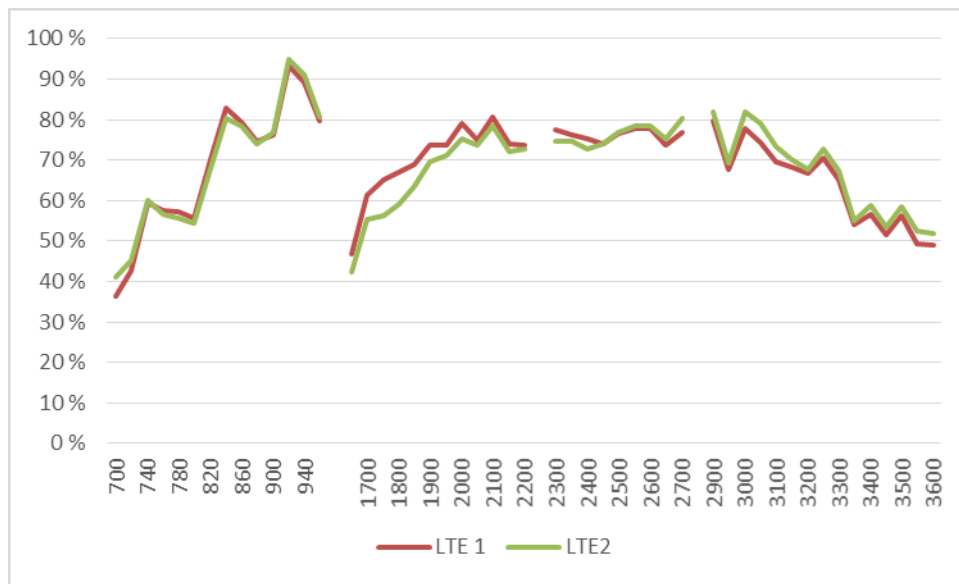
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GNSS LNA performance

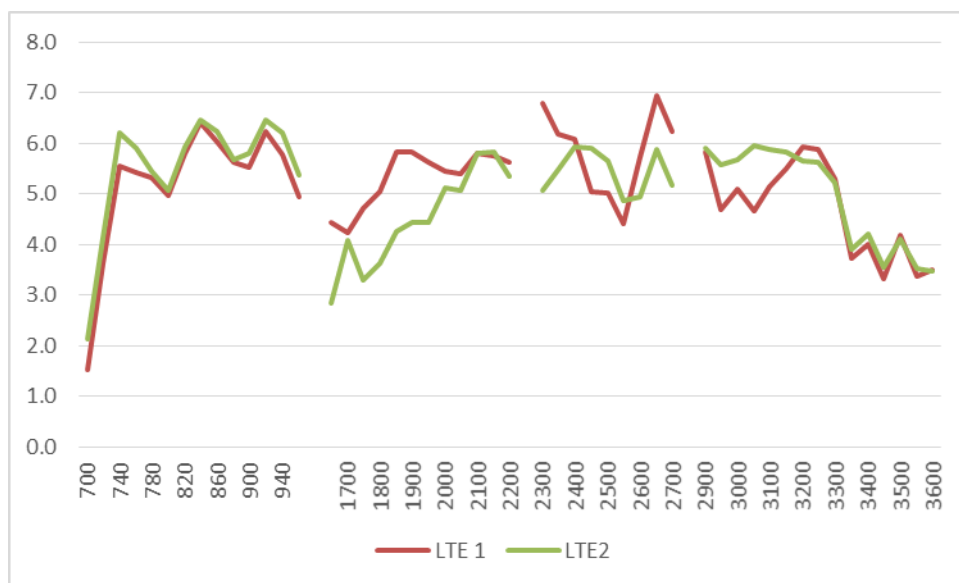


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LTE antenna total efficiency on ground plane**

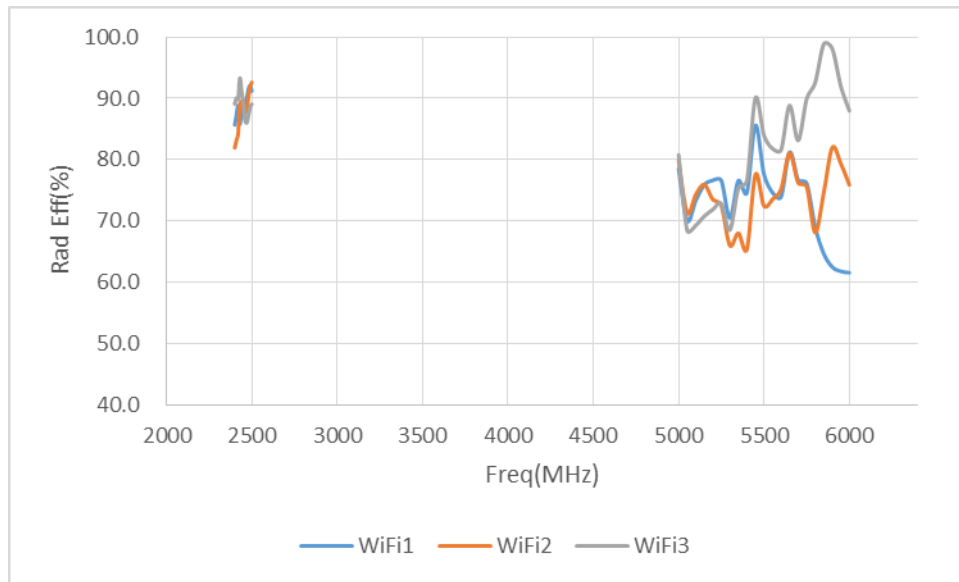


Maximum 3D gain, LTE antenna on ground plane**

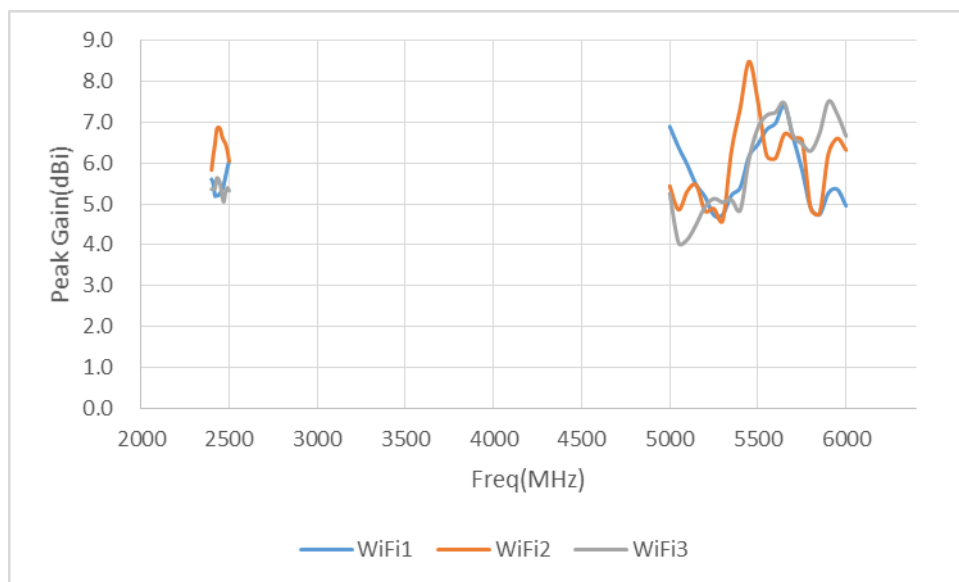


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WiFi antenna total efficiency on ground plane**

