

# EMC TEST REPORT

**Report No. : EME-060849**

**Model No. : SSG 20**

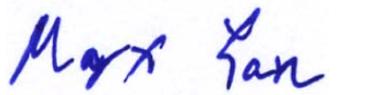
**Issued Date : Jul. 14, 2006**

**Applicant : Juniper Networks Inc.  
1194 North Mathilda Avenue, Sunnyvale, California  
94089-1206 USA**

**Test By : Intertek Testing Services Taiwan Ltd.  
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Shiang-Shan District, Hsinchu City, Taiwan**

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Project Engineer



Marx Yang

Reviewed By



Jerry Liu

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**Summary of Tests****Secure Services Gateway 20 -Model: SSG 20**  
**FCC ID: OXVSSG20****1. 802.11b+g**

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Pass
Maximum Output Power test	15.247(b)	Pass
Radiated Spurious Emission test	15.205, 15.209	Pass
Power Spectrum Density test	15.247(e)	Pass
Emission on the Band Edge test	15.247(d)	Pass
AC Power Line Conducted Emission test	15.207	Pass

**2. 802.11a**

Test	Reference	Results
Peak output power test	15.407 (a)(1)/(2)/(3)	Pass
Power Spectrum Density test	15.407 (a)(1)/(2)/(3)	Pass
Peak excursion to average ratio test	15.407(a)(6)	Pass
Radiated spurious emission test	15.407(b)(1)/(2)/(3), 15.209	Pass
RF antenna conducted spurious emission test	15.407(b)(1)/(2)/(3)	Pass
AC line conducted emission test	15.407(b)(6) 15.207	Pass

**1. General information****1.1 Identification of the EUT**

Applicant	: Juniper Networks Inc.
Product	: Secure Services Gateway 20
Model No.	: SSG 20
FCC ID.	: OXVSSG20
Frequency Range	: 1. 2412 MHz ~ 2462 MHz 2. 5180 MHz ~ 5320 MHz
Channel Number (802.11 a+b+g)	: 1. 11Channels for 2412 MHz ~ 2462 MHz 2. 8Channels for 5180 MHz ~ 5320 MHz
Channel Number (802.11 a+b+g turbo mode)	: 1. 1Channel for 2412 MHz ~ 2462 MHz 2. 3Channels for 5180 MHz ~ 5320 MHz
Frequency of Each Channel (802.11 a+b+g)	: 1. 2412 MHz + 5k MHz, k=0~10 2. 5180 MHz + 20k MHz, k=0~7
Frequency of Each Channel (Turbo mode)	: 1. 2437 MHz 2. 5210 MHz, 5250MHz, 5290MHz
Type of Modulation	: DSSS, OFDM
Rated Power	: 1. Input: 100-240Vac, 50-60Hz, 1.0A; Output: 12V, 3.0A with adapter (Model: VAN40B-12B) 2. Input: 100-240Vac, 50/60Hz, 1.2A; Output: 12V, 3.33A with adapter (Model: NU40-2120333-I3)
Power Cord	: 2C×0.75mm <sup>2</sup> × 1.8meter unshielded cable
Data Cable	: 1. RJ-45 UTP Cat.5 1.8meter × 7 2. RJ-11 unshielded cable 1.8meter × 1 3. Console Shielded cable 1.2meter × 1
Sample Received	: May 15, 2006
Test Date(s)	: May 15, 2006 ~ Jun. 10, 2006

FCC Part 15 B report has been issued for this EUT.

**1.2 Additional information about the EUT**

The EUT is a Secure Services Gateway 20, and was defined as information technology equipment.

The EUT has three kinds of modules for US marketing strategy, one is V.92, one is T1 and another is ADSL/ADSL2/2+.

For more detail features, please refer to User's manual as file name "Installation guide.pdf".

### 1.3 Antenna description

#### Antenna 1

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna No. : RFA-25-5-T39-05

Antenna Gain : 1. 1.0dBi (2400MHz~2500MHz)  
2. 3.0dBi (4900MHz~6000MHz)

Antenna Type : Omini-directional antenna

Connector Type : R SMA PLUG

#### Antenna 2

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna No. : RFA-25-3-T38-03

Antenna Gain : 1. 6.0dBi (2400MHz~2500MHz)  
2. 6.0dBi (4900MHz~6000MHz)

Antenna Type : Directional antenna

Connector Type : RP SMA PLUG

#### Antenna 3

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna No. : 120300012200J

Antenna Gain : 1. 1.0dBi (2400MHz)  
2. 3.0dBi (5000MHz)

Antenna Type : Diople antenna

Connector Type : RP SMA PLUG

### 1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.
Notebook PC	DELL	PP01L	CN-03P83-48643-33O-3930
Notebook PC	HP	OmniBook XE3	TW20705468
Notebook PC	IBM	2887	99XML12
USB HD	Transend	TS256MJ2B	N/A

## 2. Test specifications

### 2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205, §15.207, §15.209, §15.247 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

The EUT was performed according to the procedures in FCC Part 15 Subpart E Section § 15.207, §15.209 , §15.407 and ANSI C63.4/2001.

The AC power conducted emissions was invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz. (15.207 paragraph)

Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading recorded also on the report.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

The EUT setup configurations please refer to the photo of test configuration in item.

### 2.2 Operation mode

The EUT was supplied with 120Vac, 60Hz and it was running in operating mode.

Verifying three antennas (Antenna1, Antenna 2 and Antenna 3). The worst antenna is antenna 2. The final tests were executed under these conditions and recorded in this report individually.

Verifying two adapters (Model: VAN40B-12B, NU40-212033-I3). The worst adapter is VAN40B-12B. The final tests were executed under these conditions and recorded in this report individually.

The EUT was transmitted continuously during the test.

With individual verifying, the maximum output power was found at 1Mbps data rate for 802.11b mode, 6Mbps data rate for 802.11g mode and 6Mbps data rate for 802.11a mode. The final tests were executed under these conditions and recorded in this report individually.

**2.3 Test equipment**

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2007
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	08/07/2006
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/24/2006
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	11/01/2006
Horn Antenna	SCHWARZBECK	1GHz~18GHz	BBHA 9120 D	EC371	12/22/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~2GHz	VULB 9168	EC347	12/23/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	02/11/2007
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	11/10/2006
Controller	HDGmbH	N/A	CM 100	EP346	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP347	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/13/2007

Note: 1. The above equipments are within the valid calibration period.  
2. The test antennas (receiving antenna) are calibration per 3 years.

### 3. Minimum 6dB Bandwidth test (FCC 15.247)

#### 3.1 Operating environment

Temperature: 25  
Relative Humidity: 60 %  
Atmospheric Pressure: 1023 hPa

#### 3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 100kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

#### 3.3 Measured data of Minimum 6dB Bandwidth test results

##### Test Mode: 802.11b(DSSS Modulation) operating mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	11.16	> 500kHz
6 (middle)	2437	11.16	> 500kHz
11 (highest)	2462	12.12	> 500kHz

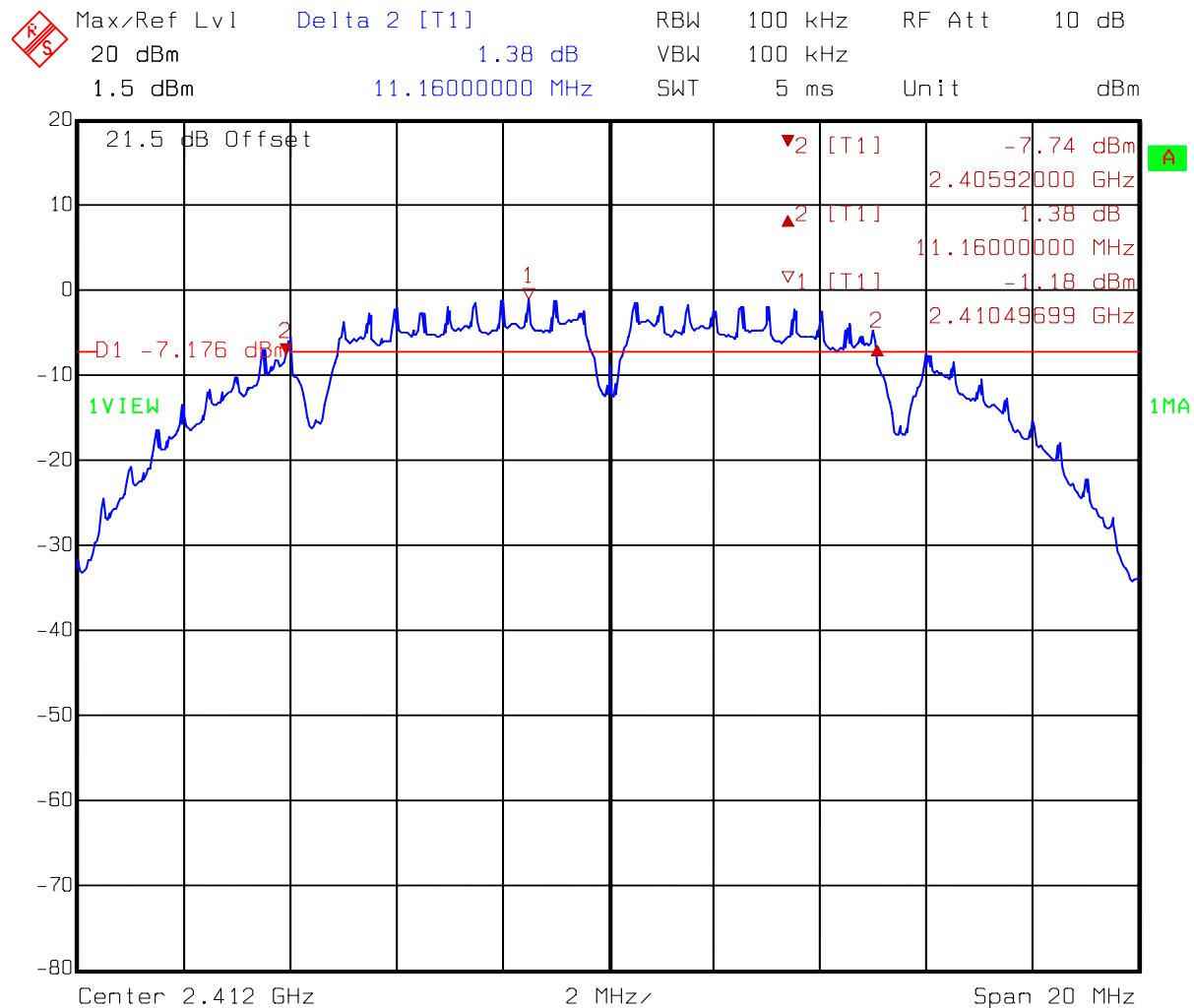
##### Test Mode: 802.11g(OFDM Modulation) operating mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	16.44	> 500kHz
6 (middle)	2437	16.44	> 500kHz
11 (highest)	2462	16.44	> 500kHz

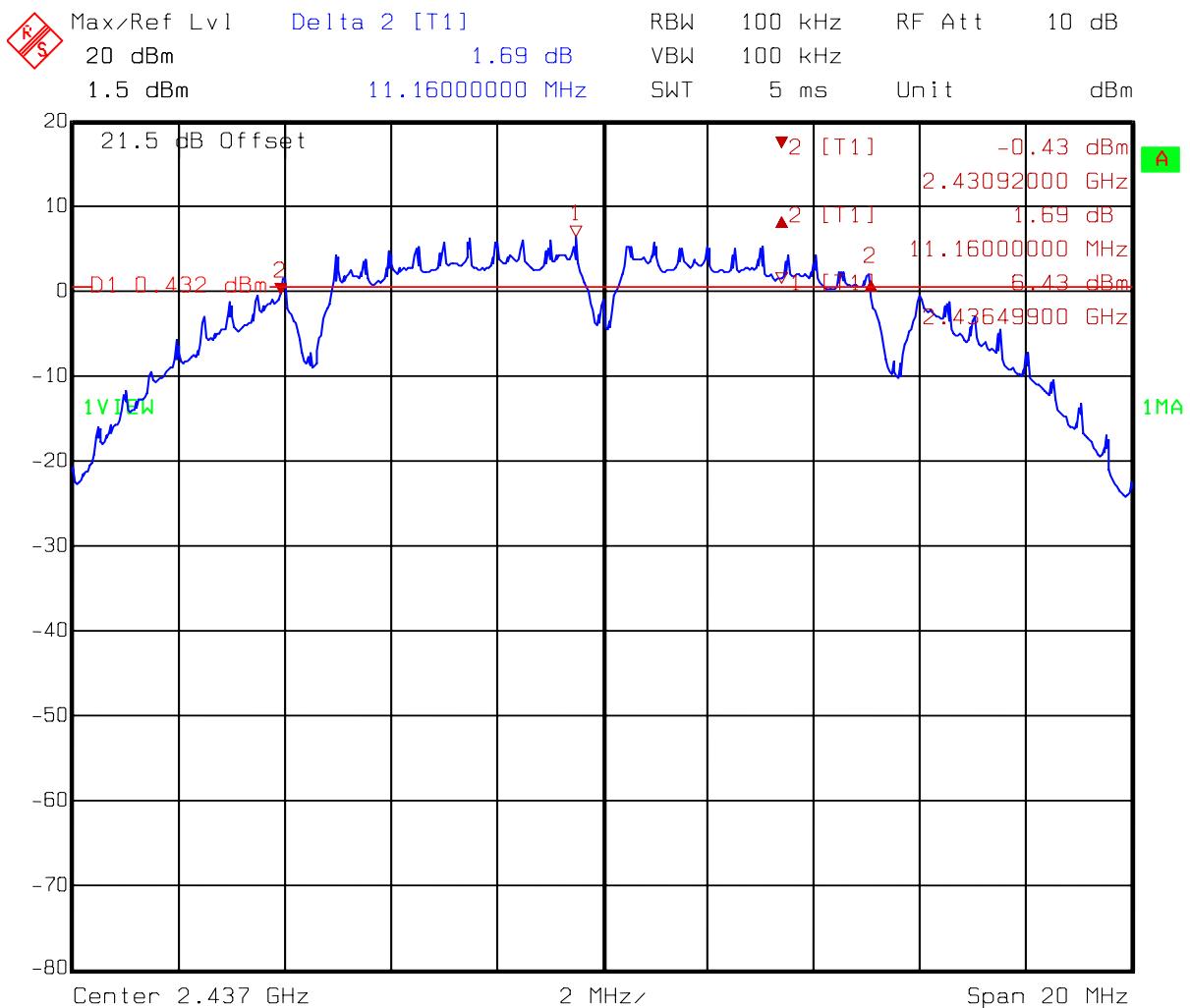
##### Test Mode: 802.11g(OFDM Modulation) turbo mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
6 (middle)	2437	31.52	> 500kHz

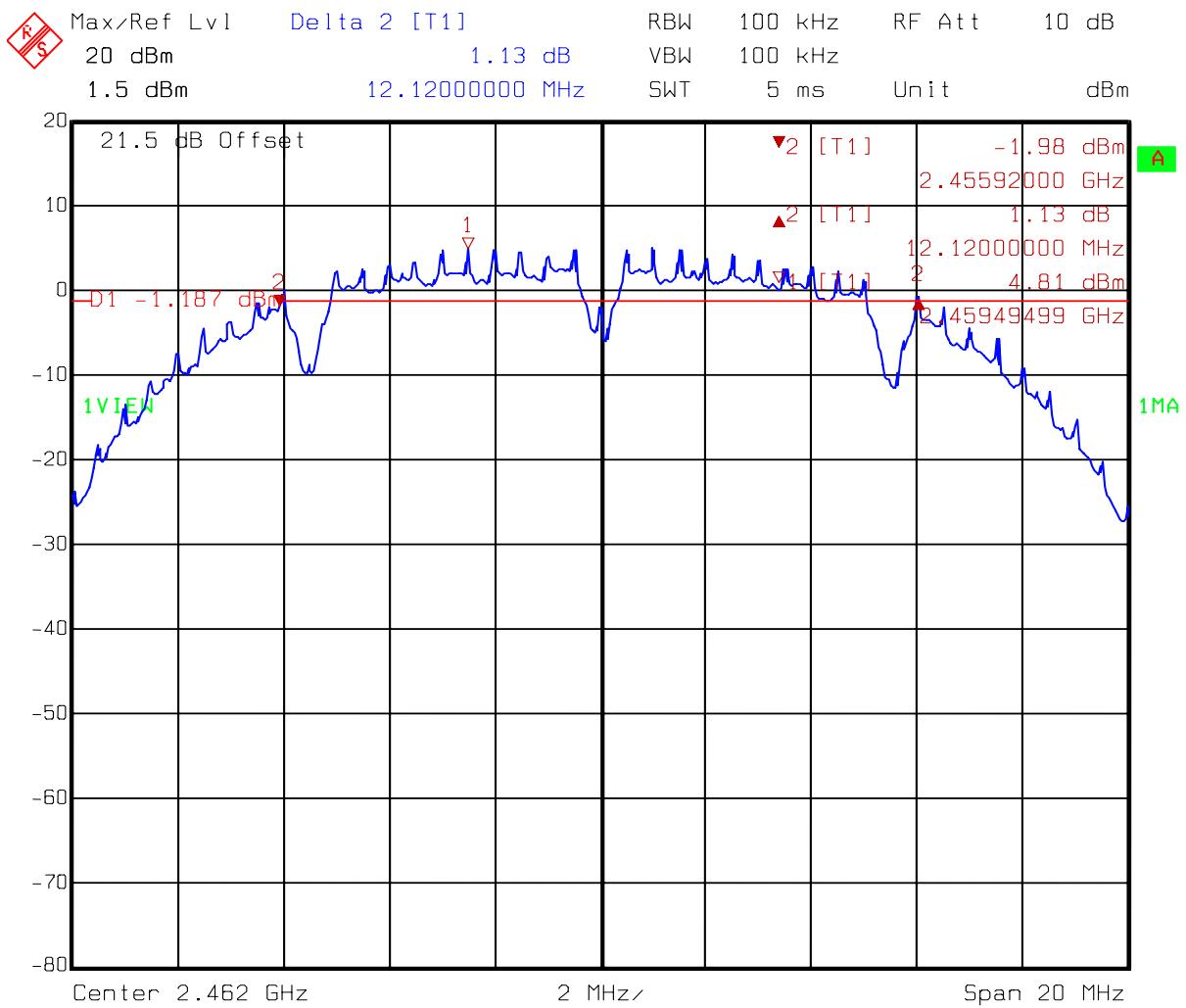
Please see the plot below.

**Test Mode: 802.11b(DSSS Modulation) operating mode**


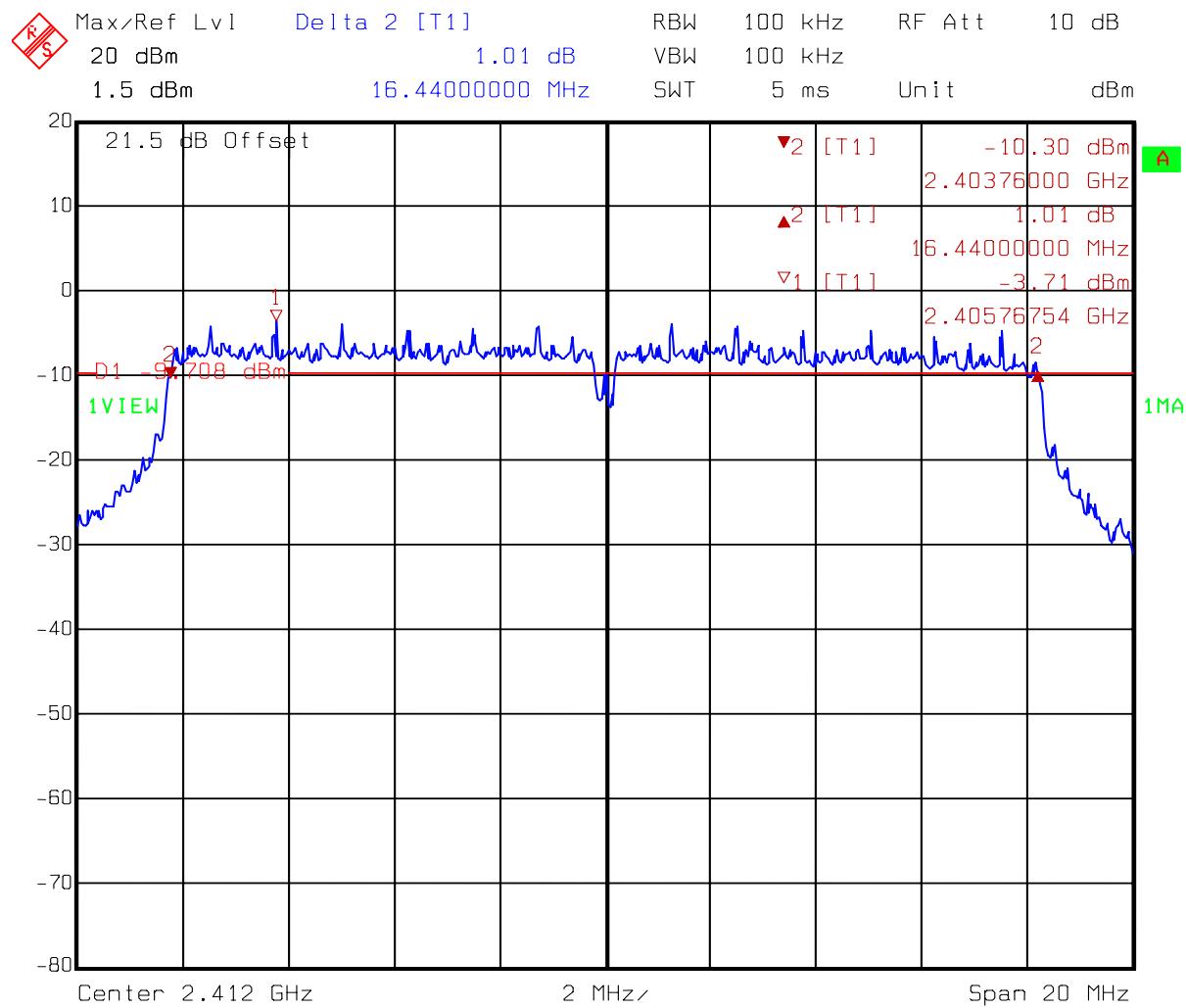
Title: 6dB Bandwidth  
 Comment A: Channel 01 at 802.11b mode  
 Date: 28.MAY 2006 17:32:15



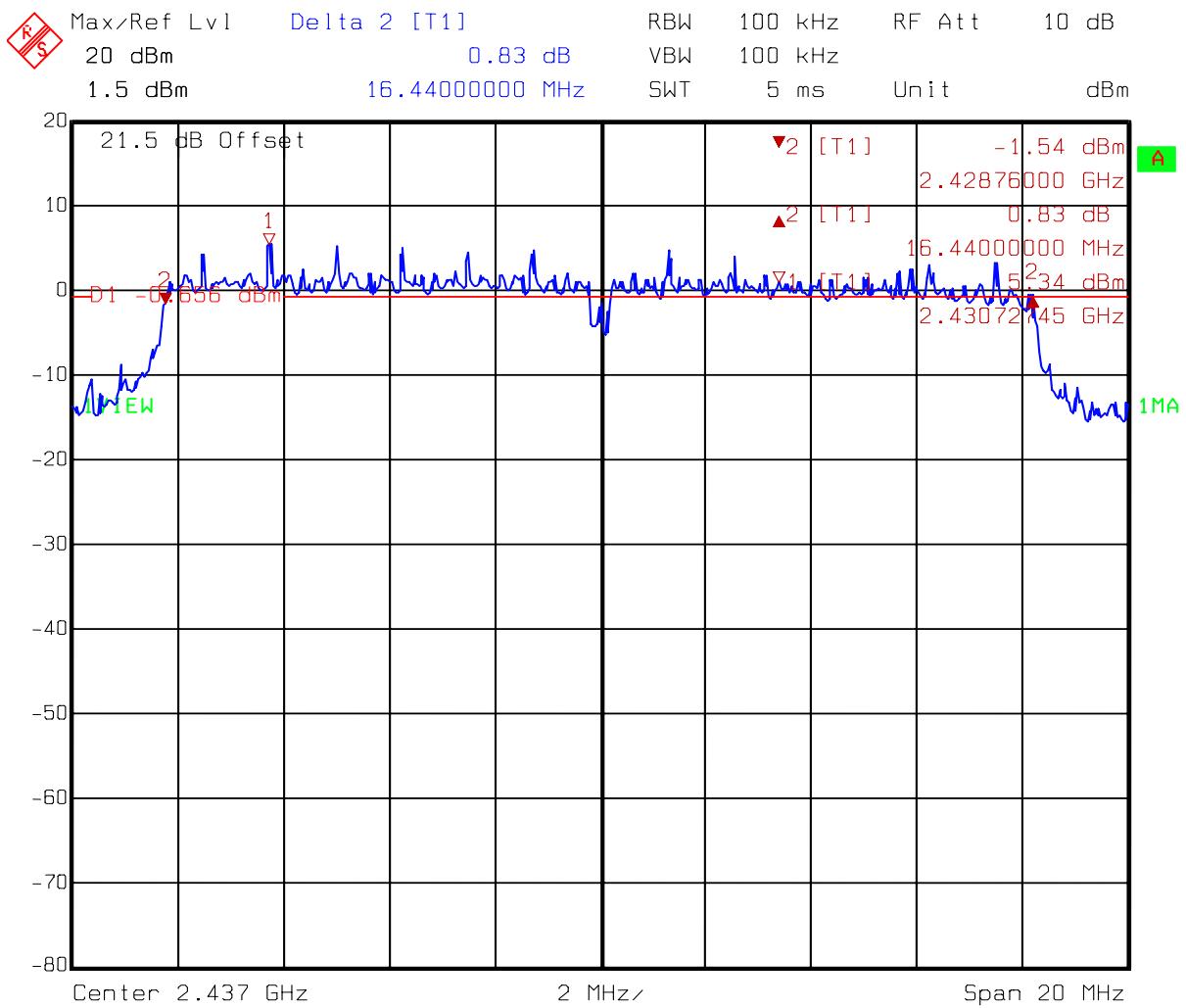
Title: 6dB Bandwidth  
Comment A: Channel 06 at 802.11b mode  
Date: 28.MAY 2006 17:34:29



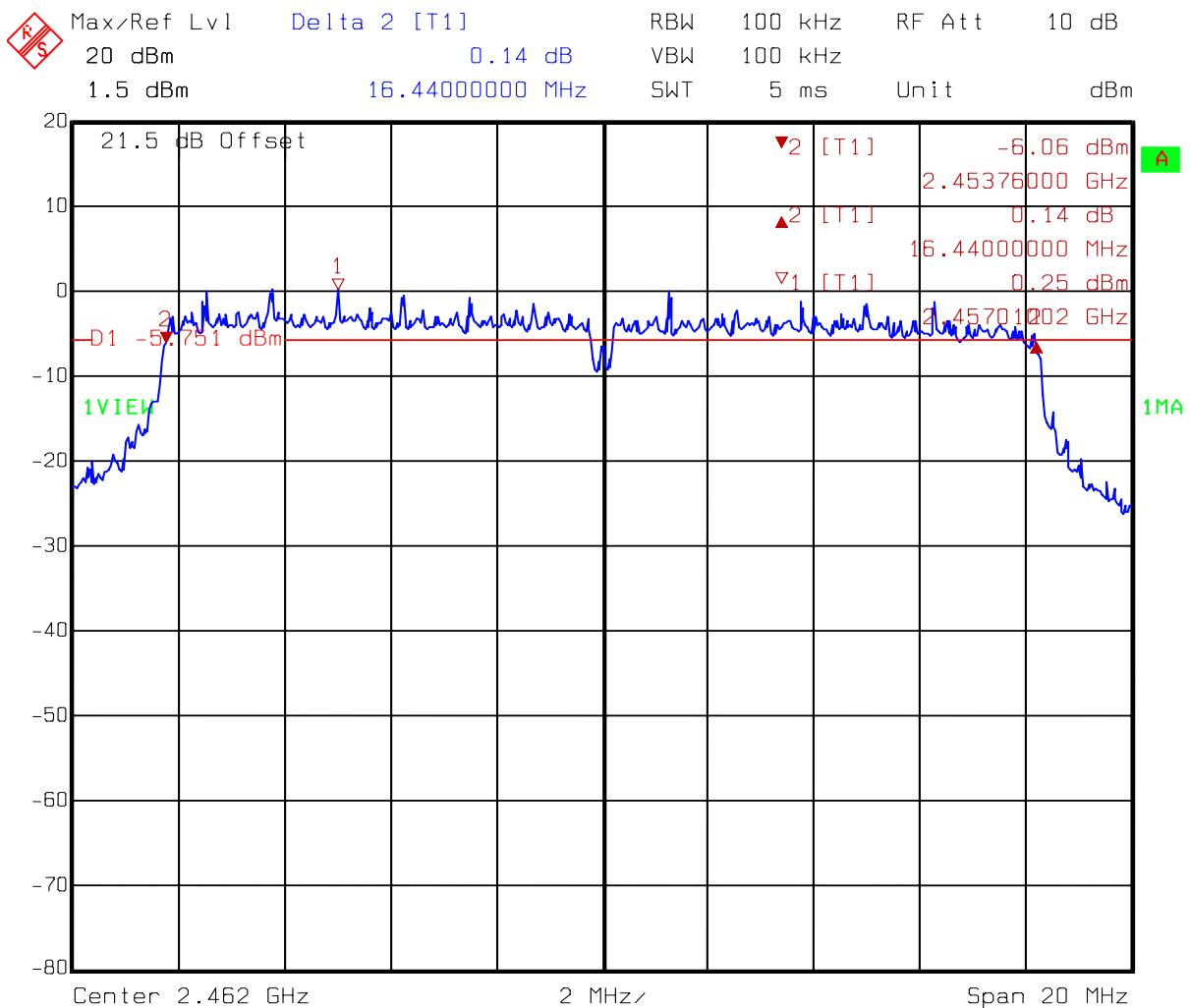
Title: 6dB Bandwidth  
Comment A: Channel 11 at 802.11b mode  
Date: 28.MAY 2006 17:36:09

**Test Mode: 802.11g(OFDM Modulation) operating mode**


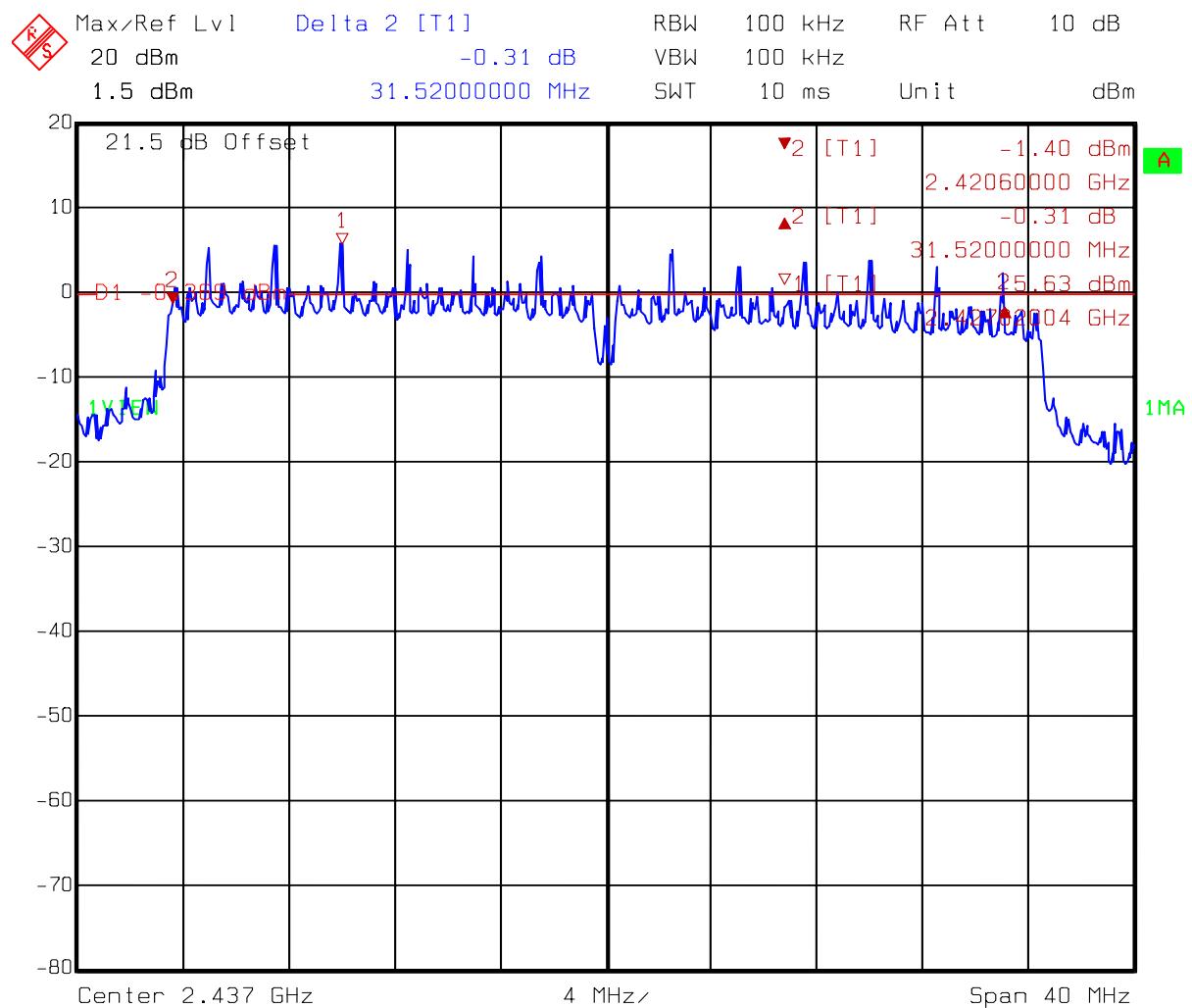
Title: 6dB Bandwidth  
 Comment A: Channel 01 at 802.11g mode  
 Date: 28.MAY 2006 17:38:24



Title: 6dB Bandwidth  
 Comment A: Channel 06 at 802.11g mode  
 Date: 28.MAY 2006 17:40:19



Title: 6dB Bandwidth  
 Comment A: Channel 11 at 802.11g mode  
 Date: 28.MAY 2006 17:43:38

**Test Mode: 802.11g(OFDM Modulation) turbo mode**


Title: 6dB Bandwidth  
 Comment A: Channel 06 at 802.11g mode (Turbo)  
 Date: 28.MAY 2006 17:41:44

#### 4. Maximum Output Power test (FCC 15.247)

##### 4.1 Operating environment

Temperature: 25  
 Relative Humidity: 60 %  
 Atmospheric Pressure: 1023 hPa

##### 4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (2.5 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

##### 4.3 Measured data of Maximum Output Power test results

###### Test Mode: 802.11b(DSSS Modulation) operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
1 (lowest)	2412	1.5	14.84	16.34	43.05	30
6 (middle)	2437	1.5	21.51	23.01	199.99	30
11 (highest)	2462	1.5	20.72	22.22	166.72	30

Remark:

Conducted Peak Output Power = Reading + C.L.

###### Test Mode: 802.11g(OFDM Modulation) operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
1 (lowest)	2412	1.5	20.13	21.63	145.55	30
6 (middle)	2437	1.5	21.51	23.01	199.99	30
11 (highest)	2462	1.5	22.78	24.28	267.92	30

Remark:

Conducted Peak Output Power = Reading + C.L.

**Test Mode: 802.11g(OFDM Modulation) operating mode**

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
6 (middle)	2437	1.5	21.2	22.7	186.21	30

Remark:

Conducted Peak Output Power = Reading + C.L.

**5. RF Antenna Conducted Spurious test****5.1 Operating environment**

Temperature: 25  
Relative Humidity: 58 %

**5.2 Test setup & procedure**

The measurements were performed from 30MHz to 25GHz RF antenna conducted per FCC 15.247 (c) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.

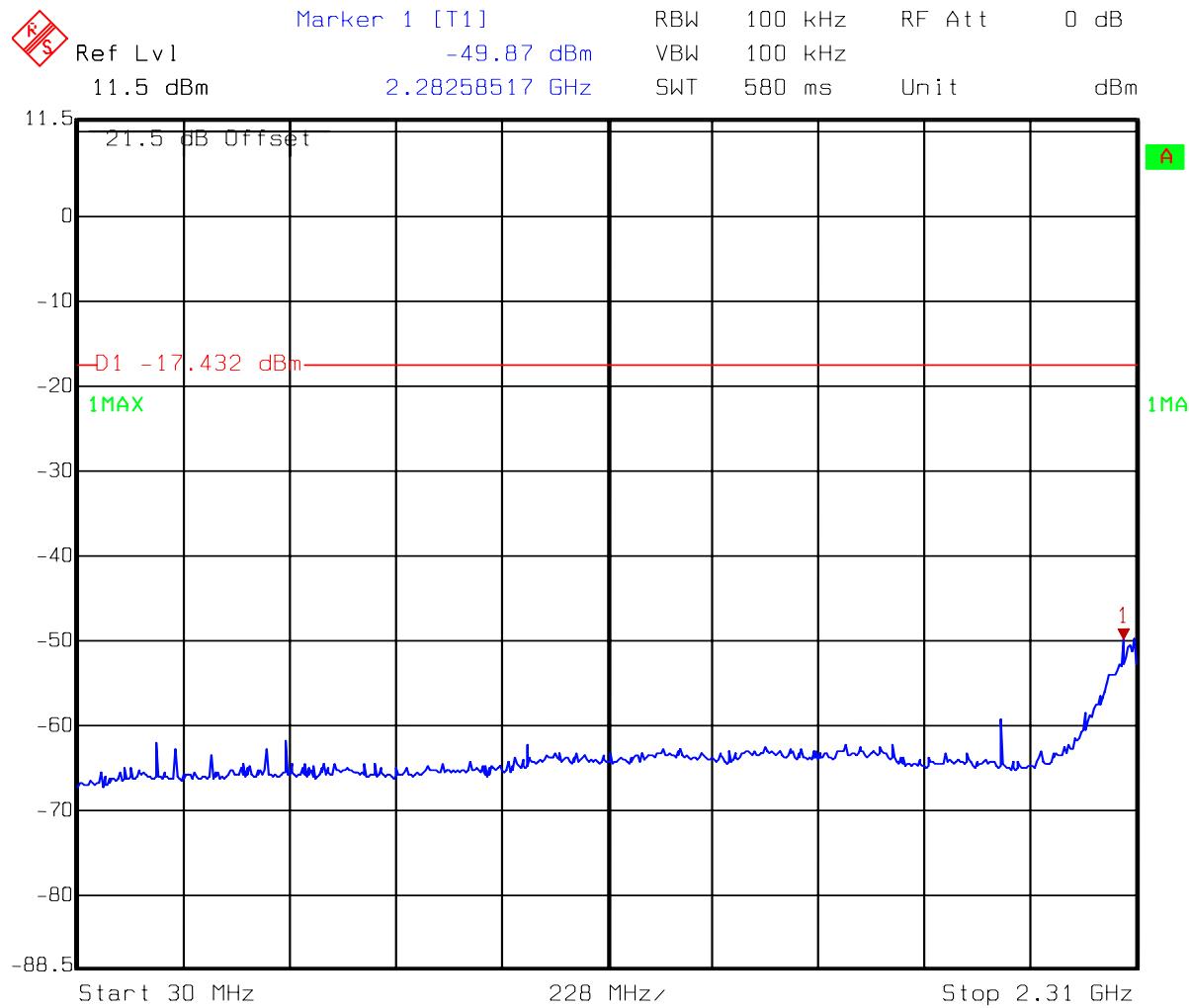
Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

**5.3 Measured data of the highest RF Antenna Conducted Spurious test result**

The test results please see the plot below.

