

Annex 1: Measuring diagrams to
TEST REPORT
No.: 19-1-0137401T08a-C01

According to:
Title 47 CFR, Chapter I
FCC Regulations, Subchapter A
Part 18, Subpart C: §15.305 / §18.307

for

Bosch Healthcare Solutions GmbH

Vivatmo pro (Handheld) + Vivatmo pro (Base Station)

**System for quantitative measurement of fractional nitric oxide (FeNO) in
human breath**

FCC ID:
Vivatmo pro (Handheld): 2AVQ9VMPHH1
Vivatmo pro (Base Station): 2AVQ9VMPBS1

Laboratory Accreditation and Listings
 Deutsche Akkreditierungsstelle D-PL-12047-01-01 D-PL-12047-01-03 D-PL-12047-01-04 Accredited EMC-Test Laboratory
accredited according to DIN EN ISO/IEC 17025:2018
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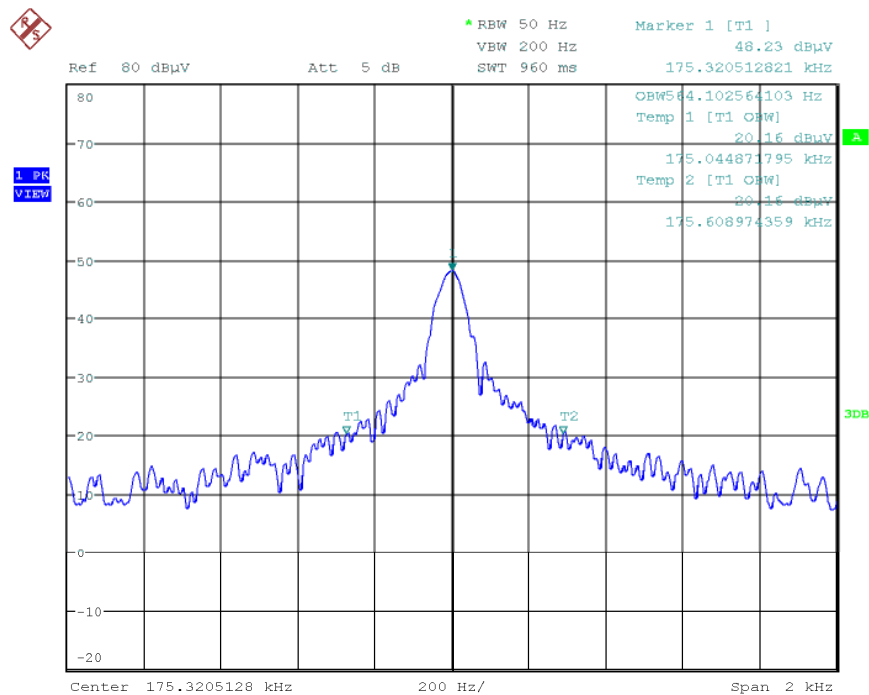
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1. Measurement diagrams

1.1. 99% OBW

1.1.1. Op.Mode 1 (TX only)



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Diagram 1: OBW 99% (Ping mode)

