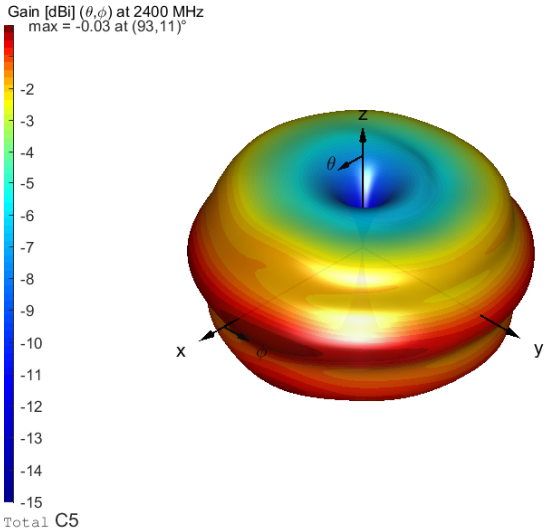
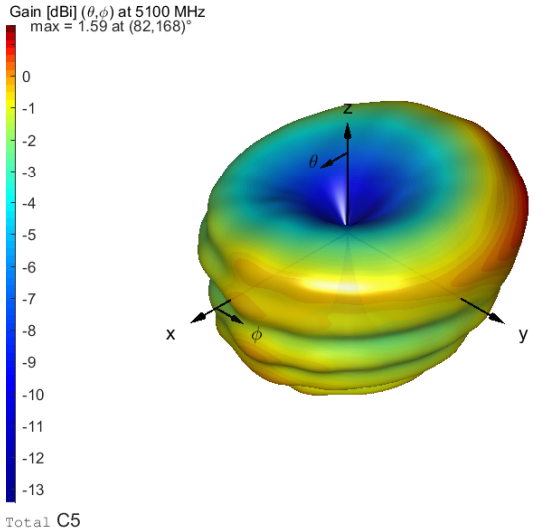
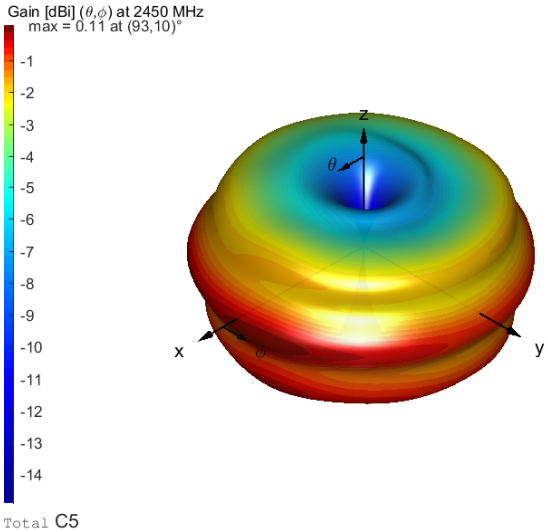
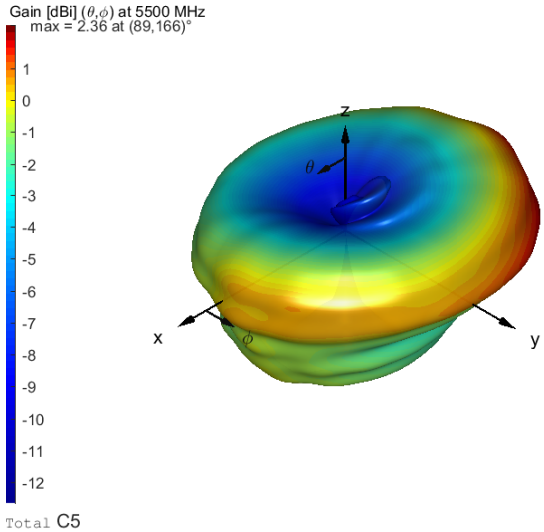
3.4 3D Polar Pattern

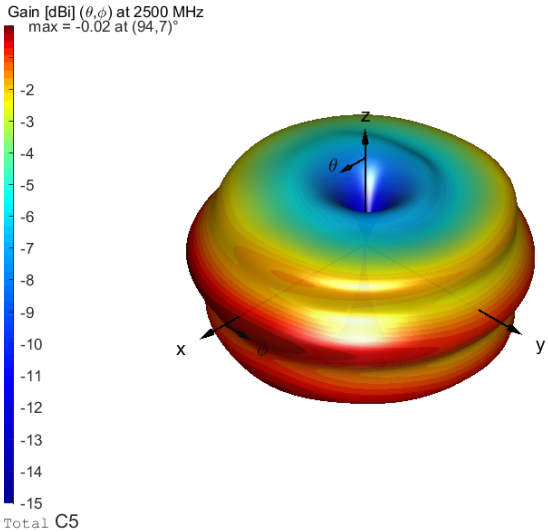
NORMALIZED TO MAX

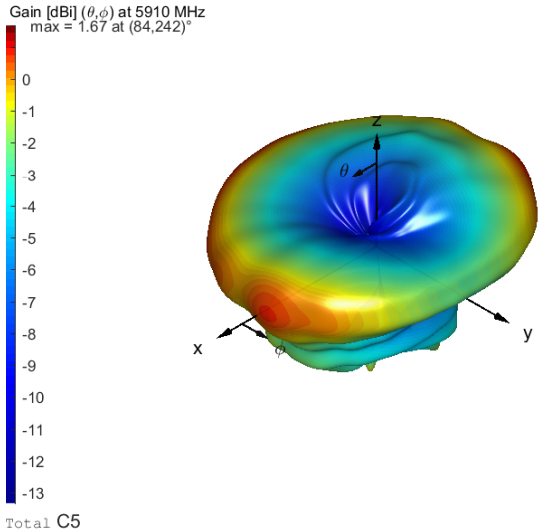








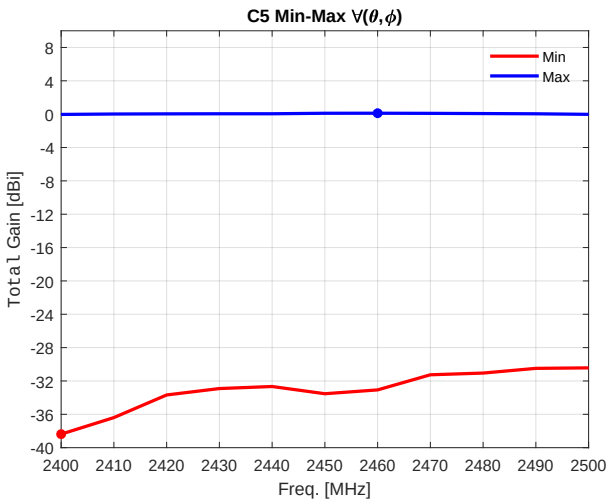




Appendix

A Global Min and Max values and directions

Lower Band

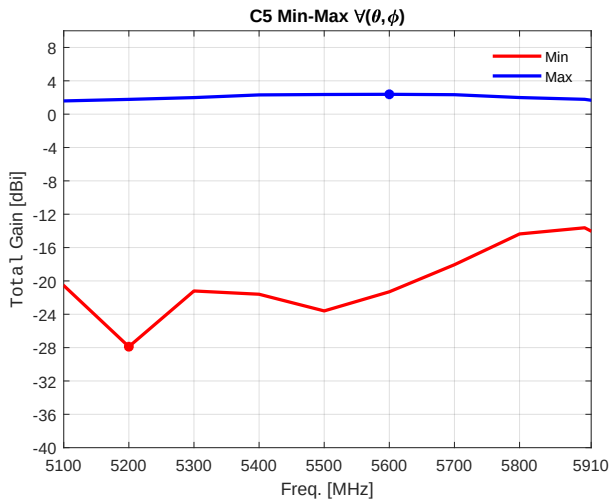


Freq. (MHz)	Min (dBi)	θ_{Min} (deg)	ϕ_{Min} (deg)	Max (dBi)	θ_{Max} (deg)	ϕ_{Max} (deg)
2400	−38.38	178	299	−0.03	93	11
2410	−36.39	178	299	0.02	93	12
2420	−33.68	178	298	0.04	93	12
2430	−32.91	177	294	0.05	93	11
2440	−32.66	177	293	0.05	93	11
2450	−33.53	177	291	0.11	93	10
2460	−33.07	177	291	0.11	93	9
2470	−31.26	177	293	0.10	93	7
2480	−31.05	178	293	0.07	93	7
2490	−30.49	177	293	0.04	93	6
2500	−30.43	178	293	−0.02	94	7

