PANL-631

POYNTING
BEYOND A CONNECTED LIFE

ANTENNAS | PANL-631 SERIES

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

617 – 6000 MHz, 6dBi; 6 x Cellular, 3 x Wi-Fi, 1 x GNSS

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

6dBi

Omni-Directional

5G

4G LTE

2.4 – 2.5 GHz
5.0 – 7.2 GHz

6x6 MIMO

IoT & M2M

-40°C to +80°C

IP65

GNSS Included

E-Mark Certified

APPLICATION AREAS

Automotive

Urban

Rural/Farm

- **10-in-1 high-performance multi-functional 5G & Wi-Fi antenna**
- **6 x Cellular, 3 x Wi-Fi & 1 x GNSS antennas**
- **Ultra-Wideband cellular antennas from 617 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-631; a state-of-the-art, multi-functional panel antenna designed to revolutionize connectivity. This versatile antenna configuration offers a 10-in-1 solution, including 6 x Cellular, 3 x Tri-Band Wi-Fi, and 1 x dual-band active GNSS antenna, which provides exceptional performance and versatility for improving cellular and GPS signal reception in vehicles or fixed installations.

The PANL-631 is an ultra-wideband antenna that covers a broad frequency range from 617 to 6000 MHz. This allows it to be used across different cellular operators and technologies, and it is ready for future cellular technologies up to 6GHz for 5G applications. The antenna provides an excellent balance between omnidirectionality, pattern diversity, and good radiation abilities at the desired elevation, which is an important criterion, especially for the transportation market.

The three tri-band Wi-Fi antennas offer concurrent 2.4GHz, 5GHz, and 6GHz bands, capable of 802.11n and 802.11ac/ax/be with 3x3 MIMO. This provides complete backward compatibility with older devices while simultaneously offering access to both current high-speed channels and the newest, least congested 6 GHz spectrum for next-generation Wi-Fi 6E/7 devices, ensuring maximum performance, future-proofing, and optimal connectivity across all wireless technologies. Additionally, the inclusion of a dual-band GNSS antenna ensures reliable navigation and precise location tracking, even in challenging environments.

Featuring a low-profile and compact design, the PANL-631 seamlessly blends into any environment, addressing both aesthetic and practical considerations. Its convenient window mount design simplifies installation, allowing for easy attachment to vehicle or building windows through either the included suction cups or adhesive mount. With exceptional GNSS capabilities and wideband performance, the PANL-631 serves as your gateway to unparalleled connectivity across diverse wireless applications.

Features

- 10-in-1 antenna solution; 6 x Cellular, 3 x Wi-Fi, 1 x GNSS
- Ultra-wideband coverage from 617 to 6000 MHz
- 6x6 MIMO cross-polarised antennas for improved results
- Low-profile and rugged mechanical design with an IP65 rating
- Easy to install with adhesive mounting and suction cup options

Application Areas

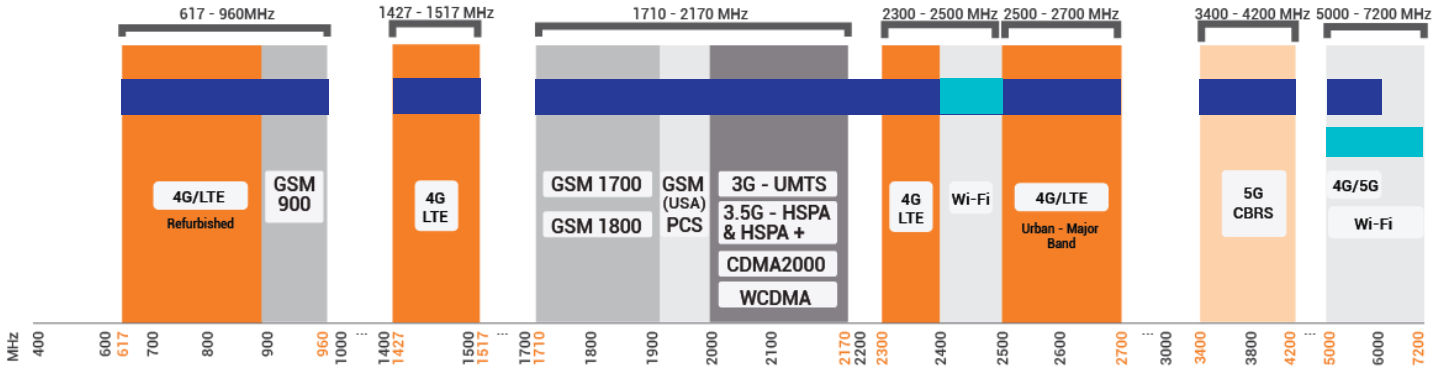
- Connection on-the-Go for vehicles and other mobile platforms
- Robust communication systems for emergency response and public safety services
- Ideal for uninterrupted communication and business operations in a home office/ small business setup
- Stable connections for remote sites and infrastructure monitoring

Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

Frequency Bands

The PANL-631 is a wide-band 5G/4G and tri-band Wi-Fi antenna that works from 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-631 works

Indicates the Wi-Fi bands on which PANL-631 works

Antenna Overview

	5G LTE	Wi Fi	GNSS
Number of Ports	6	3	1
SISO / MIMO	6x6 MIMO	3x3 MIMO	SISO
Frequency Bands	617 – 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), and +/-45°	Linear, Vertical & Horizontal	RHCP
Peak Gain	6dBi	8dBi	20±2 dB (LNA Gain)
Coax Cable Type	RTK-031	RTK-031	RTK-031
Coax Cable Length	2m	2m	2m
Connector Type	SMA (m)	RPSMA (m)	SMA (m)

Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

Electrical Specifications – Cellular

Frequency Bands:	617 – 960 MHz 1427 -1517 MHz 1710 -2700 MHz 3300 – 4200 MHz 4400 – 6000 MHz
Gain (Max):	3 dBi @ 617 – 960 MHz 4 dBi @ 1427 – 1517 MHz 5 dBi @ 1710 – 2700 MHz 6 dBi @ 3300 - 4200 MHz 6 dBi @ 4400 - 6000 MHz
VSWR:	<2.5:1across 90% of the bands
Feed Power Handling:	10 W
Input Impedance:	50 Ohm (nominal)
Polarisation:	Cross Polarised
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 8 dBi @ 5000 - 7200 MHz
VSWR:	<2.5:1 across 95% of the band
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-0631-V1-01
Mounting Accessories:	Velcro Strips and Suction Cups

Ordering Information

Commercial Name:	PANL-631
Order Product Code:	A-PANL-0631-V1-01
EAN Number:	6009710928714
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:	1.09 Kg
Packaged Weight:	1.635 Kg
Radome Material:	UV Stable ASA
Radome Colour:	Black
Mounting Type:	Adhesive Mount and Suction Mount

Environmental Specifications, Certification & Approvals

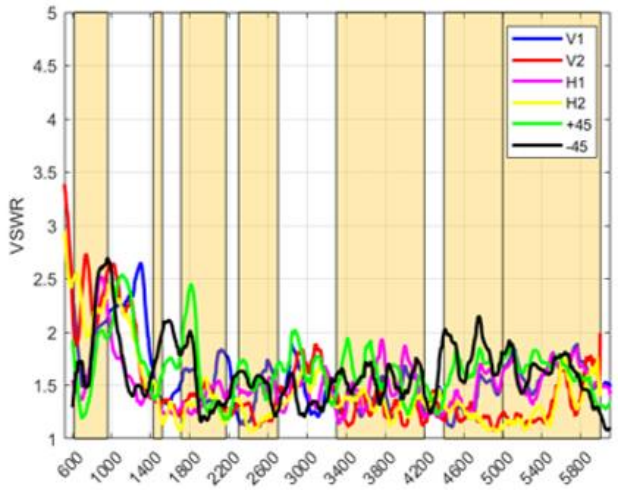
Wind Survival:	≤160km/h
Temperature Range (Operating):	-40°C to +80°C
Environmental Conditions:	Indoor
Water Ingress Protection Ratio/Standard:	IP 65
Salt Spray:	MIL-STD 810G/ASTM B117
Operating Relative Humidity:	Up to 98%
Storage Humidity:	5% to 95% - non-condensing
Storage Temperature:	-40°C to +80°C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

Revised: March 2025

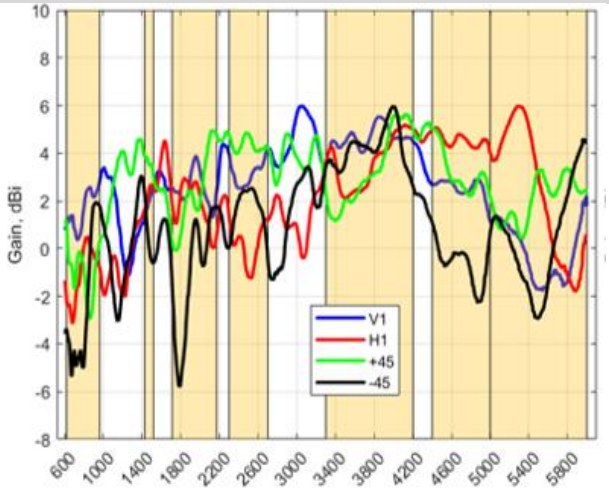
Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

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-631 delivers superior performance across all bands with a VSWR of <2.5:1 across 90% of the bands of interest.