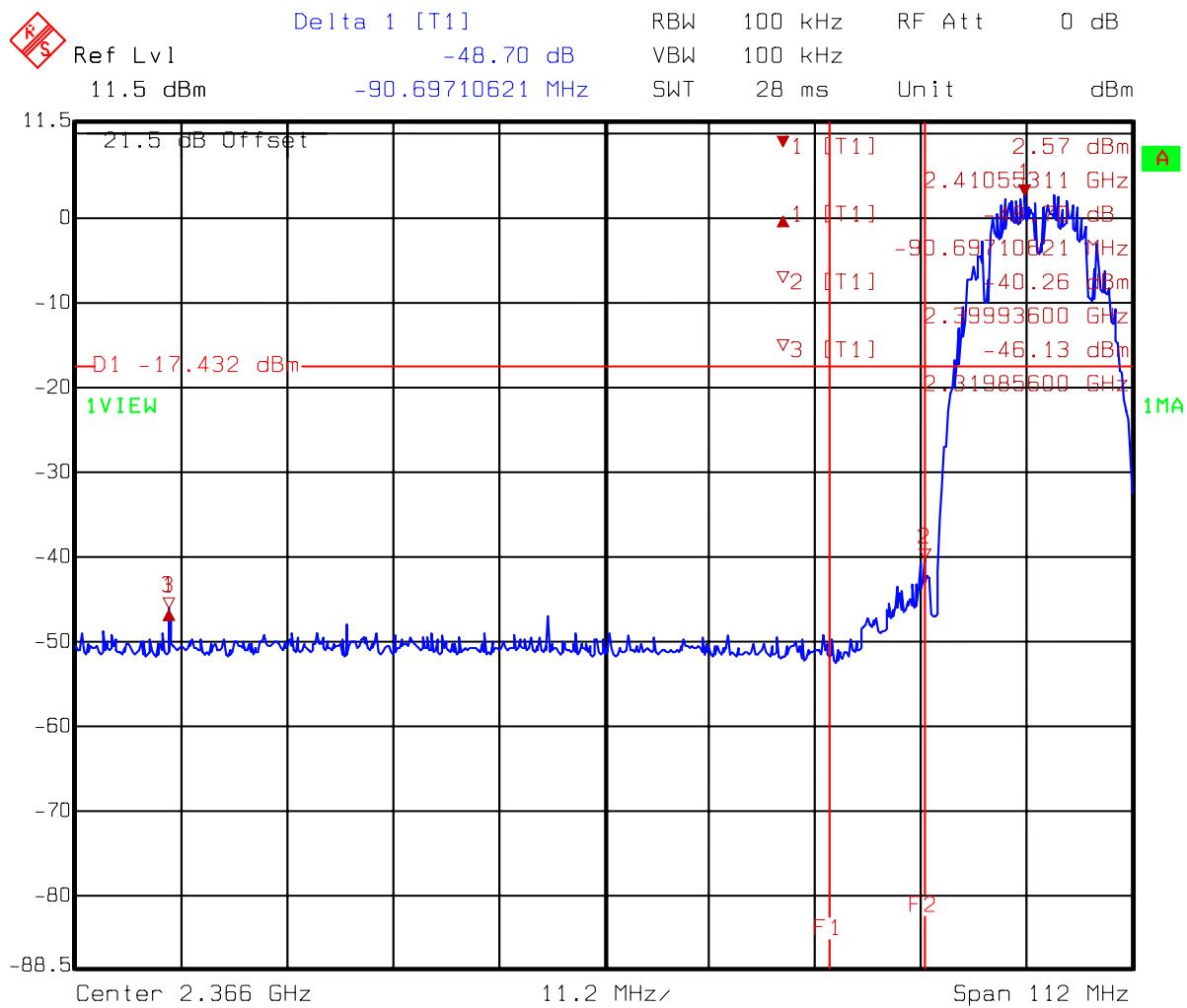
**Test Mode: 802.11b (DSSS Modulation) operating mode**

**Channel 1**



Date: 06.JUL.2006 09:34:01

## Channel 1

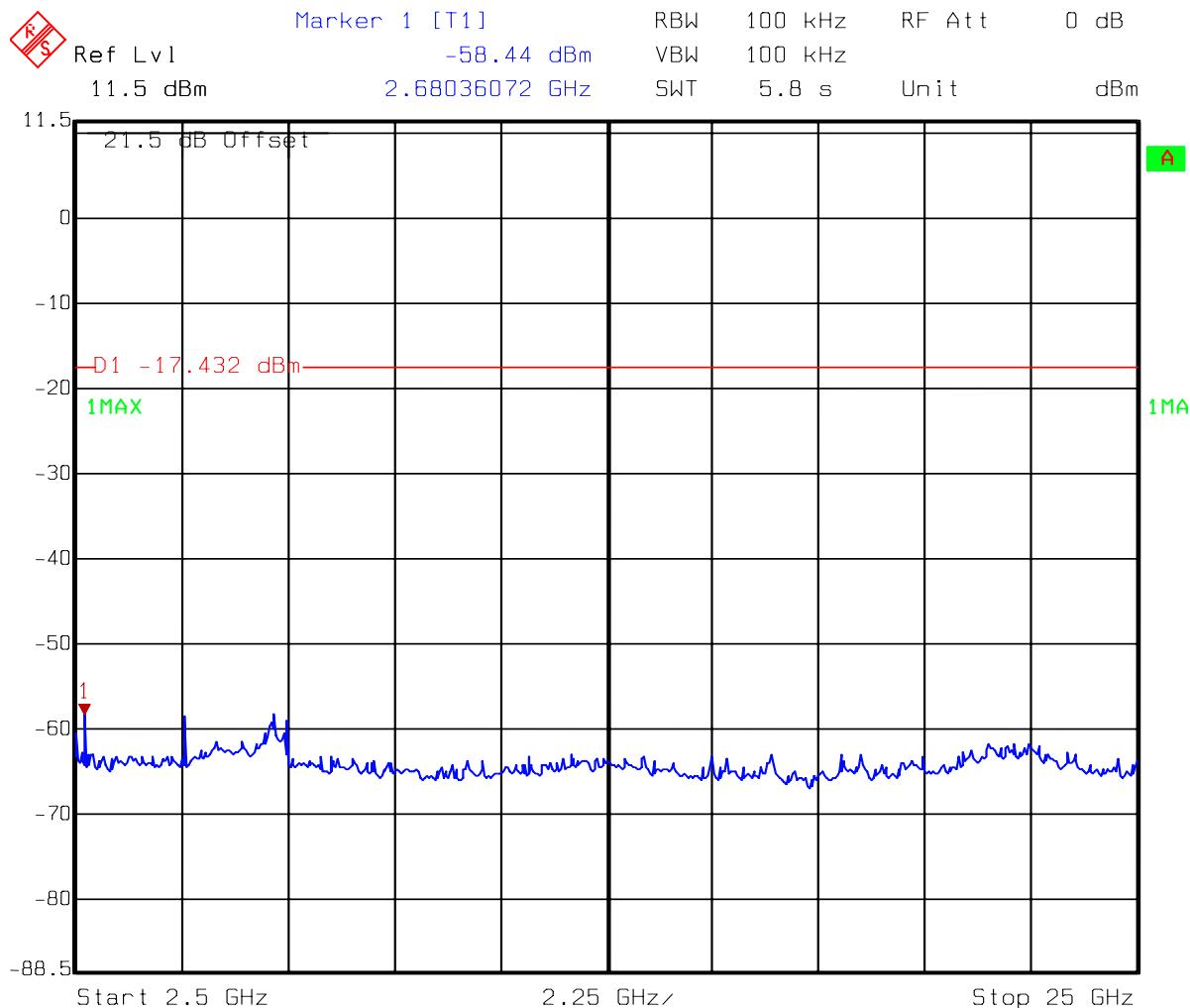


Title: Band Edge

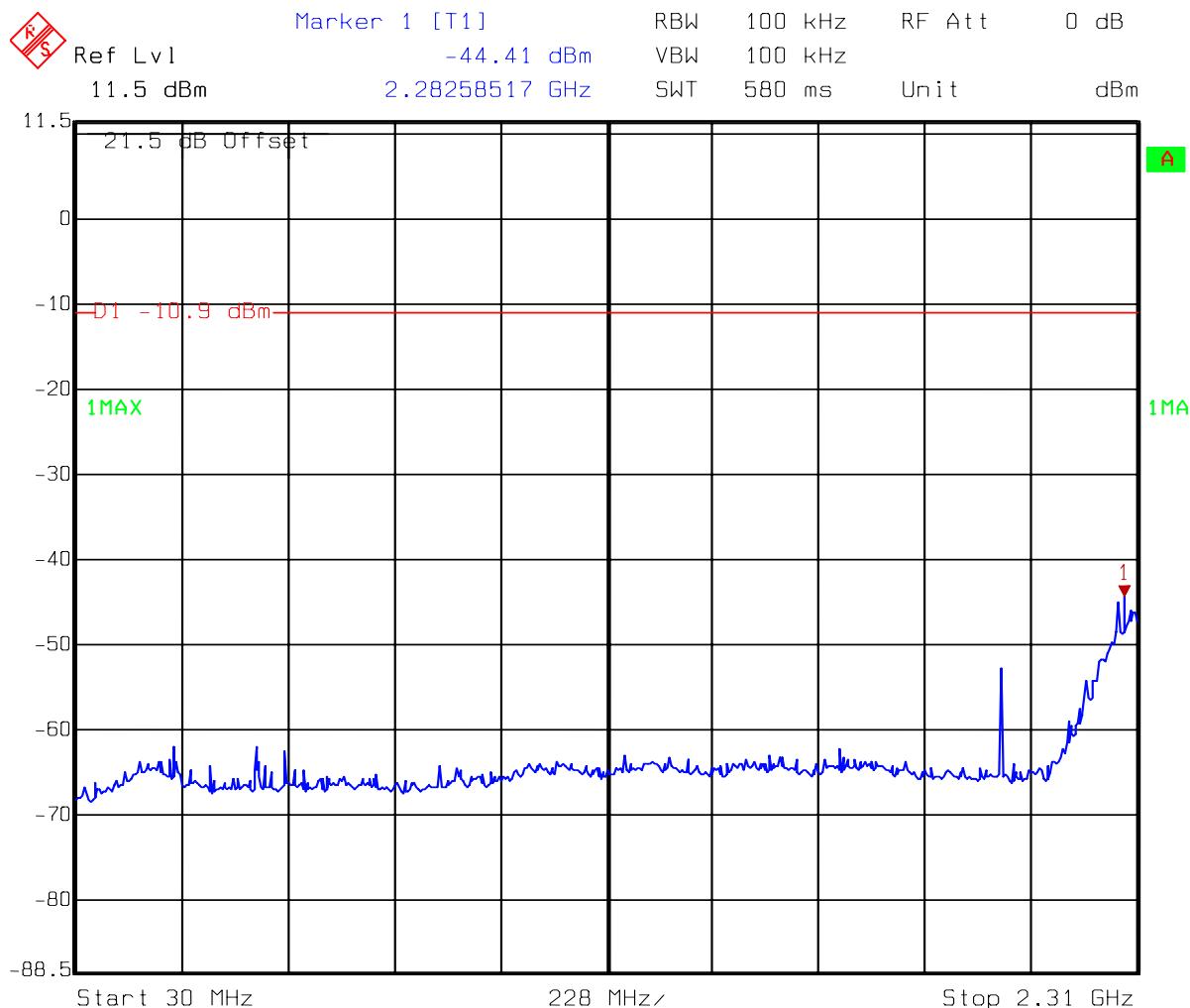
Comment A: Channel 01 at 802.11b mode

F1=2390MHz F2=2400MHz (Peak Detect) (Dercetional Ant)

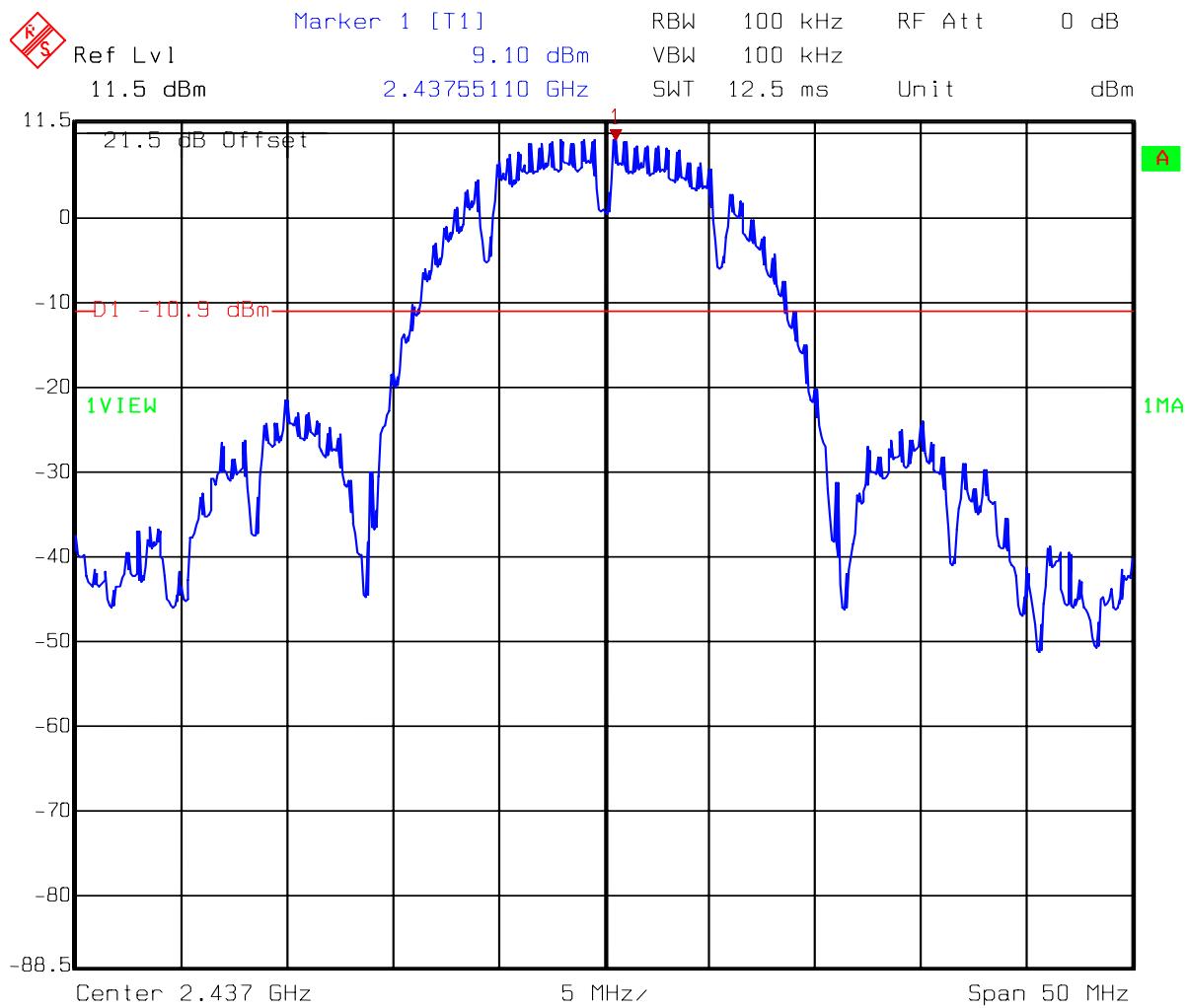
Date: 11.MAY 2006 22:02:49

**Channel 1**

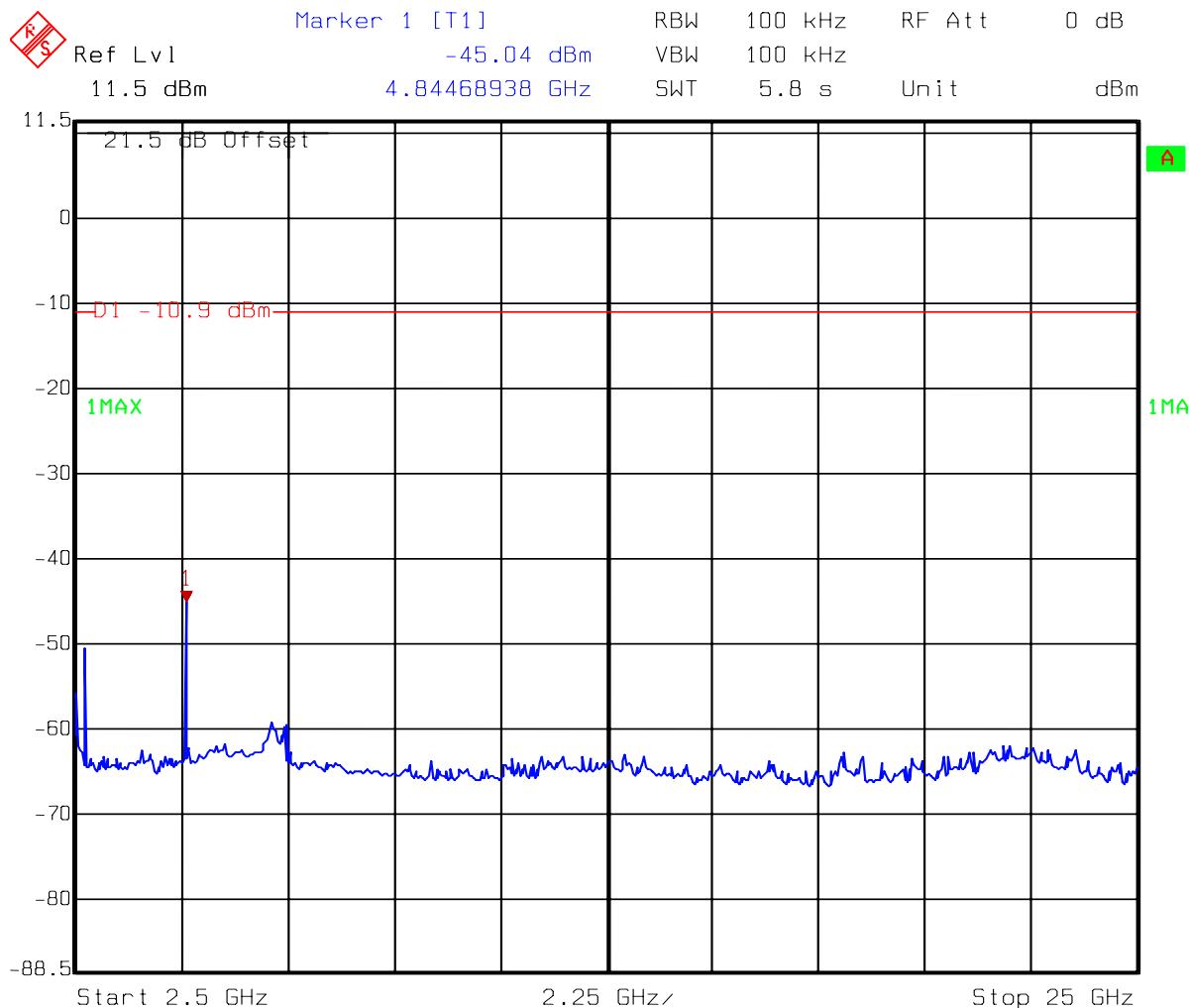
Date: 06.JUL.2006 09:36:04

**Channel 6**

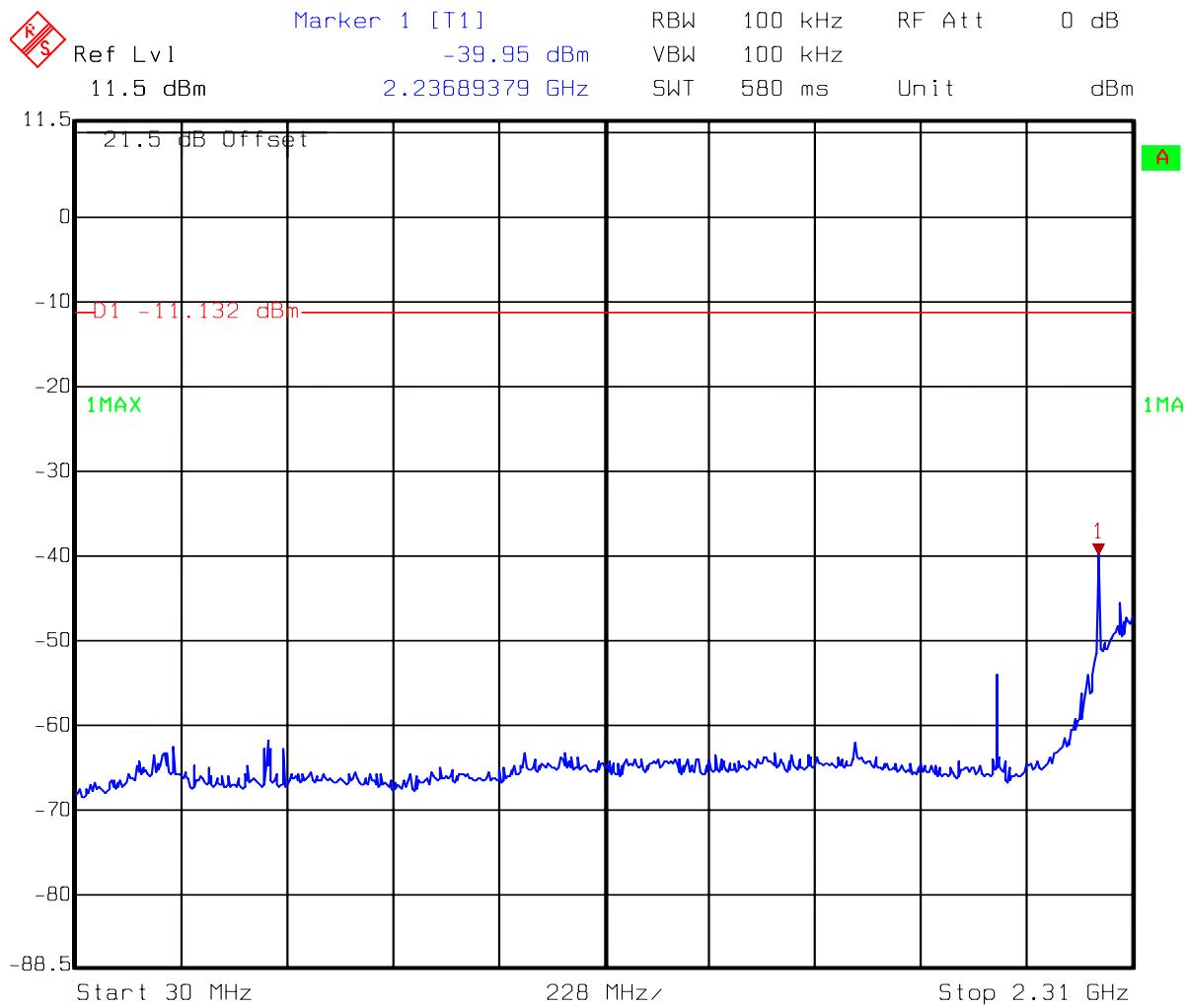
Date: 06.JUL.2006 09:51:04

**Channel 6**

Date: 06.JUL.2006 09:49:52

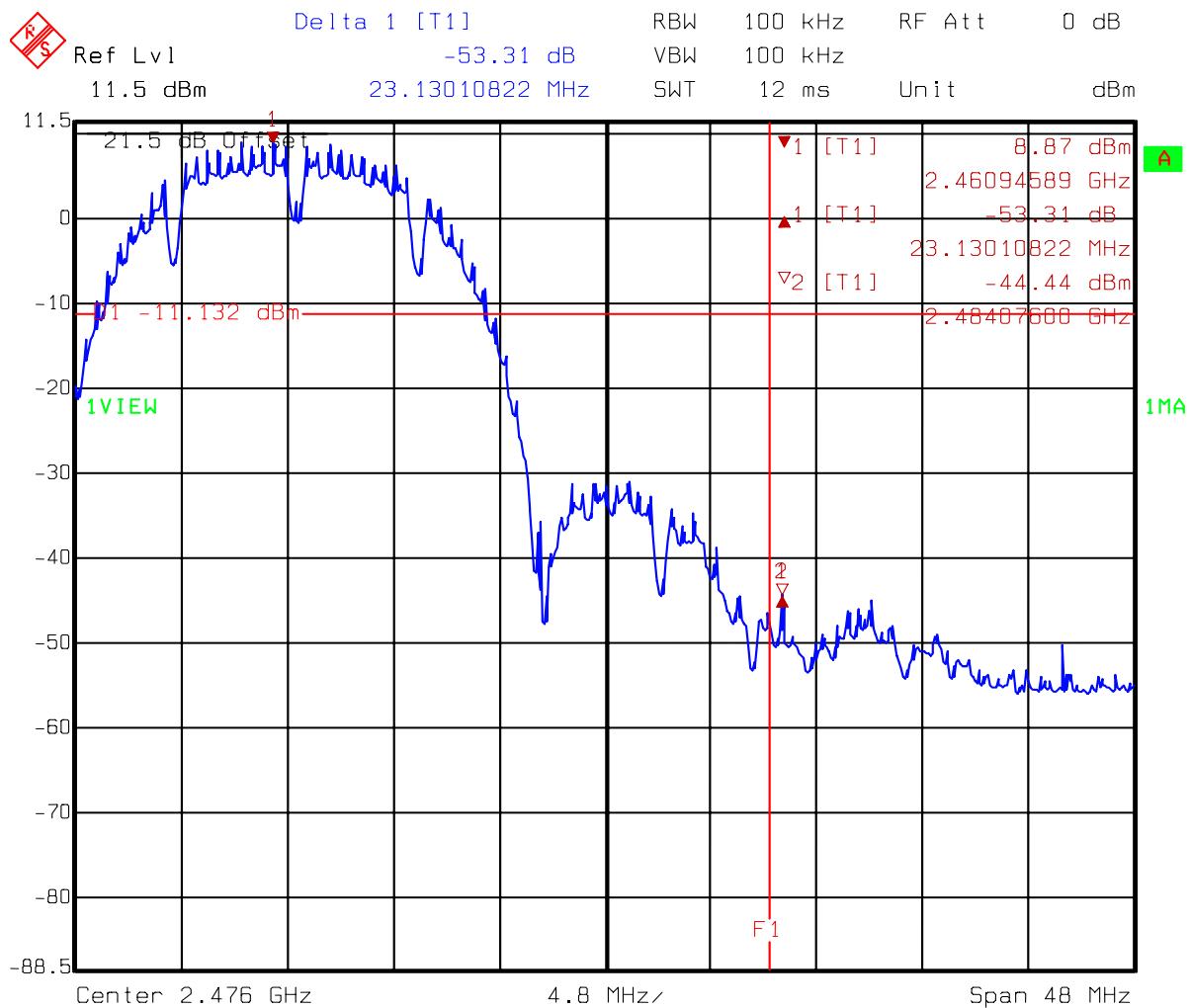
**Channel 6**

Date: 06.JUL.2006 09:51:41

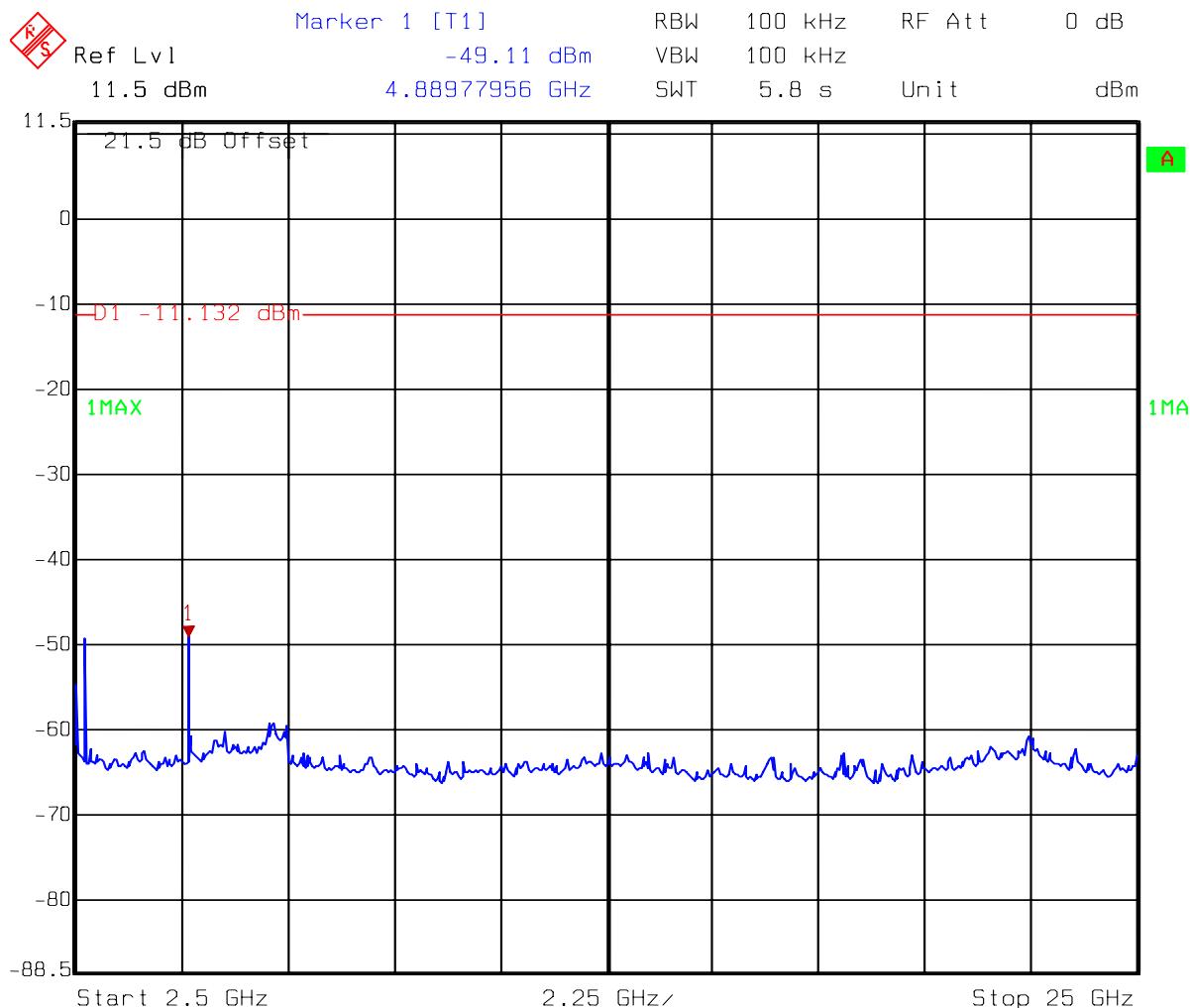
**Channel 11**

Date: 06.JUL.2006 09:40:48

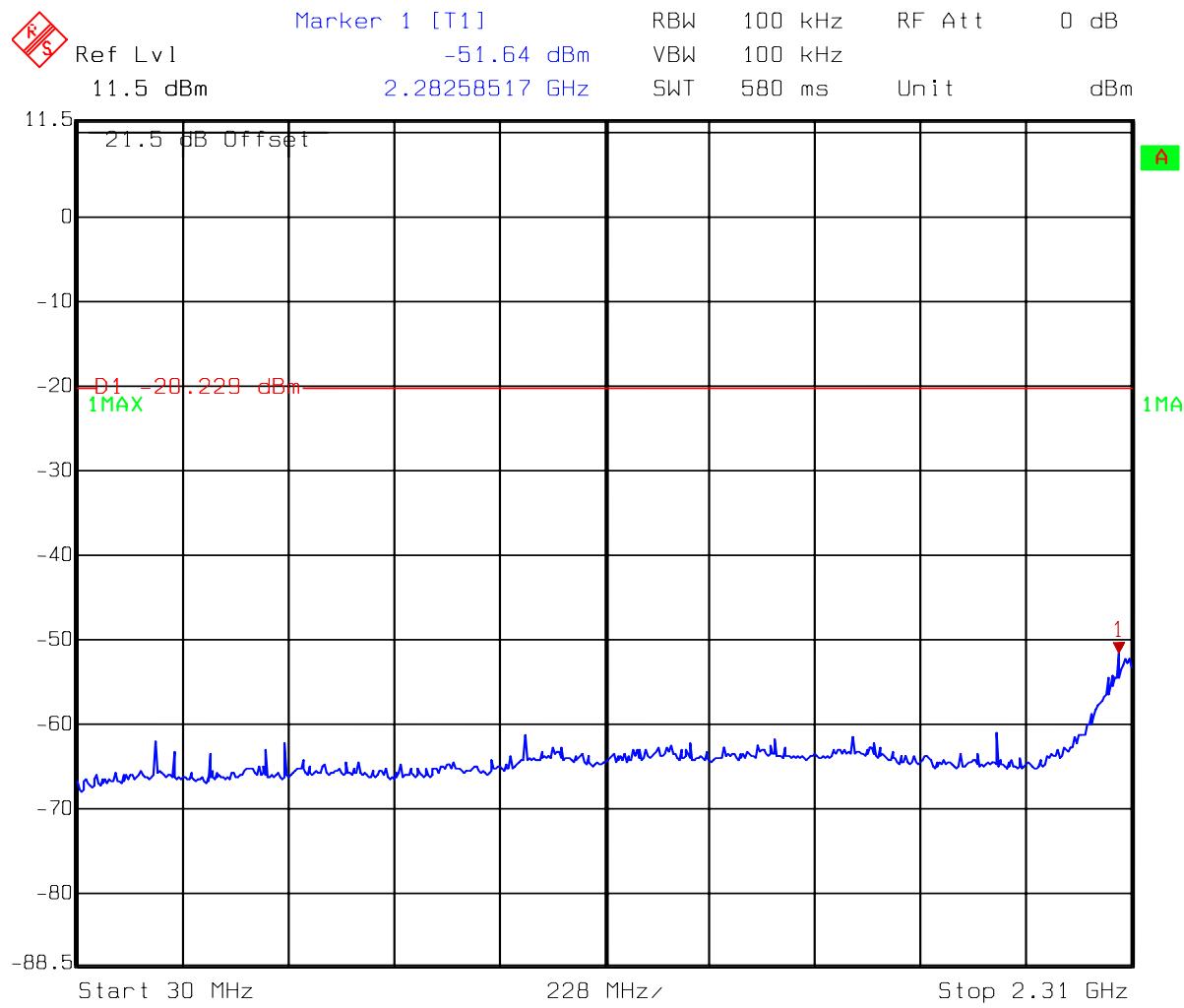
## Channel 11



Title: Band Edge  
Comment A: Channel 11 at 802.11b mode  
F1=2483.5MHz (Peak Detect) (Directional Ant)  
Date: 11.MAY 2006 21:38:04

