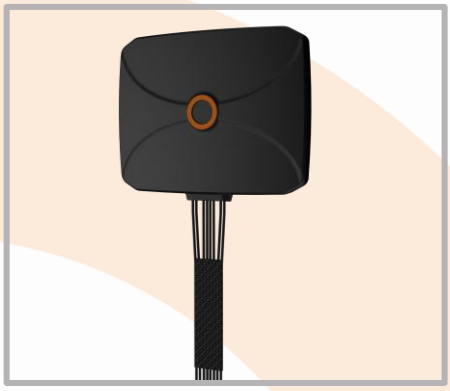
PANL-431

POYNTING
BEYOND A CONNECTED LIFE

ANTENNAS | PANL-431 SERIES

8-IN-1 OMNI-DIRECTIONAL WIDEBAND PANEL 5G ANTENNA

410 – 6000 MHz, 7.8dBi; 4 x Cellular, 3 x Wi-Fi, 1 x GNSS



410 – 470 MHz
617 – 960 MHz
1427 – 1517 MHz
1710 – 2700 MHz
3300 – 4200 MHz
4400 – 6000 MHz

CELL: 7.8dBi
Wi-Fi: 5.5dBi
GNSS: 20dBi

Omni-Directional

5G

4G LTE

2.4 – 2.5 GHz
5.0 – 7.2 GHz

4x4 MIMO

IoT & M2M

-40°C to +80°C

IP65

GNSS Included

E-Mark Certified

APPLICATION AREAS

Automotive

Urban

Rural/Farm

- **8-in-1 high-performance multi-functional 5G & Wi-Fi antenna**
- **Ultra-Wideband cellular antennas from 410 to 6000 MHz**
- **Cross-polarised cellular antennas for improved performance**
- **Antenna supports Private 5G/5G/4G/3G/2G/Wi-Fi-6e/Wi-Fi-7/LoRa/Bluetooth**
- **Omni-directional panel antenna with a low-profile design**
- **Flexible, non-invasive mounting options**
- **E-Mark certified ensuring compliance, safety, and performance in automotive applications**
- **Weather, dust, and vandal-resistant enclosure (IP65)**

Product Overview

Introducing the PANL-431; a state-of-the-art, multi-functional panel antenna designed to deliver reliable connectivity on the go. It integrates four cellular antennas, three tri-band Wi-Fi antennas, and one dual-band GNSS antenna into a compact, rugged enclosure, making it well-suited for case-mounted installations using Velcro.

Covering an ultra-wide frequency range from 410 MHz to 6000 MHz, the PANL-431 supports all major 4G LTE and 5G cellular technologies, as well as tri-band Wi-Fi (2.4 GHz, 5 GHz, and 6 GHz) for next-generation standards like Wi-Fi 6E and Wi-Fi 7. This ensures seamless connectivity across rural and urban environments, with lower bands providing long-range coverage and higher bands delivering high-speed performance. The inclusion of dual-band GNSS (L1 and L5) guarantees accurate positioning even in challenging conditions.

The antenna's omni-directional radiation patterns provide uniform coverage in all directions while the high antenna gain improves signal strength even when partially obstructed by the case material. MIMO support (4x4 for cellular and 3x3 for Wi-Fi), guarantees improved throughput and reliability, which is essential for mobile connectivity applications. The cross-polarized antennas enhance signal reliability, even when the case is moved or placed in environments with multipath interference. If the router in use has only two Wi-Fi ports, the third PANL-431 Wi-Fi antenna can be repurposed for Bluetooth applications, adding flexibility for short-range device connectivity.

Its low-profile, compact design and IP65-rated enclosure allow seamless integration inside portable cases without compromising durability or available space. Velcro mounting and short coaxial cables simplify installation while minimizing signal loss.

With the PANL-431 mounted inside a portable case, users can deploy and operate the system anywhere—rural locations, urban areas, or in motion—ensuring dependable connectivity wherever it is required.

Features

- 8-in-1 antenna solution; 4 x Cellular, 3 x Wi-Fi, 1 x GNSS
- Ultra-wideband coverage from 410 to 6000 MHz
- 4x4 MIMO cross-polarised antennas for improved performance
- Low-profile and rugged mechanical design with an IP65 rating
- Short cables reduce signal loss and simplify routing inside a case
- Easy to install with adhesive mounting option

Application Areas

- Emergency Response & Disaster Recovery Scenes
- Public Safety & Law Enforcement Operations
- Broadcasting & Media Field Kits
- Camping, overlanding, and remote travel connectivity
- Temporary pop-up offices and event setups

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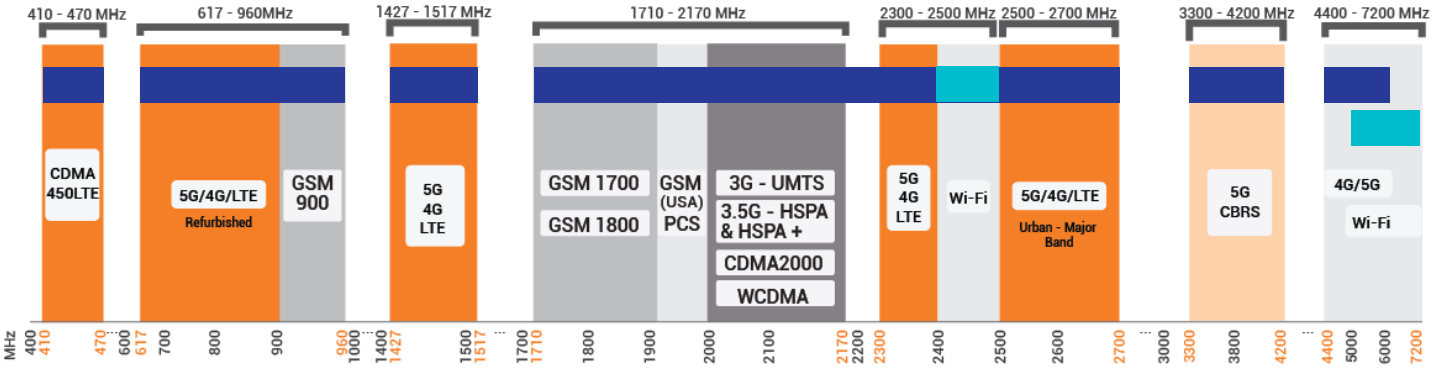
Frequency Bands

The PANL-431 is a wide-band 5G/4G and tri-band Wi-Fi antenna that works | 410 – 470 MHz | 617 – 960 MHz | 1427 – 1517 MHz | 1710 – 2700 MHz | 3300 – 4200 MHz | 4400 – 6000 MHz |and the following Wi-Fi frequency bands | 2400 – 2500 MHz | and | 5000 – 7200 MHz |



