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Test laboratory accredited by metas, the Swiss Federal Office of Metrology and Accreditation
Laboratoire d'essai accrédité par metas, l'Office fédéral de métrologie et d'accréditation
Prüflabor akkreditiert durch metas, das Bundesamt für Metrologie und Akkreditierung

Registration number
Numéro d'accréditation
Akkreditierungsnummer

STS 024

Schweizerischer Prüfstellendienst
Service suisse d'essai
Swiss testing service



Date of test: Date de l'essai: Prüfdatum:	June 11, 2003	Report no: Rapport no: Bericht Nr:	13'760	Mandate no: Mandat no: Auftrag Nr:	20035766
Report: Rapport: Bericht:	Electromagnetic compatibility				
Product name: Nom du produit: Produktname	Wallpilot				
Customer: Client: Kunde:	Phonak Communications AG	Serial no: No de série: Seriennummer:	03P0001		

Standards / Normes / Normen	Result Résultat Ergebnis
CFR 47, Part 15, Subpart C, Intentional radiator, Paragraph 15.207/209	Pass

Test performed by
Essai effectué par :
Prüfer

Erich Staub

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

Erich Staub

Test report controlled and approved by
Rapport d'essai contrôlé et approuvé par :
Prüfbescheinigung

Manfred Portmann

Rossens, June 6, 2004

(Issue Date / Date d'édition / Ausstelldatum)

V20040427

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

The present document results from tests on a specimen and does not prejudice 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\20035766_phonak wallpilot\fcc\phonak 13760.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	Standard /Norme /Norm	Result / Résultat / Ergebnis
6	Emission / Emission / Störaussendung		
6.1	Mains terminal interference voltage Tension perturbatrice aux bornes d'alimentation Störspannung auf den Energieversorgungsleitungen	CFR 47 § 15.207	✓
6.3	Radiated electromagnetic field Champ perturbateur Störfeldstärke	CFR 47 § 15.209	✓

2. Applied standards / Normes appliquées / Verwendete Normen

47 CFR Part 15 Subpart C	Code of Federal Regulations - Telecommunication, FCC Part 15, Subpart C: "Intentional Radiators"
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3. Client / Client / Kunde

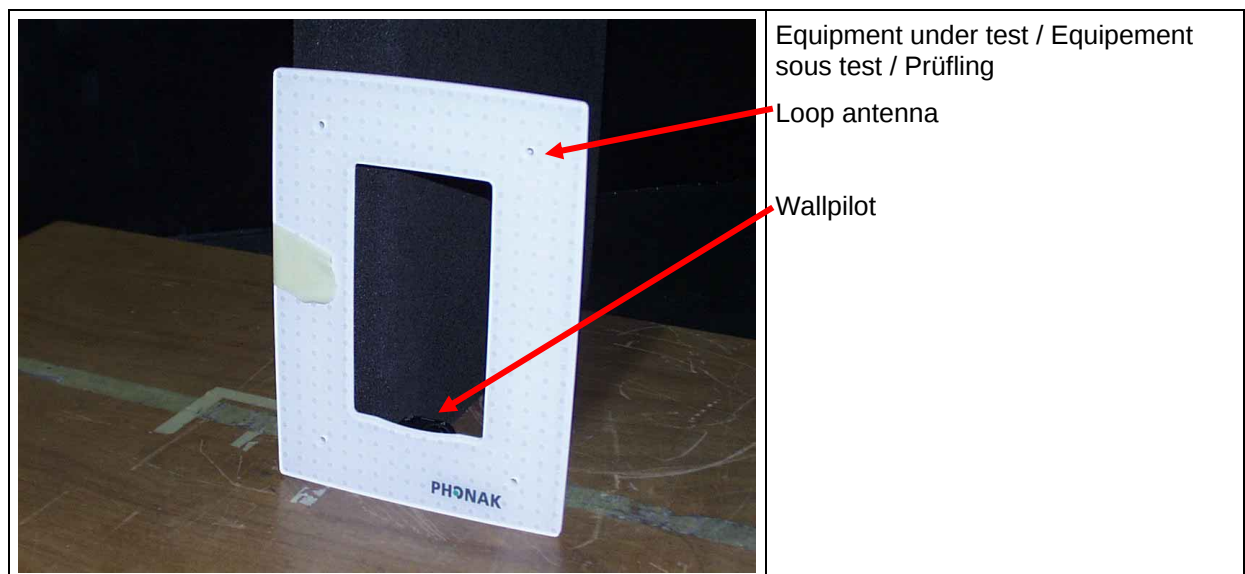
Client name and address Nom et adresse du client Name und Adresse des Kunden	Phonak Communications AG Länggasse 17 CH-3280 Murten Switzerland
Contact Person / Responsable / Kontaktperson	Louis Gerber
Telephone / Téléphone / Telefon	+41 (0)26 672 72 72
Fax / Télécopieur / Telefax	+41 (0)26 672 96 77
E-mail / Courrier électronique / E-mail	Louis.gerber@phonakcom.ch
Mandate no / no mandat no / Auftragsnr.	20035766

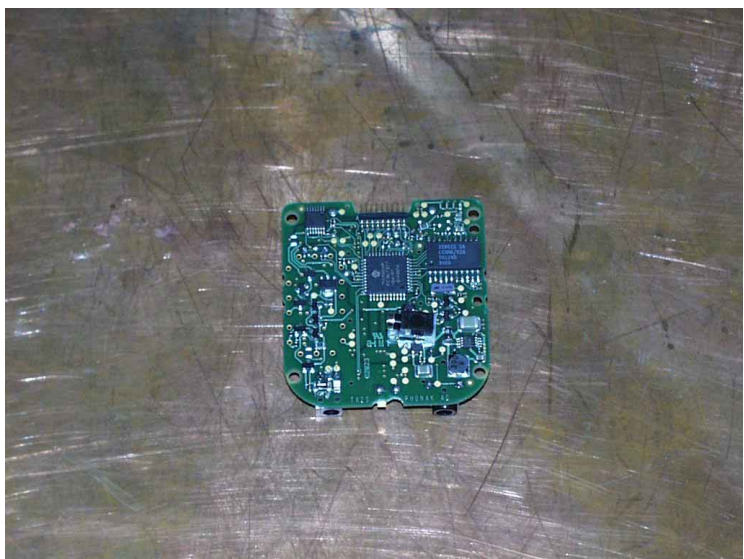
4. Equipment under test / Equipement à l'essai / Prüfling

