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**Test laboratory accredited according to ISO 17025 by the Swiss Accreditation Service SAS**
**Laboratoire d'essai accrédité selon ISO 17025 par le Service d'accréditation suisse SAS**
**Prüflabor akkreditiert nach ISO 17025 durch die Schweizerische Akkreditierungsstelle SAS**

Registration number
Numéro d'accréditation
Akkreditierungsnummer **STS 024**

Schweizerischer Prüfstellendienst
Service suisse d'essai
Swiss testing service

| | | | |
|---|---|---|---|
| Report: | ***Electromagnetic compatibility and Radio spectrum Matters*** | Report no: | ***13-MO-0447.12*** |
| Product name: | ***Roger Focus*** | Mandate no: | ***13-MO-0447*** |
| Serial no: | ***Proto 172 and Proto AQS 1*** | Model number: | ***- - -*** |
| Customer: | ***Phonak Communications AG<br>Länggasse 17<br>CH-3280 Murten<br>Switzerland*** | Date of test: | ***April 7 – 9, 2014*** |

| Standards | | Result |
|---|---|---|
| **47 CFR, Part 15** | (Subpart C, Intentional radiators: §§ 15.207/209/249) | ***Pass*** |
| | (Subpart B, Class B digital devices: § 15.109) | ***Pass*** |
| **47 CFR, Part 2** | (General rules and regulations : §§ 2.201, 2.202) | ***Pass*** |
| **Industry Canada** | RSS-Gen (General Requirements and Information for the Certification of Radio Apparatus) | ***Pass*** |
| | RSS-210 (Licence-exempt Radio Apparatus: Category I Equipment) | ***Pass*** |
| | ICES-003 (Digital Apparatus) | ***Pass*** |

These results were achieved without modifications of the EUT

Test performed by

*Mr B. Itzcovich*
*EMC test engineer*

Report prepared by

*Mr B. Itzcovich*
*EMC test engineer*

Report controlled and approved by

*Mr J. Ding*
*EMC test engineer*

*Rossens, April 21, 2014* (Issue Date) 2014-01-20

Main language : *English*

The present document results from tests on one specimen and does not prejudge to the conformity of all the manufactured products.

*t:\auftragsablage pq\auftragsablage ih-mo\2013\400-499\13-mo-0447_phonak_communications_isense microd\4 prüfberichte\13-mo-0447.12_phonak_microd_fcc.doc*



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# Contents

## 1. Summary of test results (FCC / Canada)

✓ Pass ✗ Fail ∅ Not applicable to this product — Not tested # Not required / No requirements

| § | Test Type | | Result |
|---|---|---|---|
| **7** | **Emission** | | ***CFR 47 Part 15 Industry Canada*** |
| - | Conducted emission | CFR 47 § 15.107<br>ICES-003 Table 2 | ∅ [1] |
| 7.1 | Radiated emission – Carrier | CFR 47 § 15.249<br>RSS-210 § A2.9 | ✓ |
| 7.2<br>7.3 | Radiated emission – transmit mode | CFR 47 § 15.209<br>RSS-Gen Table 5 | ✓ |
| 7.2<br>7.3 | Radiated emission – receive mode | CFR 47 § 15.109<br>RSS-Gen Table 2 | ✓ |
| **7** | **Emission** | | ***CFR 47 Part 2*** |
| 7.4 | Designation of emission | FCC 47 §2.201<br>FCC 47 §2.202 | **1M72FXD** |

1. Powered with : 1.2 $V_{DC}$ battery.

## 2. Applied standards

| | |
|---|---|
| 47 CFR Part 2 | Code of Federal Regulations - Title 47 - Telecommunication, Part 2 – Frequency allocations and radio treaty matters; General rules and regulations |
| 47 CFR Part 15 Subpart C | Code of Federal Regulations - Title 47 - Telecommunication, Part 15, Subpart C: "Intentional Radiators" |
| 47 CFR Part 15 Subpart B | Code of Federal Regulations - Title 47 - Telecommunication, Part 15, Subpart B: "Unintentional Radiators" |
| RSS-Gen issue 3, December 2010 | Spectrum Management and Telecommunications - Radio Standards Specification<br>General Requirements and Information for the Certification of Radio Apparatus |
| RSS-210 issue 8, December 2010 | Spectrum Management and Telecommunications - Radio Standards Specification<br>Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment |
| ICES-003 Issue 5, August 2012 | Spectrum Management and Telecommunications Policy - Interference-Causing Equipment Standard Digital Apparatus |

## 3. Abbreviations

Electromagnetic compatibility and radio spectrum matters:

| | |
|---|---|
| AC | Alternating current |
| AFA | Adaptive Frequency Agility |
| AM | Amplitude Modulation |
| AV | Average |
| BW | Bandwidth |
| CDN | Coupling Decoupling Network |
| CW | Continuous Wave |
| d(t) | Relative voltage change characteristic |
| DAA | Detect And Avoid spectrum access technique |
| dB | Decibel |
| dBi | gain in decibels relative to an isotropic antenna |
| DC | Direct current |
| DL | Downlink |
| dmax | Maximum relative voltage change |
| DSSS | Direct Sequence Spread Spectrum |
| e.i.r.p. | equivalent isotropic radiated power |
| EMC | Electromagnetic Compatibility |
| ERC | European Radiocommunication Committee |
| ESD | Electro Static Discharge |
| EUT | Equipment under Test |
| FHSS | Frequency Hopping Spread Spectrum |
| GBSAR | Ground Based Synthetic Aperture Radar |
| GRP | Ground reference plane |
| GTEM | Gigahertz Transverse Electromagnetic cell |
| ICNIRP | International Commission on Non-Ionizing Radiation Protection |
| ISM | Industrial Scientific Medical (frequency band) |
| ITU-R | International Telecommunications Union, Radio Sector |
| ITU-T | International Telecommunications Union, Telecommunications Sector |
| L1,L2,L3 | Phase |
| LBT | Listen Before Talk |
| LISN | Line impedance substitution network |
| MDS | Absorbing measuring clamp |
| MU | Master Unit |
| N | Neutral |
| NNB | Line impedance substitution network |
| NRI | National Radio Interfaces |
| PE | Protective earth |
| PK | Peak |
| Plt | Long-term flicker indicator |
| PM | Pulse Modulation |
| Pst | Short-term flicker Indicator |
| R&TTE | Radio and Telecommunications Terminal Equipment |
| RF | Radio Frequency |
| RFID | Radio Frequency Identification |
| RU | Remote Unit |
| SCU | System Control Unit |
| SF-CW | Step Frequency Continuous Wave (spread spectrum) |
| SND/ND | Signal + Noise + Distortion divided by Noise + Distortion |
| SRD | Short Range Device |
| TEM | Transverse Electromagnetic cell |
| TETRA | Terrestrial Trunked Radio |
| Tx | Transmitter |
| UL | Uplink |
| UWB | Ultra Wide Band |
| VSWR | Voltage Standing Wave Ratio |

General vocabulary: http://www.electropedia.com

# 4. Client

| | |
|---|---|
| Client name and address | *Phonak Communications AG*<br>*Länggasse 17*<br>*CH-3280 Murten*<br>*Switzerland* |
| Contact Person | *Mr Sébastien Holzer* |
| Telephone | *+41 26 672 33 43* |
| Fax | *+41 26 672 93 80* |
| E-mail | *Sebastien.holzer@phonak.com* |
| Mandate no | *13-MO-0447* |

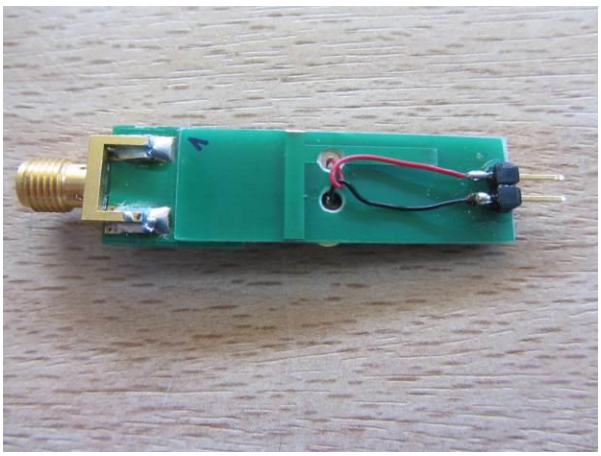
# 5. Equipment under test

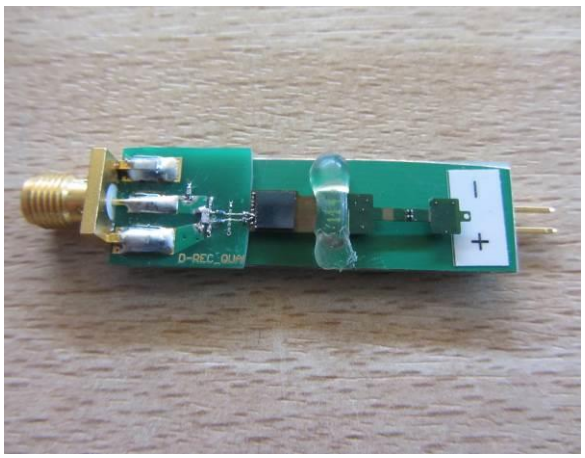
## 5.1 Identification

| | |
|---|---|
| Manufacturer name and address | *Phonak Communications AG*<br>*Länggasse 17*<br>*CH-3280 Murten*<br>*Switzerland* |
| Production country | *Vietnam* |
| Brand name | *Phonak* |
| Product name | *Roger Focus* |
| Product description | *Wireless headphone 2.4 GHz* |
| Model number | *- - -* |
| Serial no | *Proto 172 and Proto AQS 1* |
| Software version | *AQS SVN 10243* |
| Highest frequency | *2.48 GHz (transmitter carrier) / 26 MHz (main quartz)* |
| Supply | *Battery: U = 1.2 $V_{DC}$ (Zinc-air) / I = 3 mA* |
| Dimension | *~30 mm x ~13 mm x ~8 mm (l x w x h)* |
| Weight | *~2 g* |
| Technical documentation | *None. The equipment is completely identified by the above-mentioned information. Phonak Communications AG assures the traceability of the documentation and is responsible for the product identification.* |

