SPORTON International Inc.
No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw

FCC RADIO TEST REPORT

Applicant's company	**Trapeze Networks Inc.**
Applicant Address	5753 W. Las Positas Blvd. Pleasanton, CA 94588, US
FCC ID	**QZE250**
Manufacturer's company	**Alpha Networks Inc.**
Manufacturer Address	No. 8, Li-Hsin VII Road,Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.

Product Name	Dual mode 2.4GHz / 5GHz Access Point
Brand Name	Trapeze Networks, Enterasys
Model Name	400, RBT-161x-xx
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725~5850 MHz
Received Date	Oct. 27, 2006
Final Test Date	Nov. 30, 2006
Submission Type	Original Equipment

Statement

Test result included is only for the 802.11b/g part and 802.11a (5725 ~ 5850MHz) of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Lab Code: 200079-0

Table of Contents

History of This Test Report

Original Issue Date: Dec. 01, 2006

Report No.: FR6O2612AB

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Dual mode 2.4GHz / 5GHz Access Point
Brand Name	:	Trapeze Networks, Enterasys
Model Name	:	400, RBT-161x-xx
Applicant	:	Trapeze Networks Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Oct. 27, 2006 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Prepared By:	Tested By:	Reviewed By:
Tina Jao / Specialist	Sam Lee / Engineer	Roger Sheng / Manager

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	1.98 dB
4.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	3.06 dB
4.3	15.247(e)	Power Spectral Density	Complies	3.63 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	1.10 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.16 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

EUT is a Wireless Access Point with IEEE 802.11a/b/g radio functions. Only the radio detail of WLAN is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

This equipment will be marketed and installed by specific contract retailer.

The installation of this equipment is only be performed by well-trained and qualified personnel.

Items	Description
Power Type	48V DC from POE
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725~5850 MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	5725~5850 MHz : 16.56 MHz 2400 ~ 2483.5MHz : 11b: 15.92 MHz ; 11g: 16.52 MHz
Conducted Output Power	2400 ~ 2483.5MHz / 5725~5850 MHz : 11b: 26.16 dBm ; 11g: 26.94 dBm ; 11a: 24.25 dBm

3.2. Accessories

N/A

3.3. Table for Filed Antenna

For 5GHz Band antennas

Ant.	Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)	REMARK
1	**Wha Yu Industrial Co**	**C037-520720-A***	**F Type**	**NA**	**3.00**	**(Internal)**
2	ASTRON	ANT-5180 (ASTN6H)	180° Panel Ant.	Reversed-SMA	10.80	(External)
3	ASTRON	ANT-5120 (ASTN6T)	120° Panel Ant.	Reversed-SMA	12.50	(External)
4	**ASTRON**	**ANT-5060 (ASTN6S)***	**60° Panel Ant.**	**Reversed-SMA**	**14.50**	**(External)**

"*": The antenna internal F Type (3.00dBi) and external 60° Panel Antenna (14.50dBi) with highest antenna gain were configured with EUT during test.

For 2.4GHz Band antennas

Ant.	Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)	REMARK
1	**Wha Yu Industrial Co**	**C037-520721-A***	**F Type**	**NA**	**3.00**	**(Internal)**
2	ASTRON	AST12H (ANT1180)	180° Panel Ant.	Reversed-SMA	6.00	(External)
3	ASTRON	ASTG11T (ANT1120)	120° Panel Ant.	Reversed-SMA	7.00	(External)
4	**ASTRON**	**ASTG11* (ANT1060)**	**60° Panel Ant.**	**Reversed-SMA**	**10.00**	**(External)**

"*": The antenna internal F Type (3.00dBi) and external 60° Panel Antenna (10dBi) with highest antenna gain were configured with EUT during test.

Dual band antennas

For 5GHz Band

Ant.	Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)	REMARK
1	HUBER+SUHNER	SWA 2459/360/7/20/V	OMNI Antenna	N Type*	8.00	(External)
2	MAXRAD	MMO24580608	Omni directional Antenna	N Type*	8.00	(External)

Both antennas were configured with EUT during test.

*: For professional installation

For 2.4GHz Band

Ant.	Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)	REMARK
1	HUBER+SUHNER	SWA 2459/360/7/20/V (ANT7360)	OMNI Antenna	N Type*	6.00	(External)
2	MAXRAD	MMO24580608 (ANT-7360-OUT)	Omni directional Antenna	N Type*	6.00	(External)

Both antennas were configured with EUT during test.

*: For professional installation

3.4. Table for Carrier Frequencies

Frequency Allocation for 802.11b/g

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz		

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz (USA/Canada/Taiwan)	149	5745 MHz	161	5805 MHz
	153	5765 MHz	165	5825 MHz
	157	5785 MHz		

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
AC Power Line Conducted Emissions	Normal Link	11 Mbps	6
Max. Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	11b/CCK	11 Mbps	1/6/11
	11g/BPSK	6 Mbps	1/6/11
	11a/BPSK	6 Mbps	149/157/165
Radiated Emissions Below 1GHz	11g/BPSK	6 Mbps	6
Radiated Emissions Above 1GHz Band Edge Emissions	11b/CCK	11 Mbps	1/6/11
	11g/BPSK	6 Mbps	1/6/11
	11a/BPSK	6 Mbps	149/157/165
Band Edge Emissions	11b/CCK	11 Mbps	1/11
	11g/BPSK	6 Mbps	1/11
	11a/BPSK	6 Mbps	149/165

Note: There are four test modes shown in the table below:

Mode 1: Internal F Type Antenna, **C037-520721-A**. for IEEE 802.11a and IEEE 802.11b/g.

Mode 2: External Antenna, **ANT-5060 (ASTN6S)**, for IEEE 802.11a and external Antenna, **ASTG11**, for IEEE 802.11b/g.

Mode 3: External Antenna, **SWA 2459/360/7/20/V**, for IEEE 802.11a and IEEE 802.11b/g.

Mode 4: External Antenna, **MMO24580608**, for IEEE 802.11a and IEEE 802.11b/g.

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO04-HY	Conduction	Hwa Ya	-	-	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook (Remote workstation)	DELL	PP01L	DoC
POE	Trapeze	MXR-2	DoC
Adapter	LB	SA06L48-V	DoC

3.8. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Mode 1: Internal F Type Antenna, **C037-520721-A**. for IEEE 802.11a

Test Software Version	ART V5.2		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	20	20	20

Mode 1: Internal F Type Antenna, **C037-520721-A**. for IEEE 802.11b/g

Test Software Version	ART V5.2		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	21	21	21
IEEE 802.11g	21.5	22	21

Mode 2: External Antenna, **ANT-5060 (ASTN6S)**, for IEEE 802.11a

Test Software Version	ART V5.2		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	17	17.5	17.5

Mode 2: External Antenna, **ASTG11**, for IEEE 802.11b/g.

Test Software Version	ART V5.2		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	15.5	18	18
IEEE 802.11g	11	16	12

Mode 3: External Antenna, **SWA 2459/360/7/20/V**, for IEEE 802.11a

Test Software Version	ART V5.2		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	22	22	22

Mode 3: External Antenna, **SWA 2459/360/7/20/V**, for IEEE 802.11b/g.

Test Software Version	ART V5.2		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	21	21	21
IEEE 802.11g	19	21	21

Mode 4: External Antenna, **MMO24580608**, for IEEE 802.11a.

Test Software Version	ART V5.2		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	22	22	22

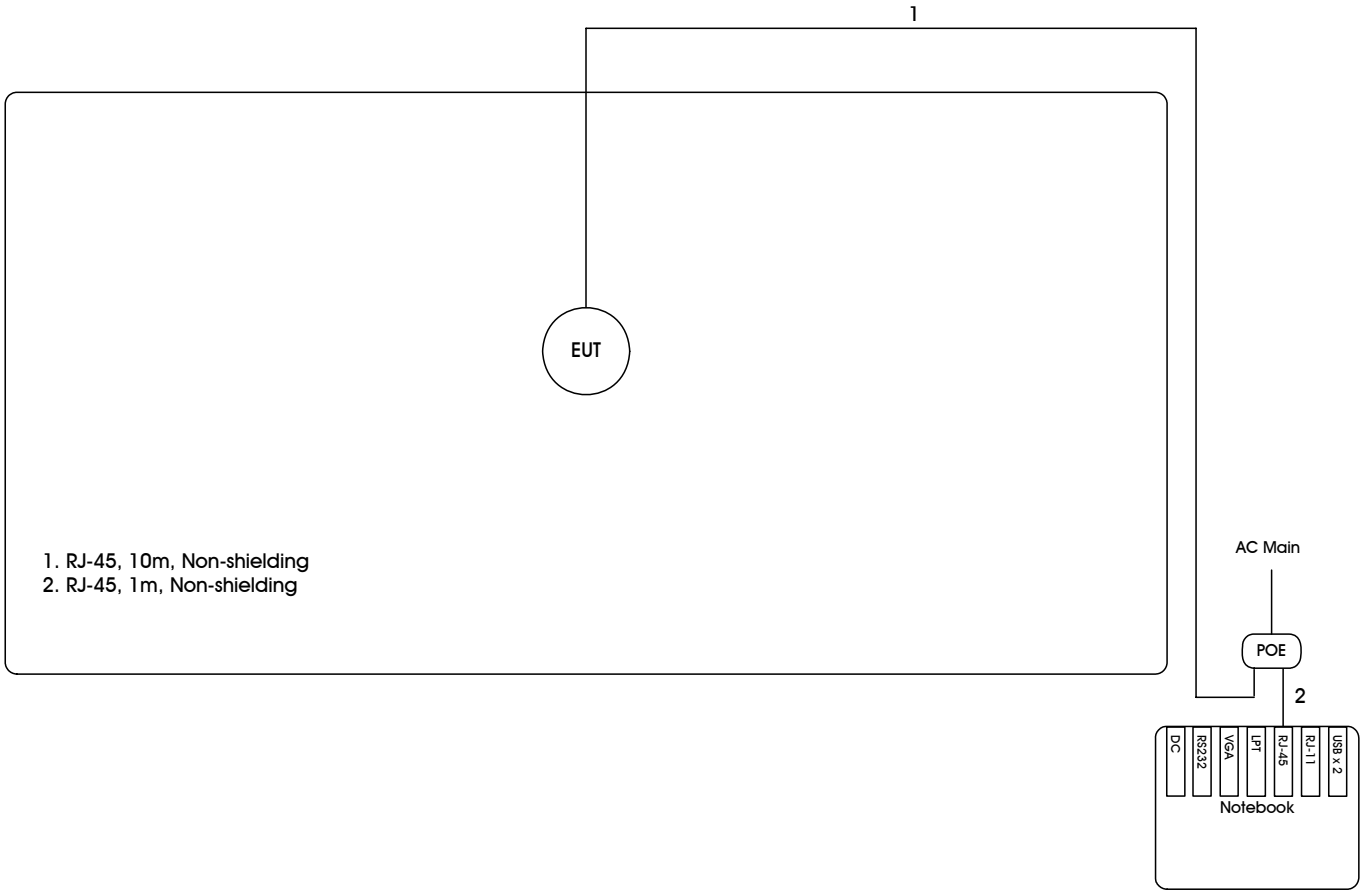
Mode 4: External Antenna, **MMO24580608**, for IEEE 802.11b/g.

Test Software Version	ART V5.2		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	21	21	20.5
IEEE 802.11g	16.5	16.5	16.5

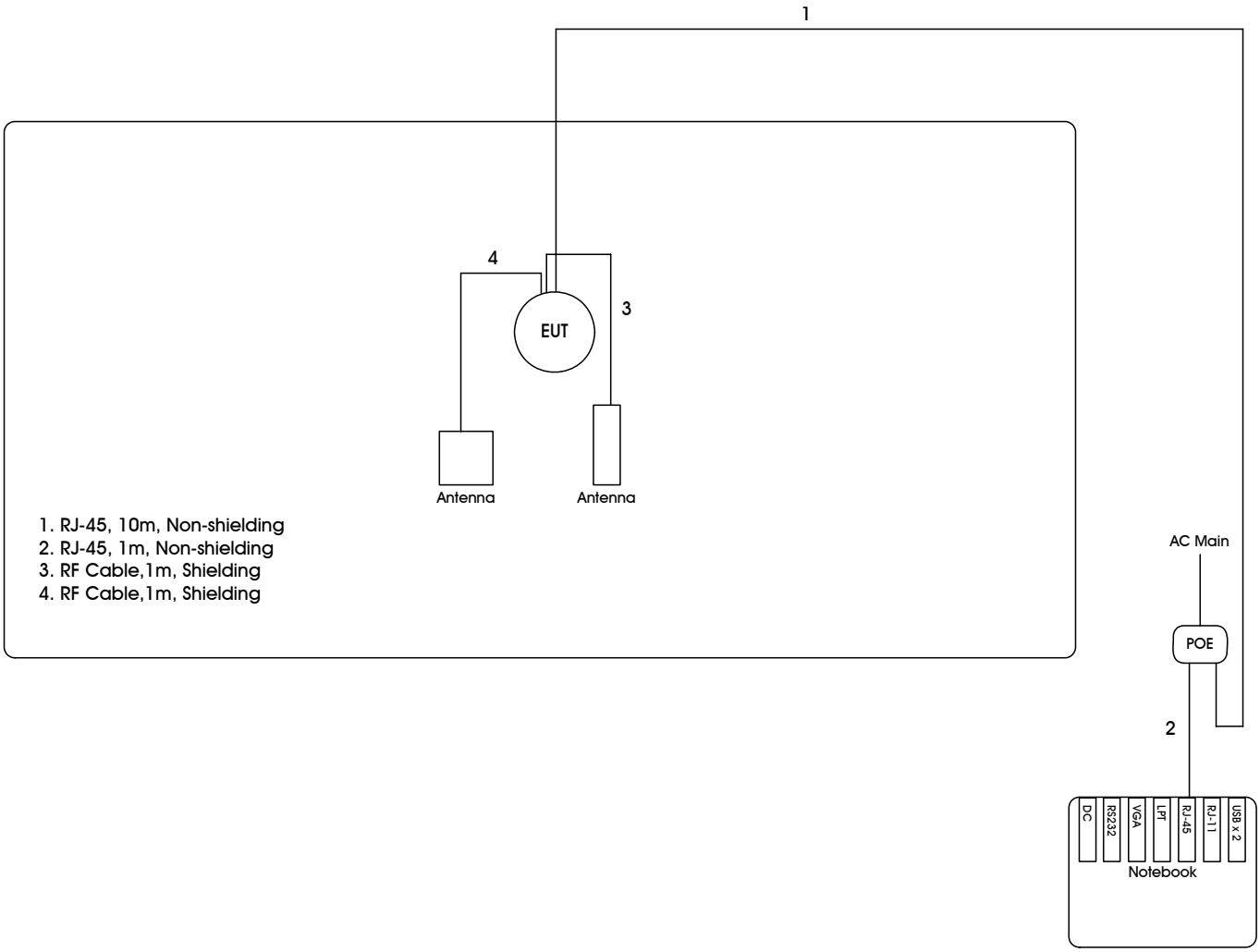
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration

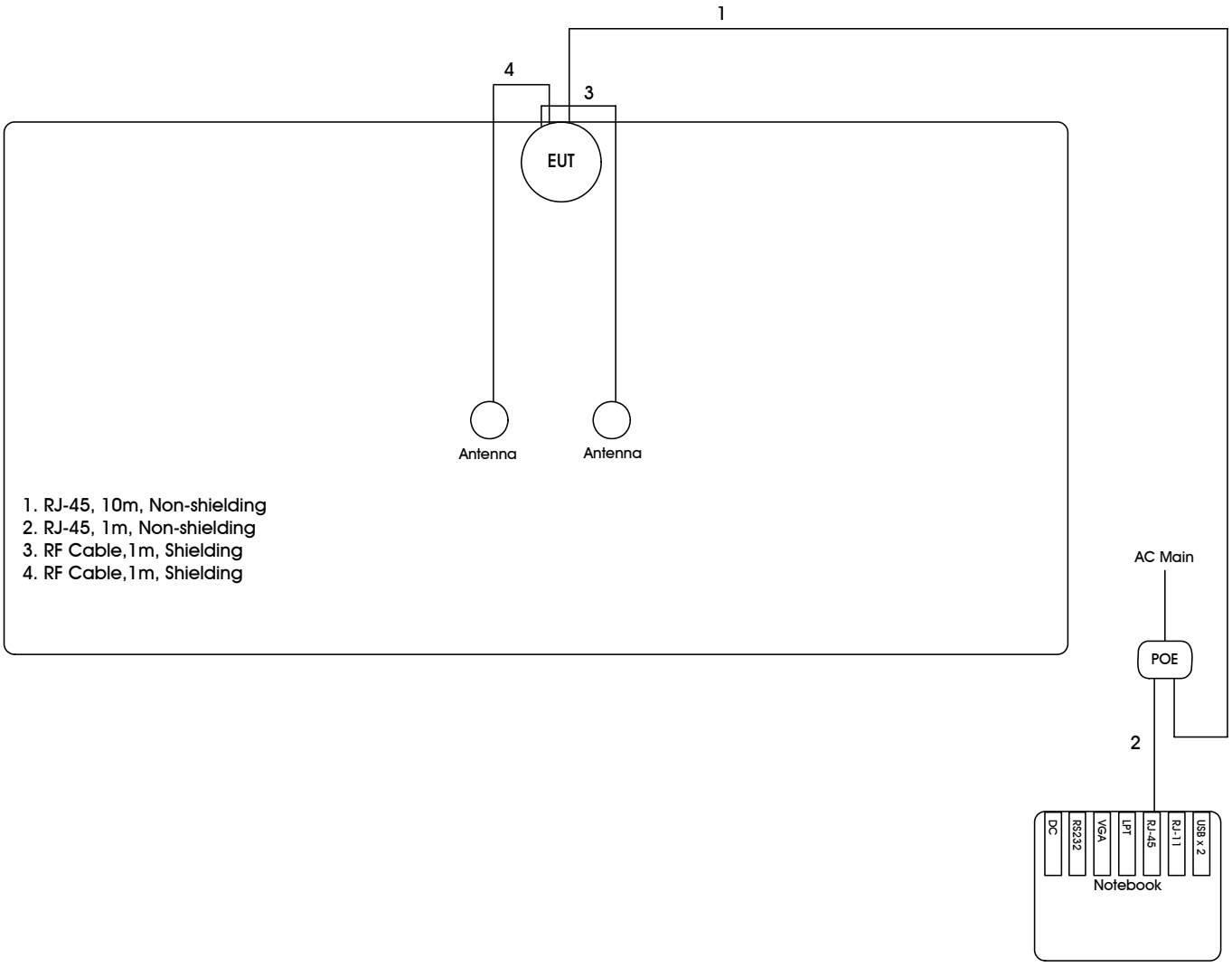
Mode 1: Internal Antenna (F Type Ant. 1) for IEEE 802.11a



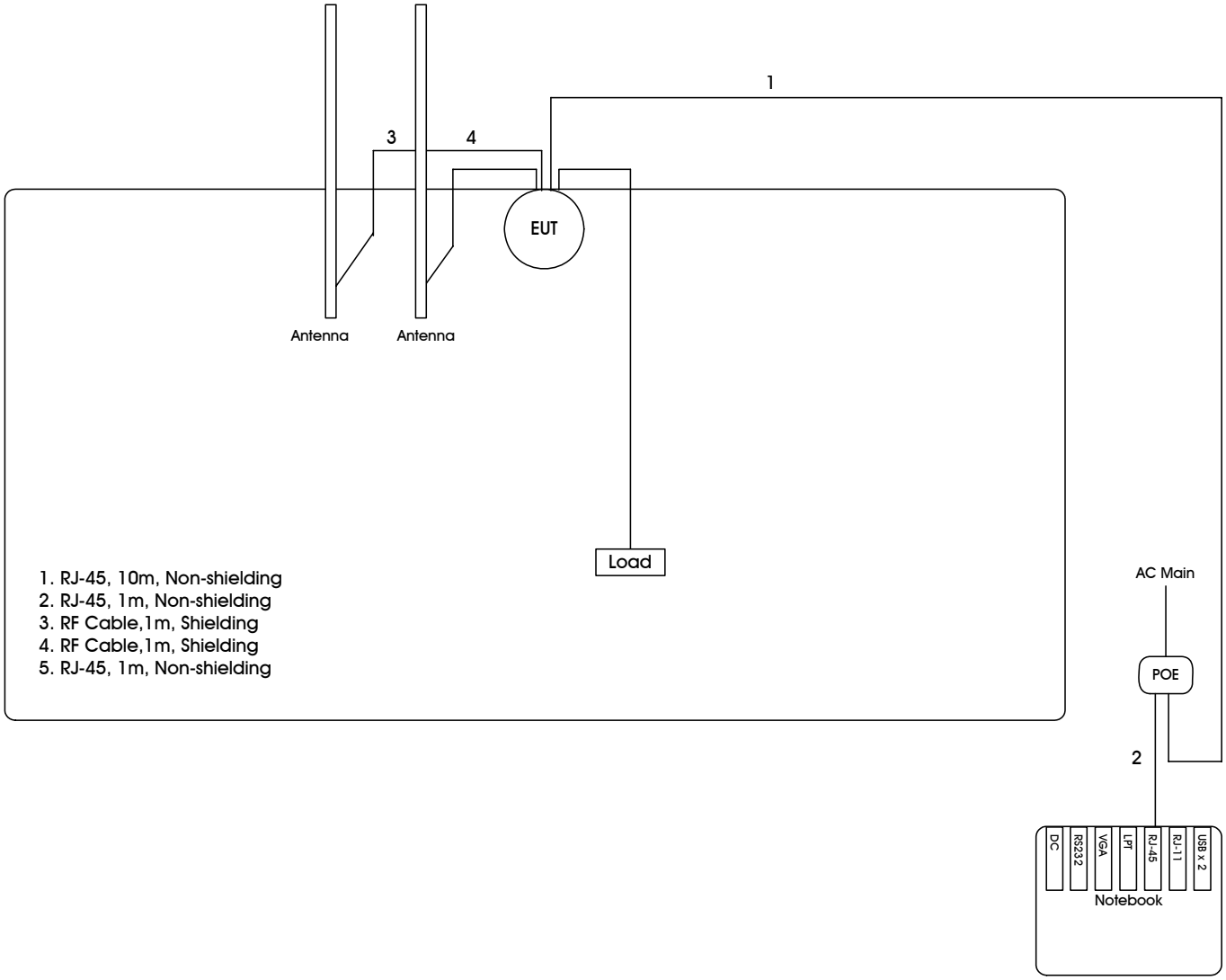
Mode 2: External Antenna, ANT-5060 (ASTN6S), for IEEE 802.11a and external Antenna, ASTG11, for IEEE 802.11b/g.



