

Antenna Measurement

Applicant: smaXtec animal care GmbH
Sandgasse 36/2
A-8010 Graz

Product: Climate sensor

Type: SX.2.1

Model: EX-2342HTP

Date: 20.11.2023

Test engineer: W. Stocksreiter, R. Findenig

Standards:

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5. Test results Climate_Sensor Antenna	Fehler! Textmarke nicht definiert.
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1. General

Company:	smaXtec animal care GmbH
Department:	R&D
Address:	Sandgasse 36/2 8010 Graz
Contact person:	DI Manuel Frech
Email:	manuel.frech@smaXtec.com
EUT received on:	20.11.2023
Test performed on:	20.11.2023
Test location:	FH-JOANNEUM EMV Laboratory Room TP20 Werk VI Strasse 46 A-8605 Kapfenberg
Performed by:	Wolfgang Stocksreiter, Roland Findenig
EUT:	Climate sensor
Model code:	SX.2.1
Model:	EX-2342HTP
Manufacturer:	smaXtec animal care GmbH
Description:	The radiation was tested at 868MHz, 888,5MHz and 915MHz

2. [Test equipment list](#)

Device	Manufacturer	Type	Indented purpose
Full anechoic chamber	Albatros	--	Gain measurements
UltraLog antenna	Rohde&Schwarz	HL562E	Gain measurements
Camera system	MK Messtechnik	dAV-Cr-HD	Visual control
Turn table control unit	INNCO	CO2000	Rotation of EUT
Receiver	Rohde&Schwarz	FSIQ 26	Receiver unit for gain measurements
Signal generator	Rohde&Schwarz	SMIQ 3.3	RF source
Antenna control unit	INNCO	CO2000	Polarization of antenna
Network Analyzer	Rohde & Schwarz	ZNB 8	Impedance measurement

3. Test parameter

Frequency: 868MHz, 888,5MHz and 915MHz
Polarization receiving antenna: horizontal and vertical
EUT antenna position: vertical (z axis – xy plane)
Measurement angle: 0-360° in 5° steps
Antenna heighth: 155cm
EUT heighth: 155cm

Loop attenuation Radiation measurements

Frequency	868MHz	888,5MHz	915MHz
Gain receiving antenna	8,35 dBi	8,19 dBi	8,12 dBi
Path losses distance 3m	40,79 dB	40,96 dB	41,21 dB
Σ Cable losses	2,83 dB	2,86 dB	2,93 dB
Applied power (Generator)	13,10 dBm	13,3 dBm	13,3 dBm
Applied power (EUT)	10 dBm	10 dBm	10 dBm