## 5.2 Pictures of the EUT


*EUT*





*PCB with temporary antenna & supply connectors (for § 7.4 test)*

### 5.3 Classification

| | |
|---|---|
| CFR 47 Part 15 | ☒ Unintentional radiator (Subpart B), Receive mode<br>☐ Class A digital device<br>☒ Class B digital device<br>☒ The highest frequency of the internal sources of the EUT is less than 108 MHz (measurement shall be made up to 1 GHz).<br>☐ The highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz (measurement shall be made up to 2 GHz).<br>☐ The highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz (measurement shall be made up to 5 GHz).<br>☐ The highest frequency of the internal sources of the EUT is above 1 GHz (measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is lower).<br>☒ Intentional radiator (Subpart C), Transmit mode<br>☒ The highest fundamental frequency of the EUT is less than 10 GHz (measurement shall be made up to the tenth harmonic or 40 GHz, whichever is lower).<br>☐ The highest fundamental frequency of the EUT is between 10 GHz and 30 GHz (measurement shall be made up to the fifth harmonic or 100 GHz, whichever is lower).<br>☐ The highest fundamental frequency of the EUT is above 30 GHz (measurement shall be made up to the fifth harmonic or 200 GHz, whichever is lower). |

### 5.4 Ports

| |
|---|
| *None* |

# 6. Test conditions

## 6.1 Climatic conditions, location and date

| Location: | Date: | Temp | Pressure [QFF]: | Rel. humidity: |
|---|---|---|---|---|
| *Electrosuisse<br>Montena EMC<br>1728 Rossens<br>Switzerland* | *April 7 – 9, 2014* | *22 – 27 °C* | *1000 – 1040 hPa* | *35 – 60 %* |

## 6.2 Test facility and methodology

*The alternate test site (ferrite chamber) is accepted by FCC (Reg. No. 90808) and by Industry Canada (Site number 3625A-2).*

*Conducted and radiated measurements are performed according to the ANSI C63.4 (2003) procedure.*

## 6.3 Attendant persons

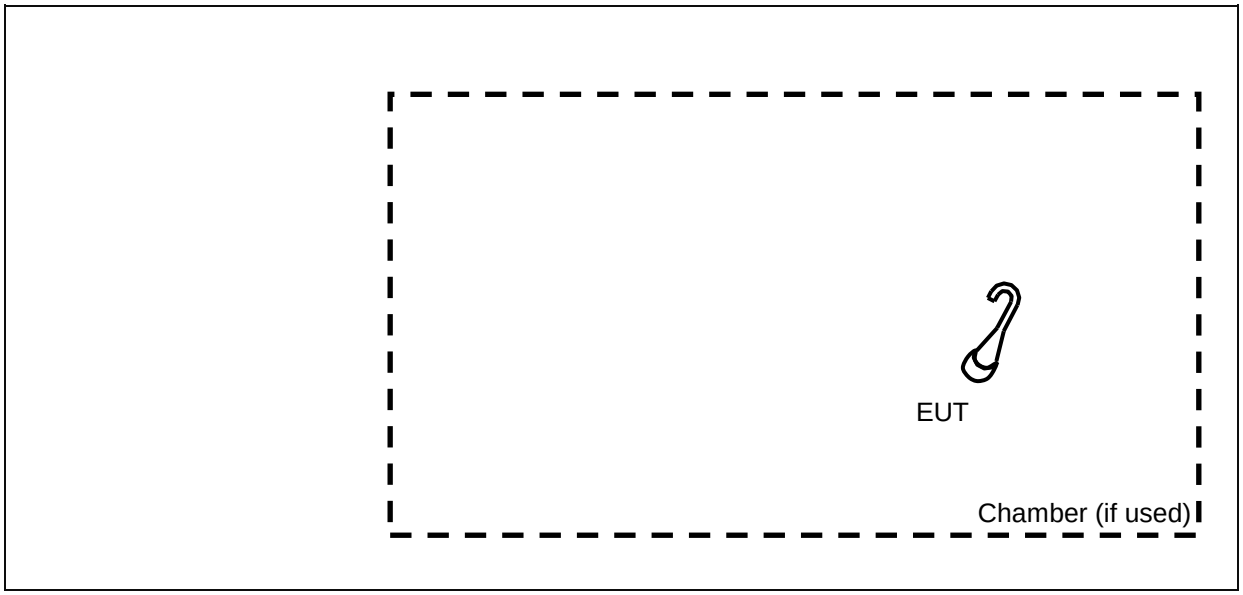
**Test Engineer(s):**

*Mr B. Itzcovich*
*EMC test engineer*

**Other(s):**

| Name | Company |
|---|---|
| *Mr Cyril Rupf (partially)* | *Phonak Communications AG* |

## 6.4 Test configuration



### 6.5 Operating conditions

*If not stated otherwise in § 7 :*

- *Power supply: 1.2 $V_{DC}$ battery*
- *Transceiver frequency: 2.44 GHz*
- *Emission power: maximum level (modulated)*

### 6.6 Auxiliary equipment

The following pieces of equipment are used for the monitoring of the EUT or are necessary for the EUT but they are not part of the EUT.

*None*

# 7. Emission tests

### 7.1 Carrier - Radiated emission

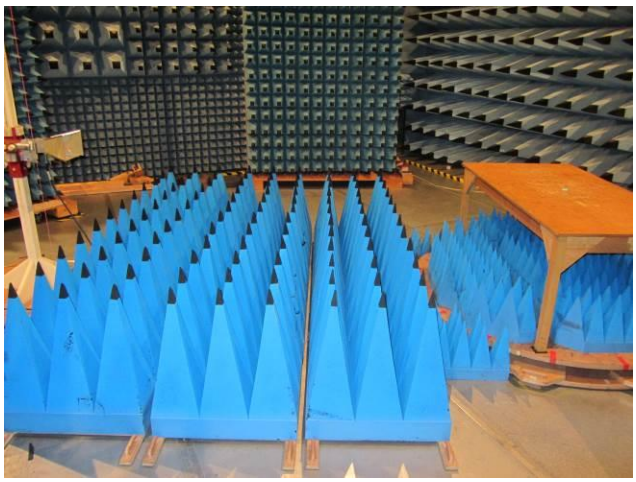
| | | | | |
|---|---|---|---|---|
| Test site: | ☐ semi-anechoic chamber (ferrites) | | ☐ open test site | |
| | ☒ semi-anechoic chamber (foam) | | ☐ ..... | |
| Meas. distance: | ☐ 1 m | ☒ 3 m | ☐ 10 m | ☐ 30 m |

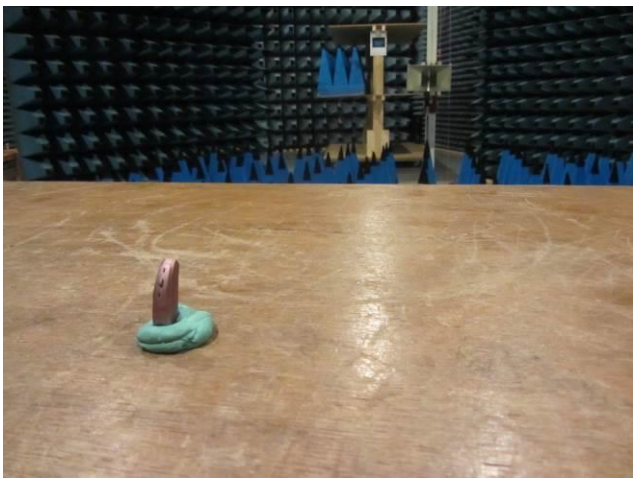
Meas. uncertainty: ± 4.7 dB

Position of EUT: *0.8 m* (height above floor of equipment under test)

Measuring method: The carrier radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is placed at the same height as the EUT successively with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out taking into account the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit are remeasured manually using a receiver.

Test set-up:





Remarks: Limit values expressed in dBµV/m and transformed to a measuring distance of 1 m (factor used = 20 dB/decade) if necessary
e.g.: for f = 2.43GHz the limit is 50mV/m at 3m (average detector);

$$20\log\left(\frac{50\,\frac{mV}{m}}{1\,\frac{\mu V}{m}}\right)=94\,\frac{dB\mu V}{m}\;at\;3m$$

Test equipment:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spectrum analyser | ☐ 88-14 | ☒ 02-06 | ☐ 03-45 | ☐ 05-39 | ☐ 07-53 | ☐ 10-70 | |
| Receiver | ☐ 94-35 | ☐ 04-29 | ☐ 10-70 | | | | |
| Preamplifier | ☐ 90-01 | ☐ 95-86 | ☐ 05-56 | ☐ 05-59 | ☐ 05-62 | ☐ 05-87 | ☒ 11-29 |
| Antenna (horn) | ☒ 90-24 | ☐ 98-12 | ☐ 98-13 | ☐ 07-31 | | | |
| Cables | ☒ 06-00 | ☐ 06-01 | | | | | |

| | | | | |
|---|---|---|---|---|
| **Result:** | ☒ **pass** | ☐ **fail** | ☐ **not applicable** | ☐ **partly tested** |

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° (max. emission @ 270°) |
| **Antenna Height :** | 1 - 2.5m (max. emission @ 1.0m) |

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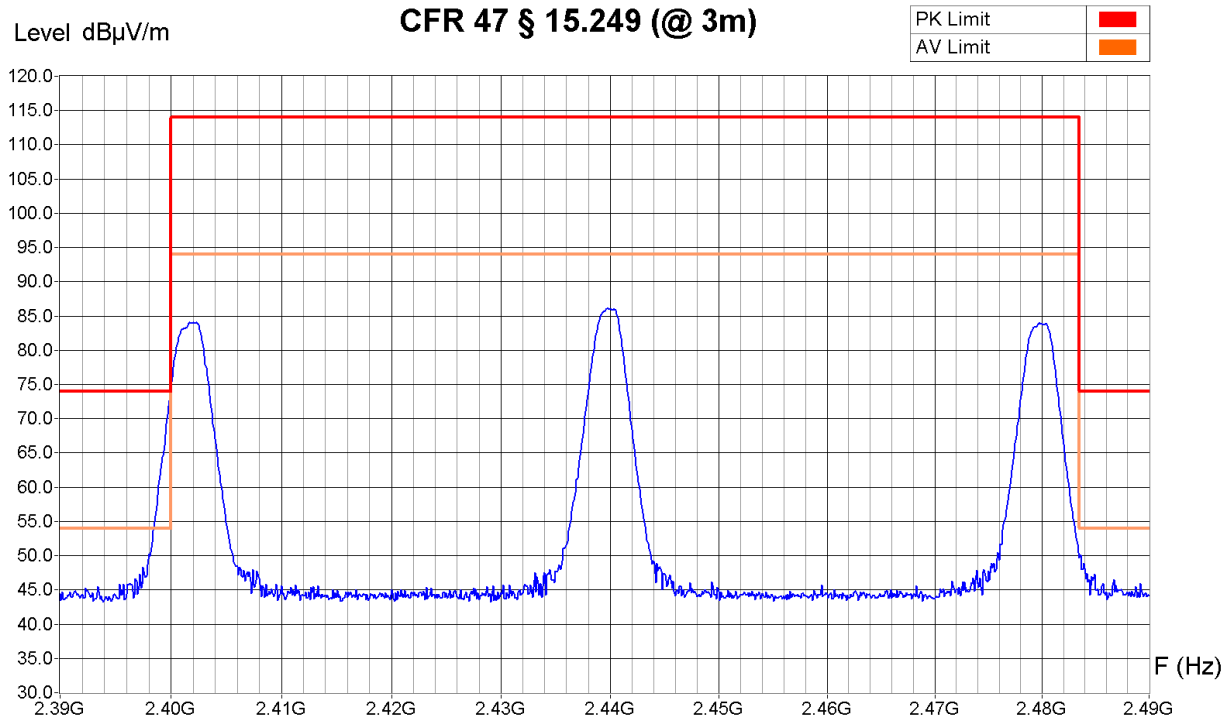
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. EUT h = 0.8 m. See photos |
| **Operating Conditions :** | Hopping transmission (f = 2.402 / 2.440 / 2.480 GHz), max. power, modulated |
| **Remarks :** | Ton = 0.184 ms, T = 5.00 ms |
| | Peak detector sweep, 1001 pts, ST = 30 s |