Gain⁺ in dBi

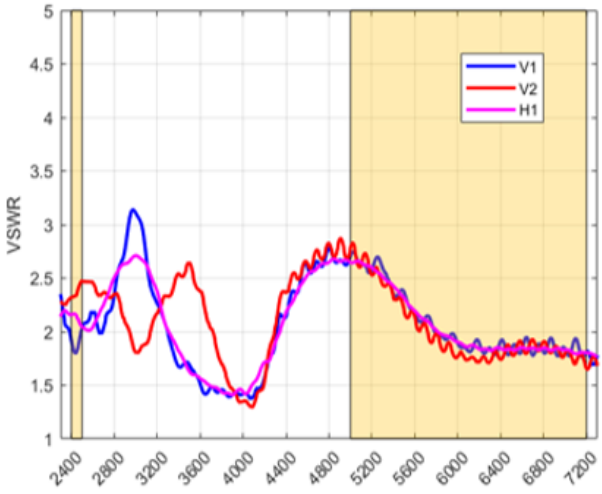
6 dBi is the peak gain across all bands from 617 – 6000 MHz

Gain @ 617 – 960 MHz:	3 dBi
Gain @ 1427 – 1517 MHz:	4 dBi
Gain @ 1710 – 2700 MHz:	5 dBi
Gain @ 3300 – 4200 MHz:	6 dBi
Gain @ 4400 – 6000 MHz:	6 dBi

**VSWR measured with 2m low loss cable*

⁺Antenna gain measured with polarisation aligned standard antenna

VSWR: Wi-Fi Antenna



GAIN (EXCLUDING CABLE LOSS): Wi-Fi 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-631 delivers superior performance across all bands with a VSWR of <2.5:1 across 95% of the band.

Gain⁺ in dBi

8 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:	8 dBi

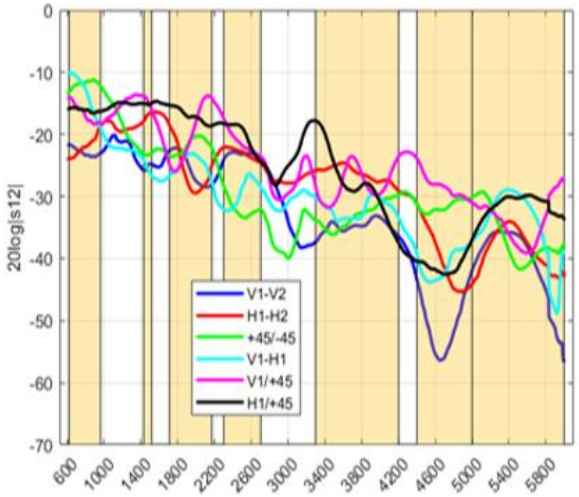
**VSWR measured with 2m low loss cable*

⁺Antenna gain measured with polarisation aligned standard antenna

Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

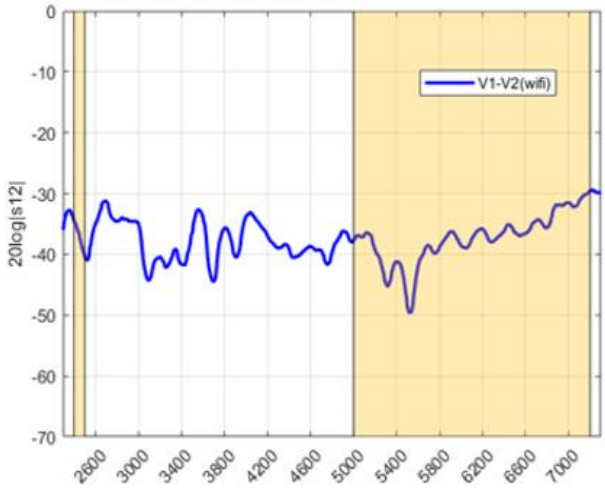
ISOLATION: Cellular Antenna



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 is 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



