

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/EMV-04/166

about
the following EMC - test/- research

Division Medical
Technology/
Communication
Technology/ EMC

Testing Body for
Communication
Technology/ EMC

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Applicant: AKG Acoustics GmbH
Lemböckgasse 21 - 25
A - 1230 Vienna

Product: T206AFC
transmitter for wireless headphone set

Accredited Testing
Laboratory,
Inspection Body,
Certification Body,
Calibration Body

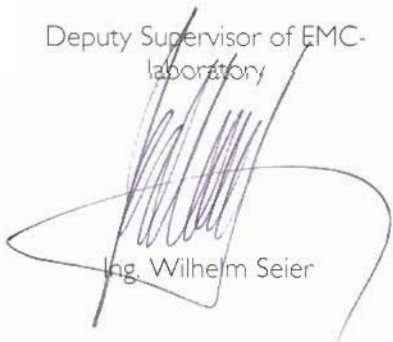
Notified Body 0408

Serial Number: ---

Standard: 47 CFR Ch. I Part 15

TÜV Österreich
Test laboratory for EMC

Deputy Supervisor of EMC-
laboratory


Ing. Wilhelm Seier



25.05.2004

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Checked by


Ing. Gerald Bildert

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

DVR 0047 333
UID ATU 37086005

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1. Applicant

Company : AKG Acoustics GmbH

Department : ---

Address : Lemböckgasse 21 - 25
A – 1230 Vienna

Contact person : Mr. Tiefenthaler

EUT received on : 24.05.2004

Tests were performed on : 25.05.2004

2. Description of EUT

EUT	T 206AFC transmitter for wireless headphone set
Serial Number	---
Manufacturer	Arkon Promowide Technology Ltd. 11/F. To 12/F., Yue Xiu Ind'l Bldg., 87 Hung To Road, Kwun Tong, Kowloon Hong Kong
Description	AKG provided the following configuration for the measurements: T 206AFC transmitter for wireless headphone set
Operating mode	The measurements were carried out at the following running states: transmit

3. Standards / Final result

Name	Title	Deviation	Result
47 CFR Ch. I Part 15	Radio Frequency Devices	none	PASS
PASS EUT passed FAIL EUT failed			

4. Test results

4.1. Conducted emission

Limits according to 15.207

Frequency range	Limit	
Detector	Quasi Peak	Average
0,150 - 0,5 MHz	66 - 56 dB μ V decreasing with the logarithm of frequency	56 - 46 dB μ V decreasing with the logarithm of frequency
0,5 - 5 MHz	56 dB μ V	46 dB μ V
5 - 30 MHz	60 dB μ V	50 dB μ V
Remark: Quasi Peak and Average limits must be both met		

Measuring apparatus parameters:

Parameter	Preview measurement	Final measurement	Parameter	Preview measurement	Final measurement
Start frequency	150 kHz	150 kHz	Detector	MP/AV	QP/AV
Stop frequency	30 MHz	30 MHz	Measuring time	10 ms	1 s
Stepsize	5 kHz	5 kHz	RF-attenuation	0dB	0dB
IF- Bandwidth	9 kHz	9 kHz	Preamplifier	0 dB	0 dB

Operating mode	Measuring result
transmit	Measurement diagram 1

Test result:

4. 1.1.) Measurement with QP-Detector

Due to the large margin of the pre-measurement results, no final measurement was performed.

4. 1.2.) Measurement with AV-Detector

Due to the large margin of the pre-measurement results, no final measurement was performed.

4. 2. Radiated emission

Limits according to 15.209 (15.249 (c))

< 1 GHz → Quasi Peak Limit > 1 GHz → Average Limit (Peak Limit 20 dB above average Limit)				
Frequency range	Limit	Bandwith	Measurement distance	Remark
0,009 – 0,150 MHz	2400µV / f(kHz)	200 Hz	300 m	1
0,150 – 0,490 MHz	2400µV / f(kHz)	9 kHz	300 m	1
0,490 – 1,705 MHz	24000µV / f(kHz)	9 kHz	30 m	1
1,705 - 30 MHz	30 µV/m	9 kHz	30 m	1
30 – 88 MHz	100 µV/m	120 kHz	3 m	---
88 – 216 MHz	150 µV/m	120 kHz	3 m	---
216 – 960 MHz	200 µV/m	120 kHz	3 m	---
960 MHz - 1000 MHz	500 µV/m	120 kHz	3 m	---
Above 1000 MHz	500 µV/m	1 MHz	3 m	---
Remark: 1) The Limit was increased for a constant measurement distance of 3m with a factor of 40 dB per Decade.				

Operating mode	Measuring result
transmit	See following pages

Test result:

**4. 2.1.) Measurement in the frequency range 9 kHz to 200 MHz
Channel 1**

Due to the large margin of the pre-measurement results, no final measurement was performed.
(see measurement diagram 2 and 3)

**4. 2.2.) Measurement in the frequency range 9 kHz to 200 MHz
Channel 2**

Due to the large margin of the pre-measurement results, no final measurement was performed.
(see measurement diagram 2 and 4)

**4. 2.3.) Measurement in the frequency range 9 kHz to 200 MHz
Channel 3**

Due to the large margin of the pre-measurement results, no final measurement was performed.
(see measurement diagram 2 and 5)

**4. 2.4.) Measurement in the frequency range 200 MHz to 10000 MHz
Channel 1**

Frequency MHz	Level dB μ V/m	Limit dB μ V/m	Margin dB	Measurement diagram
200 to 216	< 20	43,5	---	6
216 to 1000	< 35	---	---	
1831	36,5	53,9	17,4	9
2746,5	42,1	53,9	11,8	
3662	39,9	53,9	14	
all other above 1 GHz	< 40	53,9	---	

4. 2.5.) Measurement in the frequency range 200 MHz to 10000 MHz
Channel 2

Frequency MHz	Level dBµV/m	Limit dBµV/m	Margin dB	Measurement diagram
200 to 216	< 20	43,5	---	7
216 to 1000	< 35	---	---	
1832	36,3	53,9	17,6	10
2748	41,7	53,9	12,2	
3664	39,9	53,9	14	
all other above 1 GHz	< 40	53,9	---	

4. 2.6.) Measurement in the frequency range 200 MHz to 10000 MHz
Channel 3

Frequency MHz	Level dB μ V/m	Limit dB μ V/m	Margin dB	Measurement diagram
200 to 216	< 20	43,5	---	8
216 to 1000	< 35	---	---	
1883	36,4	53,9	17,5	11
2749,5	38,3	53,9	15,6	
3666	34,1	53,9	19,8	
all other above 1 GHz	< 40	53,9	---	

4.3. Field strength in the frequency range 902 – 928 MHz

Limits according to 15.249 (a):

The field strength of any emissions within this band shall not exceed 50.000 microvolts/meter (94 dB μ V/m) at 3 meters.