| | |
|---|---|
| Zone | 2.39 GHz - 2.49 |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 09:47
Filename:
05_RE_2G44_Carrier_0m8_V_FCC.png/.txt

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° (max. emission @ 270°) |
| **Antenna Height :** | 1 - 2.5m (max. emission @ 1.0m) |

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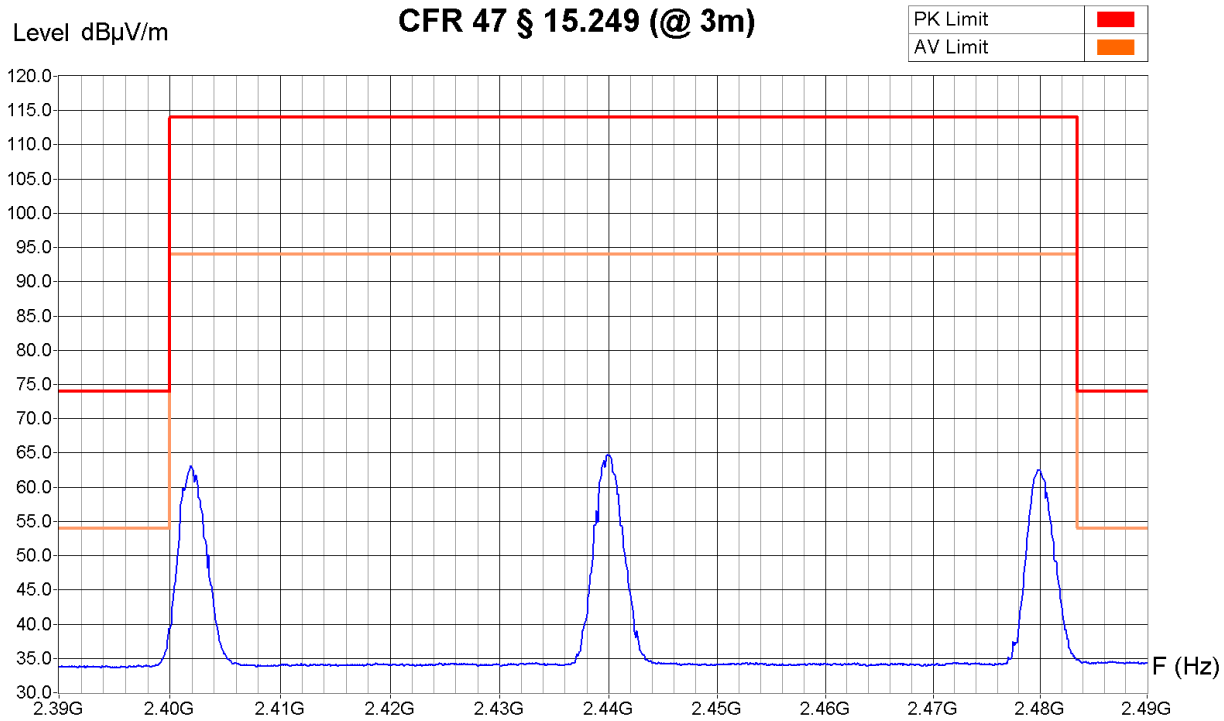
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. EUT h = 0.8 m. See photos |
| **Operating Conditions :** | Hopping transmission (f = 2.402 / 2.440 / 2.480 GHz), max. power, modulated |
| **Remarks :** | Ton = 0.184 ms, T = 5.00 ms |
| | Average RMS detector sweep, 1001 pts, ST = 30 s |




| | |
|---|---|
| Zone | 2.39 GHz - 2.49 |
| Video Bandwidth | 3 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 09:54
Filename:
06_RE_2G44_Carrier_0m8_V_FCC_AVG.png/.txt

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° (max. emission @ 0°) |
| **Antenna Height :** | 1 - 2.5m (max. emission @ 1.0m) |

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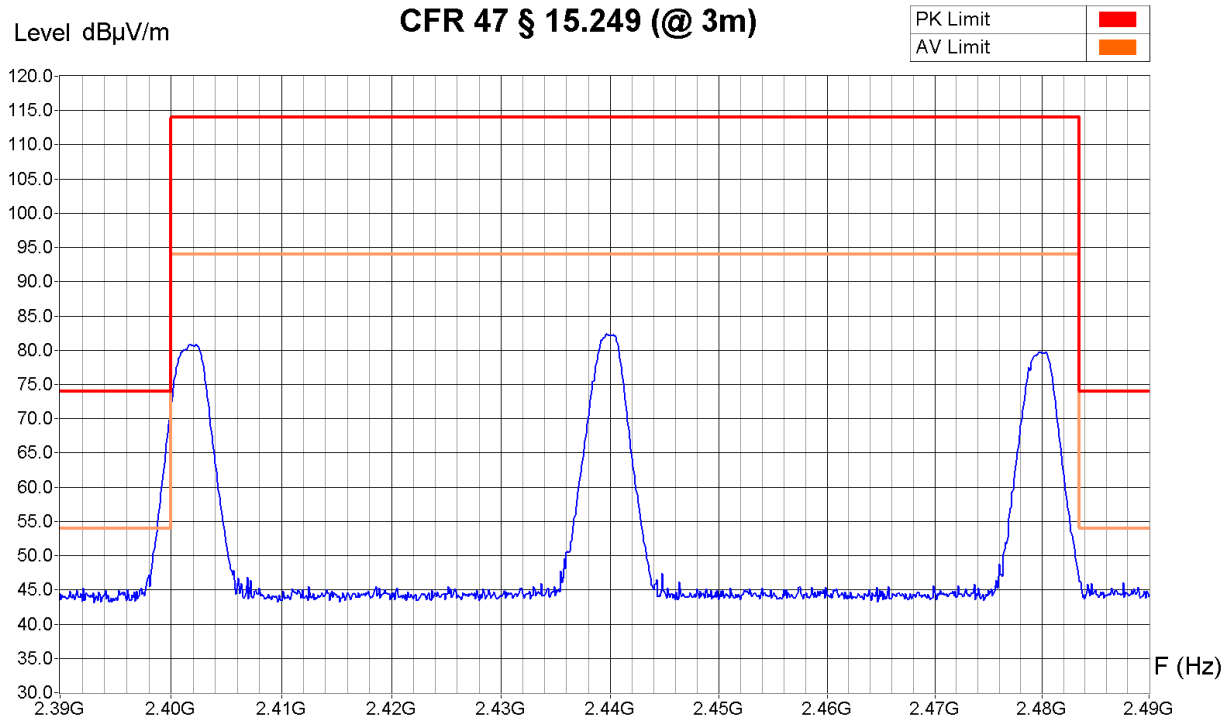
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. EUT h = 0.8 m. See photos |
| **Operating Conditions :** | Hopping transmission (f = 2.402 / 2.440 / 2.480 GHz), max. power, modulated |
| **Remarks :** | Ton = 0.184 ms, T = 5.00 ms |
| | Peak detector sweep, 1001 pts, ST = 30 s |




| | |
|---|---|
| Zone | 2.39 GHz - 2.49 |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 10:53
Filename: 07_RE_2G44_Carrier_0m8_H_FCC.png/.txt

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° (max. emission @ 0°) |
| **Antenna Height :** | 1 - 2.5m (max. emission @ 1.0m) |

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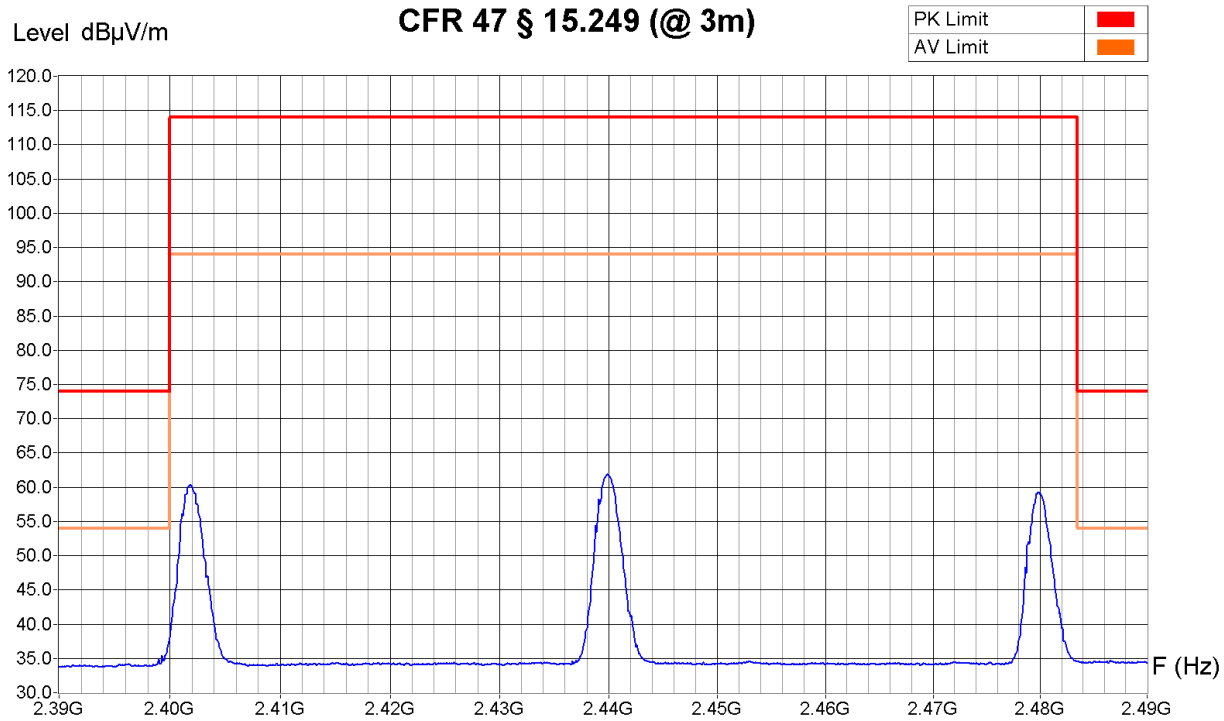
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. EUT h = 0.8 m. See photos |
| **Operating Conditions :** | Hopping transmission (f = 2.402 / 2.440 / 2.480 GHz), max. power, modulated |
| **Remarks :** | Ton = 0.184 ms, T = 5.00 ms |
| | Average RMS detector sweep, 1001 pts, ST = 30 s |




| | |
|---|---|
| Zone | 2.39 GHz - 2.49 |
| Video Bandwidth | 3 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 10:57
Filename:
08_RE_2G44_Carrier_0m8_H_FCC_AVG.png/.txt

### 7.2 Radiated electromagnetic field (30 MHz to 1 GHz)

Test site: ☒ semi-anechoic chamber (ferrites) ☐ semi-anechoic chamber (foam)
☐ semi-anechoic chamber (hybrid) ☐ laboratory

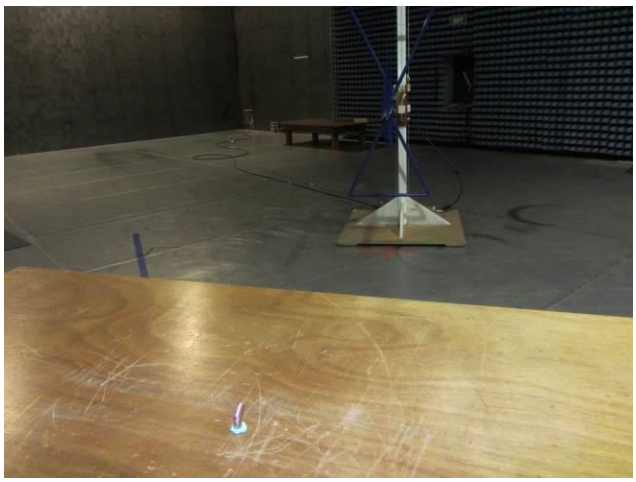
Distance: ☒ 3 m ☐ 10 m ☐ 30m

Position of EUT: *0.8 m* (height of the equipment under test above floor)

Meas. uncertainty: ± 4.6 dB

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The antenna is moved from 1 to 4 m in height successively with horizontal and vertical polarisations. The turning table is operated through 360° during the measurements. The recordings are carried out taking into account the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit are remeasured manually using a receiver.

Test set-up:



Remarks: - - -

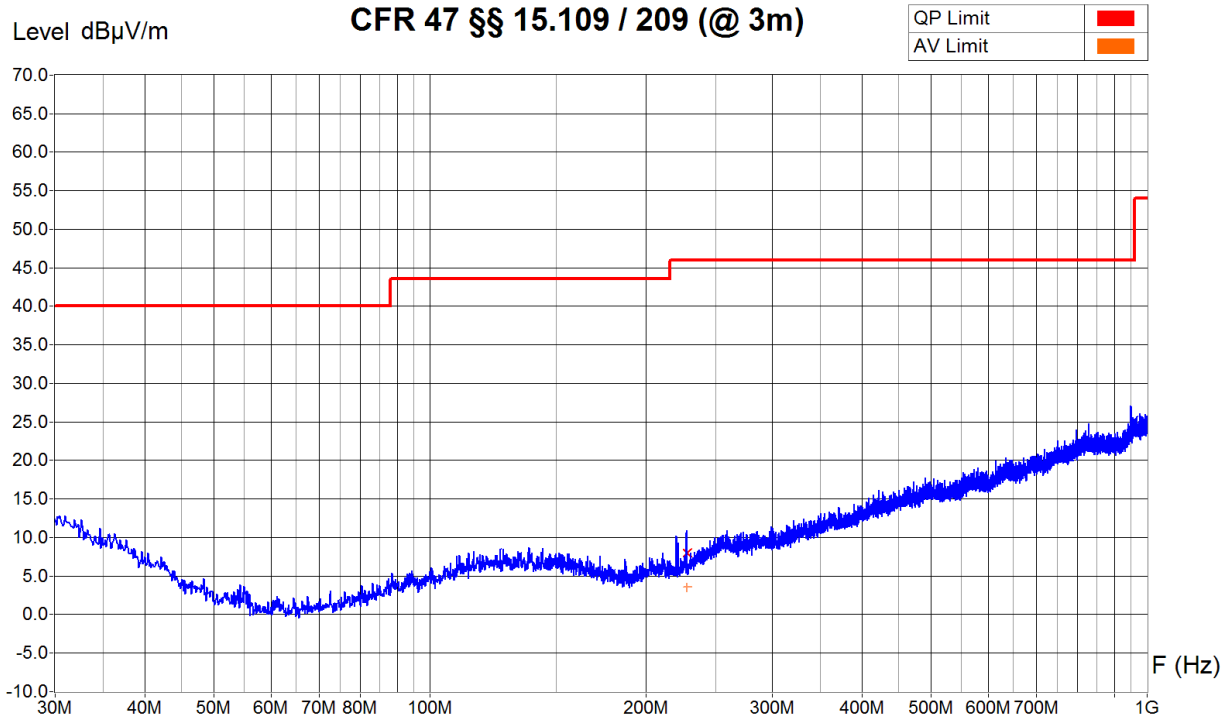
Test equipment:

| | | | | | | |
|---|---|---|---|---|---|---|
| Spectrum analyser | ☐ 88-14 | ☐ 02-06 | ☐ 03-45 | ☐ 05-39 | ☐ 07-53 | ☒ 10-70 |
| Receiver | ☐ 94-35 | ☐ 04-29 | ☒ 10-70 | | | |
| Preamplifier | ☐ 90-01 | ☐ 95-86 | ☐ 05-56 | ☒ 05-59 | ☐ 05-62 | ☐ 05-87 |
| Antenna, (biconical) | ☐ 82-02 | ☐ 87-05 | ☐ 87-16 | ☐ 91-05 | ☐ 94-37 | |
| Antenna, (log-per) | ☐ 88-20 | ☐ 90-30 | ☐ 91-35 | ☐ 94-64 | | |
| Antenna, (bilog) | ☒ 94-03 | ☐ 05-38 | | | | |
| Antenna, (horn) | ☐ 90-24 | ☐ 98-12 | ☐ 98-13 | ☐ 07-31 | | |
| Cables | ☐ 06-00 | ☒ 06-01 | | | | |

| **Result:** | **☒ pass** | **☐ fail** | **☐ not applicable** | **☐ partly tested** |
|---|---|---|---|---|

### 7.2.1 Transmit mode

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 4m |
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-01. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |




| | |
|---|---|
| Zone | 25 MHz - 1 GHz |
| Video Bandwidth | 300 KHz |
| Resol Bandwidth | 120 KHz |

Receiver Measures

| Frequency | Peak | QuasiPeak (x) | Average (+) | QP Margin |
|---|---|---|---|---|
| 228.02 MHz | 12.0 dBµV/m | 8.0 dBµV/m | 3.6 dBµV/m | 38.0 dB |

Operator: B. Itzcovich
Date/Time: 07.04.2014 09:03
Filename: 01_RE_25M-1G_TX2440_V_FCC.png/.txt

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 4m |

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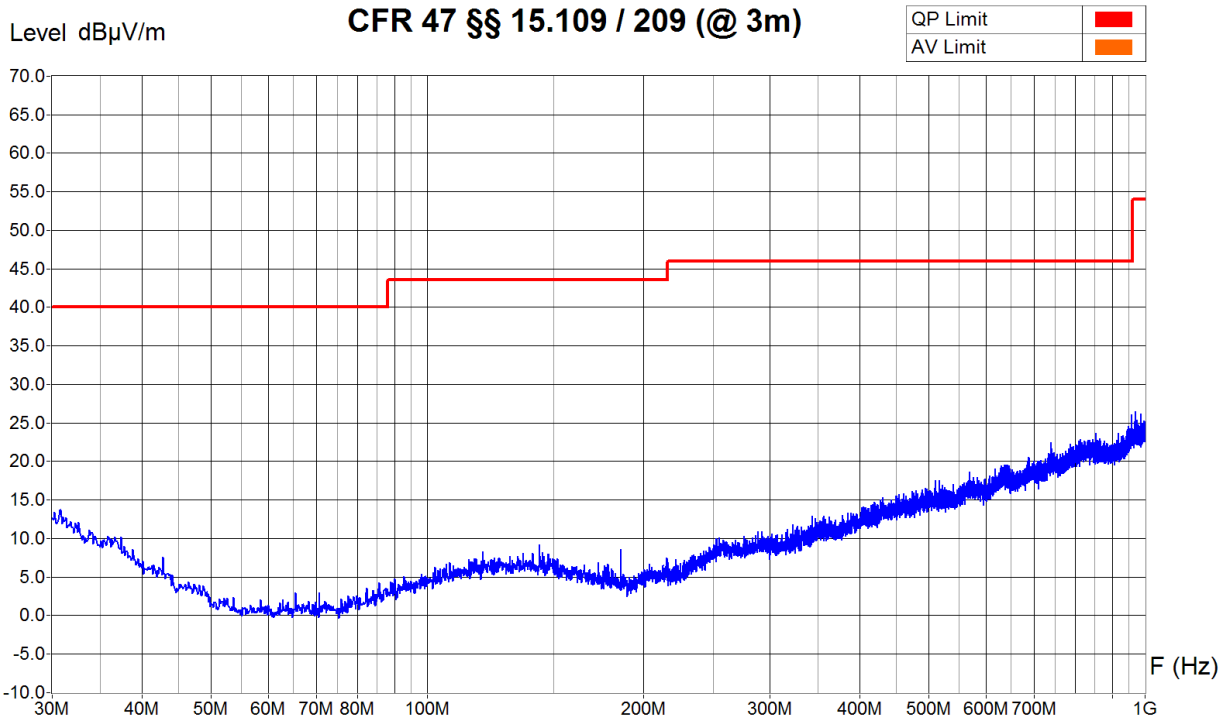
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-01. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |

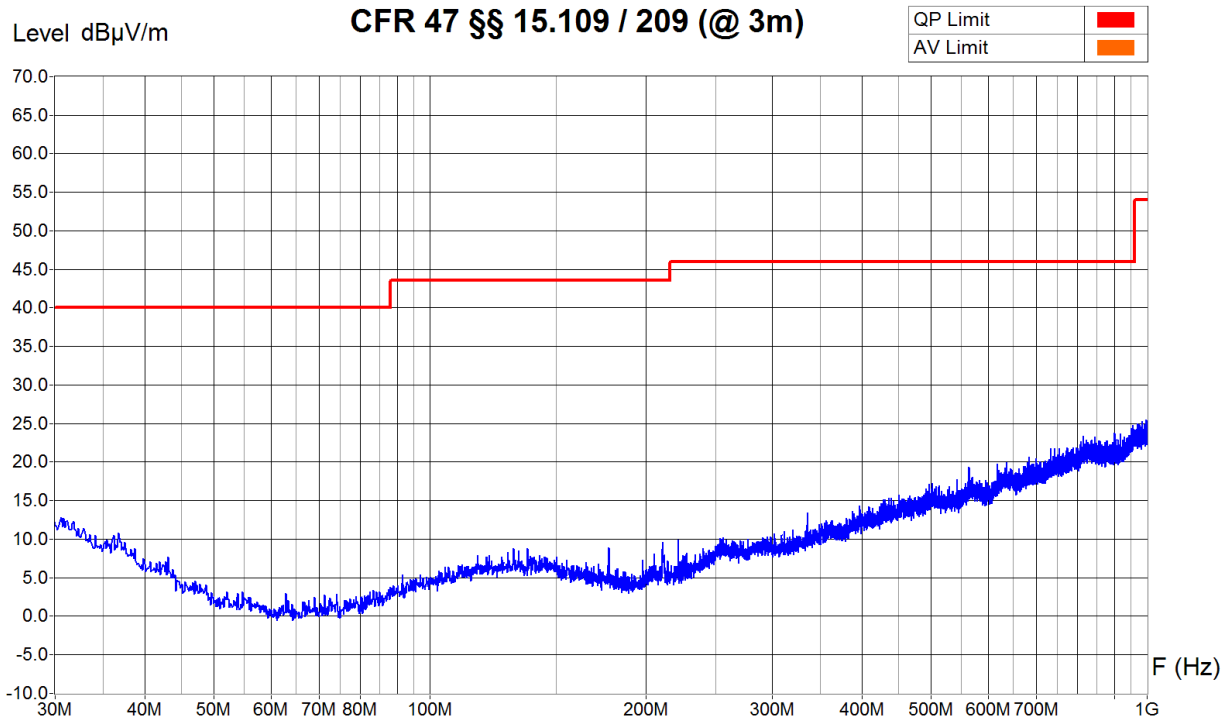



| | |
|---|---|
| Zone | 25 MHz - 1 GHz |
| Video Bandwidth | 300 KHz |
| Resol Bandwidth | 120 KHz |

Operator: B. Itzcovich
Date/Time: 07.04.2014 09:20
Filename: 02_RE_25M-1G_TX2440_V_FCC.png/.txt

### 7.2.2 Receive mode

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 4m |
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-01. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |




| | |
|---|---|
| Zone | 25 MHz - 1 GHz |
| Video Bandwidth | 300 KHz |
| Resol Bandwidth | 120 KHz |

Operator: B. Itzcovich
Date/Time: 07.04.2014 09:56
Filename: 03_RE_25M-1G_RX2440_V_FCC.png/.txt

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 4m |

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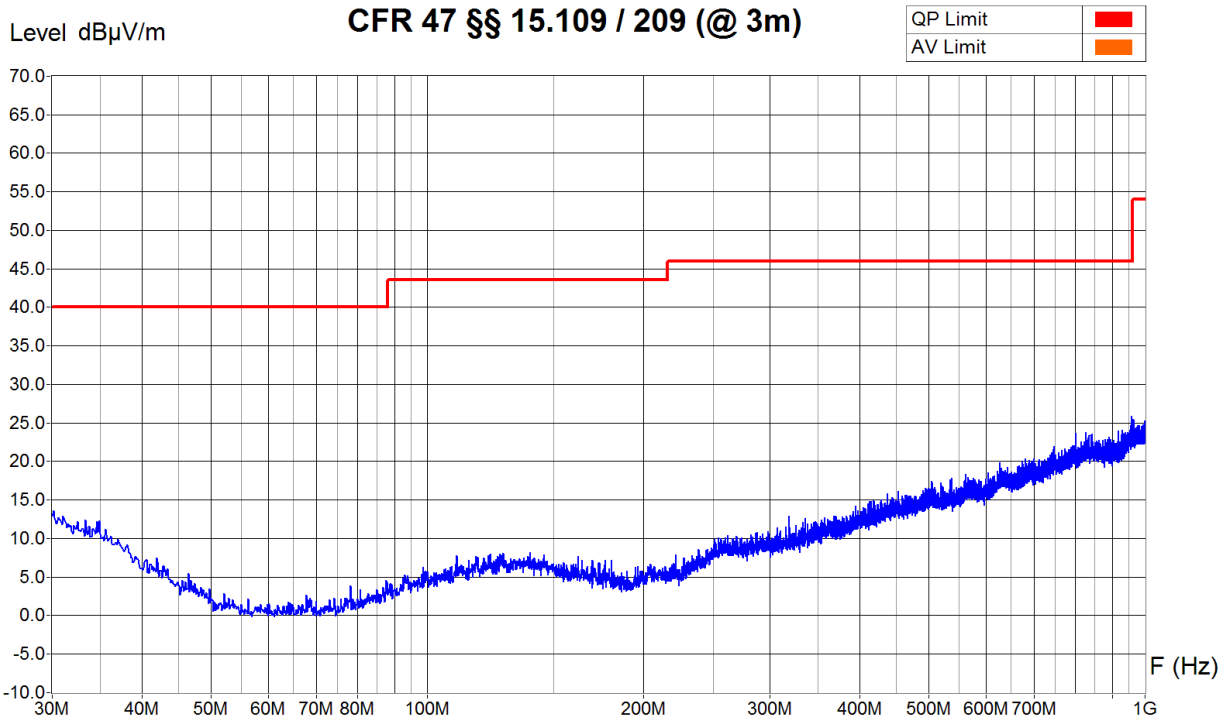
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-01. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |




| | |
|---|---|
| Zone | 25 MHz - 1 GHz |
| Video Bandwidth | 300 KHz |
| Resol Bandwidth | 120 KHz |

Operator: B. Itzcovich
Date/Time: 07.04.2014 09:26
Filename: 04_RE_25M-1G_RX2440_H_FCC.png/.txt

### 7.3 Radiated electromagnetic field (1 GHz to 26.5 GHz)

Test site: ☐ semi-anechoic chamber (ferrites) ☒ semi-anechoic chamber (foam)
☐ semi-anechoic chamber (hybrid) ☐ laboratory

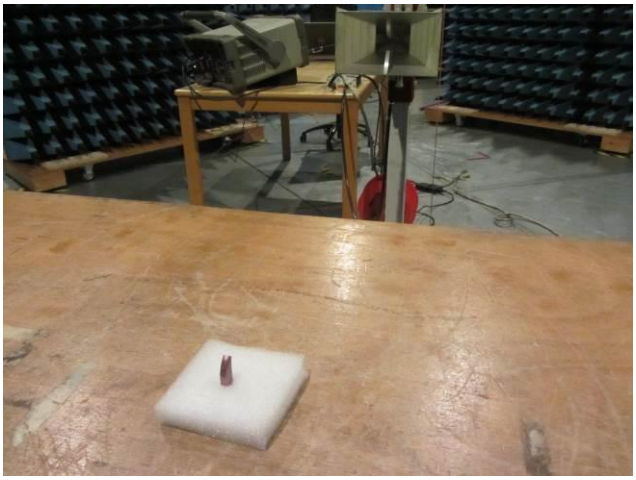
Distance: ☒ 1 m ☐ 3 m ☐ 10 m ☐ 30m

Position of EUT: *1.5 m* (height of the equipment under test above floor)

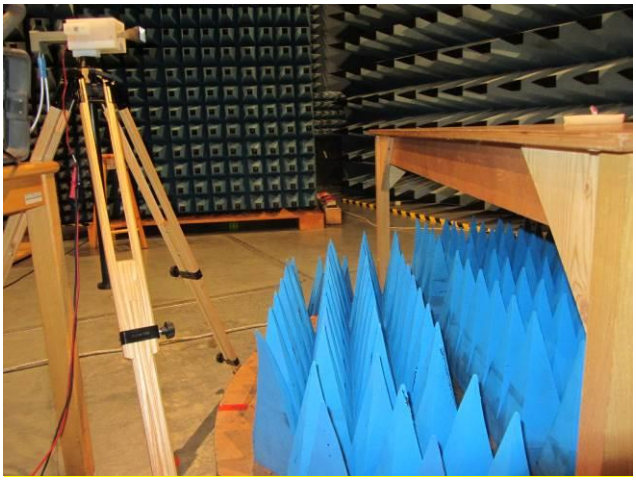
Meas. uncertainty: ± 4.7 dB

Measuring method: The electromagnetic disturbance radiated by the equipment is measured using a spectrum analyser and a wide band antenna. The turning table is operated through 360° during the measurements. The recordings are carried out taking into account the maximum value of all the disturbances appearing while the apparatus is under test. The peak values are recorded continuously on the graph. The values exceeding a limit are remeasured manually using a receiver.

Test set-up:



*1 – 18 GHz*



*18 – 26.5 GHz*

Remarks: *Harmonics #2, #3 and #4 have been measured with a longer sweep time (4 - 8s) and are below the limits*

Test equipment:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Spectrum analyser | ☐ 88-14 | ☐ 94-24 | ☒ 02-06 | ☐ 03-45 | ☐ 05-39 | ☐ 07-53 | ☐ 10-70 |
| Receiver | ☐ 94-35 | ☐ 04-29 | ☐ 10-70 | | | | |
| Preamplifier | ☐ 90-01 | ☐ 95-86 | ☐ 05-56 | ☐ 05-59 | ☐ 05-62 | ☐ 05-87 | ☒ 11-29 |
| Antenna (horn) | ☒ 90-24 | ☐ 98-10 | ☐ 98-12 | ☐ 07-31 | | | |
| Antenna with mixer | ☒ 98-12 | ☐ 98-13 | | | | | |
| Cables | ☒ 11-61 | ☒ 10-75 | ☒ 10-81 | ☒ 11-62 | | | |
| Power supply | ☐ 99-04 | ☐ 99-07 | ☒ 06-62 | | | | |
| Filter | ☐ 12-06 | | | | | | |

| **Result:** | **☒ pass** | **☐ fail** | **☐ not applicable** | **☐ partly tested** |
|---|---|---|---|---|

### 7.3.1 Transmit mode

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 2m |

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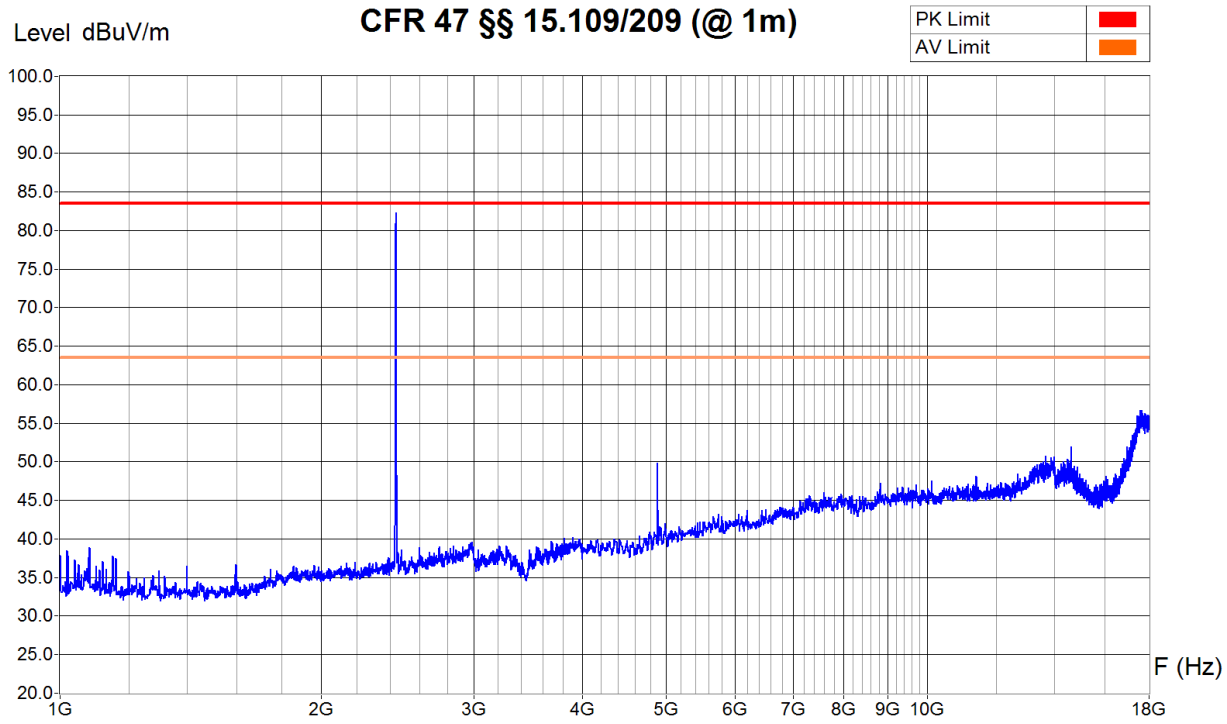
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |




| Zone | 1 GHz - 4 GHz | 4 GHz - 14 GHz | 14 GHz - 18 GHz |
|---|---|---|---|
| Video Bandwidth | 1 MHz | 1 MHz | 1 MHz |
| Resol Bandwidth | 1 MHz | 1 MHz | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 13:04
Filename: 11_RE_1-18G_TX2440_0m8_V_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 2m |

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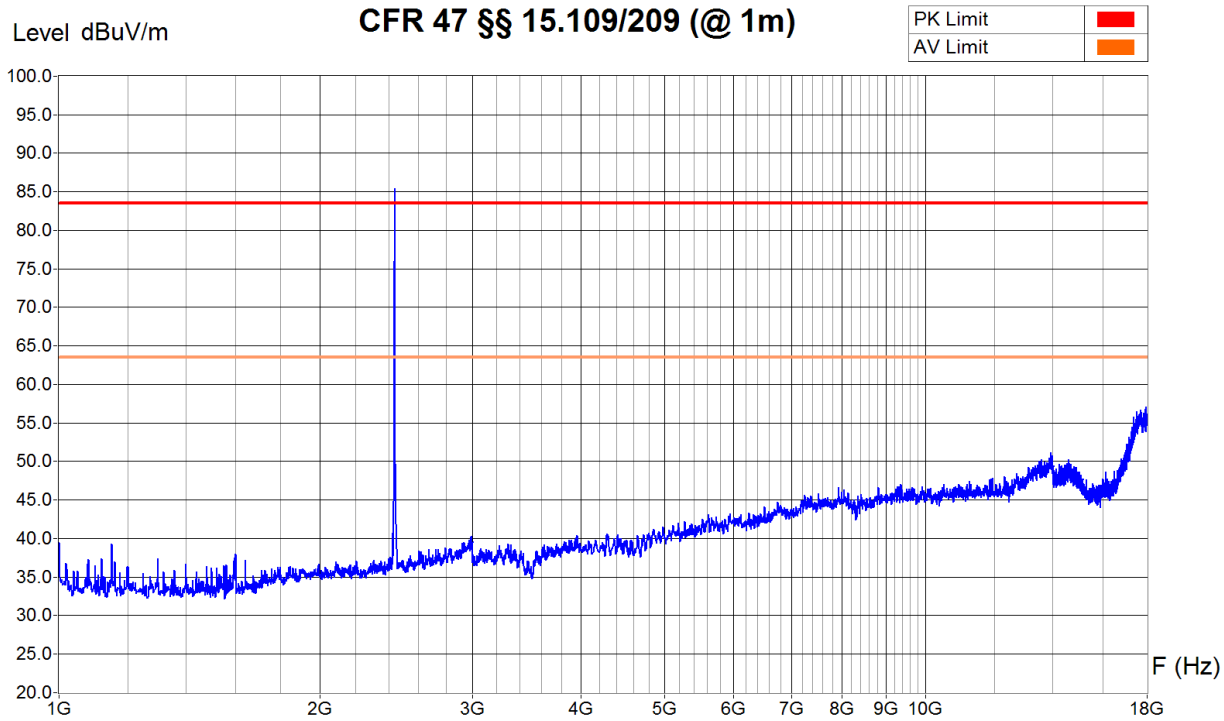
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | |




| Zone | 1 GHz - 4 GHz | 4 GHz - 14 GHz | 14 GHz - 18 GHz |
|---|---|---|---|
| Video Bandwidth | 1 MHz | 1 MHz | 1 MHz |
| Resol Bandwidth | 1 MHz | 1 MHz | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 14:48
Filename: 12_RE_1-18G_TX2440_0m8_H_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1m |

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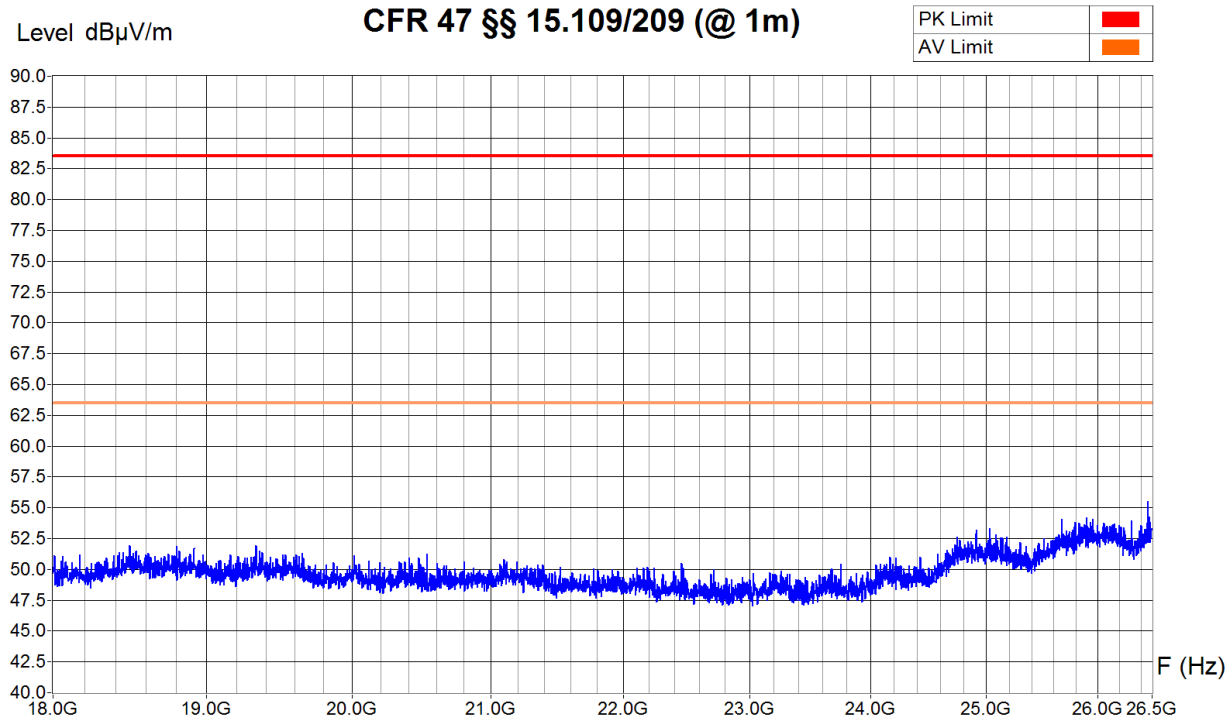
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | EUT h = 0.8m |




| | |
|---|---|
| Zone | 18 GHz - 26.50 GHz |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 16:55
Filename:
23_RE_18-26G5_TX2440_0m8_V_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1m |

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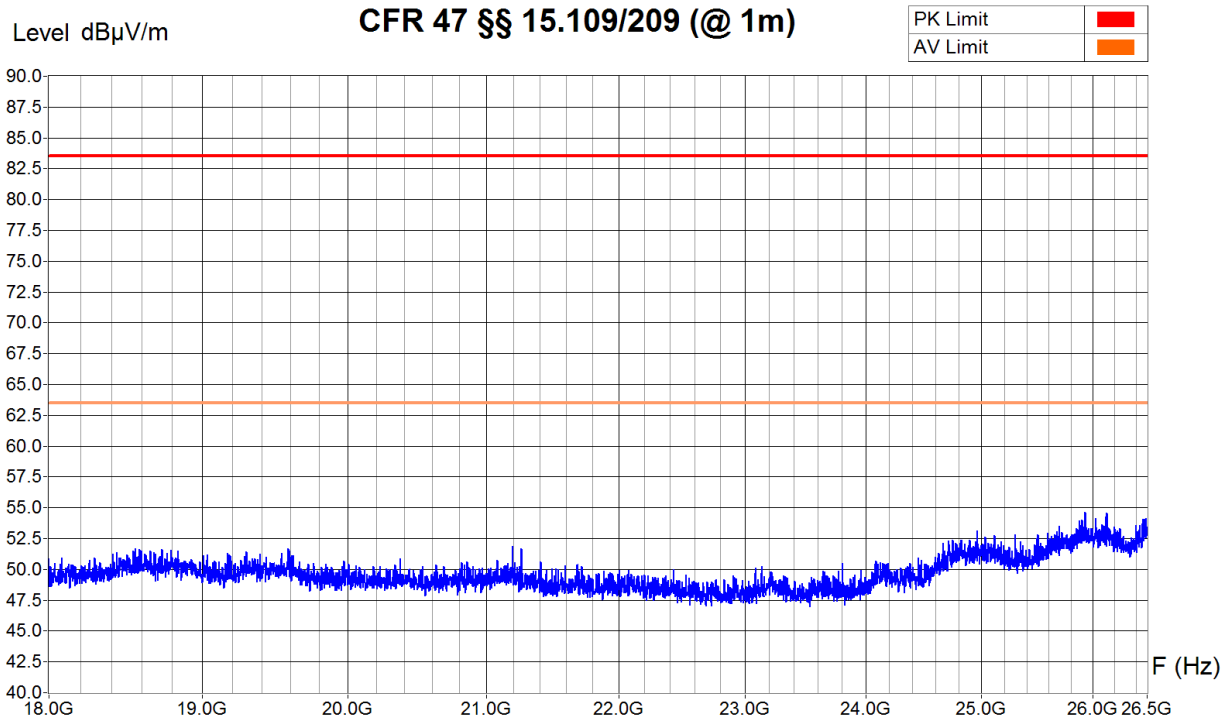
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous transmission (f = 2.440 GHz), max. power, modulated |
| **Remarks :** | EUT h = 0.8m |

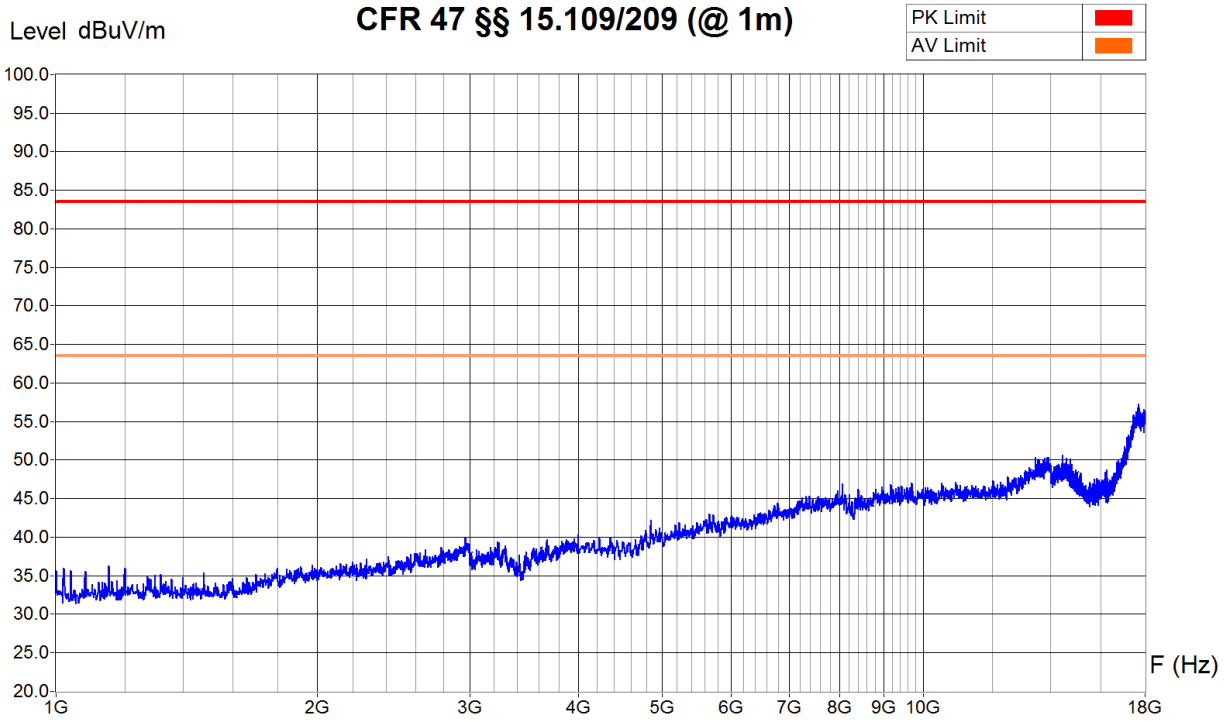



| | |
|---|---|
| Zone | 18 GHz - 26.50 GHz |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 16:56
Filename: 24_RE_18-26G5_TX2440_0m8_H_FCC.png/

### 7.3.2 Receive mode

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 2m |
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz) |
| **Remarks :** | |




| Zone | 1 GHz - 4 GHz | 4 GHz - 14 GHz | 14 GHz - 18 GHz |
|---|---|---|---|
| Video Bandwidth | 1 MHz | 1 MHz | 1 MHz |
| Resol Bandwidth | 1 MHz | 1 MHz | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 14:59
Filename: 13_RE_1-18G_RX2440_0m8_V_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1 - 2m |
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz) |
| **Remarks :** | |

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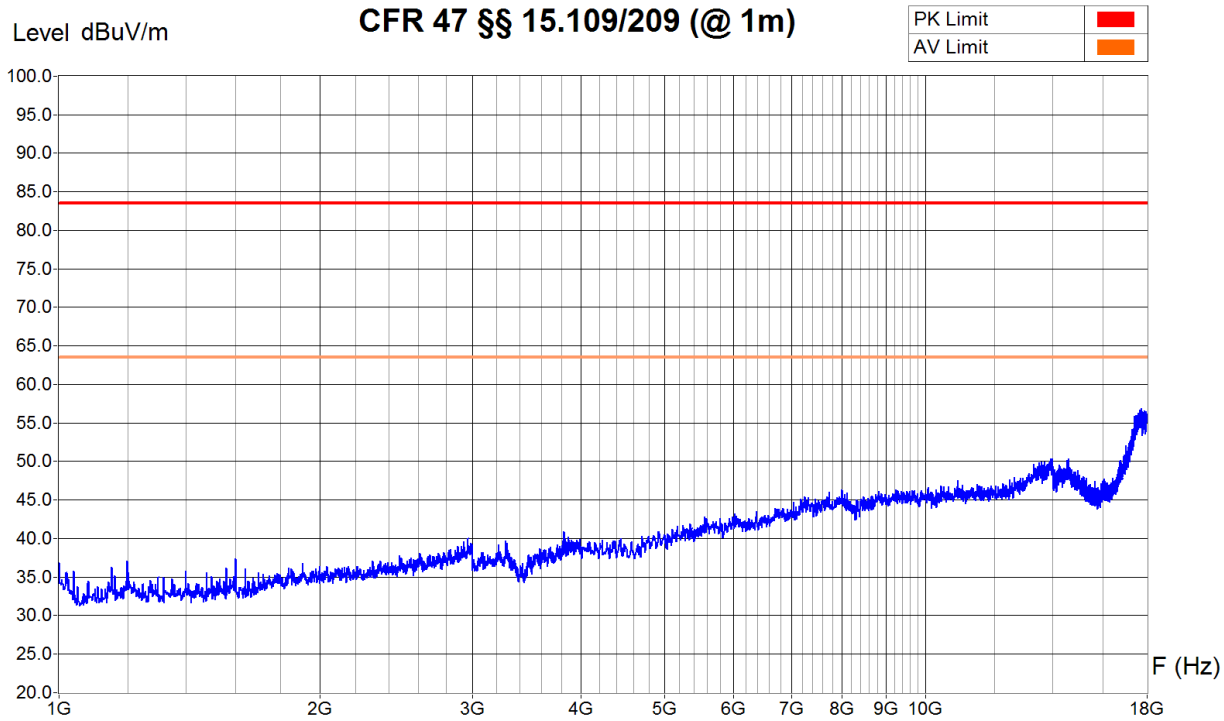


| Zone | 1 GHz - 4 GHz | 4 GHz - 14 GHz | 14 GHz - 18 GHz |
|---|---|---|---|
| Video Bandwidth | 1 MHz | 1 MHz | 1 MHz |
| Resol Bandwidth | 1 MHz | 1 MHz | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 14:54
Filename: 14_RE_1-18G_RX2440_0m8_H_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Vertical |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1m |