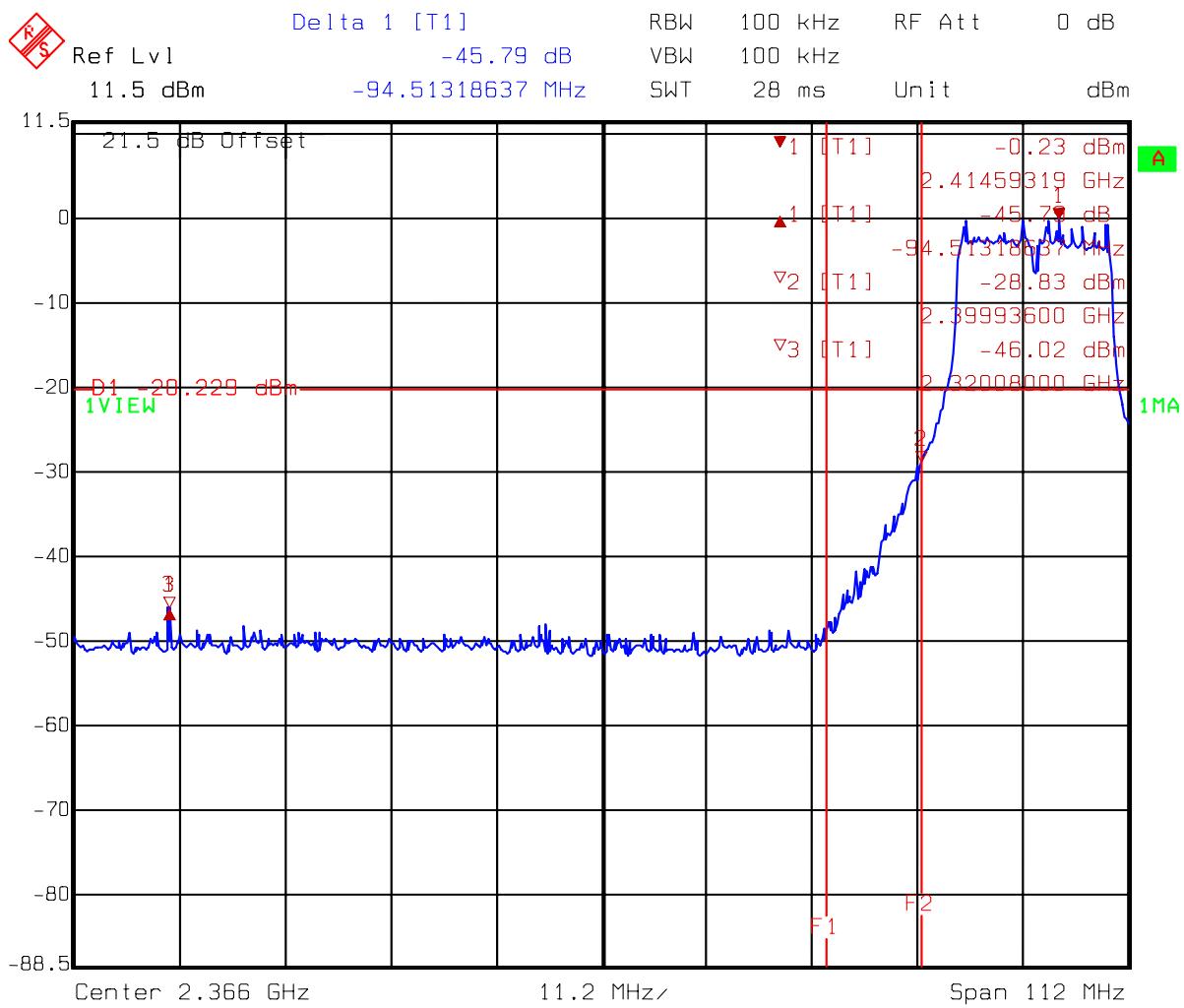
**Channel 11**

Date: 06.JUL.2006 09:40:11

**Test Mode: 802.11g (OFDM Modulation) operating mode****Channel 1**

Date: 06.JUL.2006 10:08:46

## Channel 1

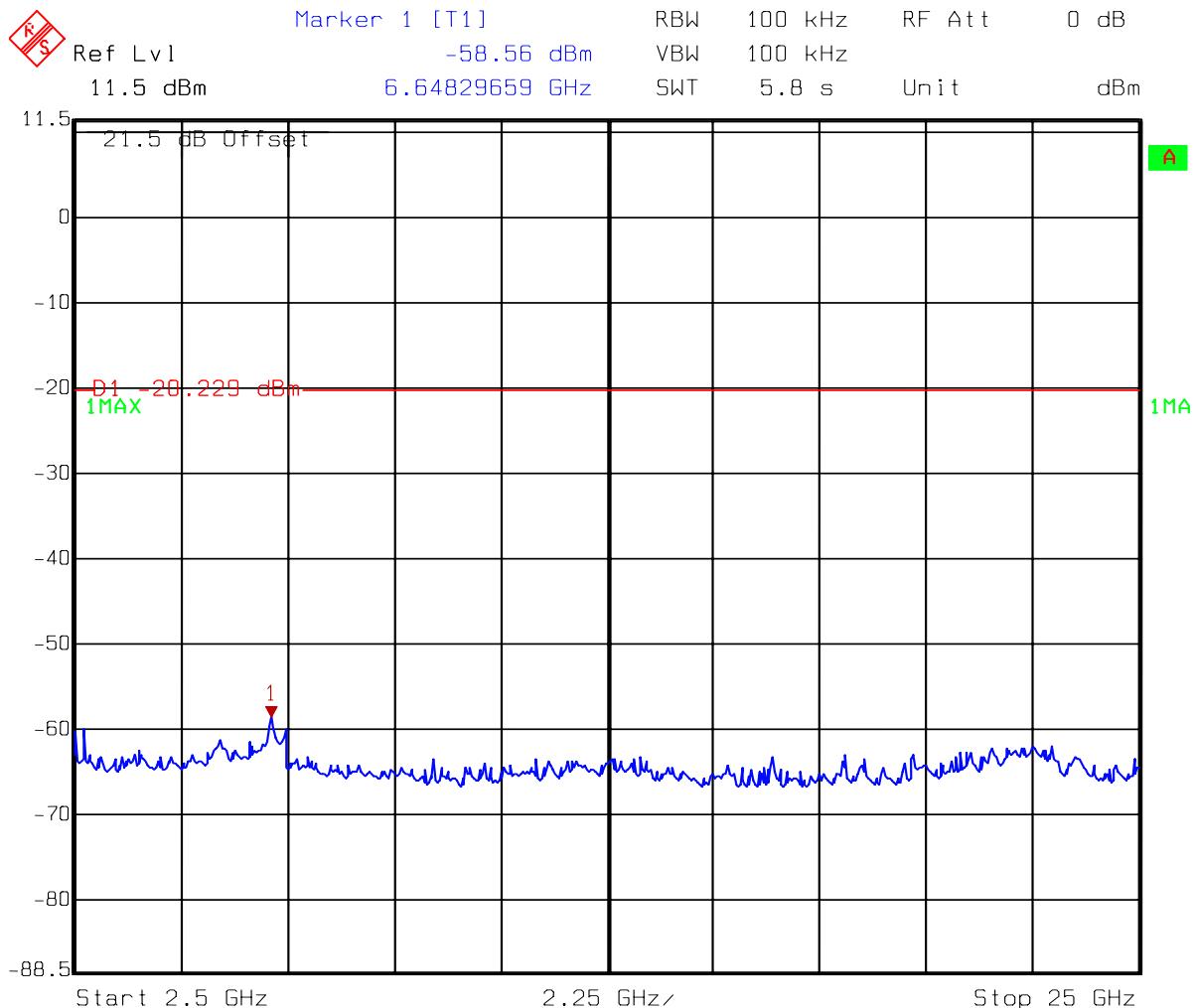


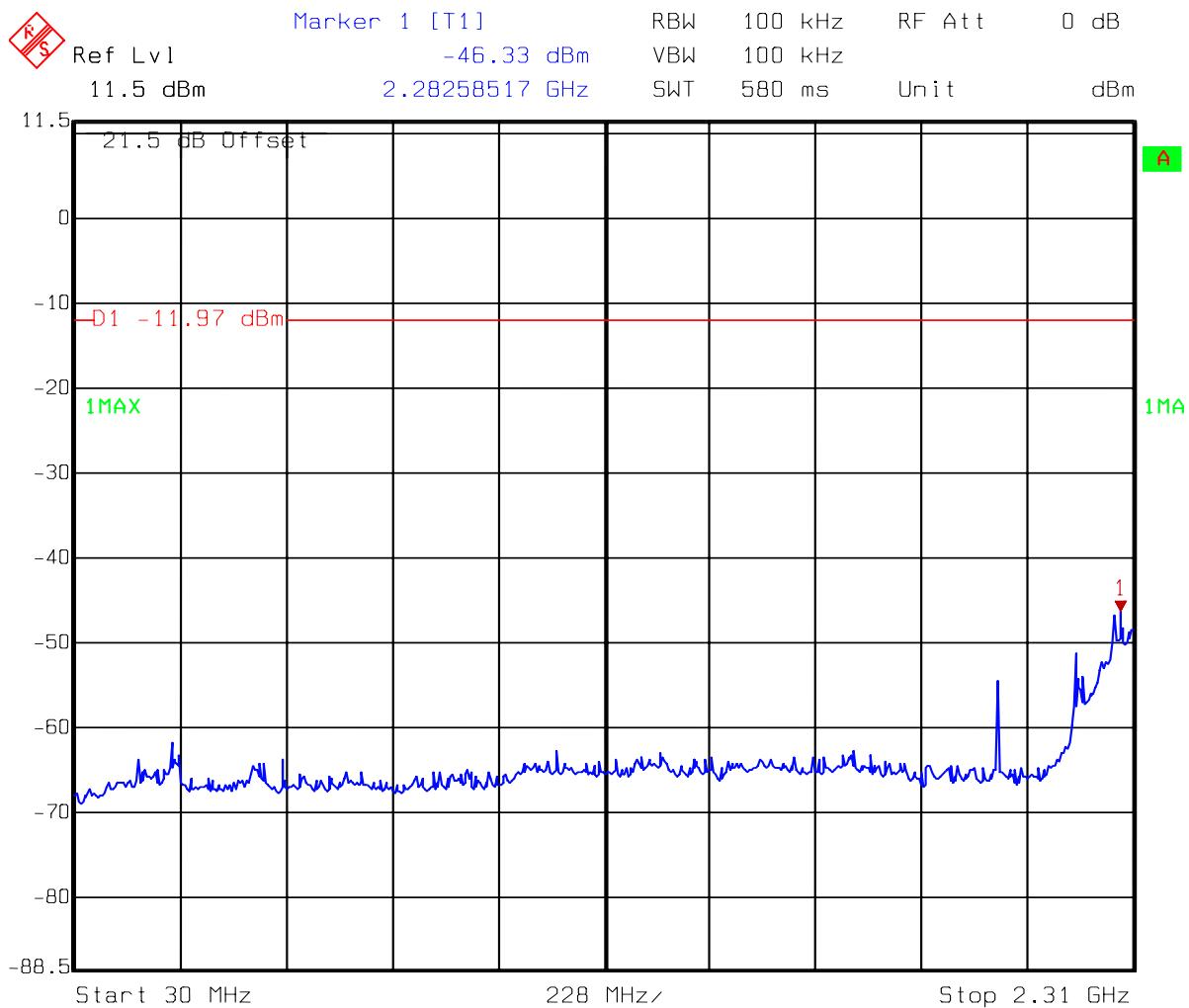
Title: Band Edge

Comment A: Channel 01 at 802.11g mode

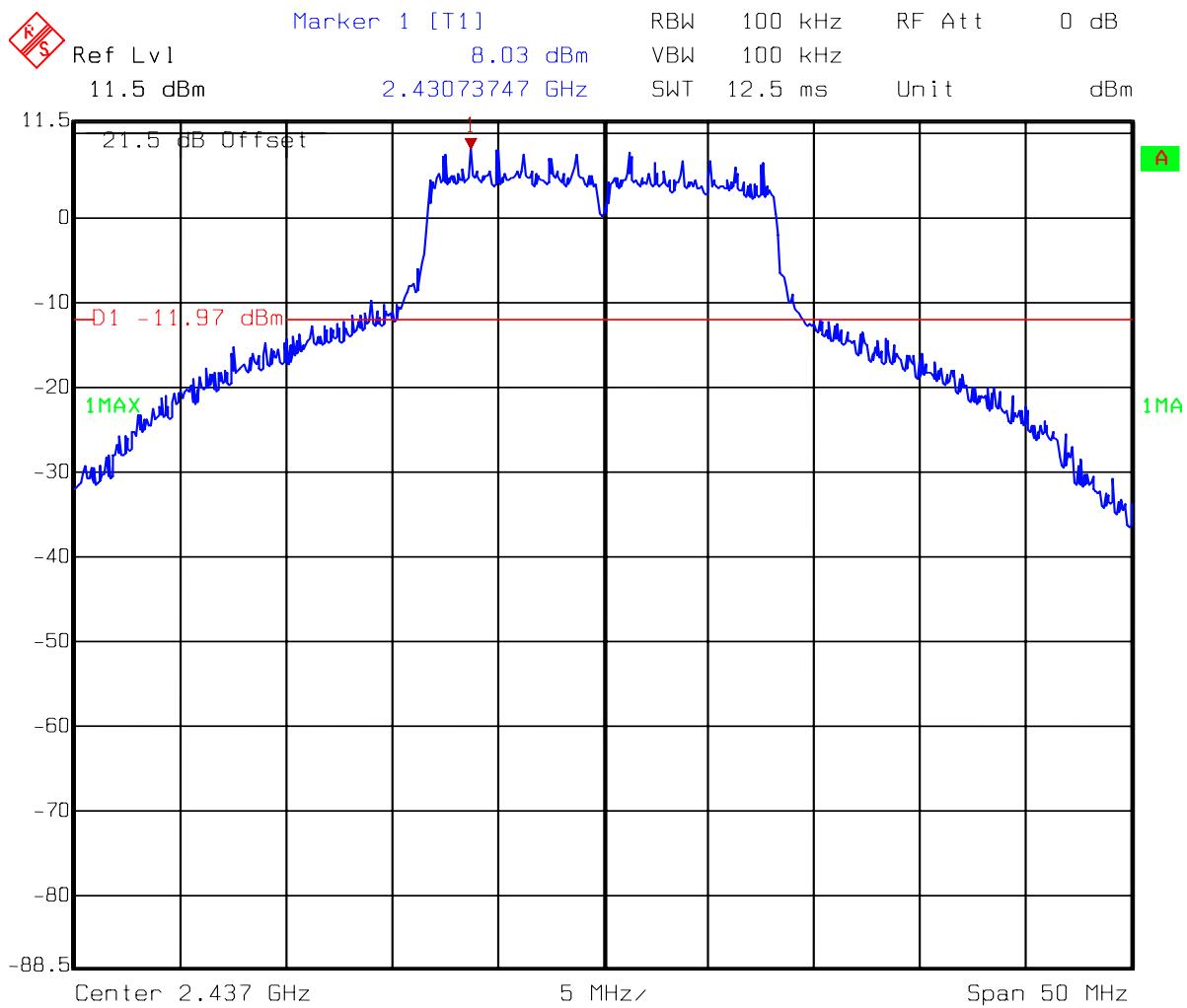
F1=2390MHz F2=2400MHz (Peak Detect) (Derectional Ant)

Date: 11.MAY 2006 23:11:34

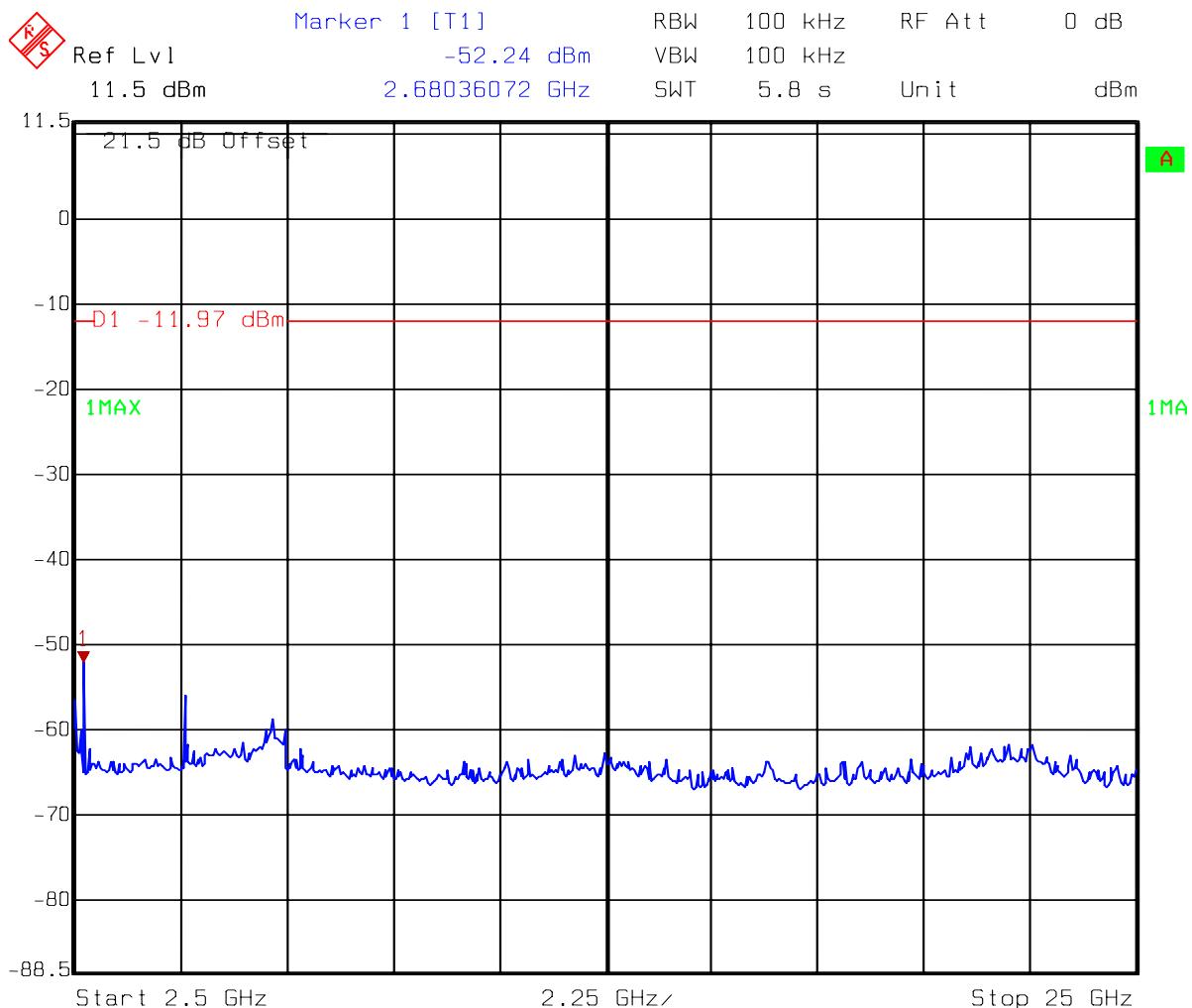
**Channel 1**

**Channel 6**

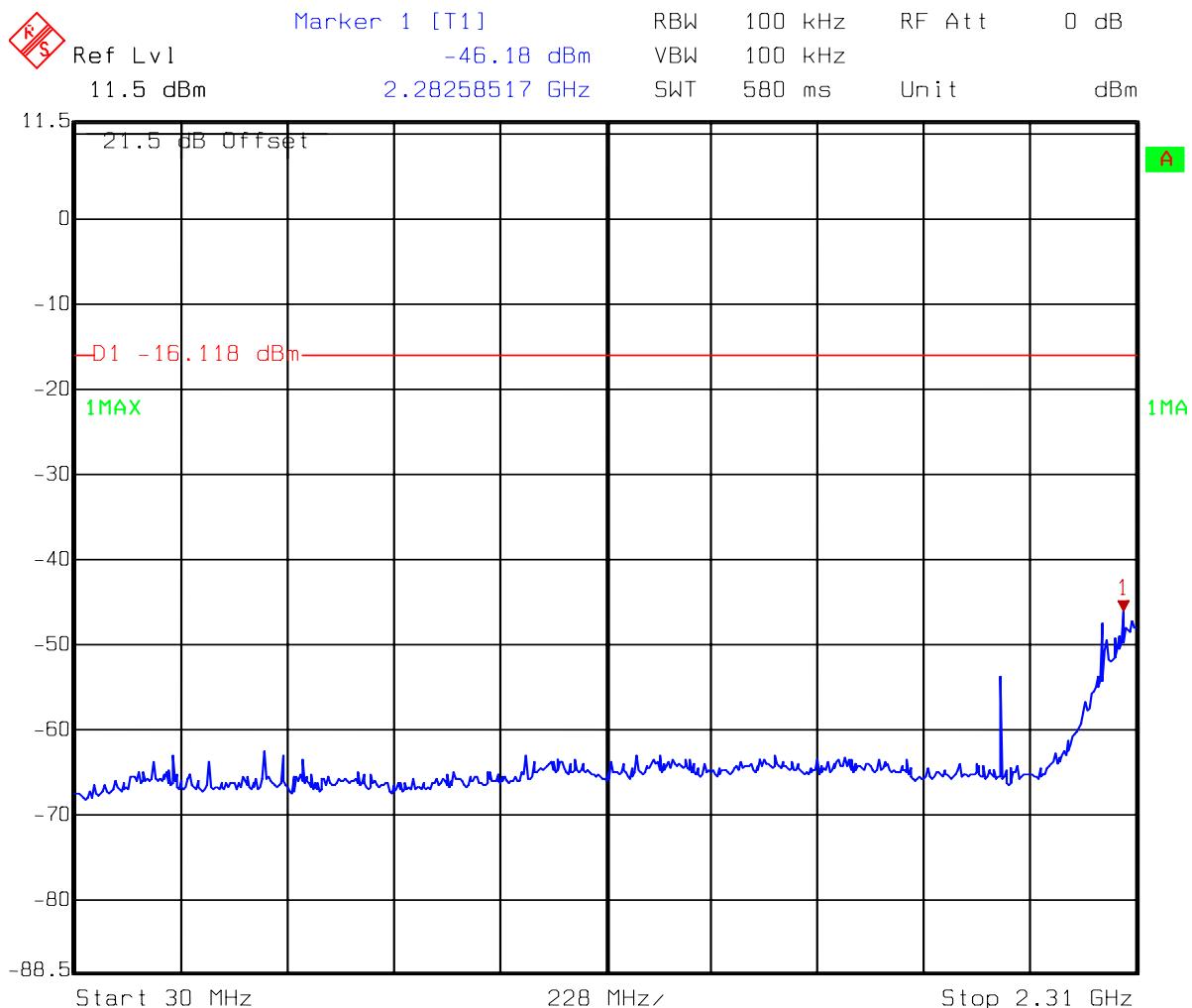
Date: 06.JUL.2006 09:59:39

**Channel 6**

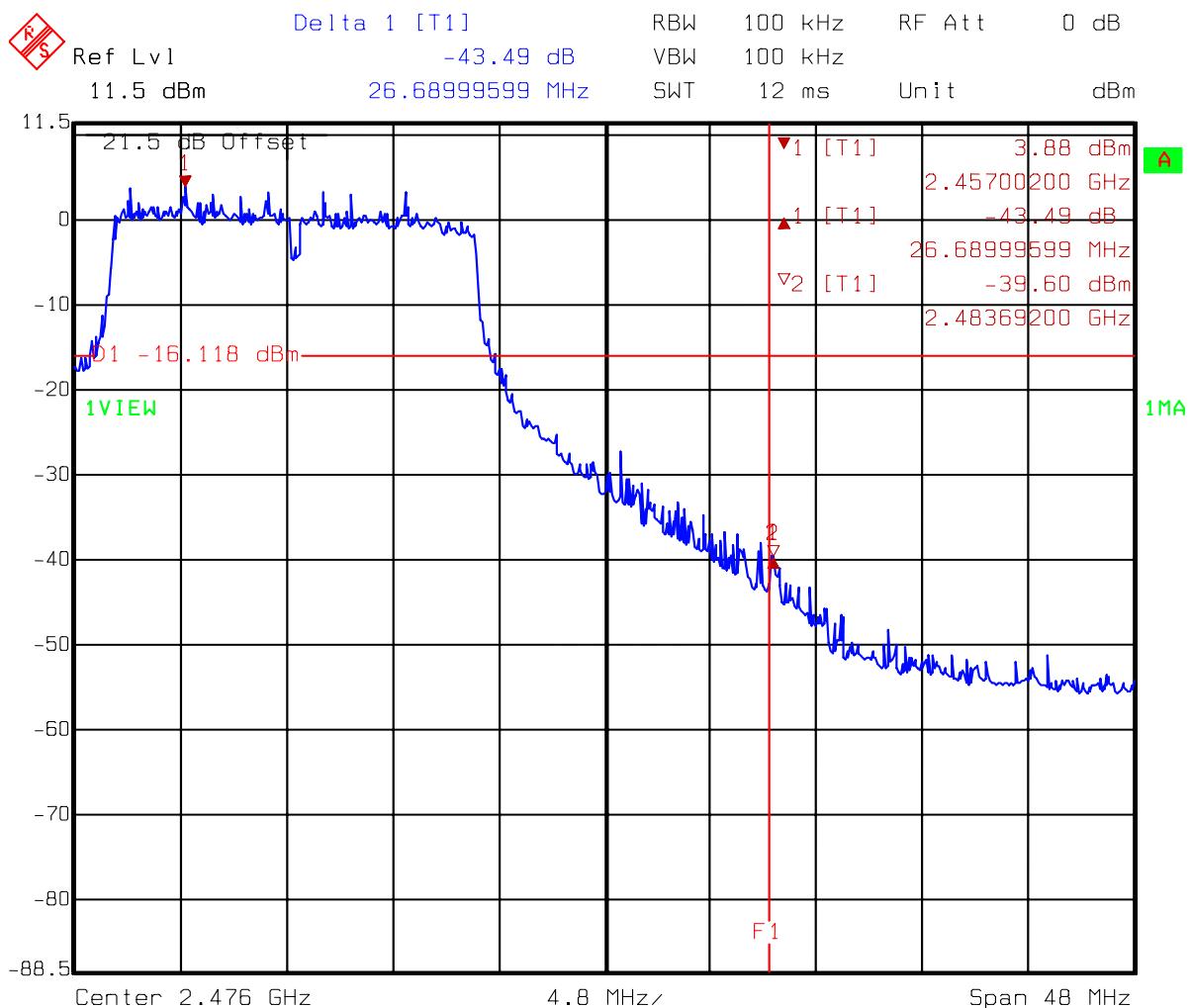
Date: 06.JUL.2006 09:58:51

**Channel 6**

Date: 06.JUL.2006 10:00:14

**Channel 11**

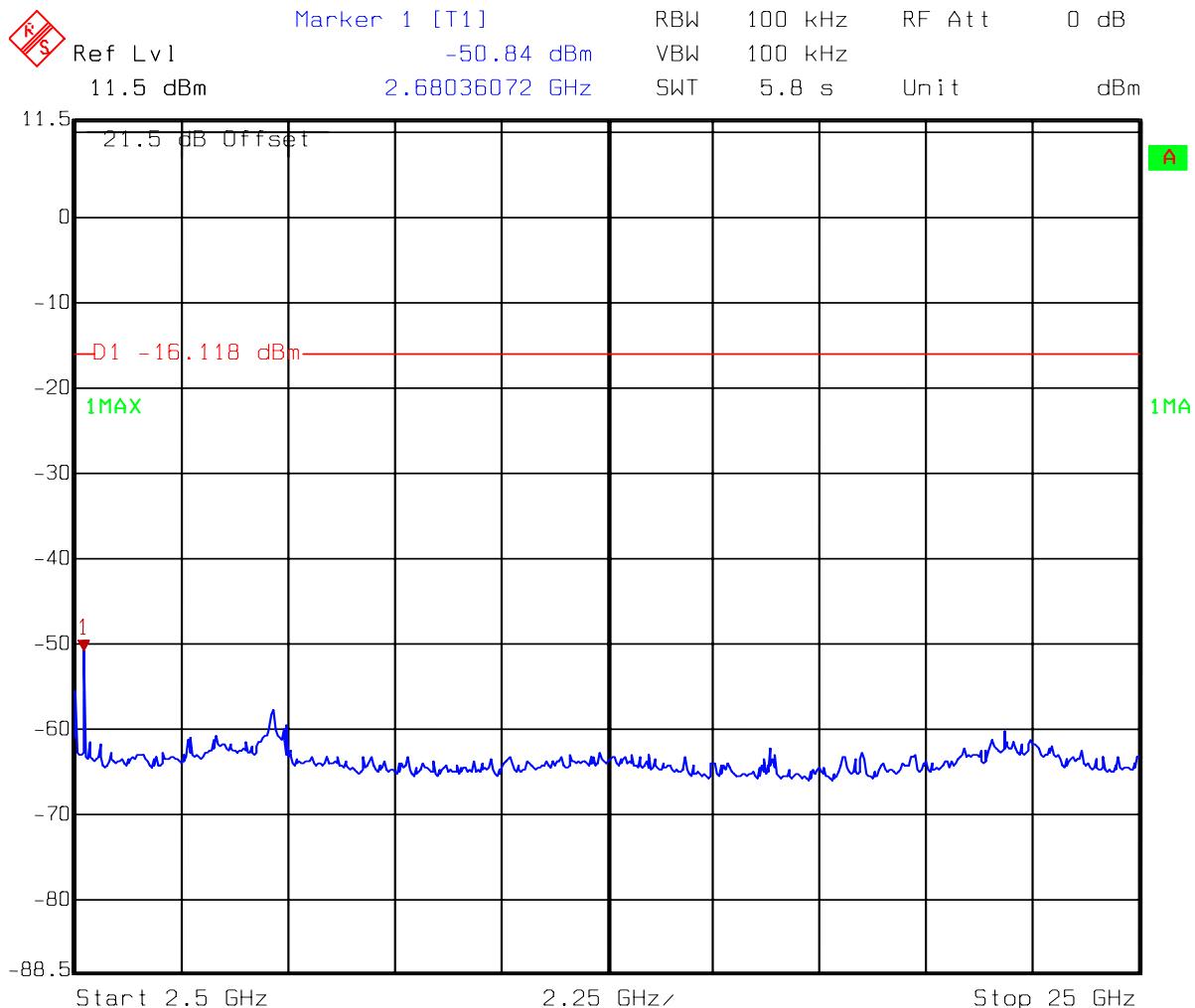
## Channel 11



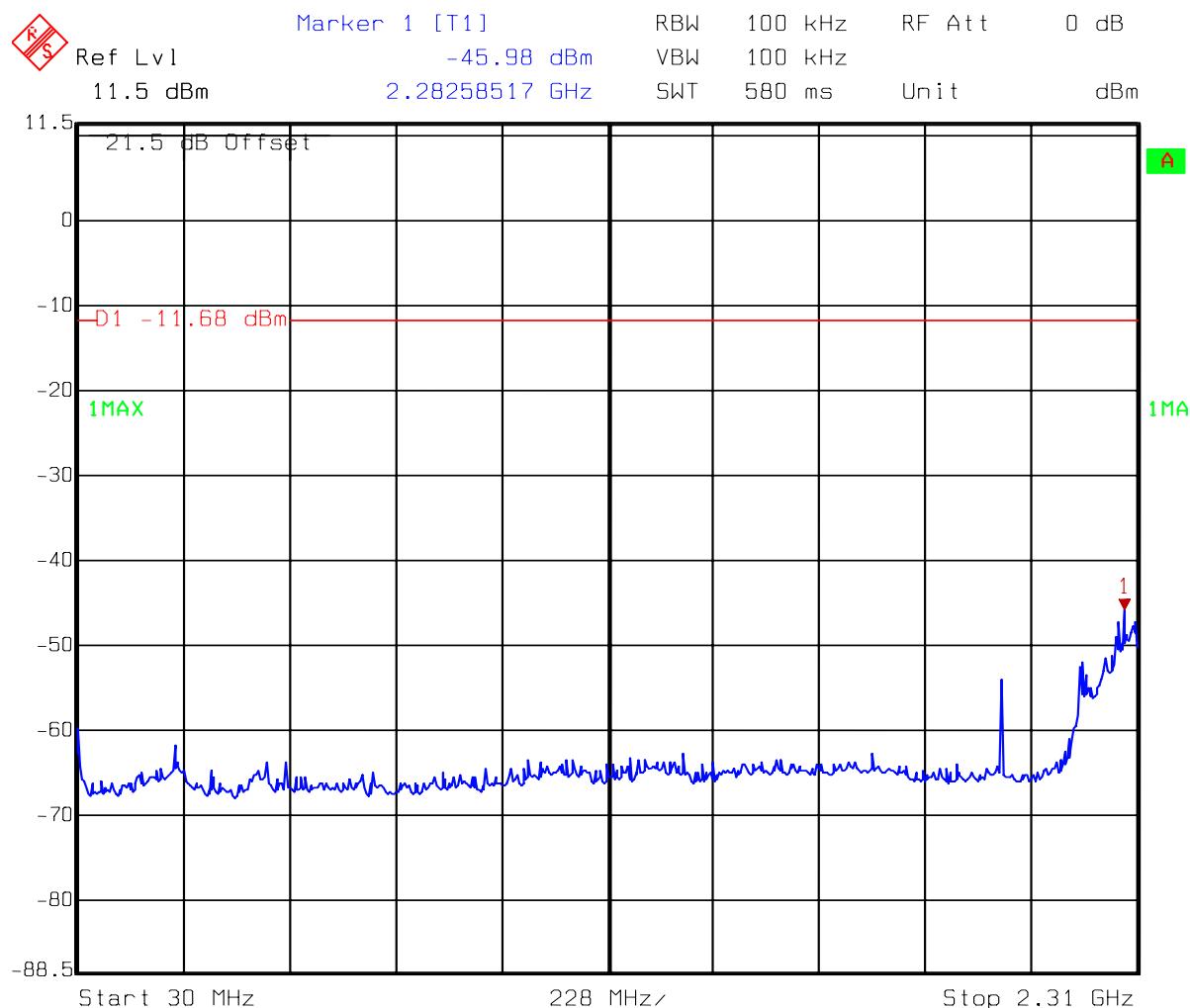
Title: Band Edge

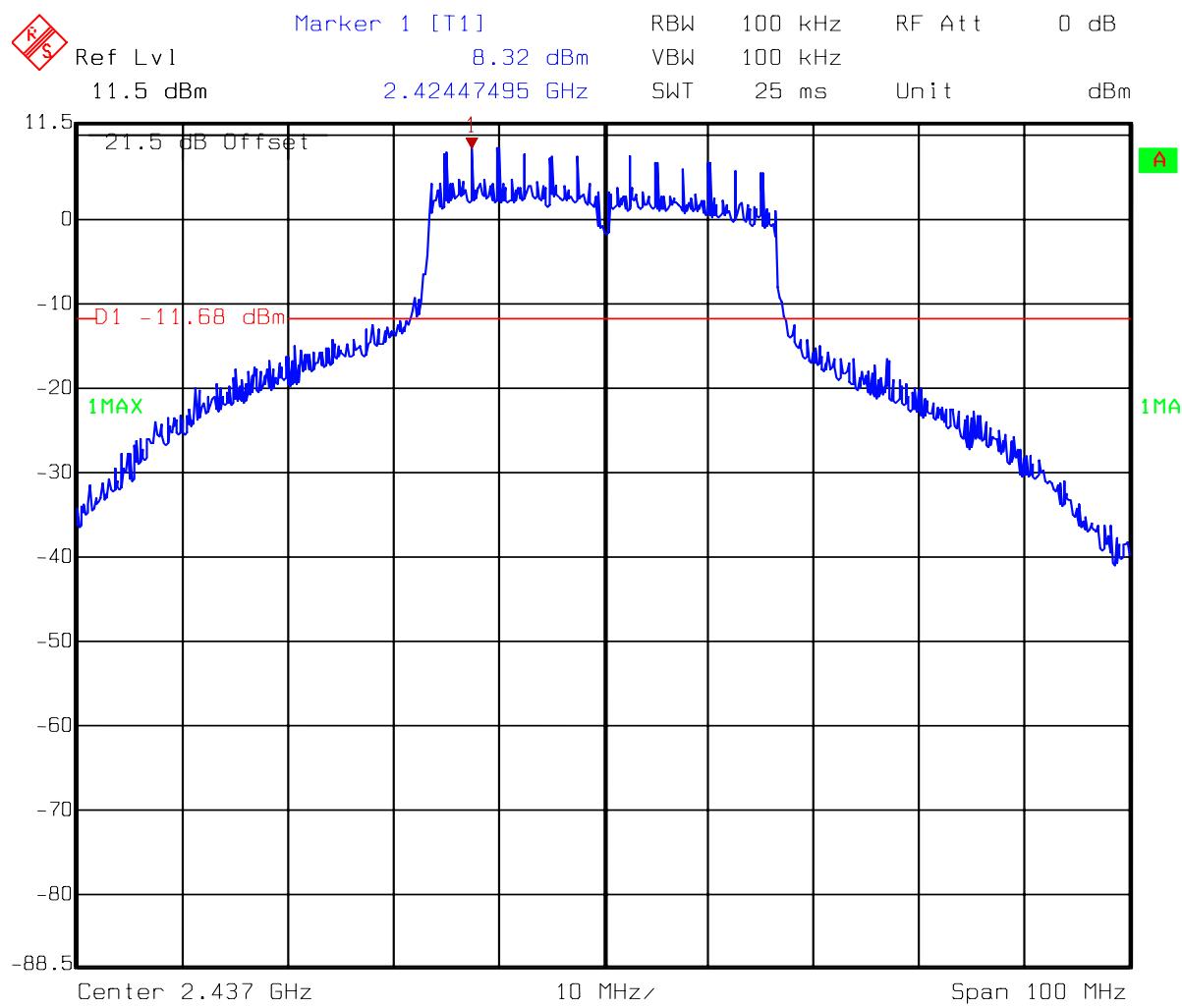
Comment A: Channel 11 at 802.11g mode  
 F1=2483.5MHz (Peak Detect) (Dercetional Ant)

Date: 11.MAY 2006 21:34:14

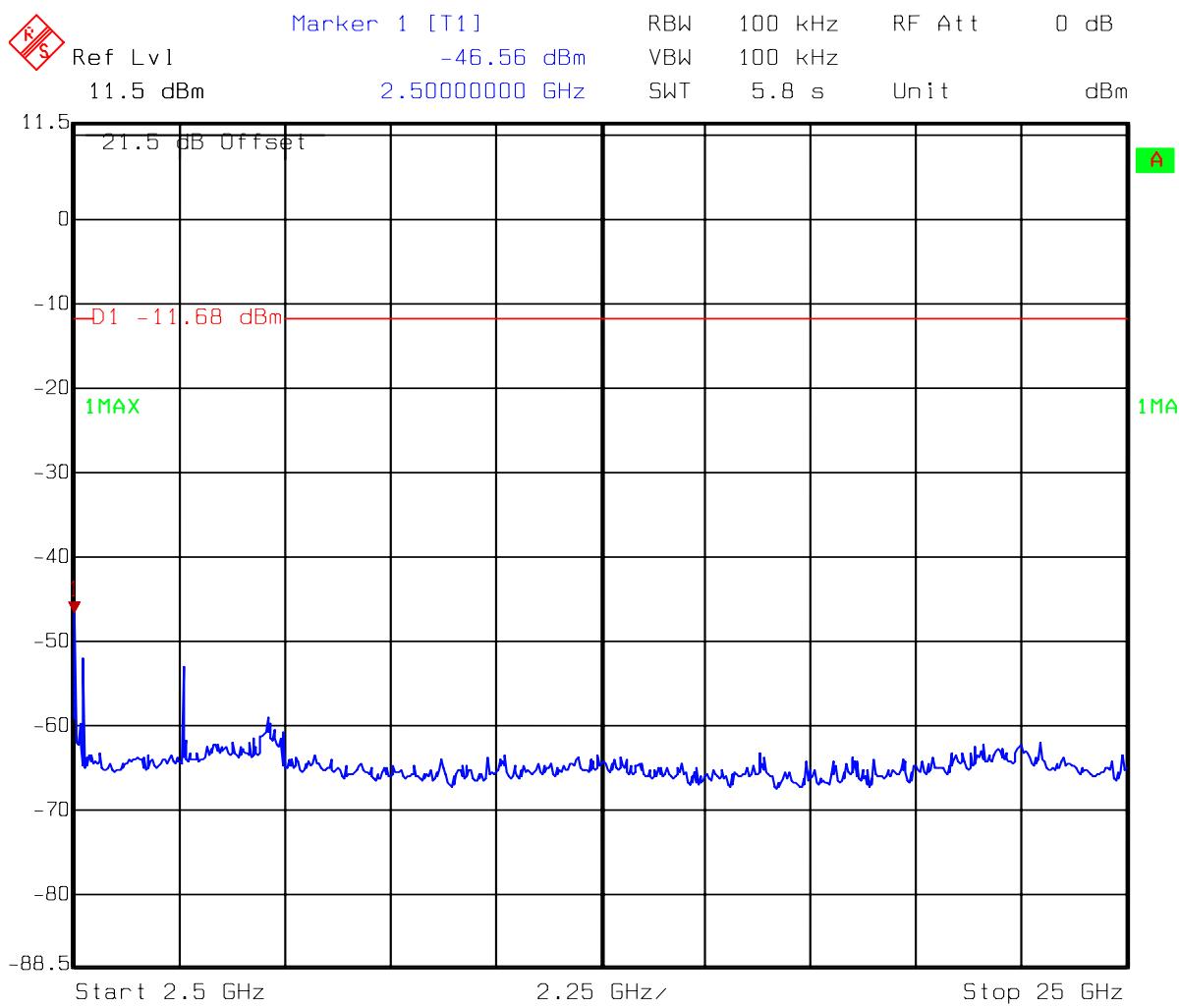
**Channel 11**

Date: 06.JUL.2006 10:14:11

**Test Mode: 802.11g (OFDM Modulation) turbo mode**



Date: 06.JUL.2006 10:01:48



Date: 06.JUL.2006 10:04:05

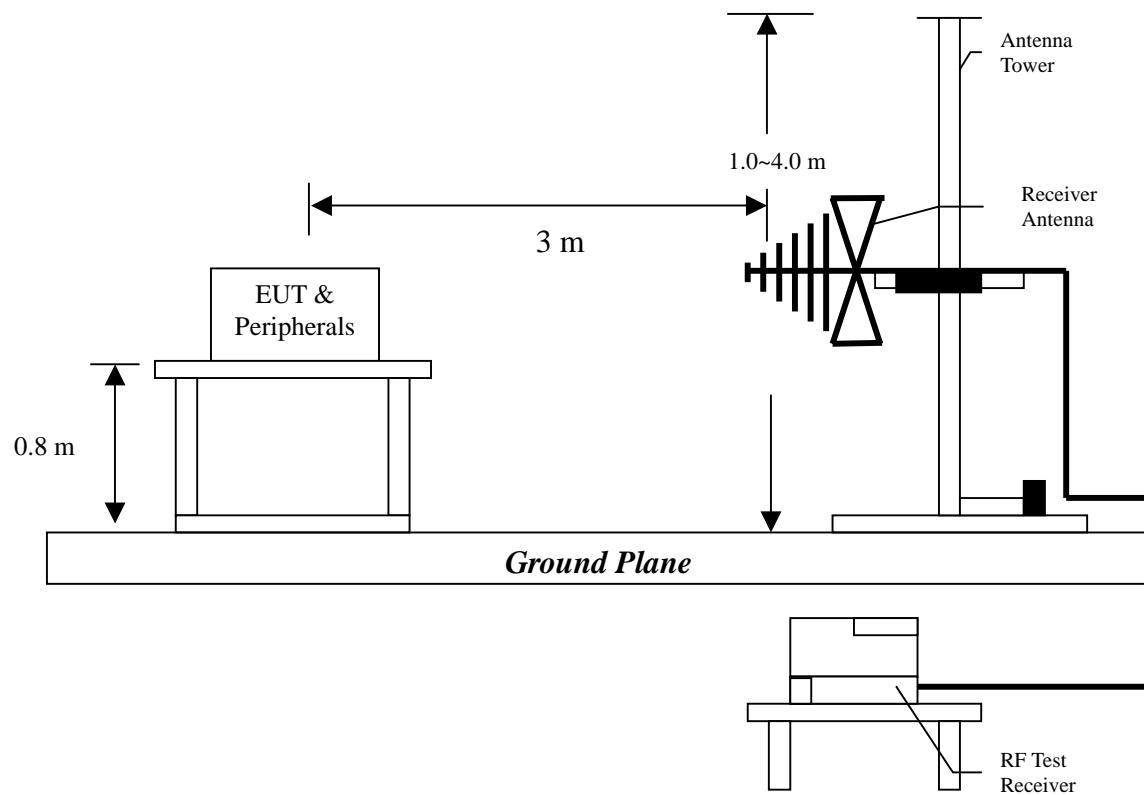
## 6. Radiated Emission test (FCC 15.247)

### 6.1 Operating environment

Temperature: 23  
Relative Humidity: 58 %  
Atmospheric Pressure: 1023 hPa

### 6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were investigated over the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meter reading using inverse scaling with distance.

The EUT test configuration, please refer to the “Spurious set-up photo.pdf”.

### **6.3 Emission limits**

The spurious Emission shall test through the 10th harmonic. 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).

Frequency (MHz)	Limits (dB $\mu$ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty (k=2) of radiated emission measurement is 4.98 dB.

**6.4 Radiated spurious emission test data****6.4.1 Measurement results: frequencies equal to or less than 1 GHz**

The test was performed on EUT under 802.11b continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11b Tx channel 1.

EUT : SSG 20  
Worst Case : 802.11b Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	94.990	QP	7.38	18.20	25.58	43.50	-8.27
V	298.690	QP	13.95	9.80	23.75	46.00	-14.35
V	365.620	QP	15.06	9.68	24.74	46.00	-15.19
V	419.940	QP	16.47	8.36	24.83	46.00	-16.04
V	549.920	QP	19.46	5.55	25.01	46.00	-20.05
V	715.790	QP	22.29	3.80	26.08	46.00	-22.70
H	132.820	QP	12.32	11.03	23.35	43.50	-12.42
H	242.430	QP	12.36	8.93	21.29	46.00	-12.92
H	299.660	QP	14.17	13.72	27.89	46.00	-13.42
H	331.670	QP	14.40	11.59	25.99	46.00	-15.10
H	365.620	QP	15.48	19.28	34.76	46.00	-14.68
H	531.490	QP	19.65	6.61	26.26	46.00	-19.24

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

The test was performed on EUT under 802.11g continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11g Tx channel 6.

EUT : SSG 20  
Worst Case : 802.11g Tx at channel 6

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	39.700	QP	12.62	11.92	24.54	40.00	-13.26
V	94.990	QP	7.38	18.66	26.04	43.50	-7.82
V	298.690	QP	13.95	10.87	24.82	46.00	-13.28
V	365.620	QP	15.06	9.25	24.31	46.00	-15.62
V	419.940	QP	16.47	7.80	24.27	46.00	-16.60
V	531.490	QP	19.46	8.16	27.62	46.00	-18.94
H	132.820	QP	12.32	11.18	23.50	43.50	-12.27
H	232.730	QP	11.74	11.97	23.71	46.00	-10.87
H	299.660	QP	14.17	13.31	27.48	46.00	-13.83
H	331.670	QP	14.40	11.86	26.26	46.00	-14.83
H	365.620	QP	15.48	18.63	34.11	46.00	-15.33
H	671.170	QP	21.52	5.31	26.83	46.00	-21.23

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

**6.4.2 Measurement results: frequency above 1GHz**

The test was performed on EUT under 802.11b continuously transmitting mode channel 1, 6, 11 were verified. The worst case occurred at 802.11b Tx channel 6.

EUT : SSG 20  
Worst Case : 802.11b Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
7290.00	PK	V	36.18	43.97	46.01	53.80	74	-7.67
7290.00	AV	V	36.18	43.97	38.51	46.30	54	-7.74

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:

1GHz-3GHz: 20dBuV  
3GHz-14GHz: 27dBuV  
14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV  
3GHz-14GHz: 16dBuV  
14GHz-26.5GHz: 28dBuV

The test was performed on EUT under 802.11g continuously transmitting mode channel 1, 6, 11 were verified. The worst case occurred at 802.11g Tx channel 6.