1.1.2. Op. Mode 2 (TX and RX)

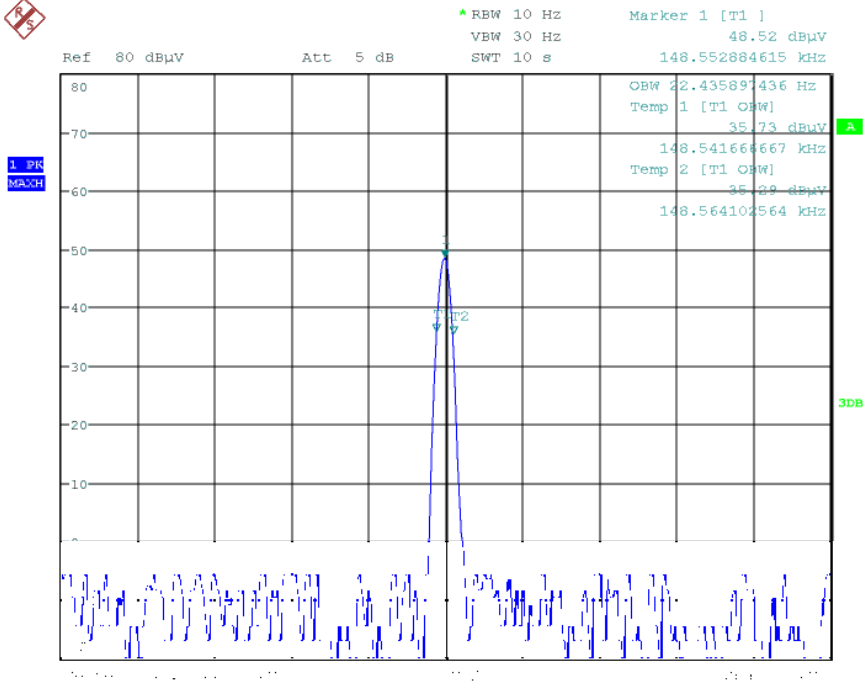
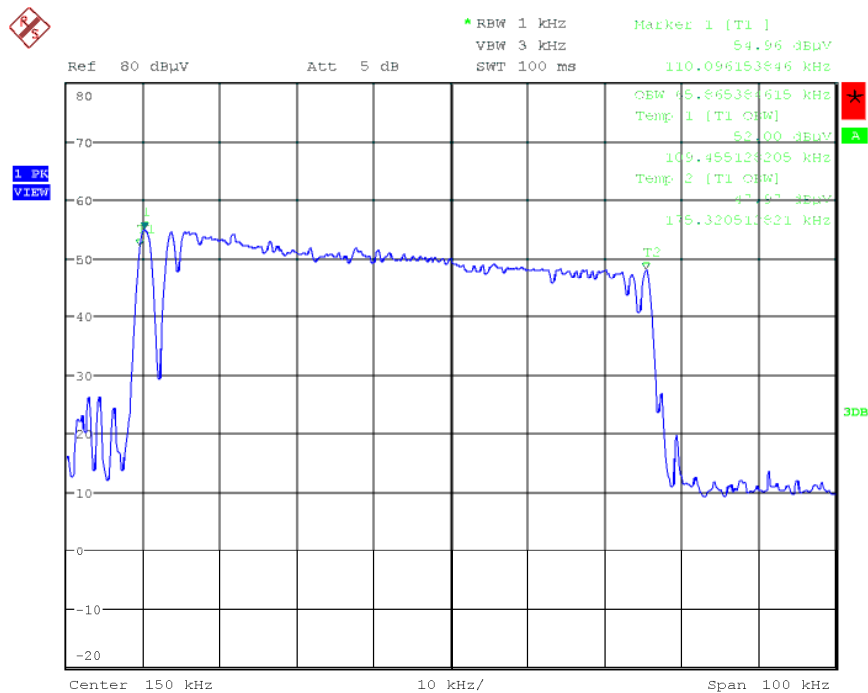


Figure 1: OBW 99% (charging mode, ideal TXRX coupling)

Diagram 2: OBW 99% (charging mode, ideal TXRX coupling)



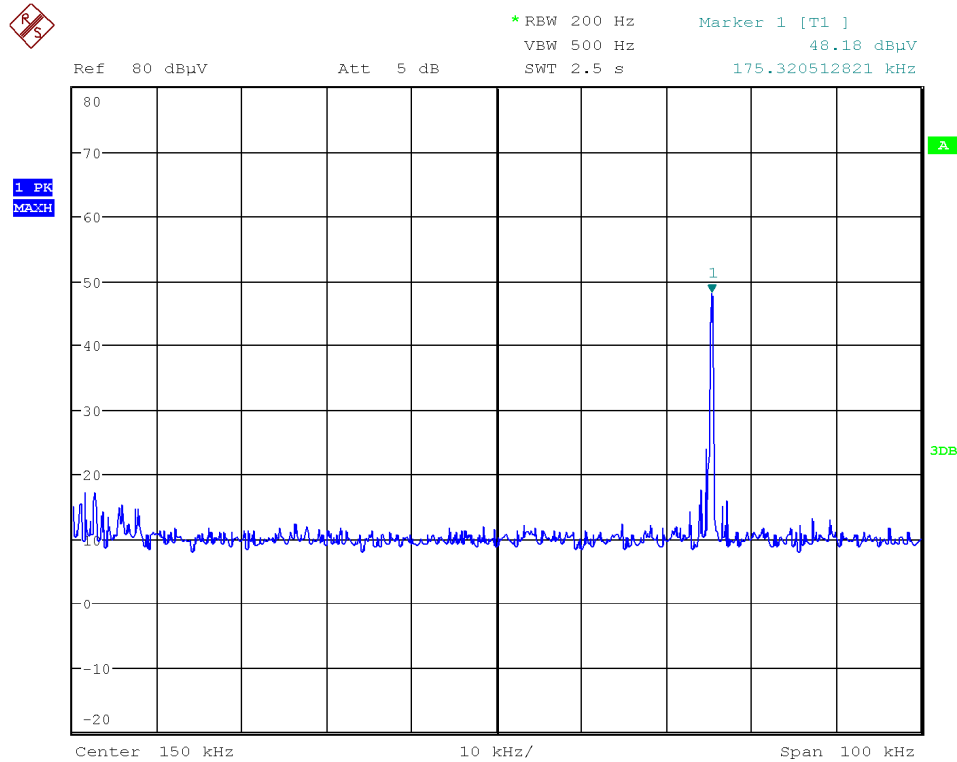
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Diagram 3: OBW 99% after spectrum stabilization (charging mode, frequency shift due to inefficient TXRX coupling and change of the battery level)

