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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: Rapport: Bericht:	***Radio spectrum matters***	Report no: Rapport no: Bericht Nr:	***15'940***
Product name: Nom du produit: Produktname	***Phonak PilotOne***	Mandate no: Mandat no: Auftrag Nr:	***20098839***
Serial no: No de série: Seriennummer:	***15***	Model number: Numéro de modèle: Modellnummer:	***Not applicable***
Customer: Client: Kunde:	***Phonak AG*** ***Laubisrütistrasse 28*** ***8712 Staefa*** ***Switzerland***	Date of test: Date de l'essai: Prüfdatum:	***November 30 to December 1, 2009***

Standards / Normes / Normen		Result Résultat Ergebnis
47 CFR, Part 15	(Subpart C, Intentional radiator: §§ 15.207/209)	***Pass***

Test performed by
Essai effectué par :
Prüfer

Mr Erich Staub, Mr Andreas Bieri

Test report prepared by
Rapport d'essai préparé par :
Berichterstatter

Mr Erich Staub, Mr Andreas Bieri

Test report controlled and approved by
Rapport d'essai contrôlé et approuvé par :
Prüfbericht kontrolliert und genehmigt durch

Mr Emmanuel de Raemy

Rossens, February 24, 2010 (Issue Date / Date d'édition / Ausstelldatum) V2009Nov12

Main language / Langue principale / Hauptsprache : *english* / *français* / *deutsch*

The present document results from tests on a specimen and does not prejudge to the conformity of all the manufactured products. - Le présent document résulte d'essais sur un spécimen. Il ne préjuge pas de la conformité de l'ensemble des produits fabriqués à l'objet essayé. - Dieser Bericht beinhaltet die Prüfergebnisse eines Mustergerätes. Es kann daraus nicht auf die Übereinstimmung der Seriegeräte mit dem Mustergerät geschlossen werden.

q:\mandats\2009\20098839_neratec_pilotone\cem-radio\rap_neratec_15940_fcc.doc

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1. Summary of test results / Résumé des résultats d'essais / Zusammenfassung der Prüfergebnisse

✓ Pass / Réussi / Bestanden

✖ Fail / Echoué / Nicht bestanden

∅ Not applicable to this product / Pas applicable à ce produit / Nicht anwendbar für dieses Produkt

— Not tested / Pas testé / Nicht geprüft

No requirements / Pas d'exigence / Keine Anforderung

§	Test Type / Type d'essai / Art der Prüfung		Result / Résultat / Ergebnis
6	***Emission / Emission / Störaussendung***		***47 CFR 15 Subpart C***
-	Conducted emission Émission par conduction Geleitete Emission	CFR 47 § 15.207 RSS-Gen § 7.2.2	∅ [1]
6.1	Radiated emission – H-field Émission par rayonnement – Champ H Gestrahlte Emission – H-Feld	CFR 47 § 15.209 RSS-310 Tables 3 and 4	✓
6.2	Radiated emission – EM-field Émission par rayonnement – Champ EM Gestrahlte Emission – EM-Feld	CFR 47 § 15.209 RSS-310 Tables 3 and 4	✓ [2]

1. Powered with / Alimenté avec / Gespeist mit : Internal non-rechargable battery
2. Measurements at frequencies above 1 GHz are not required as the highest frequency of the EUT is 10.6 MHz. / Mesures à des fréquences au dela de 1 GHz ne sont pas exigées car la fréquence maximale de l'EUT est de 10.6 MHz. / Messungen bei Frequenzen oberhalb von 1 GHz sind nicht gefordert, aufgrund der höchsten Frequenz des EUT's von 10.6 MHz.

2. Applied standards / Normes appliquées / Verwendete Normen

CFR 47 Part 15 Subpart C	Code of Federal Regulations - Title 47 - Telecommunication, Part 15, Subpart B: "Intentional Radiators"

3. Client / Client / Kunde

Client name and address Nom et adresse du client Name und Adresse des Kunden	*Phonak AG* *Laubisrütistrasse 28* *8712 Staefa* *Switzerland*
Contact Person / Responsable / Kontaktperson	*Mr Micha Knaus*
Telephone / Téléphone / Telefon	*+41 58 928 01 01*
Fax / Télécopieur / Telefax	*+41 58 928 07 07*
E-mail / Courrier électronique / E-mail	*contact@phonak.ch*
Mandate no / No. de mandat / Auftragsnr.	*20098839*

