

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/EMV-12/129

about
the following EMC - test/- research

Applicant: TRUMPF Maschinen Austria GmbH + Co. KG
Industriepark 24
A-4061 Pasching

Product: Wireless angle measurement system
OCB6000 Stick

Serial Number: ---

Standard: FCC: 47 CFR Part 15 (October 1, 2011 edition)



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IC 4413**

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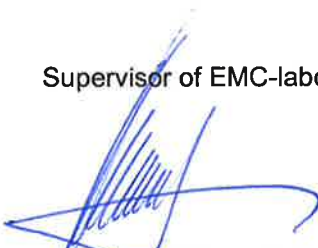
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Ing. Wilhelm Seier



20.03.2012

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The results of this test report only refer to the provided equipment.

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1. Applicant

Company: TRUMPF Maschinen Austria GmbH + Co. KG

Department: ---

Address: Industriepark 24
A-4061 Pasching

Contact person: Mr. Dipl.-Ing. Steffen Kuhn

EUT received on: 15.03.2012

Tests were performed on: 15.03.2012

2. Description of EUT

EUT: Wireless angle measurement system
OCB6000 Stick

Serial Number: ---

Manufacturer: TRUMPF Maschinen Austria GmbH + Co. KG
Industriepark 24
A-4061 Pasching

Description: TRUMPF Maschinen Austria GmbH + Co. KG provided the following
configuration for the measurements:

Serial production

Operating mode: The measurements were carried out at the following running states:
normal use

3. Standards / Final result

Name	Title	Deviation	Result
FCC: 47 CFR Part 15 (October 1, 2011 edition)	Radio Frequency Devices	none	PASS
PASS EUT passed FAIL EUT failed			

4. Test results

4.1 FIELD STRENGTH (Intentional Radiator)

§ 15.249/a

Field strength at a distance of 3m						
f (MHz)	Bandwidth (MHz)	Limit (µV/m) (Average)	Average detector		Peak detector	
			dBµV/m	µV/m	dBµV/m	µV/m
2405	1	50000	90,8	34674	93,4	46774
Up to the 10 th harmonic	1	500	< 34	< 50	< 54	< 500
Measurement uncertainty ± 6 dB						

Bandwidth: this refers to the bandwidth of the measurement receiver

LIMIT

§ 15.249/a

f (MHz)	Bandwidth (MHz)	Field strength at a distance of 3 m	
		of fundamental emissions (mV/m)	of harmonic emissions (µV/m)
2400-2483,5	1	50	500

The above standing field strength limit is based on average limits.

4. 2. Radiated emission

Limits according to 15.209

Frequency range	Detector Quasi Peak	
	Limit	Measurement distance
0,009 – 0,490 MHz	2400 μ V / f(kHz)	300 m
0,490 – 1,705 MHz	24000 μ V / f(kHz)	30 m
1,705 - 30 MHz	30	30 m
30 – 88 MHz	100	3 m
88 – 216 MHz	150	3 m
216 – 960 MHz	200	3 m
Above 960 MHz	500	3 m
Remark: The Limit was increased for a constant measurement distance of 3m with a factor of 40 dB per Decade.		

Operating mode	Measuring result
Normal operation	Measurement diagram 1-3

Test result

4. 2.1.) Measurement in the frequency range 9 kHz to 25 GHz

Due to the large margin to the limit, no final measurement was performed.