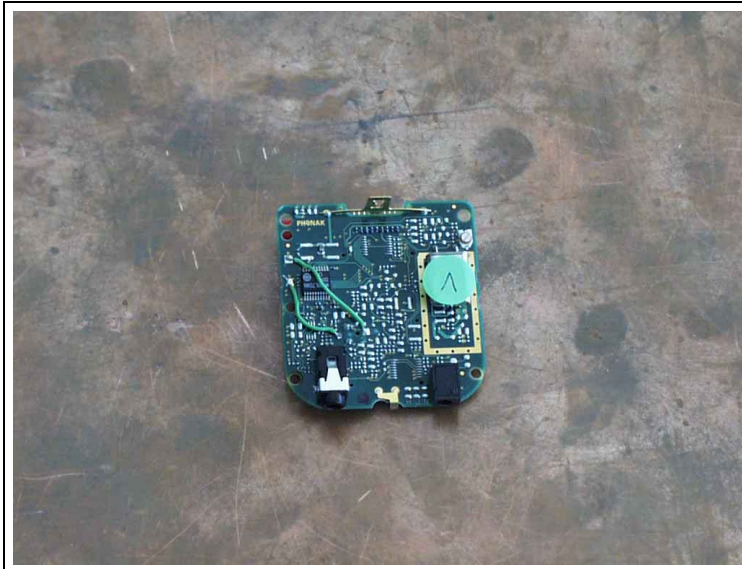
4.1 Identification / Identification / Identifikation

Manufacturer name and address Nom et adresse du fabricant Name und Adresse des Herstellers	Phonak Communications AG Länggasse 17 CH-3280 Murten Switzerland
Production country / Pays de fabrication / Ursprungsland	Switzerland
Brand name / nom de marque / Verkaufsmarke	Phonak Communications AG
Product name / Nom du produit / Produktname	Wallpilot
Product description / Description du produit / Produktbeschreibung	Wall mounted remote control for hearing aids.
Model number / Numéro de modèle / Modellnummer	054-0210
Serial no / No. de série / Seriennummer	03P0001
Software version / Version du logiciel / Softwareversion	77
Highest frequency / Fréquence la plus élevée / Höchste Frequenz	3.6 MHz; transmitting at 41 kHz
Supply / Alimentation / Speisung	$U = 3 - 6 \text{ VDC} / I_{\text{max}} = 120 \text{ mA} / P \text{ (at F3)} = 140 \text{ mW}$ External AC/DC power supply 230 VAC / 3.68 VA
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



	Equipment under test / Equipement sous test / Prüfling Wallpilot
	Equipment under test / Equipement sous test / Prüfling Wallpilot: label
	Equipment under test / Equipement sous test / Prüfling PCB bottom side



Equipment under test / Equipement sous test / Prüfling
PCB rear side

4.3 Classification / Classification / Klassierung

- *Intentional radiator*

4.4 Connected cables / Câble connectés / Angeschlossene Kabel

Access / Accès / Anschluss	Length / Longueur / Länge	Type / Type / Typ	Screened / Blindé / Geschirmt	Terminated with / Terminé avec / Abgeschlossen mit	Remark / Remarque / Bemerkung
Supply	1.5 m	2-wires	none	AC/DC power supply	- - -

4.5 Modifications before the tests / Modifications apportées avant les essais / Vor den Prüfungen angebrachte Änderungen

None

5. Test conditions / Conditions d'essai / Testbedingungen

5.1 Climatic conditions / conditions climatiques / klimatische Bedingungen

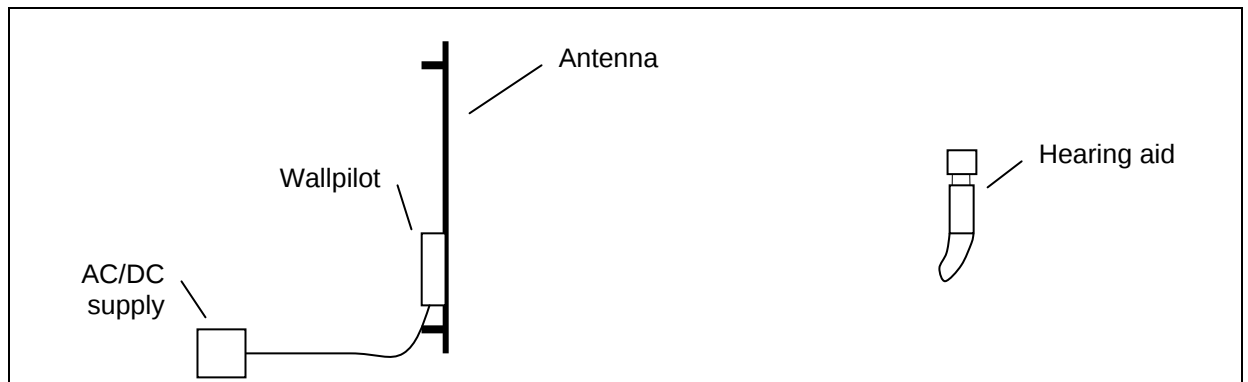
Temperature / Température / Temperatur:	23	°C
Pressure / Pression / Druck:	1017	hPa
Relative humidity / Humidité relative / Relative Luftfeuchtigkeit:	42	%

5.2 Location and Date / Lieu et date / Ort und Datum

Test period / Date des essais / Datum der Prüfungen:	June 11, 2003
Location / Lieu / Ort:	Rossens

5.3 Persons present / Personnes présentes / Anwesende Personen**Test Engineer(s) / Ingénieur(s) d'essai / Prüfsingenieur(e) :***Erich Staub***Other(s) / Autre(s) / Andere :**

Name / Nom / Name	Company / Société / Firma
<i>Louis Gerber</i>	<i>Phonak Communications AG</i>
<i>Mattia Bianchi</i>	<i>Phonak Communications AG</i>

5.4 Test configuration / Configuration d'essai / Prüfkfiguration**5.5 Operating conditions / Conditions de fonctionnement / Betriebszustand***Continuously transmitting; modulated***5.6 Monitoring of the EUT / Surveillance de l'EST / Überwachung des Prüfling**

The performance of the EUT during the test was monitored as following / La surveillance de l'EST durant le test a été réalisée de la manière suivante / Die Überwachung des Prüflings während der Prüfung erfolgte folgendermassen:

No immunity tests required

The following functions and parameters are observed during the test / Les fonctions et paramètres suivants ont été observés pendant l'essai / Folgende Funktionen und Parameter werden während der Prüfung überwacht:

*No immunity tests required***5.7 Auxillary equipment / Matériel auxiliaire / Zusatzgeräte**

The following pieces of equipment are used for the monitoring of the EUT or are necessary for the EUT but they are not tested with the EUT / Les équipements suivants servent à la surveillance de l'EST ou sont indispensables au fonctionnement de celui-ci mais ne font pas partie de l'essai / Folgende Geräte werden für die Überwachung des Prüflings gebraucht oder sind notwendig für die korrekte Funktion. Sie gehören jedoch nicht zum Prüfling.