Globally:

Freq. (MHz)	Min (dBi)	θ_{Min} (deg)	ϕ_{Min} (deg)	Max (dBi)	θ_{Max} (deg)	ϕ_{Max} (deg)
2400	−38.38	178	299			
2460				0.11	93	9

Upper Band



Freq. (MHz)	Min (dBi)	θ_{Min} (deg)	ϕ_{Min} (deg)	Max (dBi)	θ_{Max} (deg)	ϕ_{Max} (deg)
5100	−20.55	174	43	1.59	82	168
5200	−27.89	174	44	1.77	84	167
5300	−21.21	174	52	1.99	86	167
5400	−21.60	48	311	2.31	89	166
5500	−23.60	50	313	2.36	89	166
5600	−21.30	52	313	2.38	88	166
5700	−18.06	52	321	2.33	87	167
5800	−14.37	50	330	1.99	84	168
5900	−13.63	7	320	1.78	85	243
5910	−14.03	7	321	1.67	84	242

Globally:

Freq. (MHz)	Min (dBi)	θ_{Min} (deg)	ϕ_{Min} (deg)	Max (dBi)	θ_{Max} (deg)	ϕ_{Max} (deg)
5200	−27.89	174	44			
5600				2.38	88	166

⚠ The Global Min and Max refer to the antenna placed in free-space as indicated in Sec. 3.2.

BT_WLAN_2___BT_WLAN_3 antenna

Datasheet

BT WIFI Dualband Antenna (Bugatti)

Molex Part Number	Bugatti Part Number	Part Description
9 58 02	***5B4.035.510***	***BT/WiFi Ant***

Content

Dimensions 2

Antenna electrical Characteristics 3

Antenna Orientation 3

Antenna peak values 4

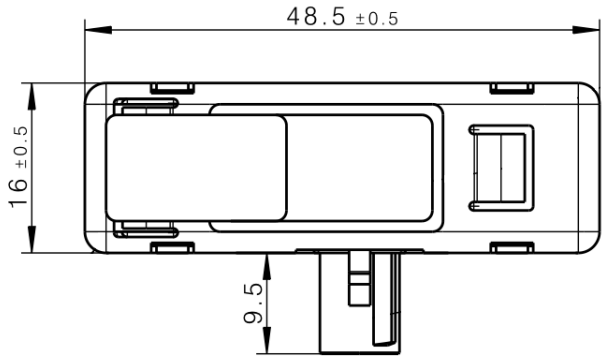
Antenna matching with ground (S22 Parameter) 5

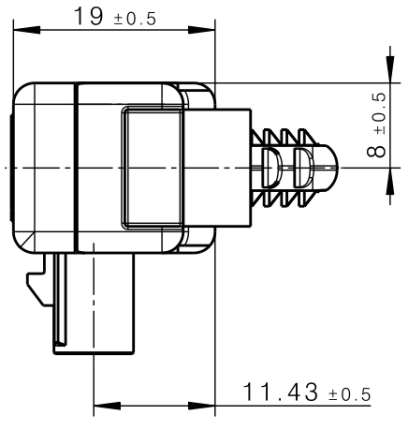
Antenna matching without ground (S22 Parameter) 6

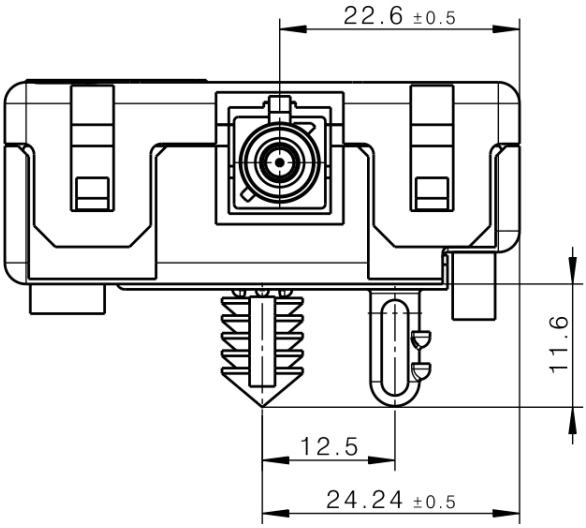
Adress:
Daimlerring 31
D-31135 Hildesheim

Fone: +49 (0) 5121/20 68-0
Fax: +49 (0) 51 21/2068-299

Dimensions



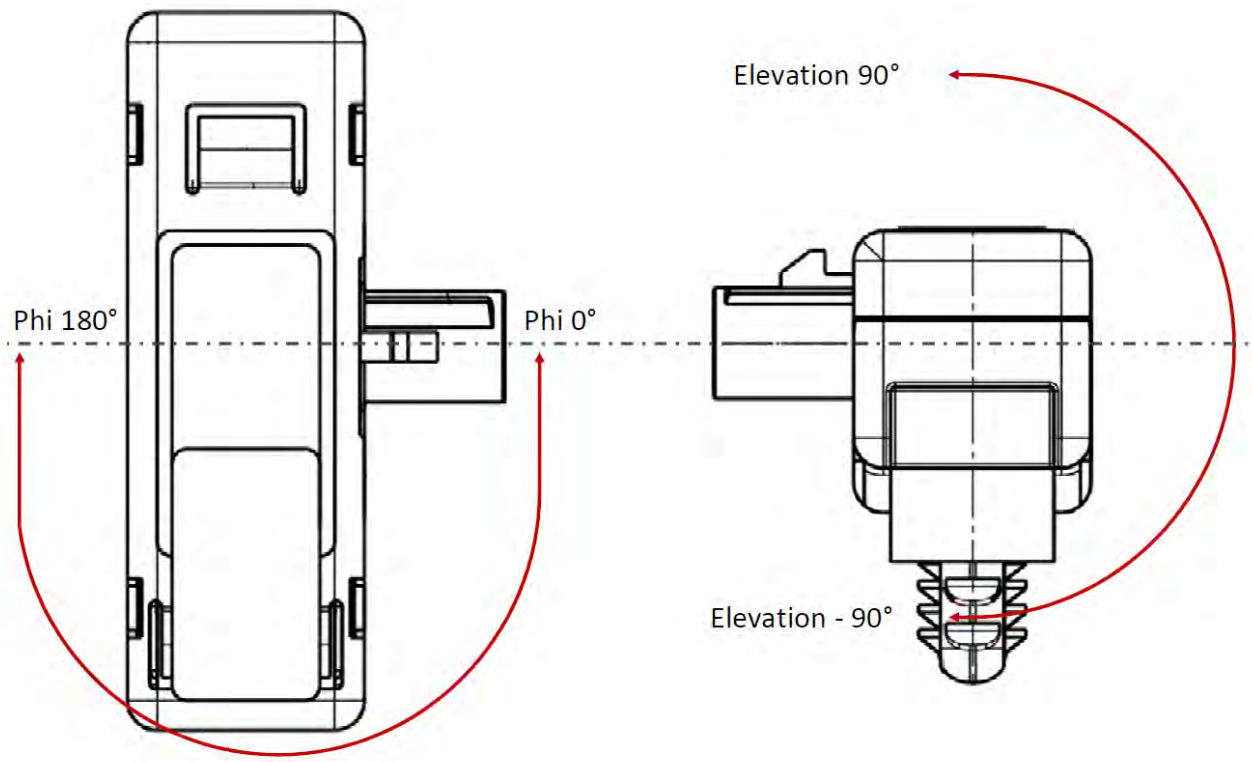




Antenna electrical Characteristics

Parameters	Min	Typ	Max	Units	Remarks
Frequency Band 2.4GHz	2400		2483.5	MHz	
Frequency Band 5GHz	5150		5850	MHz	
3D Efficiency	60			%	Final Assembly; measured without harness.
Antenna Peak Gain			3 5	dBi	@ f < 4.9GHz; @ f > 4.9GHz; Measured without harness.
Polarization		Vertical			also horizontal
S22 (Return Loss)			-8	dB	matching
Impedance		50		Ohm	Both bands
Diagnostic Resistor	9	10	11	KOhm	
Connections	Single Fakra II, Code G, male				