Appendix 1

Test equipment used

☒ Anechoic Chamber with 3m measurement distance	NT-100	☐ ESVP - Test receiver 20 - 1000 MHz	NT-201
☐ Stripline according to ISO 11452-5	NT-108	☐ ESCI - Test receiver 9 kHz - 7 GHz	NT-203/1
☒ MA 240 - Antenna mast 1 - 4 m height	NT-110	☒ ESI26 - Test receiver 20 Hz - 26,5 GHz	NT-207
☒ DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	☐ Digital Radio Tester CTS55	NT-208
☒ HD 100 Controller Mast+Turntable	NT-112	☐ Noise-gen., ITU-R 559-2 20 Hz - 20 kHz	NT-209
☐ HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐ CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
☒ HFH-Z2 - Loop Antenna 9 kHz - 30 MHz	NT-122	☐ 3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☐ HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐ Digital Radio Tester Aeroflex 3920	NT-212/1
☐ 3121C - Dipole Antenna 28 - 1000 MHz	NT-124	☐ 2855S - Communication analyzer	NT-213
☐ 3115 - Horn Antenna 1 - 18 GHz (immunity)	NT-125	☐ Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☐ 3116 - Horn Antenna 18 - 40 GHz	NT-126	☐ Diode Detector 0,01 GHz - 26,5 GHz	NT-215
☐ SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz	NT-127	☒ RubiSource T&M Timing reference	NT-216
☐ AT-1080 - Log. Per. Antenna 80 - 1000 MHz	NT-128	☐ Radiocommunication analyzer SWR 1180 MD	NT-217
☒ HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-129	☐ Mixer M19HWD 40 GHz - 60 GHz	NT-218
☐ HK-116 - bicon. Antenna 20 MHz - 300 MHz	NT-130	☐ Mixer M12HWD 60 GHz - 90 GHz	NT-219
☒ 3146 - Log. Per. Antenna 200 - 1000 MHz	NT-131	☐ DSO9104 Digital scope	NT-220/1
☐ Loop Antenna H-Field	NT-132	☐ TPS 2014 Digital scope	NT-222
☐ Horn Antenna 500 MHz - 2900 MHz	NT-133	☐ Artificial Ear according to IEC 60318	NT-224
☐ Horn Antenna 500 MHz - 6000 MHz	NT-133/1	☐ 1 kHz Sound calibrator	NT-225
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐ B10 - Harmonics and flicker analyzer	NT-232
☐ Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐ SRM-3000 Spectrum analyzer	NT-233
☐ BiConiLog Antenna 26 MHz - 2000 MHz	NT-137	☐ SRM-3006 Spectrum analyzer	NT-233/1a
☐ Conical Dipol Antenna PCD8250	NT-138	☐ E-field probe SRM 75 MHz - 3 GHz	NT-234
☒ HF 906 - Horn Antenna 1 - 18 GHz (emission)	NT-139	☐ Field Meter NBM-500 incl. E- and H-Field probes	NT-240a-d
☐ HZ-1 Antenna tripod	NT-150	☐ Hall-Teslameter ETM-1	NT-241
☐ BN 1500 Antenna tripod	NT-151	☐ EFA-3 H-field- / E-field probe	NT-243
☐ Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	☐ Field Meter EMR-200 100 kHz - 3 GHz	NT-244
☐ Power quality analyzer Fluke 1760 (complete set)	NT-160 - NT-172	☐ E-field probe 100 kHz - 3 GHz	NT-245
☐ Spectrum analyzer - FSP7 9 kHz - 7 GHz	NT-200	☐ H-field probe 300 kHz - 30 MHz	NT-246

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Appendix 1 (continued)

Test equipment used

☐	E-field probe 3 MHz – 18 GHz	NT-247	☐	VCS 500-M6 Surge-Generator	NT-326
☐	H-field probe 27 MHz – 1 GHz	NT-248	☐	BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330
☐	ELT-400 1 Hz – 400 kHz	NT-249	☐	T82-50 RF-Amplifier 2 GHz – 8 GHz	NT-331
☐	MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250	☐	500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332
☐	FCC-203I EM Injection clamp	NT-251	☐	AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333
☐	FCC-203I-DCN Ferrite decoupling network	NT-252	☐	APA01 – RF-Amplifier 0,5 GHz – 2,5 GHz	NT-334
☐	PR50 Current Probe	NT-253	☐	Preamplifier 1 GHz - 4 GHz	NT-335
☐	PR630 Current Probe	NT-254	☐	Preamplifier for GPS MKU 152 A	NT-336
☐	Fluke 87 V True RMS Multimeter	NT-260	☒	Preamplifier 100 MHz – 23 GHz	NT-337
☐	Model 2000 Digital Multimeter	NT-261	☐	DC Block 10 MHz – 18 GHz Model 8048	NT-338
☐	Fluke 87 V Digital Multimeter	NT-262/1	☐	2-97201 Electronic load	NT-341
☐	ESH2-Z5-U1 Artificial mains network 4x25A	NT-300	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐	ESH3-Z5-U1 Artificial mains network 2x10A	NT-301	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☐	ESH3-Z6-U1 Artificial mains network 1x100A	NT-302	☐	VDS 200 Mobil-impuls-generator	NT-350
☐	ESH3-Z6-U1 Artificial mains network 1x100A	NT-302a	☐	LD 200 Mobil-impuls-generator	NT-351
☐	PHE 4500/B Power amplifier	NT-304	☐	MPG 200 Mobil-Impuls-Generators	NT-352
☐	EZ10 T-Artificial Network	NT-305	☐	EFT 200 Mobil-impuls-generator	NT-353
☐	SMG - Signal generator 0,1 - 1000 MHz	NT-310	☐	AN 200 S1 Artificial Network	NT-354
☐	SMA100A - Signal generator 9 kHz - 6 GHz	NT-310/1	☐	FP-EFT 32M 3 ph. Coupling filter (Burst)	NT-400/1
☐	PM 5518 TXVPS Video generator	NT-311	☐	PHE 4500 - Mains impedance network	NT-401
☐	RefRad Reference generator	NT-312	☐	IP 6.2 Coupling filter for data lines (Surge)	NT-403
☐	SMP 02 Signal generator 10 MHz - 20 GHz	NT-313	☐	TK 9421 High Power Volt. Probe 150 kHz - 30 MHz	NT-409
☐	40 MHz Arbitrary Generator TGA1241	NT-315	☐	ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐	Artificial mains network NSLK 8127-PLC	NT-316	☐	IP 4 - Capacitive clamp (Burst)	NT-411
☐	PEFT - Burst generator up to 4 kV	NT-320	☐	Highpass-Filter 100 MHz – 3 GHz	NT-412
☐	ESD 30 System up to 25 kV	NT-321	☐	Highpass-Filter 600 MHz – 4 GHz	NT-413
☐	PSURGE 4.1 Surge generator	NT-324	☐	Highpass-Filter 1250 MHz – 4 GHz	NT-414
☐	TRANSIENT 1000 Immunity test system	NT-325	☐	Highpass-Filter 1800 MHz – 16 GHz	NT-415