1.2. H-Field requirements

1.2.1. Op. Mode 1 (TX-transmitter only)

Remark: Due to the fact that the EUT sends the ping signal with low T_{on} time and high T_{off} time, this measurement is done manually. The spectrum analyzer is set to maxhold. A correction factor applies to raw value measured as stated in below calculation:



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Diagram 4: EUT standing (worst-case position)

$Value_{300m} = Meas.Value@_{3m} - Distance\ Correction + Electric\ Antenna\ Factor\ accord.\ Calibration\ of\ antenna$

$Value_{300m} = 48.18\ dB\mu V/m - 79.43\ dB\ (300m-3m\ accord.\ Chapter\ 5.1.6) + 19dB$

$Value_{300m} = -12.25\ dB\mu V/m$

1.2.2. Op. Mode 2 (TX/RX-transmitter and receiver, ideal TXRX coupling)

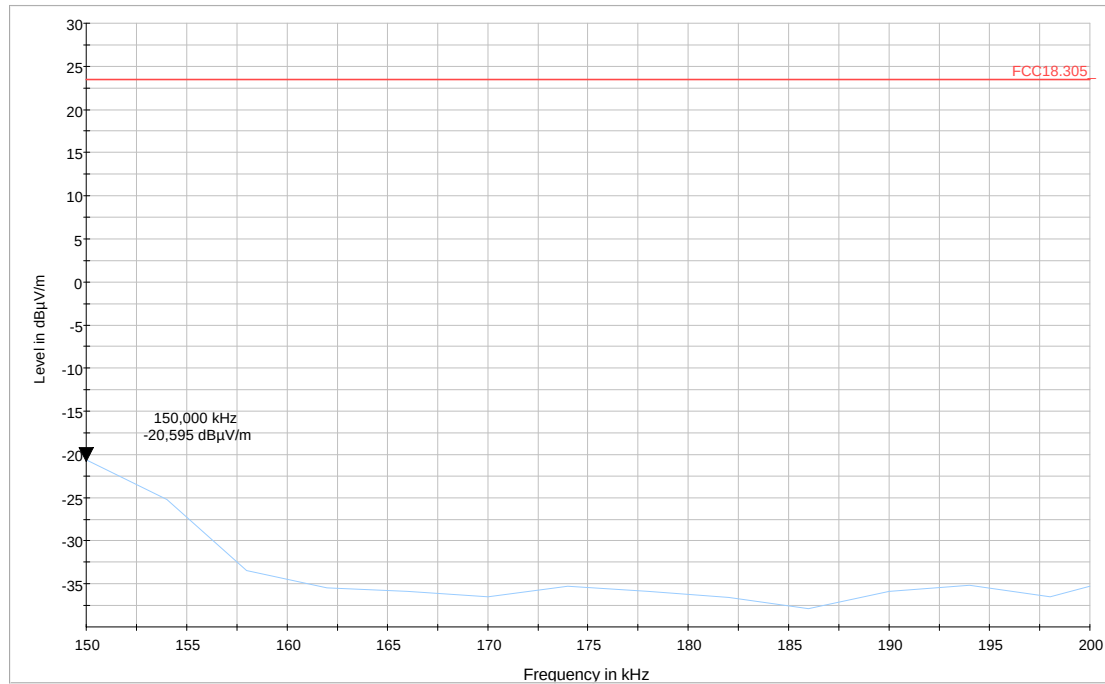


Diagram 5: EUT lying

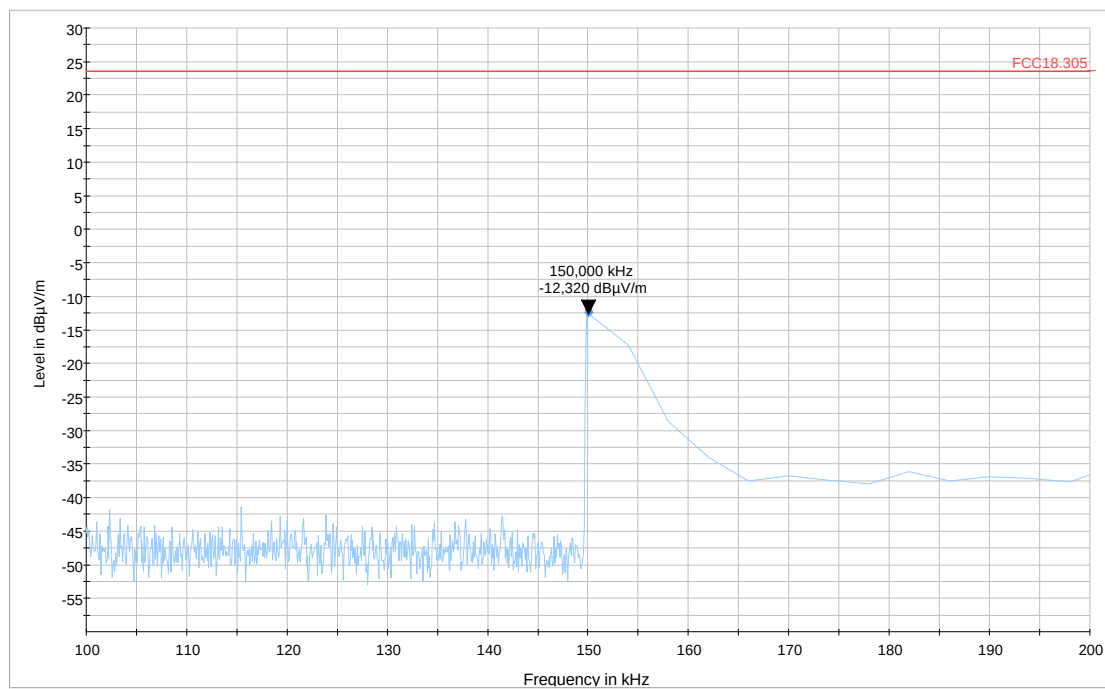


Diagram 6: EUT standing

1.3. Transmitter spurious emissions

1.3.1. Frequency 9 kHz to 30 MHz (TX-Transmitter only)

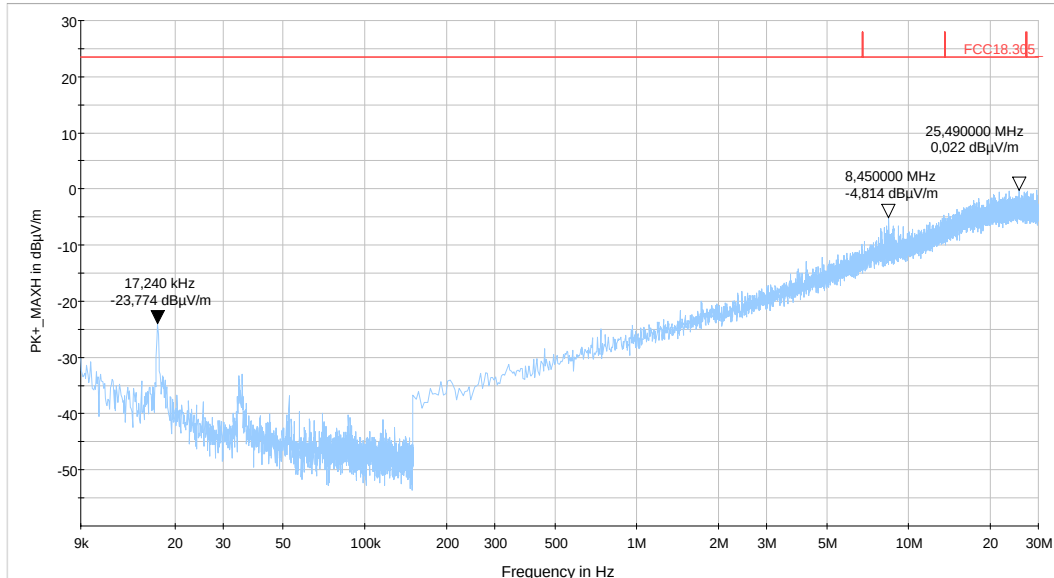


Diagram 7: Op.Mode 1, EUT is at standing position

1.3.2. Frequency 9 kHz to 30 MHz (TX/RX-transmitter and receiver)

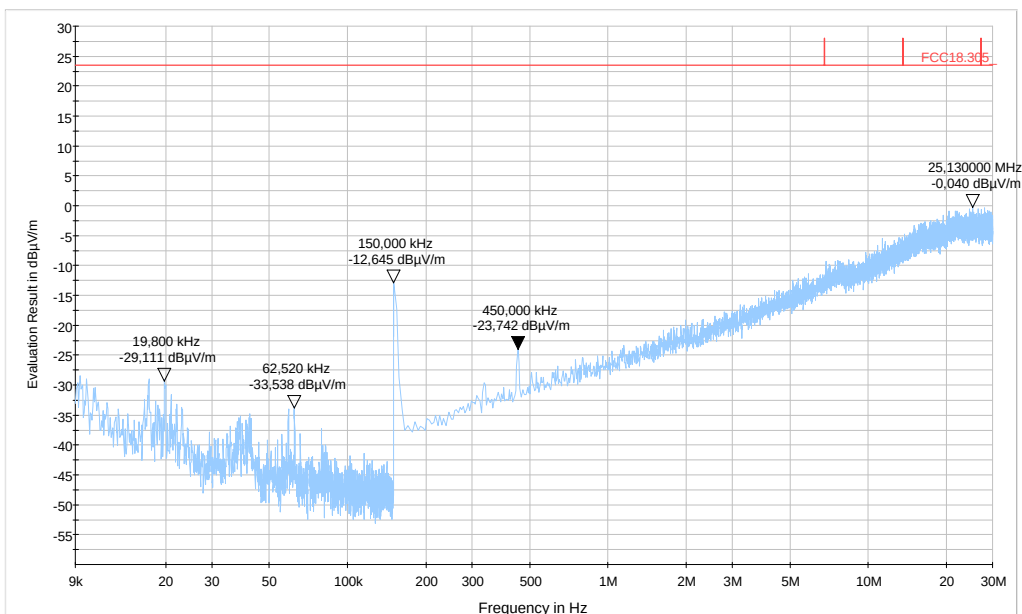


Diagram 8: Op.Mode 2, EUT is at standing position (worst-case position)