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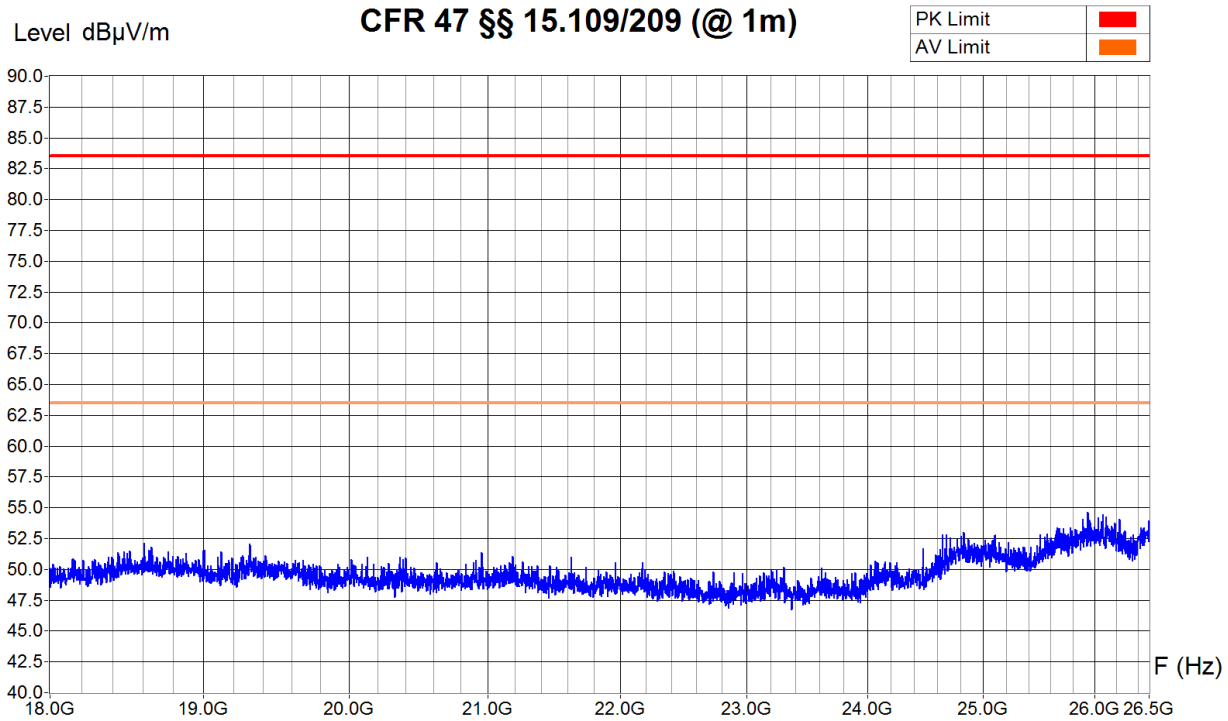
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz) |
| **Remarks :** | EUT h = 0.8m |




| | |
|---|---|
| Zone | 18 GHz - 26.50 GHz |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 16:58
Filename: 25_RE_18-26G5_RX2440_0m8_V_FCC.png/

| | |
|---|---|
| **Measurement Type :** | Radiated Field |
| **Polarisation :** | Horizontal |
| **Table Angle :** | 0 - 360° |
| **Antenna Height :** | 1m |

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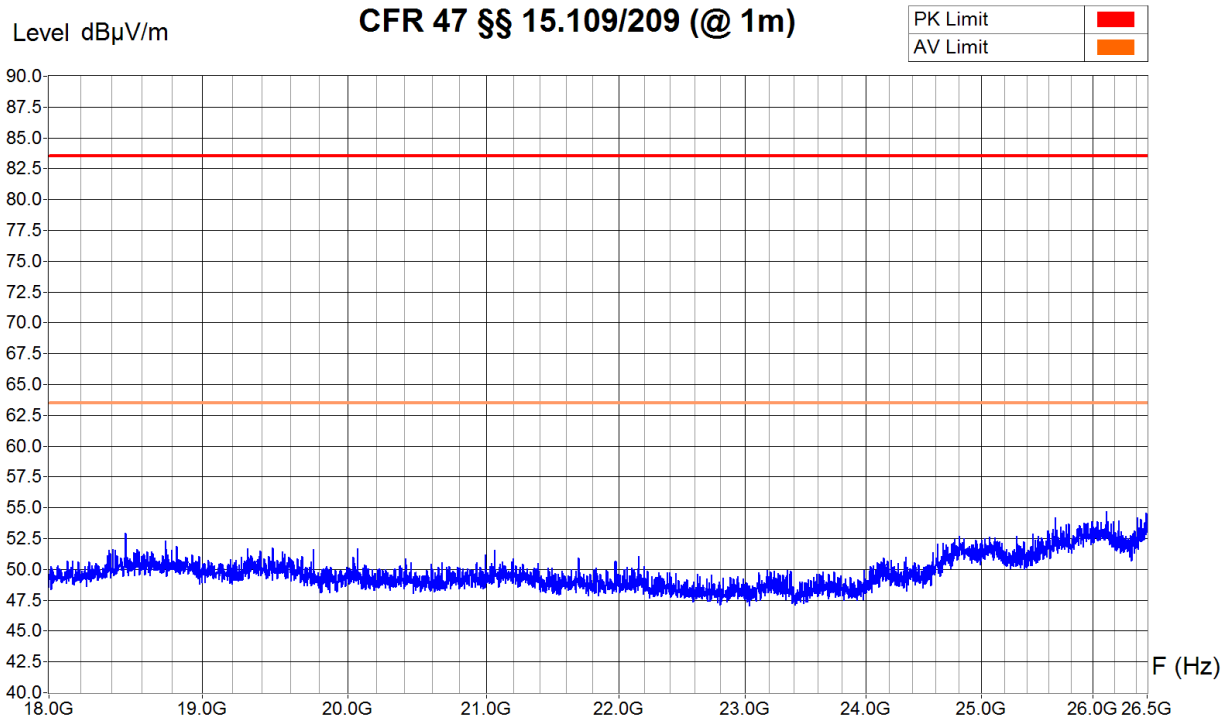
| | |
|---|---|
| **Equipment Under Test :** | Roger Focus |
| **Set-Up :** | Cage 06-00. See photo |
| **Operating Conditions :** | Continuous reception (f = 2.440 GHz) |
| **Remarks :** | EUT h = 0.8m |




| | |
|---|---|
| Zone | 18 GHz - 26.50 GHz |
| Video Bandwidth | 1 MHz |
| Resol Bandwidth | 1 MHz |

Operator: B. Itzcovich
Date/Time: 08.04.2014 16:57
Filename: 26_RE_18-26G5_RX2440_0m8_H_FCC.png/

## 7.4 Designation of emission

Standard: United States: 47 CFR "Code of Federal Regulations" – Telecommunication
☒ FCC Part 2, Subpart C: Emission: §2.201 and §2.202

Introduction: A system of designating emission, modulation and transmission characteristics shall be employed.

(a) Emissions are designated according to their classification and their necessary bandwidth.

(b) A minimum of three symbols are used to describe the basic characteristics of radio waves.

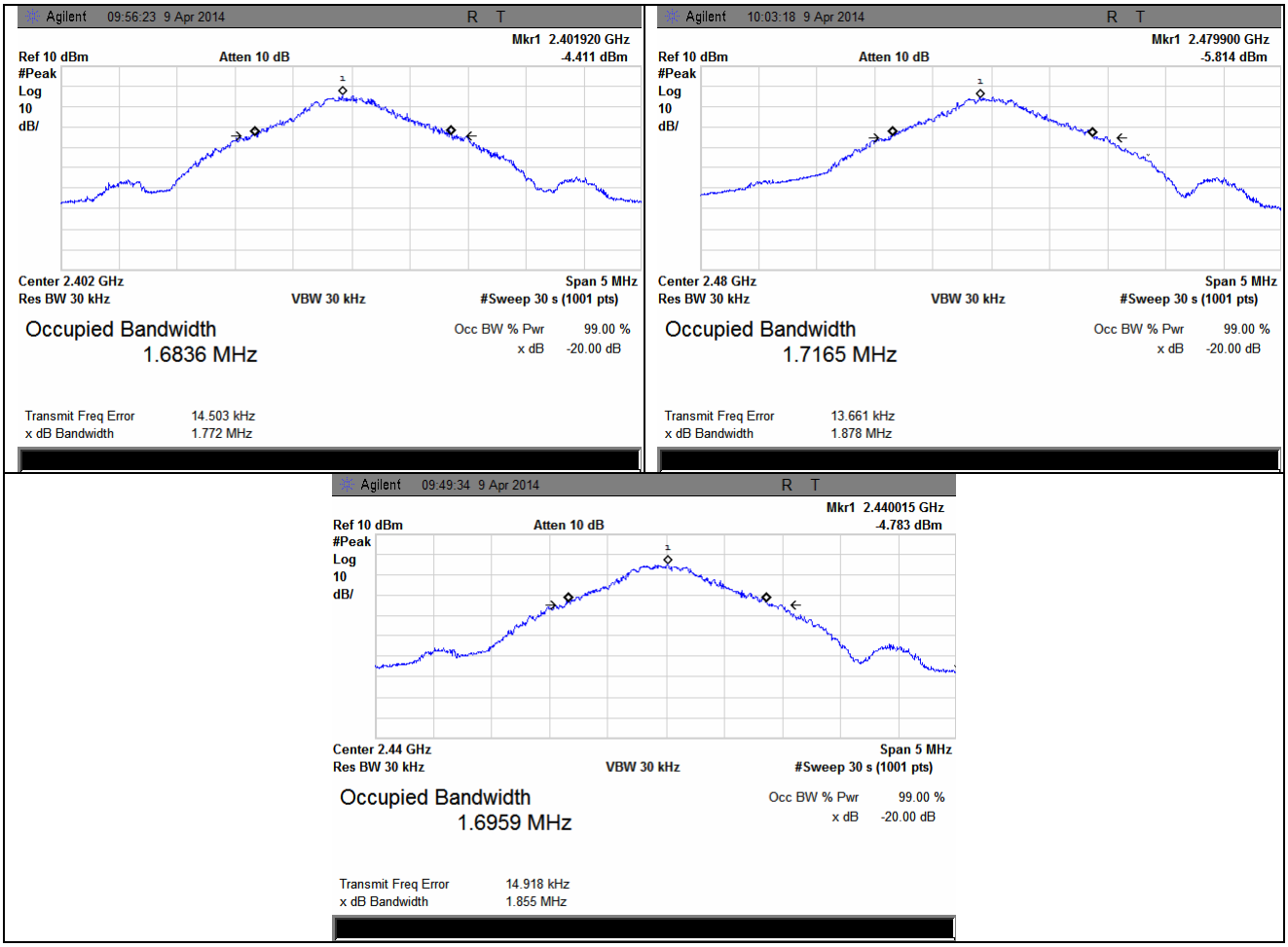
(c) Four symbols are used to describe the necessary bandwidth.

Necessary bandwidth: For a given class of emission, the minimum value of the occupied bandwidth sufficient to ensure the transmission of information at the rate and with the quality required for the system employed, under specified conditions.

$B_n$ = 1.72 MHz (occupied bandwidth)

Basic characteristics: FXD
F : frequency modulation
X : Cases not otherwise covered
D : data transmission

Designation of emission: 1M72FXD




Place and date of test: *Rossens, April 9, 2014*
Operator: *B. Itzcovich*