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Registration number
Numéro d'accréditation
Akkreditierungsnummer

STS 024

Schweizerischer Prüfstellendienst
Service suisse d'essai
Swiss testing service



Report: Rapport: Bericht:	<i>Electromagnetic compatibility</i>		Report no: Rapport no: Bericht Nr:	<i>Draft14'781</i>
Product name: Nom du produit: Produktname	<i>EL-Skyport Universal Receiver EL-Skyport Transmitter</i>		Mandate no: Mandat no: Auftrag Nr:	<i>20067171</i>
Serial no: No de série: Seriennummer:	<i>Universal Rx: U00200 Tx: T00200</i>	Model number: Numéro de modèle: Modellnummer:	<i>Universal Rx: SPUNI-V1.3 Tx: SPTX-V1.1</i>	
Customer: Client: Kunde:	<i>Elinca SA Av. de Longemalle 11 CH-1020 Renens</i>	Date of test: Date de l'essai: Prüfdatum:	<i>November 27 to 28, 2006 December 4, 2006</i>	

Standards / Normes / Normen	Result Résultat Ergebnis
CFR 47, Part 15, Subpart C, Intentional radiator, Paragraph 15.249	<i>Pass</i>
CFR 47, Part 15, Subpart C, Intentional radiator, Paragraph 15.207	<i>Pass</i>

Test performed by
Essai effectué par :
Prüfer

*Mr Erich Staub
Mr Christophe Perrenoud*

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

Mr Erich Staub

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

Mr François Trotti

Rossens, January 18, 2007

(Issue Date / Date d'édition / Ausstelldatum)

V2006Oct23

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.

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

✓ Pass / Réussi / Bestanden

✗ Fail / Echoué / Nicht bestanden

Ø 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	
6.1	Conducted emission Émission par conduction Geleitete Emission CFR 47 § 15.207	✓
6.2	Radiated emission – Carrier Émission par rayonnement – Porteuse Gestahlte Emission – Träger CFR 47 § 15.249	✓
6.3	Radiated emission – EM-field Émission par rayonnement – Champ EM CFR 47 § 15.209	✓
6.4	Émission par rayonnement – Champ EM CFR 47 § 15.249	✓
6.5	Gestahlte Emission – EM-Feld	

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	Elinca SA Av. de Longemalle 11 CH-1020 Renens
Contact Person / Responsable / Kontaktperson	Mr Dieter Rauch / Mr Dominique Aglier
Telephone / Téléphone / Telefon	+41 (0)21 637 2677
Fax / Télécopieur / Telefax	+41 (0)21 637 2681
E-mail / Courrier électronique / E-mail	elinca@elinca.ch
Mandate no / No. de mandat / Auftragsnr.	20067171

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	<i>Elinca SA Av. de Longemalle 11 CH-1020 Renens</i>
Production country / Pays de fabrication / Ursprungsland	<i>Switzerland</i>
Brand name / nom de marque / Verkaufsmarke	<i>elinchrom</i>
Product name / Nom du produit / Produktname	<i>EL-Skyport Universal Receiver EL-Skyport Transmitter</i>
Product description / Description du produit / Produktbeschreibung	<i>EL-Skyport wireless flash triggering system with wireless remote data communication</i>
Model number / Numéro de modèle / Modellnummer	<i>Universal Rx: SPUNI-V1.3 Tx: SPTX-V1.1</i>
Serial no / No. de série / Seriennummer	<i>Universal Rx: U00200 Tx: T00200</i>
Software version / Version du logiciel / Softwareversion	<i>Universal Rx: V1.3 Tx: V1.1</i>
Highest frequency / Fréquence la plus élevée / Höchste Frequenz	<i>2.475 GHz (transmitter channel 8)</i>
Supply / Alimentation / Speisung	<i>Universal Rx: Powered by external supply 5V/500mA; input = 100 – 240VAC / 47 – 63 Hz Tx: Powered by internal 3VDC lithium battery</i>
Technical documentation Documentation technique Technische Dokumentation	<i>None. The equipment is completely identified by its serial no. according to ISO 9001.</i>

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

EL-Skyport Universal Receiver with synchron cable and external AC/DC power supply

*EL-Skyport Universal Receiver**Marking plate of AC/DC power supply**EL-Skyport Transmitter*

*EL-Skyport Transmitter***4.3 Classification / Classification / Klassierung**

- Carrier between 2.448 GHz to 2.475 GHz
- Carrier power conducted max = 1 mW (0 dBm)

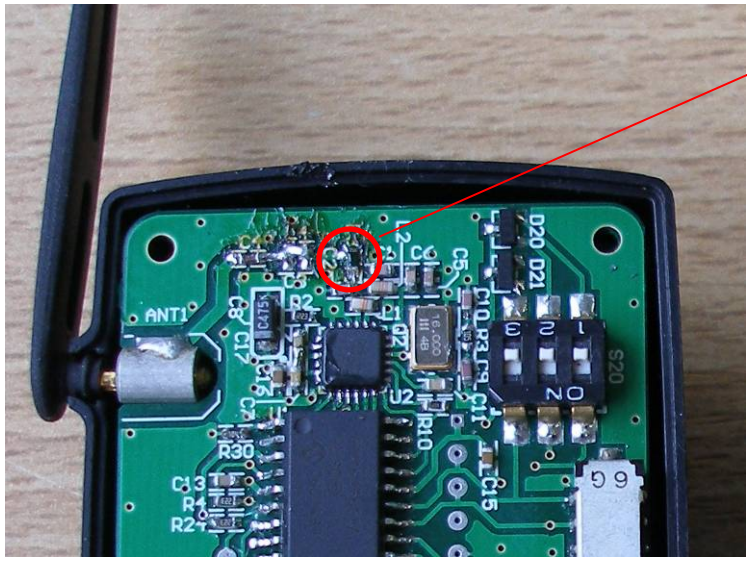
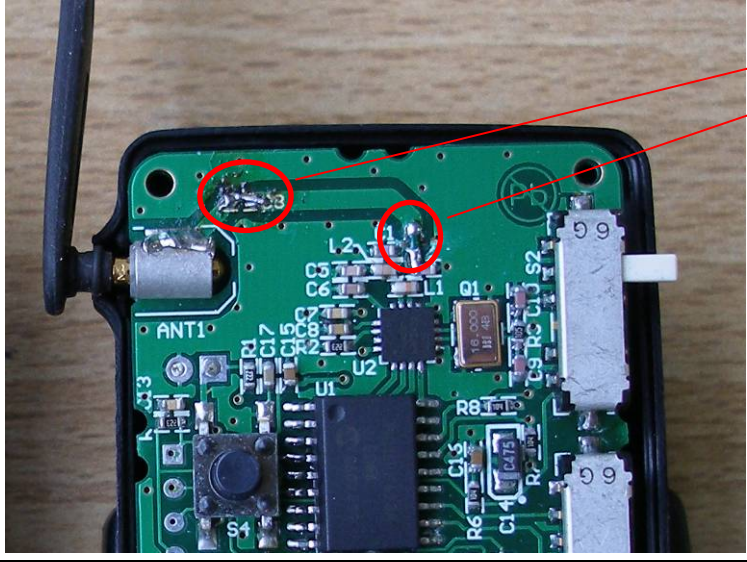
4.4 Ports / Accès / Anschlüsse*EL-Skyport Universal Receiver*

Port / Accès / Anschluss	Cable / Câble / Kabel			Remark / Remarque / Bemerkung
	Max. length / Longueur max. / Max. Länge	Type / Type / Typ	Screen / Blindage / Schirm	
5VDC IN	1.8m	L, N, PE	none	Connected to external power supply for charging the battery
Synchron cable	30cm	Phone jack	Yes	- - -

EL-Skyport Transmitter

Port / Accès / Anschluss	Cable / Câble / Kabel			Remark / Remarque / Bemerkung
	Max. length / Longueur max. / Max. Länge	Type / Type / Typ	Screen / Blindage / Schirm	
Synchron cable	30cm	Phone jack	Yes	- - -

4.5 Modifications / Modifications / Angebrachte Änderungen

	<i>EL-Skyport Universal Receiver:</i> $L3 = 1.8 \text{ nH}$
	<i>EL-Skyport Transmitter:</i> $C3$ replaced with bridge $L3 = 1.8 \text{ nH}$ placed close to amplifier

5. Test conditions / Conditions d'essai / Testbedingungen**5.1 Climatic conditions / conditions climatiques / klimatische Bedingungen**

Temperature / Température / Temperatur:	21 - 23 °C
Pressure / Pression / Druck:	960 - 970 hPa
Relative humidity / Humidité relative / Relative Luftfeuchtigkeit:	31 - 35 %

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

Test period / Date des essais / Datum der Prüfungen:	November 27 to 28, 2006 December 4, 2006
Location / Lieu / Ort:	montena emc sa route de Montena 75 CH-1728 Rossens

5.3 Test facility and Methodology

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.

5.4 Persons present / Personnes présentes / Anwesende Personen**Test Engineer(s) / Ingénieur(s) d'essai / Prüfsingenieur(e) :**

Mr Erich Staub

Mr Christophe Perrenoud

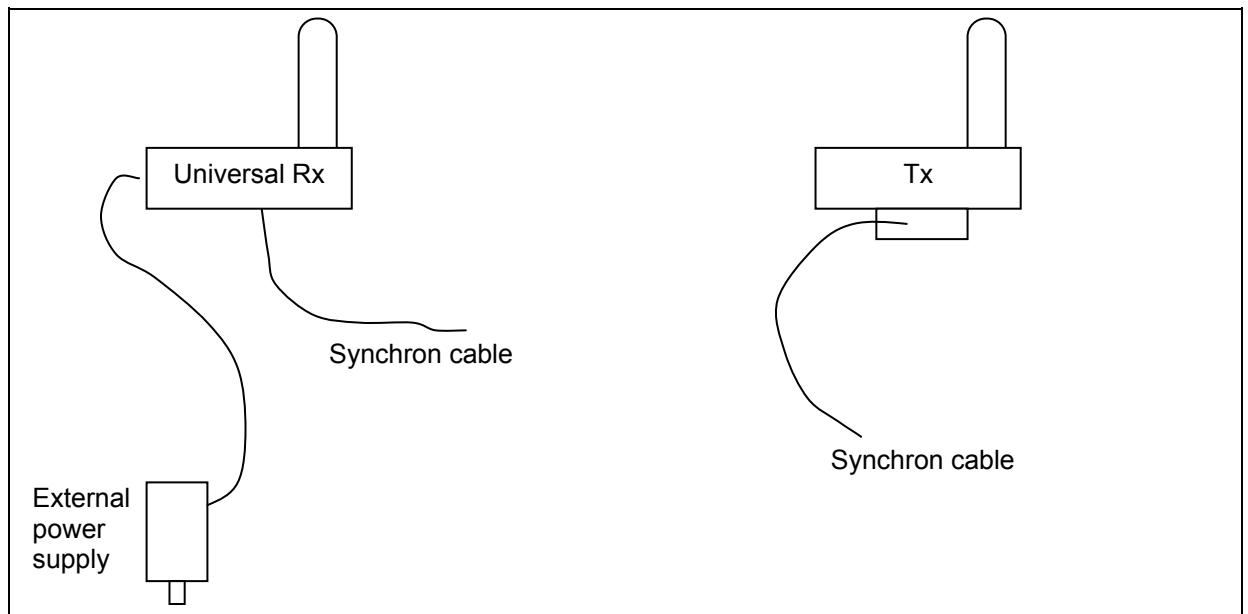
Other(s) / Autre(s) / Andere :

Name / Nom / Name

Company / Société / Firma

Mr Dieter Rauch

Rauch Elektronik

5.5 Test configuration / Configuration d'essai / Prüfkfiguration**5.6 Operating conditions / Conditions de fonctionnement / Betriebszustand**

- *Continuous transmitting every 5ms burst mode*

5.7 Auxiliary 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.

None

6. Emission tests

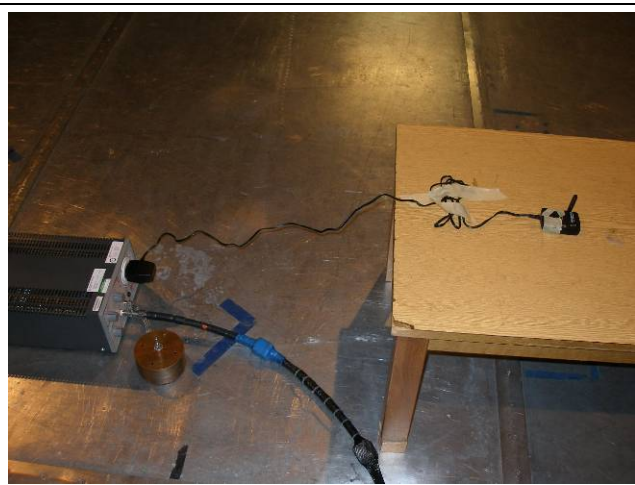
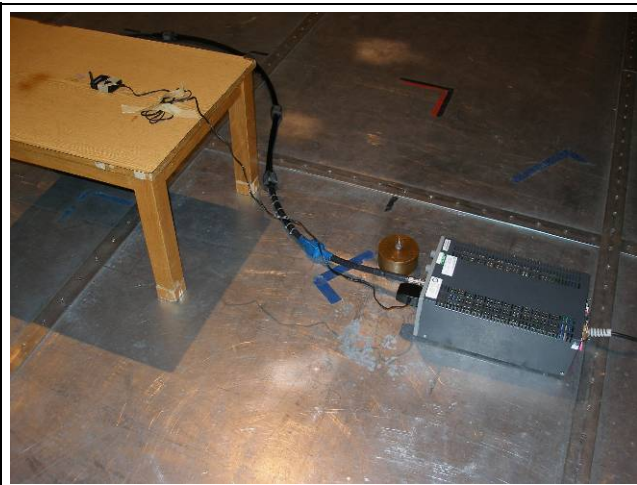
6.1 Conducted emission - Interference voltage

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

Meas. uncertainty: +/- 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 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.

Test set-up:



Remarks: ---

Test equipment:

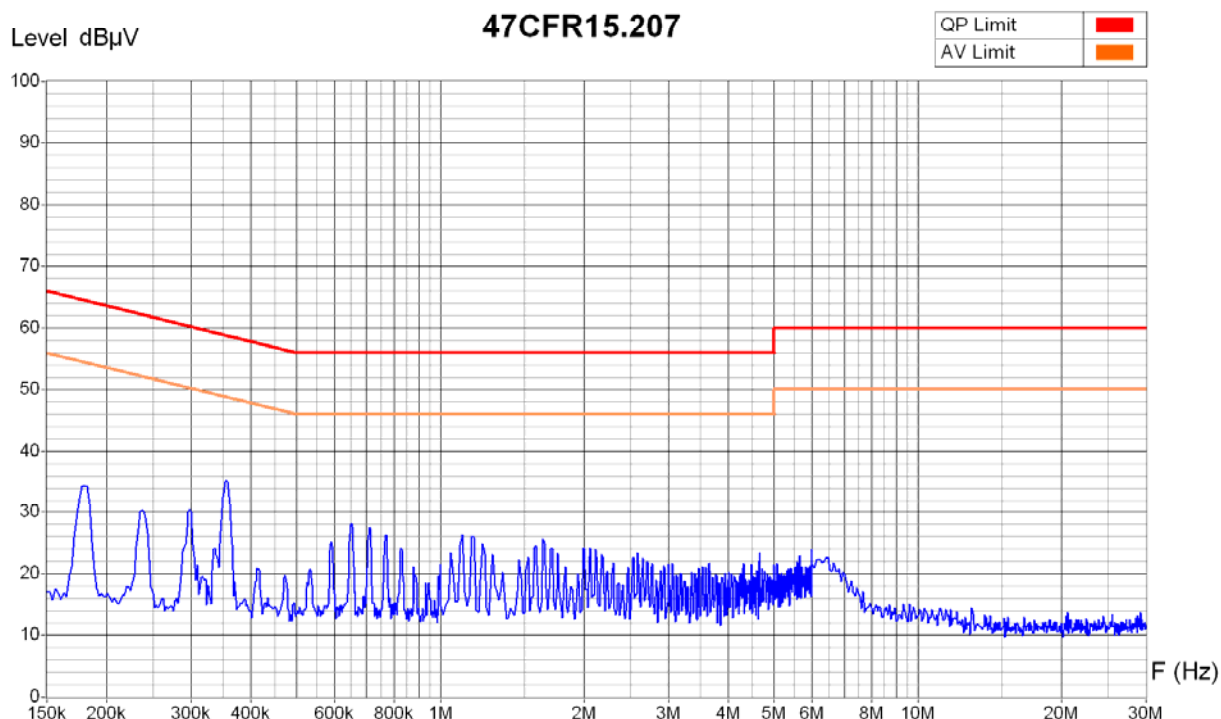
Spectrum analyser	☐ 88-14	☐ 90-26	☒ 94-24	☐ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-12	☒ 90-11	☐ 94-34	☐ 04-28		
LISN	☐ 85-13	☐ 90-08	☐ 94-36	☒ 94-40	☐ 95-12	☐ 00-43
	☐ 04-04	☐ 04-05	☐			
Protection 10 dB	☐ 91-45	☐ 91-44	☐ 95-30	☐ 95-33	☐ 95-35	☐ 95-36
	☐ 96-38	☒ included in LISN				
Protection 20 dB	☐ 91-46	☐ 95-33	☐ 95-38	☐ included in LISN		
.....						

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

Measurement Type : Voltage Interference
 Supply : Line 1
 Other :



Equipment Under Test : EL-Skyport Universal Receiver
 Set-Up : Helmsman power supply 5V/500mA
 Operating Conditions : Continous transmitting every 5 ms burst mode, channel 1 (=2448 MHz)
 Remarks : laying with antenna vertical
 L3 = 1.8 nH
 100VAC / 60Hz



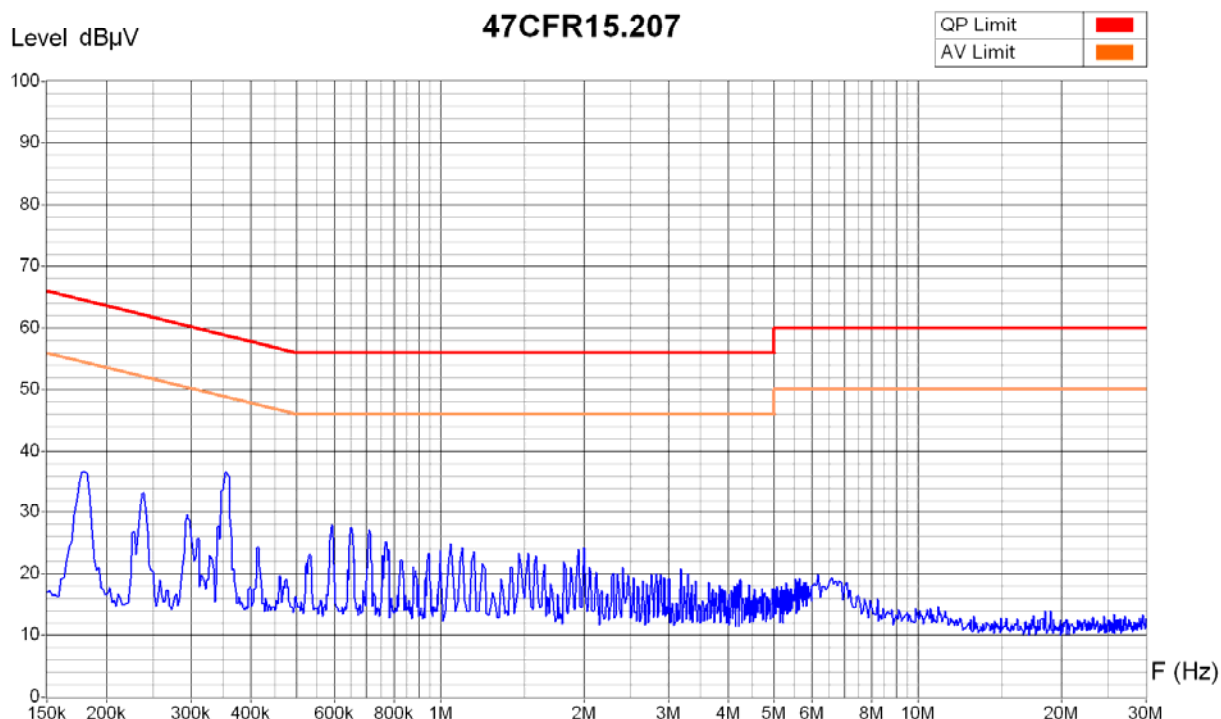
Zone	150 KHz - 1 MHz	1 MHz - 6 MHz	6 MHz - 30 MHz
Video Bandwidth	10 KHz	10 KHz	10 KHz
Resol Bandwidth	9 KHz	9 KHz	9 KHz

Operator: **E. Staub**
 Date/Time: **04.12.06 16:15**
 Filename:
 20067171_UR_ec_004_L1.png/
 .txt

Measurement Type : Voltage Interference
Supply : Line 2
Other :



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : Helmsman power supply 5V/500mA
Operating Conditions : Continous transmitting every 5 ms burst mode, channel 1 (=2448 MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH
100VAC / 60Hz



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

Operator: E. Staub
Date/Time: 04.12.06 16:10
Filename:
20067171_UR_ec_004_L2.png/
.txt

6.2 Radiated emission - Electromagnetic field (carrier)

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

Distance: ☐ 30 m ☐ 10 m ☐ 3 m ☒ 1 m

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

Meas. uncertainty: ± 6 dB (30 - 300 MHz) / ± 5.4 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 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:



Universal Receiver: laying



Transmitter: standing

Remarks: Limit values expressed in dB μ V/m and transformed to a measuring distance of 1m
(factor used = 20 dB/decade) if necessary:
e.g.: for $f = 2.45$ GHz the limit is 50mV/m at 3m;
 $20 \log_{10} (50\text{mV/m}) + 20 \log_{10} (3\text{m}/1\text{m}) = 103.5 \text{ dB}\mu\text{V/m at } 1\text{m}$

Test equipment:

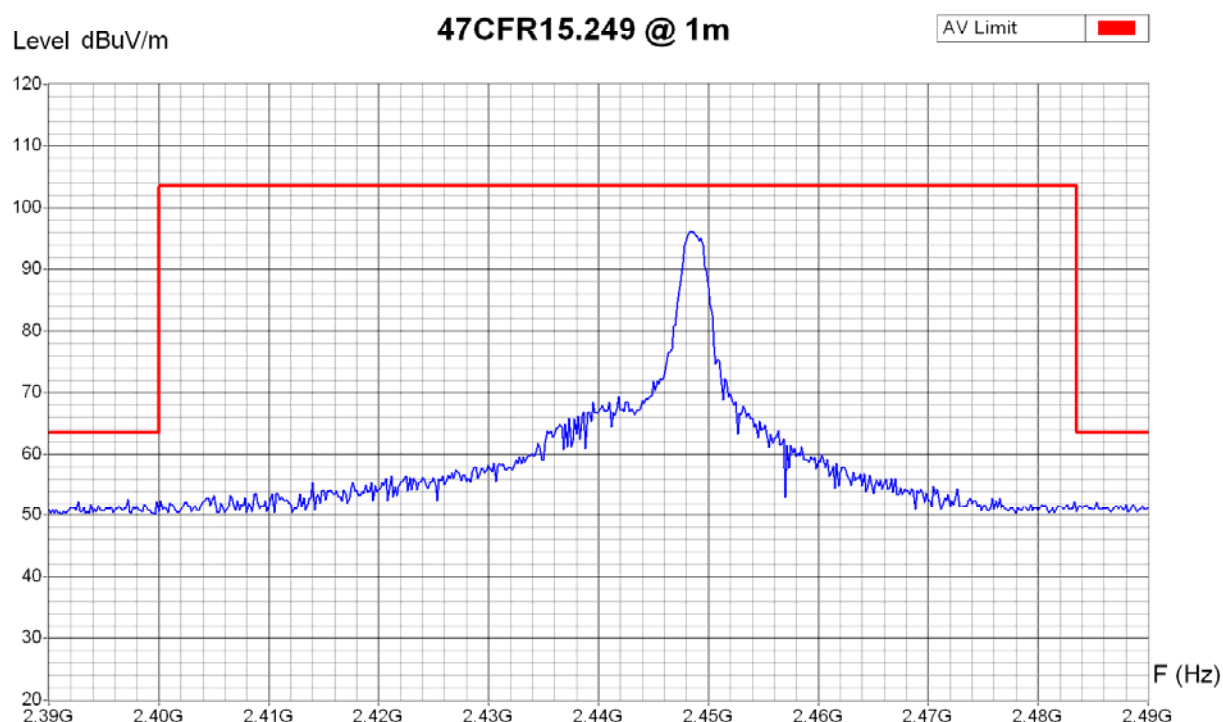
Spectrum analyser	☐ 88-14	☐ 90-26	☐ 94-24	☒ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-04	☒ 90-43	☐ 94-35			
Preamplifier	☐ 90-01	☐ 95-86	☐ 05-56	☐ 05-59	☒ 05-87	☐ „Turgi“
Antenna (horn)	☒ 90-24	☐ 90-29	☐ 98-12	☐ 98-13	☐	
.....						