EUT : SSG 20  
Worst Case : 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
7290.00	PK	V	36.18	43.97	55.92	63.71	74	-8.75
7290.00	AV	V	36.18	43.97	40.45	48.24	54	-7.40

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:

1GHz-3GHz: 20dBuV  
3GHz-14GHz: 27dBuV  
14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV  
3GHz-14GHz: 16dBuV  
14GHz-26.5GHz: 28dBuV

EUT : SSG 20

Test Condition : 802.11g Tx at channel 6 (Turbo mode)

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
7290.00	PK	V	36.18	43.97	52.71	60.50	74	-8.00
7290.00	AV	V	36.18	43.97	39.02	46.81	54	-6.97

**Remark:**

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

## 7. Power Spectrum Density test (FCC 15.247)

### 7.1 Operating environment

Temperature: 23  
Relative Humidity: 50 %  
Atmospheric Pressure 1023 hPa

### 7.2 Test setup & procedure

The power spectrum density per FCC §15.247(e) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 300kHz, and the sweep time set at 100 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

### 7.3 Measured data of Power Spectrum Density test results

#### Test Mode: 802.11b(DSSS Modulation) operating mode

Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-16.14	8
6 (middle)	2437	-8.17	8
11 (highest)	2462	-8.24	8

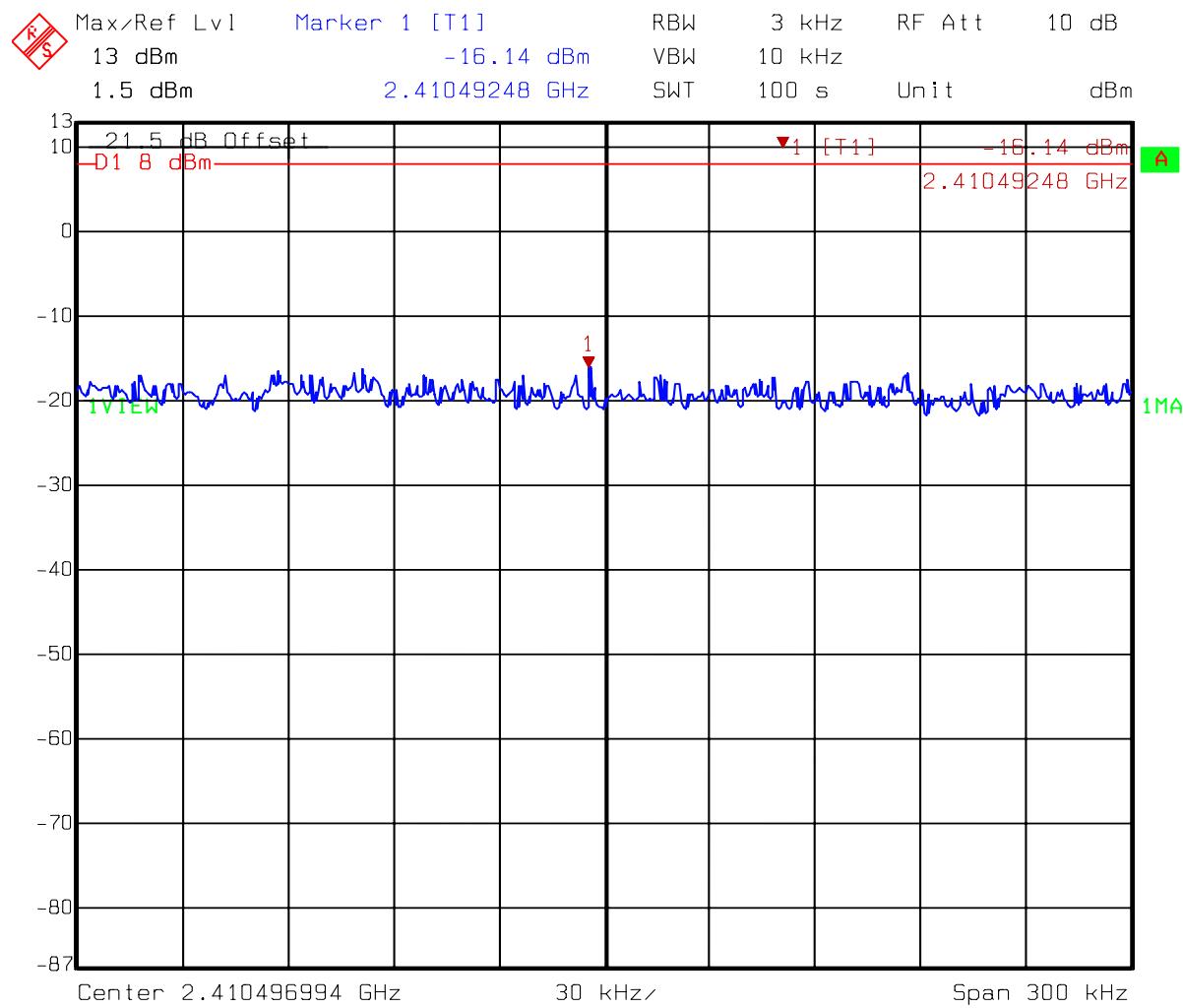
#### Test Mode: 802.11g(OFDM Modulation) operating mode

Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-17.07	8
6 (middle)	2437	-8.11	8
11 (highest)	2462	-13.32	8

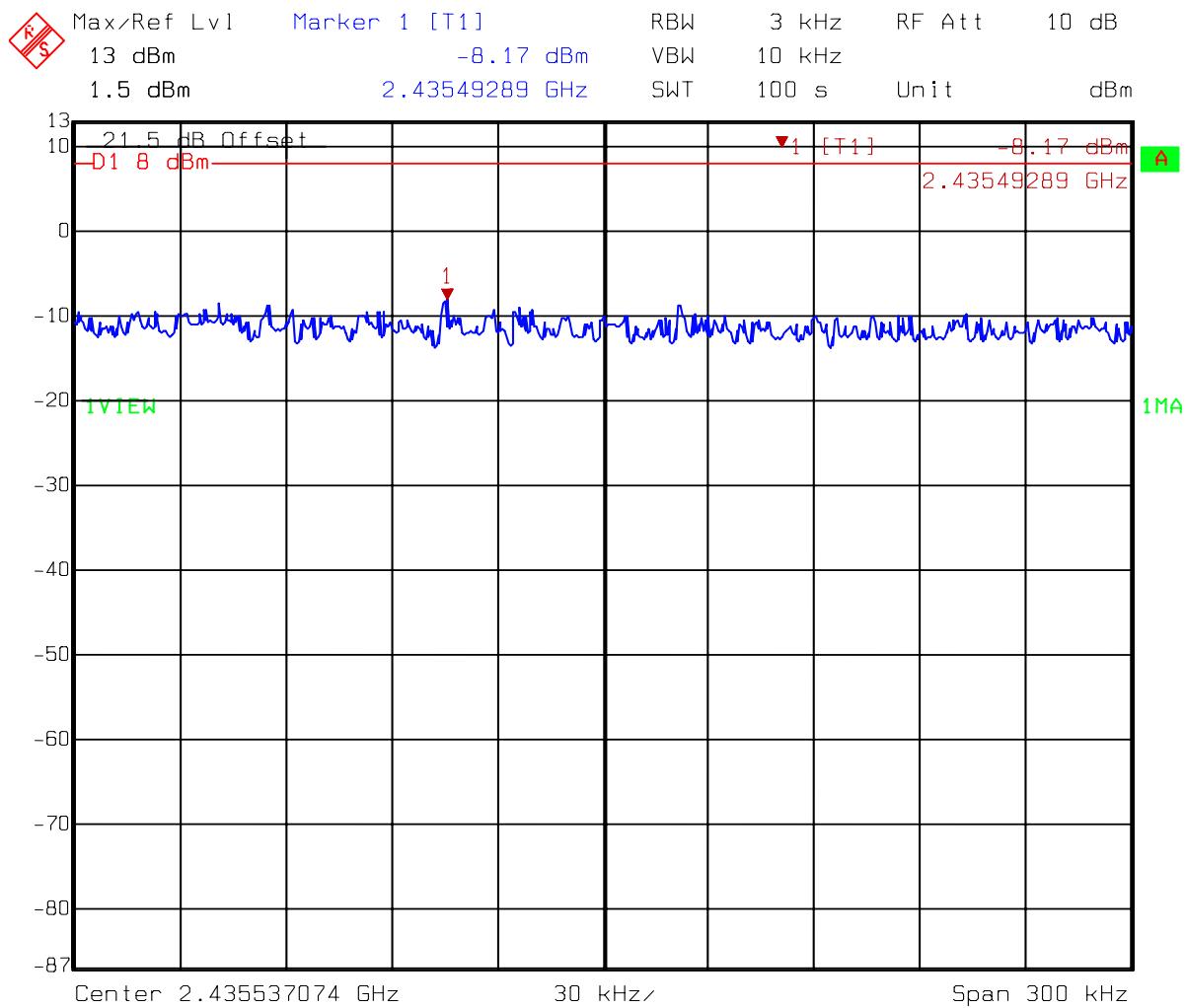
#### Test Mode: 802.11g(OFDM Modulation) turbo mode

Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
6 (middle)	2437	-11.06	8

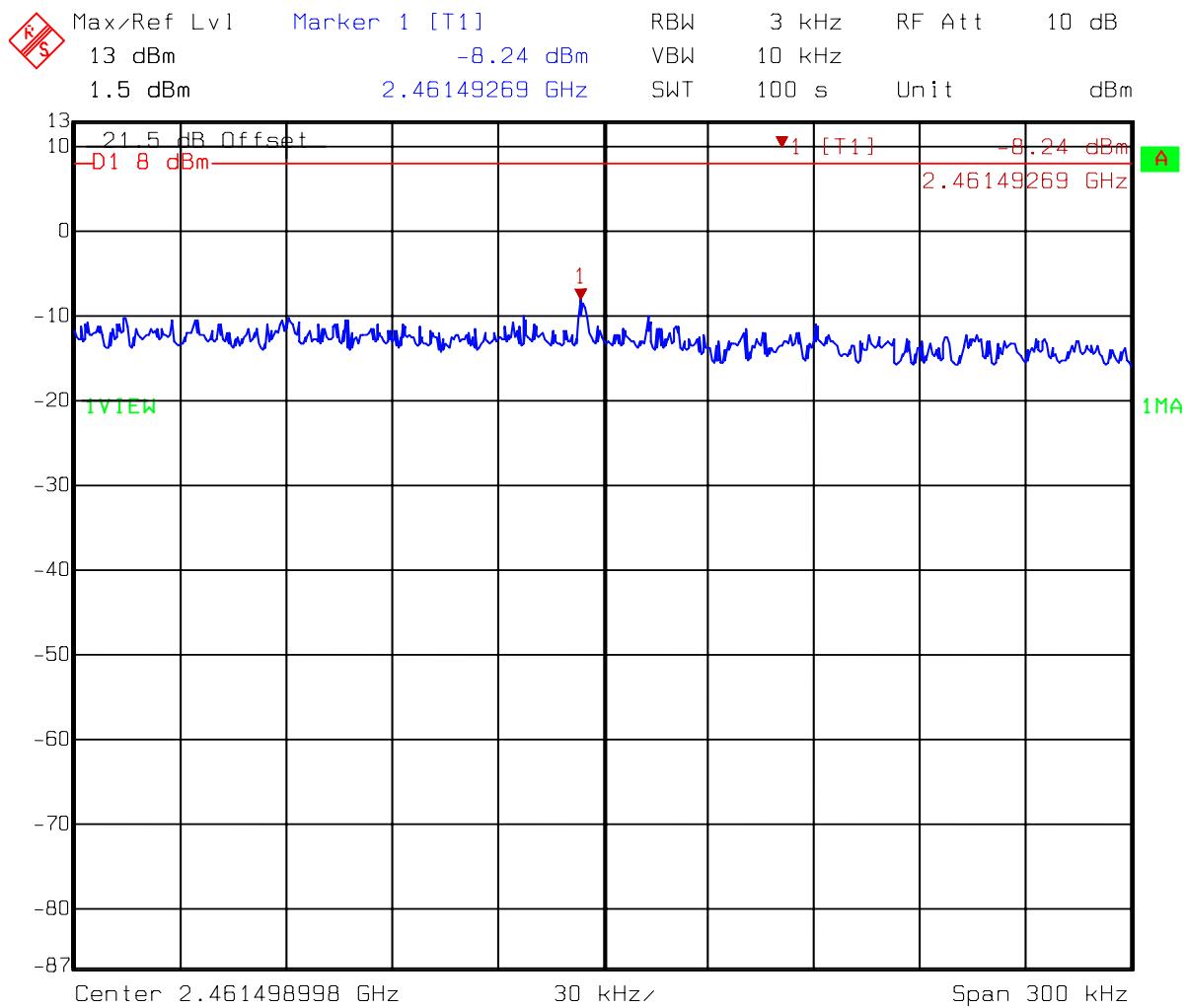
Please see the plot below.

**Test Mode: 802.11b(DSSS Modulation) operating mode**


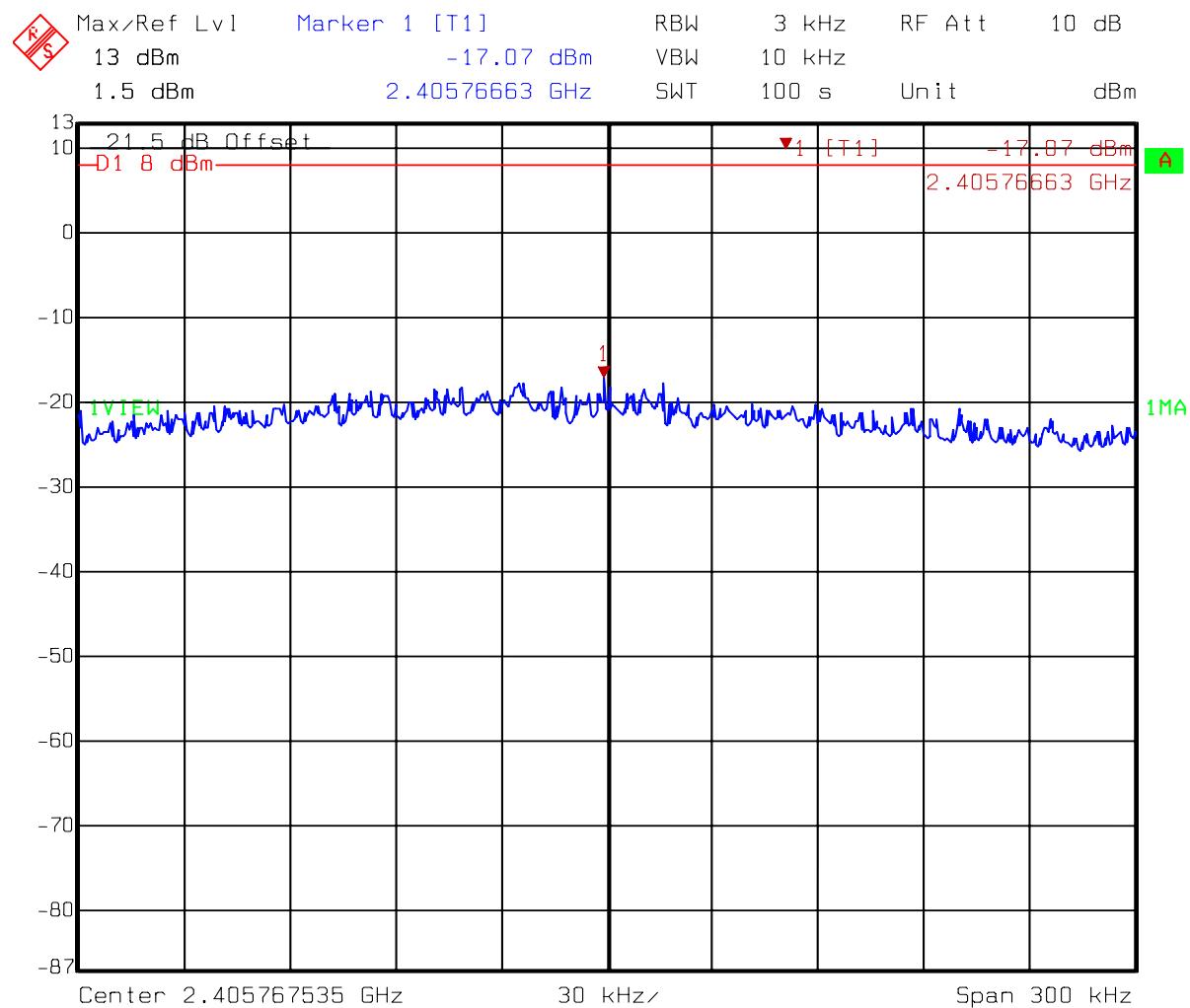
Title: Power Spectrum Density  
 Comment A: Channel 01 at 802.11b mode  
 Date: 28.MAY 2006 17:32:33



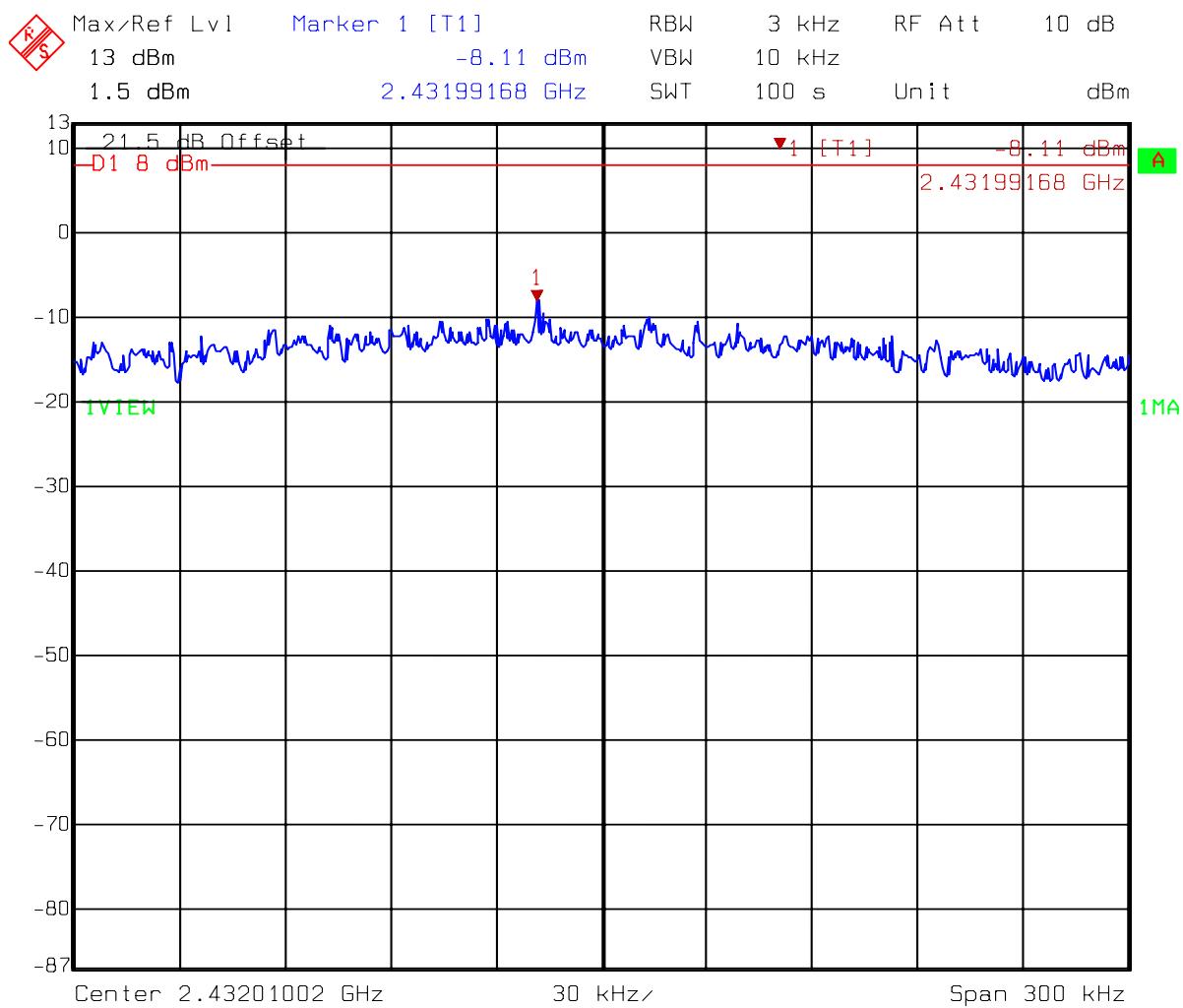
Title: Power Spectrum Density  
 Comment A: Channel 06 at 802.11b mode  
 Date: 28.MAY 2006 17:34:47



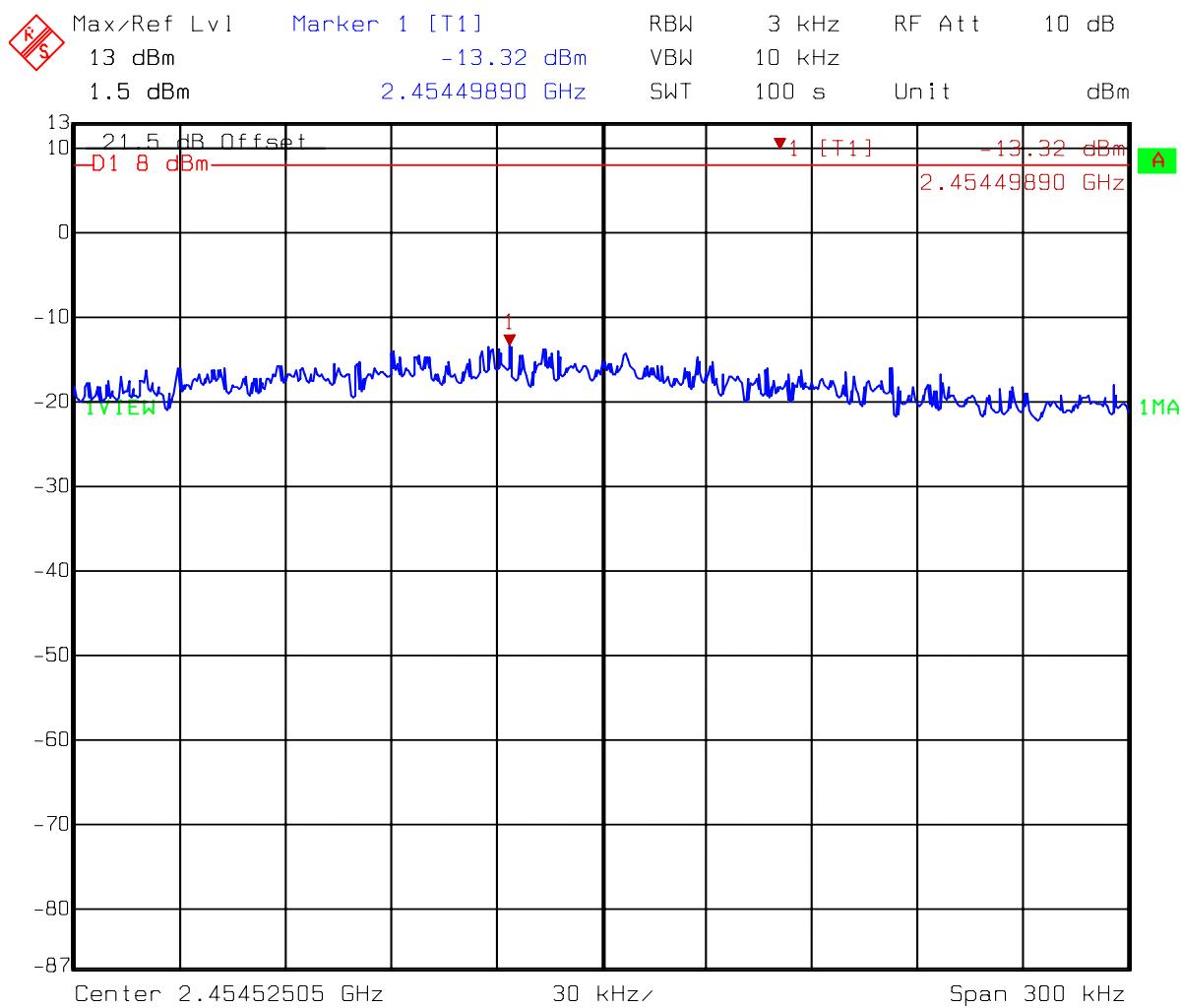
Title: Power Spectrum Density  
 Comment A: Channel 11 at 802.11b mode  
 Date: 28.MAY 2006 17:36:27

**Test Mode: 802.11g(OFDM Modulation) operating mode**


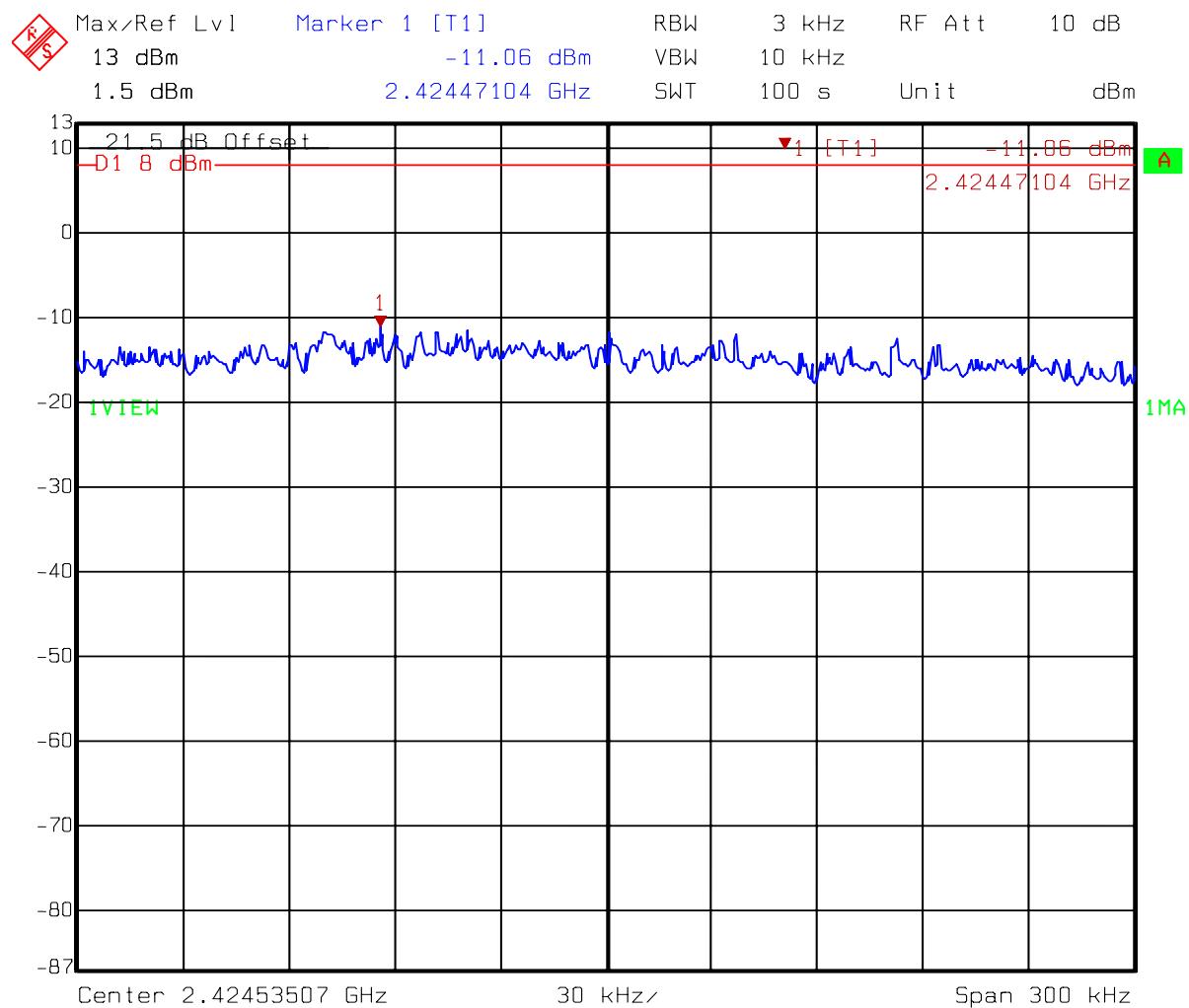
Title: Power Spectral Density  
 Comment A: Channel 01 at 802.11g mode  
 Date: 28.MAY 2006 17:38:42



Title: Power Spectrum Density  
 Comment A: Channel 06 at 802.11g mode  
 Date: 28.MAY 2006 17:40:37



Title: Power Spectrum Density  
 Comment A: Channel 11 at 802.11g mode  
 Date: 28.MAY 2006 17:43:56

**Test Mode: 802.11g(OFDM Modulation) turbo mode**


Title: Power Spectral Density  
 Comment A: Channel 06 at 802.11g mode (Turbo)  
 Date: 28.MAY 2006 17:42:02

## 8. Emission on the band edge (FCC 15.247)

In any 100kHz bandwidth outside the frequency band in which the spread spectrum 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.

### 8.1 Operating environment

Temperature: 25  
Relative Humidity: 50 %  
Atmospheric Pressure 1023 hPa

### 8.2 Test setup & procedure

The output of EUT was connected to spectrum analyzer via a 50ohm cable.

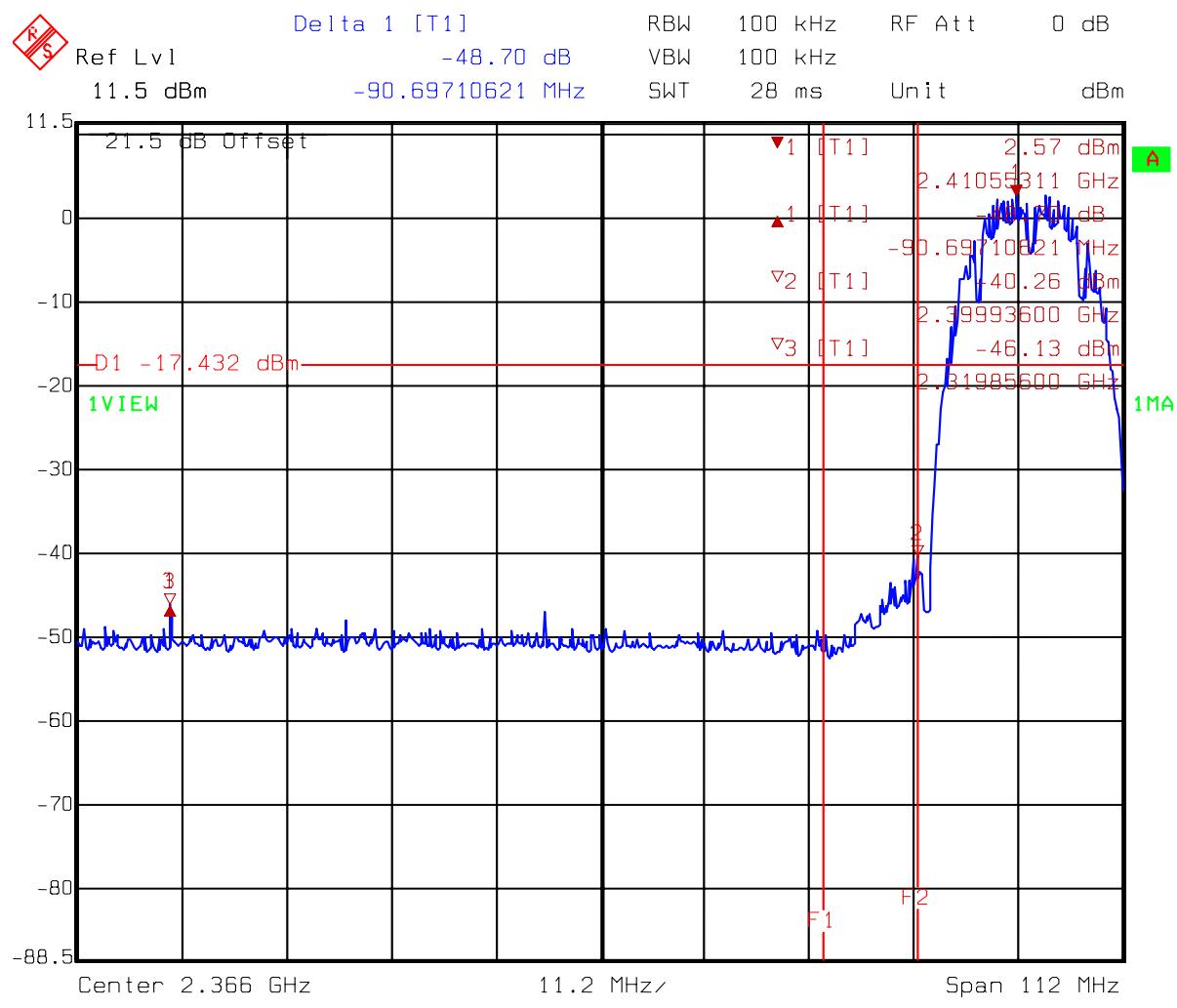
The setting of spectrum analyzer is:

Peak: RBW = 100kHz ; VBW = 100kHz  
Average: RBW = 1MHz ; VBW = 10Hz

## 8.3 Test Result

### 8.3.1 Conducted Method

#### Test Mode: 802.11b(DSSS Modulation) operating mode

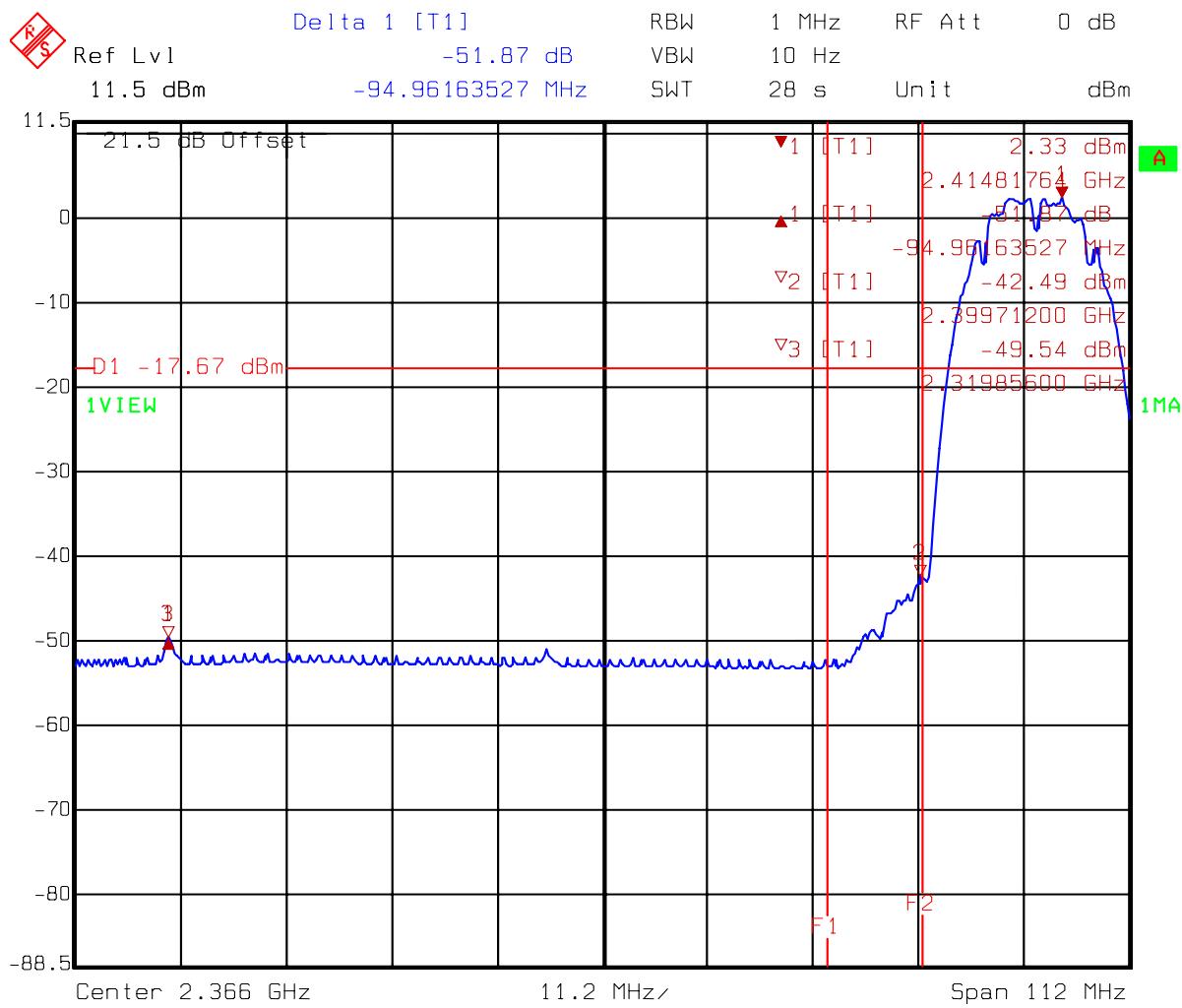


Title: Band Edge

Comment A: Channel 01 at 802.11b mode

F1=2390MHz F2=2400MHz (Peak Detect) (Dercetional Ant)

Date: 11.MAY 2006 22:02:49

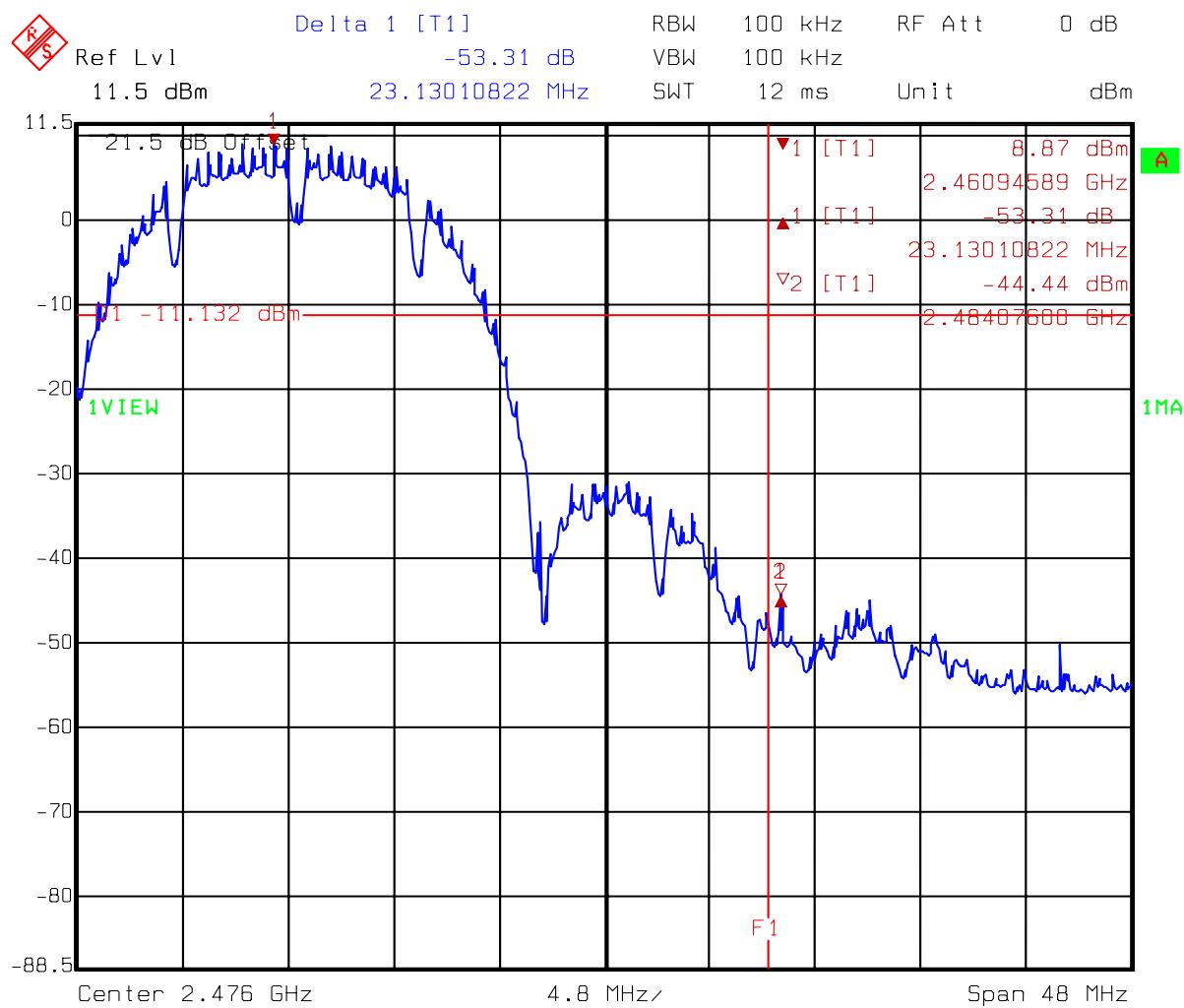


Title: Band Edge

Comment A: Channel 01 at 802.11b mode

F1=2390MHz F2=2400MHz (Average Detect) (Directional Ant)

