



Test report no. : 64103-5

Item tested : WorldPro 1010

Type of equipment : Frequency Hopping Transmitter

FCC ID : TSF107730

Client : Nera Satcom AS

FCC Part 15.247

Frequency Hopping Transmitters

RSS-210, Issue 6

Low Power Licence-Exempt
Radiocommunication Devices

21 August 2006

Authorized by : 

Egil Hauger
Technical Vericator



CONTENTS

1	GENERAL INFORMATION	3
1.1	Testhouse Info	3
1.2	Client Information	3
1.3	Manufacturer	3
2	Test Information	4
2.1	Test Item	4
2.2	Test Environment	5
2.3	Test Period	5
3	TEST REPORT SUMMARY	6
3.1	General	6
3.2	Test Summary	7
3.3	Description of modification for Modification Filing	7
3.4	Comments	7
3.5	Family List Rational	7
4	TEST RESULTS	8
4.1	Power Line Conducted Emissions	8
4.2	Channel Separation	11
4.3	Pseudorandom Hopping Algorithm	13
4.4	Occupancy Time	14
4.5	Occupied Bandwidth	17
4.6	Peak Power Output	19
4.7	Spurious Emissions	23
5	LIST OF TEST EQUIPMENT	38
6	BLOCK DIAGRAM	39
6.1	System set up	39
6.2	Power Line Conducted Emission	39
6.3	Test Site Radiated Emission	40

1 GENERAL INFORMATION

1.1 Testhouse Info

Name : Nemko Comlab
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Telephone : +47 64 84 57 00
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E-mail: post@comlab.no
FCC test firm registration # : 994405
IC OATS registration # : 4443
Total Number of Pages: 40

1.2 Client Information

Name : Nera SatCom AS
Address : Bergerveien 12, N-1375 Billingstad, Norway
Telephone : +47 67 24 47 00
Fax : +47 67 24 44 45

Contact:

Name : Roy Uggerud

1.3 Manufacturer

Name : Nera SatCom AS
Address : Bergerveien 12, N-1375 Billingstad, Norway
Telephone : +47 67 24 47 00
Fax : +47 67 24 44 45

2 Test Information

2.1 Test Item

Name :	WorldPro 1010 Bluetooth Module
FCC ID :	TSF107730
Industry Canada ID :	6200A-107730
Model/version :	WorldPro 1010
Serial number :	0306055007
Hardware identity and/or version:	Interface Unit 108034 ver. 1.1
Software identity and/or version :	CSW XSCALE 2.3.15
Frequency Range :	2402 - 2480 MHz
Tunable Bands :	1
Number of Channels :	79
Modulation :	GFSK
Emissions Designator :	1MF1D
User Frequency Adjustment :	None, Software controlled.
Rated Output Power :	10 mW

Description of Test Item

The tested equipment is a Bluetooth device that is integrated into a satellite terminal. The Bluetooth device is used to connect a cordless telephone handset to the satellite terminal.

The tested equipment has integral antennas only.

Theory of Operation

The tested equipment is a Frequency Hopping Transmitter that uses the Bluetooth protocols.

2.2 Test Environment

2.2.1 Normal test condition

Temperature:	20 - 23 °C
Relative humidity:	30 - 50 %
Normal test voltage:	115 V AC

The values are the limit registered during the test period.

2.3 Test Period

Item received date:	2006-08-10
Test period :	from 2006-08-10 to 2006-08-12

3 TEST REPORT SUMMARY

3.1 General

Manufacturer: Nera Satcom
Model No.: WorldPro 1010
Serial No.: 0306055007

All measurements are tracable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.247 and Industry Canada RSS-210 Issue 6.

Radiated tests were conducted in accordance with ANSI C63.4-2003. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3 and 10 metres.

- | | |
|---|---|
| <input checked="" type="checkbox"/> New Submission | <input checked="" type="checkbox"/> Production Unit |
| <input type="checkbox"/> Class II Permissive Change | <input type="checkbox"/> Pre-production Unit |
| DSS Equipment Code | <input type="checkbox"/> Family Listing |

THIS TEST REPORT RELATES ONLY TO THE ITEM (S) TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".



TEST REPORT #: 64103-5

TESTED BY: Frode Sveinsen
Frode Sveinsen, Test engineer

DATE: 12 August 2006

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This test report applies only to the items and configurations tested.

3.2 Test Summary

Name of test	FCC Part 15 reference	RSS-210 Issue 6 reference	Result
Supply Voltage Variations	15.31(e)	8 (RSS-GEN)	Complies
Number of Operating Frequencies	15.31(m)	A8.1	Complies
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	Complies
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2.2 (RSS-GEN)	Complies
Channel Separation	15.247(a)(1)	A8.1	Complies
Pseudorandom Hopping Algorithm	15.247(a)(1)	A8.1	Complies
Time of Occupancy	15.247(a)(1)(iii)	A8.1	Complies
Occupied Bandwidth	15.247(a)(1)	A8.1	Complies
Peak Power Output	15.247(b)	A8.4	Complies
Spurious Emissions (Antenna Conducted)	15.247(c)	A8.5	Complies ¹
Spurious Emissions (Radiated)	15.247(c) 15.109(a) 15.209(a)	A8.5	Complies

¹ The tested equipment has integrated antennas only.

3.3 Description of modification for Modification Filing

Not applicable.

3.4 Comments

This test report covers **only** the Bluetooth Module integrated into the Nera Satcom WorldPro 1010.

The channel to operate on and the modulation pattern were selected from a Rohde & Schwarz CMU200 Bluetooth tester connected to the satellite telephone. The tester was located in the control room during the measurements but a radio link to the EUT was active during all tests.

The measurements were done with the EUT powered by 115 V AC. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

All ports were populated during spurious emission measurements.

3.5 Family List Rational

Not Applicable.

4 TEST RESULTS

4.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

Test Performed By: Egil Hauger	Date of Test: 12 August 2006
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Measurement procedure: ANSI C63.4-2003 using 50 μ H/50 ohms LISN.

Test Results: Complies.

Measurement Data: See attached graph, (Peak detector).

Highest measured value (L1 and N):

Frequency	Detector	Phase	Measured value	Limit	Margin
MHz	Peak/QP/AV	N/L1	dB μ V	dB μ V	dB
0.15	QP	L1	50.6	66	15.4
	AV		20.8	56	35.2
	QP	N	50.8	66	15.2
	AV		22.0	56	34.0
0.213	QP	N	47.0	63.1	16.1
	AV		40.8	53.1	12.3
	QP	L1	47.8	63.1	15.3
	AV		40.7	53.1	12.4
0.320	QP	L1	48.3	59.7	11.4
	AV		43.7	49.7	6.0
	QP	N	47.9	59.7	11.8
	AV		43.8	49.7	5.9
0.420	QP	N	46.2	57.5	11.3
	AV		43.2	47.5	4.3
	QP	L1	46.4	57.5	11.1
	AV		43.0	47.5	4.5
10.58	QP	L1	48.6	60	11.6
	AV		34.3	50	15.7
10.5	QP	N	50.1	60	9.9
	AV		35.4	50	14.6

NEMKO COMLAB

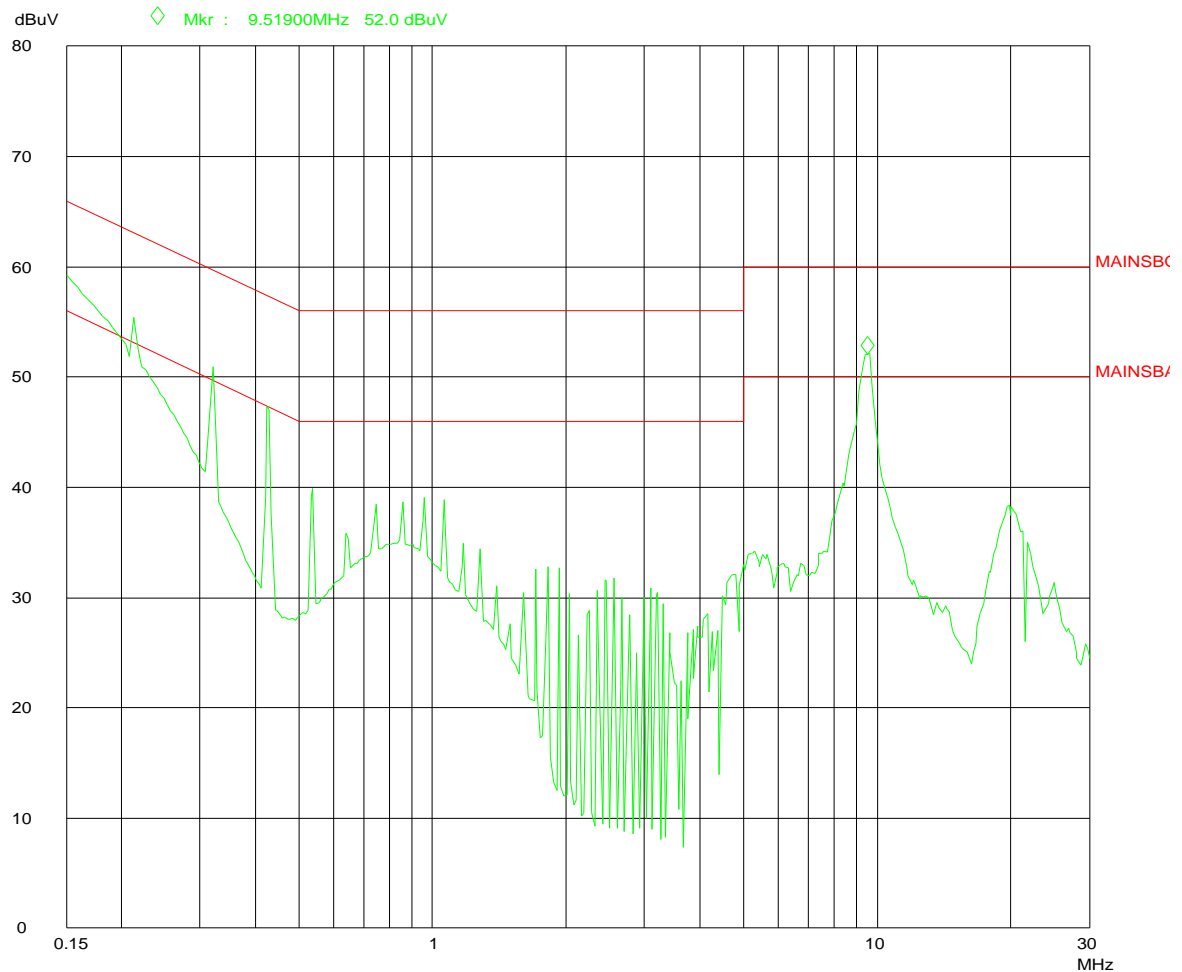
11. Aug 06 10:47

Peak

Operator: Egh
 Comment: Nera Satcom
 WorldPro 1010
 FCC 15.207
 LISN 50 uH/50 ohm Phase N
 Bluetooth TX active
 Satellite TX active

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	4.5k	9k	PK	50ms	AUTO	LN OFF	60dB



AC Mains, TX Active for both Satellite and Bluetooth, Phase N, Peak Detector

NEMKO COMLAB

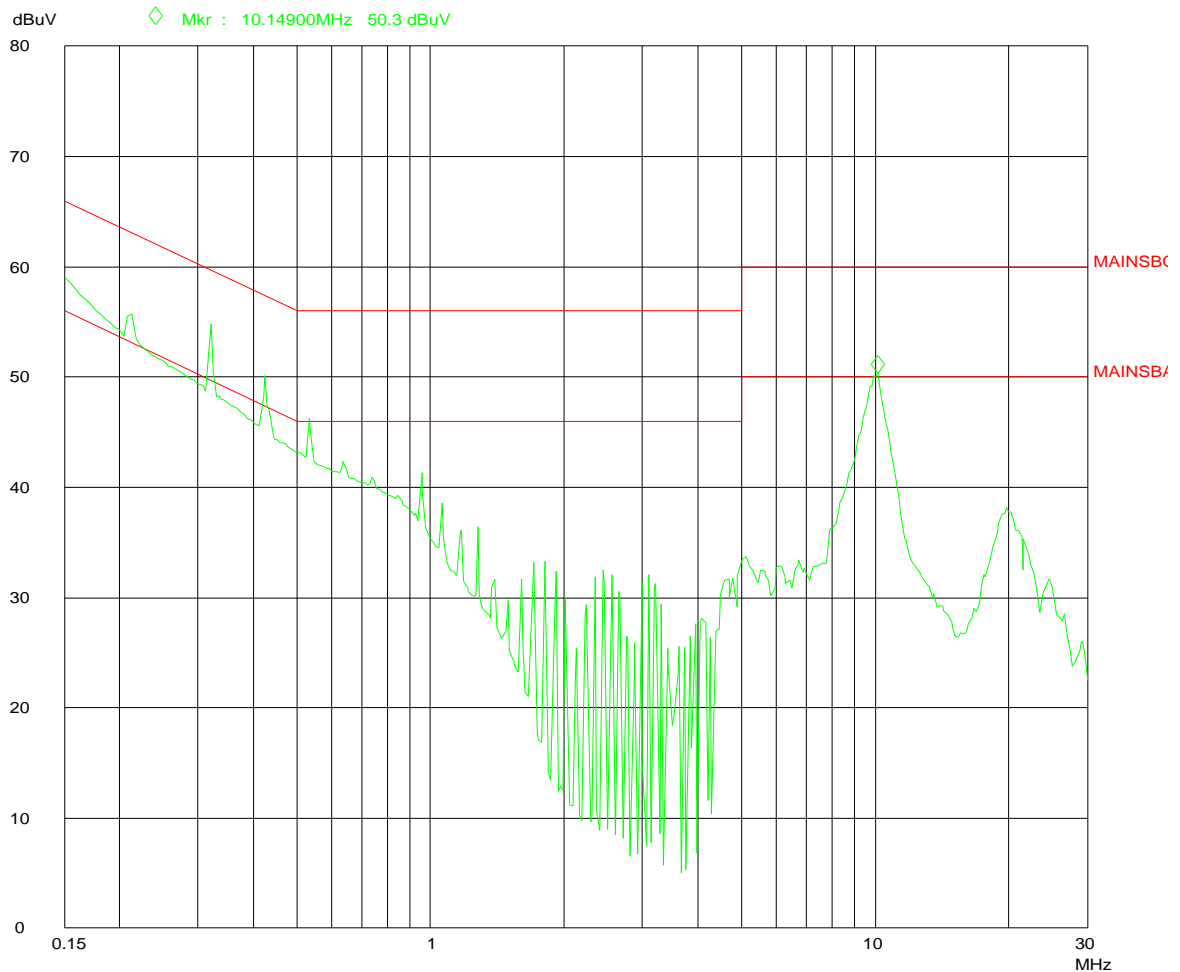
11. Aug 06 11:04

Peak

Operator: Egh
 Comment: Nera Satcom
 WorldPro 1010
 FCC 15.207
 LISN 50 uH/50 ohm Phase L1
 Bluetooth TX active
 Satellite TX active

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	30M	4.5k	9k	PK	50ms	AUTO	LN OFF	60dB



AC Mains, TX Active for both Satellite and Bluetooth, Phase L1, Peak Detector

4.2 Channel Separation

Para. No.: 15.247 (a)(1)

Test Performed By: Frode Sveinsen

Date of Test: 10 August 2006

Test Results: **Complies**

Measurement Data: Channel Separation: $3.998/4 = 999.5$ kHz
20 dB Bandwidth of hopping channel: 901.8 kHz

RF channel has no influence on 20 dB bandwidth.