Product / Produit / Produkt	Brand / Marque / Marke	Model No.	ID	Remark / Remarque / Bemerkung
<i>Hearing aid</i>	<i>Phonak</i>	<i>Supero</i>	<i>---</i>	<i>---</i>

	Auxillary equipment / Matériel auxiliaire / Zusatzgeräte Hearing aid
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5.8 Performance criteria / Critères de performance / Bewertungskriterien

No immunity tests required

6. Emission Test

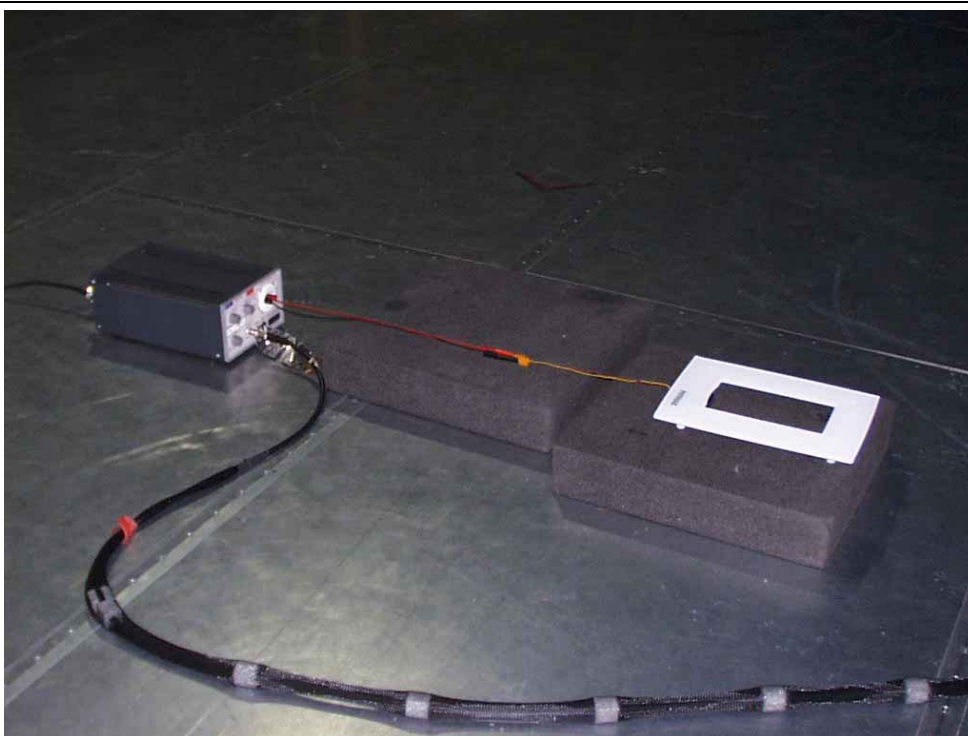
6.1 Interference voltage

Test site: ☐ anechoic chamber (foam) ☐ shielded room
☒ anechoic chamber (ferrites) ☐ laboratory
☐ open test site ☐

Test precision: +/- 1.6 dB

Measuring method: The conducted disturbance is measured using a spectrum analyser and a line impedance substitution network (LISN). The measurement of the voltage against the earth of the different phases (N, L1, L2 and L3) is carried out successively. The peak values are recorded continuously on the graph. The values that exceed the limit are remeasured with a measuring receiver. These values are indicated at the bottom of the graph.

Test set-up:



Remarks: ---

Test equipment:

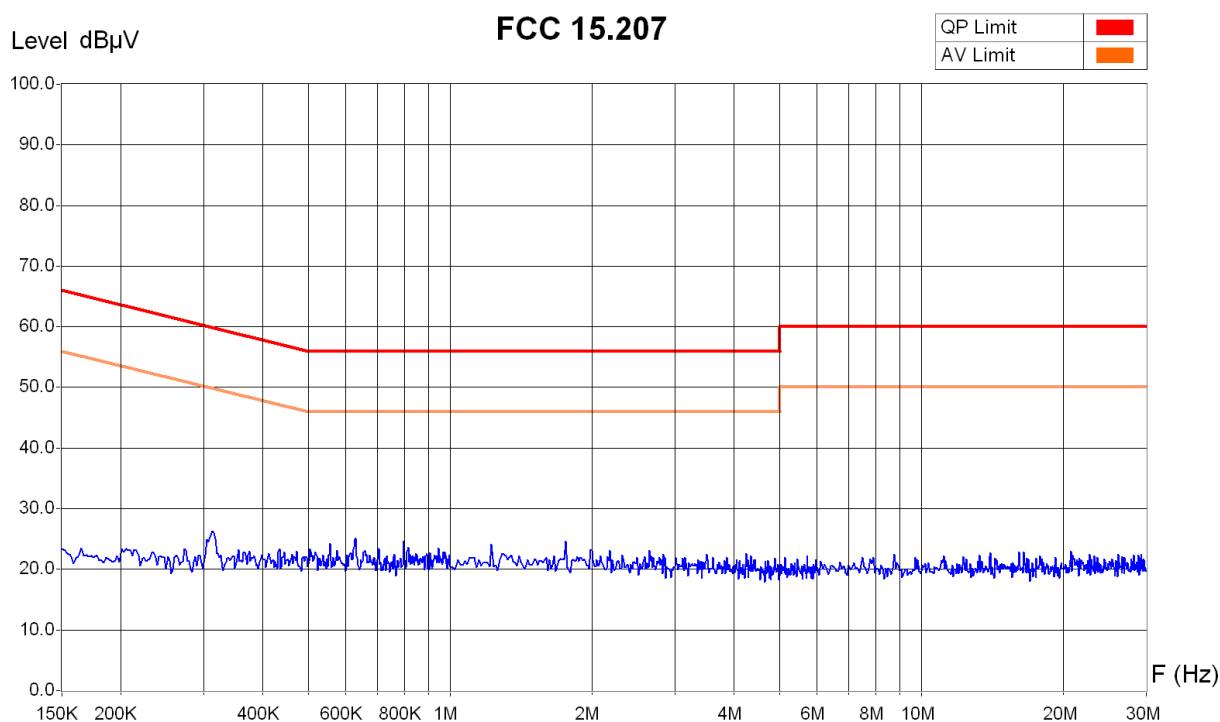
Spectrum analyser	☐ 88-14	☐ 90-26	☒ 94-24	☐ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-12	☐ 90-11	☐ 94-34			
LISN	☐ 85-13	☐ 90-08	☐ 94-36	☒ 94-40	☐ 95-12	☐ 00-43
LISN	☐ 04-04	☐ 04-05	☐			
Protection 10 dB	Included in LISN					
.....						