Measurement results:

Channel 1: 91,9 dB μ V/m at 915,5 MHz

Channel 2: 91,2 dB μ V/m at 916 MHz

Channel 3: 92,4 dB μ V/m at 916,5 MHz

Appendix 1

Test equipment used

☒	Anechoic Chamber with 3m measurement distance	NT-100	☐	ESPC - Test receiver 9 kHz - 2,5 GHz	NT-203
☒	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-Z2 - Bicon. Antenna 20 - 300 MHz	NT-120	☐	CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz	NT-210
☐	HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz	NT-121	☐	3271 - Spectrum analyzer 100 Hz - 26,5 GHz	NT-211
☒	HFH-Z2 - Loop Antenna 9 kHz - 30 MHz	NT-122	☐	Radiocommunication analyzer Marconi 2945A	NT-212
☐	HFH-Z6 - Rod Antenna 9 kHz - 30 MHz	NT-123	☐	2855S - Communication analyzer	NT-213
☐	3121C - Dipole Antenna 28 - 1000 MHz	NT-124	☐	Mixer M28HW 26,5 GHz - 40 GHz	NT-214
☒	3115 - Horn Antenna 1 - 18 GHz	NT-125	☐	Diode Detector 0,01 GHz - 26,5 GHz	NT-215
☐	3116 - Horn Antenna 18 - 40 GHz	NT-126	☐	3160-10 Horn Antenna 26,5 GHz - 40 GHz	NT-216
☐	SAS-200/543 - Bicon. Ant. 20 MHz - 300 MHz	NT-127	☐	Radiocommunication analyzer SWR 1180 MD	NT-217
☐	AT-1080 - Log. Per. Ant. 80 - 1000 MHz	NT-128	☐	Mixer M19HWD 40 GHz - 60 GHz	NT-218
☒	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-129	☐	Mixer M12HWD 60 GHz - 90 GHz	NT-219
☐	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-130	☐	TDS - 540 DSO Digital scope	NT-220
☒	3146 - Log. Per. Ant. 200 - 1000 MHz	NT-131	☐	PM97 Scopemeter	NT-221
☐	Loop Antenna H-Field	NT-132	☐	B10 - Harmonics and flicker analyzer	NT-231
☐	Horn Antenna 500 MHz - 2900 MHz	NT-133	☐	EFA-3 H-field- / E-field probe	NT-243
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-134	☐	E-field measuring instrument EMR-200; 100 kHz - 3 GHz	NT-244
☐	Log. per. Antenna 800 MHz - 2500 MHz	NT-135	☐	E-field probe 100 kHz - 3 GHz	NT-245
☐	BiConiLog Antenna 26 MHz - 2000 MHz	NT-137	☐	Magnetic field-Sensor 300 kHz - 30 MHz	NT-246
☐	Conical Dipol Antenna PCD8250	NT-138	☐	E-field probe 10 MHz - 18 GHz	NT-247
☐	HZ-1 Antenna tripod	NT-150	☐	H-field probe 10 MHz - 1 GHz	NT-248
☒	BN 1500 Antenna tripod	NT-151	☐	ELT-400 1 Hz - 400 kHz	NT-249
☐	Ant. tripod for EN61000-4-3 Model TP1000A	NT-156	☐	MDS 21 - Absorbing clamp 30 - 1000 MHz	NT-250
☐	ESVP - Test receiver 20 - 1000 MHz	NT-201			

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Appendix 1 (continued)

Test equipment used

☐	FCC-203I EM Injection clamp	NT-251	☐	AS0102-65R - RF-Amplifier 1 GHz - 2 GHz	NT-333
☐	FCC-203I-DCN Fenite 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
☐	Model 2000 Digital Multimeter	NT-261	☐	Preamplifier 100 MHz - 23 GHz	NT-337
☐	Fluke 97 Digital Multimeter	NT-262	☐	DC Block 10 MHz - 18 GHz Model 8048	NT-338
☐	Fluke 97 Digital Multimeter	NT-263	☐	2-97201 Electronic load	NT-341
☒	ESH2-Z5 Artificial mains network 4x25A	NT-300	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-344
☐	ESH3-Z5 Artificial mains network 2x10A	NT-301	☐	TSX3510P - Power supply 0-30 V / 0 - 10 A	NT-345
☐	ESH3-Z6 Artificial mains network 1x100A	NT-302	☐	VDS 200 Mobil-impuls-generator	NT-350
☐	ESH3-Z4 T-Artificial network	NT-303	☐	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	☐	FP 16/3-1 3 ph. Coupling filter (Burst)	NT-400
☐	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	☐	ESH2-Z3 - Probe 9 kHz - 30 MHz	NT-410
☐	40 MHz Arbitrary Generator T1241	NT-315	☐	IP 4 - Capacitive clamp (Burst)	NT-411
☐	PEFT - Burst generator up to 4 kV	NT-320	☐	Highpass-Filter 100 MHz - 4 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 - 18 GHz	NT-415
☐	VCS 500-M6 Surge-Generator	NT-326	☒	Highpass-Filter 3500 MHz - 18 GHz	NT-416
☐	BTA-250 - RF-Amplifier 9 kHz - 220 MHz / 250 W	NT-330	☐	HV-Attenuator 54,5 dB (Burst)	NT-420
☐	T82-50 RF-Amplifier 2 GHz - 8 GHz	NT-331	☐	RF-Attenuator 20 dB 0,1 - 1000 MHz / 25 W	NT-421
☐	500W1000M7 - RF-Amplifier 80 - 1000 MHz / 500 W	NT-332	☐	RF-Attenuator 10 dB 0,1 - 1000 MHz / 20 W	NT-422

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Appendix 1 (continued)

Test equipment used

☐ RF-Attenuator 30 dB 0,1 - 1000 MHz / 1 W	NT-423	☐ FCC-801-C1 Coupling decoupling network	NT-464
☐ RF-Attenuator 30 dB	NT-424	☐ F-16A - Current probe 1kHz - 70MHz	NT-465
☐ RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-425	☒ PC P450 - Test computer	NT-500
☐ RF-Attenuator 6 dB 0,1 - 1000 MHz / 1 W	NT-426	☐ PC P4 1700 MHz Notebook	NT-505
☐ Voltage-divider 1:100	NT-427	☐ PC PIII 933 MHz Notebook	NT-506
☐ RF-Attenuator 6 dB	NT-428	☐ Monitoring camera with Monitor	NT-511
☐ RF-Attenuator 0 dB - 81 dB	NT-429	☒ ES-K1 Test software	NT-520
☐ WRU 27 - Band blocking 27 MHz	NT-430	☐ SPS_PHE - Test software voltage fluctuations/harmonics	NT-525
☐ WHJ450C9 AA - High pass 450 MHz	NT-431	☐ SPS_EM - Test software for PHE 4500/B	NT-527
☐ WHJ250C9 AA - High pass 250 MHz	NT-432	☐ Noise power test apparatus according to EN 55014	NT-530
☐ RF-Load 150 W	NT-433	☐ Vertical coupling plane (ESD)	NT-531
☐ Impedance transducer 50 Ohm - 800 Ohm	NT-435	☐ TEM-Zelle	NT-533
☐ RF-Attenuator DC - 18 GHz 6 dB	NT-436	☐ Test cable #4 for EN 61000-4-6	NT-553
☐ RF-Attenuator DC - 18 GHz 6 dB	NT-437	☐ Test cable #3 for conducted emission	NT-554
☐ RF-Attenuator DC - 18 GHz 10 dB	NT-438	☐ Test cable #5 ESD-cable (2x470k)	NT-555
☐ RF-Attenuator DC - 18 GHz 20 dB	NT-439	☐ Test cable #6 ESD-cable (2x470k)	NT-556
☐ I+P 7780 Directional coupler 100 - 2000 MHz	NT-440	☐ Test cable #8 Sucoflex 104EA	NT-559
☐ ESH3-Z2 - Pulse limiter 9 kHz - 30 MHz	NT-441	☐ Test cable #9 (for outdoor measurements)	NT-580
☐ Power Divider 6 dB/1 W/50 Ohm	NT-443	☐ Test cable #10 (for outdoor measurements)	NT-581
☐ Directional coupler 0,1 MHz - 70 MHz	NT-444	☐ Test cable #13 Sucoflex 104PE	NT-584
☐ Directional coupler 0,1 MHz - 70 MHz	NT-445	☐ Shield chamber	NT-600
☐ Tube imitations according to EN 55015	NT-450	☐ Climatic chamber -55°C to +180°C	M-512
☐ FCC-801-M2-50A Coupling decoupling network	NT-459	☐ Control and simulation equipment for EUT	---
☐ FCC-801-M5-25 Coupling decoupling network	NT-460		
☐ FCC-801-AF10 Coupling decoupling network	NT-461		
☐ FCC-801-S25 Coupling decoupling network	NT-462		
☐ FCC-801-T4 Coupling decoupling network	NT-463		