See attached graph

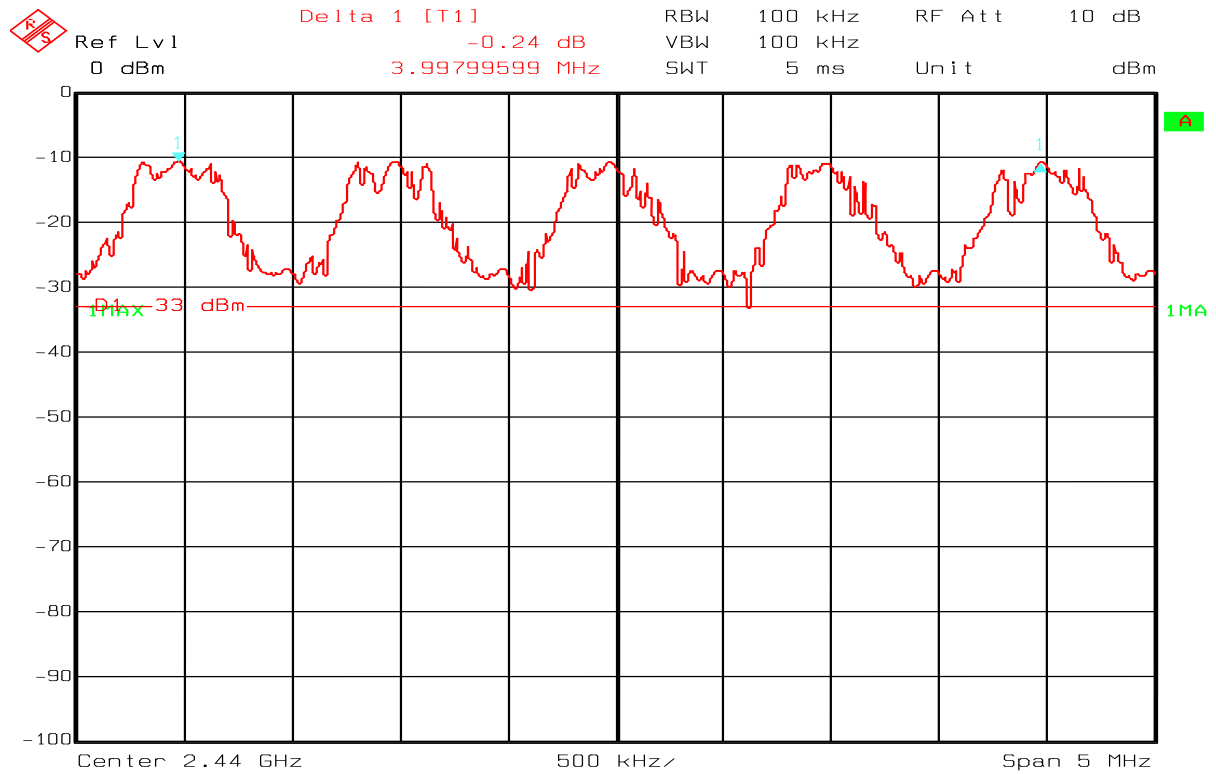
Channel Separation nominal value: 1.0 MHz.

Requirement:

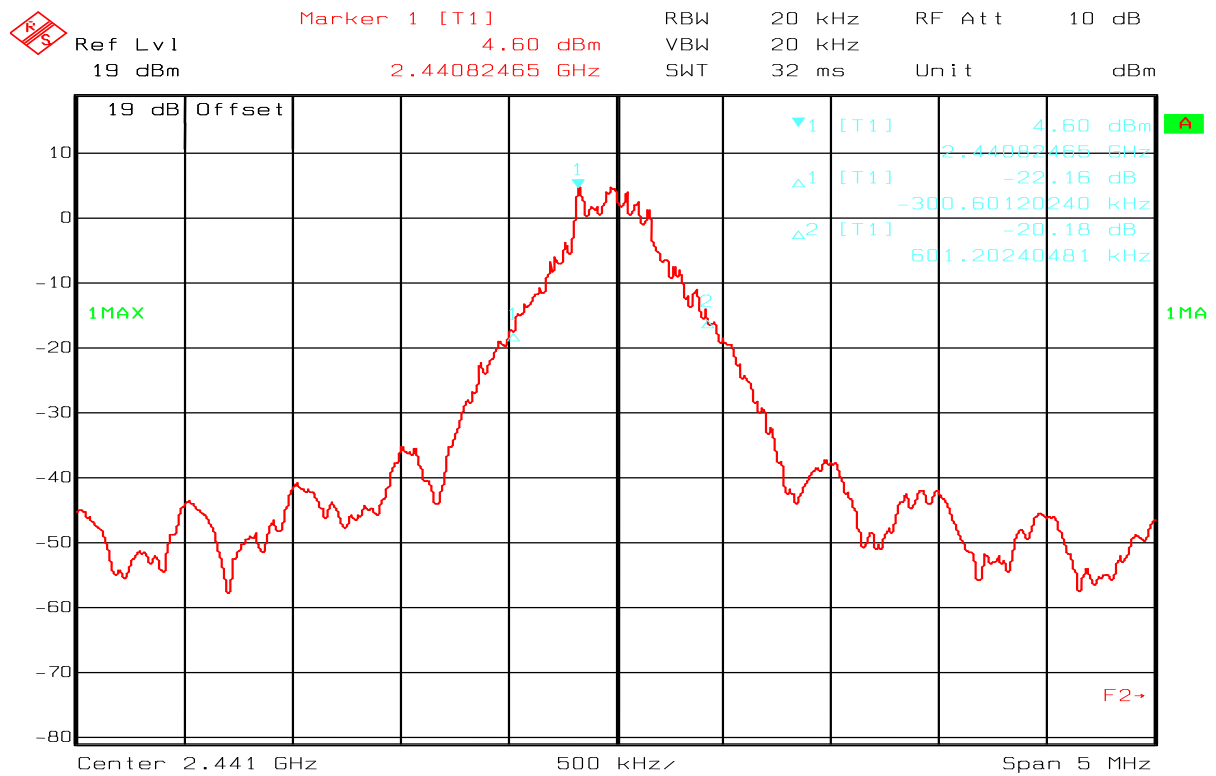
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

or:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the system operates with an output power no greater than 125 mW.



Channel separation



20 dB Bandwidth

4.3 Pseudorandom Hopping Algorithm

Para. No.: 15.247 (a)(1)

Test Performed By: Frode Sveinsen

Date of Test: 10 August 2006

Test Results: Complies

Measurement Data: /

Requirements:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally by the transmitter.

Base Table Hopping Sequence

All 79 frequencies are used in a random order in each hop sequence. The hop sequence is repeated every 99 seconds. The hopping sequence follows the Bluetooth standard.

4.4 Occupancy Time

Para. No.: 15.247 (a)(1)(iii)

Test Performed By: Frode Sveinsen

Date of Test: 10 August 2006

Test Results: **Complies**

Measurement Data:

Number of RF channel: 79

RF burst pr channel: 425.9 ms

Average time between each RF burst on same RF channel: $79 * 1250 \mu\text{s} = 98.75 \text{ ms}$

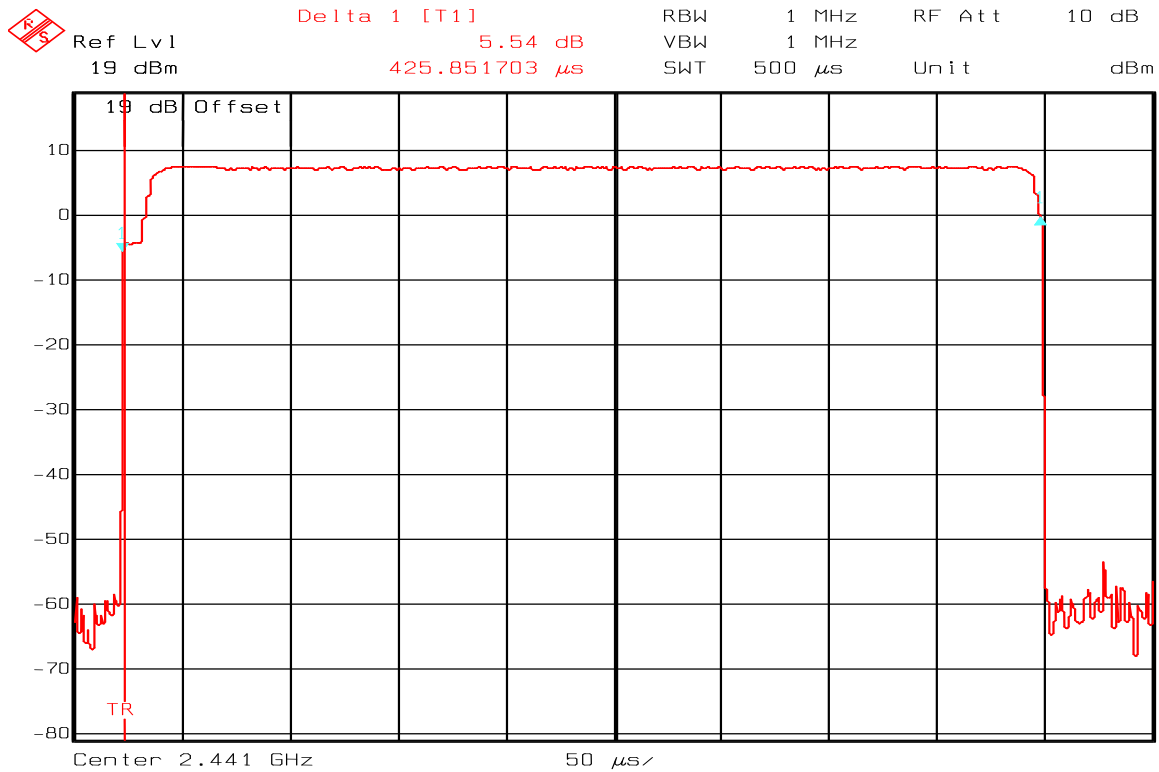
Average Time of Occupancy: $(0.426 \text{ ms} / 98.75 \text{ ms}) * 0.4 \text{ s} * 79 = 0.136 \text{ s}$

See attached graph.

Requirements:

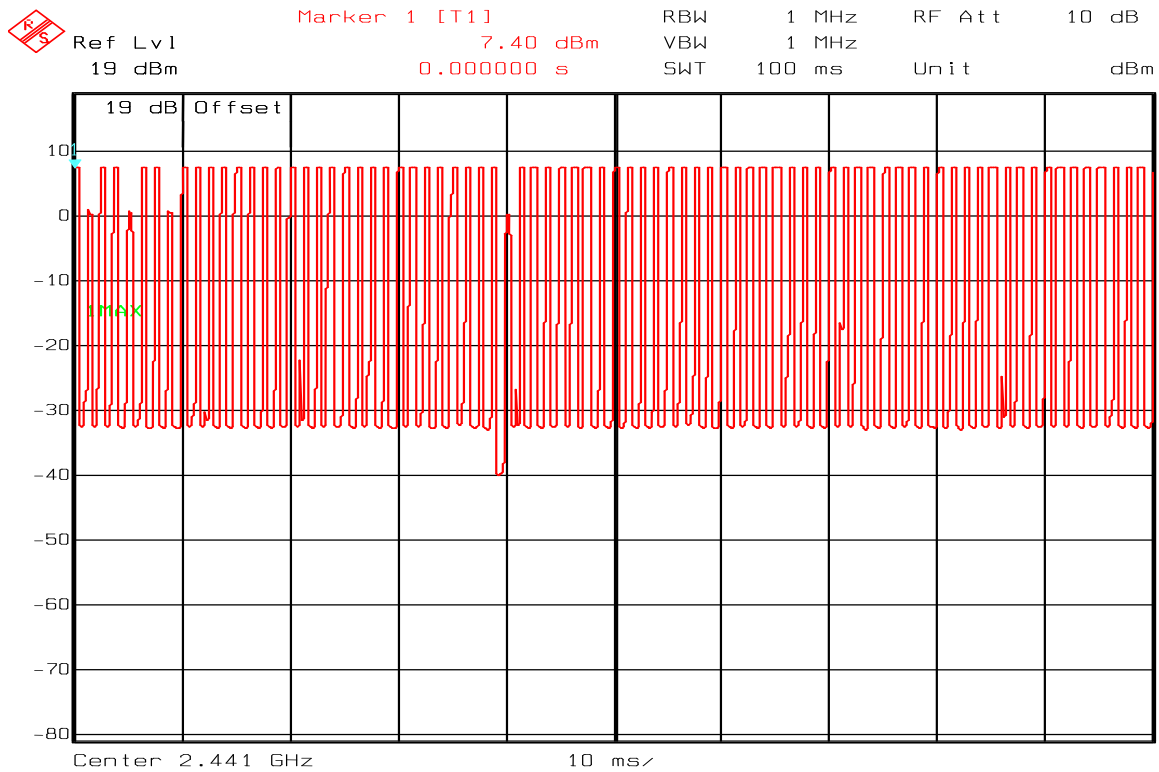
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

No requirements for Digital Transmission Systems.