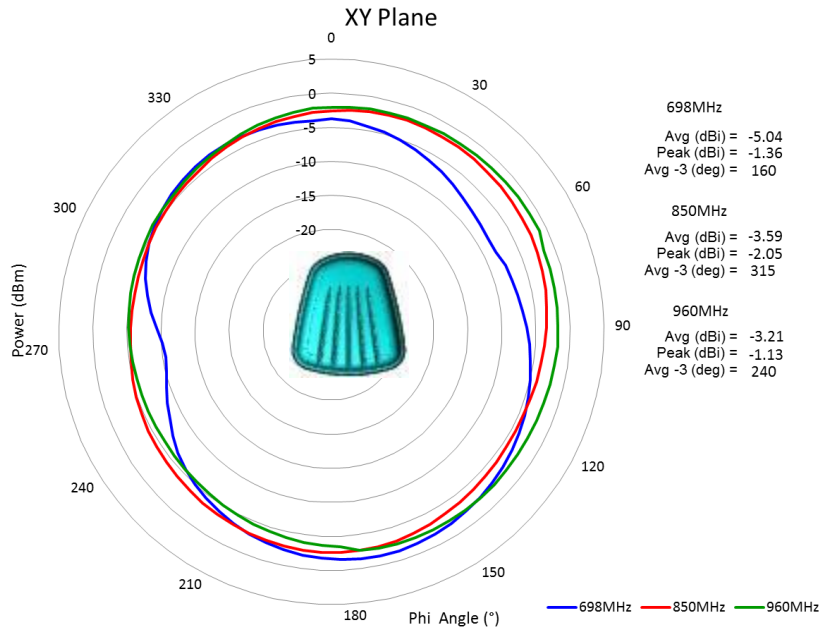


Maximum 3D gain, WiFi antenna on ground plane**

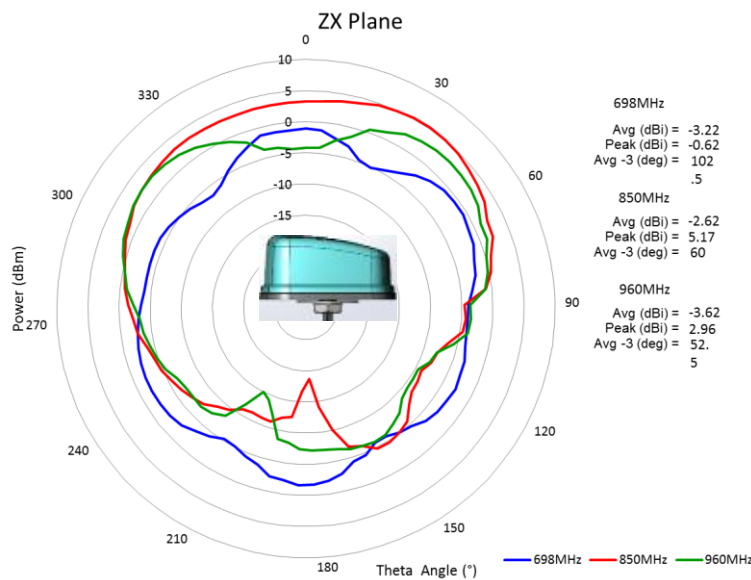


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LTE1 antenna X-Y plane radiation pattern at LTE low band**



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



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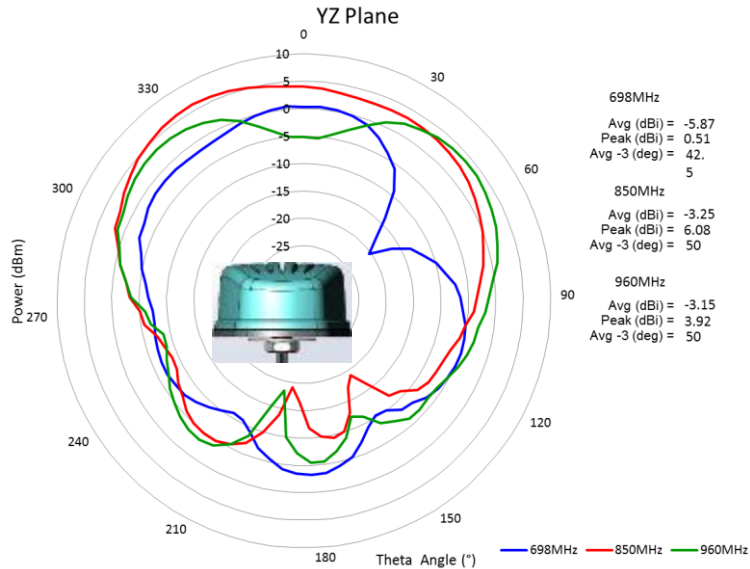
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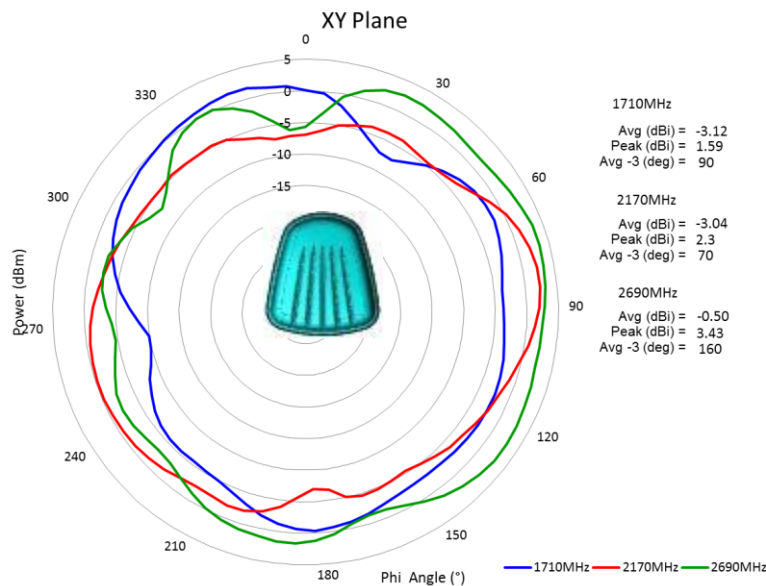
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LTE1 antenna Y-Z plane radiation pattern at LTE low band**

