

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 0024

Schweizerischer Prüfstellendienst
 Service suisse d'essai
 Swiss testing service



Report:	Electromagnetic compatibility and Radio spectrum Matters		Report no:	15-MO-0238.R02
Product name:	Roger Earpiece		Mandate no:	15-MO-0238
Serial no:	Proto 60	Model number:	---	
Customer:	Phonak Communications AG Länggasse 17 CH-3280 Murten Switzerland		Date of test:	October 12 and 19, 2015

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

These tests have been performed without modifications of the EUT.

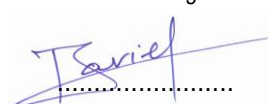
Test performed by
 Mr B. Itzcovich
 EMC Test Engineer



Report prepared by
 Mr B. Itzcovich
 EMC Test Engineer



Report controlled and approved by
 Mr T. Houriet
 EMC Test Engineer



Rossens, November 4th, 2015

(Issue Date)

2015-04-10_Rev01

Main language : English

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

t:\auftragsablage pq\auftragsablage ih-mo\2015\0200-0299\15-mo-0238_phonak_roger dm earpiece\4 prüfberichte\15-mo-0238.r02_phonak_dm-earpiece_fcc.doc

Electrosuisse Association for Electrical Engineering, Power and Information Technologies

Montena EMC
 route de Montena 75
 1728 Rossens
 Switzerland

phone +41 26 411 93 33
 fax +41 26 411 93 30
www.electrosuisse.ch
montenaemc@electrosuisse.ch

Montena EMC
 Ostermundigenstrasse 93
 3006 Bern
 Switzerland

phone +41 79 256 21 55
johannes.biner@montenaemc.ch

Contents

	<i>Page</i>
1. SUMMARY OF TEST RESULTS (FCC / CANADA)	3
2. APPLIED STANDARDS	3
3. ABBREVIATIONS	4
4. CLIENT	5
5. EQUIPMENT UNDER TEST	5
5.1 Identification	5
5.2 Pictures of the EUT	6
5.3 Classification	6
5.4 Ports	6
6. TEST CONDITIONS	7
6.1 Climatic conditions, location and date	7
6.2 Test facility and methodology	7
6.3 Attendant persons	7
6.4 Test configuration	7
6.5 Operating conditions	8
6.6 Auxiliary equipment	8
7. EMISSION TESTS	9
7.1 Carrier - Radiated emission	10
7.2 Radiated electromagnetic field (25 MHz to 1 GHz)	15
7.3 Radiated electromagnetic field (1 GHz to 26.5 GHz)	20
7.4 Designation of emission	27
8. APPENDIX	28
8.1 Test equipment	29

1. Summary of test results (FCC / Canada)

§	Test Type	Result
7	Emission	CFR 47 Part 15 Industry Canada
-	Conducted emission CFR 47 § 15.207 RSS-Gen Table 3	Not applicable ¹
7.1	Radiated emission – Carrier CFR 47 § 15.249 CFR 47 § 15.205 RSS-210 § A2.9	Pass
7.2 7.3	Radiated emission – transmit mode CFR 47 § 15.209 RSS-Gen Table 4	Pass
7.2 7.3	Radiated emission – receive mode CFR 47 § 15.109 RSS-Gen Table 2	Pass
7	Emission	CFR 47 Part 2
7.4	Designation of emission FCC 47 §2.201 FCC 47 §2.202	1M87FXD

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 4, November 2014	Spectrum Management and Telecommunications - Radio Standards Specification General Requirements and Information for the Certification of Radio Apparatus
RSS-210 issue 8, December 2010	Spectrum Management and Telecommunications - Radio Standards Specification Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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	<i>Phonak Communications AG Länggasse 17 CH-3280 Murten Switzerland</i>
Contact Person	<i>Mr Antoine Ribordy</i>
Telephone	<i>+41 26 672 96 45</i>
Fax	<i>+41 26 672 93 80</i>
E-mail	<i>antoine.ribordy@phonak.com</i>
Mandate no	<i>15-MO-0238</i>

5. Equipment under test

5.1 Identification

Manufacturer name and address	<i>Phonak Communications AG Länggasse 17 CH-3280 Murten Switzerland</i>
Production country	<i>Vietnam</i>
Brand name	<i>Phonak</i>
Product name	<i>Roger Earpiece</i>
Product description	<i>Wireless headphone 2.4 GHz</i>
Model number	<i>- - -</i>
Serial no	<i>Proto 60</i>
FCC ID IC ID	<i>FCC: KWCDME IC: 2262A-DME</i>
Software version	<i>RC13</i>
Lowest frequency	<i>26 MHz (main quartz)</i>
Highest frequency	<i>2.48 GHz (transmitter carrier) / 26 MHz (main quartz)</i>
Supply	<i>Battery: $U = 1.2 V_{DC}$ (Zinc-air) / $I = 3 \text{ mA}$ / $P = 4 \text{ mW}$</i>
Dimension	<i>~27 mm x ~10 mm x ~12 mm (l x w x h)</i>
Weight	<i>~1 g</i>
Technical documentation	<i>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.</i>

5.2 Pictures of the EUT



5.3 Classification

CFR 47 Part 15	☒ Unintentional radiator (Subpart B), Receive mode ☐ Class A digital device ☒ Class B digital device ☐ The highest frequency of the internal sources of the EUT is less than 108 MHz (measurement shall be made up to 1 GHz). ☐ 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). ☐ 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). ☐ 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). ☒ Intentional radiator (Subpart C), Transmit mode ☒ 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). ☐ 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). ☐ 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 Montena EMC 1728 Rossens Switzerland	October 12, 2015	22 - 24 °C	1005 – 1015 hPa	40 - 45 %
	October 19, 2015	22 - 24 °C	1010 – 1020 hPa	35 - 50 %

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 (2009) procedure.*

6.3 Attendant persons

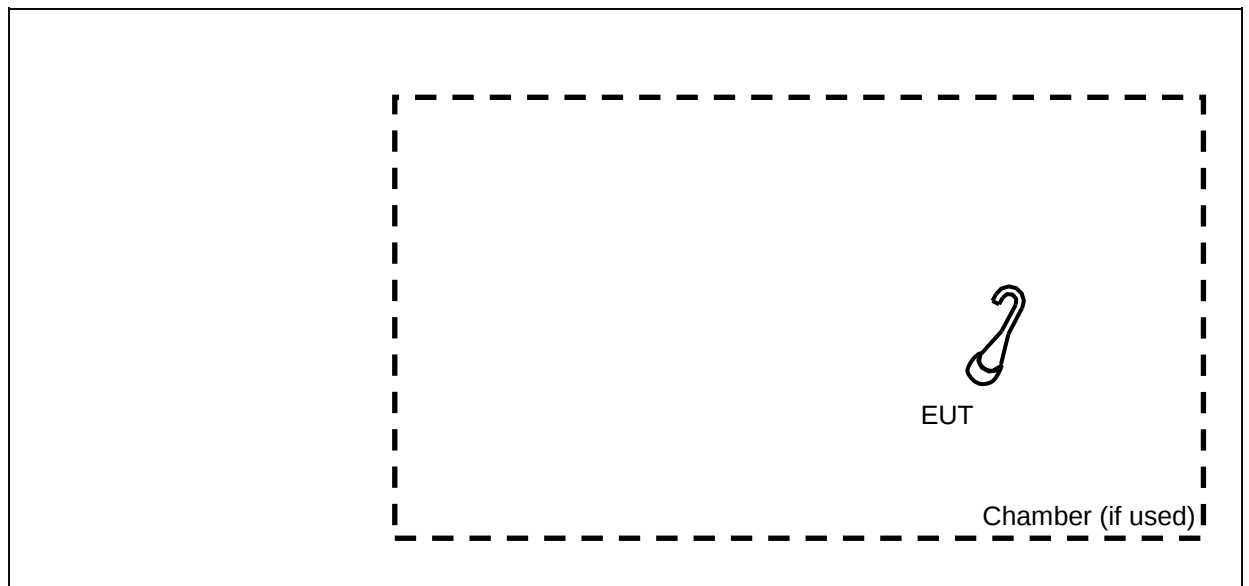
Test Engineer(s):

*Mr B. Itzcovich
EMC Test Engineer*

Other(s):

Name	Company
<i>Mr Cyril Rupf (partially)</i>	<i>Phonak Communications AG</i>

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) ☐

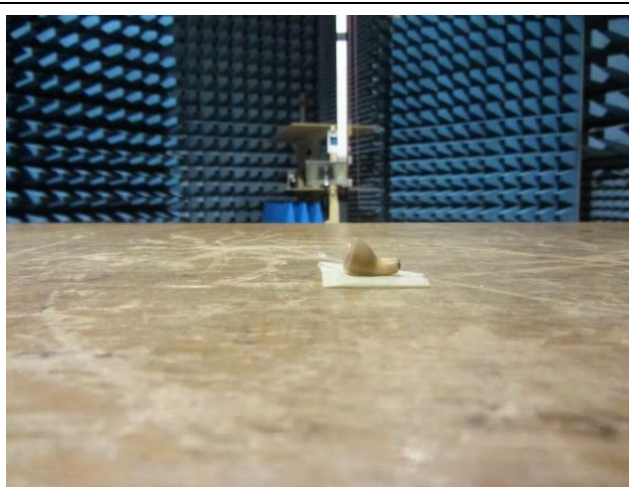
Meas. distance: ☐ 1 m ☒ 3 m ☐ 10 m ☐ 30 m

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 dB μ V/m and transformed to a measuring distance of 1 m (factor used = 20 dB/decade) if necessary
 e.g.: for $f = 2.44$ GHz, the limit is 50 mV/m at 3 m (average detector);

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

Test equipment:

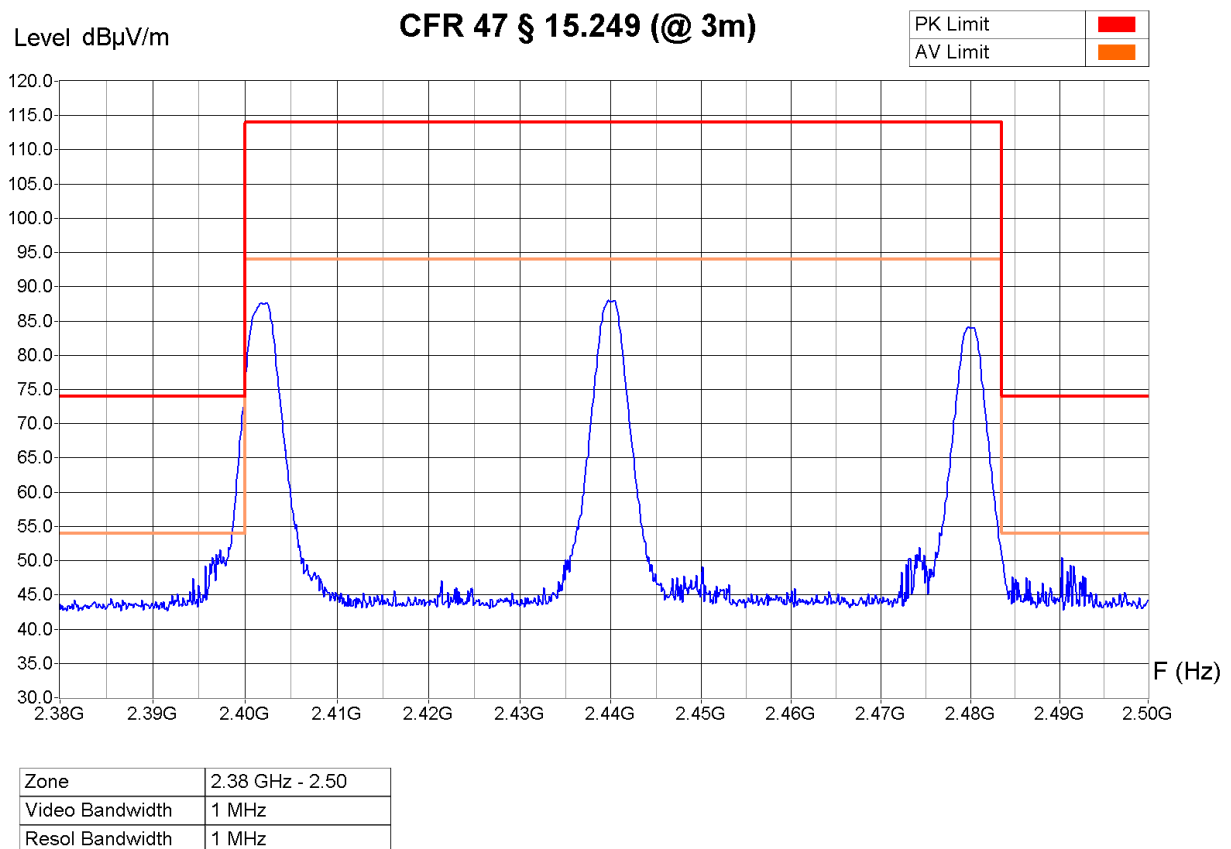
Spectrum analyser	☐ 88-14	☐ 02-06	☐ 03-45	☐ 05-39	☒ 07-53	☐ 10-70
Receiver	☐ 94-35	☐ 04-29	☐ 10-70			
Preamplifier	☐ 90-01	☐ 95-86	☐ 05-56	☐ 05-59	☐ 05-62	☐ 05-87
Antenna (horn)	☒ 90-24	☐ 98-12	☐ 98-13	☐ 07-31		☒ 14-27
Cables	☒ 06-00	☐ 06-01				

Result: ☒ pass ☐ fail ☐ not applicable ☐ partly tested

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. EUT h = 0.8 m. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us (T = 36.6 ms)
Peak detector sweep, 1001 pts, 1 sweeps, ST = 60s

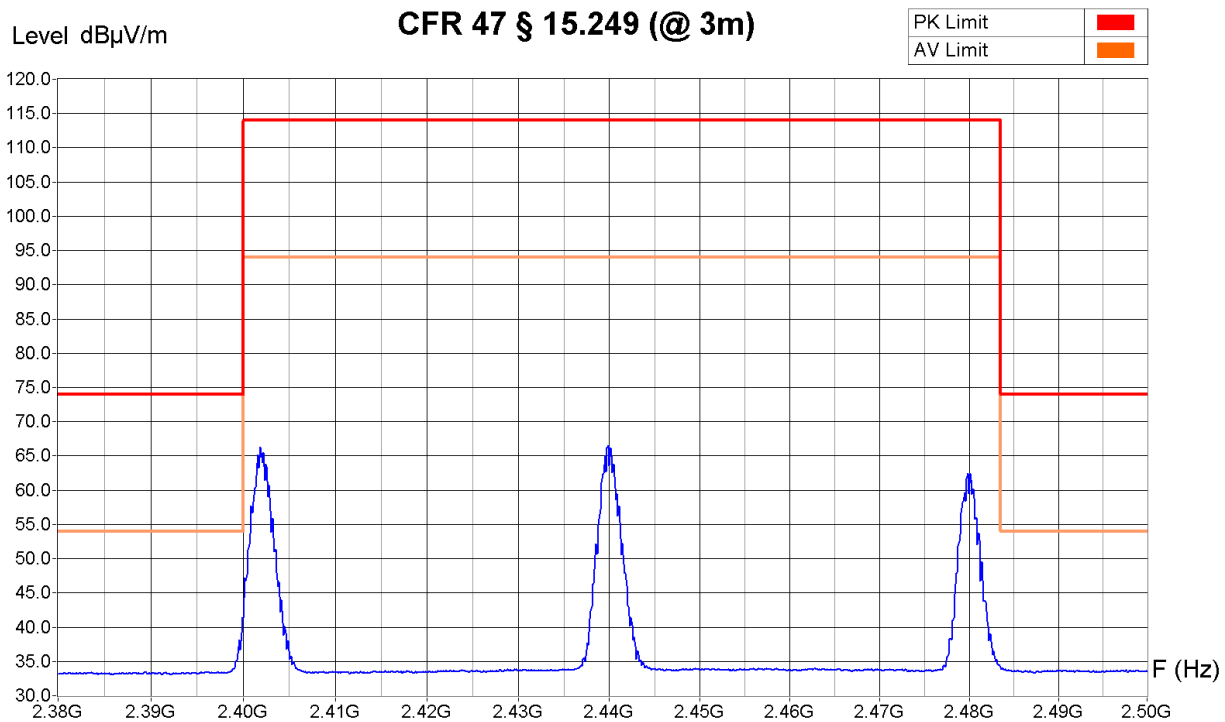


Operator: B. Itzcovich
Date/Time: 12.10.2015 09:39
Filename:
01_RE_2G44_0m8_V_PK.png/.txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
 Set-Up : Cage 06-00. EUT h = 0.8 m. See photos
 Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
 Remarks : Ton = 184 us + 76 us (T = 36.6 ms)
 Average RMS detector sweep, 1001 pts, 1 sweep, ST = 60s



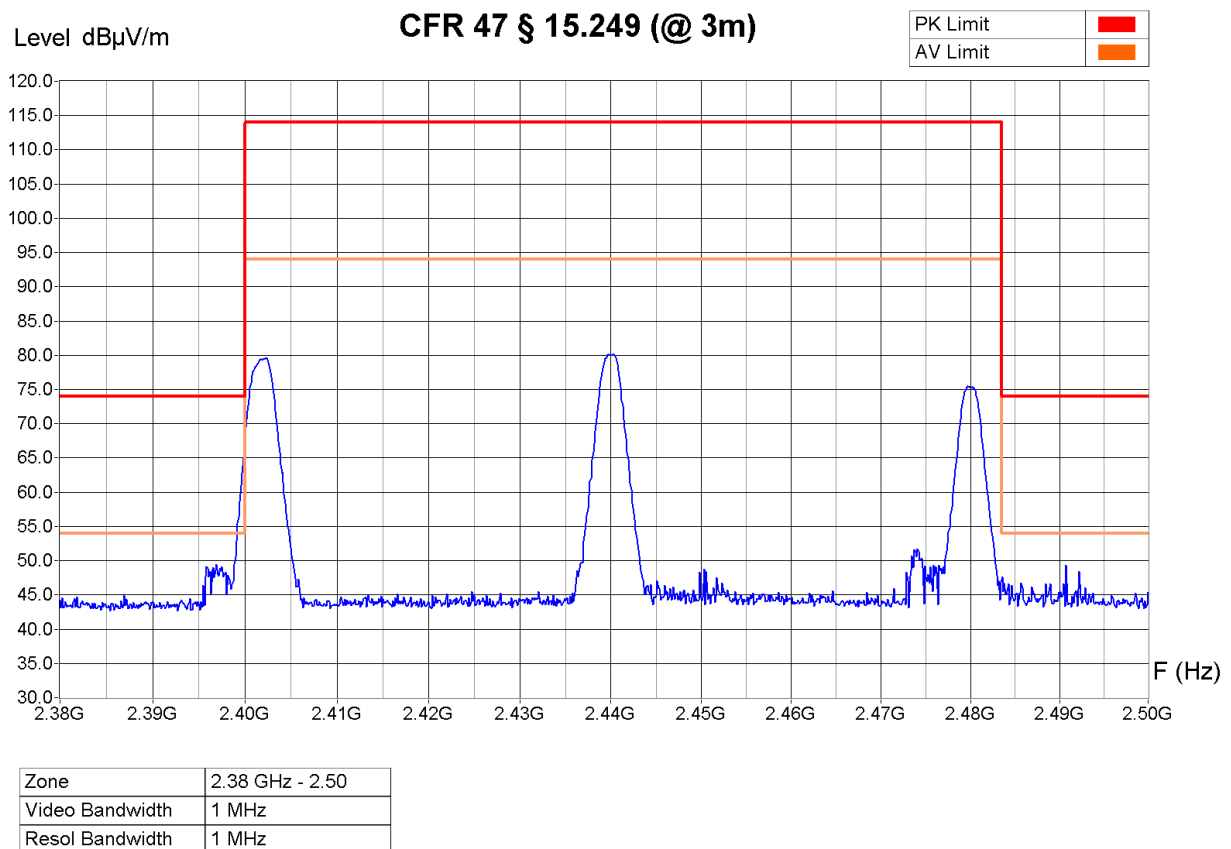
Zone	2.38 GHz - 2.50
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: B. Itzcovich
 Date/Time: 12.10.2015 09:41
 Filename:
 02_RE_2G44_0m8_V_AV.png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0° - 360° (max emission @ 200°)
Antenna Height : 1 - 2.5m (max emission @ 1m)



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. EUT h = 0.8 m. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us (T = 36.6 ms)
Peak detector sweep, 1001 pts, 1 sweeps, ST = 60s



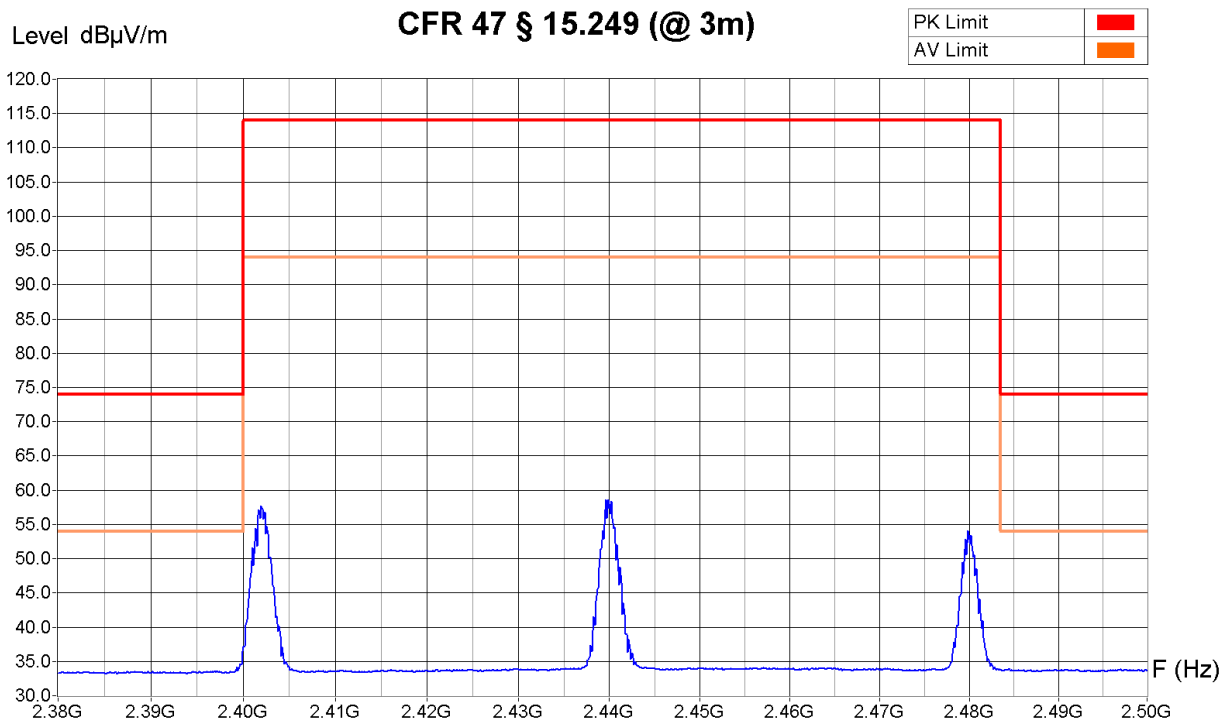
Operator: B. Itzcovich
Date/Time: 12.10.2015 09:53
Filename:
03_RE_2G44_0m8_H_PK.png/.txt

Measurement Type : Radiated Field
 Polarisation : Horizontal
 Table Angle : 0° - 360° (max emission @ 200°)
 Antenna Height : 1 - 2.5m (max emission @ 1m)



montena
 montena emc sa

Equipment Under Test : Roger Earpiece (DM Earpiece)
 Set-Up : Cage 06-00. EUT h = 0.8 m. See photos
 Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
 Remarks : Ton = 184 us + 76 us (T = 36.6 ms)
 Average RMS detector sweep, 1001 pts, 1 sweeps, ST = 60s



Zone	2.38 GHz - 2.50
Video Bandwidth	3 MHz
Resol Bandwidth	1 MHz

Operator: B. Itzcovich
 Date/Time: 12.10.2015 09:55
 Filename:
 04_RE_2G44_0m8_H_AV.png/.txt