Date: 10.AUG.2006 15:43:26

RF Burst



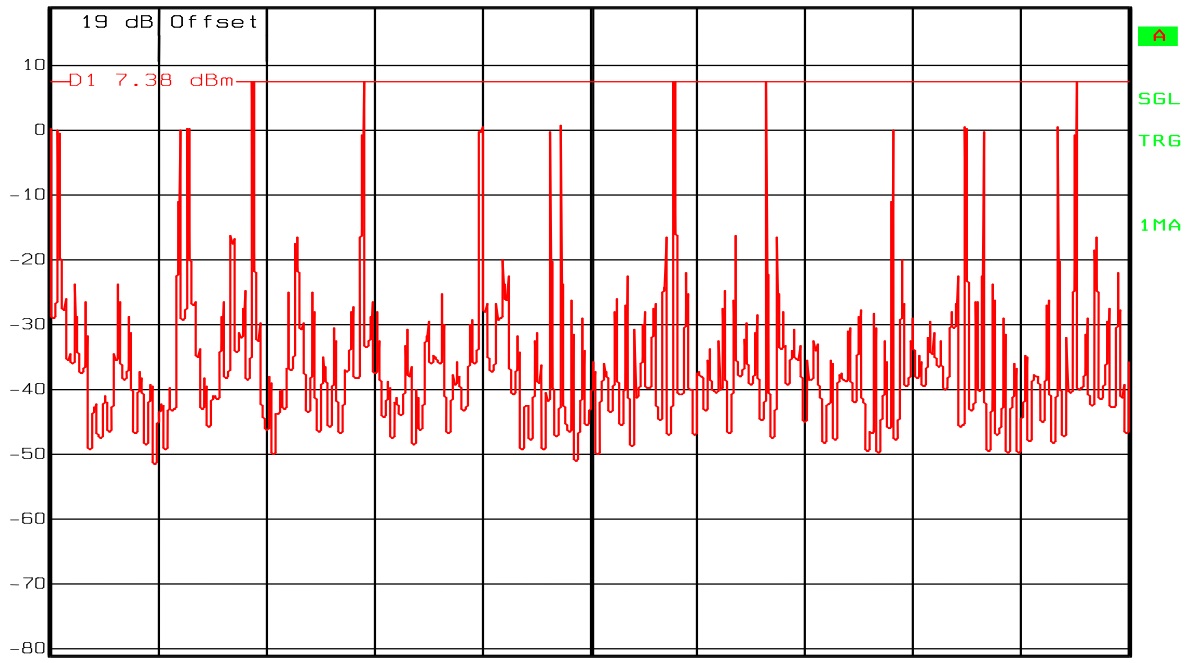
Date: 10.AUG.2006 15:55:53

Time of Occupancy (Dwell time)



Ref Lvl
 19 dBm

RBW 1 MHz RF Att 10 dB
 VBW 1 MHz
 SWT 500 ms Unit dBm



Date: 10.AUG.2006 15:57:33

Time between RF burst on same channel

4.5 Occupied Bandwidth

Para. No.: 15.247 (a)(1)(iii)

Test Performed By: Frode Sveinsen

Date of Test: 10 August 2006

Test Results: Complies

Measurement Data: 79 RF channels in use

See attached graph.

Requirements:

Frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 15 non-overlapping channels. No requirements for bandwidth for this frequency band.

Channel Centre Frequencies

The 79 channels are centred at each full MHz from 2402 to 2480 MHz.

4.6 Peak Power Output

Para. No.: 15.247 (b)

Test Performed By: Frode Sveinsen	Date of Test: 10 August 2006
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Test Results: Complies

Measurement Data:

Maximum Conducted Peak Output Power, mW

RF channel	0	39	78
Measured value	10.2	5.8	3.4

Maximum EIRP, mW

RF channel	0	39	78
Measured EIRP	4.9	10.1	5.0
Antenna gain dBi	-3.2	+2.4	+1.7

Antenna gain = $10 \cdot \log(\text{EIRP} / \text{Conducted power})$ dBi

The EIRP is calculated from measured field strength by the formula in DA00-705.

See attached graph.

Detachable antenna?

Yes No

If detachable, is the antenna connector non-standard?

Yes No

Requirements:

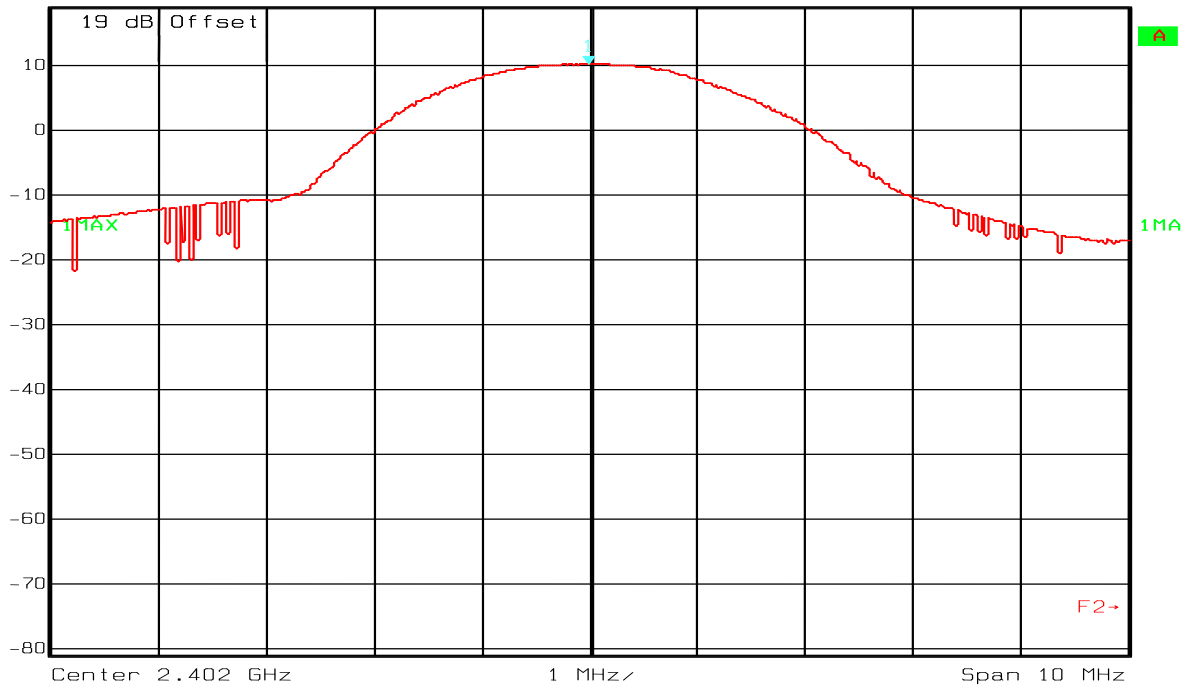
The maximum peak output power shall not exceed the following limits:

For frequency hopping systems employing at least 75 hopping channels: 1 Watt

For all other frequency hopping systems in the 2400 - 2483.5 MHz band: 0.125 Watts

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

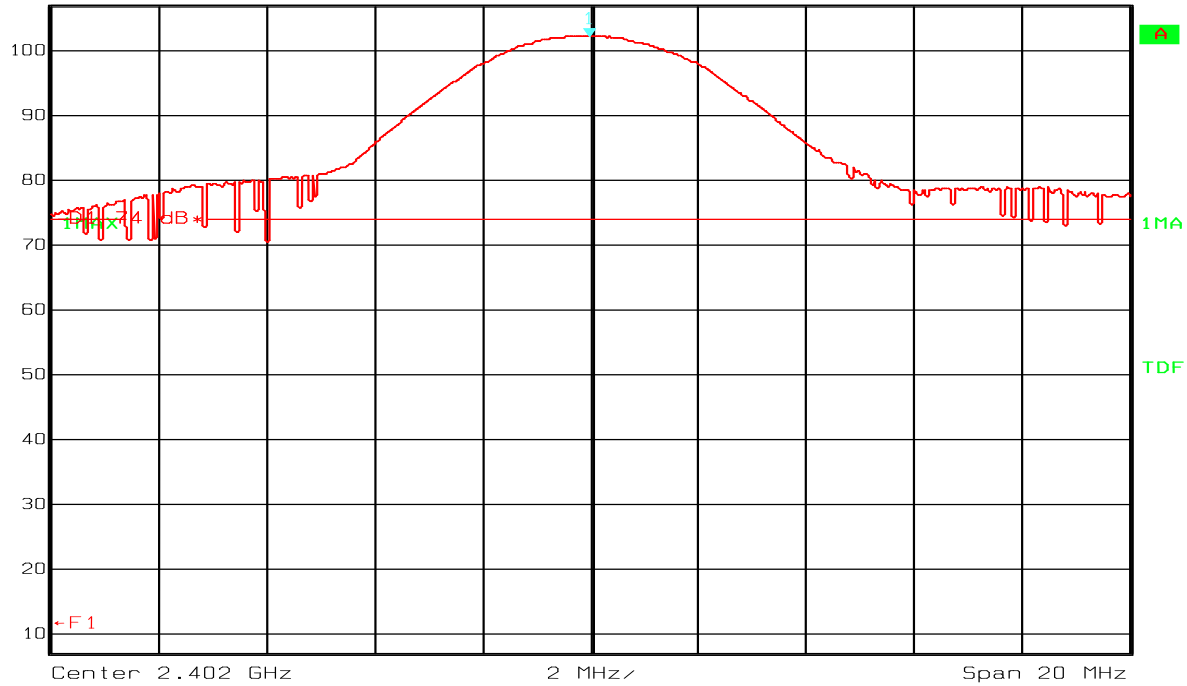
Marker 1 [T1]
10.08 dBm
2.40198998 GHz
 Ref Lvl 19 dBm
 RBW 2 MHz
 VBW 2 MHz
 SWT 5 ms
 RF Att 10 dB
 Unit dBm



Date: 10.AUG.2006 15:32:44

RF conducted channel 0

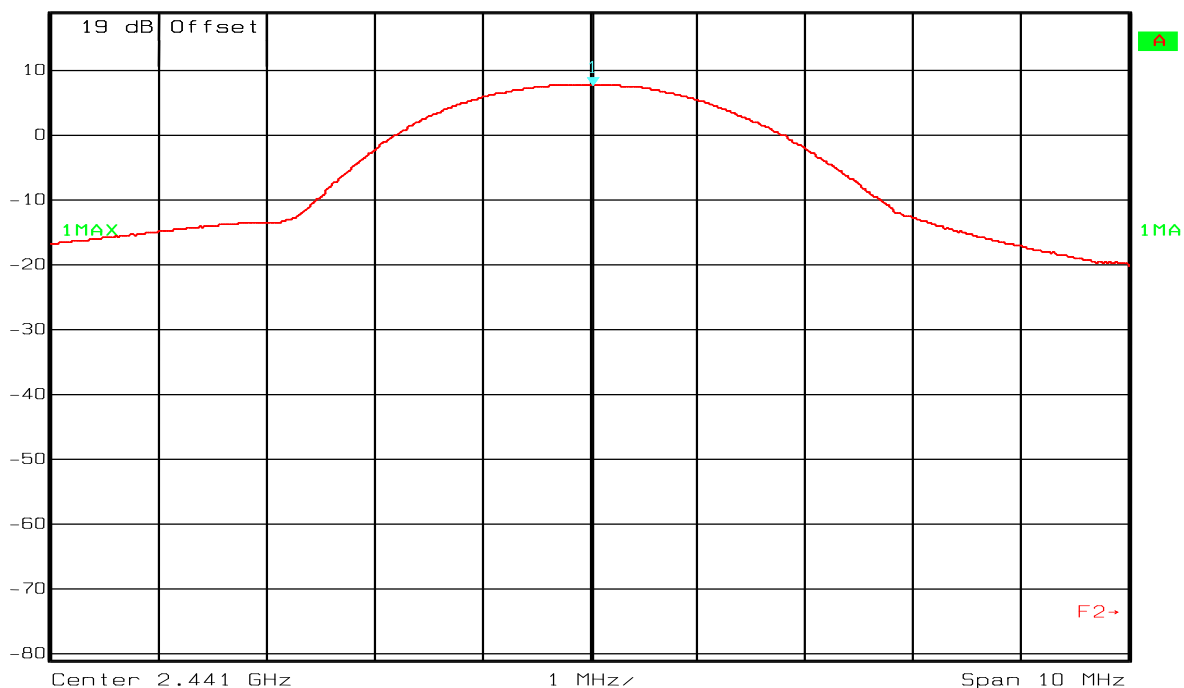
Marker 1 [T1]
102.14 dB μ V/m
2.40197996 GHz
 Ref Lvl 107 dB*
 RBW 3 MHz
 VBW 3 MHz
 SWT 5 ms
 RF Att 10 dB
 Unit dB μ V/m



Date: 10.AUG.2006 10:21:42

RF radiated channel 0

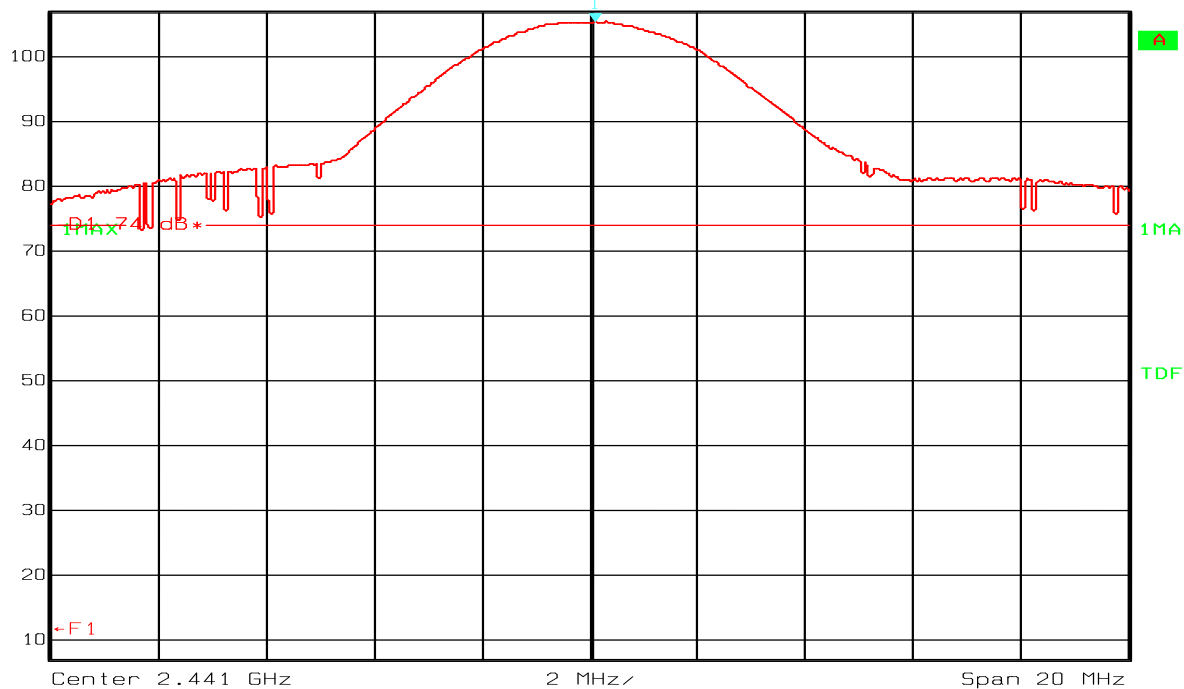
ES
Marker 1 [T1]
RBW 2 MHz
RF Att 10 dB
Ref Lvl 19 dBm
7.65 dBm
VBW 2 MHz
Unit dBm
19 dBm
2.44103006 GHz
SWT 5 ms



