

TEST REPORT
of the accredited test laboratory

TÜV Nr.:M/FG-02/113

Applicant: TÜV Rheinland Product Safety GmbH
Am Grauen Stein
D-51105 Köln

Tested Product: Hand held Computer

Type: Dolphin 7300

Manufacturer: Hand Held Products Inc.
Skaneateles Falls, NY 13153-0187; 4619 Jordan Road

Output power 0,1 W **power supply:** 3,6 VDC
nom.

Frequency range: 2412 – 2462 **Channel separation:** 5 MHz
MHz

Standard: FCC: 47 CFR 15.247

Geschäftsbereich
Medizintechnik,
Nachrichtentechnik
und EMV

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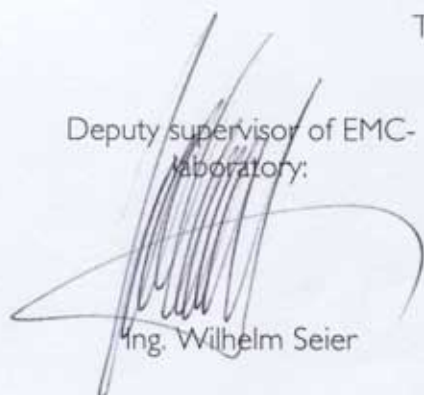
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TÜV Österreich
Test laboratory for EMC

Deputy supervisor of EMC-
laboratory:

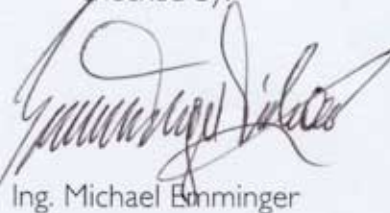

Ing. Wilhelm Seier



10. 9. 2002

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checked by:


Ing. Michael Emminger

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

LIST OF MEASUREMENTS

The complete list of measurements called for in 47 CFR 15.247 is given below.

SUBCLAUSE	PARAMETER TO BE MEASURED	PAGE
	Intentional Radiators	
	Test object data	3
15.247 (b)	Output power	4
15.247 (a)(2)	6 dB Bandwidth	5
15.247 (d)	Power density	6
15.247 (c)	Out-of-band Antenna Conducted Emission	7
15.247 (c)	Out-of-band Radiated Emission (except emissions in restricted bands)	8
15.35 (b)(c)	Radiated Emission in Restricted bands	9
15.207	AC Line-conducted Emission	10
15.109	Radiated Emission from digital part	11
15.109	Radiated Emission from Receiver L.O.	12
15.247(c)	Processing Gain	See exhibit „Procesing gain“
2.1091	RF exposure requirement	See exhibit „RF exposure“
15.203	Antenna requirement	passed

TEST OBJECT DATA

General EUT Description

The HHP Dolphin 7300 is a handheld Computer which has an integrated barcodescanner and transmits decoded barcodes through a WLAN Compact Flash Card module produced by Intel to a server. The module already has FCC Certification, some parts of the tests were not done because HHP has no influence on these parameters inside the module and the test results were so copied from the original test report which is attached to this report. The transmitter conducted RF output power was measured to verify the test results.

Overview of WLAN Compact Flash Card

FCC Identifier	PD9WCF2011BE
Use of Product	Wireless LAN communications
Type of transmission	Direct Sequence Spread Spectrum
Rated RF Output power	89 mW, 19,5 dBm
Frequency range	2412 - 2462 MHz
Number of Channels	11

Overview of the HHP Dolphin 7300

FCC Identifier	HD5-7300-2011B
Compact Flash Card used with other antenna than in original grant	

Mode of operation during the test:

The HHP Dolphin 7300 was in a test mode scanning about 5 to 10 times a second and transmits every scanned barcode.

Test site used: For the radiated measurements the anechoic chamber located at TÜV Österreich was used.

Conducted output power at antenna terminals

§ 15.247(b)

Requirements

For antennae with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennae with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN -6) dBm.

Test results (taken from original report and verified at TÜV Österreich)

Frequency (MHz)	Output (dBm)	Output (mW)
2412	17,6	58
2437	19,5	89
2462	19,1	81

6 dB RF Bandwidth

§ 15.247(a)(2)

Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz

Test results (taken from original report)

Frequency (MHz)	6 dB Bandwidth
2412	9,44 MHz
2437	9,62 MHz
2462	9,60 MHz

Power density

§ 15.247(d)

Requirements

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test result (taken from original report)

Frequency (MHz)	Power Density (dBm)
2463	-8,7

Frequency Span 600 kHz

Sweep time $\text{Frequency Span} / 3\text{kHz} = 200 \text{ seconds}$

Out-of-band Conducted Emissions

§ 15.247(c)

Requirements

In any 100 kHz bandwidth outside the EUT passband, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Test result: Refer to the plots in the original report.

Out-of-band Radiated Emissions

§ 15.247(c)

Requirements

In any 100 kHz bandwidth outside the EUT passband, the RF power shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

Result:

See measurement diagrams 1 to 4 for the frequency range 9 kHz to 3 GHz.

Results above 3 GHz:

CH 1 (2412 MHz)		CH 11 (2462 MHz)	
Frequency	Level PK @ 3m distance	Frequency	Level PK @ 3m distance
4,824	40,42	4,924	40,27
7,326	37,48	7,386	39,49
9,648	41,07	9,848	44,64
12,060	43,14	12,310	45,92
14,472	46,27	14,772	48,80
16,884	49,01	17,234	50,27
19,296	50,93	19,696	51,14
21,708	51,47	22,158	52,47
24,120	52,26	24,620	53,47

Results summary: All measured peak values are below 15.209 limit outside of restricted bands.

Transmitter Radiated Emissions in Restricted bands § 15.247(c)
 § 15.205
 § 15.209
 § 15.35

Requirements

In restricted bands the 15.209 limit must be kept.

Results

The measurement results in diagrams 5 and 6 are measured with Dolphin 7300 operating on channel 1 and 11 respectively. All measurements were made with peak detector. Measured like this all emissions keep the 15.209 limit + 20dB. The average value lies far below the peak value because the TX on time is very short, lower than 1 millisecond. Measured with an averaging time of 100ms the average value lies about 40dB below the peak value and is so far below 15.209 limit.

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Ambient temperature: 22°C

Relative humidity: 58%

AC Line Conducted Emission

§ 15.207

Test result see in the attached original test report.

Radiated Emissions from Digital Section of Transceiver (Transmitter) § 15.109

The transmitter cannot be operated without the digital section, so we measured both during measurements described on pages 8 and 9 of this report.

Radiated Emissions from Receiver Section of Transceiver (L.O. Radiation) § 15.109
§ 15.111

Not required - EUT operation above 960 MHz only.

Appendix 1

Test equipment used

Used or not	Measuring device	Internal number	Last calibration	Calibration interval (in years)
☒	Anechoic Chamber with 3m	NT-100	28.11.2001	1
☒	MA 240 - Antenna mast	NT-110	xxx	xxx
☒	DS 412 - Turntable 0 - 400 ° Azimuth	NT-111	xxx	xxx
☒	HD 100 Controller Mast+Turntable	NT-112	xxx	xxx
☒	HFH-Z2 - Loop Antenna	NT-122	25.04.2001	3
☒	3115 - Horn Antenna 1-18 GHz	NT-125	24.04.2001	3
☒	HK-116 - bicon. Ant. 20 MHz - 300 MHz	NT-129	25.04.2001	3
☒	3146 - Log. Per. Ant. 200 - 1000MHz	NT-131	25.04.2001	3
☐	Log. per. Antenna 800 MHz - 2500	NT-134	17.12.2001	3
☒	HZ-1 Antenna tripod	NT-150	xxx	xxx
☐	BN 1500 Antenna tripod	NT-151	xxx	xxx
☒	ES126 - Test receiver 20 Hz - 26,5 GHz	NT-207	28.05.2001	2
☐	ESH2-Z5 Artificial mains network	NT-300	18.02.2002	3
☐	ESH3-Z5 Artificial mains network	NT-301	18.02.2002	3
☐	ESH3-Z6 Artificial mains network	NT-302	18.02.2002	3
☐	PHE 4500/B Power amplifier	NT-304	xxx	xxx
☐	PHE 4500 - Mains impedance network	NT-401	18.07.2001	3
☐	ESH3-Z2 - Pulse limiter	NT-441	11.01.2002	1
☒	PC P450 - Test computer	NT-500	xxx	xxx
☒	ES-K1 Test software	NT-520	xxx	xxx
☒	Test cables	NT-550	xxx	xxx
☐	Test cable #3 for conducted	NT-554	11.01.2002	1

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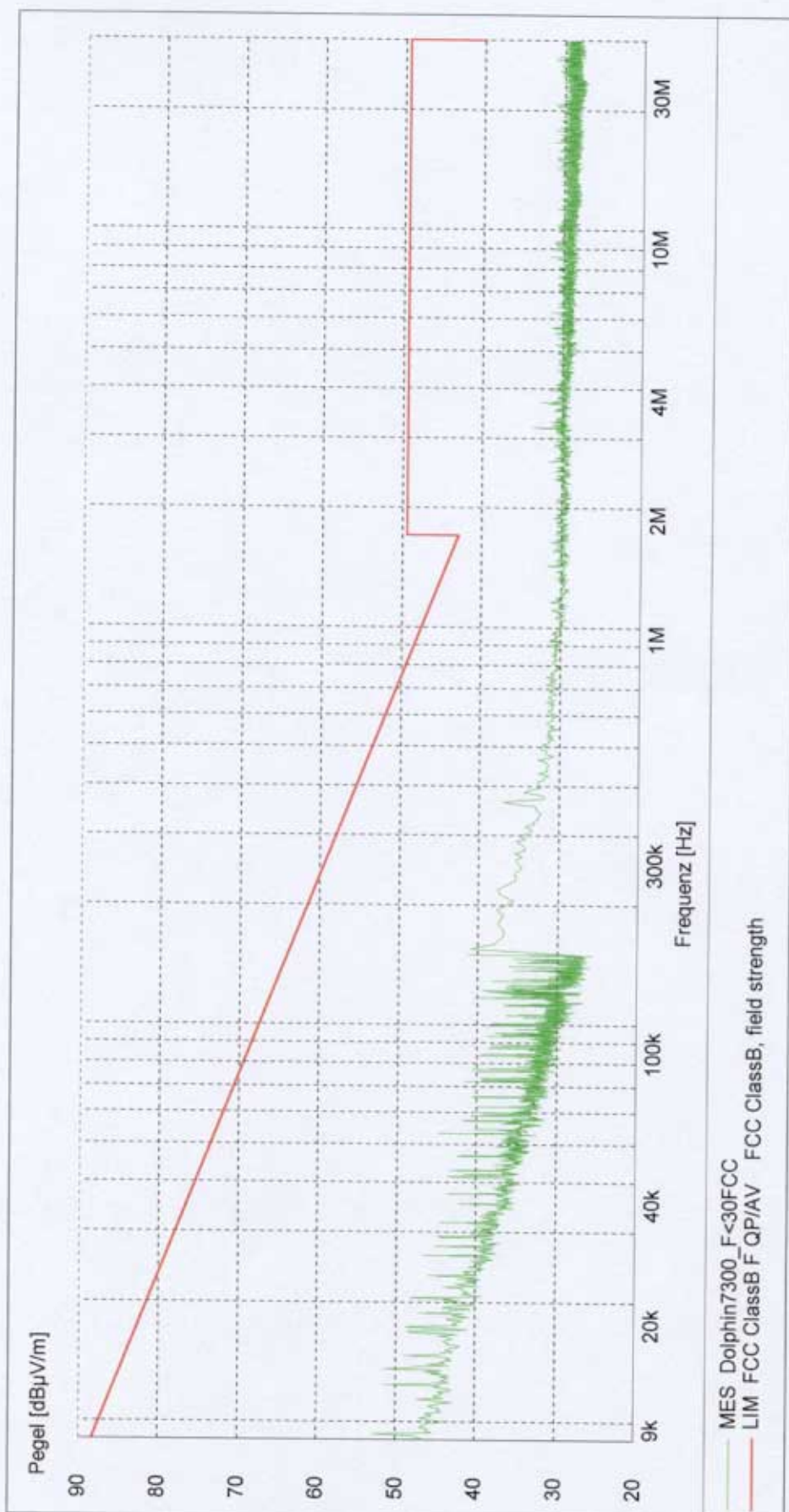
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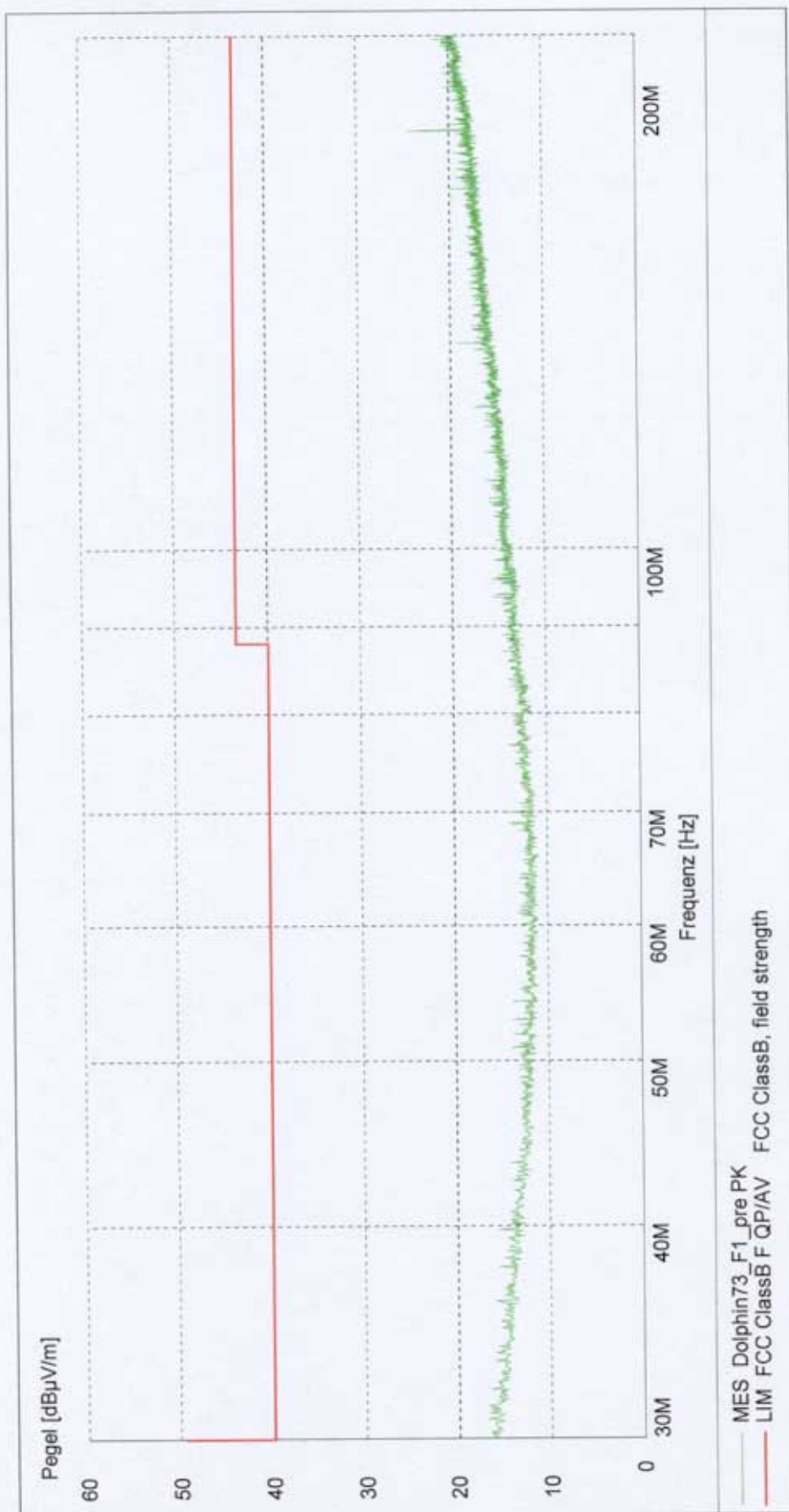
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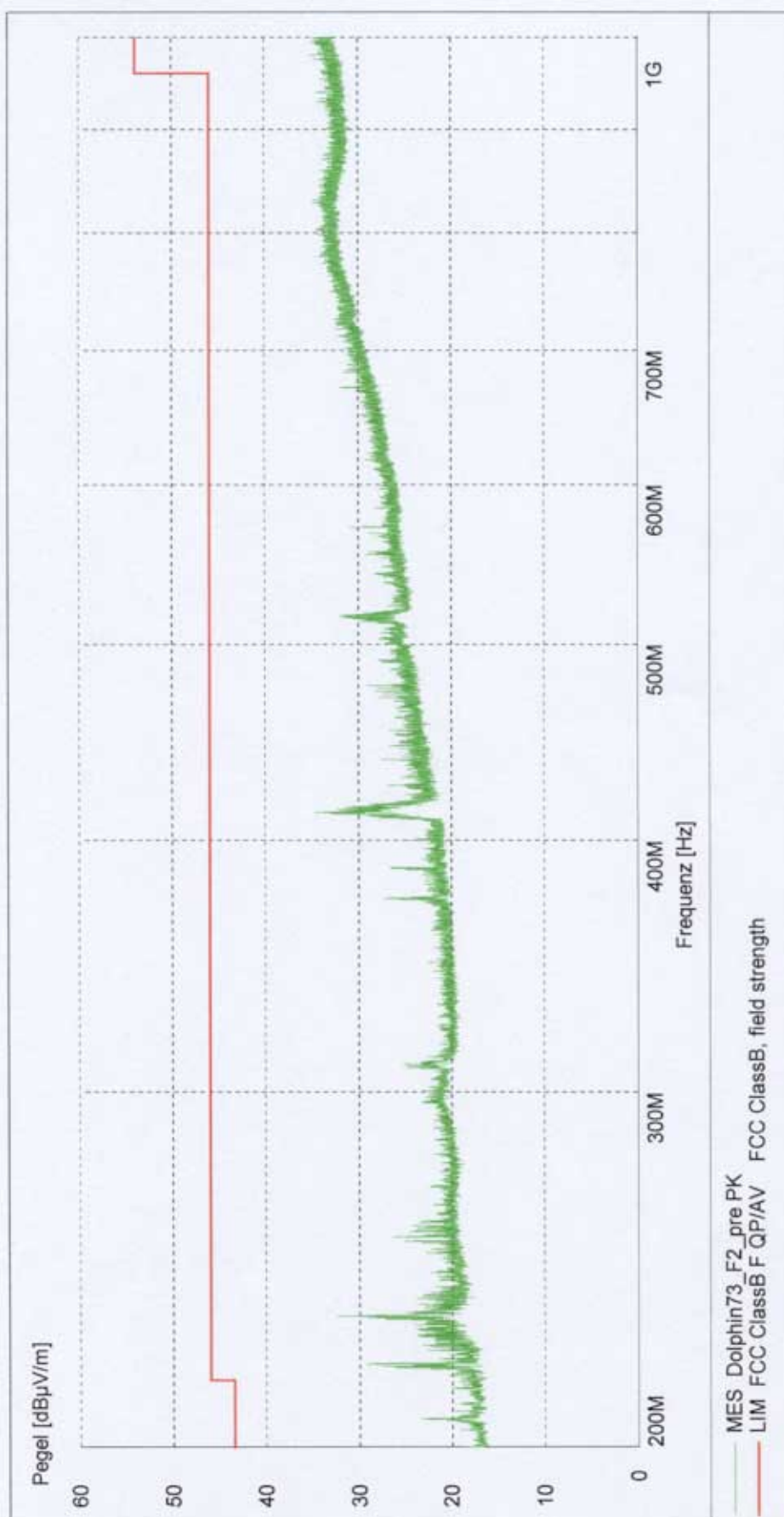
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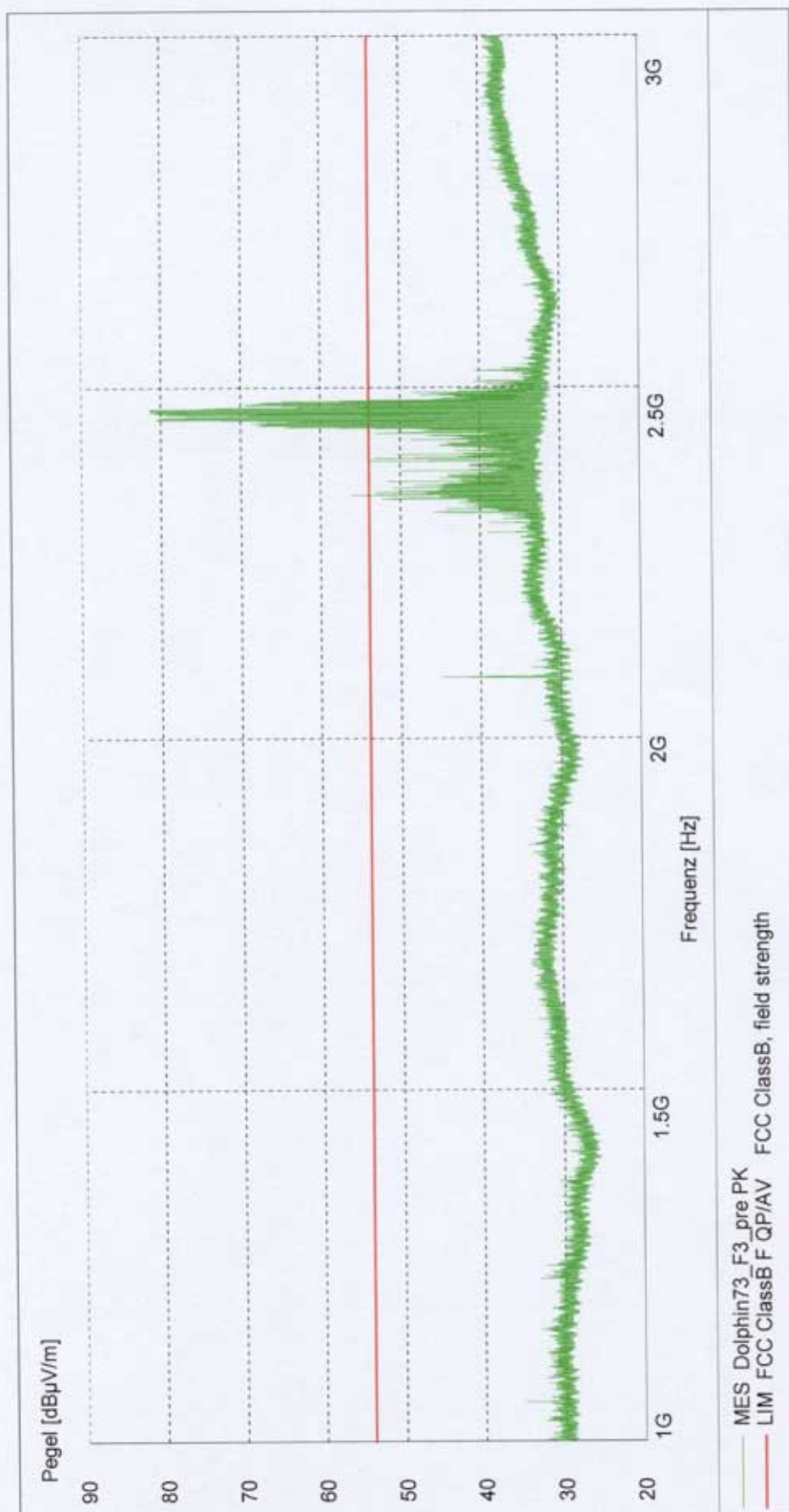