Indicates the 5G/LTE bands on which PANL-431 works

Indicates the Wi-Fi bands on which PANL-431 works

Antenna Overview

	5G LTE	Wi Fi	GNSS
Number of Ports	4	3	1
SISO / MIMO	4x4 MIMO	3x3 MIMO	SISO
Frequency Bands	410 – 6000 MHz	2400 – 2500 MHz 5000 – 6000 MHz 6000 – 7200 MHz	L1: 1575.42 MHz ± 25 MHz L5: 1176.45 MHz ± 25 MHz
Polarisation	Cross Polarised (Linear Vertical & Horizontal)	Linear, Vertical & Horizontal	RHCP
Peak Gain	7.8dBi	5.5dBi	20±2 dB (LNA Gain)
Coax Cable Type	RTK-031	RTK-031	RTK-031
Coax Cable Length	0.5m	0.5m	0.5m
Connector Type	SMA (m)	RPSMA (m)	SMA (m)

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Electrical Specifications – Cellular

Frequency Bands:	410 – 470 MHz 617 – 960 MHz 1427 – 1517 MHz 1710 – 2700 MHz 3300 – 4200 MHz 4400 – 6000 MHz
Gain (Max):	-3 dBi @ 410 – 470 MHz 4 dBi @ 617 – 960 MHz 4 dBi @ 1427 – 1517 MHz 6 dBi @ 1710 – 2700 MHz 7.8 dBi @ 3300 – 4200 MHz 6.5 dBi @ 4400 – 6000 MHz
VSWR:	≤2.5:1 across 60% of the bands
Feed Power Handling:	10 W
Input Impedance:	50 Ohm (nominal)
Polarisation:	Cross Polarised (Linear Vertical & Horizontal)
Coax Cable Loss:	0.54 dB/m @ 900 MHz 0.68 dB/m @ 1500 MHz 0.79 dB/m @ 1800 MHz 0.92 dB/m @ 2400 MHz 1.09 dB/m @ 3000 MHz 1.65 dB/m @ 5800 MHz
DC Short:	Yes

Electrical Specifications – Wi-Fi

Frequency:	2400 - 2500 MHz 5000 – 7200 MHz
Gain (Max):	2 dBi @ 2400 - 2500 MHz 5.5 dBi @ 5000 - 7200 MHz
VSWR:	≤2.5:1 across 80% of the bands
Feed Power Handling:	10 W
Nominal Input Impedance:	50 Ohm (nominal)
Polarisation:	Linear, Vertical & Horizontal
DC Short:	Yes

Electrical Specifications – GNSS

Frequency Range (GPS):	L1: 1575.42 MHz L5: 1176.45MHz
LNA Gain:	20±2 dB
VSWR:	≤2:1
DC Voltage:	2.7-5 V
Operating Current:	<15mA
Noise Figure:	≤2 dB
Nominal Impedance:	50 Ω
Polarisation:	RHCP
Coax Cable Loss:	0.68 db/m @ 1500 MHz
Out of Band Rejection:	1575 MHz ± 25 MHz: 40dBc min 1176 MHz ± 25 MHz: 40dBc min

Product Box Contents

Antenna:	A-PANL-0431-V1-0.5M
Mounting Accessories:	Velcro Strips and Suction Cups

Ordering Information

Commercial Name:	PANL-431
Order Product Code:	A-PANL-0431-V1-0.5M
EAN Number:	6009716250611
E-Mark Certification Number:	E1*10R06/03*10533*00

Mechanical Specifications

Product Dimensions:	267 mm x 210 mm x 31 mm (Excluding cables)
Packaged Dimensions:	380 x 280 x 70 mm
Weight:	0.70 Kg
Packaged Weight:	1.25 Kg
Radome Material:	UV Stable ASA
Radome Colour:	Black
Mounting Type:	Adhesive Mount and Suction Mount

Environmental Specifications, Certification & Approvals

Wind Survival:	≤160km/h
Temperature Range (Operating):	-40°C to +80°C
Environmental Conditions:	Indoor
Water Ingress Protection Ratio/Standard:	IP 65
Salt Spray:	MIL-STD 810G/ASTM B117
Operating Relative Humidity:	Up to 98%
Storage Humidity:	5% to 95% - non-condensing
Storage Temperature:	-40°C to +80°C
Enclosure Flammability Rating:	UL 94-HB
Impact Resistance:	IK 08
Product Safety & Environmental:	Complies with CE and RoHS standards

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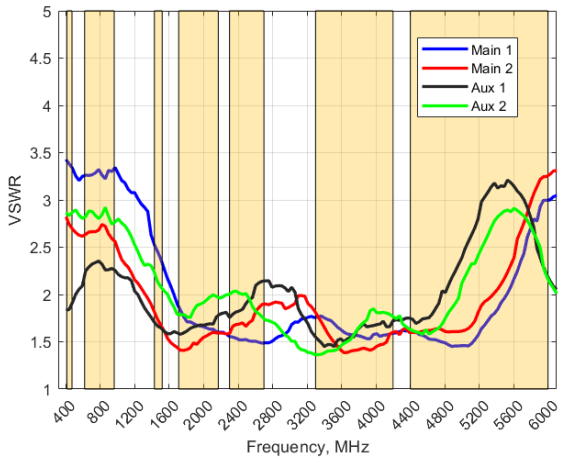
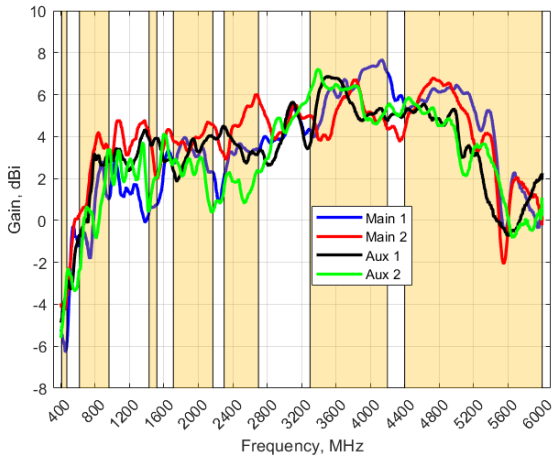
Antenna Performance Plots

VSWR: Cellular Antenna



GAIN (EXCLUDING CABLE LOSS): Cellular Antenna



Voltage Standing Wave Ratio (VSWR)*

VSWR is a measure of how efficiently radio-frequency power is transmitted from a power source, through a transmission line, into a load. In an ideal system, 100% of the energy is transmitted which corresponds to a VSWR of 1:1.

The PANL-431 delivers superior performance across all bands with a VSWR of ≤2.5:1 across 60% of the bands.