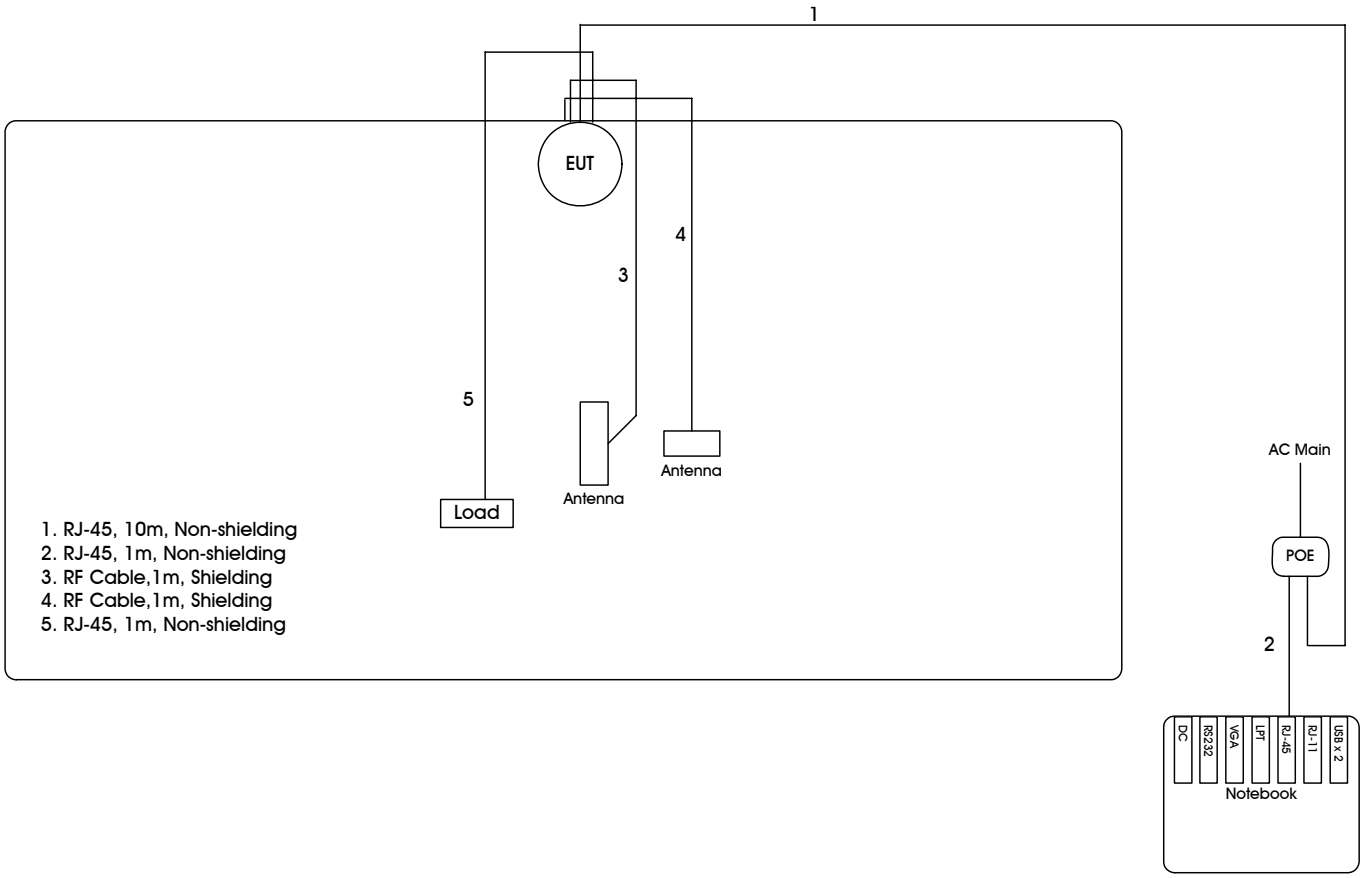
Mode 3: Omni ANT for 5GHz and 2.4GHz.



Mode 4: Omnidirectional for 5GHz and 2.4GHz.



3.9.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

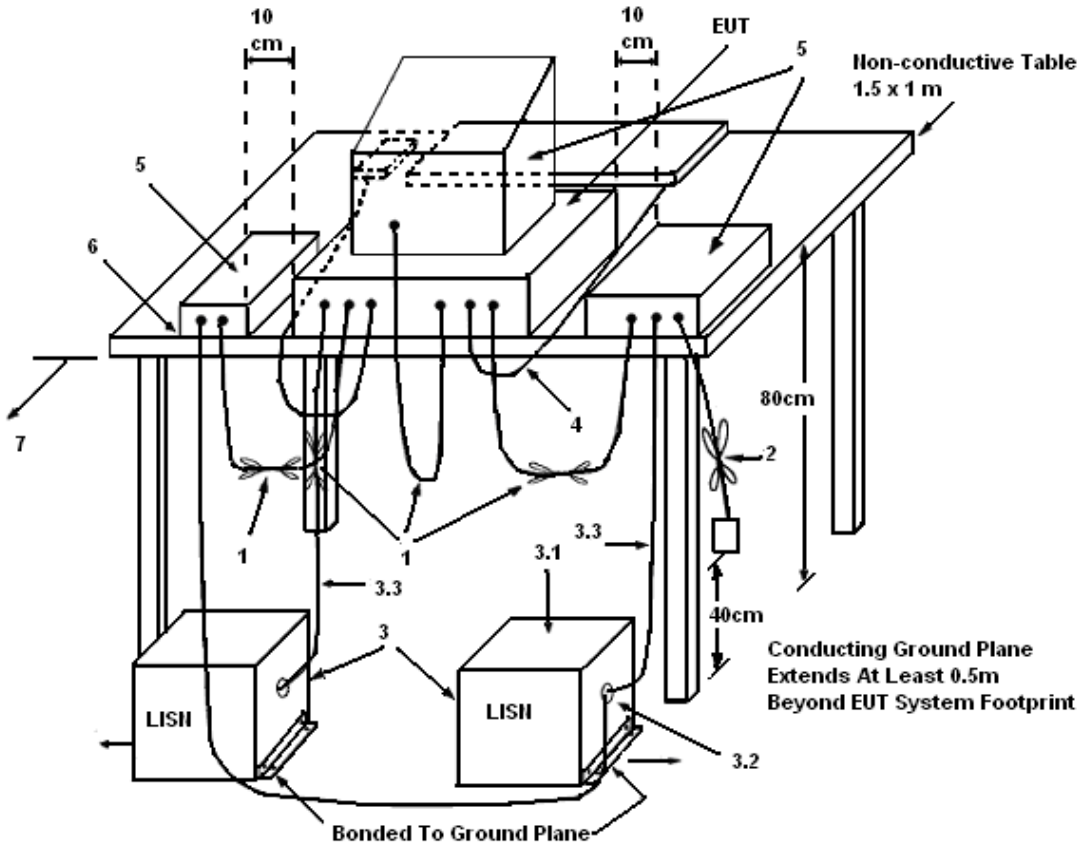
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

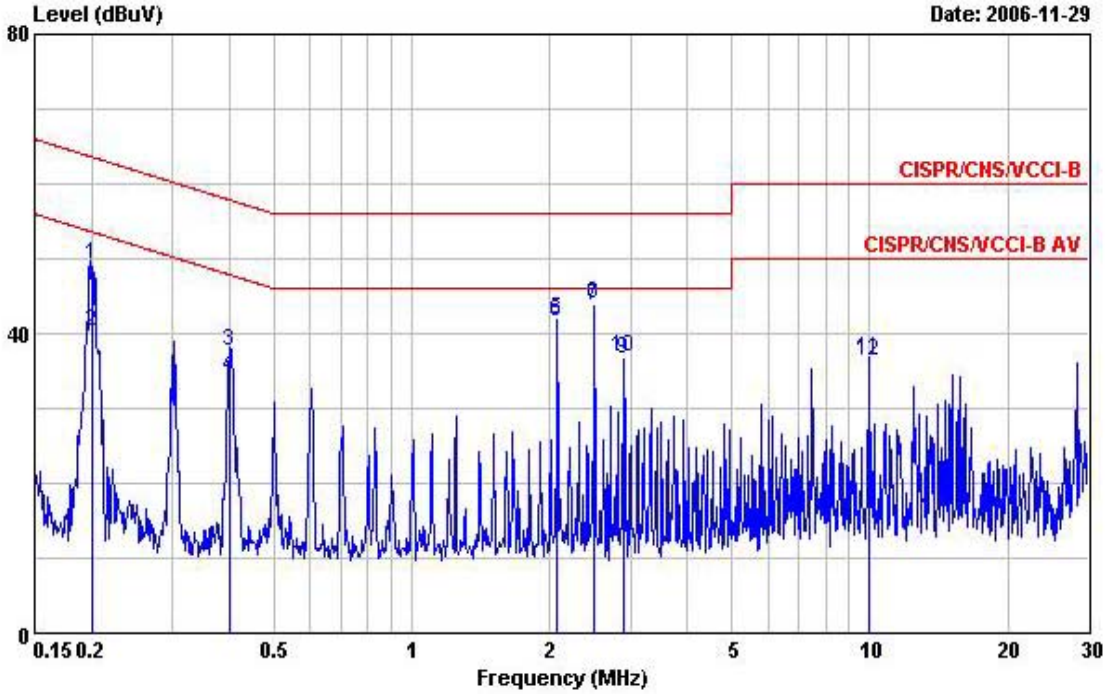
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

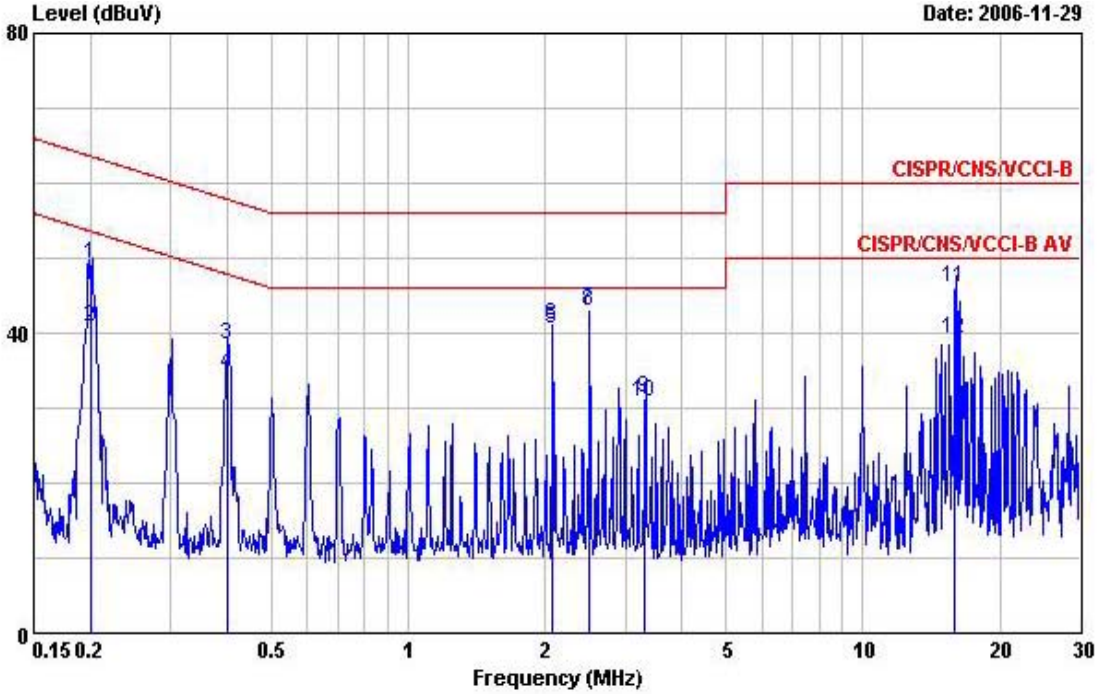
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	26°C	Humidity	55%
Test Engineer	Duncan	Phase	Line
Configuration	Normal Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2009010	49.24	-14.33	63.57	48.94	0.10	0.20	QP
2	0.2009010	40.25	-13.32	53.57	39.95	0.10	0.20	Average
3	0.4018680	37.74	-20.07	57.81	37.53	0.10	0.11	QP
4	0.4018680	34.18	-13.63	47.81	33.97	0.10	0.11	Average
5	2.075	41.85	-4.15	46.00	41.54	0.10	0.21	Average
6	2.075	41.49	-14.51	56.00	41.18	0.10	0.21	QP
7	2.490	43.58	-12.42	56.00	43.23	0.10	0.25	QP
8 @	2.490	44.02	-1.98	46.00	43.67	0.10	0.25	Average
9	2.905	36.66	-9.34	46.00	36.27	0.10	0.29	Average
10	2.905	36.93	-19.07	56.00	36.54	0.10	0.29	QP
11	9.961	36.62	-13.38	50.00	36.02	0.20	0.40	Average
12	9.961	36.31	-23.69	60.00	35.71	0.20	0.40	QP

Temperature	26°C	Humidity	55%
Test Engineer	Duncan	Phase	Neutral
Configuration	Normal Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2004330	49.30	-14.29	63.59	49.00	0.10	0.20	QP
2	0.2004330	40.75	-12.84	53.59	40.45	0.10	0.20	Average
3	0.4018680	38.34	-19.47	57.81	38.13	0.10	0.11	QP
4	0.4018680	34.58	-13.23	47.81	34.37	0.10	0.11	Average
5	2.074	40.54	-15.46	56.00	40.23	0.10	0.21	QP
6	2.074	40.95	-5.05	46.00	40.64	0.10	0.21	Average
7 @	2.490	43.23	-2.77	46.00	42.85	0.13	0.25	Average
8	2.490	42.86	-13.14	56.00	42.48	0.13	0.25	QP
9	3.320	31.22	-24.78	56.00	30.75	0.17	0.30	QP
10	3.320	30.88	-15.12	46.00	30.41	0.17	0.30	Average
11	15.850	45.95	-14.05	60.00	45.15	0.30	0.50	QP
12	15.850	39.25	-10.75	50.00	38.45	0.30	0.50	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Peak Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

4.2.2. Measuring Instruments and Setting

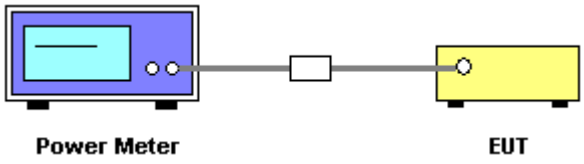
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	NRV-Z32 (model 04)

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Peak Output Power

Temperature	26.8℃	Humidity	54%
Test Engineer	Sam Lee	Configurations	802.11a/b/g

Mode 1

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.81	30.00	Complies
157	5785 MHz	23.91	30.00	Complies
165	5825 MHz	23.46	30.00	Complies

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	25.02	30.00	Complies
6	2437 MHz	25.48	30.00	Complies
11	2462 MHz	25.46	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	25.84	30.00	Complies
6	2437 MHz	26.35	30.00	Complies
11	2462 MHz	25.92	30.00	Complies

Mode 2

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	20.70	21.50	Complies
157	5785 MHz	21.20	21.50	Complies
165	5825 MHz	21.04	21.50	Complies

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.81	26.00	Complies
6	2437 MHz	23.68	26.00	Complies
11	2462 MHz	23.37	26.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	15.31	26.00	Complies
6	2437 MHz	23.01	26.00	Complies
11	2462 MHz	17.19	26.00	Complies

Mode 3

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	24.25	28.00	Complies
157	5785 MHz	24.01	28.00	Complies
165	5825 MHz	23.73	28.00	Complies

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	26.04	30.00	Complies
6	2437 MHz	26.16	30.00	Complies
11	2462 MHz	25.72	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	26.04	30.00	Complies
6	2437 MHz	26.94	30.00	Complies
11	2462 MHz	26.89	30.00	Complies

Mode 4

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	24.25	28.00	Complies
157	5785 MHz	24.01	28.00	Complies
165	5825 MHz	23.73	28.00	Complies

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	26.11	30.00	Complies
6	2437 MHz	26.08	30.00	Complies
11	2462 MHz	26.05	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.51	30.00	Complies
6	2437 MHz	23.72	30.00	Complies
11	2462 MHz	23.28	30.00	Complies

For IEEE 802.11a there are for test modes shown in the table below:

Mode 1: Internal Antenna (F Type Antenna- 1 @3dBi) for IEEE 802.11a and internal Antenna (F Type Antenna- 1 @3dBi) for IEEE 802.11b/g.

Mode 2: External Antenna (Panel Antenna- 4 @14.50dBi) for IEEE 802.11a and External Antenna (Panel Antenna- 4 @10.00dBi) for IEEE 802. b/g.

Mode 3: External Antenna for 5GHz and 2.4GHz (OMNI Antenna – 1 @8.00dBi for IEEE 802.11a and OMNI Antenna – 1 @6.00dBi for IEEE 802. b/g),

Mode 4: External Antenna (Omnidirectional Antenna –2 @8.00dBi for IEEE 802.11a and Omnidirectionall Antenna –2 @6.00dBi for IEEE 802. b/g)

Max Power limit for mode 1 is 30dBm,

Max Power limit for Mode 2 is 21.50dBm for IEEE 802.11a and is 26 dBm for the IEEE 802.11b/g.

Max Power limit for Mode 3 is 28dBm for IEEE 802.11a and is 30 dBm for the IEEE 802.11b/g.

Max Power limit for Mode 4 is 28dBm for IEEE 802.11a and is 30 dBm for the IEEE 802.11b/g.

4.3. Power Spectral Density Measurement

4.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

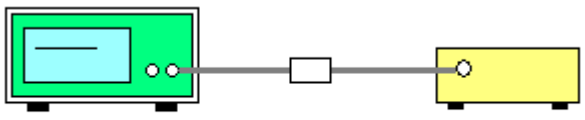
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26.8℃	Humidity	54%
Test Engineer	Sam Lee	Configurations	802.11a/b/g

Mode 1

Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-9.23	8.00	Complies
157	5785 MHz	-10.97	8.00	Complies
165	5825 MHz	-11.94	8.00	Complies

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	1.84	8.00	Complies
6	2437 MHz	4.37	8.00	Complies
11	2462 MHz	3.58	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	0.18	8.00	Complies
6	2437 MHz	-0.83	8.00	Complies
11	2462 MHz	-0.57	8.00	Complies

Mode 2

Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-12.00	-0.5	Complies
157	5785 MHz	-10.71	-0.5	Complies
165	5825 MHz	-11.20	-0.5	Complies

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-4.14	4.00	Complies
6	2437 MHz	1.09	4.00	Complies
11	2462 MHz	0.44	4.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-14.04	4.00	Complies
6	2437 MHz	-12.55	4.00	Complies
11	2462 MHz	-13.67	4.00	Complies

Mode 3

Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-5.45	6.00	Complies
157	5785 MHz	-5.35	6.00	Complies
165	5825 MHz	-5.61	6.00	Complies

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	0.78	8.00	Complies
6	2437 MHz	-0.20	8.00	Complies
11	2462 MHz	2.57	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-3.16	8.00	Complies
6	2437 MHz	-1.94	8.00	Complies
11	2462 MHz	-2.15	8.00	Complies

Mode 4

Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-5.45	6.00	Complies
157	5785 MHz	-5.35	6.00	Complies
165	5825 MHz	-5.61	6.00	Complies

Configuration IEEE 802.11b

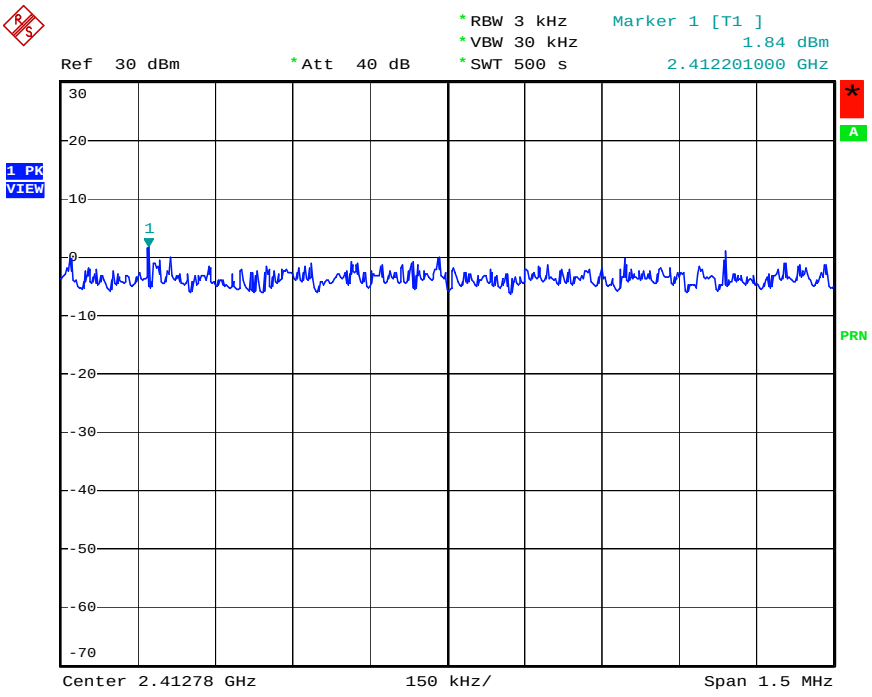
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	0.78	8.00	Complies
6	2437 MHz	-0.20	8.00	Complies
11	2462 MHz	-0.82	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-7.49	8.00	Complies
6	2437 MHz	-6.34	8.00	Complies
11	2462 MHz	-6.66	8.00	Complies