4. Equipment under test / Equipement à l'essai / Prüfling

4.1 Identification / Identification / Identifikation

Manufacturer name and address Nom et adresse du fabricant Name und Adresse des Herstellers	*Phonak AG* *Laubisrütistrasse 28* *8712 Staefa* *Switzerland*
Production country / Pays de fabrication / Ursprungsland	*Switzerland*
Brand name / nom de marque / Verkaufsmarke	*Phonak*
Product name / Nom du produit / Produktname	*Phonak PilotOne*
Product description / Description du produit / Produktbeschreibung	*Remote control (with 2 transmission frequencies: 40.96 kHz and 10.6 MHz)*
Model number / Numéro de modèle / Modellnummer	*Not applicable*
Serial no / No. de série / Seriennummer	*15*
Software version / Version du logiciel / Softwareversion	*0.0.9.0*
Highest frequency / Fréquence la plus élevée / Höchste Frequenz	*10.6 MHz*
Supply / Alimentation / Speisung	*U = 1.5 Vdc (AAA battery)*
Technical documentation Documentation technique Technische Dokumentation	*None. The equipment is completely identified by its serial no. according to ISO 9001.*

4.2 Pictures of the EUT / Photos de l'EST / Fotos des Prüflings

	*Top view*

	*Bottom view*

4.3 Classification / Classification / Klassierung

CFR 47 Part 15	☐ Unintentional radiator (Subpart B) ☐ 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) ☒ 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 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).

4.4 Ports / Accès / Anschlüsse

None

4.5 Modifications / Modifications / Angebrachte Änderungen

None

5. Test conditions / Conditions d'essai / Testbedingungen

5.1 Climatic conditions, location and date / conditions climatiques, lieu et date / klimatische Bedingungen, Ort und Datum

Location / Lieu / Ort:	Date / Date / Datum:	Temp. / Temp. / Temp.:	Pressure / Pression / Druck [QFF]:	Rel. humidity / Humidité rel. / Rel. Luftfeuchtigkeit:
montena emc sa CH-1728 Rossens	*November 30, 2009*	*21 °C*	*1015 hPa*	*36 %*
	December 1, 2009	*20.9 °C*	*1010 hPa*	*35.8 %*

5.2 Test facility and methodology / Lieu d'essai et méthodologie / Prüfort und Methodik

The alternate test site (ferrite chamber) is accepted by FCC (Reg. No. 90808).
Conducted and radiated measurements are performed according to the ANSI C63.4 (2003) procedure.

The open area test site is accepted by Industry Canada (Site number 3625A-1).

5.3 Attendant persons / Personnes présentes / Anwesende Personen

Test Engineer(s) / Ingénieur(s) d'essai / Prüfingenieur(e) :

Mr Erich Staub, Mr Andreas Bieri

Other(s) / Autre(s) / Andere :

Name / Nom / Name	Company / Société / Firma
Mr. Severin Lang	*Neratec AG*

6. Emission tests FCC

6.1 Radiated emission - Magnetic field (150 kHz to 30 MHz)

Test site:	☒ anechoic chamber (ferrites)		☐ open test site	
	☐ anechoic chamber (foam)		☐	
Meas. distance:	☒ 3 m	☐ 10 m	☐ 30 m	☐ ..... m
Meas. uncertainty:	± 2.8 dB (10 m)			
Position of EUT:	*1.5 m* (height above floor of equipment under test)			

Measuring method: The magnetic disturbance radiated by the equipment under test is measured using a spectrum analyser and a wide band magnetic antenna. The center of the antenna is placed at 1 m of height, first in the direction of the apparatus under test, then at 90° to the apparatus and if required also horizontally. If possible the turning table is operated through 360° during the measurement. The recording is carried out taking into account the maximum value of the disturbance appearing during the functioning of the apparatus under test. The peak values are recorded continuously on a graph. The values exceeding the limits are remeasured using a measuring receiver.

Test set-up:

Remarks:

Limit values expressed in dBµ A/m (factor used = 377 Ω = -51.5 dB = free-space wave impedance) and transformed to a measuring distance of 3m (factor used = 40 dB/decade) if necessary
e.g.: for f = 9kHz the limit is 2400/f(kHz)µ V/m at 300 m;

$$20\log\left(\frac{\frac{2400}{9}\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right)-20\log(377\,\Omega)+40\log\left(\frac{300\,m}{3m}\right)=77\,\frac{dB\mu A}{m}\;at\;3m$$

for f = 30MHz the limit is 30µ V/m at 30 m;

$$20\log\left(\frac{30\frac{\mu V}{m}}{1\frac{\mu V}{m}}\right)-20\log(377\,\Omega)+40\log\left(\frac{30\,m}{3m}\right)=18\,\frac{dB\mu A}{m}\;at\;3m$$

Test equipment:

Spectrum analyser	☐ 88-14	☐ 94-24	☐ 02-06	☒ 03-45	☐ 05-39	☐ 07-53
Antenna (typ: magnetic)	☒ 90-25	☐ 90-28	☐ 99-32	☐ 04-79		
Cables	☐1 06-00	☒ 06-01	☐			

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

Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (FSK, 41 kHz)
Remarks :	
Height EUT:	1.5m

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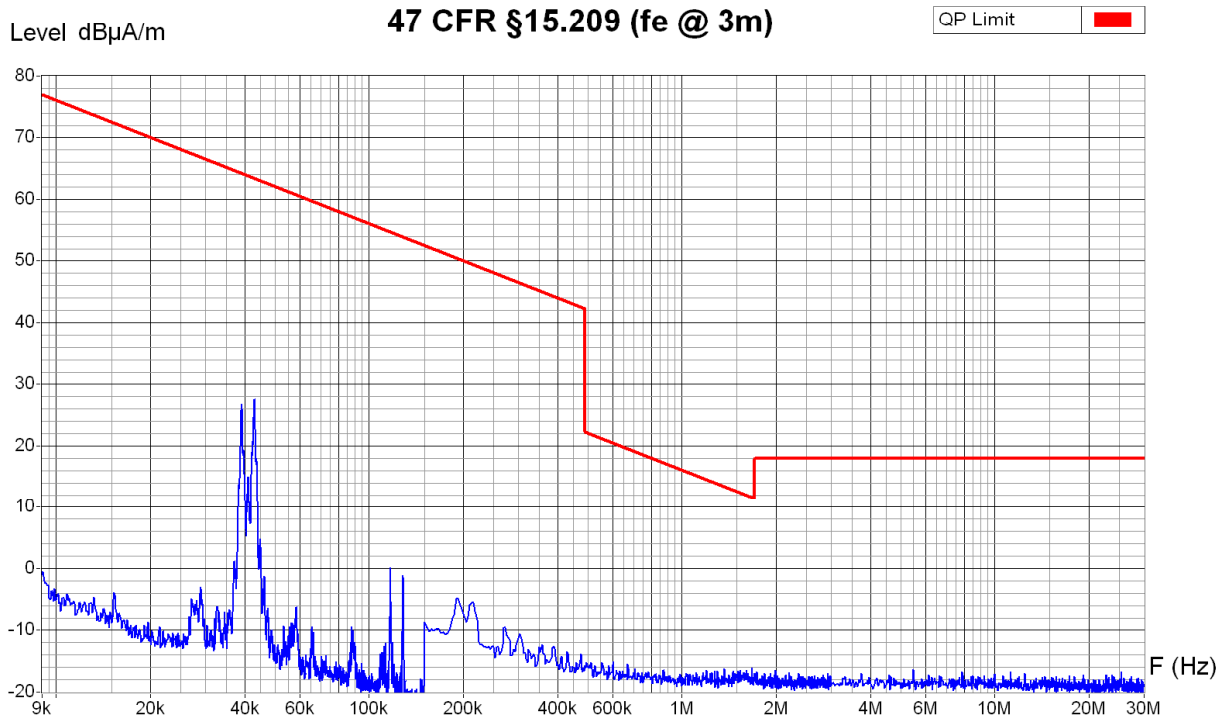

Zone	9 KHz - 80 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 01.12.2009 17:13
Filename: 011_rad_par_FCC_3m_41k.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (FSK, 41 kHz)
Remarks :	
Height EUT:	1.5m

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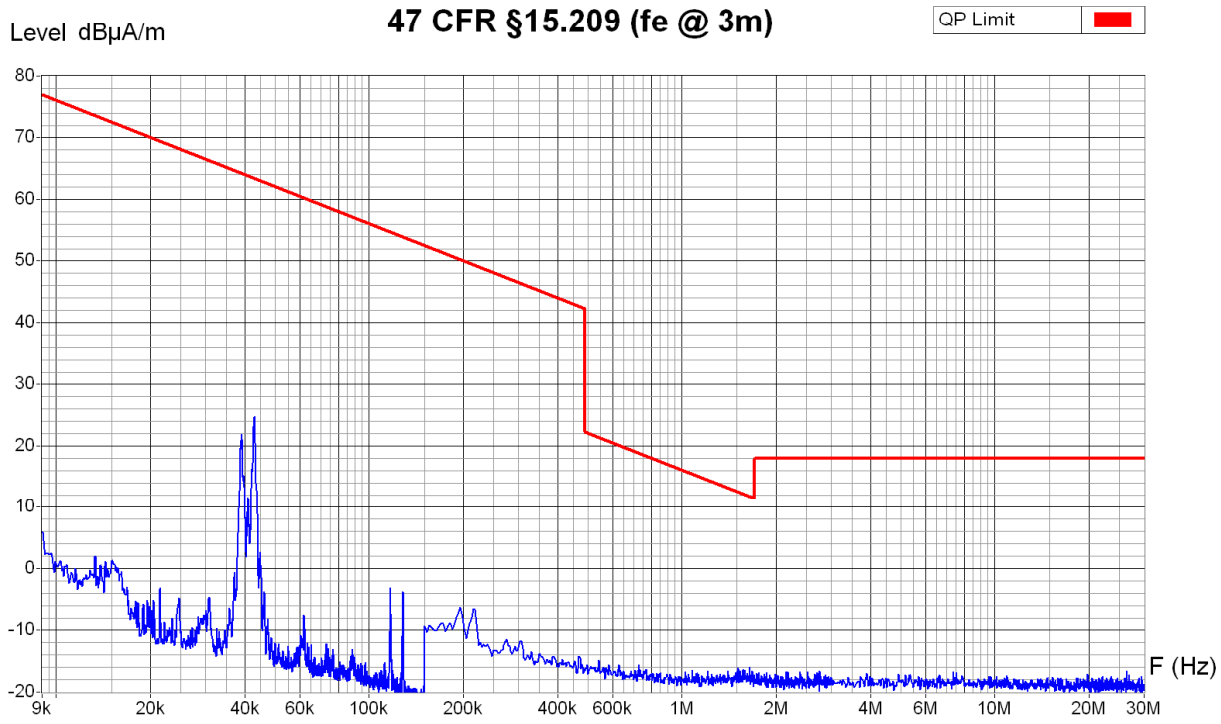

Zone	9 KHz - 80 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 01.12.2009 16:55
Filename:
011_rad_per_FCC_3m_41k.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (HIBAN 10.6 MHz)
Remarks :	
Height EUT:	1.5m

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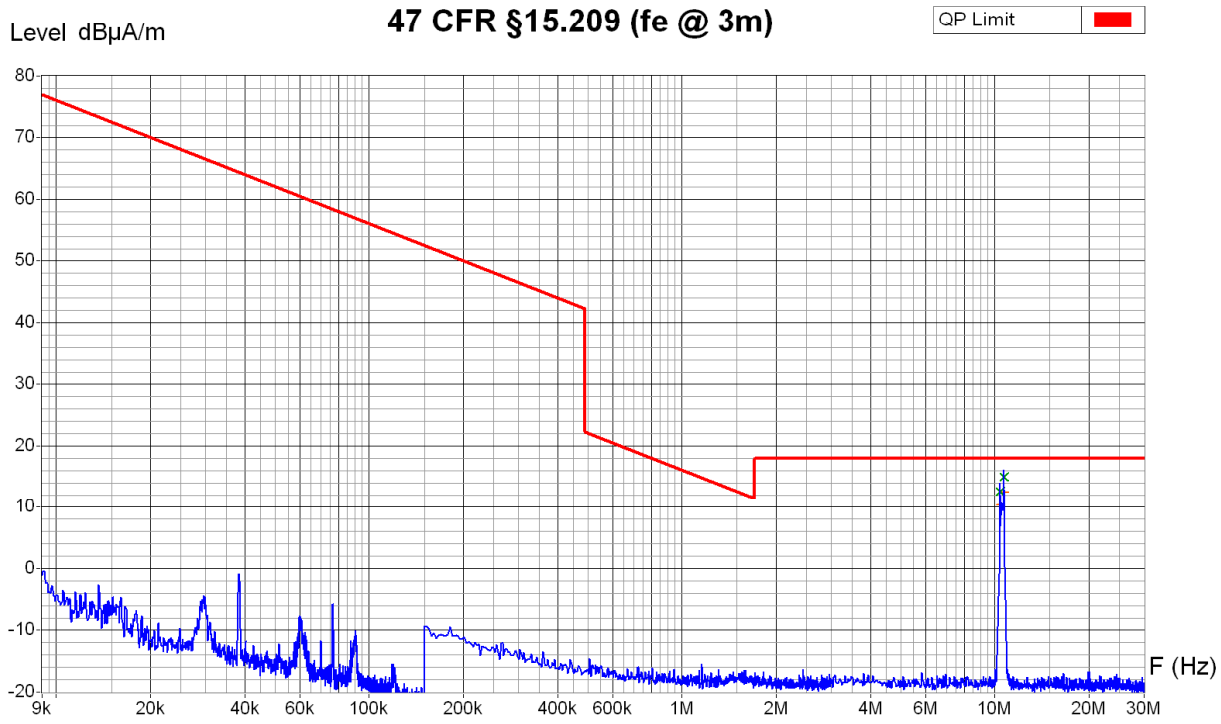

Zone	9 KHz - 80 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz

Receiver Measures

Frequency	Peak	QuasiPeak (x)	Average (+)
10.37 MHz	13.2 dBµA/m	12.6 dBµA/m	10.3 dBµA/m
10.67 MHz	15.7 dBµA/m	15.0 dBµA/m	12.5 dBµA/m

Operator: E. Staub
Date/Time: 01.12.2009 15:12
Filename:
010_rad_par_FCC_3m_10M6.png
/.txt

Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (HIBAN 10.6 MHz)
Remarks :	
Height EUT:	1.5m

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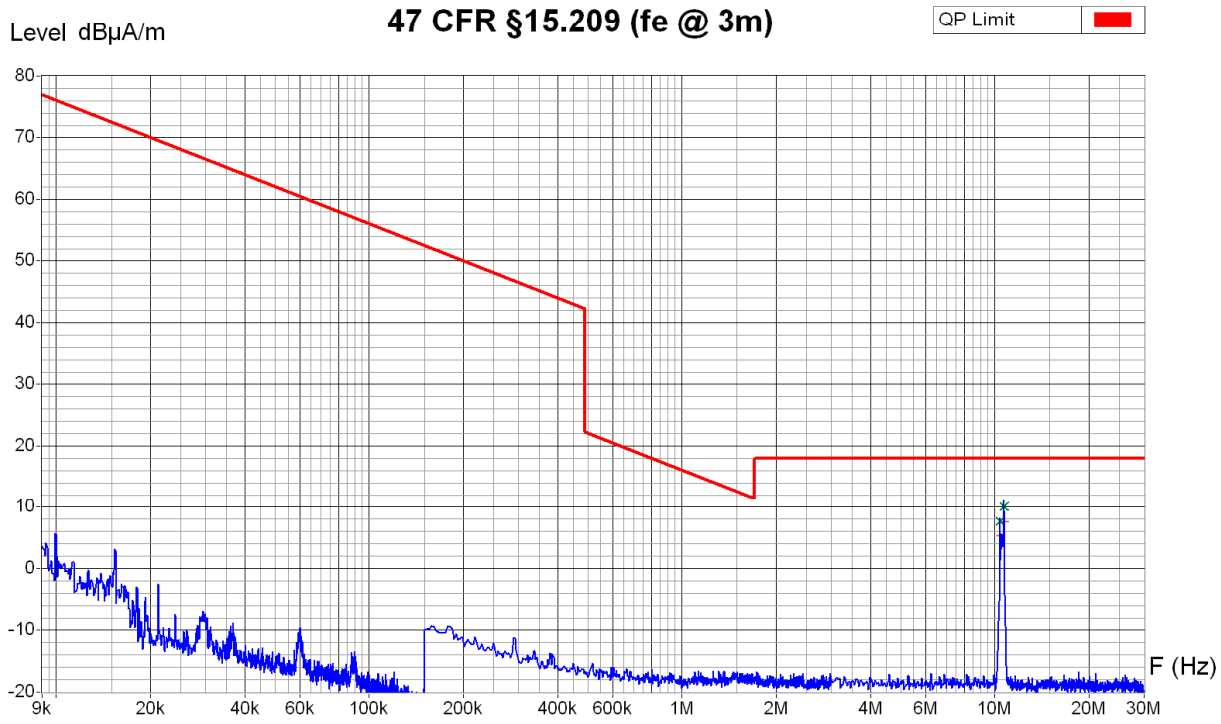

Zone	9 KHz - 80 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	300 Hz

Receiver Measures

Frequency	Peak	QuasiPeak (x)	Average (+)
10.37 MHz	8.3 dBµA/m	7.6 dBµA/m	5.3 dBµA/m
10.67 MHz	10.8 dBµA/m	10.0 dBµA/m	7.5 dBµA/m

Operator: E. Staub
Date/Time: 01.12.2009 15:52
Filename:
010_rad_per_FCC_3m_10M6.png
/.txt

6.2 Radiated emission - Electromagnetic field (30 MHz to 1 GHz)

Test site: ☐ anechoic chamber (foam) ☐ open test site
☒ anechoic chamber (ferrites) ☐ .....

Distance: ☐ 30 m ☒ 10 m ☐ 3 m ☐ .....

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

Meas. uncertainty: ± 4.6 dB (30 - 300 MHz) / ± 3.7 dB (300 - 1000 MHz)

Test 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: *Limit values expressed in dBµ V/m and transformed to a measuring distance of 3m (factor used = 20 dB/decade) if necessary*
e.g.: for f = 40MHz the limit is 100µ V/m at 3m;

$$20\log\left(\frac{100\,\frac{\mu V}{m}}{1\,\frac{\mu V}{m}}\right)+20\log\left(\frac{3m}{10m}\right)=29.5\,\frac{dB\mu V}{m}\;at\;10m$$

Test equipment:

Spectrum analyser		☐ 88-14	☐ 94-24	☐ 02-06	☒ 03-45	☐ 05-39	☐ 07-53
Receiver		☐ 85-04	☐ 90-43	☐ 94-35	☐ 04-29		
Preamplifier		☐ 90-01	☐ 95-86	☐ 05-56	☒ 05-59	☐ 05-62	☐ .....
Antenna	(bilog)	☒ 94-03	☐ 05-38	☐			
Antenna	(horn)	☐ 90-24	☐ 98-12	☐ 98-13	☐		
Cables		☐ 06-00	☒ 06-01	☐			

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

Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (HIBAN, 10.6 MHz)
Remarks :	

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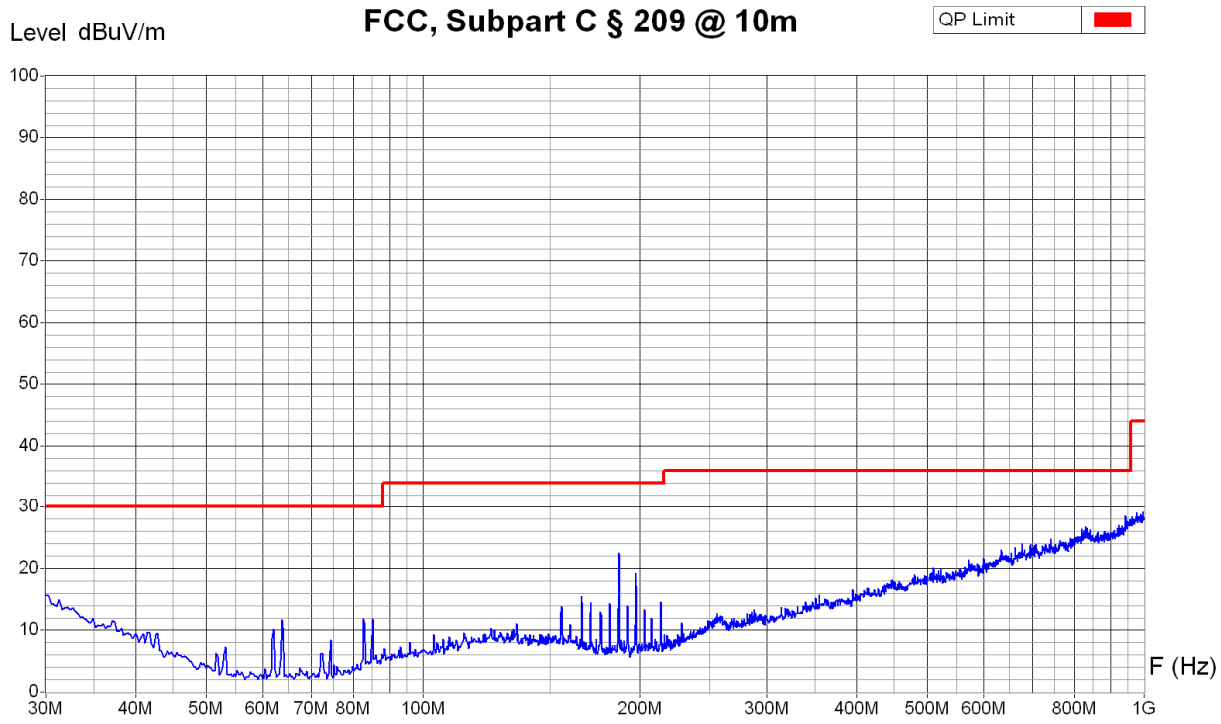

Zone
Video Bandwidth
Resol Bandwidth

Operator: BiA
Date/Time: 30.11.2009 15:19
Filename: 001_rad_hor_10m_FCC_10MHz.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (HIBAN, 10.6 MHz)
Remarks :	