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

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical



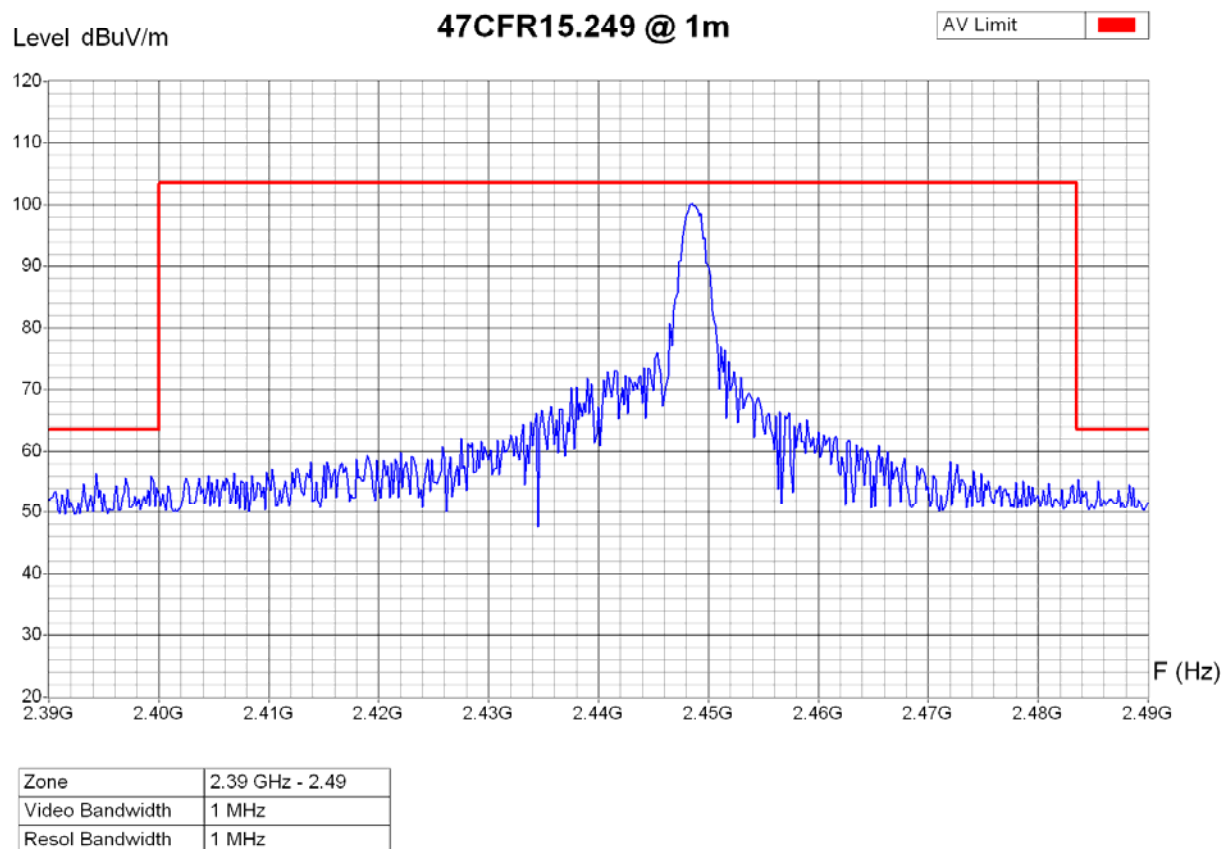
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: **E. Staub**
Date/Time: 27.11.2006 10:50
Filename:
20067171_UR_er_laying_000h.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal

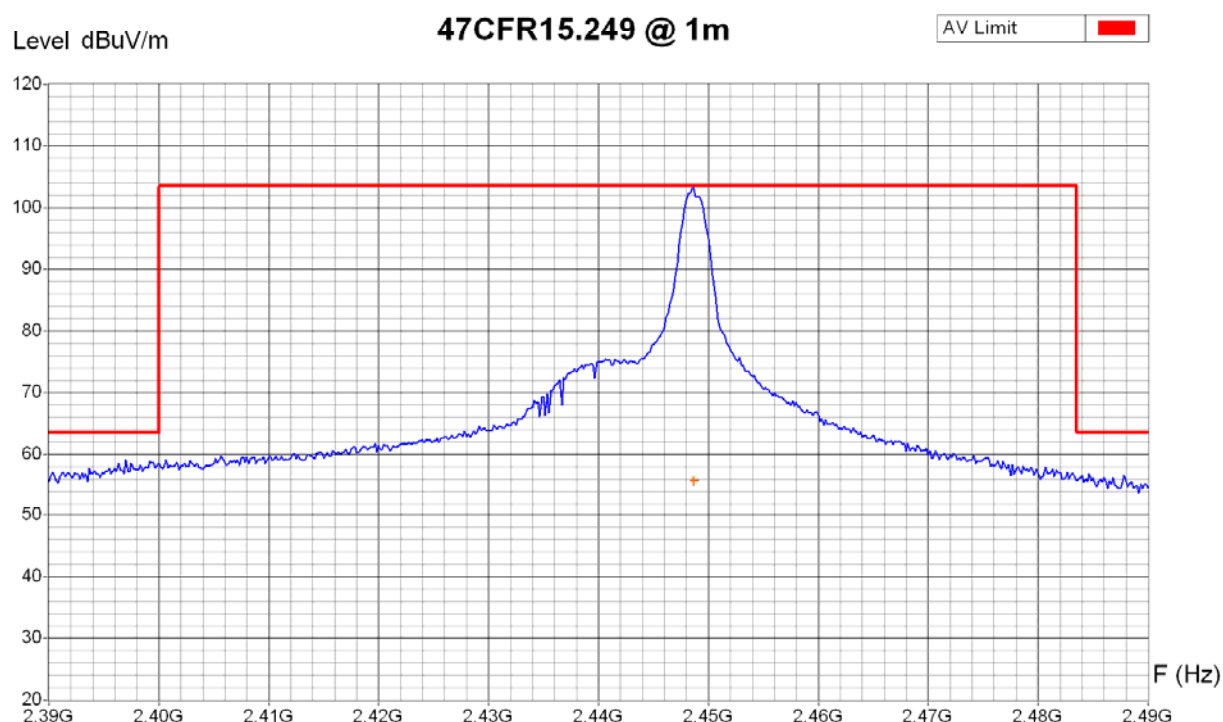


Operator: E. Staub
Date/Time: 27.11.2006 11:21
Filename:
20067171_UR_er_standing_003h.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical



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

Receiver Measures

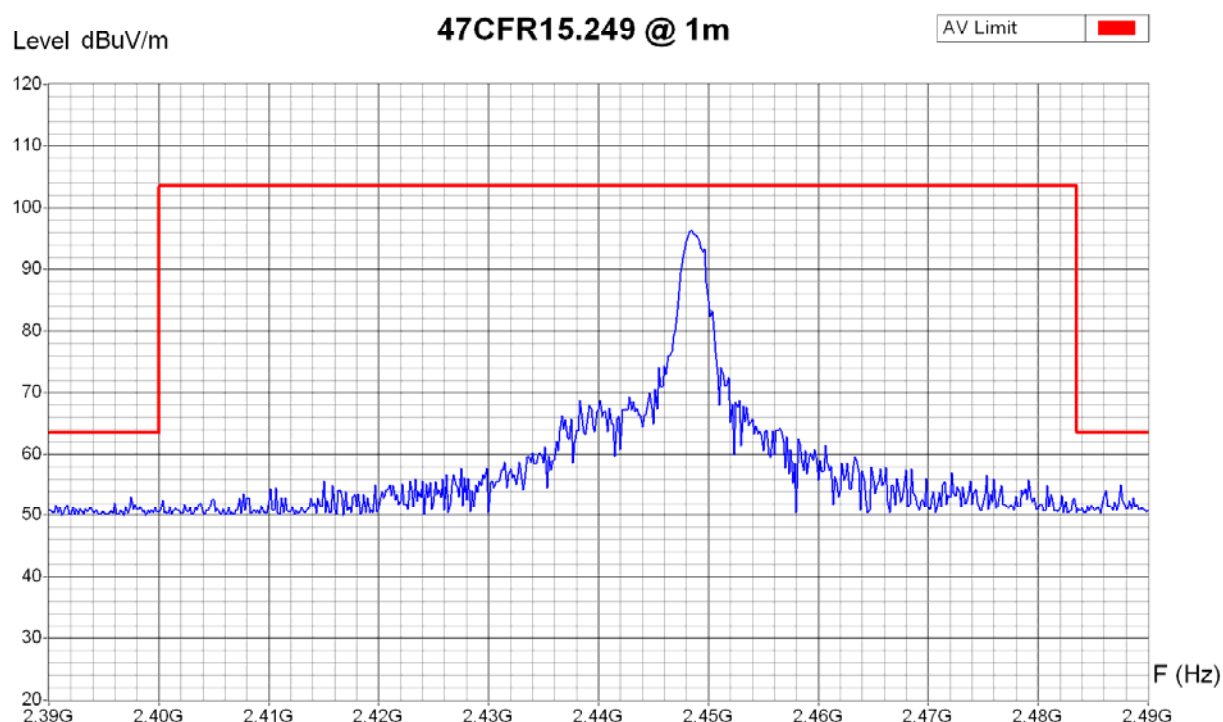
Frequency	Peak	QuasiPeak (x)	Average (+)
2.45 GHz	103.1 dBuV/m	NaN dBuV/m	55.7 dBuV/m

Operator: **E. Staub**
Date/Time: 27.11.2006 10:42
Filename:
20067171_UR_er_000v_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal



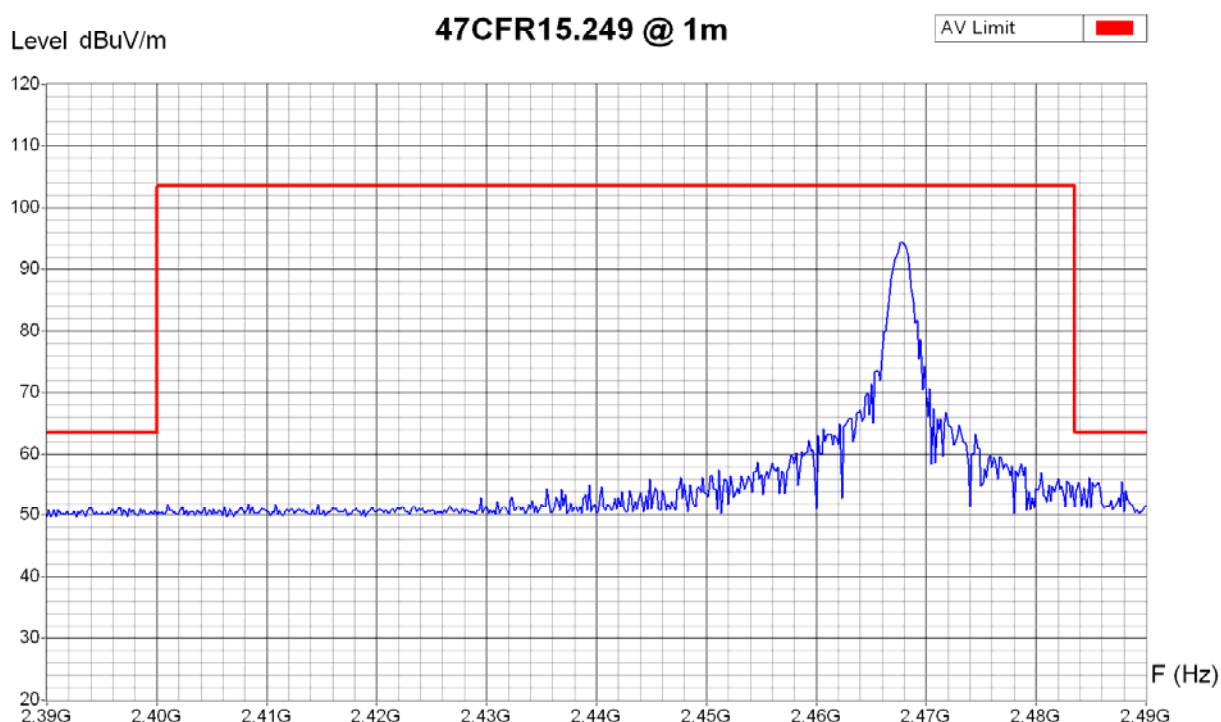
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: **E. Staub**
Date/Time: 27.11.2006 11:24
Filename:
20067171_UR_er_standing_003v.
png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2467MHz)
Remarks : laying with antenna vertical



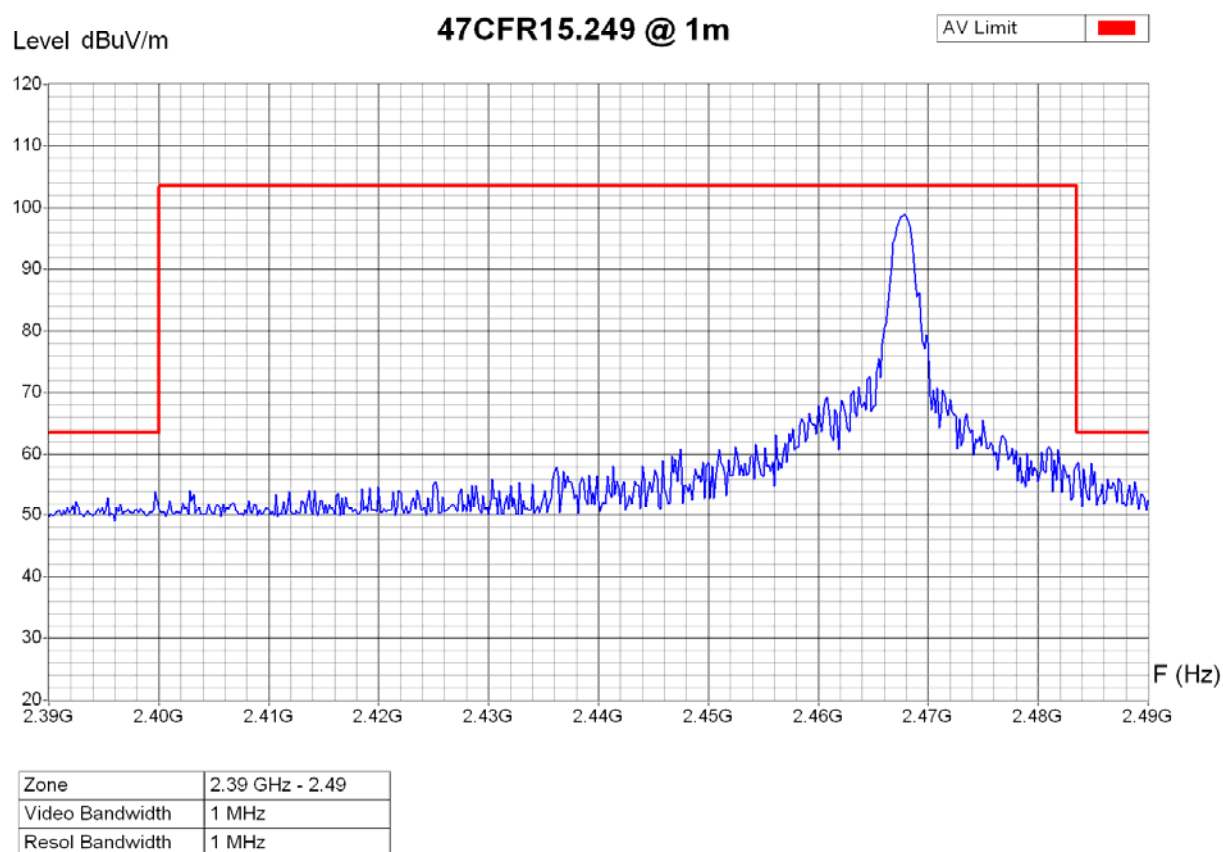
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: E. Staub
Date/Time: 27.11.2006 11:13
Filename:
20067171_UR_er_laying_001h.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2467MHz)
Remarks : standing with antenna horizontal

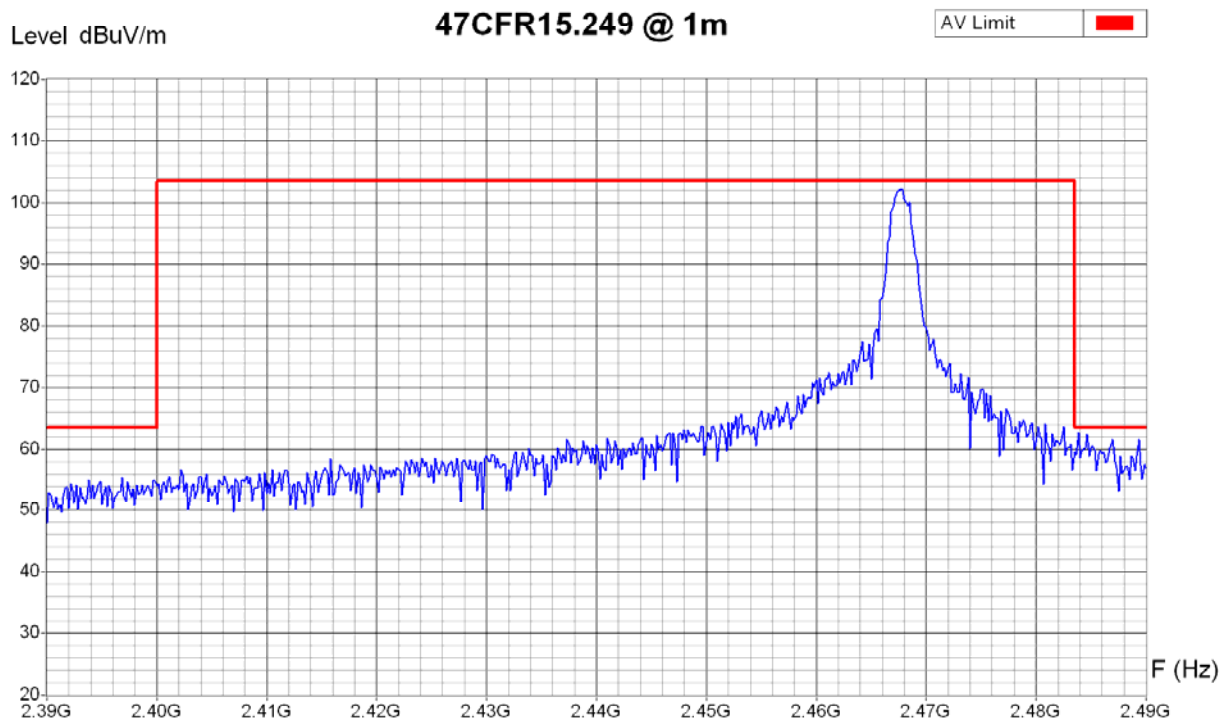


Operator: **E. Staub**
Date/Time: 27.11.2006 11:01
Filename:
20067171_UR_er_standing_002h.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2467MHz)
Remarks : laying with antenna vertical



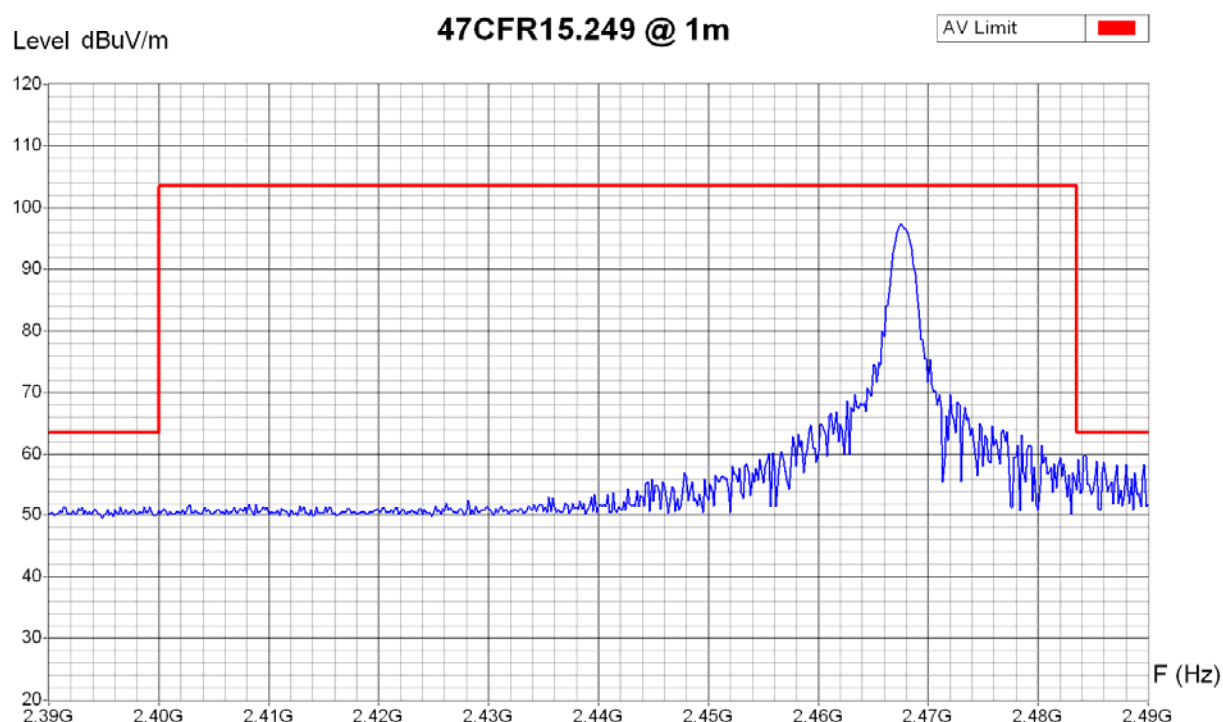
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: **E. Staub**
Date/Time: 27.11.2006 11:09
Filename:
20067171_UR_er_laying_001v.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2467MHz)
Remarks : standing with antenna horizontal



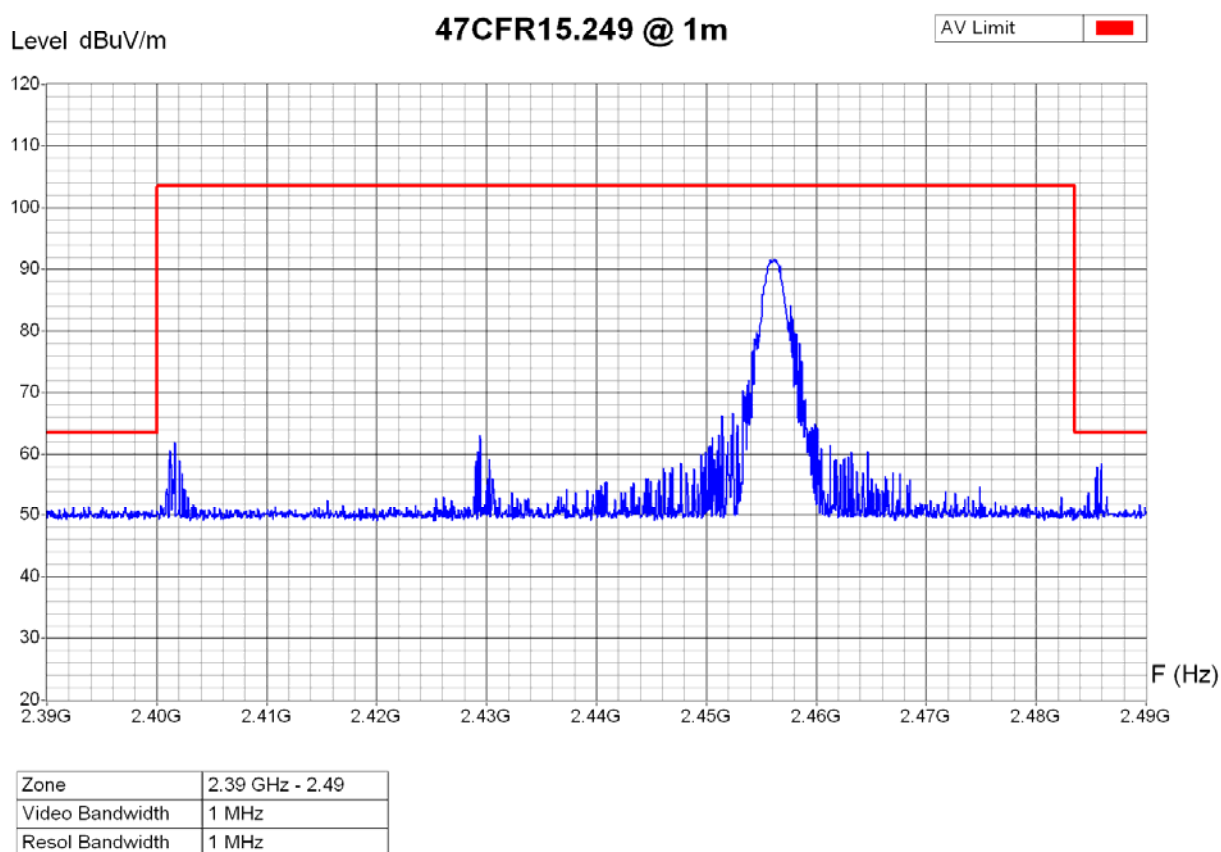
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: **E. Staub**
Date/Time: 27.11.2006 11:07
Filename:
20067171_UR_er_standing_002v.
png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical

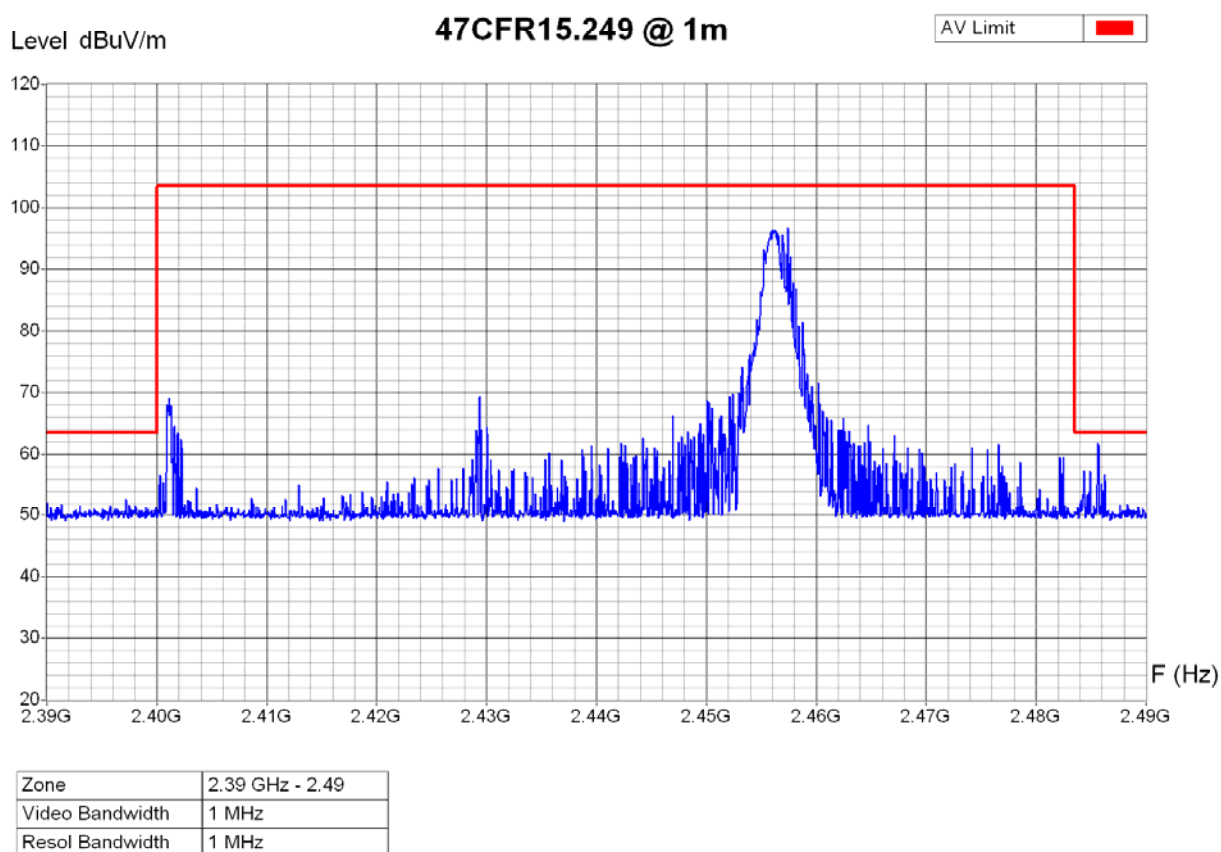


Operator: E. Staub
Date/Time: 27.11.2006 13:47
Filename:
20067171_Tx_er_000h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal

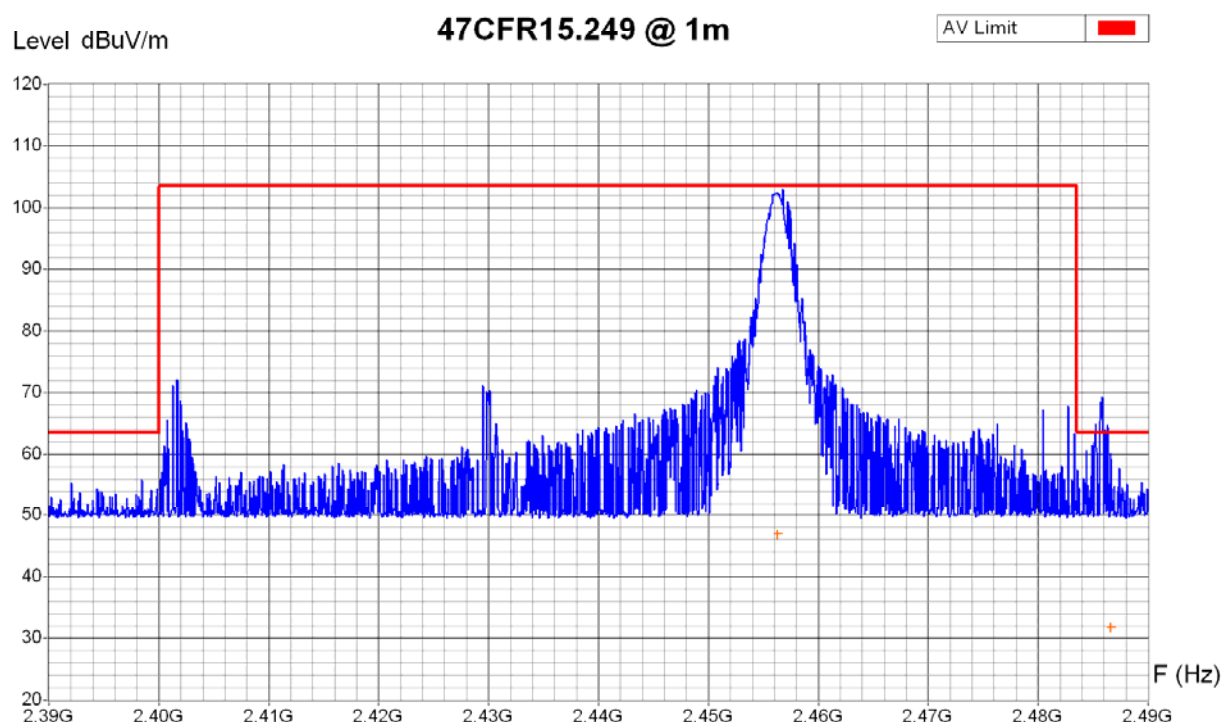


Operator: **E. Staub**
Date/Time: 27.11.2006 13:50
Filename:
20067171_Tx_er_000h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical



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

Receiver Measures

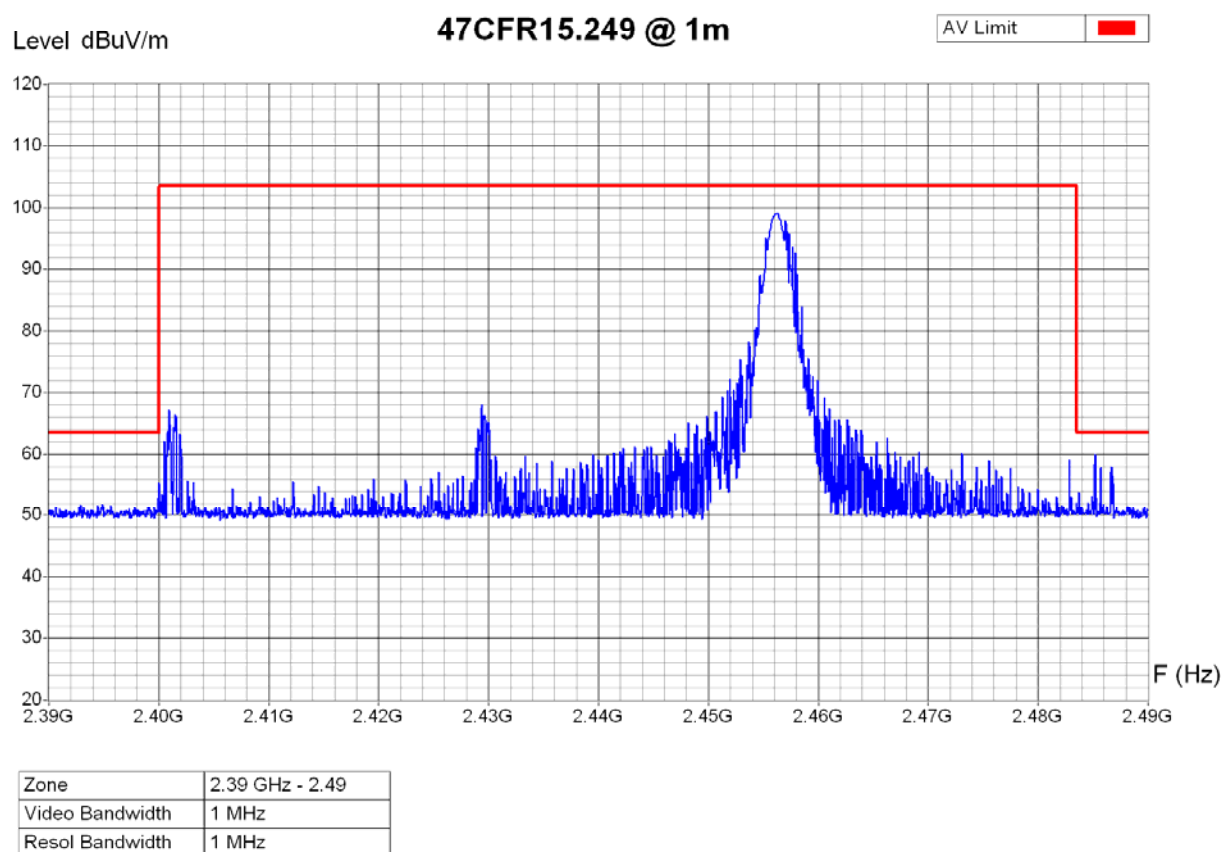
Frequency	Peak	Average (+)
2.456 GHz	102.5 dBuV/m	46.9 dBuV/m
2.487 GHz	60.1 dBuV/m	31.8 dBuV/m

Operator: **E. Staub**
Date/Time: 27.11.2006 12:30
Filename:
20067171_Tx_er_000v_laying.png
/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal

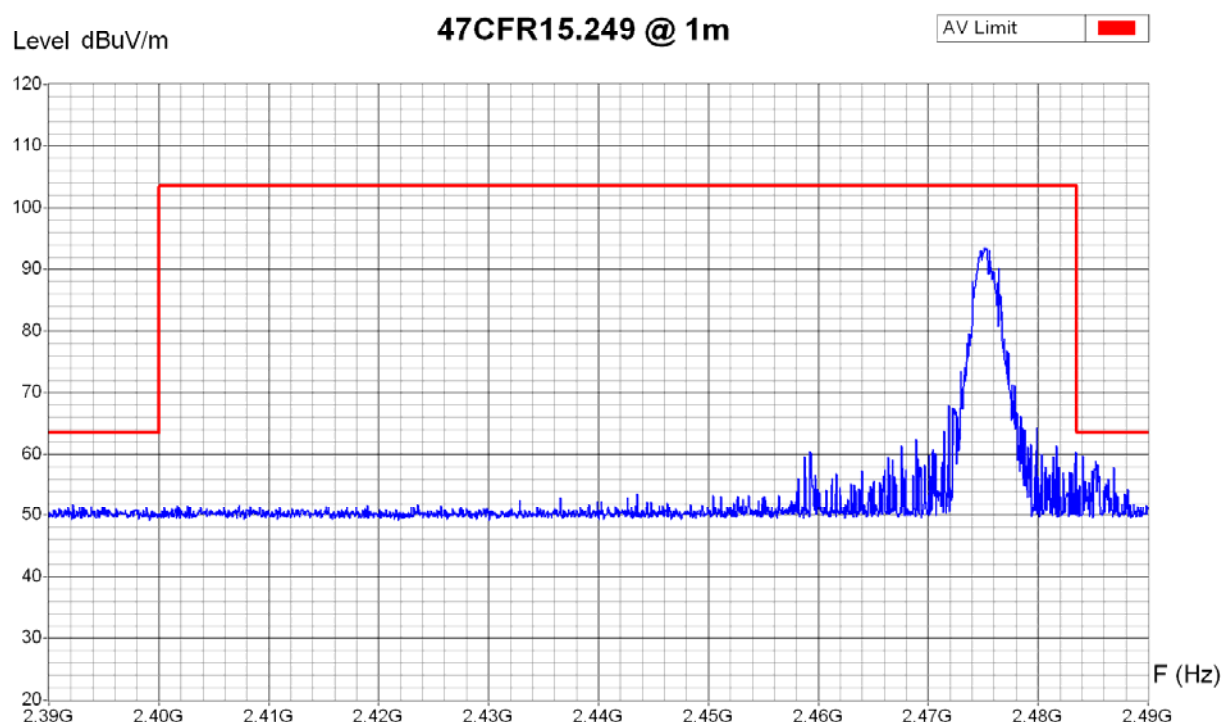


Operator: E. Staub
Date/Time: 27.11.2006 13:53
Filename:
20067171_Tx_er_000v_standing.png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2475MHz)
Remarks : laying with antenna vertical



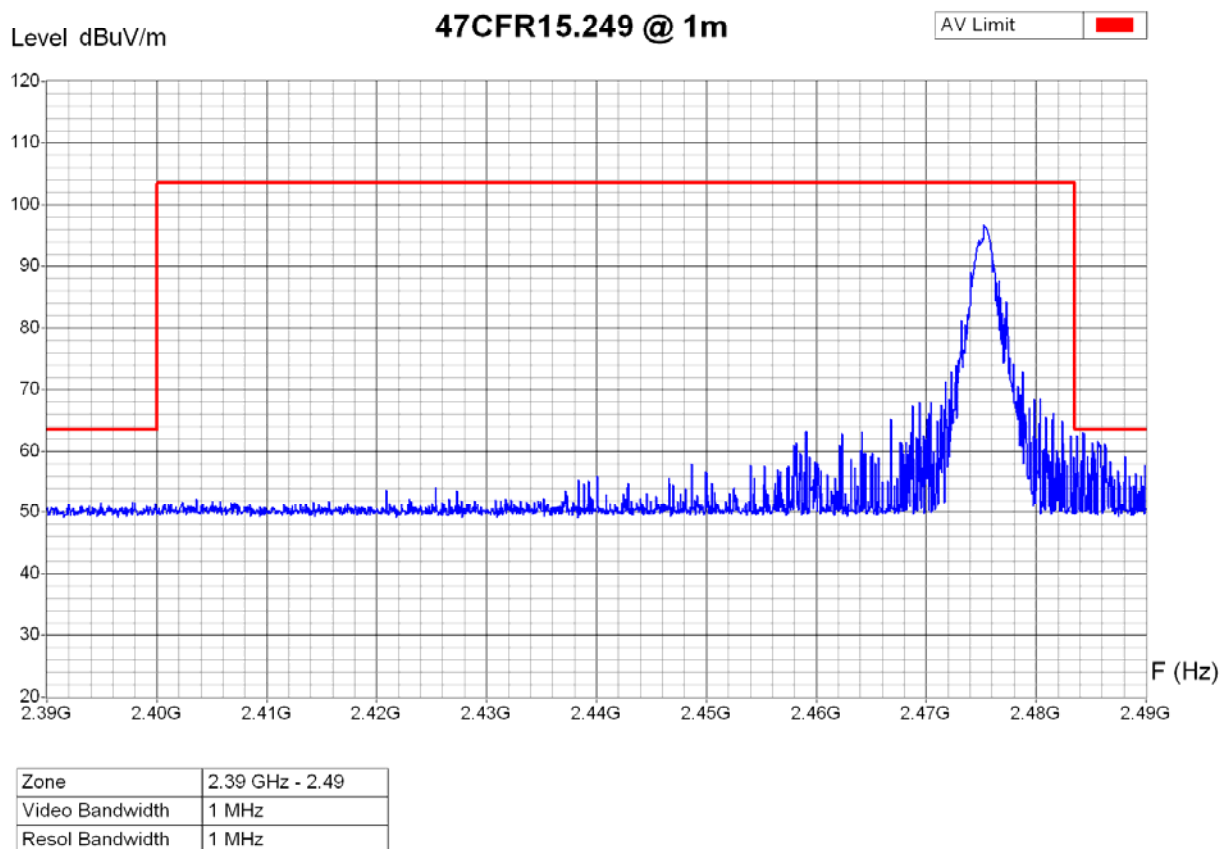
Zone	2.39 GHz - 2.49
Video Bandwidth	1 MHz
Resol Bandwidth	1 MHz

Operator: E. Staub
Date/Time: 27.11.2006 14:03
Filename:
20067171_Tx_er_001h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2475MHz)
Remarks : standing with antenna horizontal

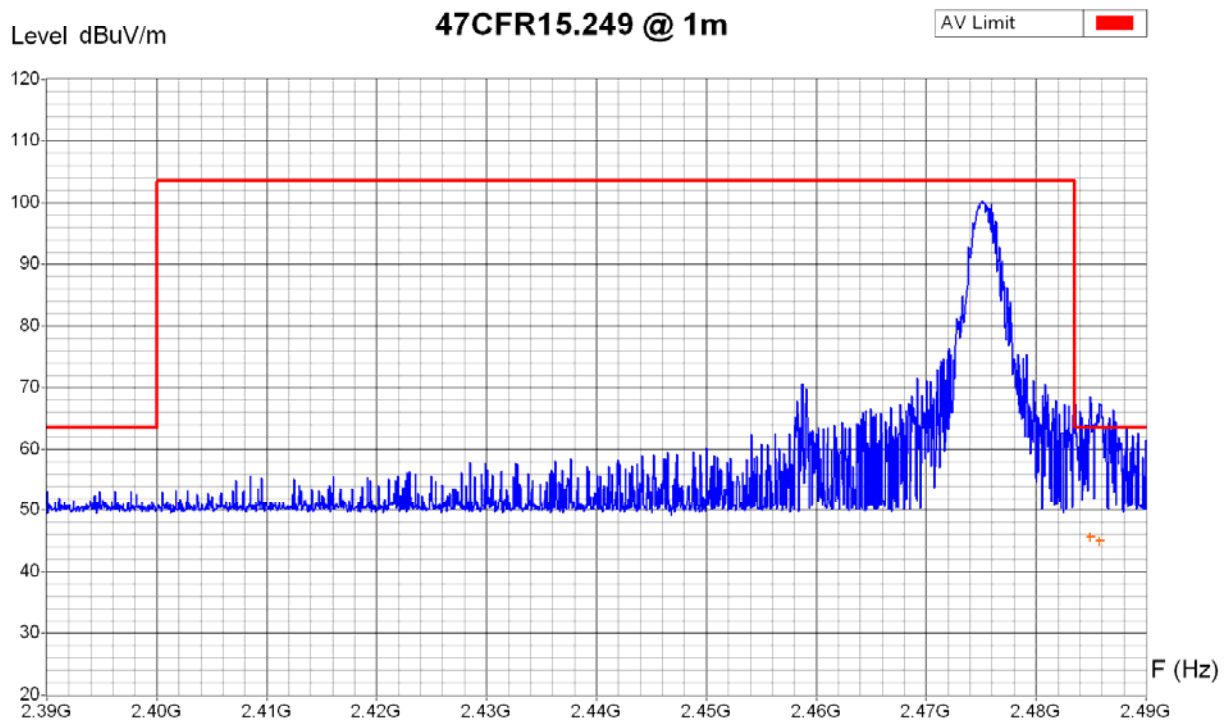


Operator: **E. Staub**
Date/Time: 27.11.2006 14:00
Filename:
20067171_Tx_er_001h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2475MHz)
Remarks : laying with antenna vertical



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

Receiver Measures

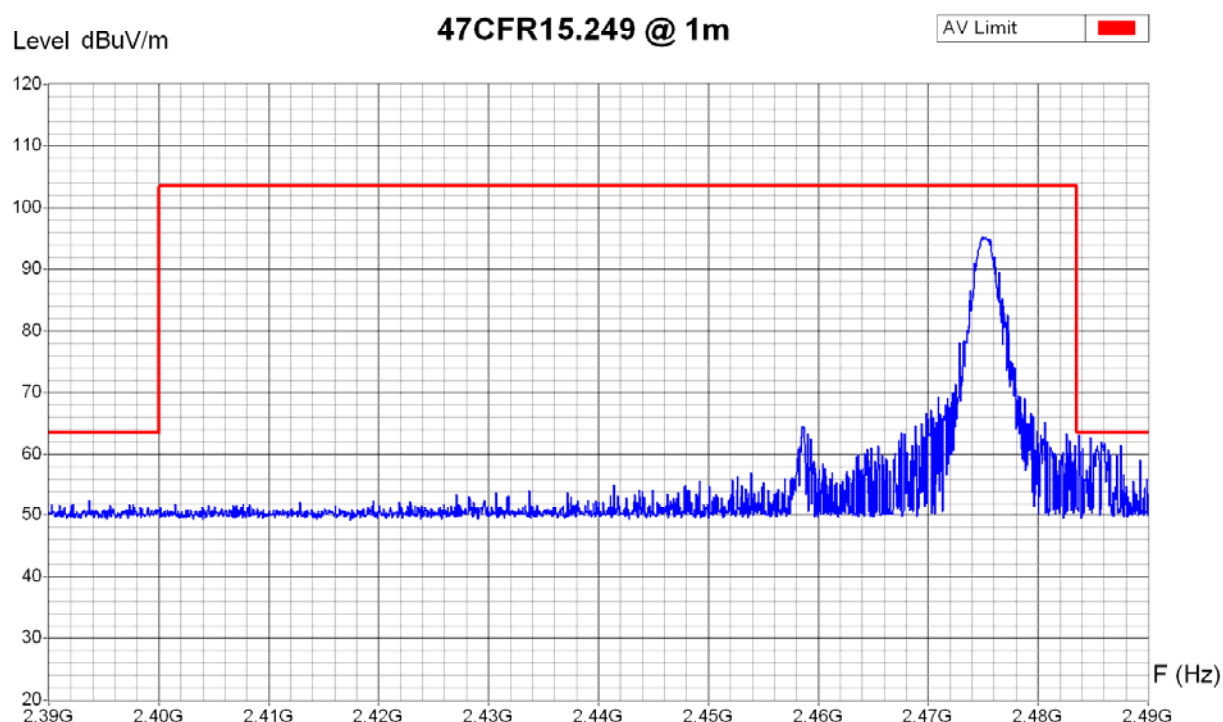
Frequency	Peak	Average (+)
2.485 GHz	68.5 dBuV/m	45.6 dBuV/m
2.486 GHz	67.4 dBuV/m	45.0 dBuV/m

Operator: **E. Staub**
Date/Time: 27.11.2006 14:05
Filename:
20067171_Tx_er_001v_laying.png
/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 8 (=2475MHz)
Remarks : standing with antenna horizontal



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

Operator: **E. Staub**
Date/Time: 27.11.2006 13:57
Filename:
20067171_Tx_er_001v_standing.p
ng.txt

6.3 Radiated emission - Electromagnetic field ($f \leq 1$ GHz)

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

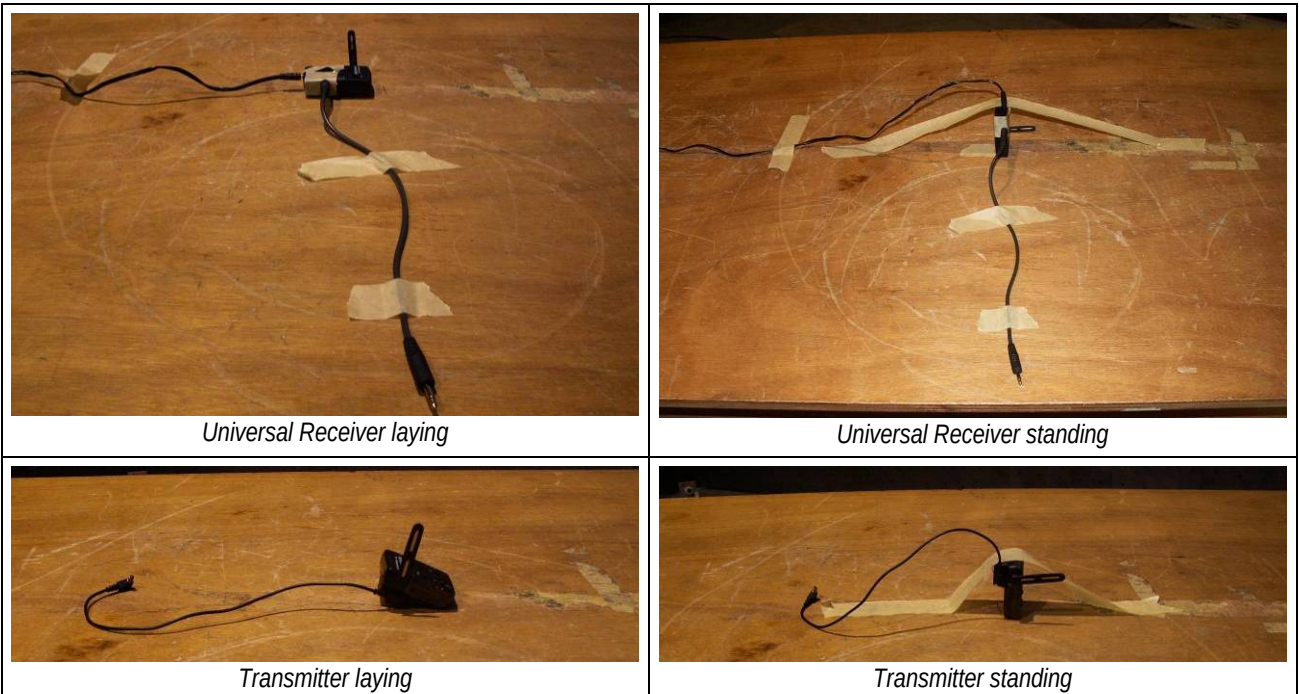
Distance: ☐ 30 m ☒ 10 m ☐ 3 m ☐

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

Meas. uncertainty: ± 6 dB (30 - 300 MHz) / ± 5.4 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 dB μ V/m and transformed to a measuring distance of 10m (factor used = 20 dB/decade) if necessary:
 e.g.: for $f = 40$ MHz the limit is 100 μ V/m at 3m;
 $20 \log_{10} (100\mu\text{V/m}) + 20 \log_{10} (3\text{m}/10\text{m}) = 30$ dB μ V/m at 10m