Date: 10.AUG.2006 15:34:09

RF conducted channel 39

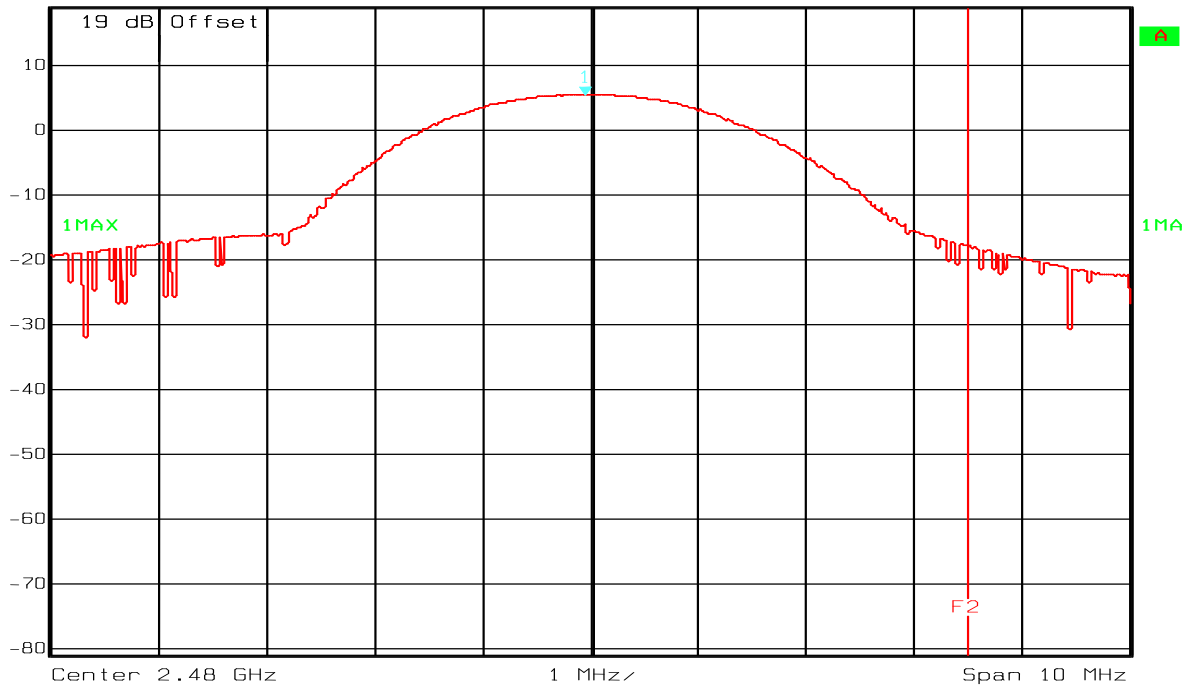
ES
Marker 1 [T1]
RBW 3 MHz
RF Att 10 dB
Ref Lvl 107 dB*
105.27 dB μ V/m
VBW 3 MHz
Unit dB μ V/m
107 dB*
2.44110020 GHz
SWT 5 ms



Date: 10.AUG.2006 11:01:52

RF radiated channel 39

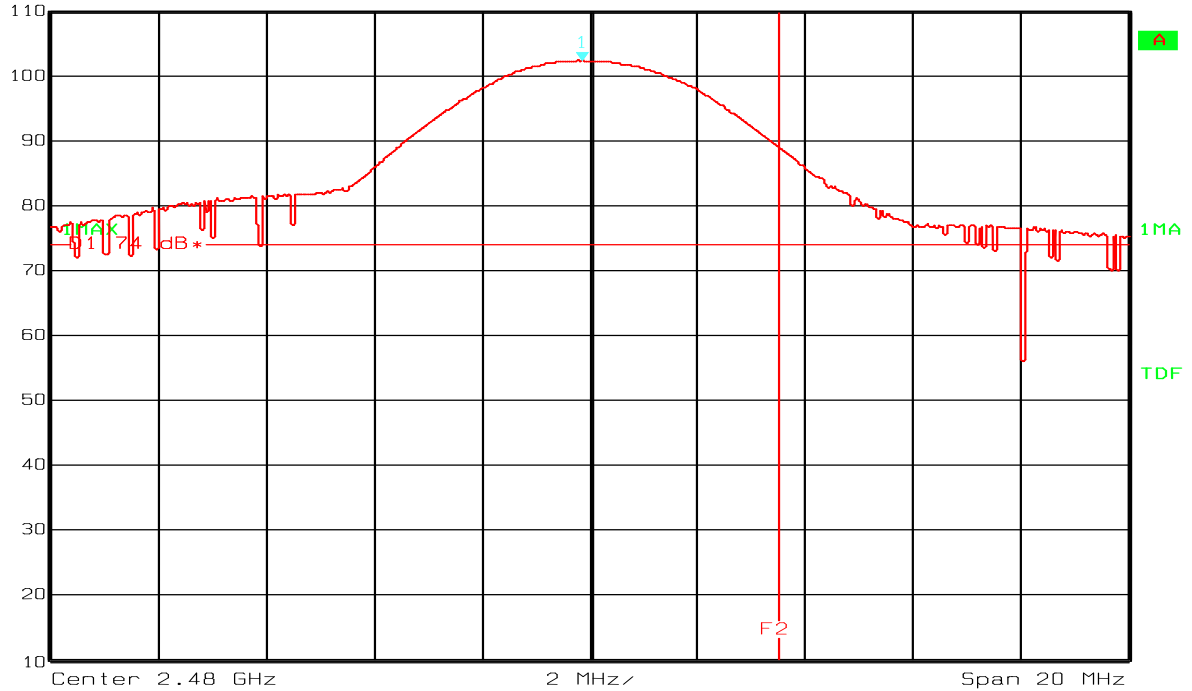
ES
Marker 1 [T1]
RBW 2 MHz
RF Att 10 dB
Ref Lvl 19 dBm
5.31 dBm
VBW 2 MHz
19 dBm
2.47994990 GHz
SWT 5 ms
Unit dBm



Date: 10.AUG.2006 15:34:56

RF conducted channel 78

ES
Marker 1 [T1]
RBW 3 MHz
RF Att 20 dB
Ref Lvl 110 dB*
102.26 dB μ V/m
VBW 3 MHz
110 dB*
2.47985972 GHz
SWT 5 ms
Unit dB μ V/m



Date: 10.AUG.2006 10:04:39

RF radiated channel 78

4.7 Spurious Emissions

Para. No.: 15.247 (c)

Test Performed By: Frode Sveinsen	Date of Test: 10 August 2006
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Test Results: Complies

Measurement Data:

Band-edge radiated power

Measured on channels 0 and 78

Frequency GHz	Power below nearest channel dB μ V/m		Limit dB μ V/m		Margin dB	
	Peak	Average	Peak	Average	Peak	Average
2.39	61.1	41.1	74	54	12.9	12.9
2.4835	70.3	50.3	74	54	3.7	3.7

The average value is calculated from the Peak value by using the Duty-Cycle correction factor.

See attached graph

RF conducted power to 25 GHz see attached graph.

Maximum RF level outside operating band:

RF ch 00: >60 dB/C, margin >40 dB

RF ch 39: >60 dB/C, margin >40 dB

RF ch 78: >60 dB/C, margin >40 dB

Radiated Emissions, 1-25 GHz

Detector: Peak

1 - 8.5 GHz: Measuring distance 3m

8.5-25 GHz: Measuring distance 1m

No spurious emissions except harmonics were detected in any of the restricted bands.

Transmitter active

Frequency	RF channel	Dist. corr. factor	Field strength, Peak, 3 meters	Duty cycle corr. factor	Limit	Margin
MHz	00 / 04	dB	dB μ V/m	dB	dB μ V/m	dB
4804	00	0	56.4	20	74	17.6
All others	00/39/78	0	≤ 54	20	74	>20

The values with average detector is 20 dB lower than in the above table, the margin of compliance is the same since the limit is also 20 dB lower.

See attached graphs.

Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer "Transducer factor".

The level in the plot from 12-18GHz is not corrected for distance conversion from 3 to 1m.

Duty Cycle Correction Factor Calculation:

See also Para 4.4 Occupancy Time.

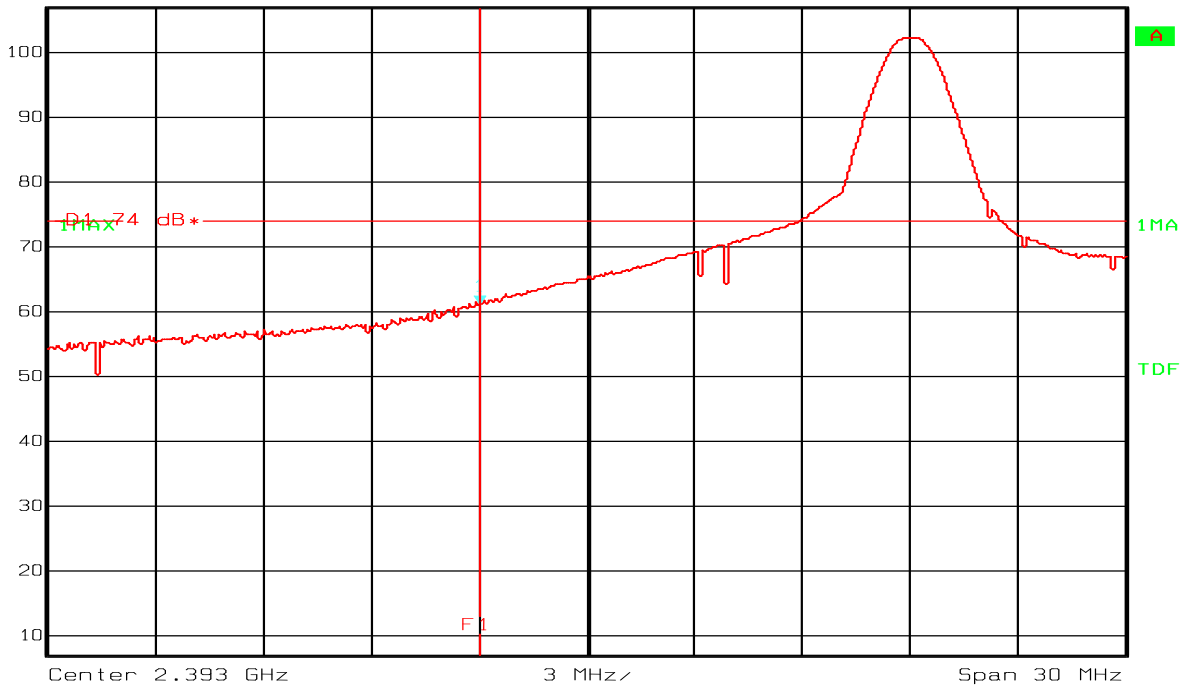
RF duty cycle: Calculation according to RF burst Para 15.35 (c)

$$20 \cdot \log(0.42 \text{ ms} / 98.75 \text{ ms}) = -47.4 \text{ dB}$$

Maximum Duty-Cycle Correction factor according to Para 15.35 (b): **-20 dB**

This value is used for calculating the field strength above 1 GHz with Peak Detector function employed on spectrum analyzer.

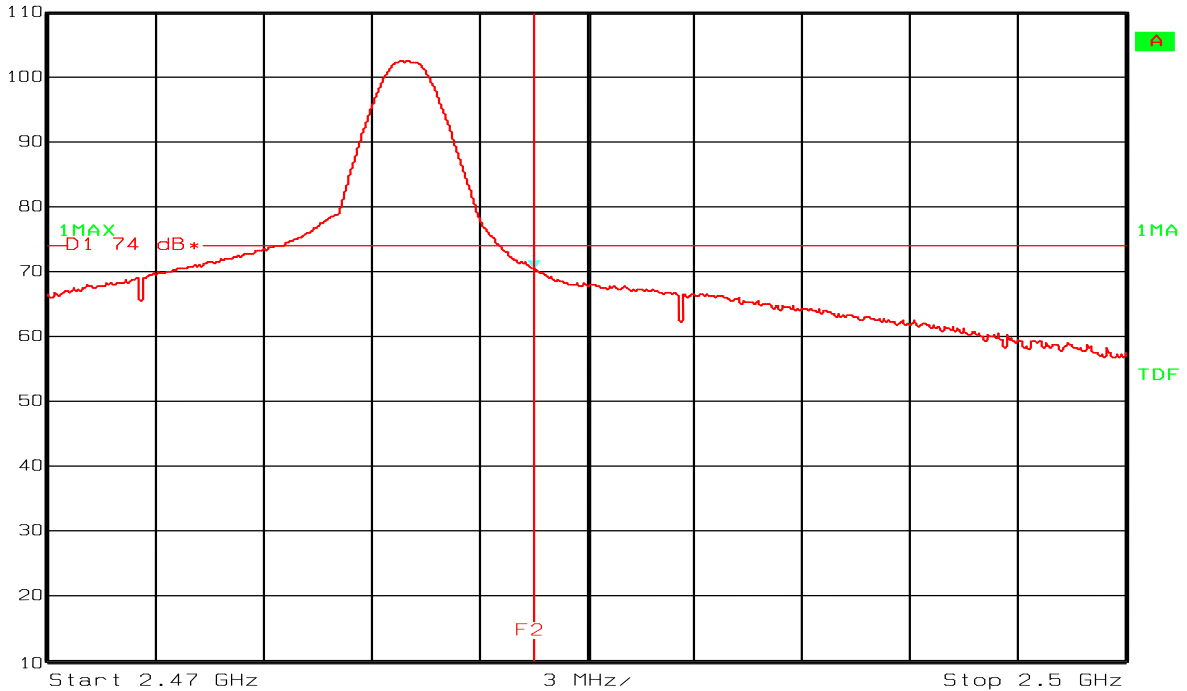

Marker 1 [T1] RBW 1 MHz RF Att 10 dB
 Ref Lvl 107 dB* 61.06 dB μ V/m VBW 1 MHz
2.39002405 GHz SWT 5 ms Unit dB μ V/m



Date: 10.AUG.2006 10:20:37

Band-edge radiated power ch 0, lower end.

