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Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: 3463A-1 (IC)
TCB ID: DE 0001



Accredited by the
German Accreditation Council
DAR-Registration Number
DAT-P-176/94-D1



Independent ETSI
compliance test house



Accredited Bluetooth® Test Facility (BQTF)

Test report no.	: 4-2479-01-04/07
Applicant	: Philips Consumer Electronics
Type	: TSU9400 + DS9400
Test Standard	: FCC Part 15.247 RSS210 Issue 6 and ICES-003
FCC ID	: PT5TSU9400
Certification No. IC	: 135P-TSU9400

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ANNEX 1: TECHNICAL PRODUCT DESCRIPTION

1. Administrative data

1.1. Administrative data of the test facility

1.1.1 Identification of the testing laboratory

Company name:	Cetecom ICT Services GmbH
Address:	Untertürkheimerstr. 6-10 D-66117 Saarbruecken Germany
Laboratory accreditation:	DAR-Registration No. DAT-P-176/94-D1 Bluetooth Qualification Test Facility (BQTF)
Responsible for testing laboratory:	Michael Berg Phone: +49 681 598 0 Fax: +49 681 598 9075 email: info@ict.cetecom.de



.....
Responsible for testing
(Harro Ames)

1.1.2 Organizational items

Reference No.:	4-2479-01-04/07
Order No.:	
Receipt of EUT:	2007-05-24
Date(s) of test:	2007-05-24 to 2007-05-25
Date of report:	2007-05-25
Number of report pages:	87
Number of diagram pages (annex):	

Version of template:	1.2



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Responsible for laboratory
(Michael Berg)

Note:

The test results of this test report relate exclusively to the item tested as specified in this report. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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During the test no hardware and software changes are allowed to be performed at the EUT.

1.1.3 Applicant's details

Applicant's name:	Philips Consumer Electronics
Address:	Interleuvenlaan 74 - 76 3001 Leuven Belgium
Contact person:	M. Gert Heysse Phone: +32 16 394 554 Fax: +32 16 394 900 email: gert.heyse@philips.com

1.2 Administrative data of manufacturer / member

Manufacturer's name:	- applicant -
Address:	

1.3 Description of the Equipment under test (EUT)

1.3.1 EUT: Type, S/N etc.

Product Name:	TSU9400 + DS9400
Product ID:	
Product Description:	Remote control with WLAN
S/N serial number:	-
HW Hardware Status:	-
SW Software Status:	-
Frequency Range [MHz]:	2412 – 2462 MHz
Type of Modulation:	DSSS, OFDM
Number of Channels:	11
Antenna:	1 internal antenna (Rangestar)
Power Supply:	3.7 DC via battery
Temperature Range:	+5° C to +45° C

Max. power radiated: 17.3 dBm

Max. power conducted: 20.8 dBm

FCC ID: PT5TSU9400

IC: 135P-TSU9400

1.3.2 If RF component testing only, description of additional used HW/SW

	Product name	Product ID	Description	S/N serial number	HW hardware status	SW software status
1						
2						
3						
4						

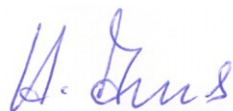
1.3.3 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	135P-TSU9400
Model Number:	TSU9400 + DS9400
Manufacturer:	Philips Consumer Electronics Interleuvenlaan 74 – 76 3001 Leuven Belgium
Tested to Radio Standards Specification (RSS) No.:	RSS-210 Issue 6, RSS-Gen and ICES-003
Open Area Test Site Industry Canada Number:	3463A-1
Frequency Range (or fixed frequency) [MHz]:	2412 – 2462 MHz
RF: Power [W] (max):	Rad. EIRP: 17.3dBm , 53.7 mW Conducted : 20.8 dBm, 120.2 mW
Antenna Type:	1 internal antenna (Rangestar)
Field Strength [dBµV/m in 3m]:	114.5 dBµV/m@3m
Occupied Bandwidth (99% BW) [kHz]:	16586kHz
Type of Modulation:	DSSS, OFDM
Emission Designator (TRC-43):	10M7G1D (DSSS), 16M6G7D (OFDM)
Transmitter Spurious (worst case) [µV/m in 3m]:	33.7dBµV/m@3m at 4874 MHz
Receiver Spurious (worst case) [µV/m in 3m]:	No peaks found above noise floor

ATTESTATION:

DECLARATION OF COMPLIANCE: I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Signature:



Date: 2007-05-25

Test engineer: Harro Ames

1.3.4 EUT operating modes

EUT operating mode no.*)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 3		low temperature, high power source conditions
Op. 4		high temperature, low power source conditions
Op. 5		high temperature, high power source conditions

*) EUT operating mode no. is used to simplify the test report.

1.3.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature / humidity	T _{nom}	°C / %	+23° / 38%
Low Temperature	T _{low}	°C	+5°
High Temperature	T _{high}	°C	+45°
Nominal Power Source	V _{nom}	V	3.7
Low Power Source	V _{low}	V	3.5
High Power Source	V _{high}	V	4.2

Type of powersource: V DC

Voltage variation was performed by variation of the voltage using an external power supply instead of the battery.

During extreme voltage tests there were no change of behavior on the sample.
Output power, power density and bandwidth did not change.

2 Teststandard & summary list of all performed test cases

TC identifier	Description
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210, RSS-Gen and ICES-003 Requirements for unintentional radiators are falling under FCC15 Subpart B, Requirements for intentional radiators are falling under FCC15 Subpart C

Test Specification Clause	Test Case	Canada test clause	Pass	Fail
None	Antenna Gain	None	Yes	
§15.247 (e)	Peak power spectral density	RSS-210 [A8.2.2]	Yes	
§15.247(a)(2)	Spectrum Bandwidth of a DSSS / OFDM System / 6dB BW	RSS-210 [A8.2.1]	Yes	
§ 15.247 (b)(3)	Maximum output power (conducted)	RSS-210 [A8.4.4]	Yes	
§ 15.247 (b)(3)	Max. peak output power (radiated)	RSS-210 [A8.4.5]	Yes	
§15.247 (d)	Band-edge compliance of conducted emissions	RSS-210 [A8.5]	Yes	
§15.205	Band-edge compliance of radiated emissions	RSS-210 [A8.5] Table 3 limits	Yes	
§15.247 (d)	Spurious Emission - conducted (Transmitter)	RSS-210 [A8.5]	Yes	
§ 15.209	Spurious Emission -radiated (Transmitter)	RSS-210 [A8.5]	Yes	
§ 15.109	Spurious Emissions-radiated (Receiver)	RSS-Gen ICES-003	Yes	
§ 15.209	Spurious Emissions-radiated <30 MHz	RSS-Gen ICES-003	Yes	
§ 15.107/207	Conducted Emissions <30 MHz (Class-B devices)	RSS-Gen ICES-003	Yes	

Requirements for unintentional radiators are falling under FCC15 Subpart B,
Requirements for intentional radiators are falling under FCC15 Subpart C

3 RF measurement testing

3.1 Description of test set-up

3.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas conform with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test set-ups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4-2003 clause 4.2.

Antennas conform with ANSI C63.2-1996 item 15.

9 kHz - 150 MHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

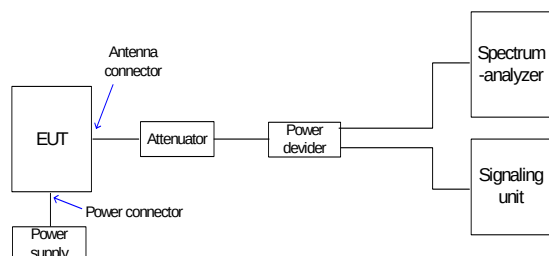
200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

>1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.209 and 15.207

3.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is connected to the spectrum analyzer. The specific losses for signal paths are first checked within a calibration. The measurement reading on the spectrum analyzer is corrected by the specific test set-up loss. The attenuator, power divider, signaling unit and the spectrum analyzer are impedance matched on 50 Ohm.



3.2 Referenced Documents

none

3.3 Additional comments

All settings and measurement procedures are according “Measurement of Digital Transmission Systems operating under Section 15.247, March 23,2005.

3.4 Antenna gain

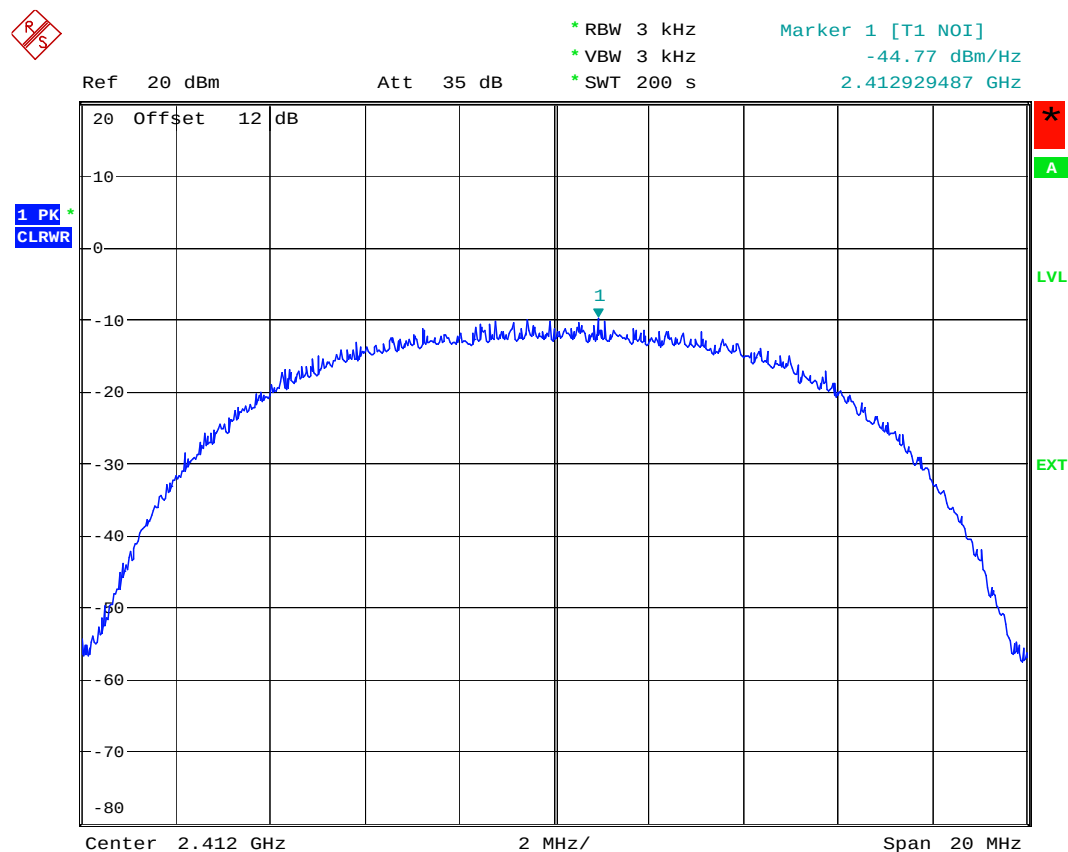
The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

	low channel	mid channel	high channel
Conducted power [dBm]	20.8	19.8	19.5
Radiated power [dBm]	17.3	16.5	14.9
Gain [dBi]	-3.5	-3.3	-4.6

3.5 Peak Power Spectral density (digitally modulated systems) §15.247(e)

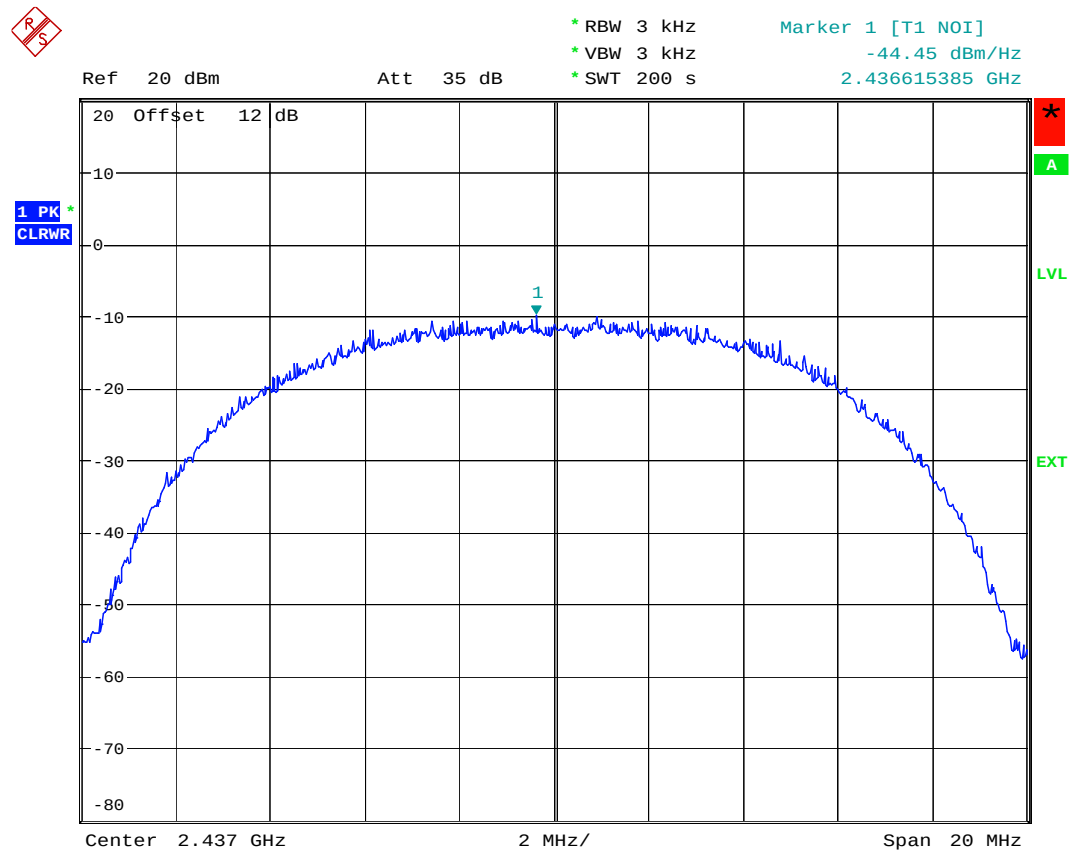
Used measuring option is PSD Option 1, as we measured the power as peak power.

Plot 1: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)



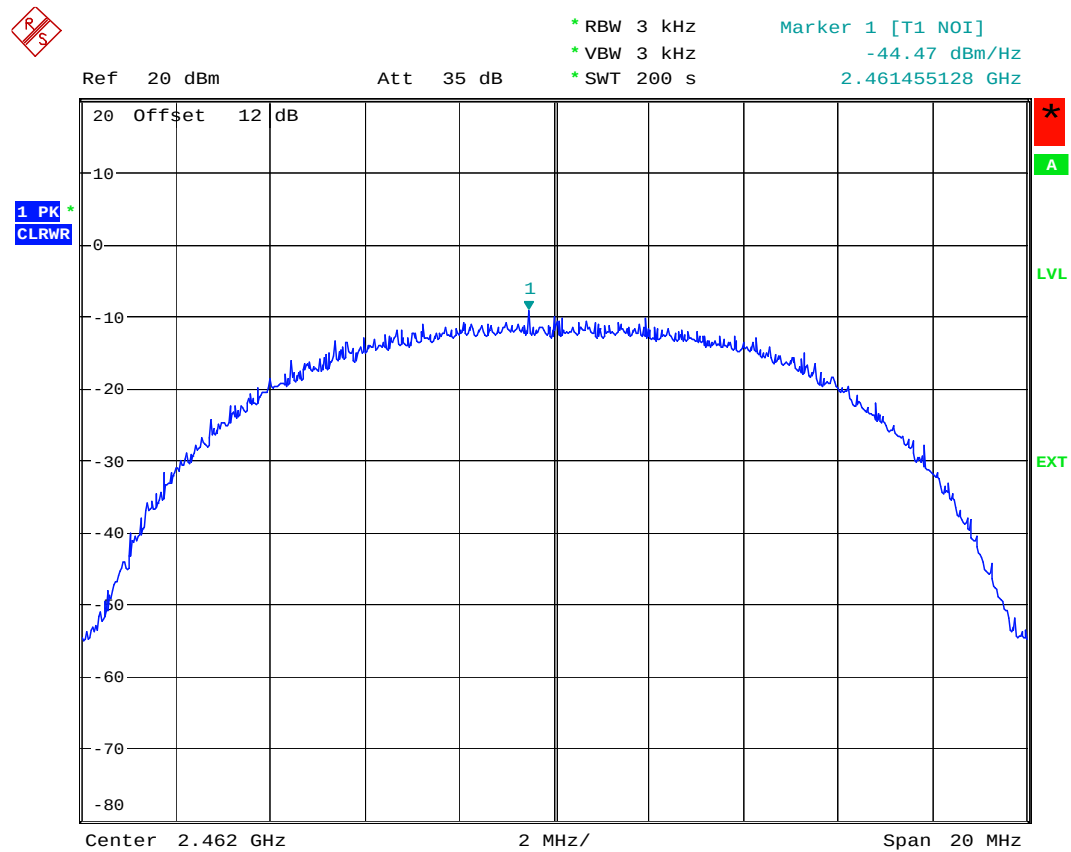
Date: 25.MAY.2007 08:03:39

Plot 2: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)



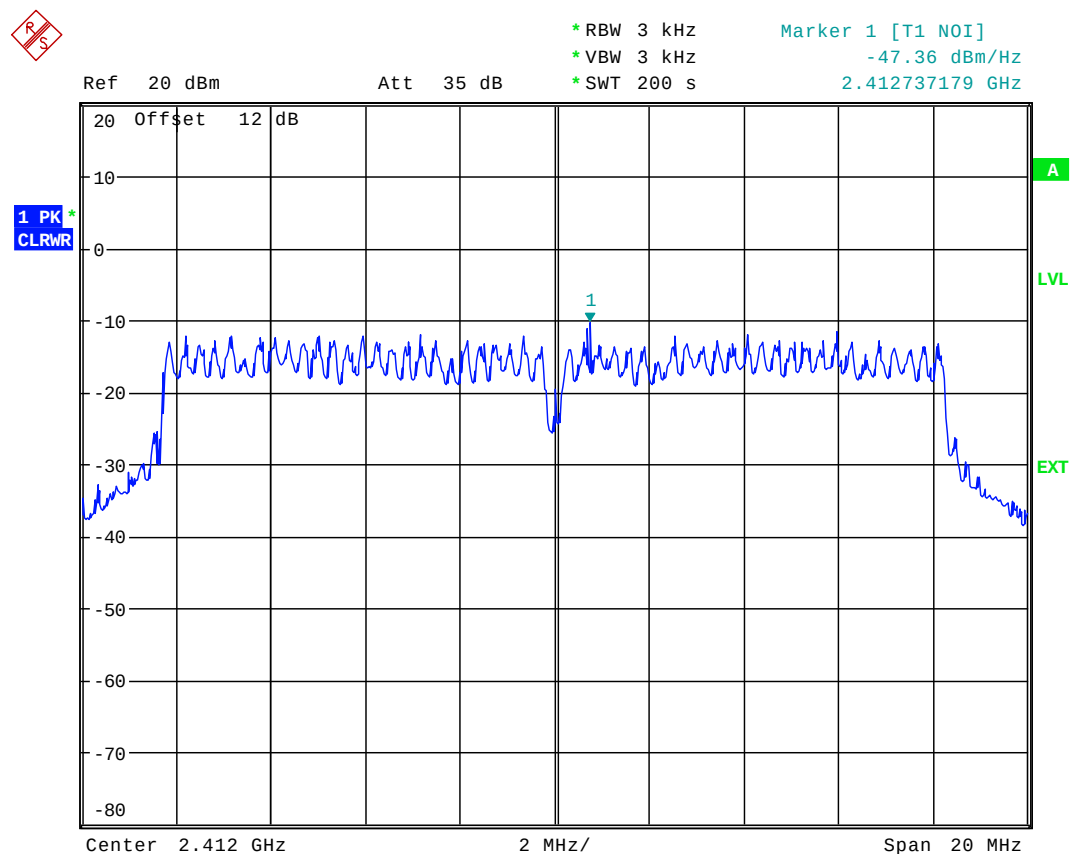
Date: 25.MAY.2007 08:07:09

Plot 3: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)