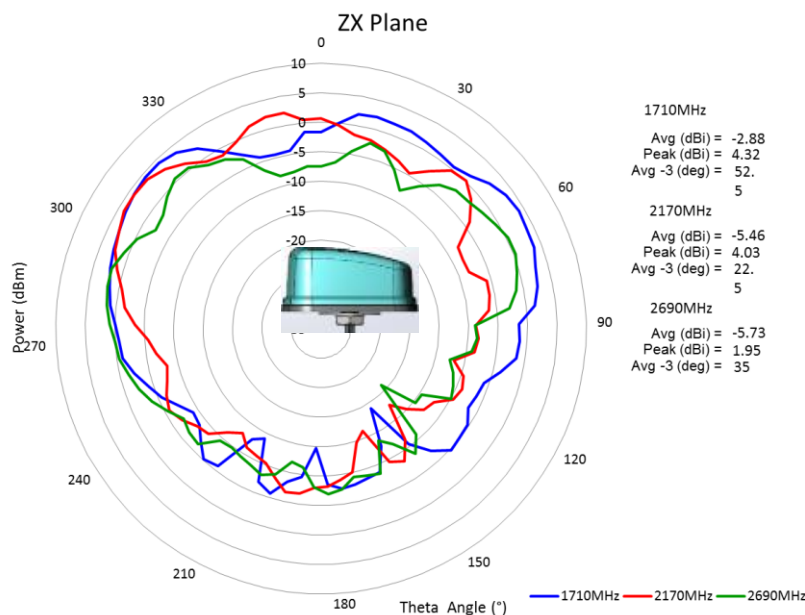


CHARTS

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



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



Issue: 1833

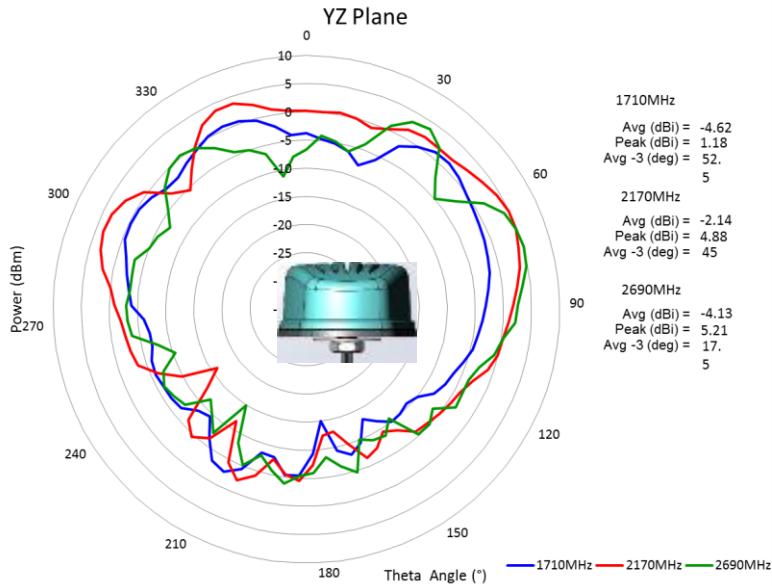
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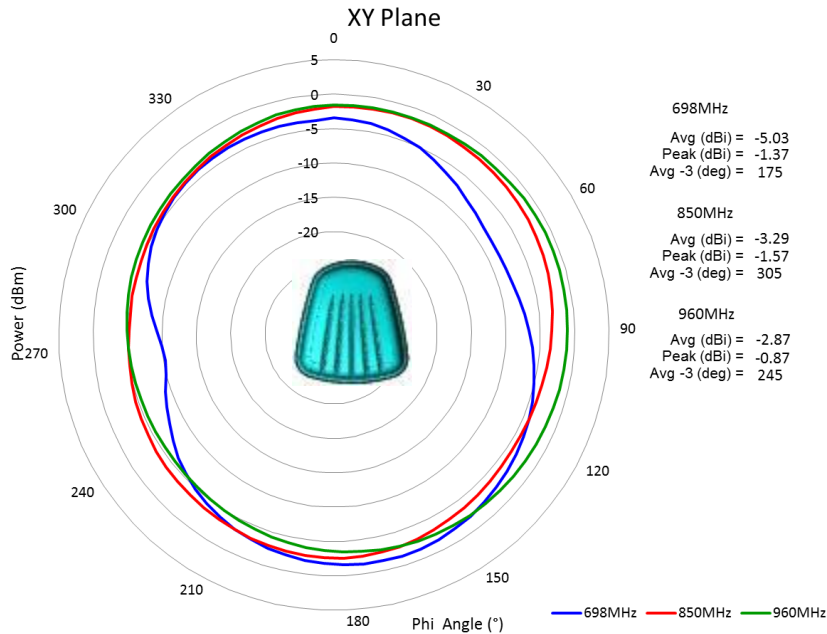
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LTE1 antenna Y-Z plane radiation pattern at LTE high band**

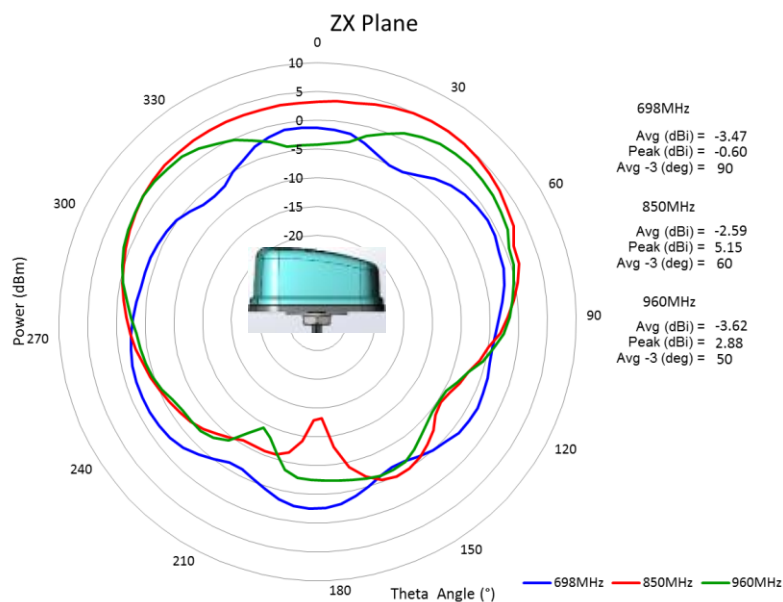


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LTE2 antenna X-Y plane radiation pattern at LTE low band**



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



Issue: 1833

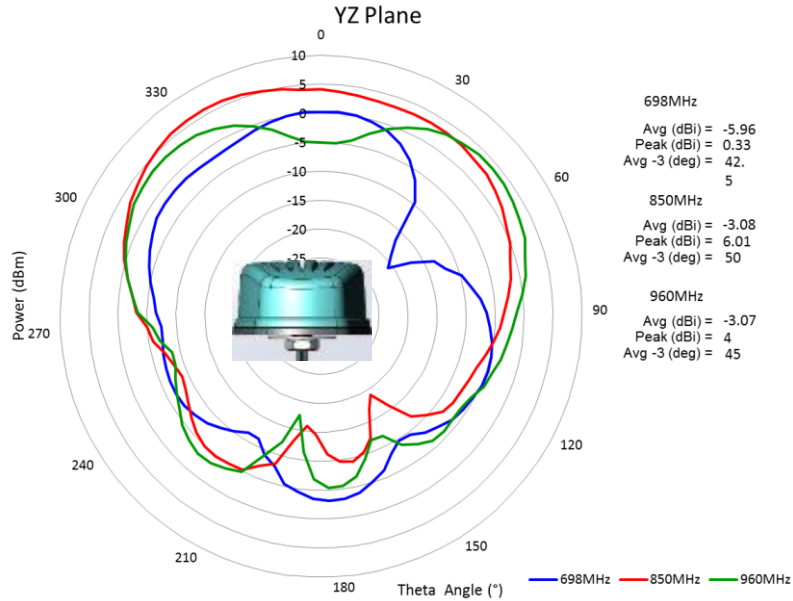
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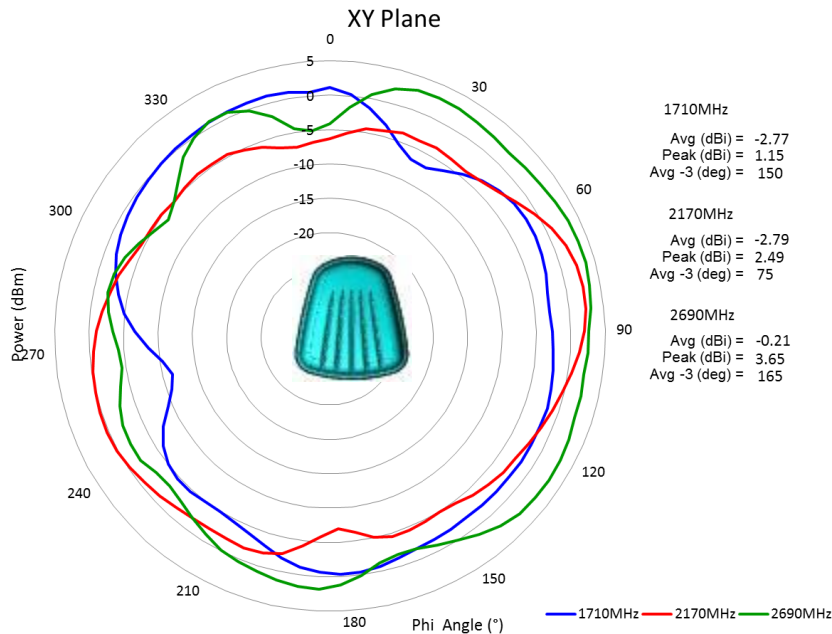
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LTE2 antenna Y-Z plane radiation pattern at LTE low band**

