# TEST REPORT

of the accredited test laboratory

**TÜV Nr.:INE-AT/FG-21/156**

| | |
|---|---|
| **Applicant:** | Liquidtool Systems AG<br>Winterseistrasse 22<br>3415 Hasle-Rüegsau<br>Switzerland |
| **Tested Product:** | LIQUIDTOOL |
| **FCC ID** | --- |
| **Manufacturer:** | See applicant |
| **Output power** | --- **power supply:** --- |
| **Frequency range:** | --- **Channel separation:** --- |
| **Accredited Standards:** | FCC: 47 CFR Part 15 (eCFR 28.06.2021)<br>RSS-247 Issue 2, February 2017<br>905462 D03 - Client Without DFS New Rules v01r02<br>ANSI C63.10-2013 |

**TÜV AUSTRIA SERVICES GMBH**
**Test laboratory for EMC**

Ing. Michael Emminger

**examined by / Testing Laboratory TÜV AUSTRIA SERVICES GMBH**

21.07.2021

Ing. Andreas Malek

**approved by / Testing Laboratory TÜV AUSTRIA SERVICES GMBH**

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


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TÜV ®

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Inspection Body,
Certification Body,
Calibration Laboratory,
Verifizierungsstelle

**Notified Body 0408**

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# 1. Applicant

| | |
|---|---|
| **Company:** | Liquidtool Systems AG |
| **Department:** | --- |
| **Address:** | Winterseistrasse 22<br>3415 Hasle-Rüegsau<br>Switzerland |
| **Contact person:** | --- |
| **EUT received on:** | 15.07.2021 |
| **Tests were performed on:** | 15.07.2021 |

# 2. Description of EUT

| | |
|---|---|
| **EUT:** | LIQUIDTOOL |
| **Serial Number:** | --- |
| **Manufacturer:** | Liquidtool Systems AG<br>Winterseistrasse 22<br>3415 Hasle-Rüegsau<br>Schweiz |
| **Description:** | Liquidtool Systems AG provided the following configuration for the measurements:<br><br>Normal use |
| **Operating mode:** | The measurements were carried out at the following running states:<br><br>test-firmware running, transmitting continuously |
| **Climatic conditions in the emc laboratory:** | Relative humidity: 35 %<br>Temperature: 23 °C |

# 3. Standards / Final result

| Name | Title | Deviation | Result |
|---|---|---|---|
| FCC: 47 CFR Part 15 (eCFR 28.06.2021) | RADIO FREQUENCY DEVICES | Only the documented results were carried out. | OK |
| RSS-247 Issue 2, February 2017 | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices | | OK |
| ANSI C63.10-2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices | | OK |

Result: Opinions and interpretation of testing laboratory
OK: EUT passed
NOK: EUT failed

## 4. TEST RESULTS

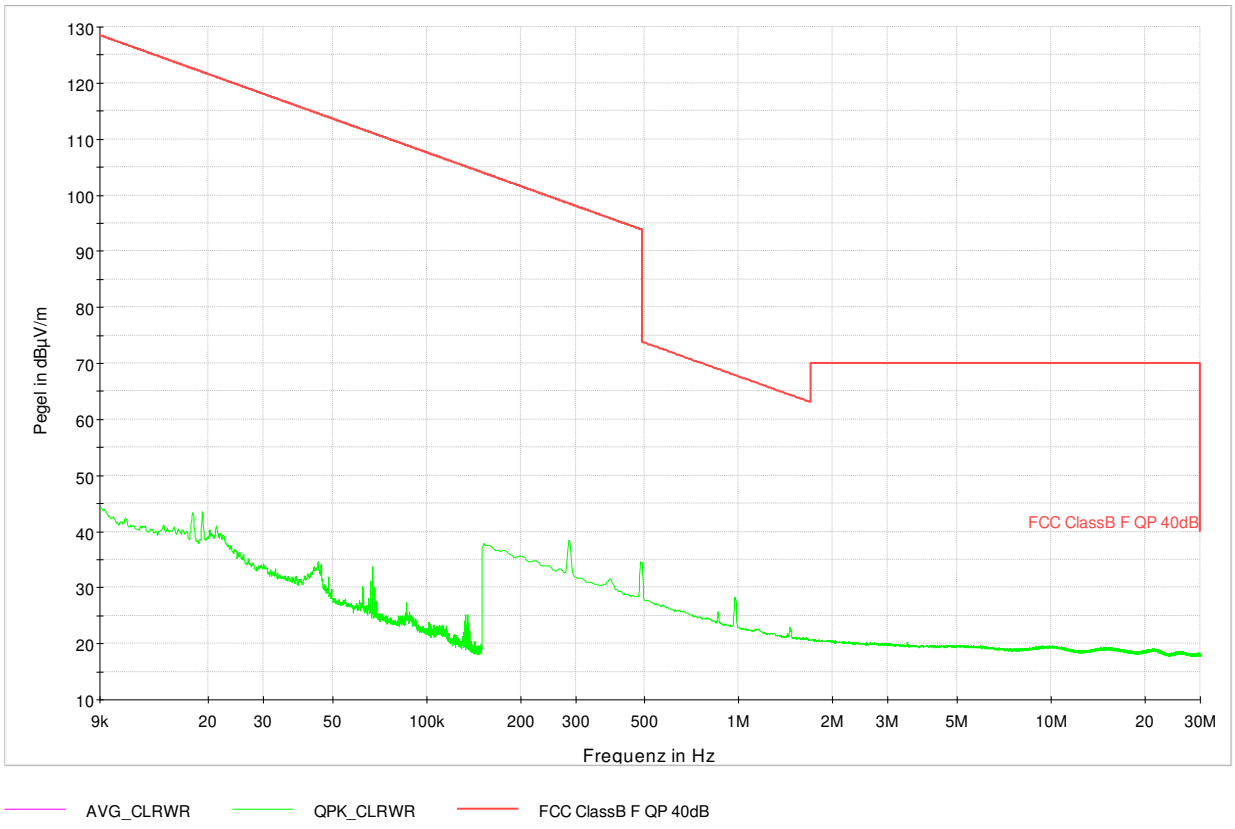
### 4.1. TEST OBJECT DATA

General EUT Description

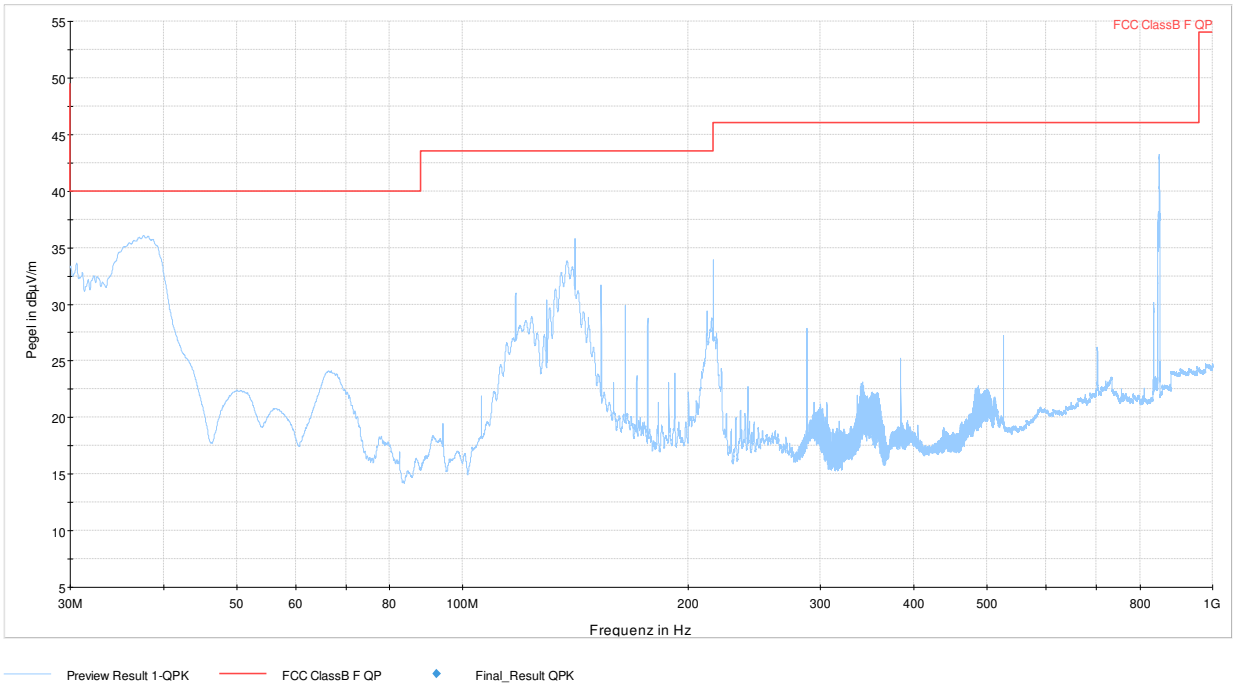
## 4.2. Emissions in restricted bands § 15.209(a)
## Emissions falling within restricted frequency bands RSS-Gen

Measurement with Peak-Detector (green line) and Average detector (magenta line):

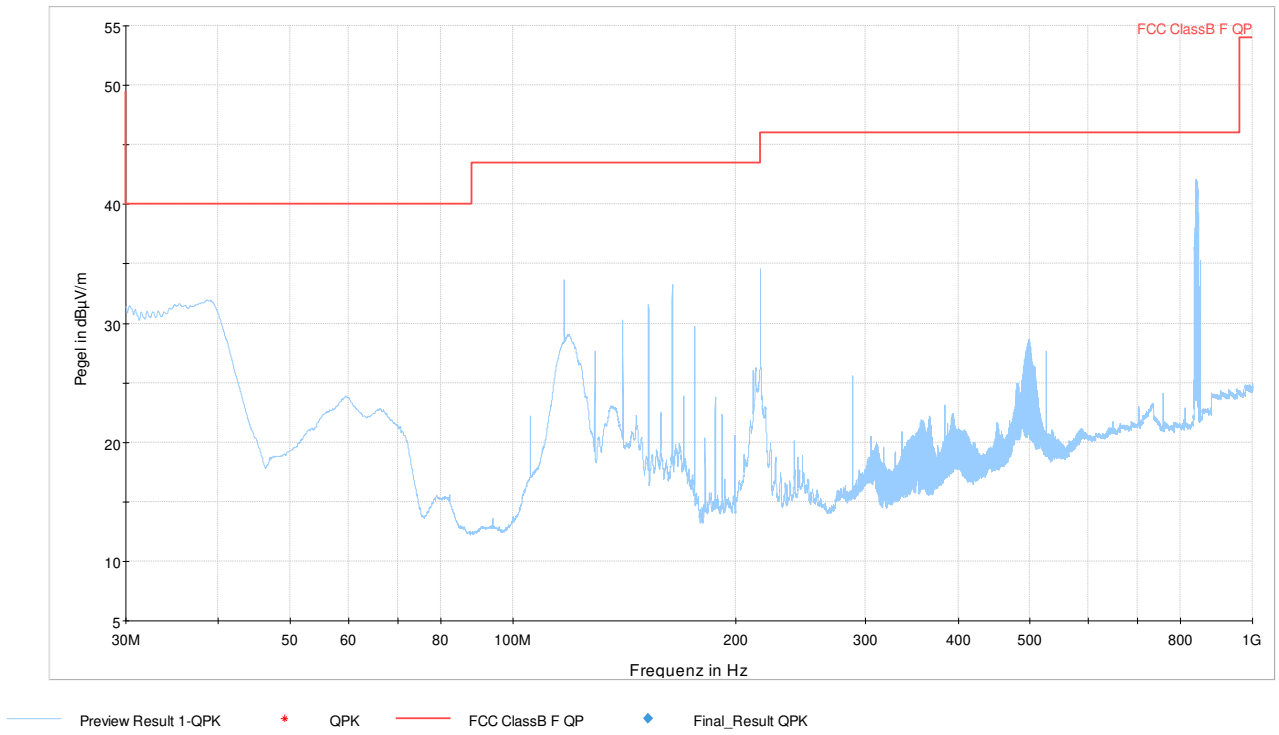
9 kHz – 30 MHz Setup: max. Emission from Bluetooth, 2,4 GHz WLAN (Channel 1, 6, 11) and 5 GHz WLAN (Channel Sweep)