Gain⁺ in dBi

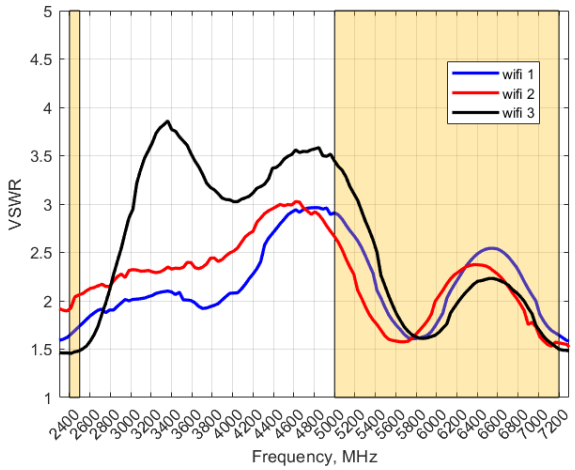
7.8 dBi is the peak gain across all bands from 410 – 6000 MHz

Gain @ 410 – 470 MHz:	-3 dBi
Gain @ 617 – 960 MHz:	4 dBi
Gain @ 1427 – 1517 MHz:	4 dBi
Gain @ 1710 – 2700 MHz:	6 dBi
Gain @ 3300 – 4200 MHz:	7.8 dBi
Gain @ 4400 – 6000 MHz:	6.5 dBi

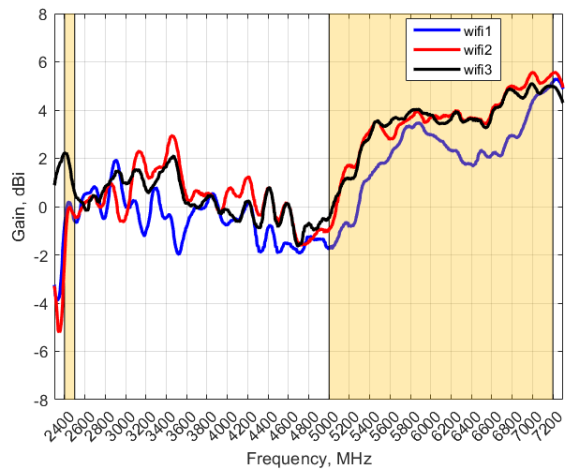
**VSWR measured with 0.5m low-loss cable*

⁺*Antenna gain measured with polarisation aligned standard antenna*

VSWR: Wi-Fi Antenna



GAIN (EXCLUDING CABLE LOSS): Wi-Fi Antenna



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The PANL-431 delivers superior performance across all bands with a VSWR of ≤2.5:1 across 80% of the bands.

Gain⁺ in dBi

5.5 dBi is the peak gain across all bands from 2400 – 2500 MHz and 5000 – 7200 MHz

Gain @ 2400 - 2500 MHz:	2 dBi
Gain @ 5000 – 7200 MHz:	5.5 dBi

**VSWR measured with 0.5m low-loss cable*

⁺*Antenna gain measured with polarisation aligned standard antenna*

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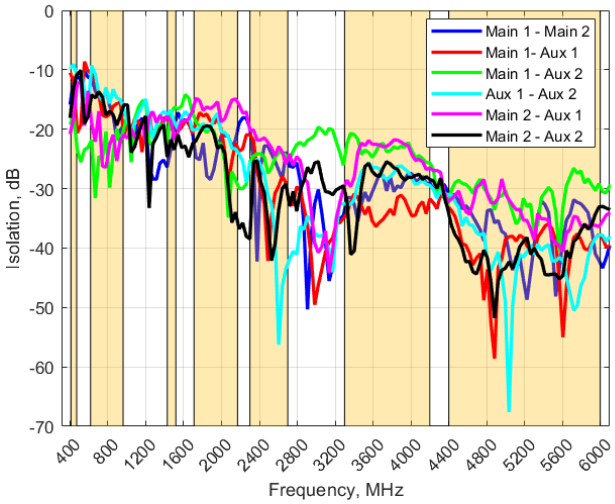
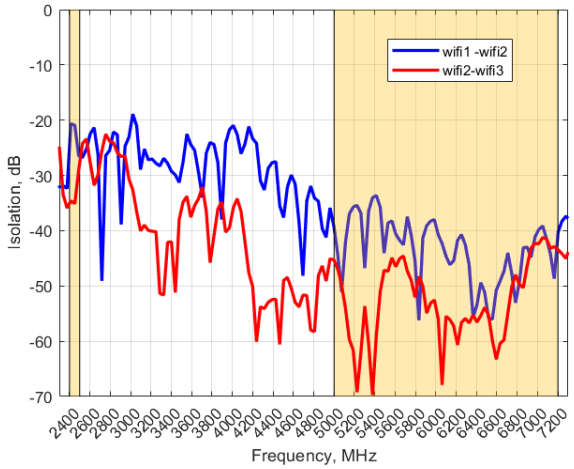
ISOLATION: Cellular Antenna



Isolation

Isolation is a measure of how much energy from one port leaks into another port undesirably. Isolation of 0 dB between 2 ports means that there are no isolation and the energy from 1 port excitation is visible on another port. Isolation of -30 dB or more means that <0.1% of 1 port's energy is leaked into another. A good isolation is under -10 dB.

ISOLATION: Wi-Fi Antenna



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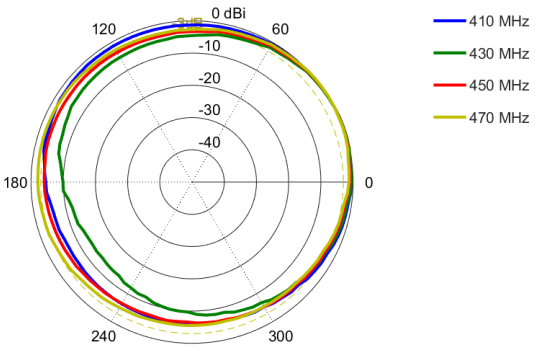
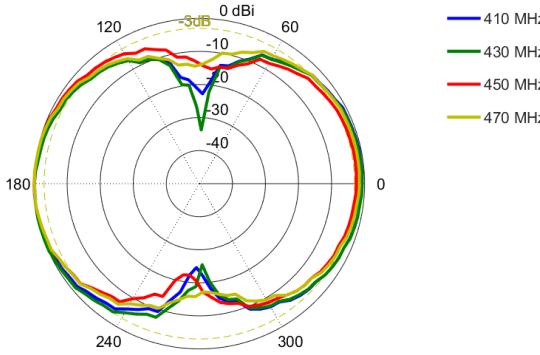
Radiation Patterns – Cellular (Main)