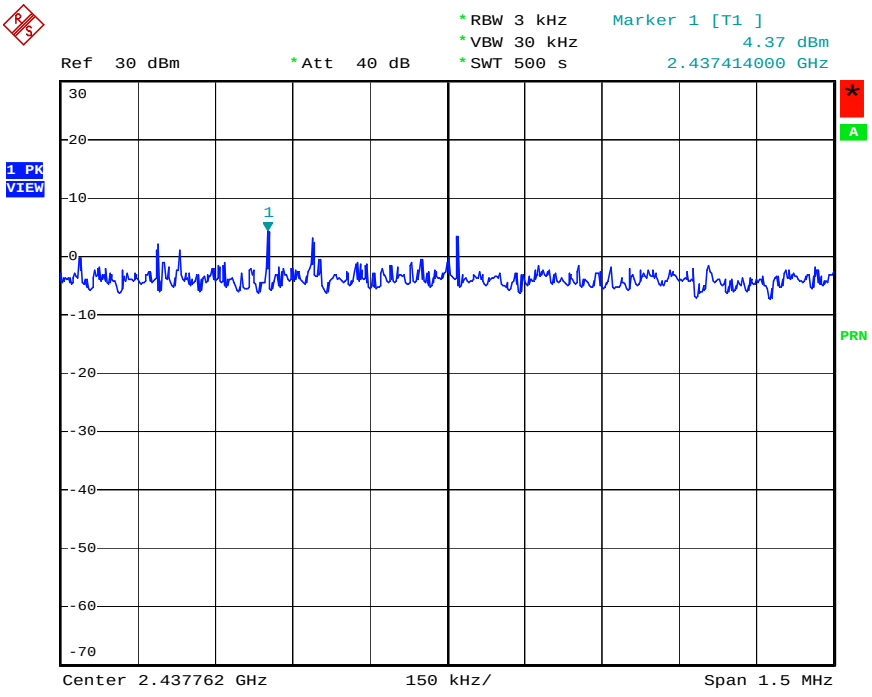
Mode 1

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



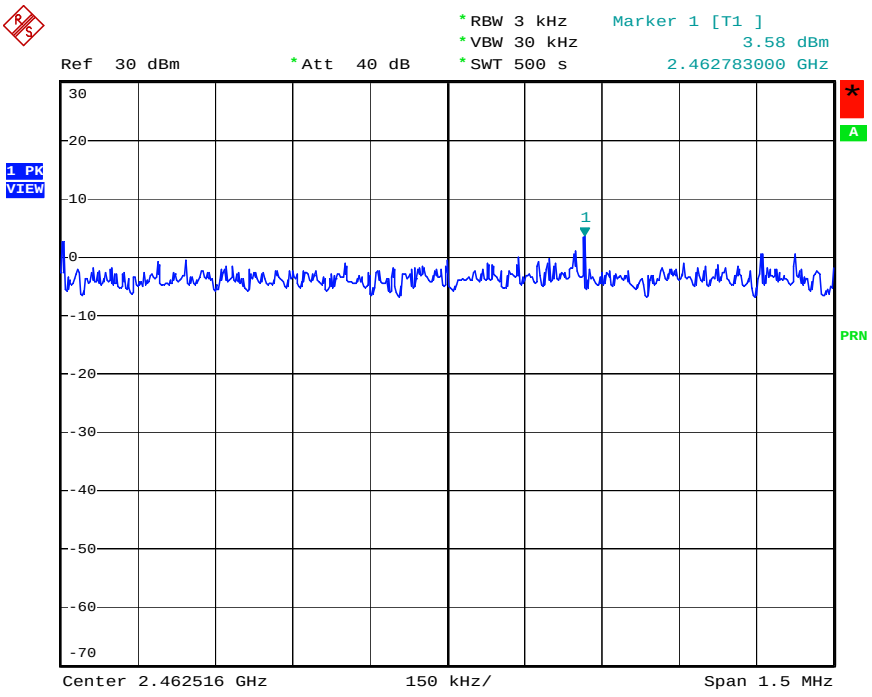
Date: 28.NOV.2006 19:14:24

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz

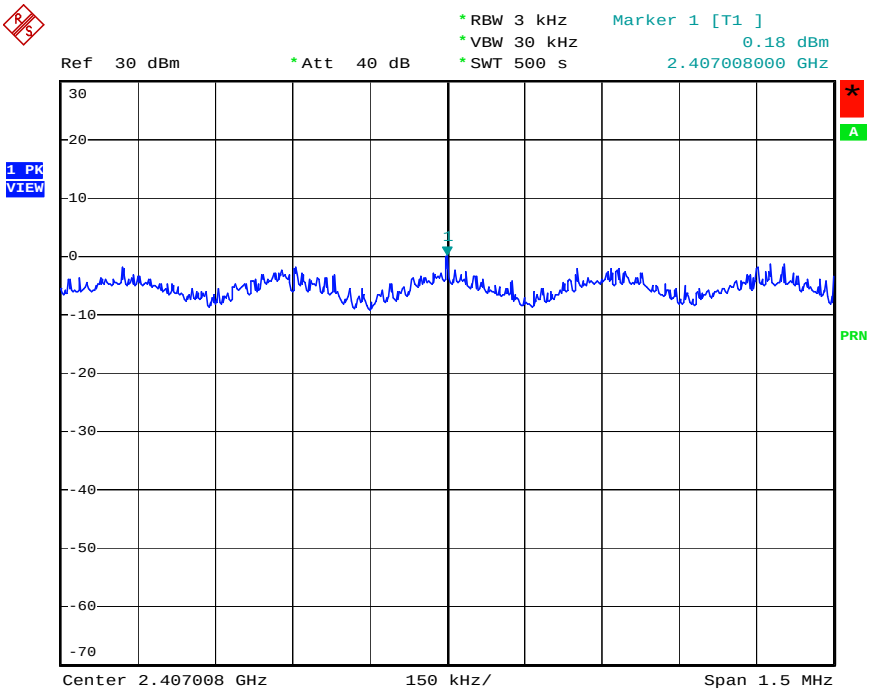


Date: 28.NOV.2006 19:12:33

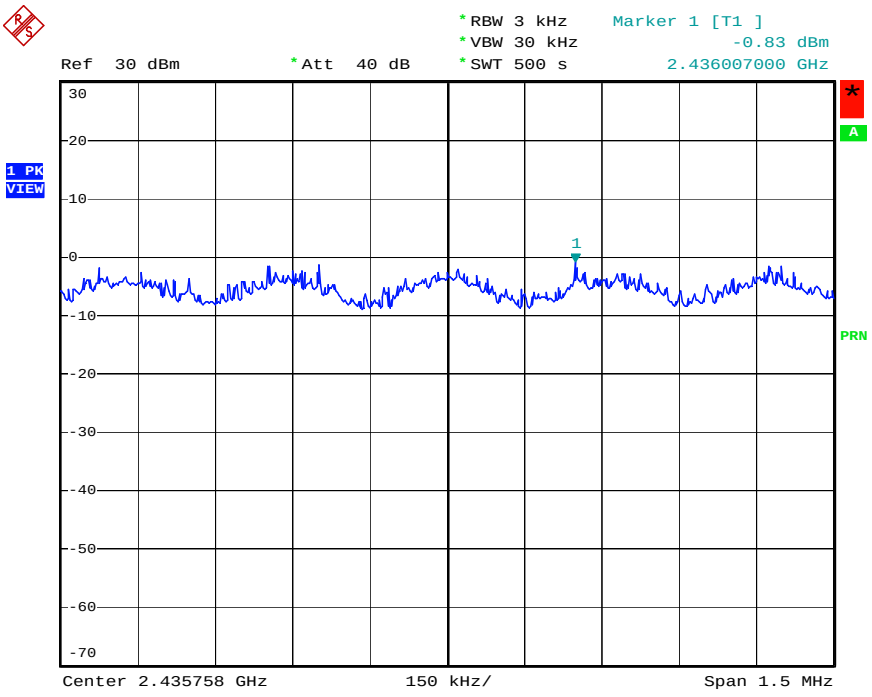
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



Power Density Plot on Configuration IEEE 802.11g / 2412 MHz

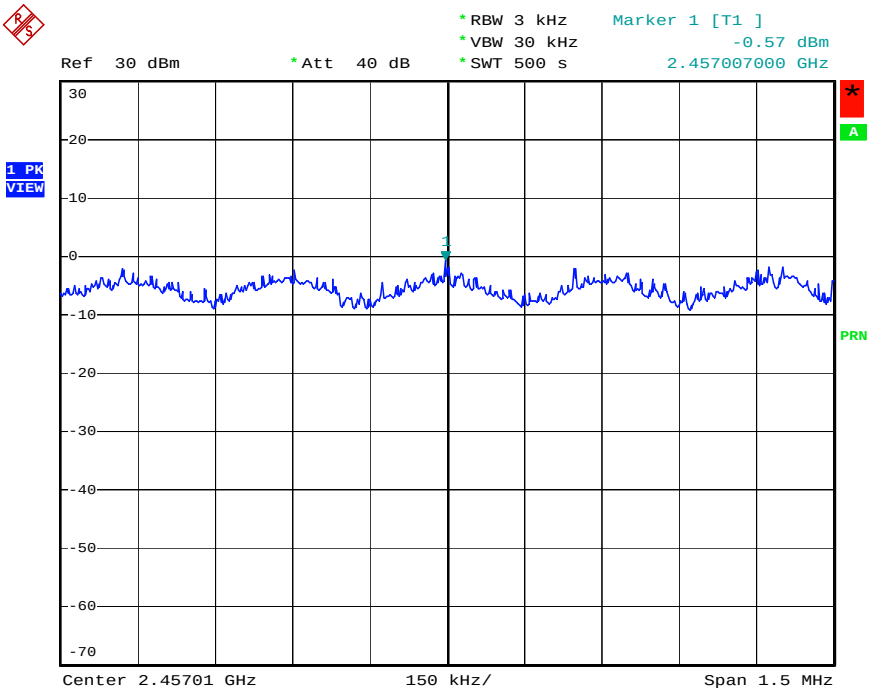


Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



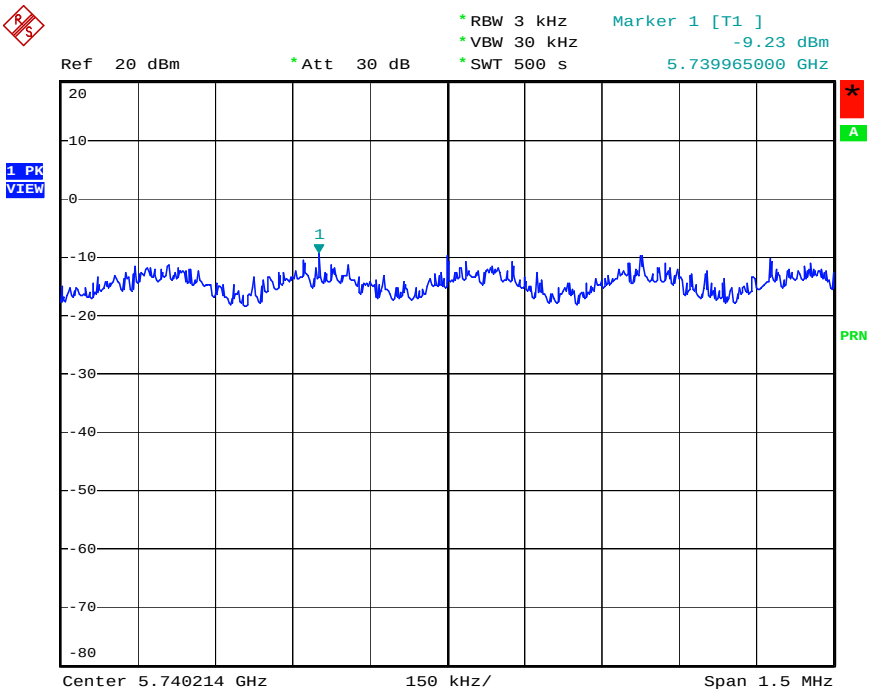
Date: 28.NOV.2006 19:22:28

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz

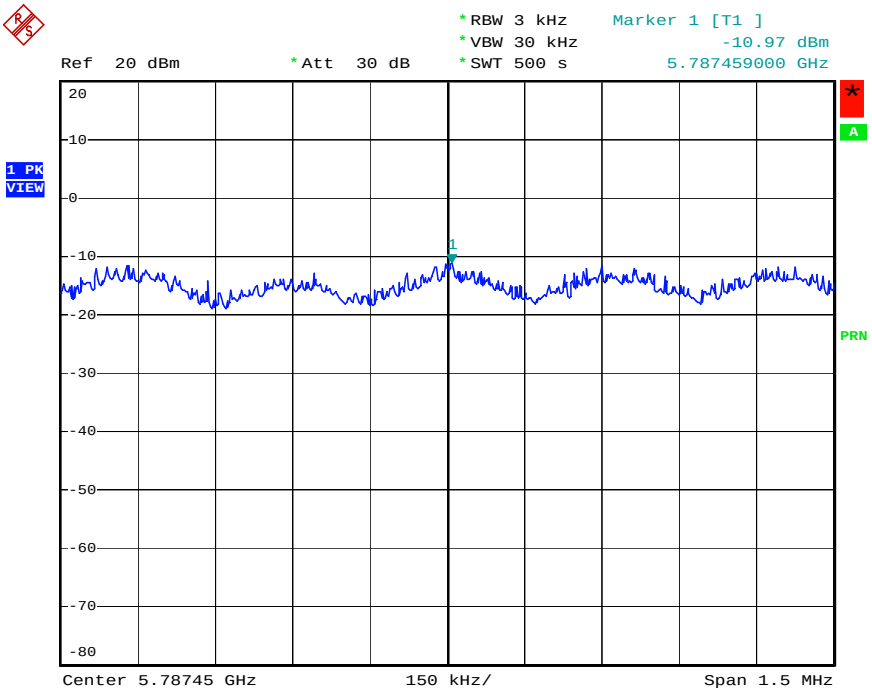


Date: 28.NOV.2006 19:25:08

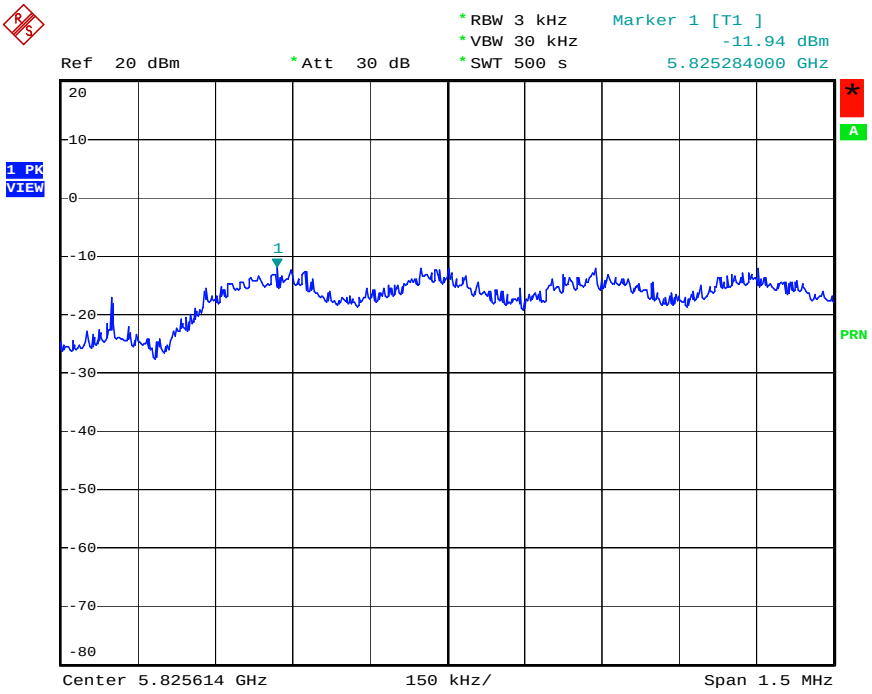
Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