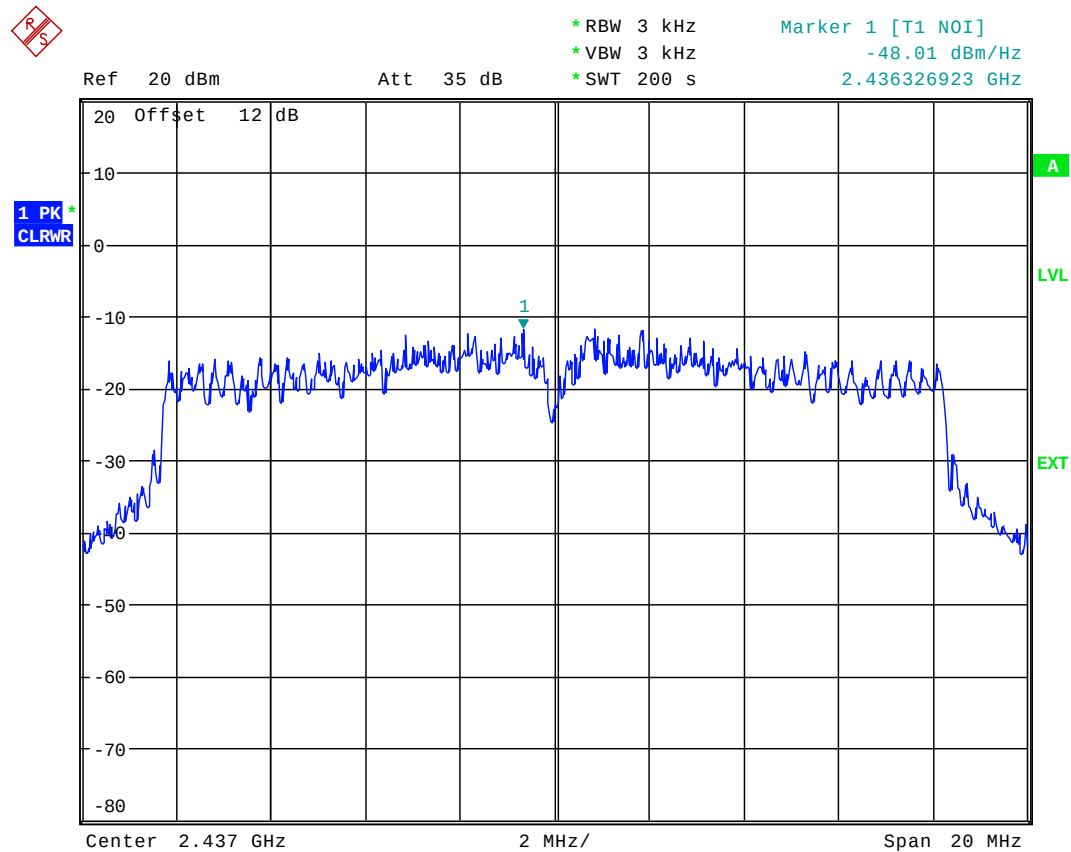


Date: 25.MAY.2007 08:12:02

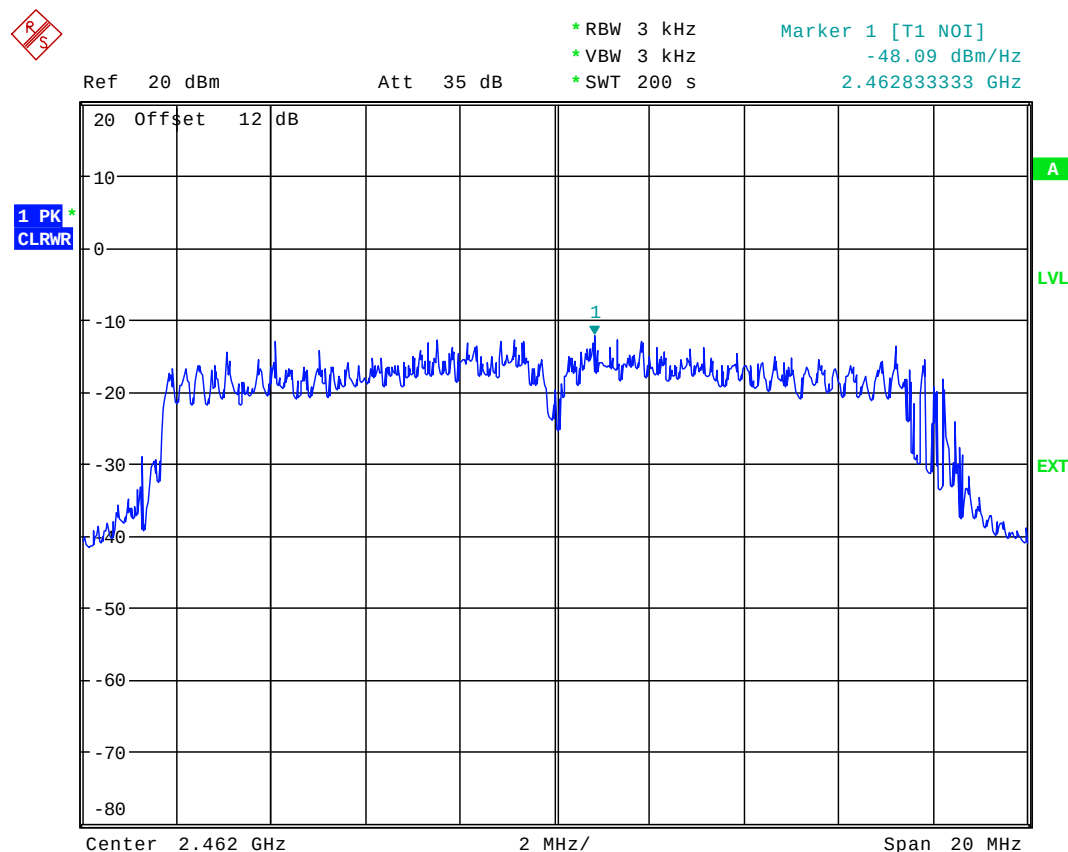
Plot 4: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)



Plot 5: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)



Plot 6: (result calculated by the spectrum analyzer FSU50 from Rohde & Schwarz)



Results:

- Plot 1: Power density : -44.8 dBm/Hz = - 10.0 dBm / 3 KHz
- Plot 2: Power density : -44.5 dBm/Hz = - 9.7 dBm / 3 KHz
- Plot 3: Power density : -44.5 dBm/Hz = - 9.7 dBm / 3 KHz
- Plot 1: Power density : -47.4 dBm/Hz = - 12.6 dBm / 3 KHz
- Plot 2: Power density : -48.0 dBm/Hz = - 13.2 dBm / 3 KHz
- Plot 3: Power density : -48.1 dBm/Hz = - 13.3 dBm / 3 KHz

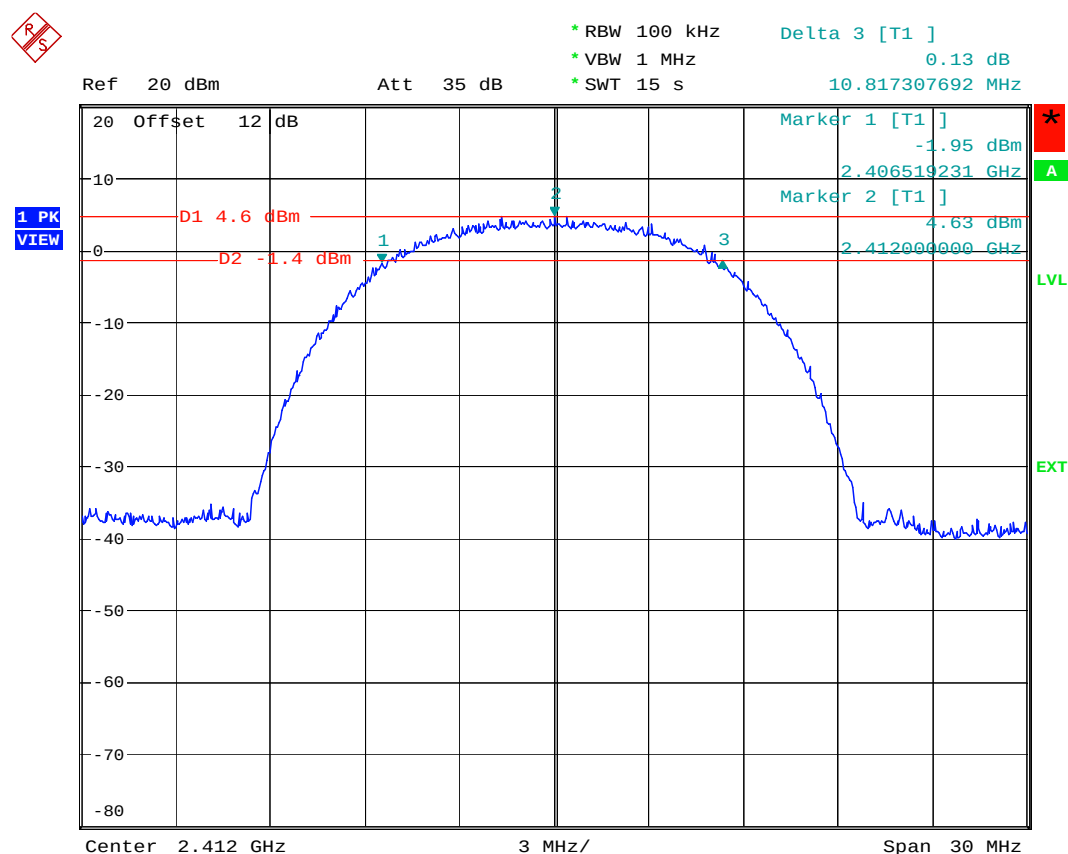
Correction factor from dBm/Hz to dBm/3KHz is +34,8 dB

Limits :

Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 KHz band during any time interval of continuous transmission
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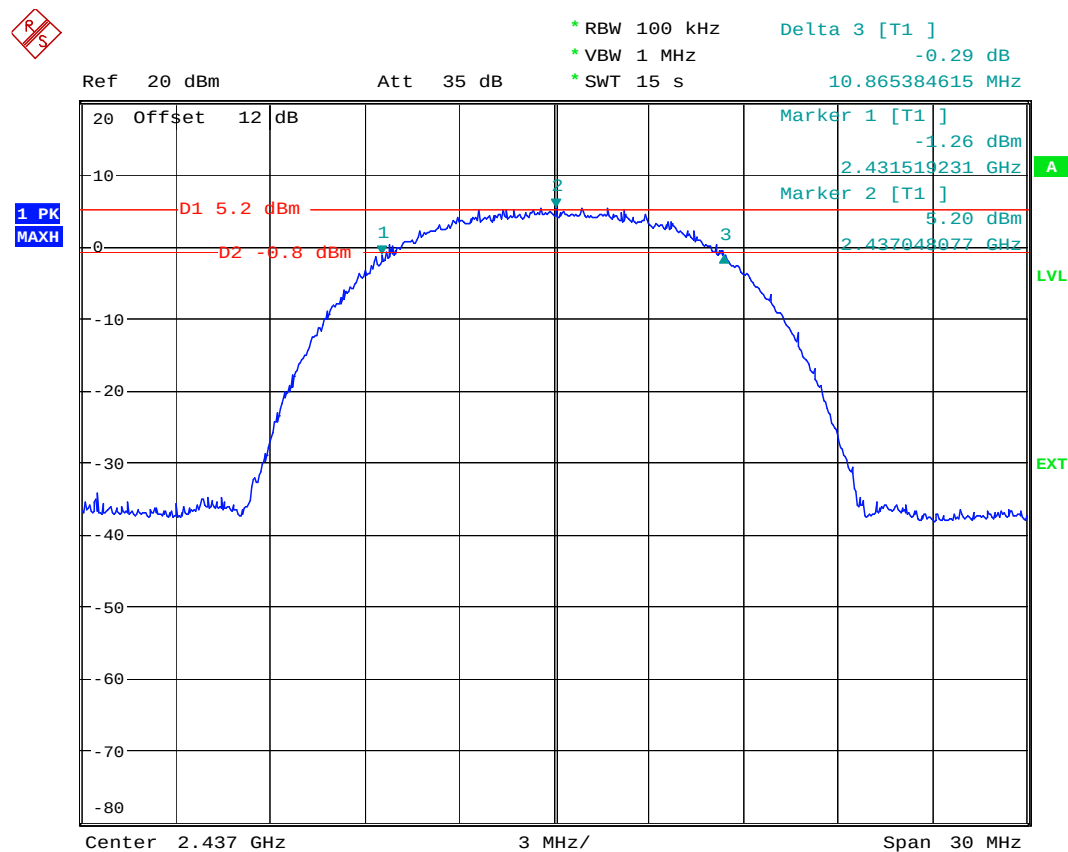
3.6 Spectrum Bandwidth of a DSSS / OFDM System / 6 dB Bandwidth §15.247(a)(2)

Plot 1 :



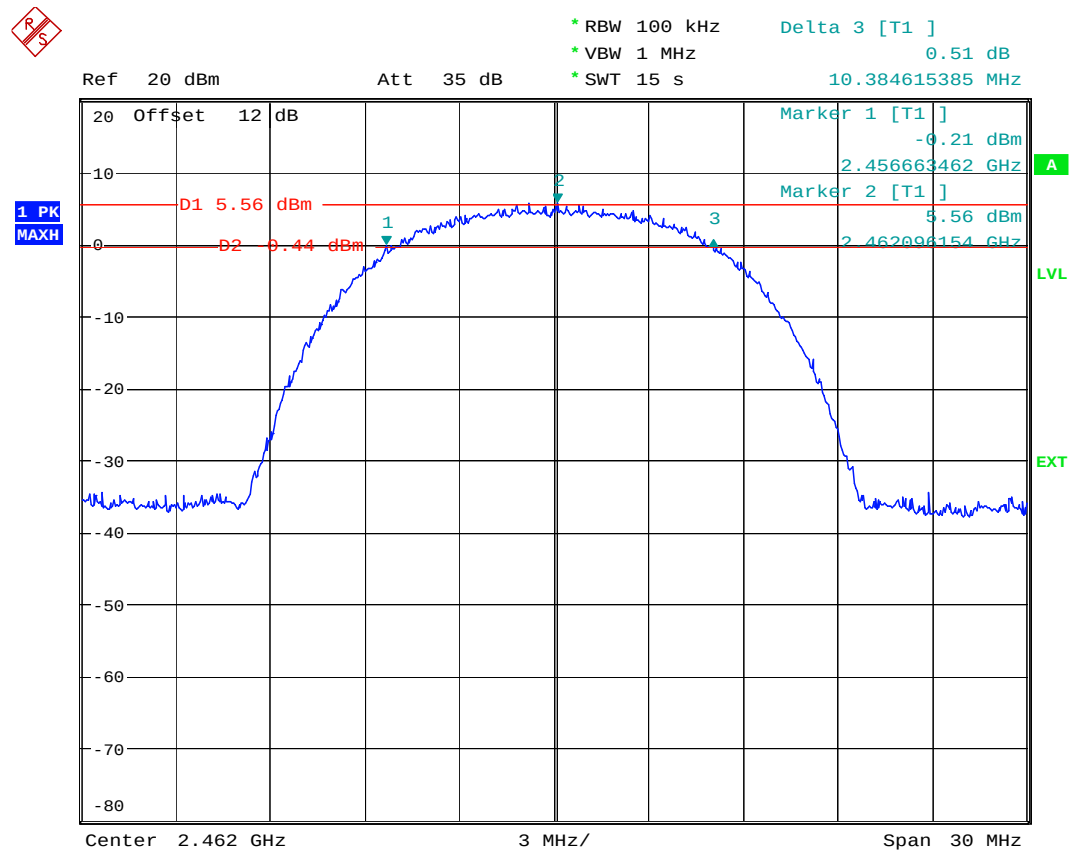
Date: 25.MAY.2007 09:01:55

Plot 2:



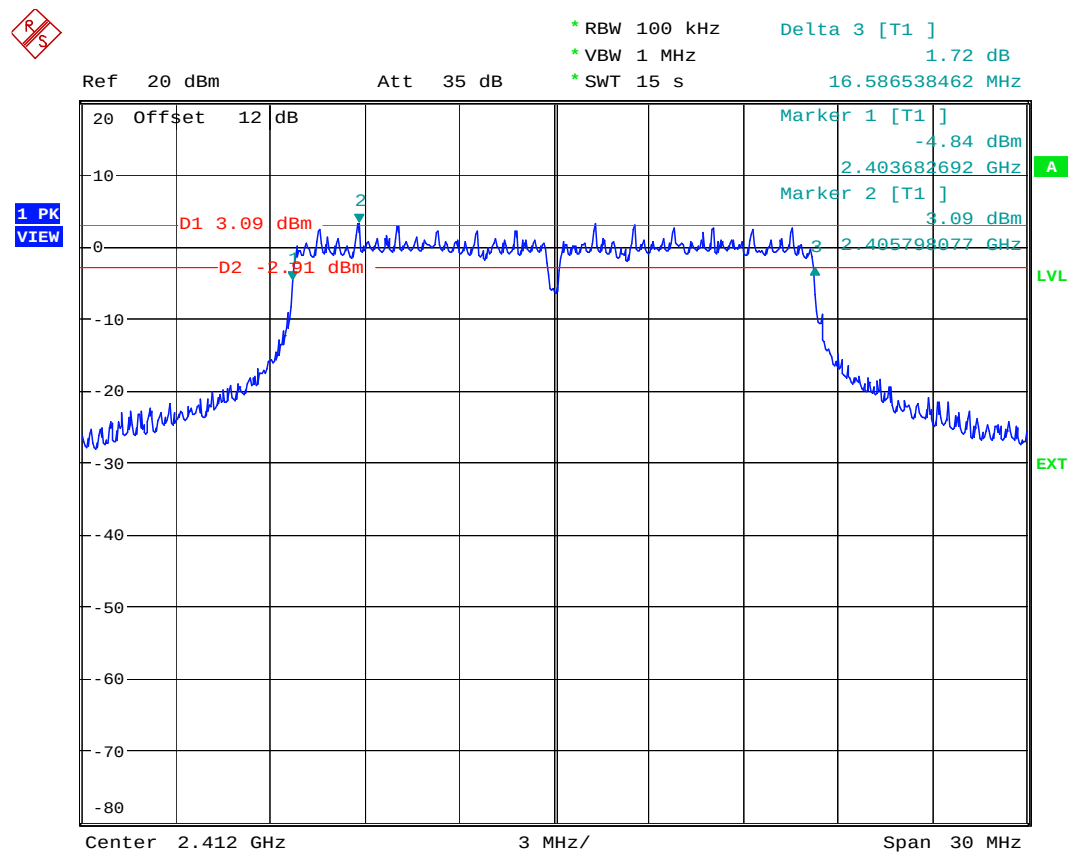
Date: 25.MAY.2007 09:00:11

Plot 3:



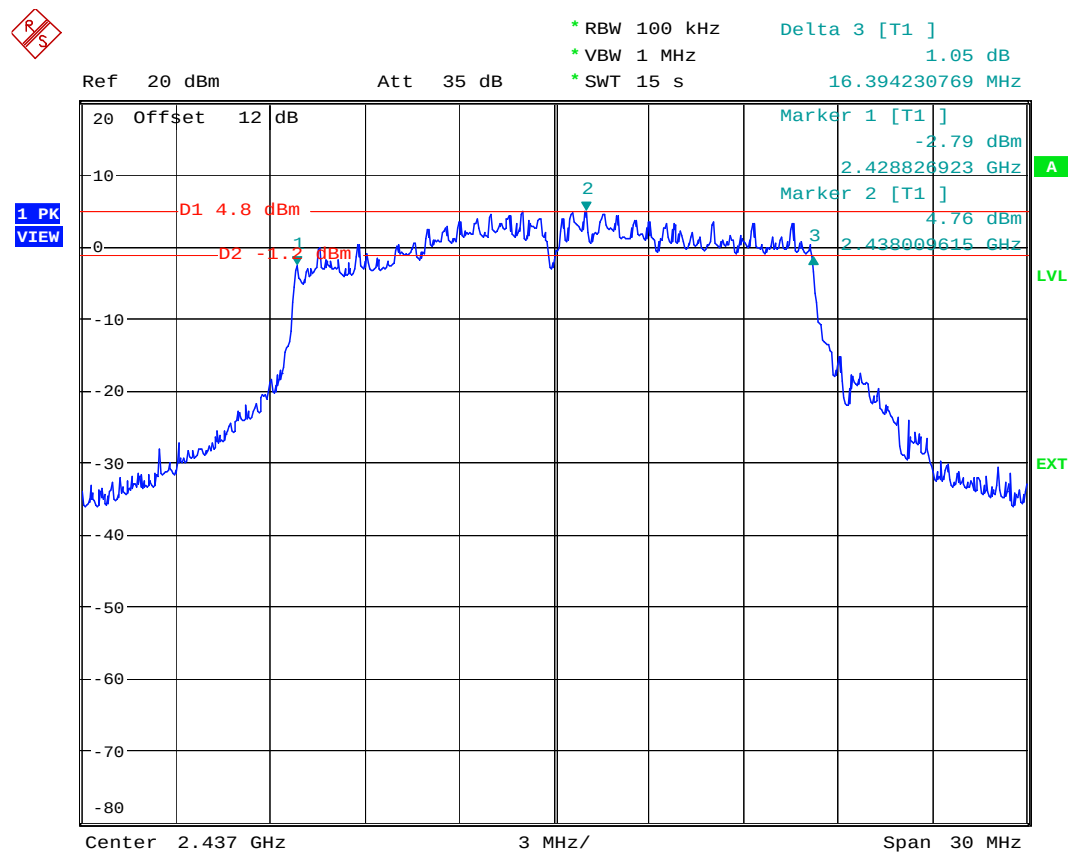
Date: 25.MAY.2007 08:46:54

Plot 4 :



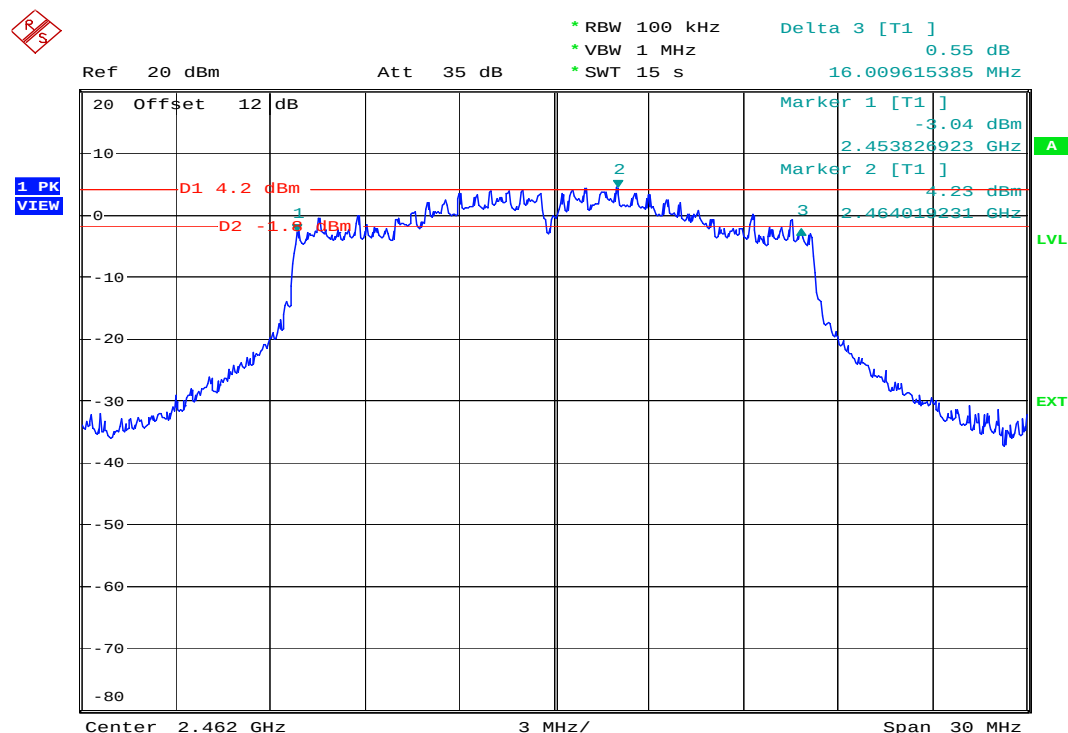
Date: 25.MAY.2007 08:36:25

Plot 5:



Date: 25.MAY.2007 08:41:30

Plot 6:



Date: 25.MAY.2007 08:45:05

As the 6-dB bandwidth of the signal is wider than the requirements of RSS210 (500 kHz at -26 dBc), the requirement for IC is also fulfilled

Results:

Test conditions		6 dB BANDWIDTH [MHz]		
Frequency [MHz]		2412	2437	2462
T _{nom}	DSSS V _{nom}	10.871	10.865	10.384
T _{nom}	OFDM V _{nom}	16.586	16.394	16.009
Measurement uncertainty		±1kHz		