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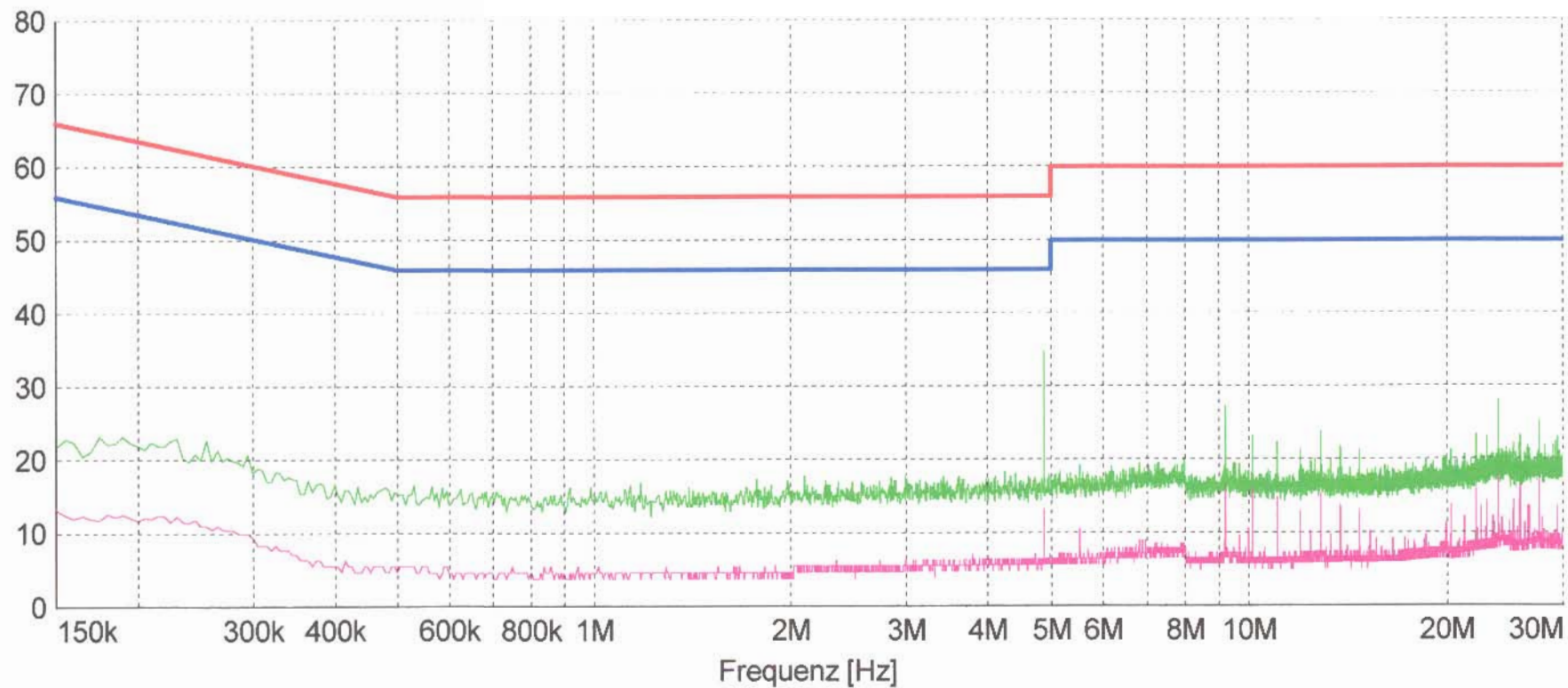
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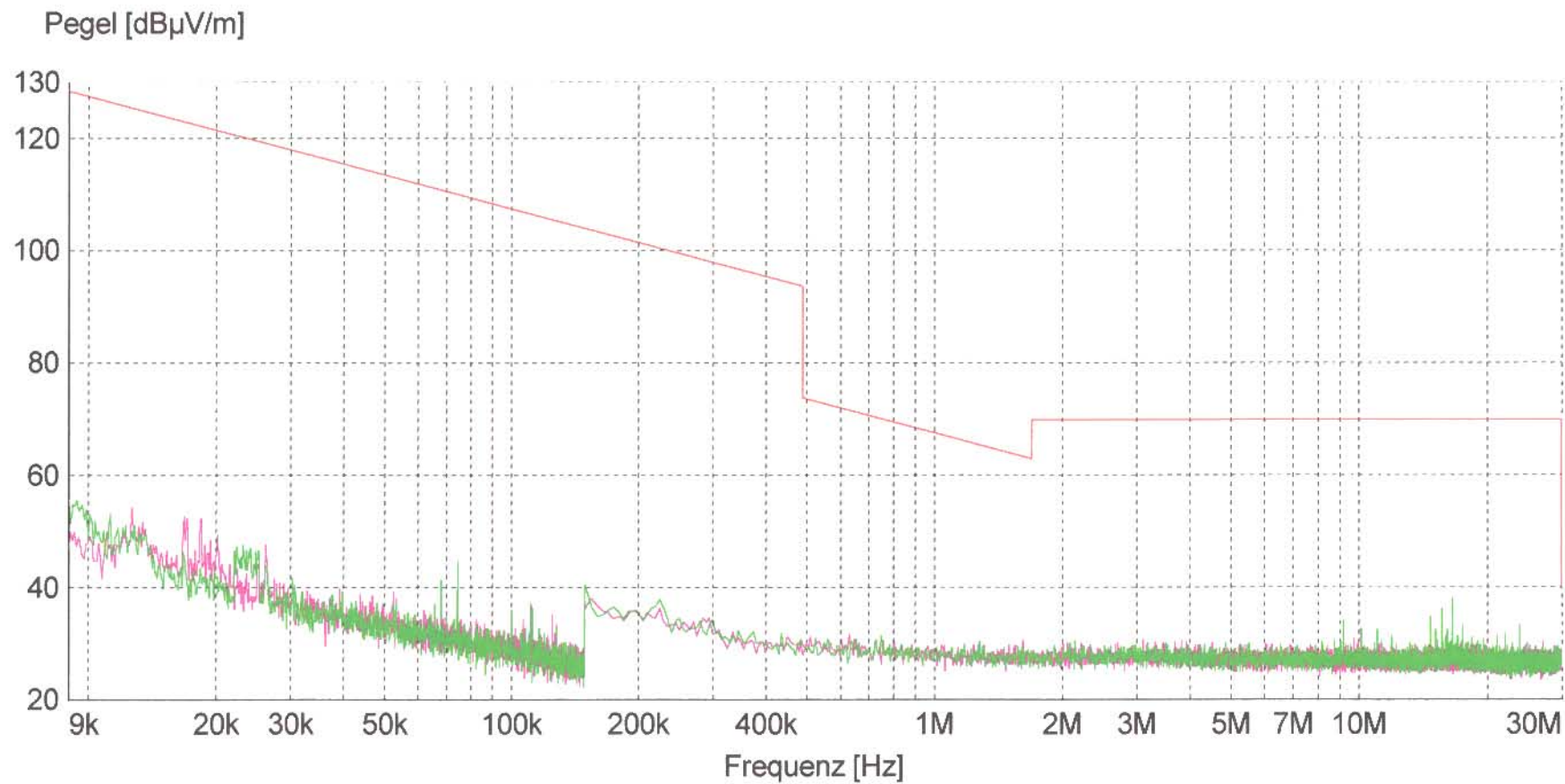
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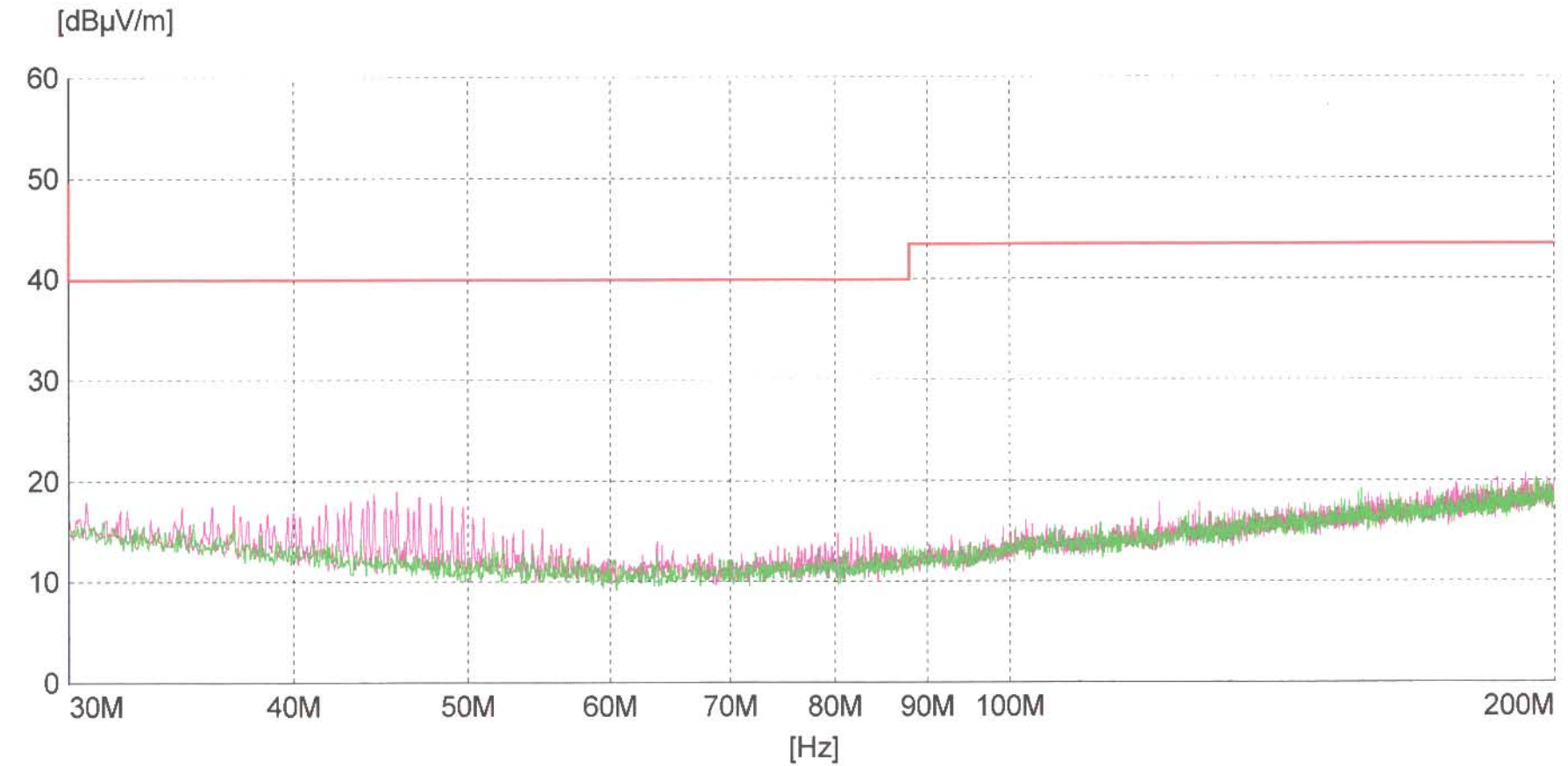