Antenna Orientation



Antenna peak values

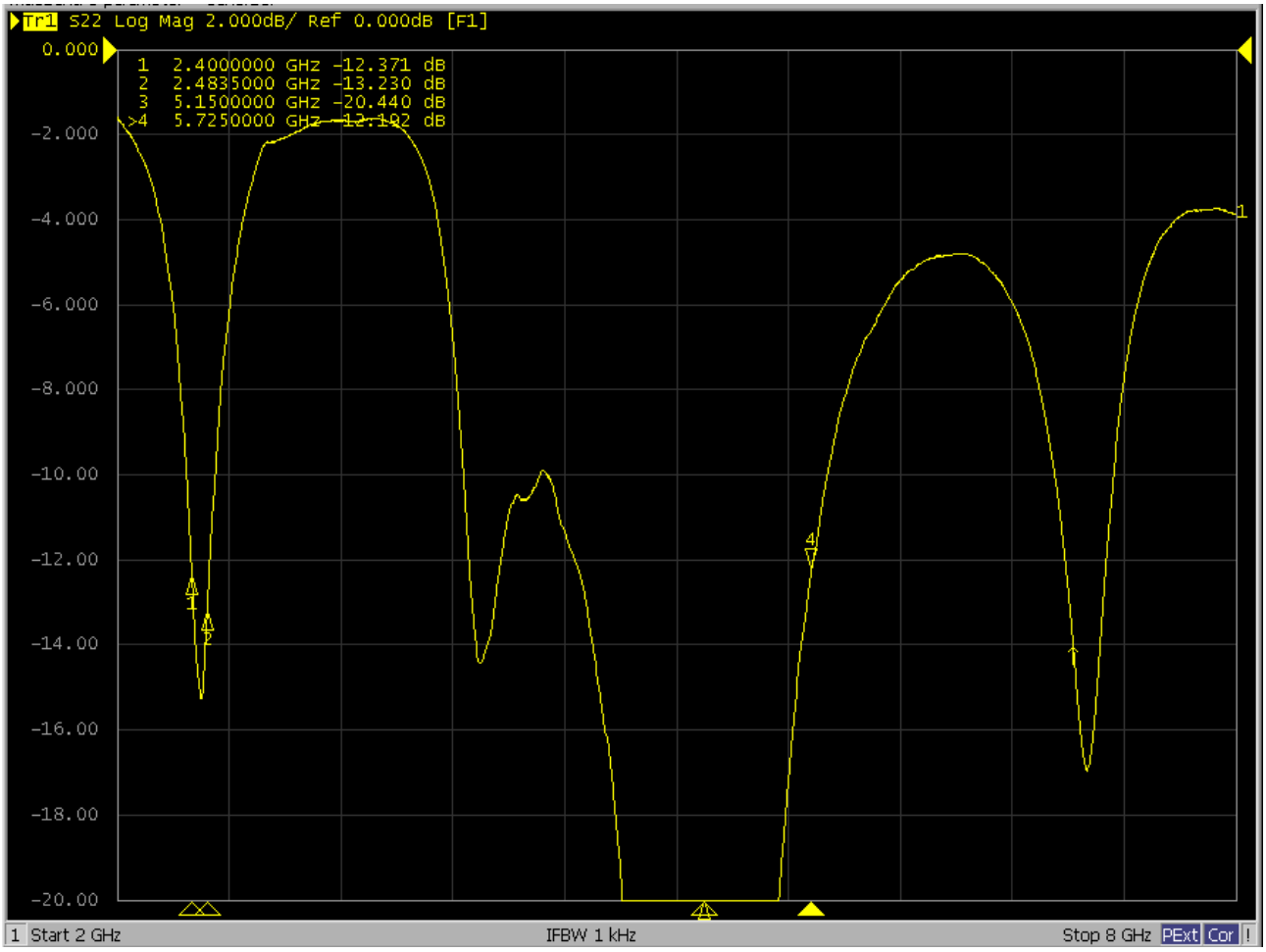
H - overall peak			
f [MHz]	max [dB]	phi [°]	elevation [°]
5550	2,63458679	340	-86

V - overall peak			
f [MHz]	max [dB]	phi [°]	elevation [°]
5600	4,0570684	270	-78

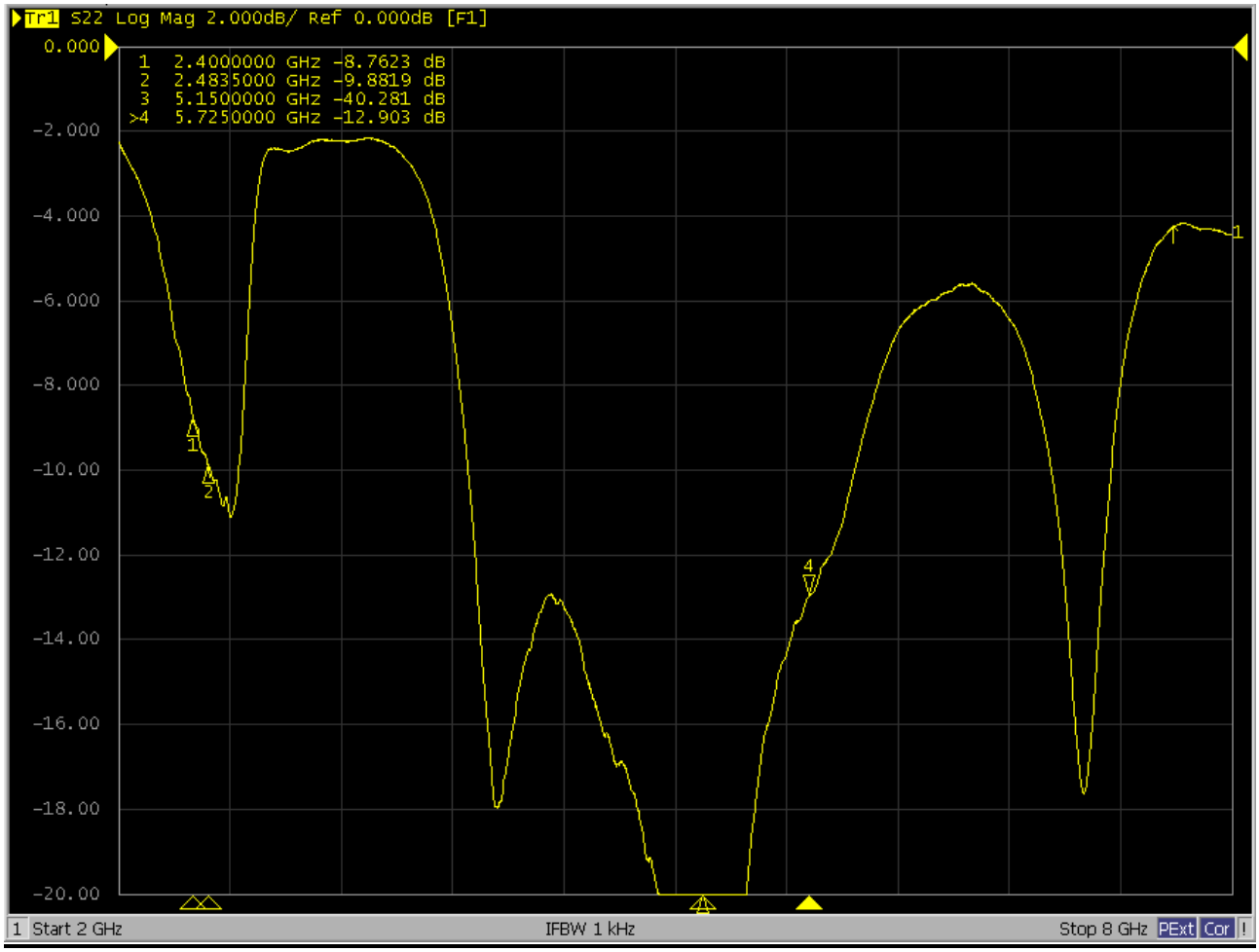
H - peak values			
f [MHz]	max [dB]	phi [°]	elevation [°]
2400	1,21905871	186	-50
2410	1,37903599	184	-50
2420	1,43412394	186	-50
2430	1,37576434	184	-50
2440	1,38299612	186	-50
2450	1,34245887	186	-50
2460	1,48013625	186	-50
2470	1,41239651	186	-48
2480	1,30163021	184	-48
2490	1,3609937	186	-50
2500	1,33425597	186	-50
5100	2,34259652	18	90
5150	1,94971276	18	68
5200	2,24032973	18	86
5250	2,05674312	328	-84
5300	2,18997632	328	-86
5350	2,15840245	336	-82
5400	2,34537031	336	-82
5450	2,31839742	338	-82
5500	2,51967581	340	-82
5550	2,63458679	340	-86
5600	2,50380553	342	-86
5650	2,4643903	342	-84
5700	2,22622551	344	-84
5750	2,50122628	348	-84
5800	2,43724023	348	-86