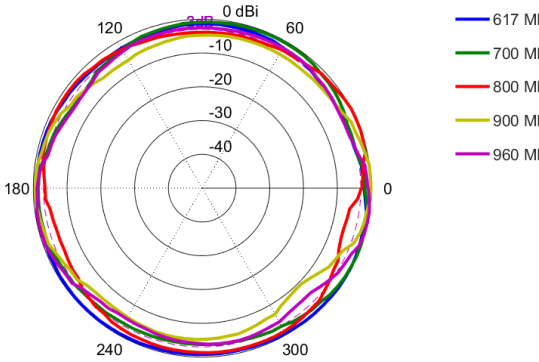
Azimuth: 410 – 470 MHz



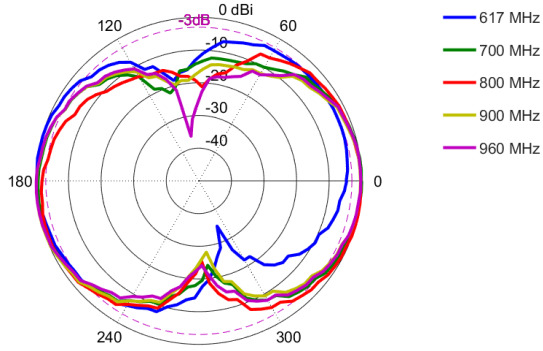
Elevation: 410 – 470 MHz



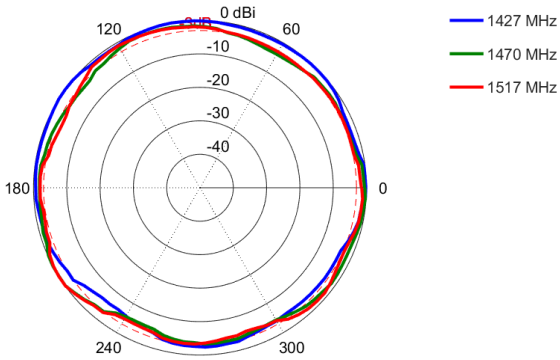
Azimuth: 617 – 960 MHz



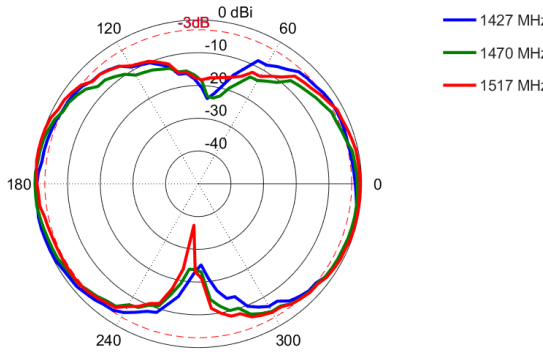
Elevation: 617 – 960 MHz



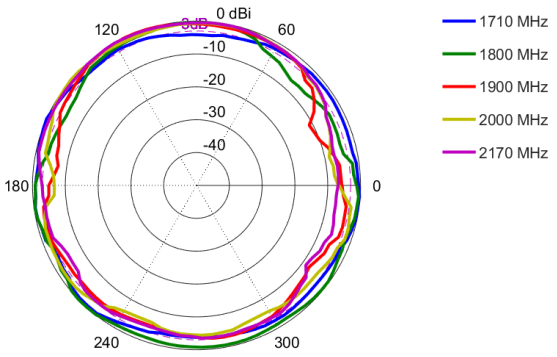
Azimuth: 1427 – 1517 MHz



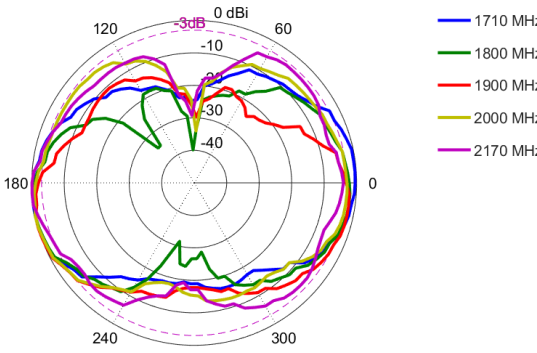
Elevation: 1427 – 1517 MHz



Azimuth: 1710 – 2170 MHz



Elevation: 1710 – 2170 MHz



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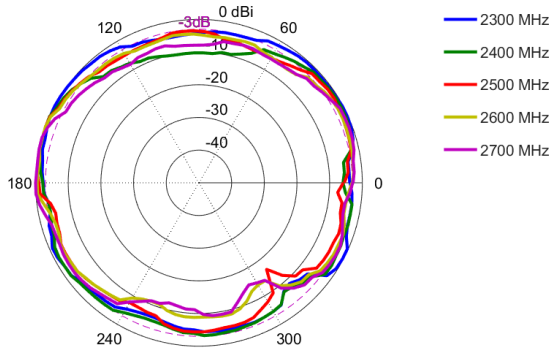
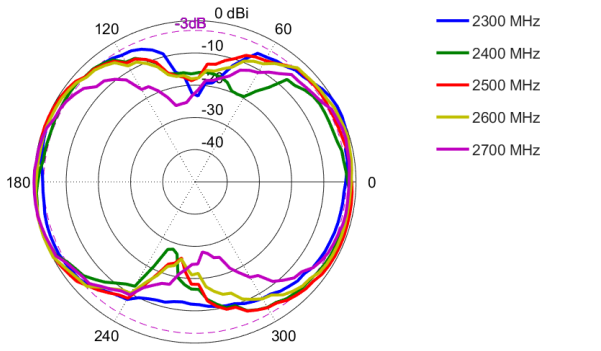
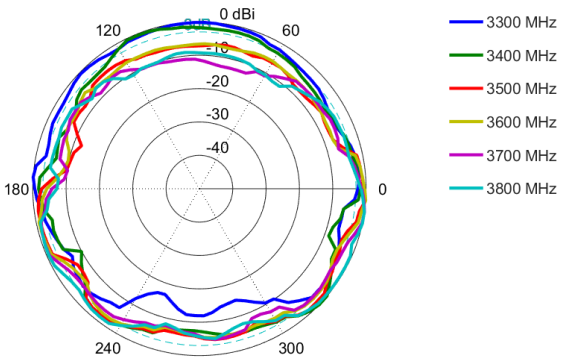
Azimuth: 2300 – 2700 MHz



