montena
montena emc sa

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:	*FCC Test report (FCC ID V38OI7P1)*	Report no: Rapport no: Bericht Nr:	*15'303*
Product name: Nom du produit: Produktname	*SpotMeII Handheld*	Mandate no: Mandat no: Auftrag Nr:	*20077722*
Serial no: No de série: Seriennummer:	*074714*	Model number: Numéro de modèle: Modellnummer:	*S-02*
Customer: Client: Kunde:	*Shockfish SA* *PSE C, EPFL* *CH-1015 Lausanne*	Date of test: Date de l'essai: Prüfdatum:	*April 7 to 28, 2008*

Standards / Normes / Normen
CFR 47, Part 15, Subpart C, Intentional radiator

Test performed by
Essai effectué par :
Prüfer

Mr Erich Staub

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

Mr Erich Staub

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

Mr Raymond Schneuwly

Rossens, July 14, 2008 (Issue Date / Date d'édition / Ausstelldatum) V2008Jul11

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\2007\20077722_shockfish_spotmell\rap_shockfish sa_15303_spotmeii.doc

montena emc sa
route de Montena 75
CH-1728 Rossens
Switzerland
phone +41 26 411 93 33
fax +41 26 411 93 30
www.montena.com/emc/
office.emc@montena.com

montena emc ag
Technopark Blumenegg
Blumeneggstrasse 50
CH-9403 Goldach
Switzerland
phone +41 71 278 41 92
fax +41 71 278 41 93

montena emc ag
EMV-Labor Turgi
Postfach 48
CH-5300 Turgi
Switzerland
phone +41 56 299 36 36
fax +41 56 299 25 08

Contents / Table des matières / Inhaltsverzeichnis

Page/Page/Seite

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
RFID	-	H-field carrier Champ H porteuse H-Feld Träger	CFR 47 § 15.225 (a) to (c)	∅ [2]
	-	H-field carrier stability Champ H stabilité de la porteuse H-Feld Trägerstabilität	CFR 47 § 15.225 (e)	∅ [3]
	6.1	Spurious emission Emissions parasites Nebenaussendung	CFR 47 § 15.225 (d) and § 15.209	✓
CSSS	-	6dB spectrum bandwidth Bande passante 6dB 6dB-Bandbreite	CFR 47 § 15.247 (a)(2)	∅ [3]
	6.2	Maximum peak power Puissance maximale peak Maximale Spitzenleistung	CFR 47 § 15.247 (b)(3)	✓
	-	Peak power spectral density Densité spectrale de la puissance peak Spektrale Spitzenleistungsdichte	CFR 47 § 15.247 (e)	∅ [3]
	6.2	Band edges emission Emissions aux bords de la bande Emission an den Bandgrenzen	CFR 47 § 15.247 (d)	✓
	6.3	Spurious emission Emissions parasites Nebenaussendung	CFR 47 § 15.247 (d)	✓
WLAN	-	6dB spectrum bandwidth Bande passante 6dB 6dB-Bandbreite	CFR 47 § 15.247 (a)(2)	∅ [3]
	6.4	Maximum peak power Puissance maximale peak Maximale Spitzenleistung	CFR 47 § 15.247 (b)(3)	✓
	-	Peak power spectral density Densité spectrale de la puissance peak Spektrale Spitzenleistungsdichte	CFR 47 § 15.247 (e)	∅ [3]
	6.4	Band edges emission Emissions aux bords de la bande Emission an den Bandgrenzen	CFR 47 § 15.247 (d)	✓
	6.5	Spurious emission Emissions parasites Nebenaussendung	CFR 47 § 15.247 (d)	✓
Standby	-	Conducted emission Émission par conduction Geleitete Emission	CFR 47 § 15.107 (Class B)	∅ [1]
	6.6	Spurious emission Emissions parasites Nebenaussendung	CFR 47 § 15.109 (Class B)	✓

1. Powered with / Alimenté avec / Gespeist mit : 4.2VDC (battery)
2. Emission of carrier is below general limits of §15.209.
3. Covered by tests of the chip manufacturer.

2. Applied standards / Normes appliquées / Verwendete Normen

47 CFR Part 15	Code of Federal Regulations - Telecommunication, FCC Part 15 - Radio frequency devices

3. Client / Client / Kunde

Client name and address Nom et adresse du client Name und Adresse des Kunden	*Shockfish SA* *PSE C, EPFL* *CH-1015 Lausanne*
Contact Person / Responsable / Kontaktperson	*Mr Roger Meyer*
Telephone / Téléphone / Telefon	*+41 21 693 85 11*
Fax / Télécopieur / Telefax	*+41 21 693 85 16*
E-mail / Courrier électronique / E-mail	*shockfish@shockfish.com*
Mandate no / No. de mandat / Auftragsnr.	*20077722*