Test equipment:

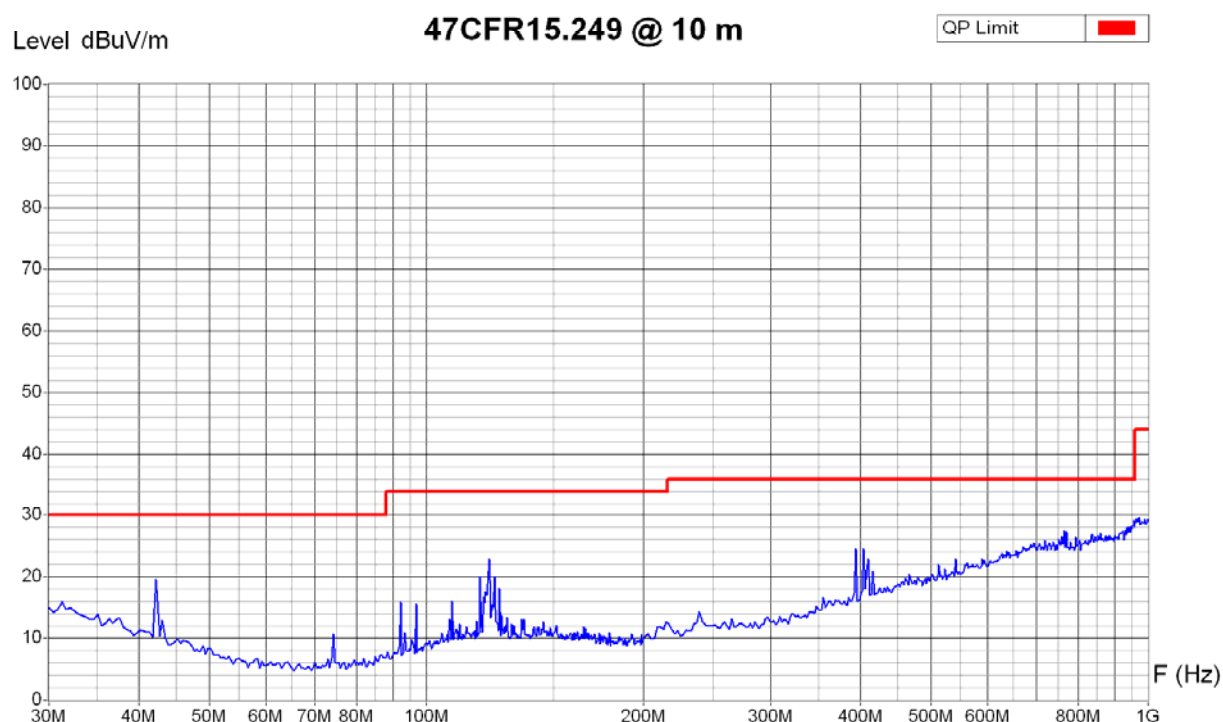
Spectrum analyser	☐ 88-14	☐ 90-26	☐ 94-24	☐ 02-06	☒ 03-45	☐ 03-57
Receiver	☐ 85-04	☐ 90-43	☒ 94-35			
Preamplifier	☐ 90-01	☐ 95-86	☐ 05-56	☒ 05-59	☐ 05-62	
Antenna (bilog)	☒ 94-03	☐ 05-38	☐			
.....						

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

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



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



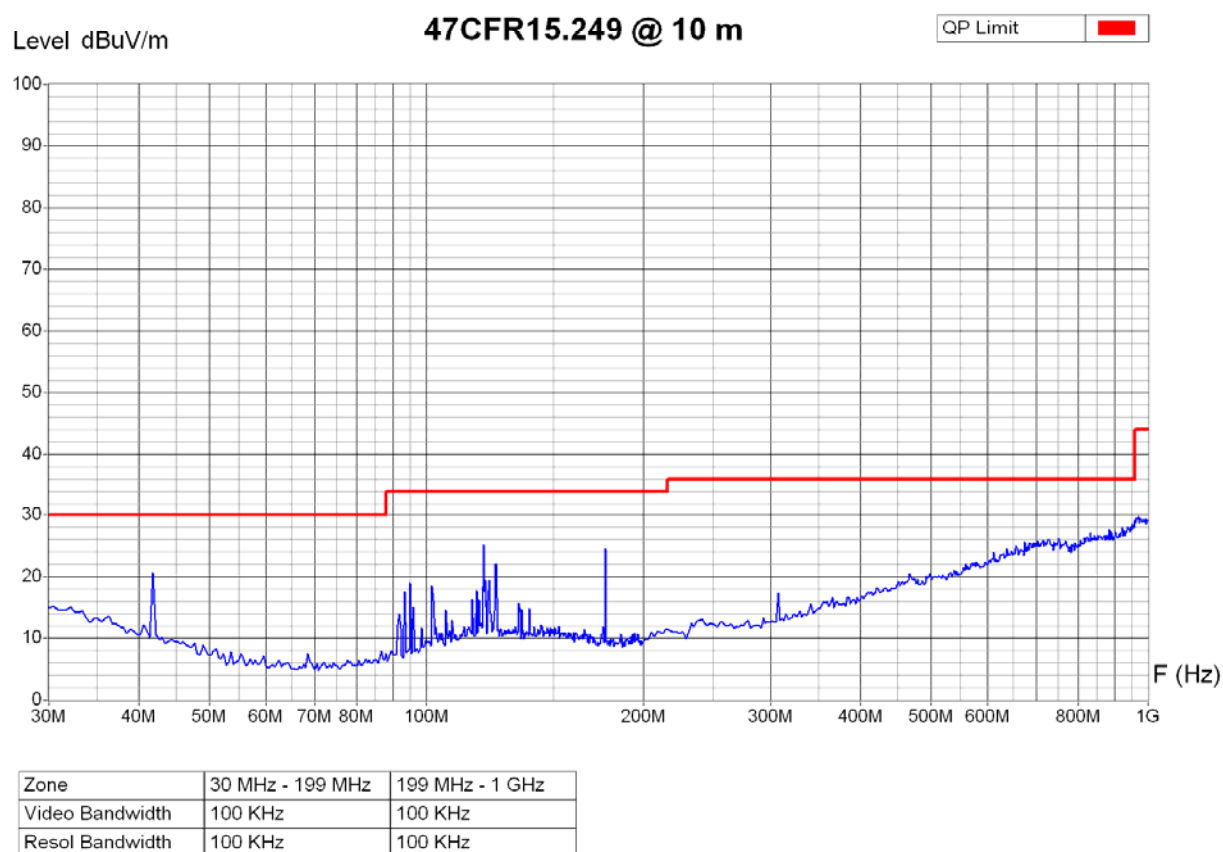
Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: C. Perrenoud
Date/Time: 28.11.06 15:28
Filename:
20067171_UR_er_010h_laying.pn
gl.txt

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



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Standing with antenna horizontal
L3 = 1.8 nH

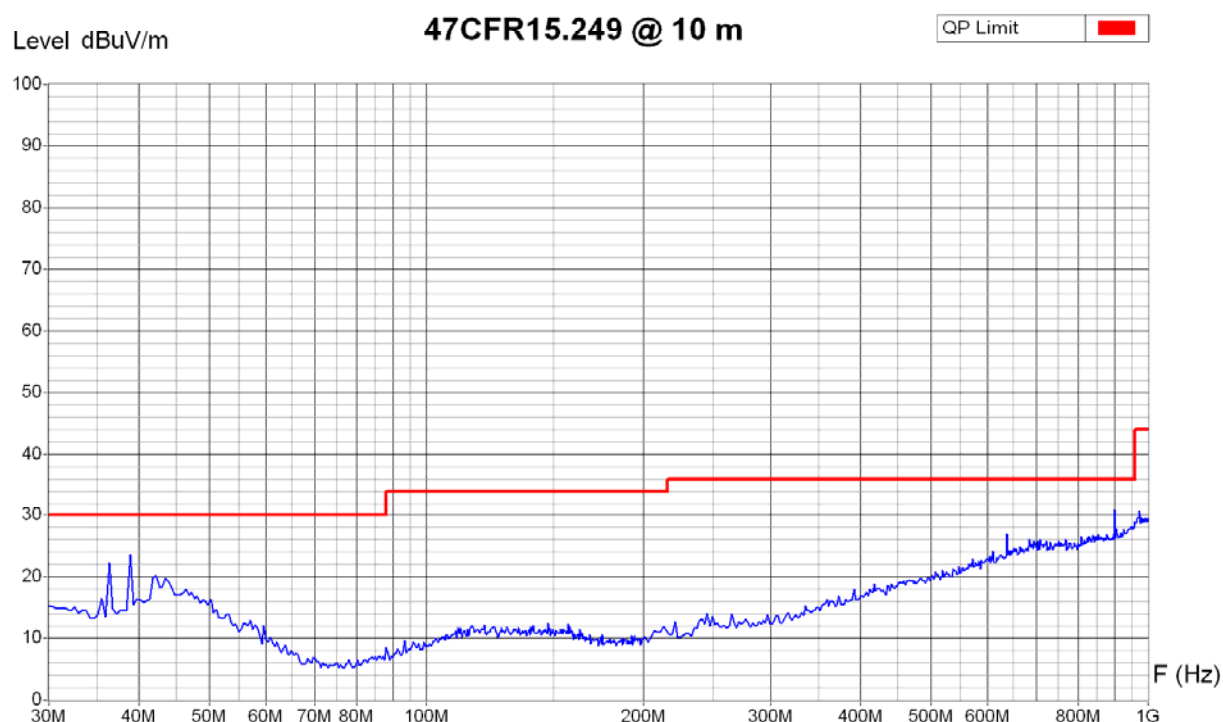


Operator: C. Perrenoud
Date/Time: 28.11.06 15:50
Filename:
20067171_UR_er_010h_standing.
png/.txt

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



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



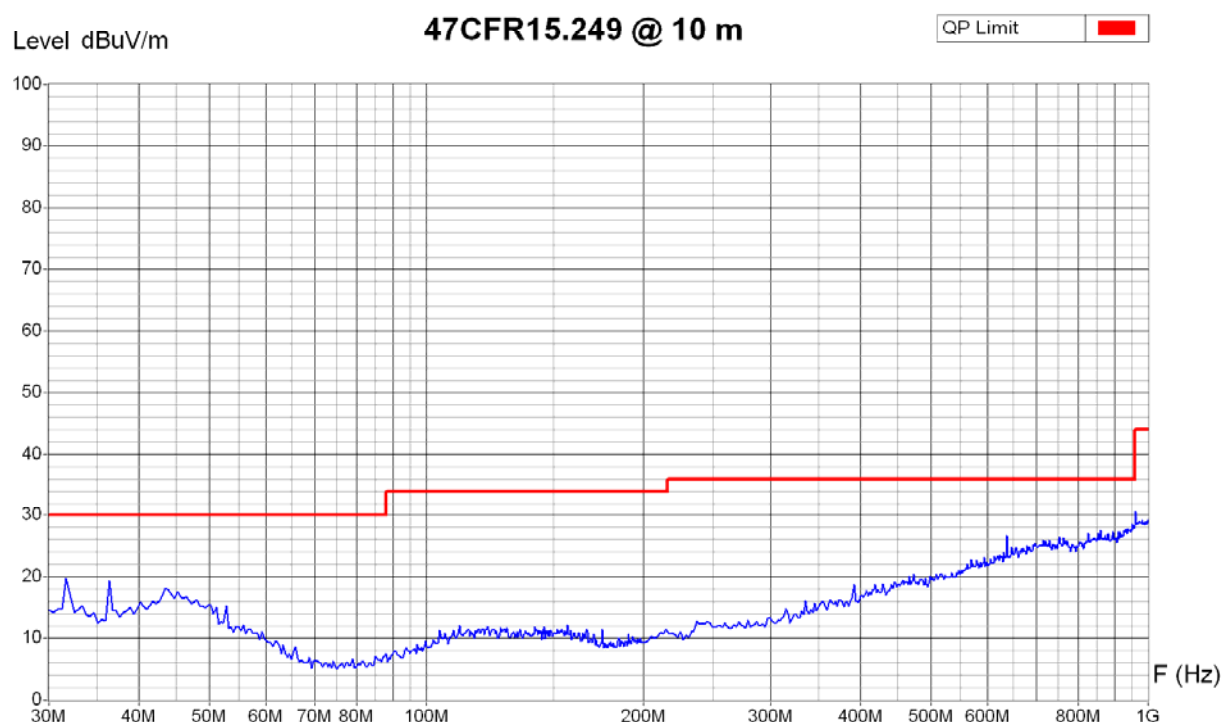
Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: C. Perrenoud
Date/Time: 28.11.06 15:12
Filename:
20067171_UR_er_010v_laying.pn
gl.txt

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



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Standing with antenna horizontal
L3 = 1.8 nH



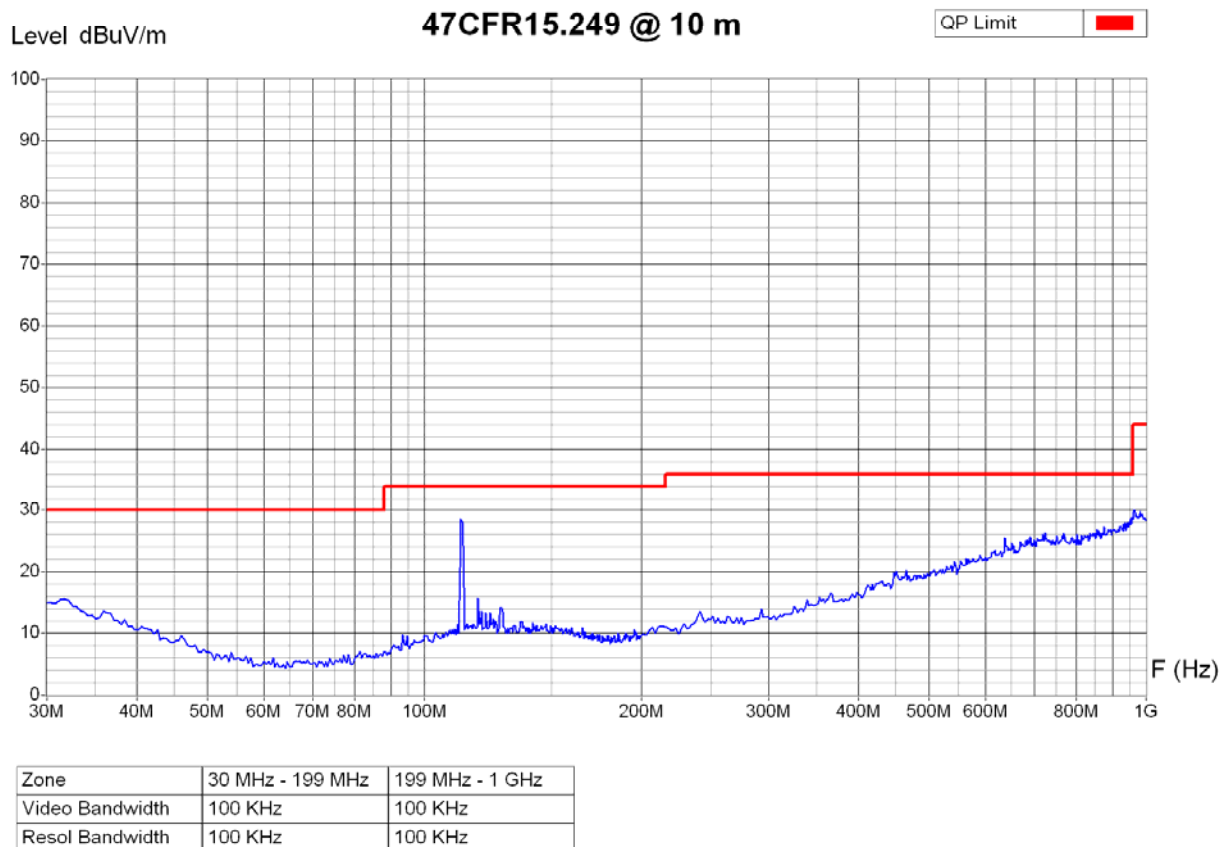
Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: C. Perrenoud
Date/Time: 28.11.06 15:39
Filename:
20067171_UR_er_010v_standing.
png/.txt

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



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier

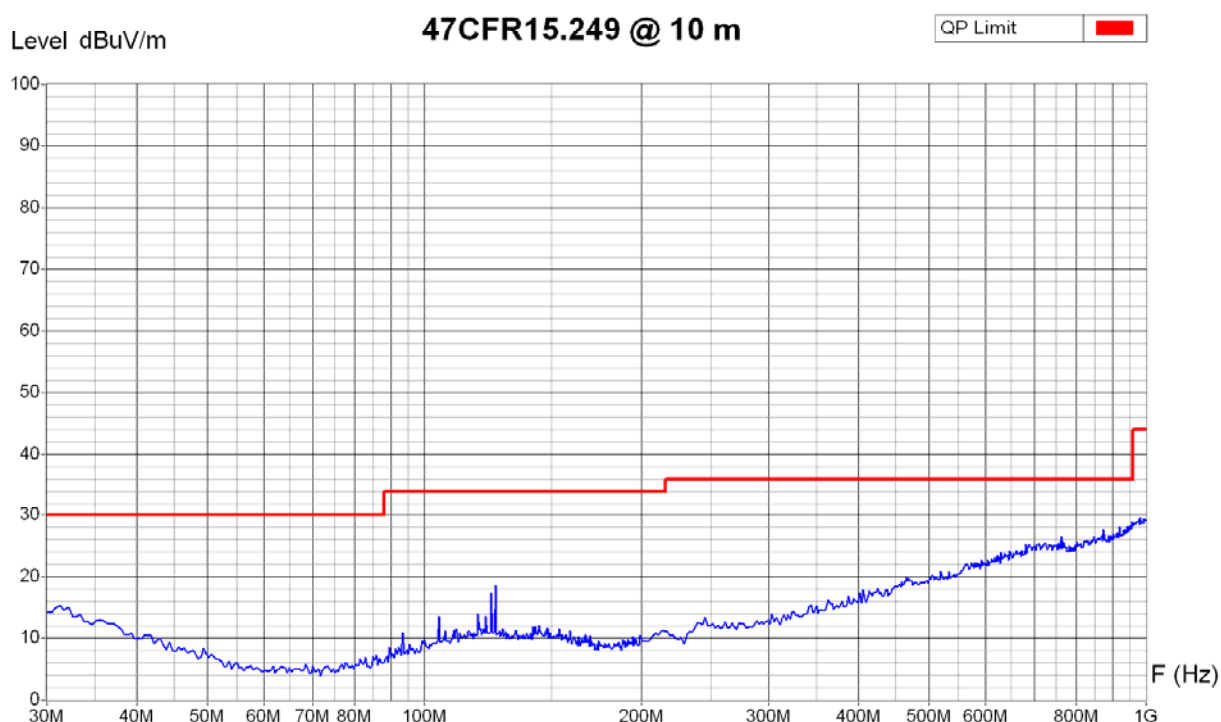


Operator: C. Perrenoud
Date/Time: 28.11.06 16:26
Filename:
20067171_Tx_er_015h_laying.pn
gl.txt

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



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



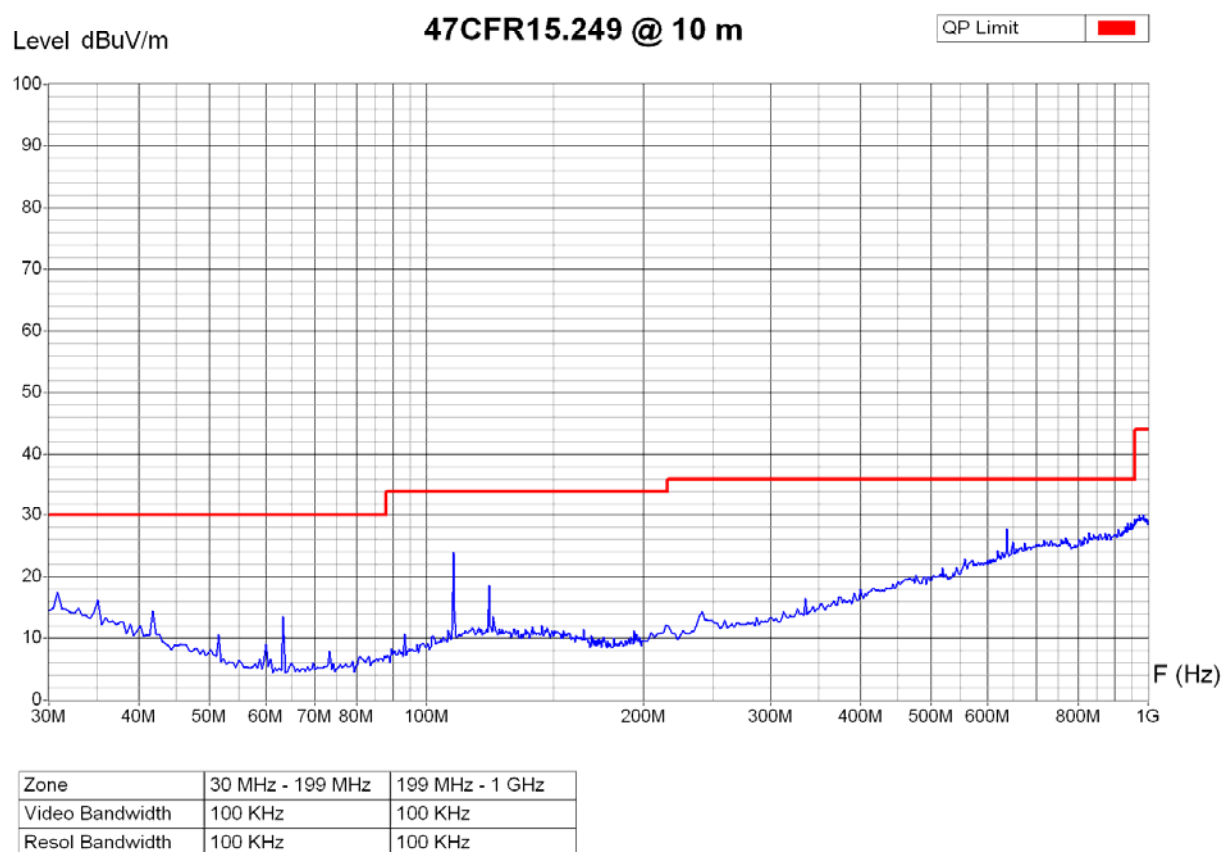
Zone	30 MHz - 199 MHz	199 MHz - 1 GHz
Video Bandwidth	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz

Operator: C. Perrenoud
Date/Time: 28.11.06 16:43
Filename:
20067171_Tx_er_015h_standing.
png/.txt

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



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier

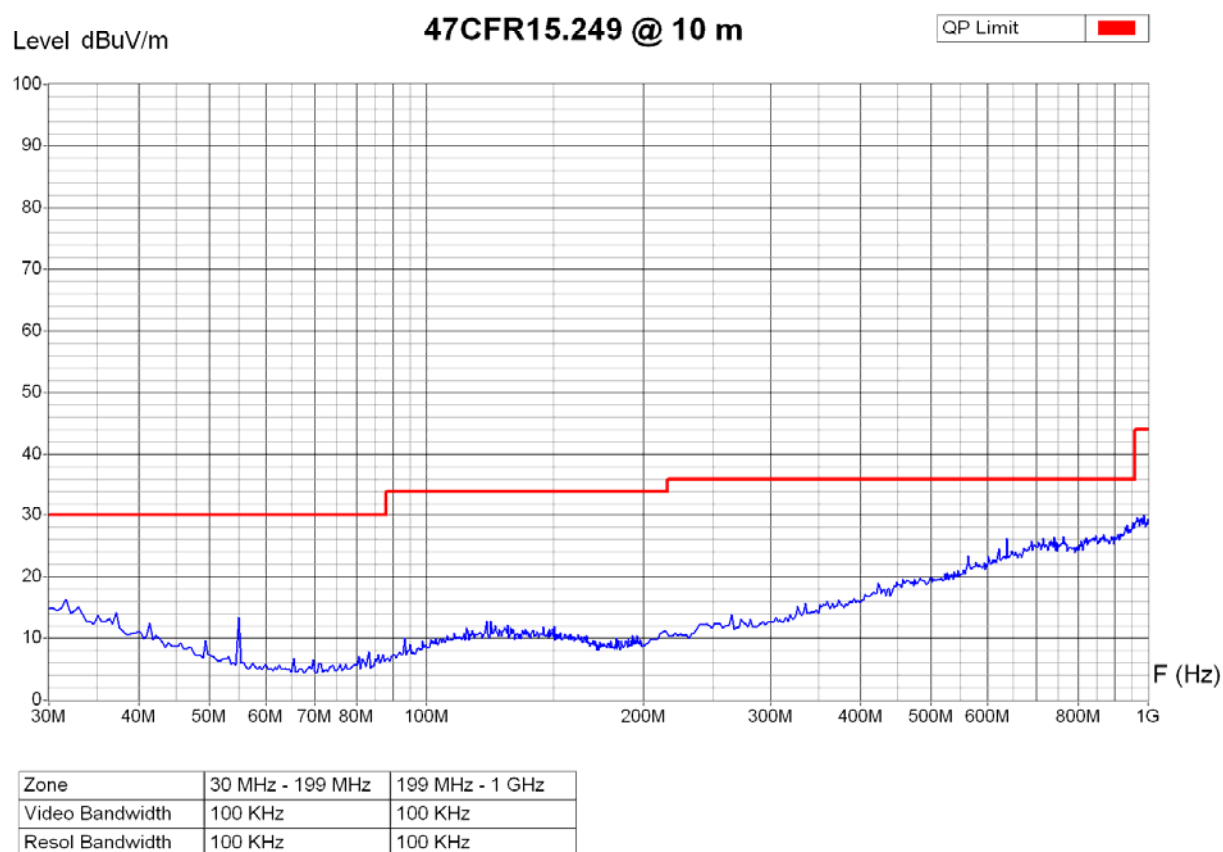


Operator: C. Perrenoud
Date/Time: 28.11.06 16:04
Filename:
20067171_Tx_er_015v_laying.png
/.txt