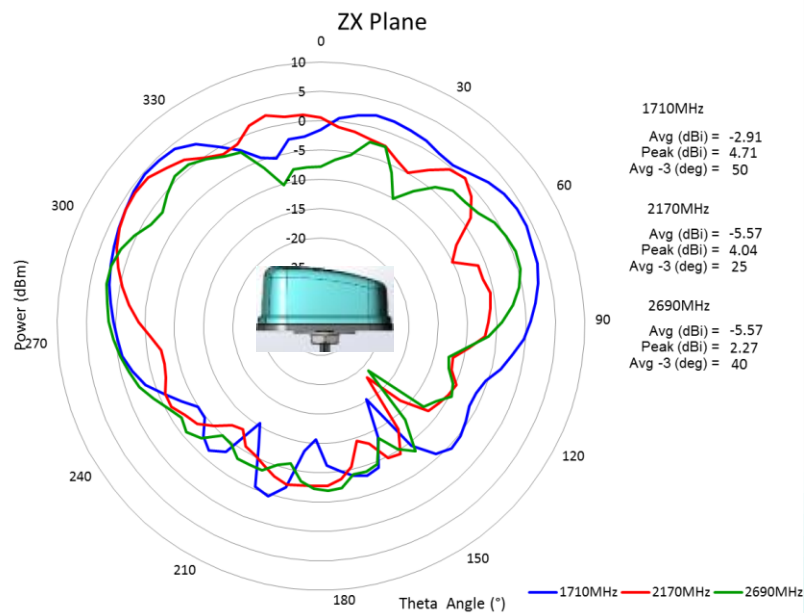


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LTE2 antenna X-Y plane radiation pattern at LTE high band**



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



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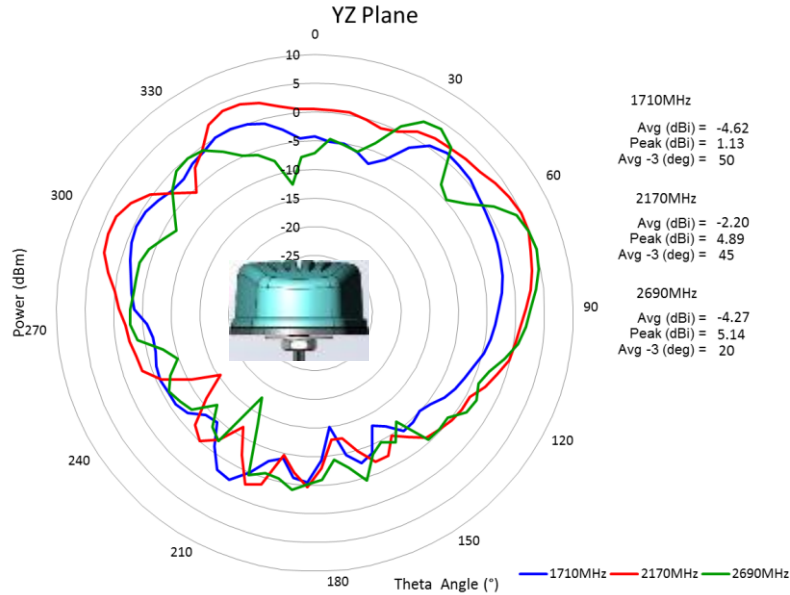
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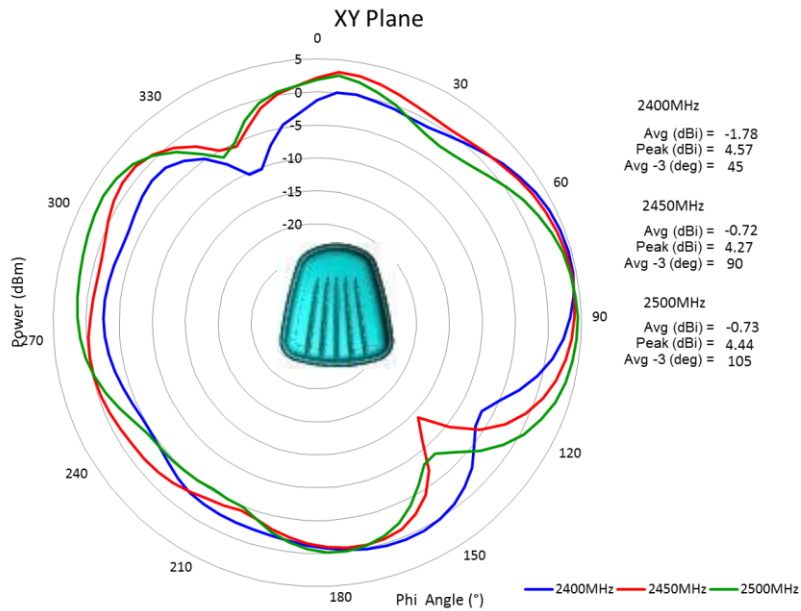
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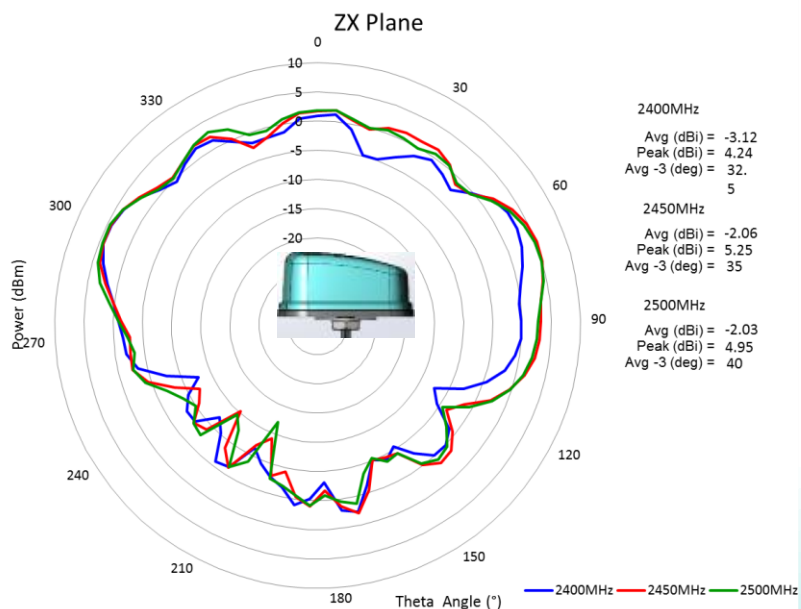


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WiFi1 antenna X-Y plane radiation pattern at WiFi low band**