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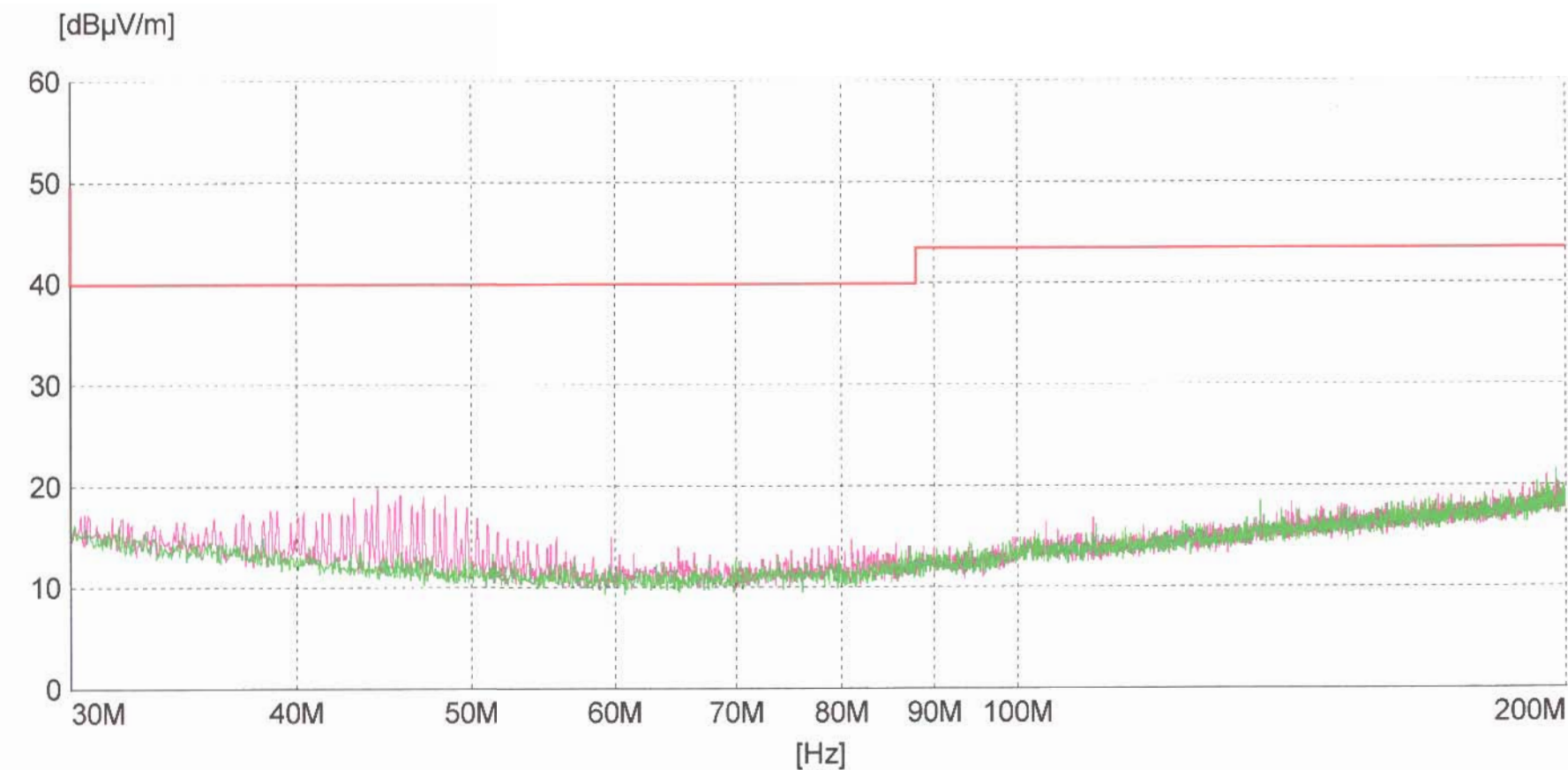
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MES	T206AFC AC pre AV		
LIM	EN 55022 V QP	EN 55022 V QP	
LIM	EN 55022 V AV	EN 55022 V AV	