Test setup



Figure 1-2: Measurement setup principal picture of DUT, Position 0°

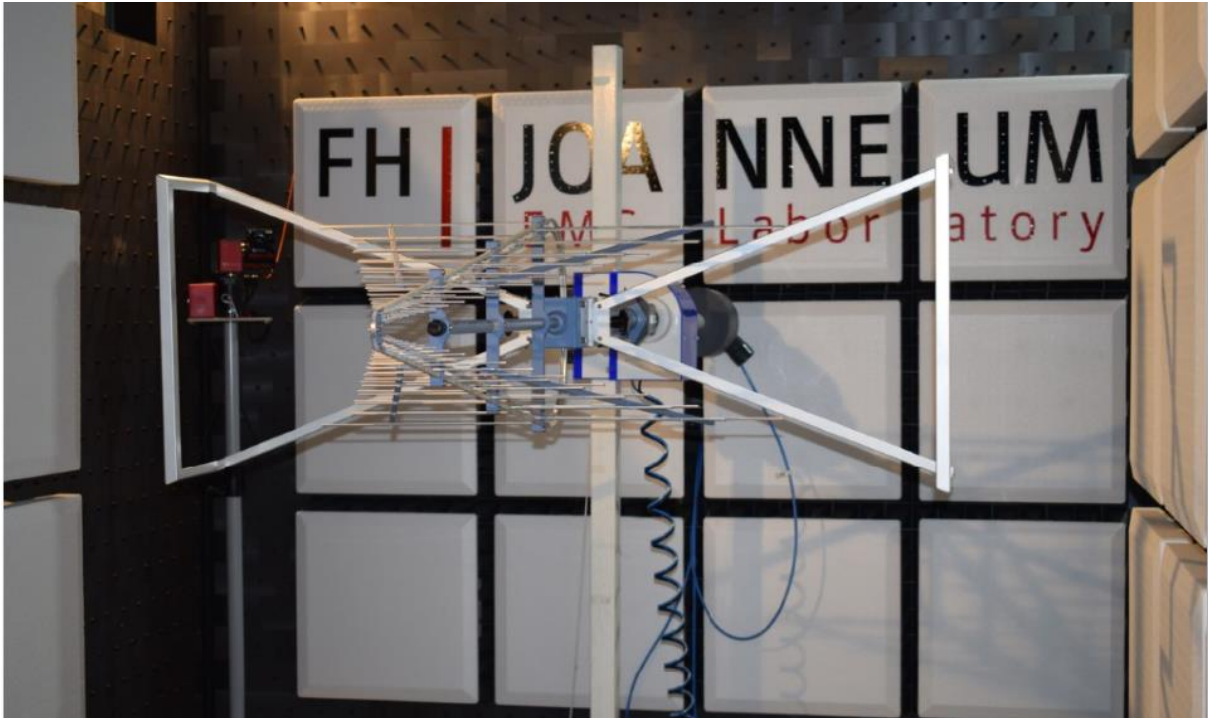


Figure 3: Ultra Log antenna in horizontal polarization.



Figure 4: Ultra Log antenna in vertical polarization.

4. Test results climate sensor SX.2.1 Antenna

Antenna specification

Specification	Value
Band Peak Gain max	-25,1 dBi
Impedance	50 ohm nominal, inclusive matching network
Type	PCB Antenna Meander, Integral
Polarization	linear
VSWR @ 915 MHz	4.1
Frequency	868-915 MHz
Weight	
Size	160 x 130 x 60 (L x W x H)
Operating Temp.	23,9 °C
Brand	smaXtec
Model code:	SX2.1 EX-2342HTP