Isolation

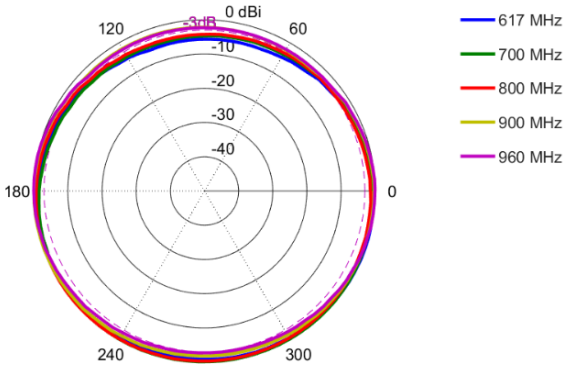
Isolation is a measure of how much energy from one port leaks into another port undesirably. Isolation of 0 dB between 2 ports means that there is no isolation and the energy from 1 port excitation is visible on another port. Isolation of -30 dB or more means that <0.1% of 1 port's energy is leaked into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

Revised: March 2025

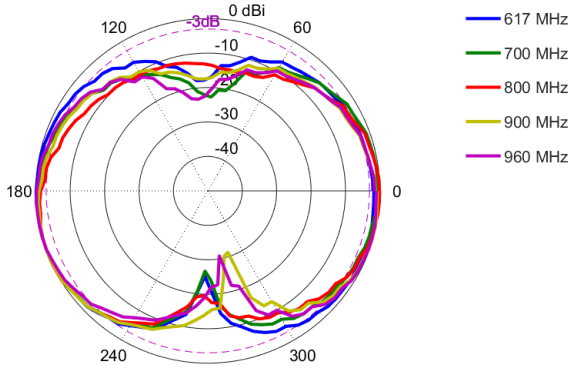
Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