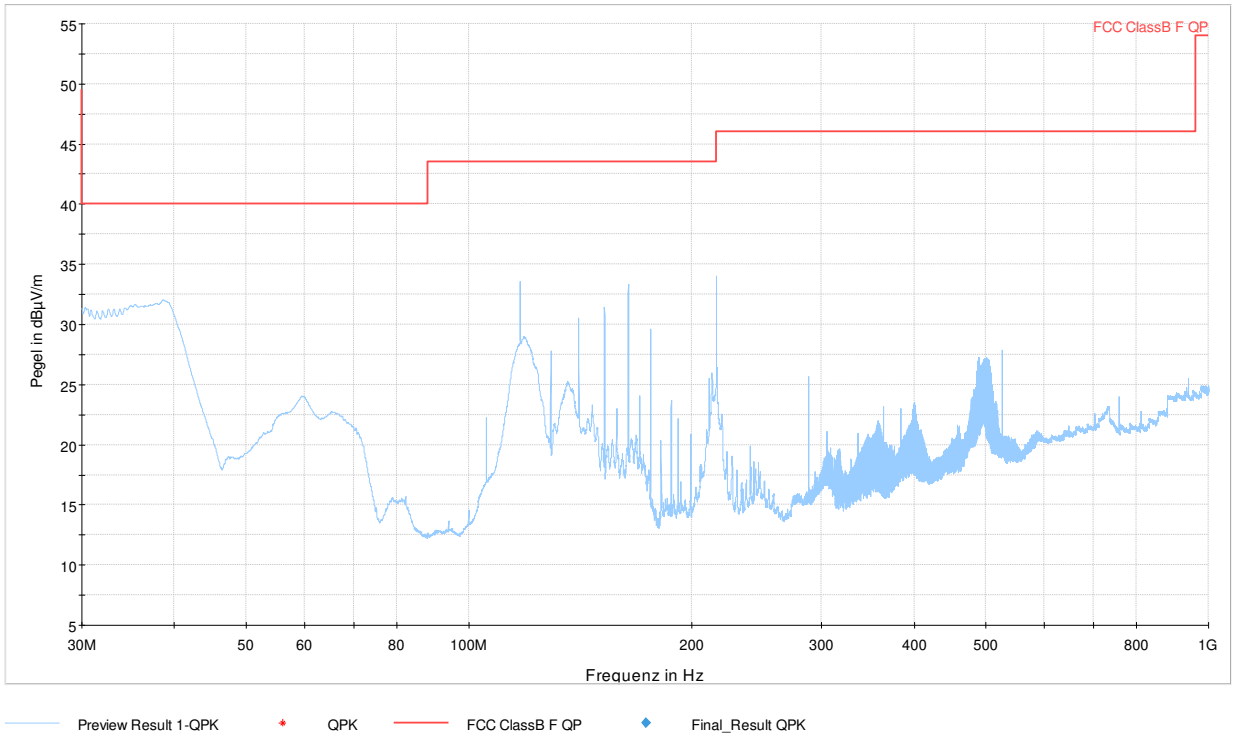
## 30-1000 MHz Setup: Bluetooth



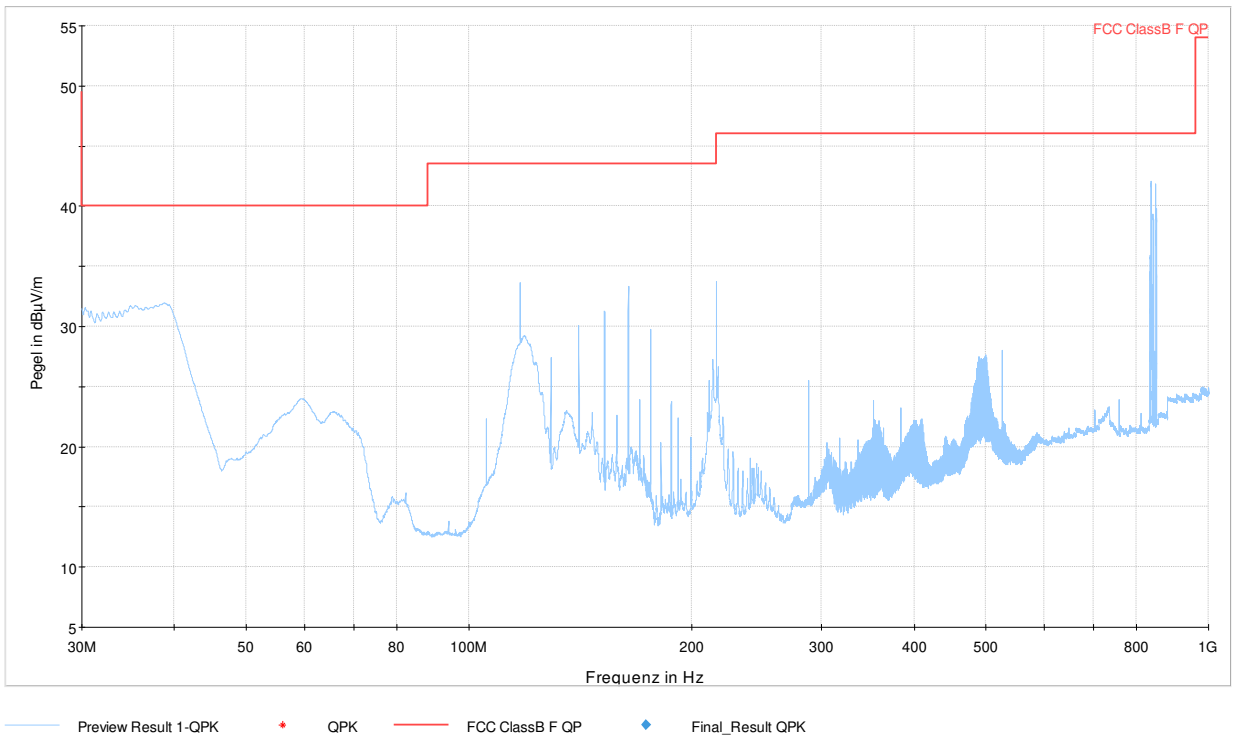
30-1000 MHz Setup: 2,4 GHz WLAN Channel 1



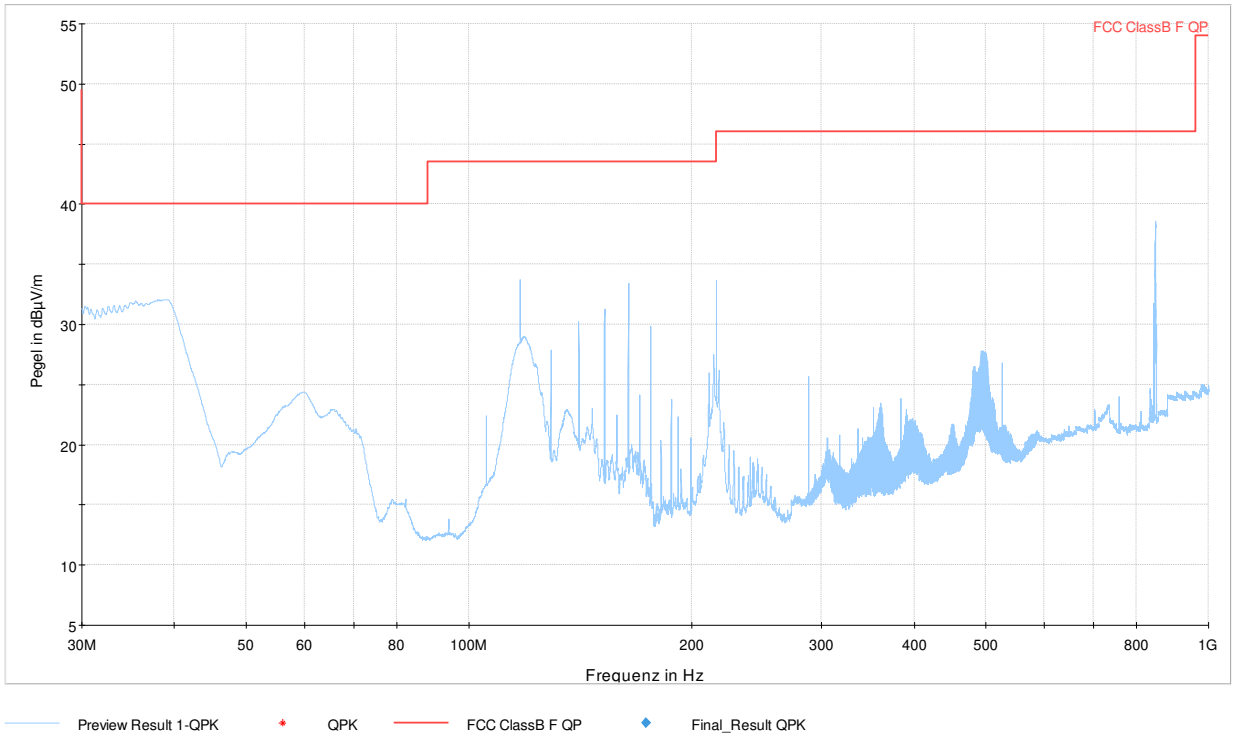
## 30-1000 MHz Setup: 2,4 GHz WLAN Channel 6



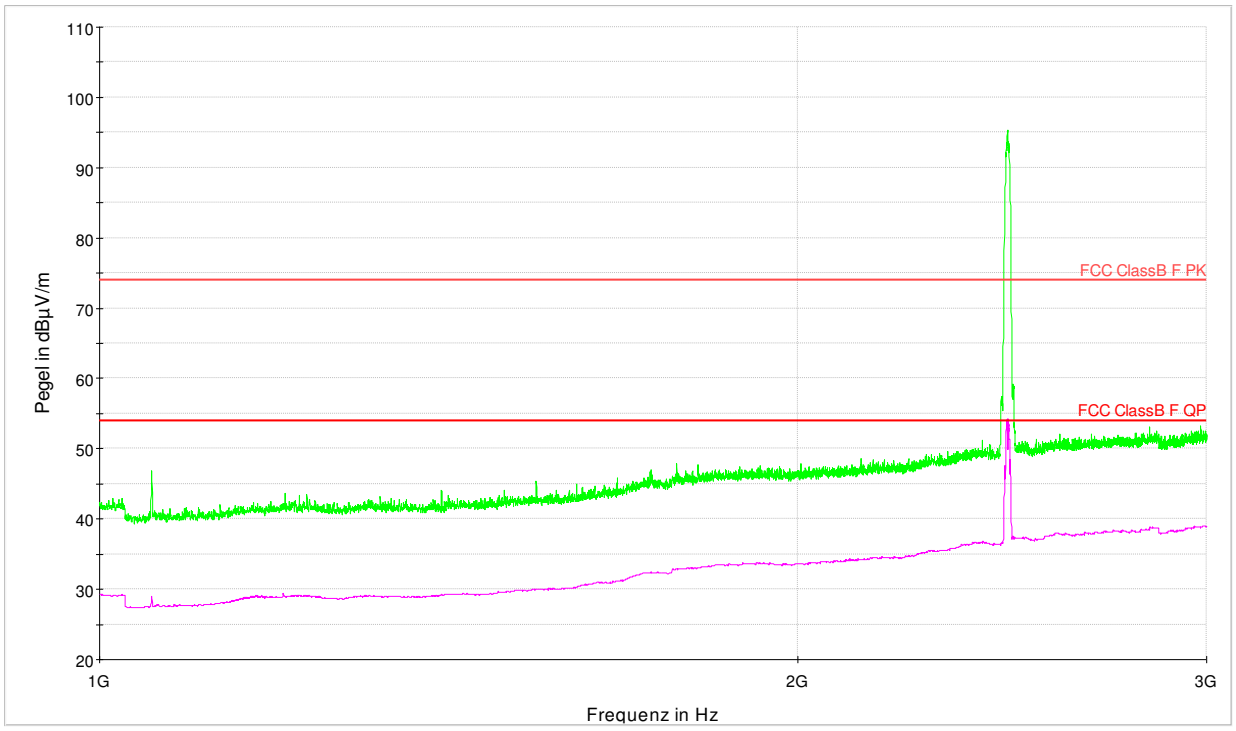
30-1000 MHz Setup: 2,4 GHz WLAN Channel 11