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



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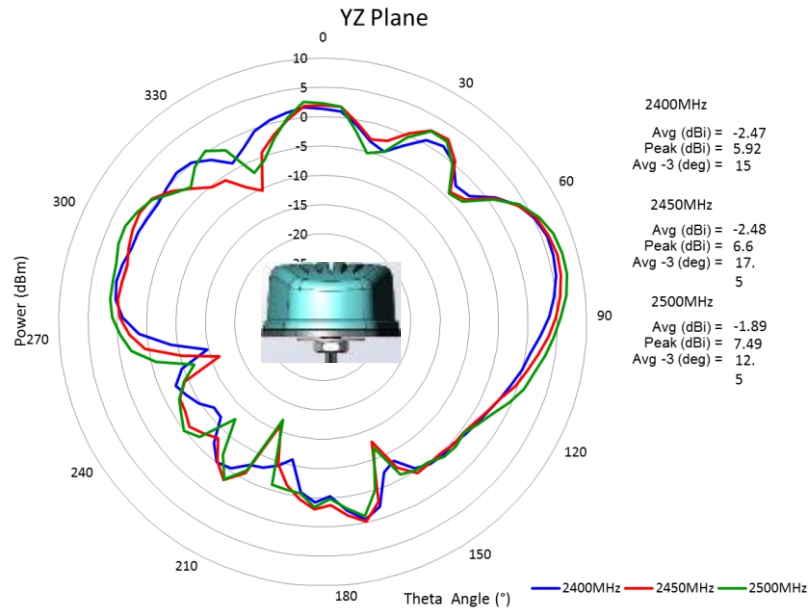
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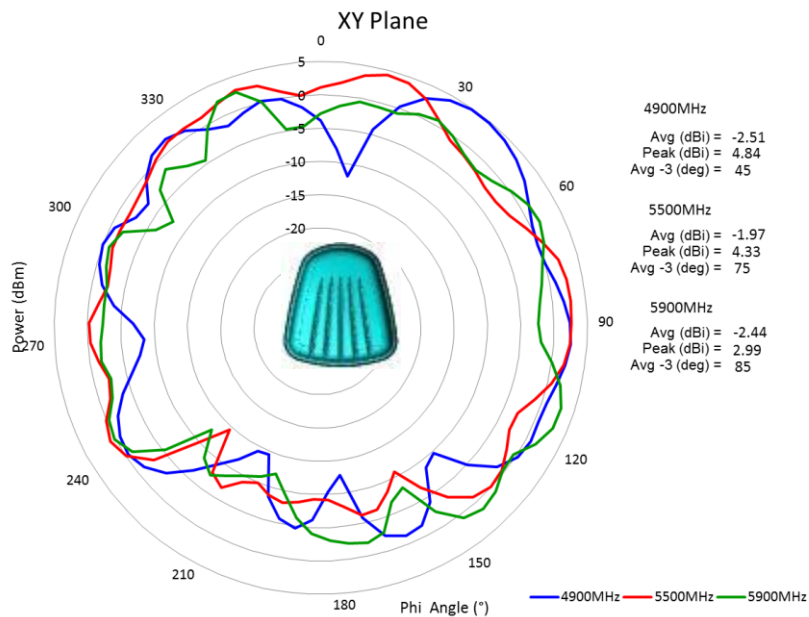
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WiFi1 antenna Y-Z plane radiation pattern at WiFi low band**

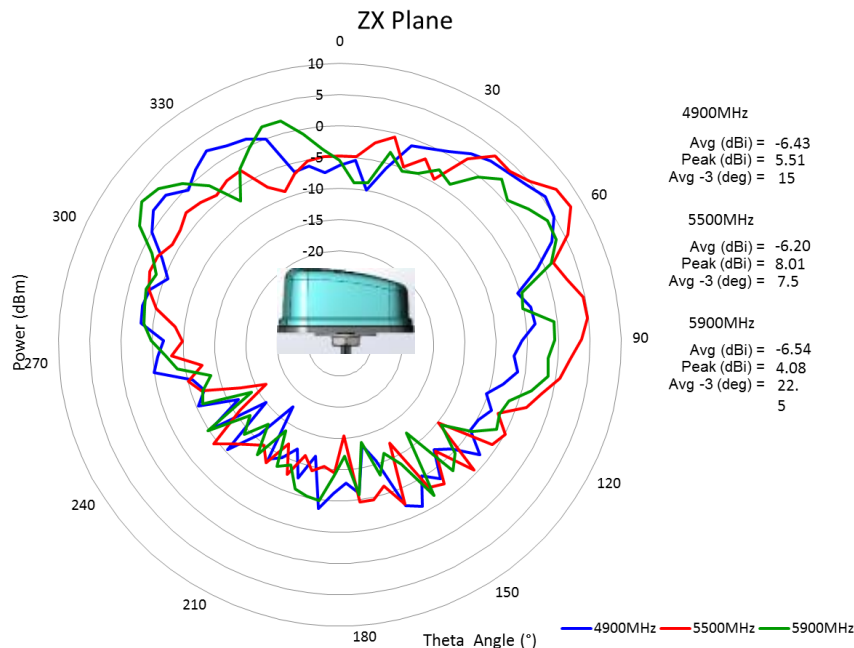


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WiFi1 antenna X-Y plane radiation pattern at WiFi high band**



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



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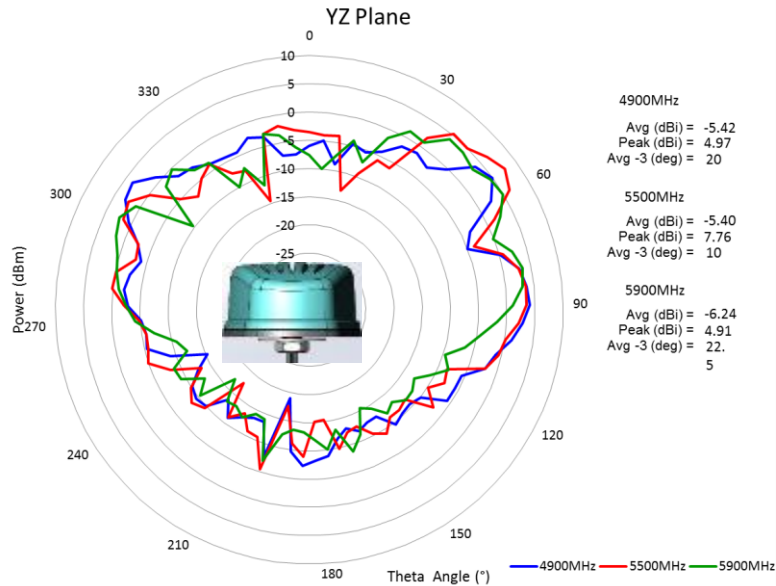
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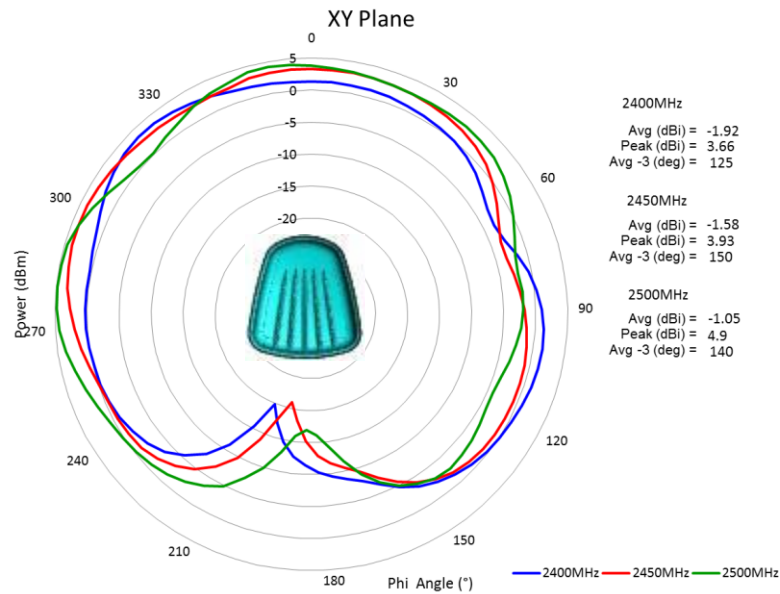
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WiFi1 antenna Y-Z plane radiation pattern at WiFi high band**

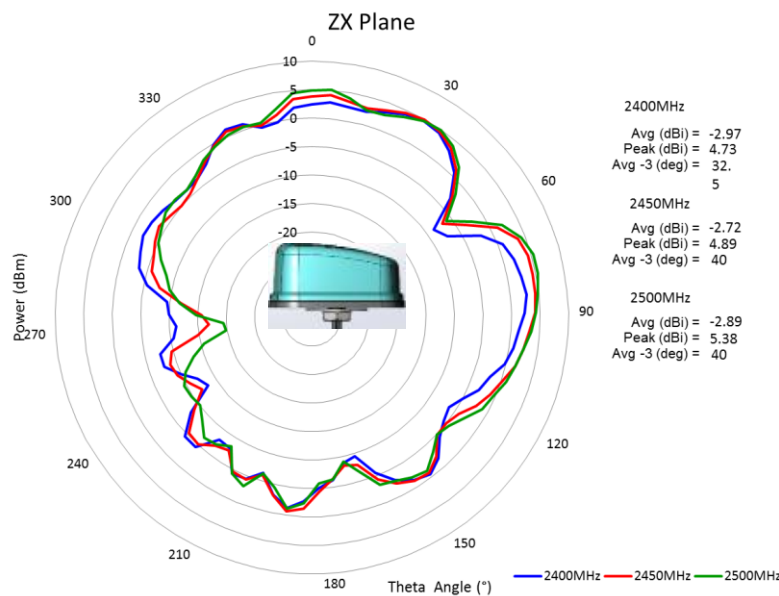


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WiFi2 antenna X-Y plane radiation pattern at WiFi low band**