Radiation Patterns - Cellular

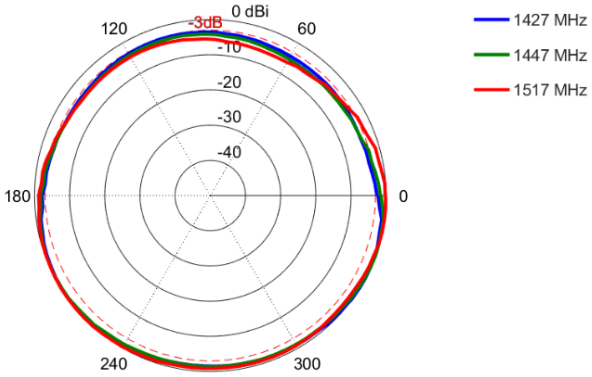
Azimuth: 617 – 960 MHz



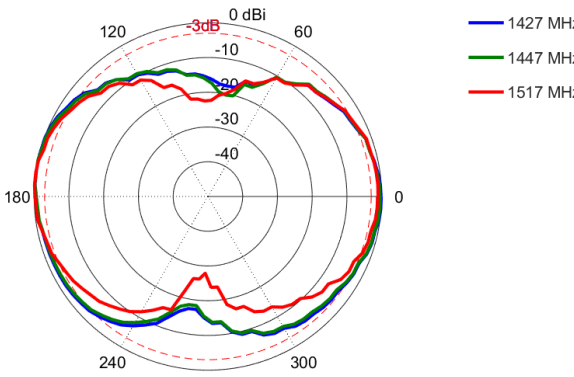
Elevation: 617 – 960 MHz



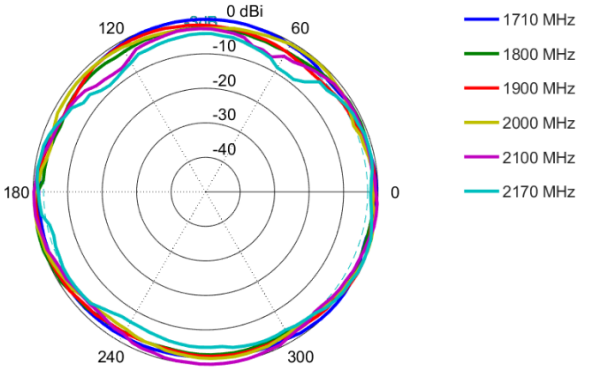
Azimuth: 1427 – 1517 MHz



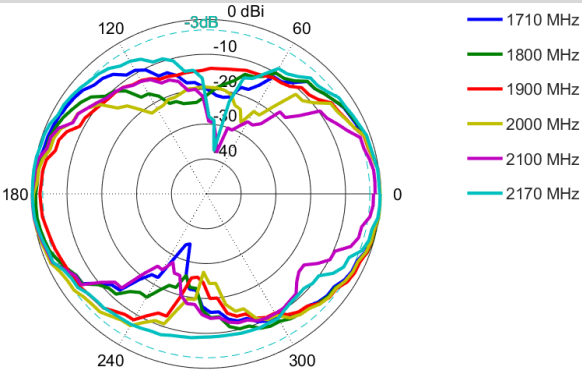
Elevation: 1427 – 1517 MHz



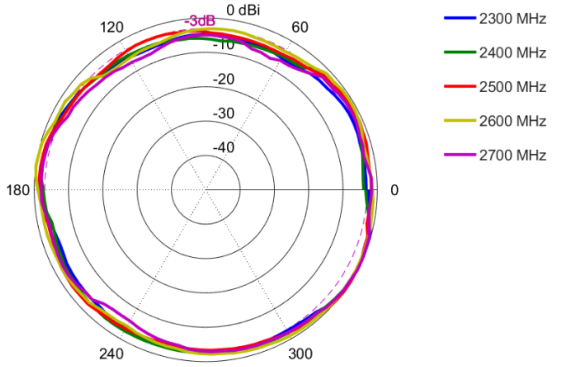
Azimuth: 1710 – 2170 MHz



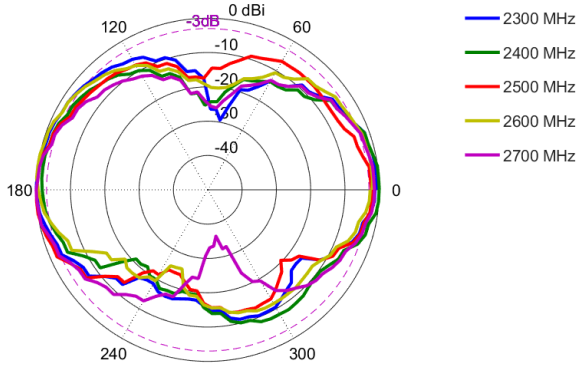
Elevation: 1710 – 2170MHz



Azimuth: 2300 – 2700 MHz



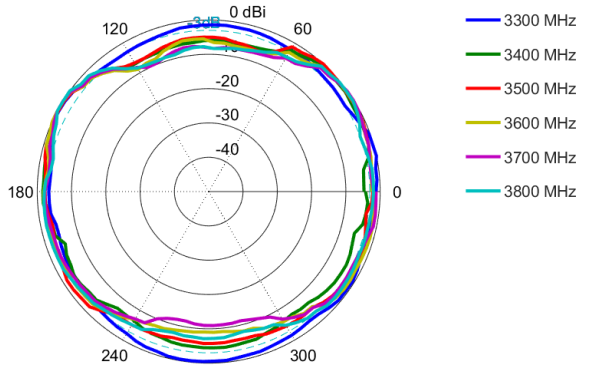
Elevation: 2300 – 2700MHz



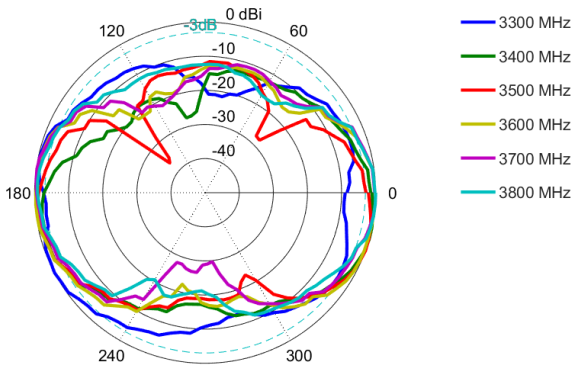
Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