1.3.3. Frequency 30 MHz to 1000 MHz (TX-Transmitter only)

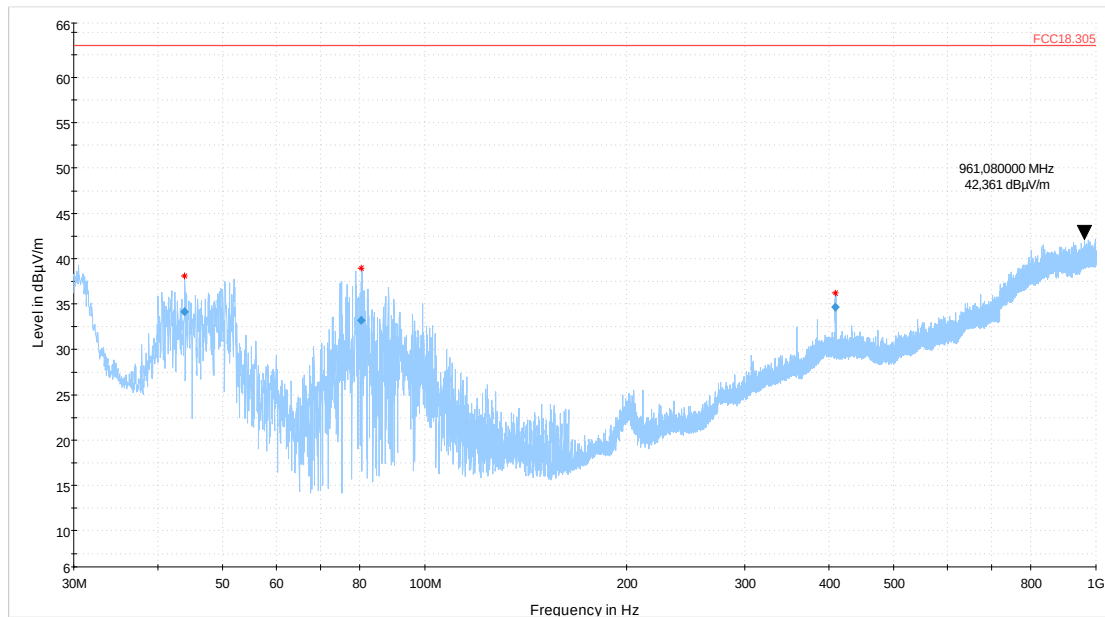


Diagram 9: Op. Mode 1, EUT is at lying position

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
43.812000	34.18	63.52	29.34	120.000	109.0	V	171.0	15.5
80.468000	33.17	63.52	30.35	120.000	134.0	V	328.0	7.0
409.152000	34.63	63.52	28.89	120.000	121.0	V	10.0	18.5

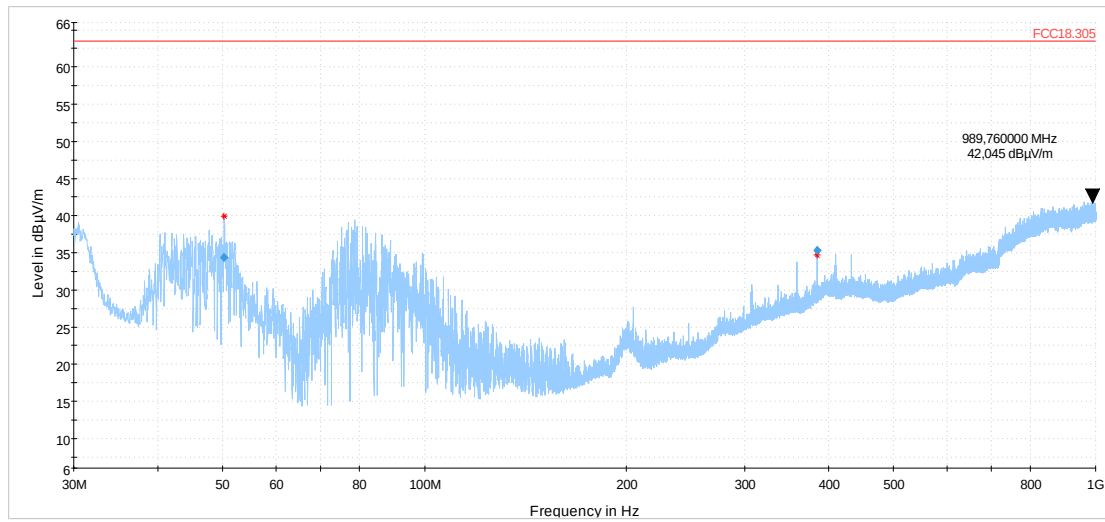


Diagram 10: Op. Mode 1, EUT is at standing position

Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
50.212000	34.40	63.52	29.12	120.000	109.0	V	187.0	12.9
383.996000	35.34	63.52	28.18	120.000	200.0	H	119.0	17.5