— MES T206AFC_V1_2
 — MES T206AFC_V1_1
 — LIM FCC ClassB F QP 40dB FCC ClassB, field strength 3m

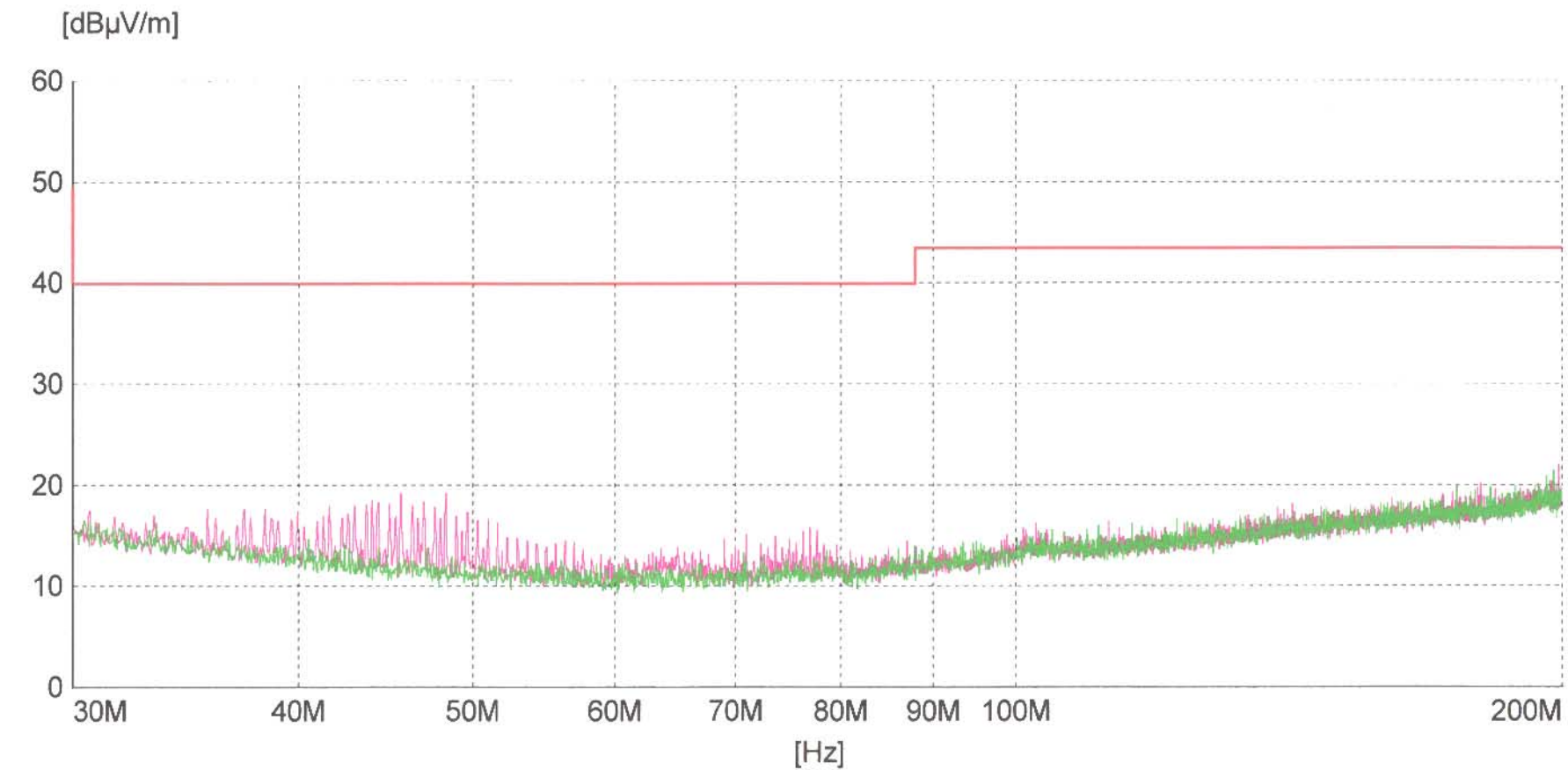


MES T206AFC_H1_Ch1
 MES T206AFC_V1_Ch1
 LIM FCC ClassB F QP/AV FCC ClassB, field strength 3m



MES T206AFC_H1_Ch2
MES T206AFC_V1_Ch2
LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m