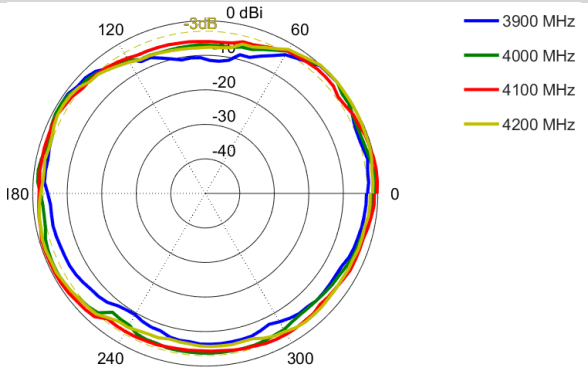
Azimuth: 3300 – 3800 MHz



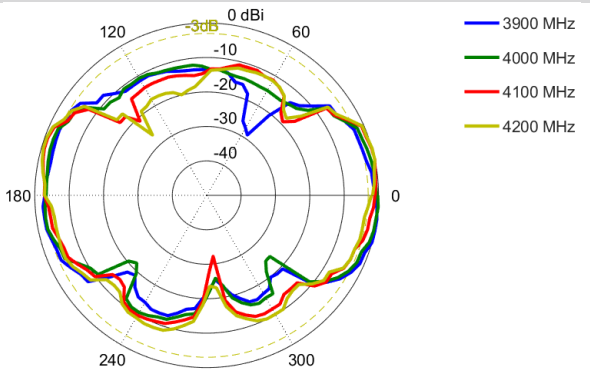
Elevation: 3300 – 3800 MHz



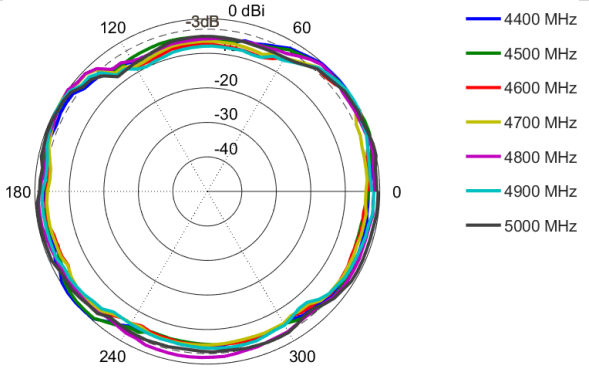
Azimuth: 3900 – 4200 MHz



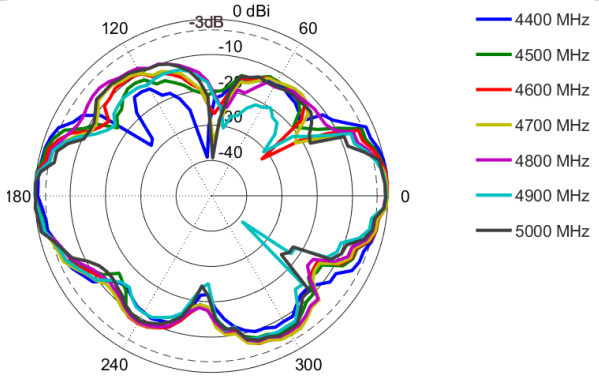
Elevation: 3900 – 4200 MHz



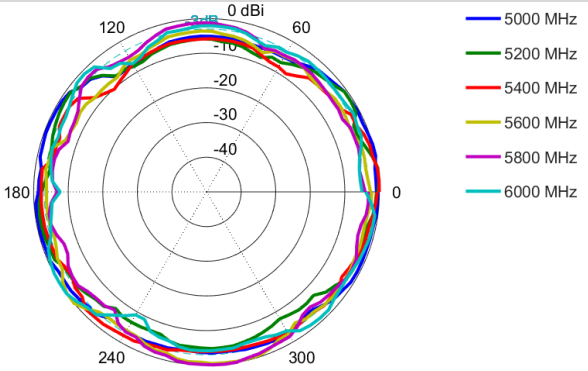
Azimuth: 4400 – 5000 MHz



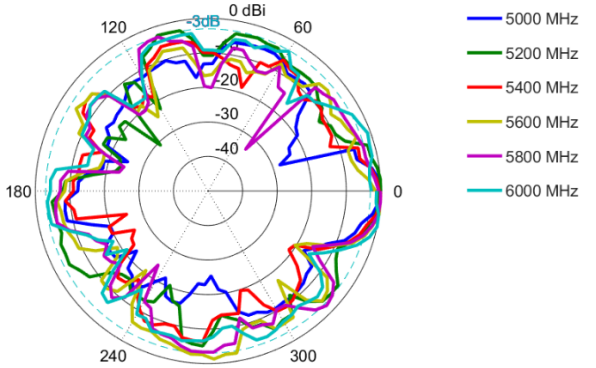
Elevation: 4400 – 5000 MHz



Azimuth: 5000 – 6000 MHz



Elevation: 5000 – 6000 MHz

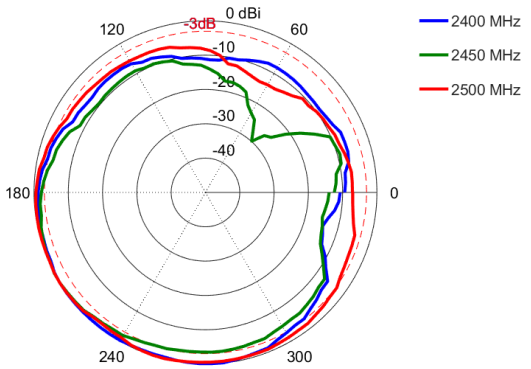


Revised: March 2025

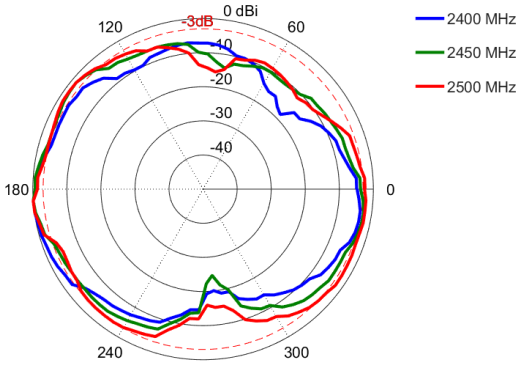
Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