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Appendix 1 (continued)

Test equipment used

☒	Highpass-Filter 3500 MHz – 18 GHz	NT-416	☐	FCC-801-S25 Coupling decoupling network	NT-462
☐	RF-Attenuator 10 dB DC – 18 GHz / 50 W	NT-417	☐	FCC-801-T4 Coupling decoupling network	NT-463
☐	RF-Attenuator 6 dB DC – 18 GHz / 50 W	NT-418	☐	FCC-801-C1 Coupling decoupling network	NT-464
☐	RF-Attenuator 3 dB DC – 18 GHz / 50 W	NT-419	☐	F-16A - Current probe 1kHz - 70MHz	NT-465
☐	RF-Attenuator 20 dB DC - 1000 MHz / 25 W	NT-421	☐	95242-1 – Current probe 1 MHz – 400 MHz	NT-468
☐	RF-Attenuator 30 dB DC - 1000 MHz / 1 W	NT-423	☐	94106-1L-1 – Current probe 100 kHz – 450 MHz	NT-471
☐	RF-Attenuator 30 dB	NT-424	☐	GA 1240 Power amplifier according to EN 61000-4-16	NT-480
☐	RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-425	☐	Coupling networks according to EN 61000-4-16	NT-481 - NT-483
☐	RF-Attenuator 6 dB DC - 1000 MHz / 1 W	NT-426	☐	Van der Hoofden Test Head	NT-484
☐	RF-Attenuator 6 dB	NT-428	☒	PC P4 3 GHz Test computer	NT-500
☐	RF-Attenuator 0 dB - 81 dB	NT-429	☐	PC P4 1700 MHz Notebook	NT-505
☐	WRU 27 - Band blocking 27 MHz	NT-430	☐	Monitoring camera with Monitor	NT-511
☐	WHJ450C9 AA - High pass 450 MHz	NT-431	☐	ES-K1 Version 1.71 SP2 Test software	NT-520
☐	WHJ250C9 AA - High pass 250 MHz	NT-432	☒	EMC32 Version 8.52 Test software	NT-520/1
☐	RF-Load 150 W	NT-433	☐	SRM-TS Version 1.3 software for SRM-3000	NT-522
☐	Impedance transducer 1:4 ; 1:9 ; 1:16	NT-435	☐	SRM-TS Version 1.2 software for SRM-3006	NT-522/1
☐	RF-Attenuator DC – 18 GHz 6 dB	NT-436	☐	SPS-PHE Test software V2.5 voltage fluctuations/harmonics	NT-525
☐	RF-Attenuator DC – 18 GHz 6 dB	NT-437	☐	SPS-EM Test software V4.0 EN61000-4-11	NT-527
☐	RF-Attenuator DC – 18 GHz 10 dB	NT-438	☐	Noise power test apparatus according to EN 55014	NT-530
☐	RF-Attenuator DC – 18 GHz 20 dB	NT-439	☐	Vertical coupling plane (ESD)	NT-531
☐	I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐	Test cable #4 for EN 61000-4-6	NT-553
☐	ESH3-22 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐	Test cable #3 for conducted emission	NT-554
☐	Power Divider 6 dB/1 W/50 Ohm	NT-443	☐	Test cable #5+#6 ESD-cable (2x470k)	NT-555 + NT-556
☐	Directional coupler 0,1 MHz – 70 MHz	NT-444	☐	Test cable #8 Sucoflex 104EA	NT-559
☐	Directional coupler 0,1 MHz – 70 MHz	NT-445	☐	Test cable #9 (for outdoor measurements)	NT-580
☐	Tube imitations according to EN 55015	NT-450	☐	Test cable #10 (for outdoor measurements)	NT-581
☐	FCC-801-M3-16A Coupling decoupling network	NT-458	☐	Test cable #13 Sucoflex 104PE	NT-584
☐	FCC-801-M2-50A Coupling decoupling network	NT-459	☐	Test cable #21 for SRM-3000	NT-592
☐	FCC-801-M5-25 Coupling decoupling network	NT-460	☐	Shield chamber	NT-600
☐	FCC-801-AF10 Coupling decoupling network	NT-461	☐	Climatic chamber	M-1200