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



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : Standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Operator: C. Perrenoud
Date/Time: 28.11.06 16:36
Filename:
20067171_Tx_er_015v_standing.p
ng.txt

6.4 Radiated emission - Electromagnetic field (1 GHz < f < 18 GHz)

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

Distance: ☐ 30 m ☐ 10 m ☐ 3 m ☒ 1 m

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

Meas. uncertainty: ± 5.4 dB

Test method: The electromagnetic disturbance 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:



Universal Receiver: laying



Transmitter: standing

- Remarks:
- Limit values expressed in dB μ V/m and transformed to a measuring distance of 1m (factor used = 20 dB/decade) if necessary:
e.g.: for f = 2GHz the limit is 500 μ V/m at 3m;
 $20 \log_{10} (500\mu\text{V/m}) + 20 \log_{10} (3\text{m}/1\text{m}) = 63.5 \text{ dB}\mu\text{V/m}$ at 1m
 - These limits do not apply to the carrier frequency at 2.4 GHz

Test equipment:

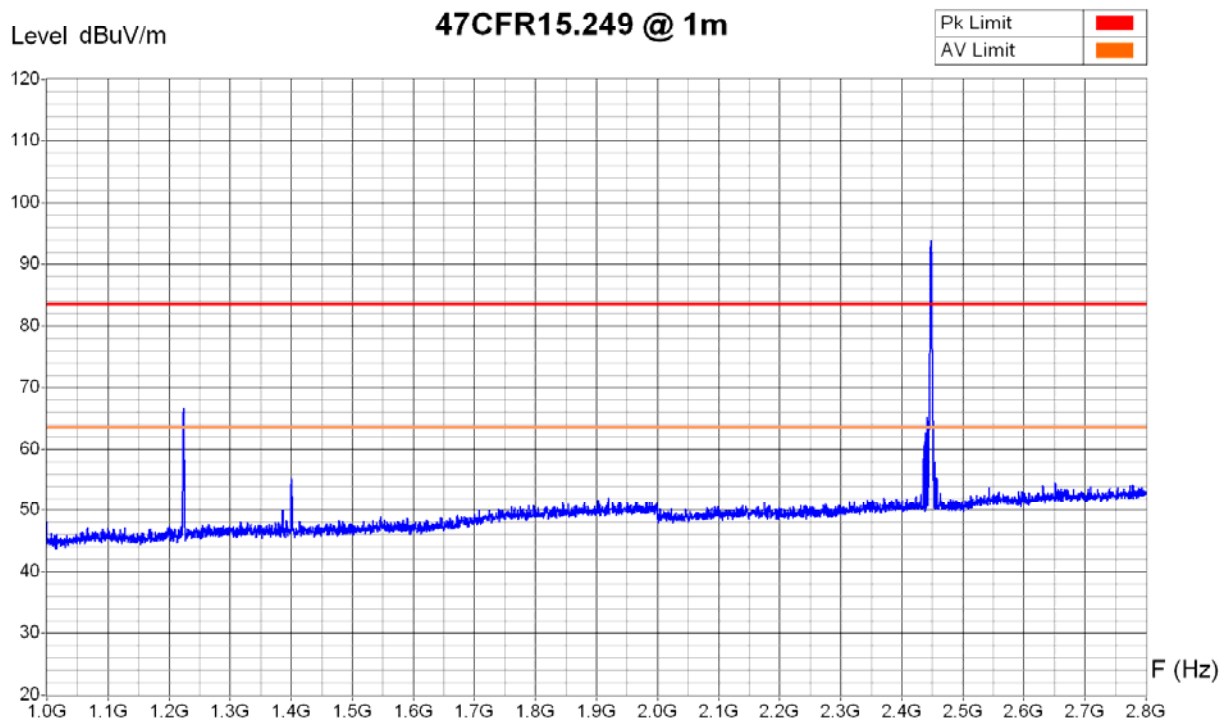
Spectrum analyser	☐ 88-14	☐ 90-26	☐ 94-24	☒ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-04	☒ 90-43	☐ 94-35			
Preamplifier	☐ 90-01	☐ 95-86	☒ 05-56	☐ 05-59	☐ 05-62	☒ 05-87
Antenna (horn)	☒ 90-24	☐ 90-29	☐ 98-12	☐ 98-13	☐	
Filters	☒ High pass					

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

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

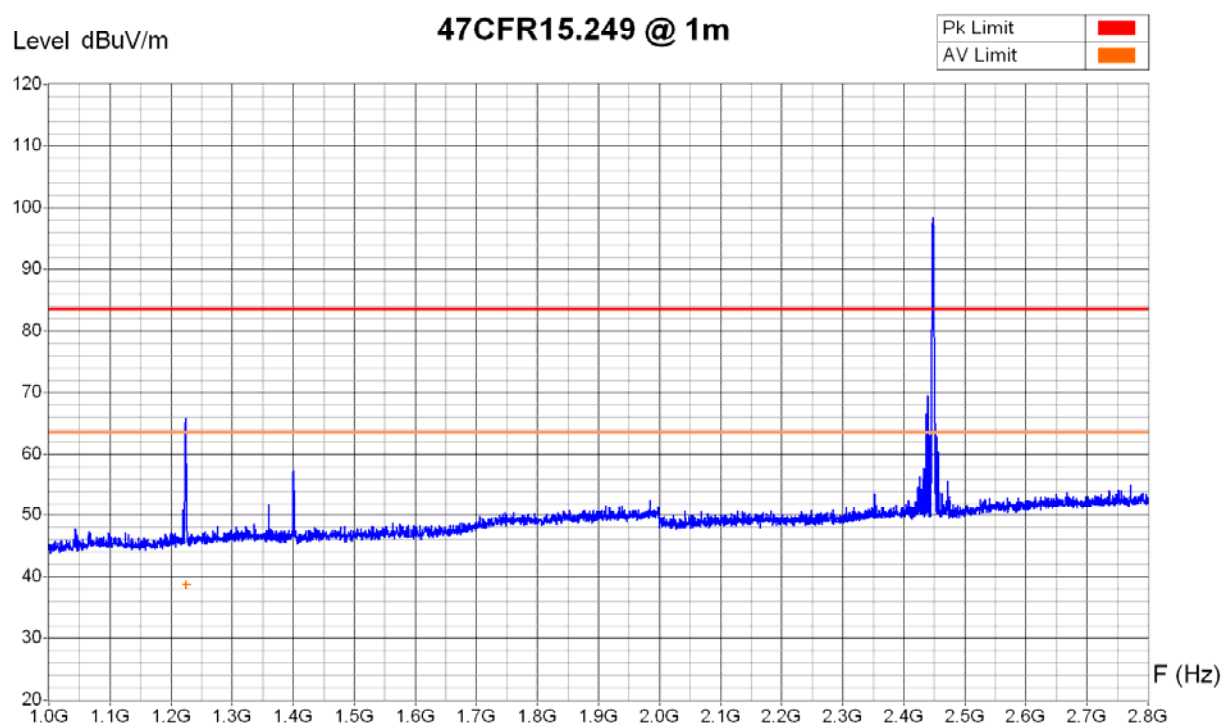
Frequency	Peak	QuasiPeak (x)	Average (+)
1.22 GHz	68.7 dBuV/m	NaN dBuV/m	19.1 dBuV/m

Operator: E. Staub
Date/Time: 27.11.2006 14:38
Filename:
20067171_UR_er_002h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

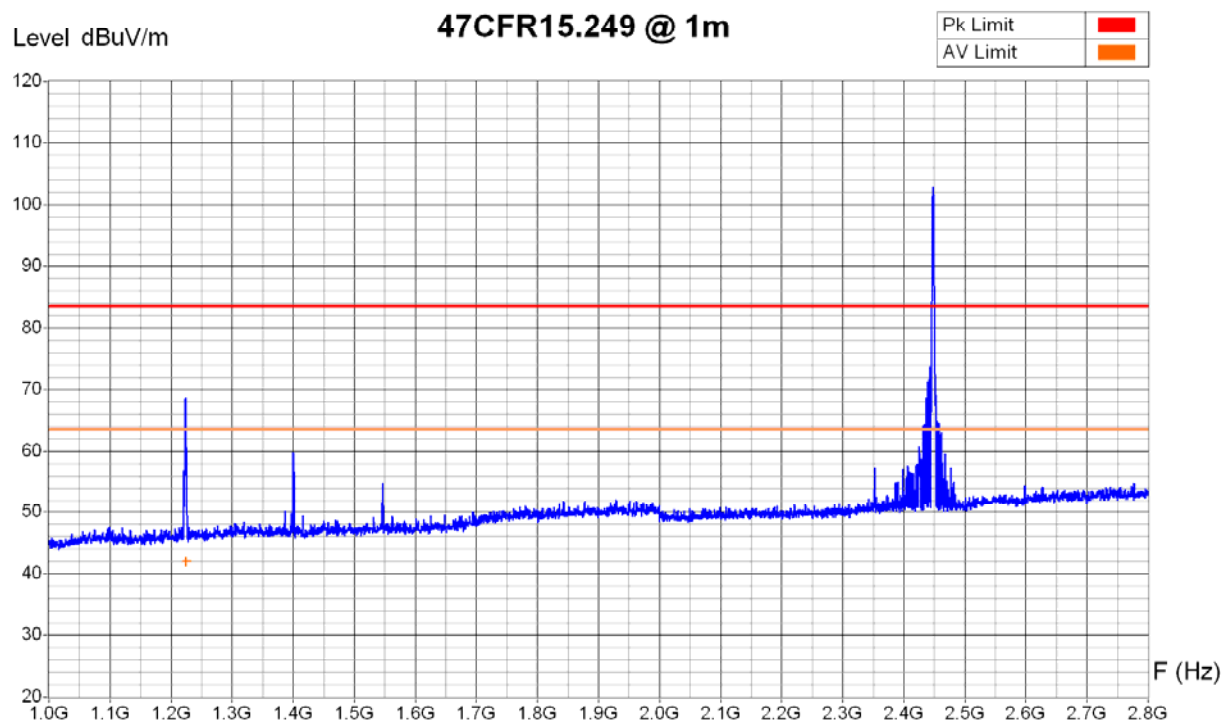
Frequency	Peak	QuasiPeak (x)	Average (+)
1.22 GHz	65.9 dBuV/m	NaN dBuV/m	38.8 dBuV/m

Operator: E. Staub
Date/Time: 27.11.2006 15:03
Filename:
20067171_UR_er_002h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

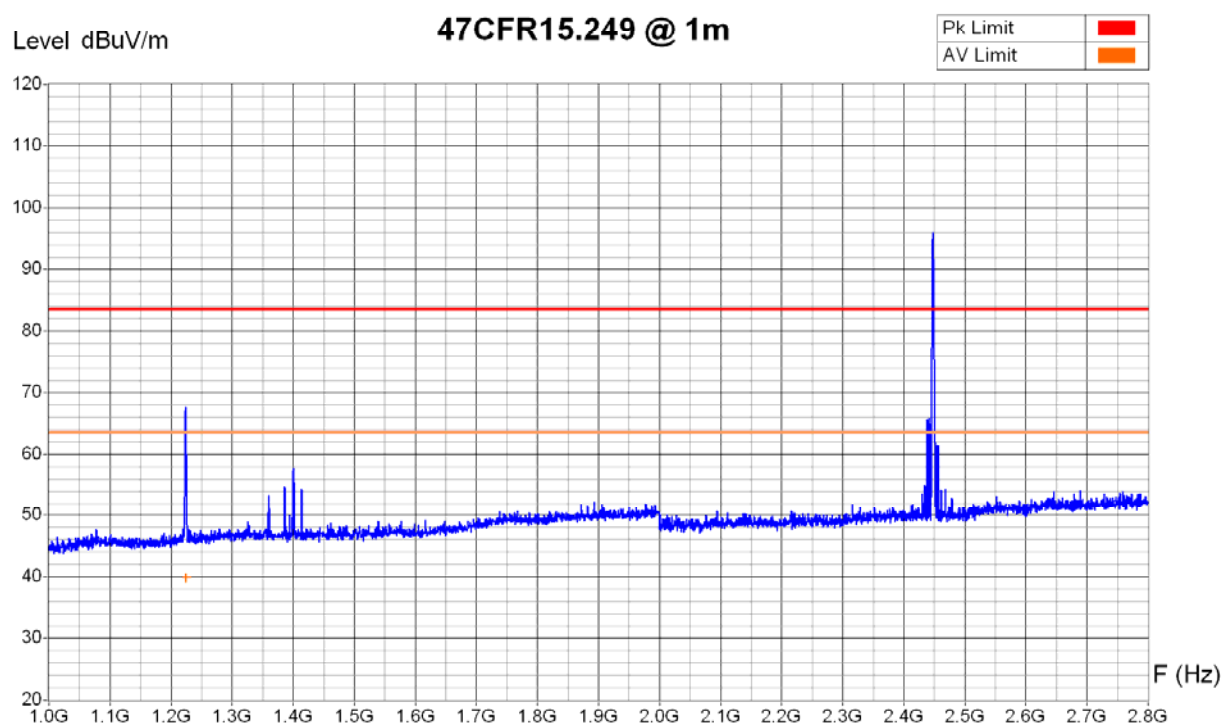
Frequency	Peak	QuasiPeak (x)	Average (+)
1.22 GHz	68.7 dBuV/m	NaN dBuV/m	42.0 dBuV/m

Operator: E. Staub
Date/Time: 27.11.2006 14:27
Filename:
20067171_UR_er_002v_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

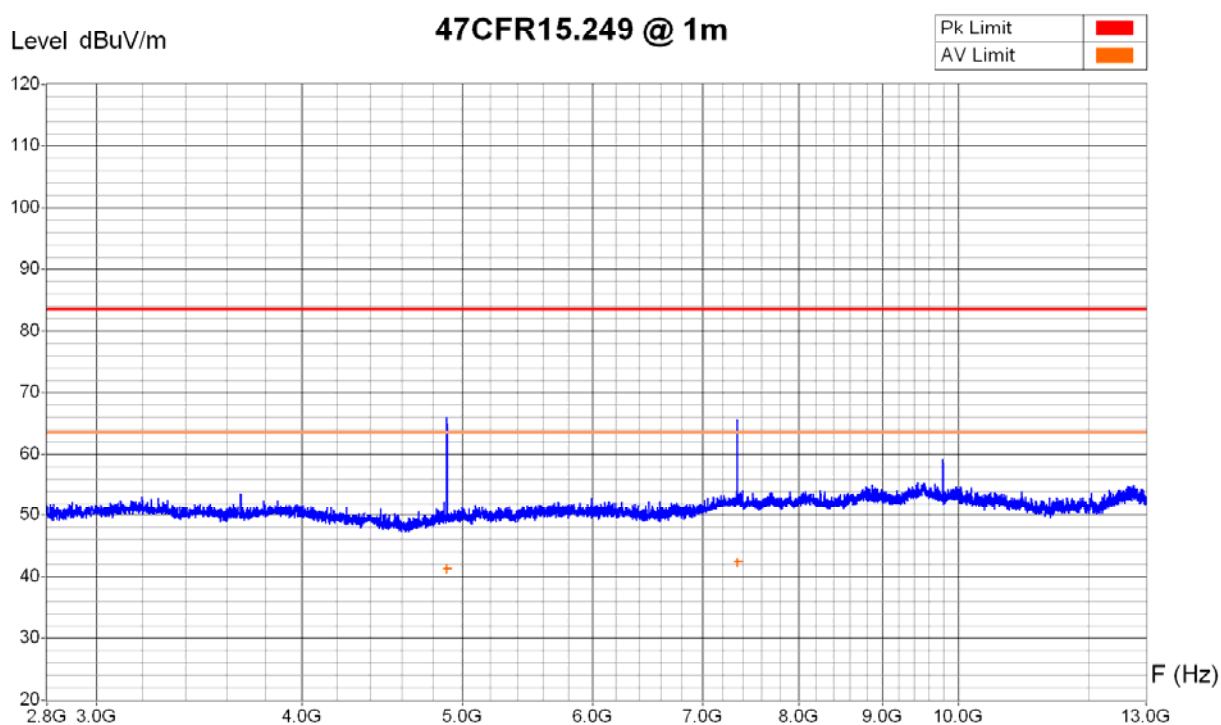
Frequency	Peak	QuasiPeak (x)	Average (+)
1.22 GHz	67.7 dBuV/m	NaN dBuV/m	39.9 dBuV/m

Operator: E. Staub
Date/Time: 27.11.2006 14:54
Filename:
20067171_UR_er_002v_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

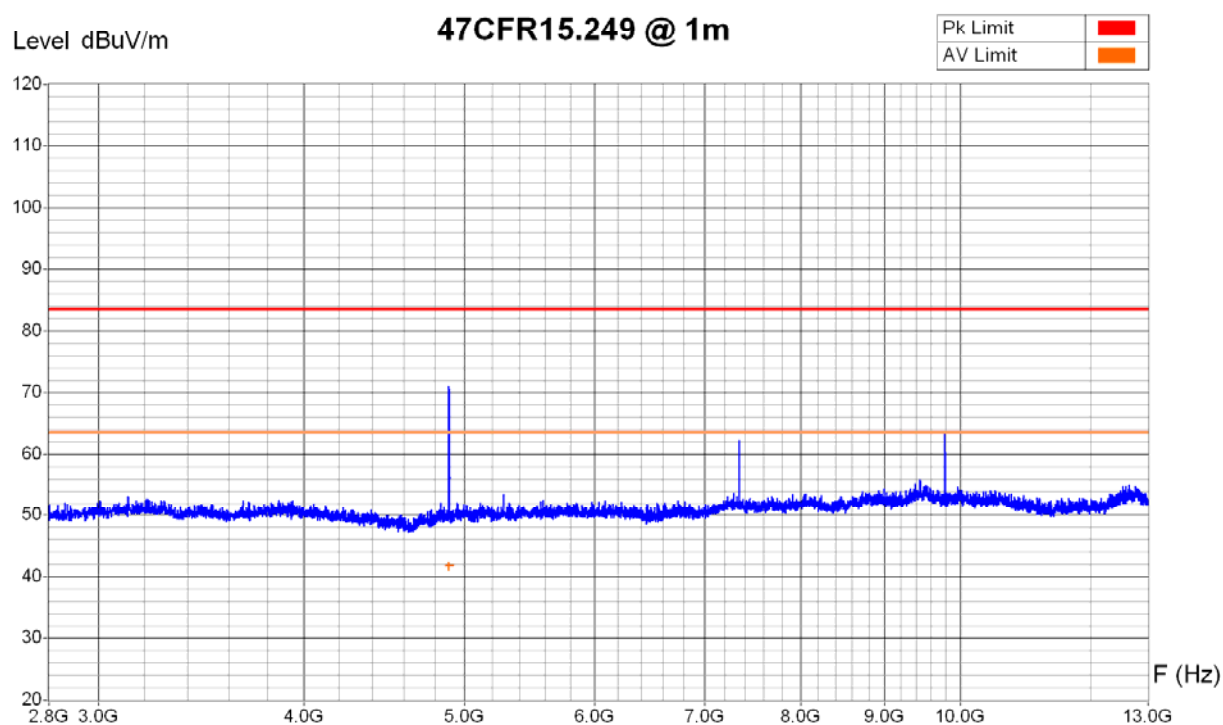
Frequency	Peak	Average (+)
4.90 GHz	66.0 dBuV/m	41.2 dBuV/m
7.34 GHz	65.6 dBuV/m	42.4 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 13:28
Filename:
20067171_UR_er_008h_laying.pn
gl.txt

Measurement Type : Radiated Field
 Polarisation : Horizontal
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
 Set-Up : 5VDC; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
 Remarks : standing with antenna horizontal
 L3 = 1.8 nH



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

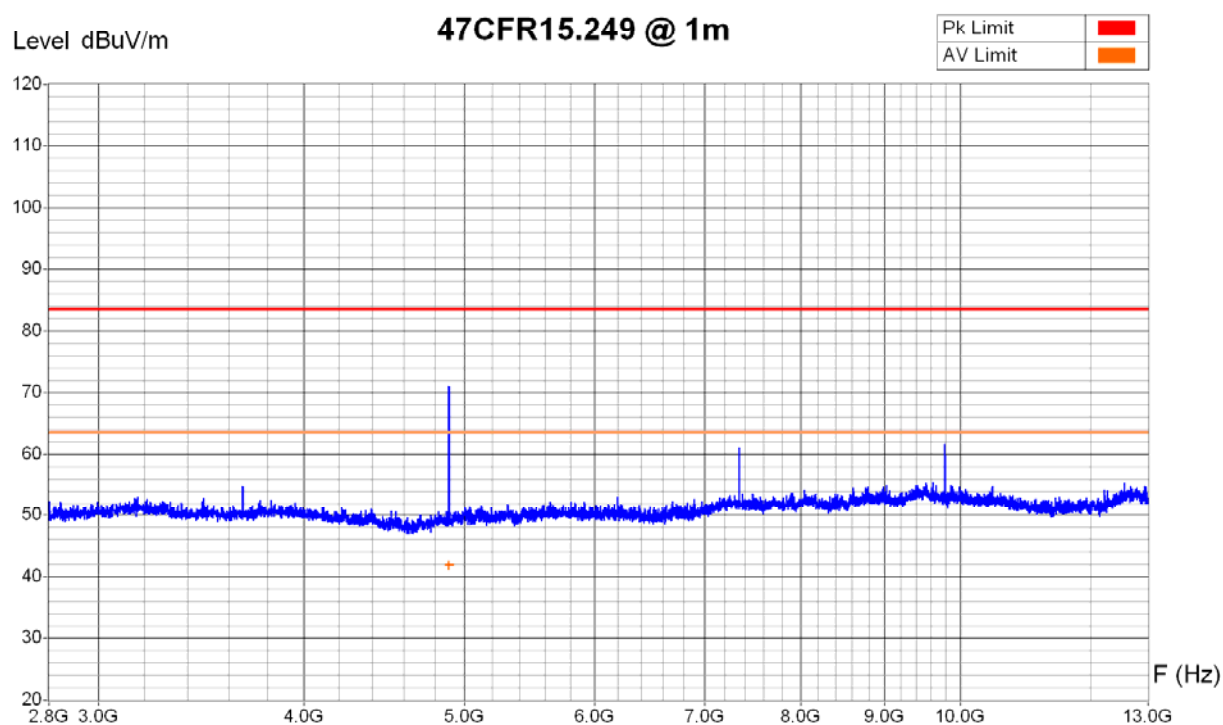
Frequency	Peak	QuasiPeak (x)	Average (+)
4.90 GHz	71.1 dBuV/m	NaN dBuV/m	41.7 dBuV/m

Operator: E. Staub
 Date/Time: 28.11.2006 12:54
 Filename:
 20067171_UR_er_008h_standing.
 png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