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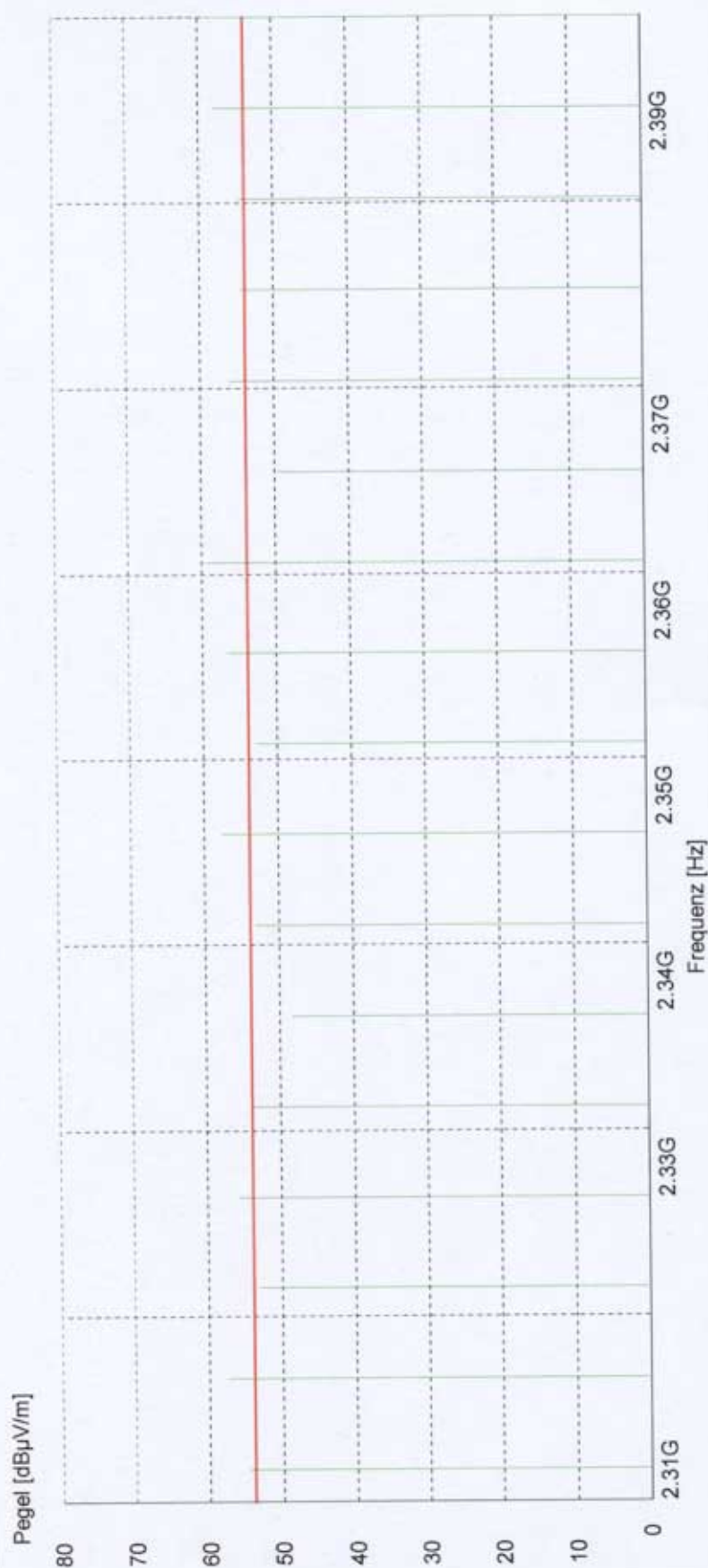
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MES Dolphn73_F3b_pre PK
LIM FCC ClassB F QP/AV FCC ClassB, field strength

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