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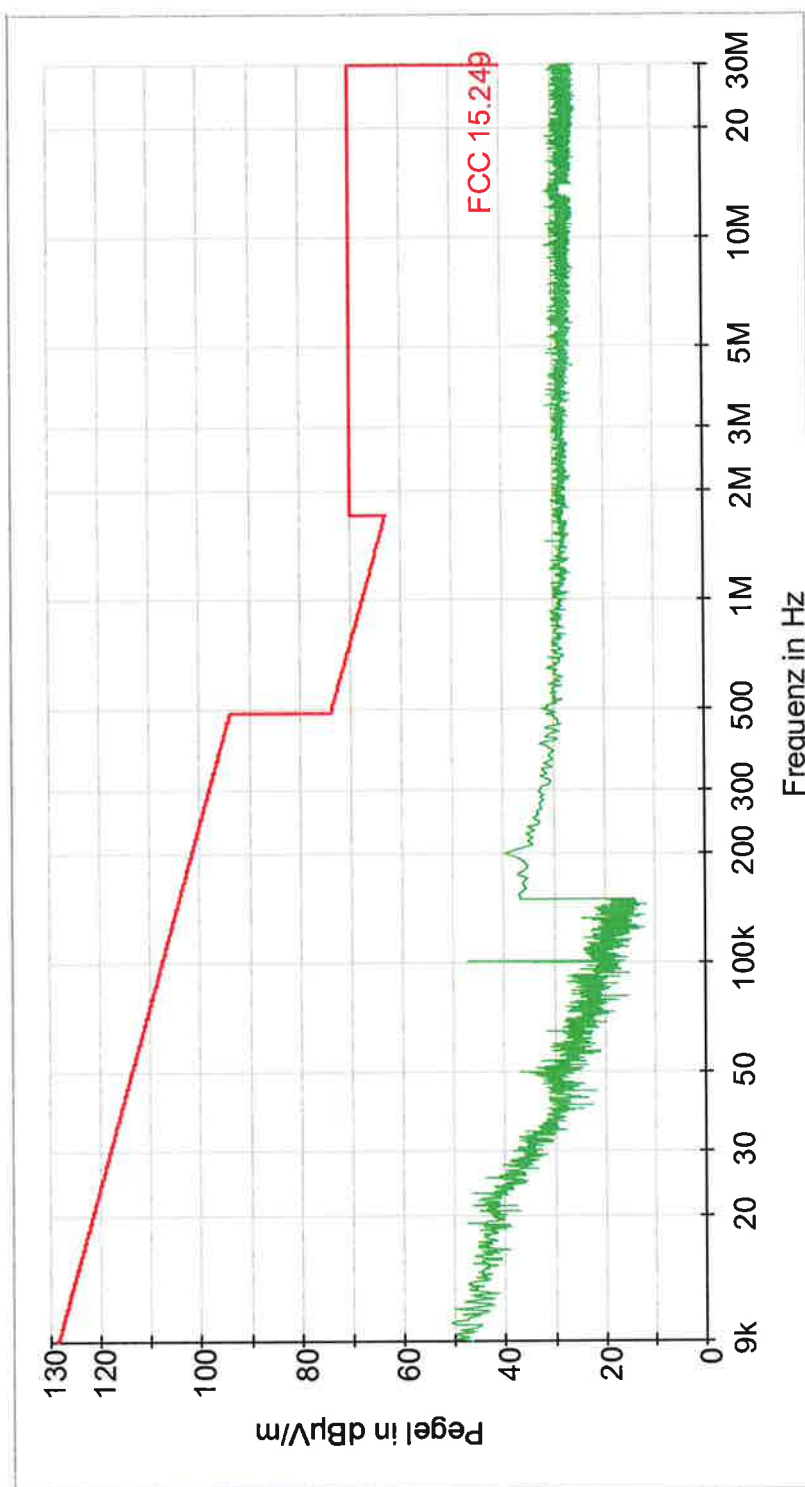