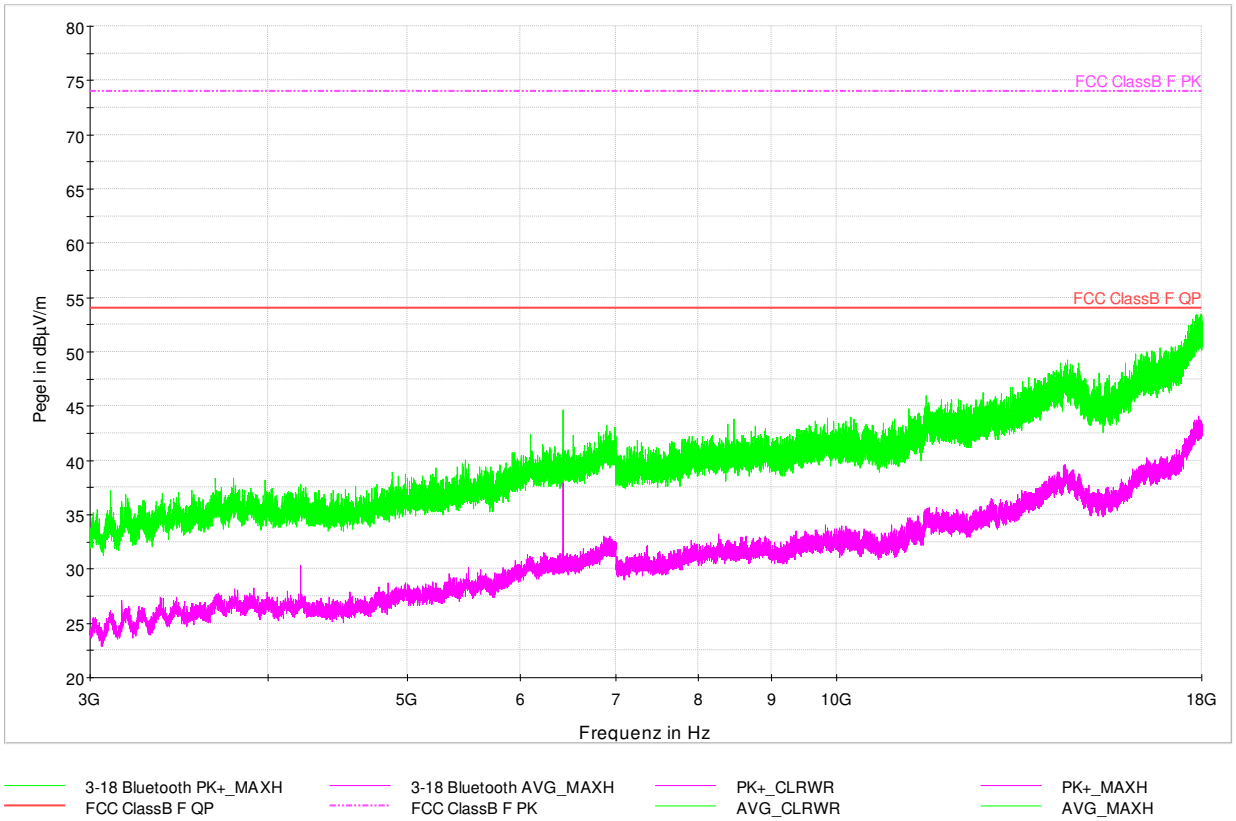


30-1000 MHz Setup: 5 GHz WLAN Channel Sweep max. Hold

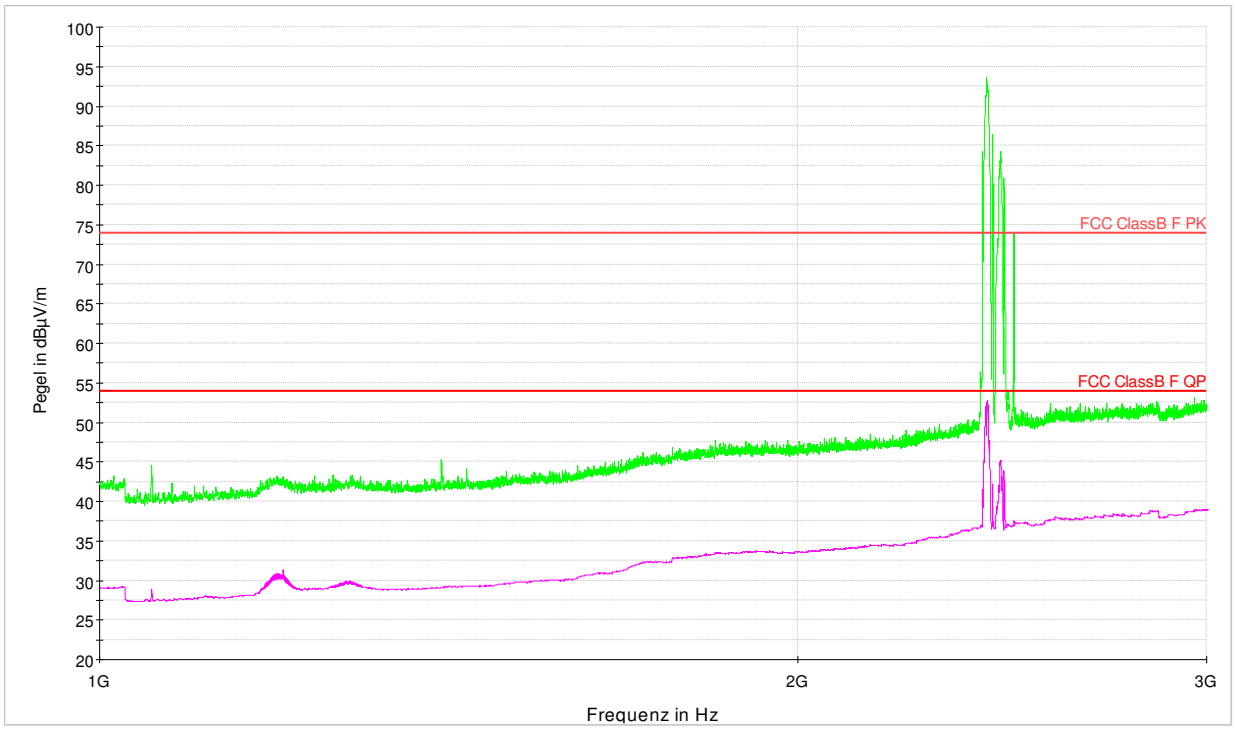


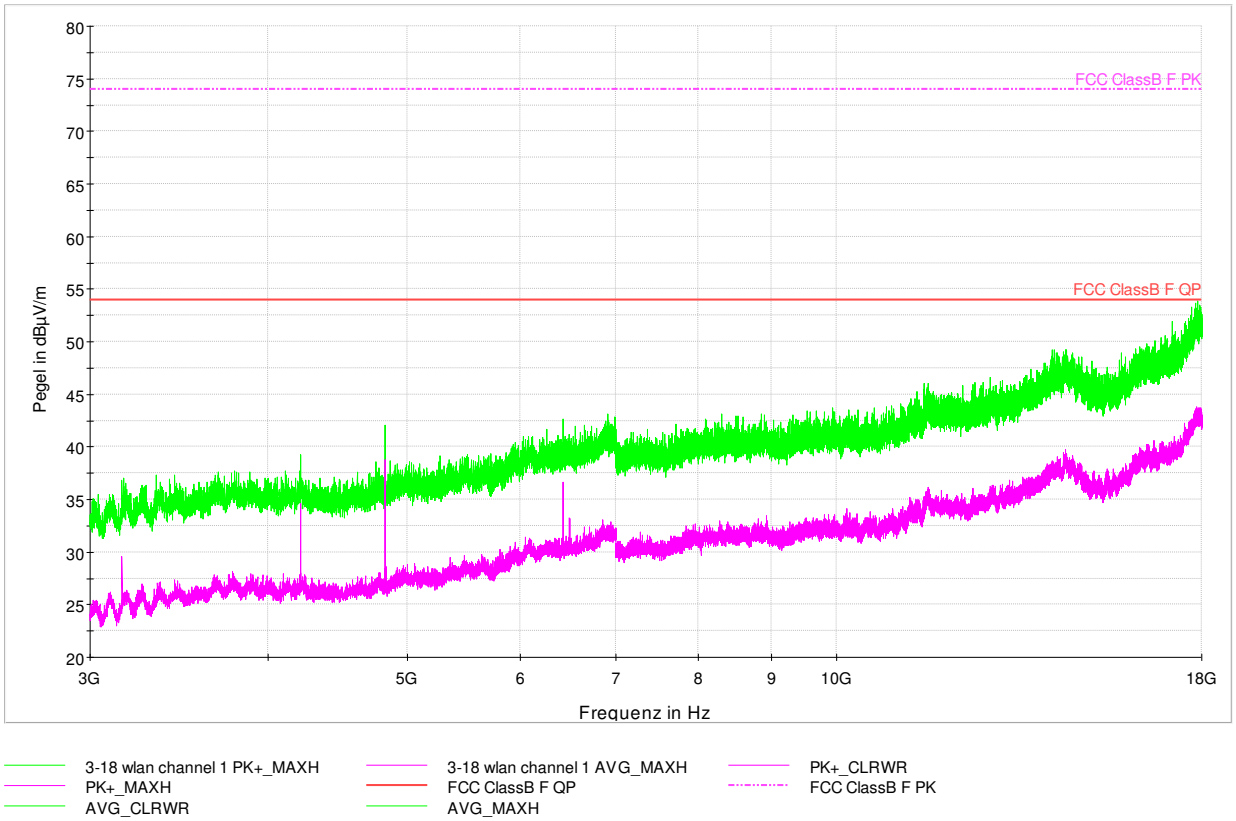
## 1 GHz – 18 GHz Setup: Bluetooth



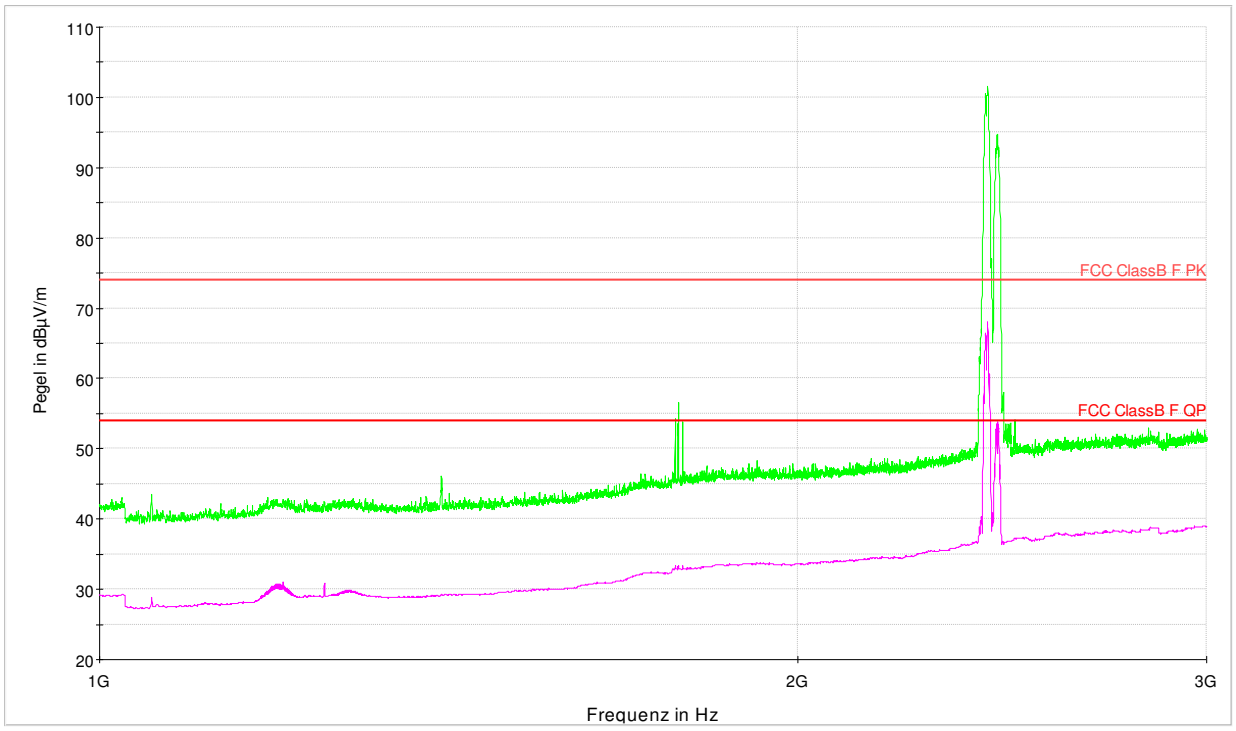



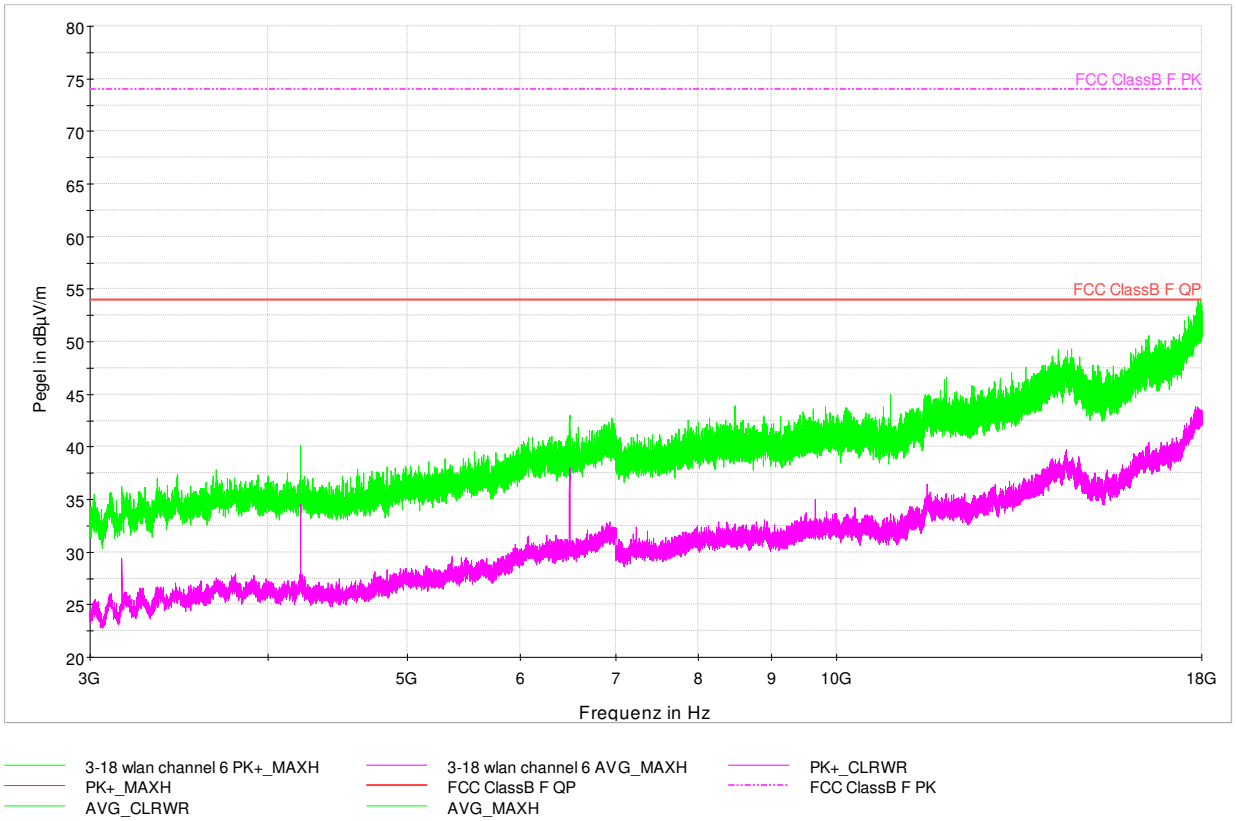
## 1 GHz – 18 GHz Setup: 2,4 GHz WLAN Channel 1