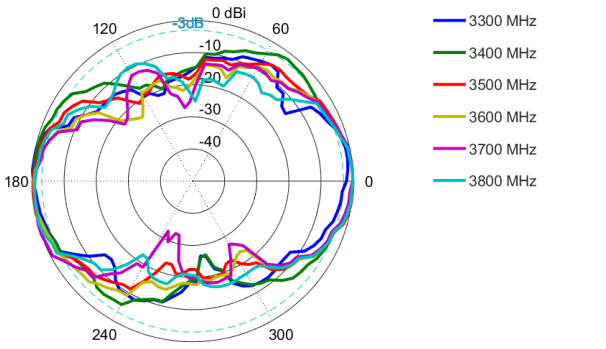
Elevation: 2300 – 2700 MHz



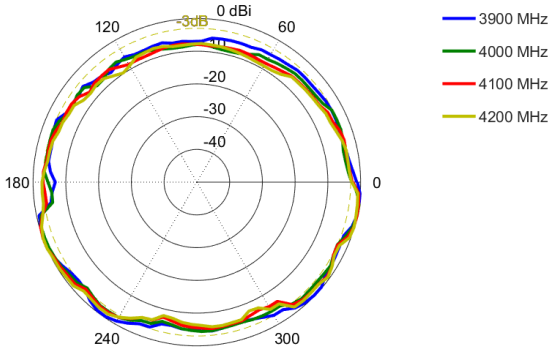
Azimuth: 3300 – 3800 MHz



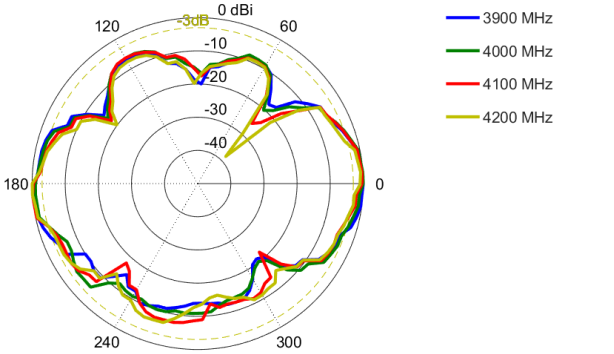
Elevation: 3300 – 3800 MHz



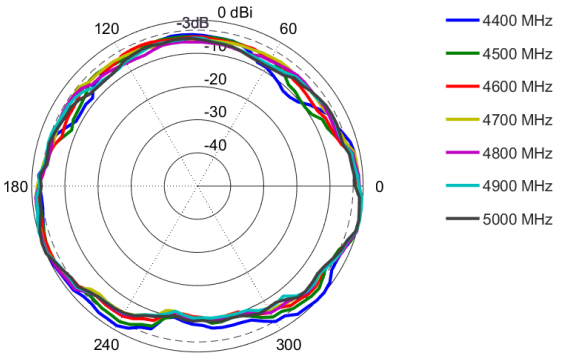
Azimuth: 3900 – 4200 MHz



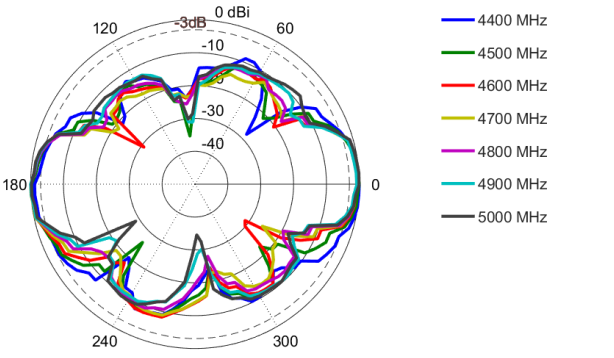
Elevation: 3900 – 4200 MHz



Azimuth: 4400 – 5000 MHz



Elevation: 4400 – 5000 MHz



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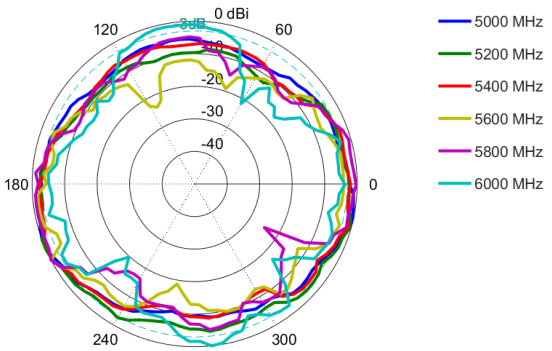
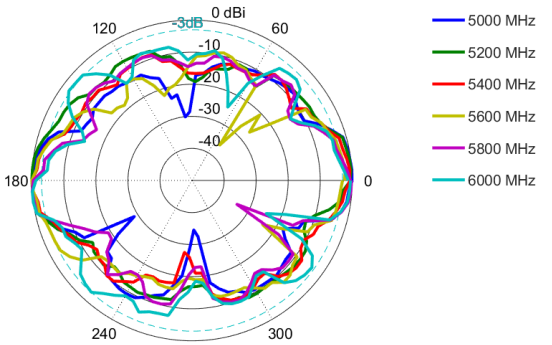
Azimuth: 5000 – 6000 MHz

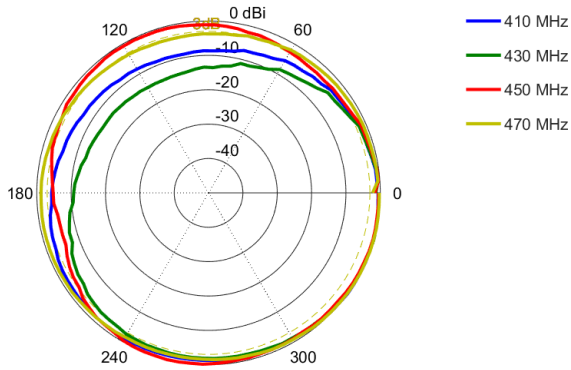


Elevation: 5000 – 6000 MHz

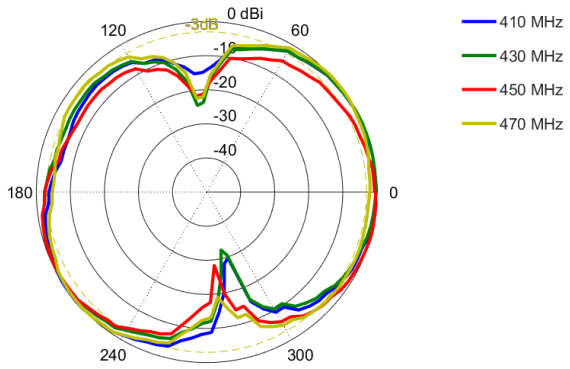


Radiation Patterns – Cellular (Aux)