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



Issue: 1833

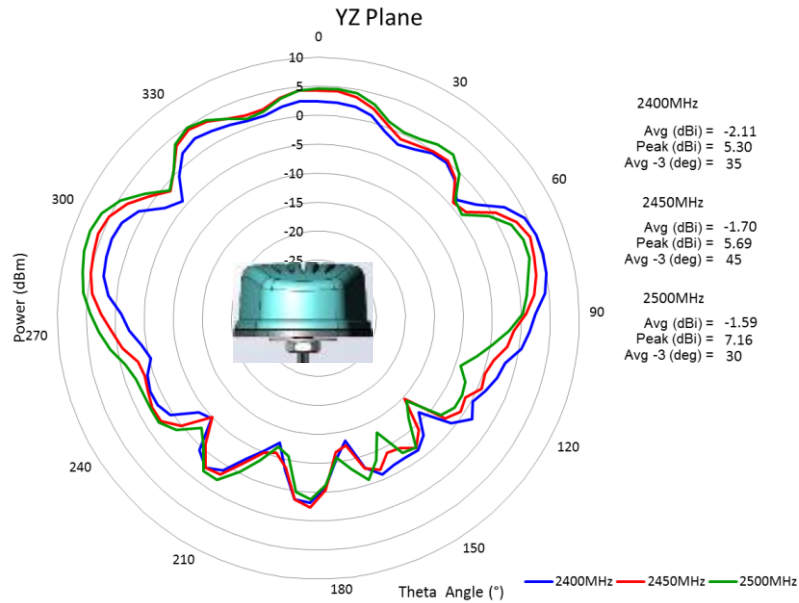
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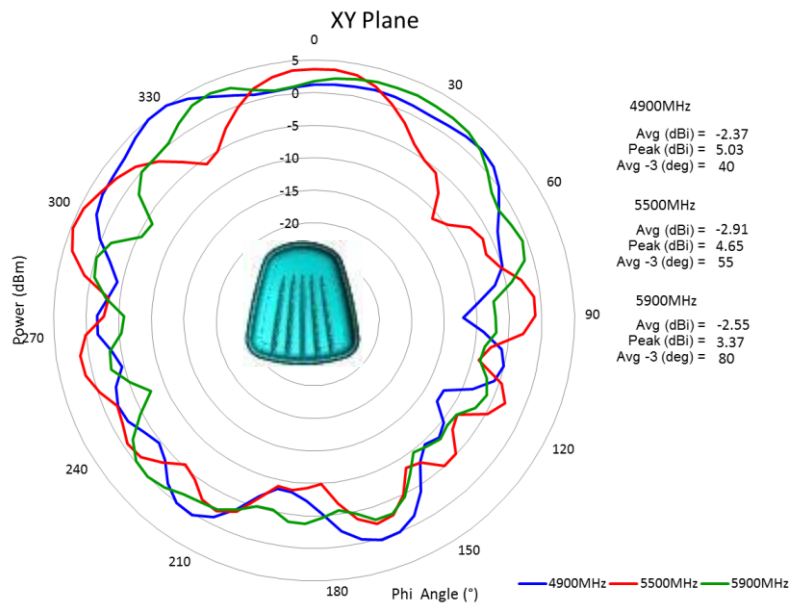
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WiFi2 antenna Y-Z plane radiation pattern at WiFi low band**

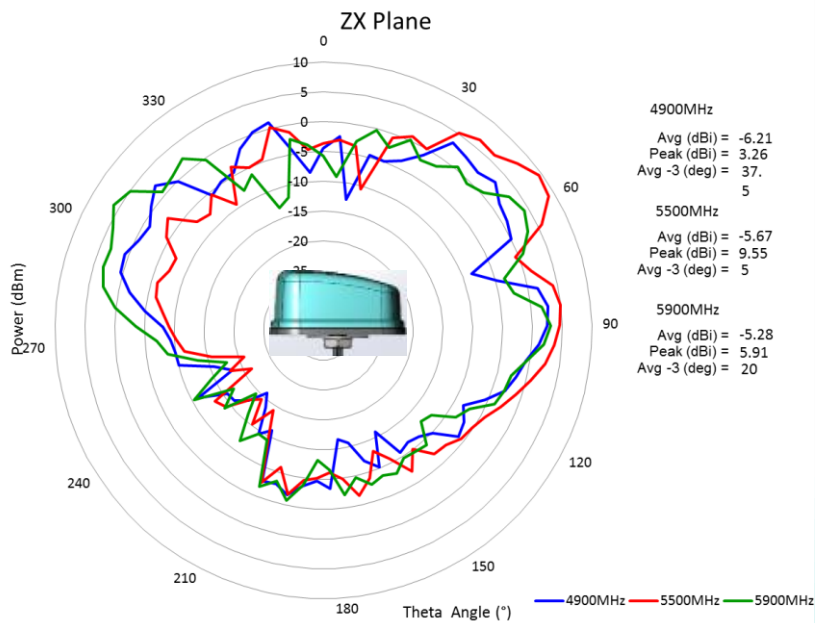


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WiFi2 antenna X-Y plane radiation pattern at WiFi high band**



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



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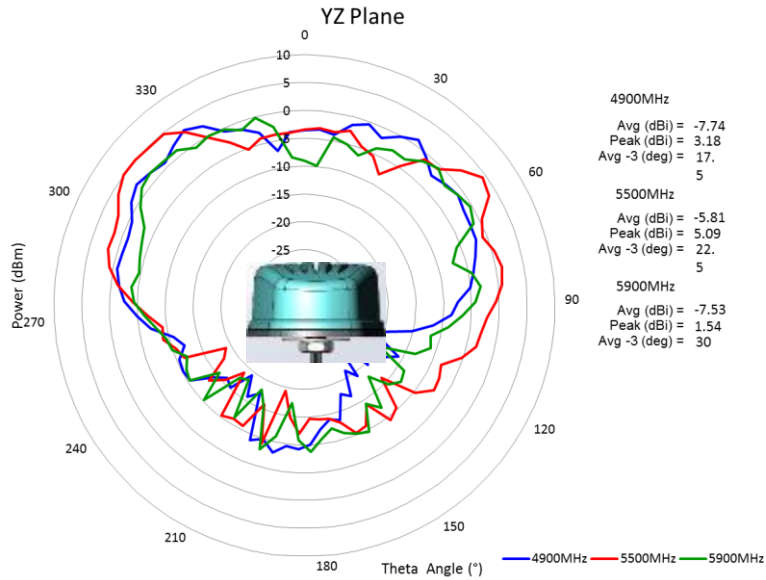
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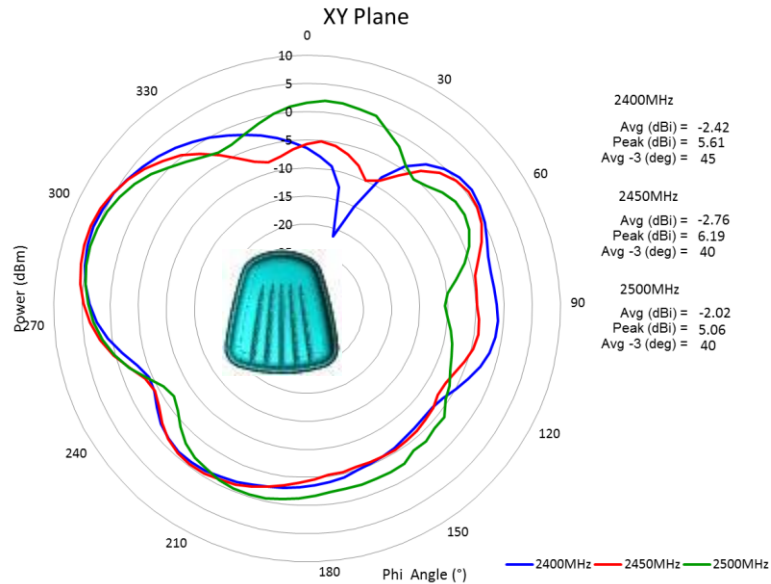
CHARTS