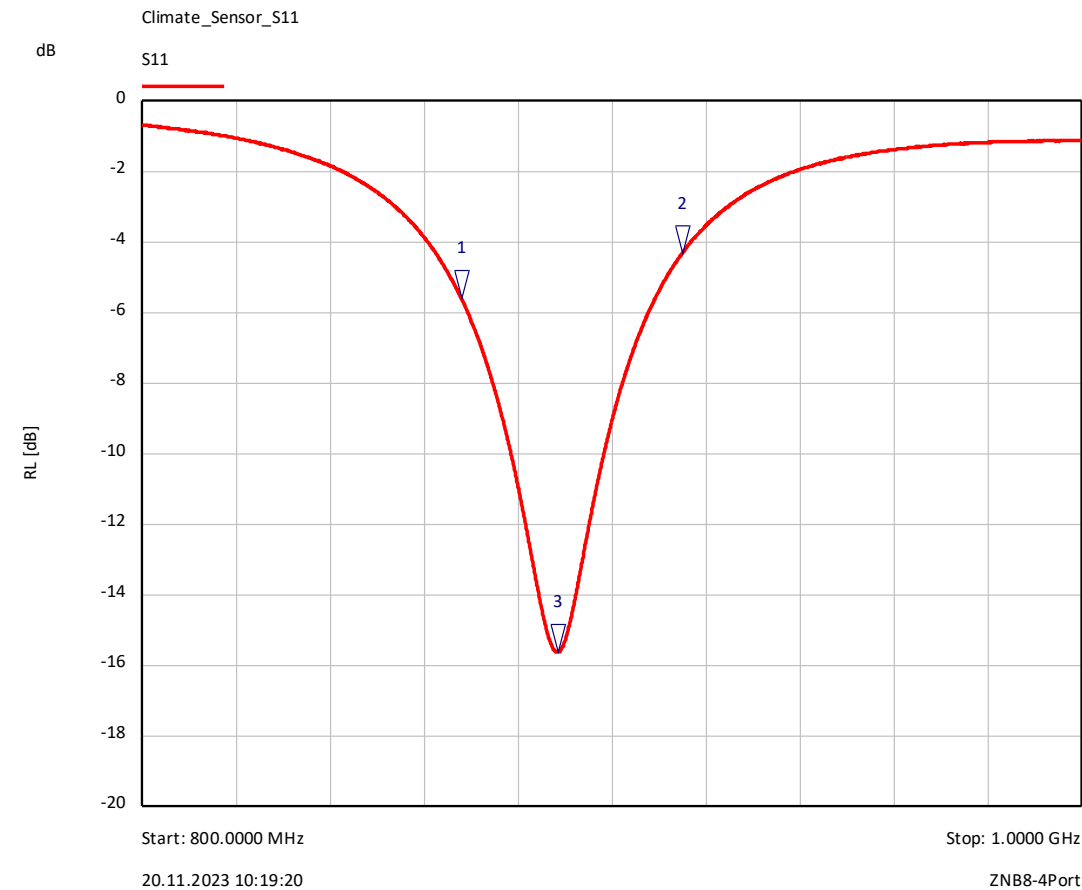


Figure 5: Device under test

Climate Sensor

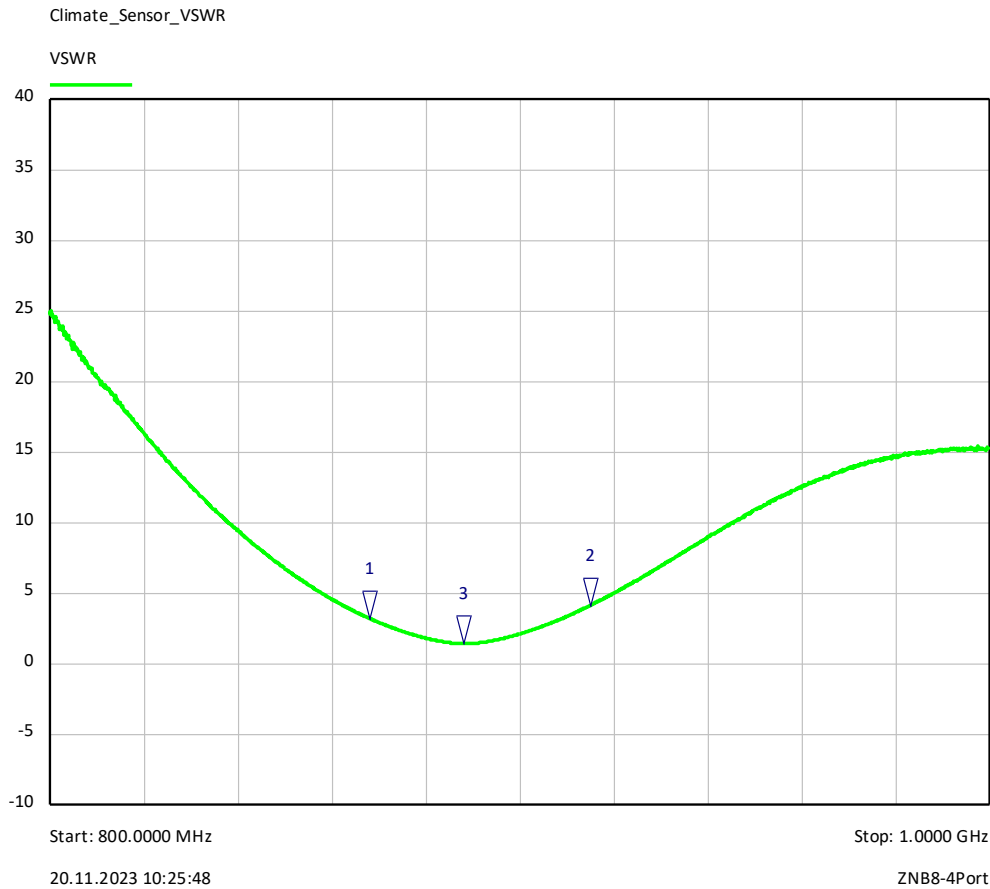
Antenna matching performance.