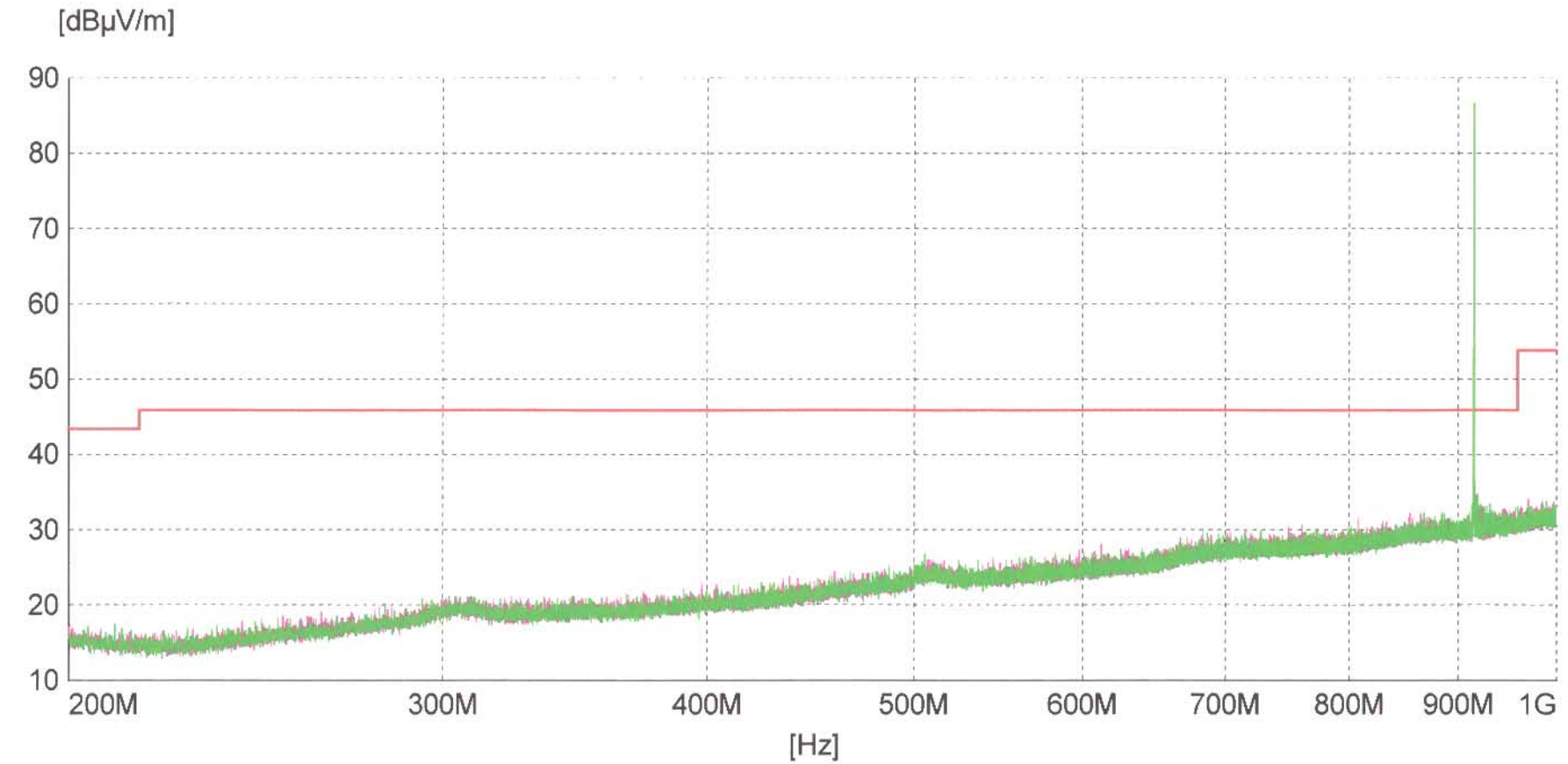


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— MES T206AFC_V1_Ch3

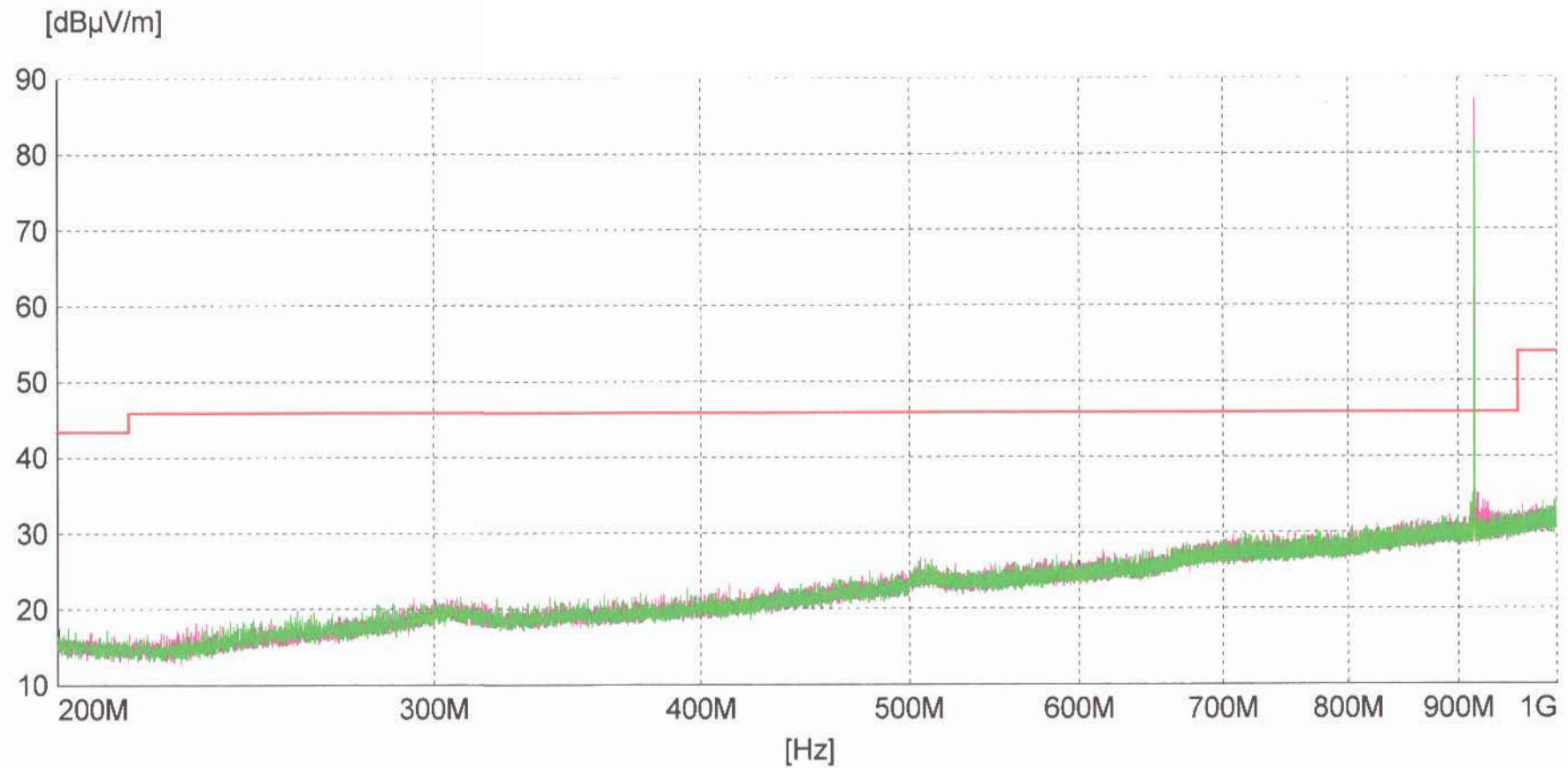
— LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m