Power Density Plot on Configuration IEEE 802.11a / 5785 MHz

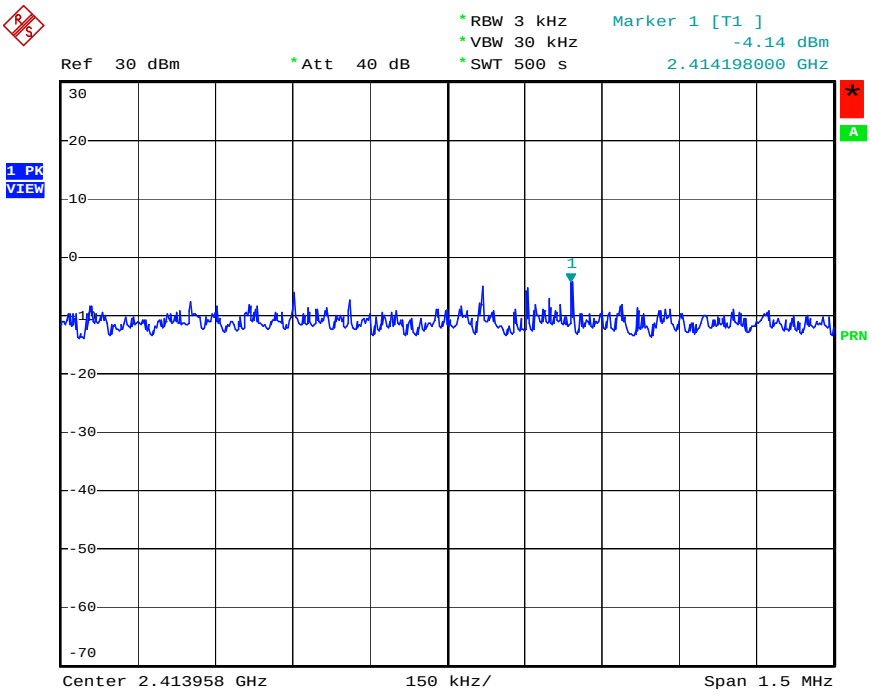


Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



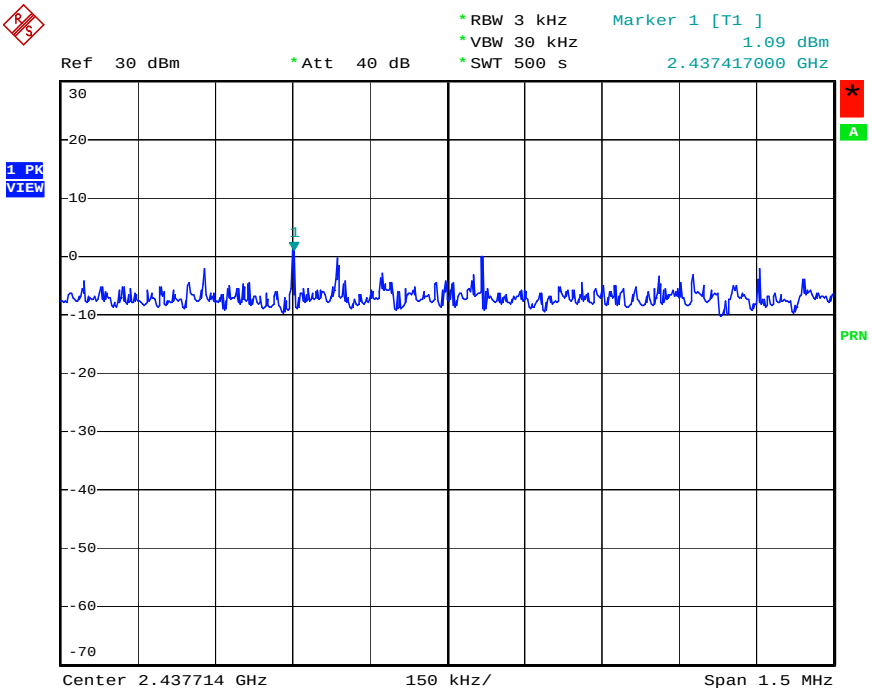
Mode 2

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



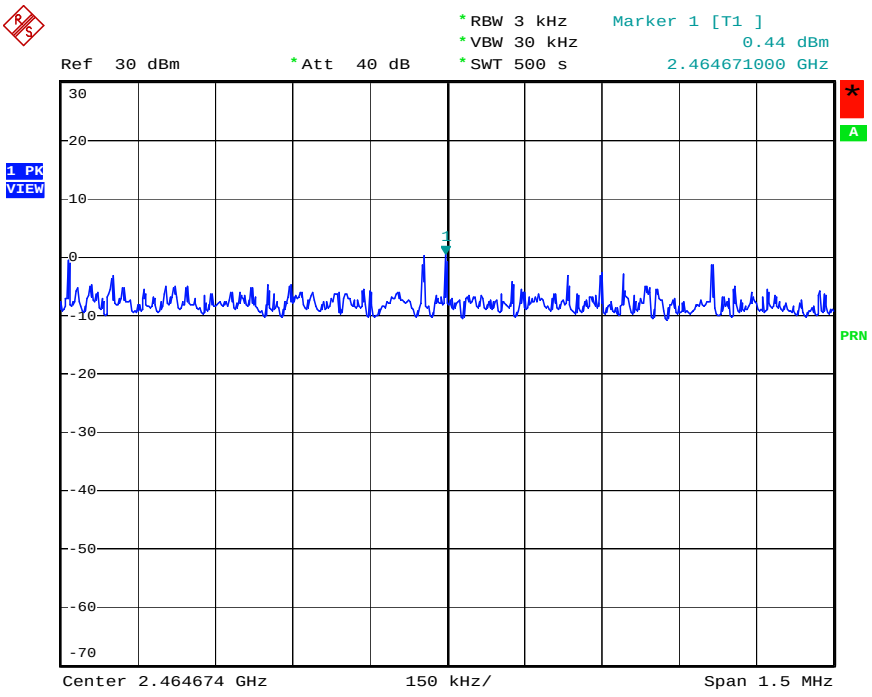
Date: 27.NOV.2006 20:27:11

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



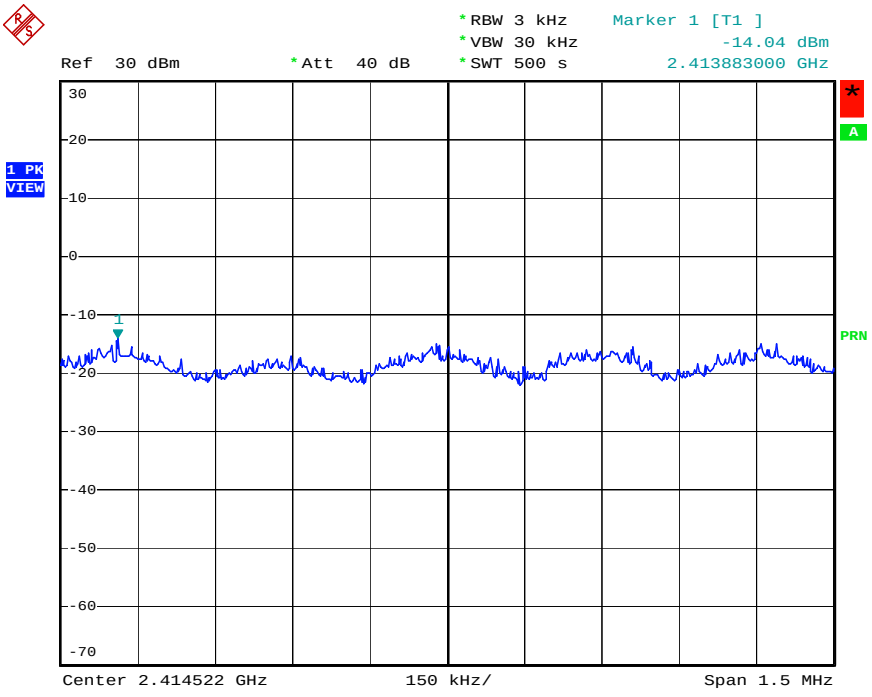
Date: 27.NOV.2006 20:24:24

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



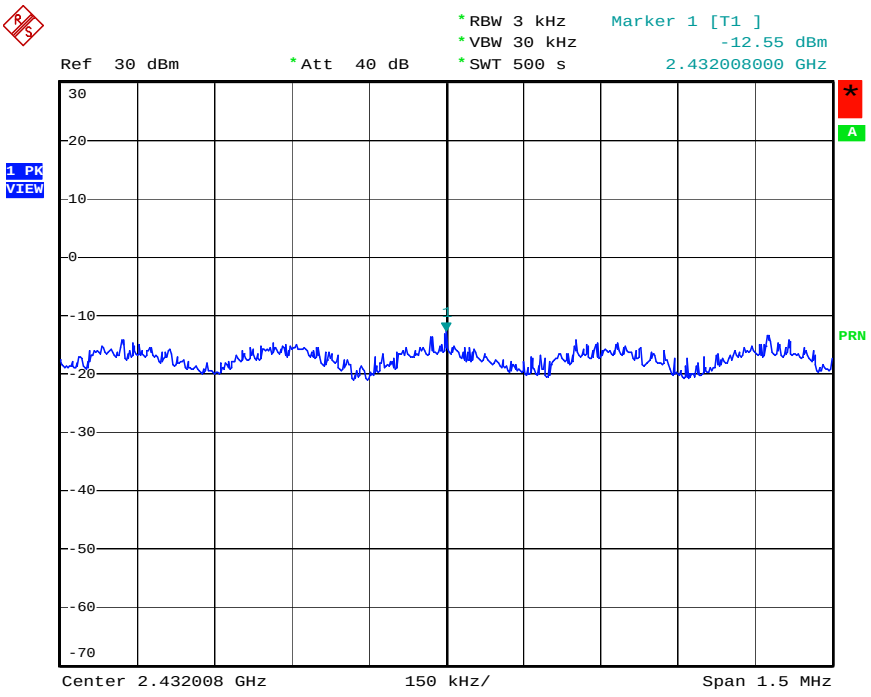
Date: 27.NOV.2006 20:22:21

Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



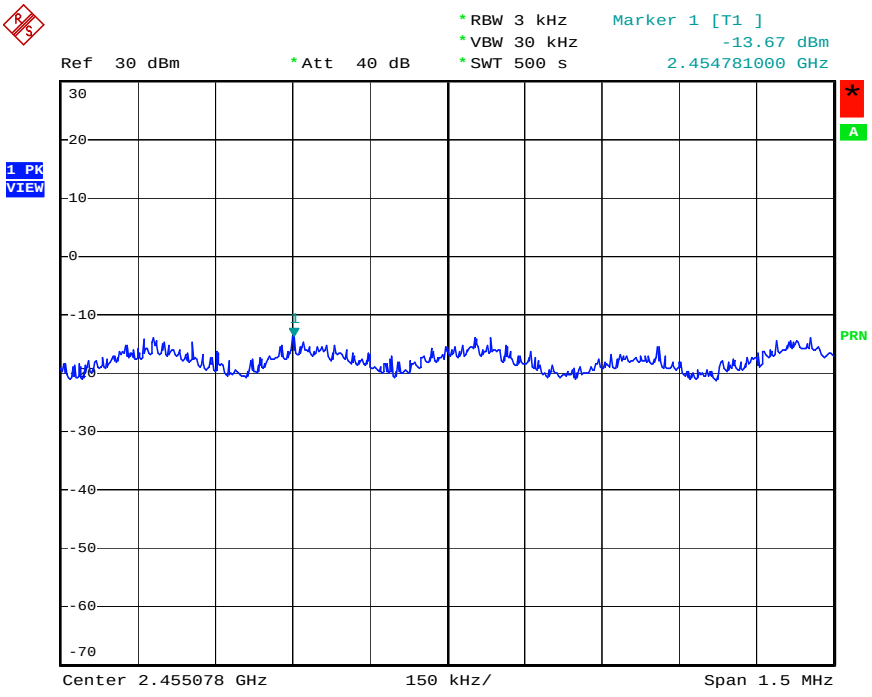
Date: 27.NOV.2006 20:30:56

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



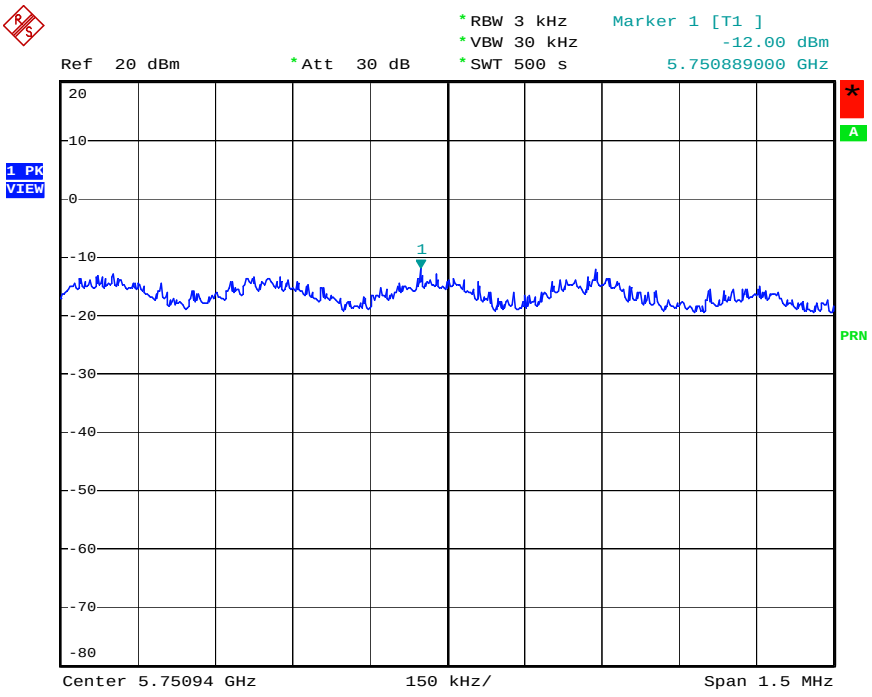
Date: 27.NOV.2006 20:32:38

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz



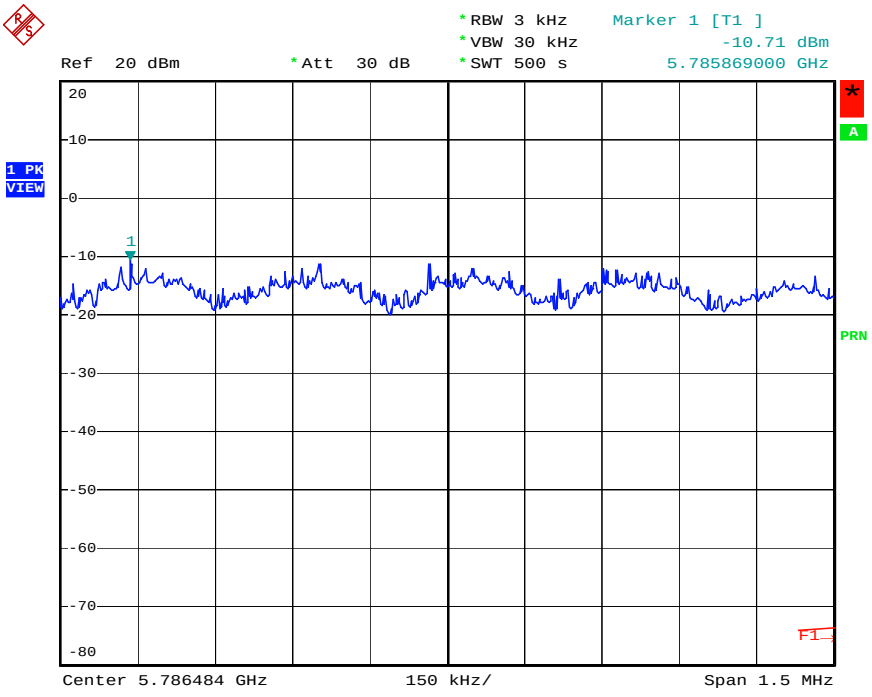
Date: 27.NOV.2006 20:34:41

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



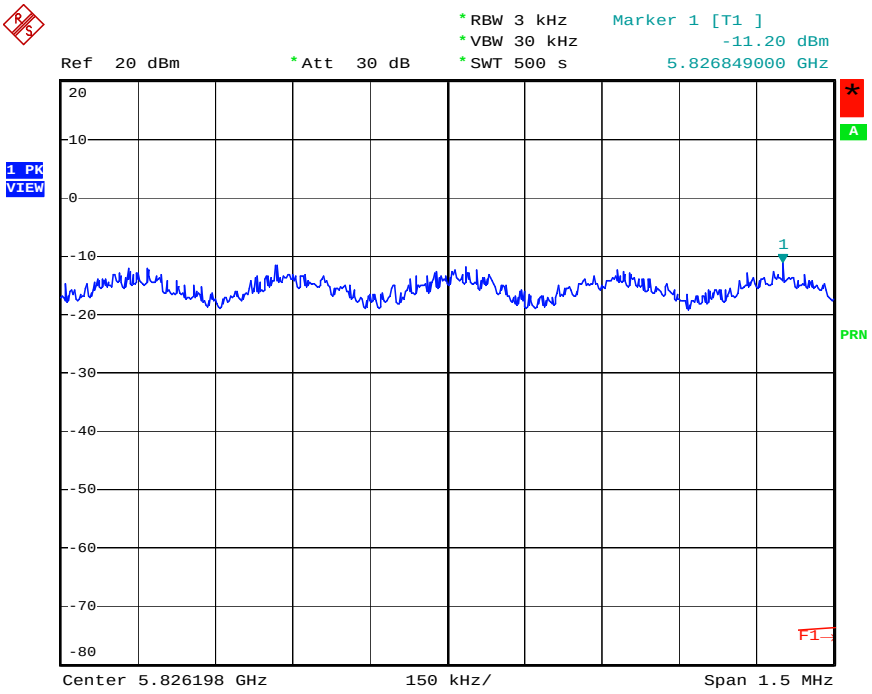
Date: 27.NOV.2006 08:48:15

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz



Date: 27.NOV.2006 08:39:22

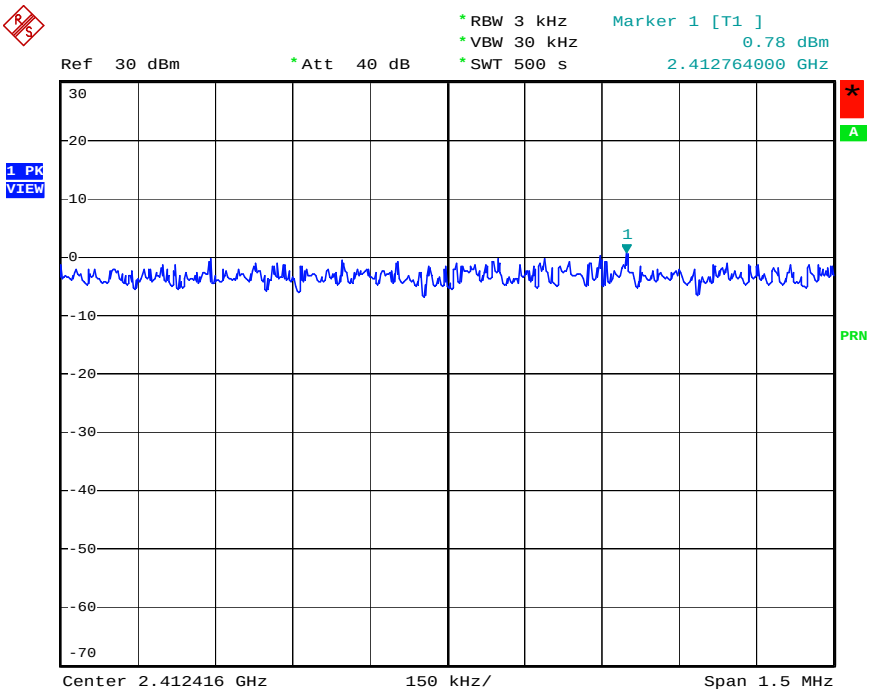
Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



Date: 27.NOV.2006 08:38:00

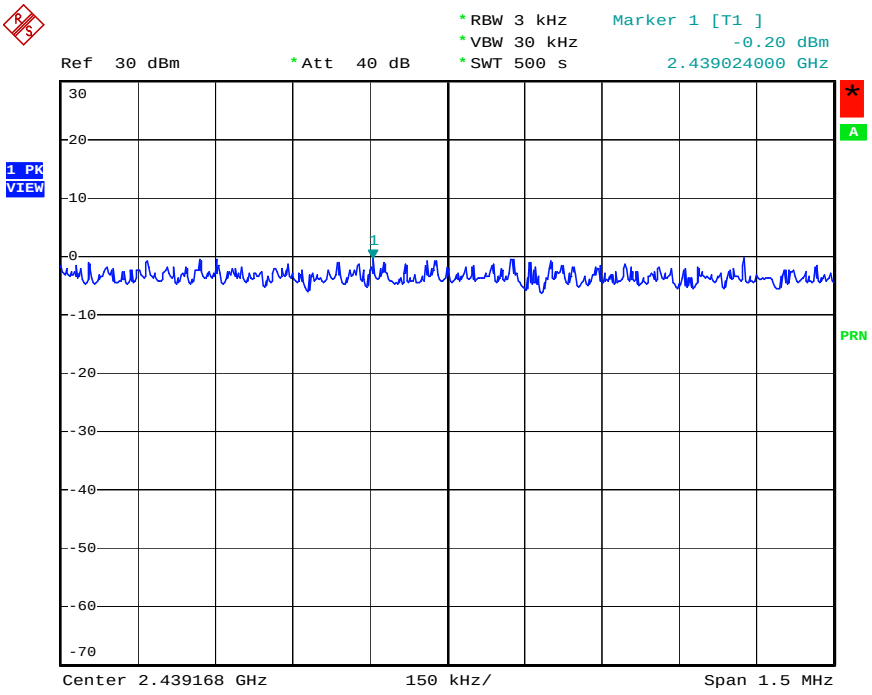
Mode 3

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



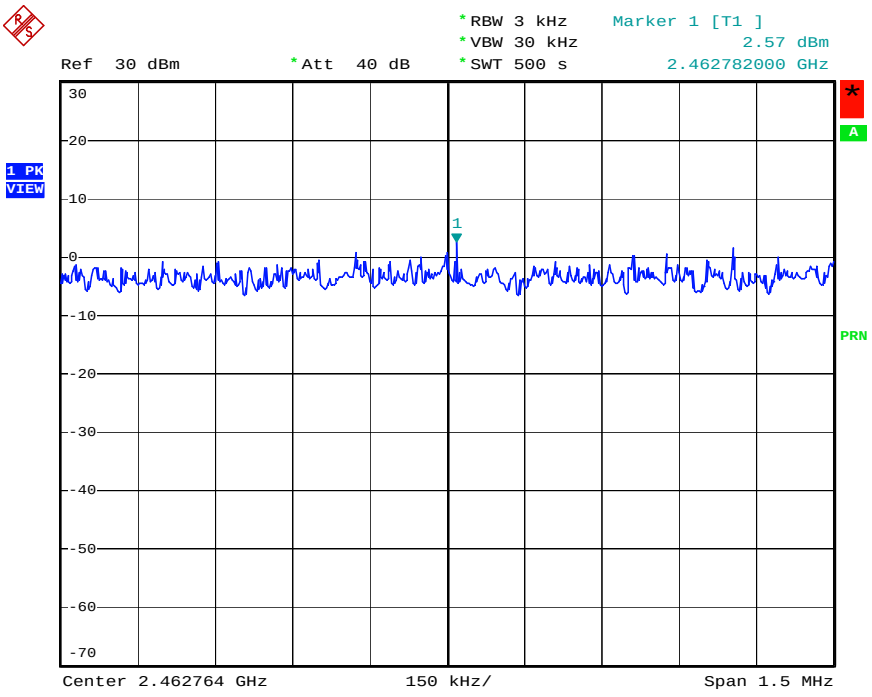
Date: 28.NOV.2006 19:50:09

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



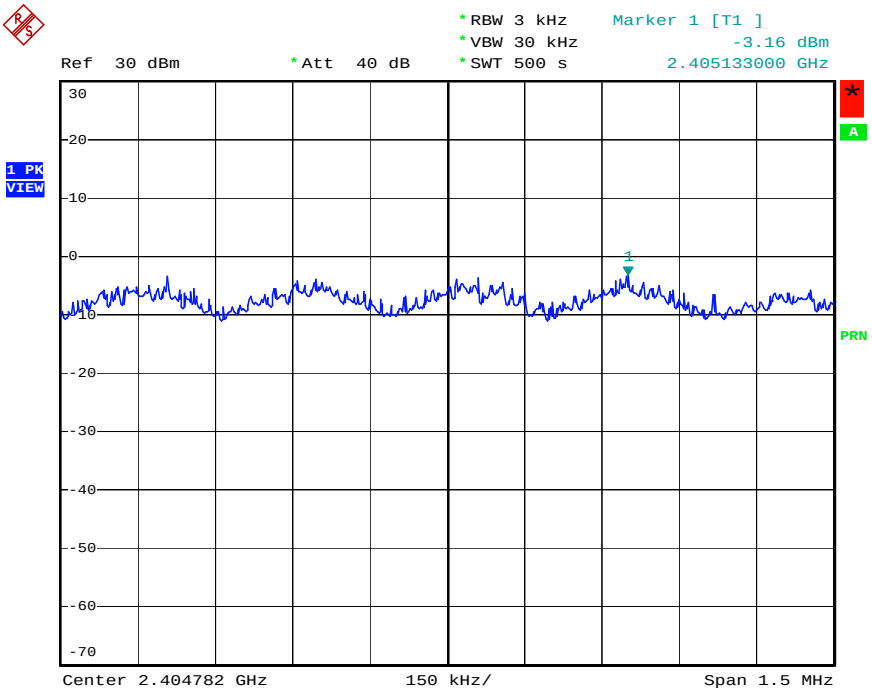
Date: 28.NOV.2006 19:48:48

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



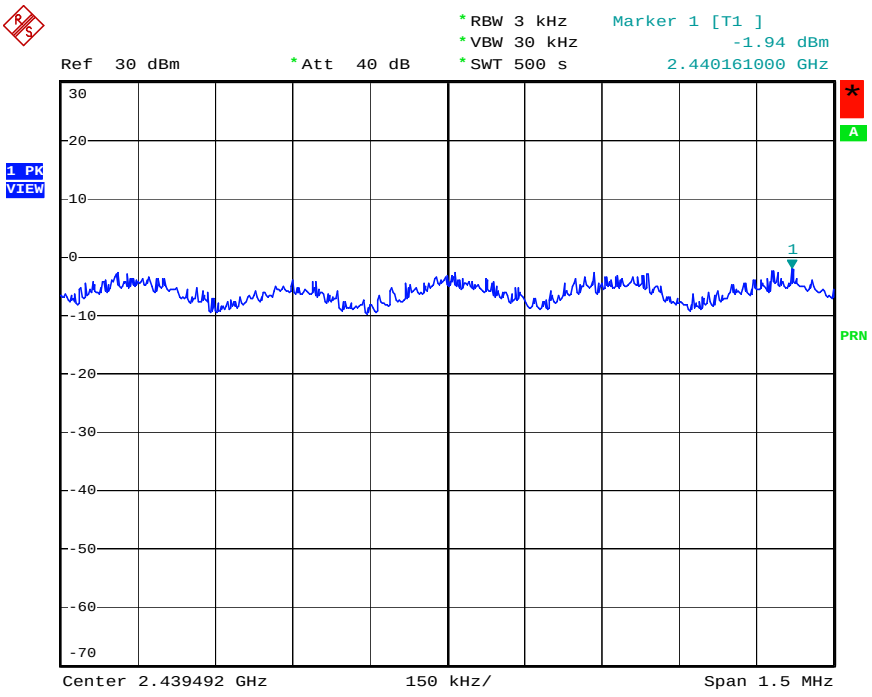
Date: 28.NOV.2006 19:47:25

Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



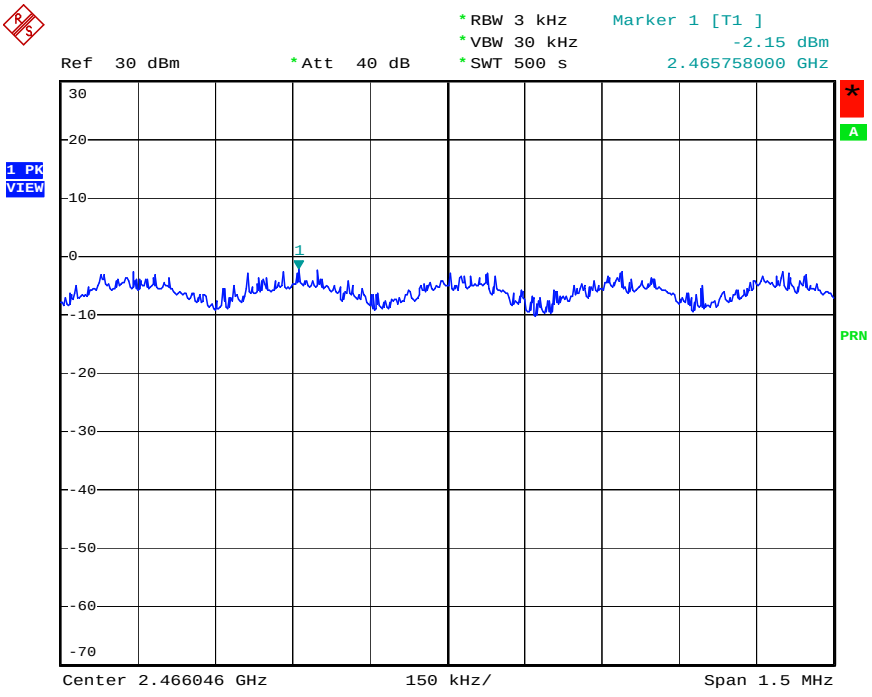
Date: 28.NOV.2006 20:01:11

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



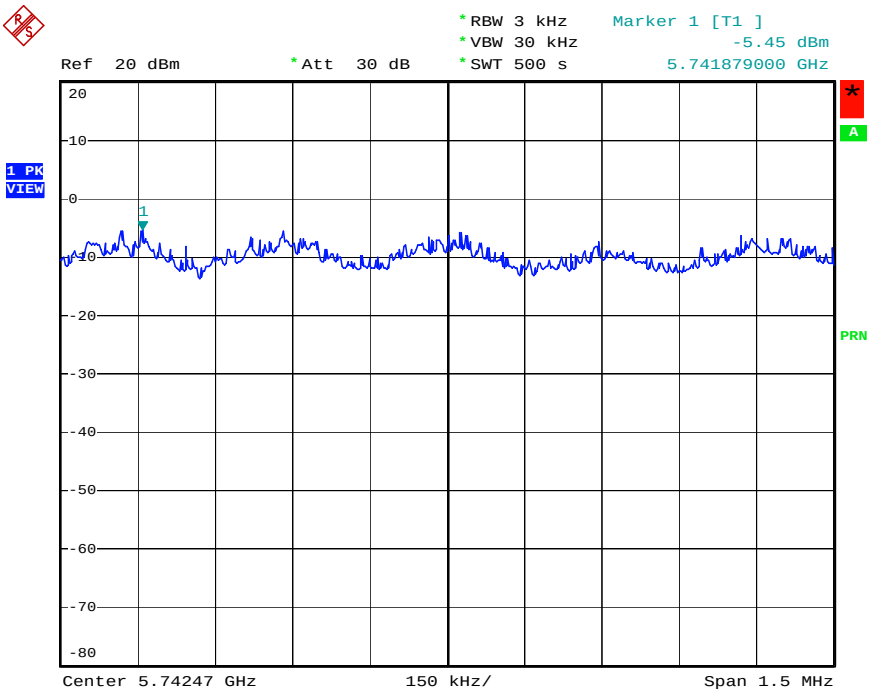
Date: 28.NOV.2006 20:02:25

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz

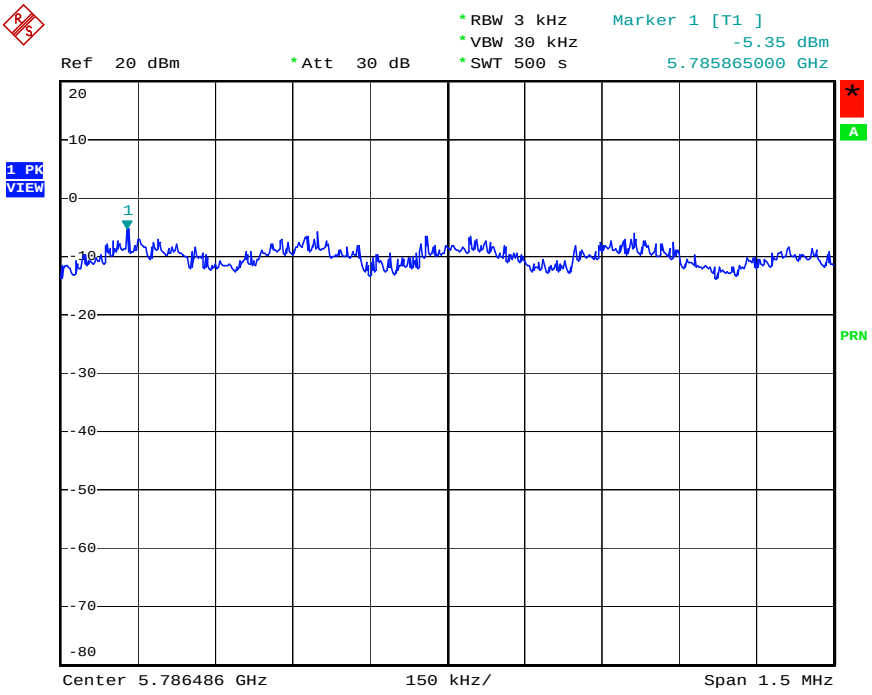


Date: 28.NOV.2006 20:04:06

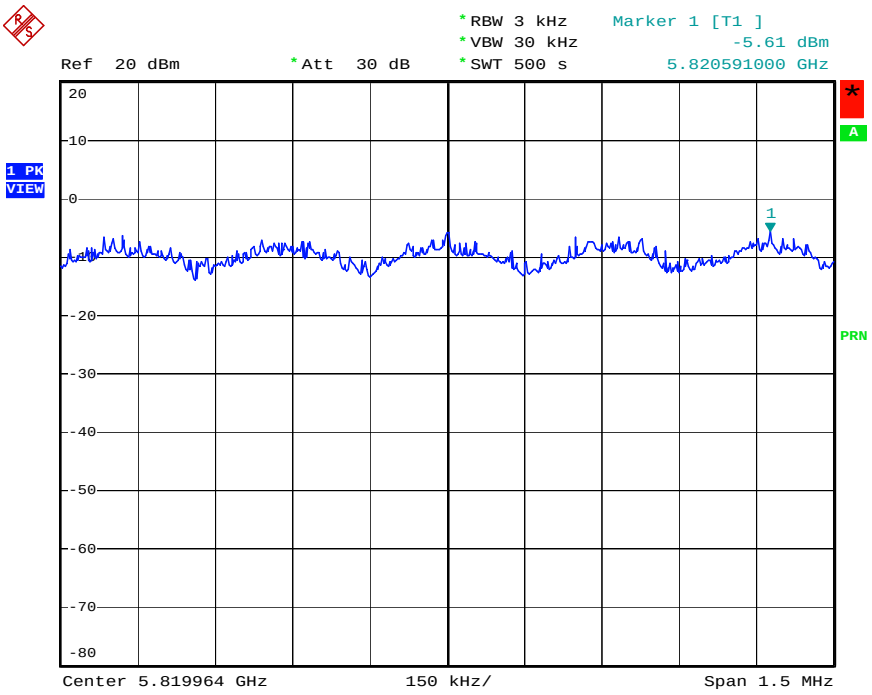
Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