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

Measurement Type : Voltage Interference
Wire : Line 1



Equipment Under Test : Wallpilot
Set-Up : P max; powered with external power supply (5 VDC)
Operating Conditions : continuous transmitting; modulated
Remarks :



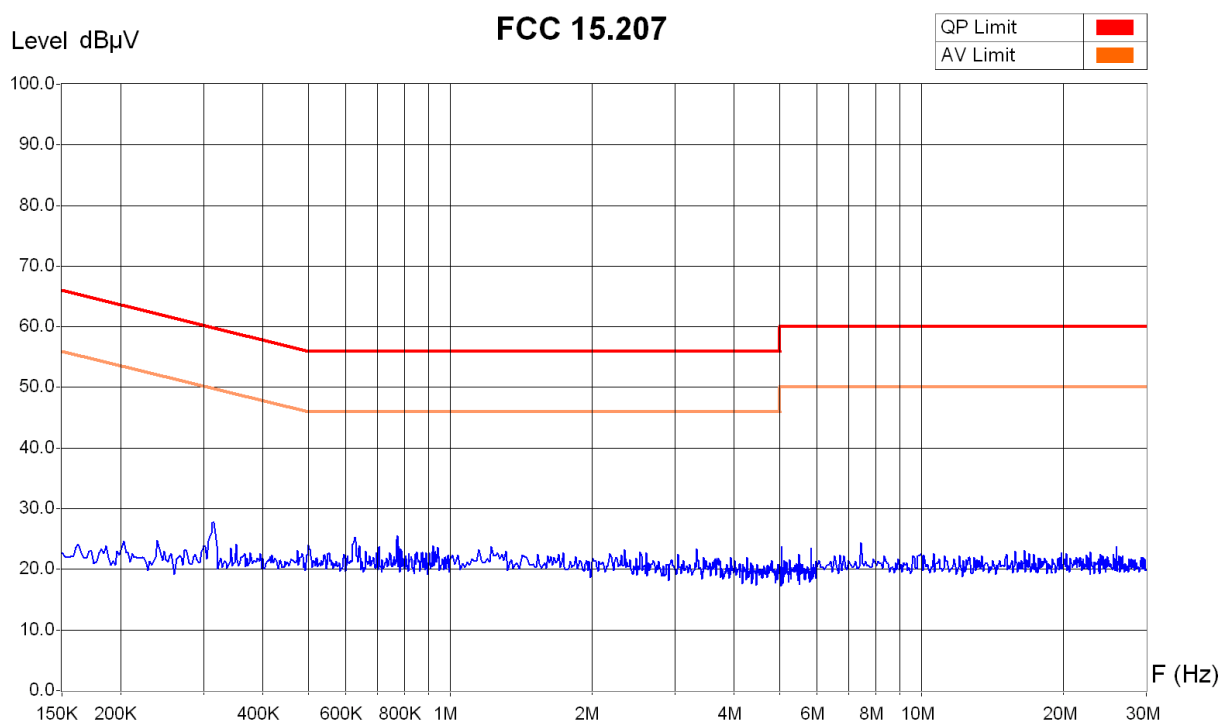
Zone	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	30 KHz	30 KHz	30 KHz
Resol Bandwidth	9 KHz	9 KHz	9 KHz
Sweep Time	0 s	0 s	0 s

Operator: E. Staub
Date/Time: 11.06.03 18:14
Filename:
20035766_ec_0001 FCC.png/.txt

Measurement Type : Voltage Interference
Wire : Neutral



Equipment Under Test : Wallpilot
Set-Up : P max; powered with external power supply (5 VDC)
Operating Conditions : continuous transmitting; modulated
Remarks :



Zone	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	30 KHz	30 KHz	30 KHz
Resol Bandwidth	9 KHz	9 KHz	9 KHz
Sweep Time	0 s	0 s	0 s

Operator: E. Staub
Date/Time: 11.06.03 10:12
Filename:
20035766_ec_000n FCC.png/.txt

6.2 Radiated magnetic field

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

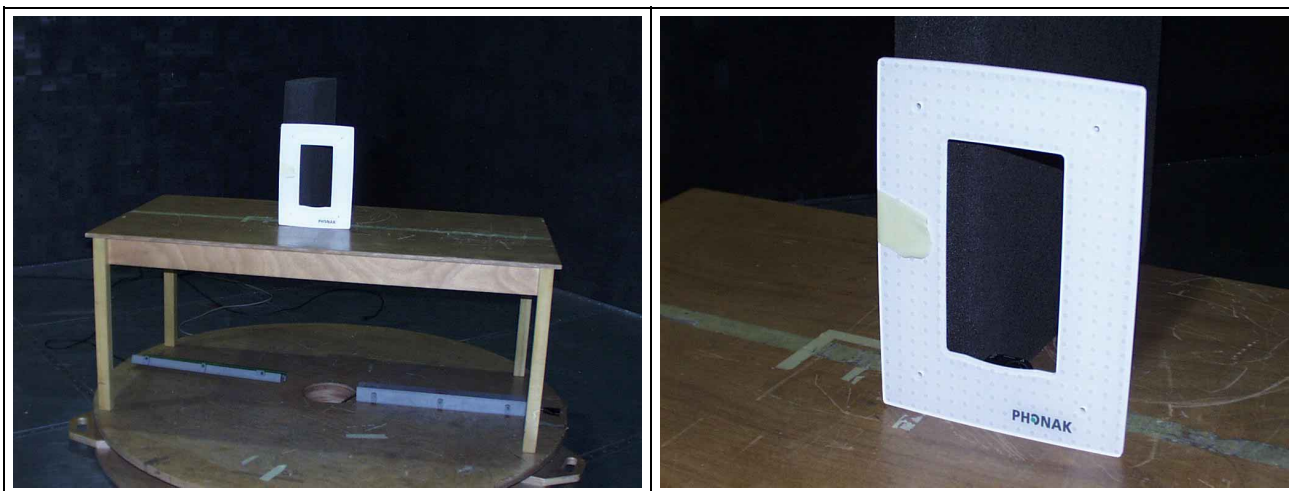
Meas. distance: ☐ 3 m ☒ 10 m ☐ 30 m ☐ m

Test precision: ± 2.8 dB (10 m)

Position of EUT: 0.8 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 bottom of the antenna is placed at 1 m of height, first in the direction of the apparatus under test and then at 90° to the apparatus. 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, these measurements are indicated below the graph.

Test set-up:



Remarks: - - -

Test equipment:

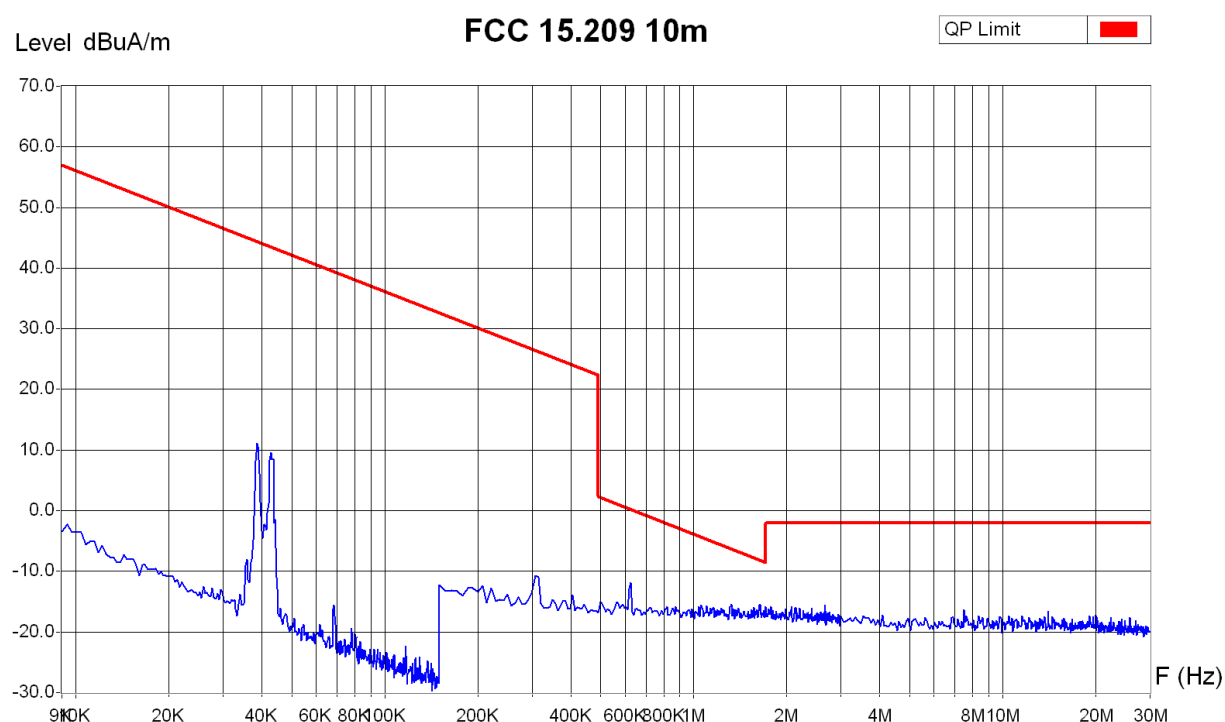
Spectrum analyser	☐ 88-14	☐ 90-26	☒ 94-24	☐ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-12	☐ 90-11	☐ 94-34	☐		
Preamplifier	☐ 88-05	☐ 90-01	☒ 90-42	☐ 95-86		
Antenna (typ: magnetic)	☒ 90-25	☐ 90-28	☐ 99-32	☐		