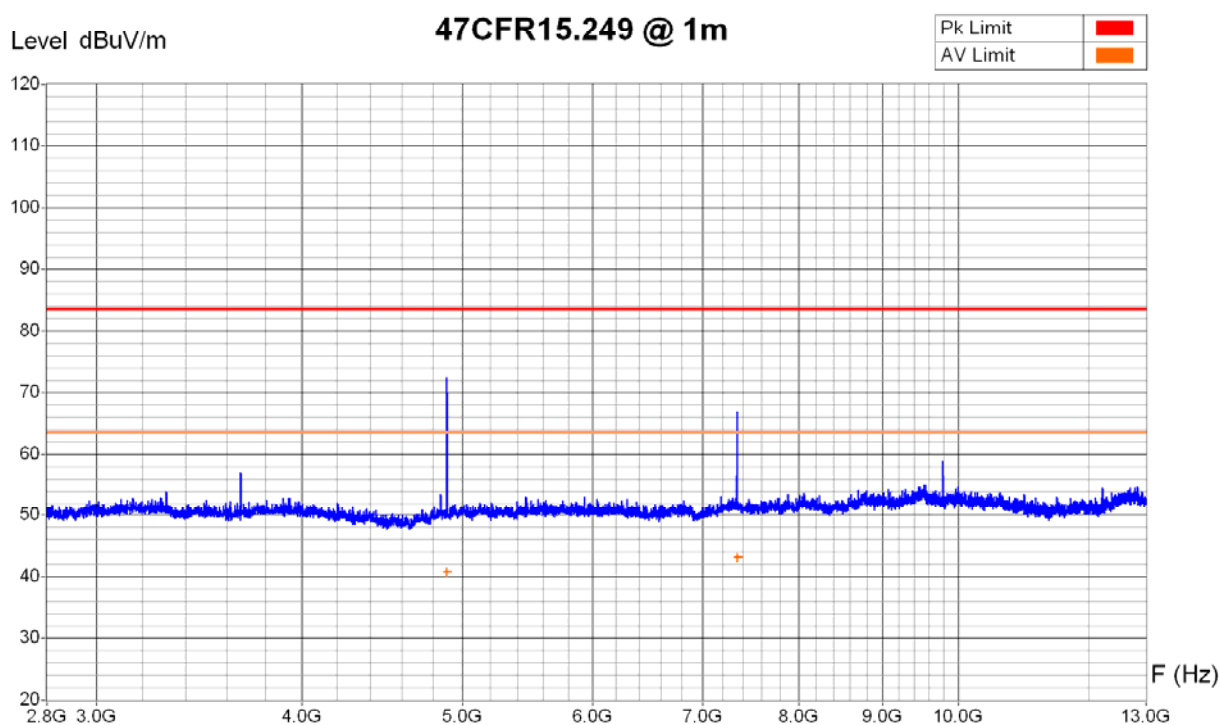
Frequency	Peak	QuasiPeak (x)	Average (+)
4.90 GHz	71.0 dBuV/m	NaN dBuV/m	41.9 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 13:33
Filename:
20067171_UR_er_008v_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal
L3 = 1.8 nH



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

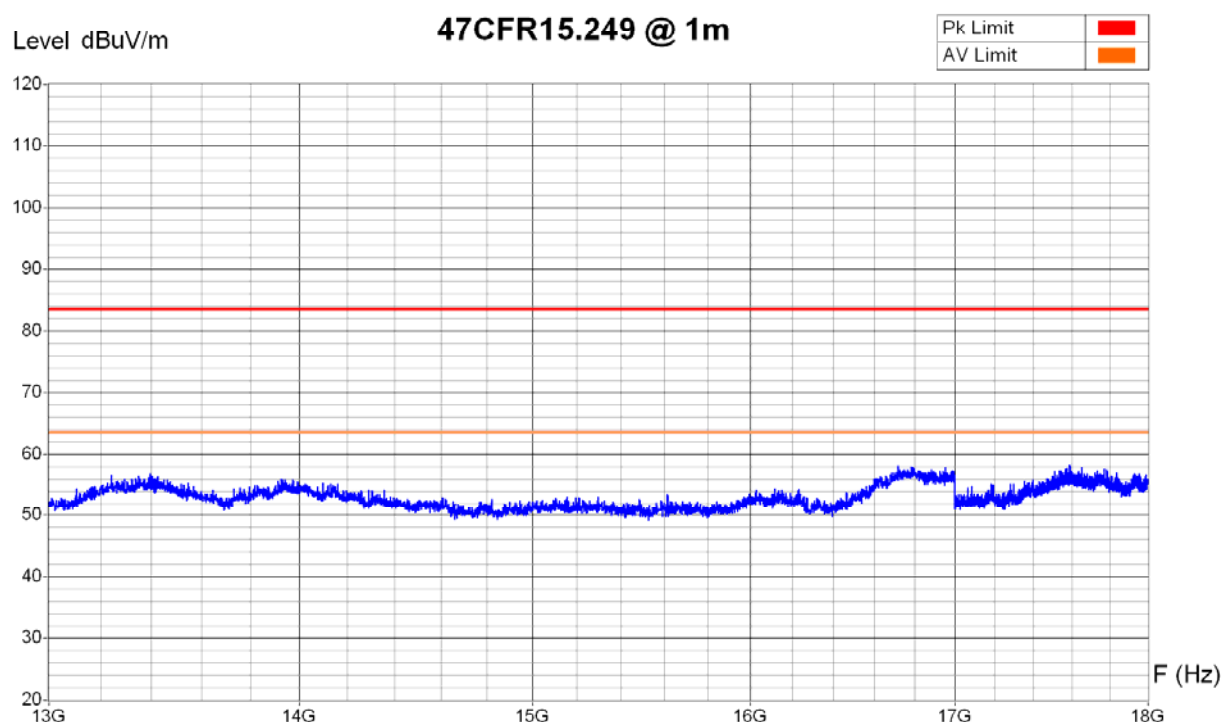
Frequency	Peak	Average (+)
4.90 GHz	72.5 dBuV/m	40.7 dBuV/m
7.34 GHz	66.9 dBuV/m	43.1 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 12:46
Filename:
20067171_UR_er_008v_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



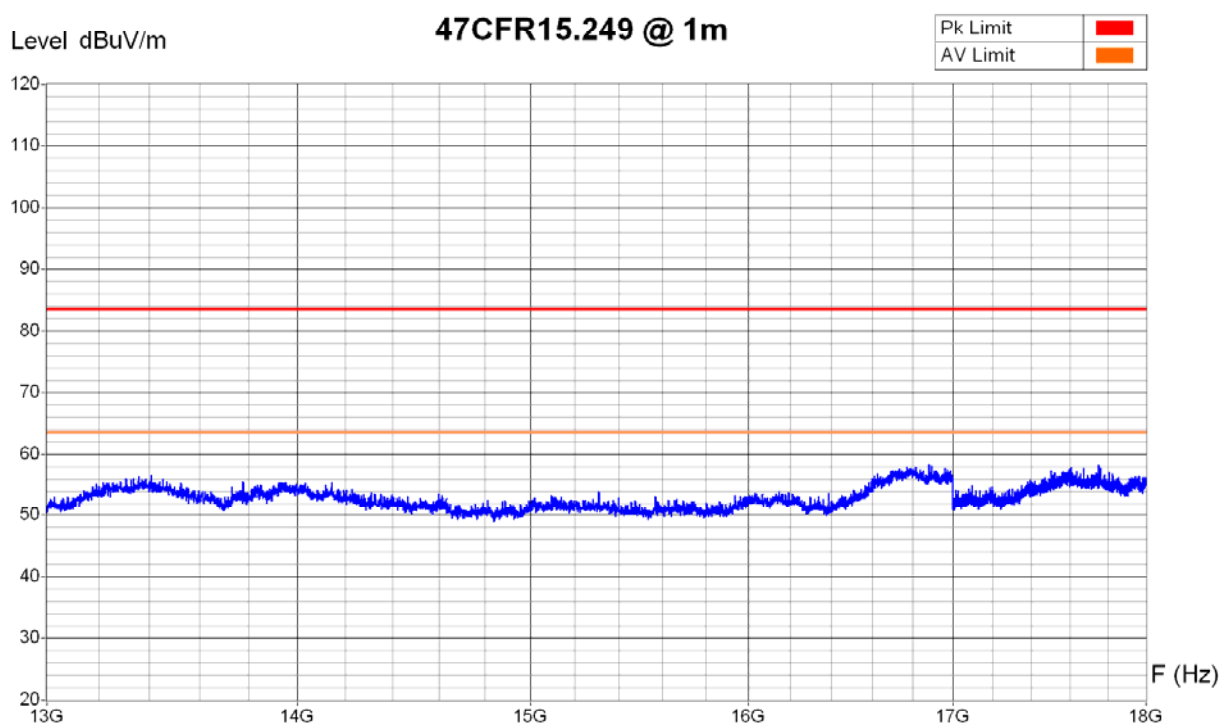
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
Date/Time: 28.11.2006 14:19
Filename:
20067171_UR_er_009h_laying.pn
gl.txt

Measurement Type : Radiated Field
 Polarisation : Horizontal
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
 Set-Up : 5VDC; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
 Remarks : standing with antenna horizontal
 L3 = 1.8 nH



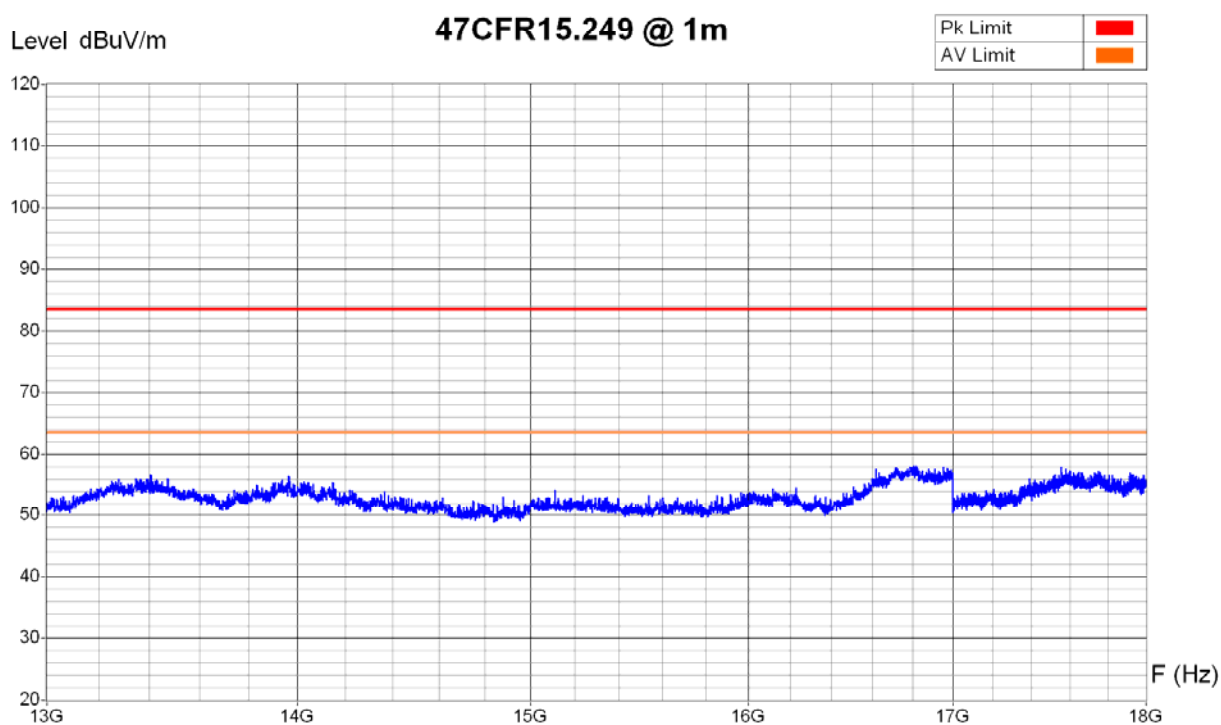
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
 Date/Time: 28.11.2006 14:16
 Filename:
 20067171_UR_er_009h_standing.
 png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



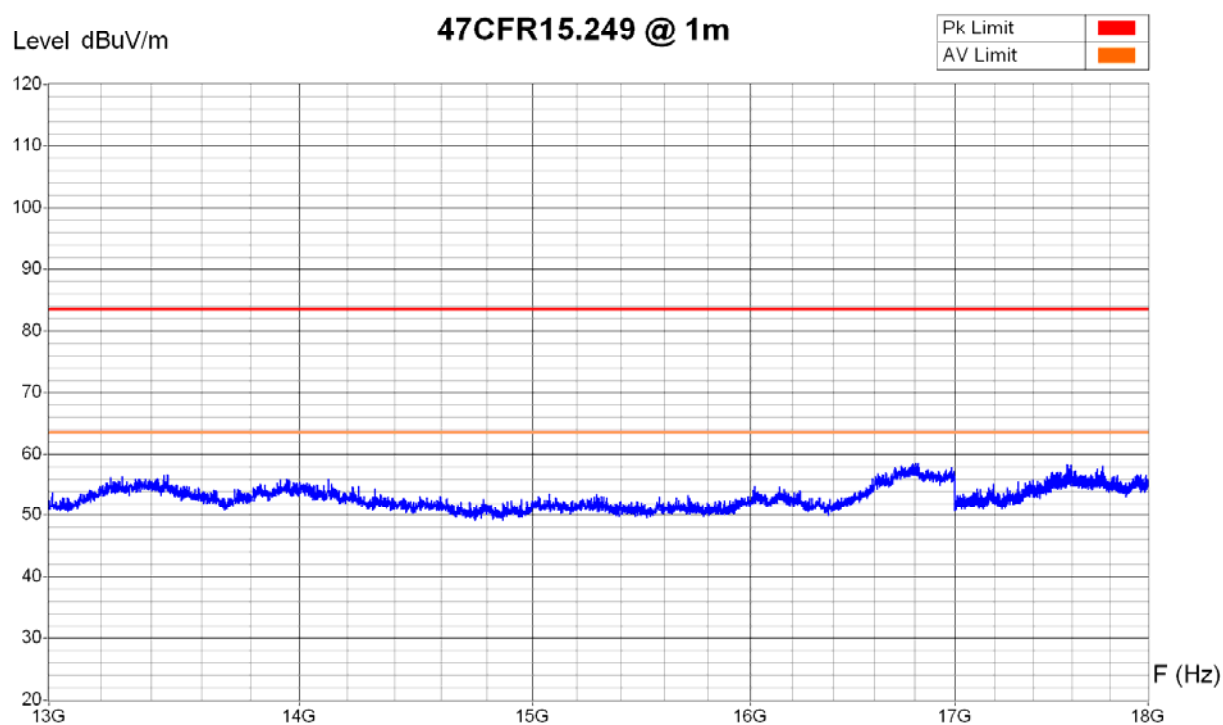
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
Date/Time: 28.11.2006 14:21
Filename:
20067171_UR_er_009v_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal
L3 = 1.8 nH



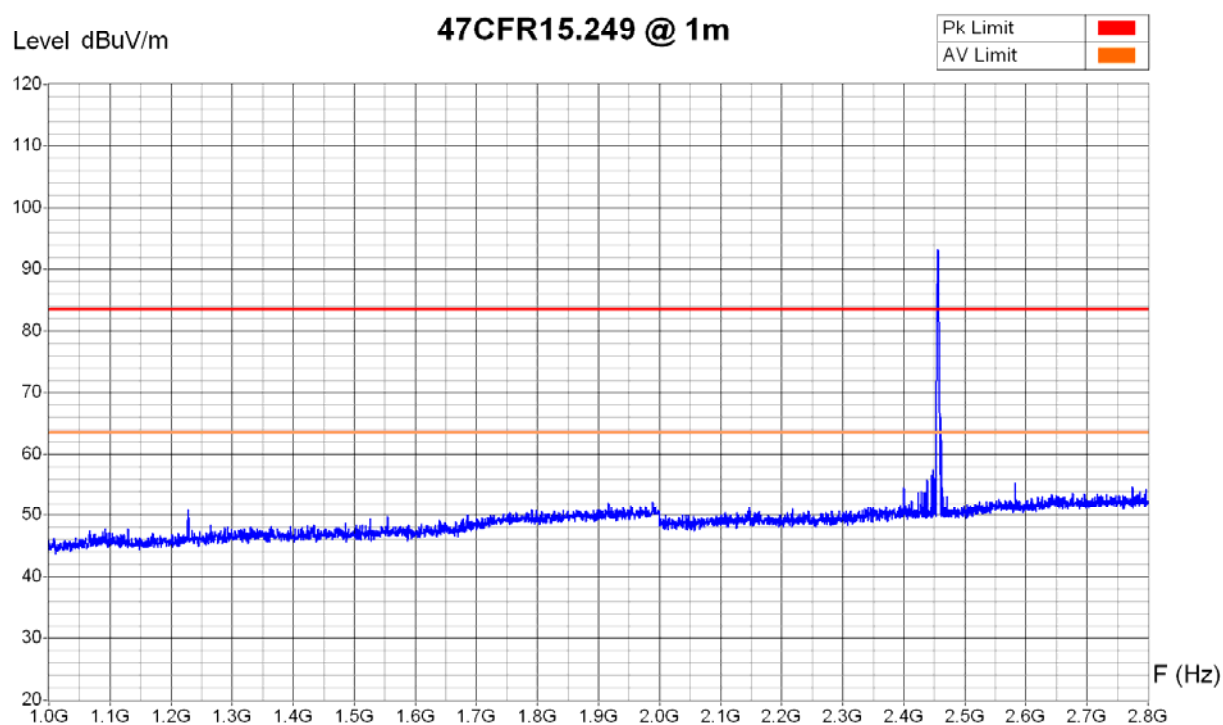
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
Date/Time: 28.11.2006 14:13
Filename:
20067171_UR_er_009v_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical



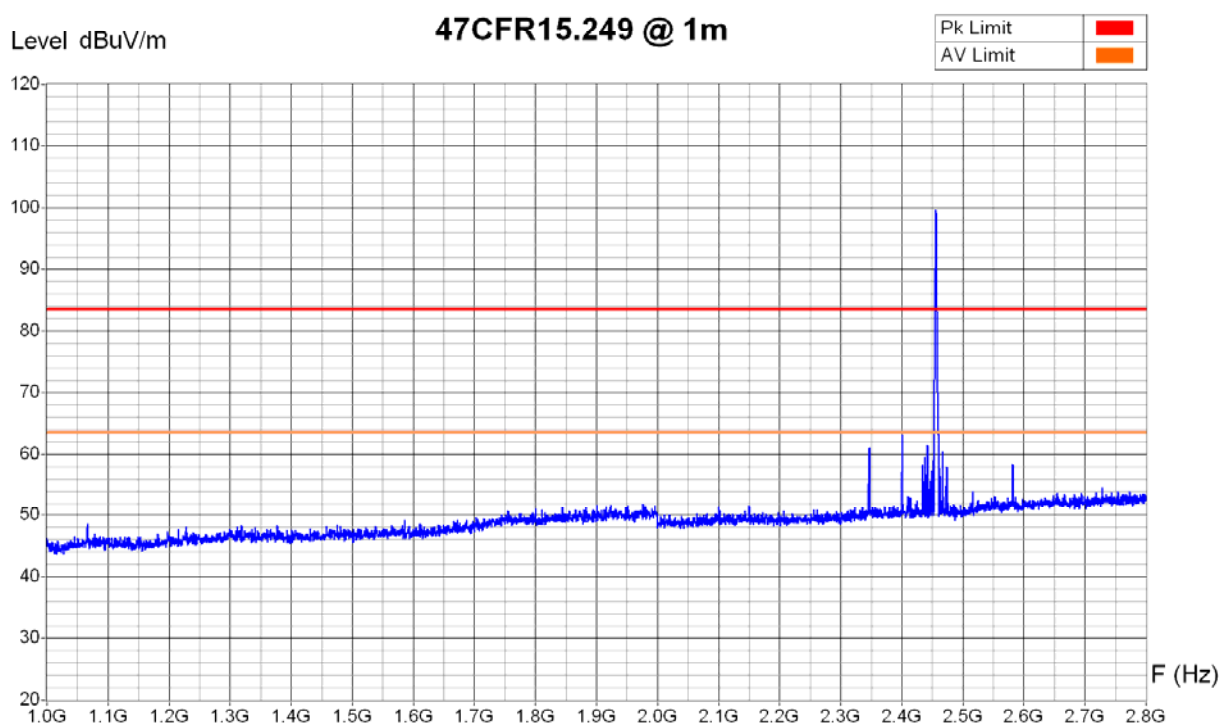
Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Operator: **E. Staub**
Date/Time: 27.11.2006 15:13
Filename:
20067171_Tx_er_002h_laying.pn
gl.txt

Measurement Type : Radiated Field
 Polarisation : Horizontal
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
 Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
 Remarks : standing with antenna horizontal



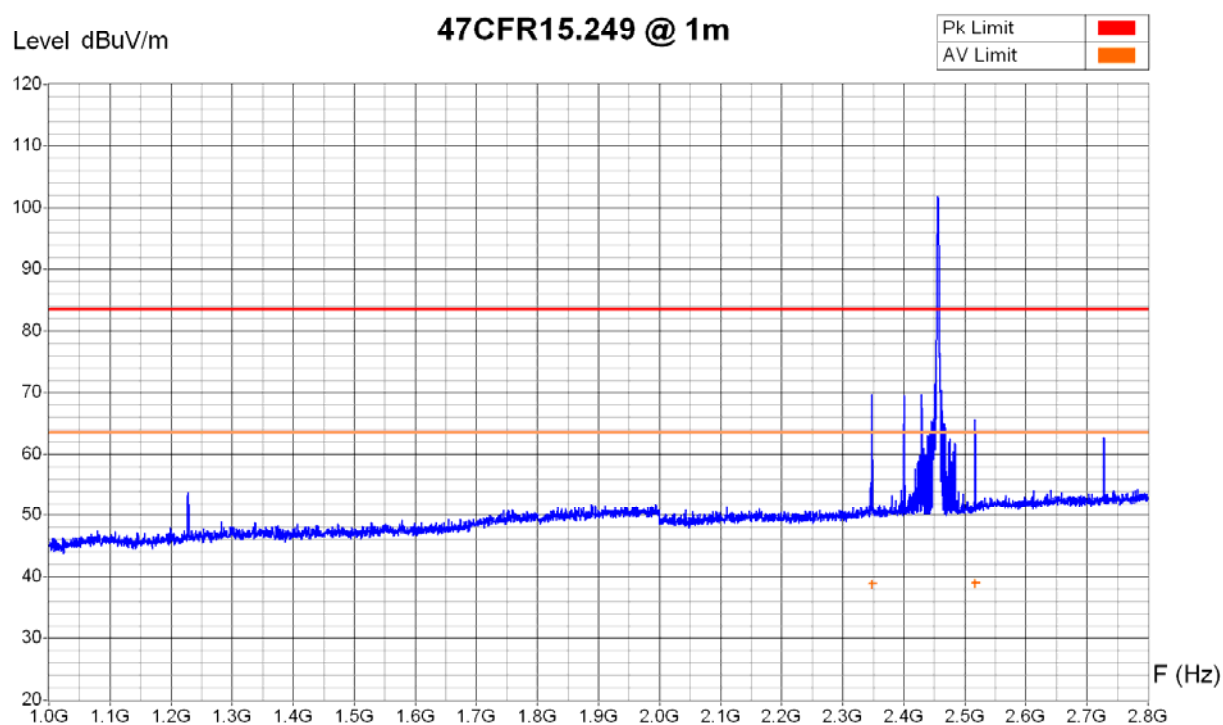
Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Operator: **E. Staub**
 Date/Time: 27.11.2006 16:05
 Filename:
 20067171_Tx_er_002h_standing.
 png/.txt

Measurement Type : Radiated Field
 Polarisation : Vertical
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
 Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
 Remarks : laying with antenna vertical



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

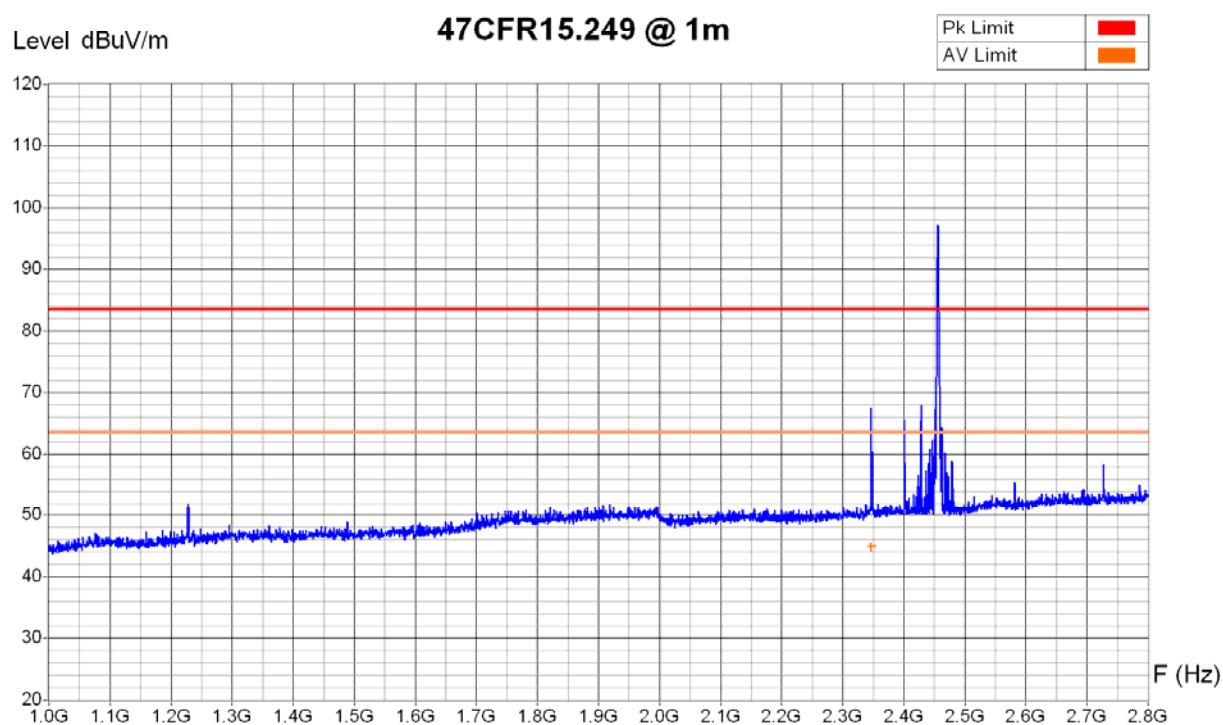
Frequency	Peak	Average (+)
2.35 GHz	69.6 dBuV/m	38.8 dBuV/m
2.52 GHz	65.7 dBuV/m	39.1 dBuV/m