Date: 11.MAY 2006 22:04:49

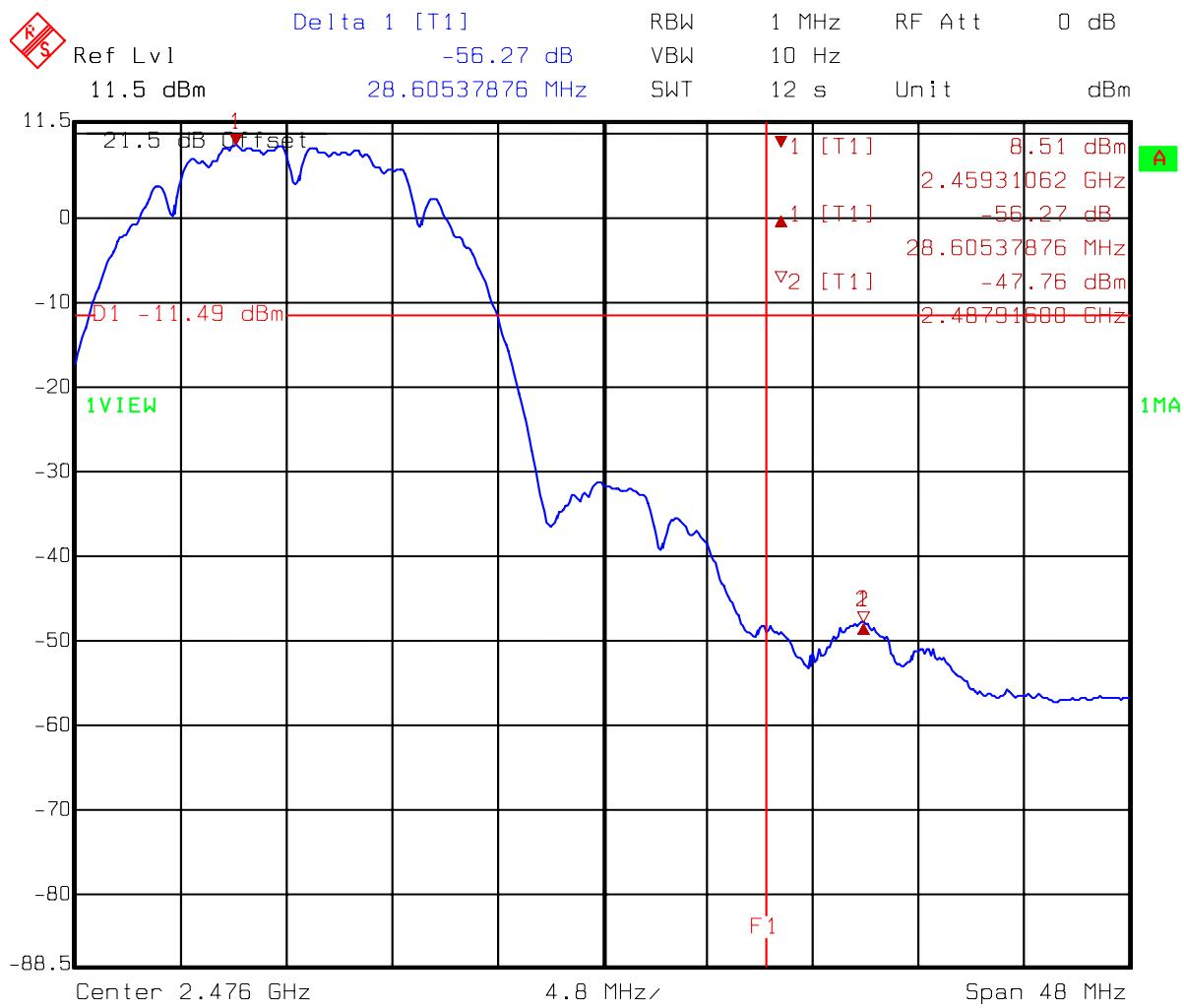


Title: Band Edge

Comment A: Channel 11 at 802.11b mode

F1=2483.5MHz (Peak Detect) (Divergent Ant)

Date: 11.MAY 2006 21:38:04

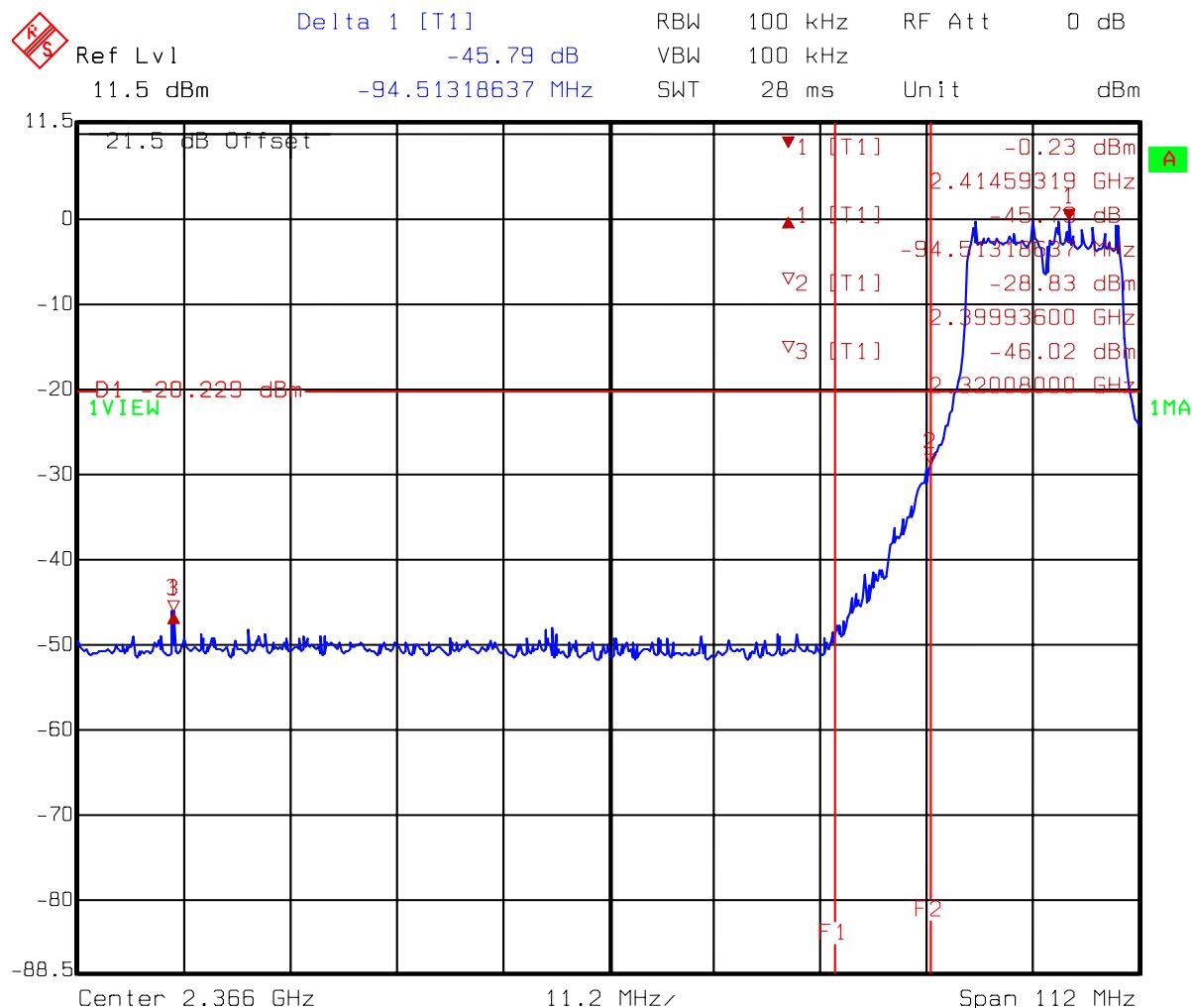


Title: Band Edge

Comment A: Channel 11 at 802.11b mode

F1=2483.5MHz (Average Detect) (Dercetional Ant)

Date: 11.MAY 2006 21:39:02

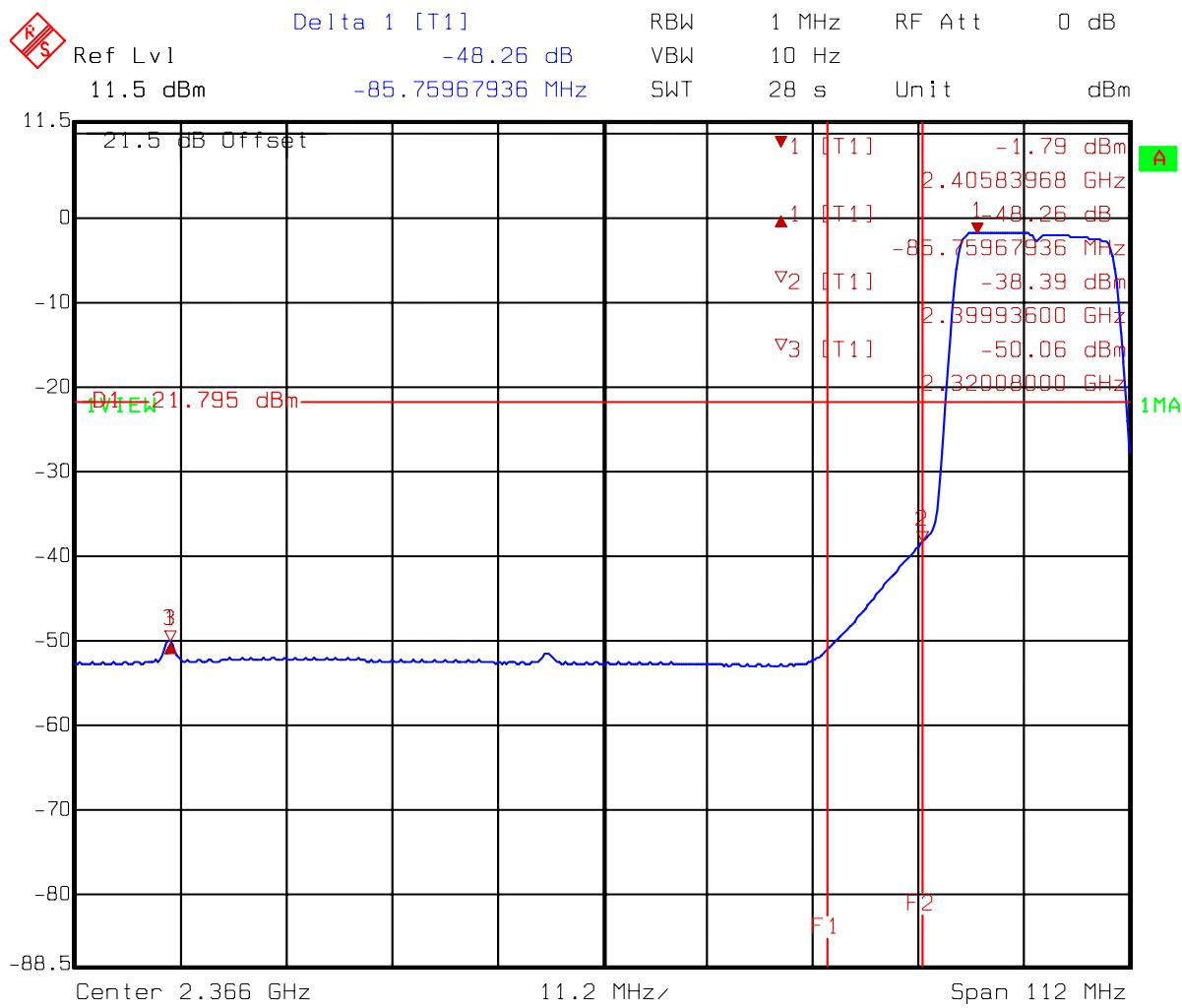
**Test Mode: 802.11g(OFDM Modulation) operating mode**


Title: Band Edge

Comment A: Channel 01 at 802.11g mode

F1=2390MHz F2=2400MHz (Peak Detect) (Dercetional Ant)

Date: 11.MAY 2006 23:11:34

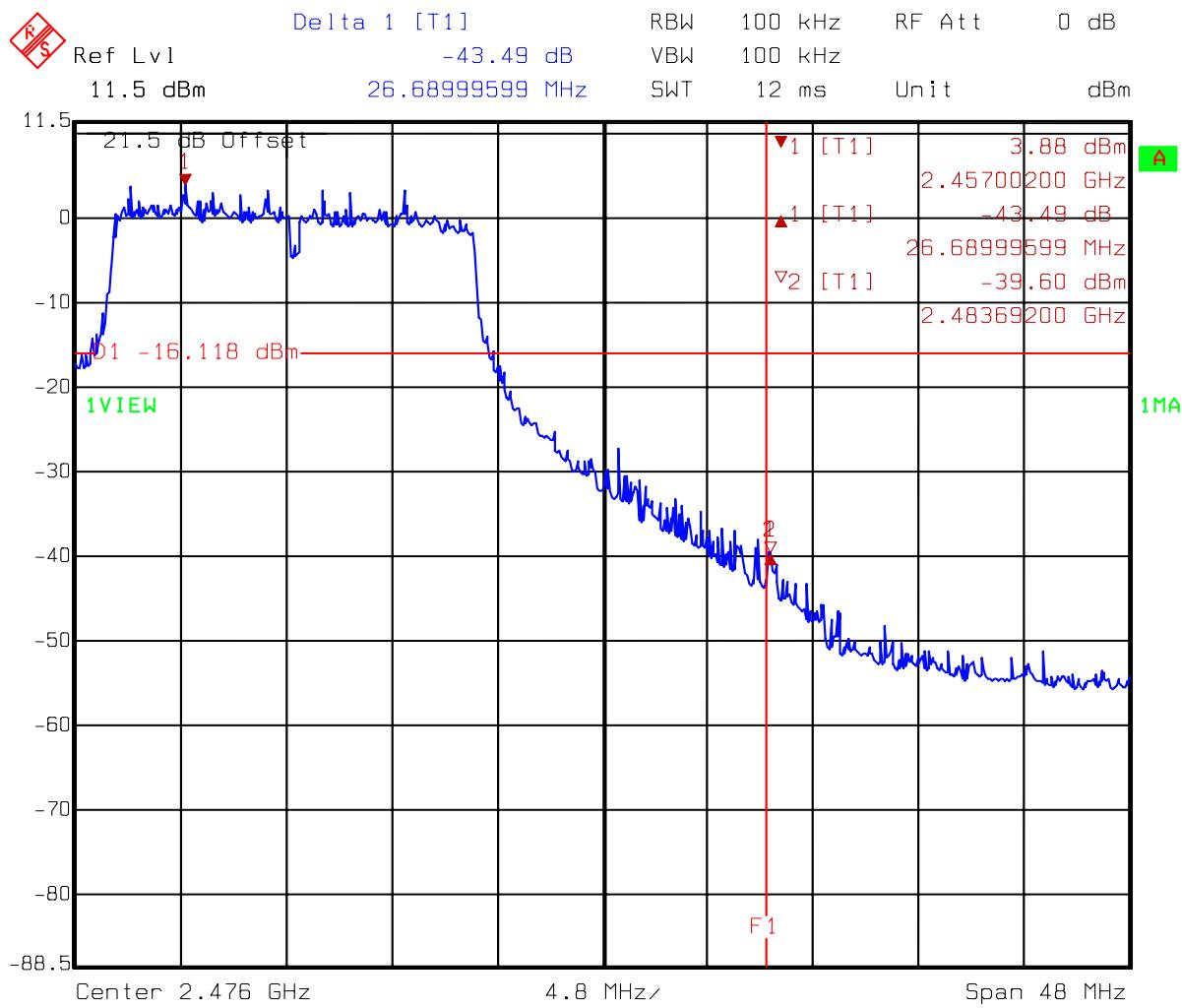


Title: Band Edge

Comment A: Channel 01 at 802.11g mode

F1=2390MHz F2=2400MHz (Average Detect) (Directional Ant)

Date: 11.MAY 2006 23:13:34

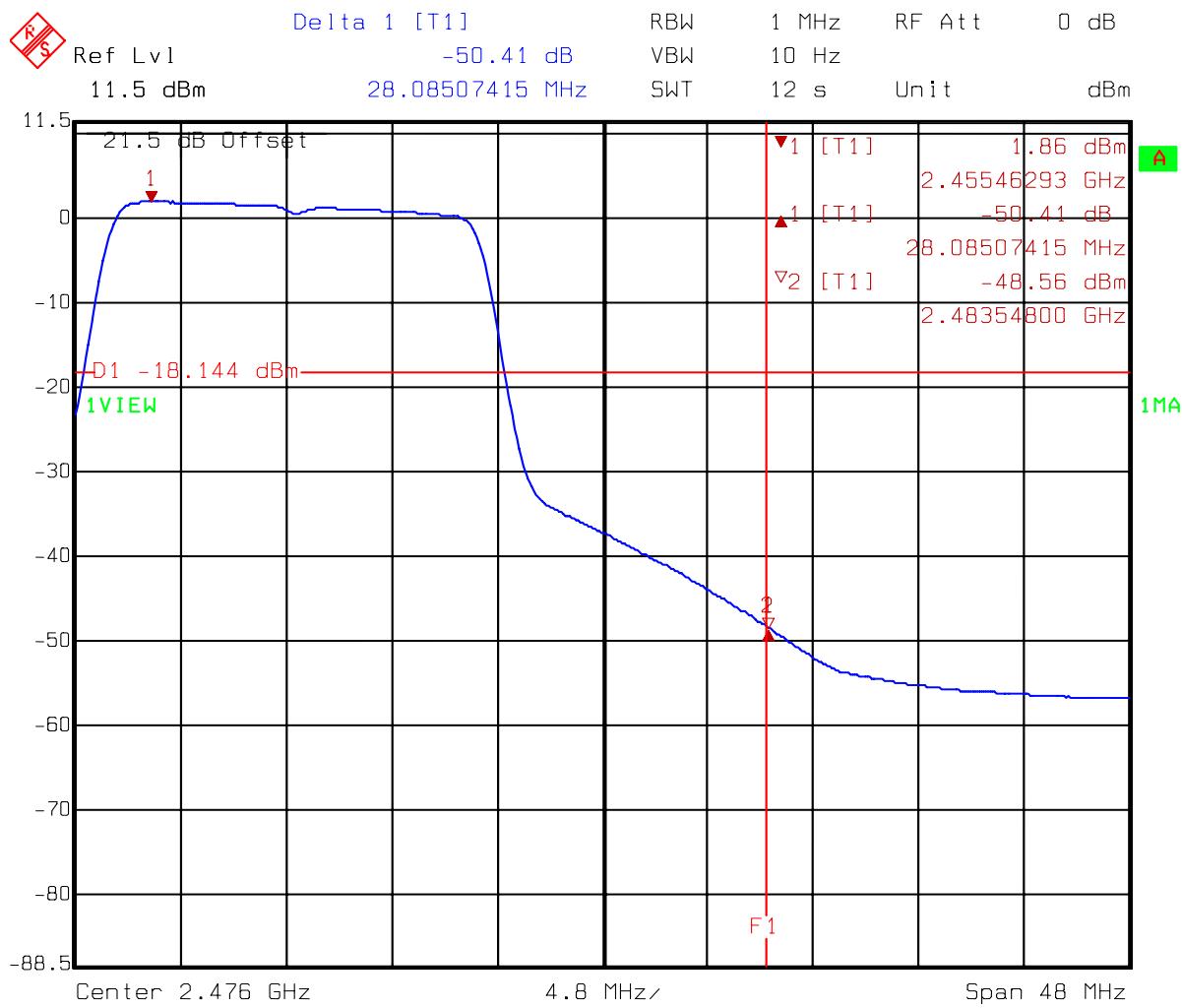


Title: Band Edge

Comment A: Channel 11 at 802.11g mode

F1=2483.5MHz (Peak Detect) (Dercetional Ant)

Date: 11.MAY 2006 21:34:14



Title: Band Edge

Comment A: Channel 11 at 802.11g mode

F1=2483.5MHz (Average Detect) (Dercetional Ant)

Date: 11.MAY 2006 21:35:02

### 8.3.2 Radiated Method

**Test Mode: 802.11b(DSSS Modulation) operating mode**

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B			
1 (lowest)	PK	107.21	48.7	58.51	74	-15.49
	AV	103.44	51.87	51.57	54	-2.43
11 (highest)	PK	111.20	53.31	57.89	74	-16.11
	AV	108.28	56.27	52.01	54	-1.99

Remark: 1.  $C = A - B$

2.  $E = C - D$

**Test Mode: 802.11g(OFDM Modulation) operating mode**

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dB <sub>c</sub> )	Limit @ 3 m (dB <sub>uV/m</sub> )	Margin (dB)
		Max. Field Strength of Fundamental @3m (dB <sub>uV/m</sub> )	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dB <sub>c</sub> )			
		A	B			
1 (lowest)	PK	109.67	45.79	60.97	74	-13.03
	AV	100.25	48.26	48.38	54	-5.62
11 (highest)	PK	112.44	43.49	59.13	74	-14.87
	AV	102.97	50.41	46.70	54	-7.30

Remark: 1. C = A – B

2. E = C – D

## 9. Peak Output Power test (FCC 15.407)

### 9.1 Operating environment

Temperature: 25  
Relative Humidity: 50 %  
Atmospheric Pressure: 1023 hPa

### 9.2 Test setup & procedure

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm SMA cable connected to power meter via power sensor. Power was read directly and cable loss correction (7.0dB) was added to the reading to obtain power at the EUT antenna terminals.

### 9.3 Limit

Operating Frequency (MHz)	Output power limit
5150~5250	< 50mW (17dBm) or 4dBm+10 log B
5250~5350, 5470~5725	< 250mW (24dBm) or 11dBm+10 log B
5725~5825	< 1W (30dBm) or 17dBm+10 log B

Remark: where B is the -26 dB emission bandwidth in MHz.

### 9.4 Measured data of Maximum Output Power test results

#### For Frequency band (5180MHz ~ 5240MHz) Normal mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
36	5180	2.3	10.13	12.43	17.50	17
44	5220	2.3	9.35	11.65	14.62	17
48	5240	2.3	10.02	12.32	17.06	17

Remark:

Conducted Peak Output Power = Reading + C.L.

**For Frequency band (5260MHz ~ 5320MHz) Normal mode**

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
52	5260	2.3	8.23	10.53	11.30	24
56	5280	2.3	12.91	15.21	33.19	24
64	5320	2.3	11.52	13.82	24.10	24

Remark:

Conducted Peak Output Power = Reading + C.L.

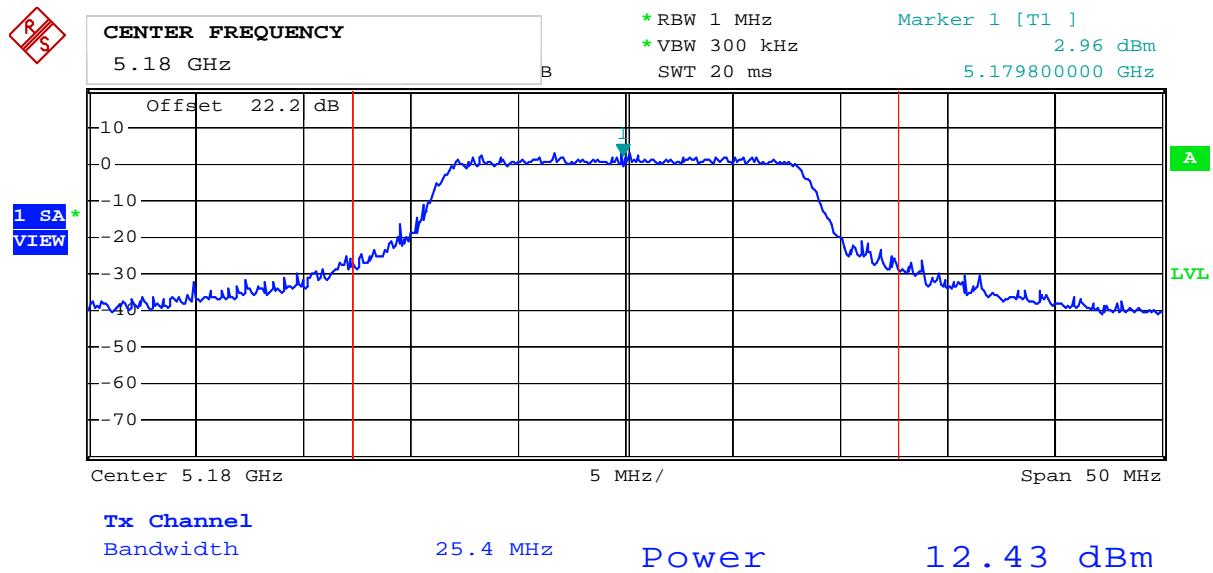
**For Frequency band (5180MHz ~ 5240MHz, 5260MHz ~ 5320MHz) turbo mode**

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (dBm)
				(dBm)	(mW)	
42	5260	2.3	11.81	14.11	25.76	17
50	5280	2.3	11.85	14.15	26.00	17
58	5290	2.3	10.85	13.15	20.65	24

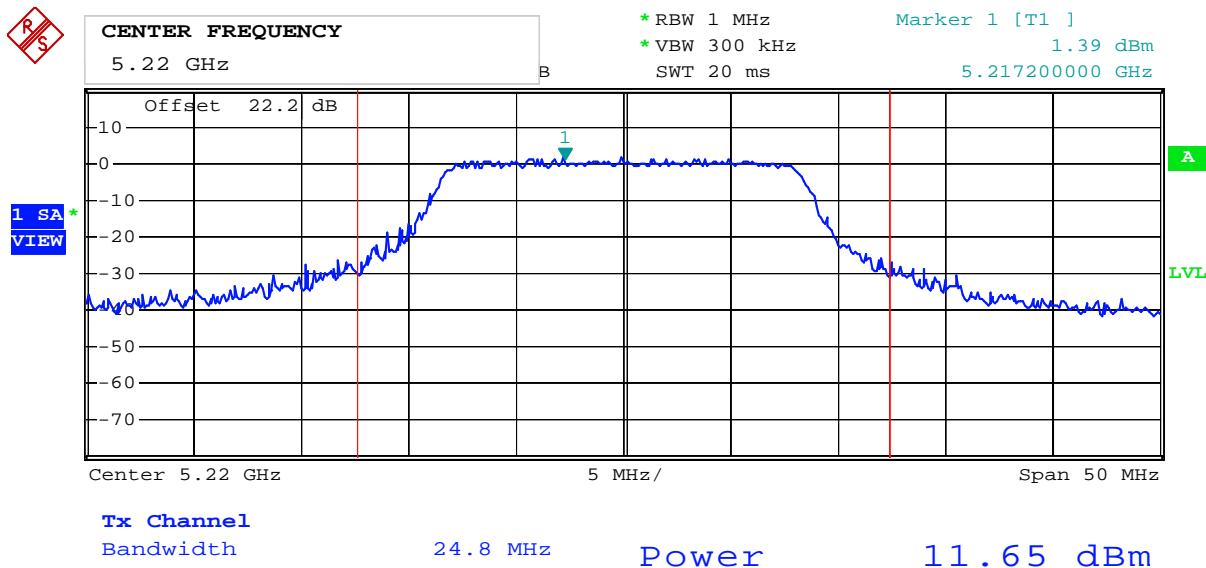
Remark:

Conducted Peak Output Power = Reading + C.L.

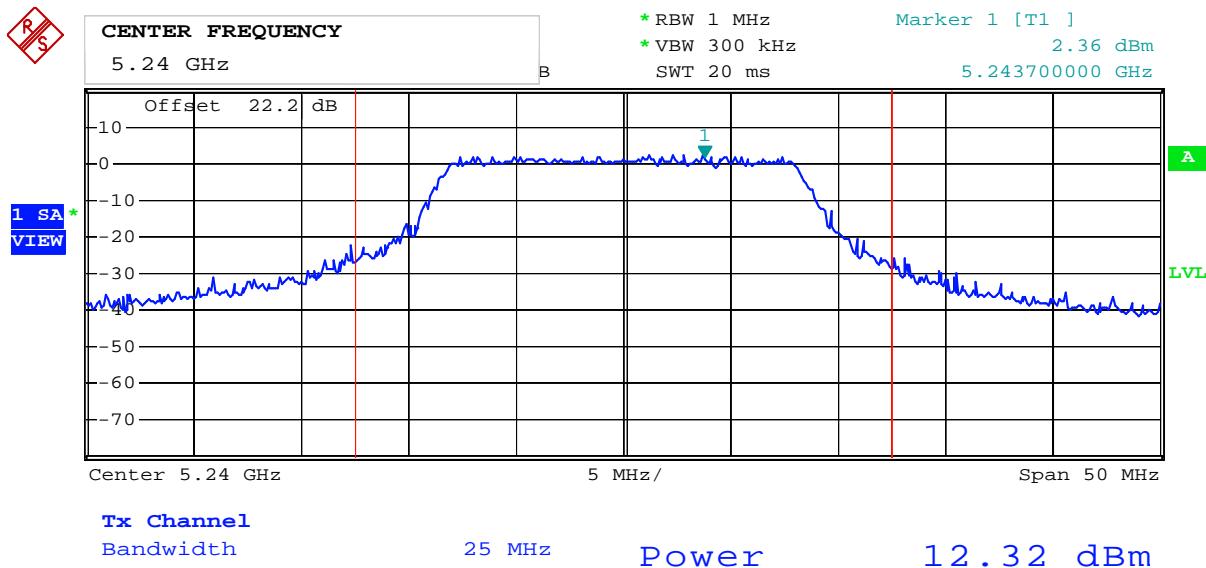
Please see the plot below.

**For Frequency band (5150MHz ~ 5250MHz)**

Comment: 2nd comment ...  
Date: 22.MAY.2006 16:14:07

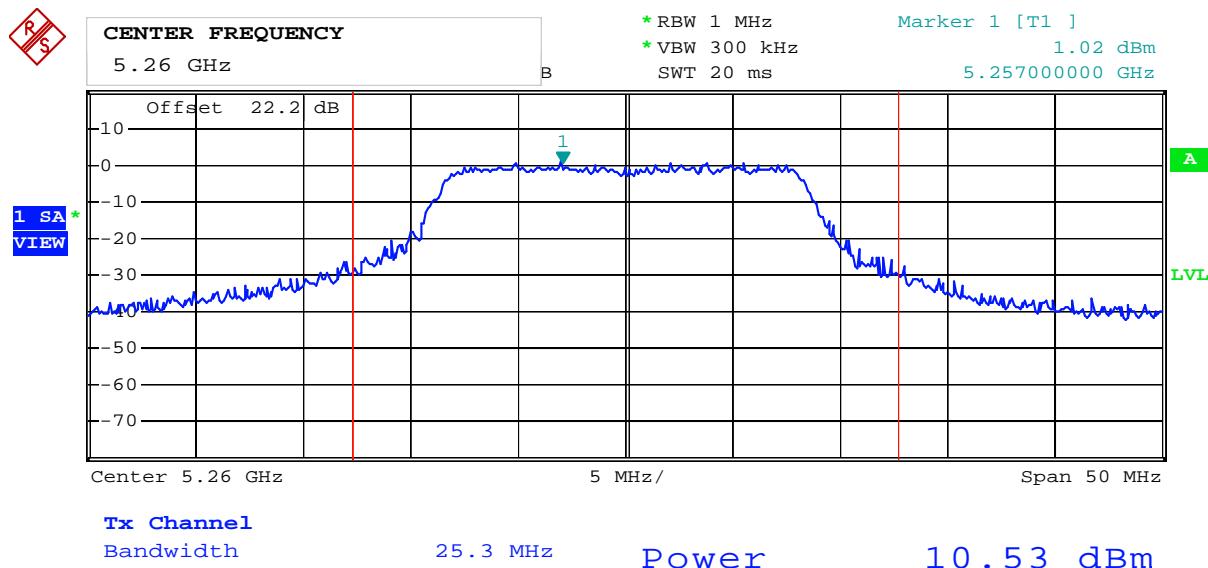


Comment: 2nd comment ...  
Date: 22.MAY.2006 16:19:23

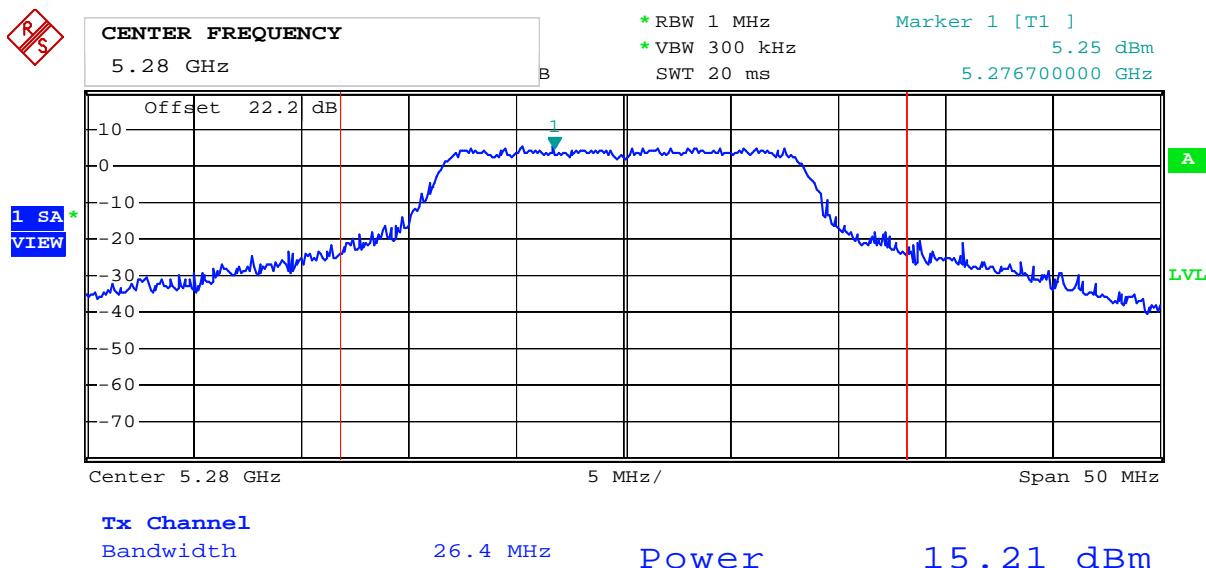


Comment: 2nd comment ...  
Date: 22.MAY.2006 16:47:50

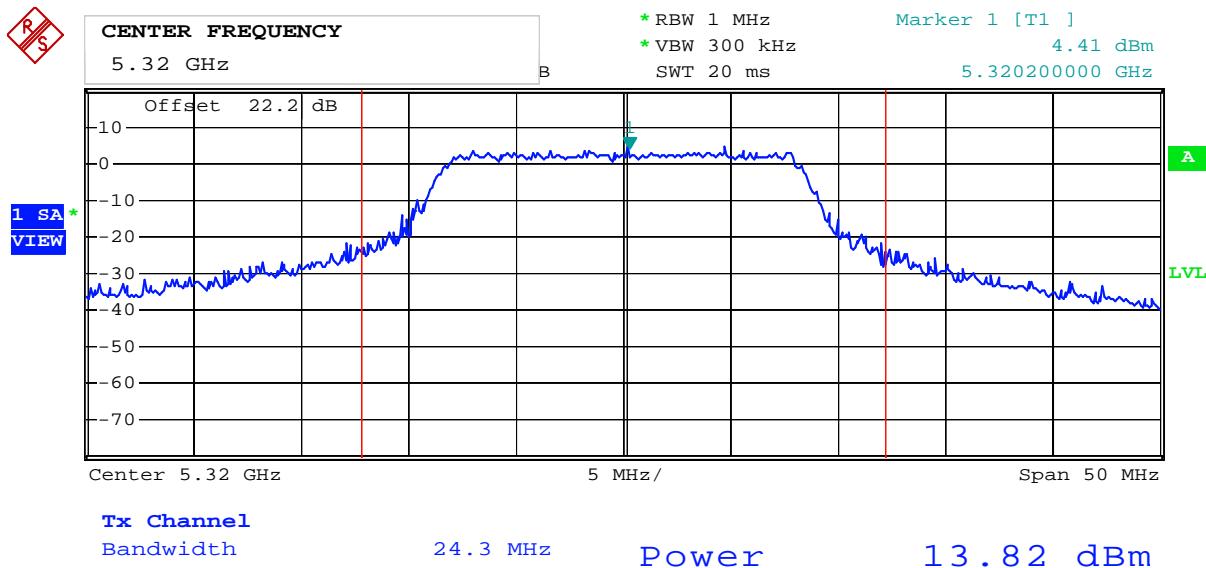
## For Frequency band (5250MHz ~ 5350MHz)



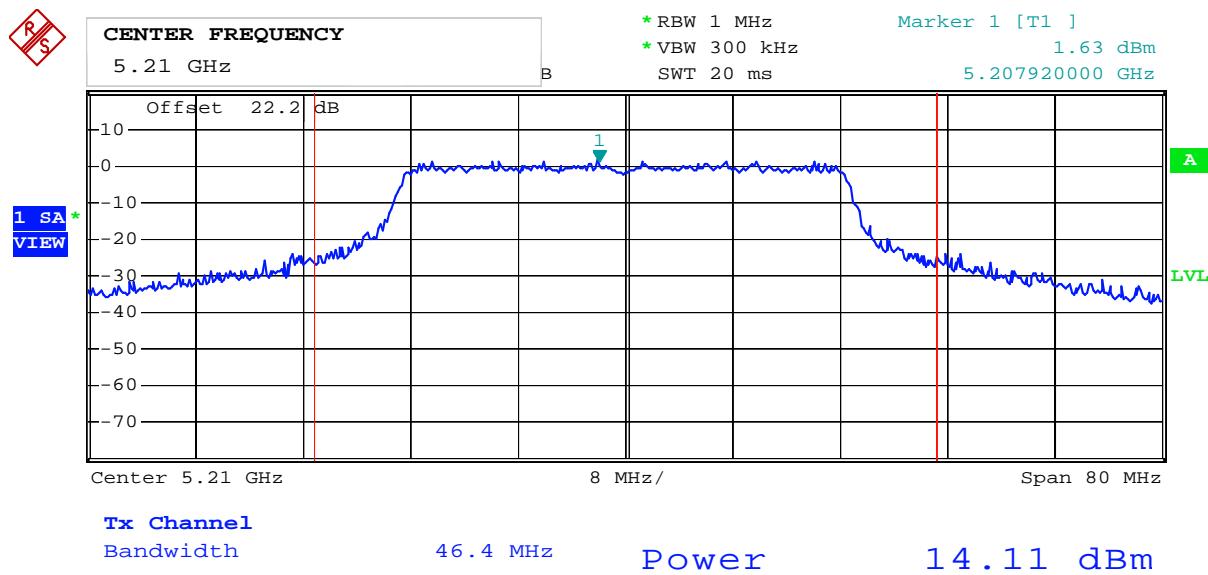
Comment: 2nd comment ...  
 Date: 22.MAY.2006 16:54:01



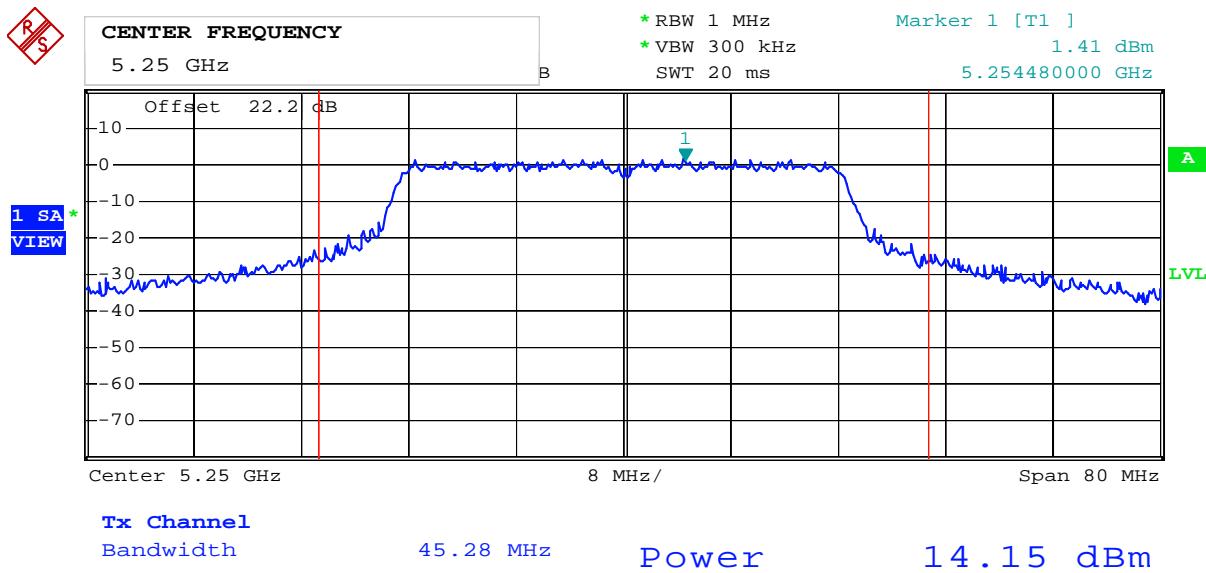
Comment: 2nd comment ...  
Date: 22.MAY.2006 17:00:05



Comment: 2nd comment ...  
Date: 22.MAY.2006 17:06:49

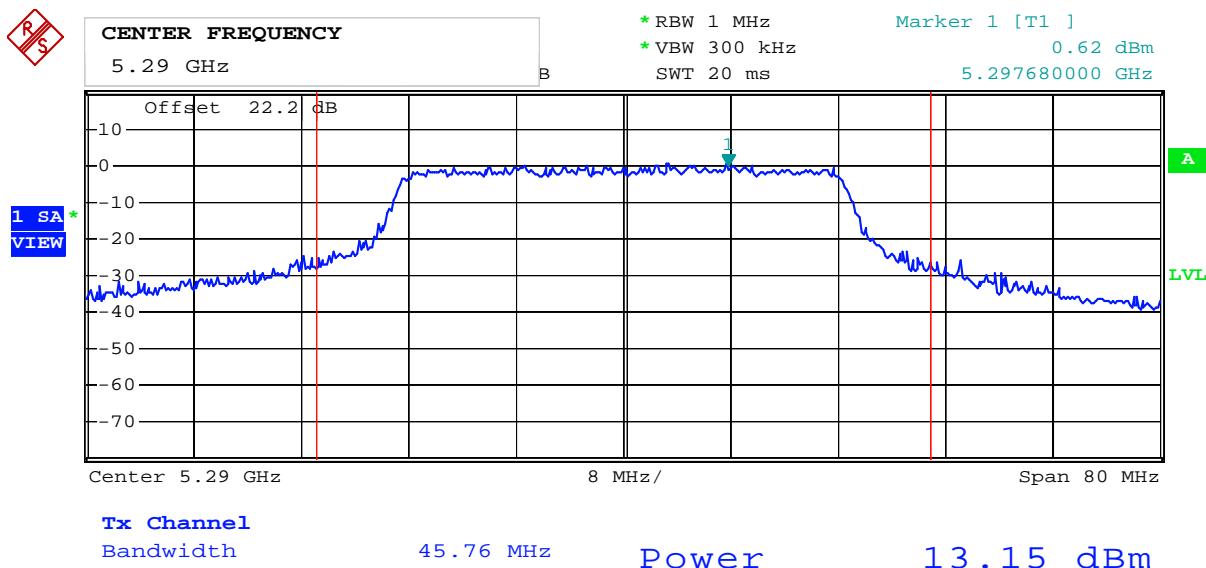
**Turbo mode**

Comment: 2nd comment ...  
Date: 22.MAY.2006 18:03:11



Comment: 2nd comment ...