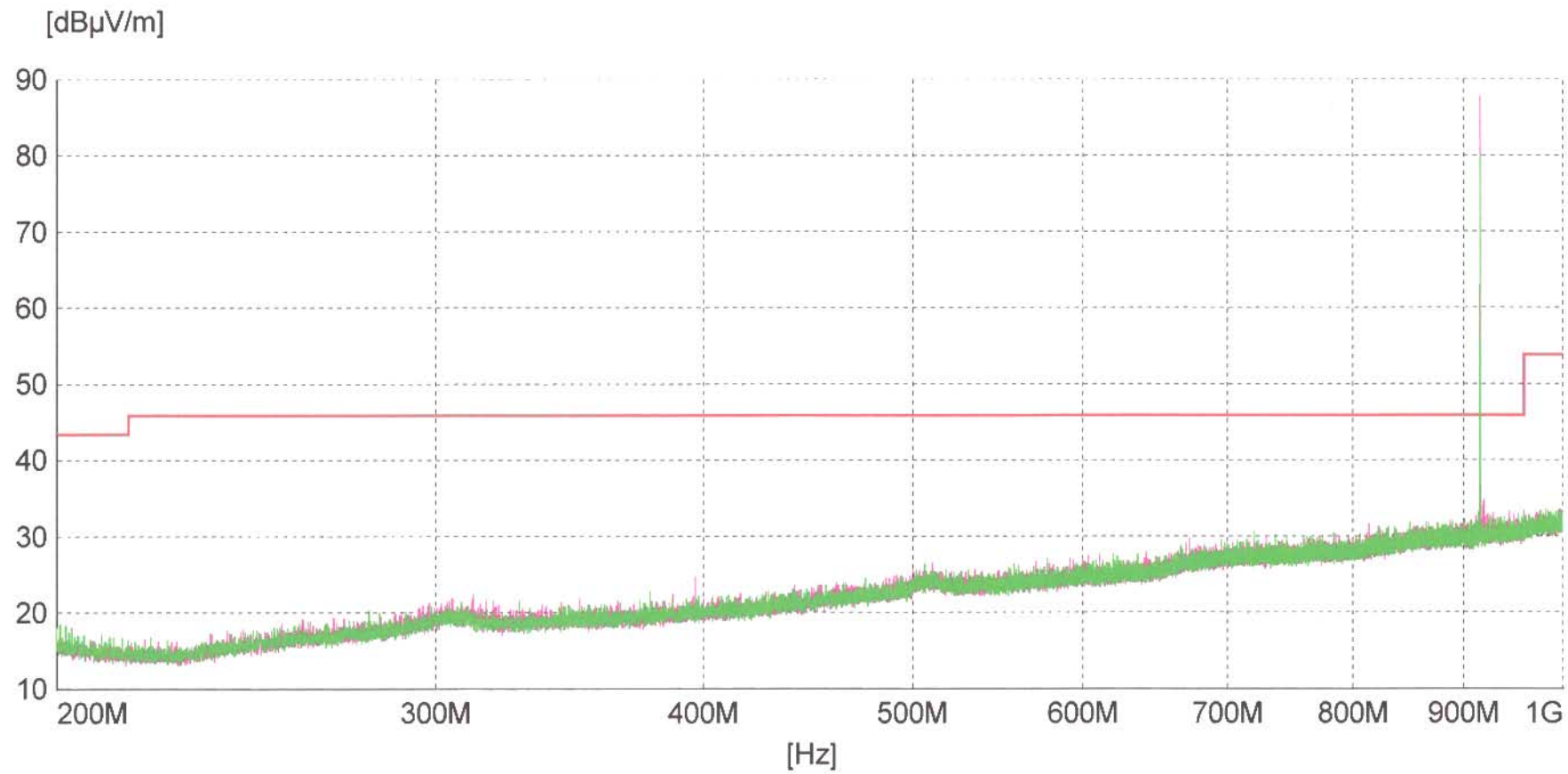
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— MES T206AFC_V2_Ch1
— LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m

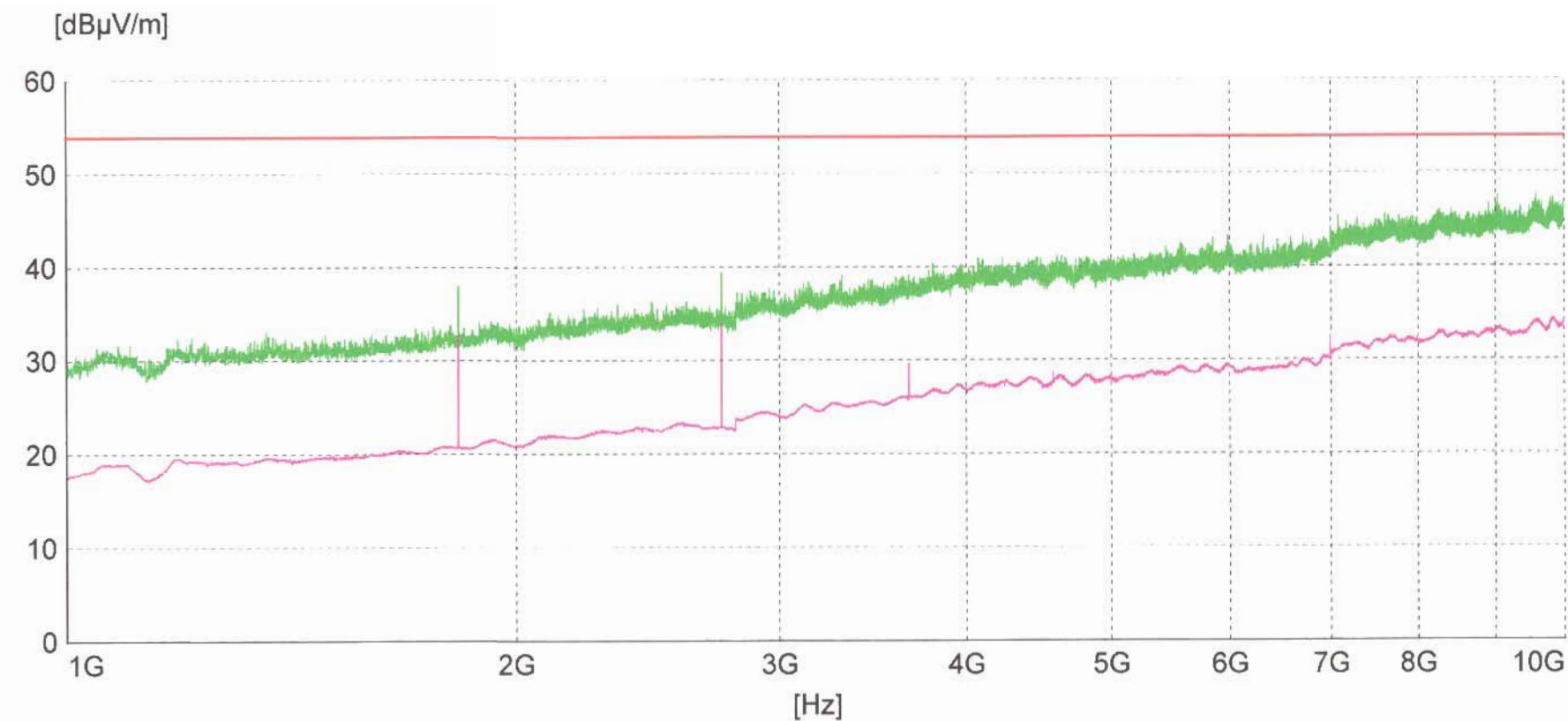


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 — LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m