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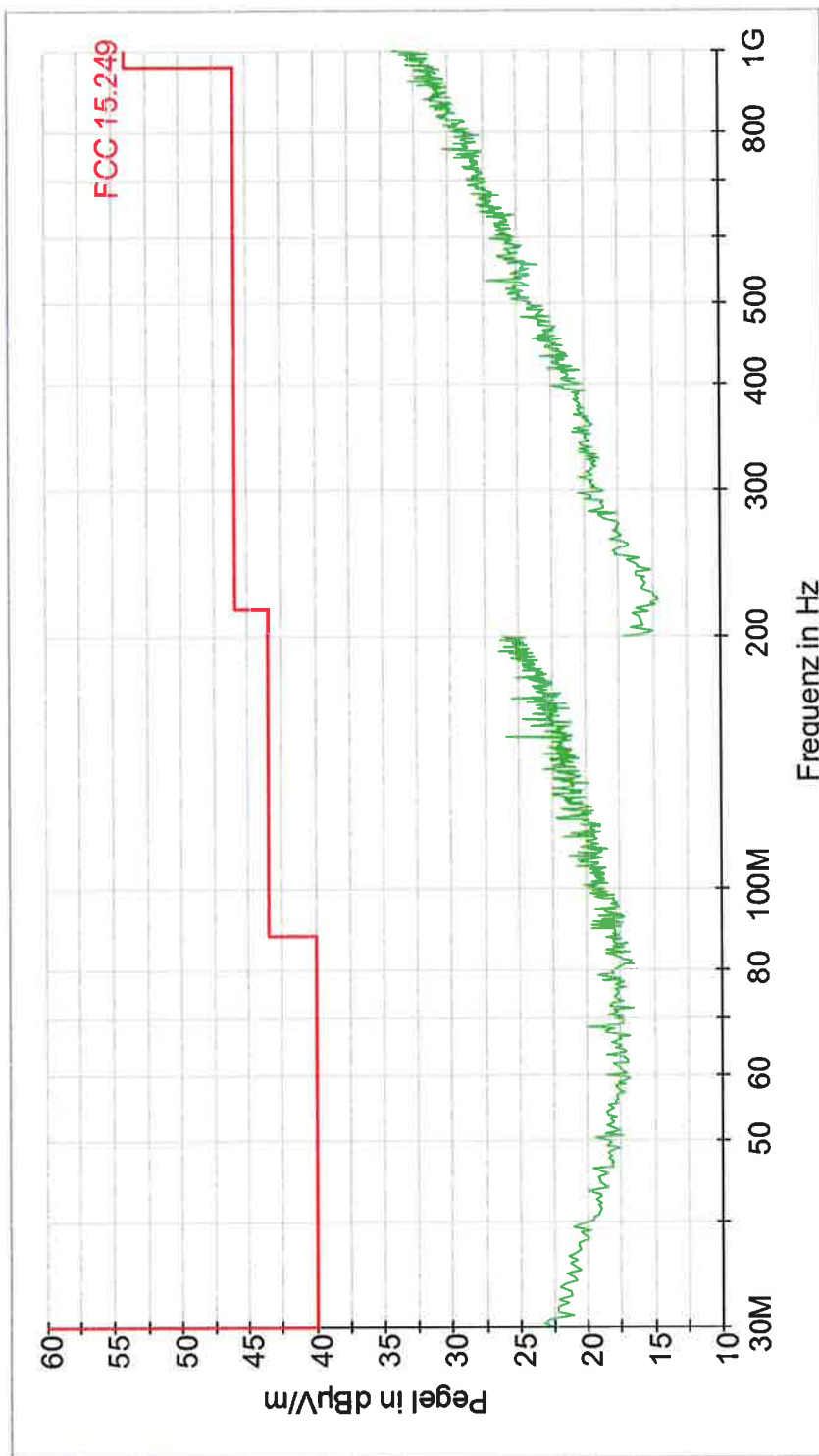
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