Power Density Plot on Configuration IEEE 802.11a / 5785 MHz

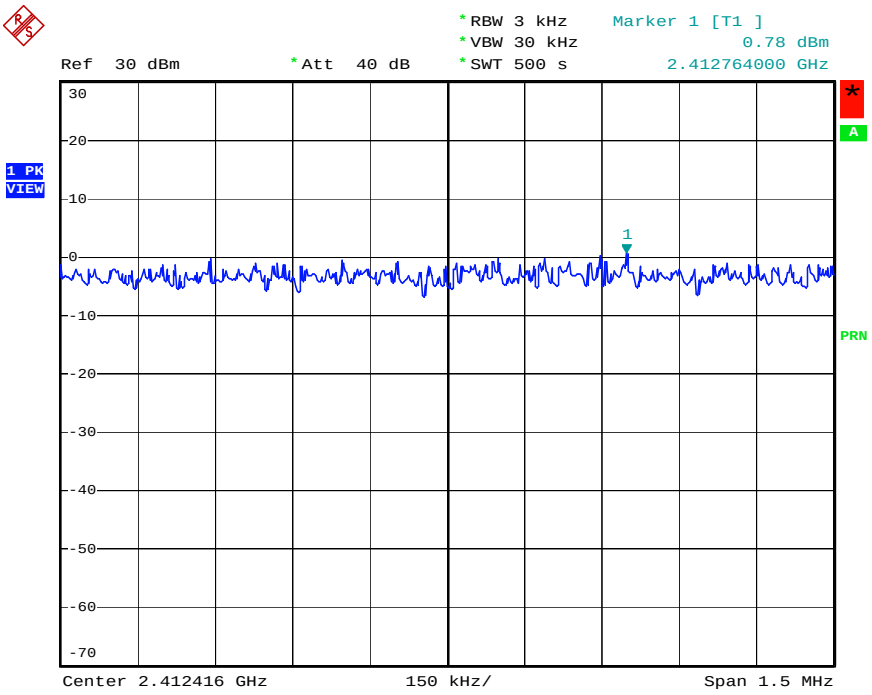


Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



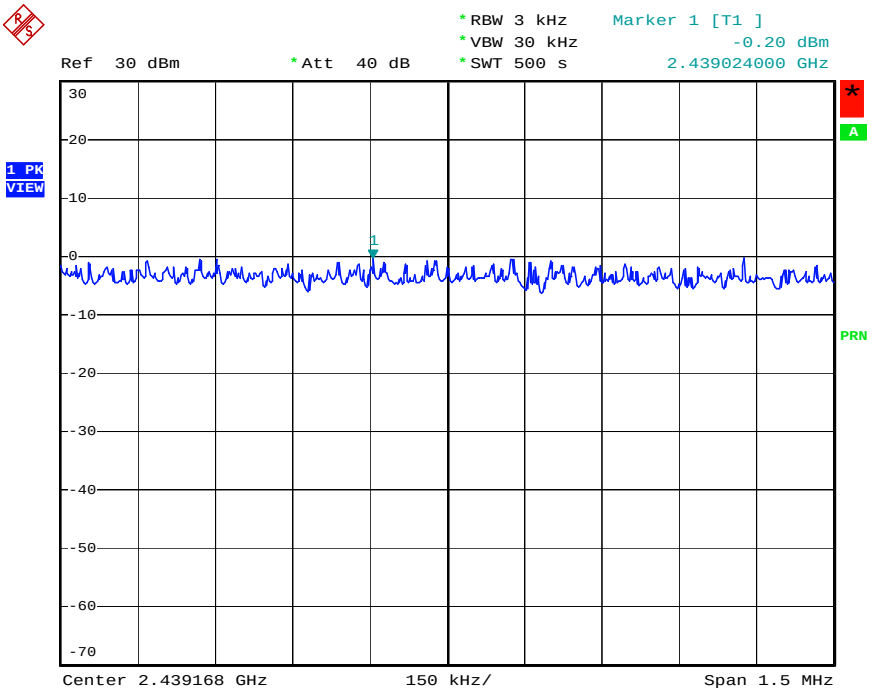
Mode 4

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz



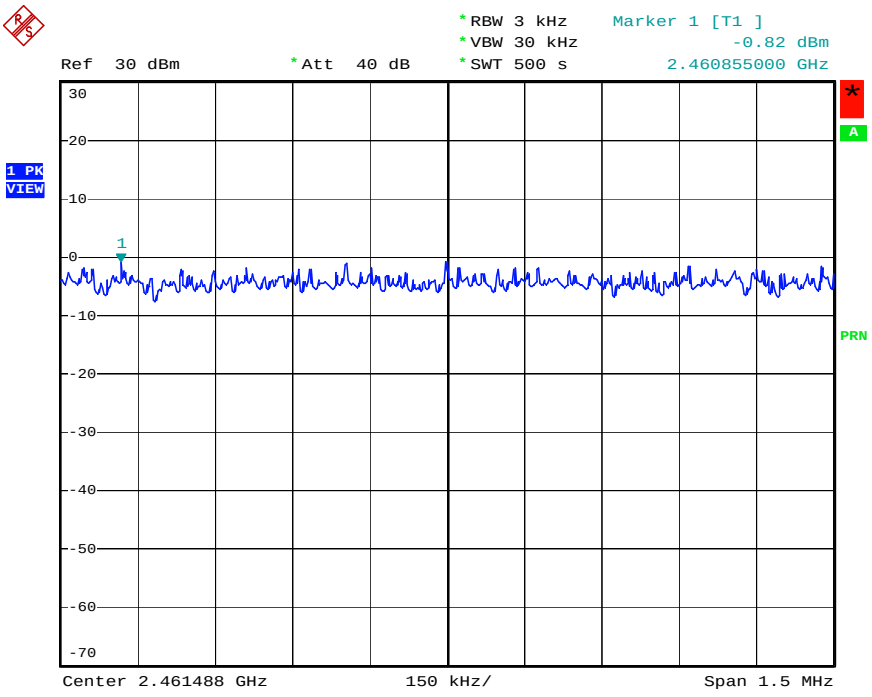
Date: 28.NOV.2006 19:50:09

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz



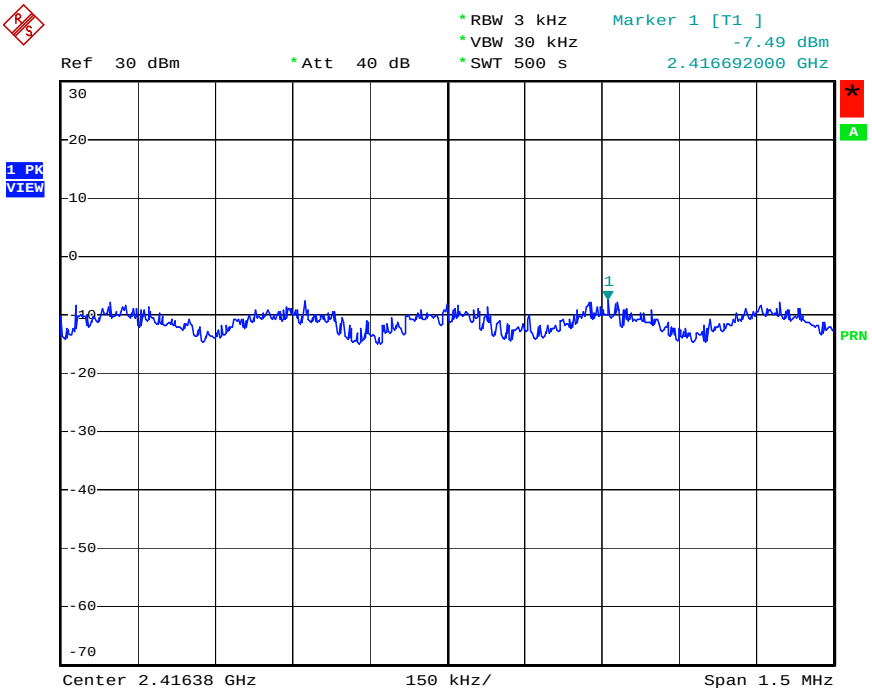
Date: 28.NOV.2006 19:48:48

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz



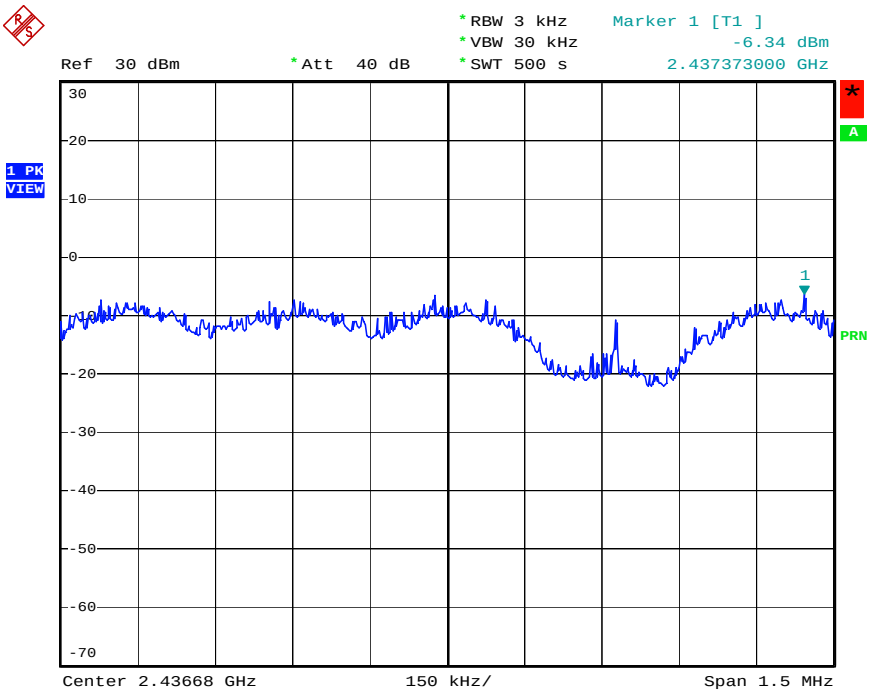
Date: 28.NOV.2006 19:52:20

Power Density Plot on Configuration IEEE 802.11g / 2412 MHz



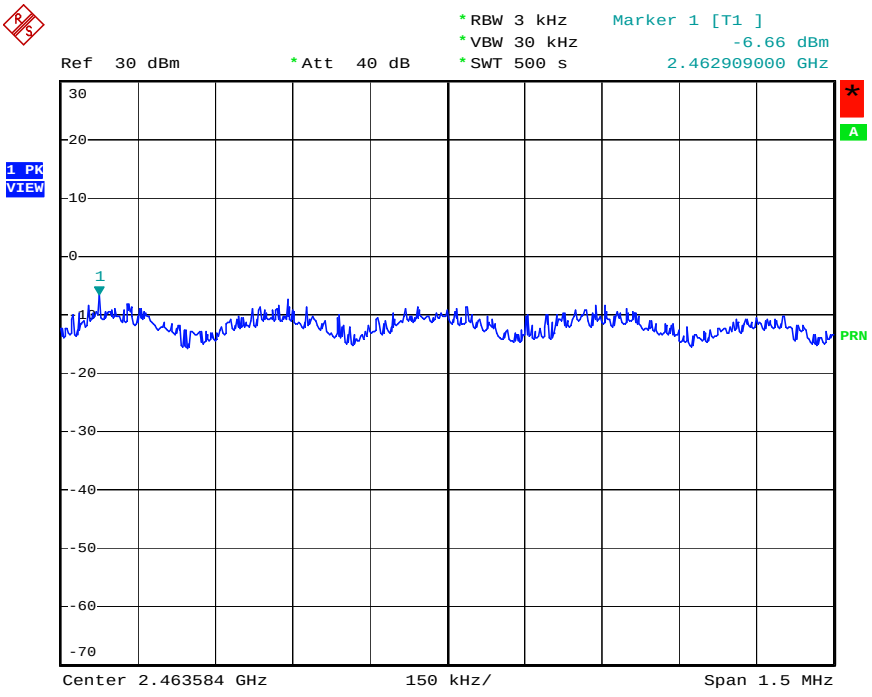
Date: 28.NOV.2006 20:10:38

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz



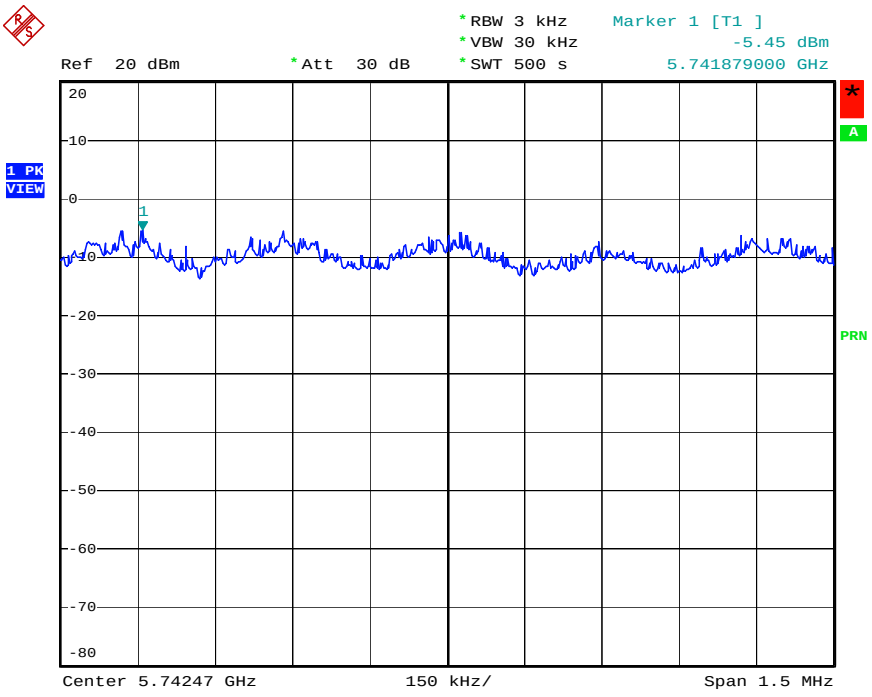
Date: 28.NOV.2006 20:09:25

Power Density Plot on Configuration IEEE 802.11g / 2462 MHz



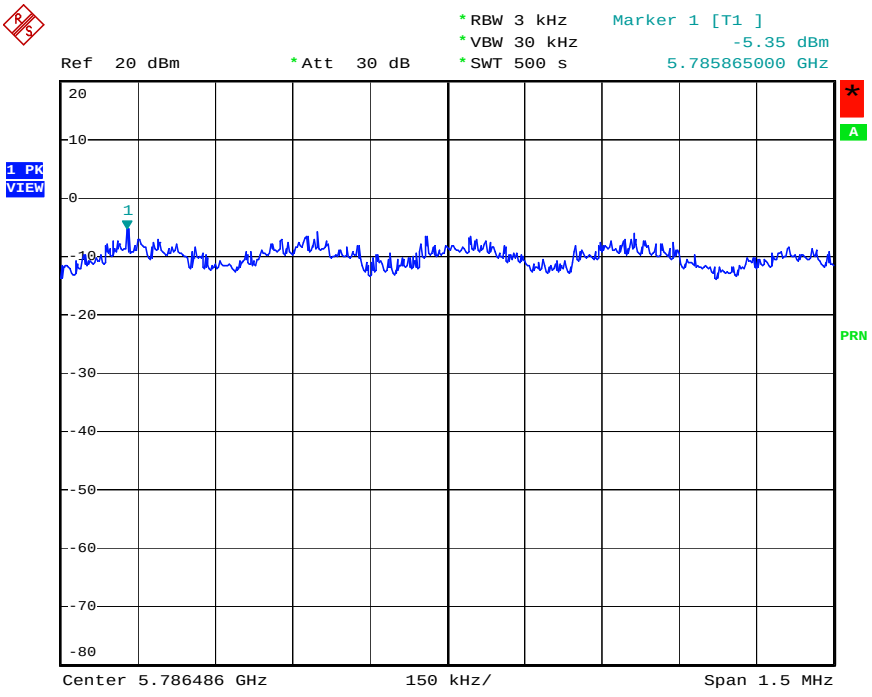
Date: 28.NOV.2006 20:07:37

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz



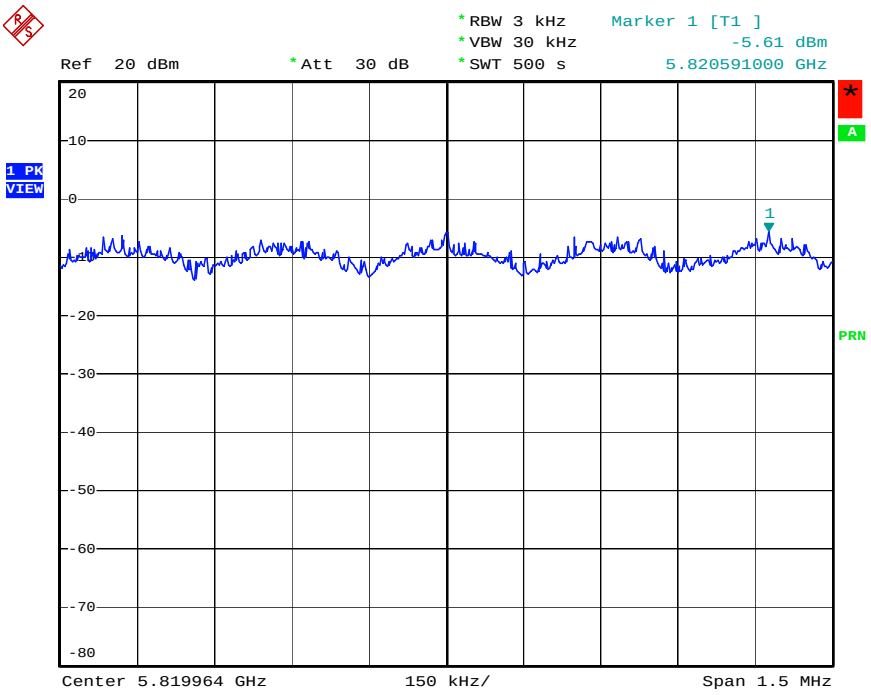
Date: 27.NOV.2006 10:40:26

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz



Date: 27.NOV.2006 10:35:43

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz



4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.4.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	26.8℃	Humidity	54%
Test Engineer	Sam Lee	Configurations	802.11a/b/g

Mode 1

Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	16.56	500	Complies
157	5785 MHz	16.40	16.52	500	Complies
165	5825 MHz	16.40	16.52	500	Complies

Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	11.72	15.44	500	Complies
6	2437 MHz	11.72	15.84	500	Complies
11	2462 MHz	11.28	15.92	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	16.52	500	Complies
6	2437 MHz	16.40	16.52	500	Complies
11	2462 MHz	16.40	16.48	500	Complies

Mode 2

Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.44	16.52	500	Complies
157	5785 MHz	16.40	16.48	500	Complies
165	5825 MHz	16.44	16.52	500	Complies

Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.00	15.28	500	Complies
6	2437 MHz	12.00	15.36	500	Complies
11	2462 MHz	11.48	15.32	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	16.52	500	Complies
6	2437 MHz	16.40	16.52	500	Complies
11	2462 MHz	16.40	16.52	500	Complies

Mode 3

Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	16.56	500	Complies
157	5785 MHz	16.36	16.56	500	Complies
165	5825 MHz	16.44	16.56	500	Complies

Configuration IEEE 802.11b

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	11.76	15.32	500	Complies
6	2437 MHz	11.72	15.32	500	Complies
11	2462 MHz	11.76	15.28	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	16.52	500	Complies
6	2437 MHz	16.40	16.52	500	Complies
11	2462 MHz	16.40	16.52	500	Complies

Mode 4

Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	16.56	500	Complies
157	5785 MHz	16.36	16.56	500	Complies
165	5825 MHz	16.44	16.56	500	Complies