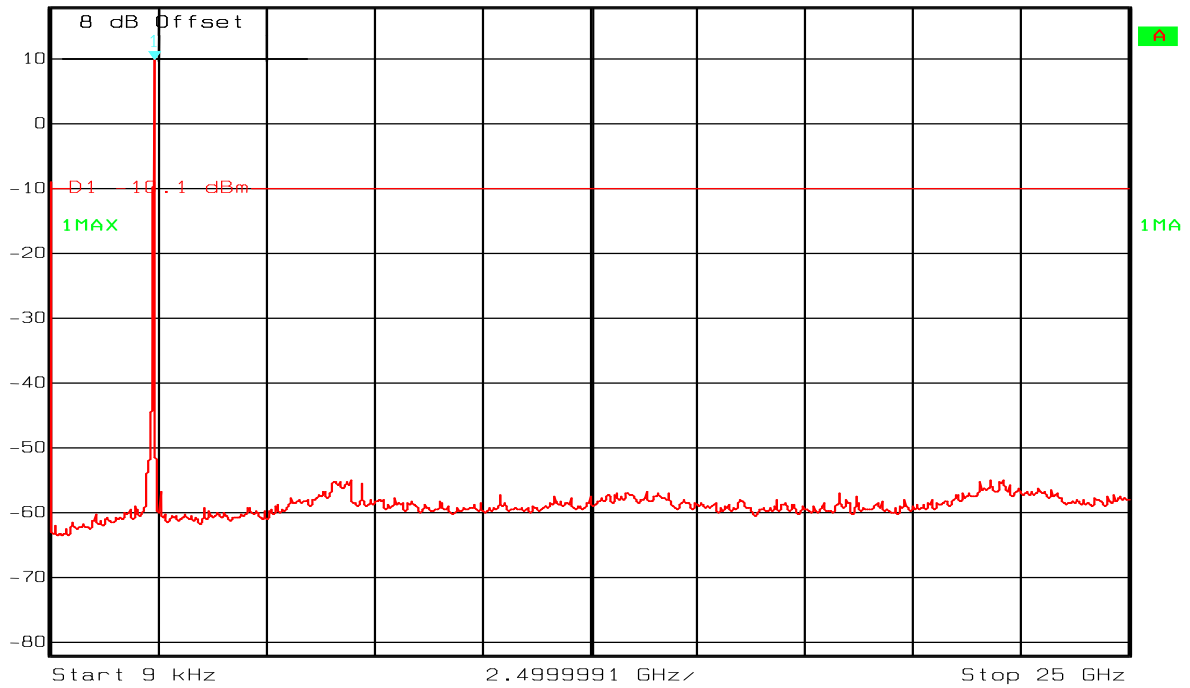

Marker 1 [T1] RBW 1 MHz RF Att 20 dB
 Ref Lvl 110 dB* 70.27 dB μ V/m VBW 1 MHz
2.48352705 GHz SWT 5 ms Unit dB μ V/m



Date: 10.AUG.2006 9:58:34

Band-edge radiated power ch 78, upper end.

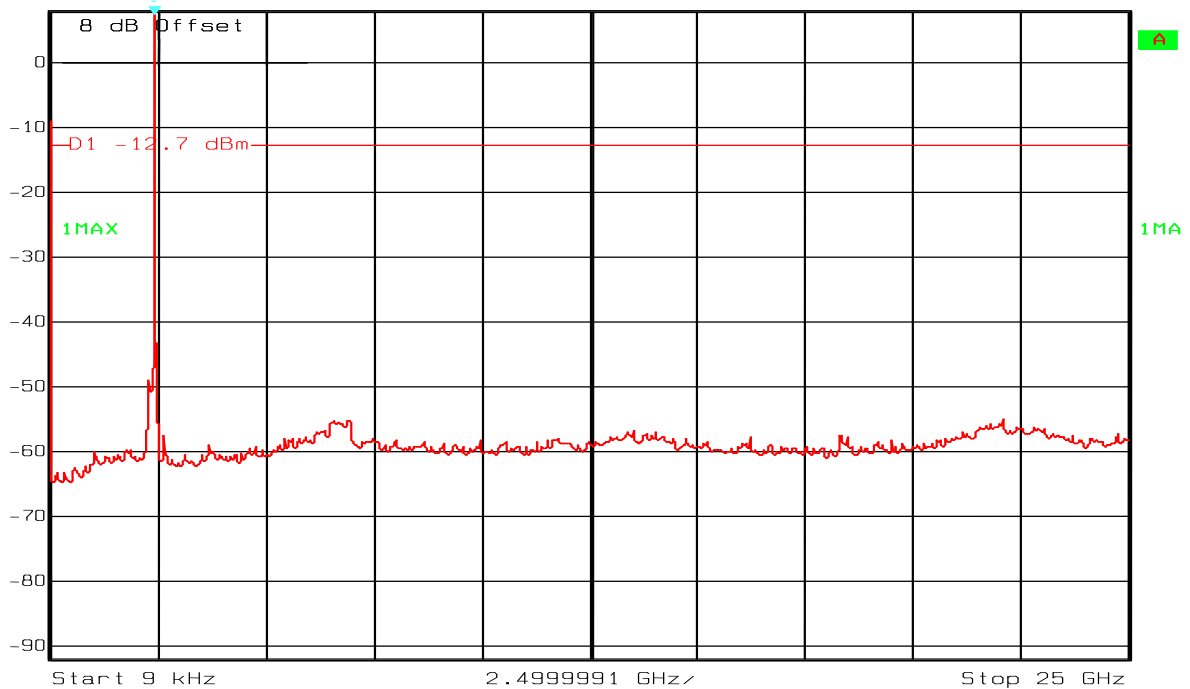
ES
Marker 1 [T1]
RBW 100 kHz RF Att 20 dB
Ref Lvl 18 dBm 9.83 dBm
18 dBm 2.40481775 GHz
VBW 100 kHz
SWT 6.4 s Unit dBm



Date: 10.AUG.2006 16:07:01

Conducted Emissions ch 00

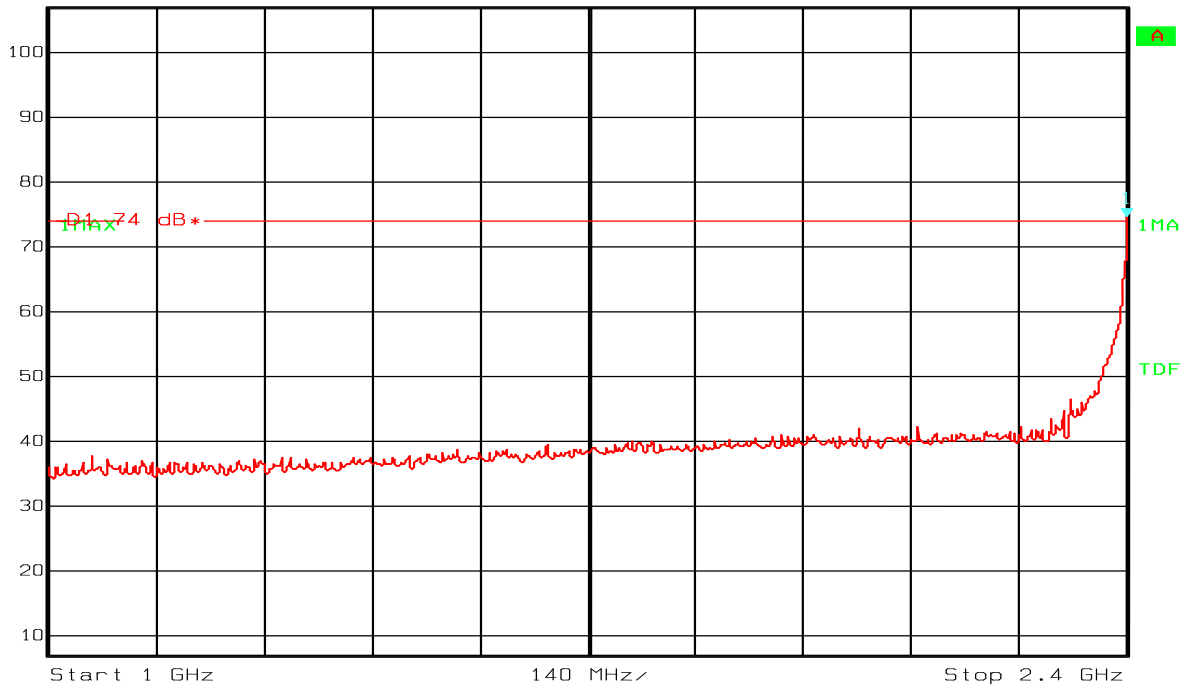
ES
Marker 1 [T1]
RBW 100 kHz RF Att 20 dB
Ref Lvl 8 dBm 7.28 dBm
8 dBm 2.40481775 GHz
VBW 100 kHz
SWT 6.4 s Unit dBm



Date: 10.AUG.2006 16:04:48

Conducted Emissions ch 39

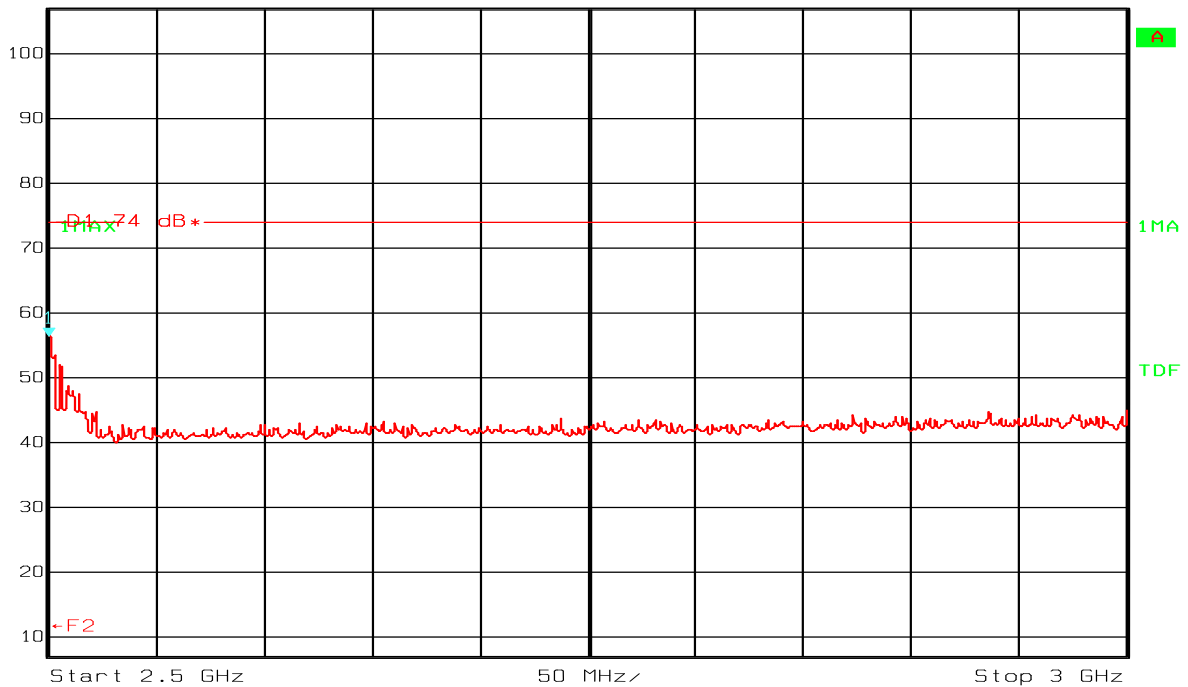
KS
Marker 1 [T1]
RBW 1 MHz RF Att 10 dB
74.65 dB μ V/m
VBW 1 MHz
2.40000000 GHz
SWT 5 ms Unit dB μ V/m
Ref Lvl 107 dB*