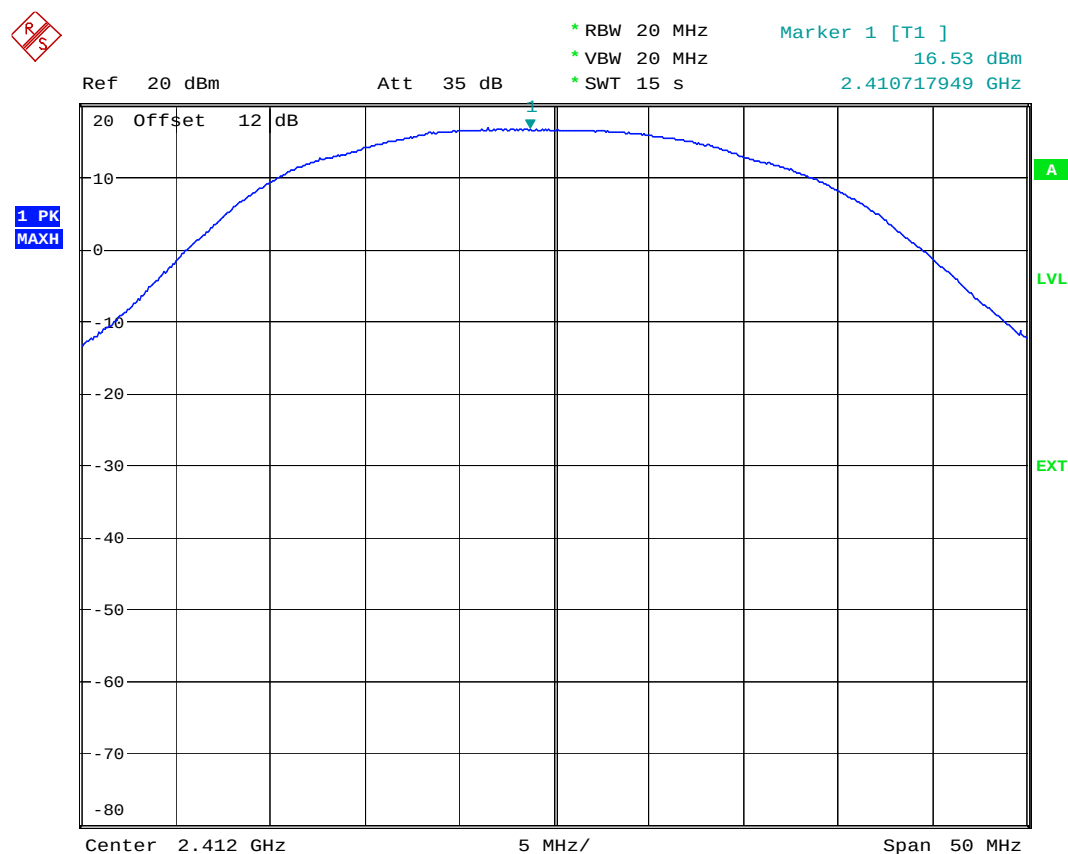
RBW: 100 kHz / VBW 1MHz

Limits :

Under normal test conditions only	> 500 KHz
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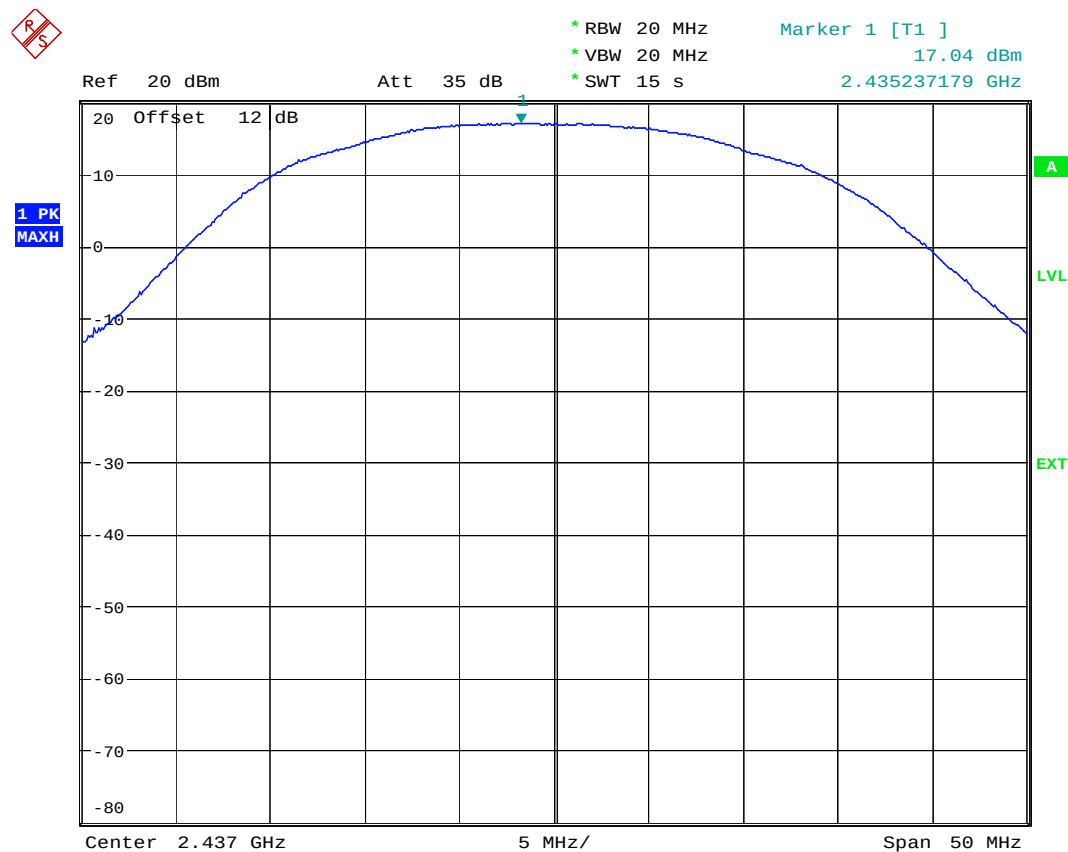
3.7 Maximum output power (conducted) §15.247 (b)(3)

Plot 1:



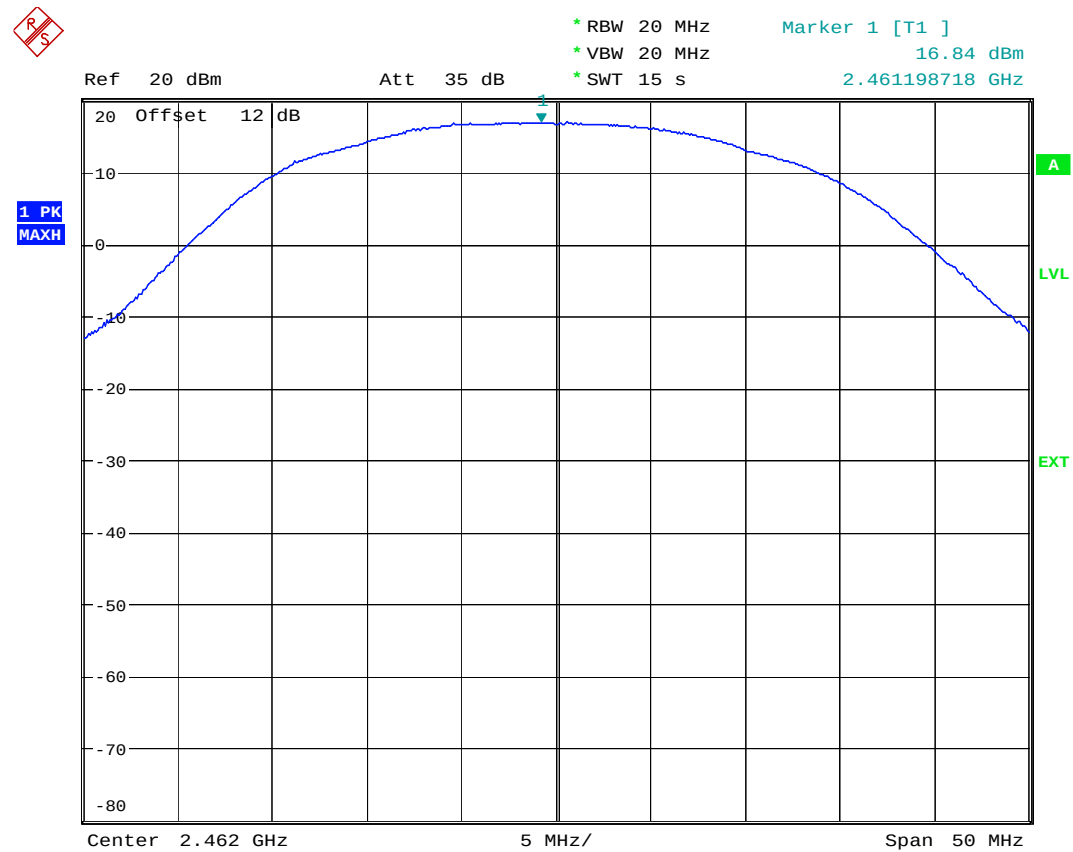
Date: 25.MAY.2007 09:03:46

Plot 2:



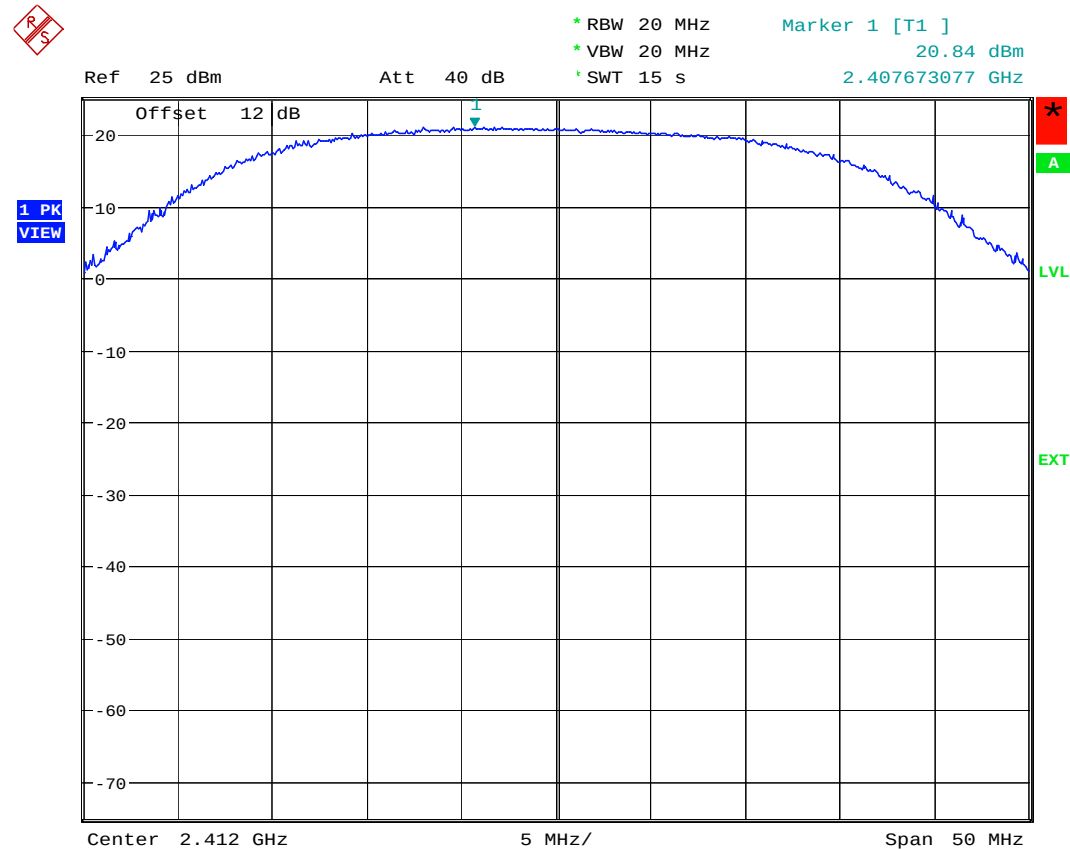
Date: 25.MAY.2007 09:05:31

Plot 3:



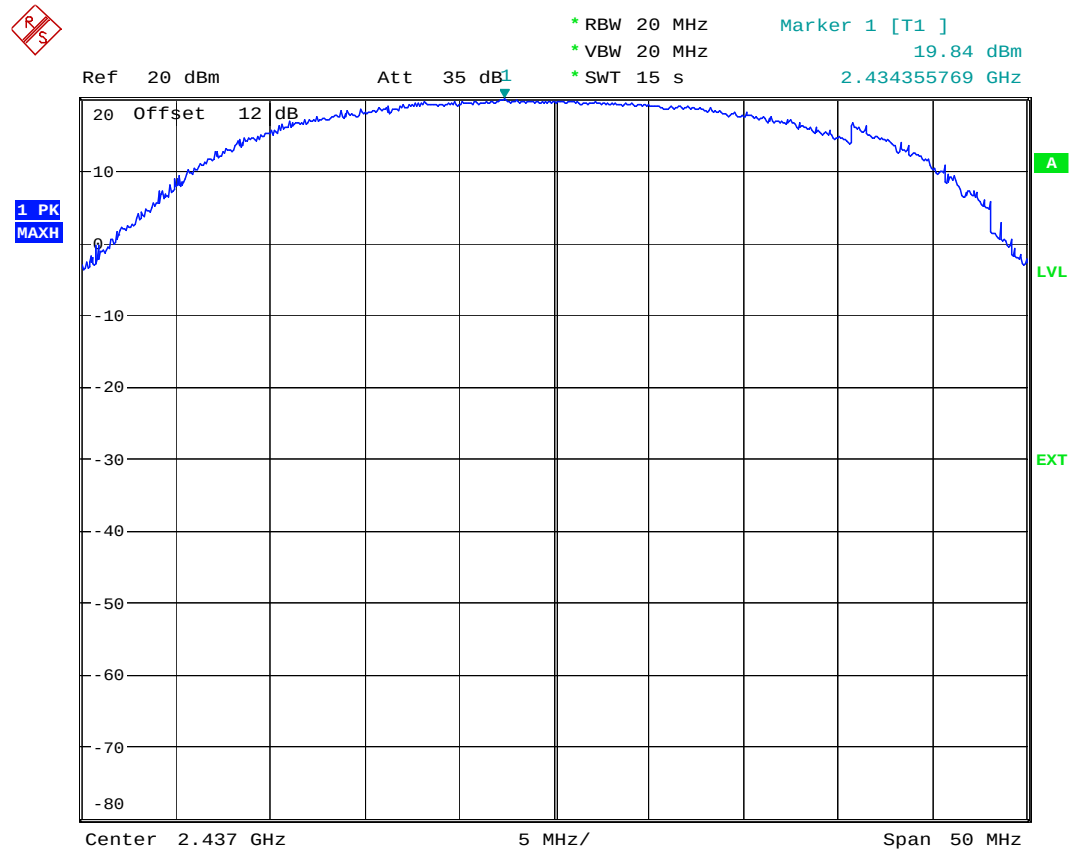
Date: 25.MAY.2007 09:06:43

Plot4:



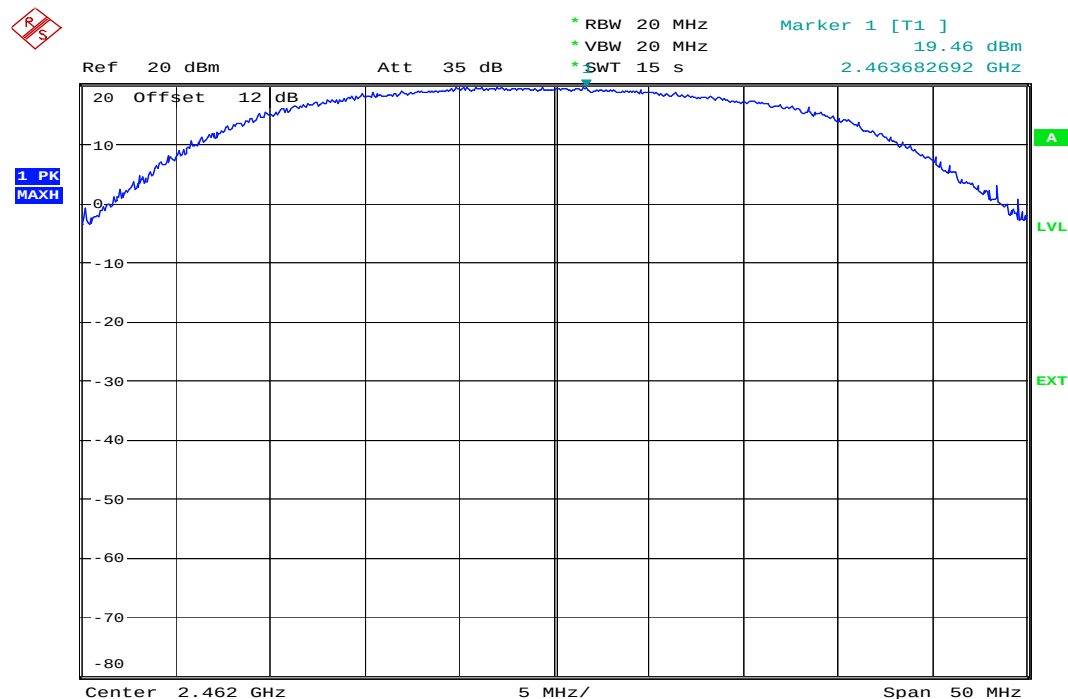
Date: 25.MAY.2007 09:11:43

Plot 5:



Date: 25.MAY.2007 09:09:33

Plot 6:



Date: 25.MAY.2007 09:08:11

Results:

Test conditions		Max. peak output power [dBm]			
Frequency [MHz]					
		2412	2437	2462	
T _{nom}	DSSS V _{nom}	PK	16.5	17.0	16.8
T _{nom}	OFDM V _{nom}	PK	20.8	19.8	19.5
Measurement uncertainty		±3dB			

RBW / VBW : 20 MHz

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt / 30 dBm
--	------------------------

MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm²)
P = power input to the antenna (in appropriate units e.g. mW)
G = power gain of the antenna in the direction of interest relative to the isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = \text{EIRP}/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

Calculation:

(Calculated for max. EIRP)

EIRP: 17.3 dBm (53.7 mW)

calculated at distance of 20 cm:

$$\text{power density} = 53.7 / 4\pi 20^2 = 0.0107 \text{ mW/ cm}^2$$

Limit:

1mW/ cm² is the reference level for general public exposure according to the OET Bulletin 65,
Edition 97-01 Table 1.

3.8 Max. peak output power (radiated) §15.247 (b)(3)

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T _{nom}	DSSS V _{nom}	15.7	14.0	12.6
T _{nom}	OFDM V _{nom}	17.3	16.5	14.9
Measurement uncertainty		±3dB		

RBW / VBW : 1 MHz

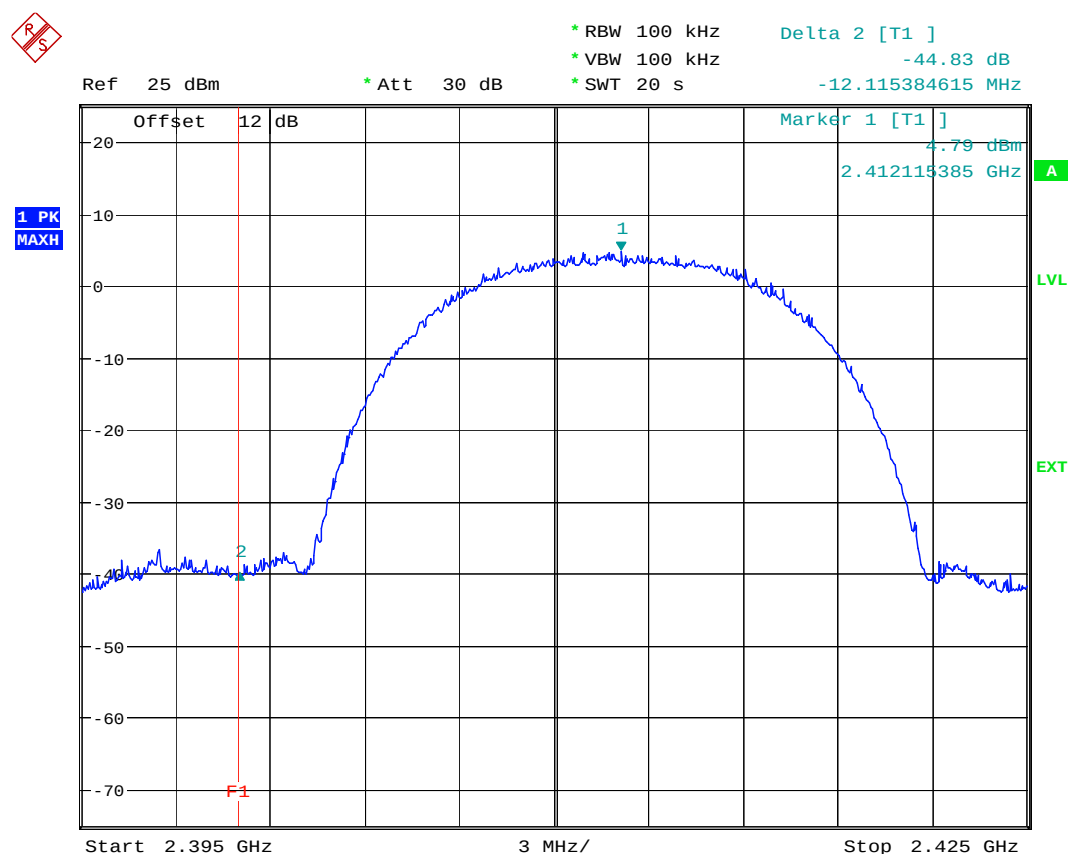
Measured at a distance of 3m

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt
--	---------------

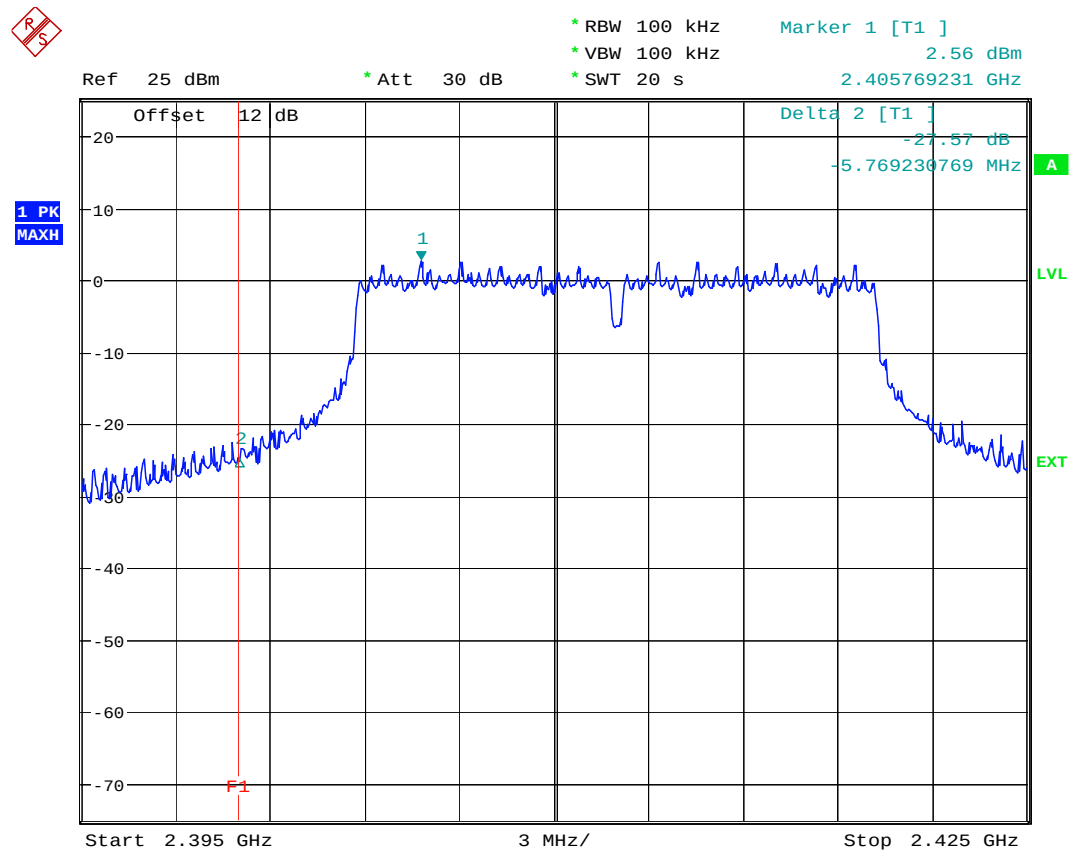
3.9 Band-edge compliance of conducted emissions §15.247 (d)