V - peak values			
f [MHz]	max [dB]	phi [°]	elevation [°]
2400	0,59348167	268	-78
2410	0,71979746	268	-78
2420	0,82626247	266	-76
2430	0,72447664	268	-76
2440	0,7095765	268	-78
2450	0,70647293	270	-78
2460	0,83437951	88	90
2470	0,81557035	90	90
2480	0,6757775	88	90
2490	0,50494027	268	88
2500	0,48468508	270	88
5100	2,42378646	284	-52
5150	2,58413962	282	-54
5200	3,15152737	282	-54
5250	3,28829198	284	-52
5300	3,38213639	282	-54
5350	3,56555509	282	-54
5400	3,67829067	266	-78
5450	3,69990588	266	-78
5500	3,86243897	268	-78
5550	4,04730467	266	-80
5600	4,0570684	270	-78
5650	4,01961046	270	-80
5700	3,81938365	270	-80
5750	3,75201399	270	-80
5800	4,03162441	272	-80

Antenna matching with ground (S22 Parameter)



Antenna matching without ground (S22 Parameter)



Porsche Bluetooth Antenna: BTANTP01

9Y0 051 506, A,…

BTLE antenna

Continental
The Future in Motion

Porsche Bluetooth Antenna: BTANTP01

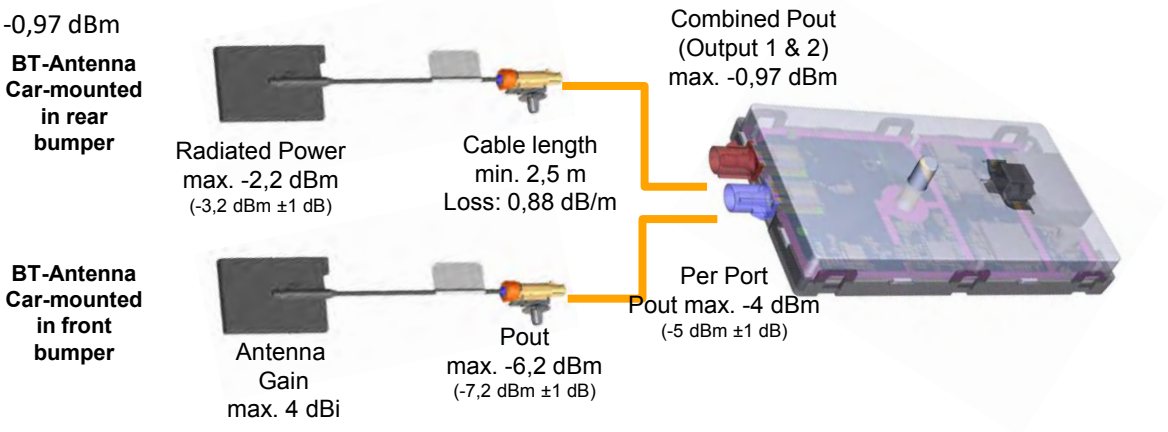
Porsche No.	Additional Customer No.	EZ-No.	Car	Function	Homologation Title	BT-Gen.	Country	TGS
9Y0 051 506		50011040	PO536	BT-ANT	BTANTP01	-	RDW	02S
9Y0 051 506 A	36231264	52512577	PO513,536,992,AU513	BT-ANT	BTANTP01	-	RDW	01S

Revision History

V1 First Release

System Overview

- Max. Ratiated Power/ EIRP for each antenna= -2,2 dBm (0,6mW)
- Max. Conducted Power = -4,0 dBm
- Max Combined Power = -0,97 dBm

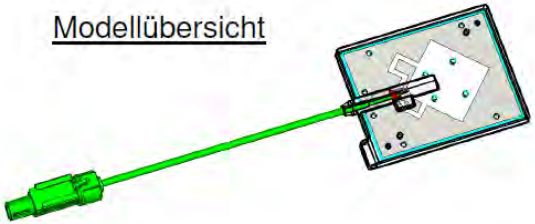


Antenna hardware:

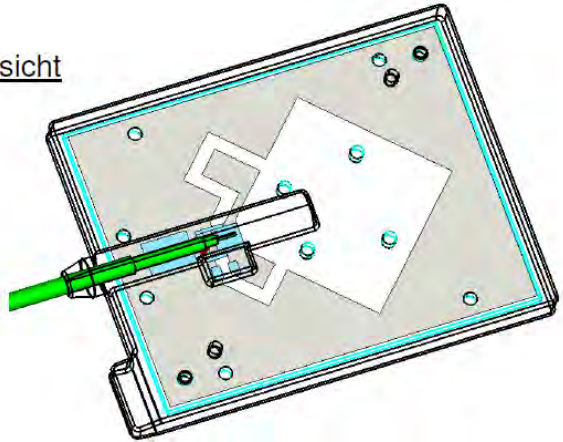
- both antennas can transmit simultaneously
- No MIMO possible (passive splitted)

Antenna Design

Modellübersicht



Detailansicht



Used Car-Bumper Antenna – Technical Data

9Y0.051.506_ / A:

- **Antenna Type**: Slot Patch Antenna
- **Polarization**: Circular
- **Antenna Gain**: max. 4 dBi
- **Antenna Rated Power**: max. -2,2 dBm
- **Antenna Connector**:

Fakra-Connector acc.	ISO 20860-1
Frequency:	DC to 6 GHz
Impedance:	50 Ohm
Return Loss:	> 15 dB
Decoupling:	> 16 dB
Temperature Range:	-40 °C to +105 °C

Interface Description

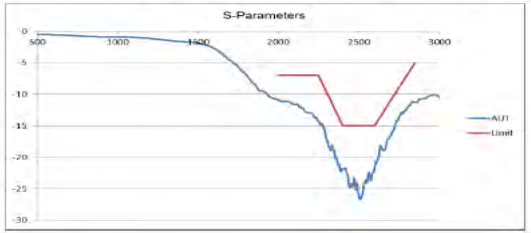
Connector name	Pin	Description	Remark
FAKRA	C1	RF	Diagnosis 10 kOhm

Diagnosis Resistor

Measurement	Min. value	Typ. value	Max. value	Unit
DC-resistance	9	10	11	kOhm

RF Performance

Return loss of antenna in dB. Frequency range from 500 MHz to 3 GHz.