7.2 Radiated electromagnetic field (25 MHz to 1 GHz)

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

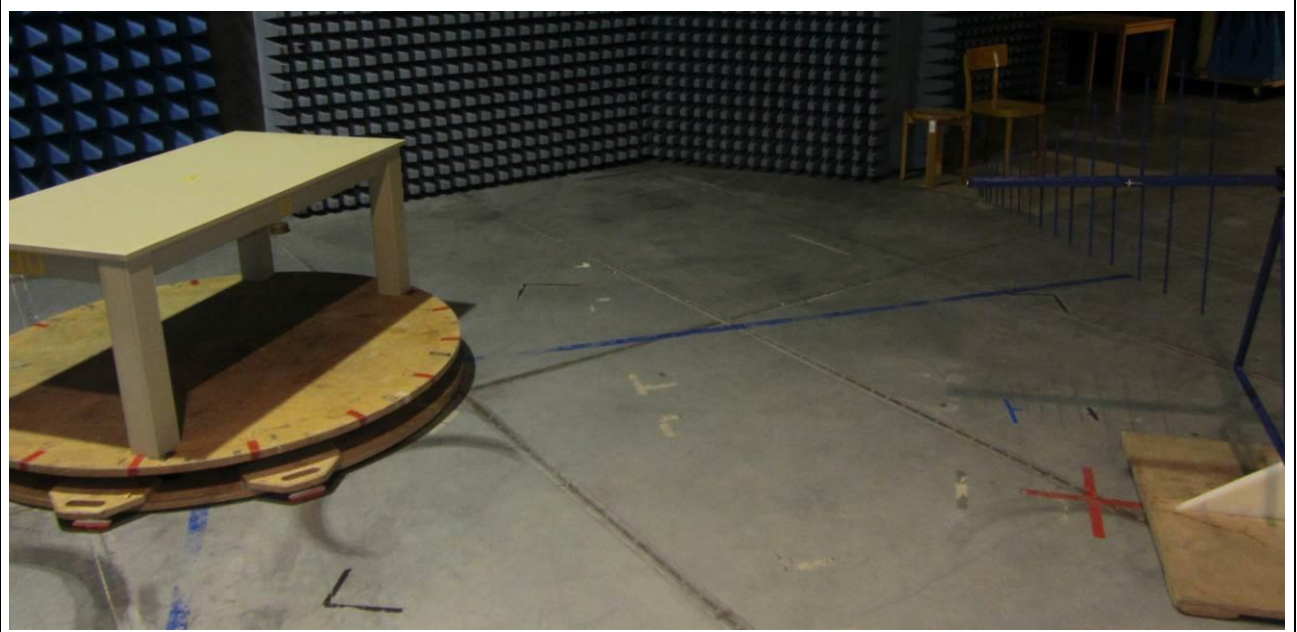
Distance: ☒ 3 m ☐ 10 m ☐ 30m

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, (bilog)	☒ 94-03	☐ 05-38				
Cables	☐ 06-00	☒ 06-01				

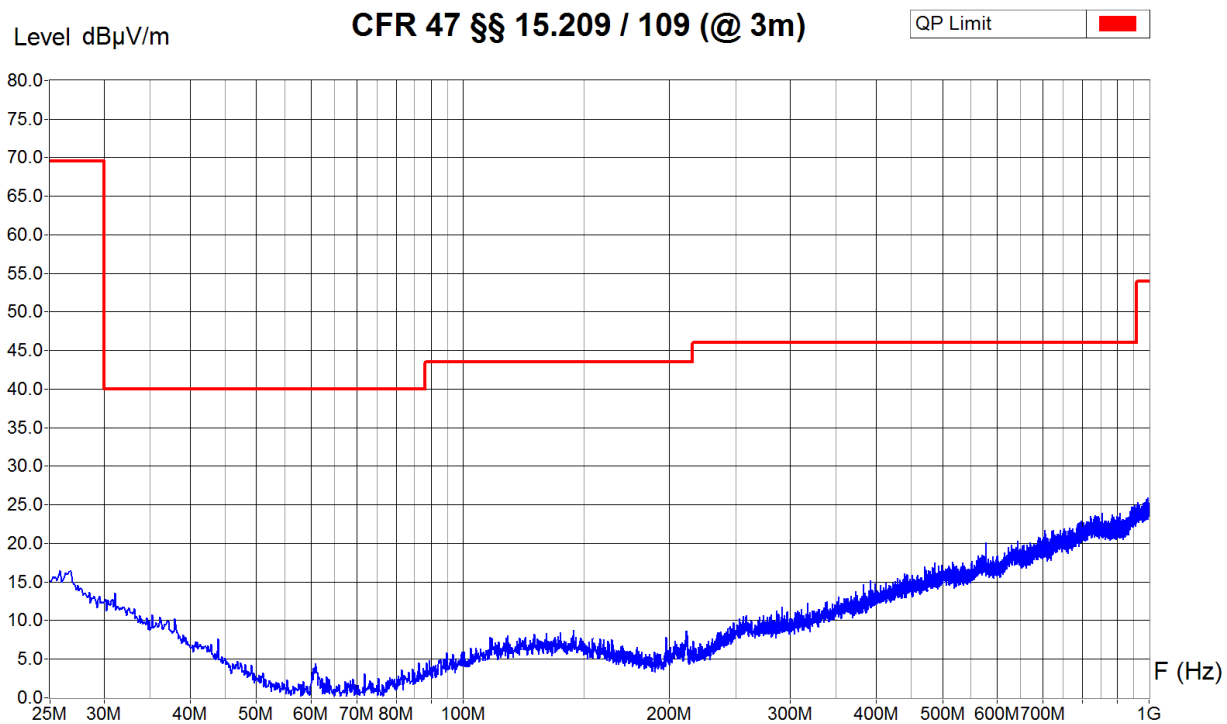
Result:	☒ pass	☐ fail	☐ not applicable	☐ partly tested
----------------	--	-------------------------------	---	--

7.2.1 Transmit mode

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
 Set-Up : Cage 06-01. See photos
 Operating Conditions : Hopping emission ($f = 2.402 / 2.440 / 2.480$ GHz), modulated, max power
 Remarks : Ton = 184 us + 76 us / T = 36.6 ms
 Peak detector sweeps (max hold), 8001 pts, SWT = 0.5 s



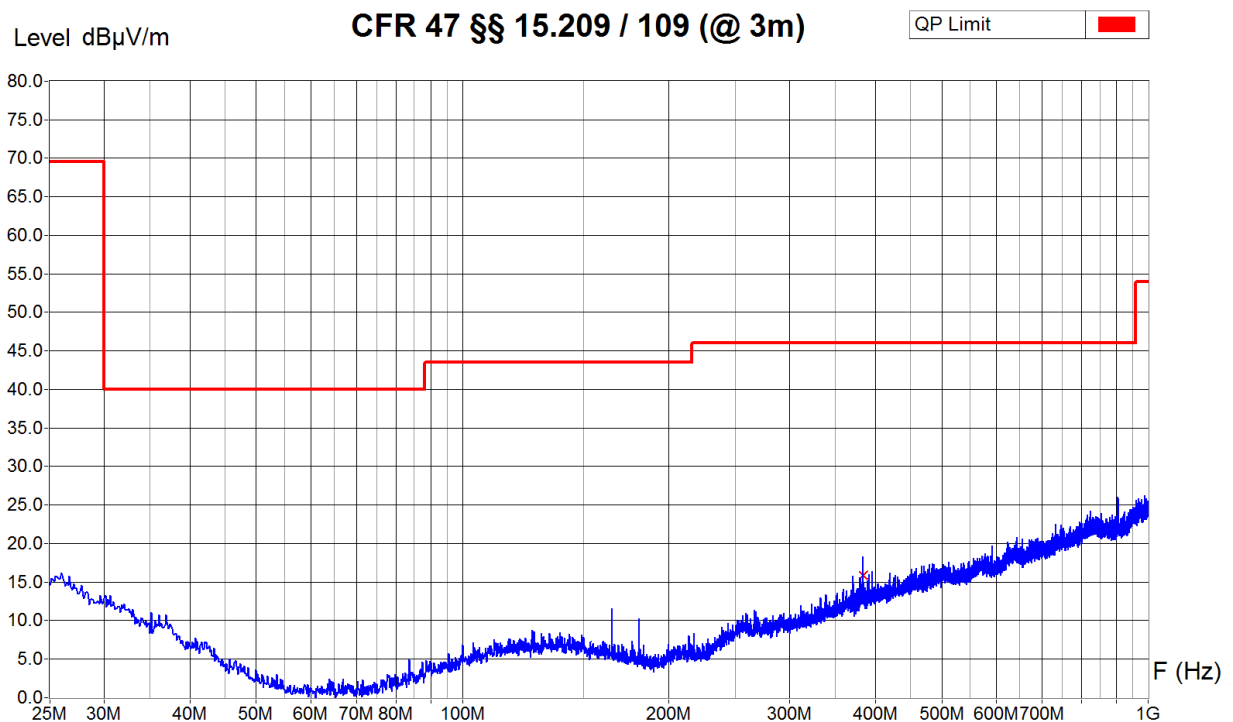
Zone	25 MHz - 1 GHz
Video Bandwidth	300 KHz
Resol Bandwidth	120 KHz

Operator: B. Itzcovich
 Date/Time: 19.10.2015 09:13
 Filename:
 11_RE_25M-1G_TX3f_FCC.png/
 .txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-01. See photos
Operating Conditions : Hopping emission ($f = 2.402 / 2.440 / 2.480$ GHz), modulated, max power
Remarks : Ton = 184 us + 76 us / T = 36.6 ms
Peak detector sweeps (max hold), 8001 pts, SWT = 0.5 s



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

Receiver Measures

Frequency	Peak	QuasiPeak (x)	Average (+)	QP Margin
384.03 MHz	19.4 dB μ V/m	15.9 dB μ V/m	12.8 dB μ V/m	30.1 dB

Operator: B. Itzcovich
Date/Time: 19.10.2015 09:28
Filename:
12_RE_25M-1G_TX3f_FCC.png/
.txt

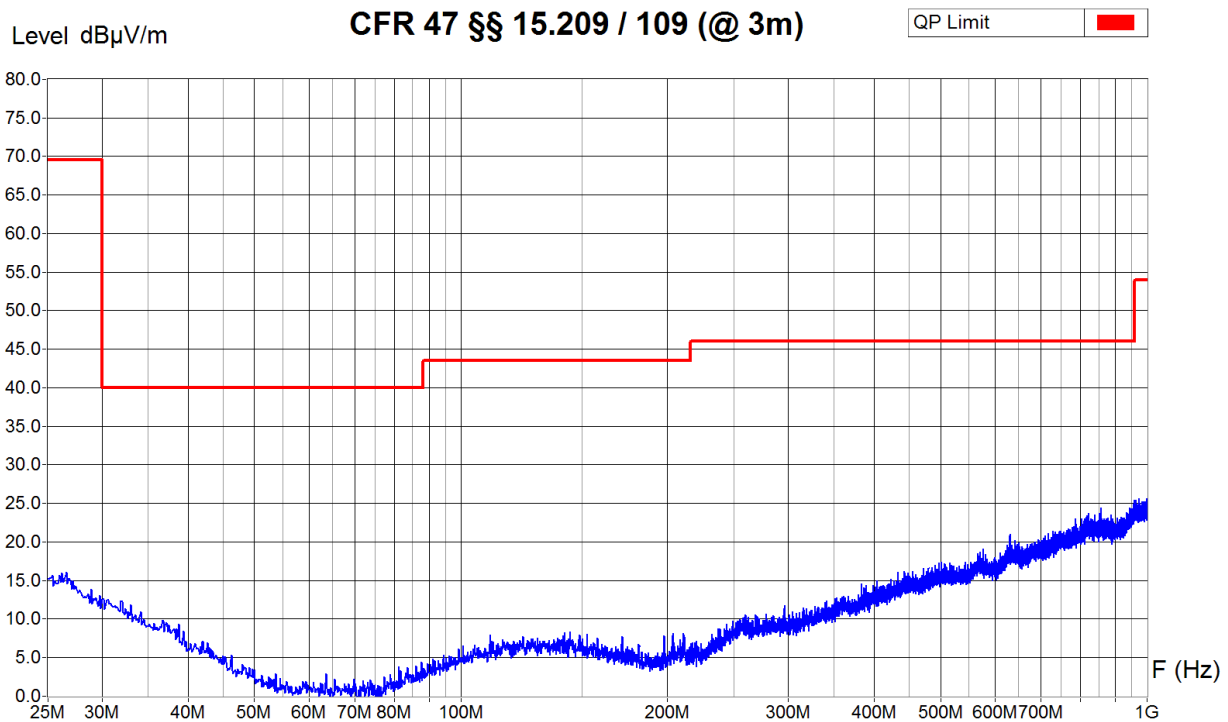
7.2.2 Receive mode

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
 Set-Up : Cage 06-01. See photos
 Operating Conditions : Continuous reception (f = 2.440 GHz)
 Remarks :

Peak detector sweeps (max hold), 8001 pts, SWT = 0.5 s



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

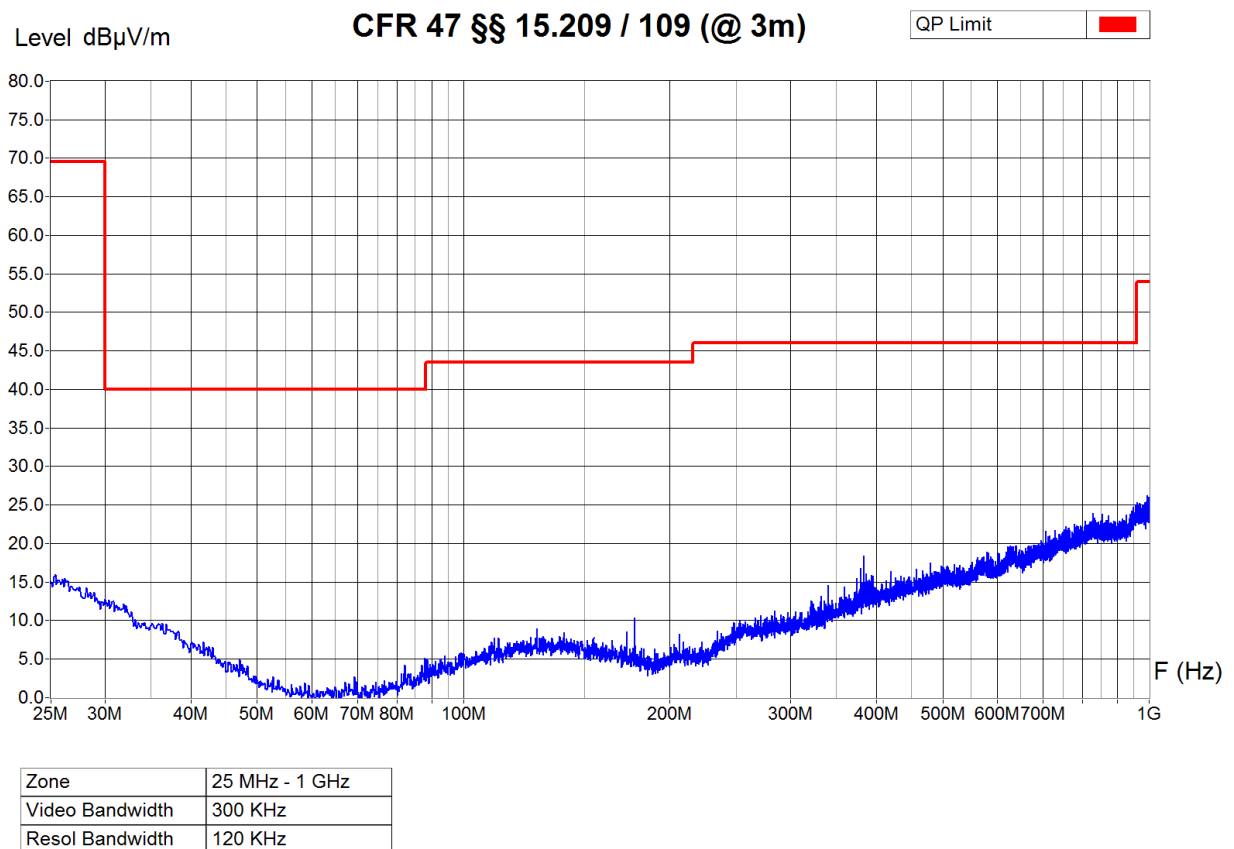
Operator: B. Itzcovich
 Date/Time: 19.10.2015 09:54
 Filename:
 13_RE_25M-1G_RX_V_FCC.png/
 .txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-01. See photos
Operating Conditions : Continuous reception (f = 2.440 GHz)
Remarks :

Peak detector sweeps (max hold), 8001 pts, SWT = 0.5 s



Operator: B. Itzcovich
Date/Time: 19.10.2015 09:46
Filename:
14_RE_25M-1G_RX_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: 0.8 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:



Remarks: ---

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	☒ 14-27
Antenna (horn)	☒ 90-24	☐ 98-10	☐ 98-12	☐ 07-31			
Antenna with mixer	☒ 98-12	☐ 98-13					
Cables	☒ 10-79	☒ 10-75	☒ 10-81	☒ 11-62			
Power supply	☐ 99-04	☐ 99-07	☒ 06-62				
Filter	☐ 12-06						

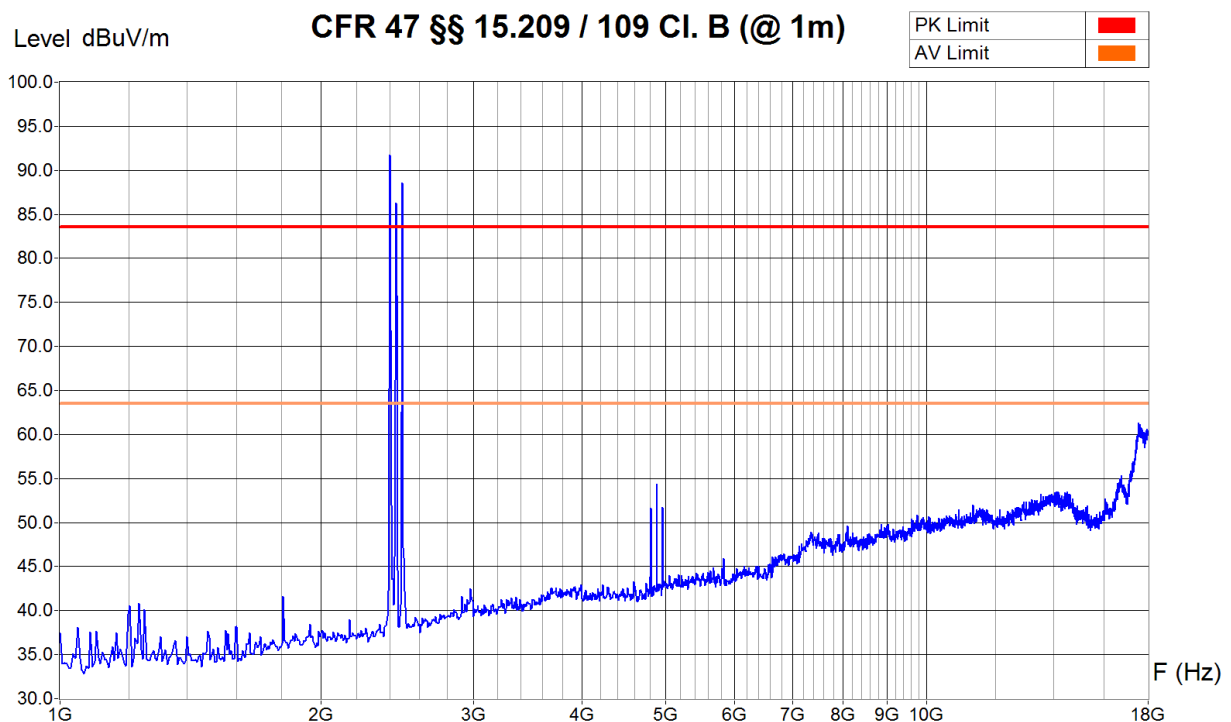
Result: ☒ pass ☐ fail ☐ not applicable ☐ partly tested

7.3.1 Transmit mode

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us / T = 36.6 ms
Peak detector sweeps (max hold), 1001 pts per zone, SWT = 0.5 s



Zone	1 GHz - 7 GHz	7 GHz - 13 GHz	13 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz

Frequency	Average RMS detector meas.
17.960 GHz	51.91 dBuV/m

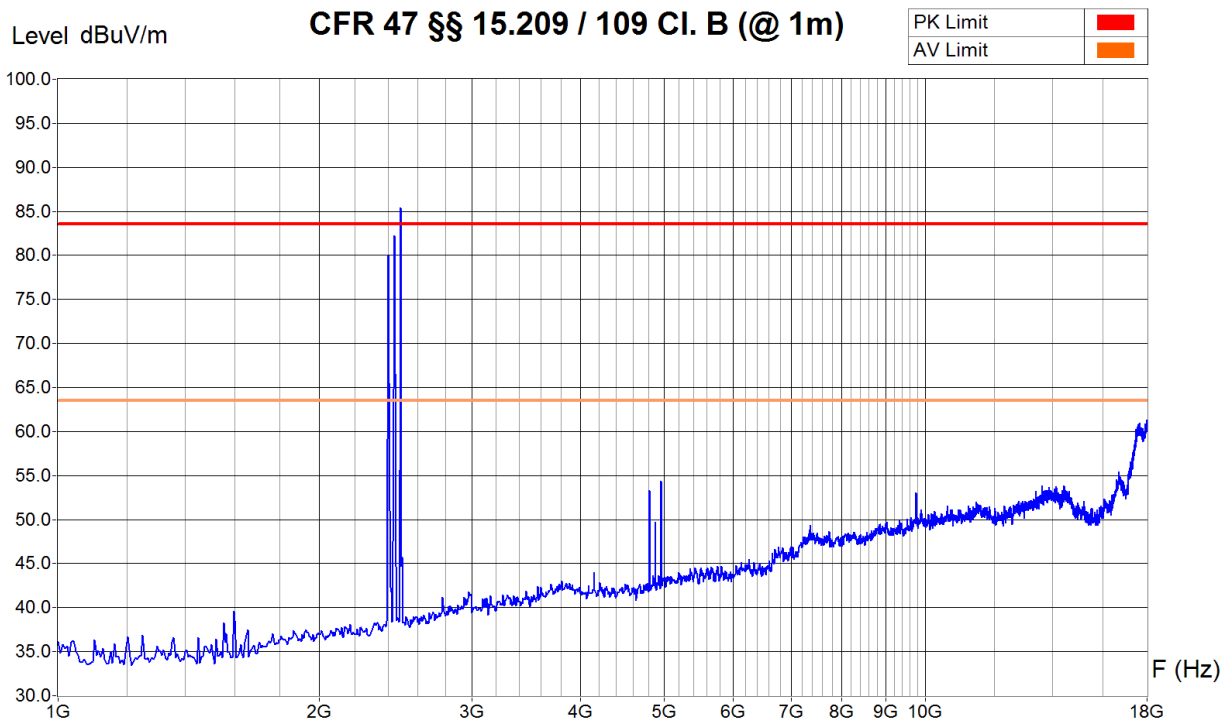
Operator: B. Itzcovich
Date/Time: 19.10.2015 11:55
Filename:
15_RE_1-18G_TX3f_V_FCC.png/
.txt

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



montena
montena emc sa

Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us / T = 36.6 ms
Peak detector sweeps (max hold), 1001 pts per zone, SWT = 0.5 s



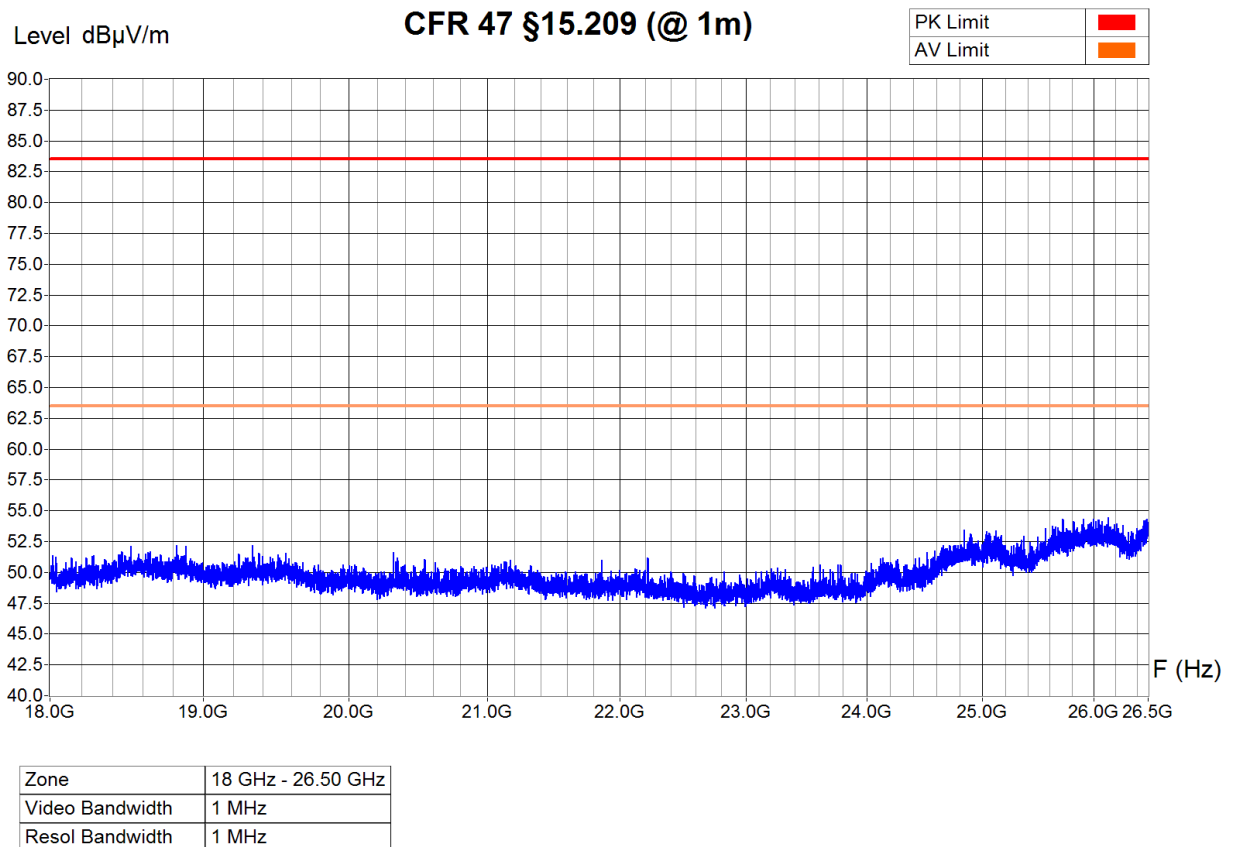
Zone	1 GHz - 7 GHz	7 GHz - 13 GHz	13 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz

Operator: B. Itzcovich
Date/Time: 19.10.2015 12:27
Filename:
16_RE_1-18G_TX3f_H_FCC.png/
.txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us / T = 36.6 ms
Peak detector sweeps (max hold), 8001 pts per zone, SWT = 0.5 s

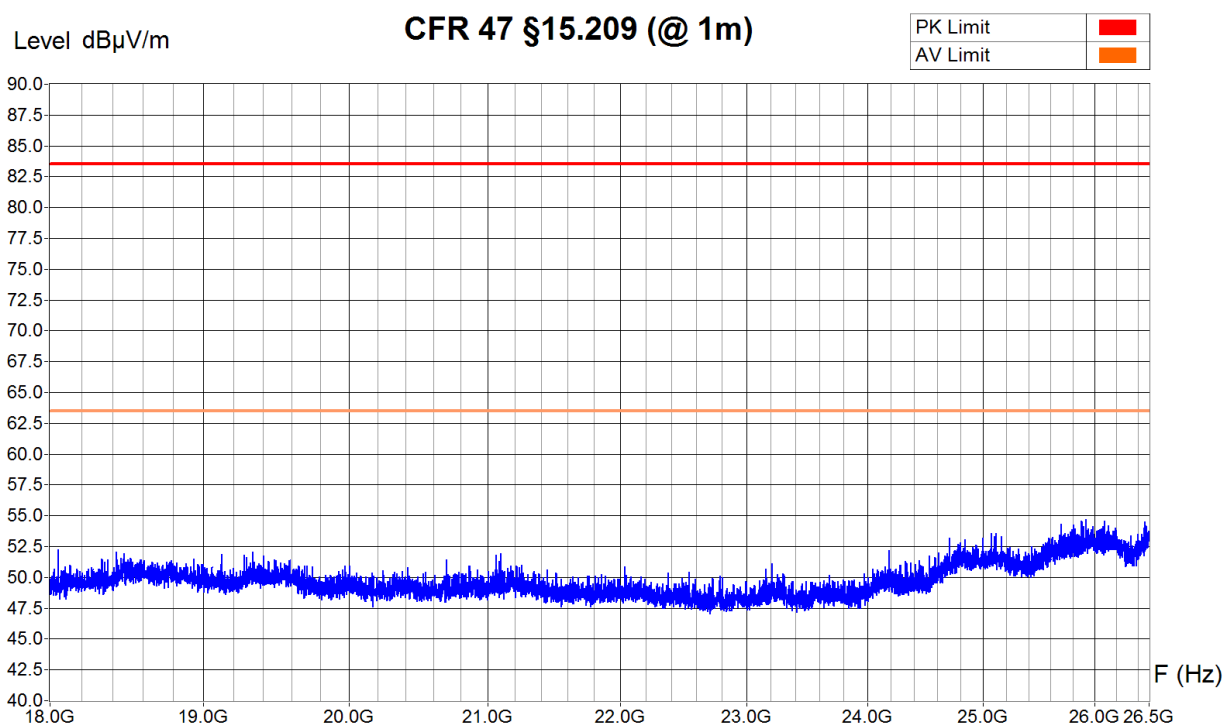


Operator: B. Itzcovich
Date/Time: 19.10.2015 13:32
Filename:
19_RE_18-
26G5_TX3f_V_FCC.png/.txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. See photos
Operating Conditions : Hopping emission (f = 2.402 / 2.440 / 2.480 GHz), modulated, max power
Remarks : Ton = 184 us + 76 us / T = 36.6 ms
Peak detector sweeps (max hold), 8001 pts per zone, SWT = 0.5 s



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

Operator: B. Itzcovich
Date/Time: 19.10.2015 13:35
Filename:
20_RE_18-
26G5_TX3f_H_FCC.png/.txt

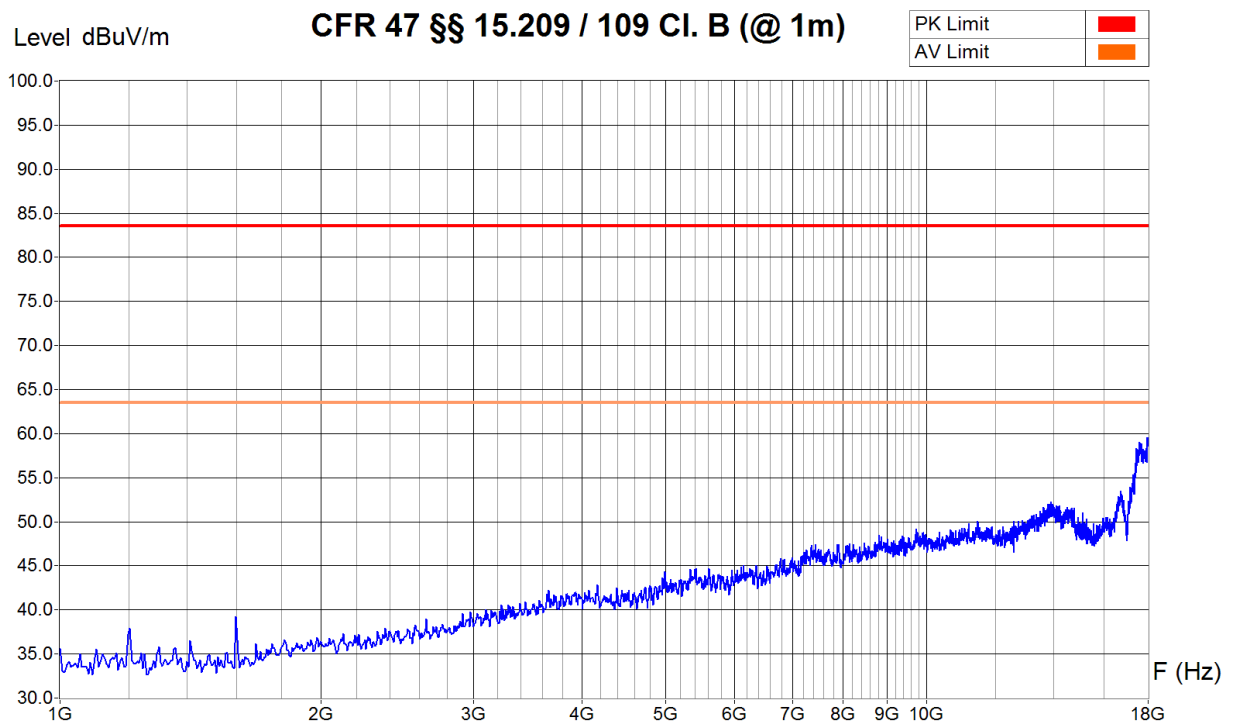
7.3.2 Receive mode

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
Set-Up : Cage 06-00. See photos
Operating Conditions : Continuous reception (f = 2.440 GHz)
Remarks :

Peak detector sweeps (max hold), 1001 pts per zone, SWT = 0.5 s



Zone	1 GHz - 7 GHz	7 GHz - 13 GHz	13 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz

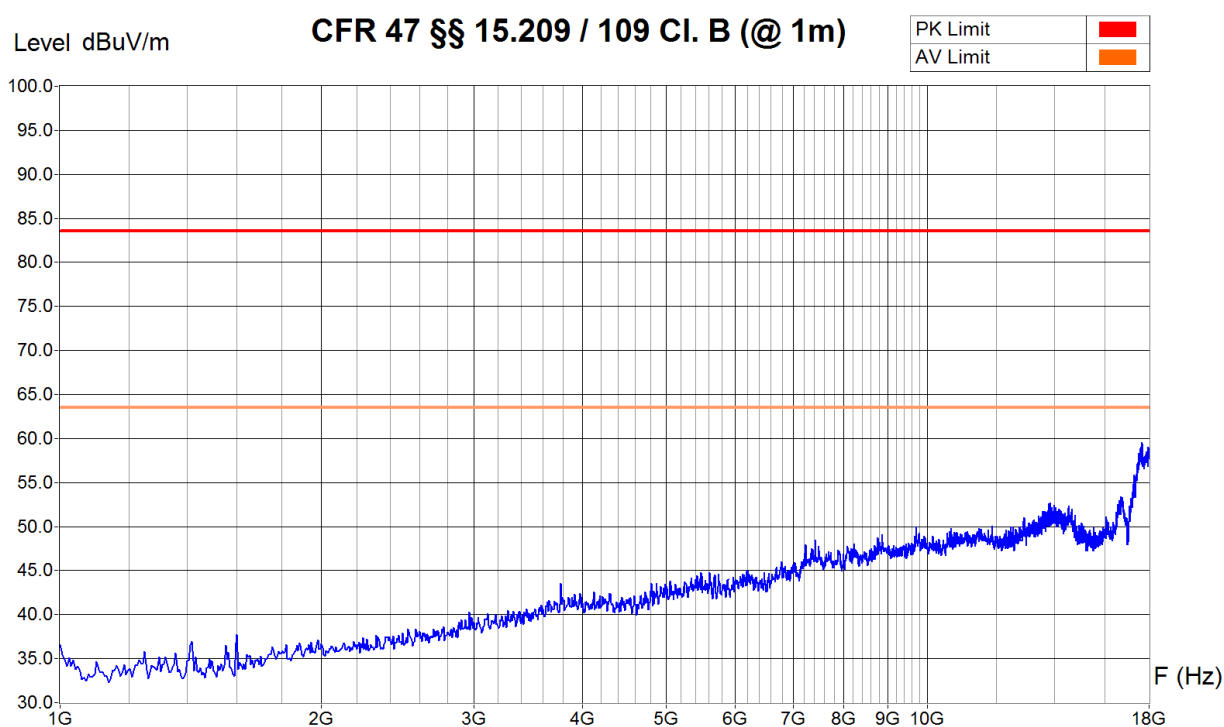
Operator: B. Itzcovich
Date/Time: 19.10.2015 12:49
Filename:
17_RE_1-18G_RX_V_FCC.png/
.txt

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



Equipment Under Test : Roger Earpiece (DM Earpiece)
 Set-Up : Cage 06-00. See photos
 Operating Conditions : Continuous reception (f = 2.440 GHz)
 Remarks :

Peak detector sweeps (max hold), 1001 pts per zone, SWT = 0.5 s



Zone	1 GHz - 7 GHz	7 GHz - 13 GHz	13 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz

Operator: B. Itzcovich
 Date/Time: 19.10.2015 12:42
 Filename:
 18_RE_1-18G_RX_H_FCC.png/
 .txt

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.

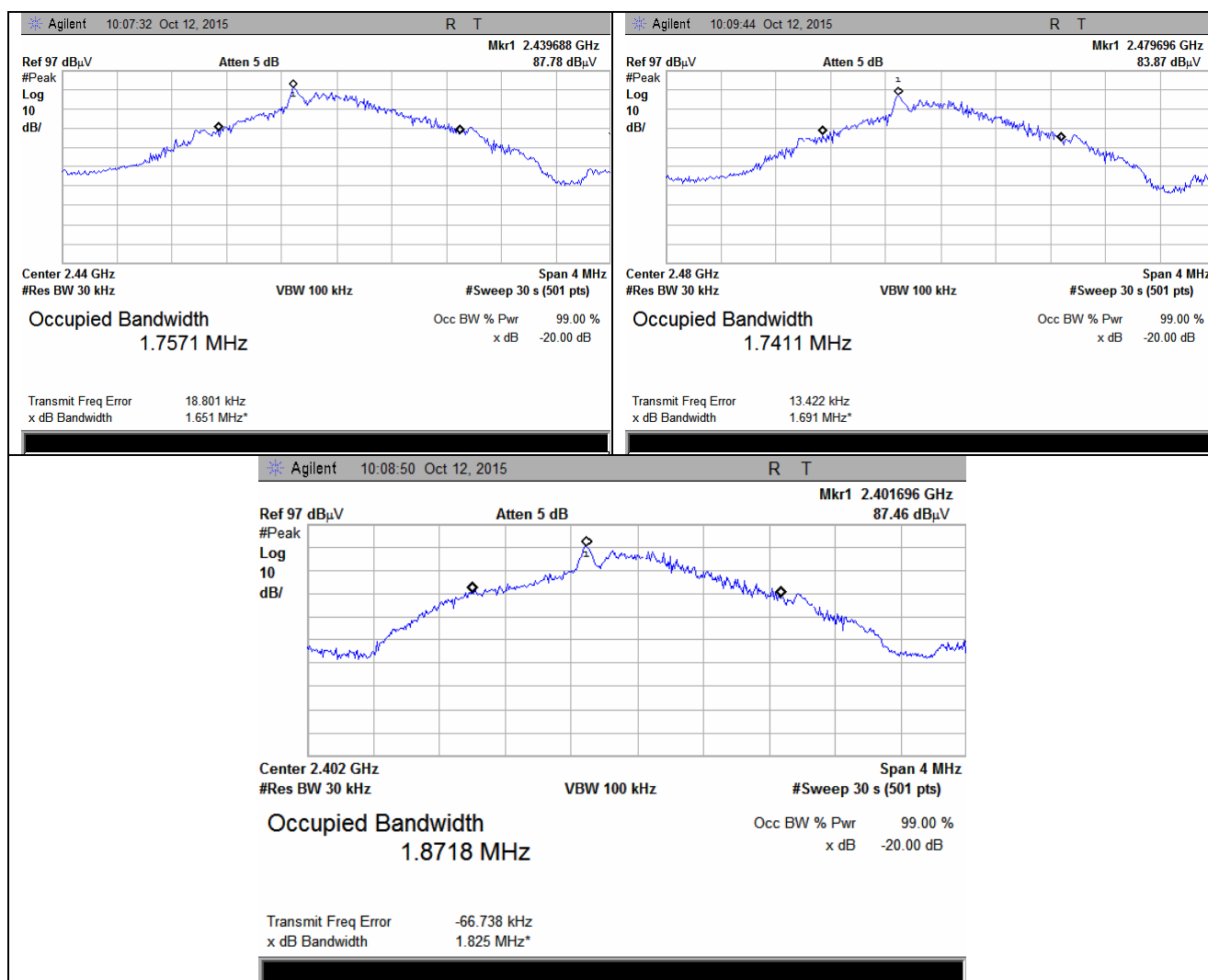
(c) Four symbols are used to describe the necessary bandwidth.

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.

$$B_n = 1.87 \text{ MHz (occupied bandwidth)}$$

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

Designation of emission: 1M87FXD



Place and date of test:
 Operator:

Rossens, October 12, 2015
 B. Itzcovich

8. Appendix

8.1 Test equipment

Inventory No.	Designation	Manufacturer	Type	Serial No.	Cal. date	Next calibr.	Cal. period [year]
90-24	Horn antenna	Emco	3115	9008-3514	09 Jul. 2015	09 Jul. 2017	2
94-03	Bi-Log antenna	Chase	CBL6111	1056	03 Sep. 2014	03 Sep. 2016	2
98-12	Horn Antenna + Preamp. + Mixer	Emco + Miteq + Hewlett Packard	3160-09 + JDM2W-18002650- 27-10P-R + 11970K	9809-1121 + 1707479 + 232A01295	17 Aug. 2012	17 Aug. 2017	5
05-59	Preamplifier	Montena EMC	AM-1300	432972	19 Aug. 2014	19 Aug. 2016	2
14-27	Preamplifier	Montena EMC	AFS42-00101800- 25-S-42	1275133	28 Oct. 2014	28 Oct. 2016	2
06-00	Cable	Huber&Suhner	ST18A ST18A SF106PA	6224/18A 8399/18A 463/6PA	19 Nov. 2014	19 Nov. 2015	1
06-01	Cable	Huber&Suhner	SF106PA SF106PA SF106PA	415/6PA 414/6PA 412/6PA	19 Dec. 2014	19 Dec. 2015	1
10-79	Cable	Huber&Suhner	ST18A	8444/18A	19 Dec. 2014	19 Dec. 2016	2
10-75	Cable	Huber&Suhner	ST18A	8385/18A	19 Dec. 2014	19 Dec. 2016	2
10-81	Cable	Huber&Suhner	SF104P	44159/4P	19 Dec. 2014	19 Dec. 2016	2
11-62	Cable	Huber&Suhner	SF104P	51338/4P	19 Dec. 2014	19 Dec. 2016	2
07-53	Spectr. analyzer	Hewlett Packard	E4407B	SG45101517	30 Oct. 2014	30 Oct. 2016	2
10-70	Receiver + Spectr. analyzer	Rohde&Schwarz	ESU8	1302.6005K08	13 Oct. 2014	13 Oct. 2016	2

Remark: Test equipment for which no calibration date is defined, is controlled during the test by another calibrated equipment. E.g. the output of a power supply with variable transformer is verified by a calibrated multimeter.