Plot 1, lowest channel DSSS



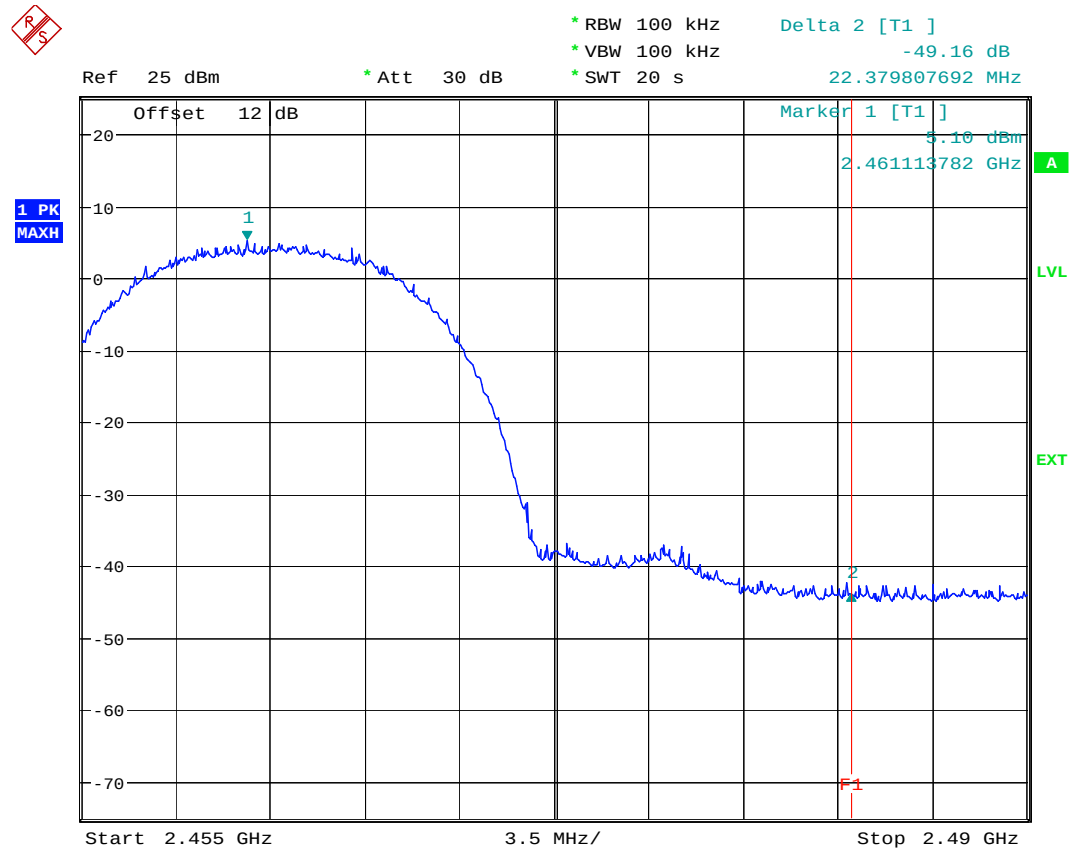
Date: 25.MAY.2007 09:23:08

Plot 1, lowest channel OFDM



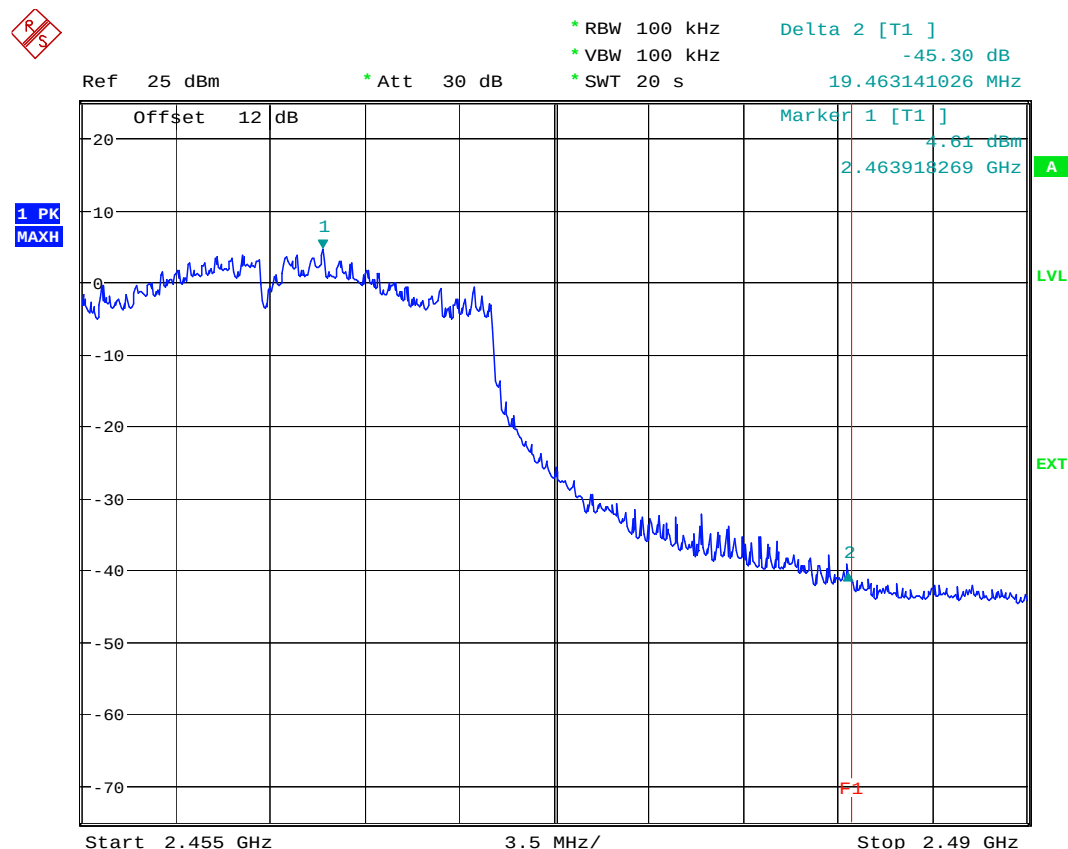
Date: 25.MAY.2007 09:24:54

Plot 2, highest channel DSSS



Date: 25.MAY.2007 09:27:51

Plot 2, highest channel OFDM



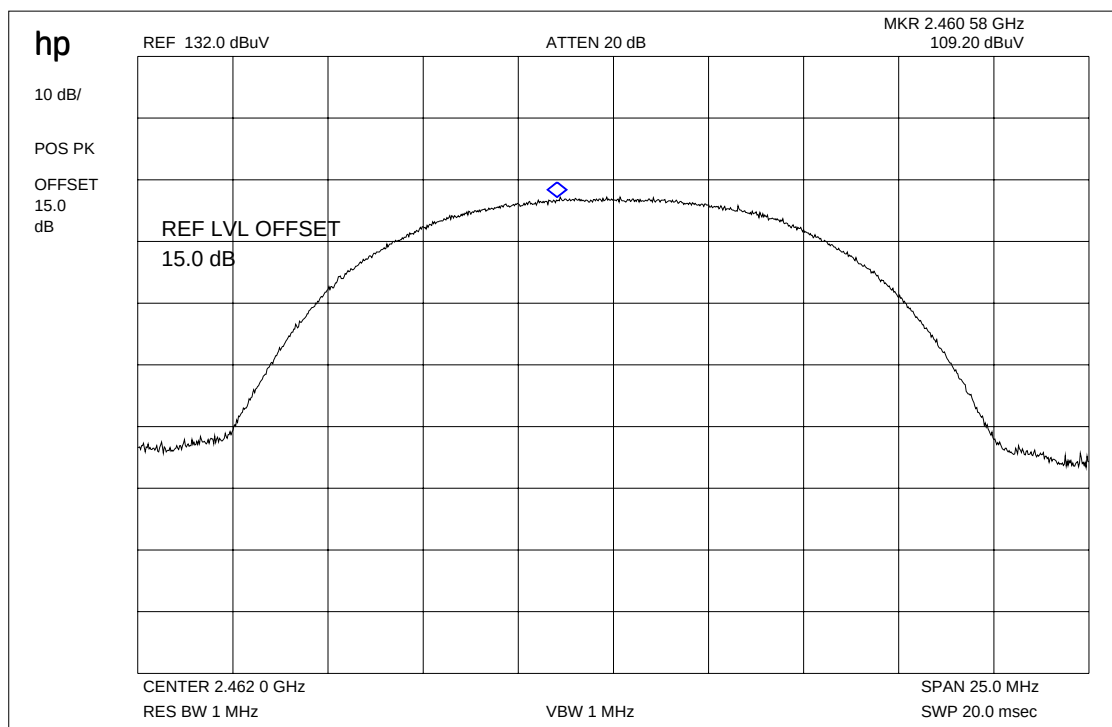
Date: 25.MAY.2007 09:26:30

Limits:

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).
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3.10 Band-edge compliance of radiated emissions §15.205

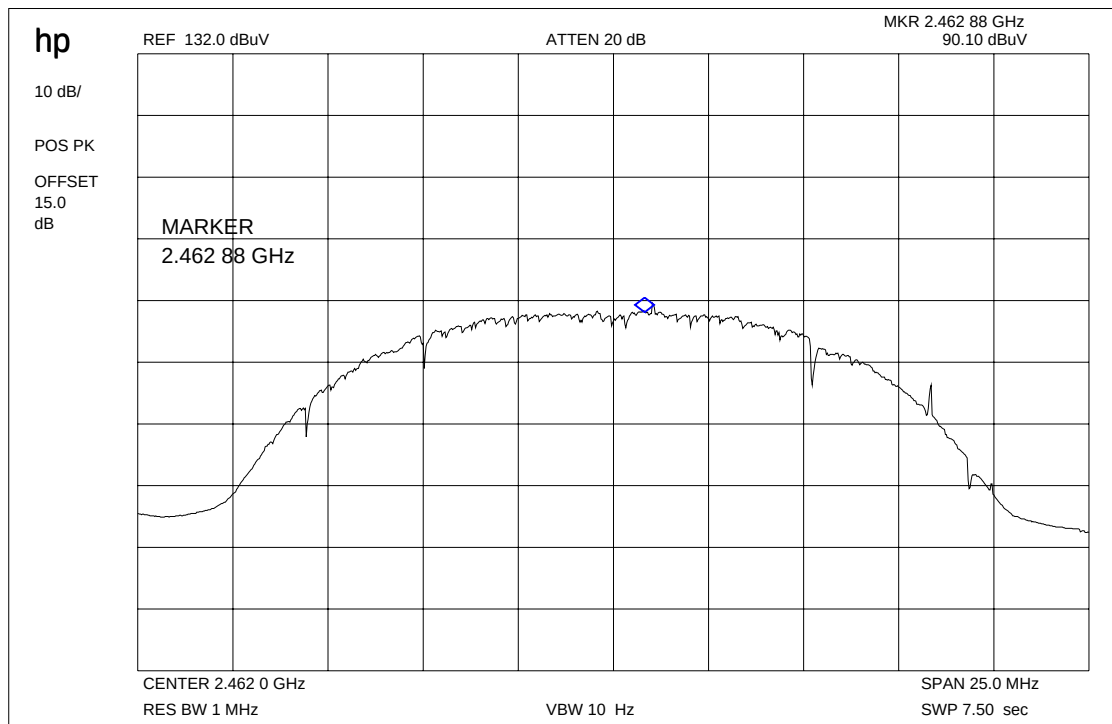
Plot 1 : Max field strength in 3m distance (single frequency) peak DSSS



Result:

Frequency	Meter reading	Cable loss	Antenna factor	Results
2462 MHz	93.6	22.8 dB	-7.2	109.2

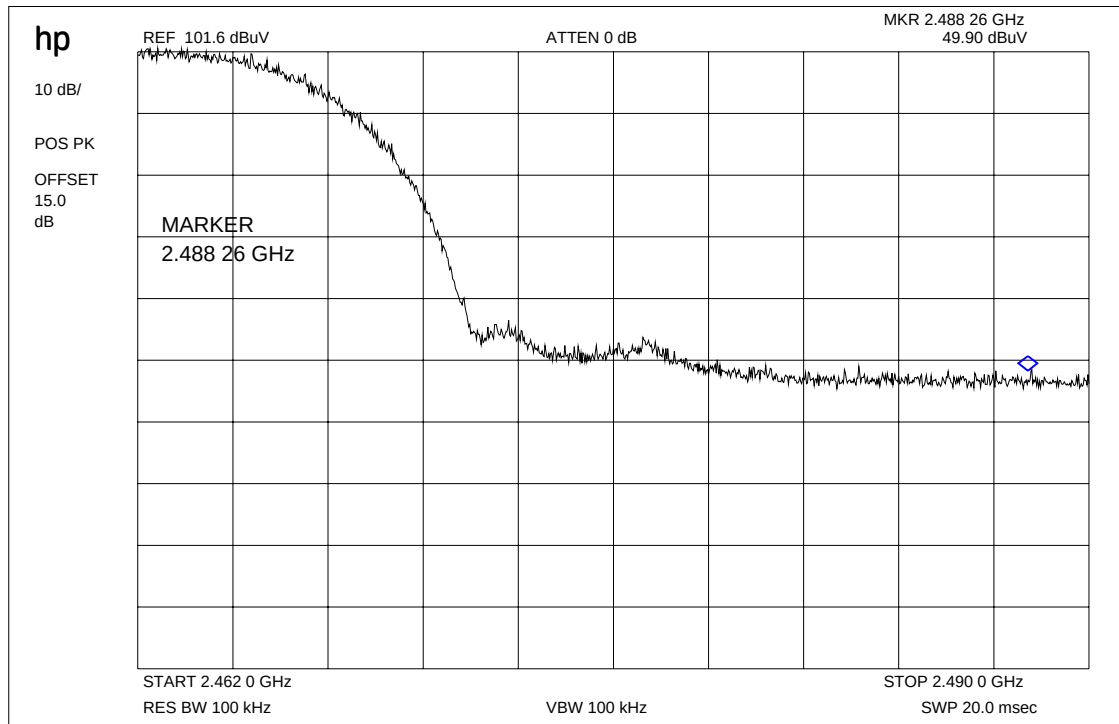
Plot 2 : Max field strength in 3m distance (single frequency) average DSSS



Result:

Frequency	Meter reading	Cable loss	Antenna factor	Results
2462 MHz	74.5	22.8 dB	-7.2	90.1

Plot 3: Marker-Delta Method RBW/VBW = 1% of span DSSS

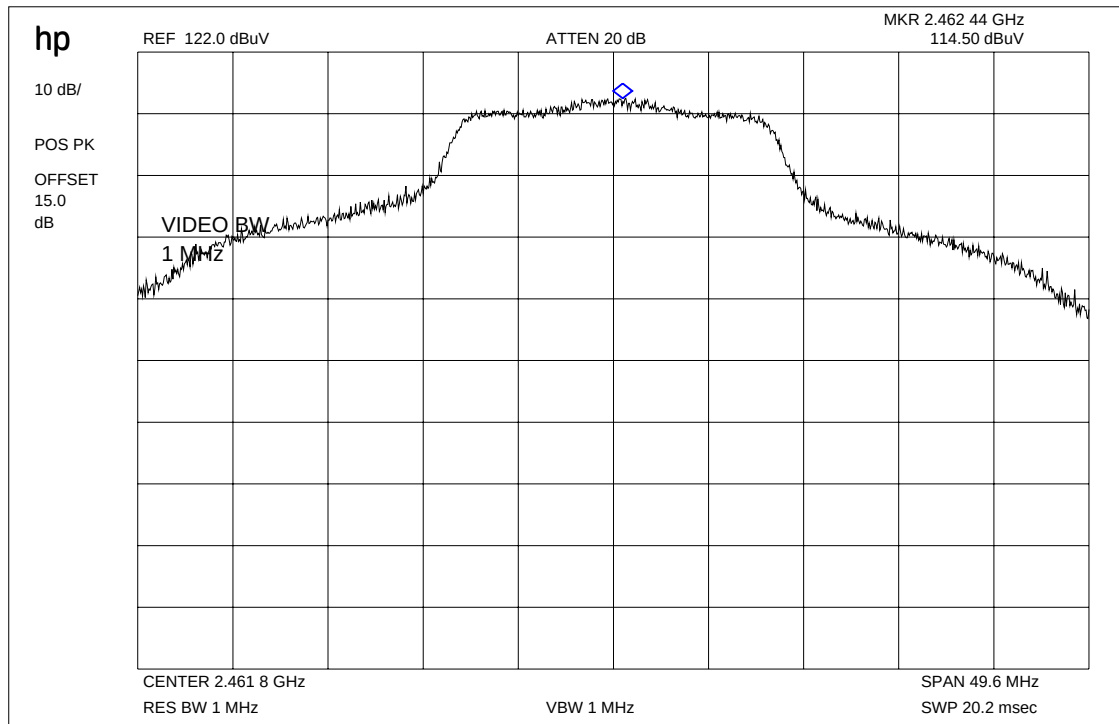


Result:

Marker-Delta-Value : 51.7 dB

This measurement was made to show that the behavior of the system is conform to FCC 15.205 (restricted bands)

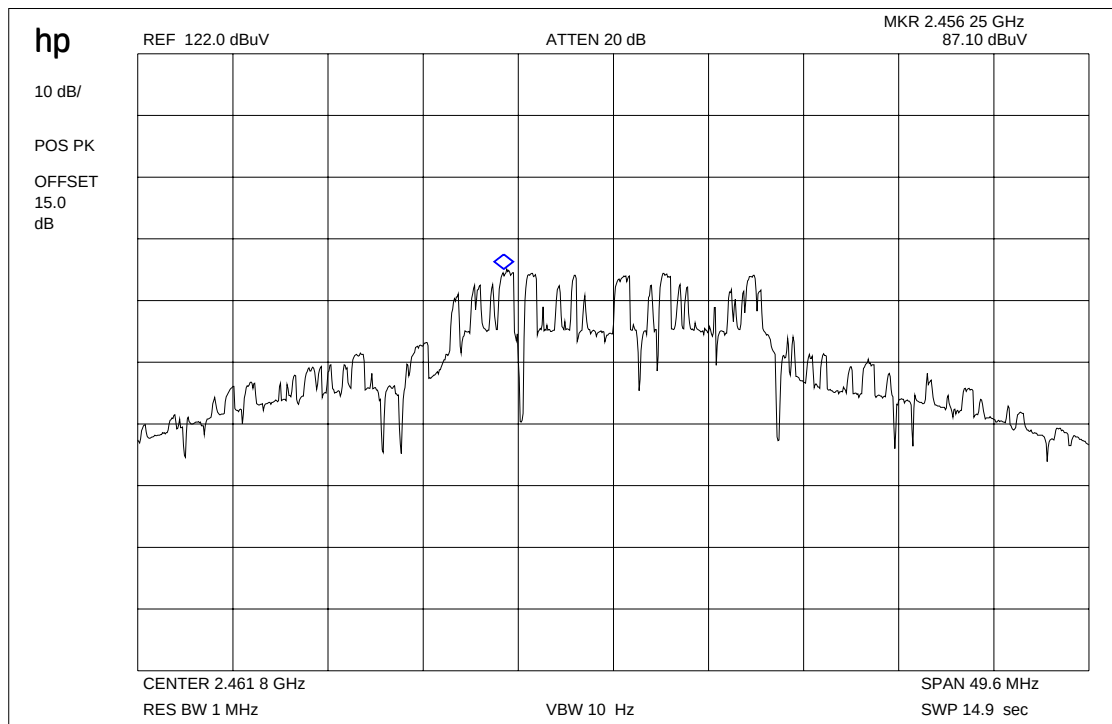
Plot 4 : Max field strength in 3m distance (single frequency) peak OFDM



Result:

Frequency	Meter reading	Cable loss	Antenna factor	Results
2462 MHz	98.9	22.8 dB	-7.2	114.5