Return loss:



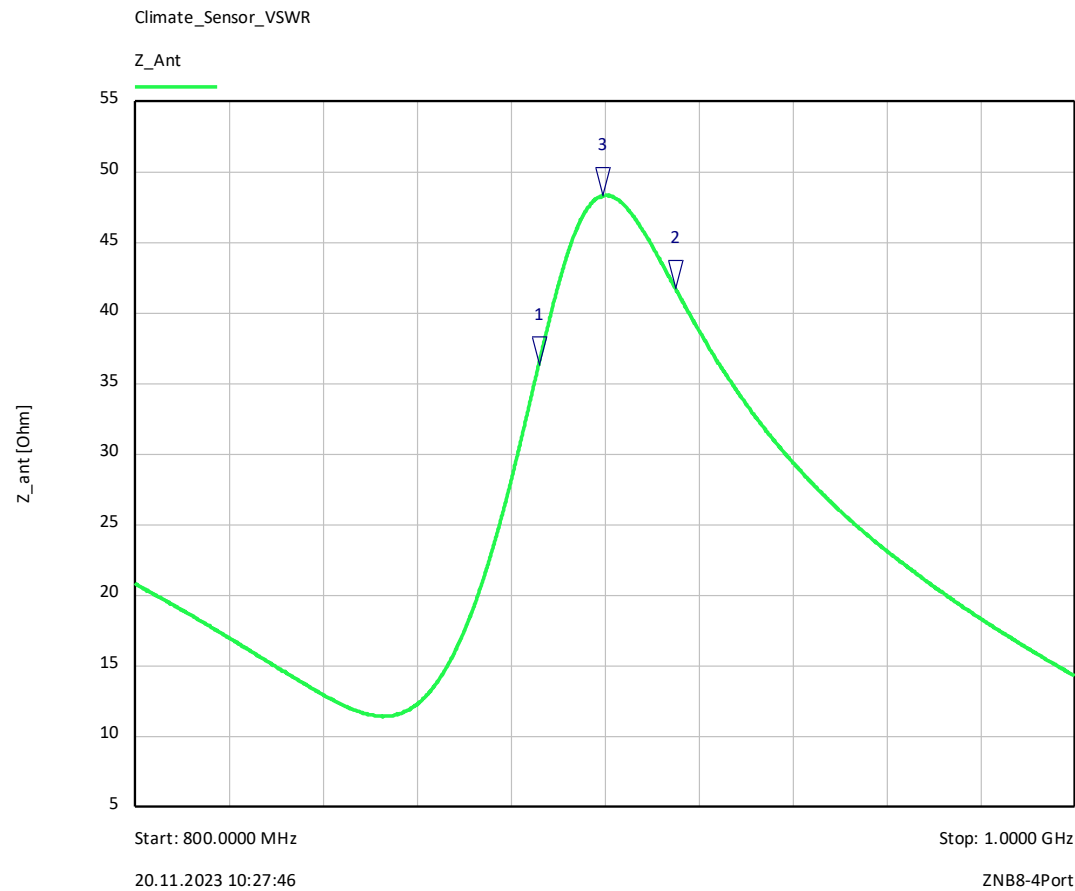
Mkr	Trace	X-Axis	Value	Notes
1	S11	868.0000 MHz	-5.59 dB	
2	S11	915.0000 MHz	-4.34 dB	
3	S11	888.5000 MHz	-15.65 dB	

VSWR:



Mkr	Trace	X-Axis	Value	Notes
1	VSWR	868.0000 MHz	3.20	
2	VSWR	915.0000 MHz	4.10	
3	VSWR	888.1250 MHz	1.40	