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	*Shockfish SA* *PSE C, EPFL* *CH-1015 Lausanne*
Production country / Pays de fabrication / Ursprungsland	*Switzerland*
Brand name / nom de marque / Verkaufsmarke	*Spotme*
Product name / Nom du produit / Produktname	*SpotMeII Handheld*
Product description / Description du produit / Produktbeschreibung	*PDA with 802.11b/g WLAN, CSSS and RFID radio functions. It is intended to be used as a communicator device for conferences, events or trade shows on a rental basis.*
Model number / Numéro de modèle / Modellnummer	*S-02*
Serial no / No. de série / Seriennummer	*074714*
Software version / Version du logiciel / Softwareversion	*revC2.2*
Highest frequency / Fréquence la plus élevée / Höchste Frequenz	*2462 MHz (channel 11)*
Supply / Alimentation / Speisung	*U = 4.2VDC (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 closed*
	*Top view open*
	*Rear view open*

	*ID label*

4.3 Classification / Classification / Klassierung

CFR 47 Part 15	☐ Unintentional radiator (Subpart B) ☒ Intentional radiator (Subpart C) ☐ Class A digital device ☐ Class B digital device

4.4 Ports / Accès / Anschlüsse

Port / Accès / Anschluss	**Cable / Câble / Kabel**			**Remark / Remarque / Bemerkung**
	Max. length / Longueur max. / Max. Länge	**Type / Type / Typ**	**Screen / Blindage / Schirm**	
Charging contacts	- - -	- - -	- - -	- - -

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	*April 7 to 28, 2008*	*18 - 25 °C*	*1000 – 1050 hPa*	*30 - 40 %*

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

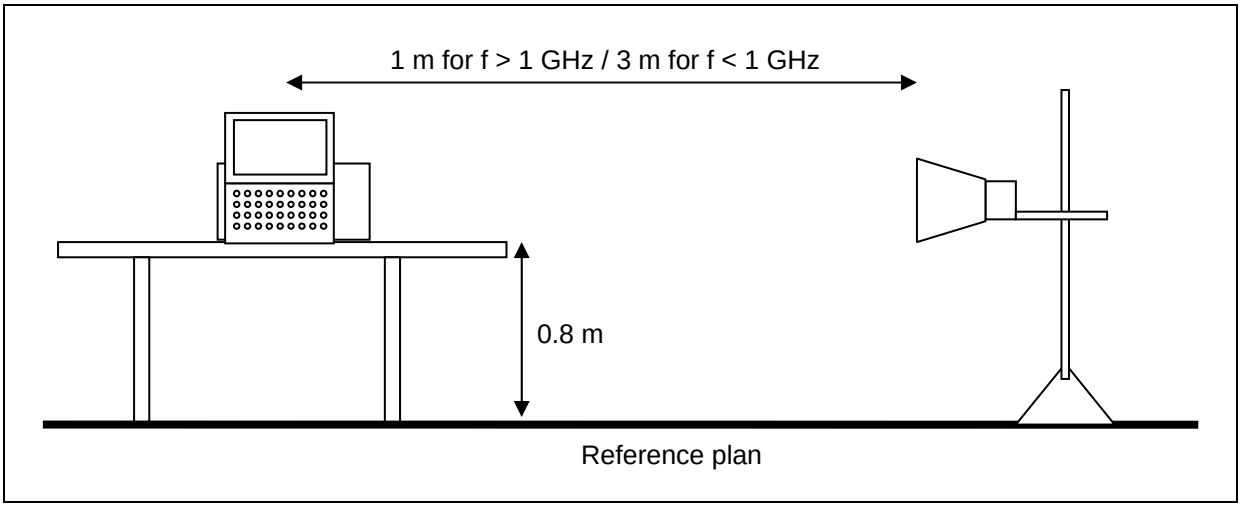
The alternate test site (ferrite chamber) is accepted by FCC (Reg. No. 0009508433). *Conducted and radiated measurements are performed according to the ANSI C63.4 (2003) procedure.*

5.3 Attendant persons / Personnes présentes / Anwesende Personen

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

Mr Erich Staub

5.4 Test configuration / Configuration d'essai / Prüfkonfiguration



6. Emission tests

6.1 Spurious emission (RFID)

6.1.1 Radiated emission - Magnetic field (150 kHz – 30 MHz)

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

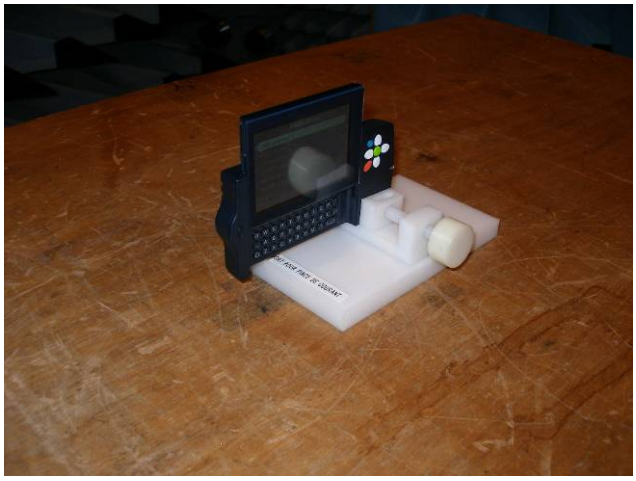
Meas. distance: ☒ 3 m ☐ 10 m ☐ 30 m ☐ ..... m