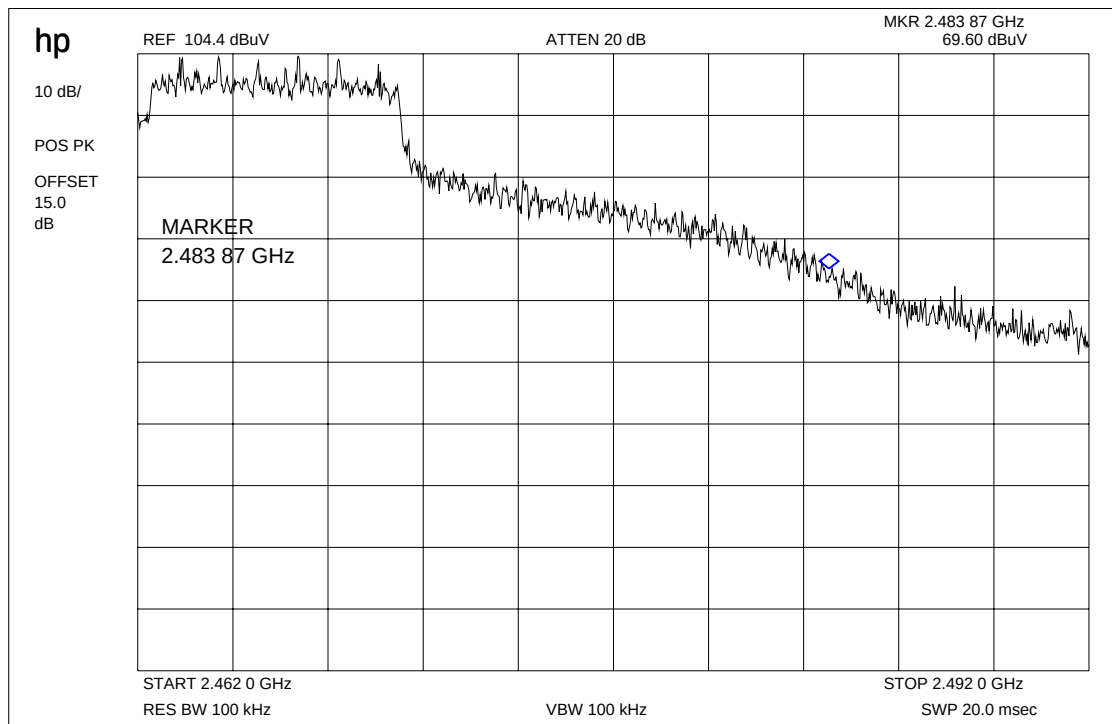
Plot 5 : Max field strength in 3m distance (single frequency) average OFDM



Result:

Frequency	Meter reading	Cable loss	Antenna factor	Results
2462 MHz	71.5	22.8 dB	-7.2	87.1

Plot 3: Marker-Delta Method RBW/VBW = 1% of span OFDM



Result:

Marker-Delta-Value : 34.8 dB

This measurement was made to show that the behavior of the system is conform to FCC 15.205 (restricted bands)

Results & Limits:

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

DSSS

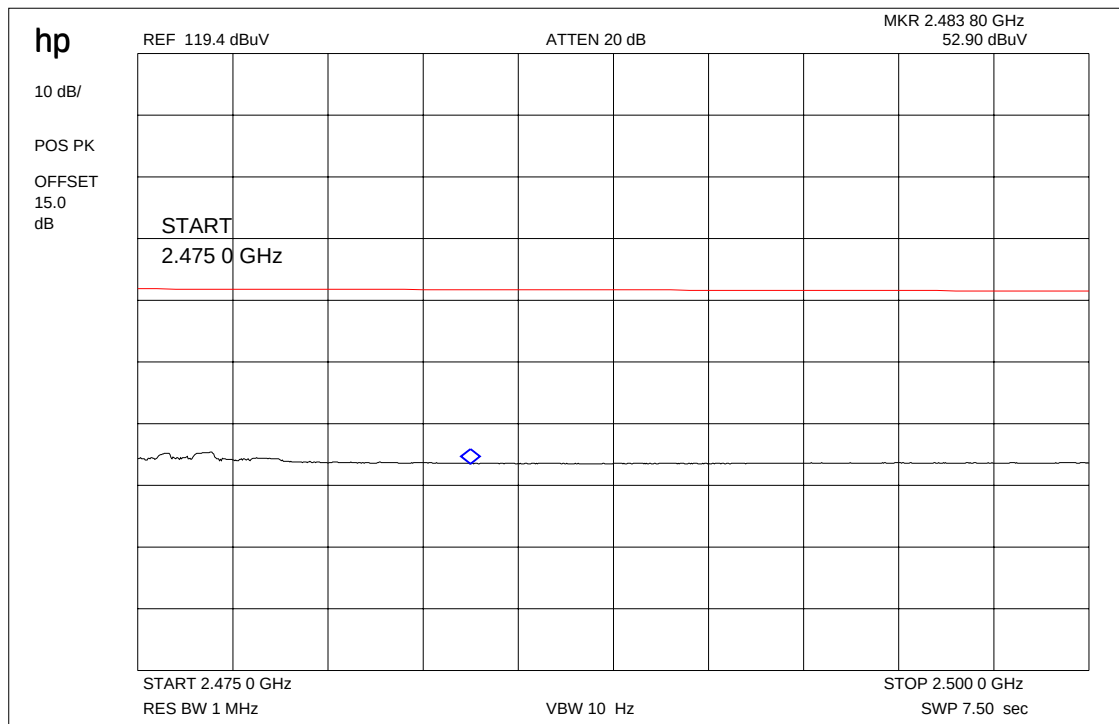
high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	93.6 dB μ V/m	+15,6 dB	109.2 dB μ V/m
Max. average value	1 MHz RBW 10 Hz VBW	74.5 dB μ V/m	+15.6 dB	90.1 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	51.7 dB		
Value at band edge	limit 54 dB μ V/m			38.4 dB μ V/m
Statement:				Complies

OFDM

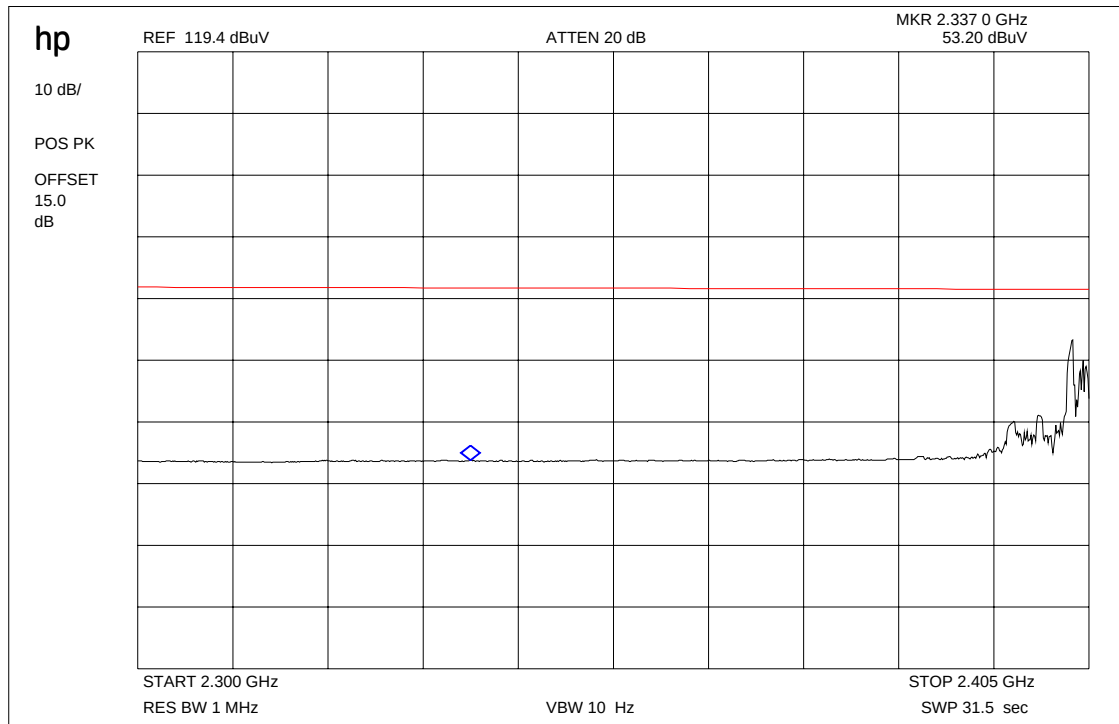
high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	98.9 dB μ V/m	+15,6 dB	114.5 dB μ V/m
Max. average value	1 MHz RBW 10 Hz VBW	71.5 dB μ V/m	+15.6 dB	87.1 dB μ V/m
Delta value	Peak 100 kHz RBW/VBW	34.8 dB		
Value at band edge	limit 54 dB μ V/m			52.3 dB μ V/m
Statement:				Complies

Band edge compliance in the next restricted bands.

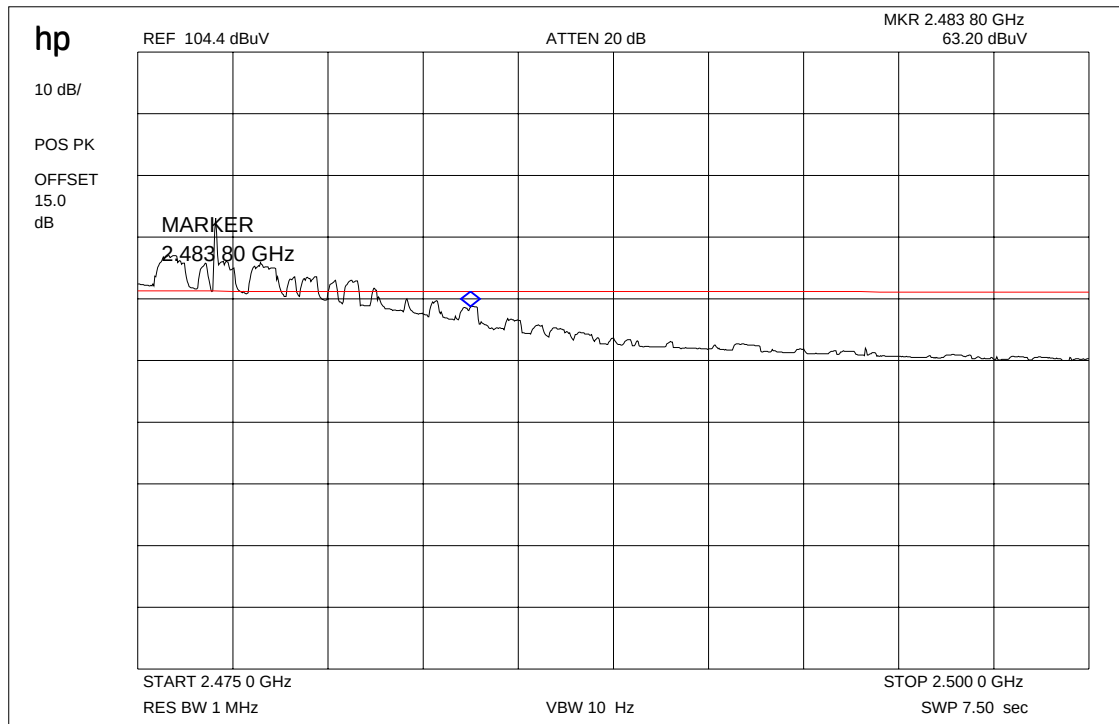
upper edge DSSS



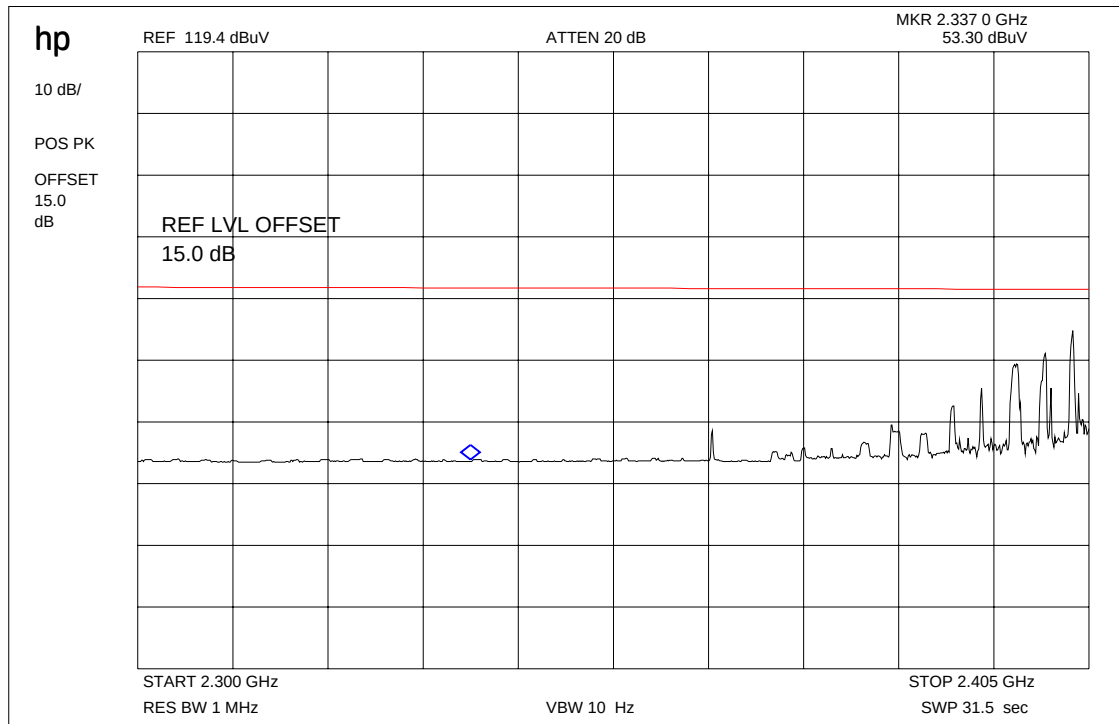
lower edge DSSS



higher edge OFDM

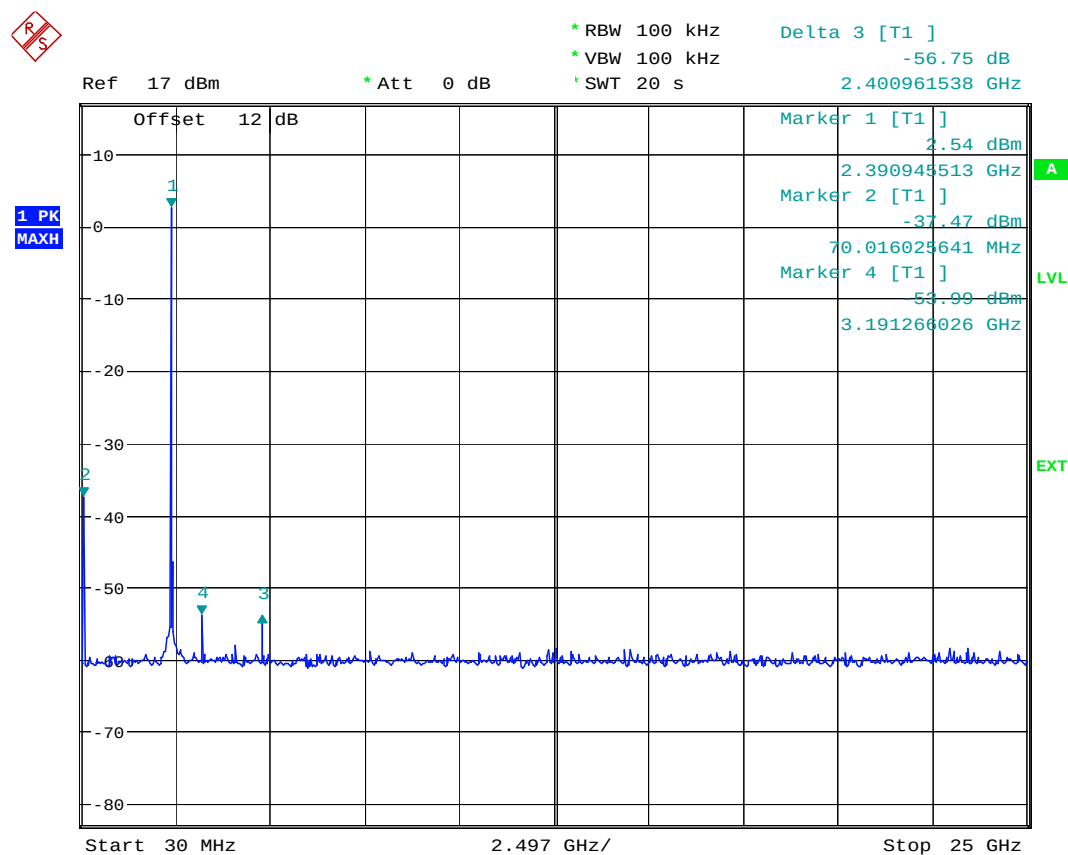


lower edge OFDM



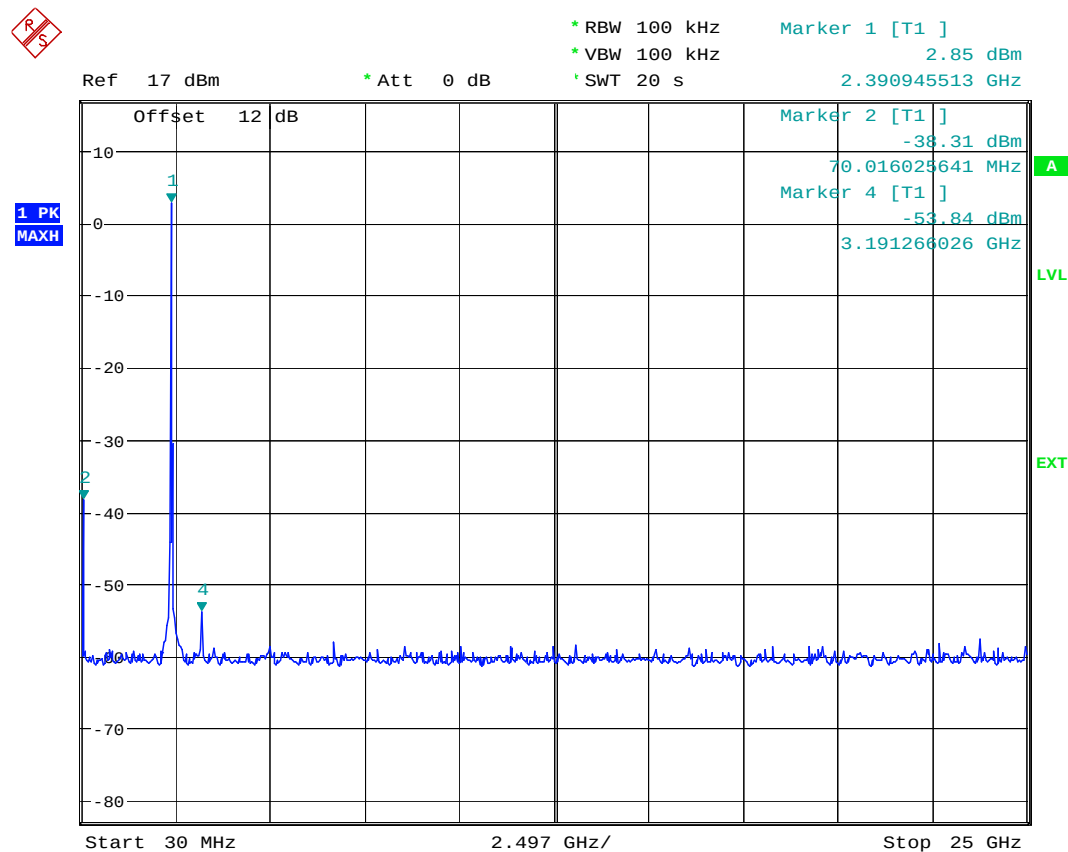
3.11 Spurious Emissions - conducted (Transmitter) §15.247 (c)