24.05.2017 Version: V1 Page 1 of 1

Porsche P0426

Datasheet : Part No: 95C.035.500, Fuba 30006738 GNSS Performance in Heckscheibe

27.07.2021

M. Schöneberg

Fuba Electrical Engineering

Documentation Of Changes

Date	Chapter	Changes	Author
27.07.2021	1	Initial Version	M. Schöneberg

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Table Of Content

- 1. Overview
- 2. Sat – Antenna Performance
  - 2.2. Passive Measurement Results L2/5
- 3. LNA Measurements
  - 3.1 Gain1559-1606 MHz
  - 3.2 P_{1dB}
  - 3.3 Intermodulation Measurement, OIP3, 1559-1605 MHz
  - 3.4 Noise

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2.2 Passive Measurement Radom

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2.2 Passive Measurement Radom

Partno: 95C.035.500

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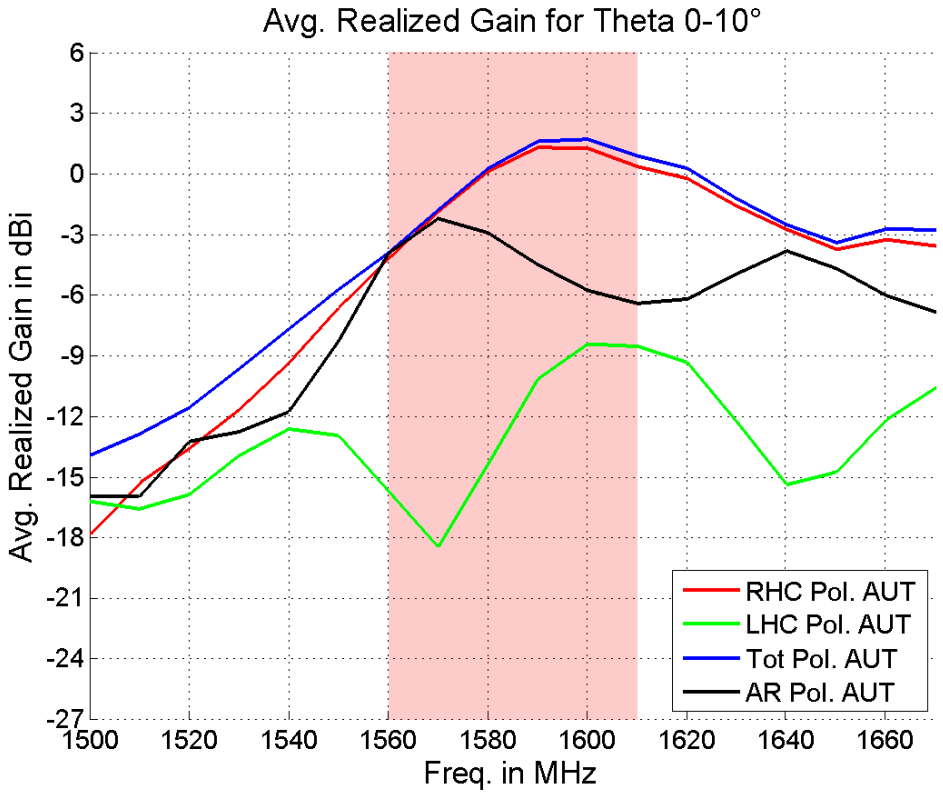
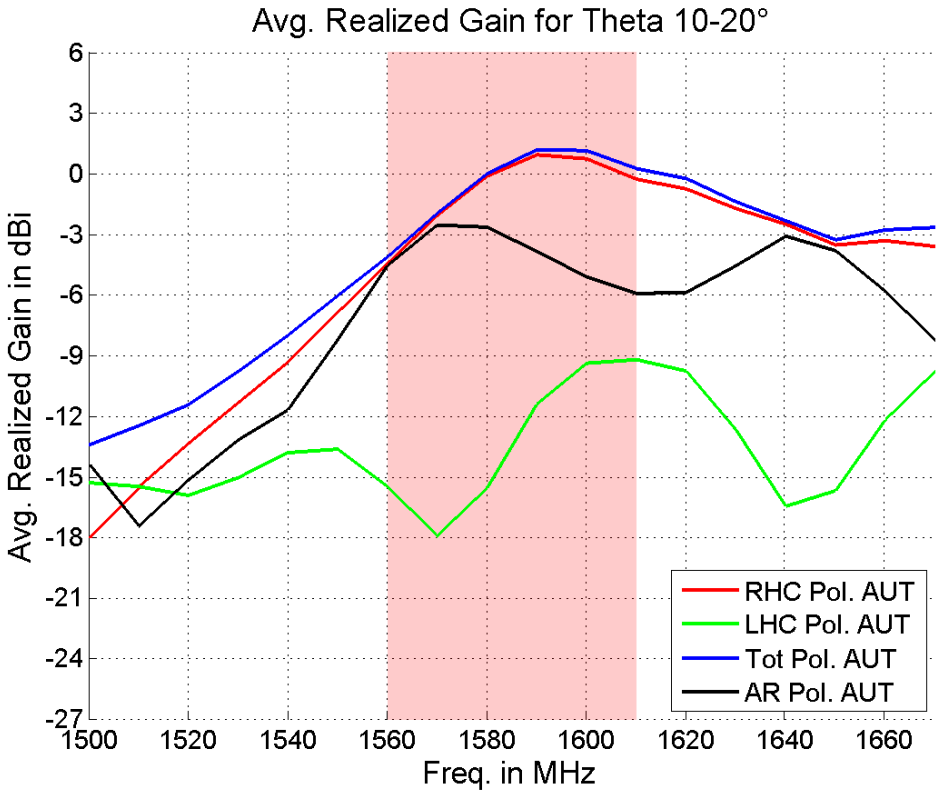
2.2. Passive Measurement Results GNSS

Radom





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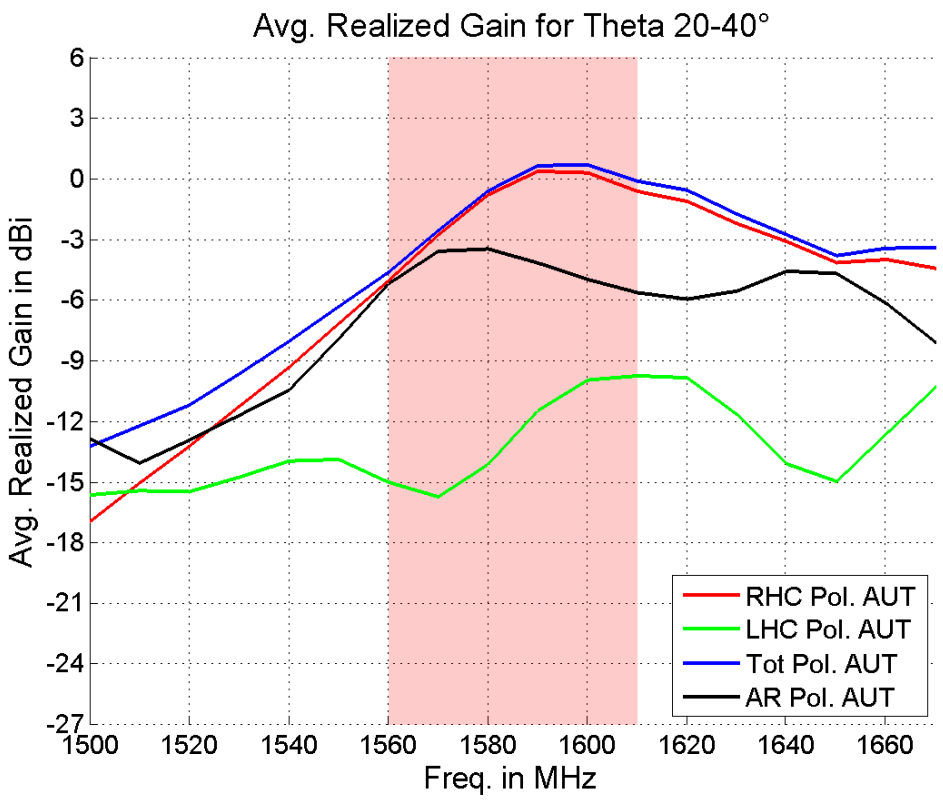
2.2. Passive Measurement Results GNSS