Date: 10.AUG.2006 10:17:07

Spurious Emissions 1.0 – 2.4 GHz, ch 00

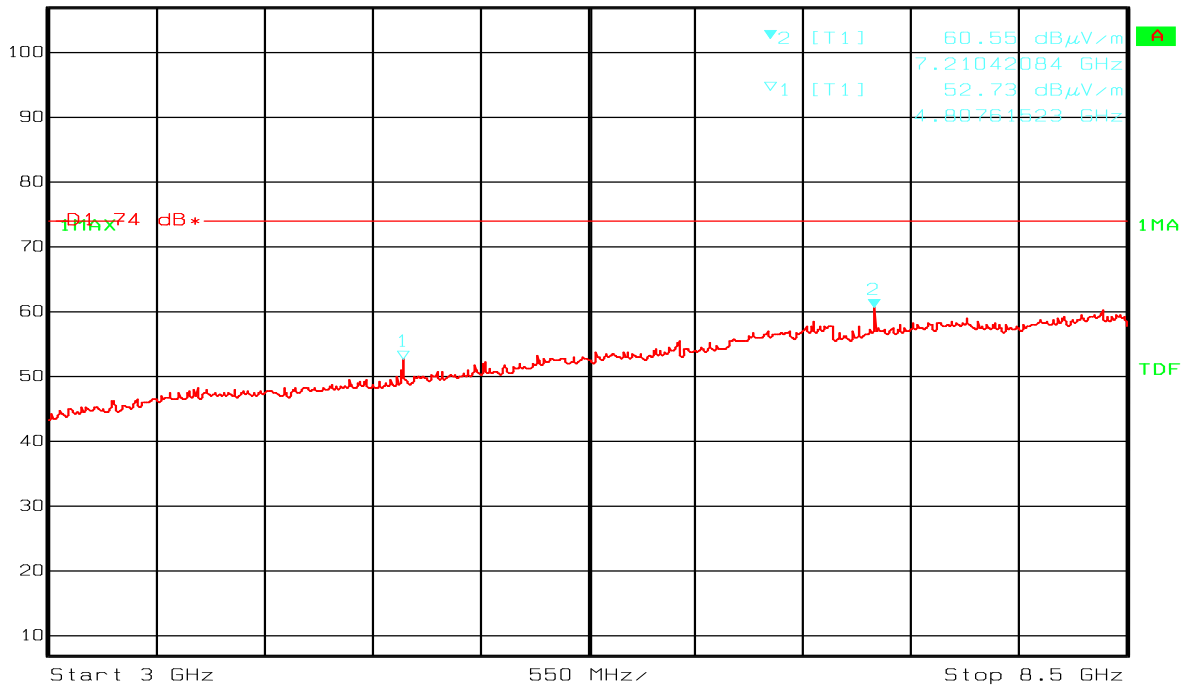
KS
Marker 1 [T1]
RBW 1 MHz RF Att 10 dB
56.48 dB μ V/m
VBW 1 MHz
2.50000000 GHz
SWT 5 ms Unit dB μ V/m
Ref Lvl 107 dB*



Date: 10.AUG.2006 10:08:03

Spurious Emissions 2.5 – 3.0 GHz, ch 00

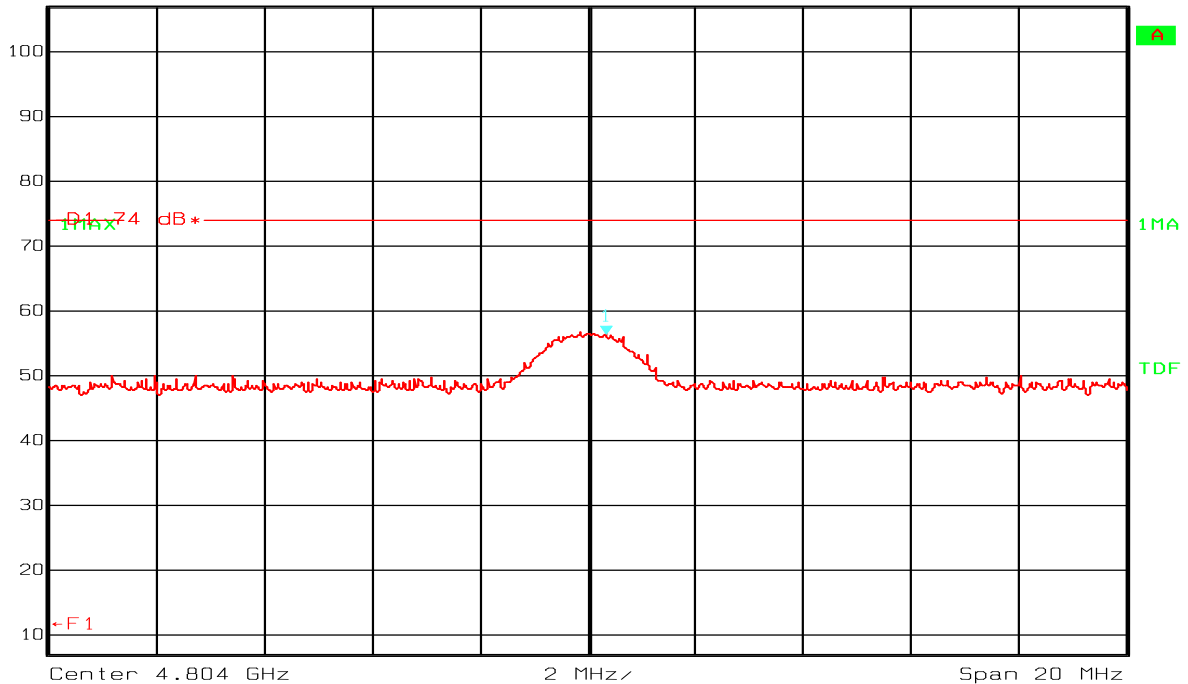
ES
Ref Lvl 107 dB*
 Marker 2 [T1]
RBW 1 MHz
 RF Att 10 dB
 VBW 1 MHz
 Unit dB μ V/m



Date: 10.AUG.2006 10:15:02

Spurious Emissions 3.0 – 8.5 GHz, ch 00

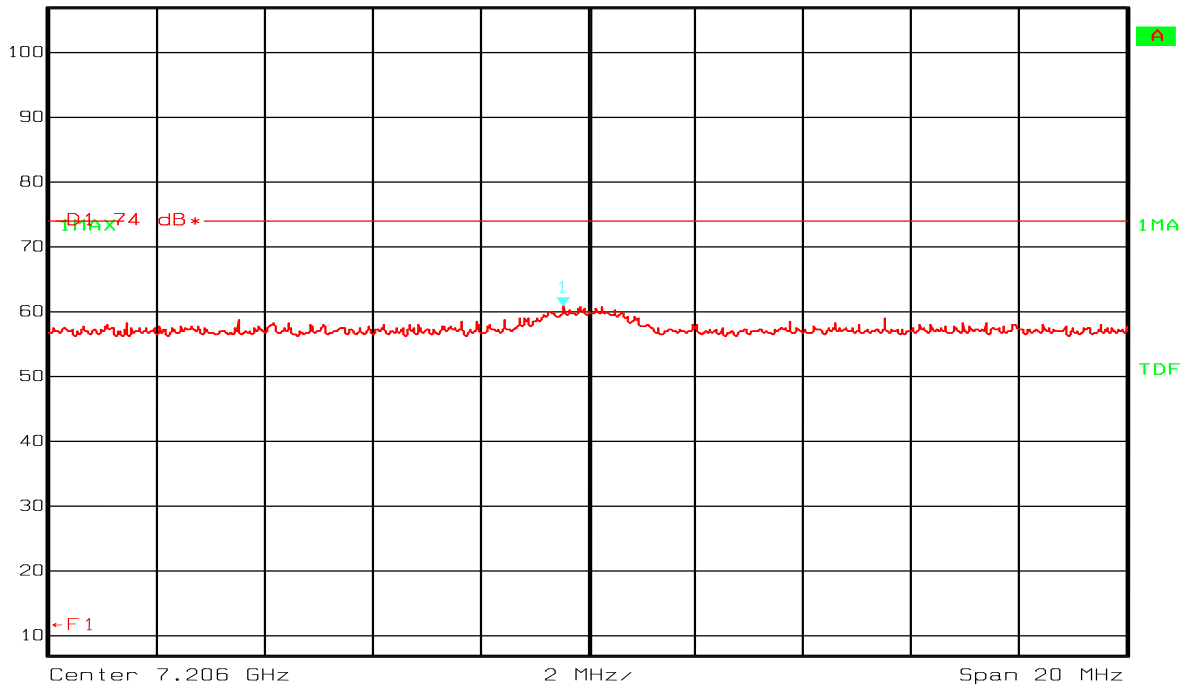
ES
Ref Lvl 107 dB*
 Marker 1 [T1]
RBW 1 MHz
 RF Att 10 dB
 VBW 1 MHz
 Unit dB μ V/m



Date: 10.AUG.2006 10:52:58

Spurious Emissions Second Harmonic, ch 00

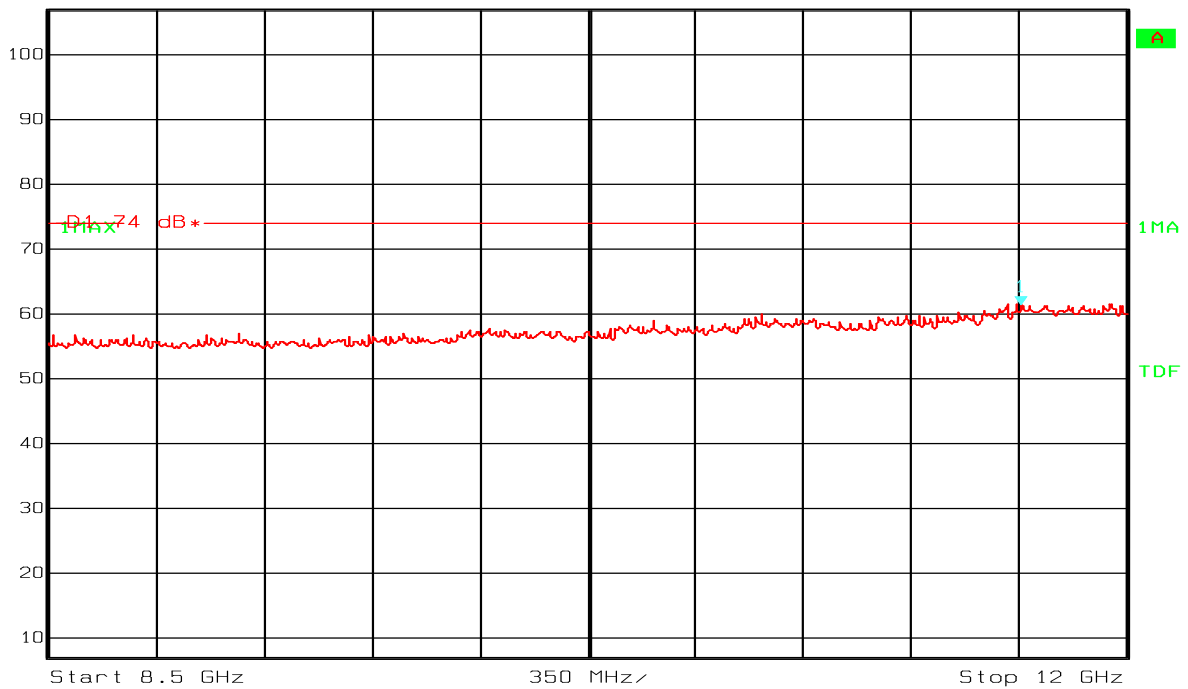

Ref Lvl 107 dB* **Marker 1 [T1]** 60.89 dB μ V/m RBW 1 MHz RF Att 10 dB
 107 dB* 7.20553908 GHz VBW 1 MHz Unit dB μ V/m
 SWT 5 ms



Date: 10.AUG.2006 10:58:10

Spurious Emissions Third Harmonic, ch 00

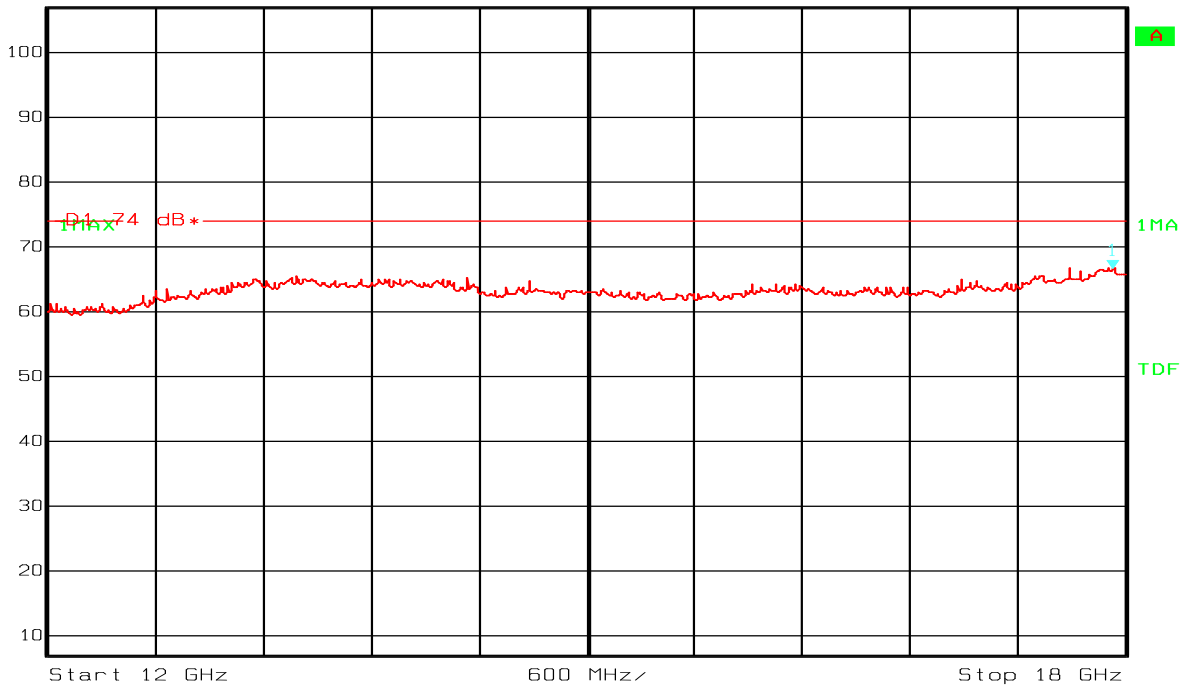

Ref Lvl 107 dB* **Marker 1 [T1]** 61.43 dB μ V/m RBW 1 MHz RF Att 10 dB
 107 dB* 11.65631263 GHz VBW 1 MHz Unit dB μ V/m
 SWT 20 ms