Plot1: 2412 MHz DSSS



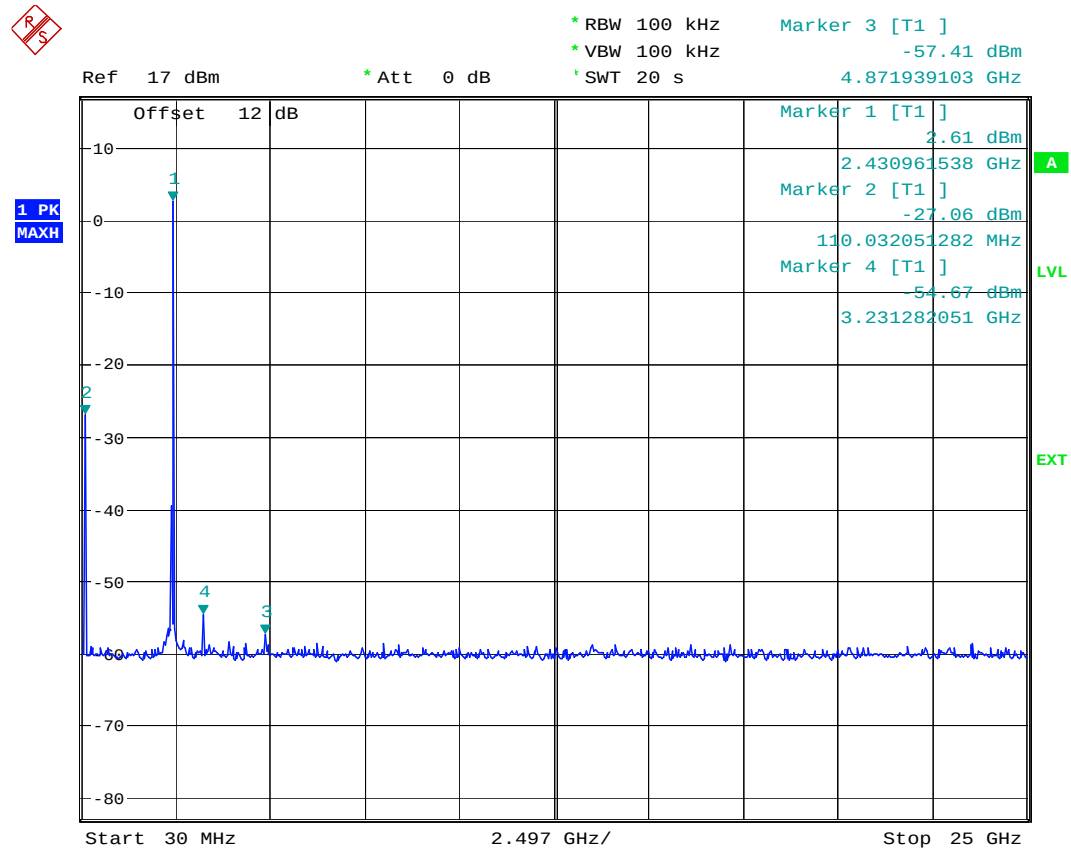
Date: 25.MAY.2007 09:43:50

Plot 2: 2412 MHz OFDM



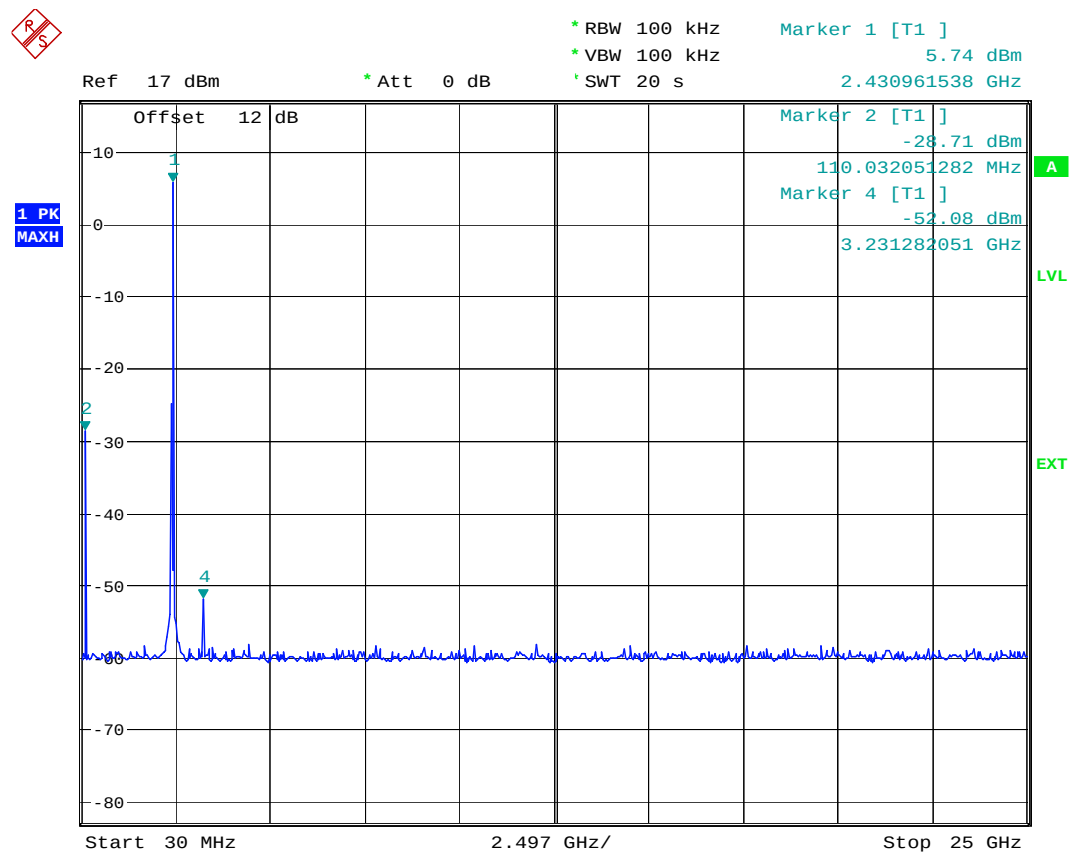
Date: 25.MAY.2007 09:42:05

Plot 3: 2437 MHz DSSS



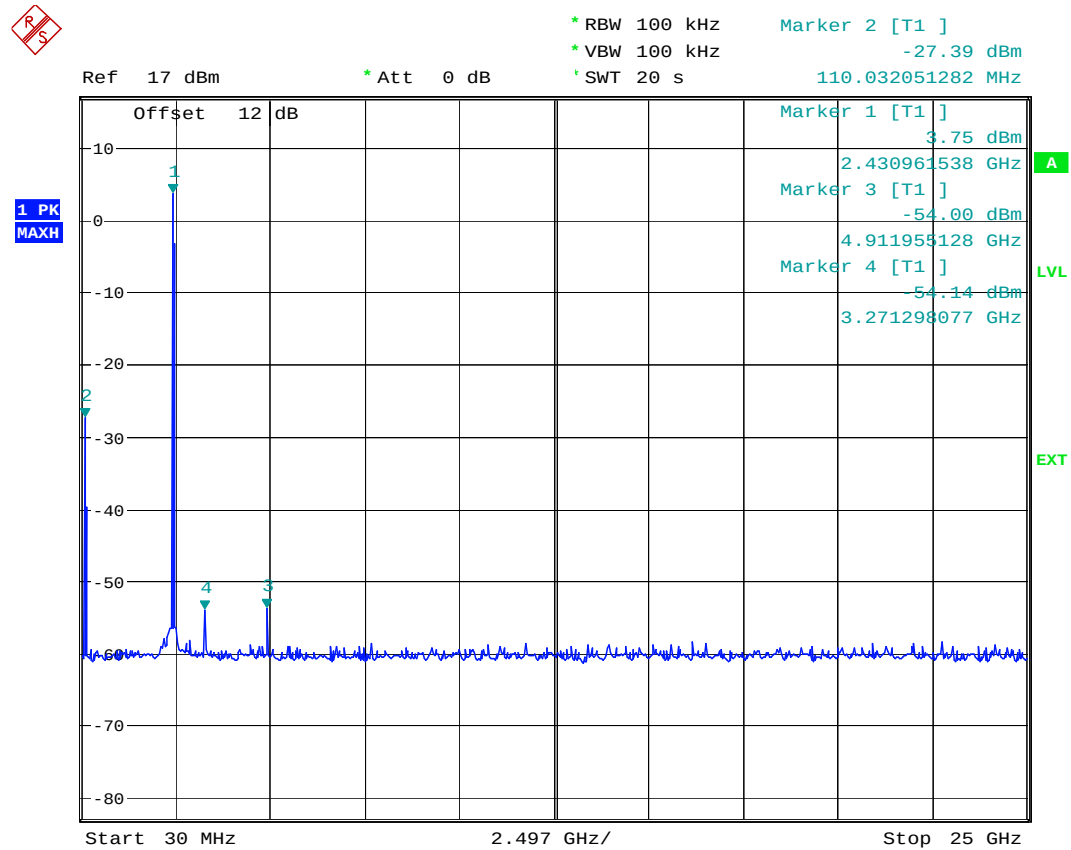
Date: 25.MAY.2007 09:38:01

Plot 4: 2437 MHz OFDM



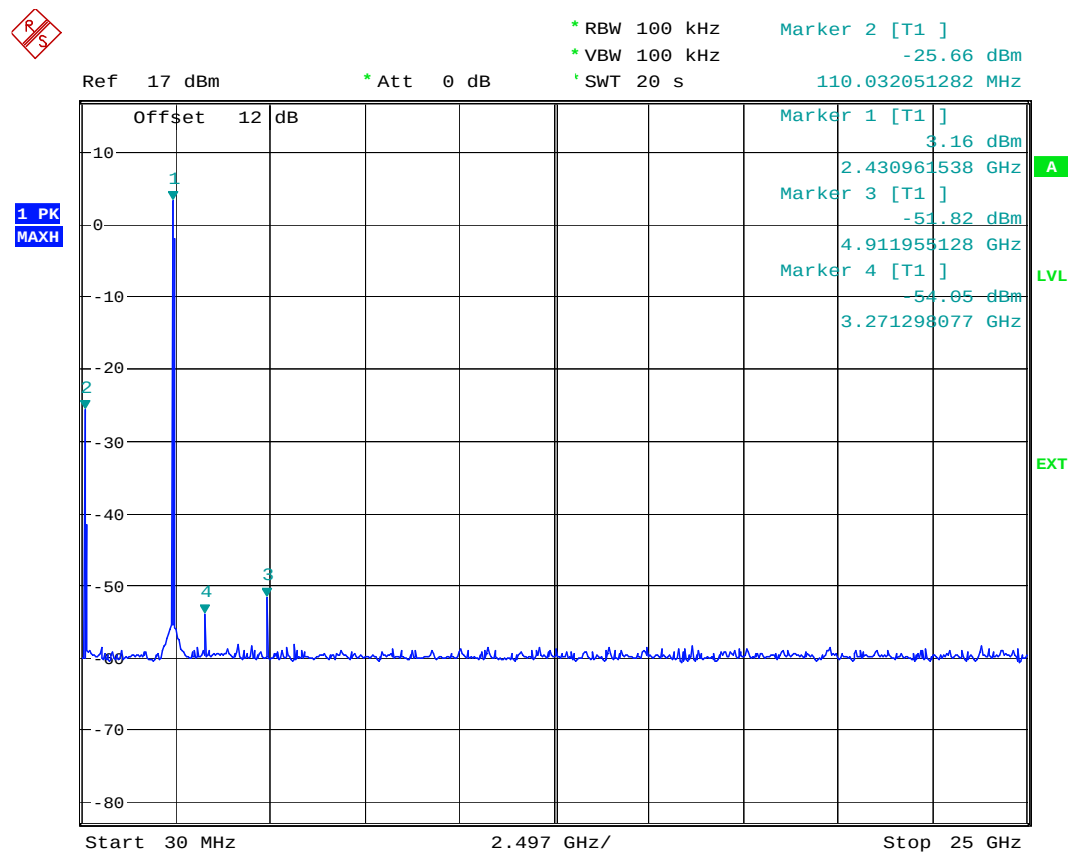
Date: 25.MAY.2007 09:40:37

Plot 5: 2462 MHz DSSS



Date: 25.MAY.2007 09:35:55

Plot 6: 2462 MHz OFDM



Date: 25.MAY.2007 09:34:37

Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emmission power	actual attenuation below frequency of operation [dB]	results
2412			30 dBm	-	Operating frequency
70.0		-30.3	-20 dBc		pass
3191		-53.8			pass
4824		-56.7			
2437			30 dBm		Operating frequency
95		-28.7	-20 dBc		pass
3230		-52.1			pass
4874		-57.4			
2462			30 dBm		Operating frequency
110		-25.7	-20 dBc		pass
4924		-51.8			pass
Measurement uncertainty			± 3dB		

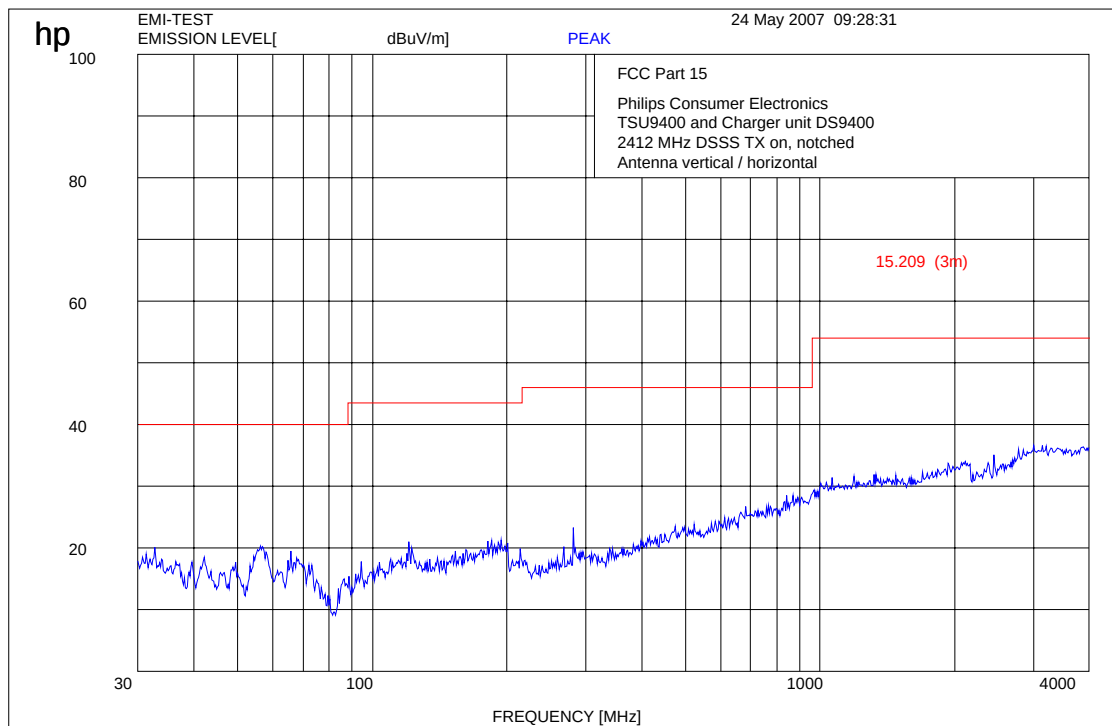
RBW : 100 kHz VBW: 100 kHz

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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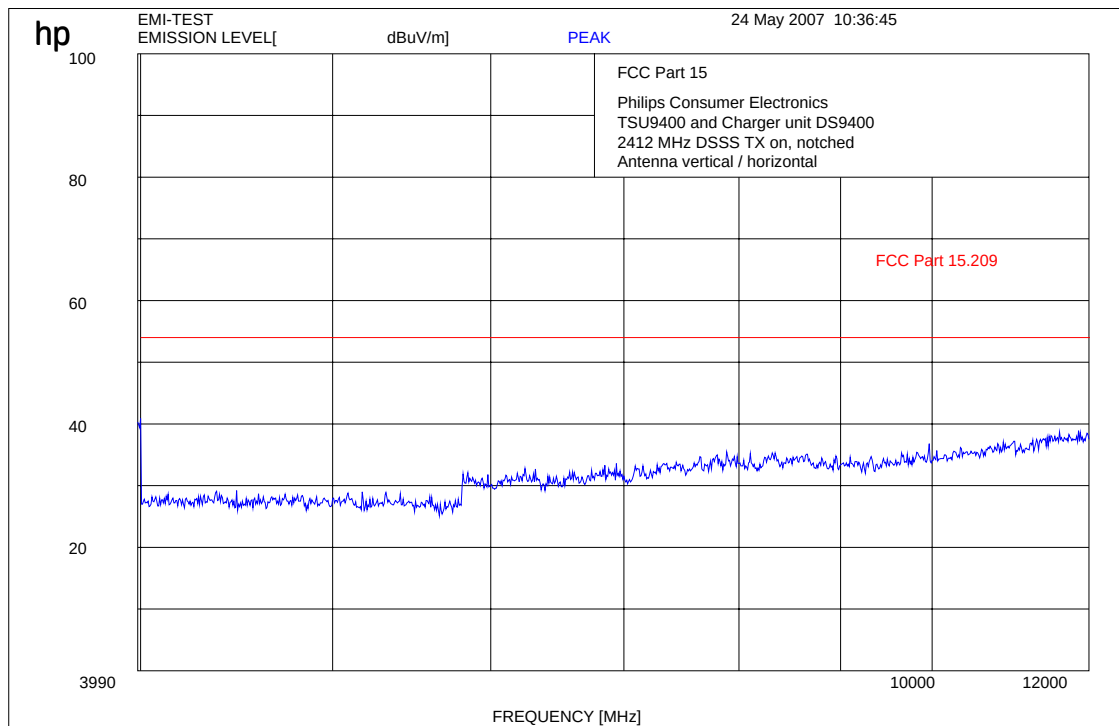
Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

3.12 Spurious Emissions - radiated (Transmitter) §15.209

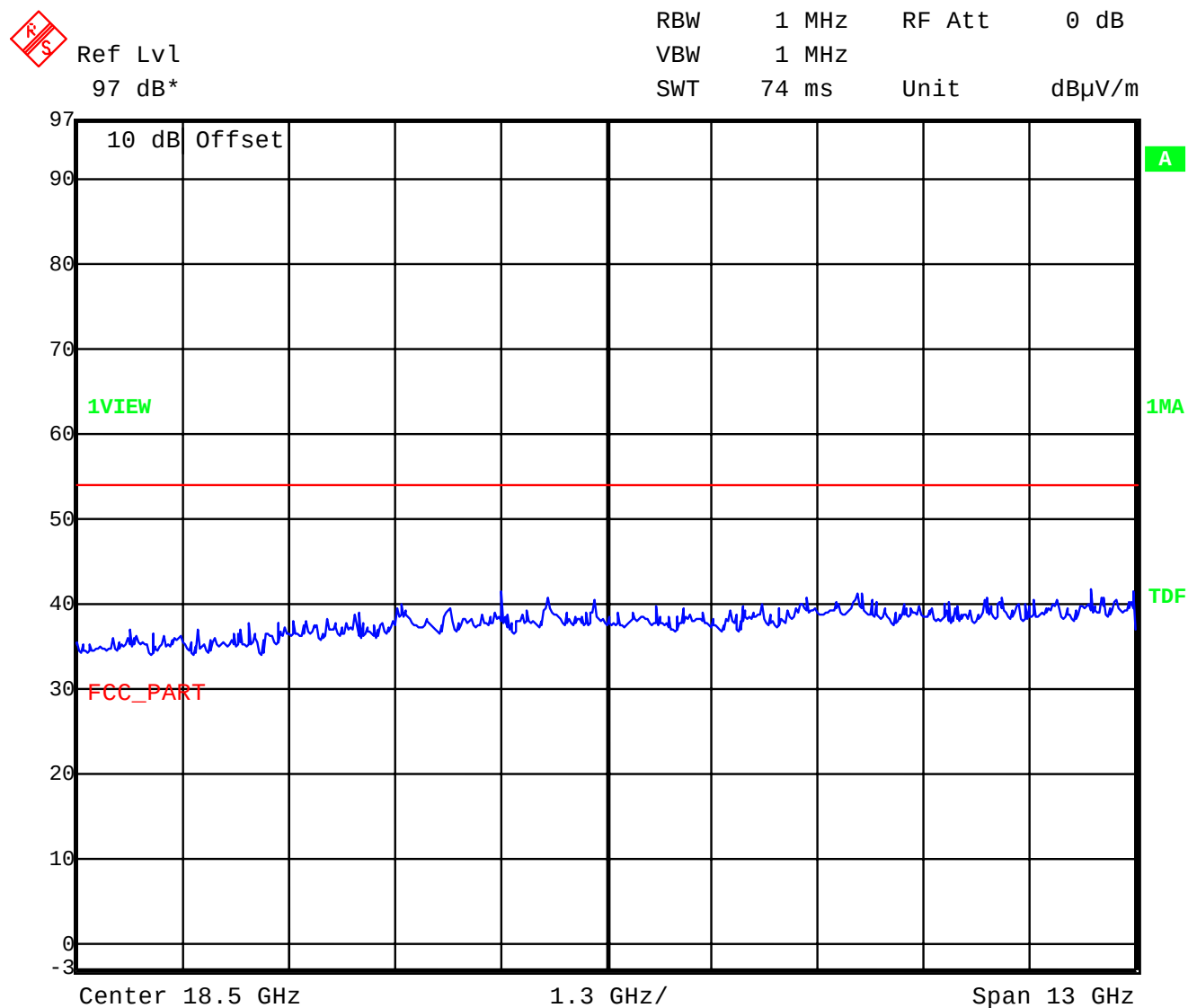
Plot 1: 0.03 - 4 GHz vertical / horizontal (lowest channel) (DSSS)



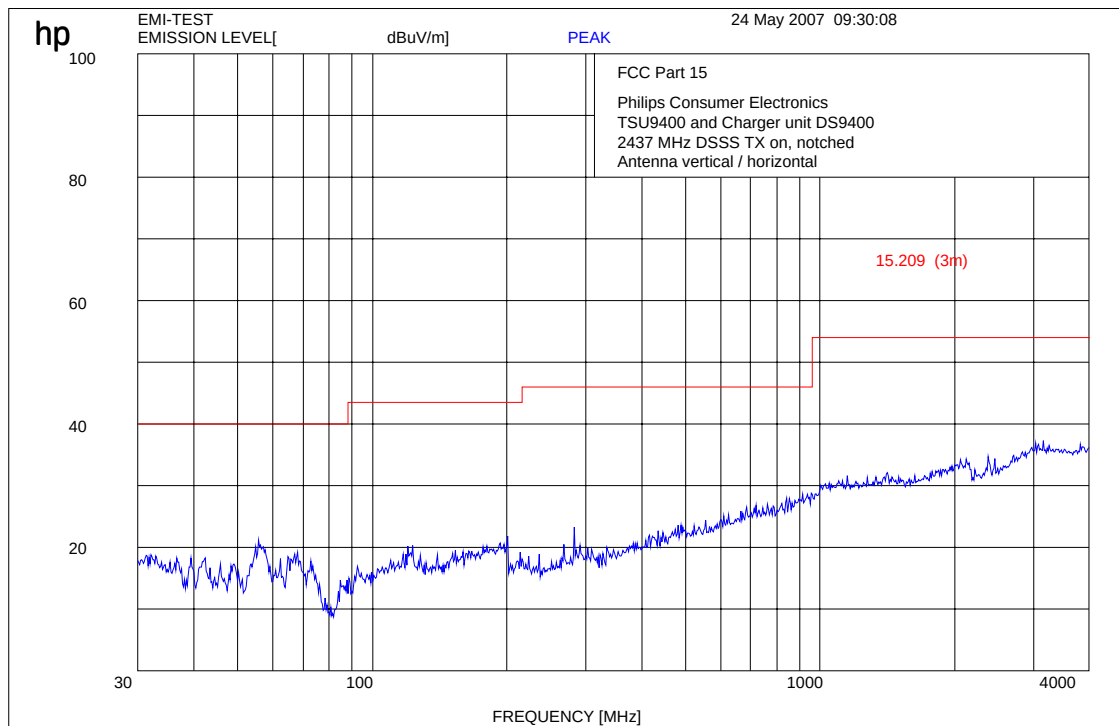
Plot 2: 4- 12 GHz (lowest channel) (DSSS)



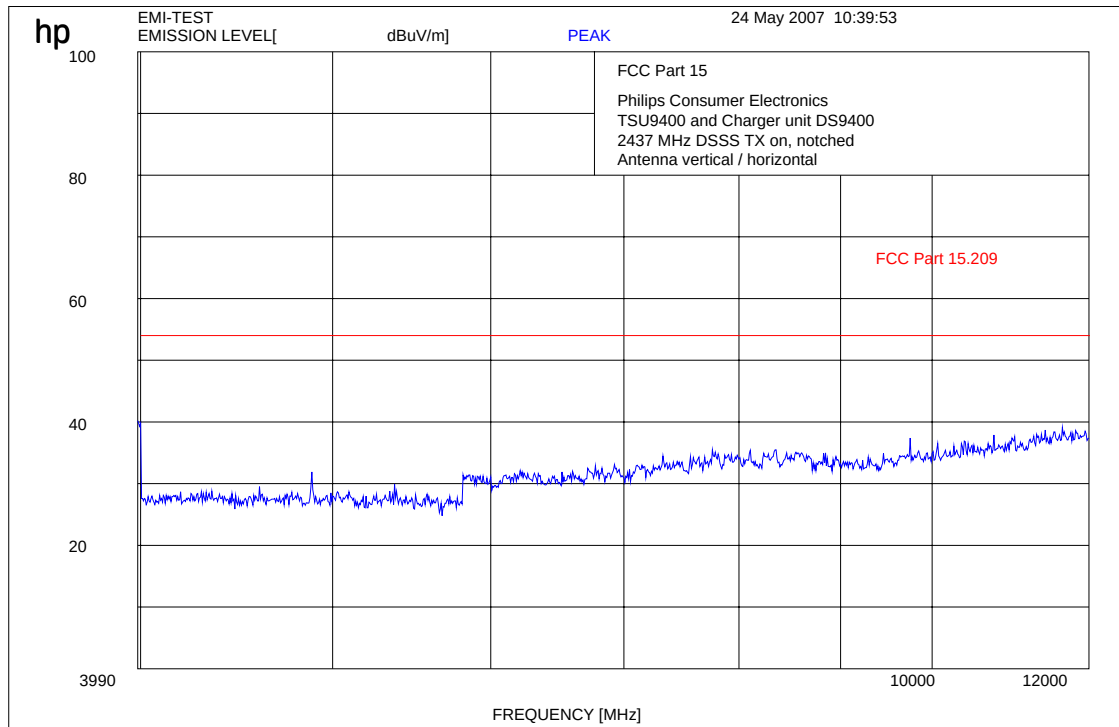
Plot 3: 12 – 25 GHz horizontal / vertical (valid for all three channels and both type of modulation)