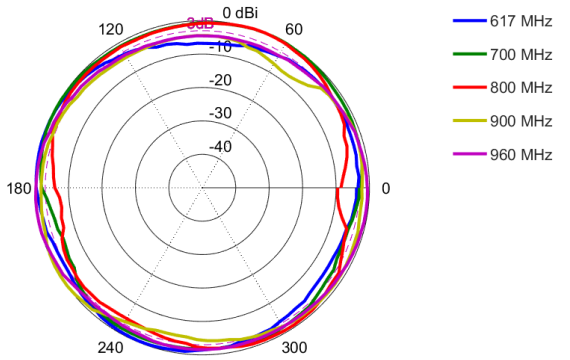
Azimuth: 410 – 470 MHz



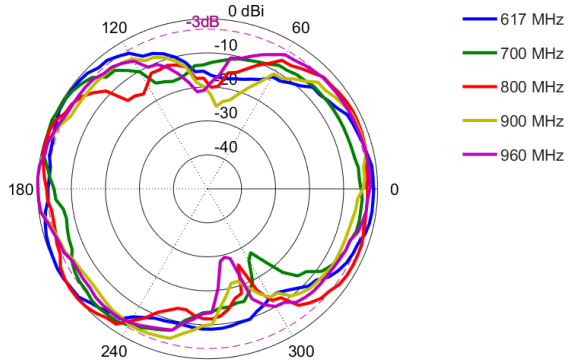
Elevation: 410 – 470 MHz



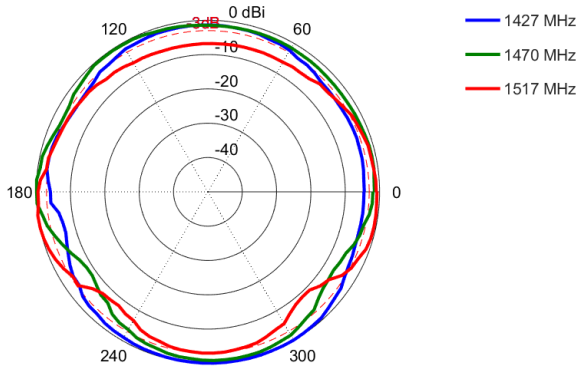
Azimuth: 617 – 960 MHz



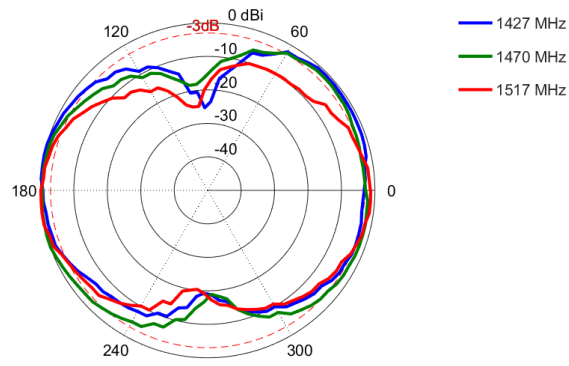
Elevation: 617 – 960 MHz



Azimuth: 1427 – 1517 MHz



Elevation: 1427 – 1517 MHz



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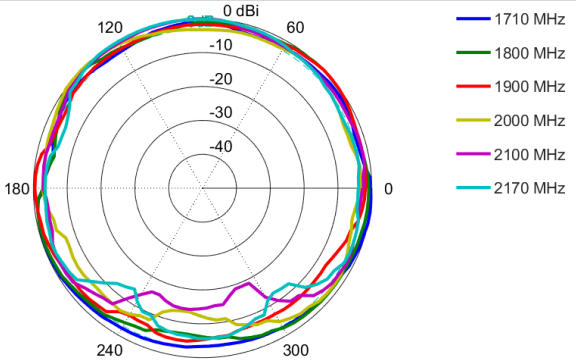
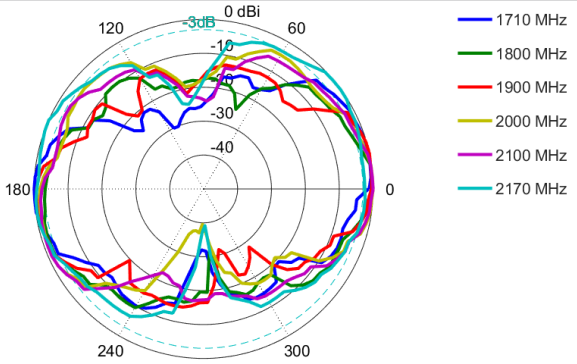
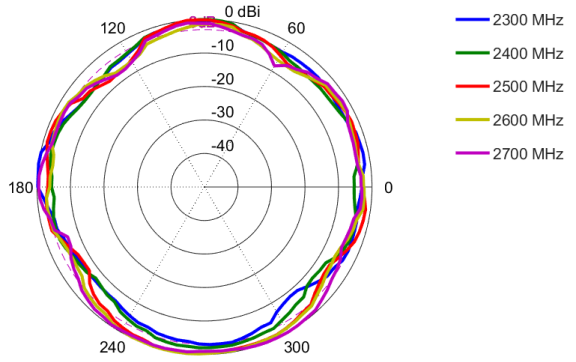
Azimuth: 1710 – 2170 MHz