Date: 10.AUG.2006 11:26:10

Spurious Emissions 8.5 - 12.0 GHz, ch 39

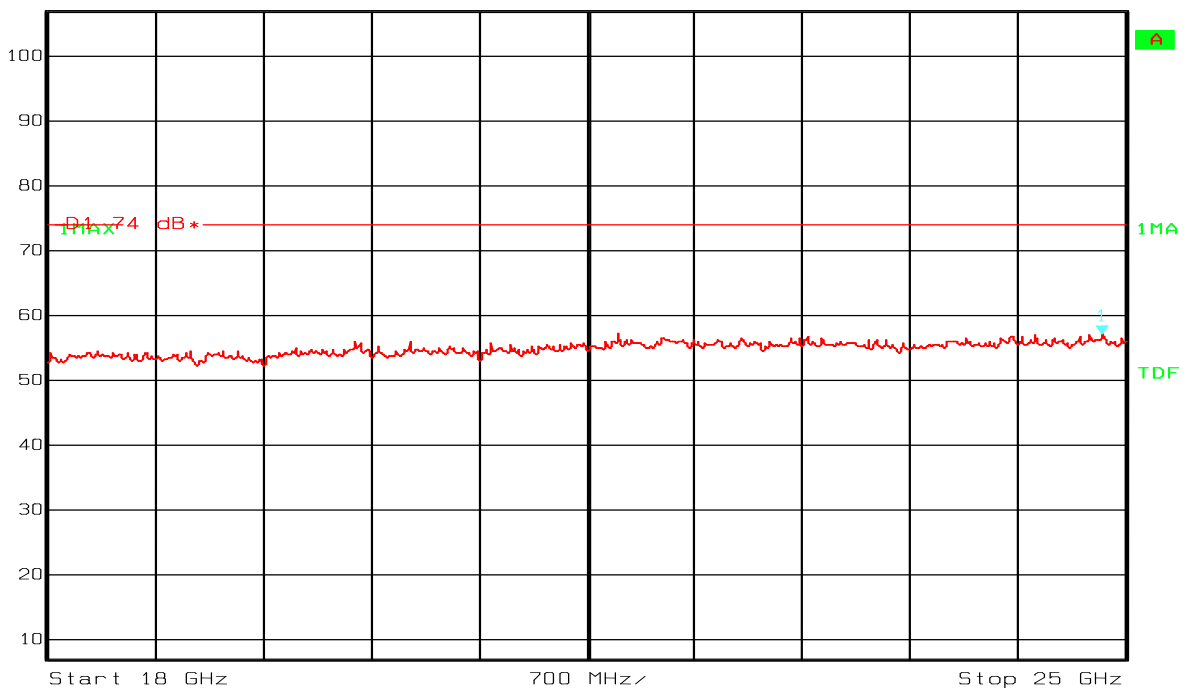
	Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
	107 dB*	66.61 dB μ V/m	VBW	1 MHz		
		17.92785571 GHz	SWT	34 ms	Unit	dB μ V/m



Date: 10.AUG.2006 11:37:19

Spurious Emissions 12 – 18 GHz, ch 39
@1m, NOT corrected for distance

	Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
	107 dB*	57.22 dB μ V/m	VBW	1 MHz		
		24.84569138 GHz	SWT	40 ms	Unit	dB μ V/m



Date: 10.AUG.2006 12:05:04

Spurious Emissions 18 – 25 GHz, ch 00

Radiated emission 30 – 1000 MHz.

Detector: Quasi-Peak

Measuring distance 10 m according to CISPR 22.

Tested in speech mode with active connection.

Frequency	Operational condition	Field strength	Measuring distance	Limit FCC15.209	Margin
MHz		dB μ V/m	metres	dB μ V/m	dB
51.1	TX on	27	3	40	13
60.95	TX on	29	3	40	11
398.1	TX on	30	3	46	16
449.25	TX on	20	3	46	26
497.65	TX on	33	3	46	13
547.4	TX on	28	3	46	18

See attached graphs.

Radiated emission 10 kHz-30 MHz.

Measuring distance 10 m, measured with Peak detector.

No component detected, see attached graph.

Limit is converted to 10 m using 40 dB/decade according to 15.31 (f) (2).

Nemko Comlab
Peak

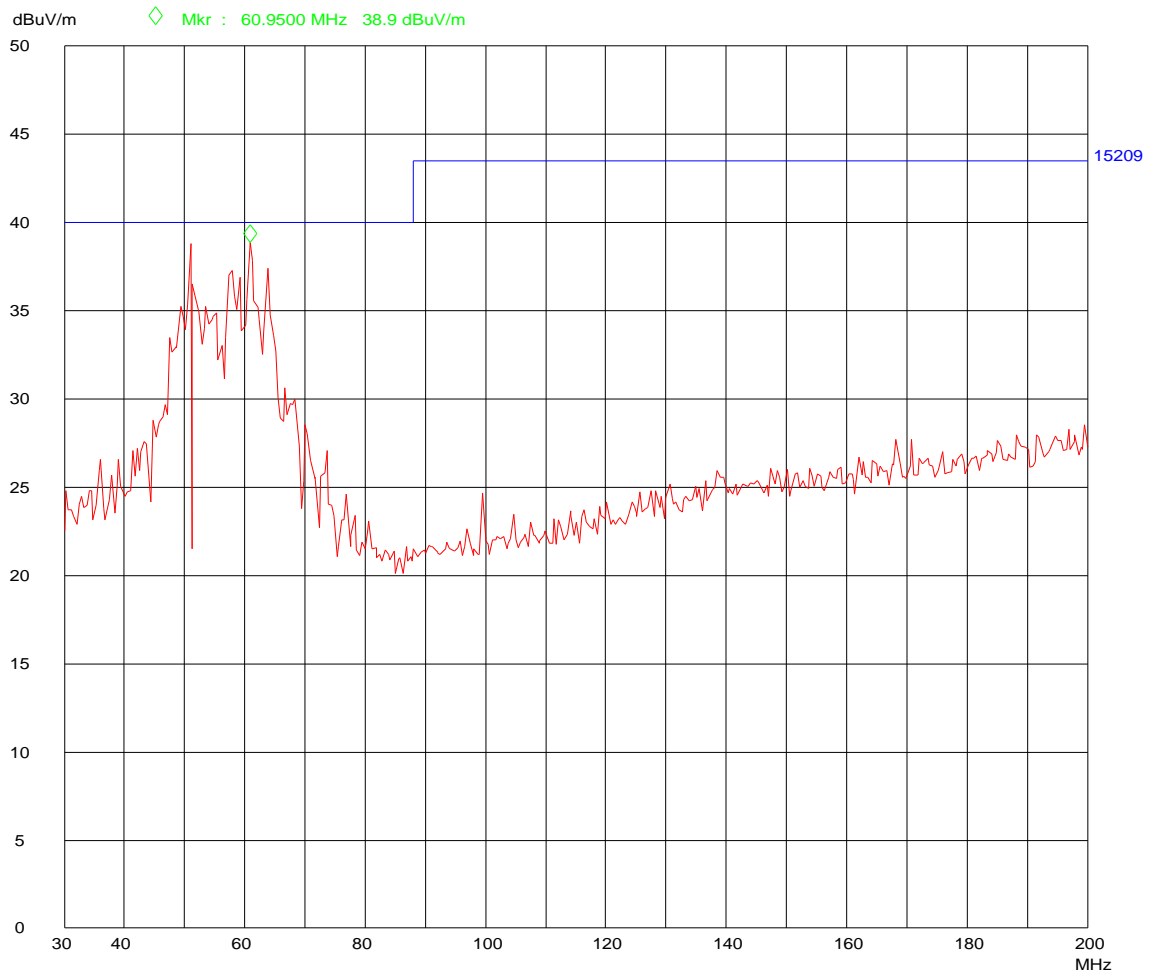
09. Aug 06 13:32

EUT: Worldpro 1000
 Manuf: Nera Satcom
 Op Cond: Distance 3m, 1m VP
 Operator: FS
 Test Spec: FCC 15.209

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	200M	50k	120k	PK	50ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
20	30M	200M	HK116



30-200 MHz vertical polarization, measuring distance 3 m

Nemko Comlab
Peak

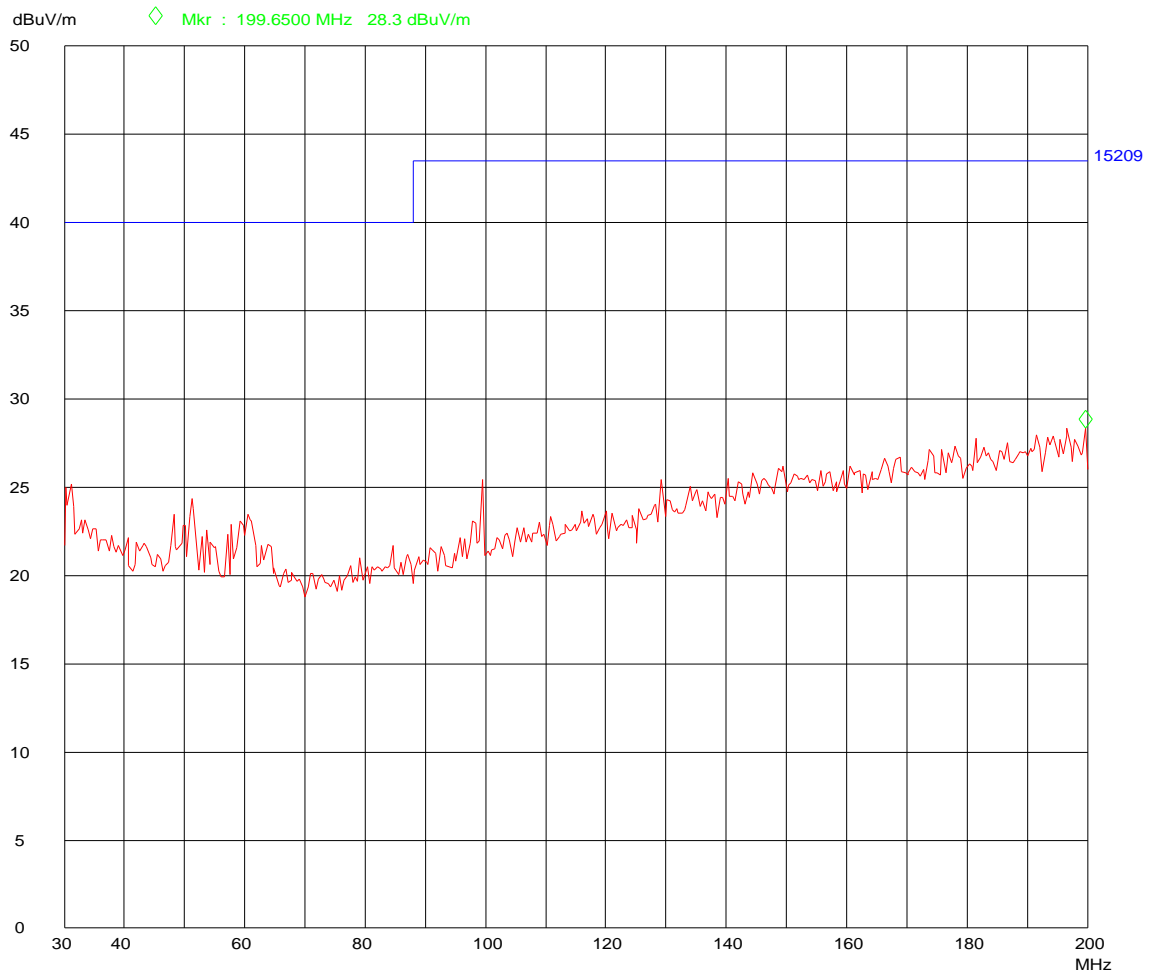
09. Aug 06 13:41

EUT: Worldpro 1000
 Manuf: Nera Satcom
 Op Cond: Distance 3m, 2m HP
 Operator: FS
 Test Spec: FCC 15.209

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30M	200M	50k	120k	PK	50ms	AUTO	LN ON	60dB

Transducer No.	Start	Stop	Name
20	30M	200M	HK116



30-200 MHz horizontal polarization, measuring distance 3 m

Nemko Comlab
Peak

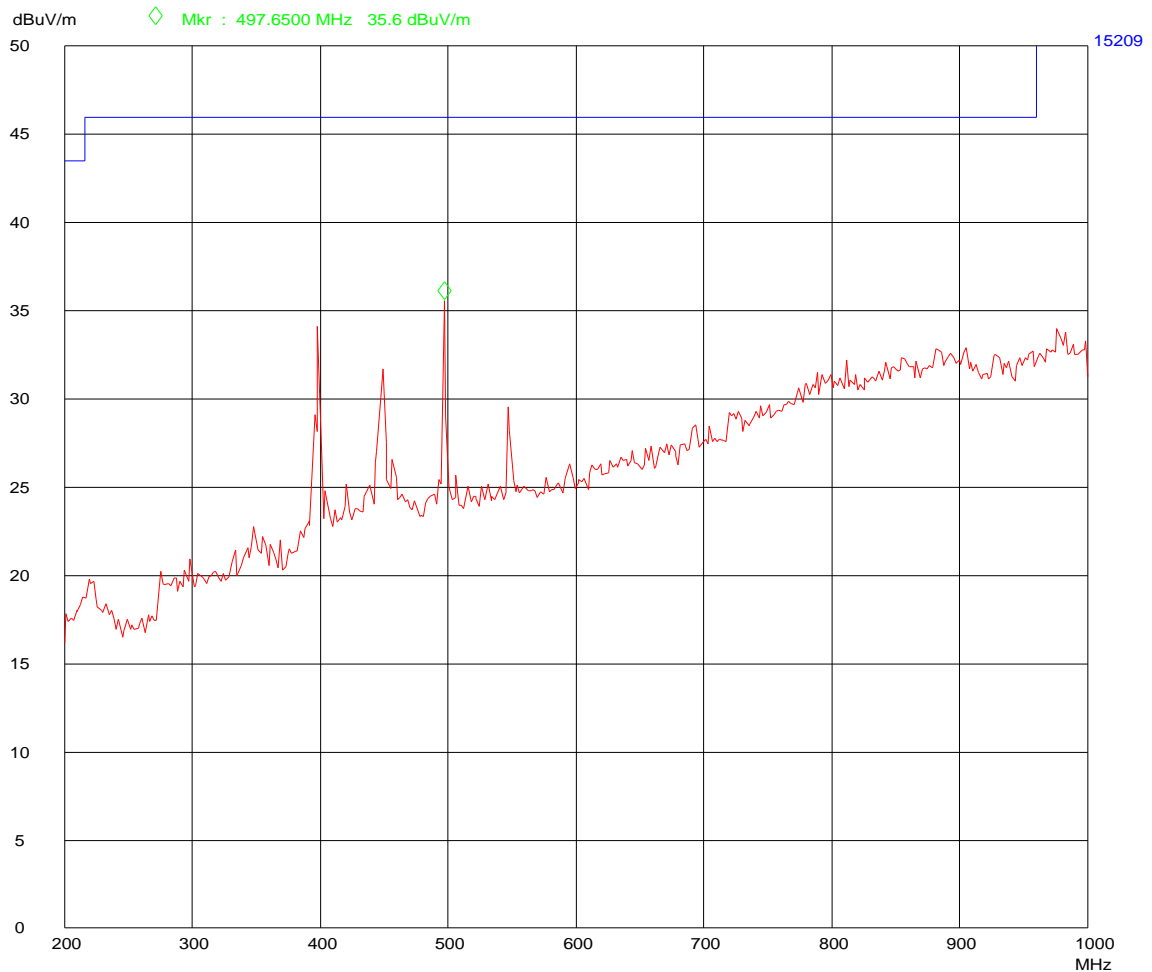
09. Aug 06 15:07

EUT: Worldpro 1000
 Manuf: Nera Satcom
 Op Cond: Distance 3m, H=1m VP
 Operator: FS
 Test Spec: FCC 15.209