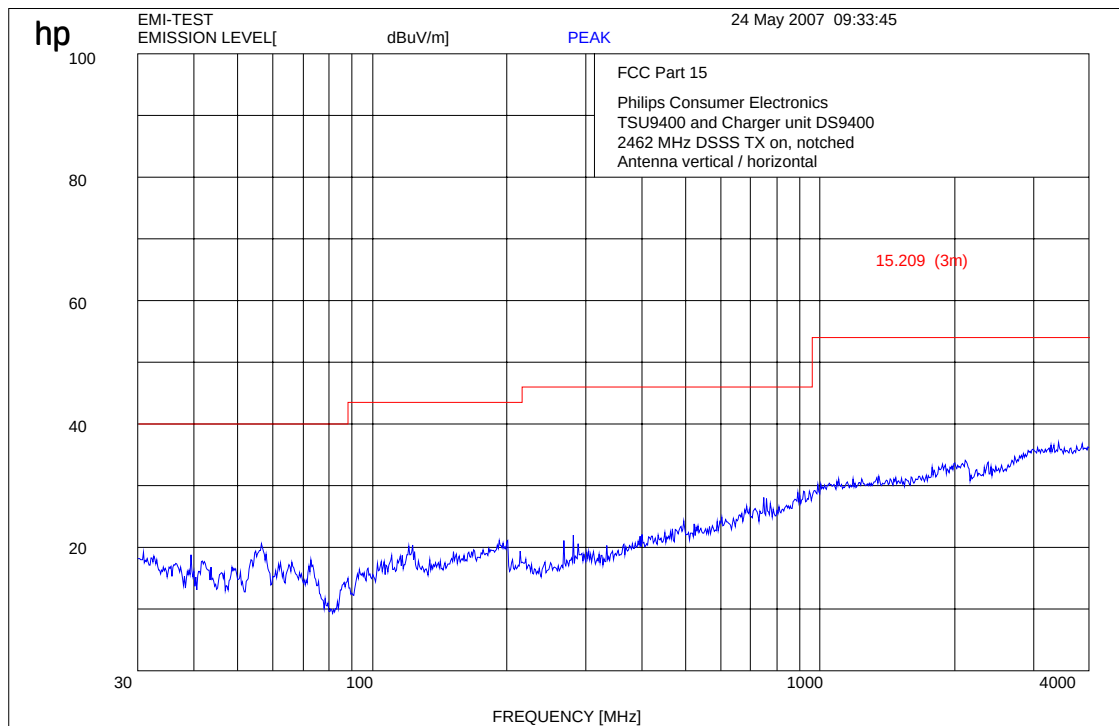
Plot 4: 0.03 - 4 GHz vertical / horizontal (middle channel) (DSSS)



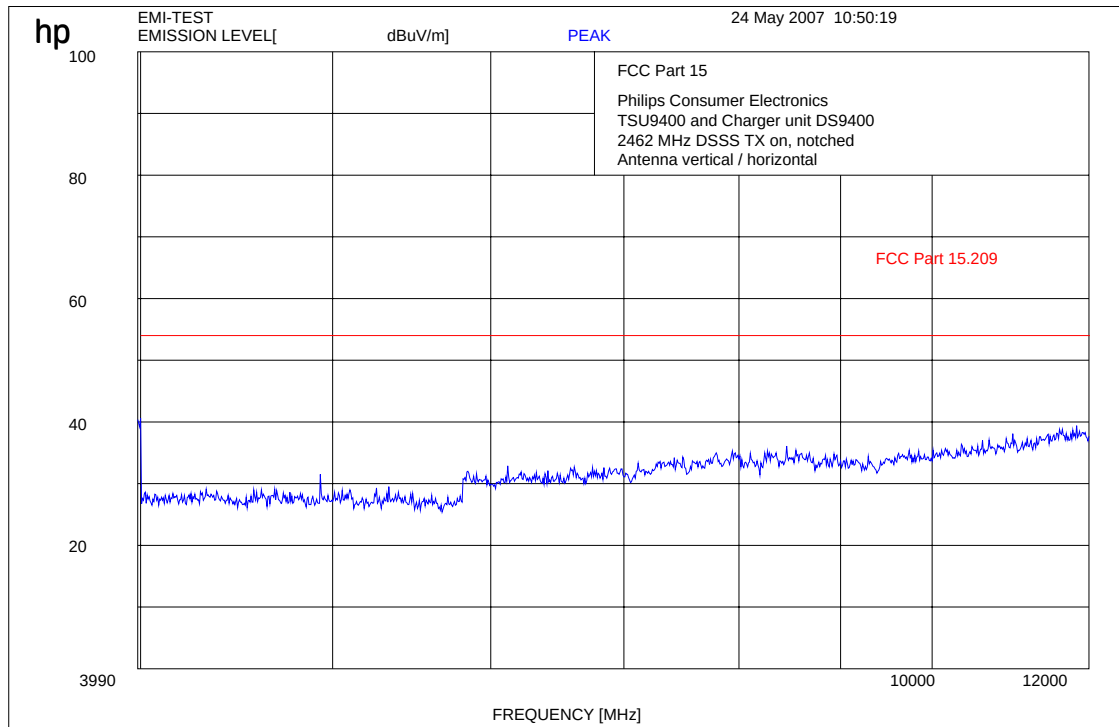
Plot 5: 4- 12 GHz (middle channel) (DSSS)



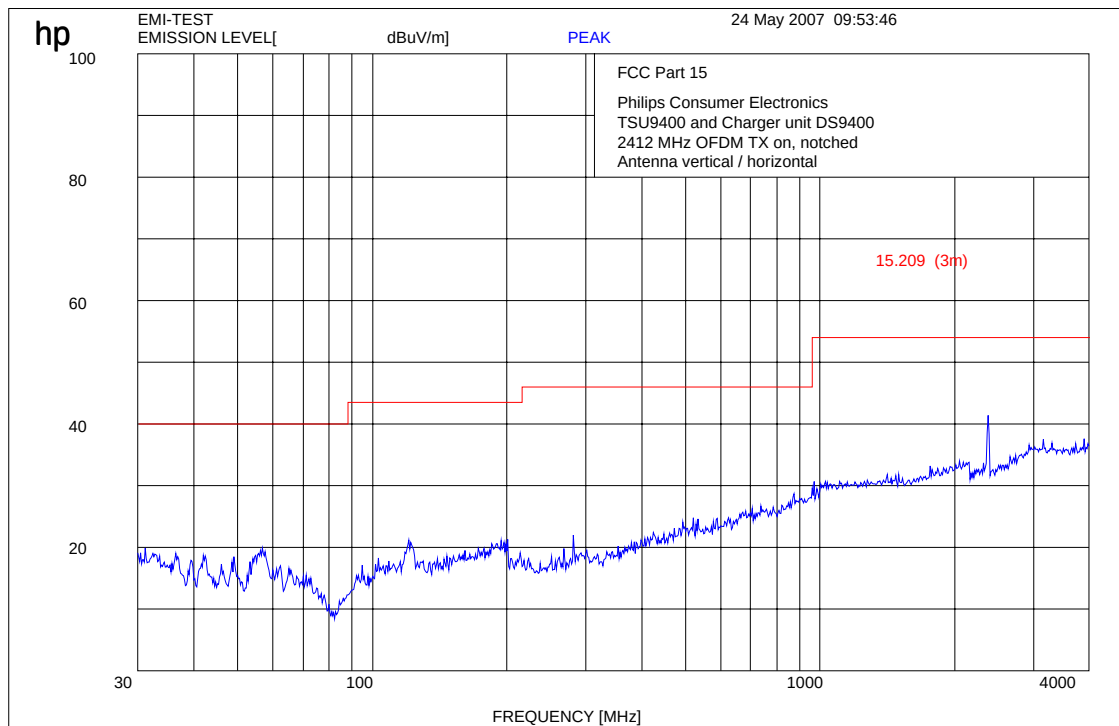
Plot 6: 0.03 - 4 GHz vertical / horizontal (highest channel) (DSSS)



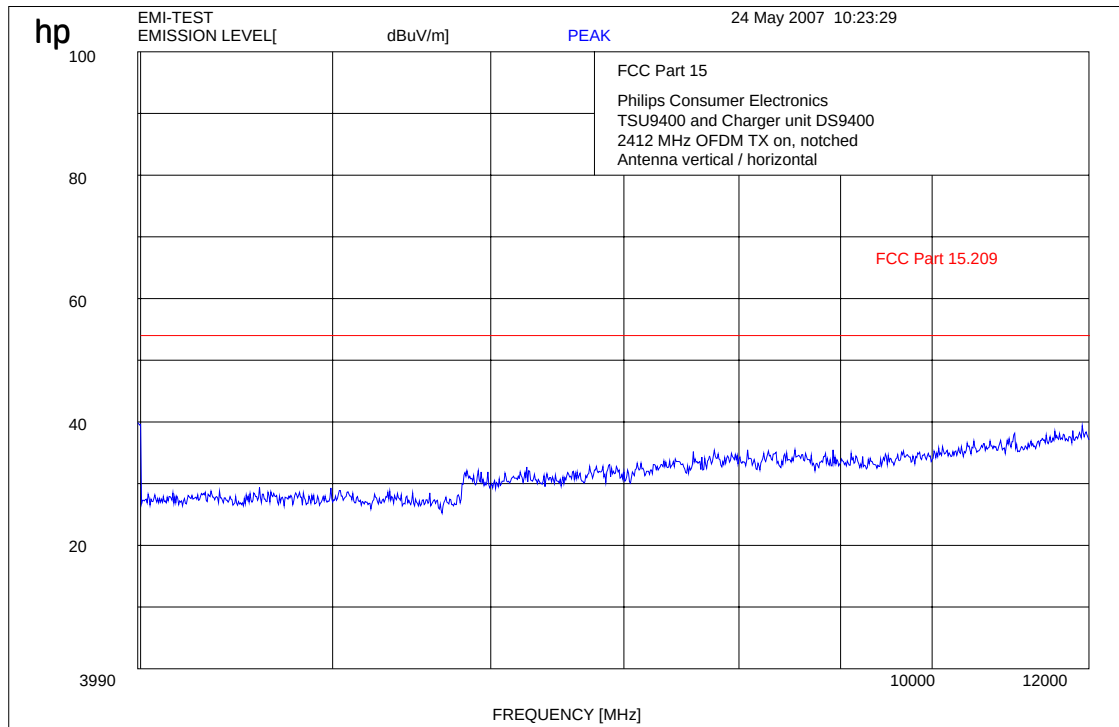
Plot 7: 4- 12 GHz (highest channel) (DSSS)



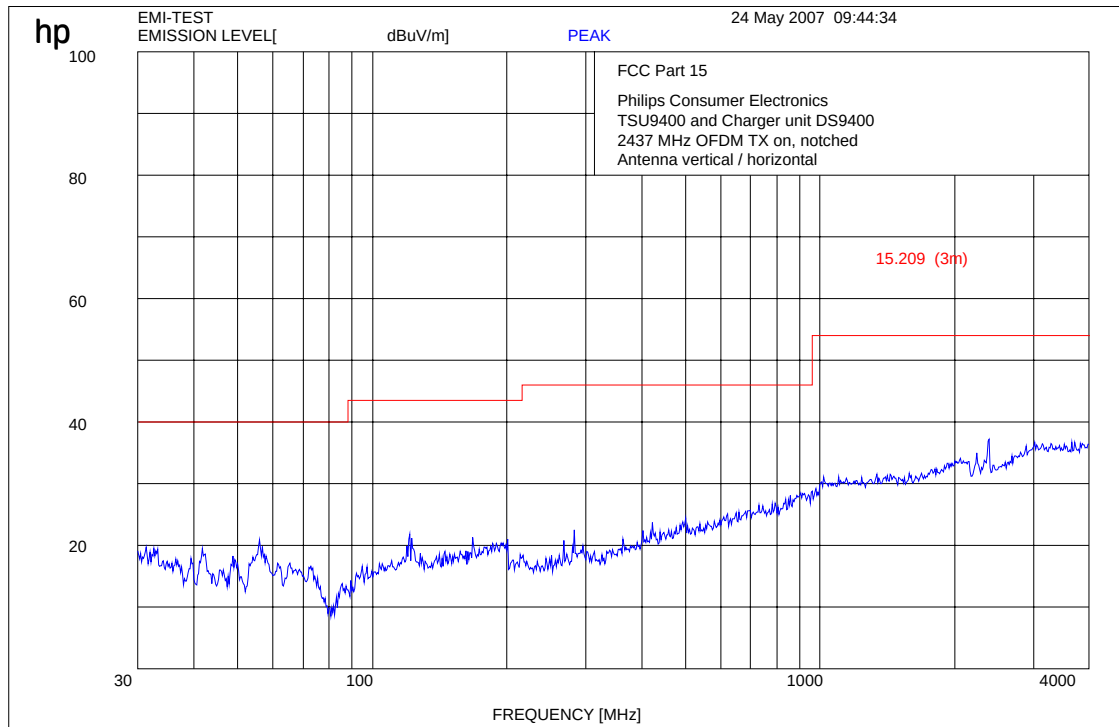
Plot 8: 0.03 - 4 GHz vertical / horizontal (lowest channel) (OFDM)



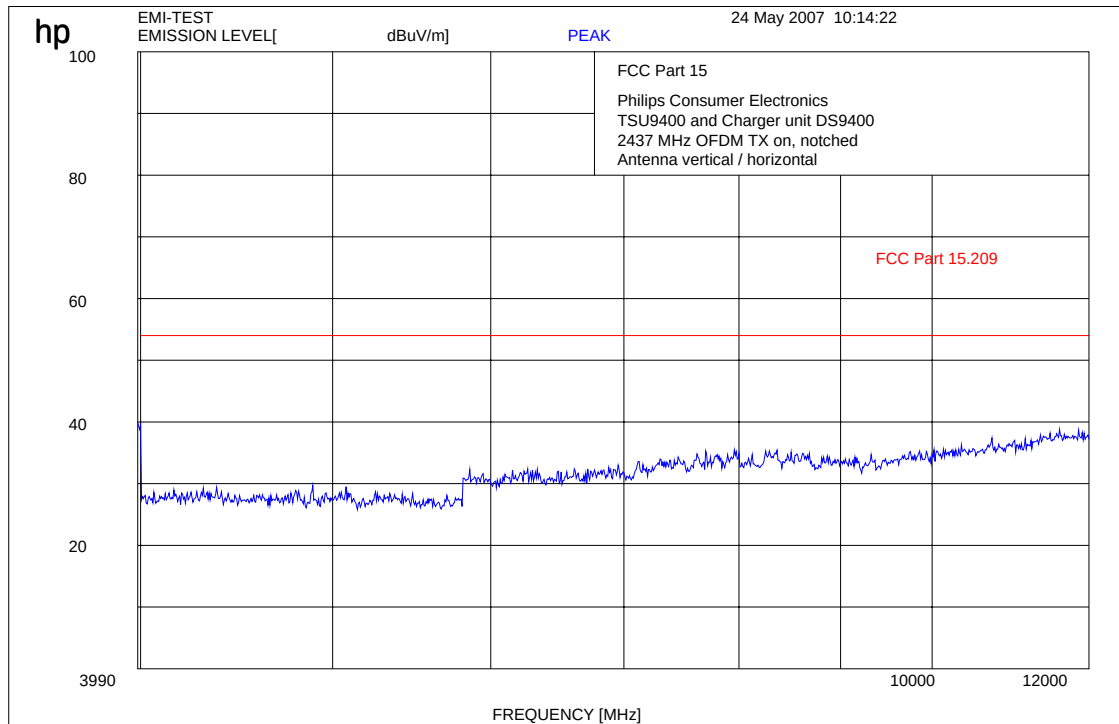
Plot 9: 4- 12 GHz (lowest channel) (OFDM)



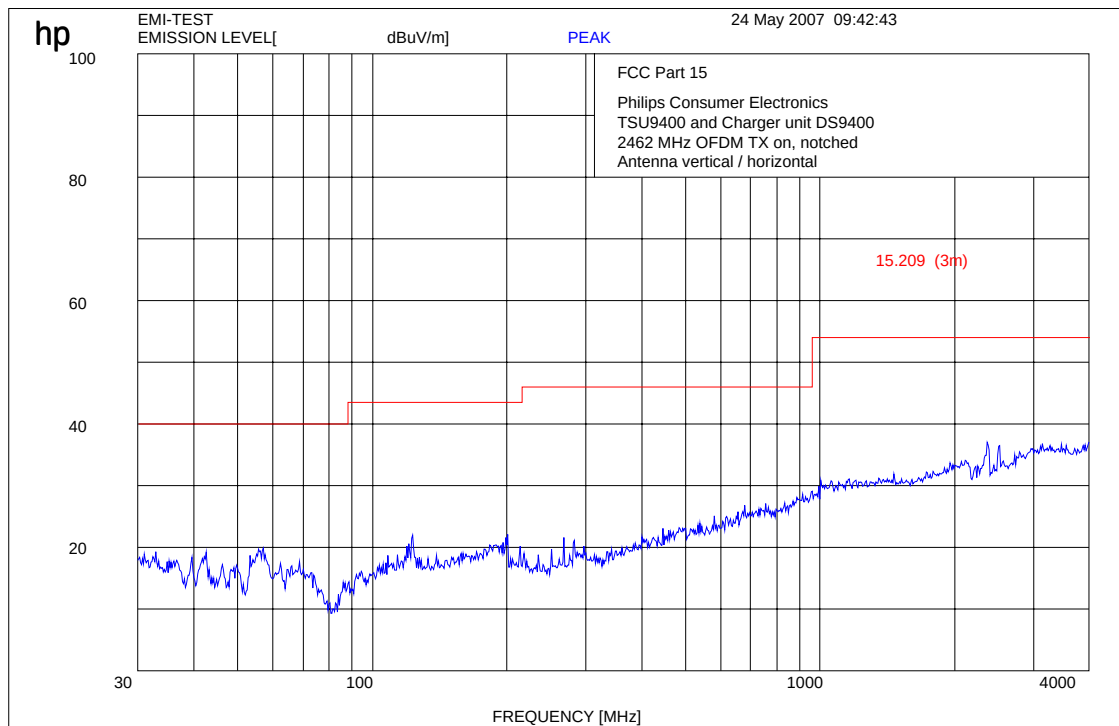
Plot 10: 0.03 - 4 GHz vertical / horizontal (middle channel) (OFDM)



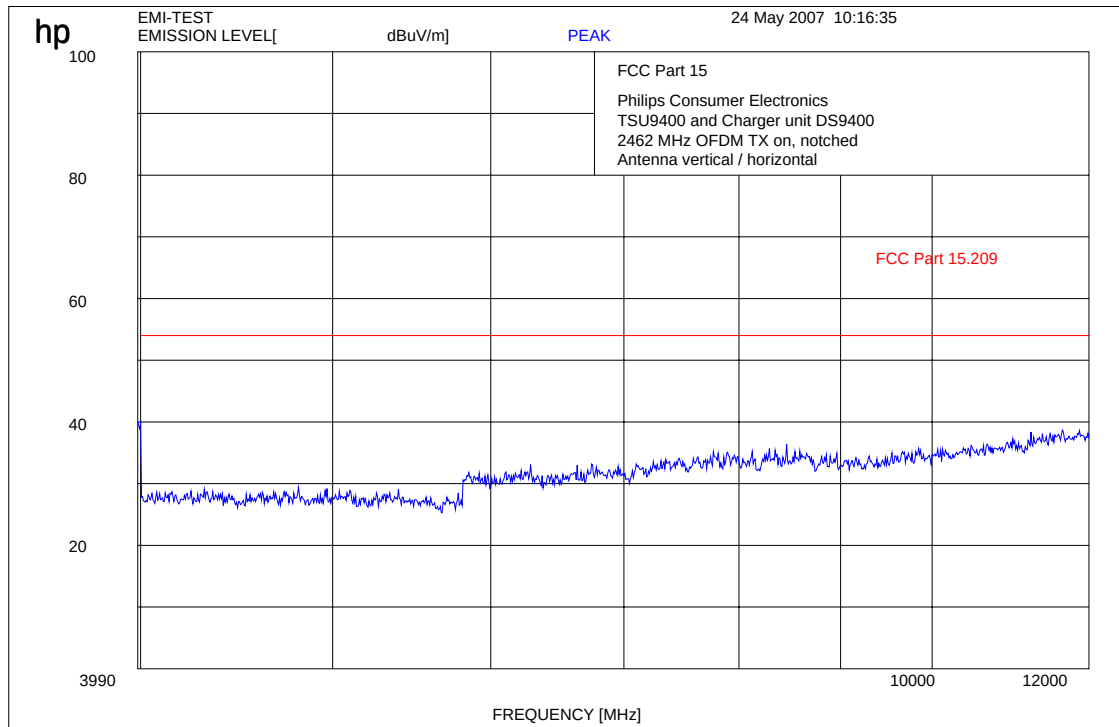
Plot 11: 4- 12 GHz (middle channel) (OFDM)



Plot 12: 0.03 - 4 GHz vertical / horizontal (highest channel) OFDM)