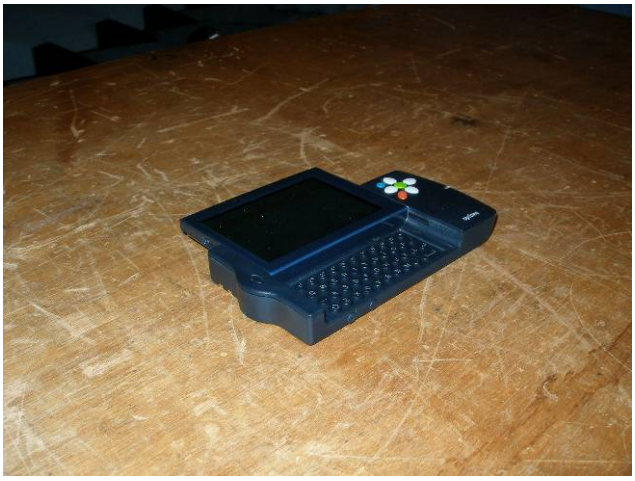
Meas. uncertainty: ± 2.8 dB (10 m)

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 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 dBµA/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)µV/m at 300 m;

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

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

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

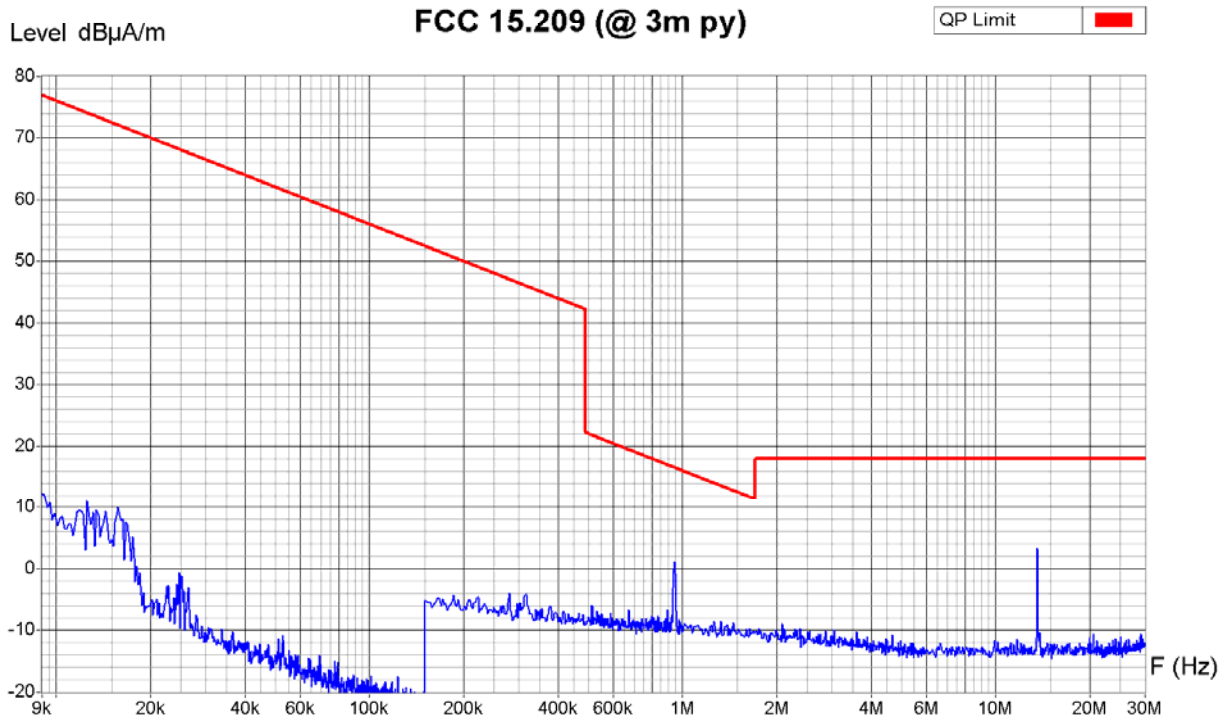
Test equipment:

Spectrum analyser	☐ 88-14	☐ 90-26	☐ 94-24	☐ 02-06	☐ 03-45	☒ 03-57
Receiver	☐ 85-12	☐ 90-11	☐ 94-34	☐ 04-28	☐	
Antenna (typ: magnetic)	☒ 90-25	☐ 90-28	☐ 99-32	☐		
Cables	☒ 06-00					

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

Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0 - 360°
Antenna Height :	1m (center of loop antenna)
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, upright
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa

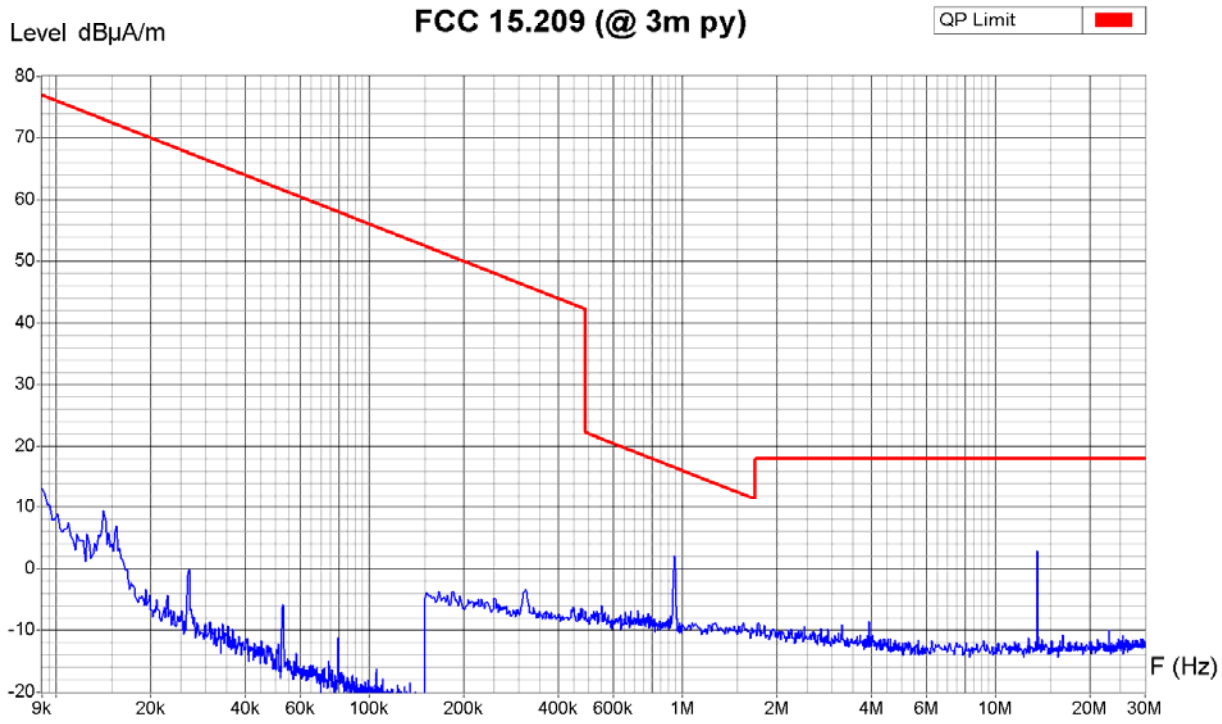


Zone	9 KHz - 80 KHz	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 15.04.08 13:37
Filename:
20077722_handheld_FCC SP-RFID_000pa.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0 - 360°
Antenna Height :	1m (center of loop antenna)
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, upright
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa

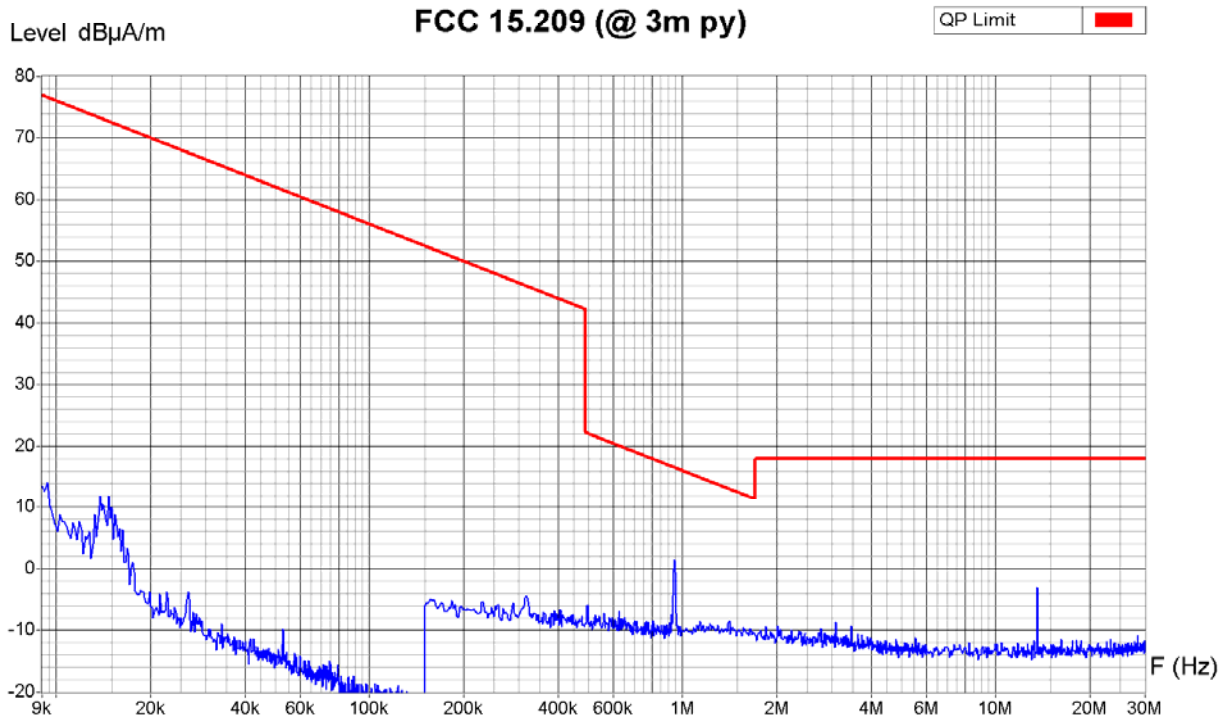


Zone	9 KHz - 80 KHz	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 15.04.08 12:53
Filename:
20077722_handheld_FCC SP-RFID_000pe.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Parallel
Table Angle :	0 - 360°
Antenna Height :	1m (center of loop antenna)
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, laying
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa

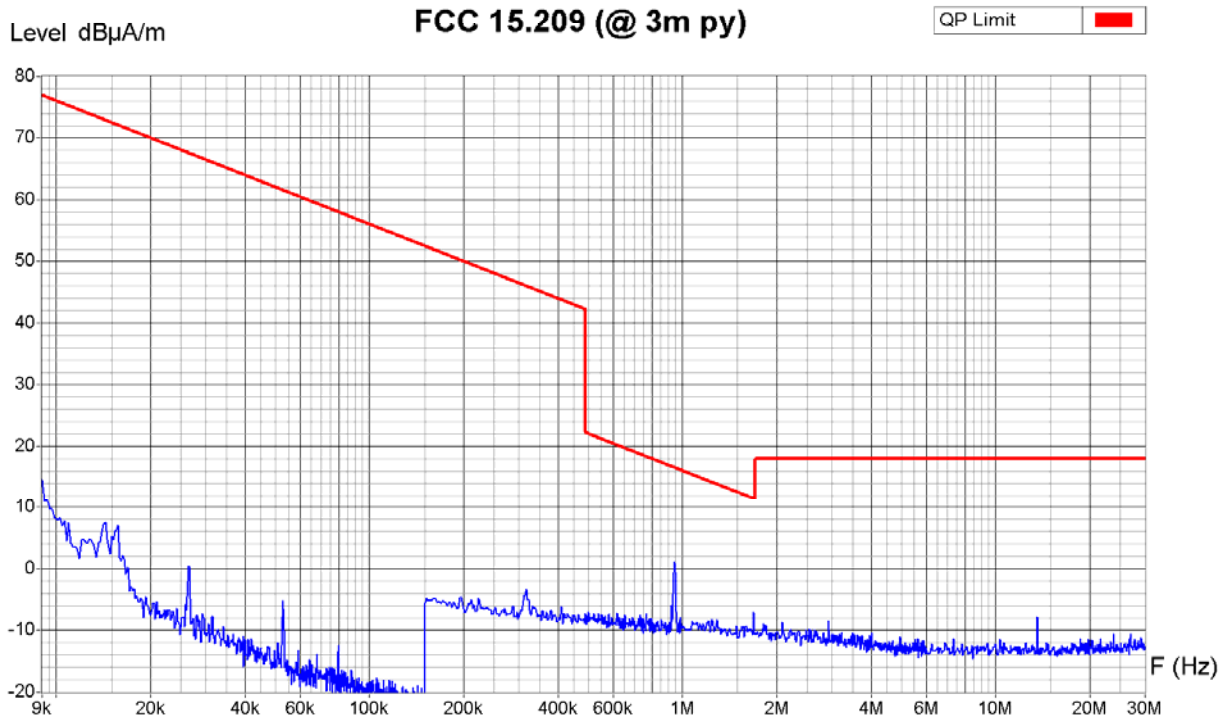


Zone	9 KHz - 80 KHz	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 15.04.08 13:45
Filename:
20077722_handheld_FCC SP-RFID_001pa.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Perpendicular
Table Angle :	0 - 360°
Antenna Height :	1m (center of loop antenna)
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, laying
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa



Zone	9 KHz - 80 KHz	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz	80 KHz - 150 KHz
Video Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz
Resol Bandwidth	300 Hz	10 KHz	10 KHz	10 KHz	300 Hz

Operator: E. Staub
Date/Time: 15.04.08 13:02
Filename:
20077722_handheld_FCC SP-RFID_001pe.png/.txt

6.1.2 Radiated emission - Electromagnetic field (30 MHz – 1 GHz)

Test site: ☐ semi-anechoic chamber (foam) ☐ open test site
☒ semi-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 dBµV/m and transformed to a measuring distance of 3m (factor used = 20 dB/decade) if necessary*
e.g.: for f = 40MHz the limit is 100µV/m at 3m;

$$20\log\left(\frac{100_{[\mu V/m]}}{1_{[\mu V/m]}}\right) = 40 dB\mu V \ at\ 3m$$

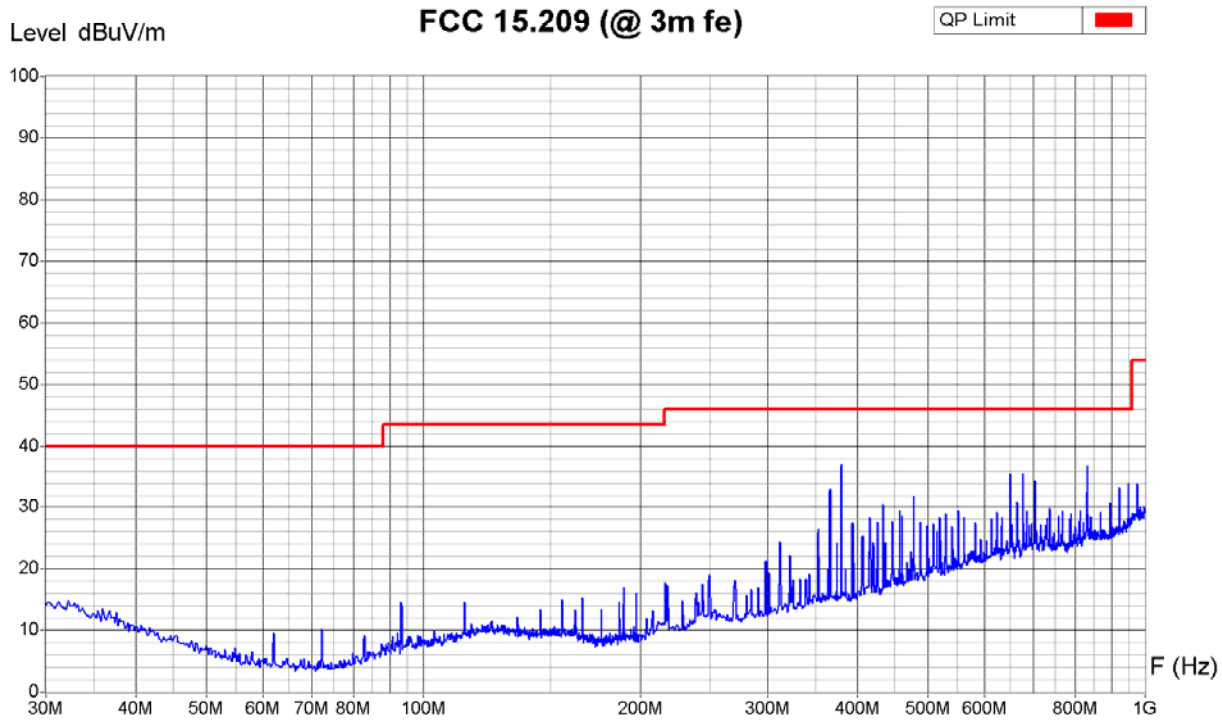
Test equipment:

Spectrum analyser		☐ 88-14	☐ 90-26	☐ 94-24	☐ 02-06	☒ 03-45	☐ 03-57
Receiver		☐ 85-04	☐ 90-43	☒ 94-35			
Preamplifier		☐ 90-01	☐ 95-86	☐ 05-56	☒ 05-59	☐ 05-62	☐ .....
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	☐ 90-29	☐ 98-12	☐ 98-13	☐	
Cables		☒ 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 :	SpotMeII handheld
Set-Up :	handheld open, upright
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa

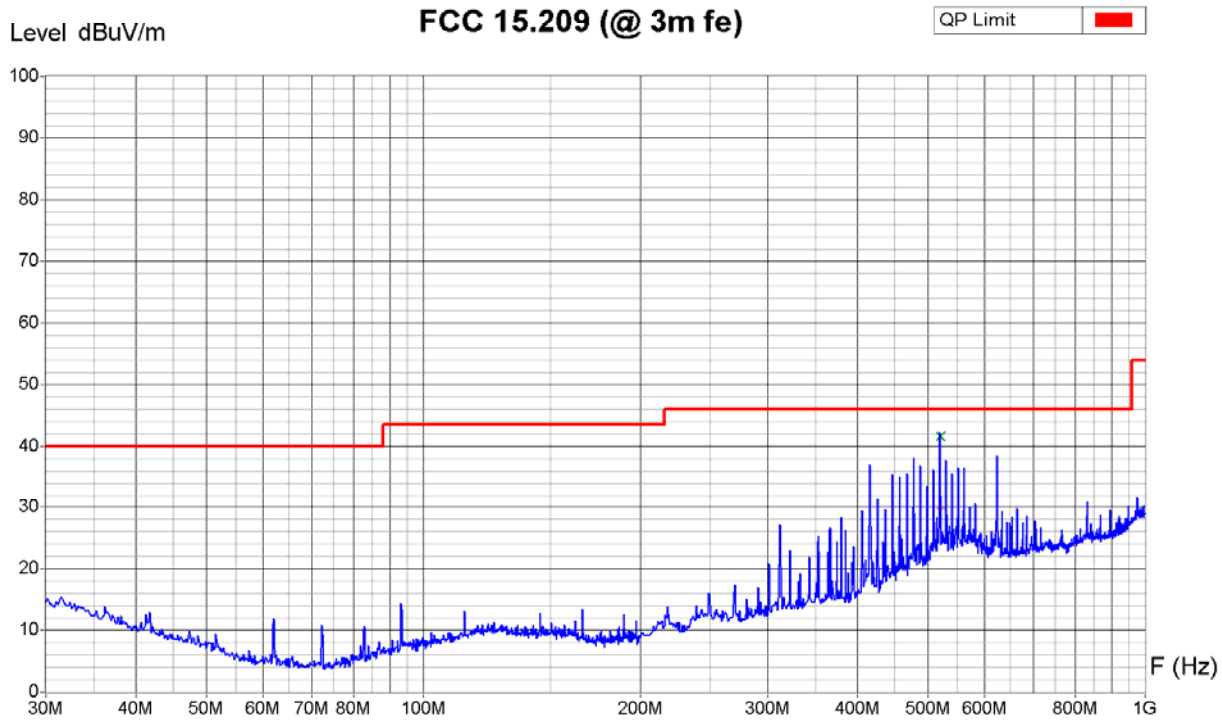


Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.04.08 12:32
Filename:
20077722_handheld_FCC SP-RFID_001h.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, upright
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa



Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

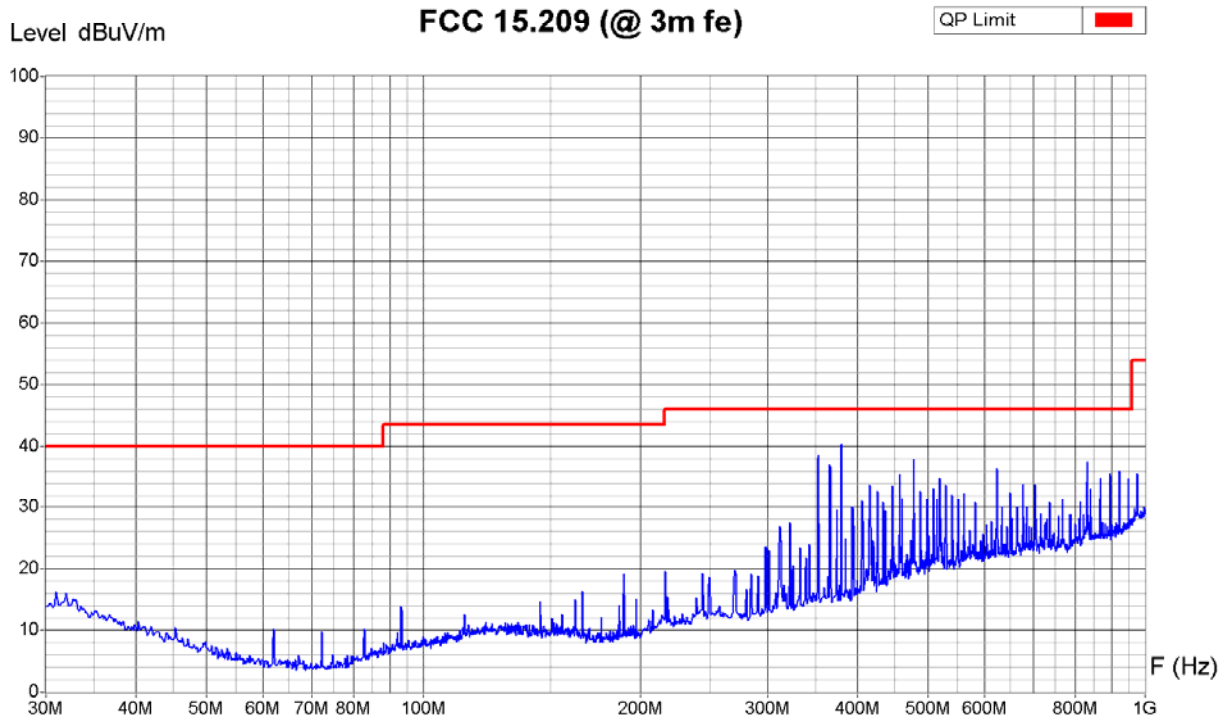
Receiver Measures

Frequency	Peak	QuasiPeak (x)	Average (+)	QP Margin
520 MHz	44.9 dBuV/m	41.6 dBuV/m	29.7 dBuV/m	4.4 dB

Operator: E. Staub
Date/Time: 28.04.08 12:22
Filename:
20077722_handheld_FCC SP-RFID_001v.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Horizontal
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, laying
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa

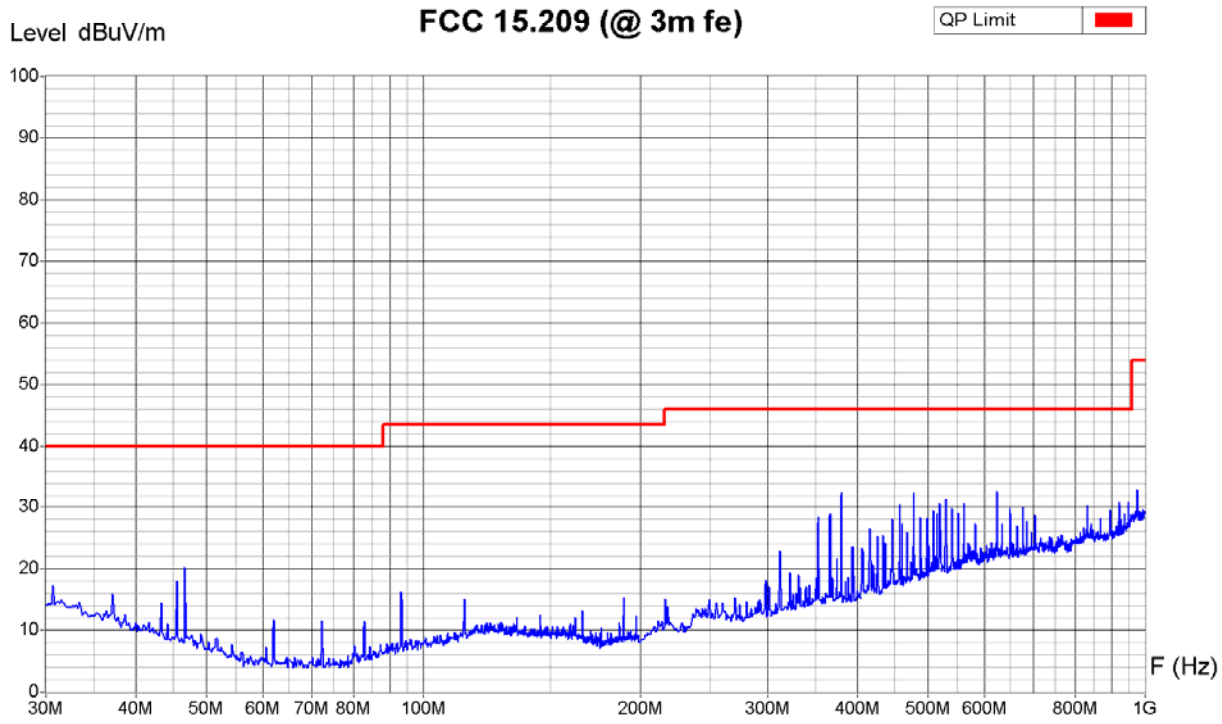


Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.04.08 12:40
Filename:
20077722_handheld_FCC SP-RFID_002h.png/.txt

Measurement Type :	Radiated Field
Polarisation :	Vertical
Table Angle :	0 - 360°
Antenna Height :	1 - 4m
Equipment Under Test :	SpotMeII handheld
Set-Up :	handheld open, laying
Operating Conditions :	Tx, RFID, Pmax
Remarks :	

montena
montena emc sa



Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.04.08 12:47
Filename:
20077722_handheld_FCC SP-RFID_002v.png/.txt