Date: 22.MAY.2006 18:07:29



Comment: 2nd comment ...  
Date: 22.MAY.2006 18:11:49

## 10. Power Spectrum Density test (FCC 15.407)

### 10.1 Operating environment

Temperature: 25  
Relative Humidity: 50 %  
Atmospheric Pressure: 1023 hPa

### 10.2 Test setup & procedure

The power spectrum density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 1MHz, the video bandwidth set at 3MHz. Power spectrum density was read directly and cable loss (7.0dB)/external attenuator (20dB) correction was added to the reading to obtain power at the EUT antenna terminals.

#### Limit

Operating Frequency (MHz)	Power density limit
5150~5250	< 4dBm/MHz
5250~5350, 5470~5725	< 11dBm/MHz
5725~5825	< 17dBm/MHz

### 10.3 Measured data of Power Spectrum Density test results

#### For Frequency band (5180MHz ~ 5240MHz) Normal mode

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
36	5180	-4.37	4
40	5200	-5.35	4
48	5240	-4.74	4

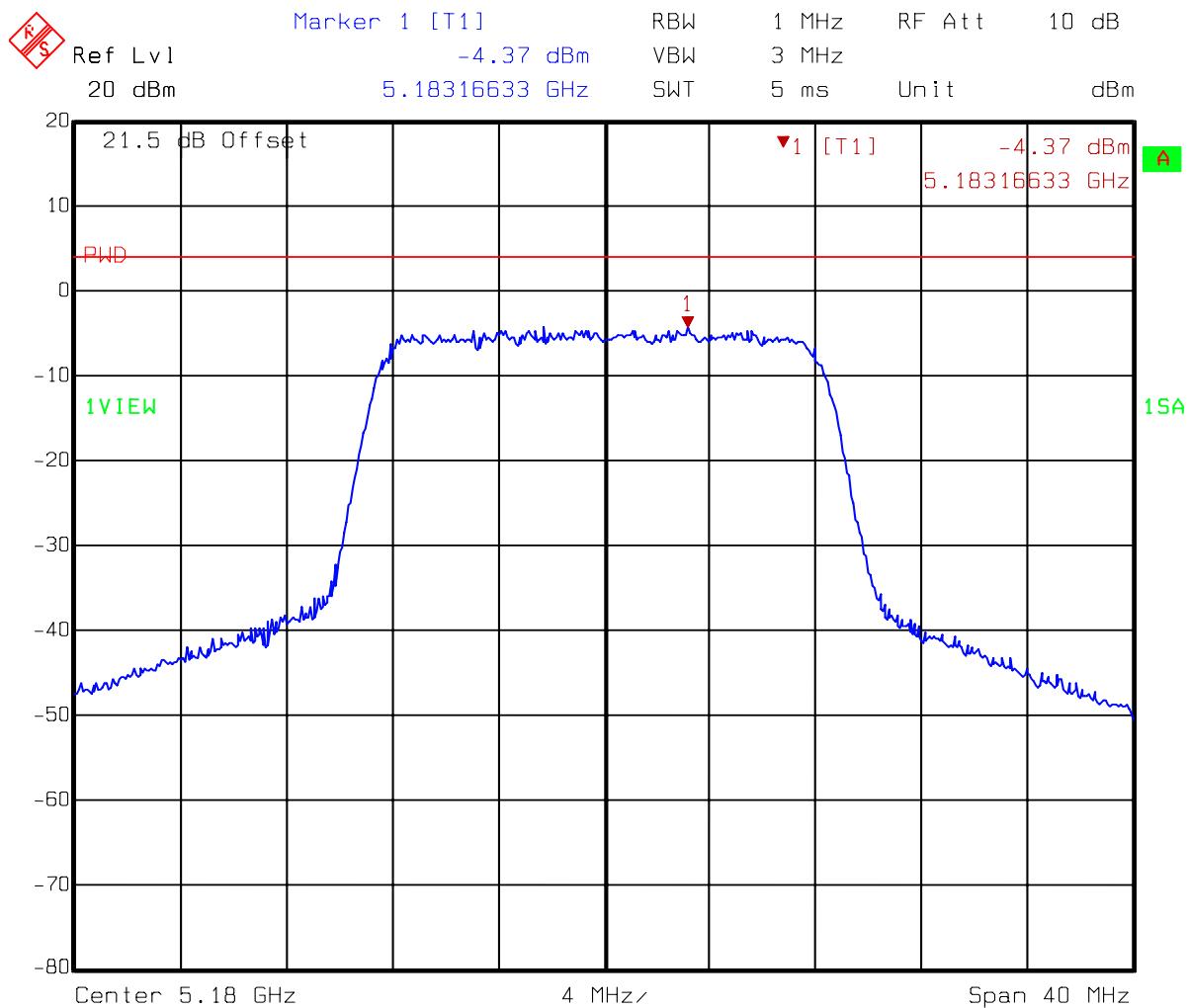
**For Frequency band (5260MHz ~ 5320MHz) Normal mode**

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
52	5260	-5.41	11
60	5300	-1.53	11
64	5320	-3.96	11

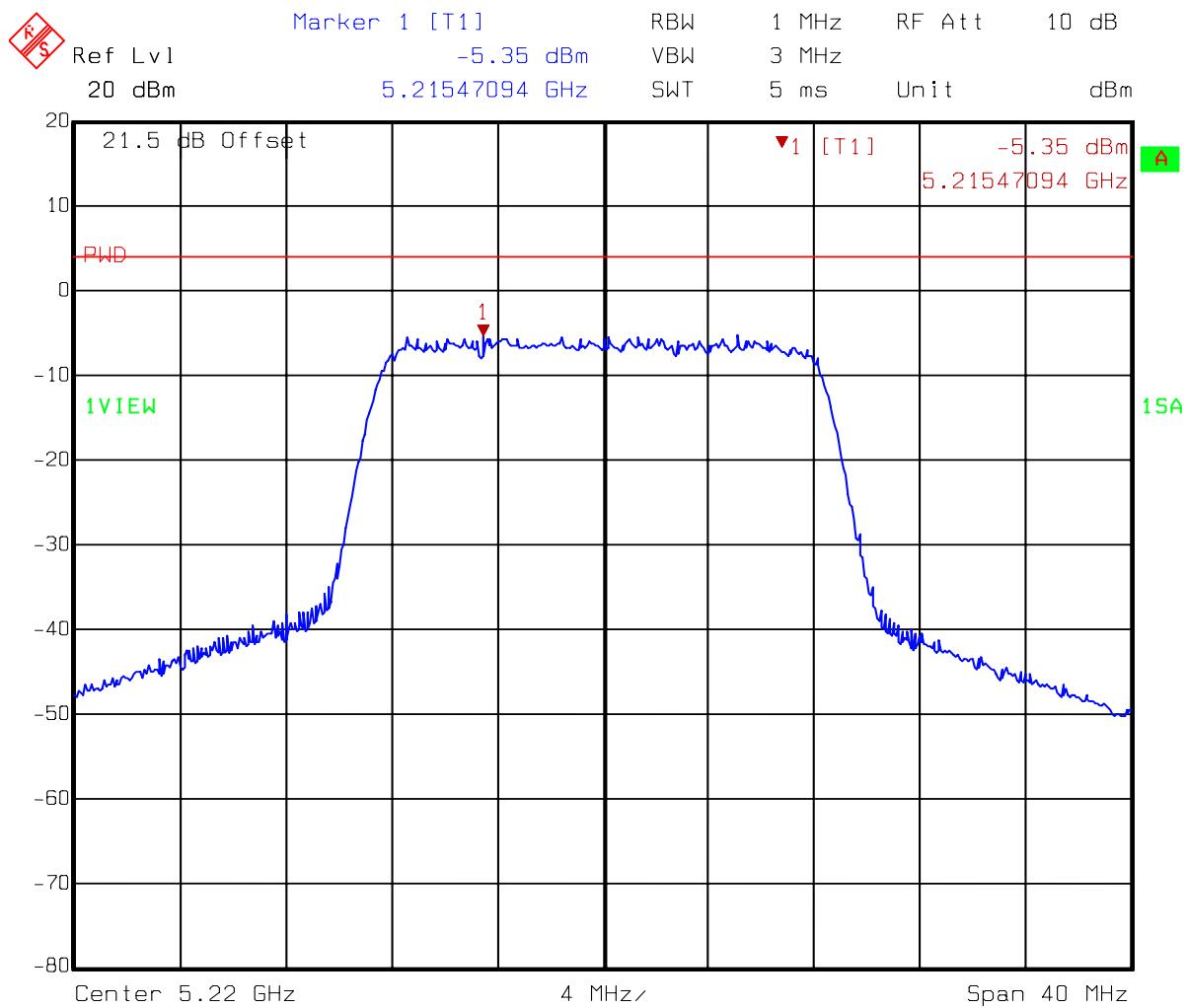
**For Frequency band ((5180MHz ~ 5240MHz, 5260MHz ~ 5320MHz) turbo mode**

Channel	Frequency (MHz)	Measured level (dBm)	Limit (dBm)
42	5210	-5.81	4
50	5250	-5.86	11
58	5290	-7.22	11

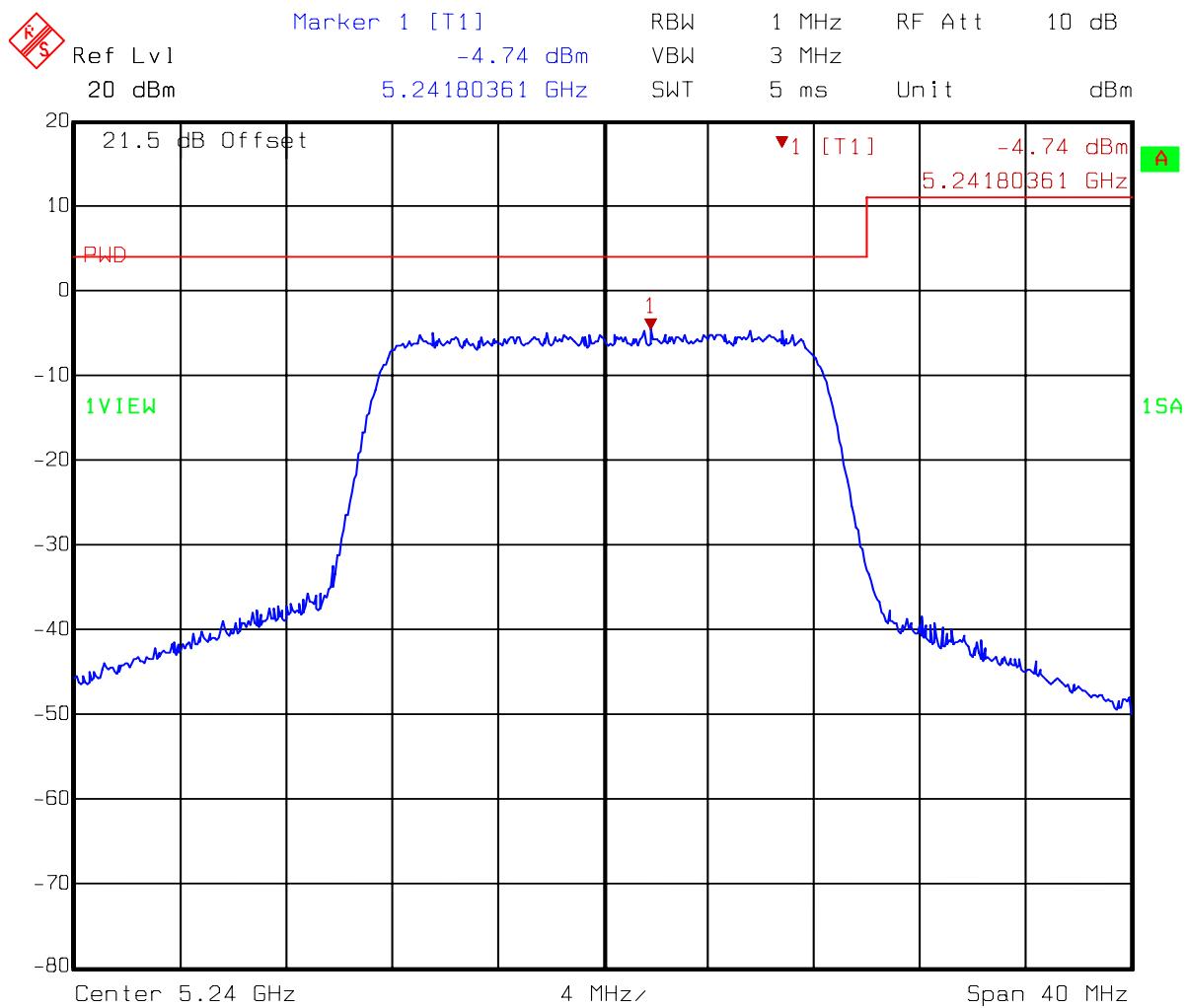
Please see the plot below.

**For Frequency band (5180MHz ~ 5240MHz)**


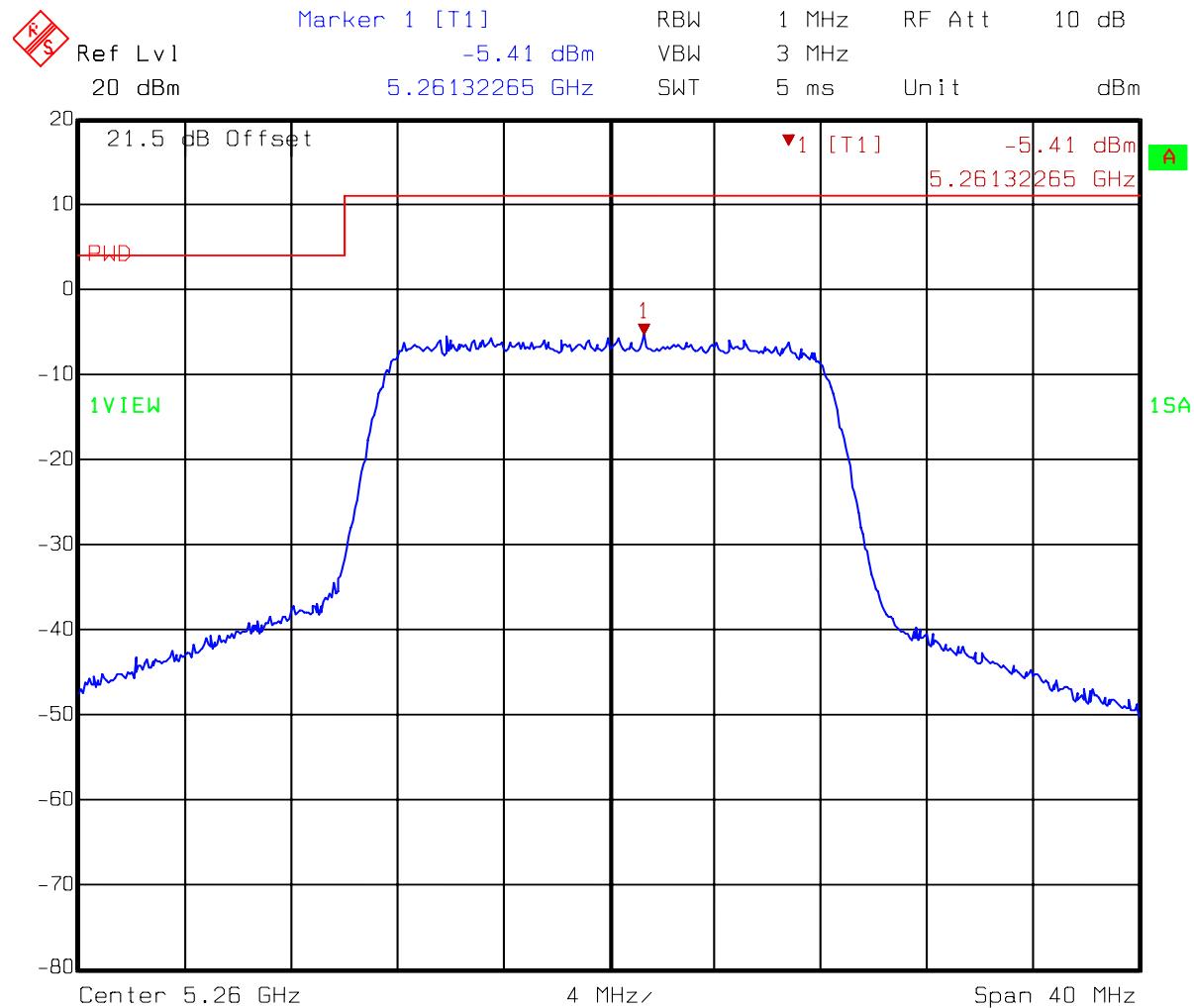
Title: Power Density  
 Comment A: 5180MHz at 802.11a mode  
 Date: 29.MAY 2006 15:12:07



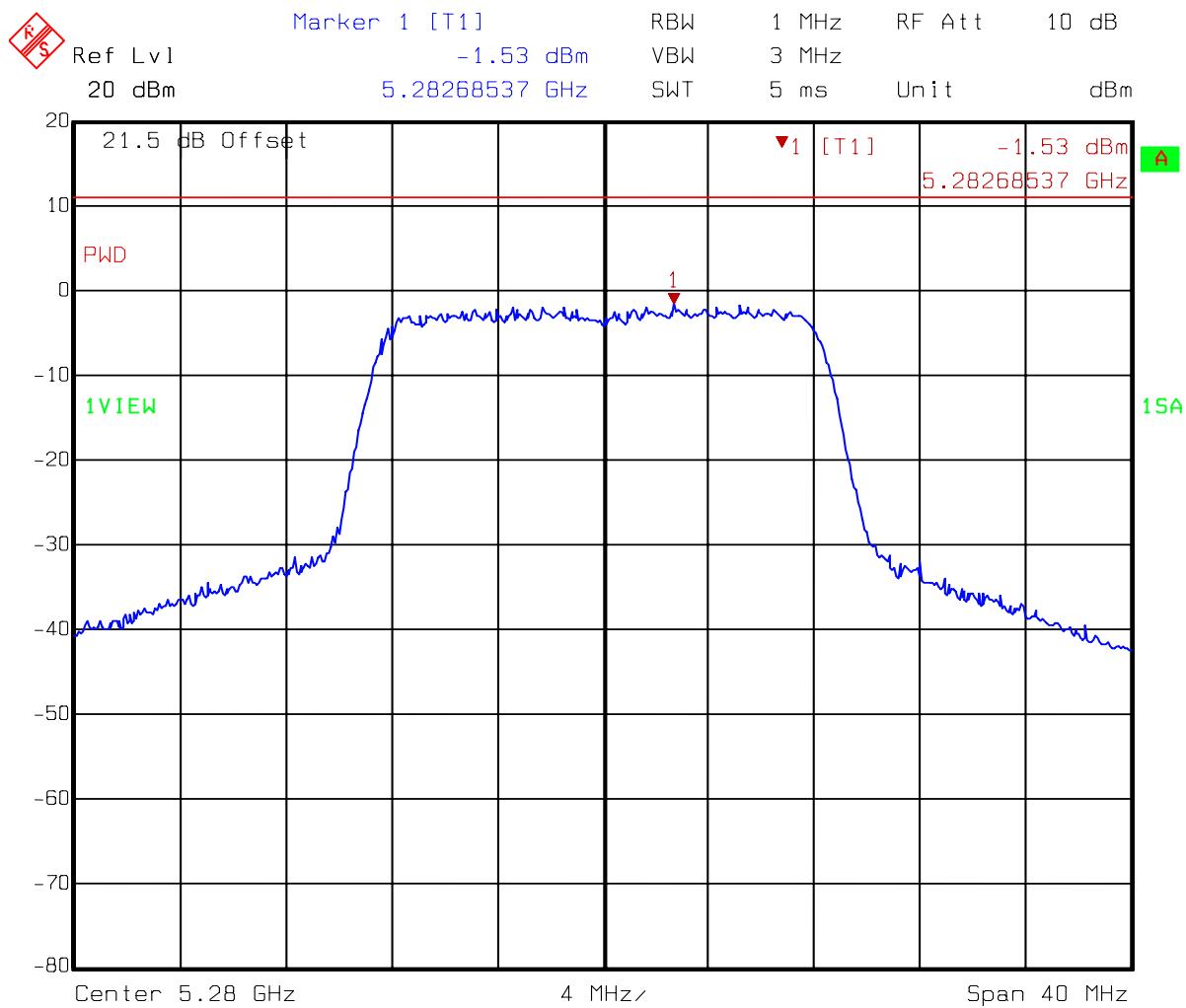
**Title:** Power Density  
**Comment A:** 5220MHz at 802.11a mode  
**Date:** 29.MAY 2006 15:13:32



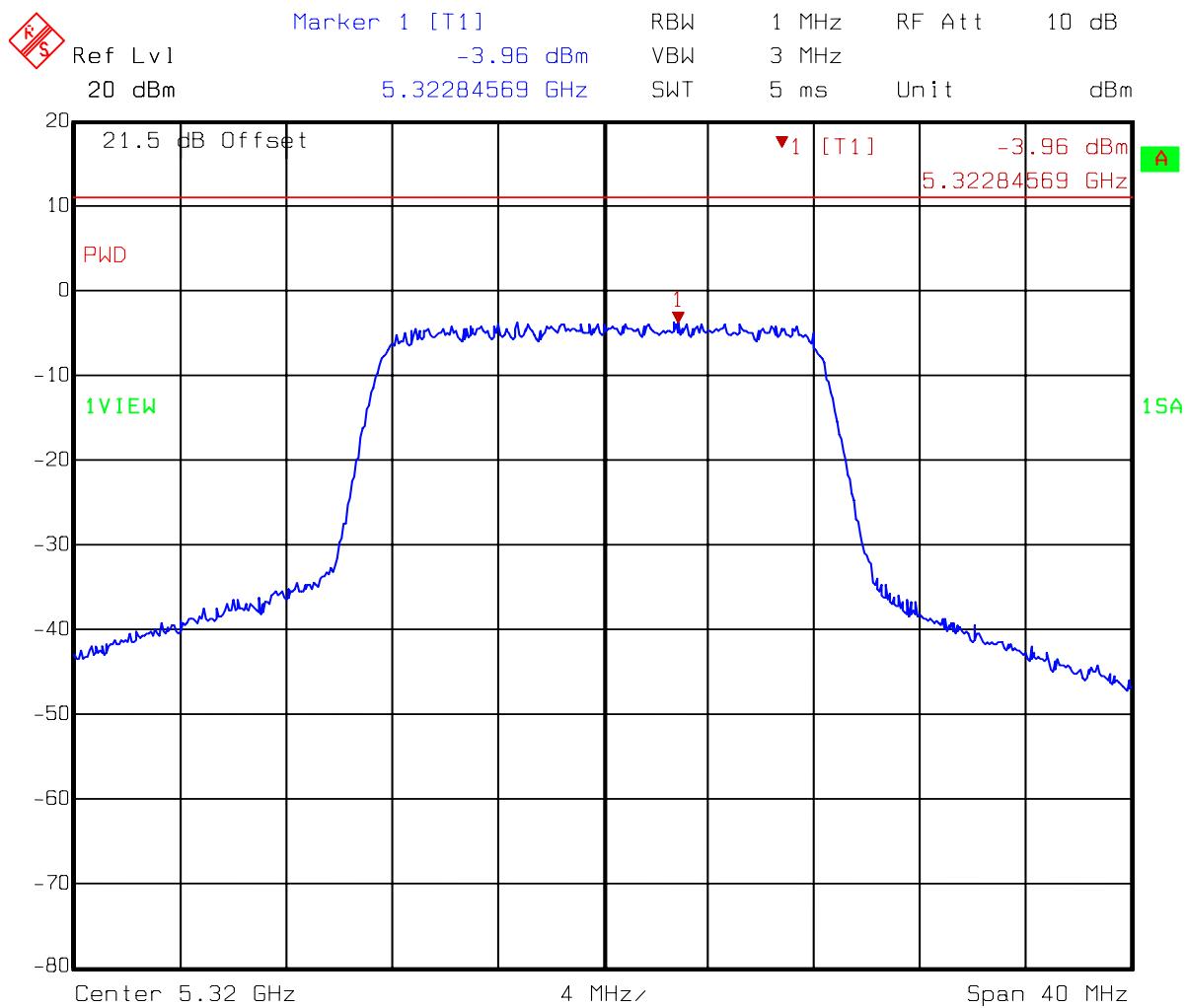
**Title:** Power Density  
**Comment A:** 5240MHz at 802.11a mode  
**Date:** 29.MAY 2006 15:15:06

**For Frequency band (5260MHz ~ 5320MHz)**


Title: Power Density  
 Comment A: 5260MHz at 802.11a mode  
 Date: 29.MAY 2006 15:17:02

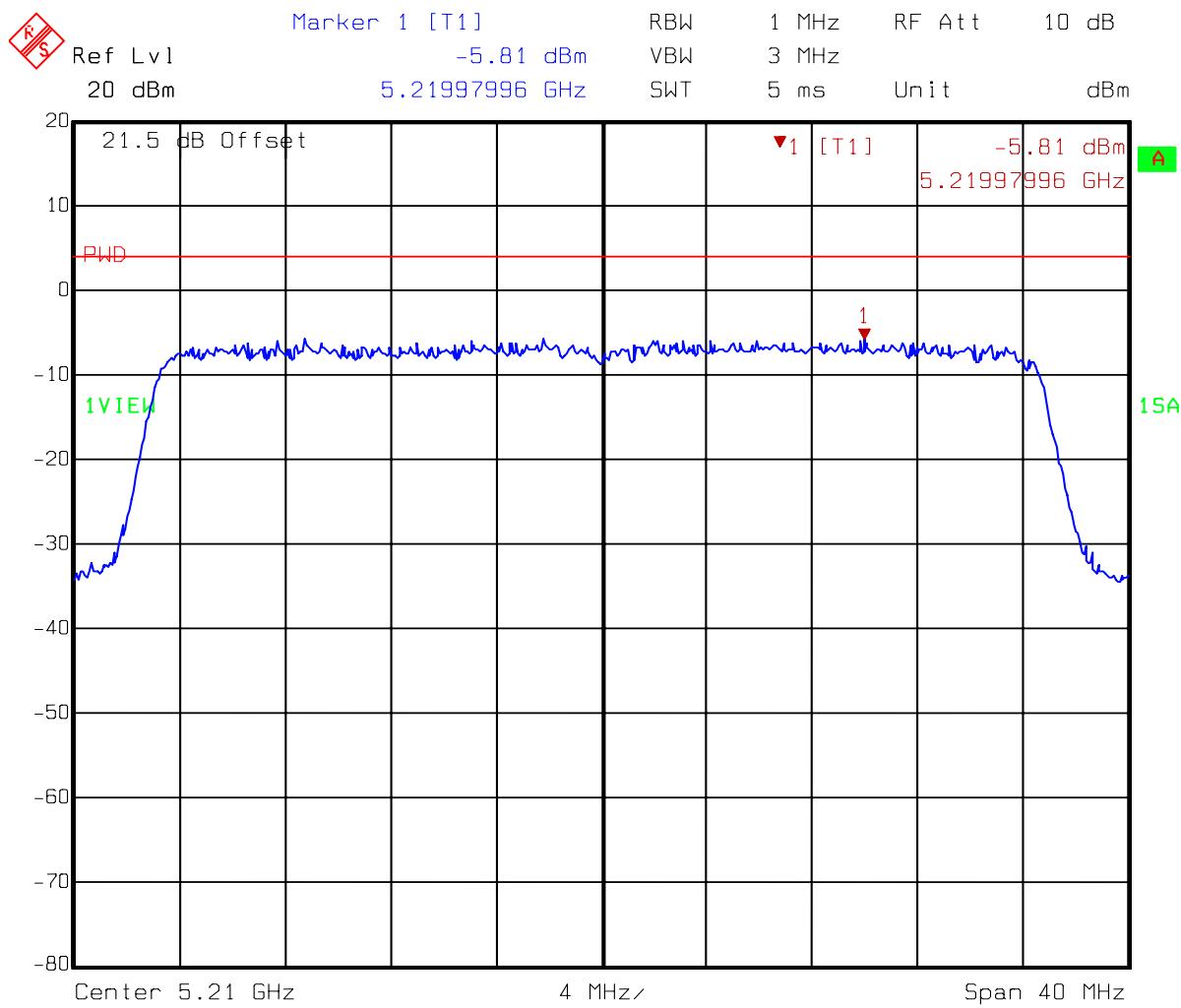


Title: Power Density  
 Comment A: 5280MHz at 802.11a mode  
 Date: 29.MAY 2006 15:18:46



Title: Power Density  
 Comment A: 5320MHz at 802.11a mode  
 Date: 29.MAY 2006 15:20:38

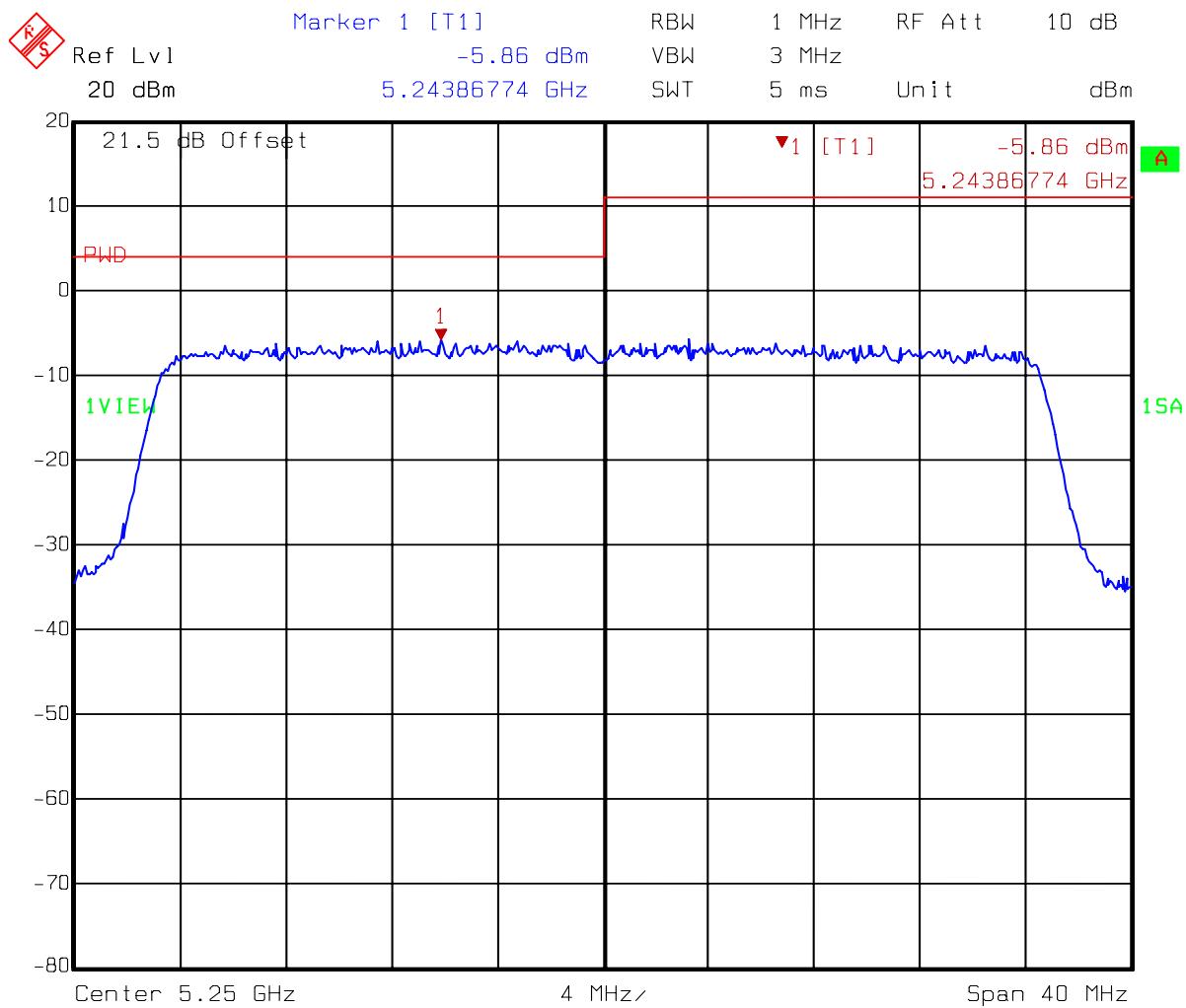
## Turbo mode



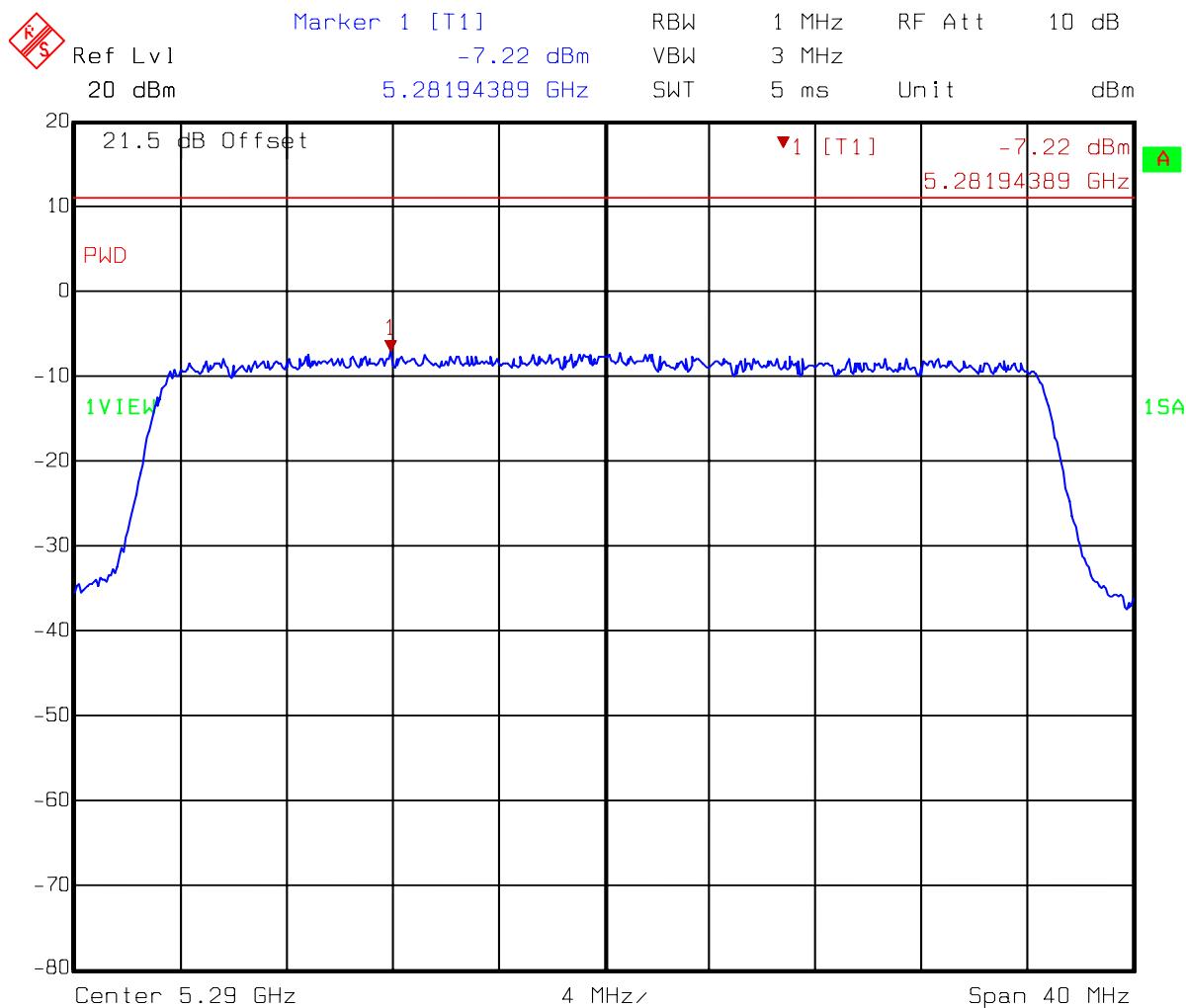
Title: Power Density

Comment A: 5210MHz at 802.11a mode (Turbo Mode)

Date: 29.MAY 2006 15:35:03



**Title:** Power Density  
**Comment A:** 5250MHz at 802.11a mode (Turbo Mode)  
**Date:** 29.MAY 2006 15:36:41



**Title:** Power Density  
**Comment A:** 5290MHz at 802.11a mode (Turbo Mode)  
**Date:** 29.MAY 2006 15:38:11

**11. Peak excursion to average ratio test (FCC 15.407)****11.1 Operating environment**

Temperature: 25  
Relative Humidity: 50 %  
Atmospheric Pressure: 1023 hPa

**11.2 Test setup & procedure**

The power spectrum density per FCC §15.407(a)(6) was measured from the antenna port of the EUT. Using a 50ohm spectrum analyzer with the RBW=VBW=10MHz for peak measurement and RBW=1MHz, VBW=30kHz for average measurement. Peak excursion to average ratio was read directly.