Configuration IEEE 802.11b

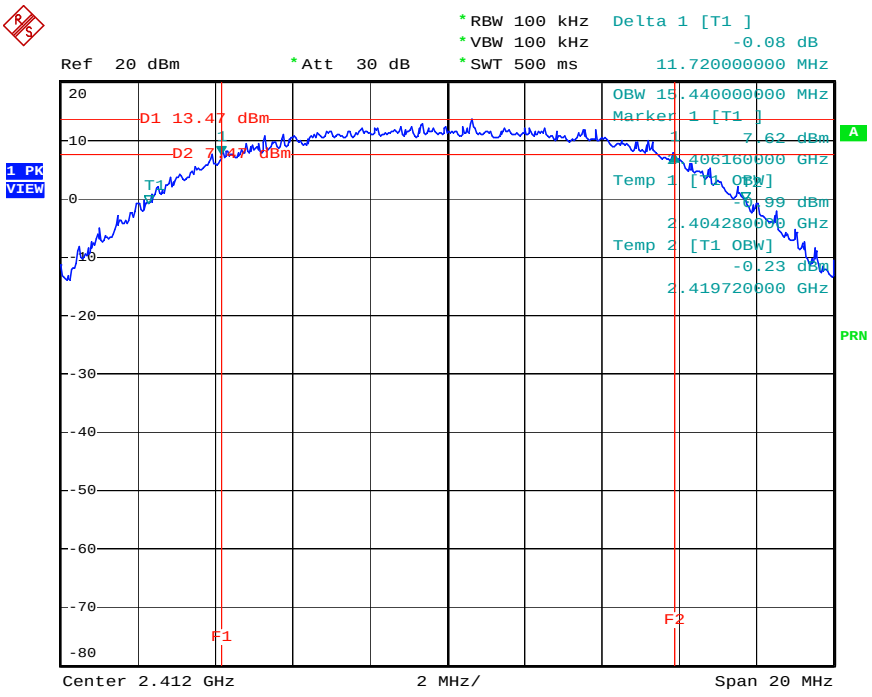
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	11.76	15.32	500	Complies
6	2437 MHz	11.72	15.32	500	Complies
11	2462 MHz	11.76	15.28	500	Complies

Configuration IEEE 802.11g

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	16.52	500	Complies
6	2437 MHz	16.40	16.52	500	Complies
11	2462 MHz	16.40	16.52	500	Complies