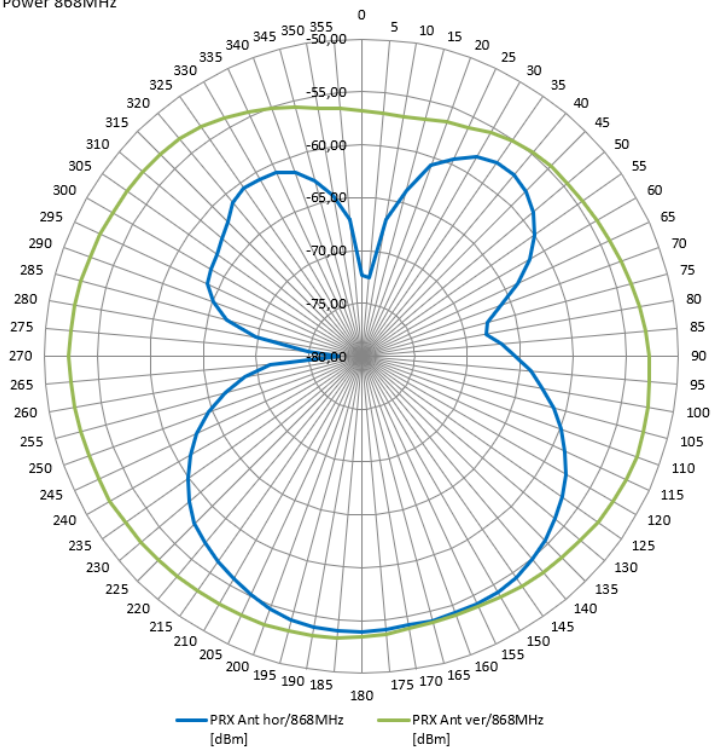
Impedance:



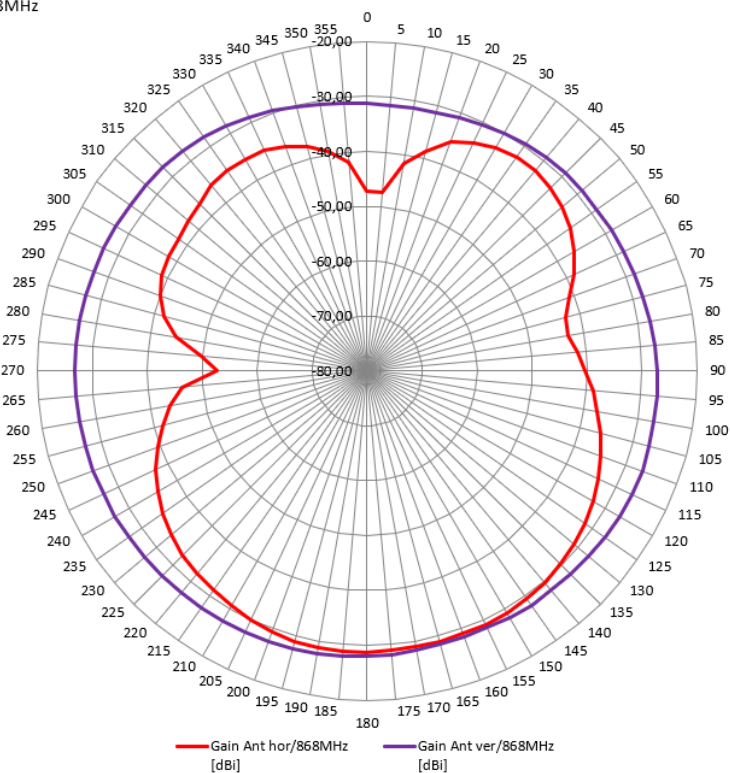
Mkr	Trace	X-Axis	Value	Notes
1	Z_Ant	886.0000 MHz	36.31	
2	Z_Ant	915.0000 MHz	41.77	
3	Z_Ant	899.6250 MHz	48.37	

5. Radiation pattern

Received Power 868MHz

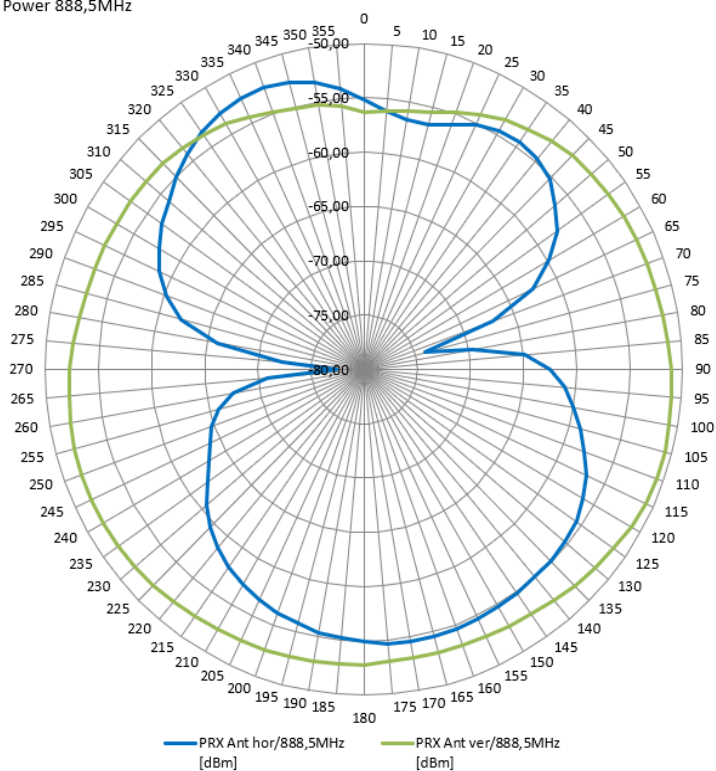


Gain 868MHz

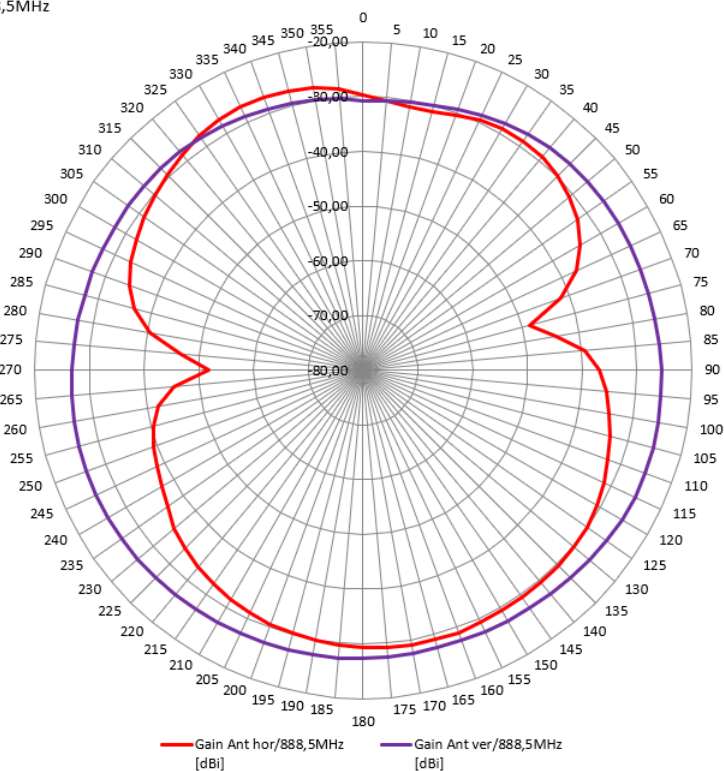


Note: Max horizontal gain **-28,78dBi** at **180°**, Max vertical gain at **-26,65dBi** at **110°**.

Received Power 888,5MHz

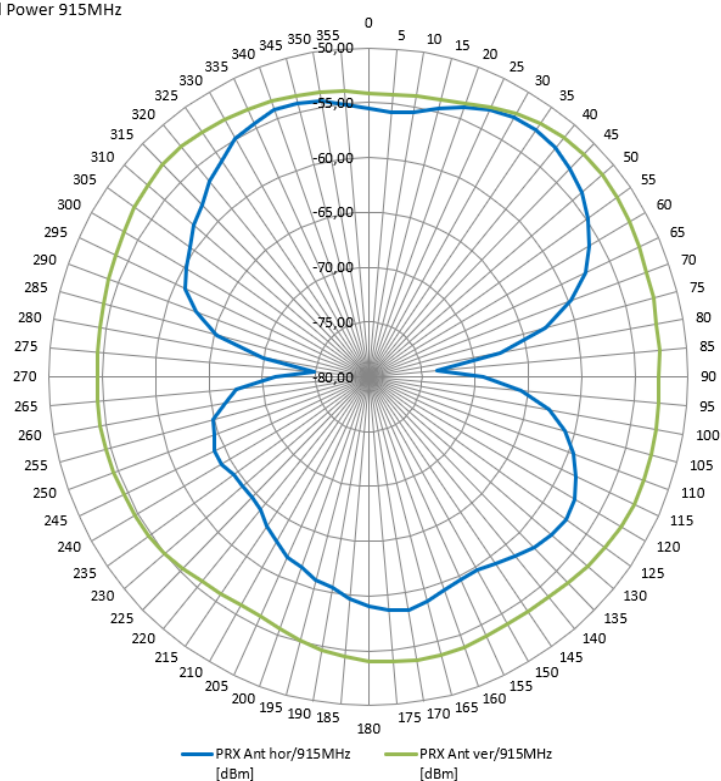


Gain 888,5MHz

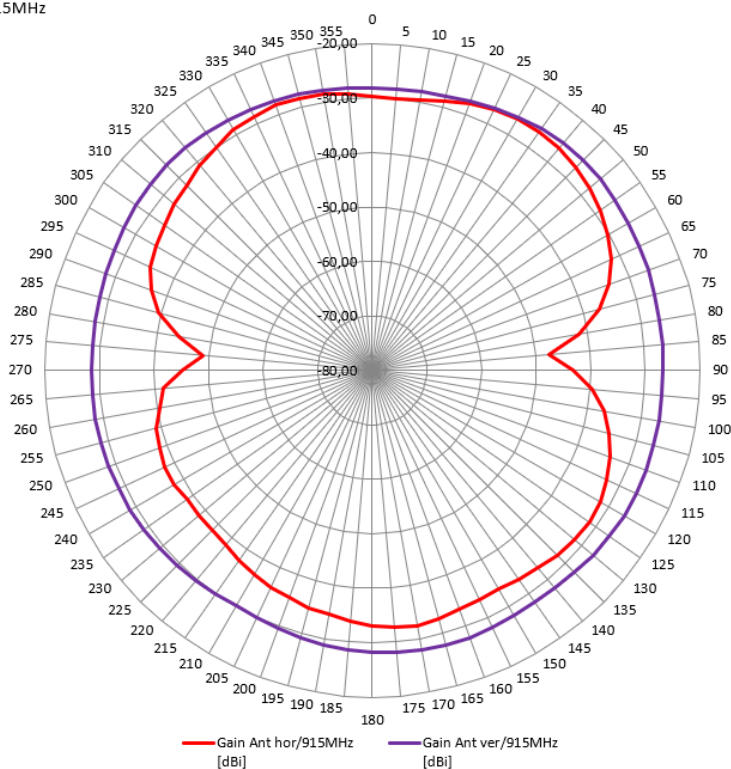


Note: Max horizontal gain **-26,90dBi** at **340°**, Max vertical gain at **-25,10dBi** at **105°**.

Received Power 915MHz



Gain 915MHz



Note: Max horizontal gain **-26,63dBi** at **35°**, Max vertical gain at **-25,36dBi** at **50°**.

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