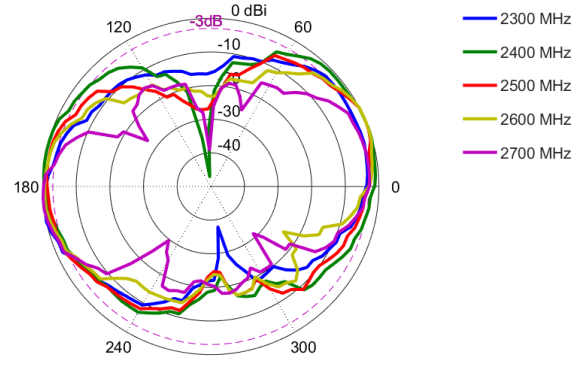
Elevation: 1710 – 2170 MHz



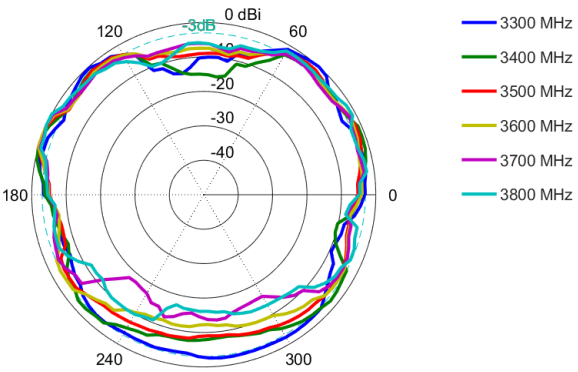
Azimuth: 2300 – 2700 MHz



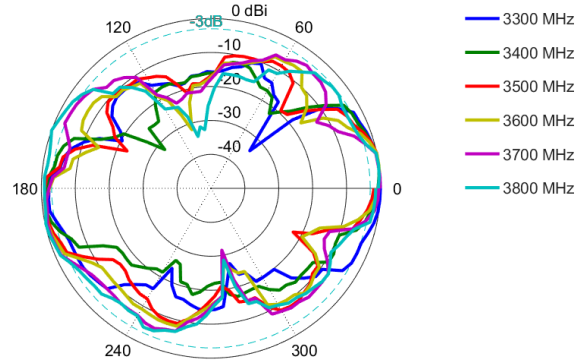
Elevation: 2300 – 2700 MHz



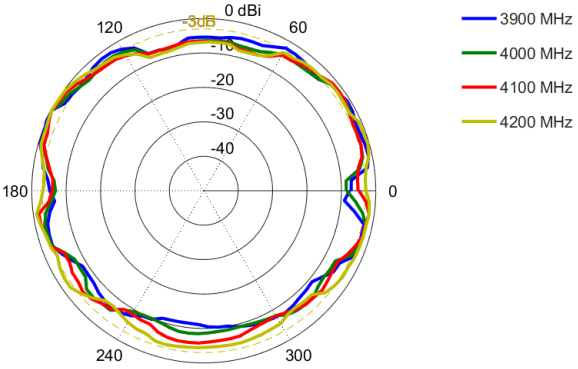
Azimuth: 3300 – 3800 MHz



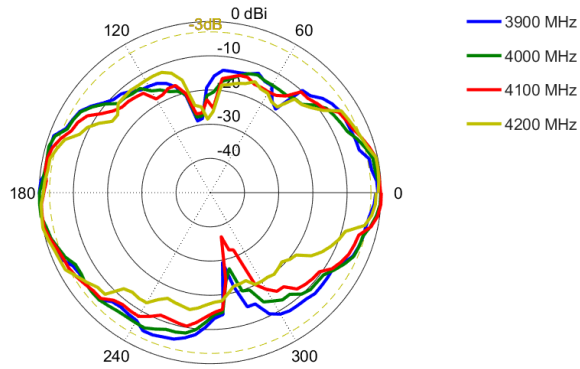
Elevation: 3300 – 3800 MHz



Azimuth: 3900 – 4200 MHz



Elevation: 3900 – 4200 MHz



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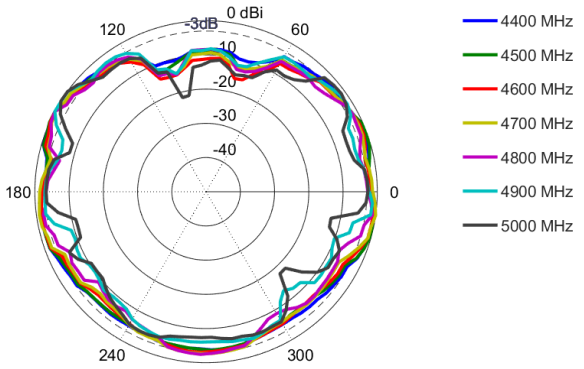
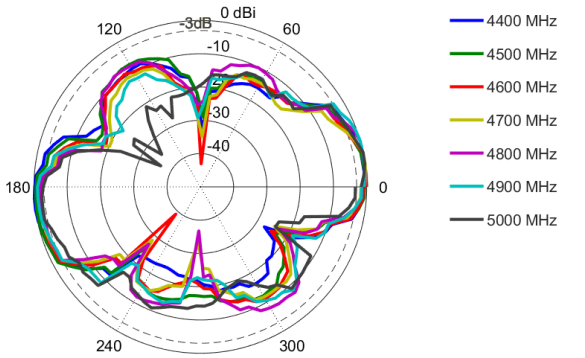
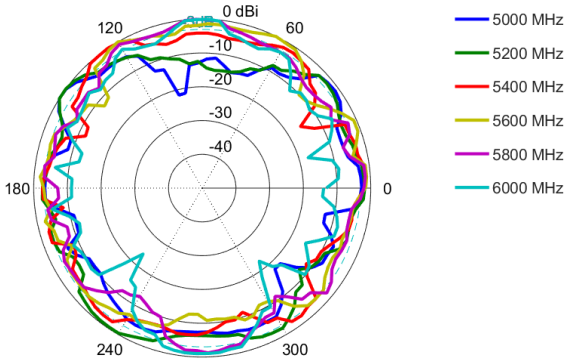
Azimuth: 4400 – 5000 MHz