Radom



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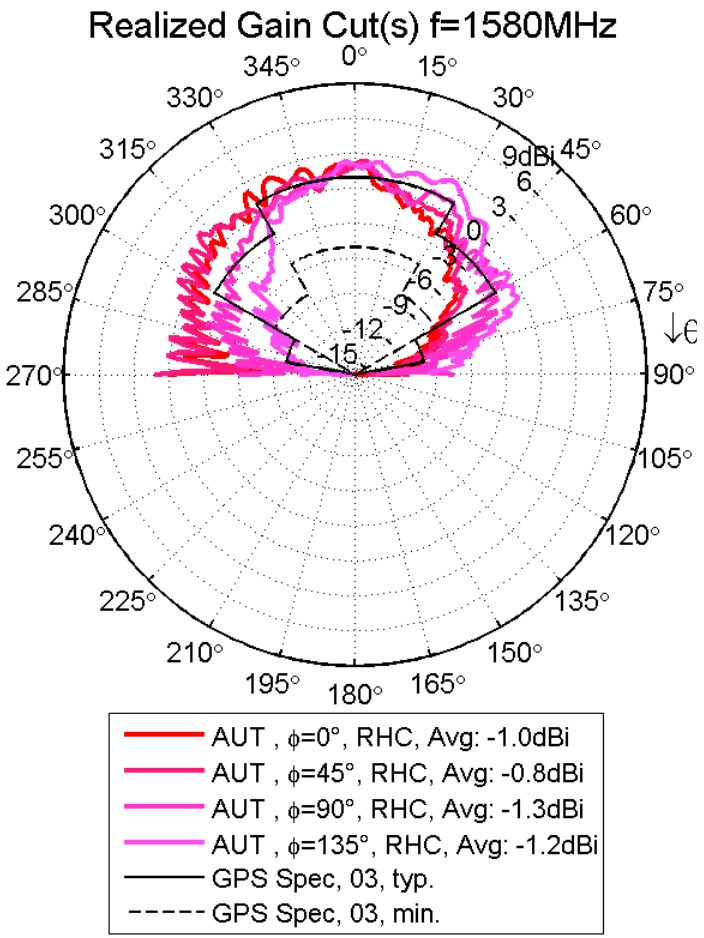
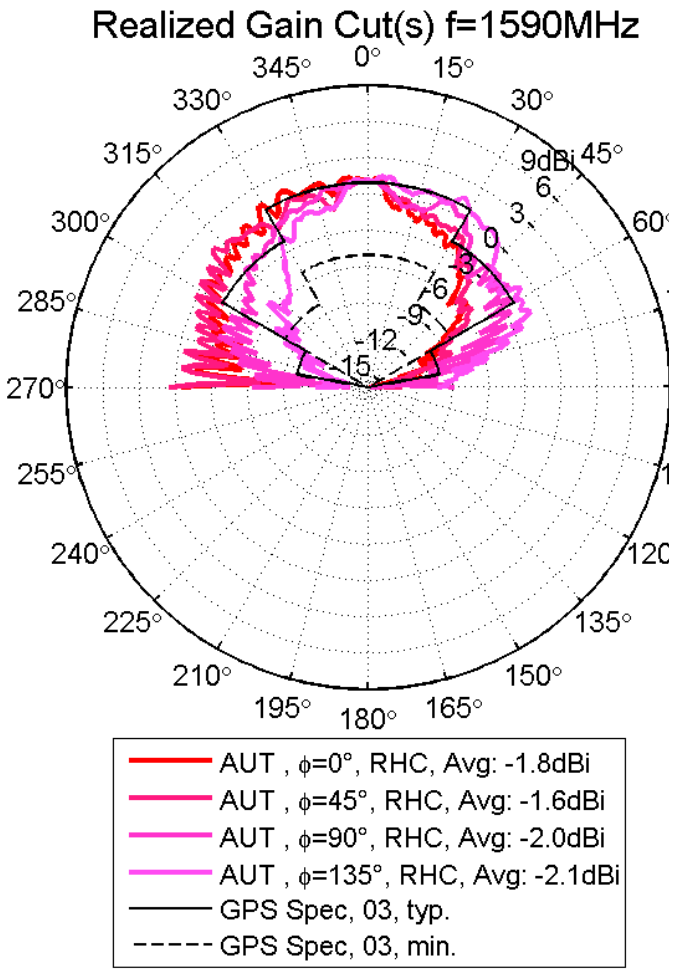
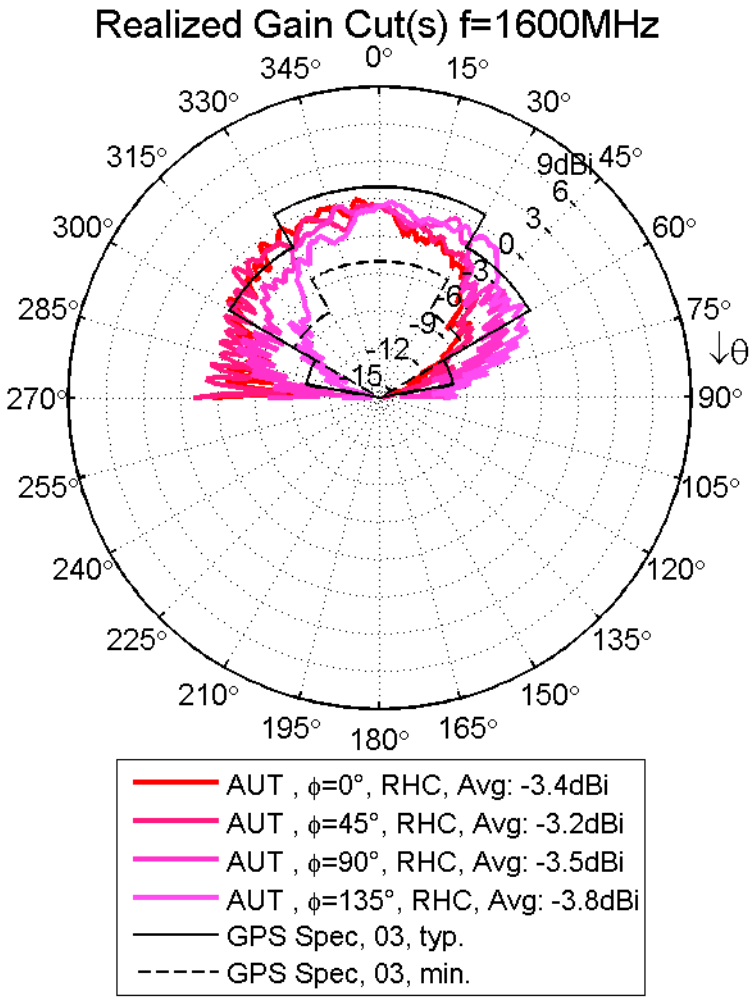
2.2. Measurement Results 2D-Chart (GNSS L1)







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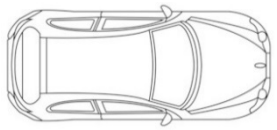
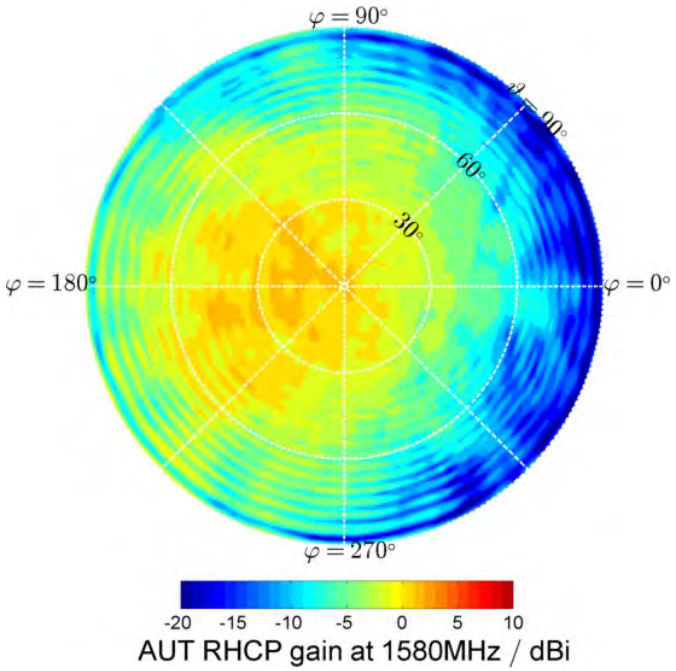
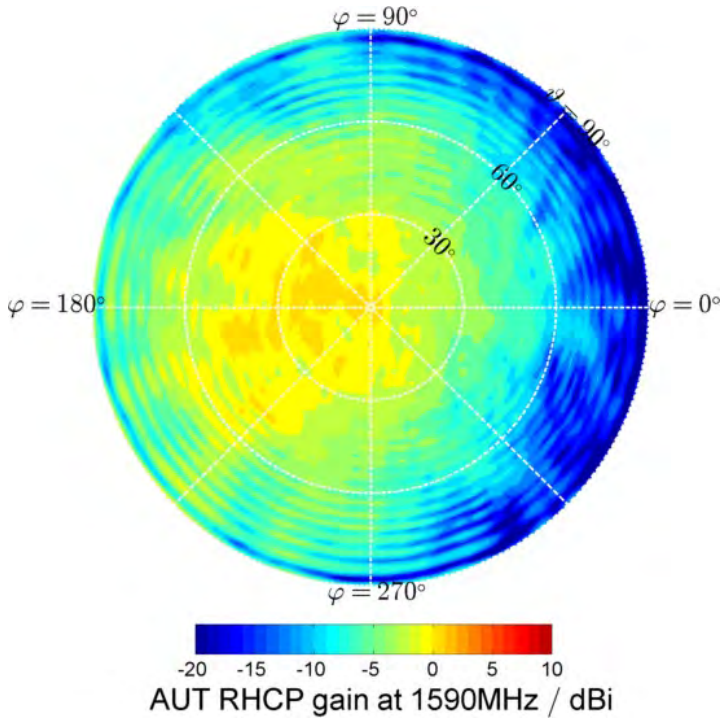
2.2. Measurement Results 3D-Chart (GNSS L1)