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

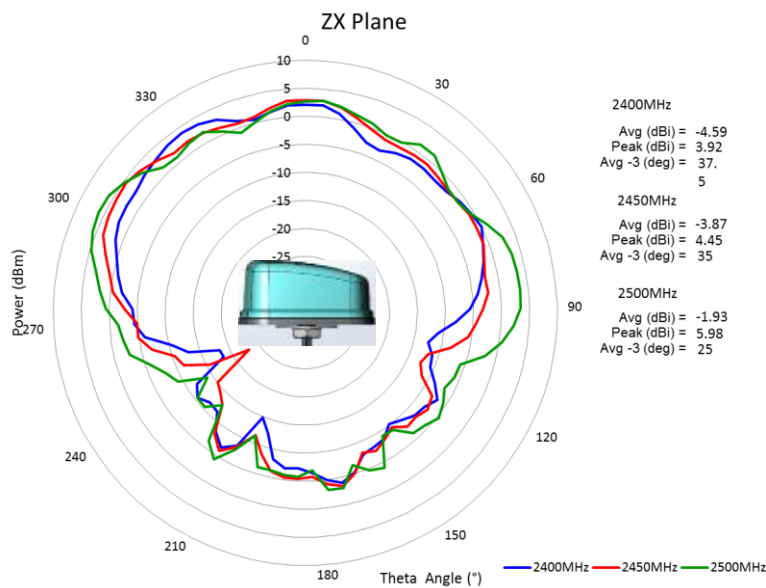


CHARTS

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



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



Issue: 1833

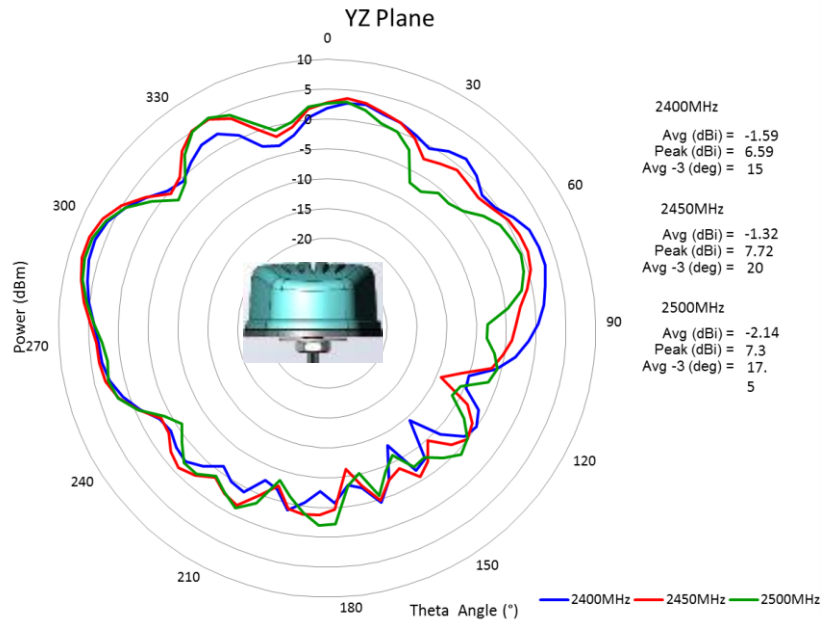
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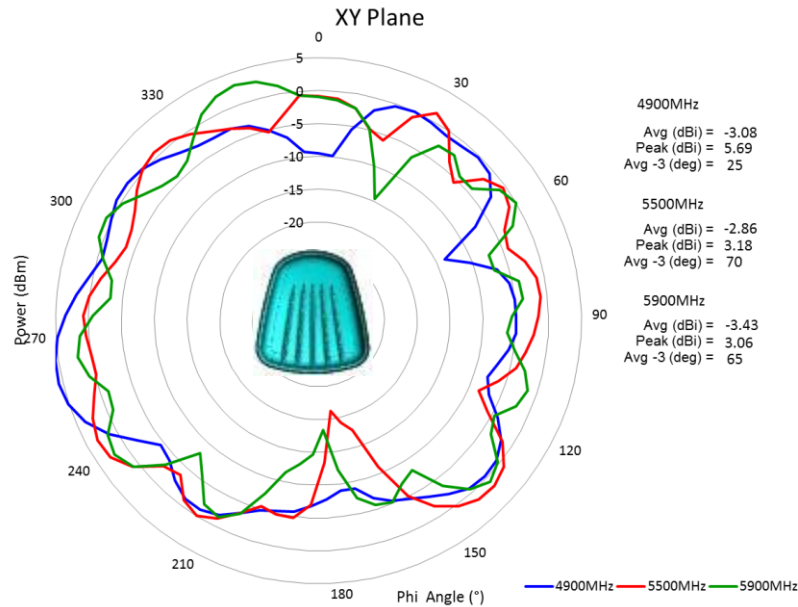
CHARTS