1.3.4. Frequency 30 MHz to 1000 MHz (TX/ RX – transmitter and receiver)

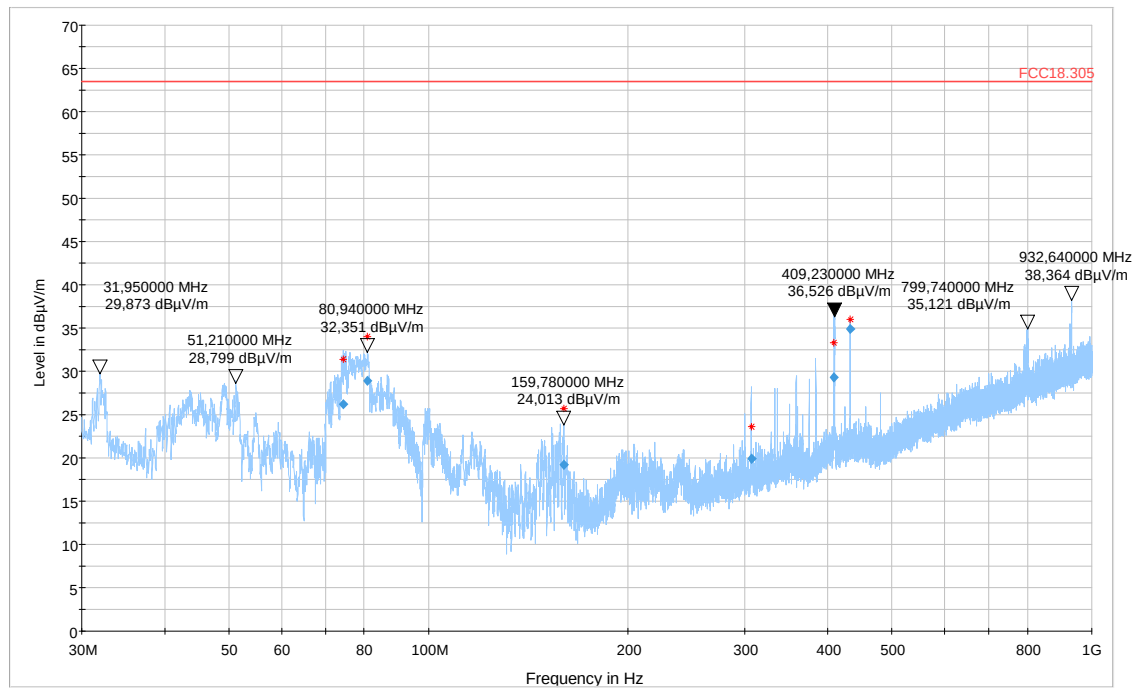


Diagram 11: Op. Mode 2, EUT is at lying position

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
74.288000	26.23	63.52	37.29	1000.0	120.000	146.0	V	0.0	6.7
80.972000	28.88	63.52	34.64	1000.0	120.000	126.0	V	289.0	7.1
159.800000	19.18	63.52	44.34	1000.0	120.000	105.0	V	289.0	9.2
307.236000	19.93	63.52	43.59	1000.0	120.000	105.0	H	136.0	15.4
408.820000	29.34	63.52	34.18	1000.0	120.000	127.0	V	173.0	18.5
431.992000	34.94	63.52	28.58	1000.0	120.000	121.0	V	173.0	19.3