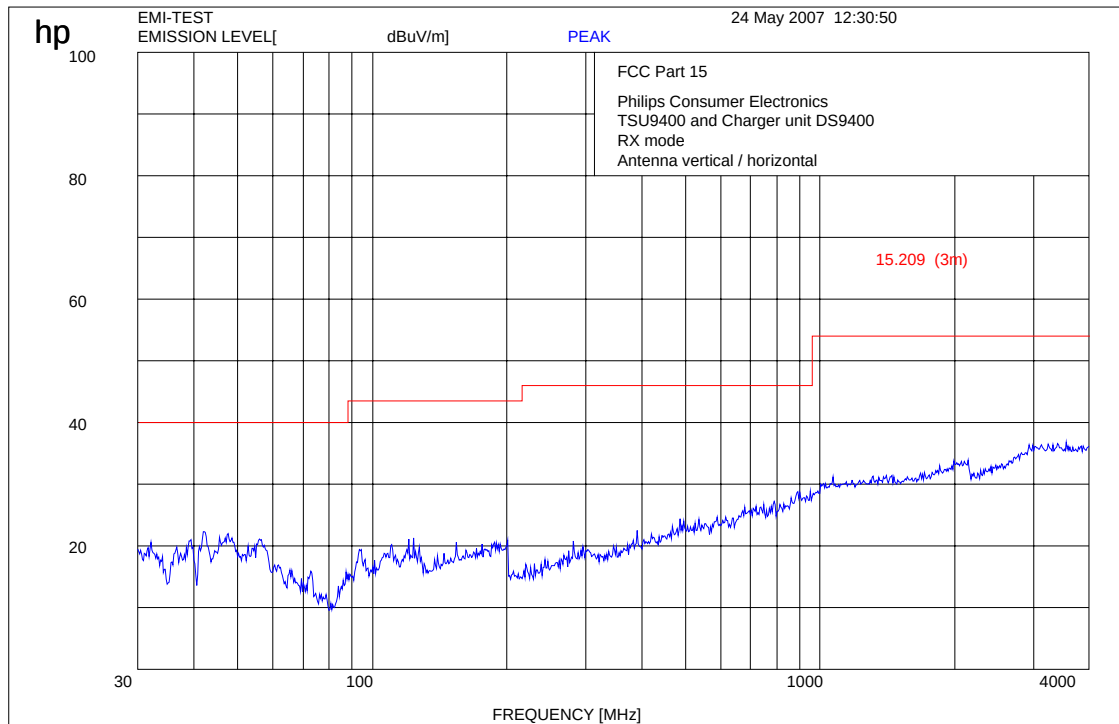
Plot 13: 4- 12 GHz (highest channel) (OFDM)



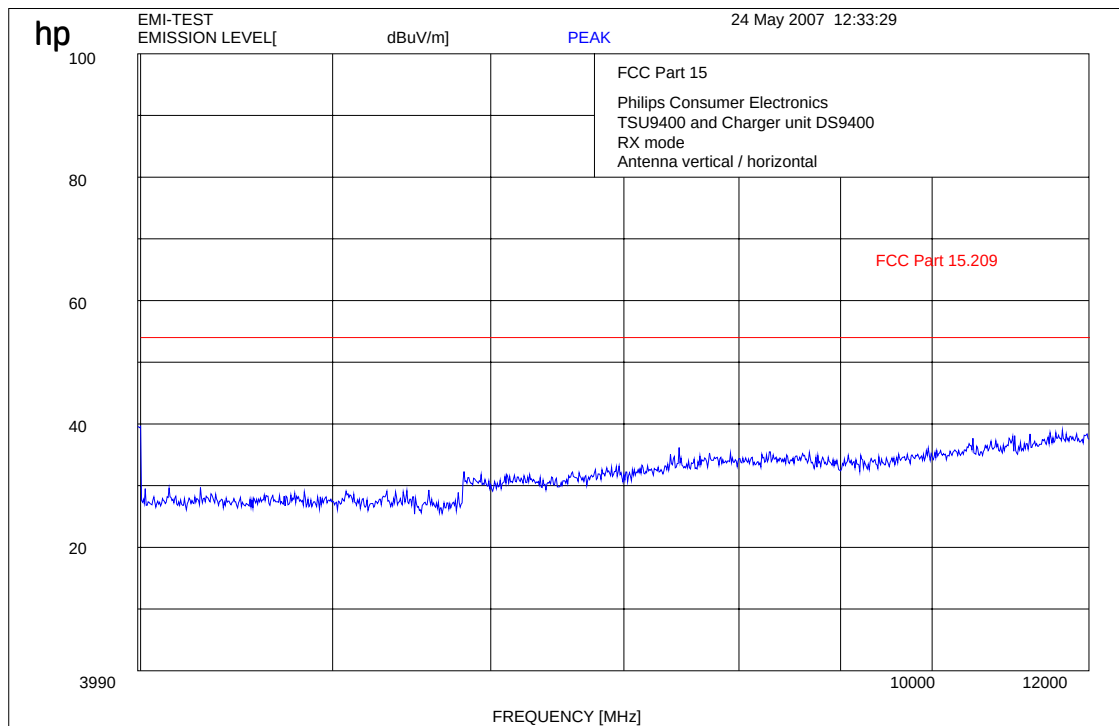
Frequency [MHz]	Field strength [$\mu\text{V/m}$]	Measurement distance (m)
30 - 88	100 (40 dB $\mu\text{V/m}$)	3
88 - 216	150 (43.5 dB $\mu\text{V/m}$)	3
216 - 960	200 (46 dB $\mu\text{V/m}$)	3
above 960	500 (54 dB $\mu\text{V/m}$)	3

3.13 Spurious Emissions - radiated (Receiver) §15.109 / 209

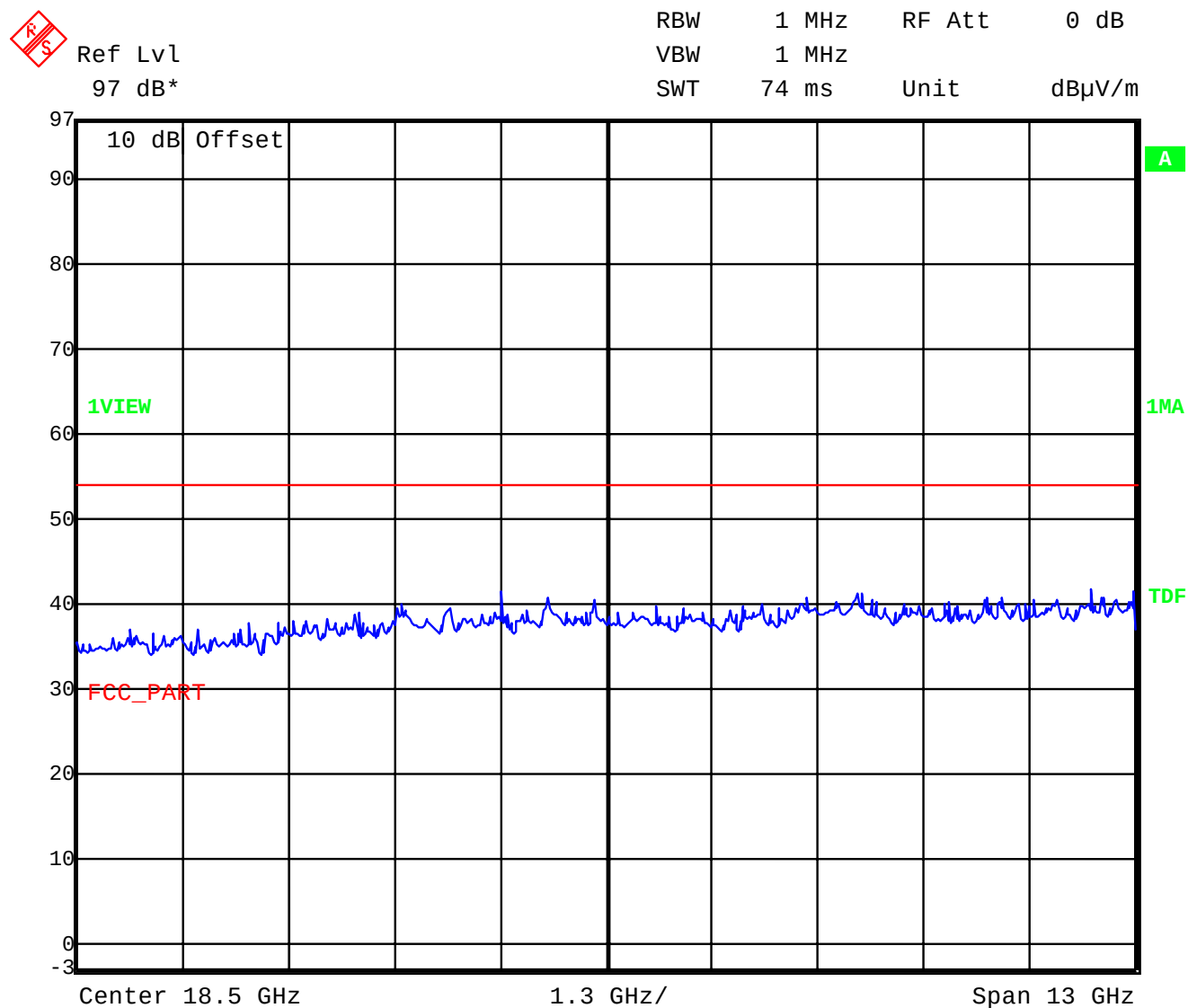
Plot 1: 0.03 - 4 GHz vertical / horizontal (receiver)



Plot 2: 4- 12 GHz (receiver)



Plot 3: 12- 25 GHz (receiver)



Results:

Spurious Emissions level [$\mu\text{V/m}$]								
CH 1 / 2 / 3								
f[MHz]	Detector	Level [$\mu\text{V/m}$]	f[MHz]	Detector	Level [$\mu\text{V/m}$]	f[MHz]	Detector	Level [$\mu\text{V/m}$]
no	peaks	found	< 20 dB	below	limit			
Measurement uncertainty			± 3 dB					

$f < 1$ GHz : RBW/VBW: 100 kHz

$f \geq 1$ GHz : RBW/VBW: 1 MHz

see above plots

Measurement distance see table

Limits : § 15.109 / 209

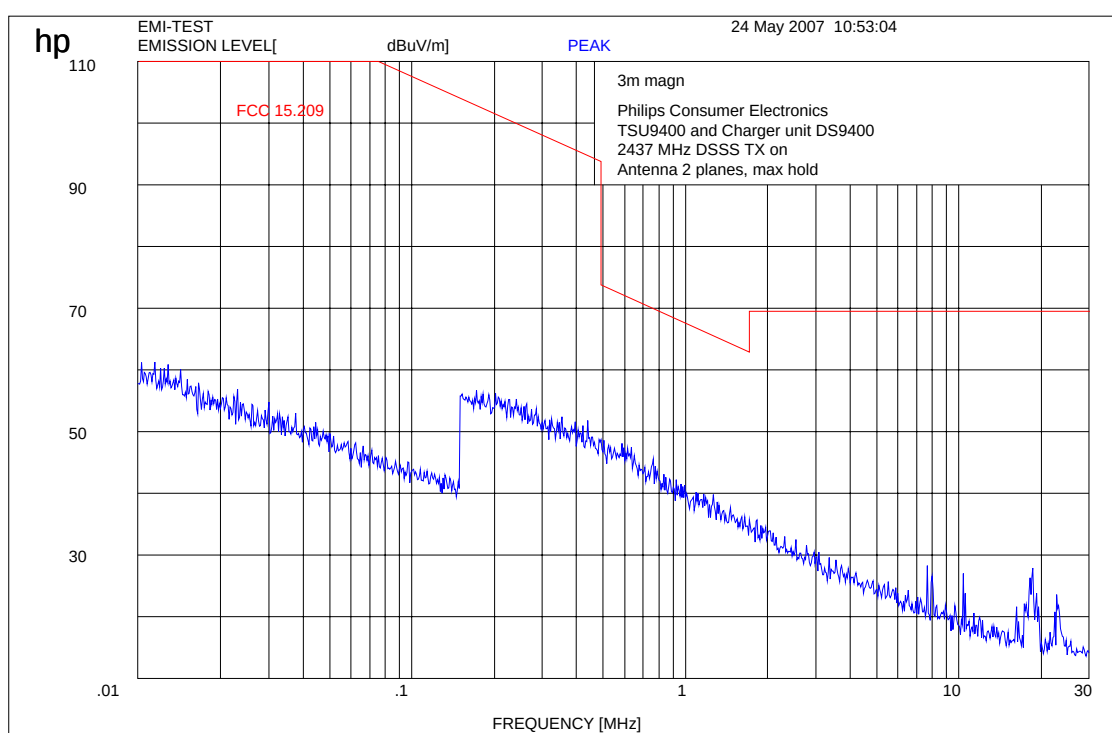
Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
30 - 88	100 (40 dB $\mu\text{V/m}$)	3
88 - 216	150 (43.5 dB $\mu\text{V/m}$)	3
216 - 960	200 (46 dB $\mu\text{V/m}$)	3
above 960	500 (54 dB $\mu\text{V/m}$)	3

3.14 Spurious Emissions - radiated <30 MHz §15.209

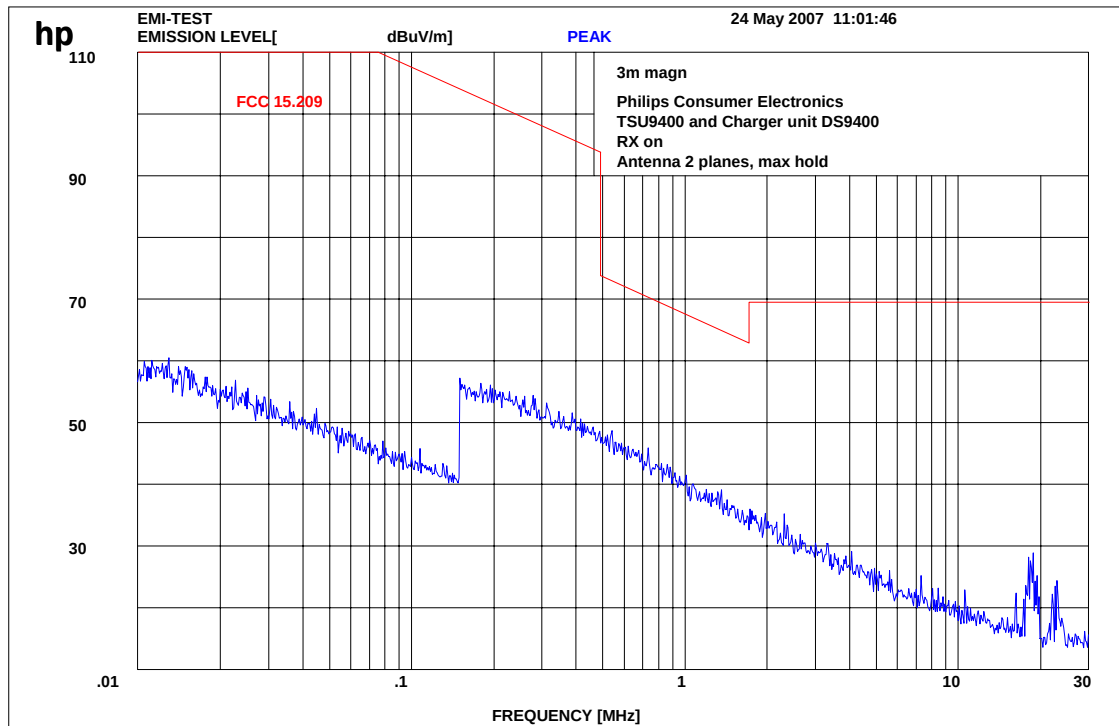
Measured at 3 m distance.

Values recalculated with 40 dB/decade according to FCC rules.

Plot 1: TX on



Plot 2: RX on

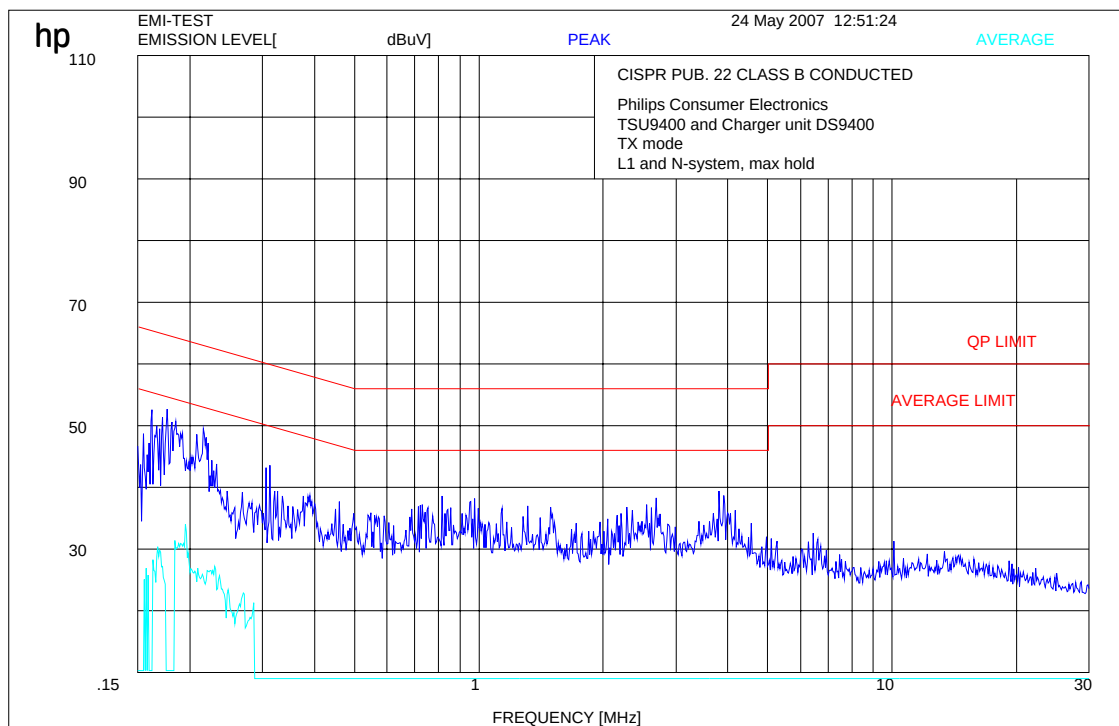


Limits:

Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	54 dB $\mu\text{V/m}$	3

3.15 Conducted Emissions <30 MHz §15.107/207

Plot 1: CISPR 22, Class B



We measured in TX and RX mode, L1 and N floating and grounded, max value was hold.

Limits :

Under normal test conditions only	See plots
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3.16 Used Testequipment

No.	Instrument/ Ancillary	Manufacturer	Type	Serial-No.	Internal ID No.	Last calibration	Calibration interval
Radiated emission in chamber C							
1.	Fully anechoic chamber	MWB		87400/02	300000996	n.a.	
2.	Bi conical antenna	EMCO	3104C	9909-4868	300002590	verification	
3.	Log. Per. antenna	EMCO	3146	2130	300001603	verification	
4.	Double ridge horn	EMCO	3115P	3088	300001032	verification	
5.	Active loop antenna	EMCO	6502	2210	300001015	verification	
6.	Loop antenna	Rohde & Schwarz	HFH2-Z2	891847-35	300001169	verification	
7.	Spectrum analyzer	Hewlett-Packard	8566B	2747A05306	300001000	29-Mrz-06	24
8.	Spectrum analyzer display	Hewlett-Packard	85662A	2816A16541	300002297	29-Mrz-06	24
9.	Quasi peak adapter	Hewlett-Packard	85650A	2811A01131	300000999	29-Mrz-06	24
10.	RF pre selector	Hewlett-Packard	85685A	2833A00768	400000081	29-Mrz-06	24
11.	Workstation	Hewlett-Packard	Vectra VL		300001688	n.a.	
12.	Software	Hewlett-Packard	EMI Halle C		300000983	n.a.	
13.	Power attenuator	Byrd	8325	1530	300001595	n.a.	
14.	Band reject filter	Wainwright	WRCG1855/1910	7	300003350	n.a.	
15.	Band reject filter	Wainwright	WRCG2400/2483	11	300003351	n.a.	
16.	Power supply unit	Hewlett-Packard	6032A	2818A03450	300001040	17-Mrz-06	24
17.	Universal communication tester	Rohde & Schwarz	CMU 200	103992	300003231	17-Mrz-06	24
Laboratories Short Range Devices							
18.	Amplifier	Parzich GMBH	js42-00502650- 28-5a	928979	300003143	04-Nov-06	24
19.	Analog-/Digital multi- meter		DF-971A	438309, 438320, 438361	400000082	15-Apr-07	24
20.	Audio Analyzer 2Hz - 300 kHz	Rohde & Schwarz	UPD	841074/009	300001236	22-Apr-06	24
21.	Bit error analyzer	Hewlett-Packard	37732A	3606U03073	300001446	04-Mai-06	24
22.	Communication tester	Rohde & Schwarz	CMD55	831050/082	300003018	28-Jan-07	24
23.	Communication test Set	Schlumberger	4040	1725117	300001387	08-Jul-07	24
24.	Directional coupler	Amplifier Research	DC 3010	12709	300001226	n.a.	
25.	Directional coupler	EMV	DC3010	12306	300001429	n.a.	
26.	Field strength meter (Near field probe)	EMCO	7405	9202-2150	300001203	n.a.	
27.	Frequency Counter	Hewlett-Packard	5386A	2704A01243	300000998	30-Mrz-06	24
28.	Climatic chamber	Heraeus Voetsch	VT 4002	5,8566E+13	300003019	12-Dez-05	24
29.	Climatic chamber	Heraeus Voetsch	VT 4002	521/83761	300002326	21-Jan-06	24
30.	Power measuring head	Hewlett-Packard	8484A	2237A10156	300001140	11-Mrz-06	24
31.	Power measuring head	Hewlett-Packard	8482A	2237A06016	300001139	09-Mrz-06	24
32.	Power measuring head	Hewlett-Packard	8484A	2237A10494	300001666	11-Mrz-06	24
33.	Power measuring head	Hewlett-Packard	8482A	1925A04674	300001667	09-Mrz-06	24
34.	Power measuring head	Hewlett-Packard	8485A	2238A00849	300001668	14-Mrz-06	24
35.	Power measuring head	Hewlett-Packard	8482A	2237A06009	300001267	09-Mrz-06	24
36.	Power measuring head (attenuator)	Hewlett-Packard	8482B	2703A02586	300001492	14-Mrz-06	24
37.	Local Oscillator	Hewlett-Packard	70900A	2842A02221	300002019	18-Sep-05	36
38.	Measurement Receiver	Rohde & Schwarz	ESH 2	871921/095	300002505	22-Apr-06	24
39.	Spectrum analyzer	Rohde & Schwarz	FSU50	2000012	300003443	12-Jan-07	24
40.	Signal generator	Rohde & Schwarz	SMU 200A	101633	300003496	11-Dec-06	24
41.	Multi-meter digital	Rohde & Schwarz	UDS 5	872677/042	300001325	21-Okt-06	24
42.	Power supply	Hewlett-Packard	6038A	3122A11097	300001204	17-Mrz-06	24
43.	Power supply	Hewlett-Packard	6038A	2848A07027	300001174	17-Mrz-06	24
44.	Power supply	Zentro	2X30V	2007	300001109	verification	24
45.	Power supply	Hewlett-Packard	6038A	2752A04866	300001161	17-Mrz-06	24
46.	Power supply	Heiden	1108-32	1701	300001392	verification	24
47.	Power supply	Heiden	1108-32	1802	300001383	verification	24
48.	Power supply	Heiden	1108-32	3202	300001187	verification	24