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

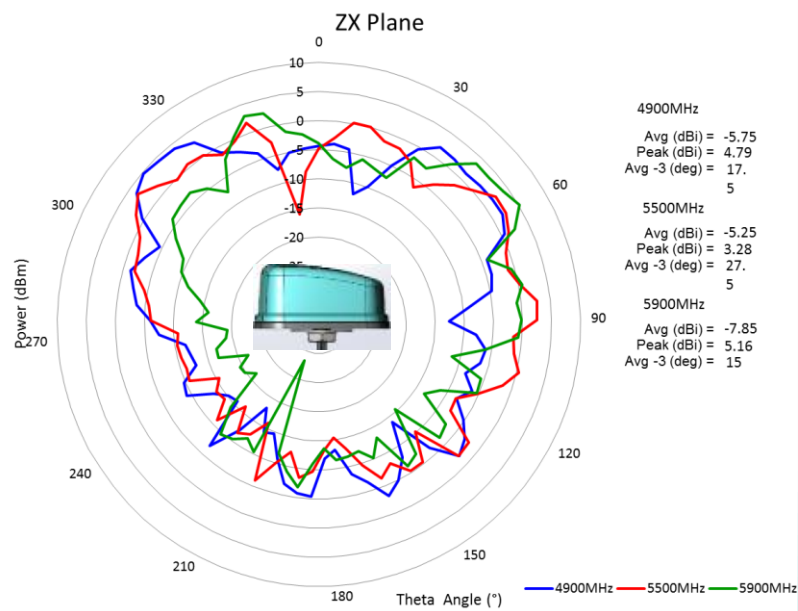


CHARTS

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



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



Issue: 1833

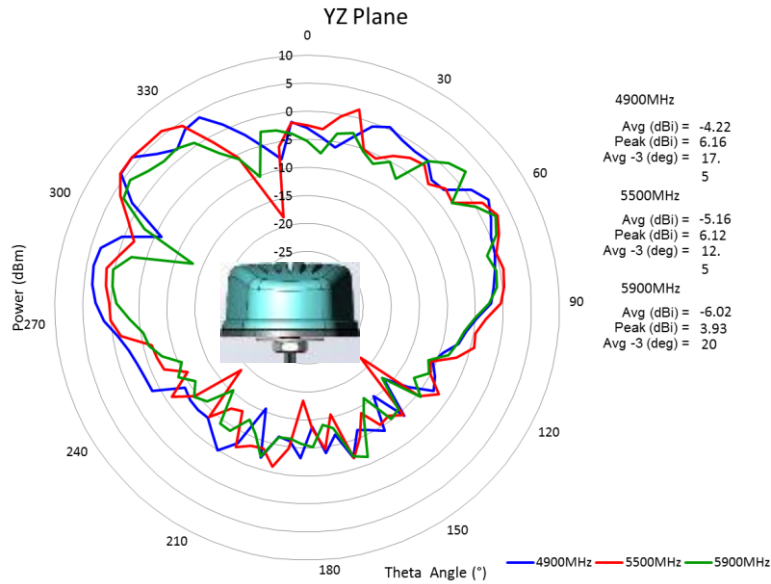
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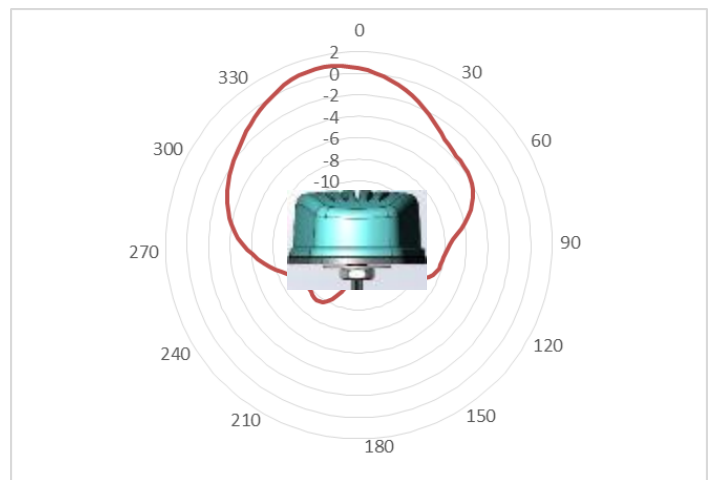
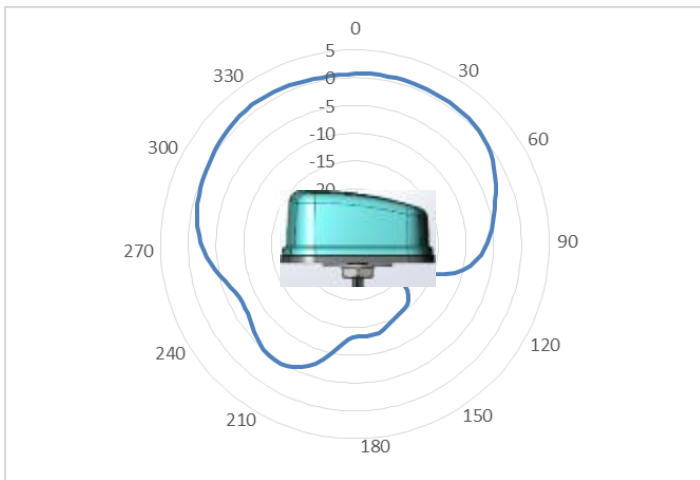
CHARTS

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

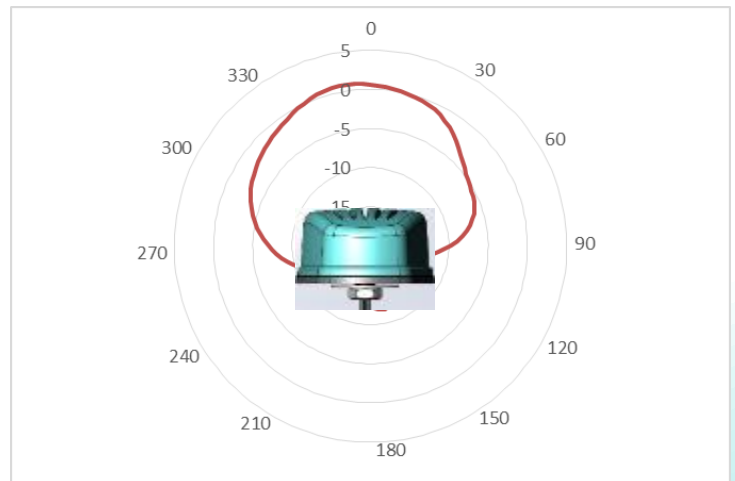
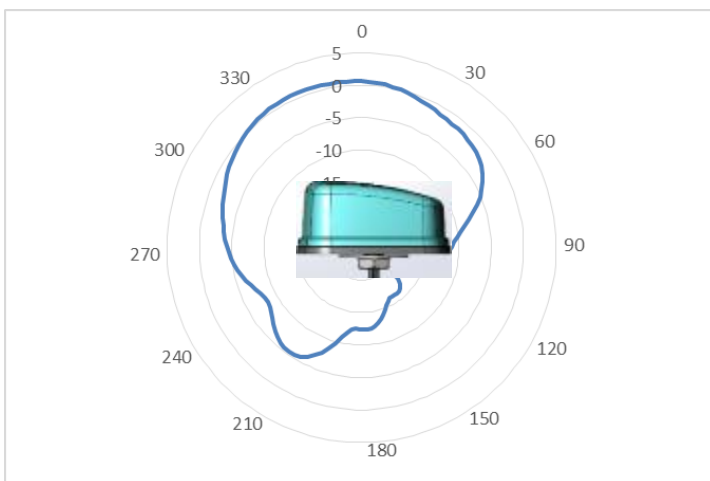


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GNSS antenna, BD2 RHCP patterns, in free space*

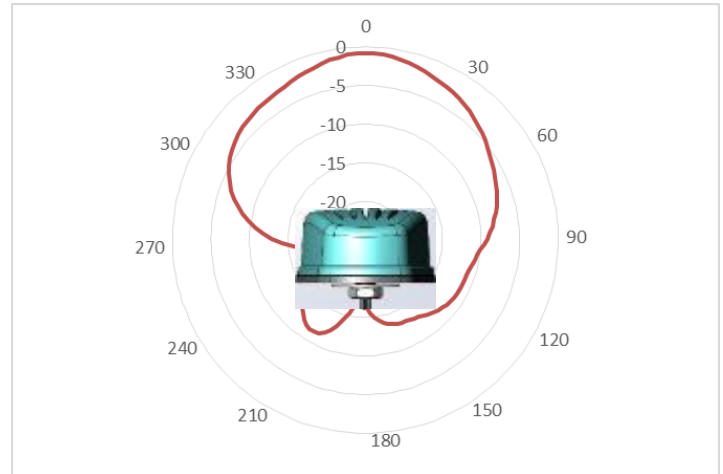
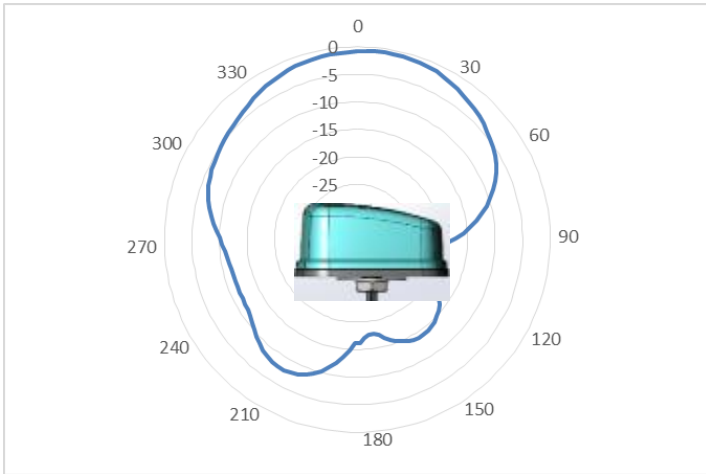


GNSS antenna, GPS & Galileo RHCP patterns, in free space*



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GNSS antenna, GLONASS RHCP patterns, in free space*



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

Series: Panther

**PART NUMBER: PAN62311DM, PAN62312DM,
PAN62311DMR, PAN62312DMR**

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

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