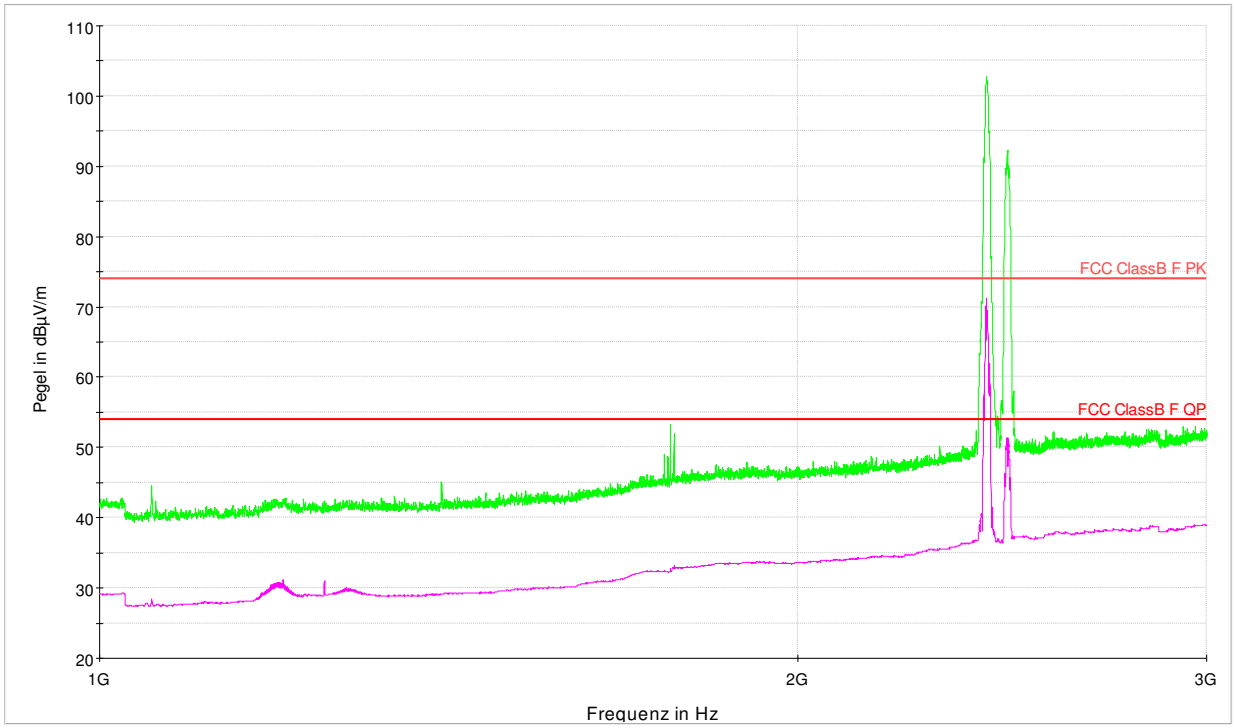



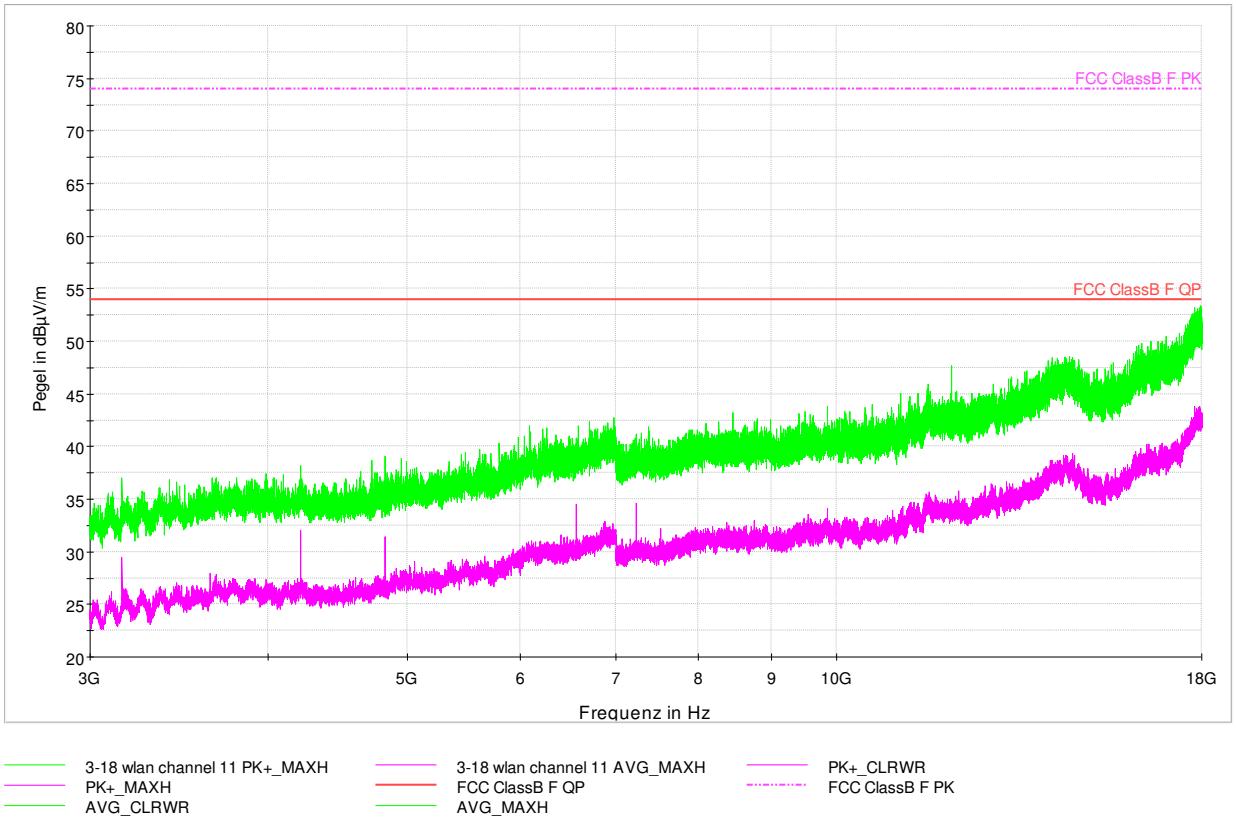
## 1 GHz – 18 GHz Setup: 2,4 GHz WLAN Channel 6