**Limit**

Operating Frequency (MHz)	Peak excursion to average ratio limit
5150~5250	<13dB
5250~5350, 5470~5725	<13dB
5725~5825	<13dB

**11.3 Measured data of Peak excursion to average ratio test results****For Frequency band (5180MHz ~ 5240MHz) Normal mode**

Channel	Frequency (MHz)	Measured peak excursion (dB)	Limit (dB)
36	5180	9.62	13
40	5200	9.43	13
48	5240	9.63	13

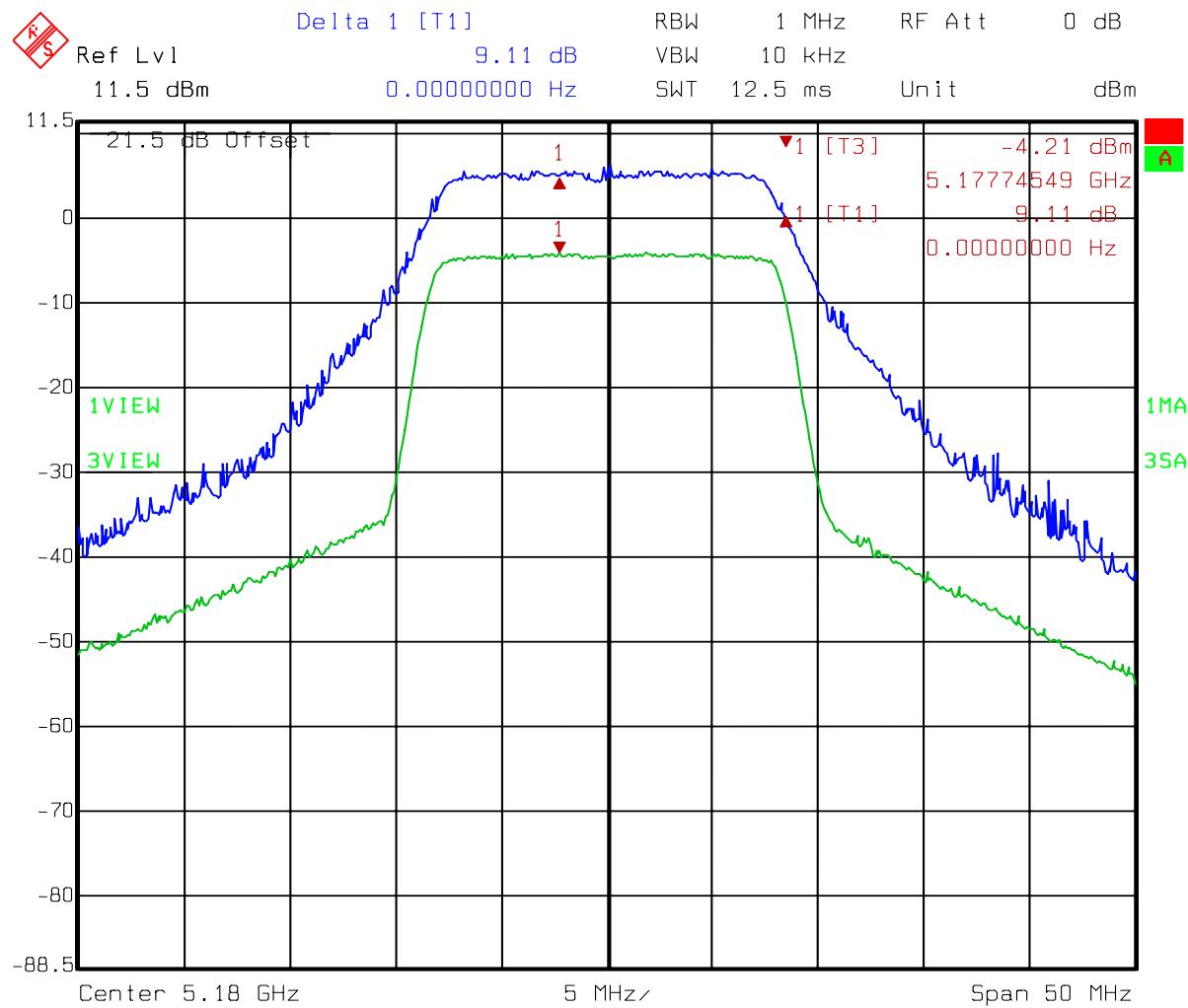
**For Frequency band (5260MHz ~ 5320MHz) Normal mode**

Channel	Frequency (MHz)	Measured peak excursion (dB)	Limit (dB)
52	5260	9.28	13
60	5300	9.38	13
64	5320	9.49	13

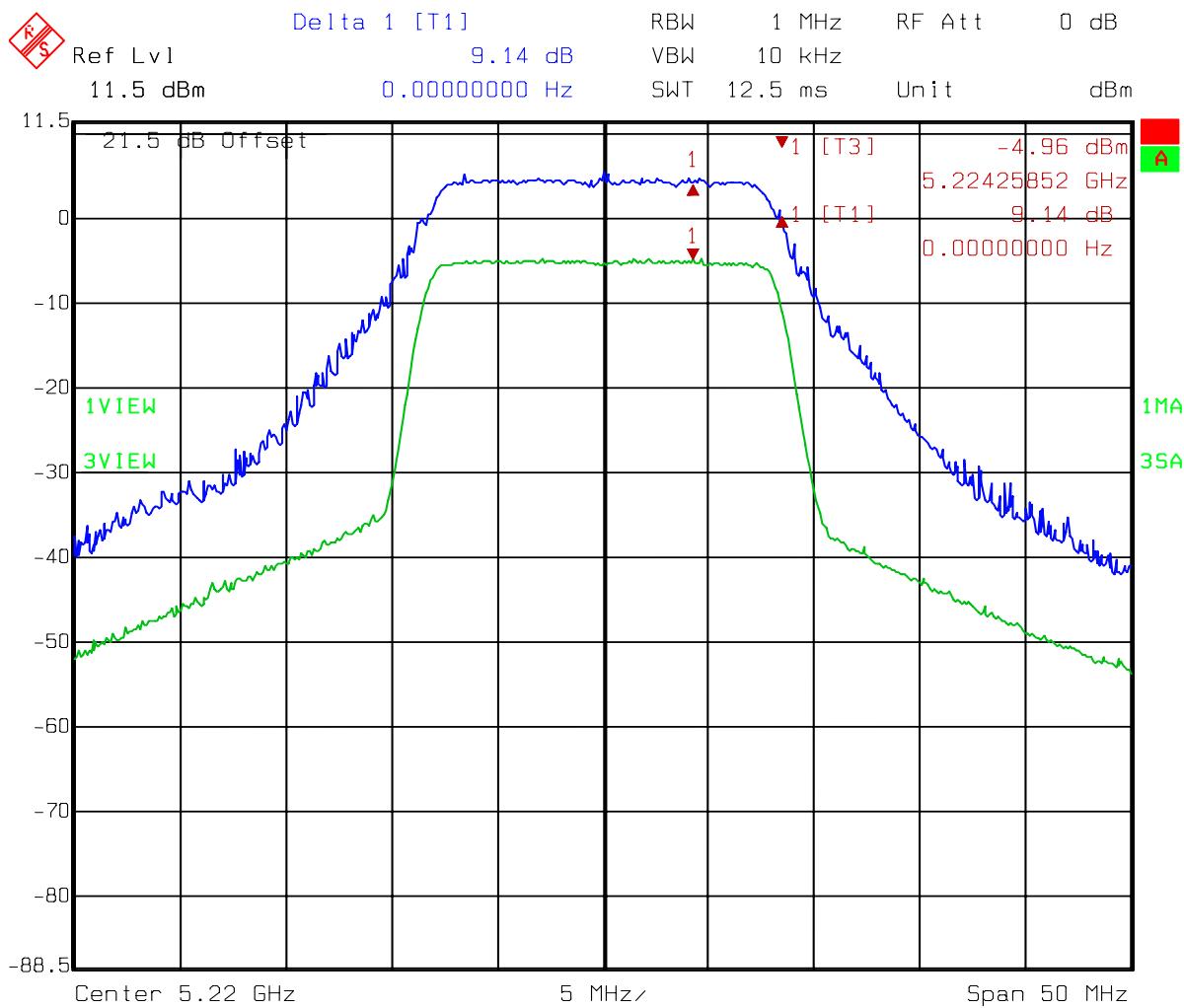
**For Frequency band ((5180MHz ~ 5240MHz, 5260MHz ~ 5320MHz) Turbo mode**

Channel	Frequency (MHz)	Measured peak excursion (dB)	Limit (dB)
42	5210	8.12	13
50	5250	9.14	13
58	5290	6.44	13

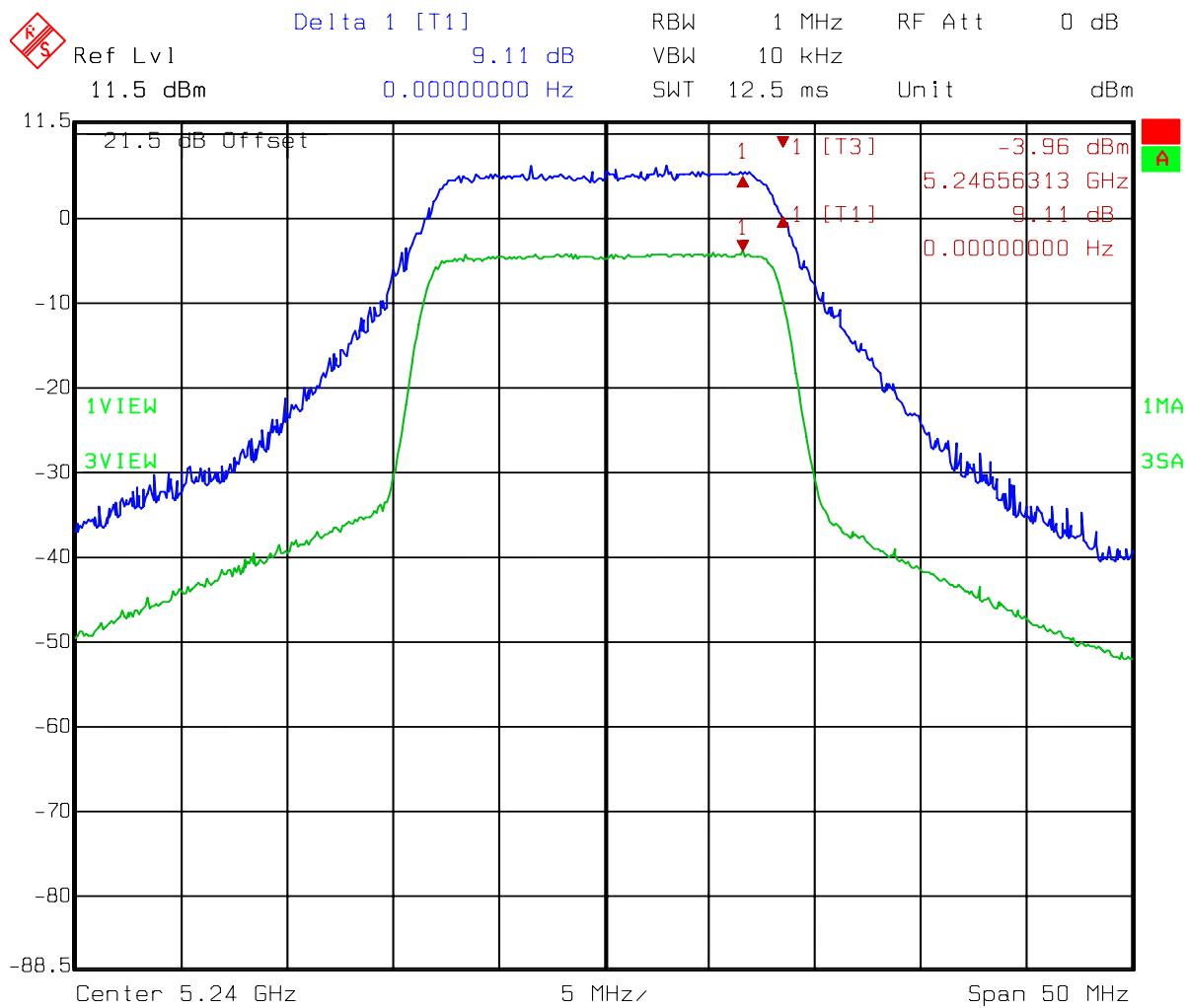
Please see the plot below.

**For Frequency band (5180MHz ~ 5240MHz)**


Title: Peak to Excursion Avg. rate  
 Comment A: 5180MHz at 802.11a mode  
 Date: 29.MAY 2006 15:12:38

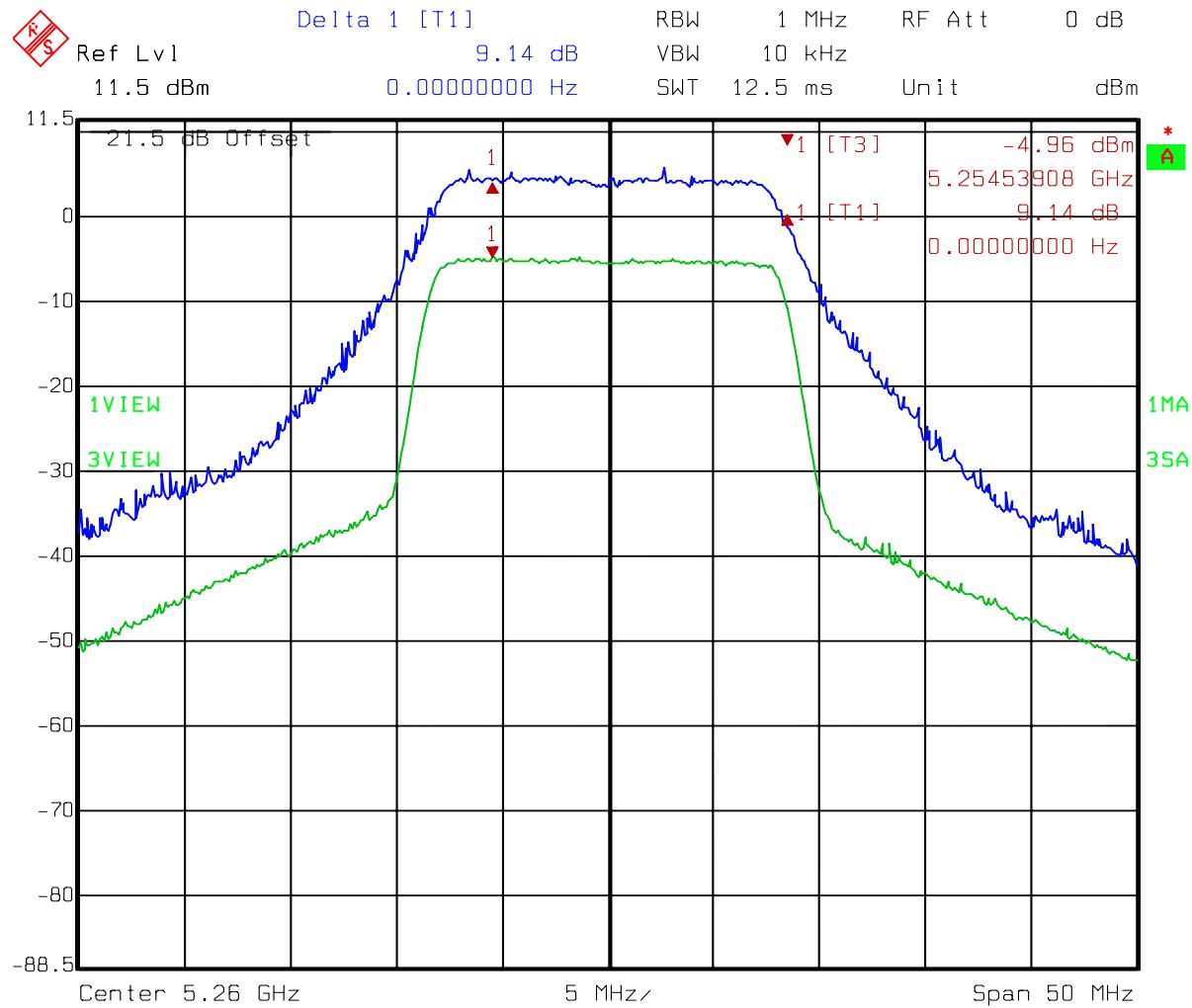


Title: Peak to Excursion Avg. rate  
 Comment A: 5220MHz at 802.11a mode  
 Date: 29.MAY 2006 15:14:03

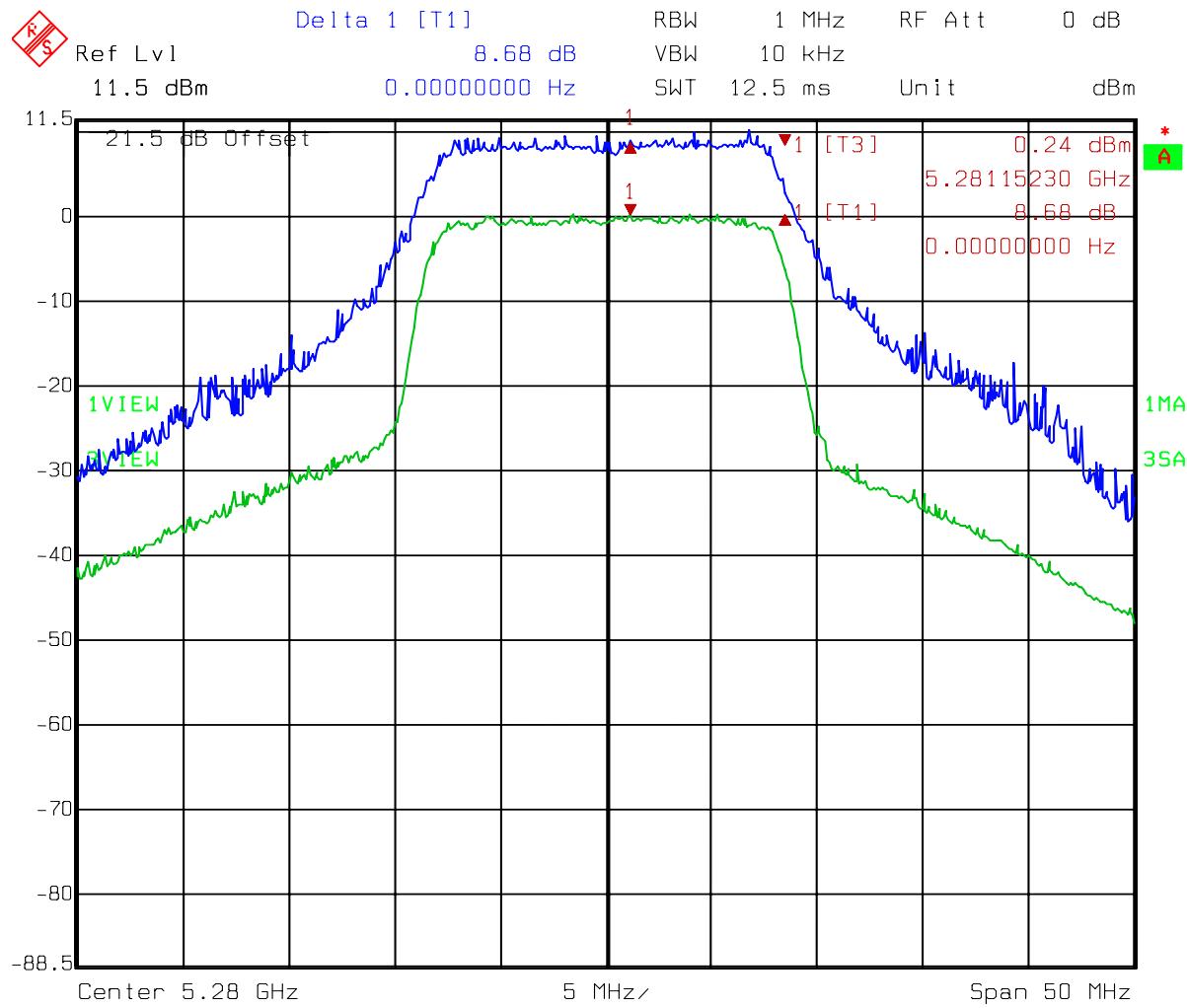


Title: Peak to Excursion Avg. rate  
 Comment A: 5240MHz at 802.11a mode  
 Date: 29.MAY 2006 15:15:36

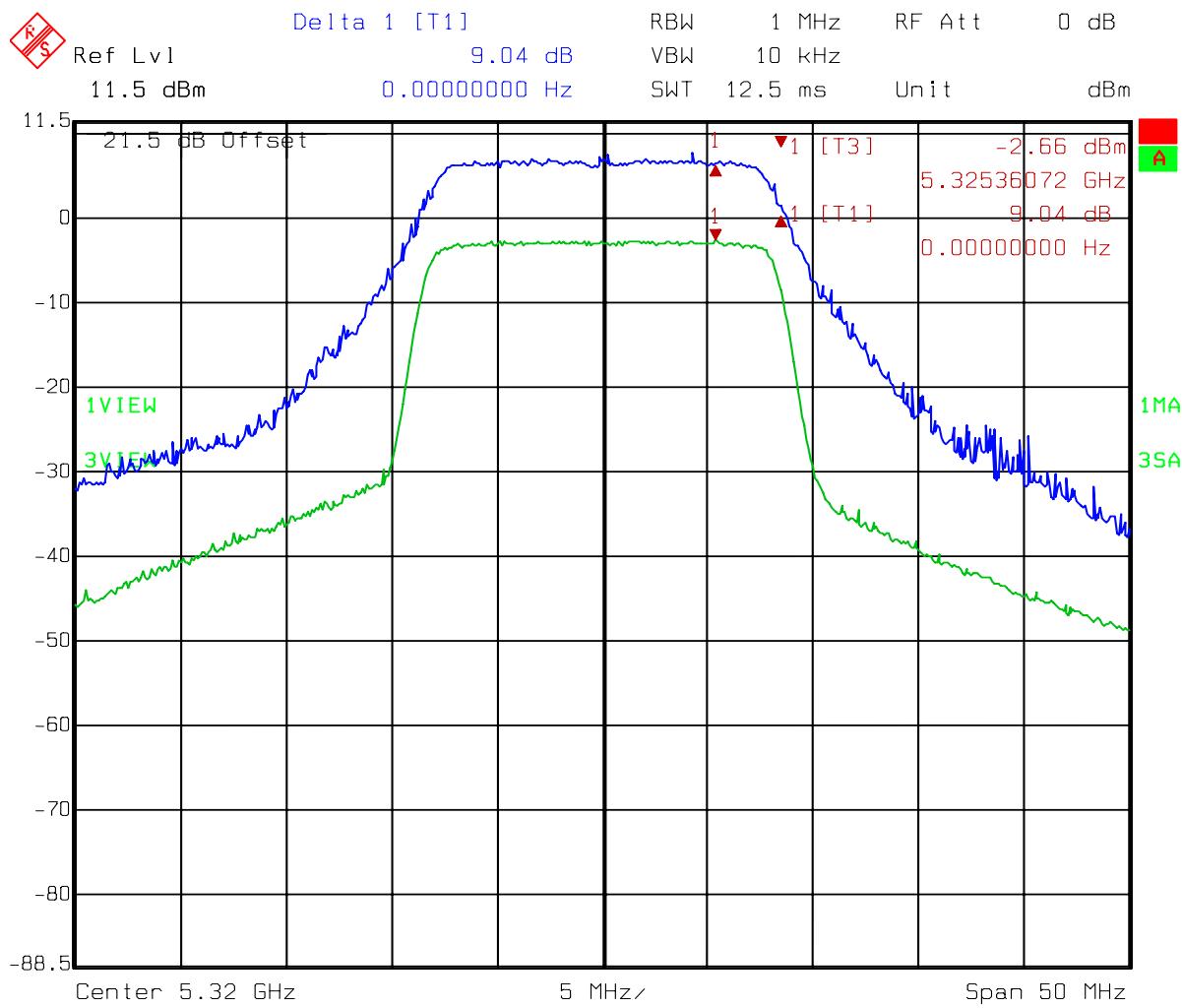
### For Frequency band (5260MHz ~ 5320MHz)



Title: Peak to Excursion Avg. rate  
Comment A: 5260MHz at 802.11a mode  
Date: 29.MAY 2006 15:17:32

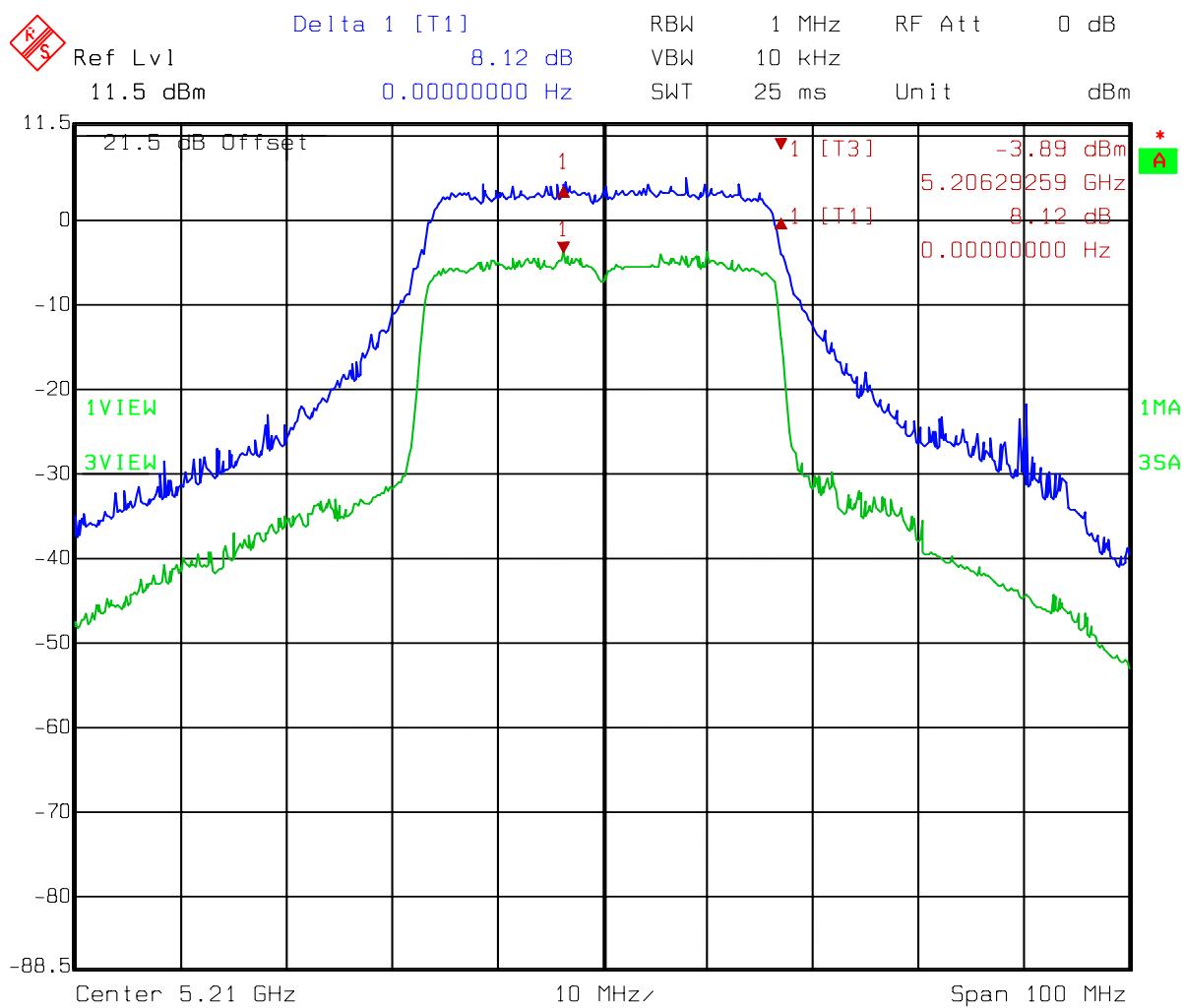


Title: Peak to Excursion Avg. rate  
 Comment A: 5280MHz at 802.11a mode  
 Date: 29.MAY 2006 15:19:17

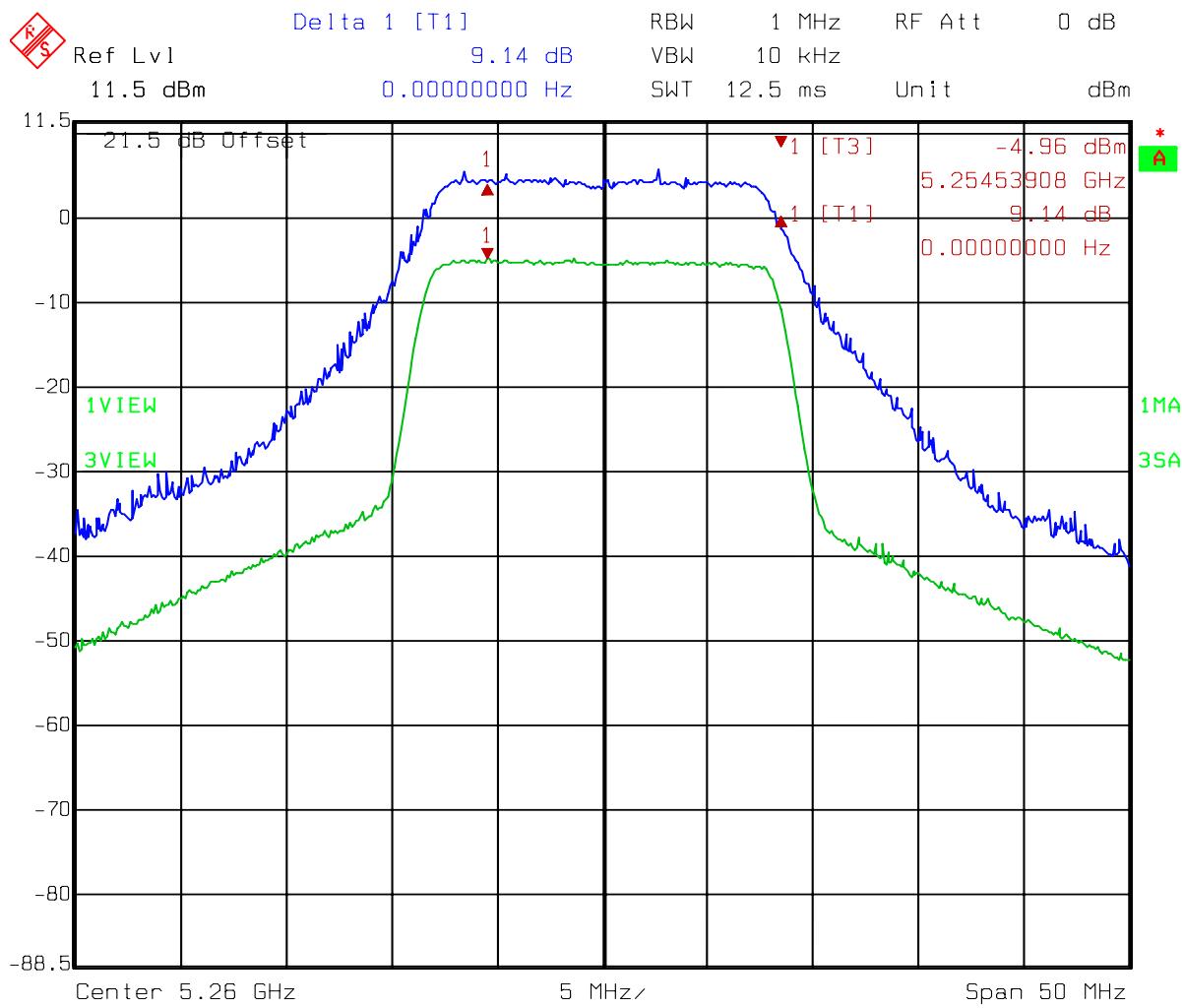


Title: Peak to Excursion Avg. rate  
 Comment A: 5320MHz at 802.11a mode  
 Date: 29.MAY 2006 15:21:09

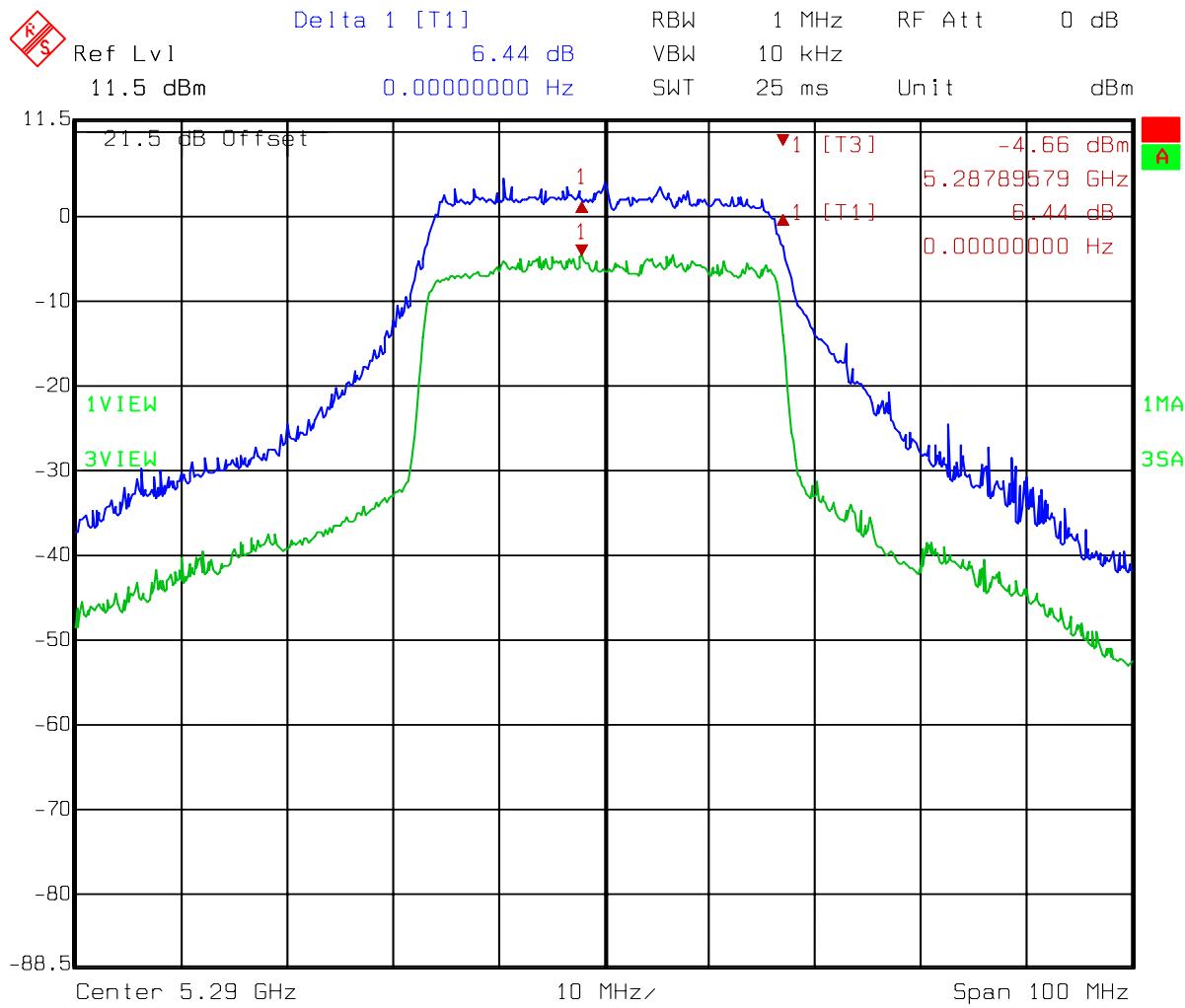
## Turbo mode



Title: Peak to Excursion Avg. rate  
 Comment A: 5210MHz at 802.11a mode (Turbo Mode)  
 Date: 29.MAY 2006 15:35:34



Title: Peak to Excursion Avg. rate  
 Comment A: 5260MHz at 802.11a mode  
 Date: 29.MAY 2006 15:17:32



Title: Peak to Excursion Avg. rate  
 Comment A: 5290MHz at 802.11a mode (Turbo Mode)  
 Date: 29.MAY 2006 15:38:42

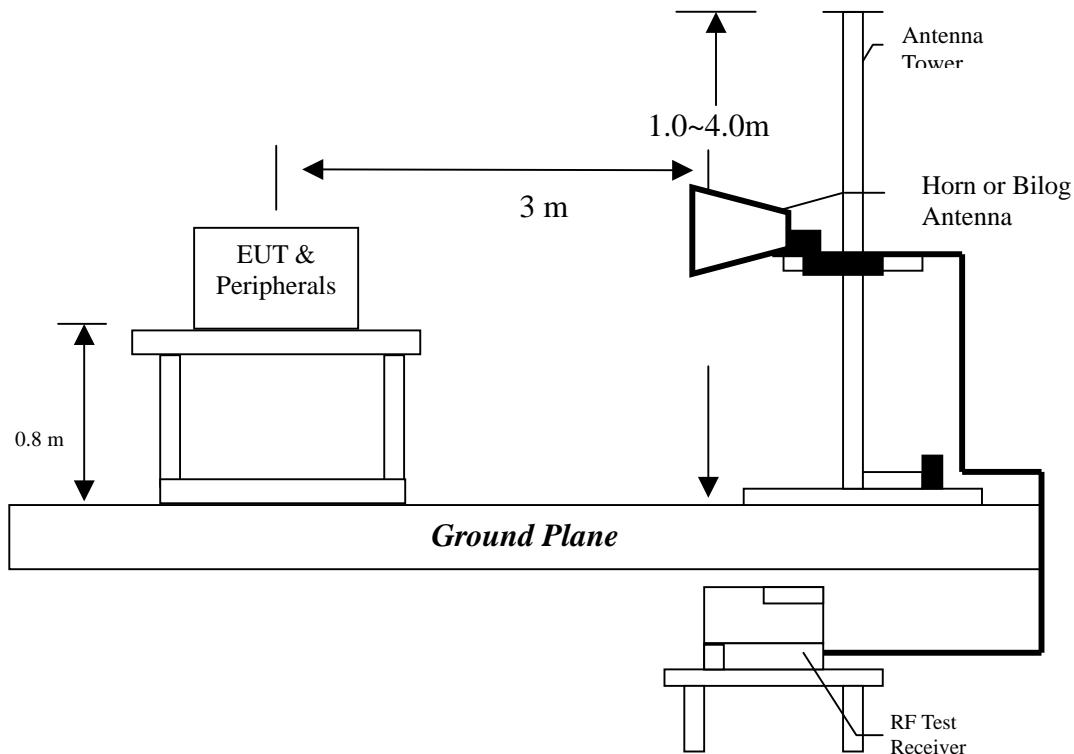
## 12. Radiated Emission test (FCC 15.205 & 15.209)

### 12.1 Operating environment

Temperature: 23  
Relative Humidity: 58 %  
Atmospheric Pressure 1023 hPa

### 12.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emission measurements were performed from 30MHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

### **12.3 Emission limits**

The spurious Emission shall test through the 10th harmonic. 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).

Frequency (MHz)	Limits (dB $\mu$ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty ( $k=2$ ) of radiated emission measurement is  $\pm 3.078$  dB.

Expanded uncertainty ( $k=2$ ) of conducted emission measurement is  $\pm 2.02$  dB.

**12.4 Radiated spurious emission test data****12.4.1 Measurement results: frequencies equal to or less than 1 GHz**

The test was performed on EUT under 802.11a continuously transmitting mode. Channel 36, 40, 44, 48, 52, 56, 60 and 64 were verified. The worst case occurred at 802.11a Tx channel 56.

EUT : SSG 20  
Worst Case : 802.11a Tx at channel 56

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	91.110	QP	7.38	18.17	25.55	43.50	-7.83
V	198.780	QP	12.00	10.94	22.94	43.50	-11.73
V	299.660	QP	13.95	12.80	26.74	46.00	-13.92
V	364.650	QP	15.06	11.47	26.53	46.00	-14.88
V	495.600	QP	18.43	5.84	24.27	46.00	-18.07
V	630.430	QP	21.53	5.10	26.63	46.00	-21.44
H	132.820	QP	12.32	10.64	22.95	43.50	-12.55
H	232.730	QP	11.74	12.62	24.37	46.00	-10.87
H	299.660	QP	14.17	14.66	28.83	46.00	-13.21
H	331.670	QP	14.40	11.63	26.03	46.00	-14.19
H	365.620	QP	15.48	19.37	34.85	46.00	-15.03
H	872.930	QP	24.12	7.62	31.75	46.00	-23.59

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

**12.4.2 Measurement results: frequency above 1GHz**

The test was performed on EUT under 802.11a continuously transmitting mode. Channel 36, 40, 44, 48, 52, 56, 60 and 64 were verified. The worst case occurred at 802.11a Tx channel 36.

EUT : SSG 20

Worst Case : 802.11a Tx at channel 36

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
10364.00	PK	V	33.72	48.15	44.00	58.43	74	-15.23
10364.00	AV	V	33.72	48.15	30.29	44.73	54	-14.33

**Remark:**

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 40GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

The noise floor are listedas below :

For PK:

1GHz-3GHz: 20dBuV  
3GHz-14GHz: 27dBuV  
14GHz-26.5GHz: 39dBuV  
26.5GHz-40GHz: 42dBuV

For AV:

1GHz-3GHz: 10dBuV  
3GHz-14GHz: 16dBuV  
14GHz-26.5GHz: 28dBuV  
26.5GHz-40GHz: 29dBuV

**13. Emission on the band edge §FCC 15.205**

The measurement was made to the average and peak field strength of the fundamental frequency. And the spurious emission in the restrict band must also comply with the FCC subpart C 15.209.