Operator: **E. Staub**
 Date/Time: 27.11.2006 15:16
 Filename:
 20067171_Tx_er_002v_laying.png
 /txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal



Zone	1 GHz - 2 GHz	2 GHz - 2.80 GHz
Video Bandwidth	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz

Receiver Measures

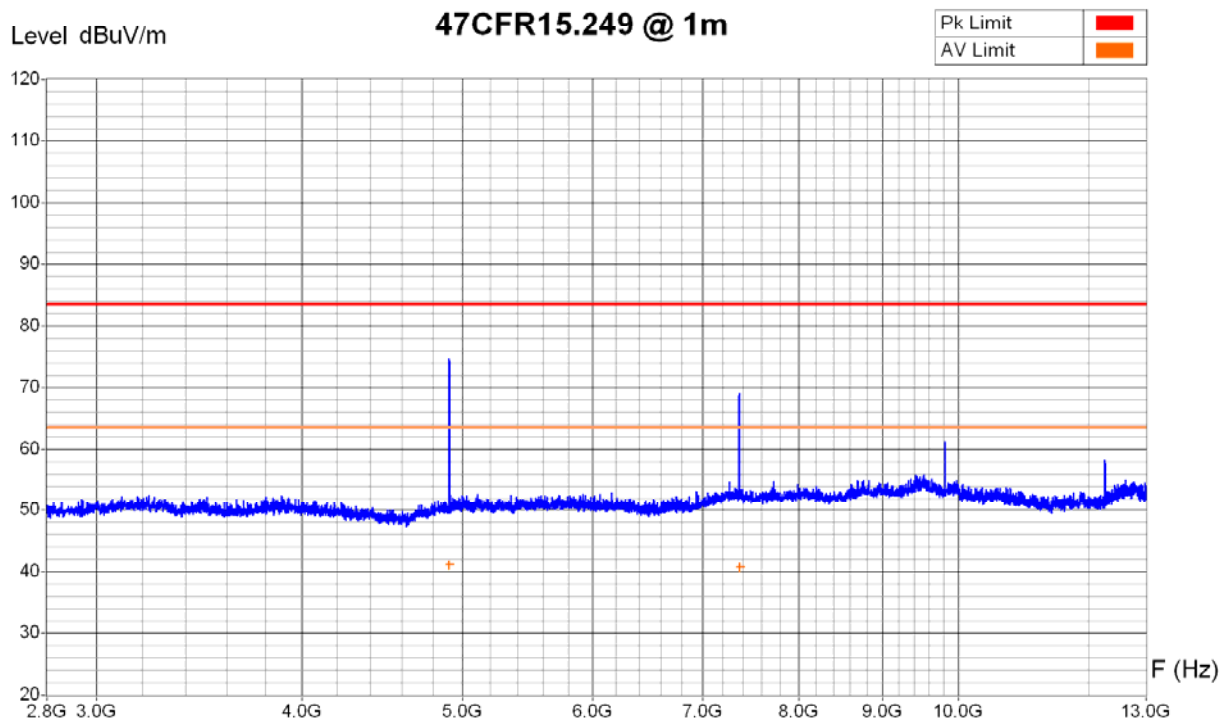
Frequency	Peak	QuasiPeak (x)	Average (+)
2.35 GHz	67.5 dBuV/m	NaN dBuV/m	44.9 dBuV/m

Operator: E. Staub
Date/Time: 27.11.2006 15:54
Filename:
20067171_Tx_er_002v_standing.p
ng/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna verticalemarks
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

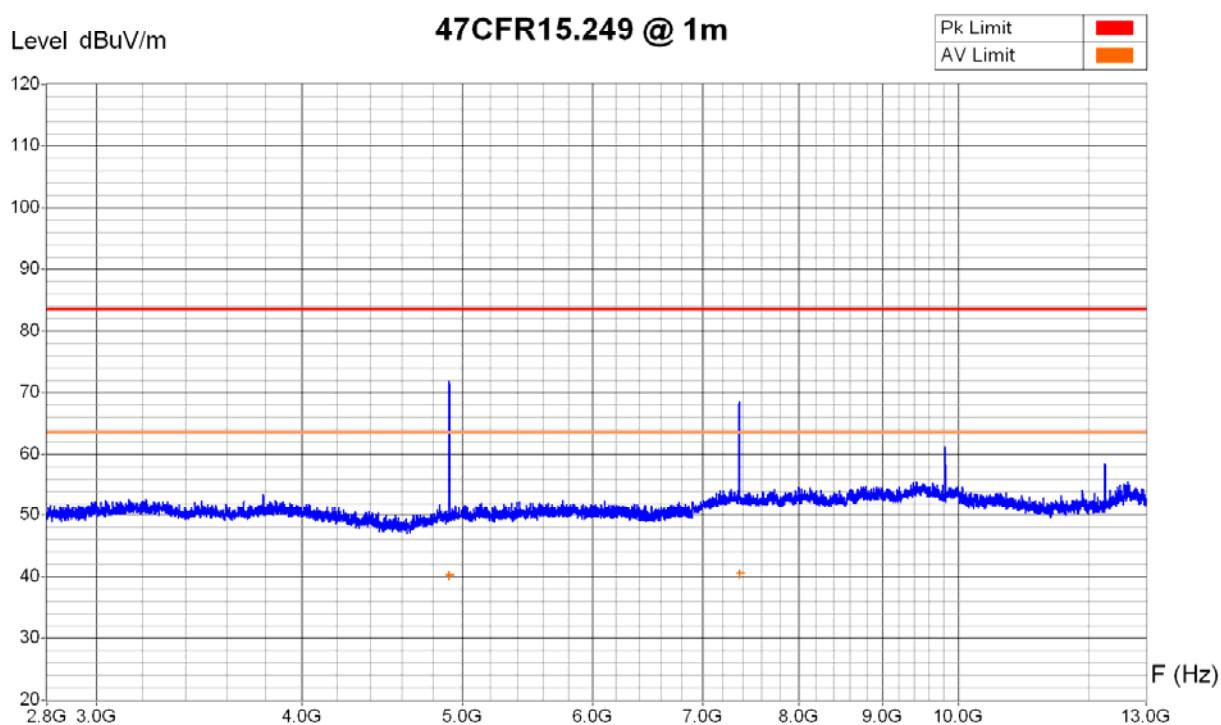
Frequency	Peak	Average (+)
4.91 GHz	74.8 dBuV/m	41.2 dBuV/m
7.37 GHz	69.0 dBuV/m	40.8 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 12:15
Filename:
20067171_Tx_er_012h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

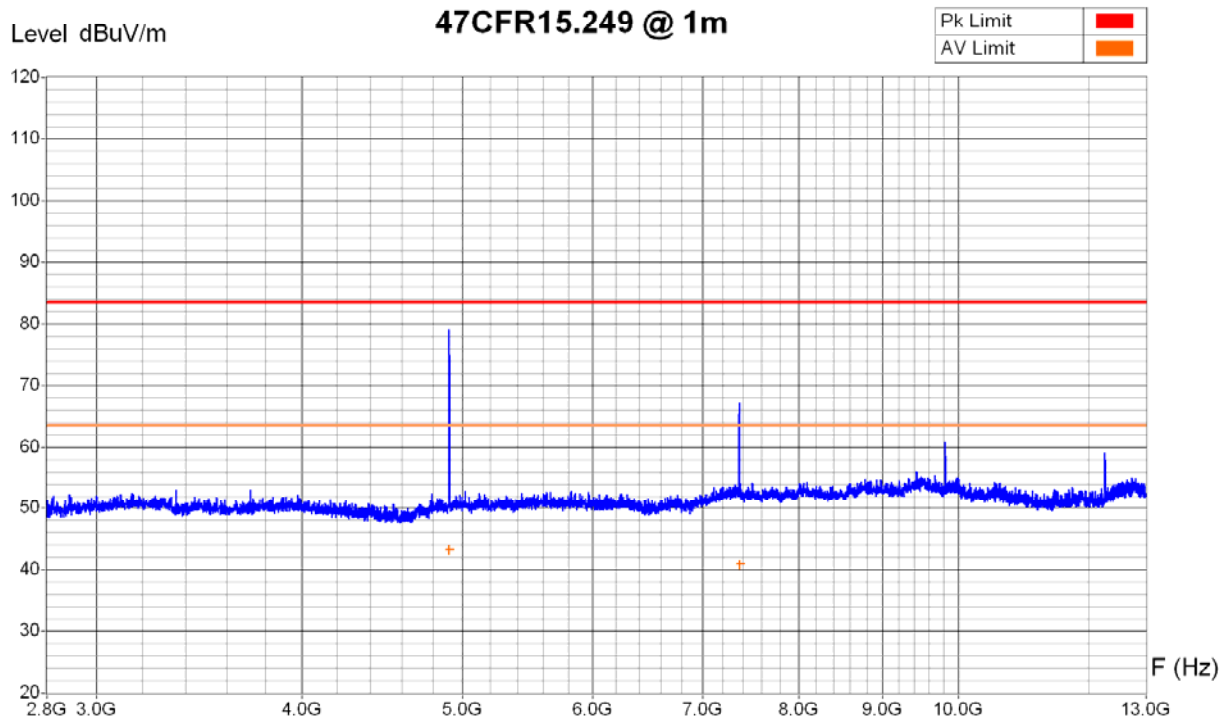
Frequency	Peak	Average (+)
4.91 GHz	71.8 dBuV/m	40.2 dBuV/m
7.37 GHz	68.6 dBuV/m	40.5 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 11:23
Filename:
20067171_Tx_er_012h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

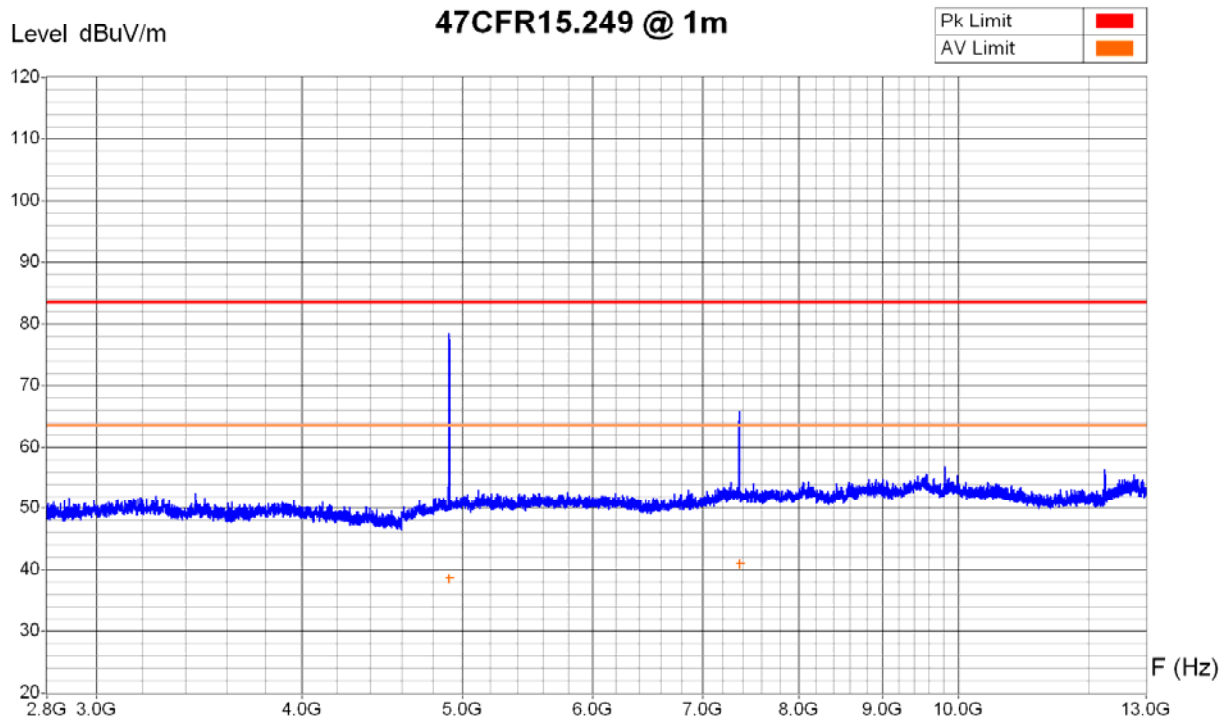
Frequency	Peak	Average (+)
4.91 GHz	79.1 dBuV/m	43.2 dBuV/m
7.37 GHz	67.2 dBuV/m	40.9 dBuV/m

Operator: E. Staub
Date/Time: 28.11.2006 12:14
Filename:
20067171_Tx_er_012v_laying.png
/.txt

Measurement Type : Radiated Field
 Polarisation : Vertical
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
 Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
 Remarks : standing with antenna horizontal
 C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	2.80 GHz - 4.60	4.60 GHz - 6.90	6.90 GHz - 10 GHz	10 GHz - 13 GHz
Video Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz
Resol Bandwidth	1 MHz	1 MHz	1 MHz	1 MHz

Receiver Measures

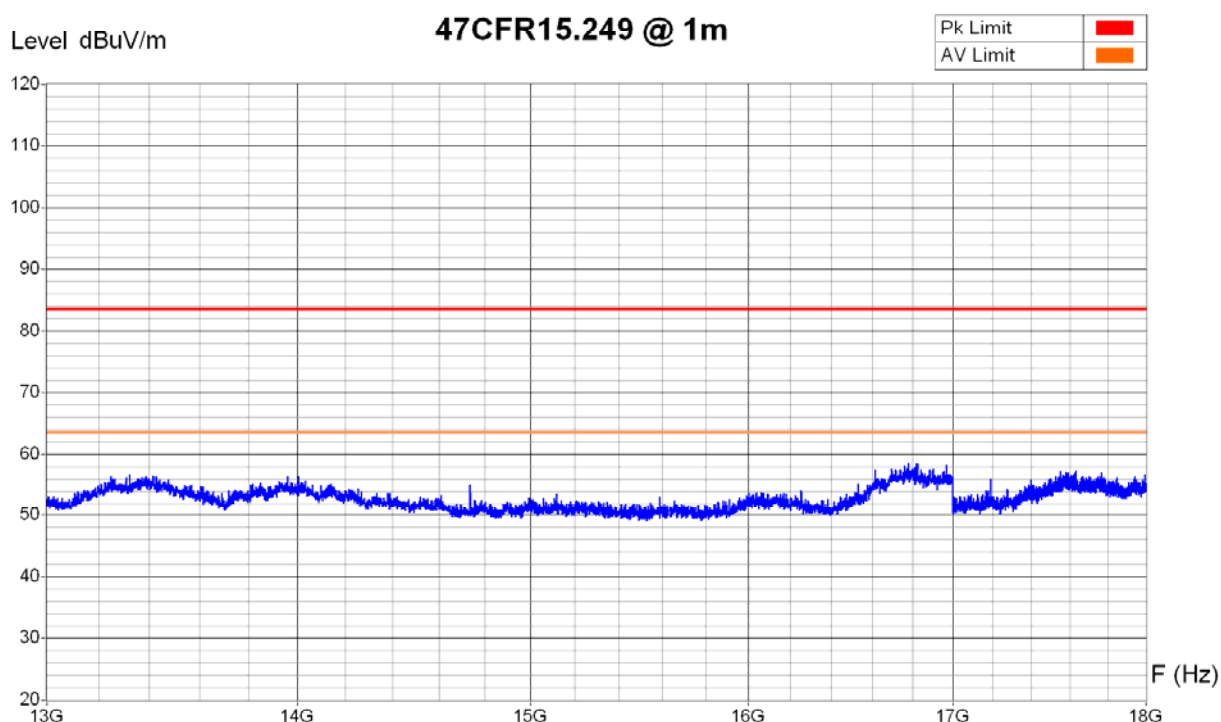
Frequency	Peak	Average (+)
4.91 GHz	78.5 dBuV/m	38.6 dBuV/m
7.37 GHz	65.9 dBuV/m	41.0 dBuV/m

Operator: E. Staub
 Date/Time: 28.11.2006 11:41
 Filename:
 20067171_Tx_er_012v_standing.p
 ng/.txt

Measurement Type : Radiated Field
 Polarisation : Horizontal
 Table Angle : 0 - 360°
 Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
 Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
 Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
 Remarks : laying with antenna vertical
 C3 replaced with bridge; L3 = 1.8 nH close to amplifier



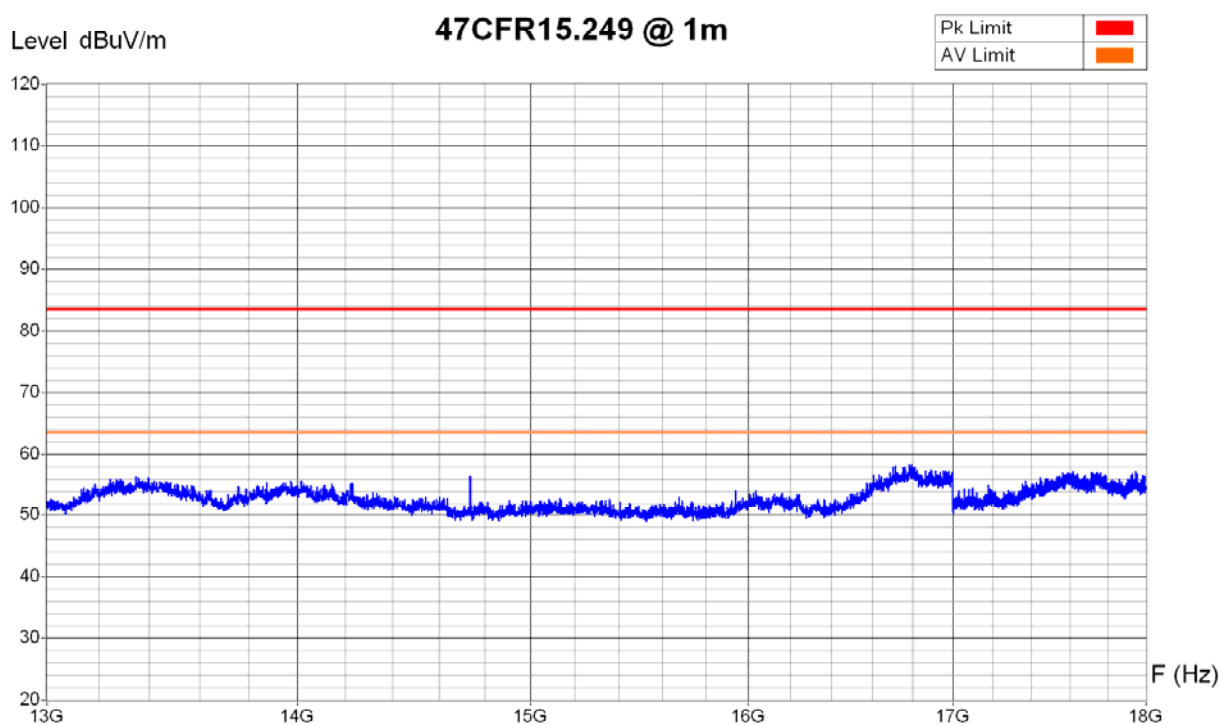
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
 Date/Time: 28.11.2006 14:44
 Filename:
 20067171_Tx_er_013h_laying.pn
 gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



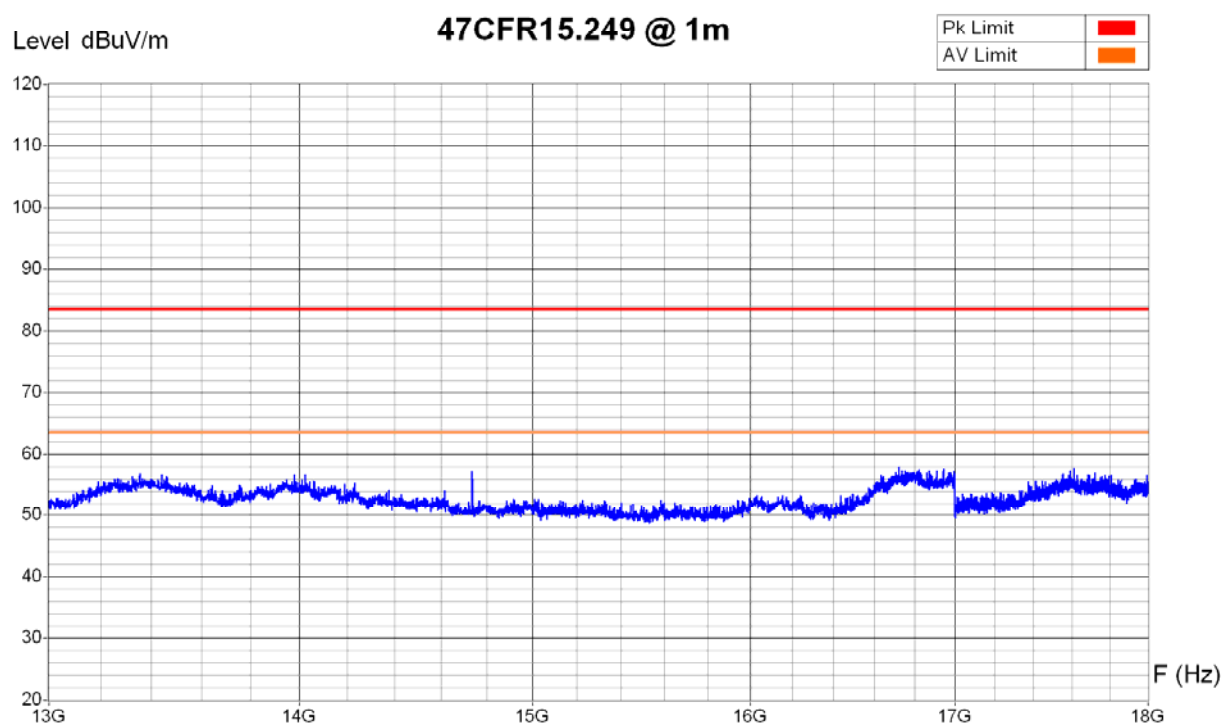
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: **E. Staub**
Date/Time: 28.11.2006 14:42
Filename:
20067171_Tx_er_013h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



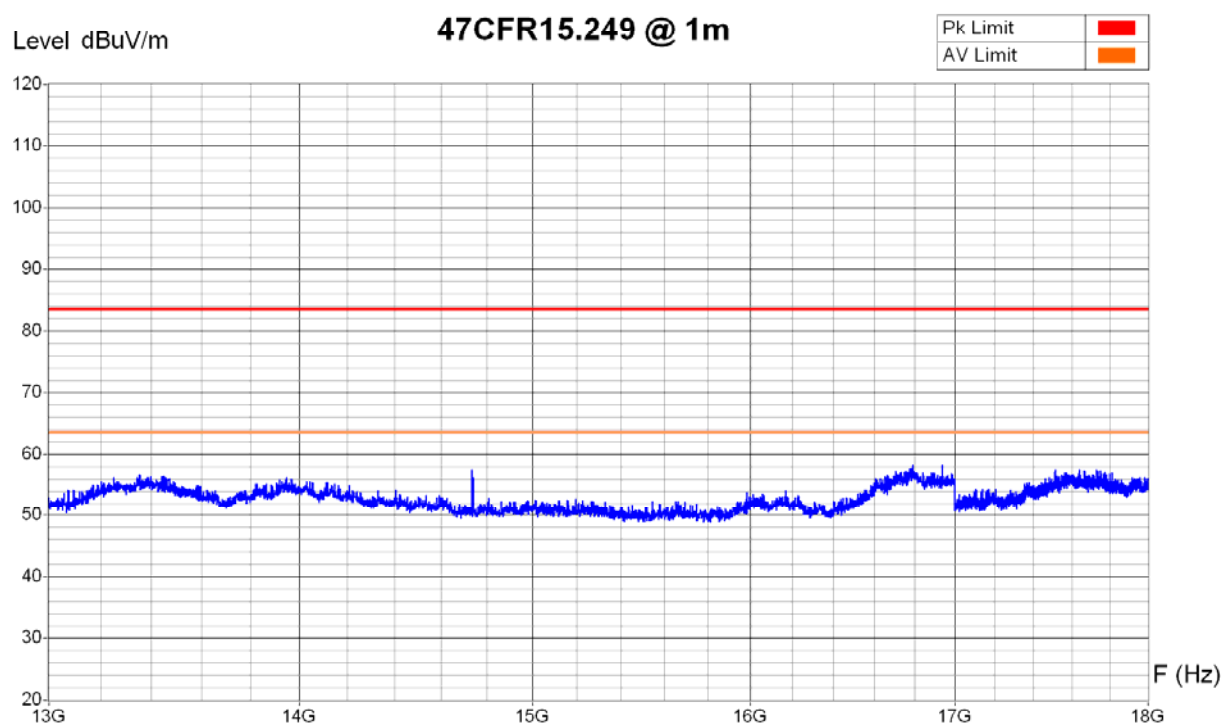
Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: E. Staub
Date/Time: 28.11.2006 14:47
Filename:
20067171_Tx_er_013v_laying.png
/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	13 GHz - 15 GHz	15 GHz - 17 GHz	17 GHz - 18 GHz
Video Bandwidth	1 MHz	1 MHz	300 KHz
Resol Bandwidth	1 MHz	1 MHz	300 KHz