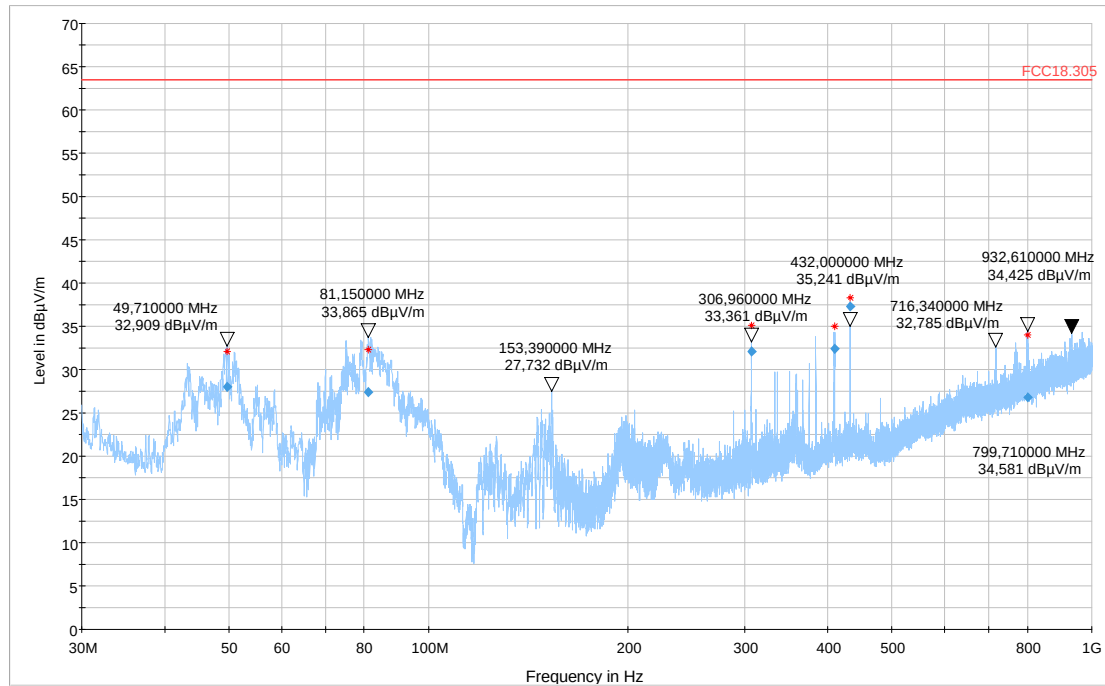


Diagram 12: Op. Mode 2, EUT is at standing position

Final_Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.650000	28.04	63.52	35.48	1000.0	120.000	105.0	V	12.0	13.1
81.142000	27.43	63.52	36.09	1000.0	120.000	109.0	V	321.0	7.1
306.980000	32.13	63.52	31.39	1000.0	120.000	105.0	H	156.0	15.4
409.302000	32.39	63.52	31.13	1000.0	120.000	201.0	H	136.0	18.5
432.006000	37.31	63.52	26.21	1000.0	120.000	187.0	H	139.0	19.3
799.650000	26.82	63.52	36.7	1000.0	120.000	283.0	V	129.0	25.3

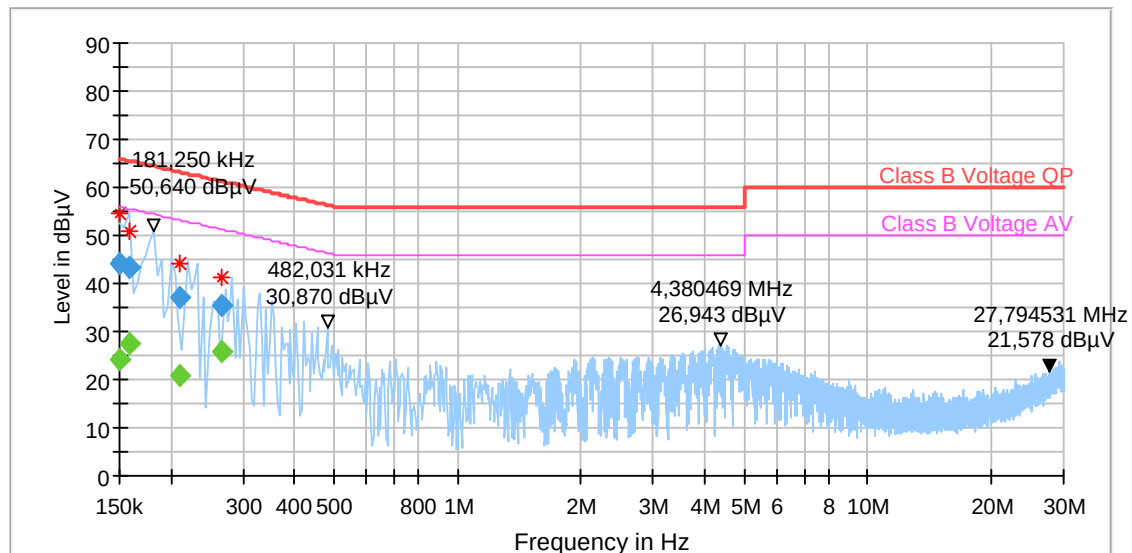
1.4. AC power line conducted emissions

1.01_AC_EMI_TXRX

Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Standard:	FCC 18.307(b)
Operating Mode:	Wireless charging
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions::	Humidity : 38%rH; Temperature: 21°C
Operator:	GHu
Verdict:	Passed
Comment:	S15+S07