**13.1 Operating environment**

Temperature: 22  
Relative Humidity: 56 %  
Atmospheric Pressure 1023 hPa

**13.2 Test setup & procedure**

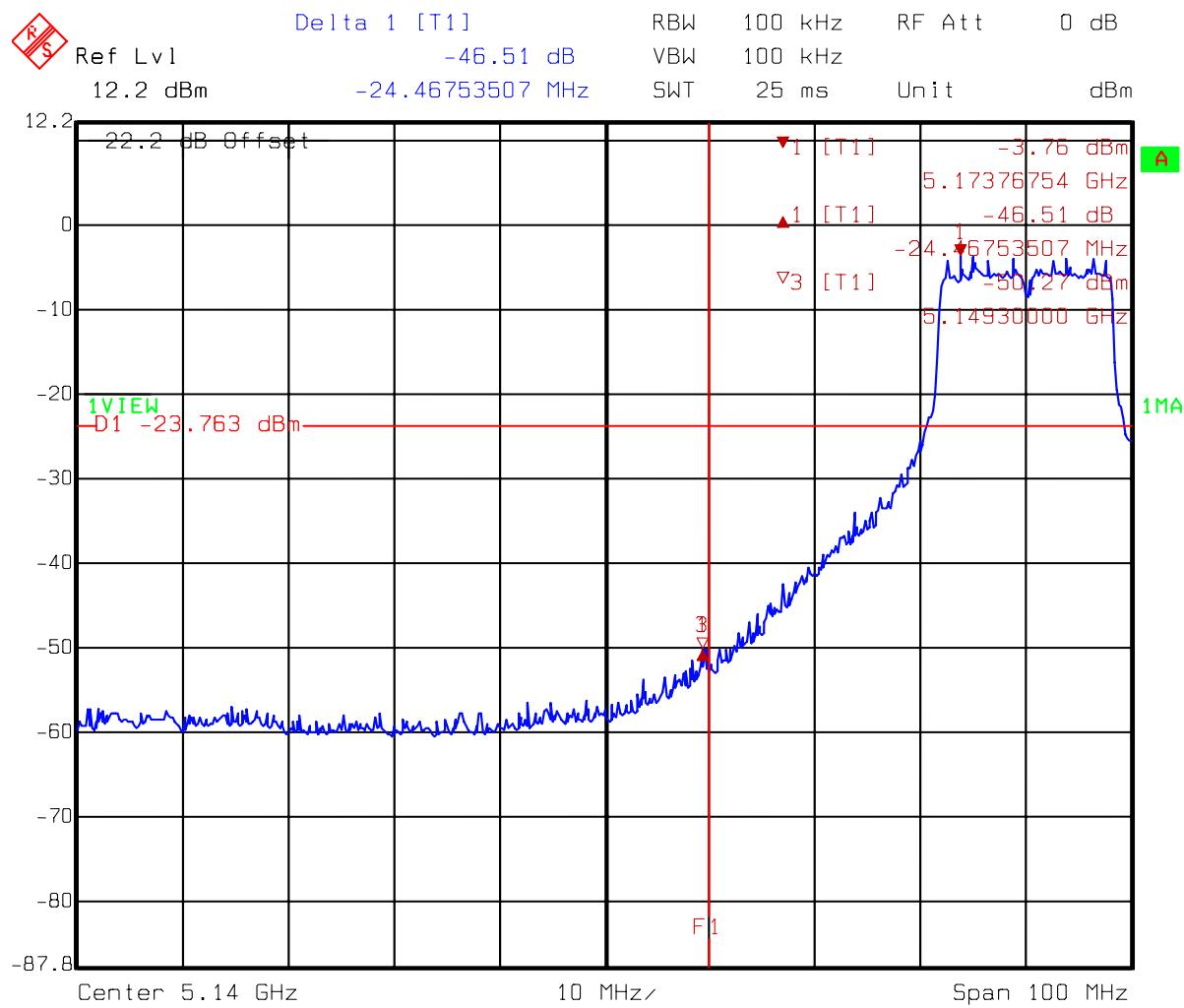
The output of EUT was connected to spectrum analyzer via a 50ohm cable.

The setting of spectrum analyzer is:

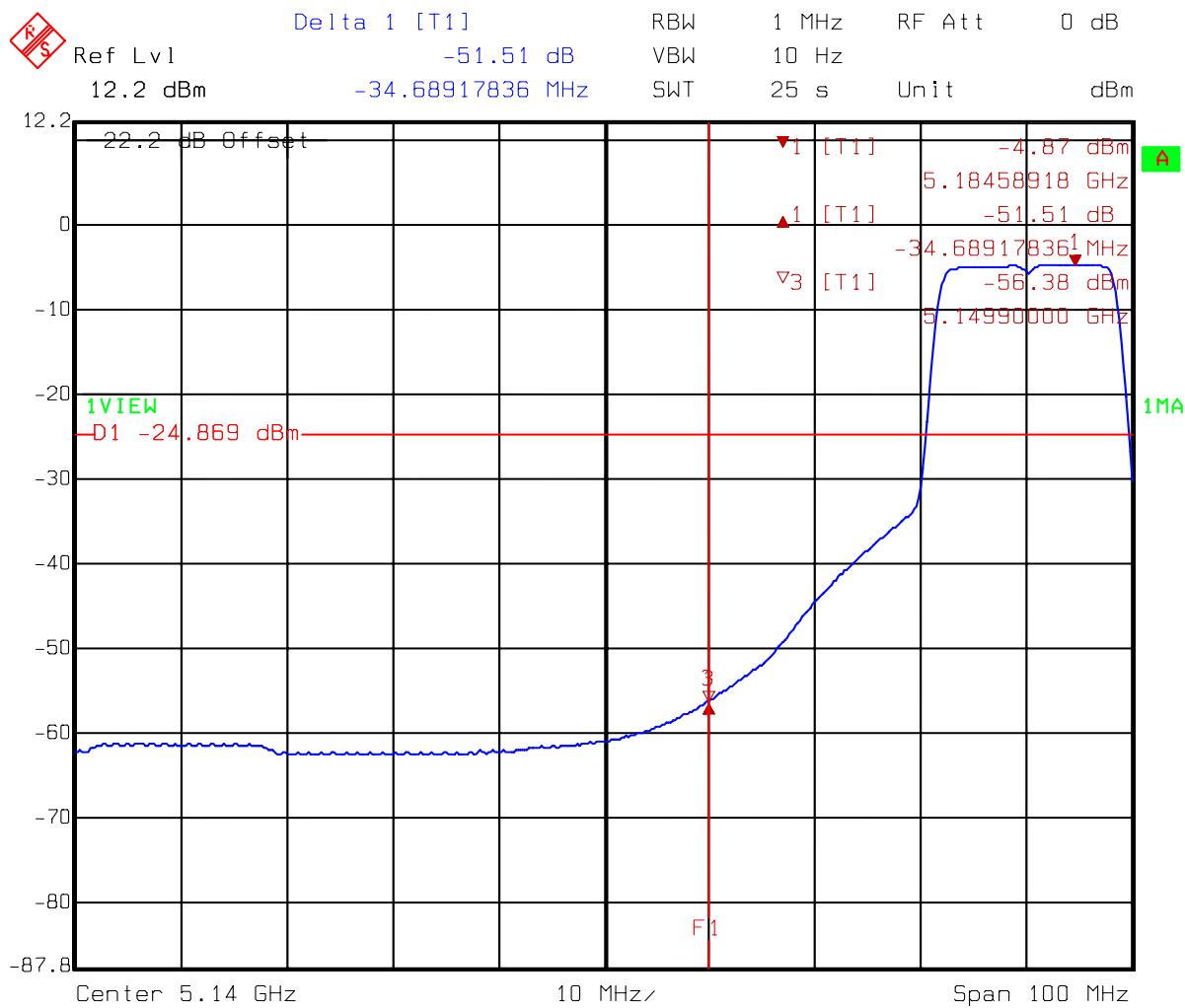
Peak: RBW = 100kHz ; VBW = 100kHz  
Average: RBW = 1MHz ; VBW = 10Hz

### 13.3 Test Result

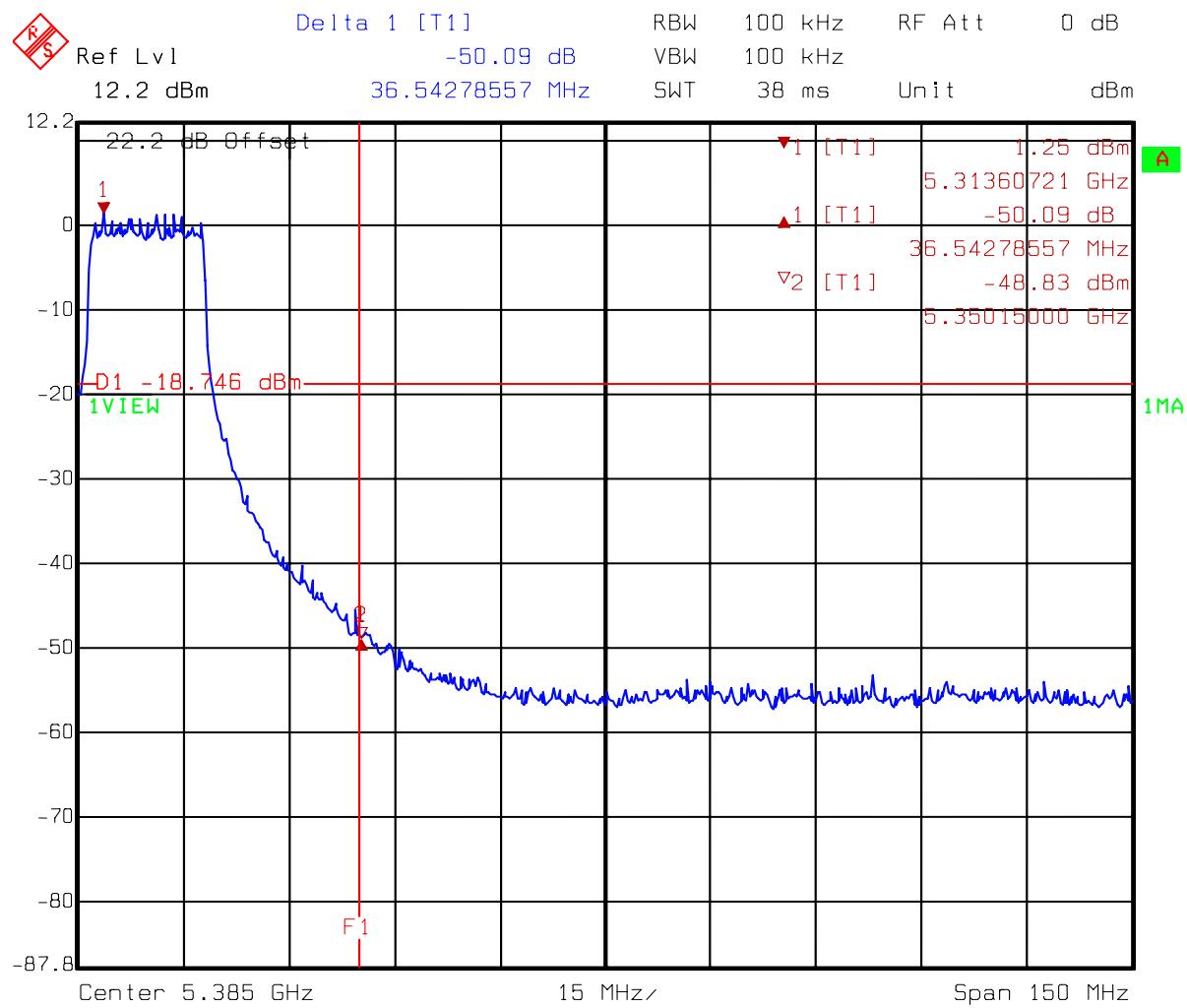
### 13.3.1 Conducted Method



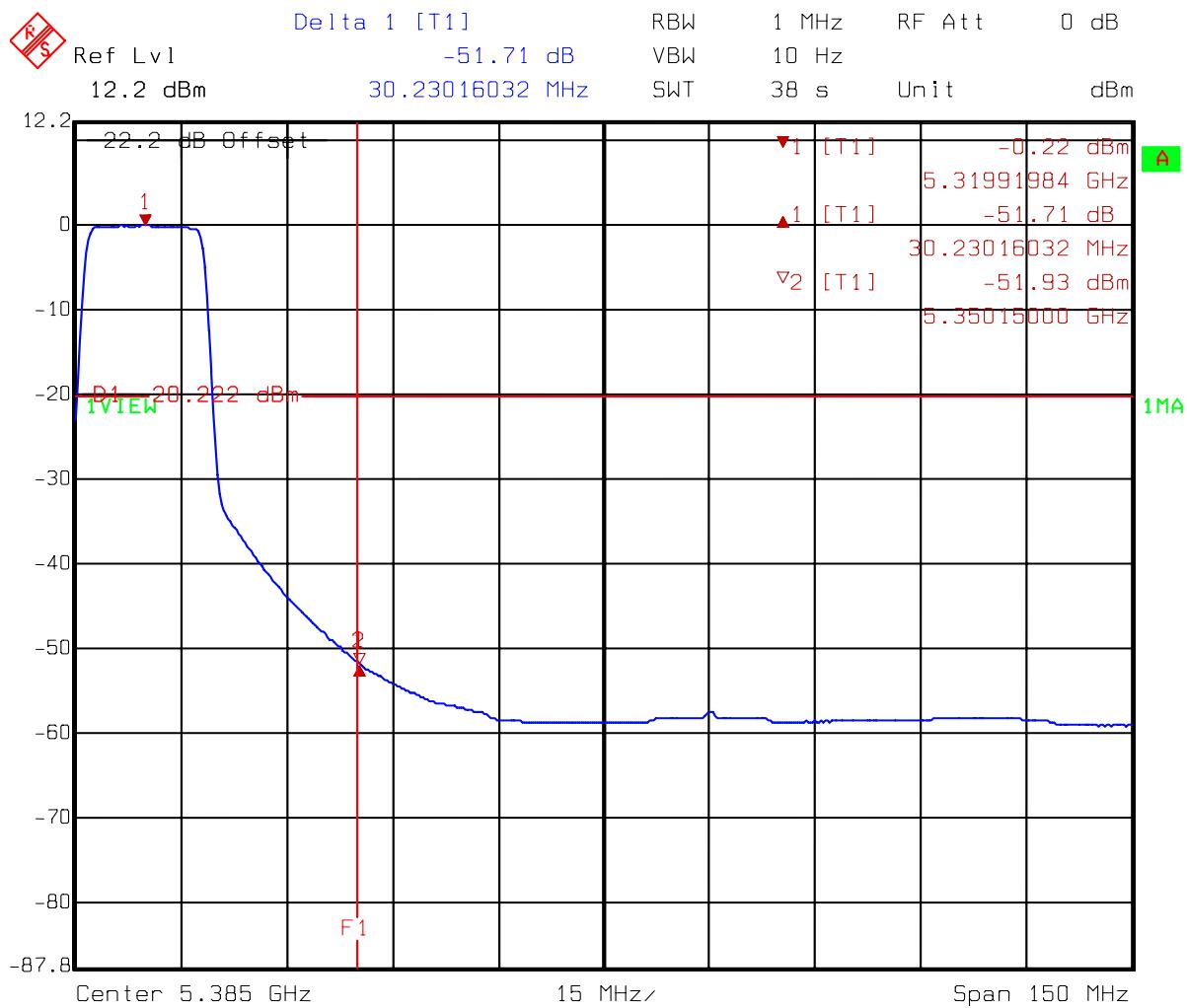
Title: Band Edge  
Comment A: Channel 036 at 802.11a mode  
F1=5150MHz (Peak Detect)  
Date: 15.MAY 2006 21:11:03



Title: Band Edge  
 Comment A: Channel 036 at 802.11a mode  
 F1=5150MHz (Average Detect)  
 Date: 15.MAY 2006 21:11:52



Title: Band Edge  
 Comment A: Channel 064 at 802.11a mode  
 F1=5350MHz (Peak Detect)  
 Date: 15.MAY 2006 21:01:31



Title: Band Edge  
 Comment A: Channel 064 at 802.11a mode  
 F1=5350MHz (Average Detect)  
 Date: 15.MAY 2006 21:02:34

### 13.3.2 Radiated Method

**Test Mode: 802.11a (OFDM Modulation) operating mode**

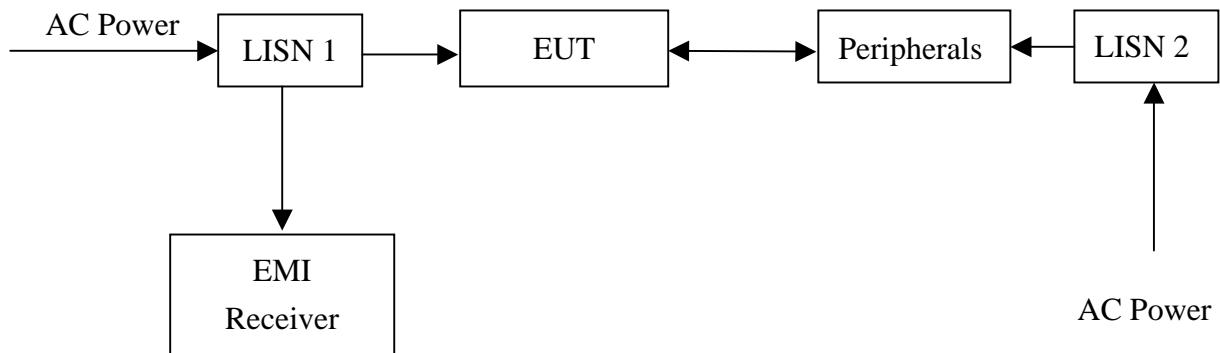
Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B			
36 (5180MHz)	PK	113.21	46.51	64.51	74	-9.49
	AV	101.83	51.51	49.96	54	-4.04
64 (5320MHz)	PK	115.16	50.09	61.85	74	-12.15
	AV	104.68	51.71	48.41	54	-5.59

Remark: 1. C = A - B

2. E = C - D

**14. Power Line Conducted Emission test §FCC 15.207****14.1 Operating environment**

Temperature: 23  
Relative Humidity: 58 %  
Atmospheric Pressure 1023 hPa

**14.2 Test setup & procedure**

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement. The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

**14.3 Emission limit**

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

\*Decreases with the logarithm of the frequency.

**14.4 Uncertainty of Conducted Emission**

Expanded uncertainty (k=2) of conducted emission measurement is  $\pm 2.6$  dB.

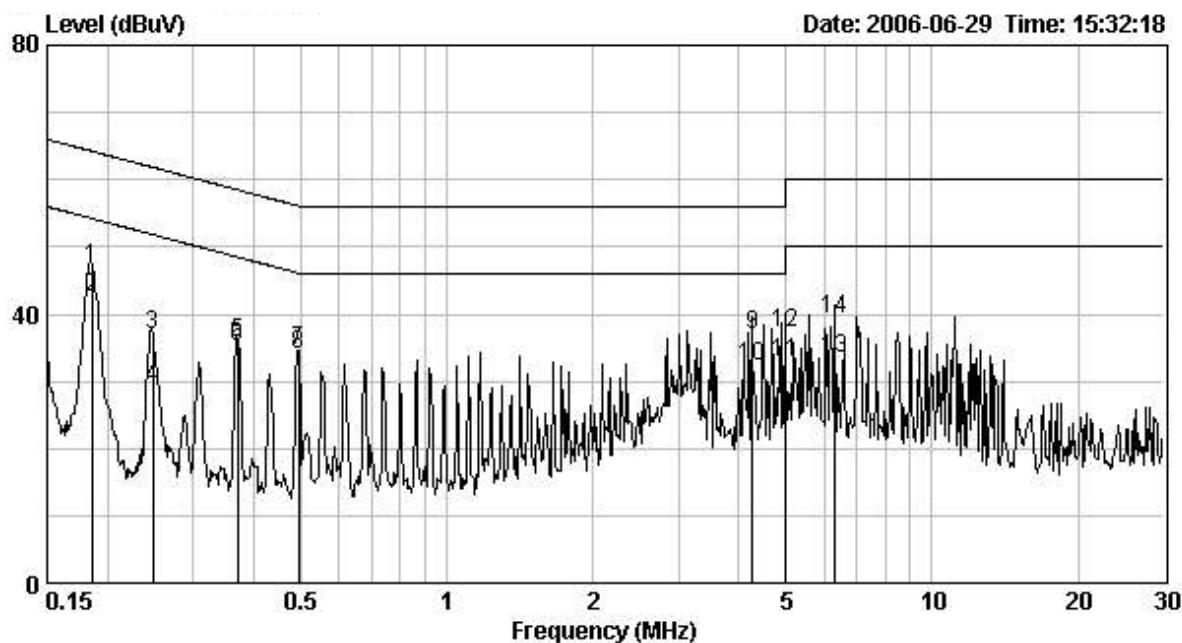
**14.5 Power Line Conducted Emission test data**

Phase: Line  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: T1+ADSL/ADSL2/ADSL2+  
With Adapter: Fairway, VAN40B-12B

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB)	
						Qp	AV
0.186	0.10	46.96	64.22	42.54	54.22	-17.26	-11.68
0.247	0.10	36.93	61.84	28.98	51.84	-24.91	-22.86
0.371	0.10	35.65	58.48	35.10	48.48	-22.83	-13.38
0.495	0.10	34.45	56.08	34.00	46.08	-21.63	-12.08
4.261	0.25	36.83	56.00	32.19	46.00	-19.17	-13.81
4.999	0.28	37.08	56.00	32.79	46.00	-18.92	-13.21
6.297	0.34	39.25	60.00	33.27	50.00	-20.75	-16.73

**Remark:**

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

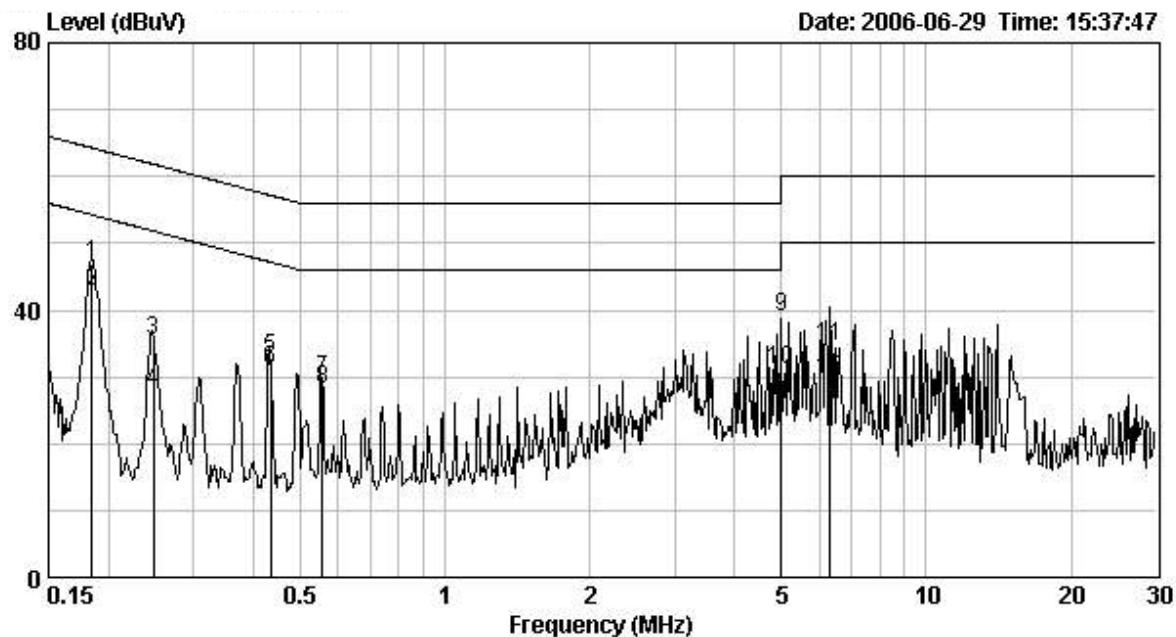


Phase: Neutral  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: T1+ADSL/ADSL2/ADSL2+  
With Adapter: Fairway, VAN40B-12B

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
0.185	0.10	46.86	64.26	42.85	54.26	-17.40	-11.41
0.248	0.10	35.51	61.82	27.95	51.82	-26.31	-23.87
0.433	0.10	32.85	57.19	31.13	47.19	-24.34	-16.06
0.556	0.10	29.52	56.00	28.11	46.00	-26.48	-17.89
5.000	0.25	39.01	60.00	30.99	50.00	-20.99	-19.01
6.296	0.26	34.54	60.00	29.48	50.00	-25.46	-20.52

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

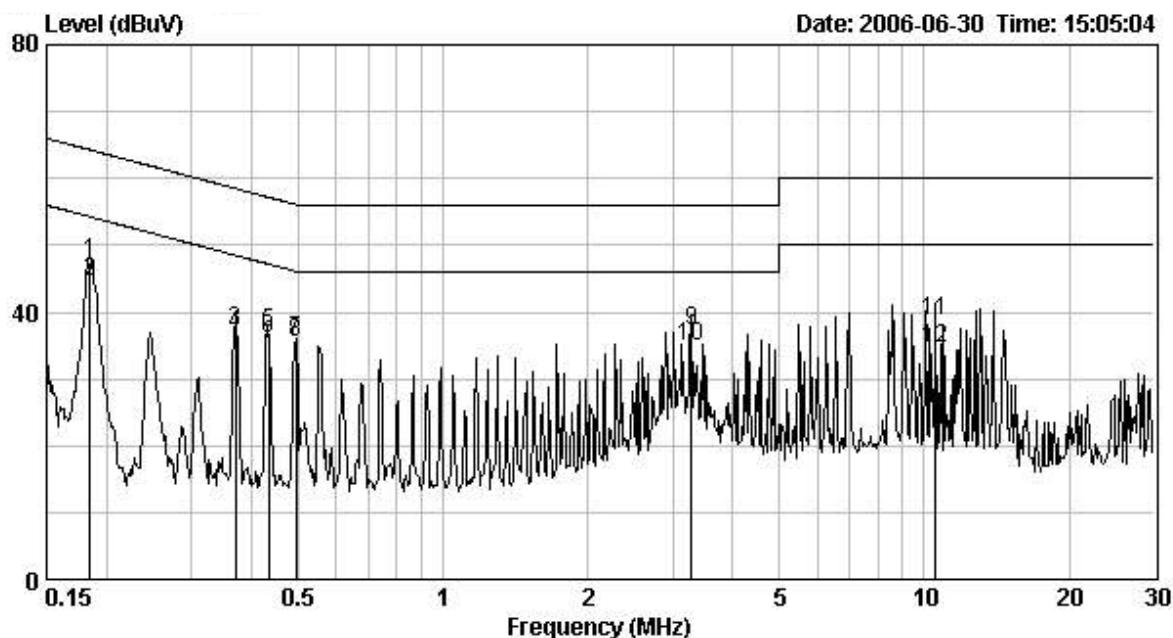


Phase: Line  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: V.92+ADSL/ADSL2/ADSL2+  
With Adapter: Fairway, VAN40B-12B

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
-----	-----	-----	-----	-----	-----	Qp	Av
0.185	0.10	47.61	64.28	44.62	54.28	-16.67	-9.66
0.371	0.10	37.23	58.48	36.58	48.48	-21.25	-11.90
0.433	0.10	36.93	57.19	36.03	47.19	-20.26	-11.16
0.495	0.10	35.69	56.09	35.43	46.09	-20.40	-10.66
3.276	0.19	37.31	56.00	34.73	46.00	-18.69	-11.27
10.568	0.54	38.81	60.00	34.44	50.00	-21.19	-15.56

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

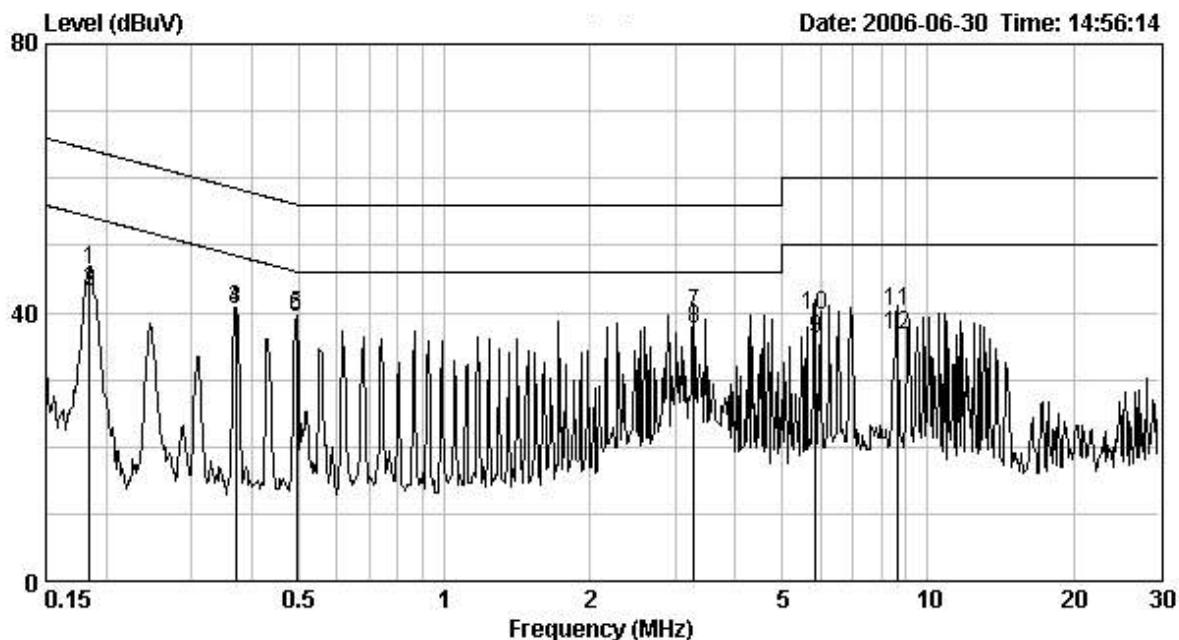


Phase: Neutral  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: V.92+ADSL/ADSL2/ADSL2+  
With Adapter: Fairway, VAN40B-12B

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
-----	-----	-----	-----	-----	-----	Qp	Av
0.185	0.10	46.21	64.28	43.01	54.28	-18.07	-11.27
0.371	0.10	40.49	58.48	40.50	48.48	-17.99	-7.98
0.495	0.10	39.53	56.08	39.29	46.08	-16.55	-6.79
3.276	0.19	39.91	56.00	37.41	46.00	-16.09	-8.59
5.874	0.26	39.67	60.00	36.13	50.00	-20.33	-13.87
8.656	0.29	40.04	60.00	36.50	50.00	-19.96	-13.50

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

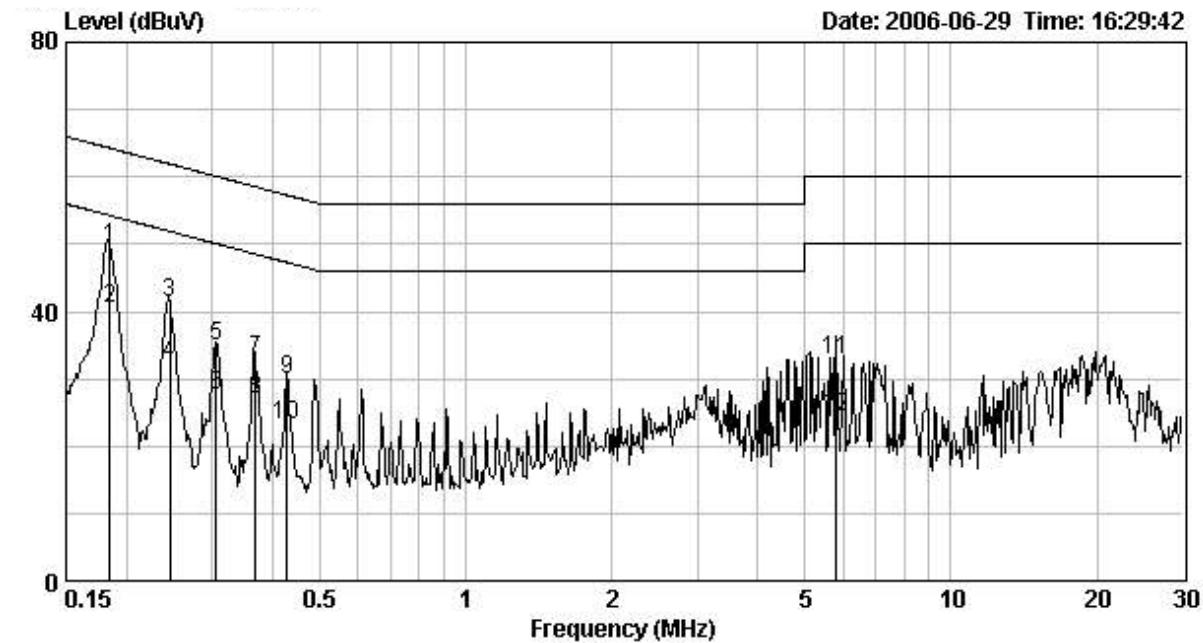


Phase: Line  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: T1+ADSL/ADSL2/ADSL2+  
With Adapter: LEI, NU40-2120333-I3

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
						Qp	Av
0.184	0.10	49.59	64.29	40.31	54.29	-14.70	-13.98
0.245	0.10	41.35	61.92	32.34	51.92	-20.57	-19.58
0.306	0.10	34.83	60.08	27.46	50.08	-25.25	-22.62
0.368	0.10	32.85	58.55	26.97	48.55	-25.70	-21.58
0.429	0.10	29.98	57.27	23.15	47.27	-27.29	-24.12
5.817	0.32	32.87	60.00	24.32	50.00	-27.13	-25.68

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

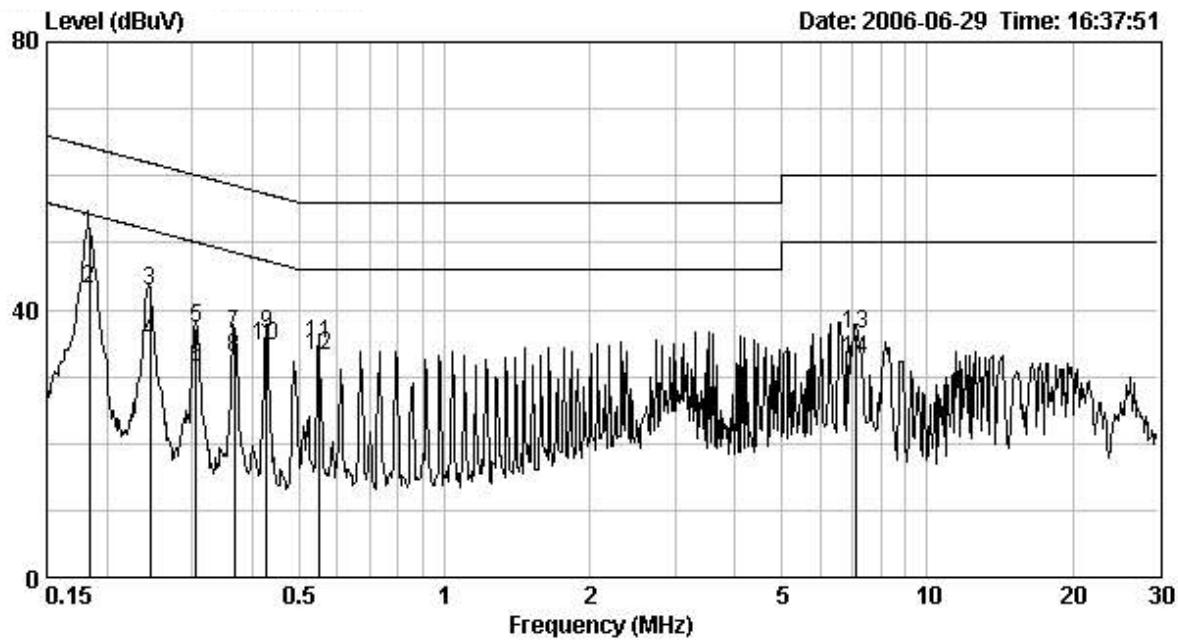


Phase: Neutral  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: T1+ADSL/ADSL2/ADSL2+  
With Adapter: LEI, NU40-2120333-I3

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB)	
-----	-----	-----	-----	-----	-----	Qp	Av
0.184	0.10	51.40	64.30	42.96	54.30	-12.90	-11.34
0.245	0.10	42.67	61.91	35.11	51.91	-19.24	-16.80
0.306	0.10	37.20	60.09	31.45	50.09	-22.89	-18.64
0.367	0.10	36.43	58.57	32.77	48.57	-22.14	-15.80
0.428	0.10	36.40	57.29	34.60	47.29	-20.89	-12.69
0.552	0.10	34.85	56.00	33.09	46.00	-21.15	-12.91
7.096	0.27	36.42	60.00	32.42	50.00	-23.58	-17.58

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

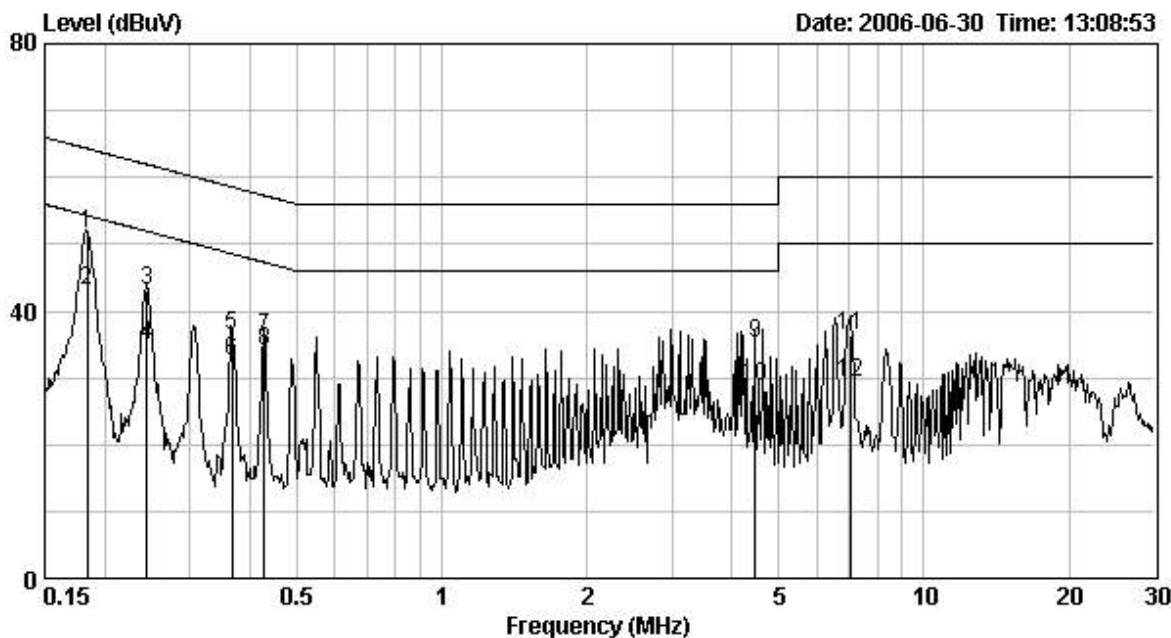


Phase: Line  
 Model No.: SSG 20  
 Test Condition: Normal operating mode  
 With module: V.92+ADSL/ADSL2/ADSL2+  
 With Adapter: LEI, NU40-2120333-I3

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit		Margin	
			Qp (dBuV)	AV (dBuV)	Av (dBuV)	Qp (dB)
0.184	0.10	51.46	64.32	42.96	54.32	-12.86 -11.36
0.244	0.10	43.03	61.94	34.79	51.94	-18.91 -17.15
0.368	0.10	36.41	58.55	32.67	48.55	-22.14 -15.88
0.429	0.10	35.90	57.27	34.03	47.27	-21.37 -13.24
4.473	0.26	35.29	56.00	28.70	46.00	-20.71 -17.30
7.039	0.37	36.23	60.00	29.34	50.00	-23.77 -20.66

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral  
Model No.: SSG 20  
Test Condition: Normal operating mode  
With module: V.92+ADSL/ADSL2/ADSL2+  
With Adapter: LEI, NU40-2120333-I3

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit AV (dBuV)	Margin (dB)	
						Qp	AV
0.183	0.10	49.73	64.33	40.65	54.33	-14.60	-13.68
0.246	0.10	41.01	61.90	33.10	51.90	-20.89	-18.80
0.307	0.10	34.73	60.06	27.89	50.06	-25.33	-22.17
4.653	0.25	34.48	56.00	24.17	46.00	-21.52	-21.83
6.246	0.26	30.32	60.00	27.06	50.00	-29.68	-22.94
20.313	0.75	28.39	60.00	18.75	50.00	-31.61	-31.25

## Remark:

1. Corr. Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)