Scan Settings (1 Range)

Frequencies				Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp OpRge
200M	1000M	50k	120k	PK	50ms	AUTO LN	ON 60dB

Transducer No.	Start	Stop	Name
21	200M	1000M	HL223



200-1000 MHz vertical polarization, measuring distance 3 m

Nemko Comlab
Peak

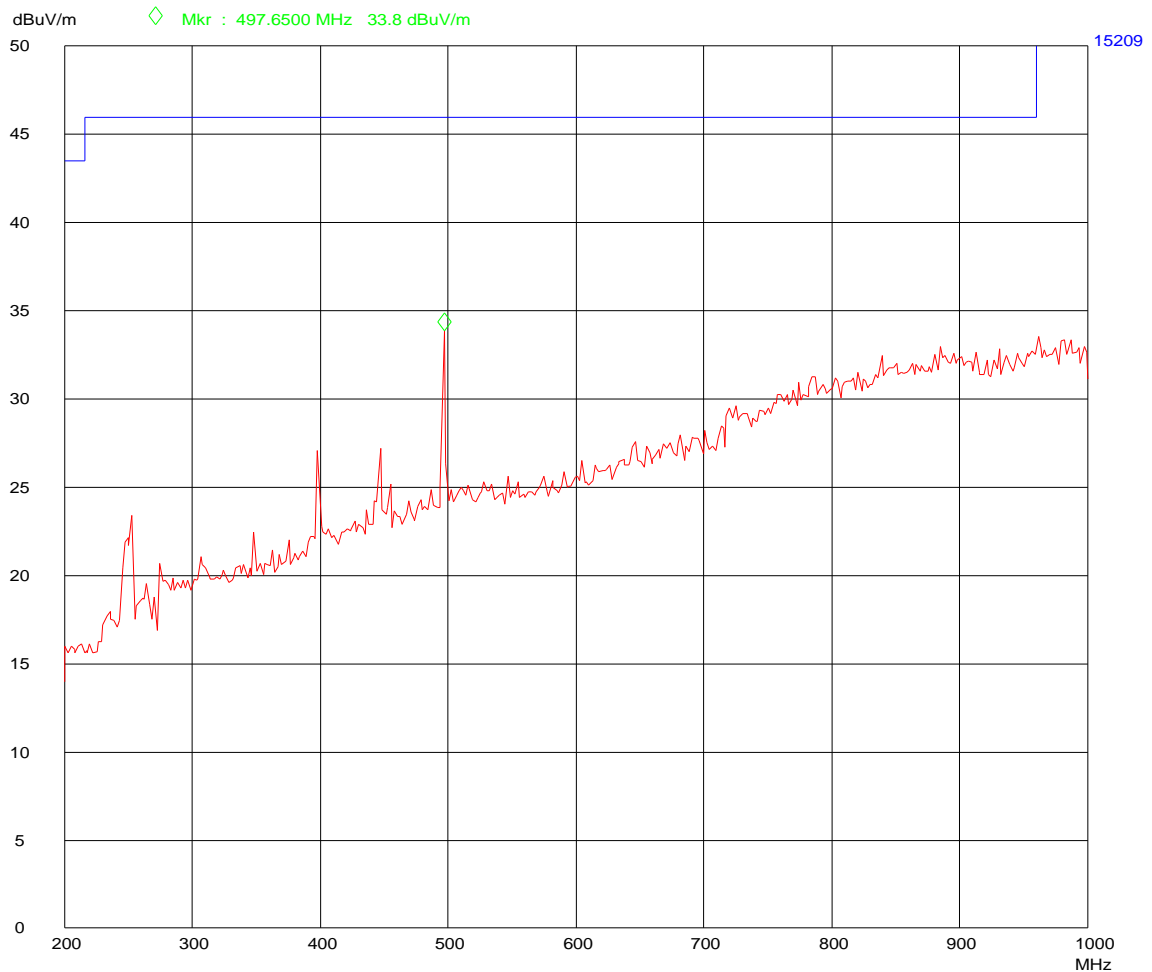
09. Aug 06 14:48

EUT: Worldpro 1000
 Manuf: Nera Satcom
 Op Cond: Distance 3m, H=2m HP
 Operator: FS
 Test Spec: FCC 15.209

Scan Settings (1 Range)

Frequencies				Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp OpRge
200M	1000M	50k	120k	PK	50ms	AUTO LN	ON 60dB

Transducer No.	Start	Stop	Name
21	200M	1000M	HL223



200-1000 MHz horizontal polarization, measuring distance 3 m

NEMKO COMLAB

10. Aug 06 15:47

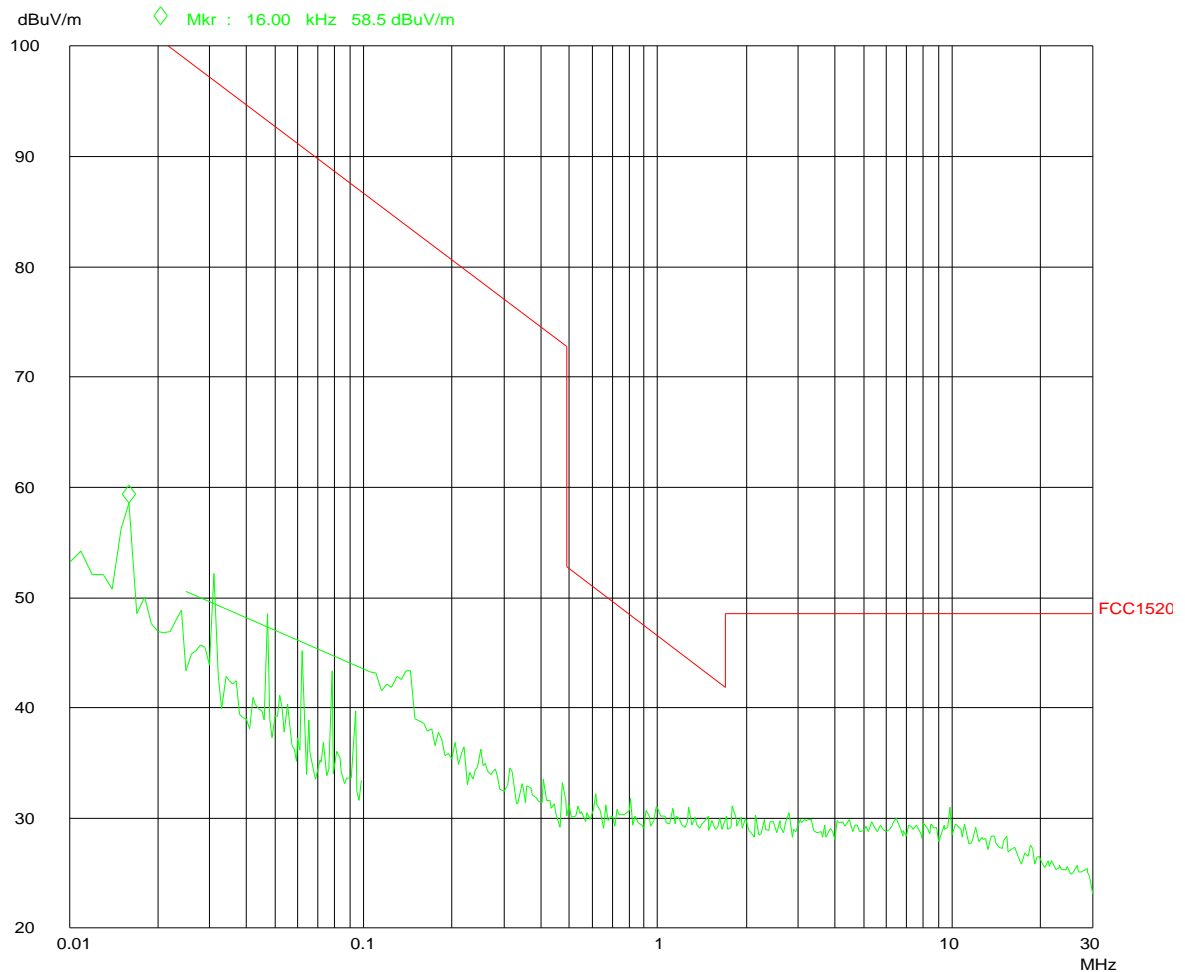
Peak

Operator: FS
 Comment: Nera Satcom
 WorldPro 1000
 FCC 15.209
 Loop Antenna, Distance: 10m

Scan Settings (4 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
10k	100k	1k	1k	PK	20ms	0dB	LN OFF	60dB
20k	20k	5k	9k	PK	20ms	AUTO	LN ON	60dB
20k	10M	5k	9k	PK	20ms	AUTO	LN OFF	60dB
10M	30M	5k	9k	PK	20ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
13	10k	30M	HFH2Z2



10 kHz - 30 MHz, measuring distance 10 m

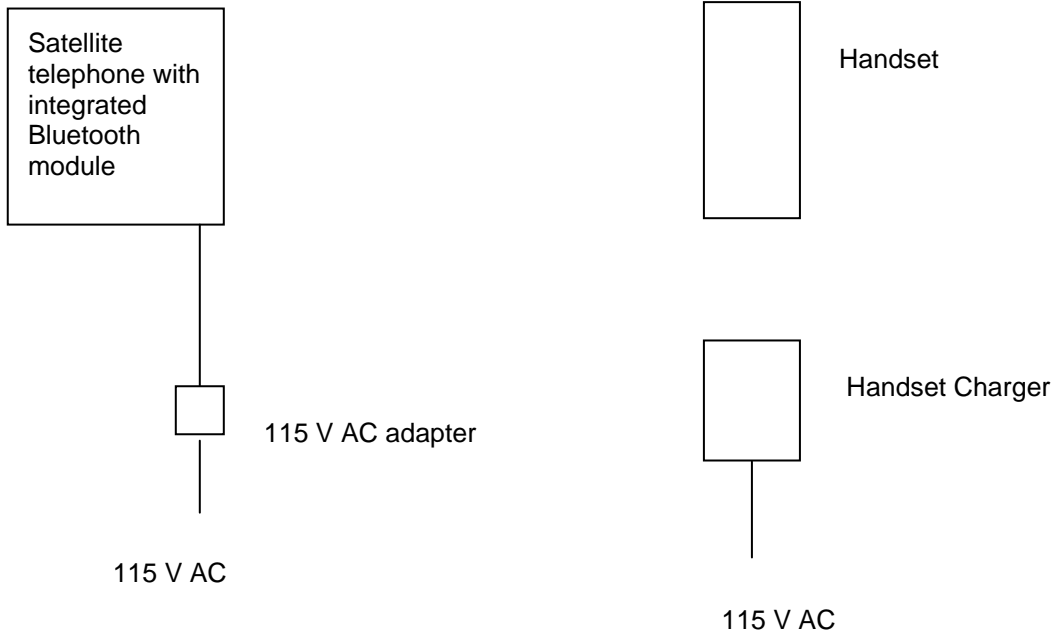
5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

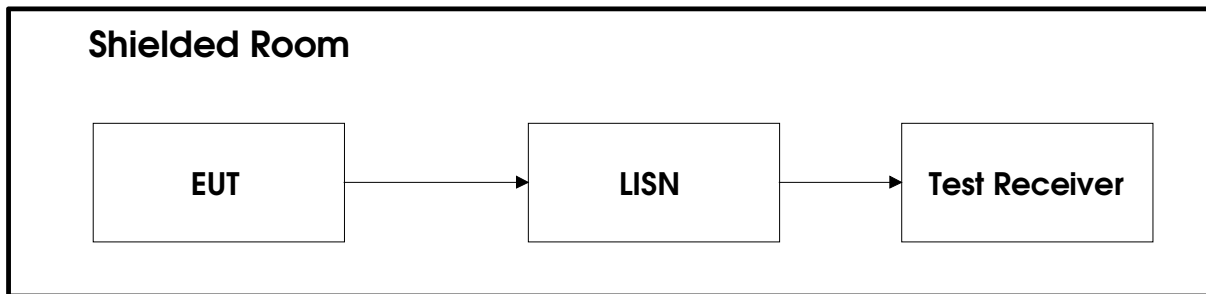
No.	Instrument/ancillary	Type of instrument/ancillary	Manufacturer	Ref. no.
1	FSEK	Spectrum Analyzer	Rohde & Schwarz	LR 1337
2	ESVS 30	Test Receiver	Rohde & Schwarz	LR 1101
3	3115	Antenna horn	EMCO	LR 1330
4	643	Antenna horn	Narda	LR 093
5	642	Antenna horn	Narda	LR 220
6	PM7320X	Antenna horn	Siverts lab	LR 103
7	DBF-520-20	Antenna horn	Systron Donner	LR 101
8	638	Antenna horn	Narda	LR 098
9	ESH3-Z3	LISN	Rohde & Schwarz	LR 1076
10	80S	Signal Generator	Powertron	LT 502
11	8449B	Amplifier	Hewlett Packard	LR 1322
12	4HC3000/18000-1-KK	High Pass filter	Trilithic	sn. 9849045
13	HFH2-Z2	Antenna loop	Rohde and Schwarz	LR 285
14	HL223 Log Period	Antenna	Rohde & Schwarz	LR 1261
15	HK116 Biconical	Antenna	Rohde & Schwarz	LR 1260
16	ESN	Test Receiver	Rohde & Schwarz	LR1237
17	NRVD	Power meter	Rohde & Schwarz	LR 1347
18	NRV-Z5	RF Probe	Rohde & Schwarz	LR 1371
19	HM34	Temp/Humidity meter	Vaisala	LR 1270

6 BLOCK DIAGRAM

6.1 System set up



6.2 Power Line Conducted Emission



6.3 Test Site Radiated Emission