Result:	☒ pass	☐ fail	☐ not applicable	☐ not tested
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Measurement Type : Radiated Field
Polarisation : Parallel
Table Angle : 0 - 360°
Antenna Height : 1 m



Equipment Under Test : Wallpilot
Set-Up : P max; with external supply
Operating Conditions : continuously transmitting
Remarks :



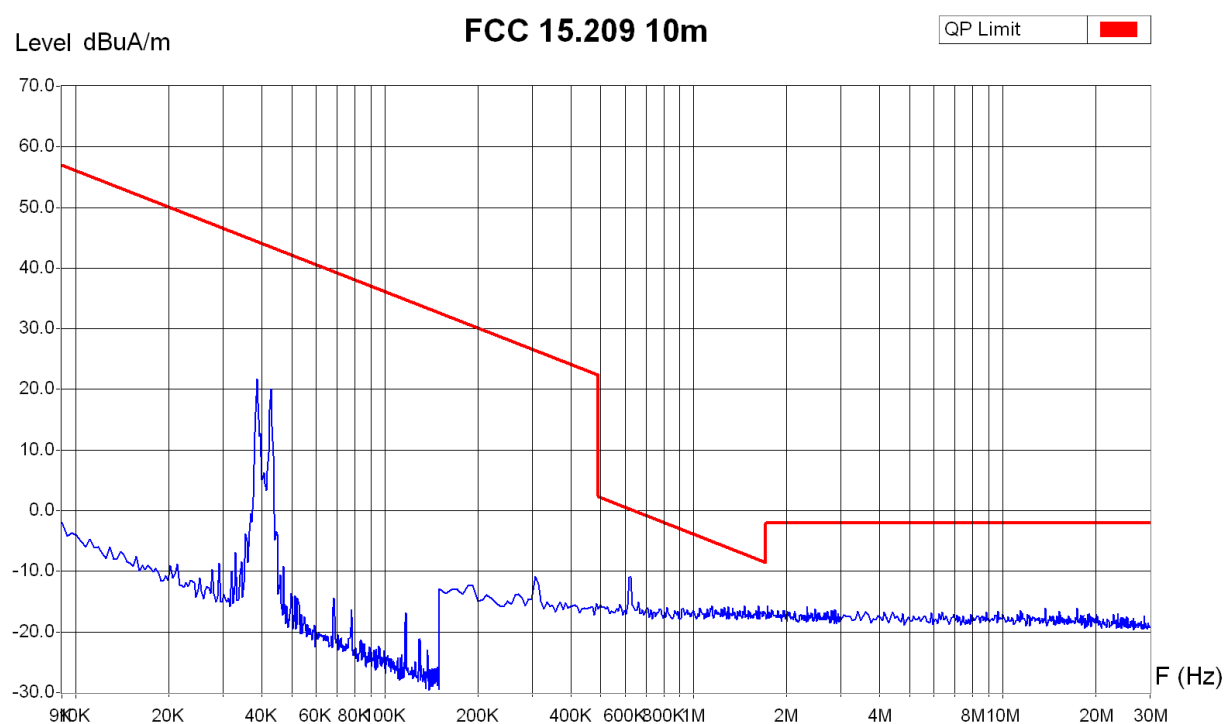
Zone	9 KHz - 150 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz
Video Bandwidth	300 Hz	30 KHz	30 KHz
Resol Bandwidth	300 Hz	10 KHz	10 KHz

Operator: E. Staub
Date/Time: 11.06.03 12:00
Filename:
20035766_er_002pa FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; with external supply
Operating Conditions : continuously transmitting
Remarks :



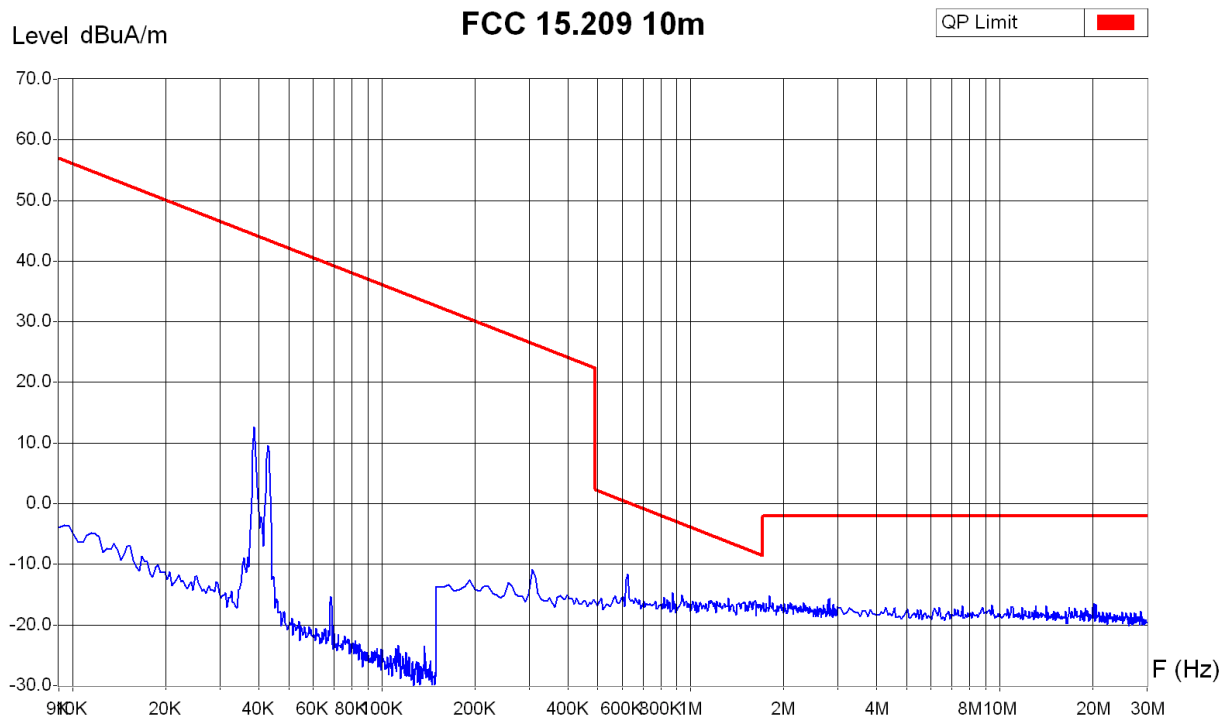
Zone	9 KHz - 150 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz
Video Bandwidth	300 Hz	30 KHz	30 KHz
Resol Bandwidth	300 Hz	10 KHz	10 KHz

Operator: E. Staub
Date/Time: 11.06.03 11:47
Filename:
20035766_er_002pe FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; powered by internal battery
Operating Conditions : continuously transmitting
Remarks :



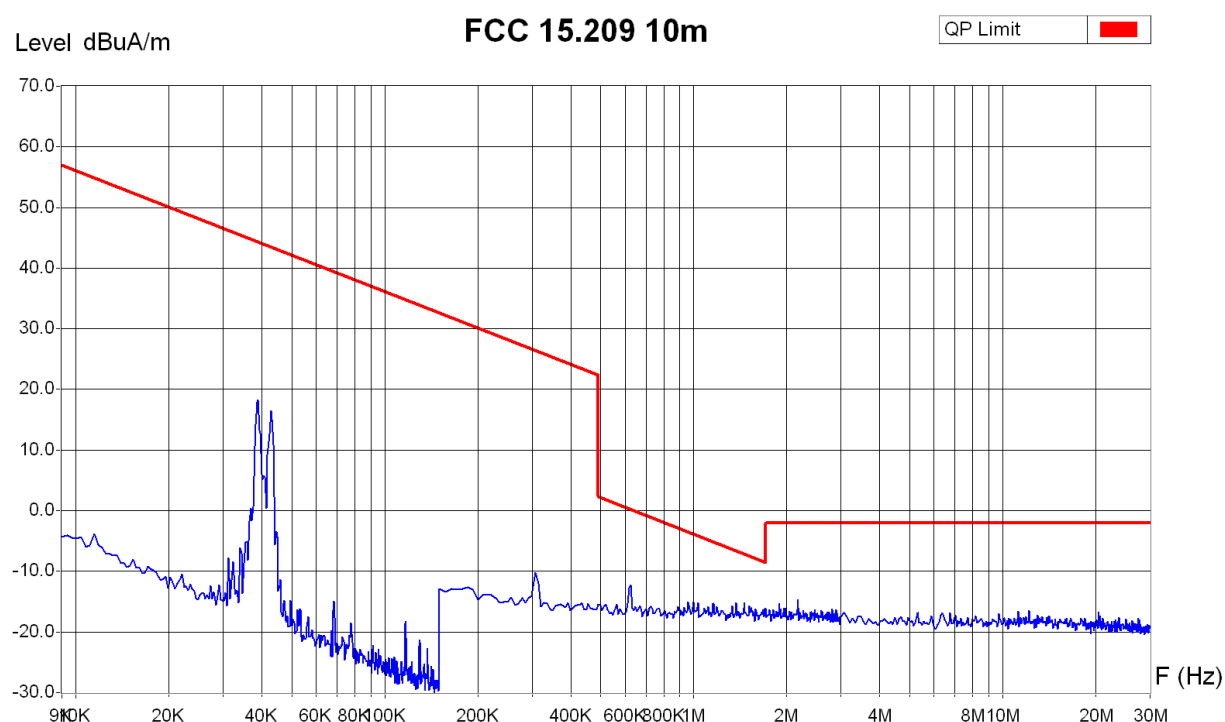
Zone	9 KHz - 150 KHz	150 KHz - 3 MHz	3 MHz - 30 MHz
Video Bandwidth	300 Hz	30 KHz	30 KHz
Resol Bandwidth	300 Hz	10 KHz	10 KHz

Operator: E. Staub
Date/Time: 11.06.03 13:49
Filename:
20035766_er_004pa FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; powered by internal battery
Operating Conditions : continuously transmitting
Remarks :



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

Operator: E. Staub
Date/Time: 11.06.03 13:42
Filename:
20035766_er_004pe FCC.png/.txt

6.3 Radiated electromagnetic field

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

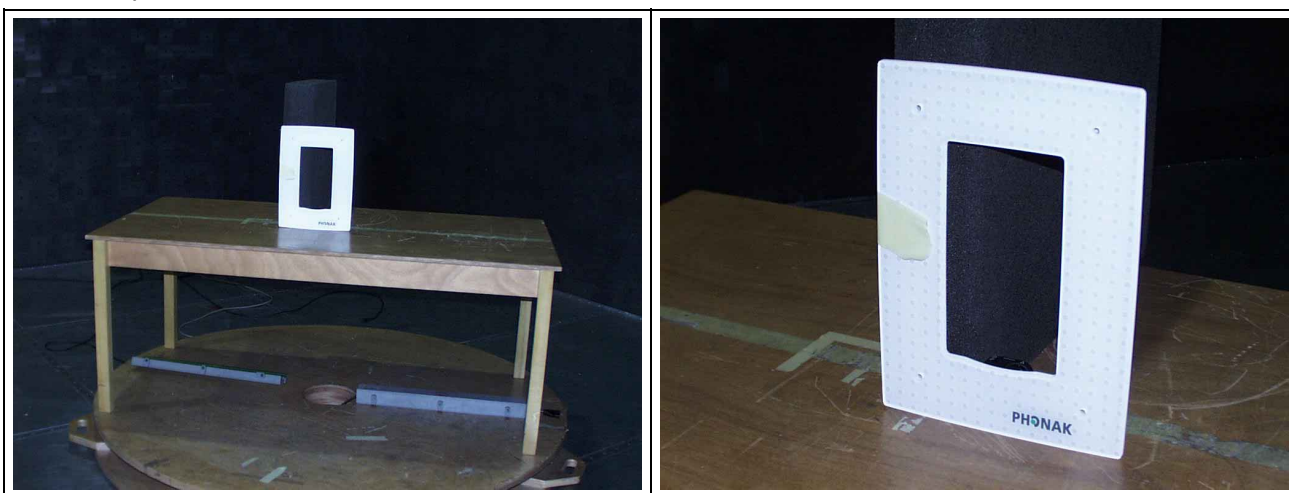
Distance: ☐ 30 m ☒ 10 m ☐ 3 m ☐

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

Test precision: ± 6 dB (30 - 300 MHz) / ± 5.4 dB (300 - 1000 MHz)

Test method: The electromagnetic disturbance radiated by the equipment is measured from 30 to 1000 MHz 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 disturbance appearing while the apparatus is under test.

Test set-up:



Remarks: - - -

Test equipment:

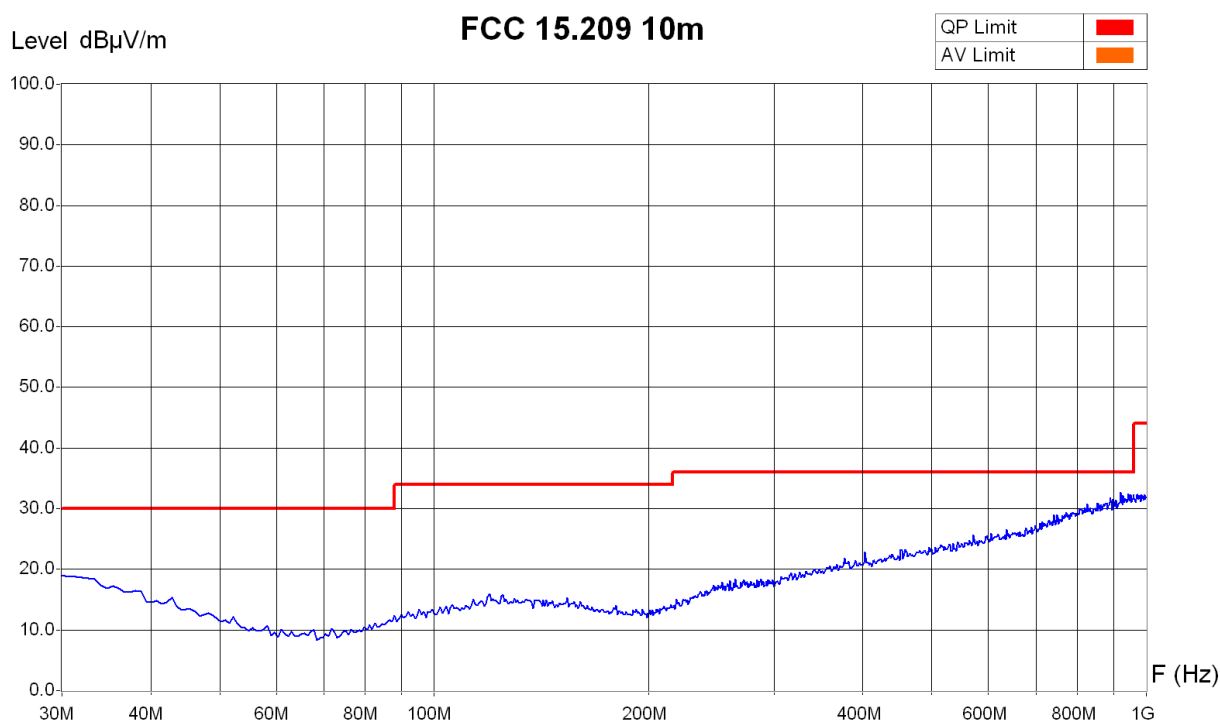
Spectrum analyser	☐ 88-14	☐ 90-26	☒ 94-24	☐ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-04	☐ 90-43	☐ 94-35			
Preamplifier	☐ 88-05	☐ 90-01	☒ 90-42	☐ 95-86		
Antenna (biconical)	☐ 82-02	☐ 87-05	☐ 87-16	☐ 91-05	☐ 94-37	
Antenna (log-per)	☐ 88-20	☐ 90-30	☐ 91-35	☐ 94-64		
Antenna (bilog)	☒ 94-03	☐				
Antenna (horn)	☐ 90-24	☐ 90-29	☐ 98-12	☐ 98-13	☐	
.....						

Result:	☒ pass	☐ fail	☐ not applicable	☐ not tested
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Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 1 - 4m



Equipment Under Test : Wallpilot
Set-Up : P max; without charger
Operating Conditions : continuous transmitting; modulated
Remarks :



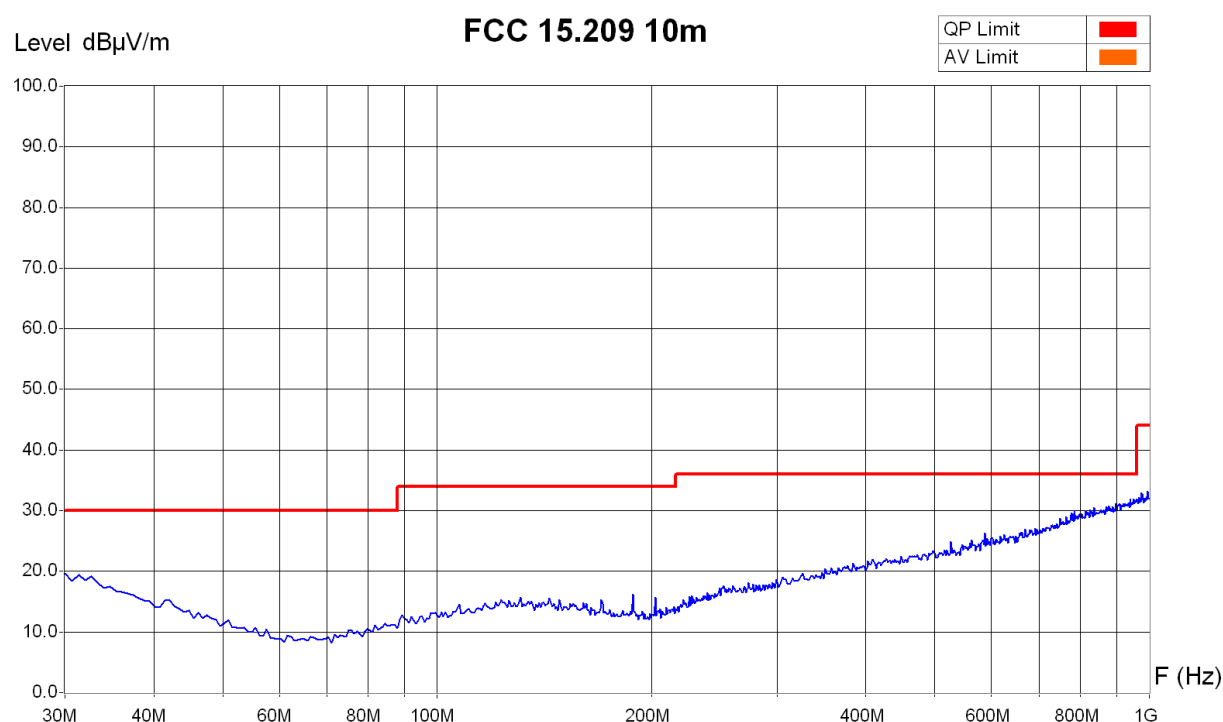
Zone	30 MHz - 300 MHz	300 MHz - 1 GHz
Video Bandwidth	300 KHz	300 KHz
Resol Bandwidth	120 KHz	120 KHz
Sweep Time	72 ms	210 ms

Operator: E. Staub
Date/Time: 11.06.03 10:12
Filename:
20035766_er_000h FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; without charger
Operating Conditions : continuous transmitting; modulated
Remarks :



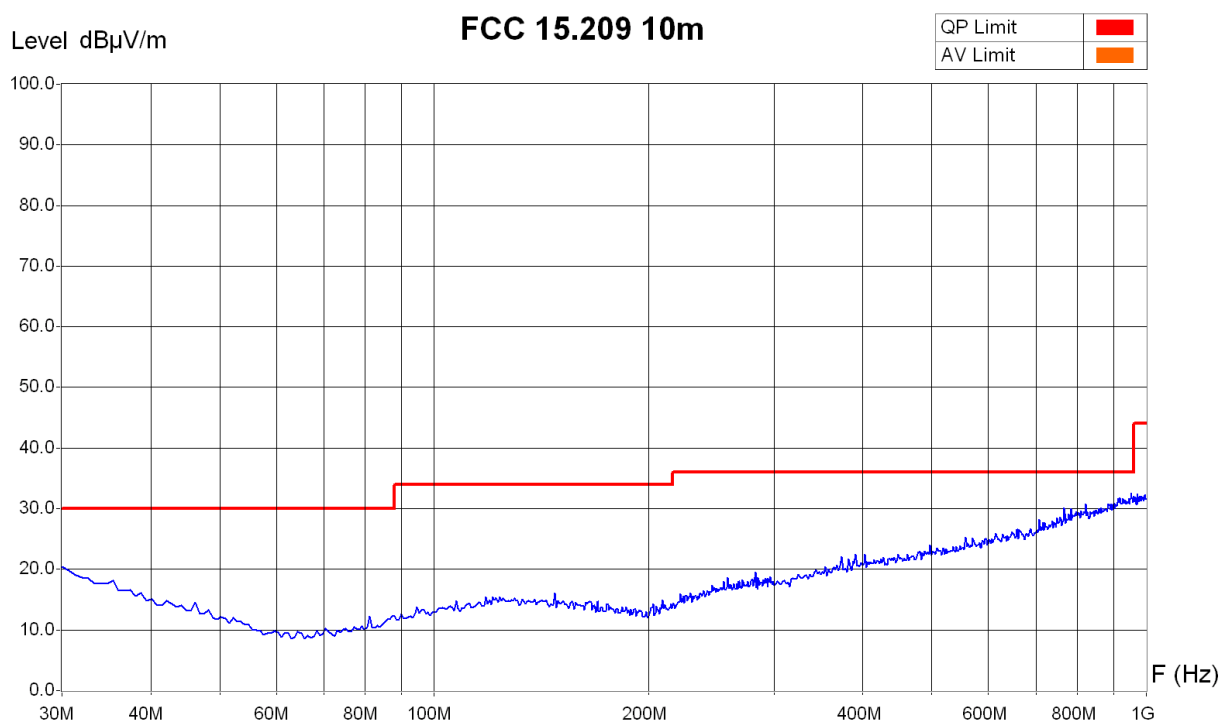
Zone	30 MHz - 300 MHz	300 MHz - 1 GHz
Video Bandwidth	300 KHz	300 KHz
Resol Bandwidth	120 KHz	120 KHz
Sweep Time	72 ms	210 ms

Operator: E. Staub
Date/Time: 11.06.03 09:57
Filename:
20035766_er_000v FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; with external supply
Operating Conditions : continuous transmitting; modulated
Remarks :



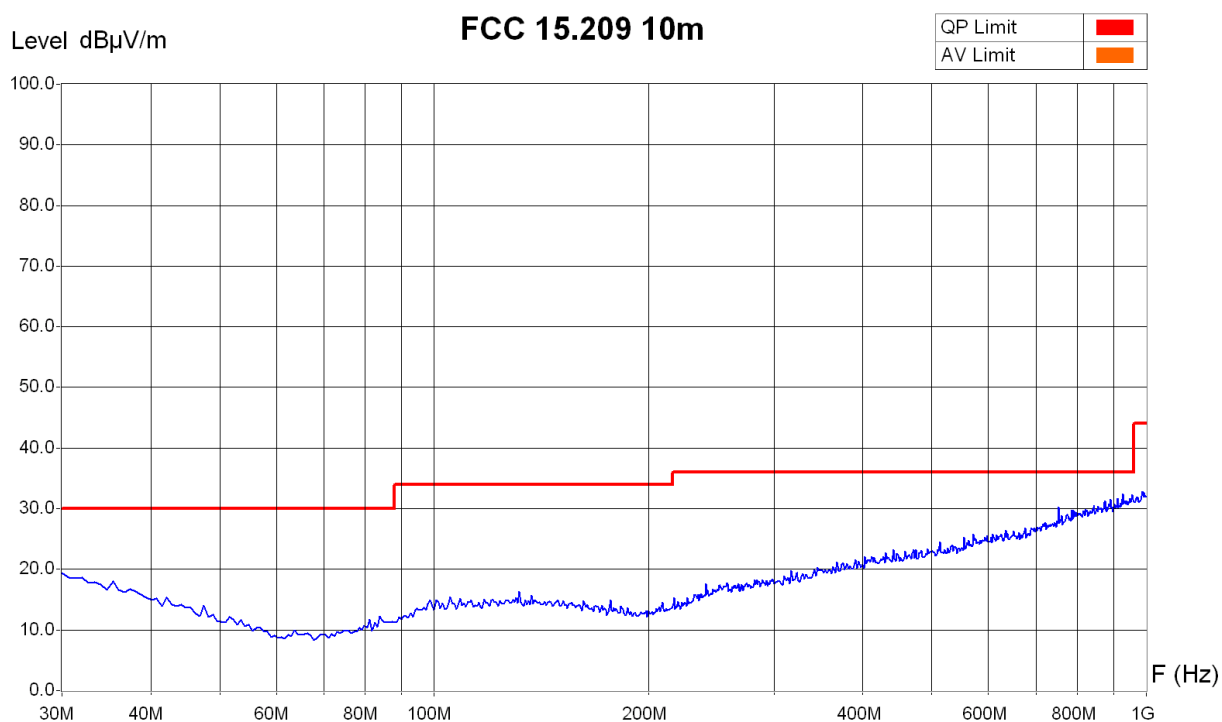
Zone	30 MHz - 300 MHz	300 MHz - 1 GHz
Video Bandwidth	300 KHz	300 KHz
Resol Bandwidth	120 KHz	120 KHz
Sweep Time	72 ms	210 ms

Operator: E. Staub
Date/Time: 11.06.03 11:07
Filename:
20035766_er_001h FCC.png/.txt

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



Equipment Under Test : Wallpilot
Set-Up : P max; with external supply
Operating Conditions : continuous transmitting; modulated
Remarks :



Zone	30 MHz - 300 MHz	300 MHz - 1 GHz
Video Bandwidth	300 KHz	300 KHz
Resol Bandwidth	120 KHz	120 KHz
Sweep Time	72 ms	210 ms

Operator: E. Staub
Date/Time: 11.06.03 11:15
Filename:
20035766_er_001v FCC.png/.txt