Operator: **E. Staub**
Date/Time: 28.11.2006 14:39
Filename:
20067171_Tx_er_013v_standing.p
ng/.txt

6.5 Radiated emission - Electromagnetic field (18 GHz < f < 26.5 GHz)

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

Distance: ☐ 30 m ☐ 10 m ☐ 3 m ☒ 1 m

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

Meas. uncertainty: ± 5.4 dB

Test method: The electromagnetic disturbance 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:



Universal Receiver: laying



Transmitter: standing

Remarks: Limit values expressed in dB μ V/m and transformed to a measuring distance of 1m (factor used = 20 dB/decade) if necessary
 e.g.: for f = 19GHz the limit is 500 μ V/m at 3m;
 $20 \log_{10} (500\mu\text{V/m}) + 20 \log_{10} (3\text{m}/1\text{m}) = 63.5 \text{ dB}\mu\text{V/m at } 1\text{m}$

Test equipment:

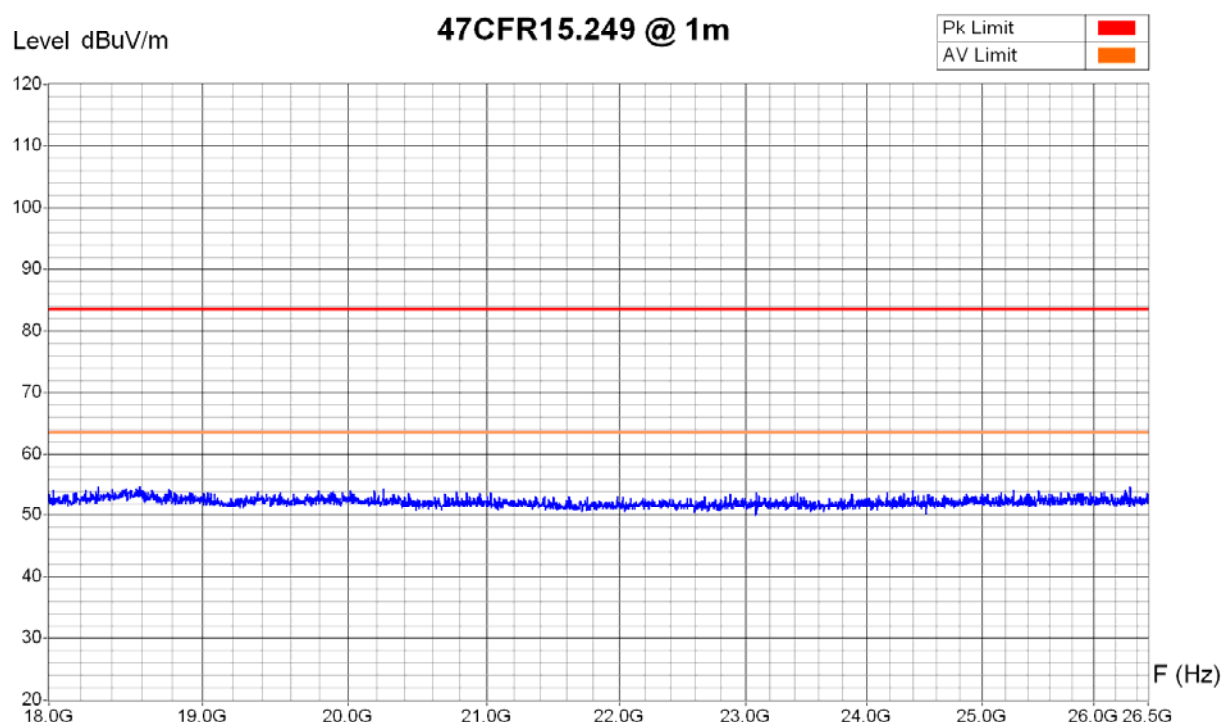
Spectrum analyser	☒ 88-14	☐ 90-26	☐ 94-24	☐ 02-06	☐ 03-45	☐ 03-57
Receiver	☐ 85-04	☐ 90-43	☐ 94-35			
Preamplifier	☐ 90-01	☐ 95-86	☐ 05-56	☐ 05-59	☐ 05-62	☐ 05-87
Antenna (horn)	☐ 90-24	☐ 90-29	☒ 98-12	☐ 98-13	☐	
Mixers	☒ External					

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

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



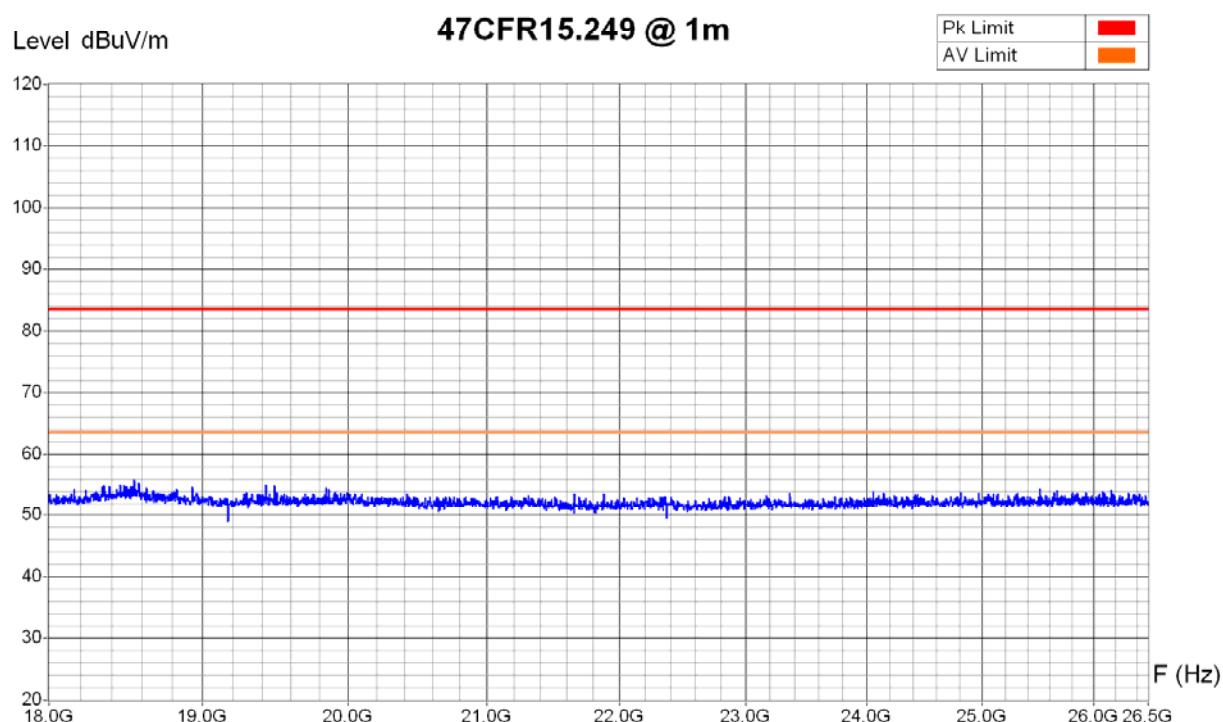
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 16:17
Filename:
20067171_UR_er_011h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal
L3 = 1.8 nH



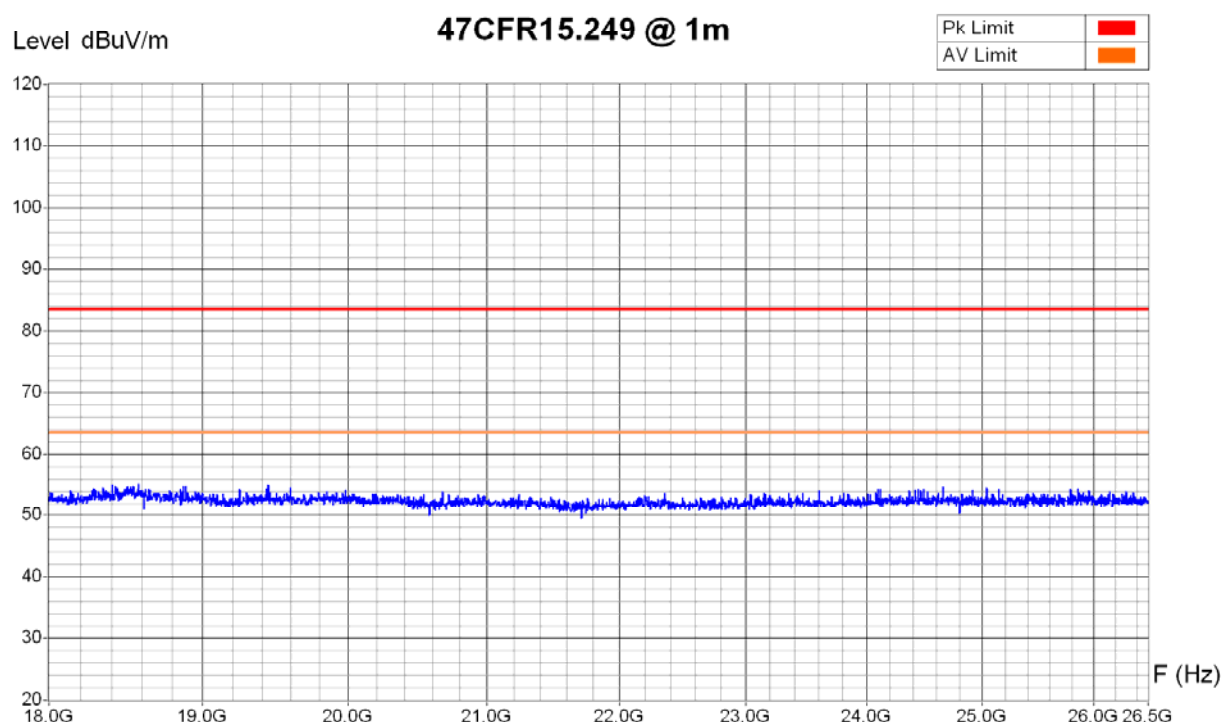
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 16:12
Filename:
20067171_UR_er_011h_staying.p
ng/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : laying with antenna vertical
L3 = 1.8 nH



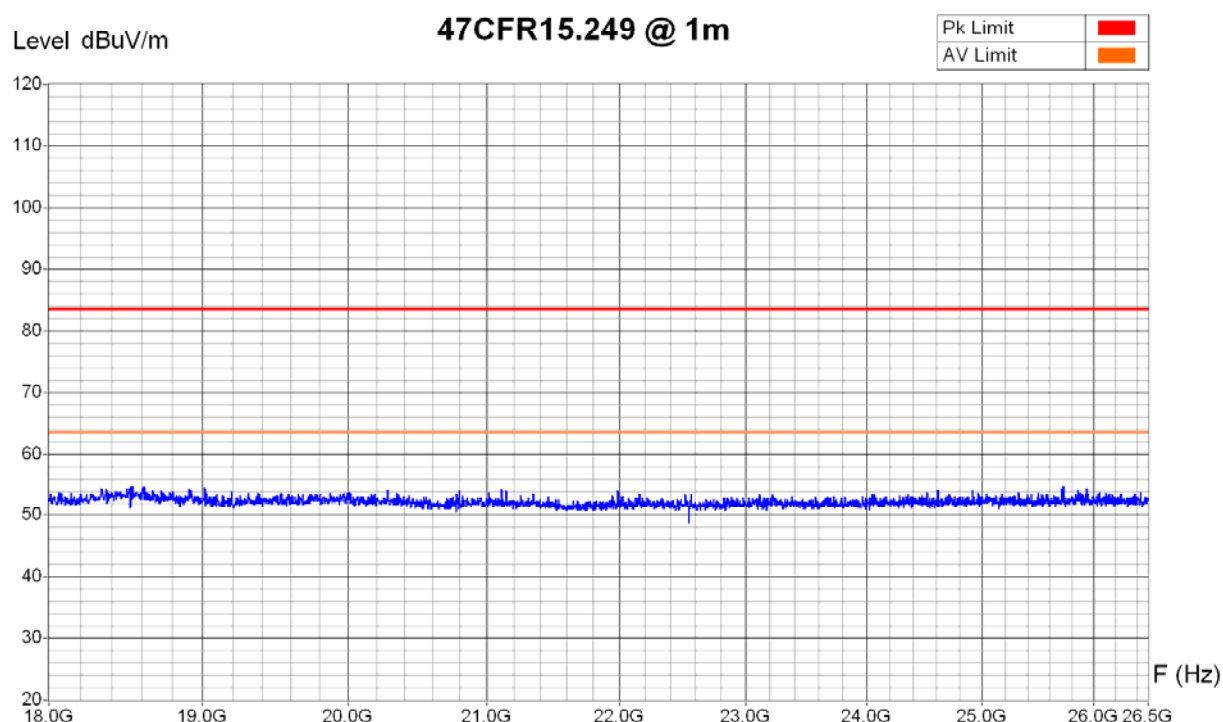
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 16:03
Filename:
20067171_UR_er_011v_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Universal Receiver
Set-Up : 5VDC; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2448MHz)
Remarks : standing with antenna horizontal
L3 = 1.8 nH



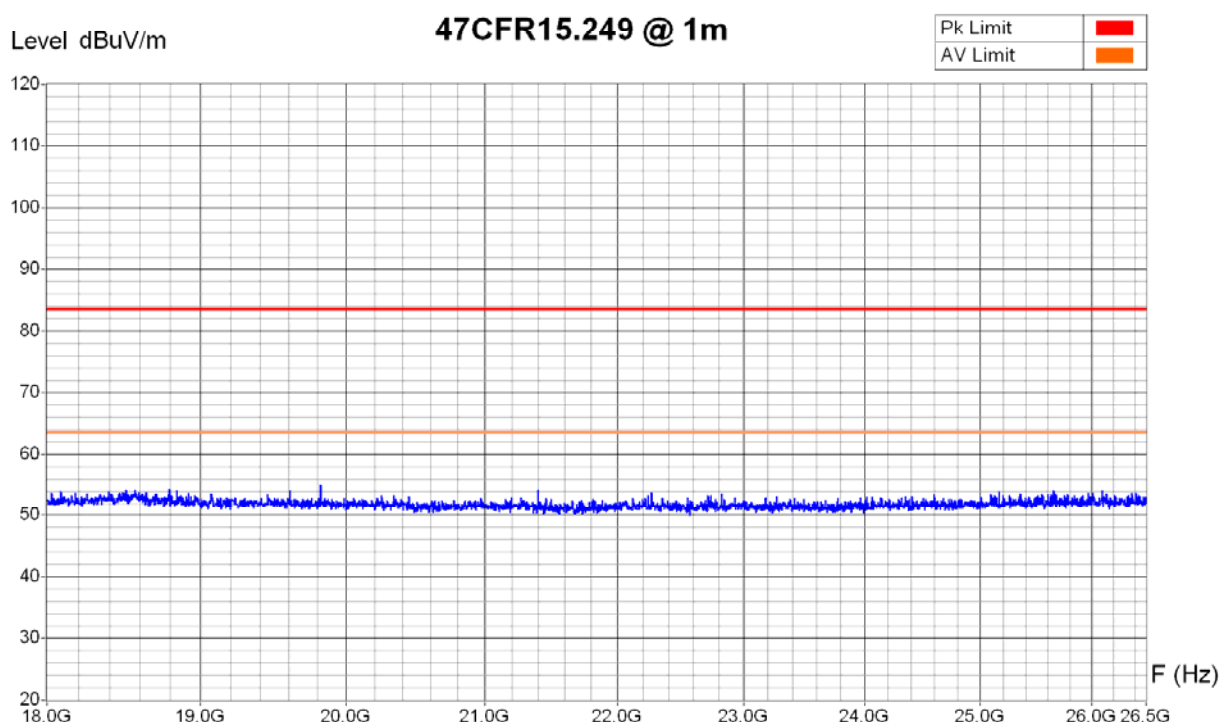
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: **E. Staub**
Date/Time: 28.11.2006 16:07
Filename:
20067171_UR_er_011v_staying.p
ng/.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



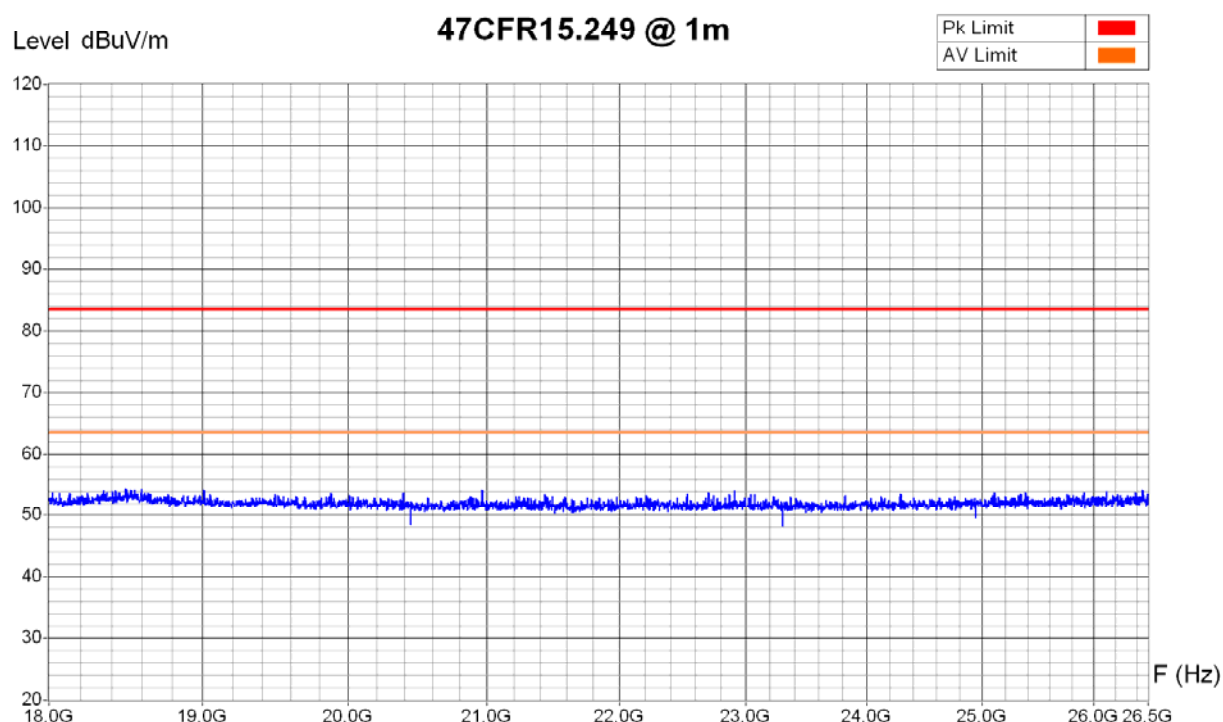
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 15:30
Filename:
20067171_Tx_er_014h_laying.pn
gl.txt

Measurement Type : Radiated Field
Polarisation : Horizontal
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



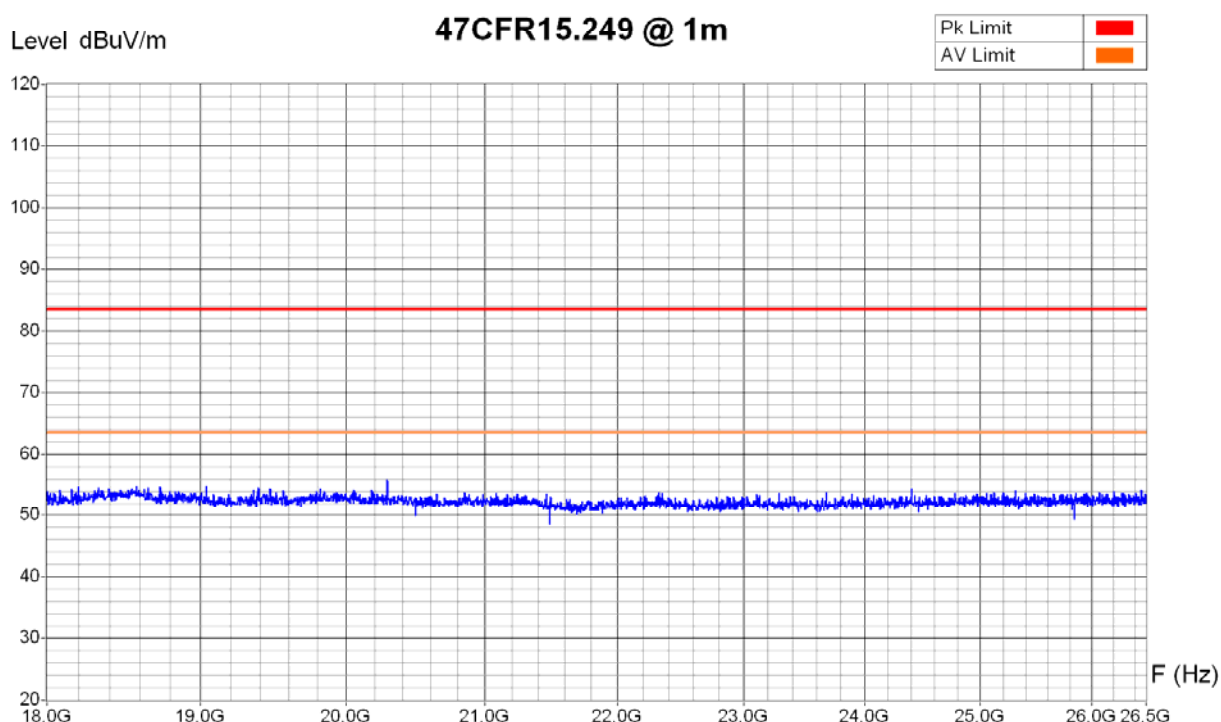
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 15:34
Filename:
20067171_Tx_er_014h_standing.
png/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : laying with antenna vertical
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



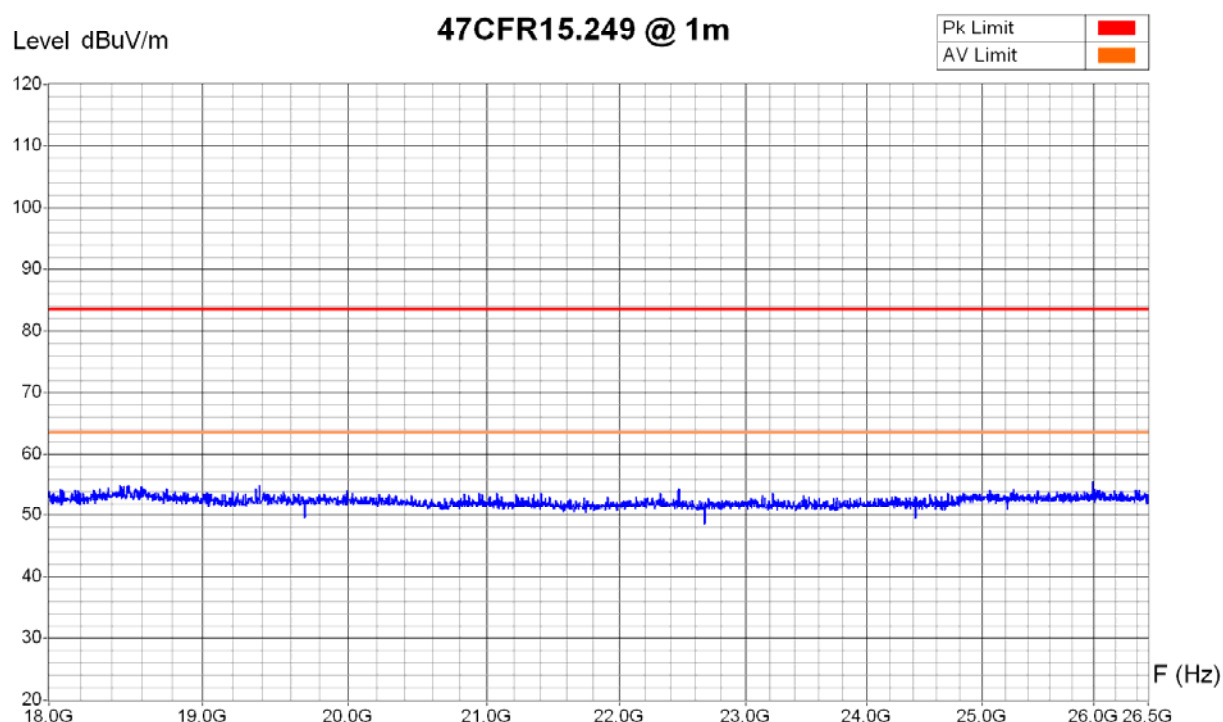
Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 15:48
Filename:
20067171_Tx_er_014v_laying.png
/.txt

Measurement Type : Radiated Field
Polarisation : Vertical
Table Angle : 0 - 360°
Antenna Height : 0.95m



Equipment Under Test : EL-Skyport Transmitter
Set-Up : Internal 3VDC lithium; synchron cable (L = 30cm)
Operating Conditions : Continuous transmitting every 5ms burst mode, channel 1 (=2456MHz)
Remarks : standing with antenna horizontal
C3 replaced with bridge; L3 = 1.8 nH close to amplifier



Zone	18 GHz - 19.70 GHz	19.70 GHz - 21.40	21.40 GHz - 23.10	23.10 GHz - 24.80	24.80 GHz - 26.50
Video Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz
Resol Bandwidth	100 KHz	100 KHz	100 KHz	100 KHz	100 KHz

Operator: E. Staub
Date/Time: 28.11.2006 15:42
Filename:
20067171_Tx_er_014v_standing.p
ng/.txt