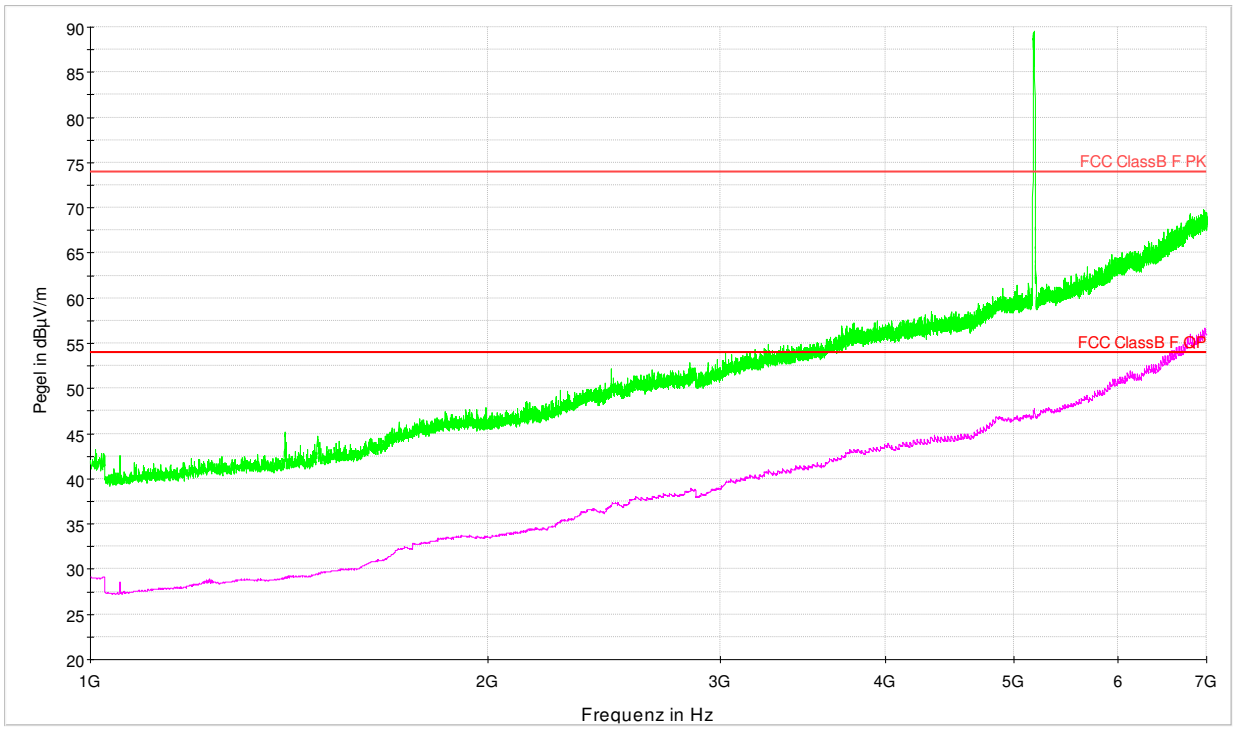



## 1 GHz – 18 GHz Setup: 2,4 GHz WLAN Channel 11

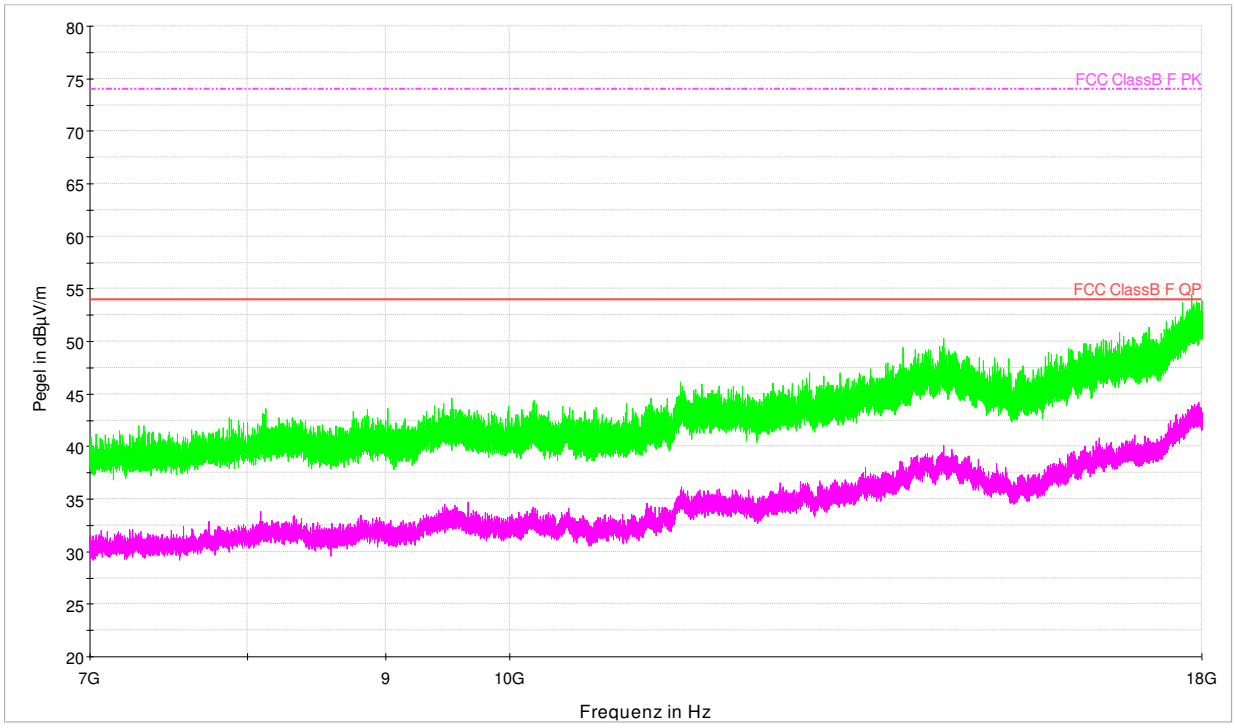


## 1 GHz – 18 GHz Setup: 5 GHz WLAN Channel 36

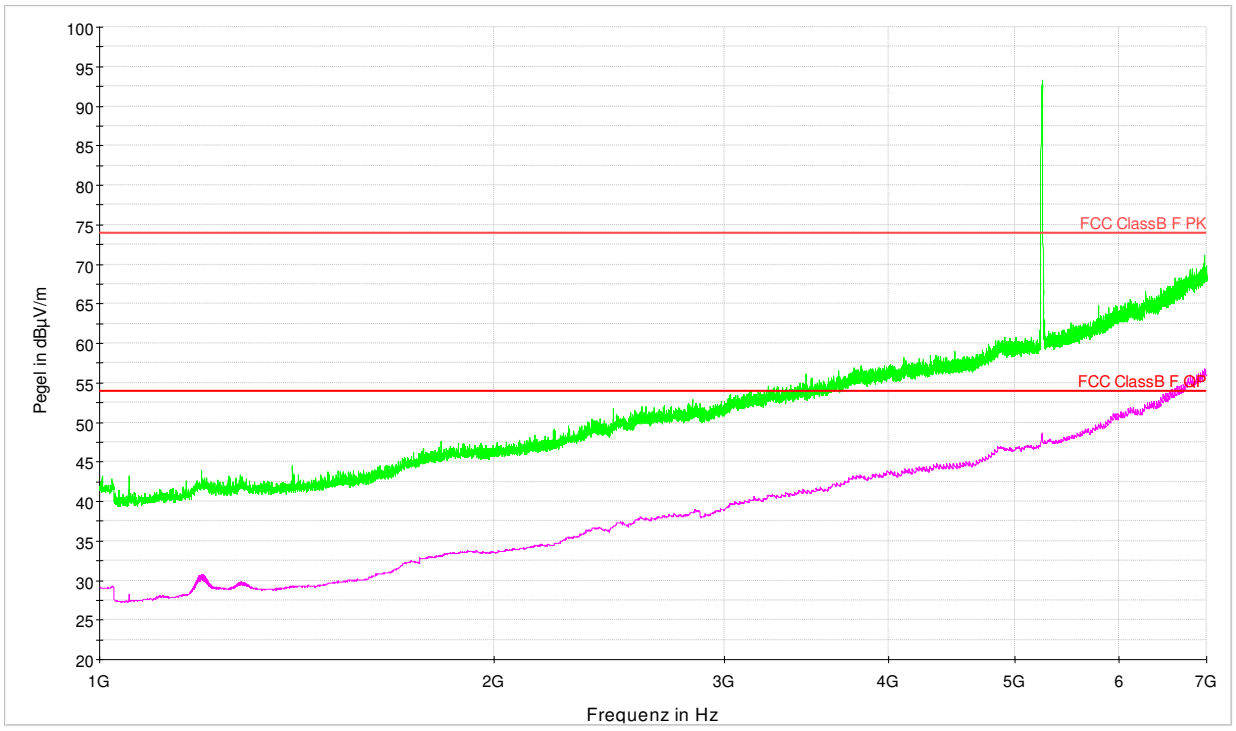



5GHz Channal 36 PK+_MAXH
PK+_MAXH
AVG_CLRWR
5GHz Channal 36 AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

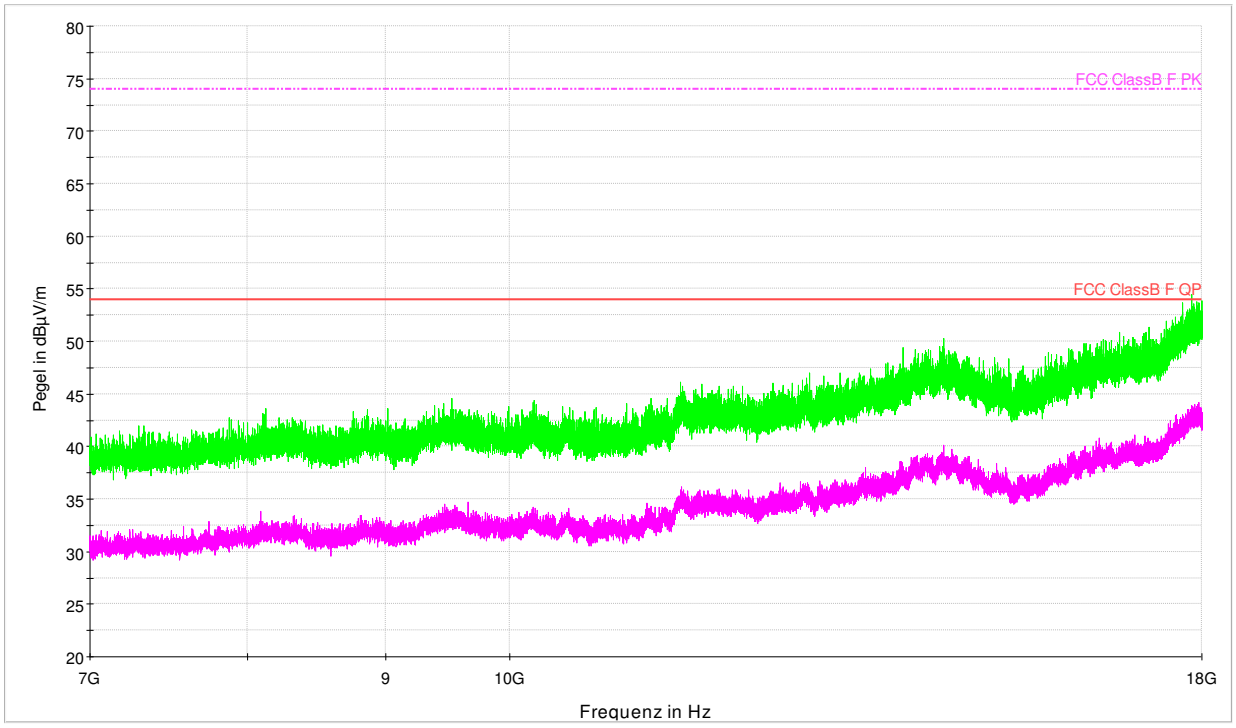



7-18 5GHz sweep PK+_MAXH
PK+_MAXH
AVG_CLRWR
7-18 5GHz sweep AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

## 1 GHz – 18 GHz Setup: 5 GHz WLAN Channel 48

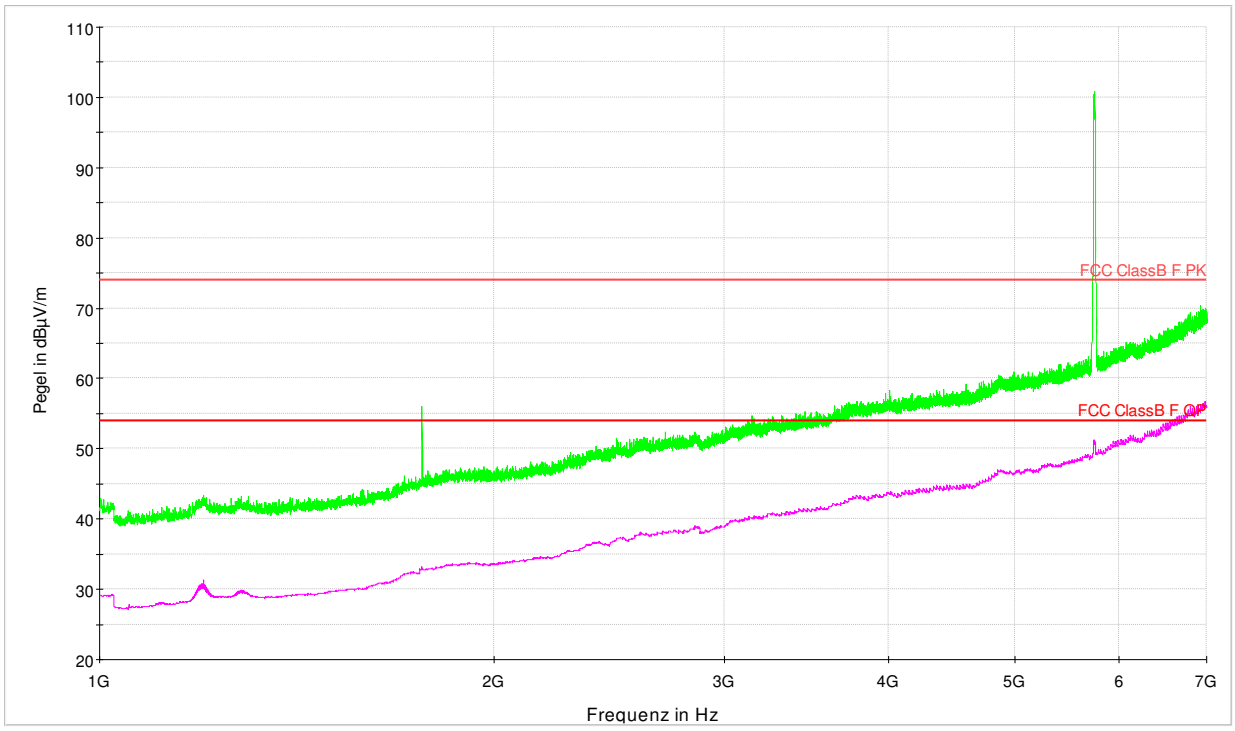



5GHz Channal 48 PK+_MAXH
PK+_MAXH
AVG_CLRWR
5GHz Channal 48 AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

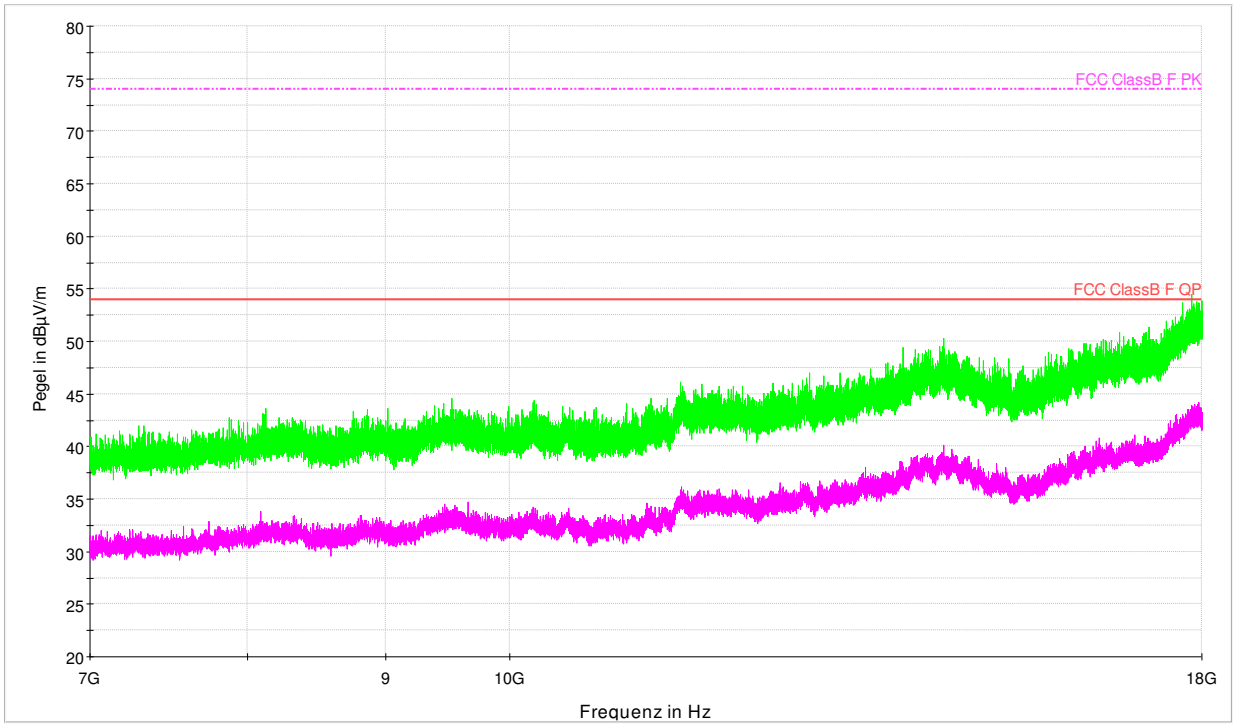



7-18 5GHz sweep PK+_MAXH
PK+_MAXH
AVG_CLRWR
7-18 5GHz sweep AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

## 1 GHz – 18 GHz Setup: 5 GHz WLAN Channel 149

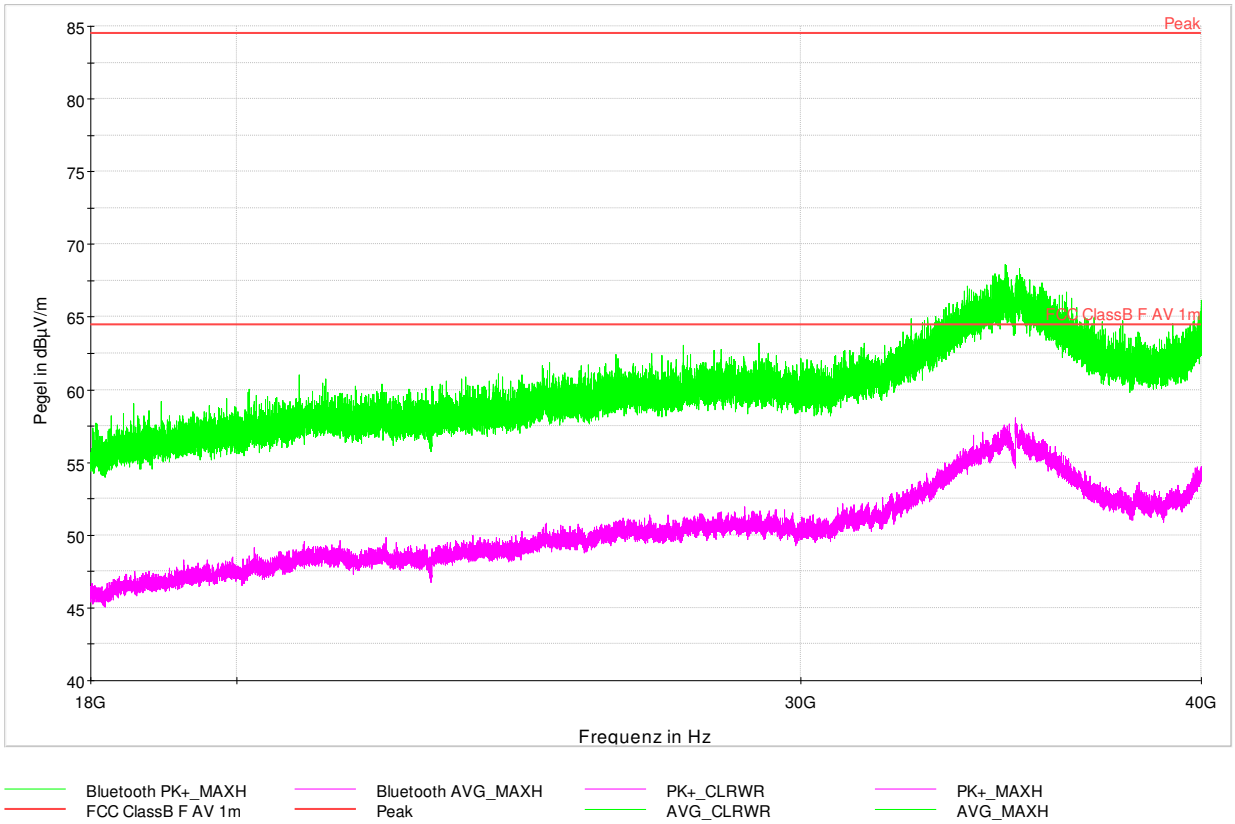



5GHz Channal 149 PK+_MAXH
PK+_MAXH
AVG_CLRWR
5GHz Channal 149 AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

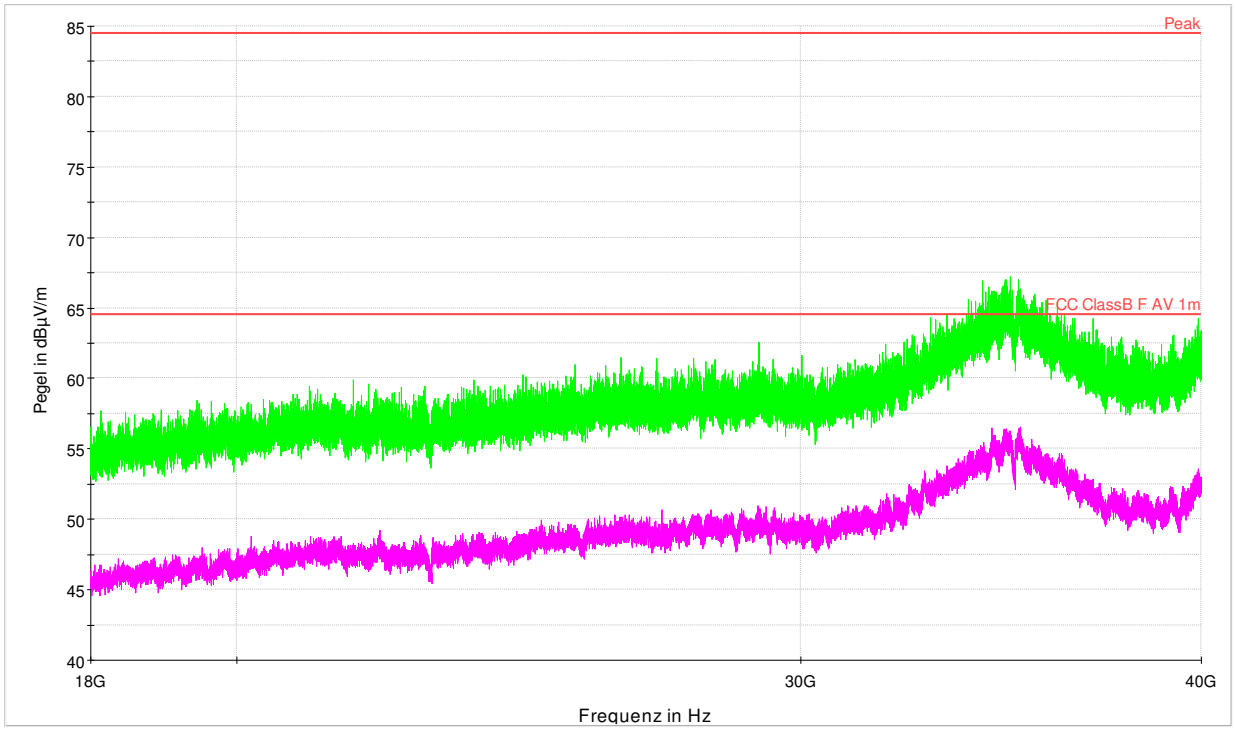



7-18 5GHz sweep PK+_MAXH
PK+_MAXH
AVG_CLRWR
7-18 5GHz sweep AVG_MAXH
FCC ClassB F QP
AVG_MAXH
PK+_CLRWR
FCC ClassB F PK

## 18 GHz – 40 GHz Setup: Bluetooth

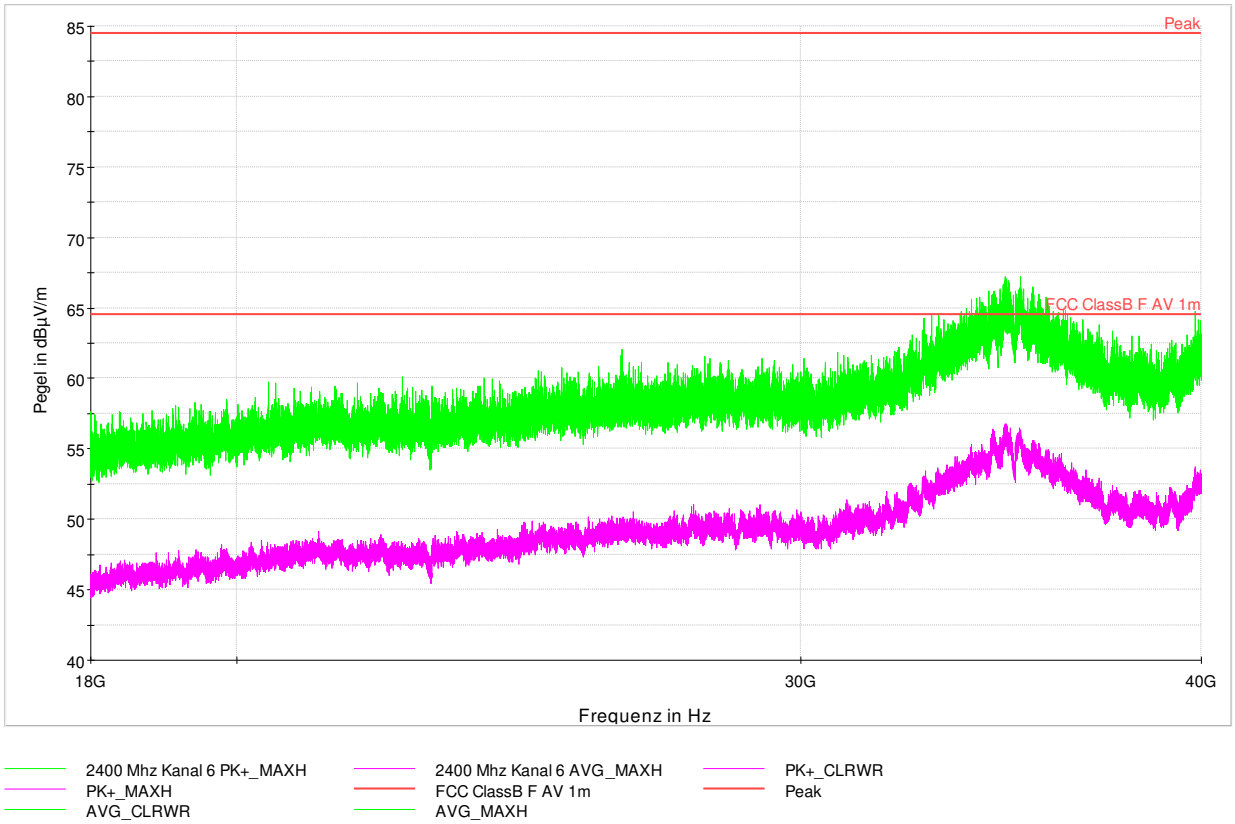


## 18 GHz – 40 GHz Setup: 2,4 GHz WLAN Channel 1

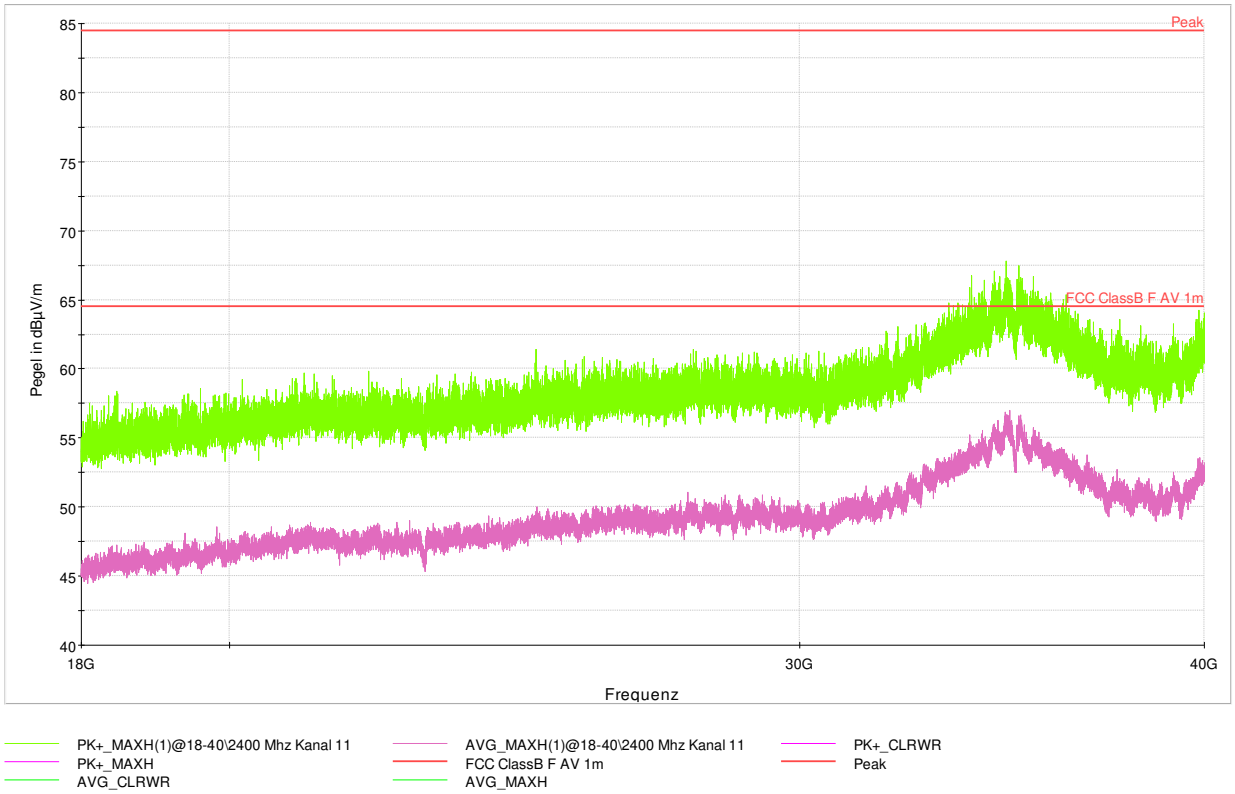



2400 Mhz Kanal 1 PK+_MAXH
PK+_MAXH
AVG_CLRWR
2400 Mhz Kanal 1 AVG_MAXH
FCC ClassB F AV 1m
AVG_MAXH
PK+_CLRWR
Peak

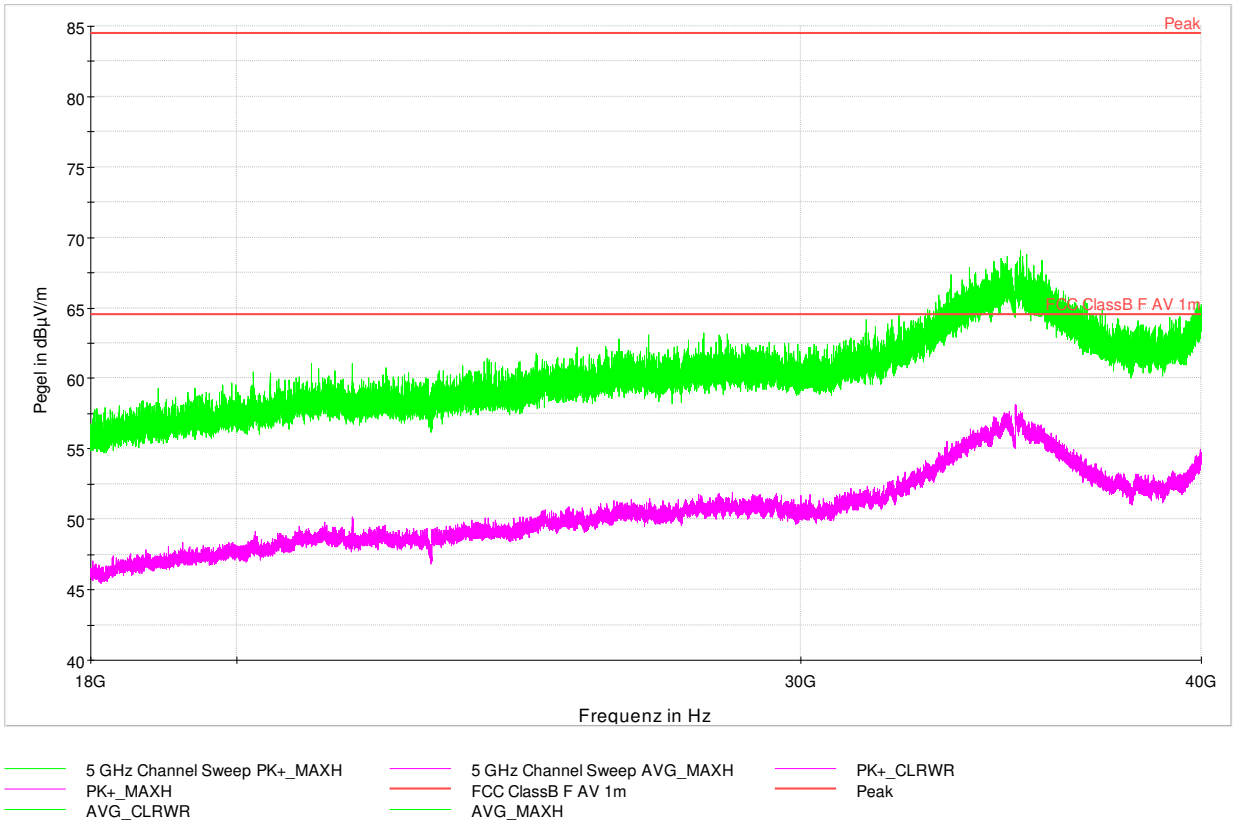
## 18 GHz – 40 GHz Setup: 2,4 GHz WLAN Channel 6



## 18 GHz – 40 GHz Setup: 2,4 GHz WLAN Channel 11



18 GHz – 40 GHz Setup: 5 GHz WLAN Channel sweep




**LIMIT** **SUBCLAUSE 15.209(a) – RSS-Gen**

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |

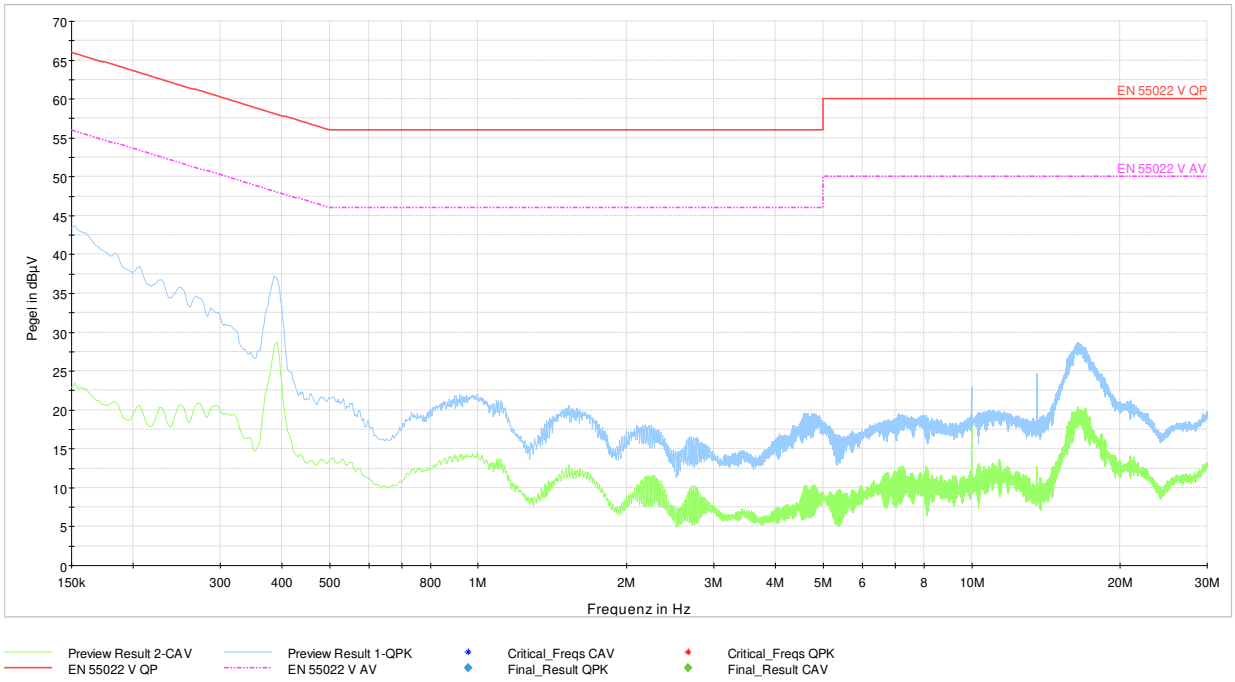
Test Equipment used: EMV-100; EMV-101; EMV-102; EMV-103; EMV-105; EMV-110; EMV-111; EMV-112; EMV-114; EMV-200; EMV-205; NT-122; NT-126; NT-416

## 4.3. Conducted Limits

**§ 15.207**
**RSS-Gen 8.8**

Measurement with Peak-Detector (green line) and Average detector (magenta line):

Setup: max. Emission from Bluetooth, 2,4 GHz WLAN (Channel 1, 6, 11) and 5 GHz WLAN (Channel Sweep)




**LIMIT** **SUBCLAUSE 15.207(a) – RSS-Gen 8.8**

| Frequency of emission (MHz) | Conducted limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

Test Equipment used: NT-300; NT-554; NT-441; EMV-205

# Appendix 1
# Test equipment used

| | | |
|---|---|---|
| ☒ | Anechoic Chamber with 3m measurement distance | NT-100 |
| ☐ | Stripline according to ISO 11452-5 | NT-108 |
| ☒ | MA4000 - Antenna mast 1 - 4 m height | NT-110/1 |
| ☒ | DS - Turntable 0 - 400 ° Azimuth | NT-111/1 |
| ☒ | CO3000 Controller Mast+Turntable | NT-112/1 |
| ☐ | HUF-Z3 - Log. Per. Antenna 200 - 1000 MHz | NT-121 |
| ☐ | FMZB1513 - Loop Antenna 9 kHz - 30 MHz | NT-122/1 |
| ☐ | HFH-Z6 - Rod Antenna 9 kHz - 30 MHz | NT-123 |
| ☐ | 3121C - Dipole Antenna 28 - 1000 MHz | NT-124 |
| ☐ | 3115 - Horn Antenna 1 - 18 GHz (immunity) | NT-125 |
| ☒ | 3116 - Horn Antenna 18 - 40 GHz | NT-126 |
| ☐ | SAS-200/543 - Bicon. Antenna 20 MHz - 300 MHz | NT-127 |
| ☐ | AT-1080 - Log. Per. Antenna 80 - 1000 MHz | NT-128 |
| ☐ | HK-116 - bicon. Antenna 20 MHz - 300 MHz | NT-129 |
| ☐ | HK-116 - bicon. Antenna 20 MHz - 300 MHz | NT-130 |
| ☐ | 3146 - Log. Per. Antenna 200 – 1000 MHz | NT-131 |
| ☒ | VULB 9163 Trilog Antenna 30 – 3000 MHz | NT-131/1 |
| ☒ | Loop Antenna H-Field | NT-132 |
| ☐ | Horn Antenna 500 MHz - 2900 MHz | NT-133 |
| ☐ | Horn Antenna 500 MHz - 6000 MHz | NT-133/1 |
| ☐ | Log. per. Antenna 800 MHz - 2500 MHz | NT-134 |
| ☐ | Log. per. Antenna 800 MHz - 2500 MHz | NT-135 |
| ☐ | BiConiLog Antenna 26 MHz – 2000 MHz | NT-137 |
| ☐ | Conical Dipol Antenna PCD8250 | NT-138 |
| ☒ | HF 906 - Horn Antenna 1 - 18 GHz (emission) | NT-139 |
| ☐ | HZ-1 Antenna tripod | NT-150 |
| ☐ | BN 1500 Antenna tripod | NT-151 |
| ☒ | Ant. tripod for EN61000-4-3 Model TP1000A | NT-156 |
| ☐ | Power quality analyzer Fluke 1760 (complete set) | NT-160 - NT-173 |
| ☐ | Spectrumanalyzer – FSP7 9 kHz – 7 GHz | NT-200 |
| ☐ | ESCI - Test receiver 9 kHz - 7 GHz | NT-203/1 |
| ☒ | ESR – Test receiver 20 Hz – 26,5 GHz | NT-207/1 |
| ☐ | Digital Radio Tester CMW500 | NT-208/1 |
| ☐ | Noise-gen., ITU-R 559-2 20 Hz – 20 kHz | NT-209 |
| ☐ | CMTA - Radiocommunication analyzer ; 0,1 - 1000 MHz | NT-210 |
| ☐ | 3271 - Spectrum analyzer 100 Hz - 26,5 GHz | NT-211 |
| ☐ | Digital Radio Tester Aeroflex 3920 | NT-212/1 |
| ☐ | Mixer M28HW 26,5 GHz - 40 GHz | NT-214 |
| ☐ | RubiSource T&M Timing reference | NT-216 |
| ☐ | Radiocommunicationanalyzer SWR 1180 MD | NT-217 |
| ☐ | Mixer M19HWD 40 GHz – 60 GHz | NT-218 |
| ☐ | Mixer M12HWD 60 GHz – 90 GHz | NT-219 |
| ☐ | DSO9104 Digital scope | NT-220/1 |
| ☐ | TPS 2014 Digital scope | NT-222 |
| ☐ | Artificial Ear according to IEC 60318 | NT-224 |
| ☐ | 1 kHz Sound calibrator | NT-225 |
| ☐ | SRM-3006 Spectrumanalyzer | NT-233/1a |
| ☐ | E-field probe SRM 75 MHz – 3 GHz | NT-234 |
| ☐ | Field Meter NBM-500 incl. E- and H-Field probes | NT-240a-e |
| ☐ | Magnetometer HP-01 | NT-241/1 |
| ☐ | EFA-3 H-field- / E-field probe | NT-243 |
| ☐ | EHP-50F H-field- / E-field probe | NT-243/1 |
| ☐ | Field Meter EMR-200 100 kHz – 3 GHz | NT-244 |
| ☐ | E-field probe 100 kHz – 3 GHz | NT-245 |
| ☐ | H-field probe 300 kHz – 30 MHz | NT-246 |

**Division:**
Industry & Energy

Department: FG

Test report number:
INE-AT/FG-21/156



Date: 21.07.2021

# Appendix 1 (continued)
# Test equipment used

| | | |
|---|---|---|
| ☐ | E-field probe<br>3 MHz – 18 GHz | NT-247 |
| ☐ | H-field probe<br>27 MHz – 1 GHz | NT-248 |
| ☐ | ELT-400<br>1 Hz – 400 kHz | NT-249 |
| ☐ | MDS 21 - Absorbing clamp<br>30 - 1000 MHz | NT-250 |
| ☐ | FCC-203I<br>EM Injection clamp | NT-251 |
| ☐ | FCC-203I-DCN<br>Ferrite decoupling network | NT-252 |
| ☐ | PR50<br>Current Probe | NT-253 |
| ☐ | i310s<br>Current Probe | NT-254/1 |
| ☐ | Fluke 87 V<br>True RMS Multimeter | NT-260 |
| ☐ | Model 2000<br>Digital Multimeter | NT-261 |
| ☐ | Fluke 87 V<br>Digital Multimeter | NT-262/1 |
| ☒ | ESH2-Z5-U1 Artificial mains network 4x25A | NT-300 |
| ☐ | ESH3-Z5-U1 Artificial mains network 2x10A | NT-301 |
| ☐ | ESH3-Z6-U1 Artificial mains network 1x100A | NT-302 |
| ☐ | ESH3-Z6-U1 Artificial mains network 1x100A | NT-302a |
| ☐ | EZ10<br>T-Artificial Network | NT-305 |
| ☐ | SMG - Signal generator<br>0,1 - 1000 MHz | NT-310 |
| ☐ | SMA100A - Signal generator<br>9 kHz - 6 GHz | NT-310/1 |
| ☐ | RefRad<br>Reference generator | NT-312 |
| ☐ | SMP 02 Signal generator<br>10 MHz - 20 GHz | NT-313 |
| ☐ | 40 MHz Arbitrary Generator<br>TGA1241 | NT-315 |
| ☐ | Artificial mains network<br>NSLK 8127-PLC | NT-316 |
| ☐ | PSURGE 4.1<br>Surge generator | NT-324 |
| ☐ | IMU4000<br>Immunity test system | NT-325/1 |
| ☐ | VCS 500-M6<br>Surge-Generator | NT-326 |
| ☐ | Oscillatory Wave Simulator incl. Coupling networks | NT-328a+b+c |
| ☐ | BTA-250 - RF-Amplifier<br>9 kHz - 220 MHz / 250 W | NT-330 |
| ☐ | T82-50 RF-Amplifier<br>2 GHz – 8 GHz | NT-331 |
| ☐ | Prana N-MT 500 - RF-Amplifier<br>80 - 1000 MHz / 500 W | NT-332/1 |
| ☐ | AS0102-65R - RF-Amplifier<br>1 GHz - 2 GHz | NT-333 |
| ☐ | APA01 – RF-Amplifier<br>0,5 GHz – 2,5 GHz | NT-334 |
| ☐ | Preamplifier<br>1 GHz - 4 GHz | NT-335 |
| ☐ | Preamplifier for GPS<br>MKU 152 A | NT-336 |
| ☒ | Preamplifier<br>1 GHz – 18 GHz | NT-337/1 |
| ☐ | DC Block 10 MHz – 18 GHz<br>Model 8048 | NT-338 |
| ☐ | 2-97201<br>Electronic load | NT-341 |
| ☐ | TSX3510P - Power supply<br>0-30 V / 0 - 10 A | NT-344 |
| ☐ | TSX3510P - Power supply<br>0-30 V / 0 - 10 A | NT-345 |
| ☐ | VDS 200<br>Mobil-impuls-generator | NT-350 |
| ☐ | LD 200<br>Mobil-impuls-generator | NT-351 |
| ☐ | MPG 200<br>Mobil-Impuls-Generators | NT-352 |
| ☐ | EFT 200<br>Mobil-impuls-generator | NT-353 |
| ☐ | AN 200 S1<br>Artificial Network | NT-354 |
| ☐ | FP-EFT 32M<br>3 ph. Coupling filter (Burst) | NT-400/1 |
| ☐ | PHE 4500 - Mains impedance network | NT-401 |
| ☐ | IP 6.2 Coupling filter for data lines (Surge) | NT-403 |
| ☐ | TK 9421 High Power Volt. Probe<br>150 kHz - 30 MHz | NT-409 |
| ☐ | ESH2-Z3 - Probe<br>9 kHz - 30 MHz | NT-410 |
| ☐ | IP 4 - Capacitive clamp (Burst) | NT-411 |
| ☐ | Highpass-Filter<br>100 MHz – 3 GHz | NT-412 |
| ☐ | Highpass-Filter<br>600 MHz – 4 GHz | NT-413 |
| ☐ | Highpass-Filter<br>1250 MHz – 4 GHz | NT-414 |
| ☐ | Highpass-Filter<br>1800 MHz – 16 GHz | NT-415 |

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# Appendix 1 (continued)
# Test equipment used

| | | |
|---|---|---|
| ☐ | RF-Attenuator 10 dB<br>DC – 18 GHz / 50 W | NT-417/1 |
| ☐ | RF-Attenuator 6 dB<br>DC – 18 GHz / 50 W | NT-418 |
| ☐ | RF-Attenuator 3 dB<br>DC – 18 GHz / 50 W | NT-419 |
| ☐ | RF-Attenuator 20 dB<br>DC - 1000 MHz / 25 W | NT-421 |
| ☐ | RF-Attenuator 30 dB<br>DC - 1000 MHz / 1 W | NT-423 |
| ☐ | RF-Attenuator<br>30 dB | NT-424 |
| ☐ | RF-Attenuator 6 dB<br>DC - 1000 MHz / 1 W | NT-425 |
| ☐ | RF-Attenuator 6 dB<br>DC - 1000 MHz / 1 W | NT-426 |
| ☐ | RF-Attenuator<br>6 dB | NT-428 |
| ☐ | RF-Attenuator<br>0 dB - 81 dB | NT-429 |
| ☐ | WRU 27 - Band blocking<br>27 MHz | NT-430 |
| ☐ | WHJ450C9 AA - High pass<br>450 MHz | NT-431 |
| ☐ | WHJ250C9 AA - High pass<br>250 MHz | NT-432 |
| ☐ | RF-Load<br>150 W | NT-433 |
| ☐ | Impedance transducer<br>1:4 ; 1:9 ; 1:16 | NT-435 |
| ☐ | RF-Attenuator DC – 18 GHz<br>6 dB | NT-436 |
| ☐ | RF-Attenuator DC – 18 GHz<br>6 dB | NT-437 |
| ☐ | RF-Attenuator DC – 18 GHz<br>10 dB | NT-438 |
| ☐ | RF-Attenuator DC – 18 GHz<br>20 dB | NT-439 |
| ☐ | I+P 7780 Directional coupler<br>100 - 2000 MHz | NT-440 |
| ☐ | ESH3-Z2 - Pulse limiter<br>9 kHz - 30 MHz | NT-441 |
| ☐ | Power Divider<br>6 dB/1 W/50 Ohm | NT-443 |
| ☐ | Directional coupler<br>0,1 MHz – 70 MHz | NT-444 |
| ☐ | Directional coupler<br>0,1 MHz – 70 MHz | NT-445 |
| ☐ | Tube imitations<br>according to EN 55015 | NT-450 |
| ☐ | FCC-801-M3-16A<br>Coupling decoupling network | NT-458 |
| ☐ | FCC-801-M2-50A<br>Coupling decoupling network | NT-459 |
| ☐ | FCC-801-M5-25<br>Coupling decoupling network | NT-460 |
| ☐ | FCC-801-AF10<br>Coupling decoupling network | NT-461 |
| ☐ | FCC-801-S25<br>Coupling decoupling network | NT-462 |
| ☐ | FCC-801-T4<br>Coupling decoupling network | NT-463 |
| ☐ | FCC-801-C1<br>Coupling decoupling network | NT-464 |
| ☐ | SW 9605 - Current probe<br>150 kHz – 30 MHz | NT-465/1 |
| ☐ | 95242-1 – Current probe<br>1 MHz – 400 MHz | NT-468 |
| ☐ | 94106-1L-1 – Current probe<br>100 kHz – 450 MHz | NT-471 |
| ☐ | WHKX12-2700-3000-18000<br>3 GHz Highpass filter | NT-472 |
| ☐ | WHKX10-3870-4500-18000<br>4,5 GHz Highpass filter | NT-473 |
| ☐ | GA 1240 Power amplifier<br>according to EN 61000-4-16 | NT-480 |
| ☐ | Coupling networks<br>according to EN 61000-4-16 | NT-481 -<br>NT-483 |
| ☐ | Van der Hoofden Test Head | NT-484 |
| ☐ | WRCJV12-5820-5850-5950-5980<br>5,9 GHz Band Reject Filter | NT-490 |
| ☐ | WHKX10-5670-6300-18000<br>6 GHz Highpass filter | NT-491 |
| ☐ | WHK12-935-1000-7000<br>1 GHz Highpass filter | NT-492 |
| ☐ | EMC Video/Audiosystem | NT-511/1 |
| ☐ | ES-K1 Version 1.71 SP2<br>Test software | NT-520 |
| ☐ | EMC32 Version 10.60.20<br>Test software | NT-520/1 |
| ☐ | SRM-TS Version 1.3<br>software for SRM-3000 | NT-522 |
| ☐ | SRM-TS Version 1.3.1<br>software for SRM-3006 | NT-522/1 |
| ☐ | Spitzenberger und Spies<br>Test software V4.1 | NT-525 |
| ☐ | Vertical coupling plane<br>(ESD) | NT-531 |
| ☐ | Test cable #4<br>for EN 61000-4-6 | NT-553 |
| ☐ | Test cable #3<br>for conducted emission | NT-554 |
| ☐ | Test cable #5+#6<br>ESD-cable (2x470k) | NT-555 +<br>NT-556 |
| ☐ | Test cable #8<br>Sucoflex 104EA | NT-559 |
| ☐ | Test cable #9<br>(for outdoor measurements) | NT-580 |
| ☐ | Test cable #10<br>(for outdoor measurements) | NT-581 |
| ☐ | Test cable #13<br>Sucoflex 104PE | NT-584 |
| ☐ | Test cable #21<br>for SRM-3000 | NT-592 |
| ☐ | Shield chamber | NT-600 |
| ☐ | Climatic chamber | M-1200 |

# Appendix 1 (continued)
# Test equipment used

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|---|---|---|
| ☐ | Anechoic Chamber<br>3 m / 5 m measuring distance | EMV-100 |
| ☐ | Turntabel<br>6 m diameter | EMV-101 |
| ☐ | Antenna mast + controller | EMV-102+<br>EMV-103 |
| ☐ | EMC Video/Audiosystem | EMV-104 |
| ☐ | EMC Software<br>EMC32 Version 10.60.20 | EMV-105 |
| ☐ | Hornantenna 1 – 18 GHz<br>HF 907 | EMV-110 |
| ☐ | Antennapre.amp. 1 – 18 GHz<br>ERZ-LNA0200-1800-30-2 | EMV-111 |
| ☐ | Trilog Antenna 30-3000 MHz<br>VULB9163 | EMV-112 |
| ☐ | Monopol 9 kHz – 30 MHz<br>VAMP 9243 | EMV-113 |
| ☒ | Antennapre.amp 18 – 40 GHz<br>BBV 9721 | EMV-114 |
| ☐ | Hornantenna 200 – 2000 MHz<br>AH-220 | EMV-115 |
| ☐ | DC Artificial Network<br>PVDC 8300 | EMV-150 |
| ☐ | AC Artificial Network<br>NNLK 8121 RC | EMV-151 |
| ☐ | EMI Receiver<br>ESW44 | EMV-200/1 |
| ☐ | Signalgenerator 9 kHz – 40 GHz<br>N5173B | EMV-201 |
| ☐ | GPS Frequency normal<br>B-88 | EMV-202 |
| ☐ | DC Power supply<br>N5745A | EMV-203 |
| ☒ | Spektrum Analyzator<br>FSV40 | EMV-205 |
| ☐ | Thd Multimeter<br>Model 2015 | EMV-206 |
| ☐ | Poweramplifier<br>PAS15000 | EMV-<br>207/abc |
| ☐ | Inrush Current Source | EMV-<br>208/abc |
| ☐ | Arb.-generator<br>Sycore | EMV-209 |
| ☐ | Harmonics/Flicker analyzer<br>ARS 16/3 | EMV-210 |
| ☐ | Power Supply<br>Regatron AC | EMV-214 |
| ☐ | Power Supply<br>Regatron DC | EMV-215 |
| ☐ | Harmonics/Flicker analyser<br>Zimmer | EMV-216 |
| ☐ | Flicker Impedanz<br>Newtons4th 753 | EMV-218 |
| ☐ | Comemso | EMV-219 |
| ☐ | HF- Ampflifier 9 kHz-225 MHz<br>BBL200 | EMV-300/1 |
| ☐ | HF- Amplifier 80 -1000 MHz<br>BBA150 | EMV-301 |
| ☐ | HF- Amplifier 0,8 - 6 GHz<br>BBA150 | EMV-302 |
| ☐ | High Power Ant. 20-200 MHz<br>HPBA-2510 | EMV-303/1 |
| ☐ | High Power Ant. 20-200 MHz<br>S12018-21 | EMV-303/2 |
| ☐ | Log.per Antenna 80-2700 MHz<br>STLP 9128 E special | EMV-304 |
| ☐ | Log.per Antenna 0,7 – 9 GHz<br>STLP9149 | EMV-305 |
| ☐ | HF- Ampflifier 9 kHz-250 MHz<br>BBA150 (low noise) | EMV-306 |
| ☐ | ISO11451-2 TLS<br>10 kHz – 30 MHz | EMV-307 |
| ☐ | Load Dump Generator<br>LD 200N | EMV-350 |
| ☐ | Ultra Compact Symulator<br>UCS 200N100 | EMV-351 |
| ☐ | Automotive Power fail module<br>PFM 200N100.1 | EMV-352 |
| ☐ | Voltage Drop Symulator<br>VDS 200Q100 | EMV-353 |
| ☐ | Arb. Generator<br>AutoWave | EMV-354 |
| ☐ | Ultra Compact Symulator<br>UCS 500N7 | EMV-355 |
| ☐ | Coupling decoupling network<br>CNI 503B7 / 32 A | EMV-356 |
| ☐ | Coupling decoupling network<br>CNI 503B7 / 63 A | EMV-357 |
| ☐ | Telecom Surge Generator<br>TSurge 7 | EMV-358 |
| ☐ | Coupling decoupling network<br>CNI 508N2 | EMV-359 |
| ☐ | Coupling decoupling network<br>CNV 504N2.2 | EMV-360 |
| ☐ | Immunity generator<br>NSG4060/NSG4060-1 | EMV-361 |
| ☐ | Coupling network<br>CDND M316-2 | EMV-362 |
| ☐ | Coupling network<br>CT419-5 | EMV-363 |
| ☐ | ESD Generator<br>NSG 437 | EMV-364 |
| ☐ | Pulse Limiter<br>VTSD 9561-F BNC | EMV-405 |
| ☐ | Transient emission<br>BSM200N40+BS200N100 | EMV-<br>450+451 |
| ☐ | Cap. Coupling Clamp<br>HFK | EMV-455 |
| ☐ | Mag. Field System<br>MS100N+MC26100+MC2630 | EMV-<br>456-458 |

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# Test equipment used



| | | |
|---|---|---|
| ☐ | Coupling network<br>CDN M2-100A | EMV-459 |
| ☐ | Coupling network<br>CDN M3-32A | EMV-460 |
| ☐ | Coupling network<br>CDN M5-100A | EMV-461 |
| ☐ | Current Clamp<br>CIP 9136A | EMV-462 |
| ☐ | DC Artificial Network<br>HV-AN 150 | EMV-464+465 |
| ☐ | Coupling Clamp<br>EM 101 | EMV-466 |
| ☐ | Decoupling Clamp<br>FTC 101 | EMV-467 |
| ☐ | Power attenuator<br>10 dB / 250 Watt | EMV-469/2 |
| ☐ | HV AMN<br>NNHV 8123 800A | EMV-472 |
| ☐ | HV AMN<br>NNHV 8123 800A | EMV-473 |