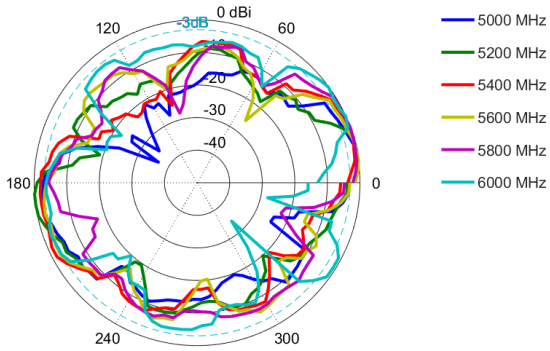
Elevation: 4400 – 5000 MHz



Azimuth: 5000 – 6000 MHz

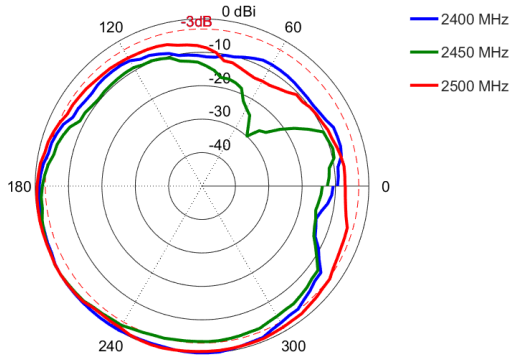


Elevation: 5000 – 6000 MHz

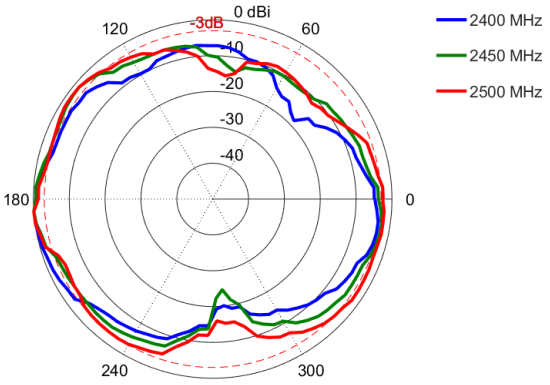


Radiation Patterns – Wi-Fi

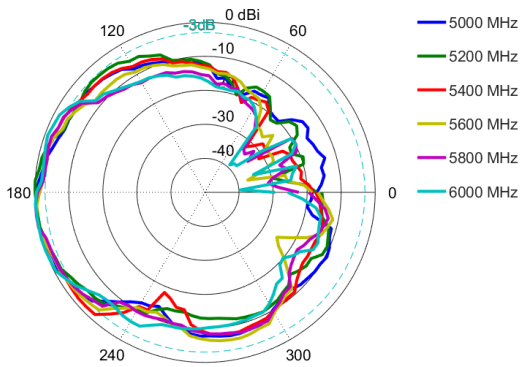
Azimuth: 2400 – 2500 MHz



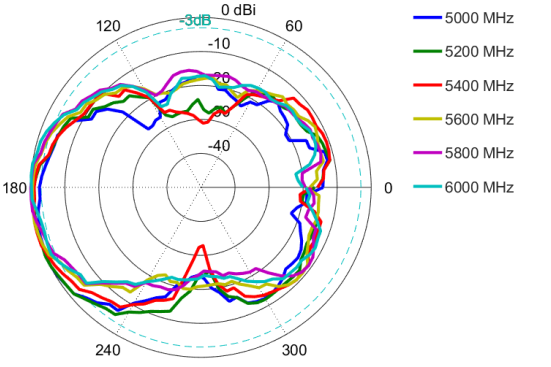
Elevation: 2400 – 2500MHz



Azimuth: 5000 – 6000MHz



Elevation: 5000 – 6000MHz



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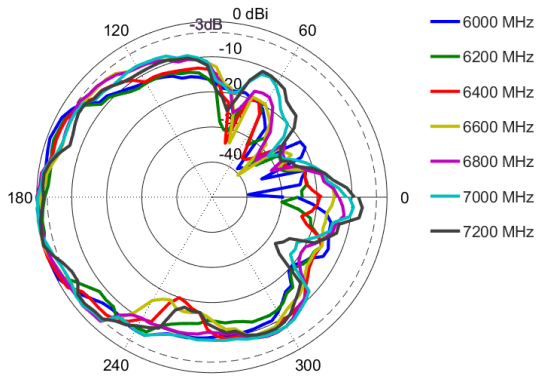
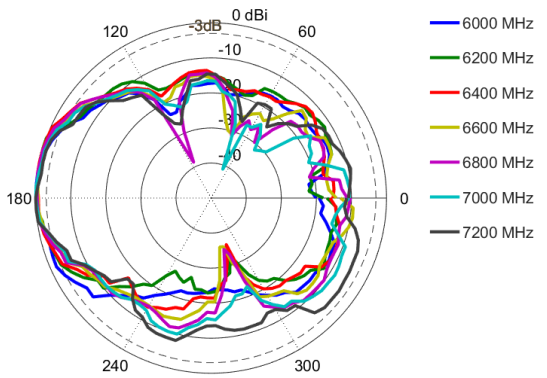
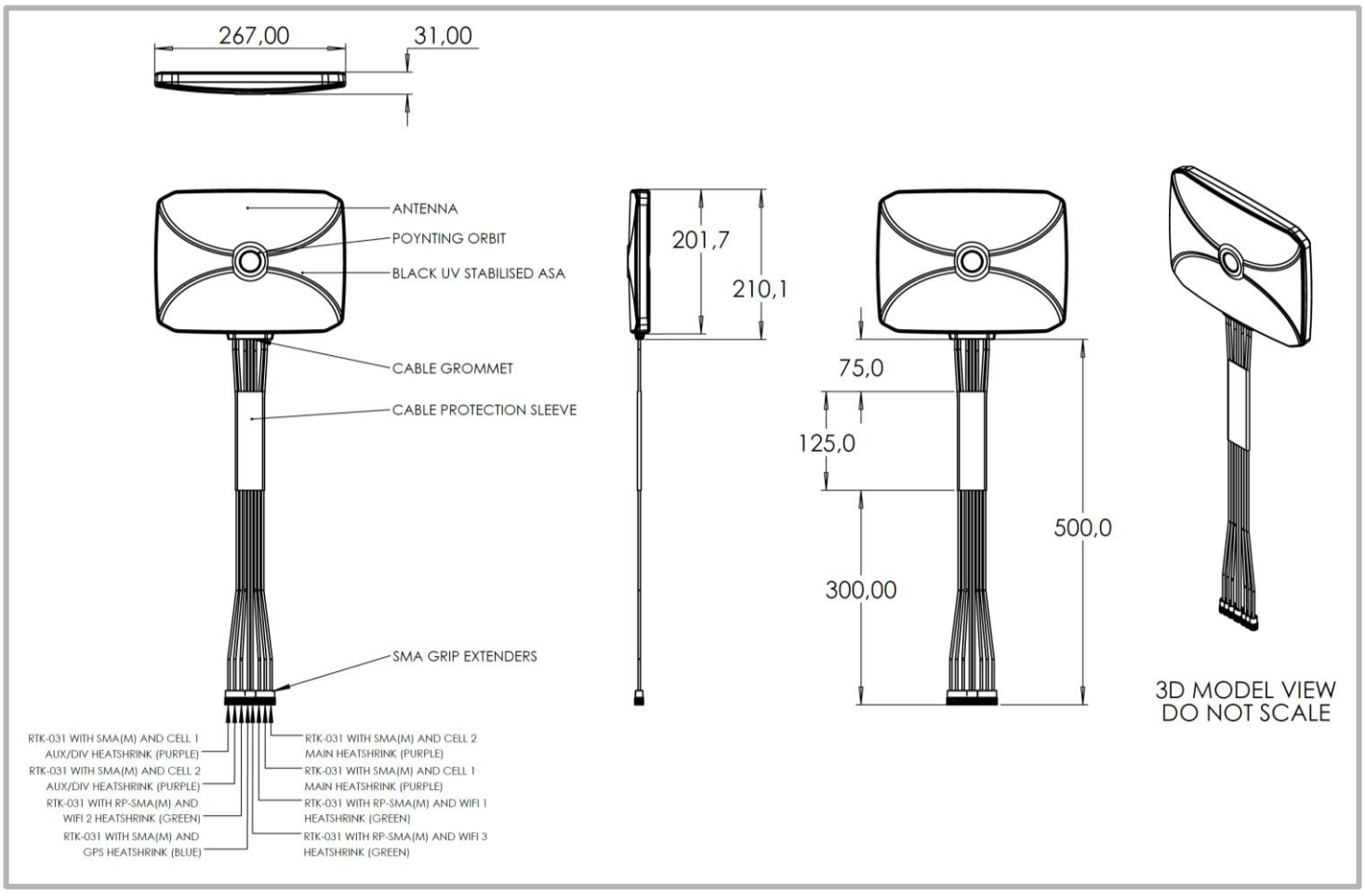
Azimuth: 6000 – 7200 MHz



Elevation: 6000 – 7200 MHz



Technical Drawings



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Mounting Options

Adhesive Mount

Using the provided Velcro mount assembly

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Additional Accessories

See accessories technical specifications on www.poynting.tech

CONTACT POYNTING

Poynting Antennas (Pty) Ltd - Head Office
Unit 4, N1 Industrial Park,
Landmarks Avenue,
Samrand, 0157, South Africa
Phone: +27 (0) 12 657 0050
E-mail: info@poynting.tech
International Email: sales-global@poynting.tech

Poynting Europe
Regus Business Center Neue Messe Riem
Kronstadter Straße 4
81677 München
Germany
Phone: +49 89 7453 9002
E-mail: sales-europe@poynting.tech

Poynting USA
1804 Owen Court, Suite 104,
Mansfield,
TX 76063
USA
Phone: +1 817 533-8130
E-mail: sales-us@poynting.tech