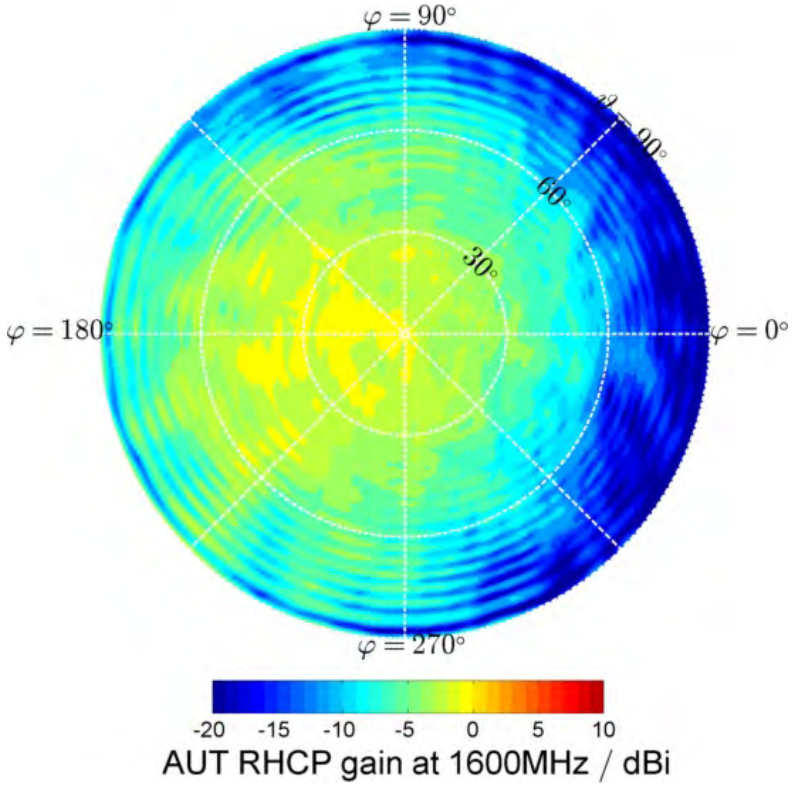
Radom



Driving Direction







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3.0 LNA Measurements GNSS 1559-1605 MHz

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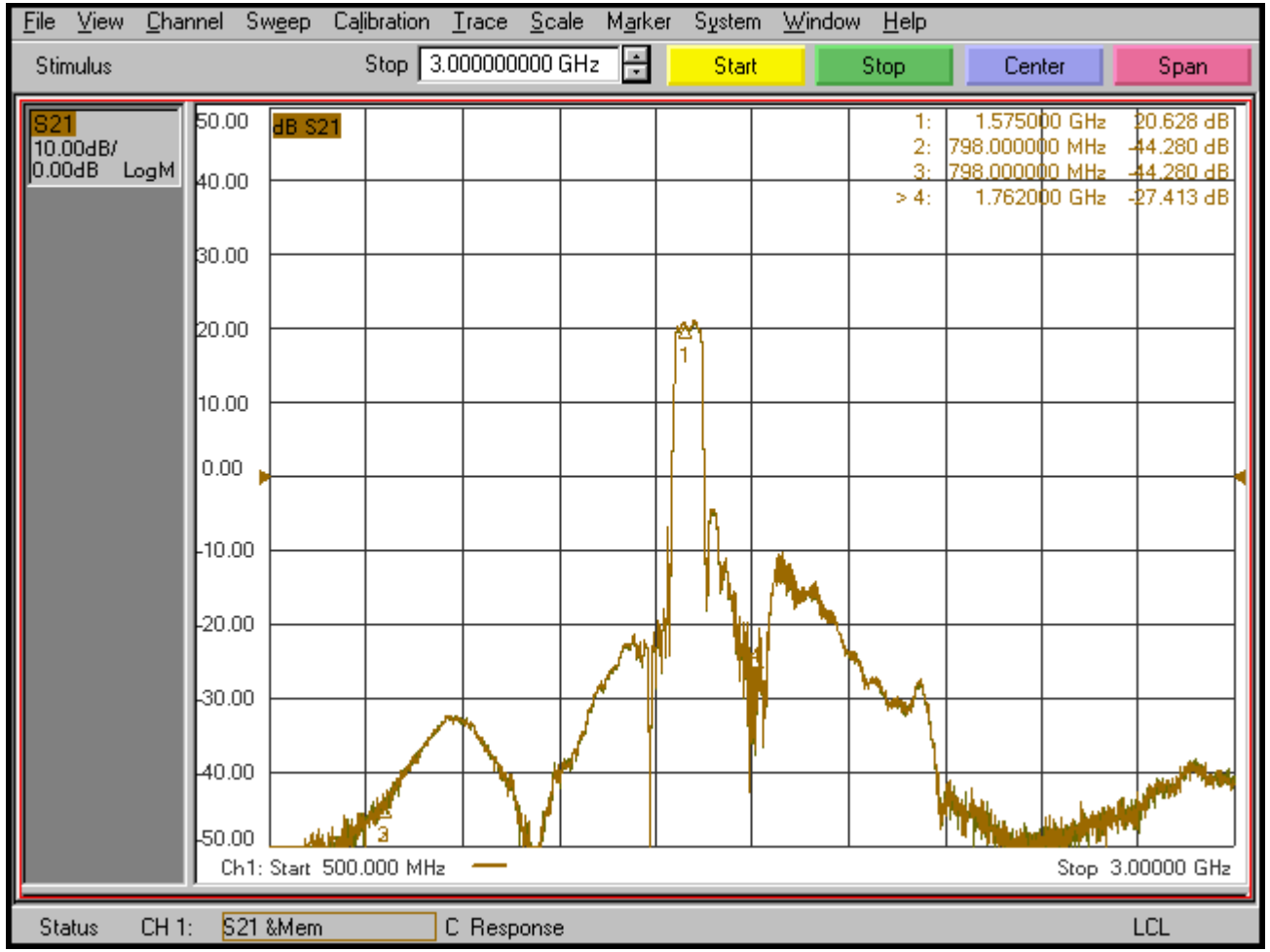
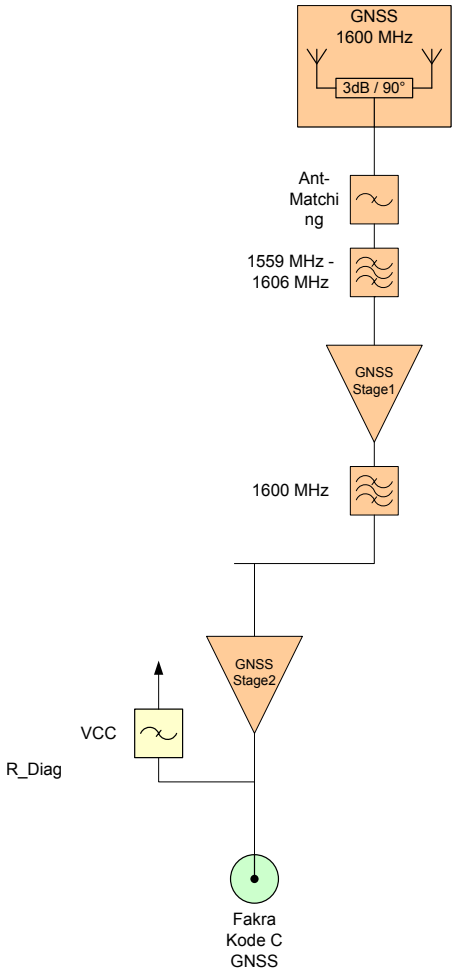
GNSS LNA Measurements
3.1 Gain1559-1606 MHz