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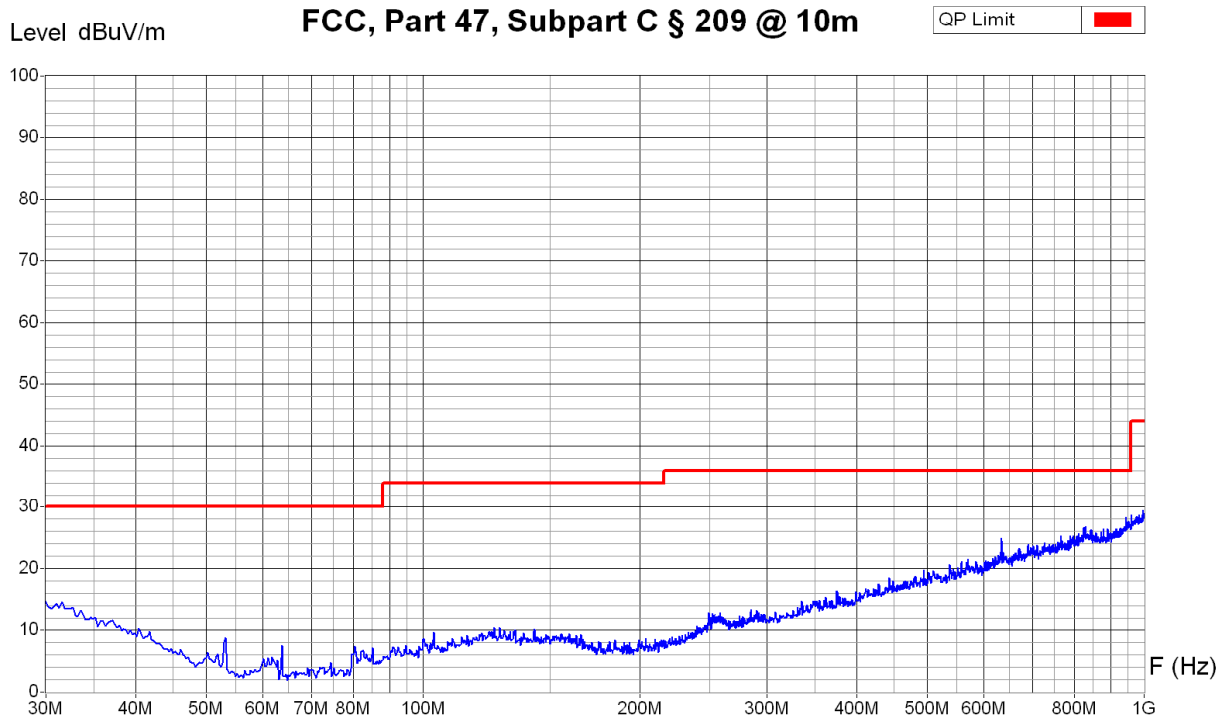

Zone
Video Bandwidth
Resol Bandwidth

Operator: BiA
Date/Time: 30.11.2009 14:47
Filename: 001_rad_ver_10m_FCC_10MHz.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (FSK, 41 kHz)
Remarks :	

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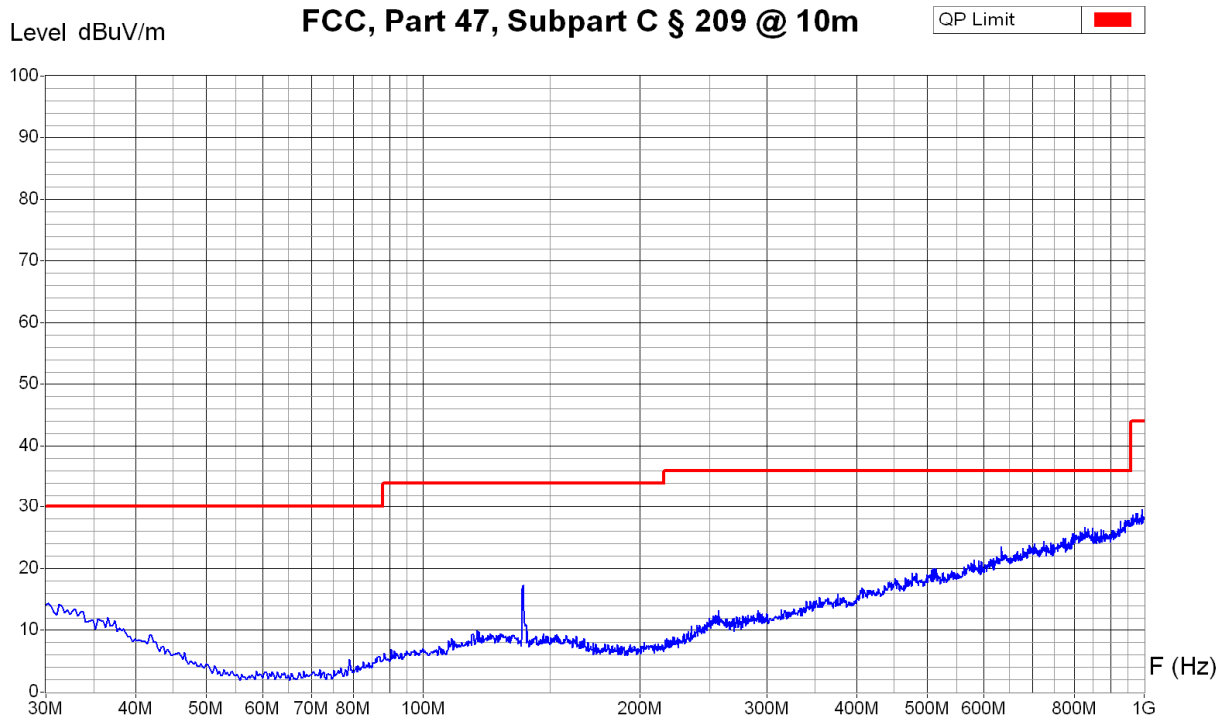

Zone
Video Bandwidth
Resol Bandwidth

Operator: BiA
Date/Time: 30.11.2009 15:51
Filename: 002_rad_hor_10m_FCC_41kHz.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	PilotOne
Set-Up :	See picture
Operating Conditions :	prn (FSK, 41 kHz)
Remarks :	

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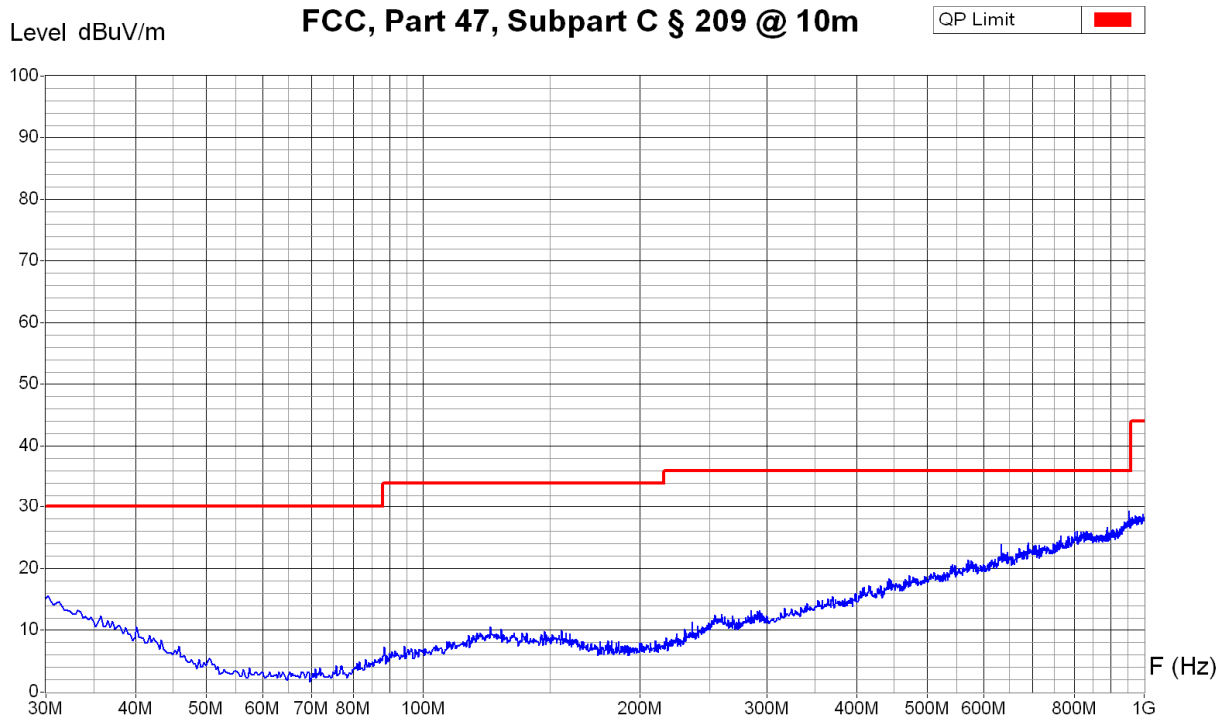

Zone
Video Bandwidth
Resol Bandwidth

Operator: BiA
Date/Time: 30.11.2009 15:41
Filename: 002_rad_ver_10m_FCC_41kHz.png/.txt