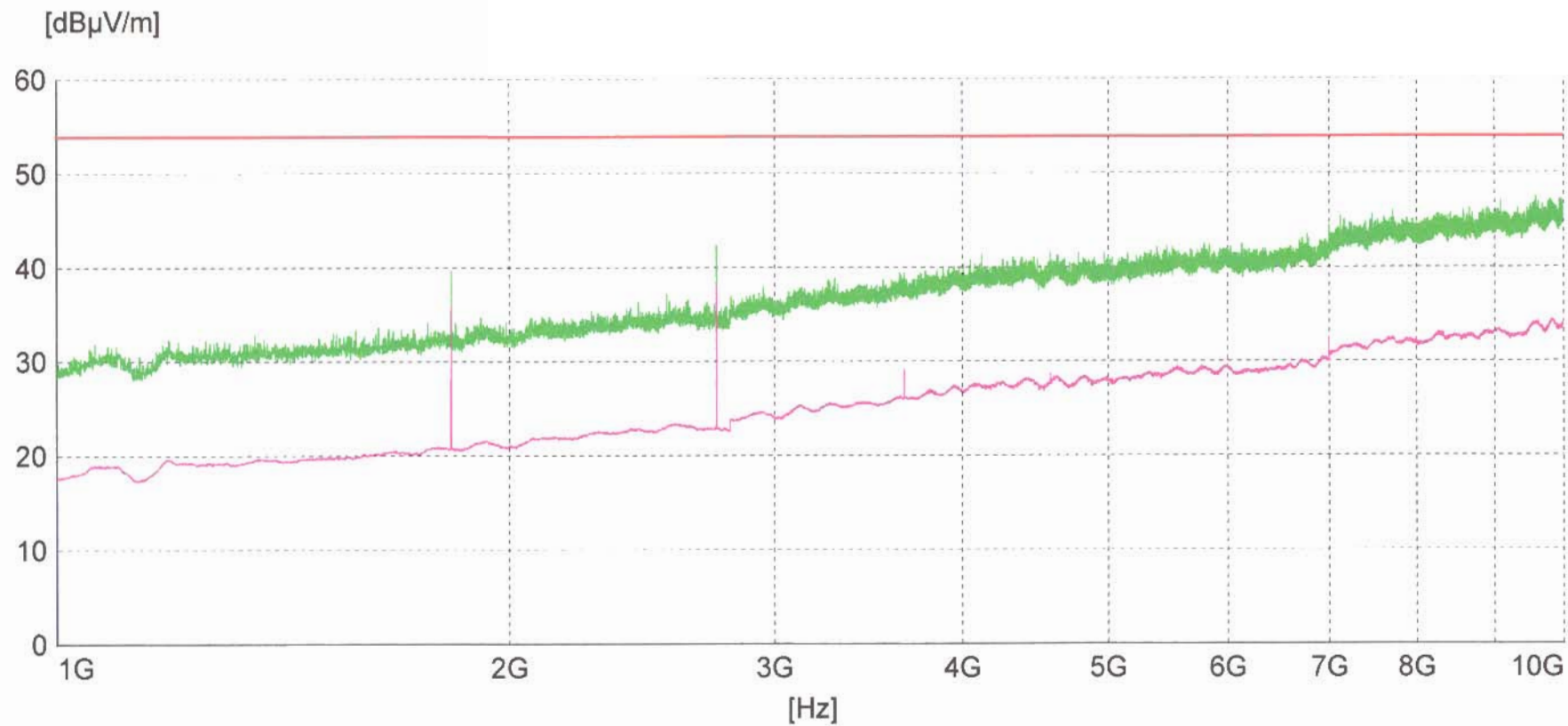


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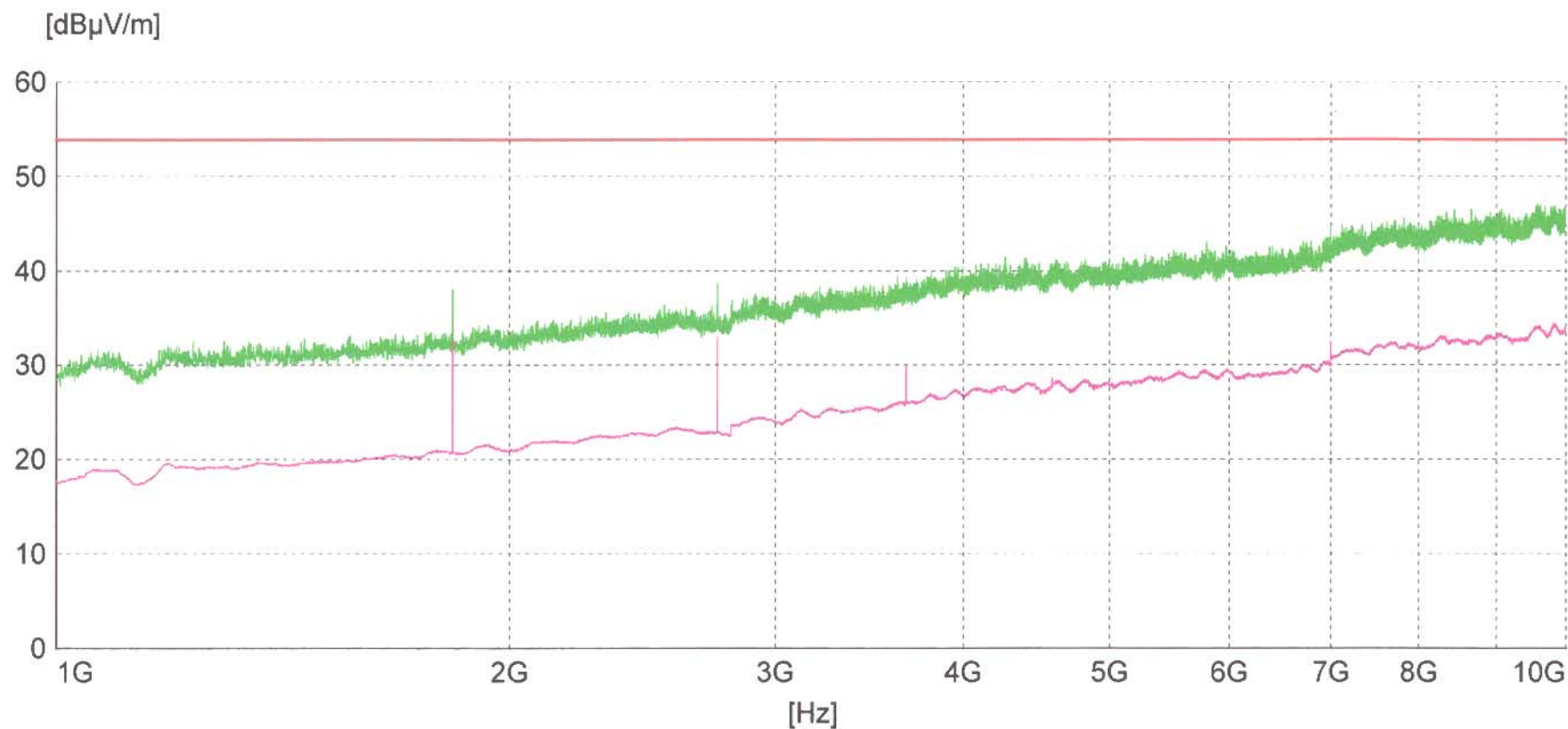
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 — MES T206AFC V4 Ch1 AV
 — MES T206AFC V3 Ch1 MP
 — MES T206AFC V4 Ch1 MP
 — LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m



- MES T206AFC V3 Ch2 AV
- MES T206AFC V4 Ch2 AV
- MES T206AFC V3 Ch2 MP
- MES T206AFC V4 Ch2 MP
- LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m



— MES T206AFC_V3_Ch3_AV
 — MES T206AFC_V4_Ch3_AV
 — MES T206AFC_V3_Ch3_MP
 — MES T206AFC_V4_Ch3_MP
 — LIM FCC ClassB F QP/AV

FCC ClassB, field strength 3m