Full Spectrum



Final Result

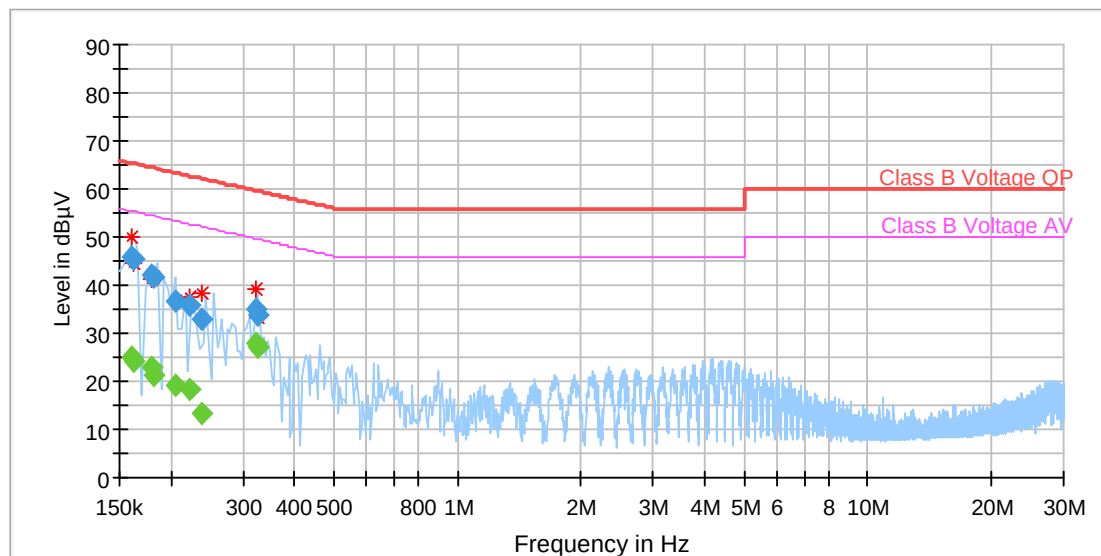
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.150000	---	24.09	56.00	31.91	1000.0	9.000	N	GND	0.1
0.150000	44.05	---	66.00	21.95	1000.0	9.000	N	GND	0.1
0.158750	43.54	---	65.53	21.99	1000.0	9.000	L1	GND	0.1
0.158750	---	27.39	55.53	28.14	1000.0	9.000	L1	GND	0.1
0.209531	---	20.81	53.22	32.41	1000.0	9.000	L1	GND	0.1
0.209531	37.07	---	63.22	26.15	1000.0	9.000	L1	GND	0.1
0.265313	35.27	---	61.26	25.99	1000.0	9.000	L1	GND	0.1
0.265313	---	25.98	51.26	25.28	1000.0	9.000	L1	GND	0.1

1.02_AC_EMI_TX_only

Common Information

Test Description:	Conducted Voltage Measurement Class B
Test Site Location:	Conducted Emission, CETECOM GmbH Essen
Test Software:	R&S EMC32 v9.15
Test Standard:	FCC 18.307(b)
Operating Mode:	Wireless charging
Measured on line:	N/L1
Diagram details:	Shows the peak values as a sum of measured ports in maxhold mode
Environmental Conditions::	Humidity : 38%rH; Temperature: 21°C
Operator:	GHu
Verdict:	Passed
Comment:	S15+S07

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.160000	45.78	---	65.46	19.68	1000.0	9.000	N	GND	0.1
0.160000	---	24.95	55.46	30.51	1000.0	9.000	N	GND	0.1
0.162656	45.35	---	65.33	19.98	1000.0	9.000	N	GND	0.1
0.162656	---	24.36	55.33	30.97	1000.0	9.000	N	GND	0.1
0.180469	---	23.10	54.46	31.36	1000.0	9.000	L1	GND	0.1
0.180469	42.04	---	64.46	22.42	1000.0	9.000	L1	GND	0.1
0.182188	41.78	---	64.39	22.61	1000.0	9.000	N	GND	0.1
0.182188	---	21.14	54.39	33.25	1000.0	9.000	N	GND	0.1
0.205625	---	19.27	53.38	34.11	1000.0	9.000	L1	GND	0.1
0.205625	36.57	---	63.38	26.81	1000.0	9.000	L1	GND	0.1
0.221250	---	18.18	52.77	34.59	1000.0	9.000	N	GND	0.1
0.221250	35.69	---	62.77	27.08	1000.0	9.000	N	GND	0.1
0.237969	---	13.42	52.17	38.75	1000.0	9.000	N	GND	0.1
0.237969	32.90	---	62.17	29.27	1000.0	9.000	N	GND	0.1
0.323281	---	27.74	49.62	21.88	1000.0	9.000	L1	GND	0.1
0.323281	35.07	---	59.62	24.55	1000.0	9.000	L1	GND	0.1
0.327656	33.95	---	59.51	25.56	1000.0	9.000	L1	GND	0.1
0.327656	---	27.20	49.51	22.31	1000.0	9.000	L1	GND	0.1

END OF THE ANNEX