Reduced
Gain = 20,6 dB

28mA@ 5Volt





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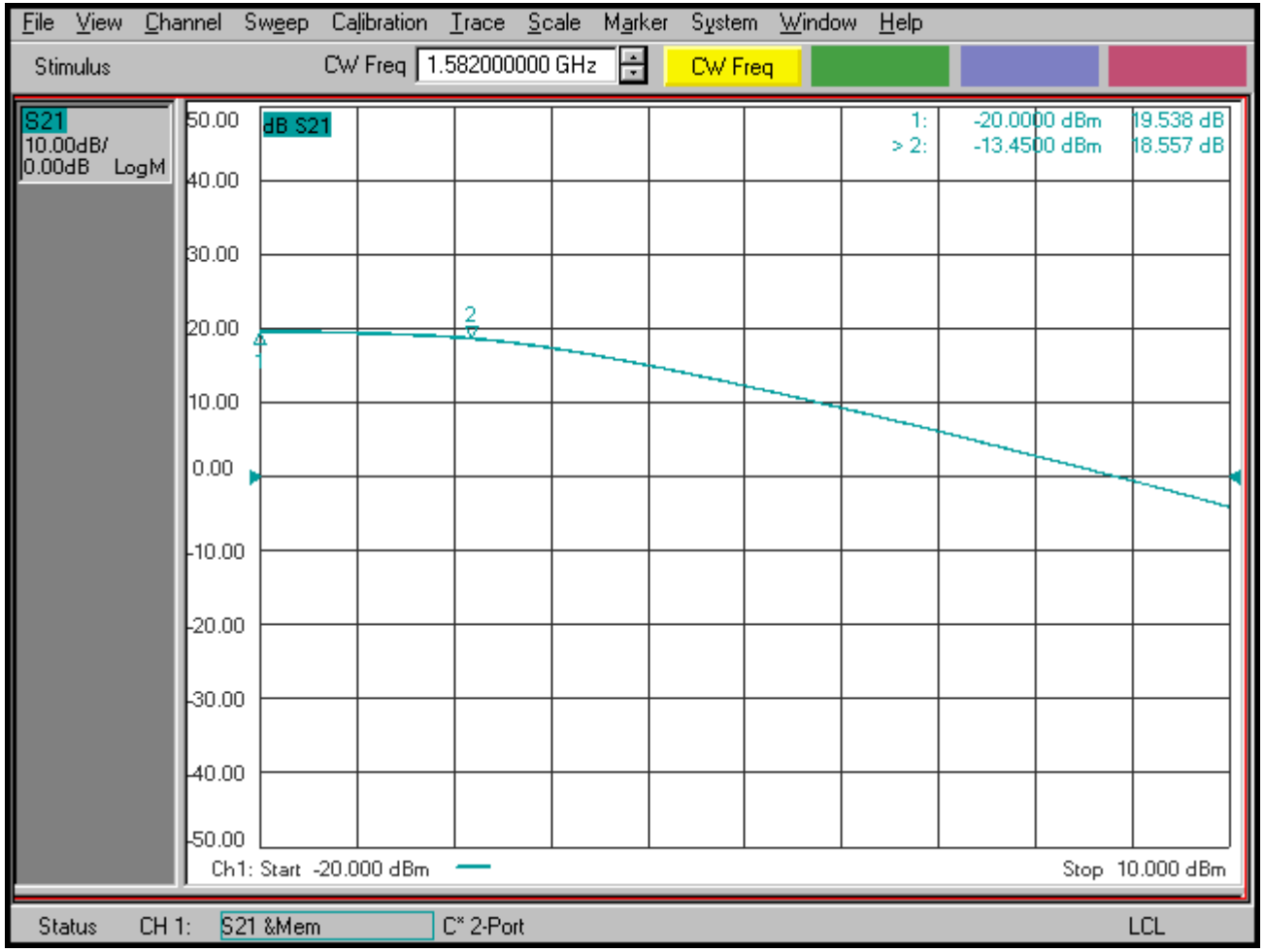
GNSS LNA Measurements
3.2 P_{1dB}

Gain = 20,6 dB

P_{in1dB}= -13,4 dBm

P_{out1dB}= 7,2 dBm



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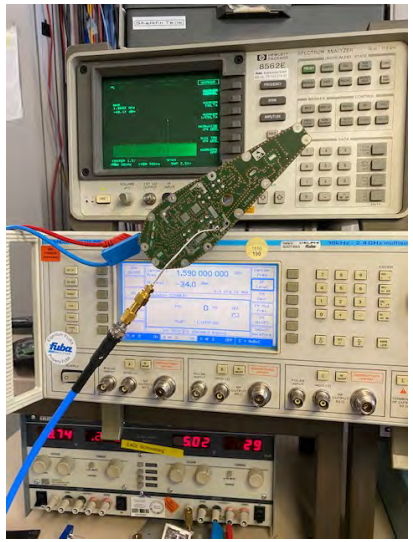
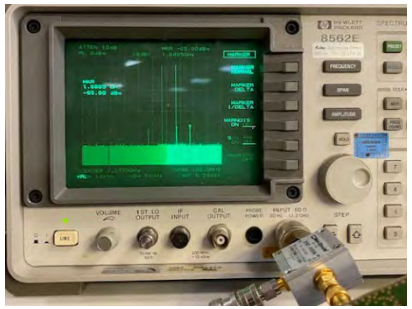
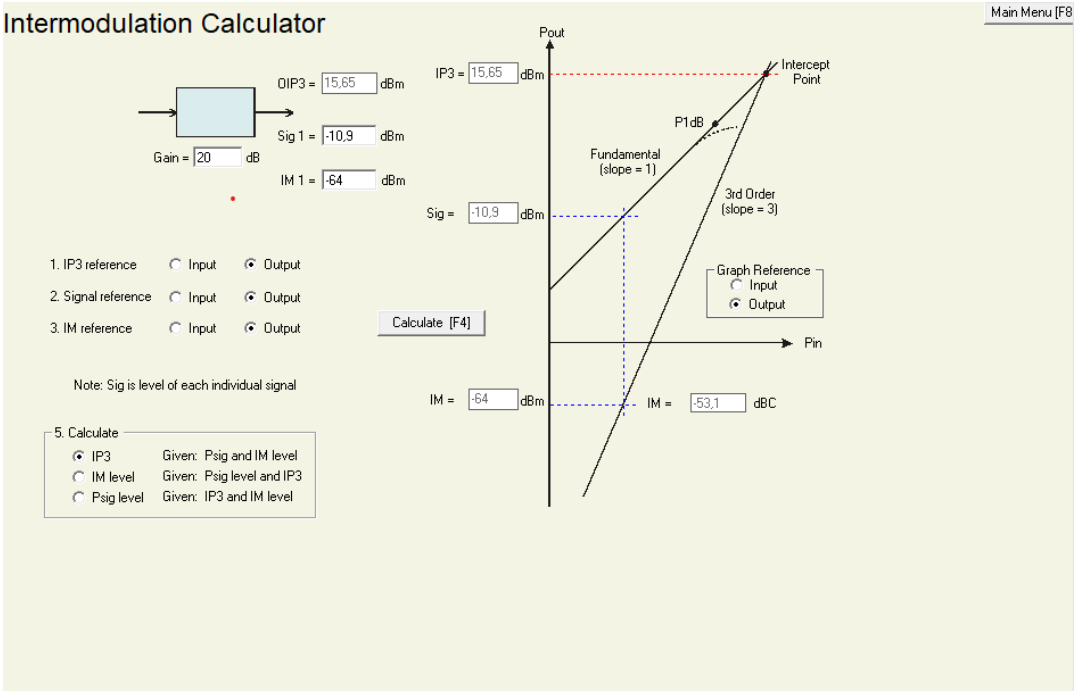
GNSS LNA Measurements

3.3 Intermodulation Measurement, OIP3, 1559-1605 MHz





Used frequencies
f1 = 1.58 GHz
f2 = 1.59 GHz



OIP3 = 15,6 dBm, with 20,6 dB LNA gain

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GNSS LNA Measurements

3.4 Noise

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