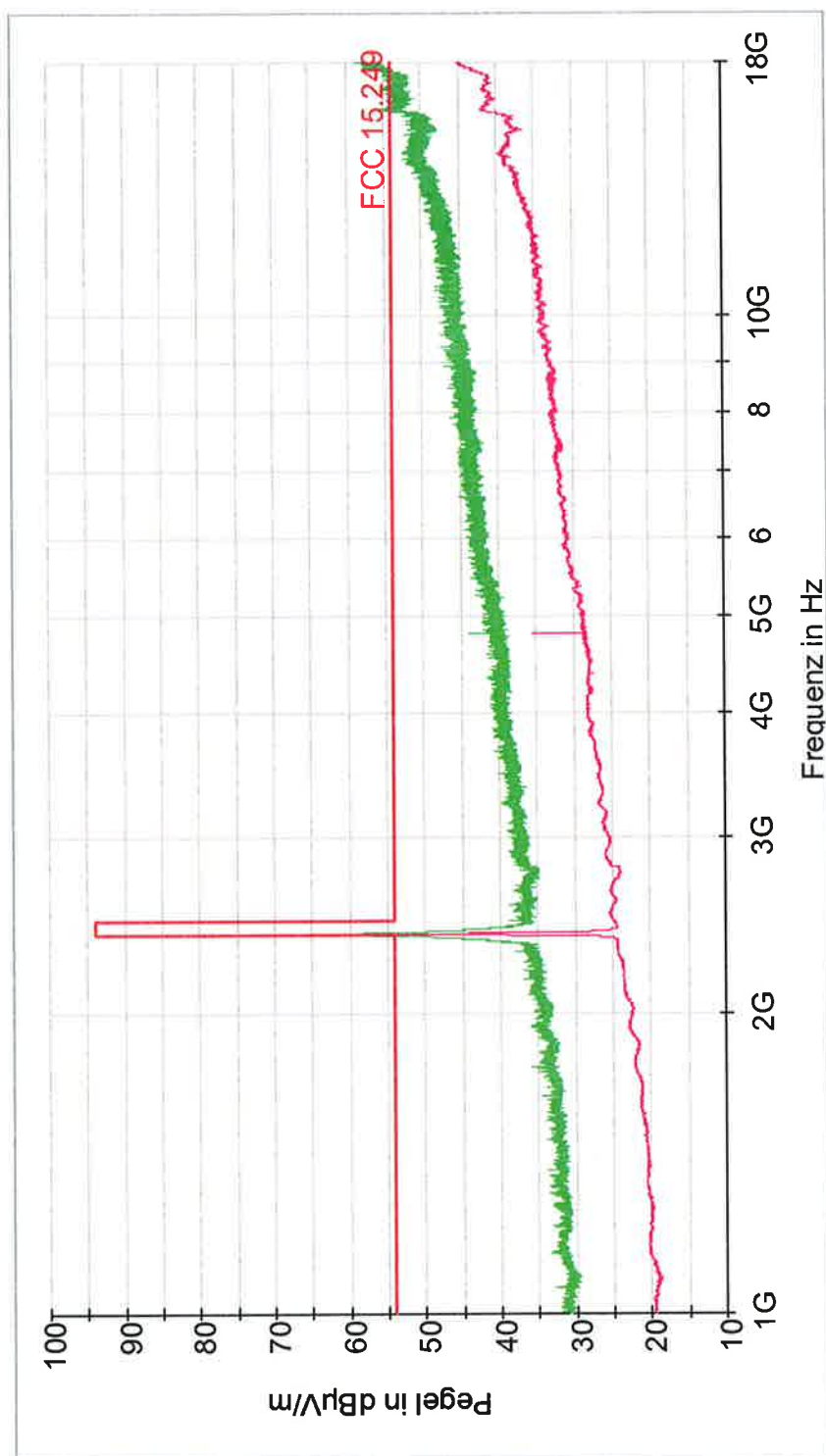
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