Radiation Patterns – Wi-Fi

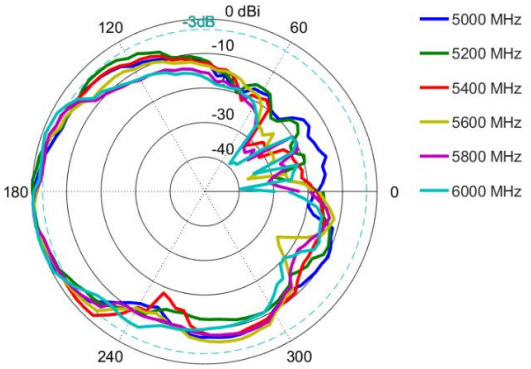
Azimuth: 2400 – 2500 MHz



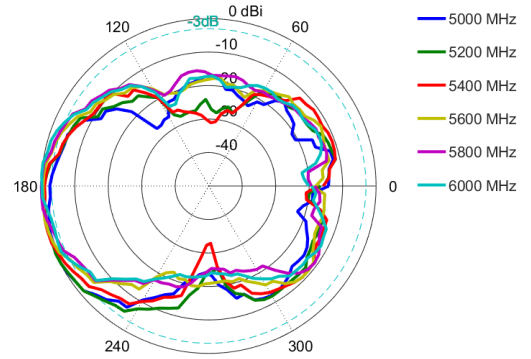
Elevation: 2400 – 2500MHz



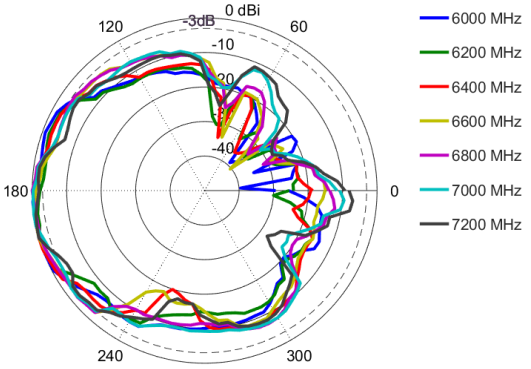
Azimuth: 5000 – 6000MHz



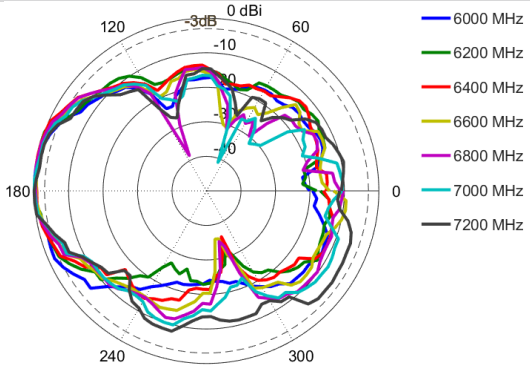
Elevation: 5000 – 6000MHz



Azimuth: 6000 – 7200 MHz



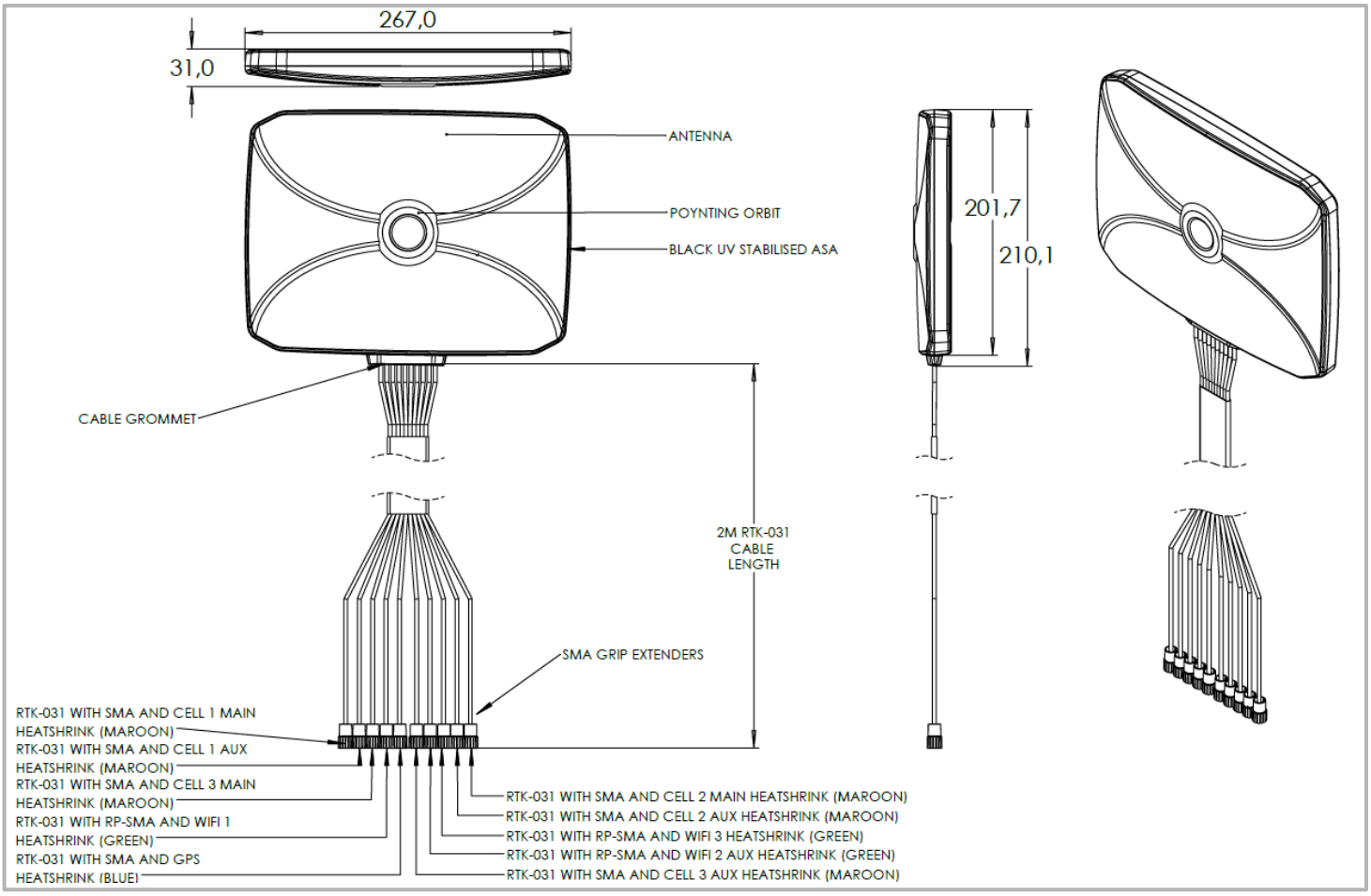
Elevation: 6000 – 7200 MHz



Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

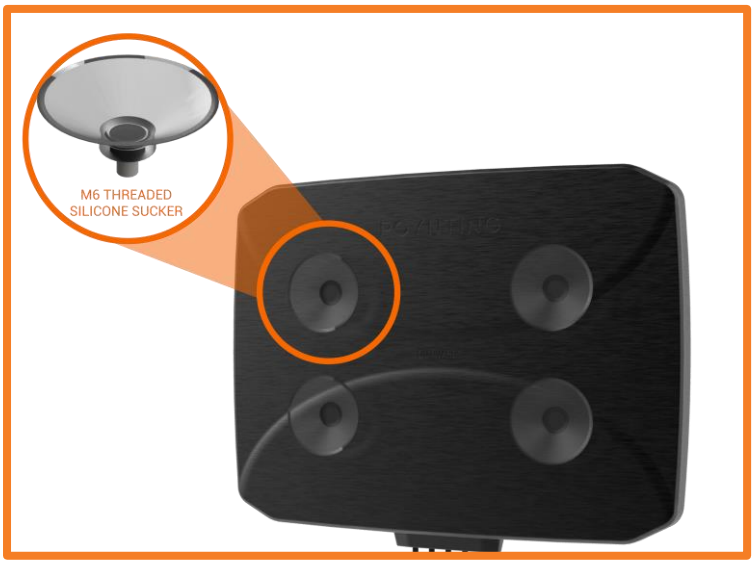
Technical Drawings



Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

Mounting Options



Suction Mount

Window mounting using the provided Suction Cups

Adhesive Mount

Window mounting using the provided Velcro mount assembly

Revised: March 2025

Regulatory Compliance: RoHS 2011/65/EU Compliant | ISO 9001:2015
Document version: TS-A-PANL-0631-V1-01 REV 2.0
www.poynting.tech

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