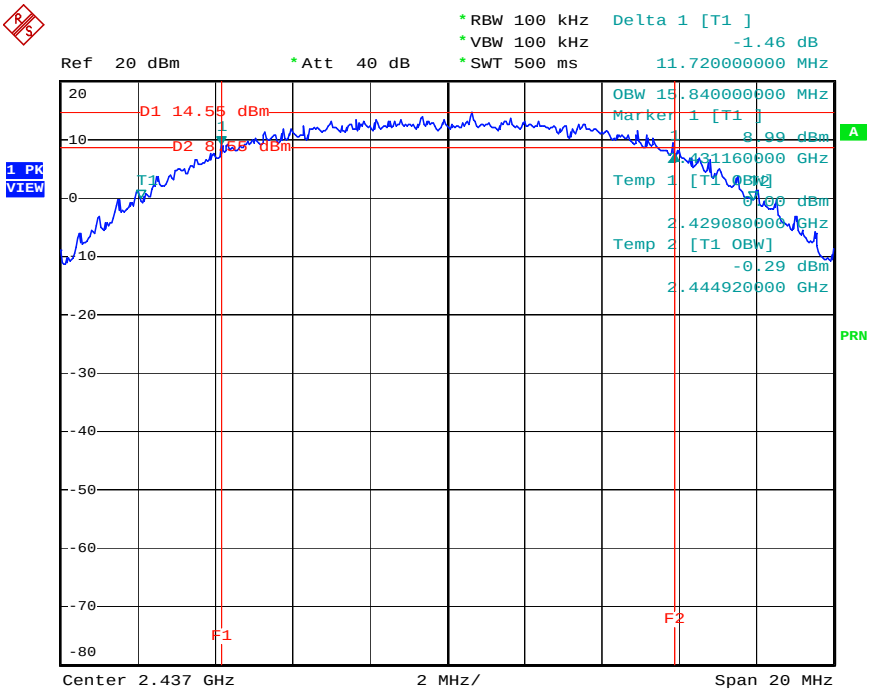
Mode 1

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz



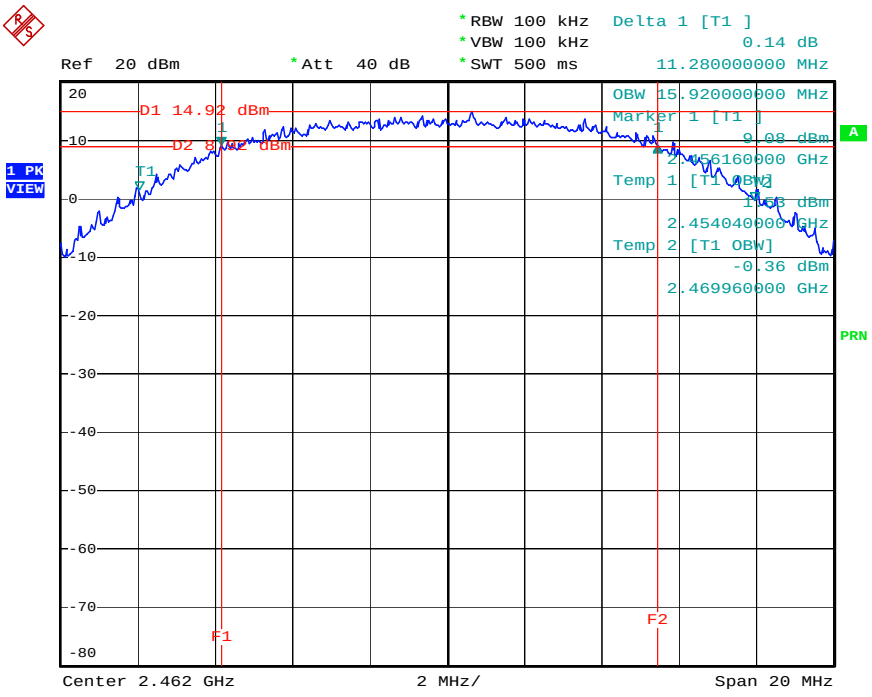
Date: 27.NOV.2006 16:27:27

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz



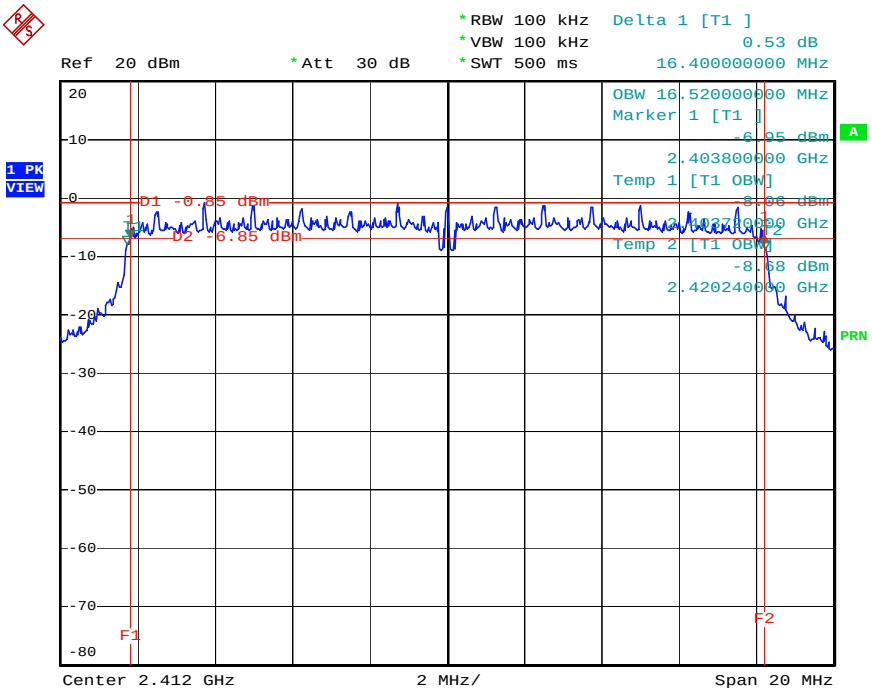
Date: 27.NOV.2006 16:41:25

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



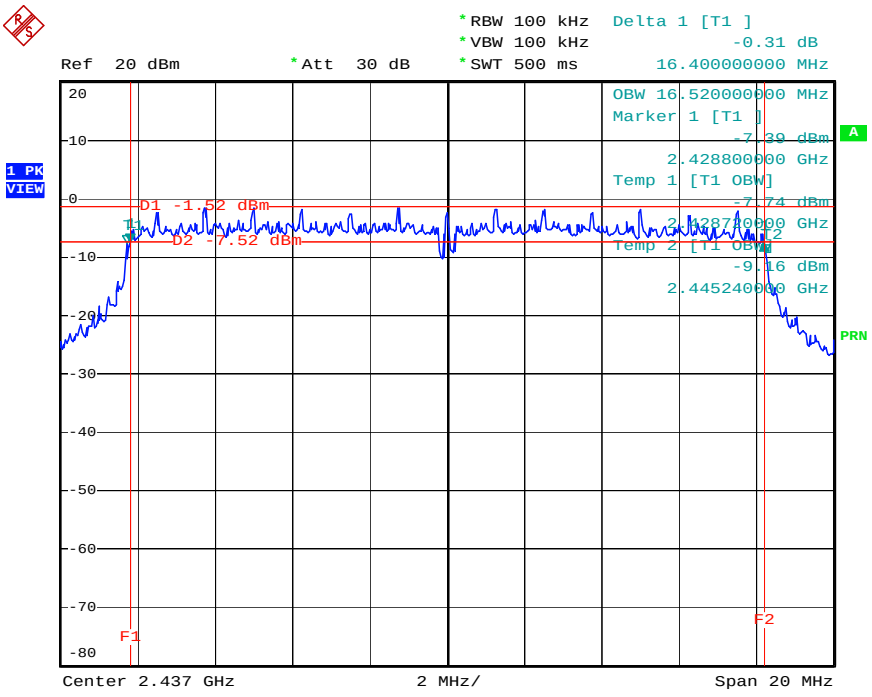
Date: 27.NOV.2006 16:56:42

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz



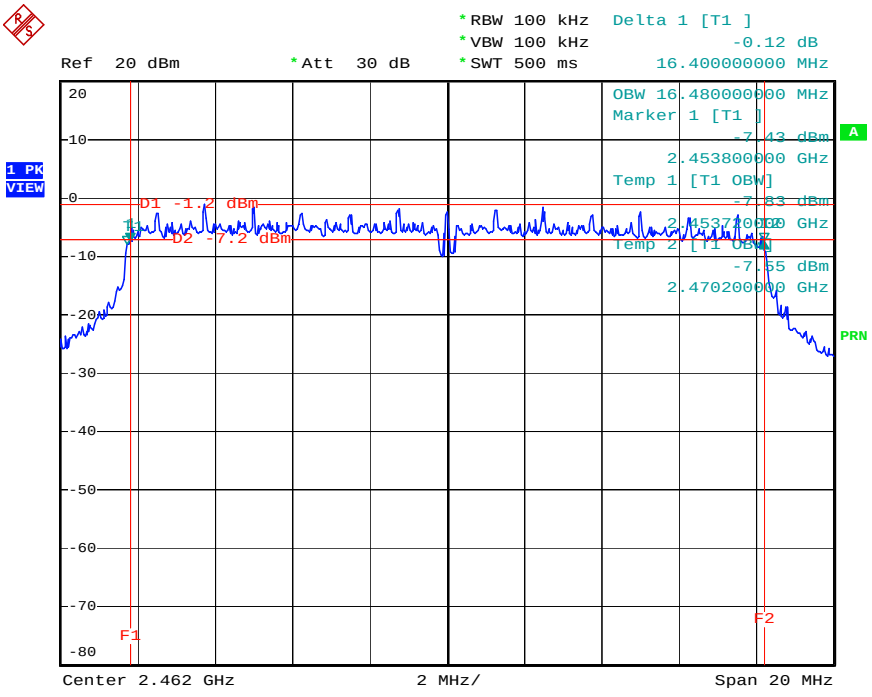
Date: 1.NOV.2006 09:04:43

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



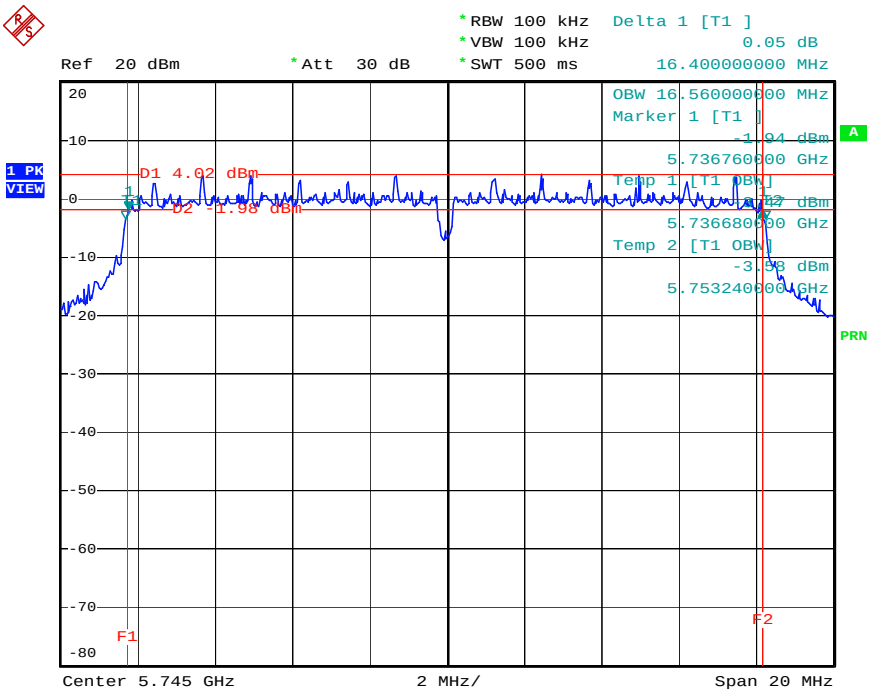
Date: 1.NOV.2006 09:10:17

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz



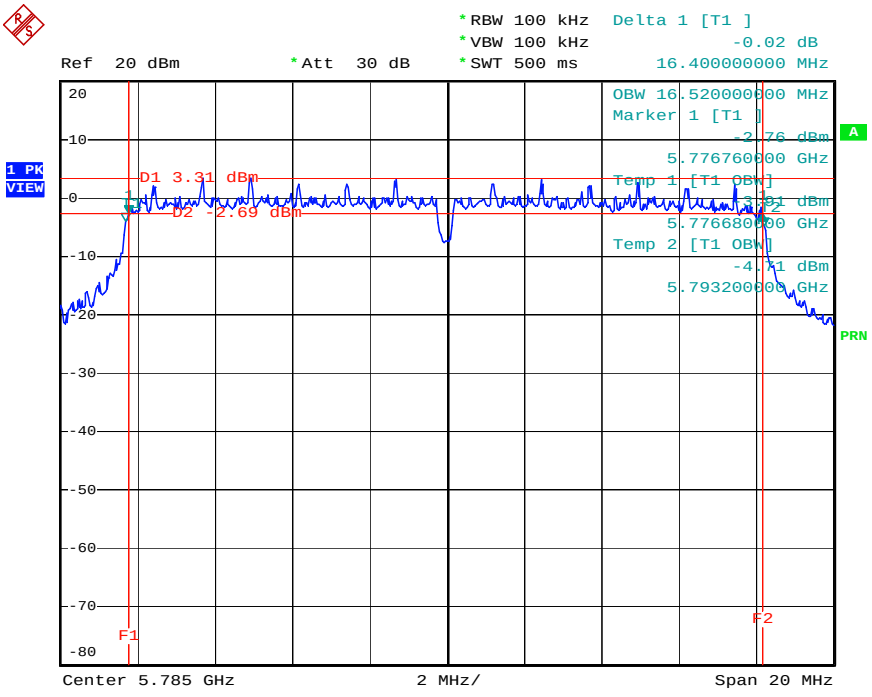
Date: 1.NOV.2006 09:11:58

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz



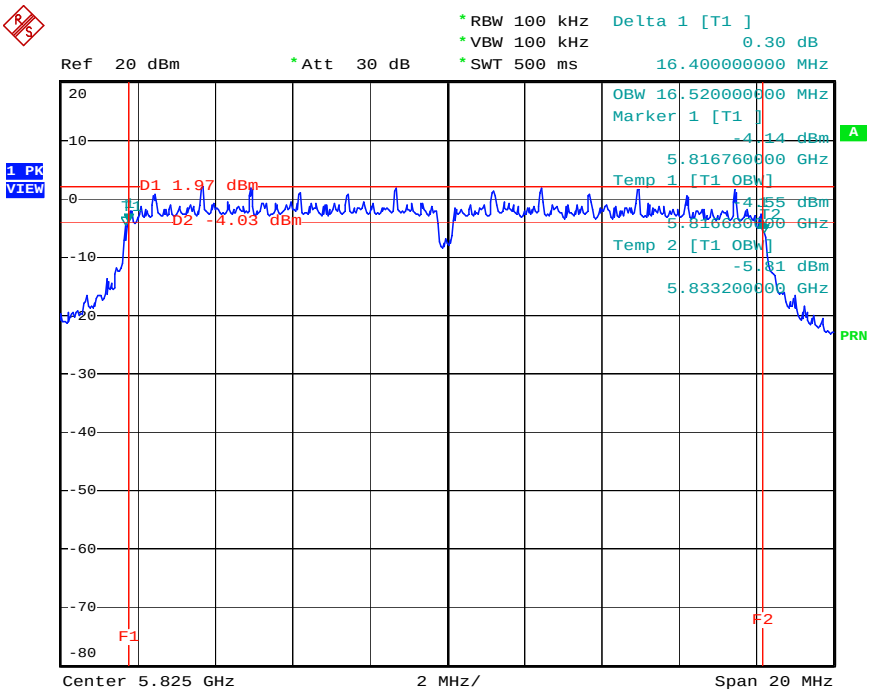
Date: 27.NOV.2006 13:28:45

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz



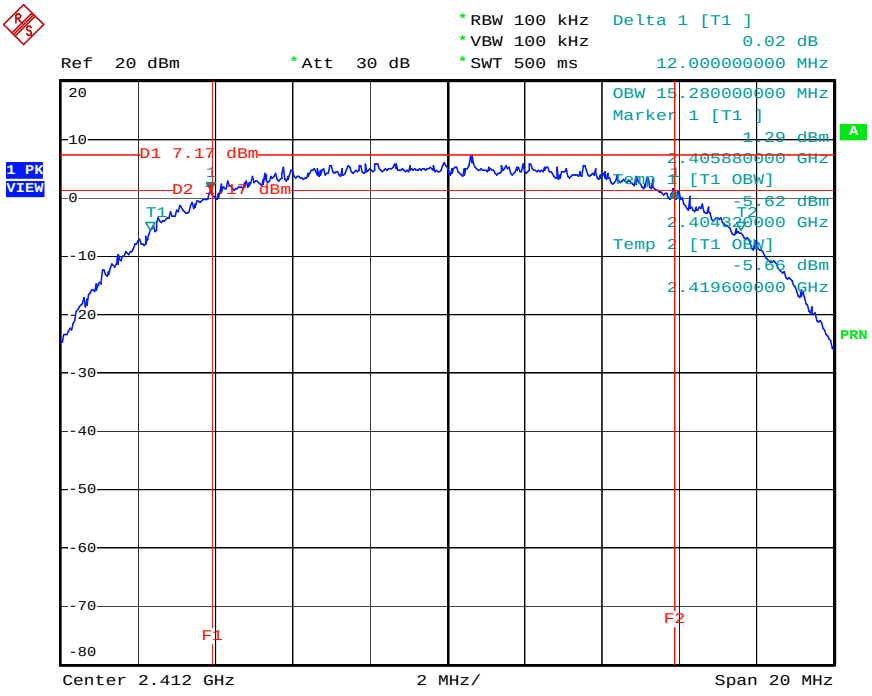
Date: 27.NOV.2006 13:25:54

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz



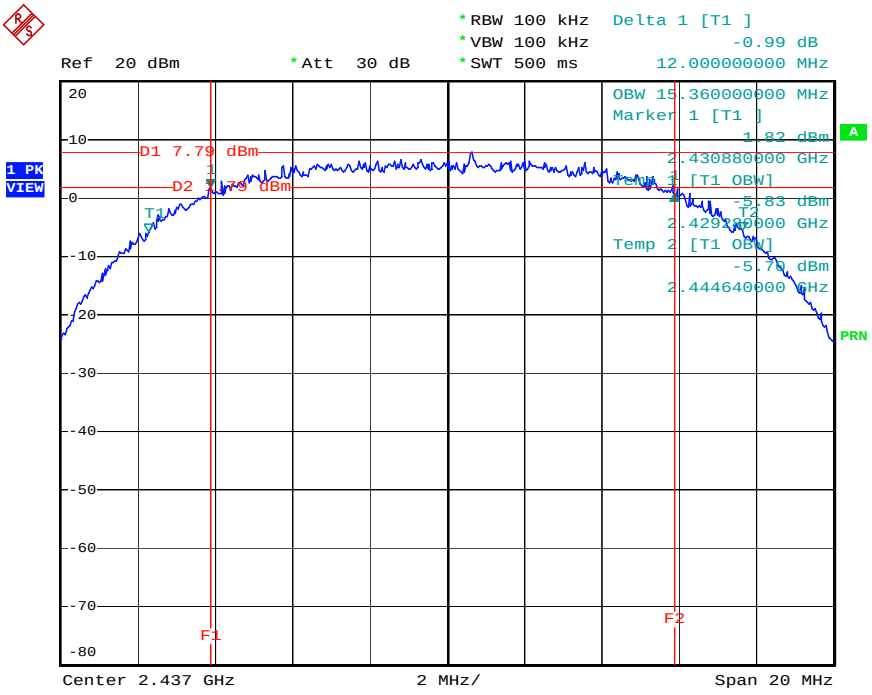
Mode 2

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz



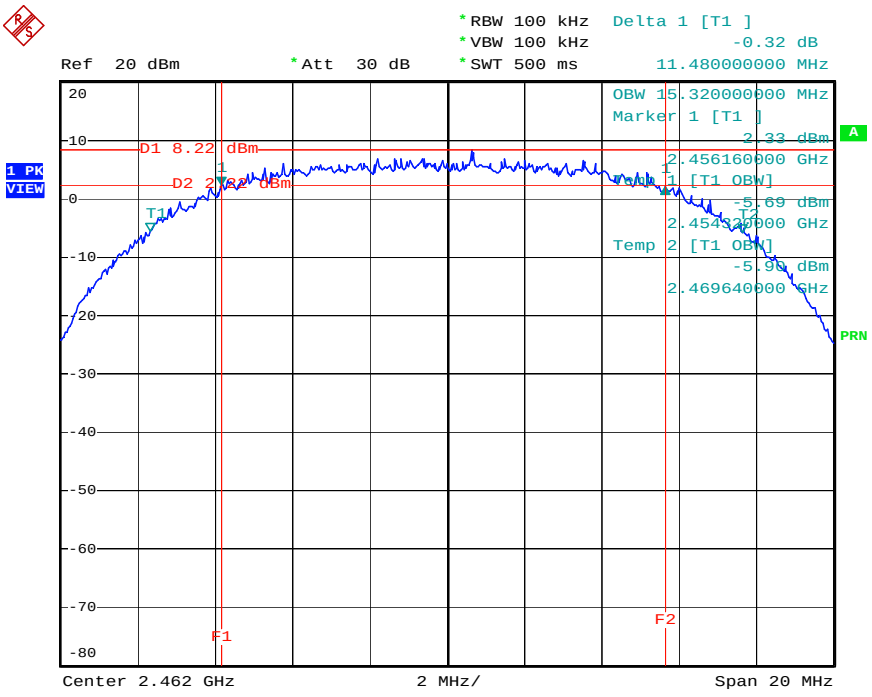
Date: 21.NOV.2006 09:17:01

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz



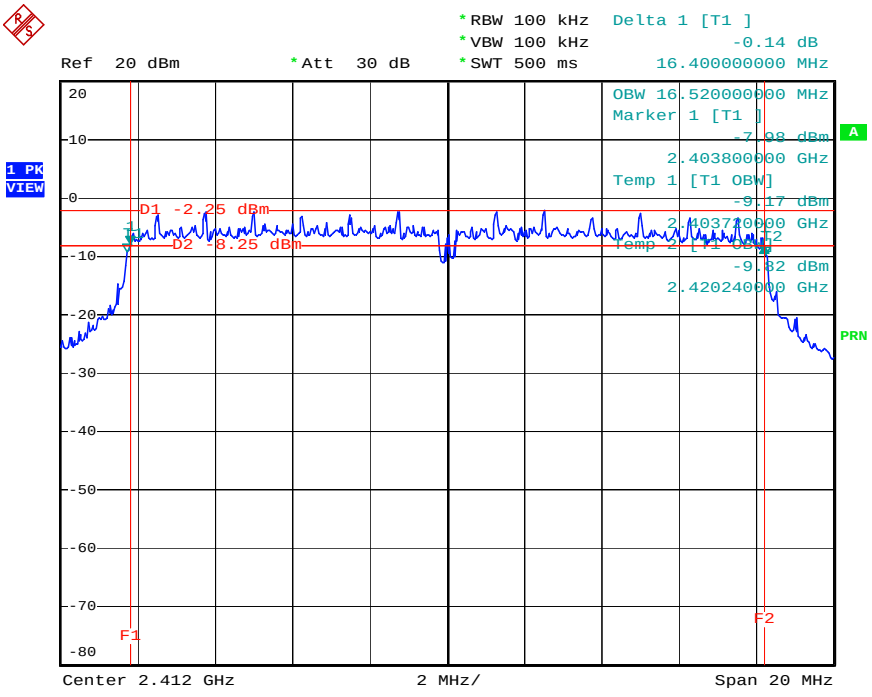
Date: 21.NOV.2006 09:23:07

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



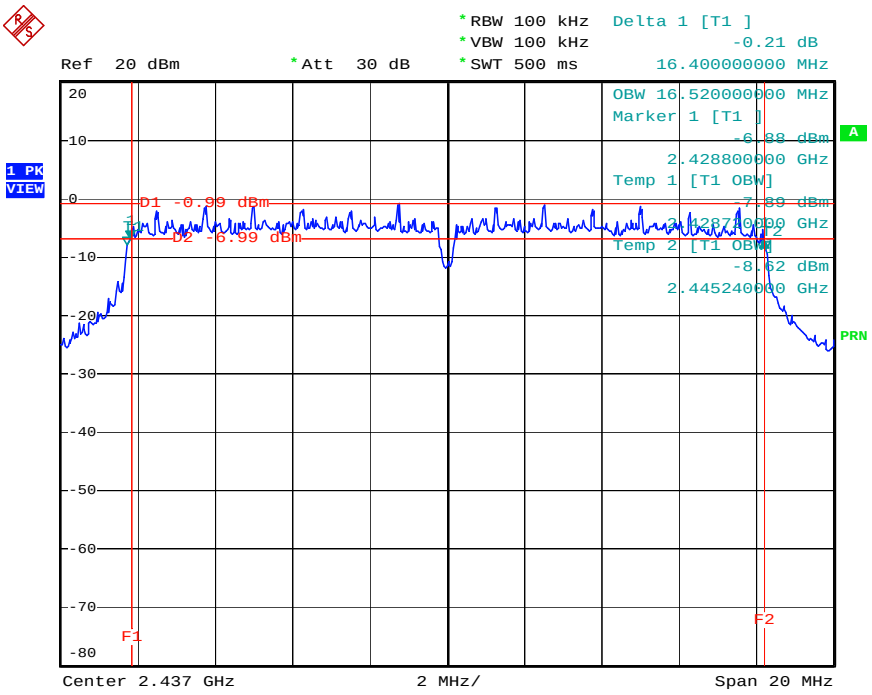
Date: 21.NOV.2006 09:24:29

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz



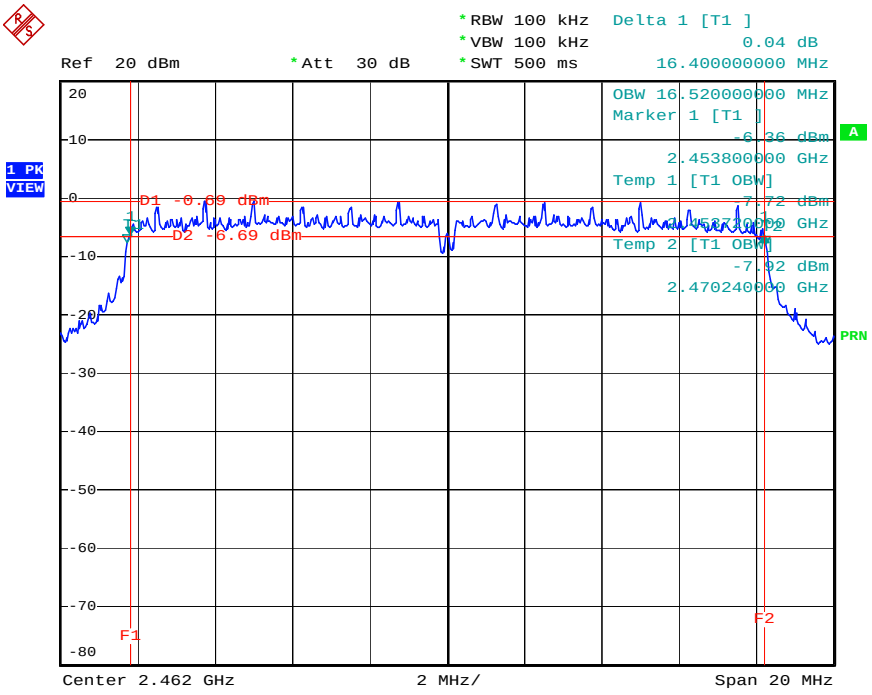
Date: 21.NOV.2006 09:59:10

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



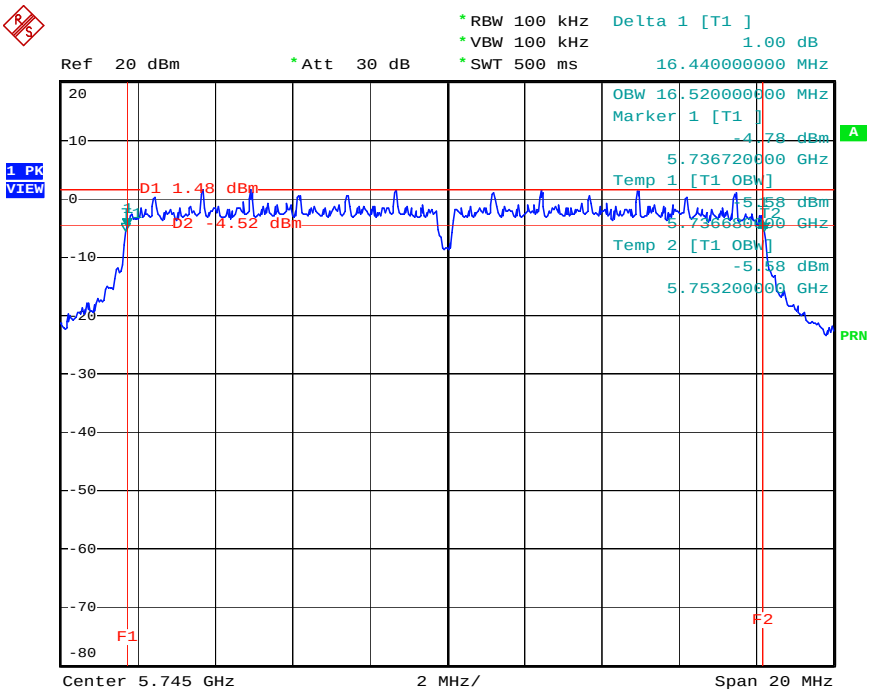
Date: 21.NOV.2006 10:06:27

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz

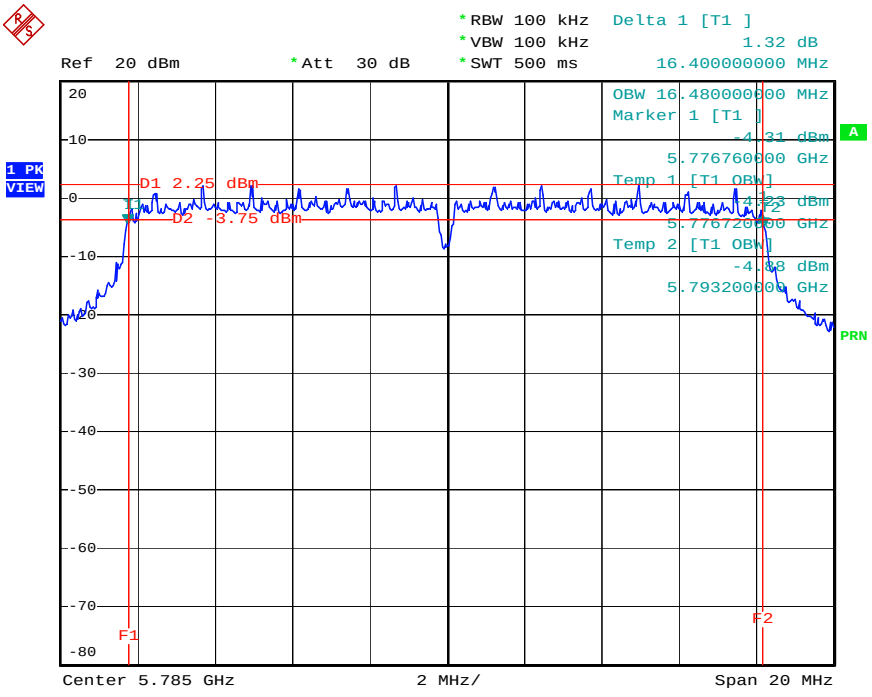


Date: 21.NOV.2006 10:07:35

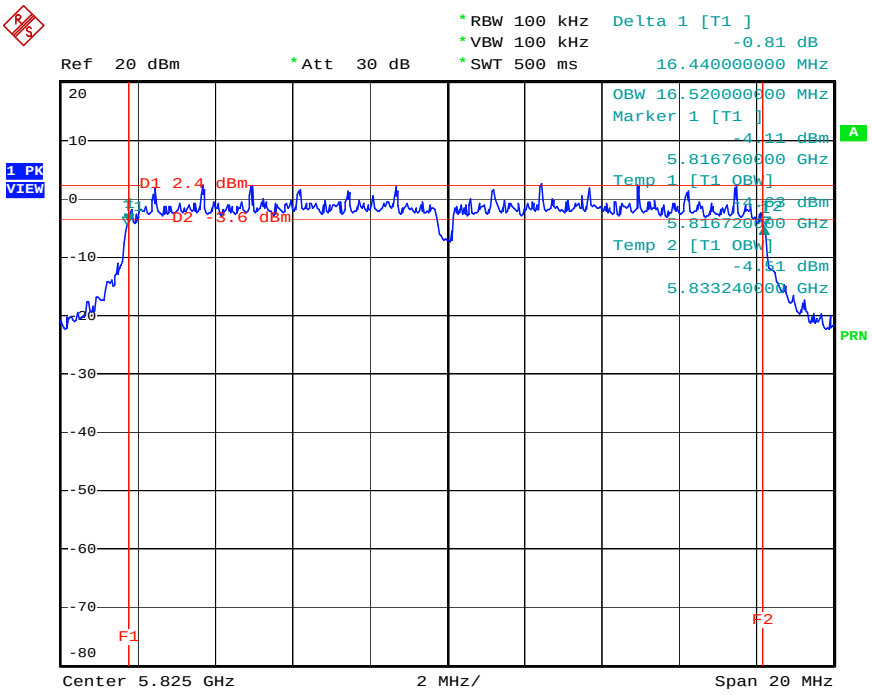
6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz



6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz

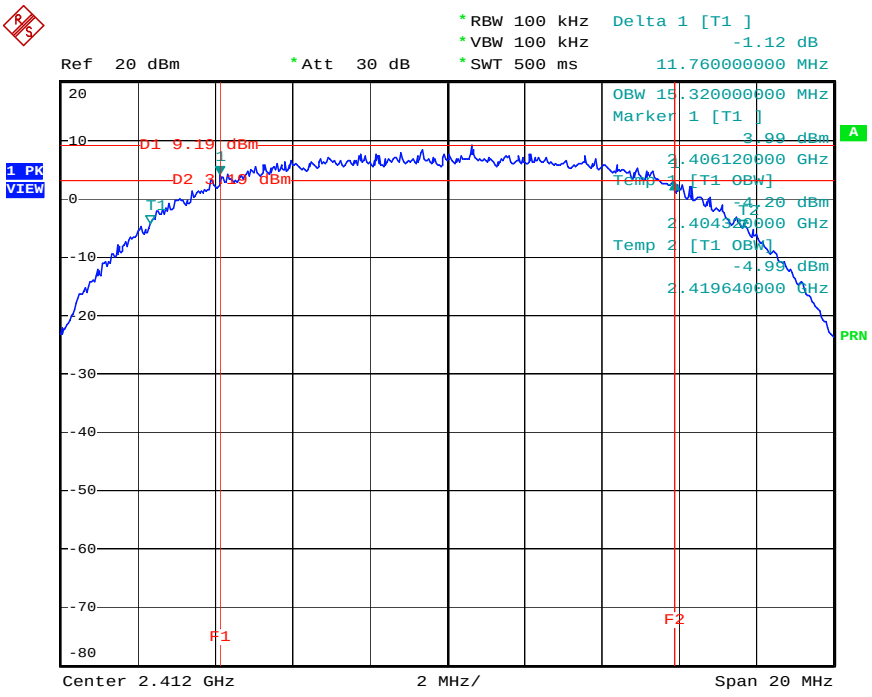


6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz



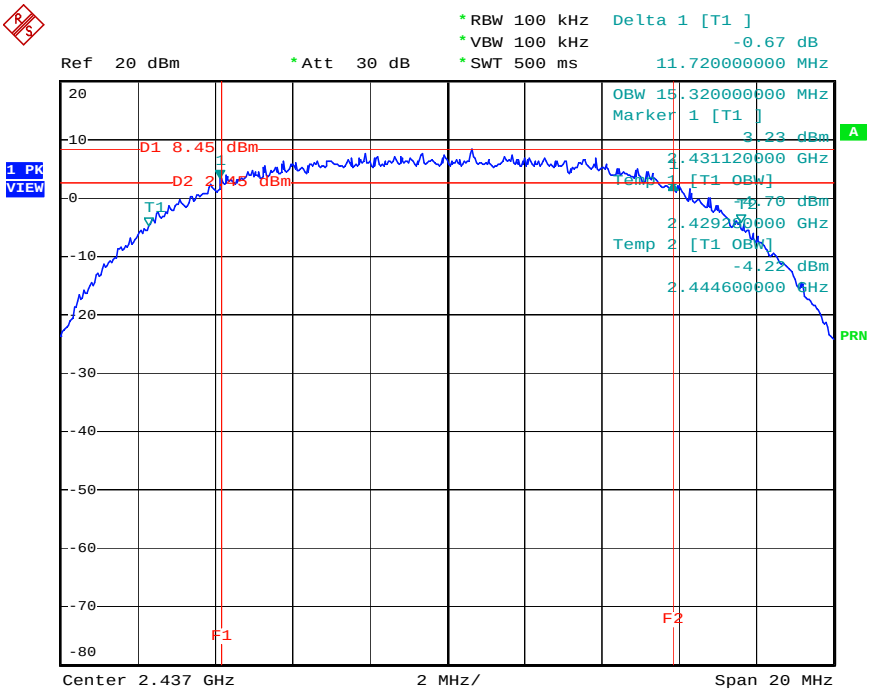
Mode 3

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz



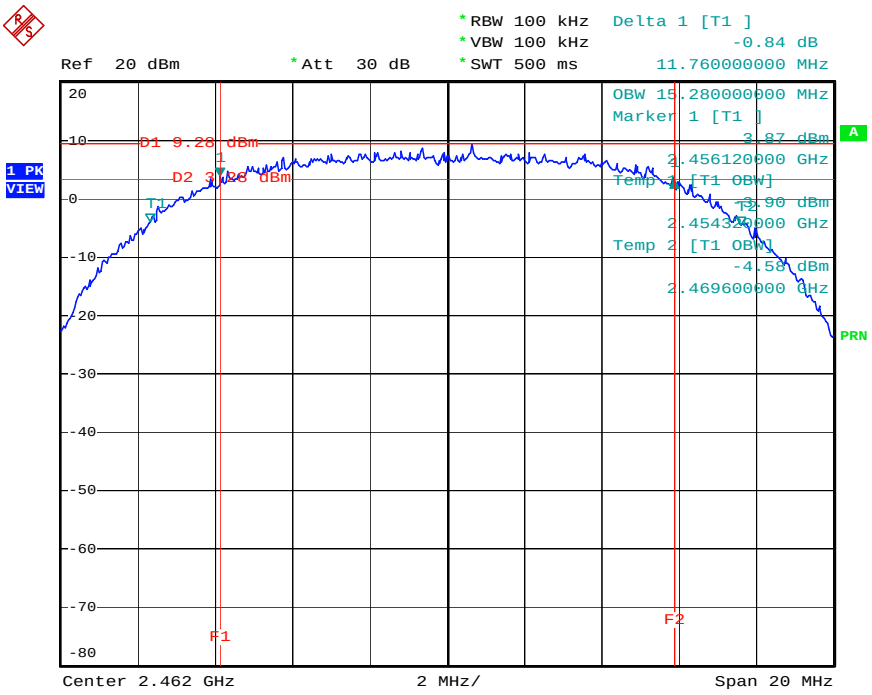
Date: 21.NOV.2006 10:59:03

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz



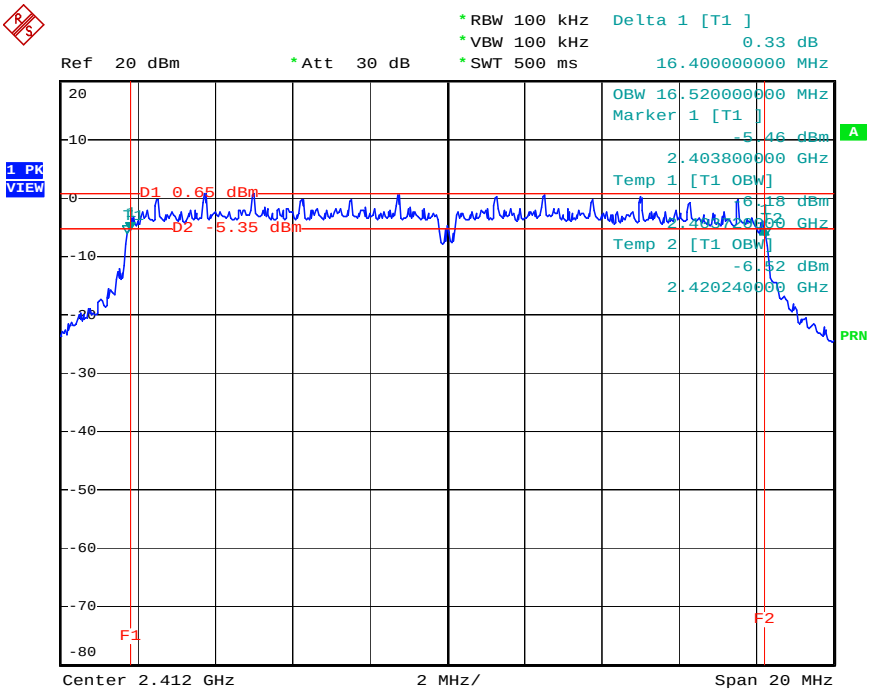
Date: 21.NOV.2006 11:04:30

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



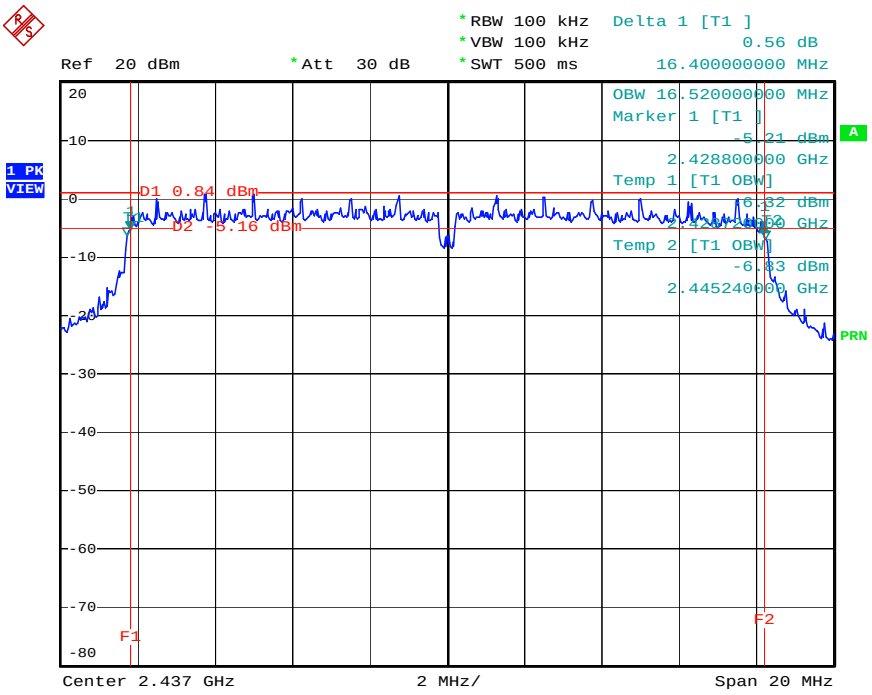
Date: 21.NOV.2006 11:05:39

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz



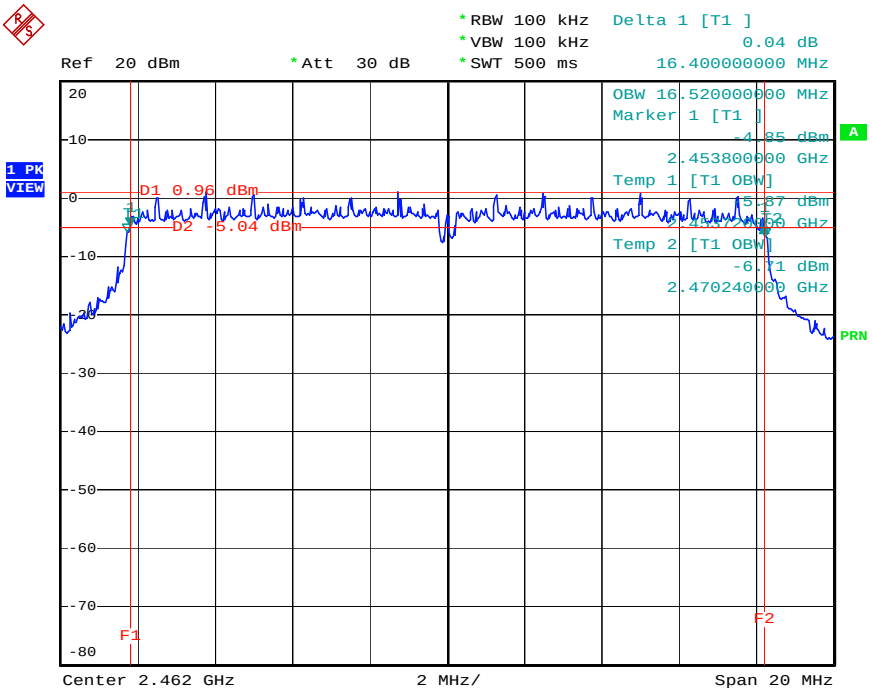
Date: 21.NOV.2006 10:33:08

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



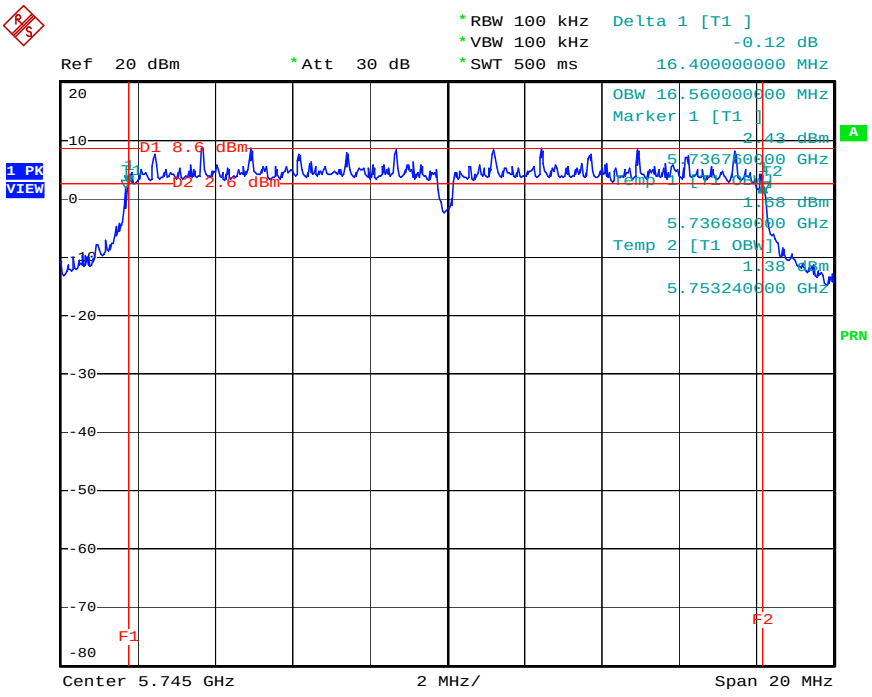
Date: 21.NOV.2006 10:46:04

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz



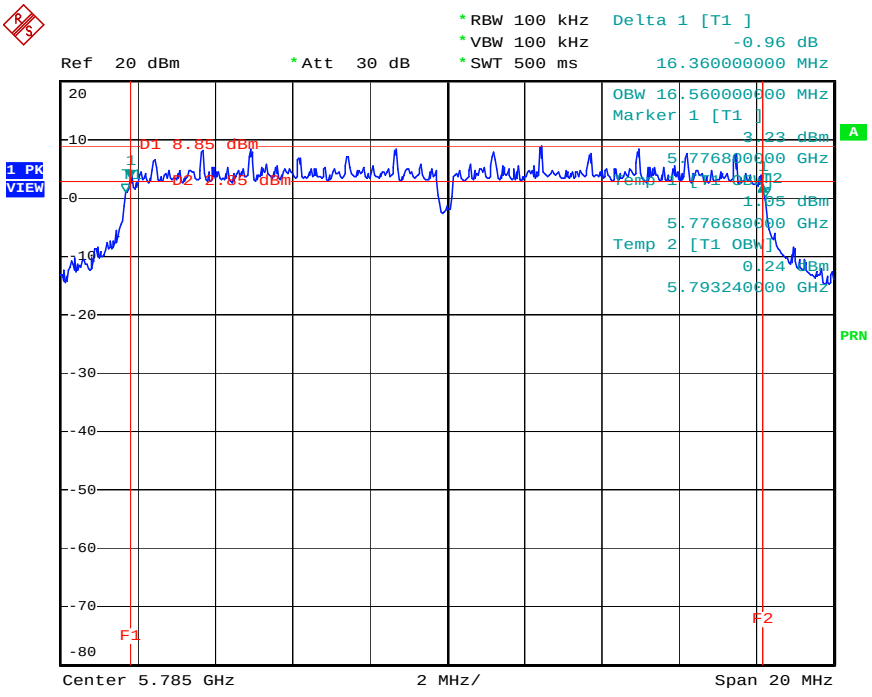
Date: 21.NOV.2006 10:47:06

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz



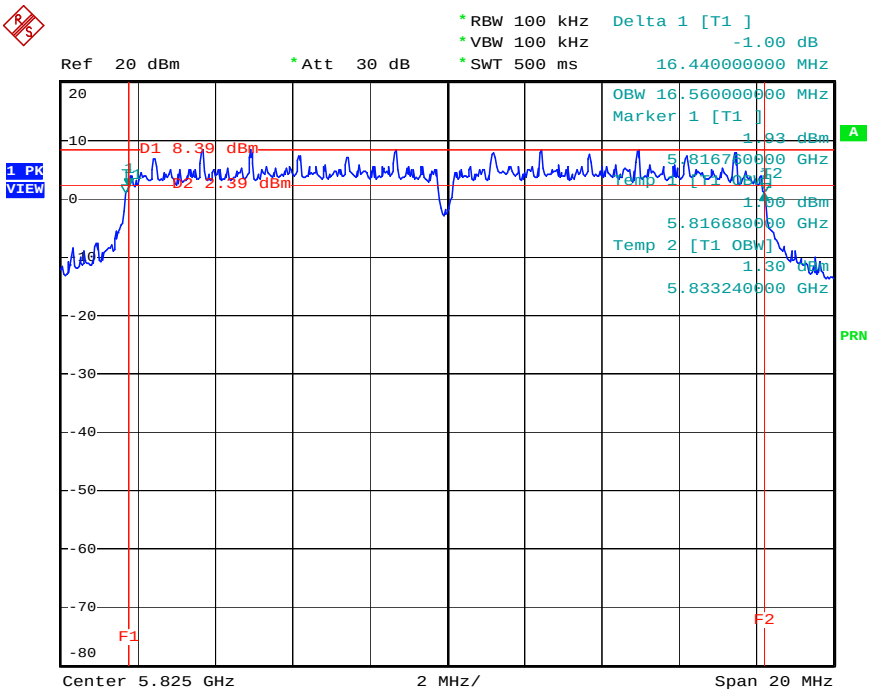
Date: 27.NOV.2006 10:37:57

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz



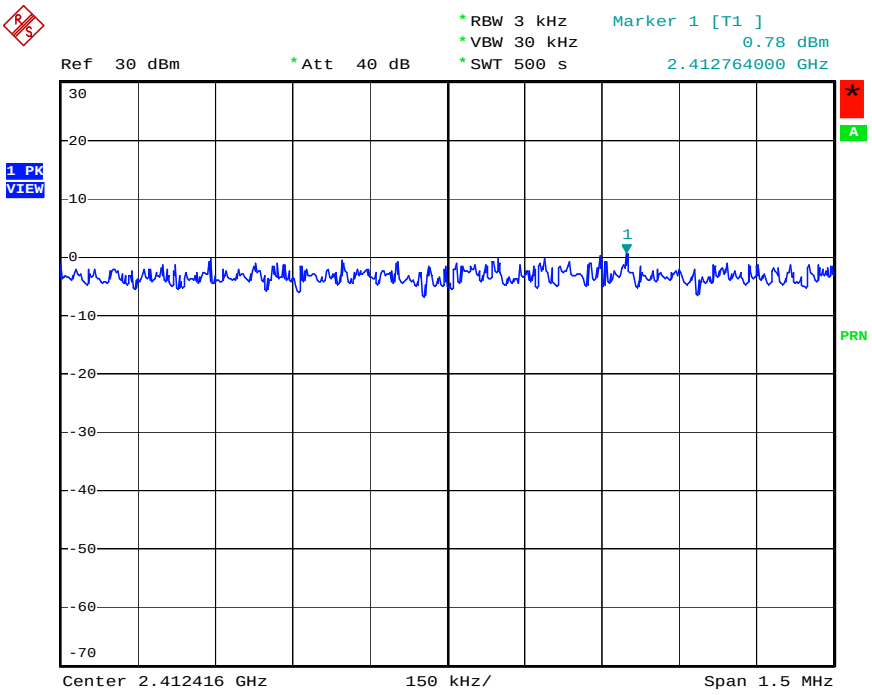
Date: 27.NOV.2006 10:37:01

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz



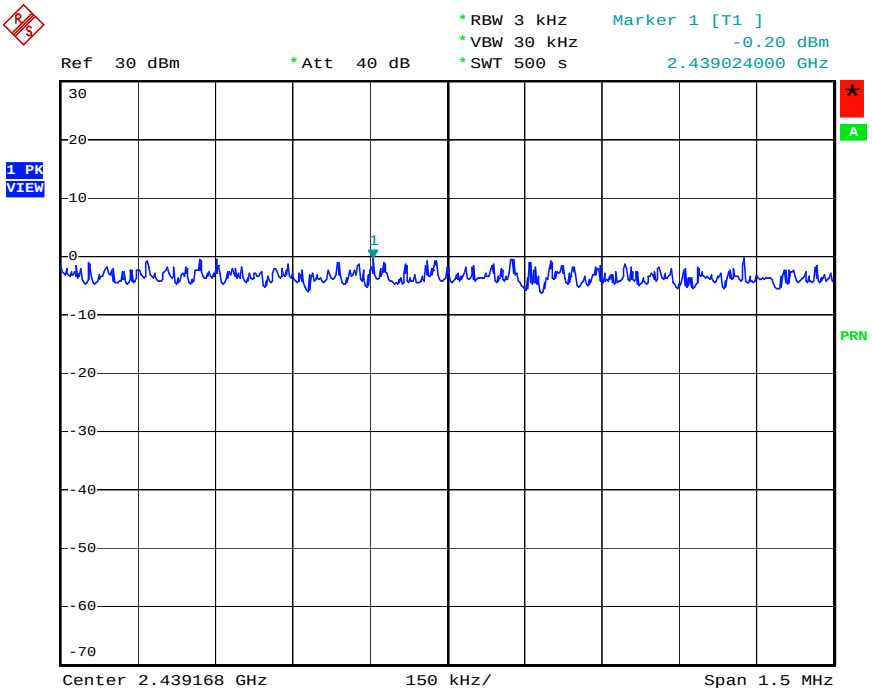
Mode 4

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz



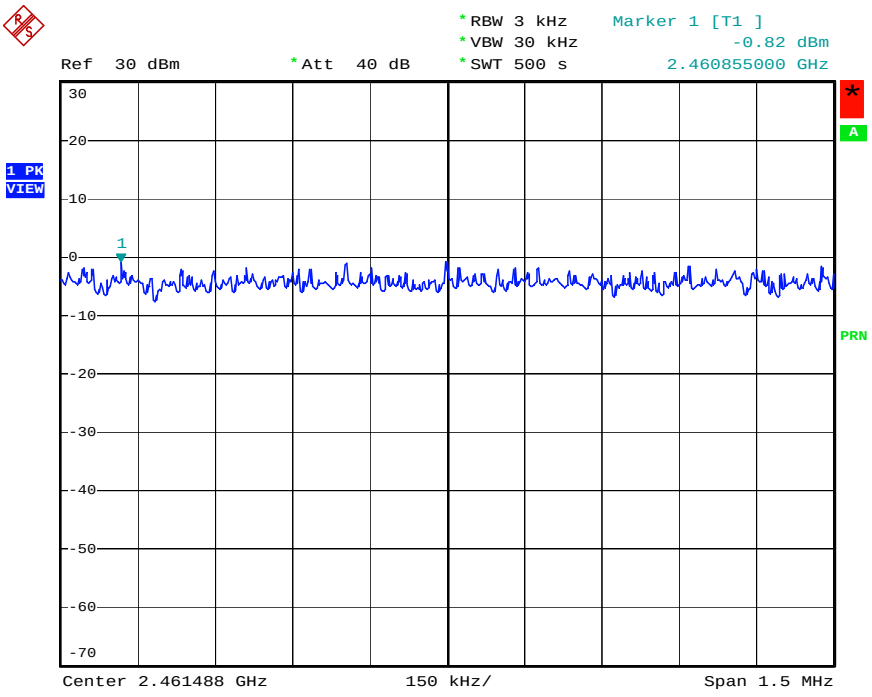
Date: 28.NOV.2006 19:50:09

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz



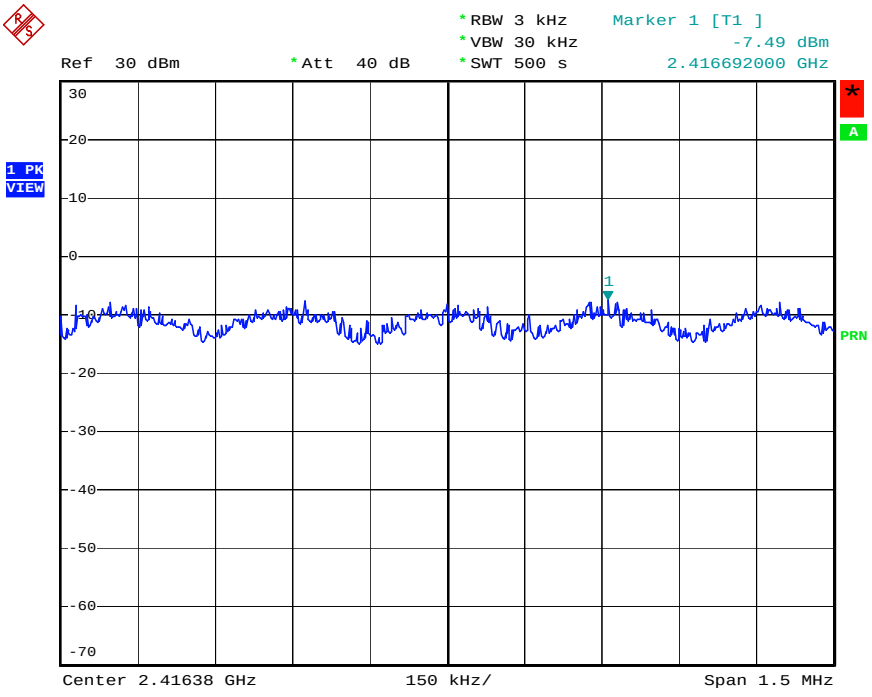
Date: 28.NOV.2006 19:48:48

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz



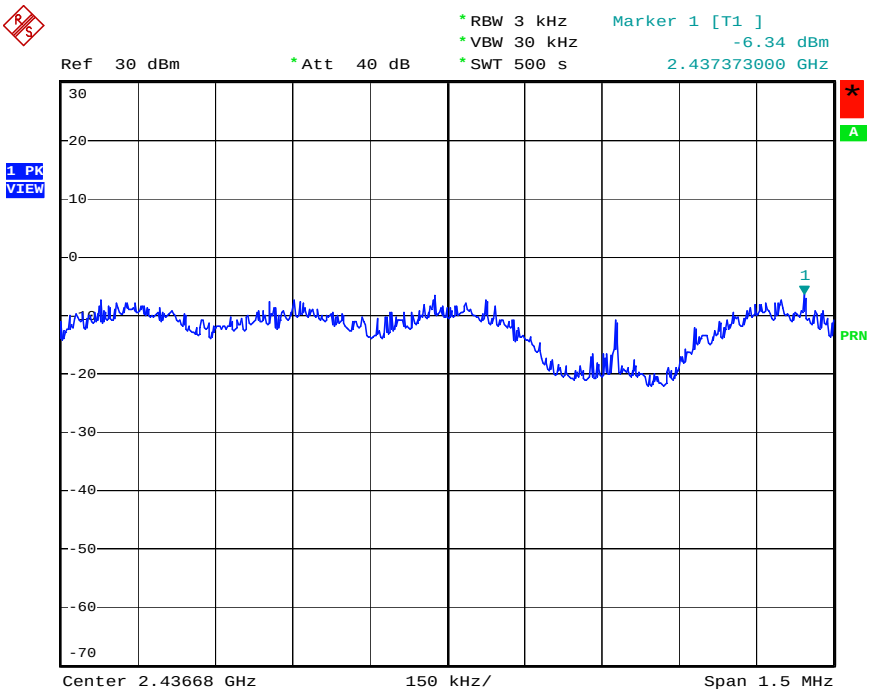
Date: 28.NOV.2006 19:52:20

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz



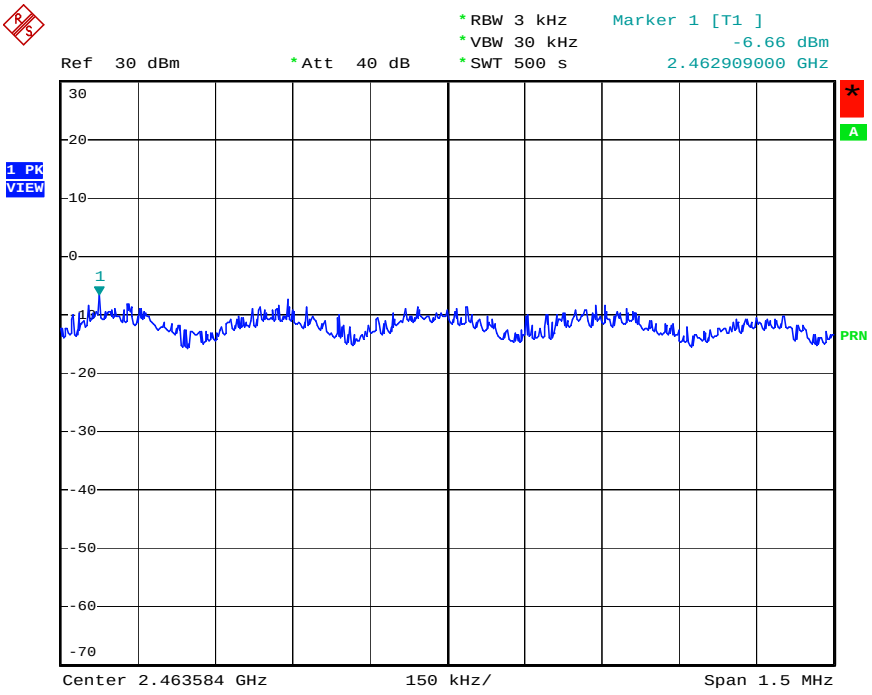
Date: 28.NOV.2006 20:10:38

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz



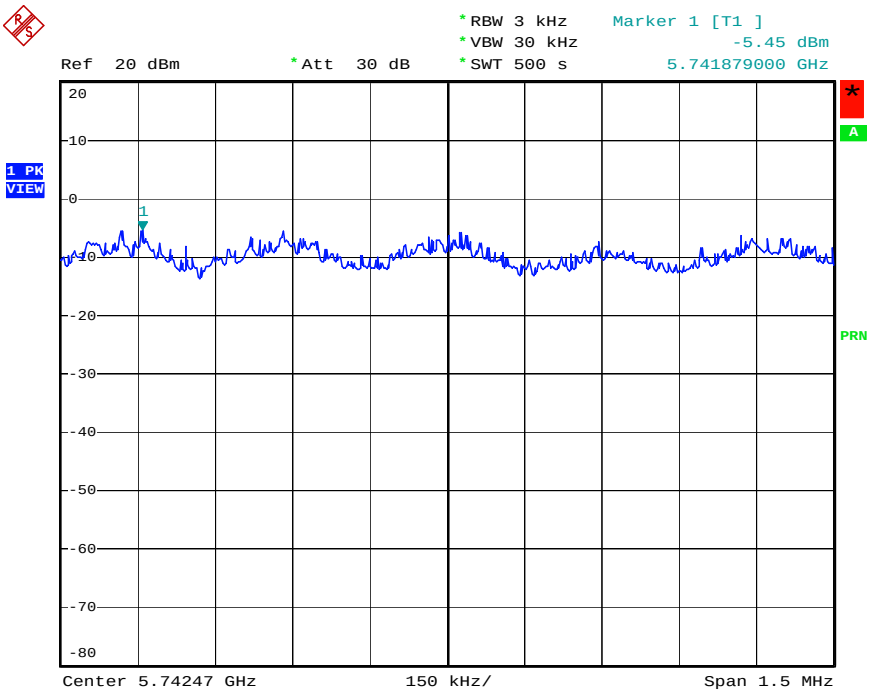
Date: 28.NOV.2006 20:09:25

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2462 MHz



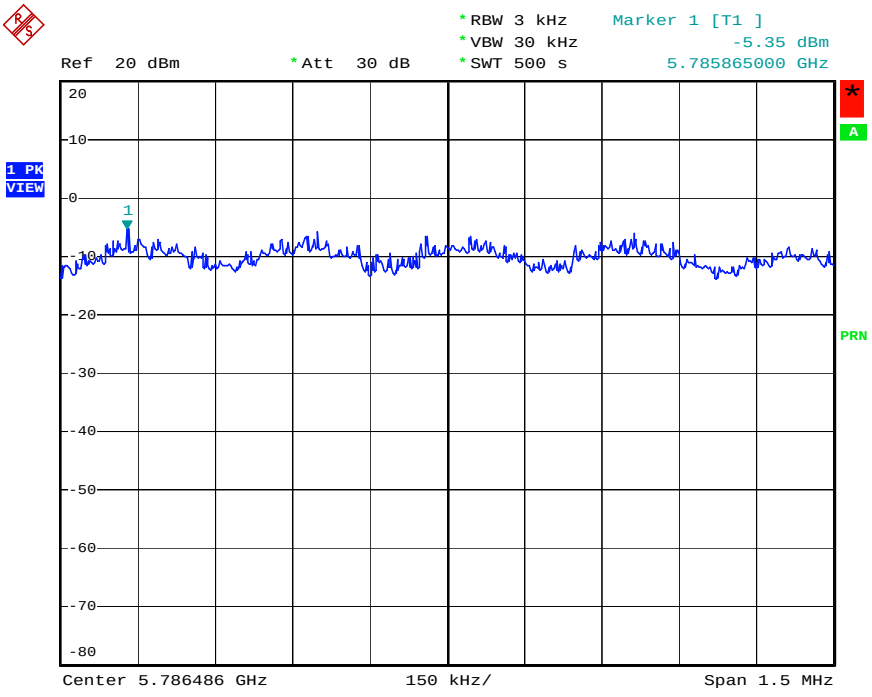
Date: 28.NOV.2006 20:07:37

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz



Date: 27.NOV.2006 10:40:26

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz



Date: 27.NOV.2006 10:35:43

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz