

TEST REPORT

Report Number: 3087319MPK-005A

Project Number: 3087319 & 3090394

January 31, 2006

**Testing performed on the
802.11a Wireless Access Point**

Models: ORiNOCO AP-4000, ORiNOCO AP-4000M, & ORiNOCO AP-4900M

FCC ID: HZB-L49U24U50

to

**FCC Part 15, Subpart E
for
Proxim Corporation**



A2LA Certificate Number: 1755-01

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1.0 Introduction

The HZB-L49U24U50 product is a 802.11a/b/g Access Point device. The product was previously approved by FCC under the same FCC ID for the 2.4GHz, 5.15-5.35 GHz and 5.725-5.850 GHz bands operation under Part 15 and for 4.9 GHz band operation under part 90. This report records all test results of the same product hardware for the 5.47-5.725 GHz band as per Part 15.407, except for DFS testing. The 5.47-5.725 GHz band was disabled with the prior application as the band was not open for certification at that time.

The FCC application to include the 5.47-5.725 GHz band will be a Class II permissive change.

1.1 Summary of Tests

FCC ID: HZB-L49U24U50

TEST	REFERENCE	RESULTS
Output power	15.407(a)(2)	Complies
26 dB Bandwidth	15.407(a)(2)	
Peak power spectral density	15.407(a)(2)	Complies
Out-of-band Antenna Conducted Emission	15.407(b)(3)	Complies
Peak excursion	15.407(a)(6)	Complies
Radiated Emission above 1 GHz	15.209, 15.205	Complies
Radiated Emission below 1 GHz	15.209	Complies
AC Line-conducted Emission	15.207	Complies
Frequency stability	15.407(g)	Test was not performed *
Transmit Power Control (TPC) Dynamic Frequency Selection (DFS)	15.407(h)	Test was not performed **
RF Exposure Requirement	2.1091	Complies, see exhibit "RF Exposure"
Antenna Requirement	15.203	Not Applicable; professional installation is required

* Compliance is addressed in Report # RF921107R02 issued by ADT

** Test was not requested by the Applicant

A pre-production version of the EUT was received on December 10, 2005 in good operating condition. As declared by the Applicant, it is identical to the production units.

Date of Test: December 10, 2005 – January 20, 2006

2.0 General Description

2.1 Product Description

The HZB-L49U24U50 product is a 802.11a/b/g Access Point device.

Overview of the FCC ID: HZB-L49U24U50 product

Applicant name & address	Proxim Wireless Corporation 2115 O'Nel Drive, San Jose, CA 95131 USA
Manufacturer	Proxim Wireless Corporation
Model	ORiNOCO AP-4000, ORiNOCO AP-4000M, ORiNOCO AP-4900M
FCC Identifier	HZB-L49U24U50
Use of Product	Wireless Access Point
Date Rate	6 Mbps – 54 Mbps, 12 Mbps – 108 Mbps in turbo mode
Type of Modulation	OFDM
Rated RF Output	24 dBm for maximum antenna gain of 6 dBi
Frequency Range	5470 – 5725 MHz
Number of Channel(s)	11 channels from 5.50 GHz, to 5.70 GHz in regular mode 5 channels from 5.52 GHz to 5.68 GHz in turbo mode
Antenna	See the table below. The EUT requires professional installation when using external antennas with a standard connector.



As declared by the Applicant, the following antennas may be used with the device:

Antenna Type	Manufacturer	Model Number	Mid-band Gain (dBi)	Antenna used for testing
Omni	Proxim	integral antenna	0	X
	SmartAnt	R0320-102	10	X
Sector	Proxim	5054-SA60-17	17	X
Panel	Proxim	1086-PA50-7	7	
	SmartAnt	R0320-091	15	
	SmartAnt	R0209-116	18	
	SmartAnt	R0209-149	23	
1 Foot Flat Panel	Gabriel	DFPD1-52	23.5	
	Andrew	FPA5250D12-N	23.6	
	Mars	MA-WA-58-1X	23	
2 Foot Flat Panel	Gabriel	DFPD2-52	28	X
	Andrew	FPA5250D24-N	28.2	
	RSI	A57A24-U	26.5	
2 Foot Parabolic	Gabriel	SSP2-52B	28.5	
	Gabriel	SSD2-52A	28.4	
	Gabriel	HSSP2-52	28.1	
	Radio Waves	SP2-5.2	28.3	
	Radio Waves	SPD2-5.2	28.1	
	Andrew	P2F-52	29.4	
	Andrew	PX2F-52	29.4	
	RSI	P-57C24	29	
3 Foot Parabolic	Radio Waves	SP3-5.2	31.4	
	Radio Waves	SPD3-5.2	31.1	
	Andrew	P3F-52	33.4	
	Andrew	PX3F-52	33.4	
8 foot Parabolic	Gabriel	SSP8-52	39.8	X

Formula for determining maximum output power setting for 5.47-5.725 GHz operation:

Max Tx (dBm) is the lesser of P_{RF} and $30-G+FL$

where:

G = Antenna Gain

Tx is the output power measured at the antenna input

FL is feeder loss including loss of connectors

P_{RF} is the approved RF power as shown on FCC grant

Note:

All Proxim radios using external antennas require professional installation.

Antennas with gain less than 7 dBi, or greater than 33.4dBi are not allowed

Antennas of other make may be used with the HZB-L49U24U50 product, but must be of the same type, within the range of each type listed

The antennas marked with "X" have been chosen for testing.

2.2 Related Submittal(s) Grants

None.

2.3 Test Methodology

Both conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Sheet"** of this Application. All other measurements were made in accordance with the procedures in parts 2 and 15 of CFR 47.

2.4 Test Facility

The test site and conducted measurement facility used to collect the radiated data is site 1, a 10 meter semi-anechoic chamber. This test facility and site measurement data have been fully placed on file with the FCC and A2LA accredited.

3.0 System Test Configuration

The following frequency and configuration were selected for the tests:

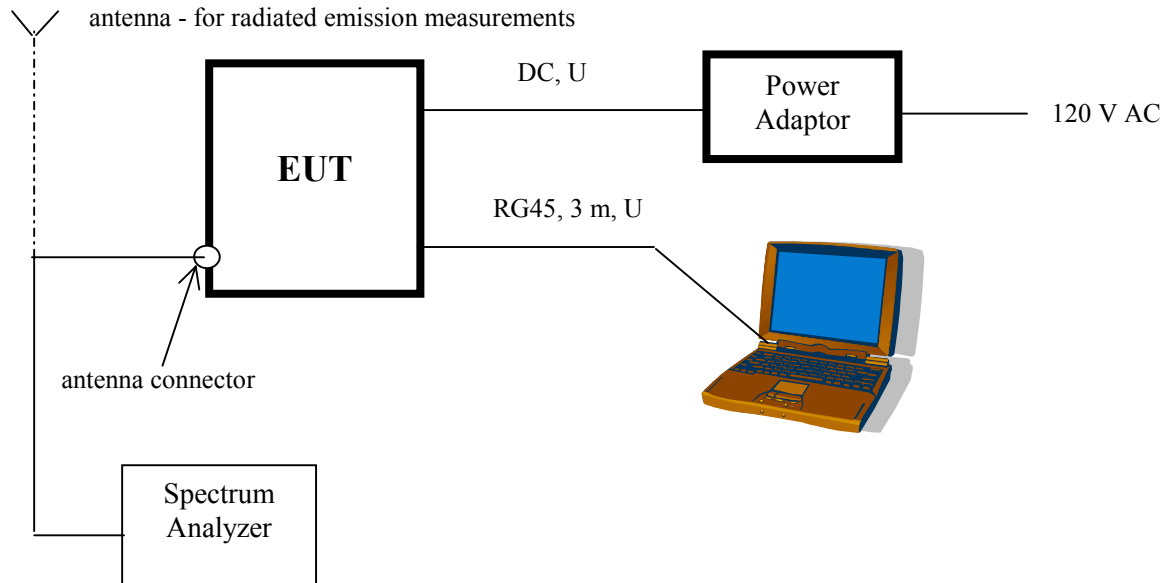
Frequency MHz	Date rate	Mode
5500	6 MBps	regular
5600	6 MBps	regular
5700	6 MBps	regular
5520	72 Mbps	turbo
5600	72 MBps	turbo
5680	72 MBps	turbo

Limited tests were performed for 54 Mbps (regular mode) and 108 Mbps (turbo mode).

3.1 Support Equipment and description

Laptop computer: Dell Latitude.

3.2 Block Diagram of Test Setup



S = Shielded
U = Unshielded

F = With Ferrite
m = Meter

3.3 Justification

For emission testing, the Equipment Under Test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst-case emissions.

For radiated emission measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

Care was taken to ensure proper power supply voltages during testing.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology.

3.5 Mode of operation during test

Transmitting modulated signal on low, middle and high channels. As requested by the Applicant, the signal was setup for OFDM with data rate of 6 Mbps (regular mode) and 72 Mbps (turbo mode). Limited tests were performed for 54 Mbps (regular mode) and 108 Mbps (turbo mode).

3.6 Modifications required for Compliance

Intertek installed no modifications during compliance testing in order to bring the product into compliance.

3.7 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

4.0 Measurement Results

4.1 26-dB Bandwidth

Procedure

The Procedure, described in the FCC Public Notice DA 02-2138, was used.

The antenna port of the EUT was connected to the input of a spectrum analyzer (SA). For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 26 dB lower than PEAK level. The 26-dB bandwidth was determined from where the channel output spectrum intersected the display line.

Test Result

Regular mode

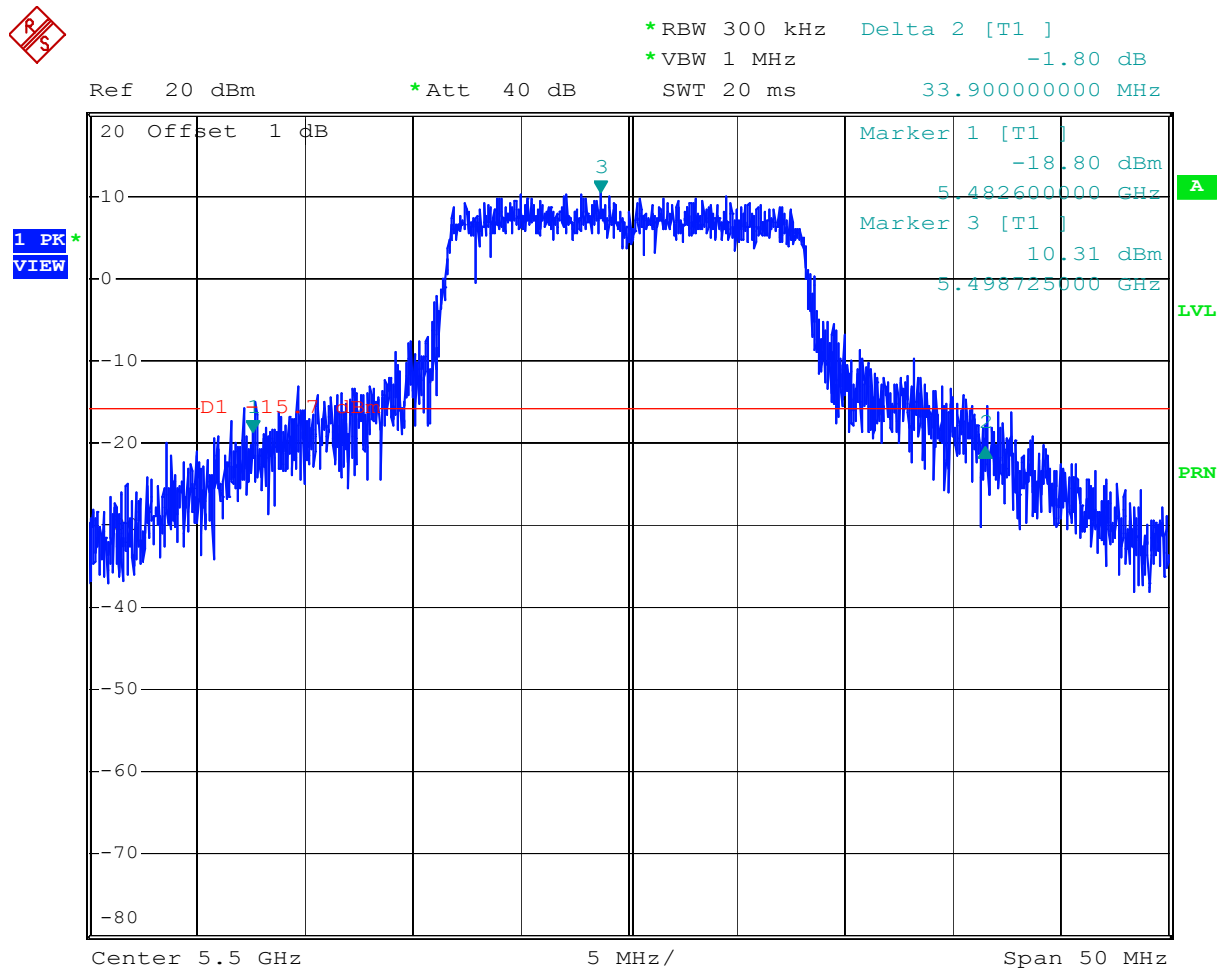
Frequency MHz	Rate, Mbps	26-dB Bandwidth, MHz	Plot #
5500	6	33.9	1.1
5600	6	34.4	1.2
5600	54	25.8	1.3
5700	6	35.3	1.4

Turbo mode

Frequency MHz	Rate, Mbps	26-dB Bandwidth, MHz	Plot #
5520	72	56.3	1.5
5600	72	57.8	1.6
5600	108	50.2	1.7
5680	72	59.5	1.8

On the plots 1.1 – 1.6 the 26-dB bandwidth is presented.

Plot 1.1

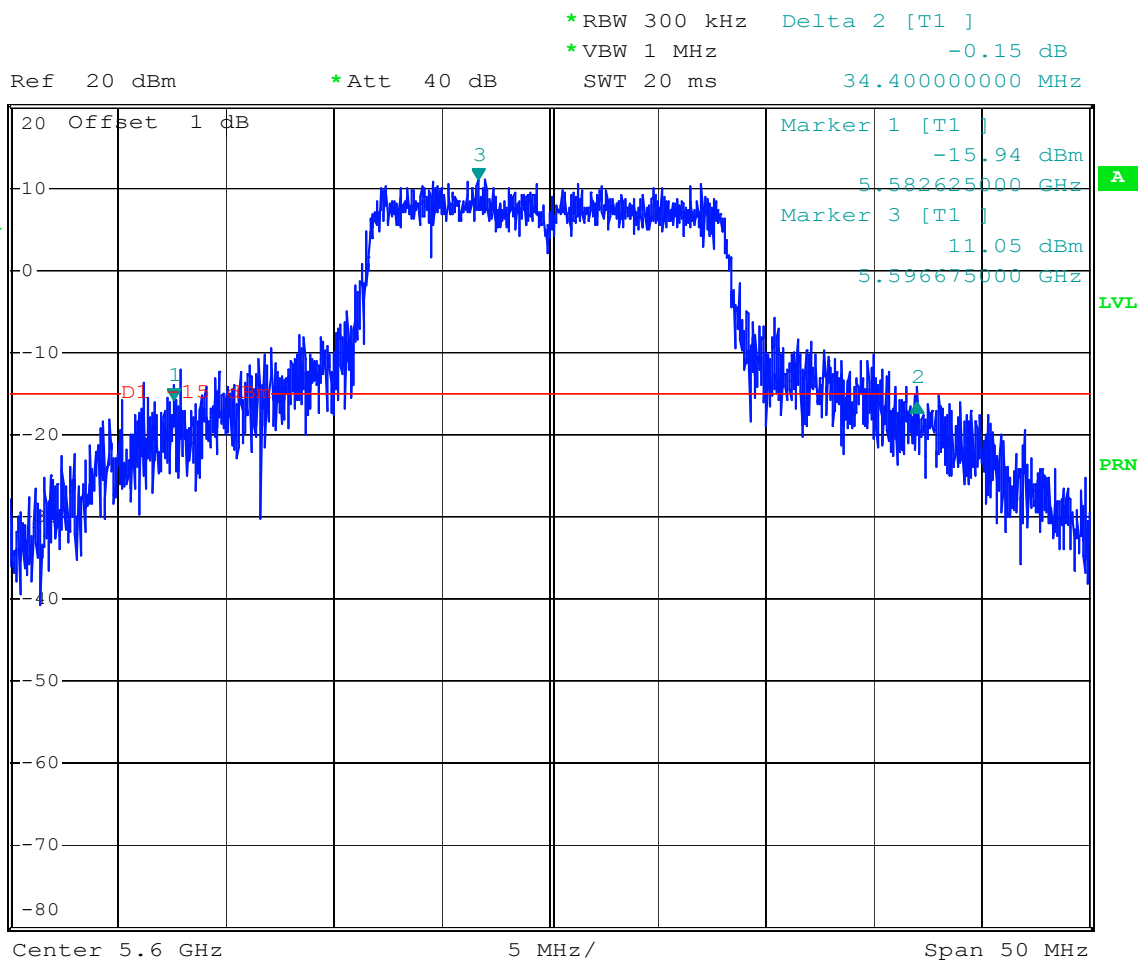


Comment: bandwidth, 5500 MHz, 6 Mbps
 Date: 19.DEC.2005 15:02:35

Plot 1.2

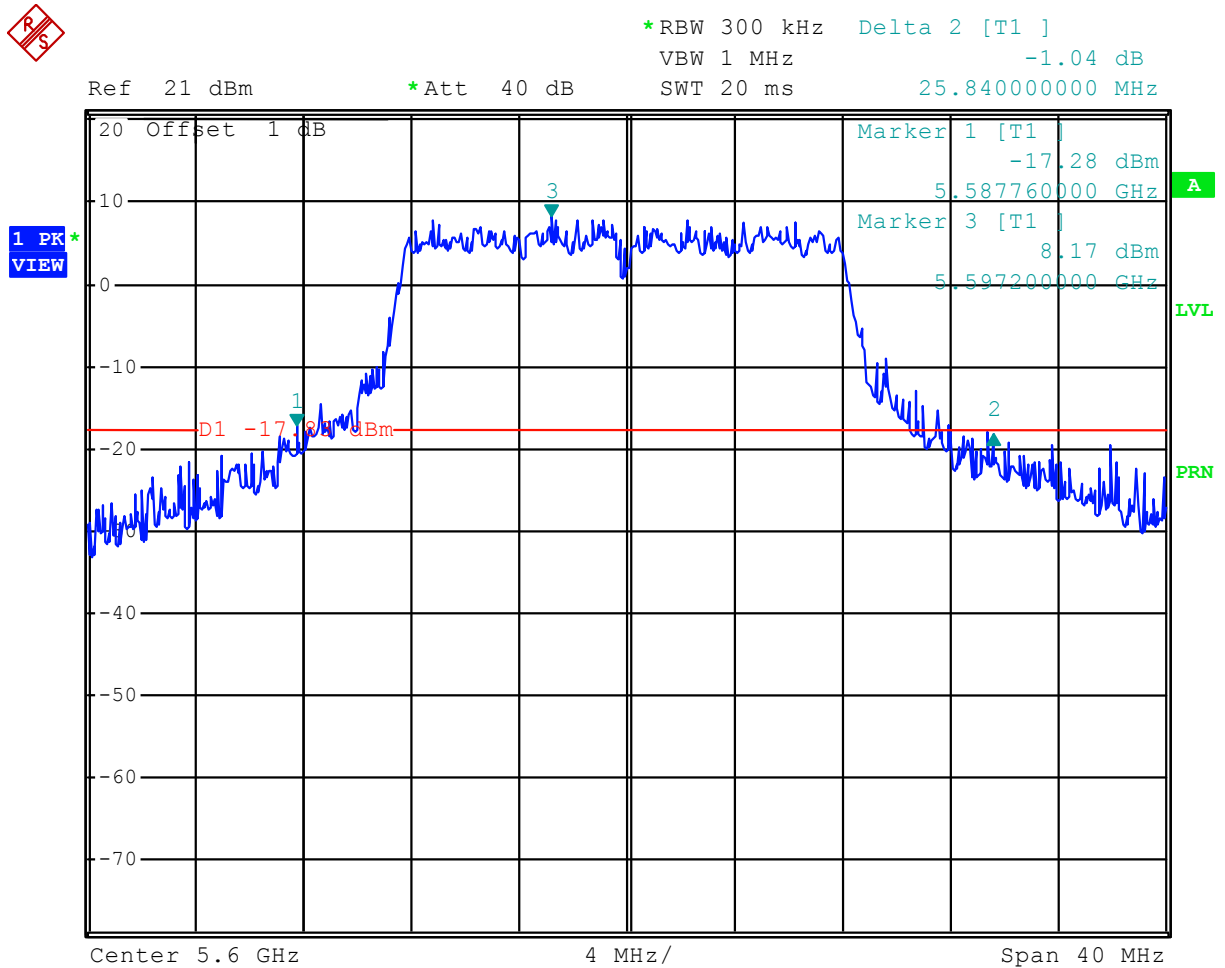


1 PK*
VIEW



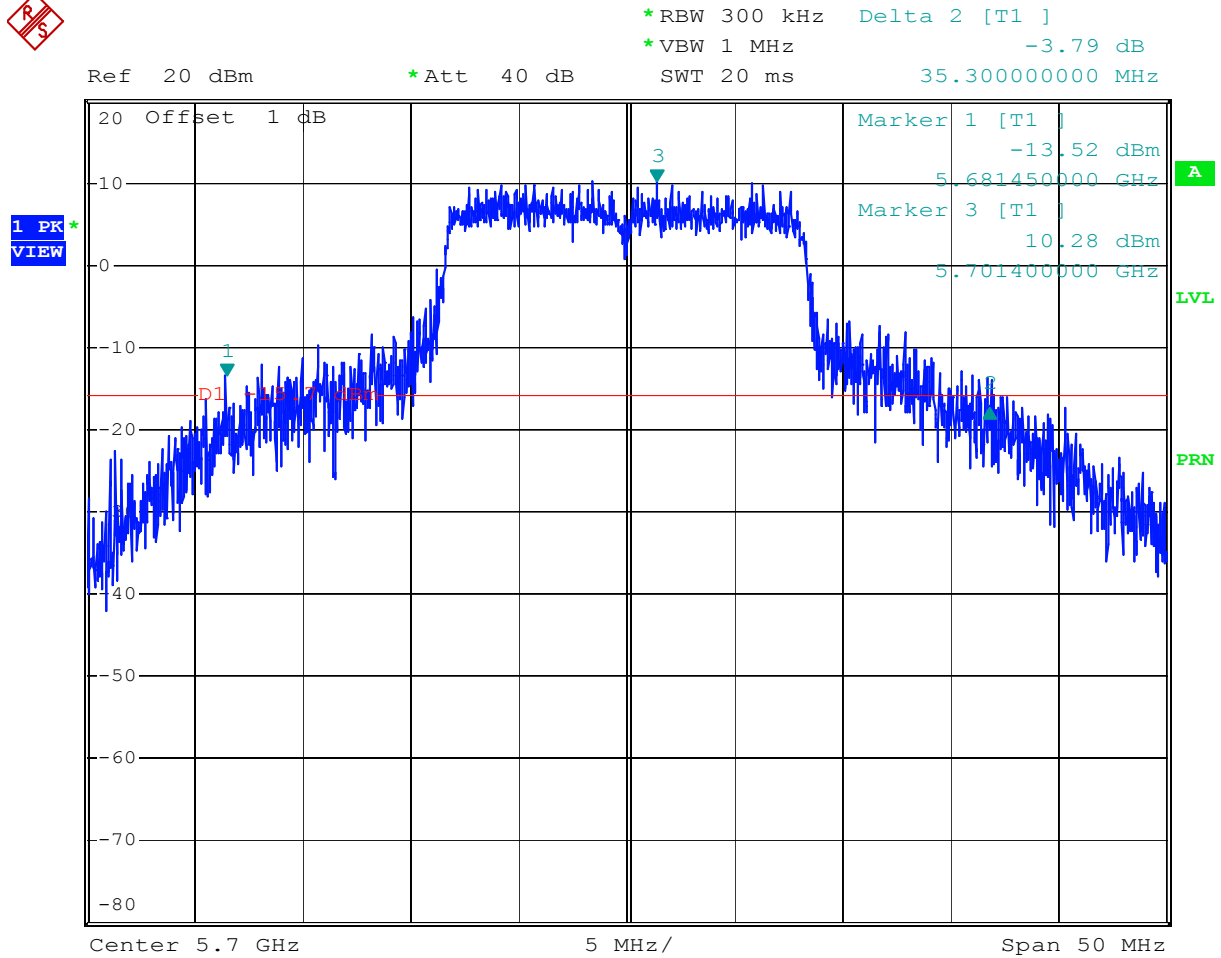
Comment: bandwidth, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 15:05:24

Plot 1.3



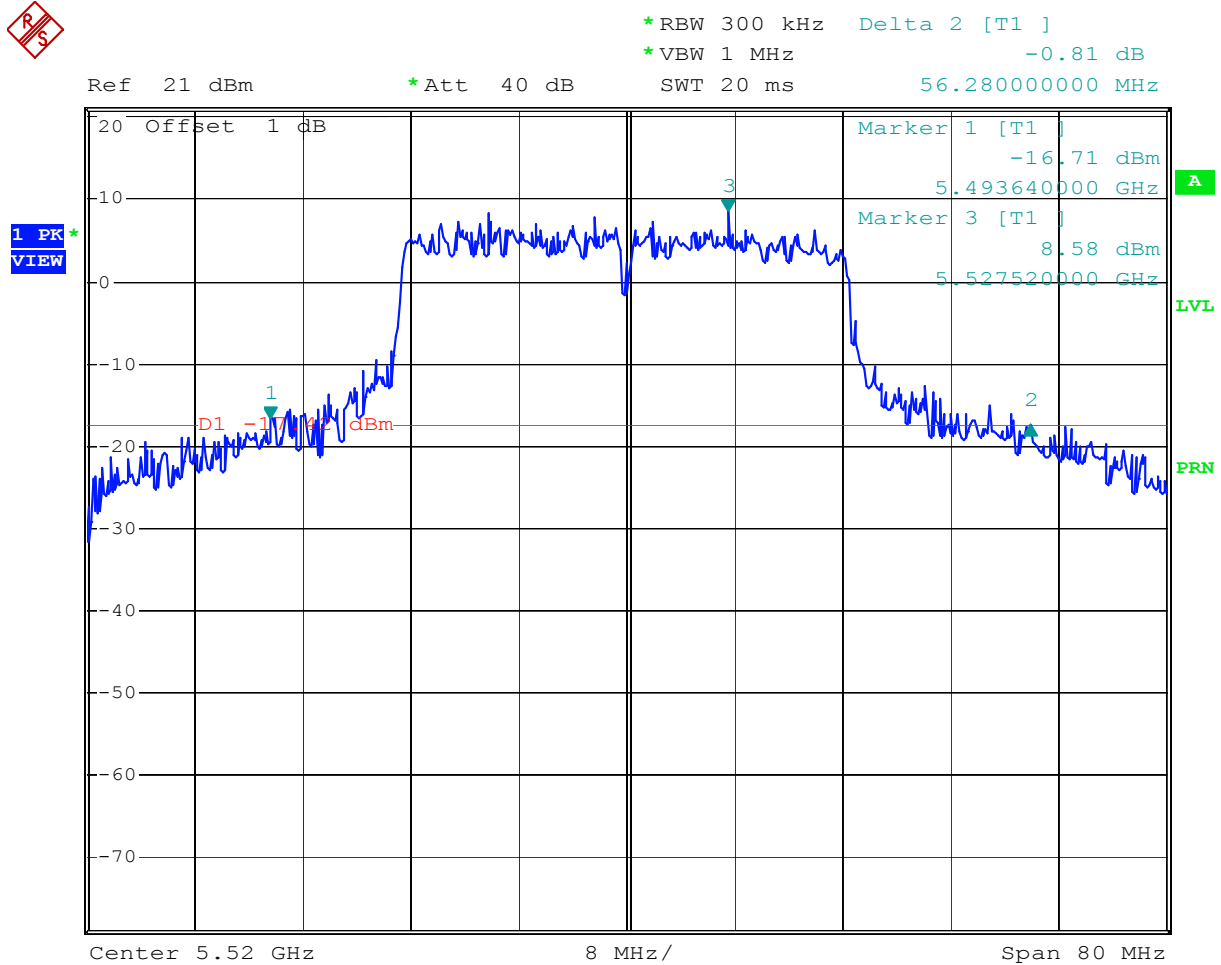
Comment: 26-dB bandwidth, 5600 MHz, 54 Mbps
 Date: 16.JAN.2006 17:22:31

Plot 1.4



Comment: bandwidth, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 15:08:52

Plot 1.5



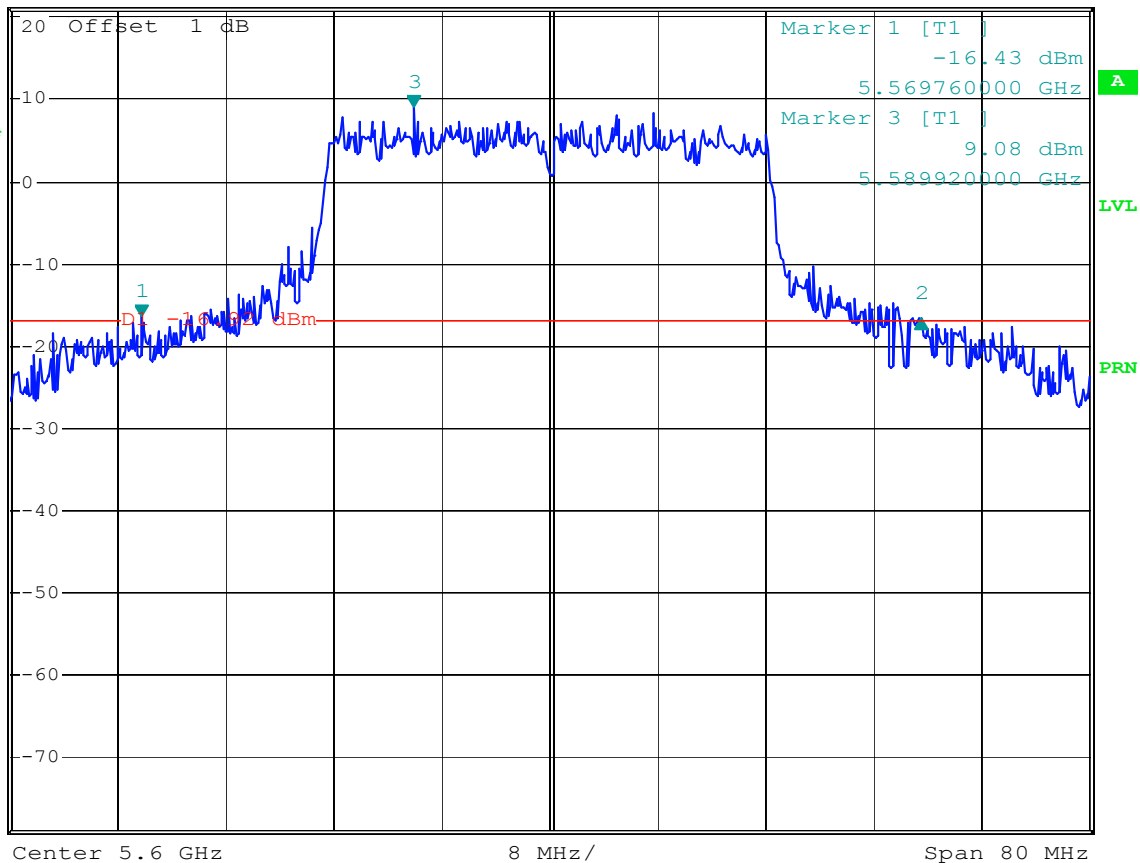
Comment: 26-dB bandwidth, 5520 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 16:18:04

Plot 1.6



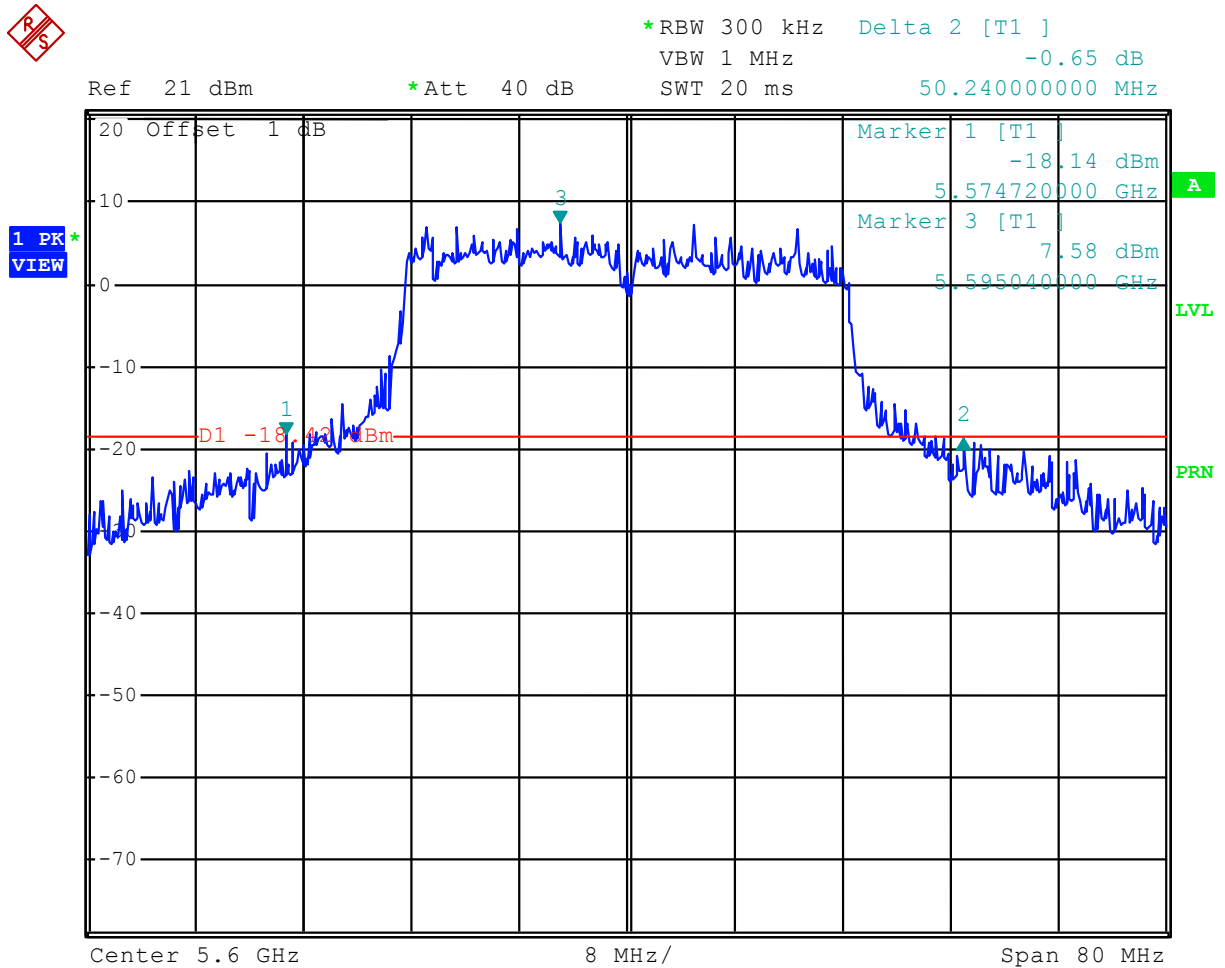
*RBW 300 kHz Delta 2 [T1]
 *VBW 1 MHz -0.32 dB
 Ref 21 dBm *Att 40 dB SWT 20 ms 57.760000000 MHz

1 PK*
 VIEW



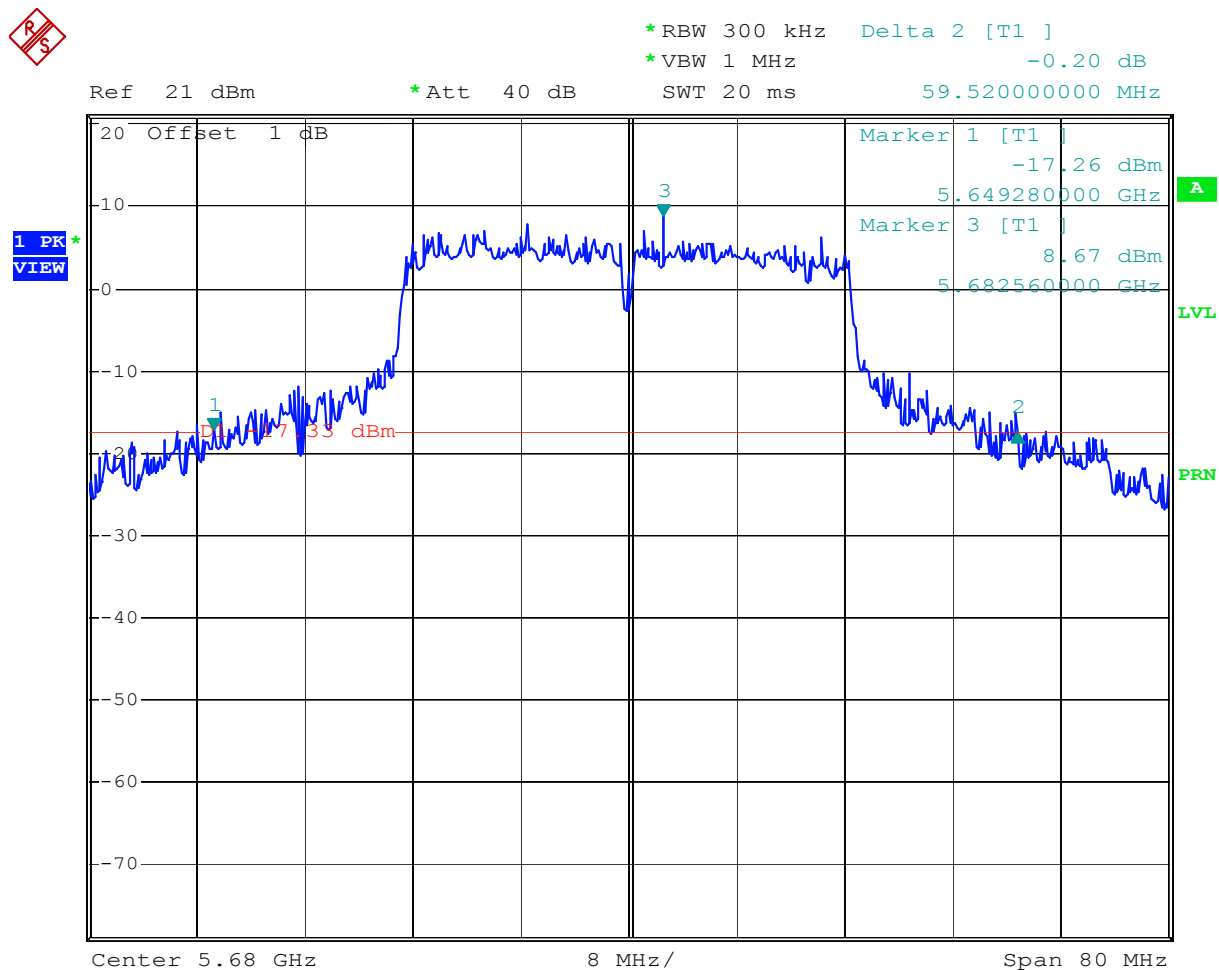
Comment: 26-dB bandwidth, 5600 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 16:22:54

Plot 1.7



Comment: 26-dB bandwidth, 5600 MHz, turbo mode, 108 Mbps
 Date: 16.JAN.2006 17:19:21

Plot 1.8



Comment: 26-dB bandwidth, 5680 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 16:26:35

4.2 Conducted Output Power

FCC Rule: 15.407(a)(2)

Requirement

The maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or $(11 \text{ dBm} + 10\text{Log } B)$, where B is the 26-dB bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Procedure

The Procedure, described in the FCC Public Notice DA 02-2138, was used.

The Method #3 was selected for the measurement. The antenna port of the EUT was connected to the input of a spectrum analyzer (SA).

Test Results

Regular mode

Frequency MHz	26-dB Bandwidth MHz	Maximum conducted output power mW	Margin to 250 mW limit dB	Plot #
5500	33.9	245.6	0.1	2.1
5600	34.4	246.6	0.1	2.2
5700	35.3	242.3	0.2	2.3

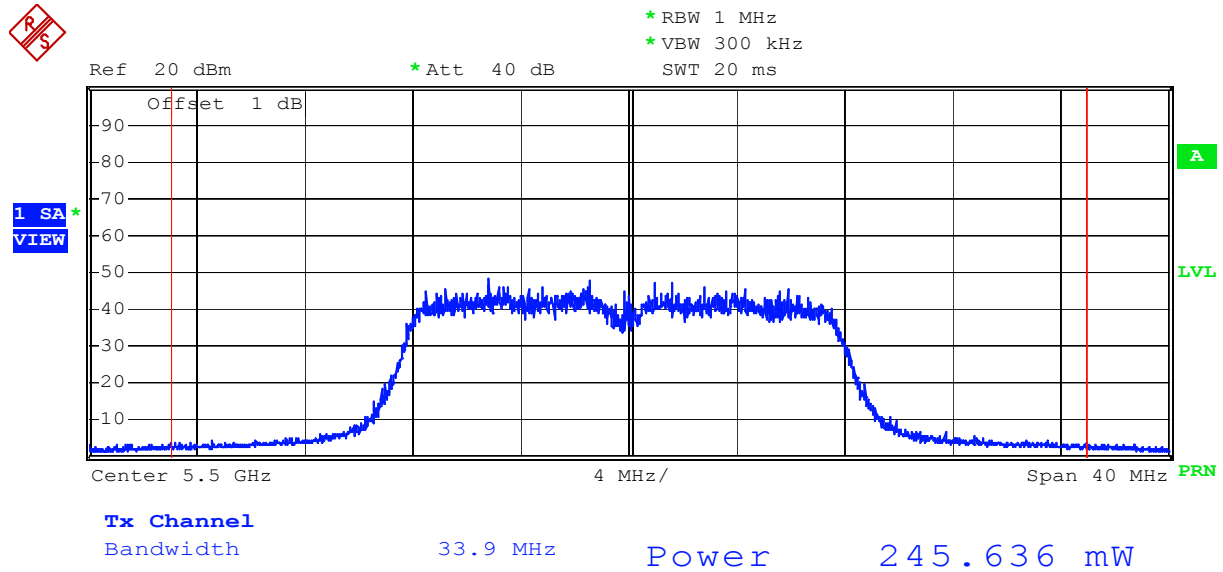
Turbo mode

Frequency MHz	26-dB Bandwidth MHz	Maximum conducted output power mW	Margin to 250 mW limit dB	Plot #
5520	56.3	248.3	0.1	2.4
5600	57.8	247.8	0.1	2.5
5680	59.5	240.3	0.2	2.6

Note: If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

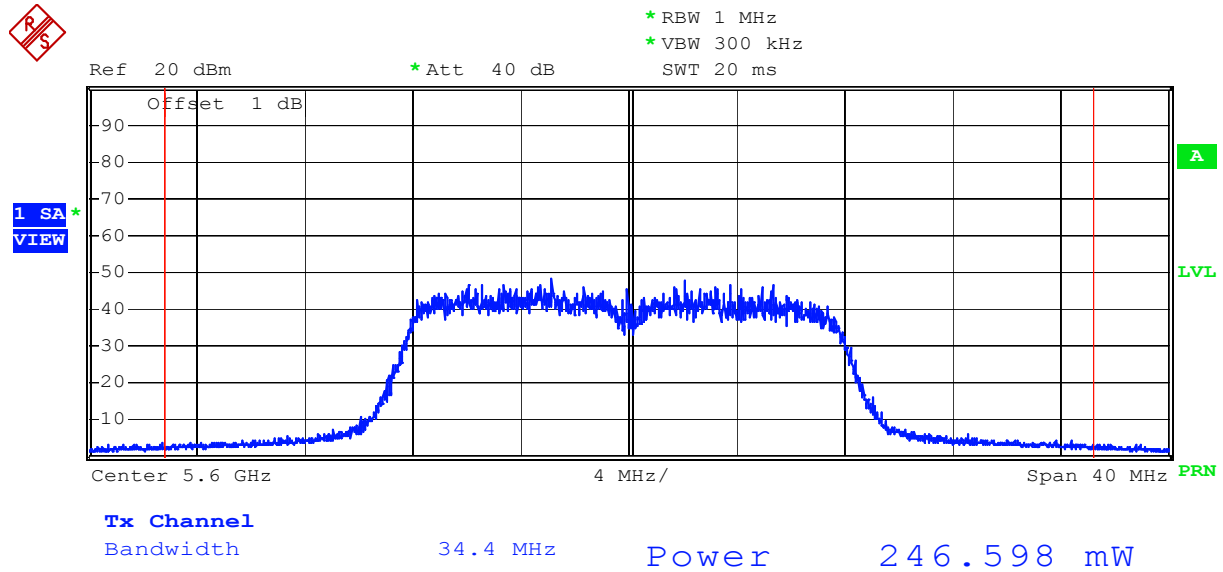
On the plots 2.1 – 2.6 the Maximum conducted output power is presented.

Plot 2.1



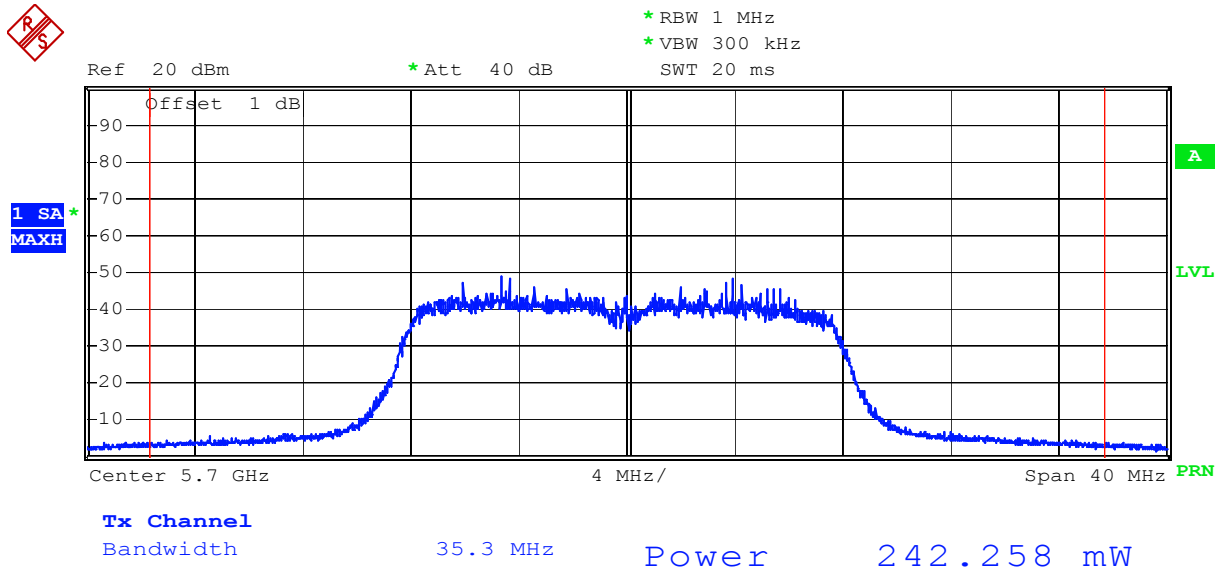
Comment: Peak Transmit Power, 5500 MHz, 6 Mbps
Date: 19.DEC.2005 15:22:39

Plot 2.2



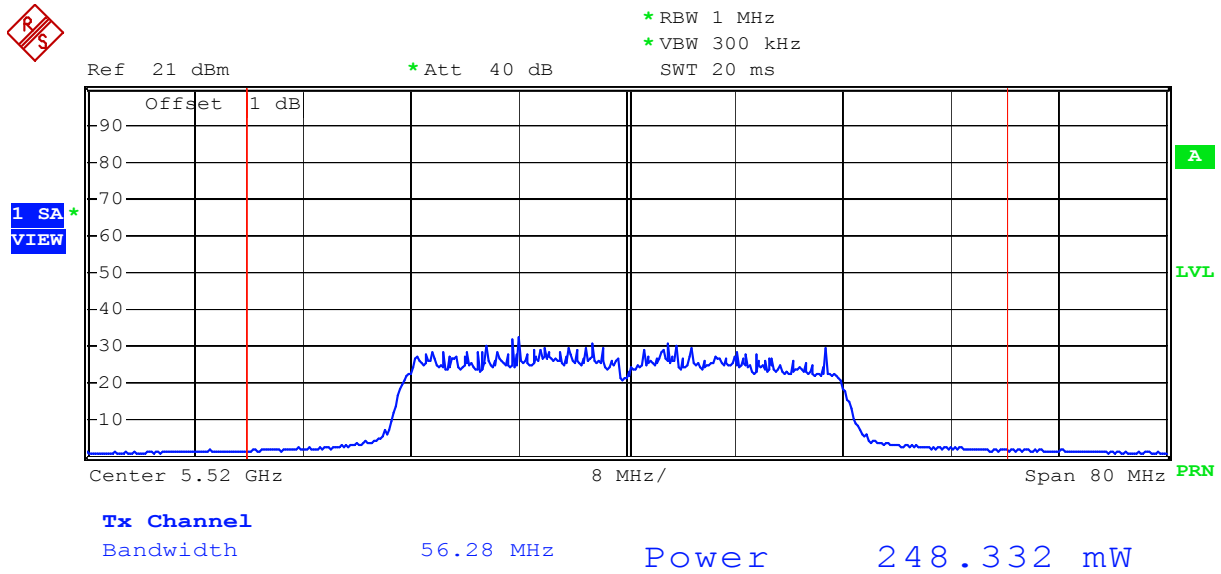
Comment: Peak Transmit Power, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 15:24:23

Plot 2.3



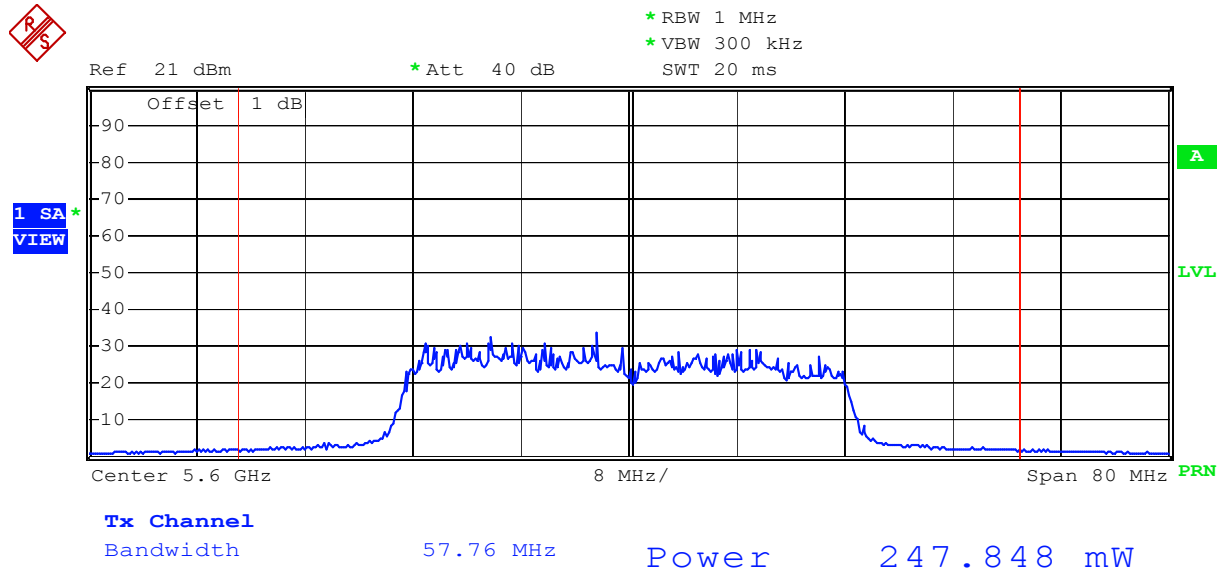
Comment: Peak Transmit Power, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 15:27:58

Plot 2.4



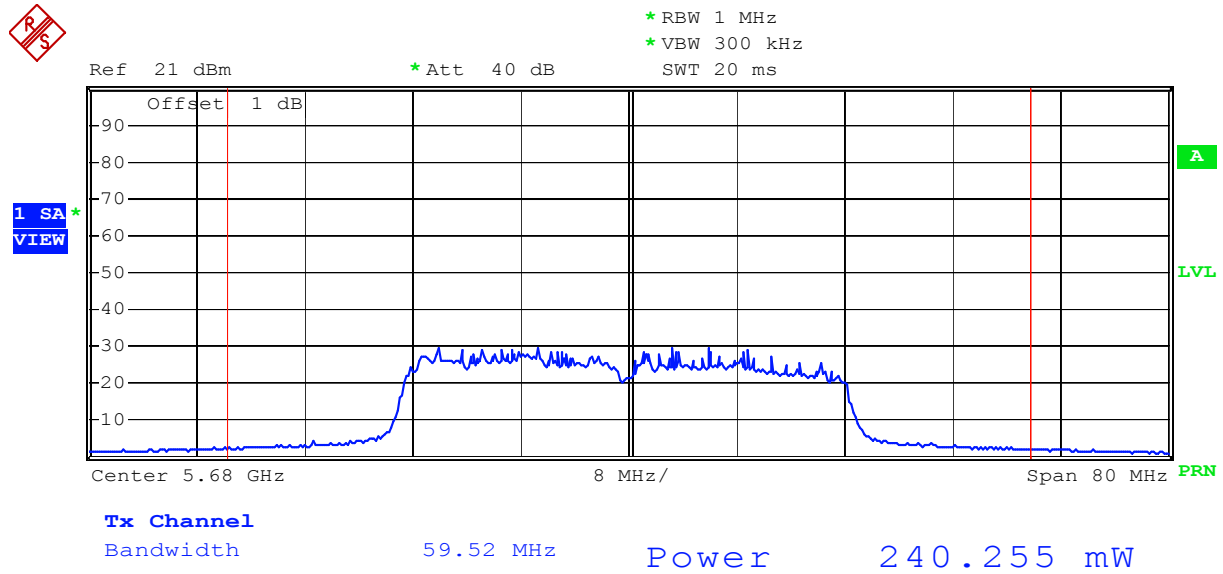
Comment: Peak transmit power, 5520 MHz, turbo mode, 72 Mbps
Date: 19.JAN.2006 16:41:16

Plot 2.5



Comment: Peak transmit power, 5600 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 16:46:44

Plot 2.6



Comment: Peak transmit power, 5680 MHz, turbo mode, 72 Mbps
Date: 19.JAN.2006 16:49:19

4.3 Peak Power Spectral Density FCC Rule: 15.407(a)(2)

Requirement

The peak power spectral density (PPSD) shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Procedure

The Procedure, described in the FCC Public Notice DA 02-2138, was used.
The Method #2 (with the sample detector and averaging over 100 sweeps) was selected for the measurement.
The antenna port of the EUT was connected to the input of a spectrum analyzer (SA).
The spectrum analyzer Resolution Bandwidth was set to 1 MHz.

Test Result

Frequency MHz	Mode	Peak Power Spectral Density dBm	Margin to 11 dBm limit dB	Plot #
5500	regular	6.4	4.6	3.1
5600	regular	6.6	4.4	3.2
5600	turbo	2.5	8.5	3.3
5700	regular	6.1	4.9	3.4

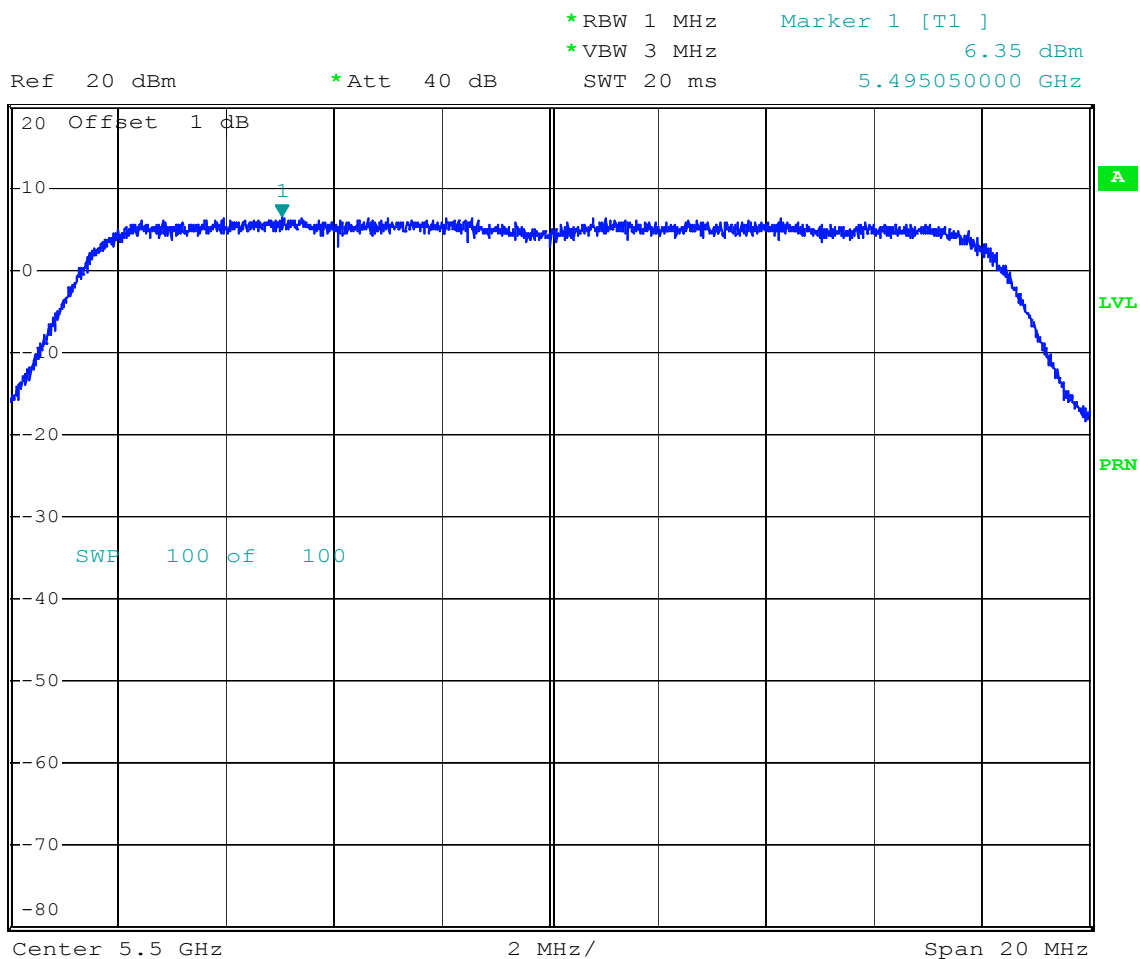
On the plots 3.1 – 3.4 the Peak Power Spectral Density is presented.

The EUT passed by 4.4 dB.

Plot 3.1



1 SA
VIEW

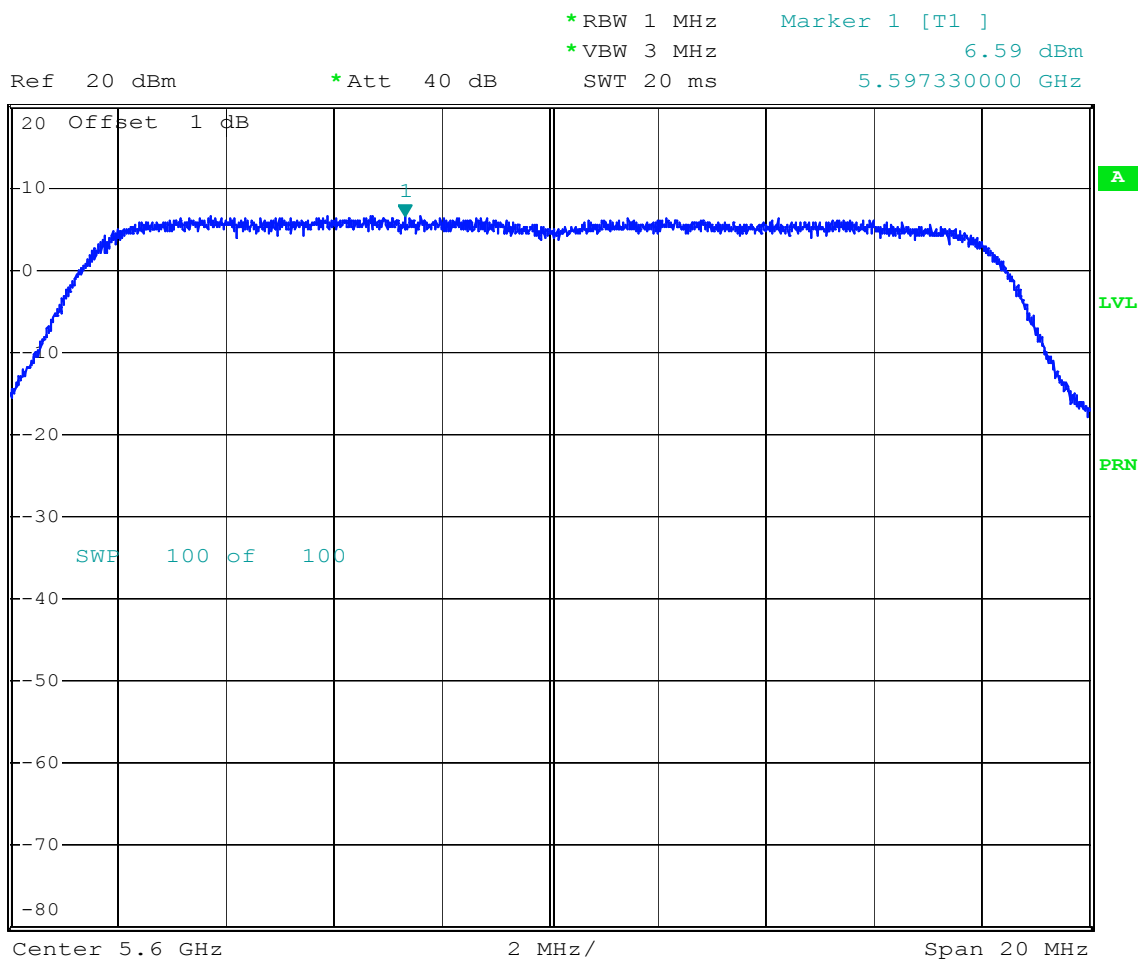


Comment: Peak power spectral density, 5500 MHz, 6 Mbps
 Date: 19.DEC.2005 15:33:43

Plot 3.2

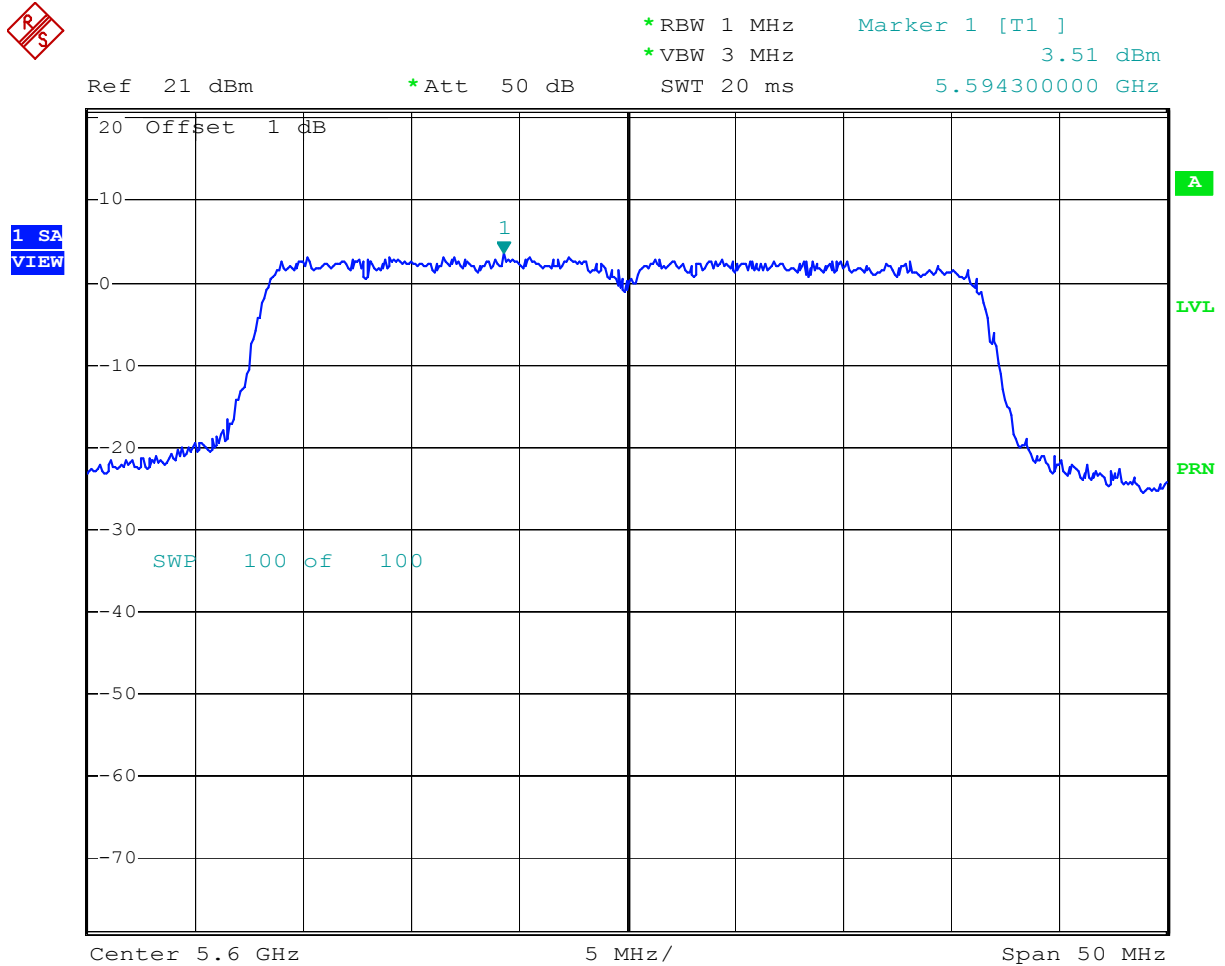


1 SA
VIEW



Comment: Peak power spectral density, 5600 MHz, 6 Mbps
 Date: 19.DEC.2005 15:34:55

Plot 3.3

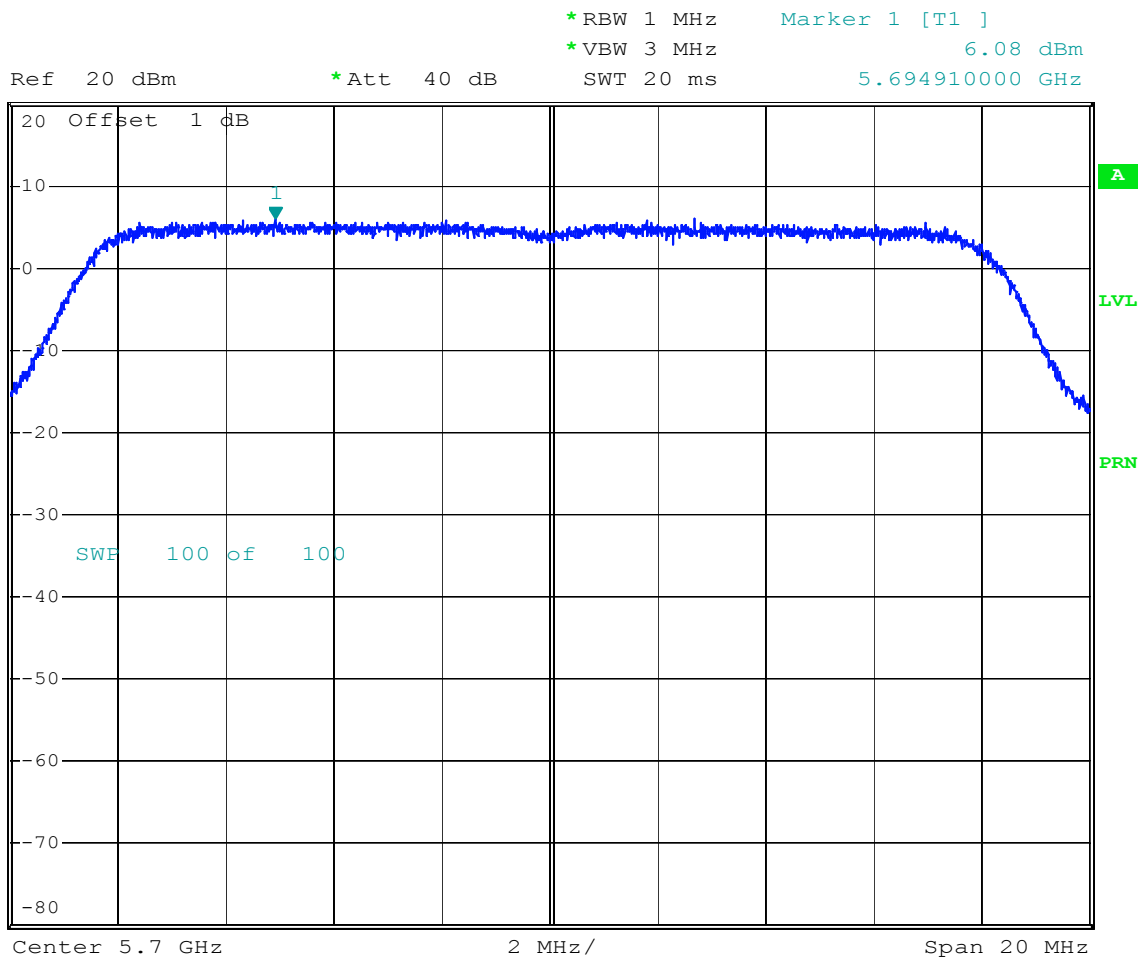


Comment: Peak power spectral density, 5680 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 13:42:08

Plot 3.4



1 SA
VIEW



Comment: Peak power spectral density, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 15:35:53

4.4 Ratio of the peak excursion of the modulation envelope FCC Rule: 15.407(a)(6)

Requirement

The Ratio of the peak excursion of the modulation envelope to the maximum conducted output power shall not exceed 13 dB across any 1 megahertz bandwidth.

Procedure

The Procedure, described in the FCC Public Notice DA 02-2138, was used.

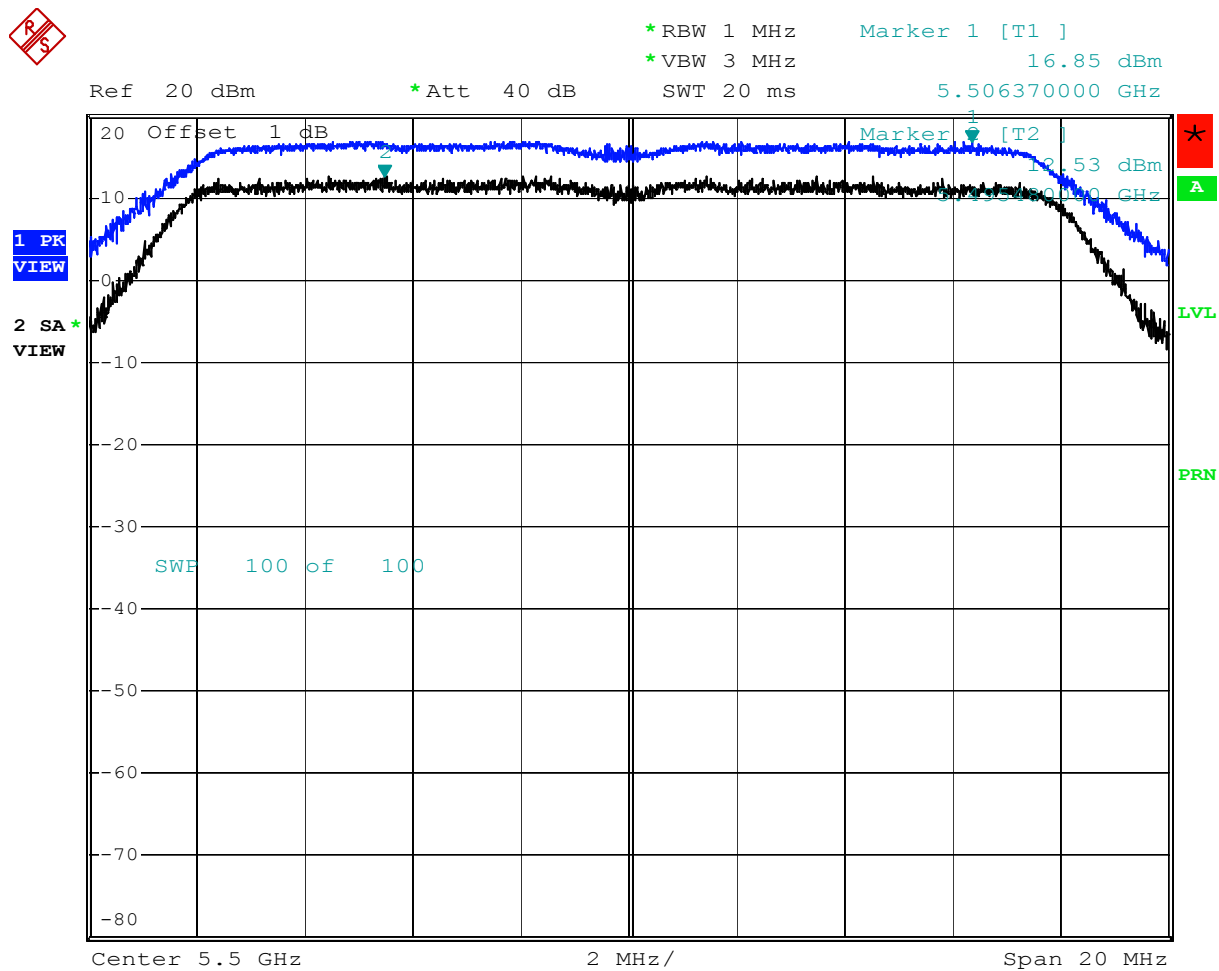
Results

Frequency MHz	Mode	Ratio of the peak excursion dBm	Margin to 13 dBm limit dB	Plot #
5500	regular	4.3	8.7	4.1
5600	regular	4.7	8.3	4.2
5600	turbo	4.8	8.2	4.3
5700	regular	4.3	8.7	4.4

On the plots 4.1 – 4.3 the Ratio of the peak excursion is presented.

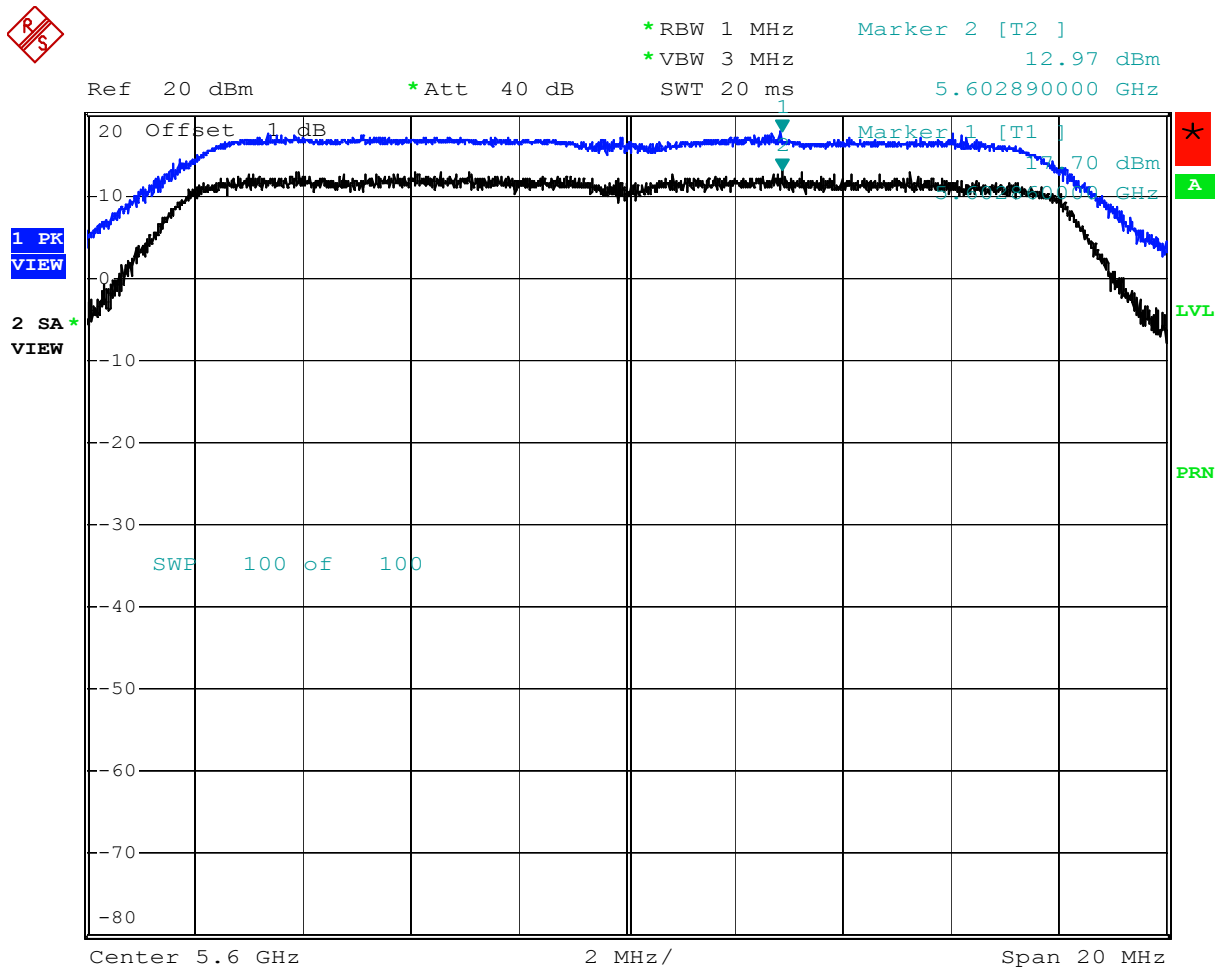
The EUT passed by 8.2 dB.

Plot 4.1



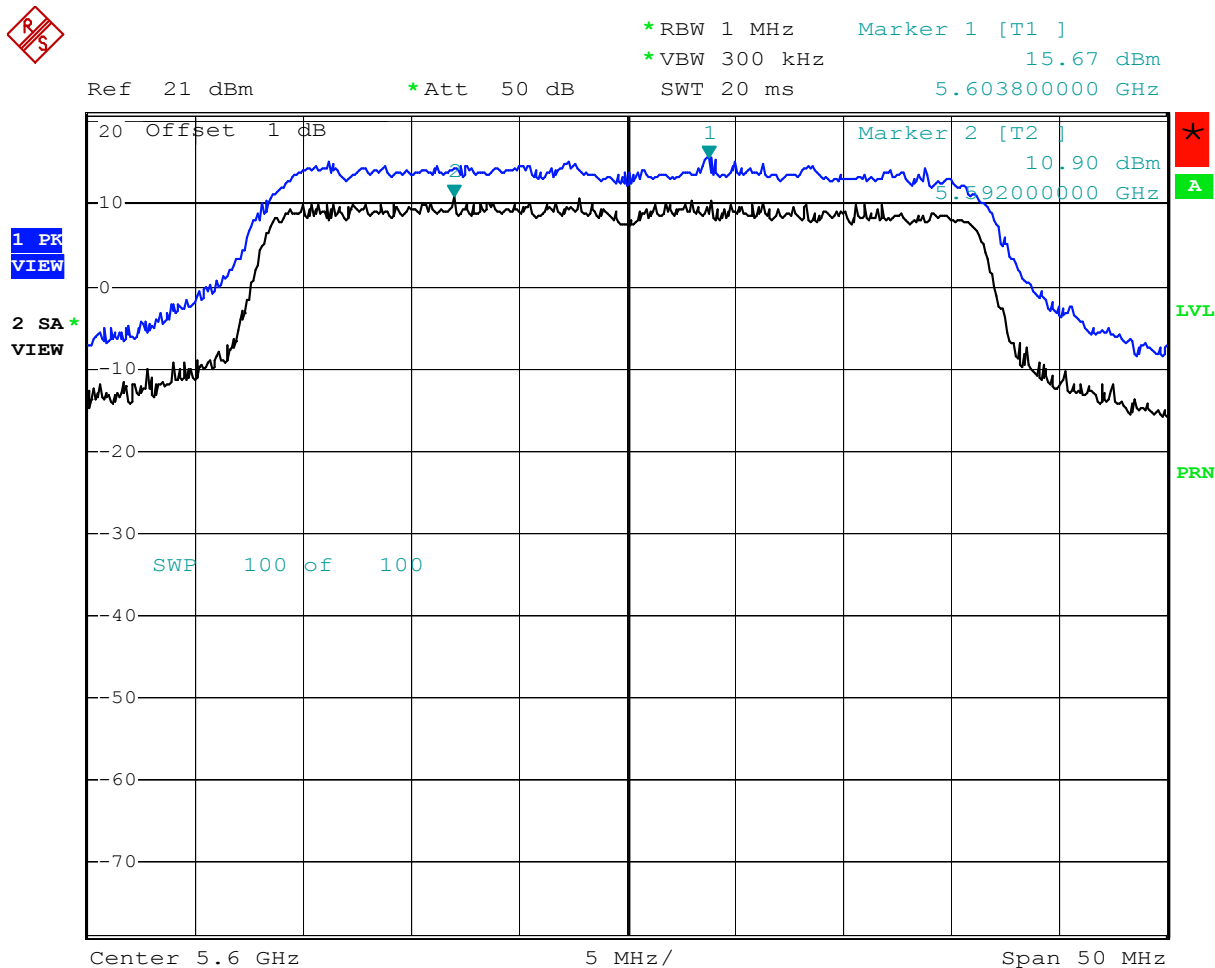
Comment: Peak excursion, 5500 MHz, 6 Mbps
 Date: 19.DEC.2005 15:43:35

Plot 4.2



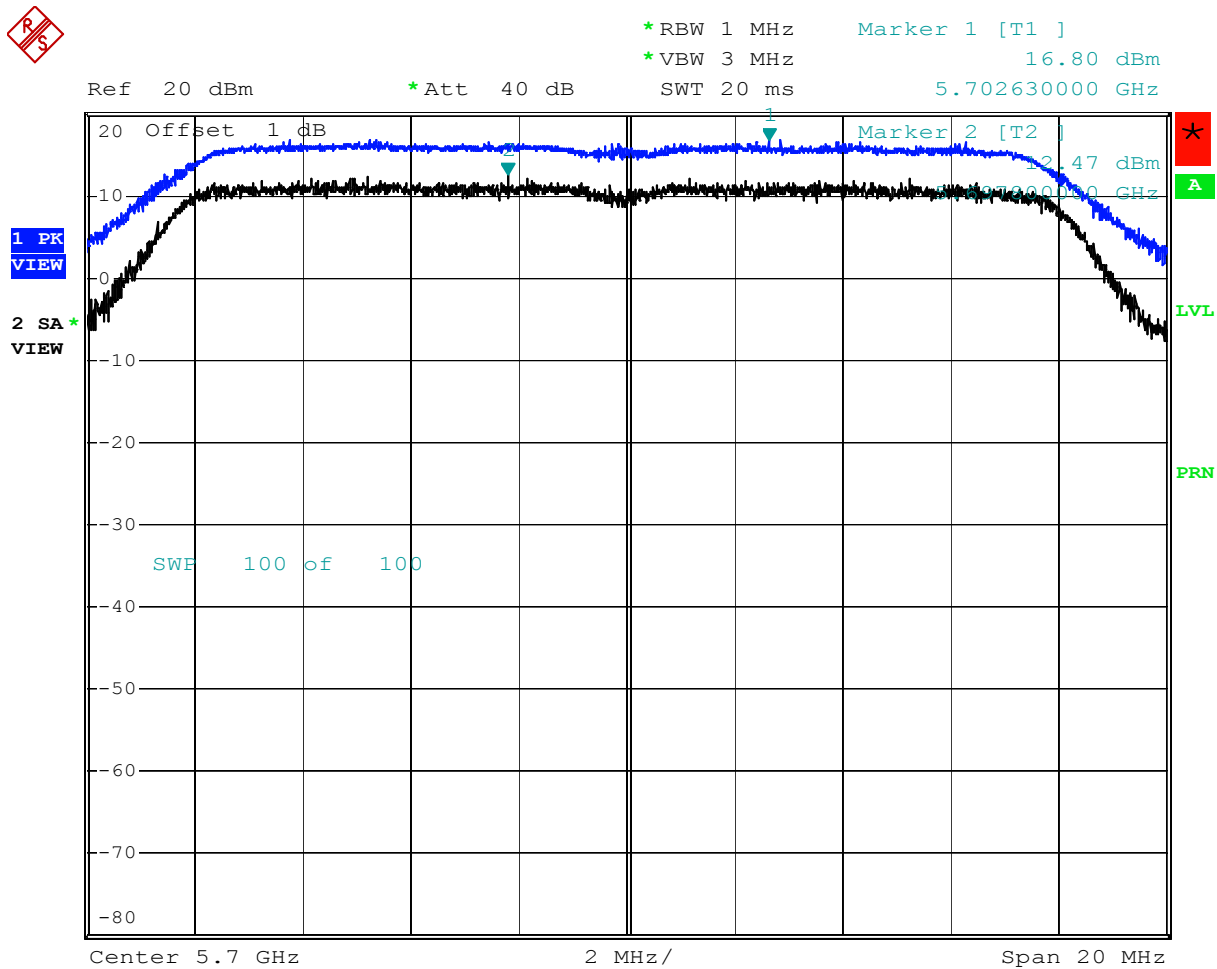
Comment: Peak excursion, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 16:32:08

Plot 4.3



Comment: Peak excursion, 5680 MHz, turbo mode, 72 Mbps
 Date: 19.JAN.2006 13:54:40

Plot 4.4



Comment: Peak excursion, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 16:35:46

4.5 Out-of-Band Conducted Emissions FCC Rule: 15.247(c)

Requirements

All emissions outside of the 5.47 – 7.725 GHz band shall not exceed an EIRP of –27 dBm/MHz.

Procedure

A spectrum analyzer was connected to the antenna port of the transmitter. Analyzer Resolution Bandwidth was set to 1 MHz. The out-of-band emissions were measured from 30 MHz to 40 GHz for low, middle and high channel.

Test Result

Refer to the plots below for the test result.

The EUT passed by 2.9 dB.

Regular mode

Frequency MHz	Description	Margin to -27dBm/MHz EIRP limit (antenna gain up to 6 dBi), dB	Plot #
5500	Scan 30 MHz – 1 GHz	> 20	5.1
	Scan 1 GHz – 5.47 GHz	10.9	5.2
	Scan 5.725 GHz – 10 GHz	> 20	5.3
	Scan 10 GHz – 20 GHz	19.8	5.4
	Scan 20 GHz – 40 GHz	> 20	5.5
5600	Scan 30 MHz – 5.47 GHz	19.9	5.6
	Scan 5.725 GHz – 10 GHz	> 20	5.7
	Scan 10 GHz – 20 GHz	19.8	5.8
	Scan 20 GHz – 40 GHz	> 20	5.9
5770	Scan 30 MHz – 5.47 GHz	19.8	5.10
	Scan 5.725 GHz – 10 GHz	15.4	5.11
	Scan 10 GHz – 20 GHz	19.2	5.12
	Scan 20 GHz – 40 GHz	> 20	5.13

Turbo mode

Frequency MHz	Description	Margin to -27dBm/MHz EIRP limit (antenna gain up to 6 dBi), dB	Plot #
5520	Scan 30 MHz – 5.47 GHz (72 Mbps)	8.6	5.14
	Scan 30 MHz – 5.47 GHz (108 Mbps)	7.4	5.15
5680	Scan 5.725 GHz – 6 GHz (72 Mbps)	8.7	5.16
	Scan 5.725 GHz – 6 GHz (108 Mbps)	9.0	5.17

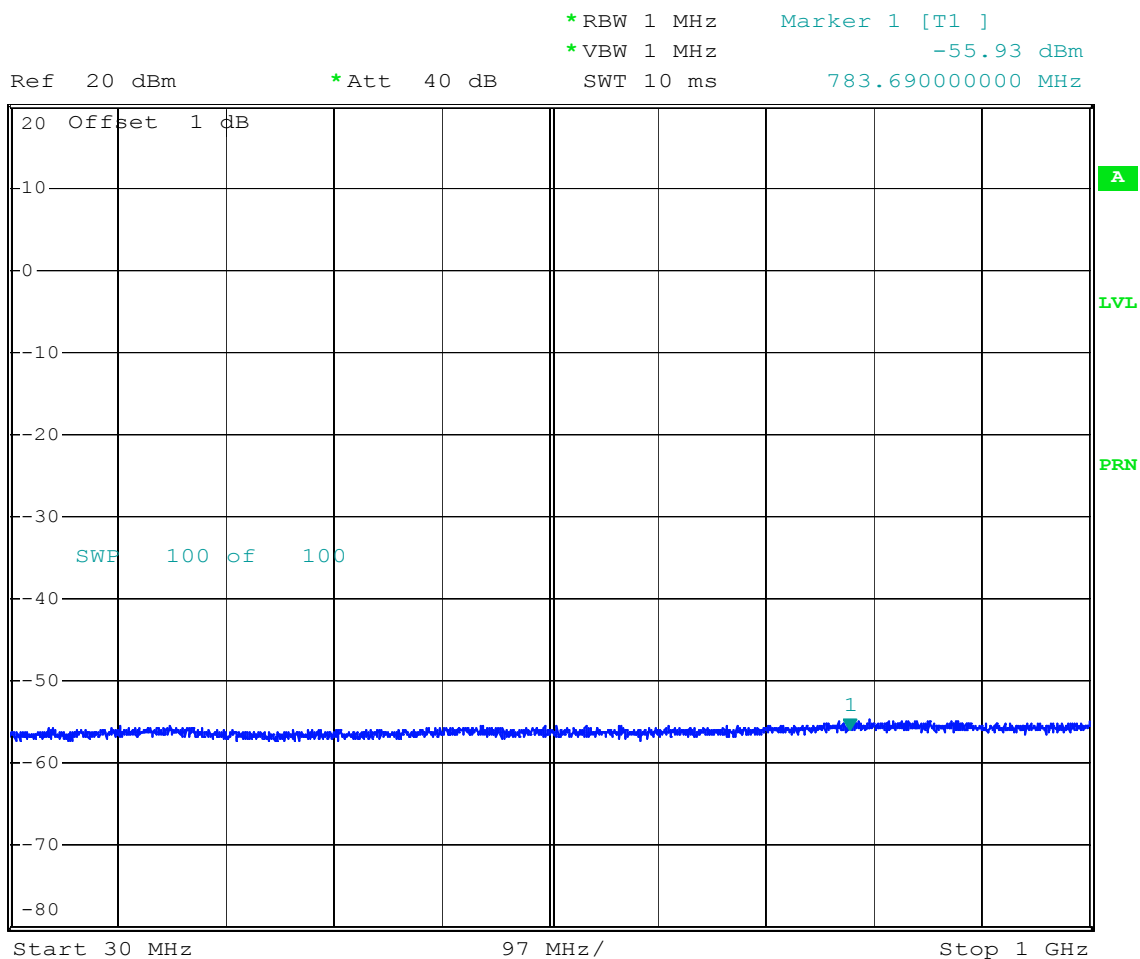
Minimum Power

Frequency MHz	Description	Margin to -27dBm/MHz EIRP limit (maximum antenna gain of 33.4 dBi), dB	Plot #
5500	Scan 5.43 GHz – 5.54 GHz	4.9	5.18
5520	Scan 5.43 GHz – 5.6 GHz (turbo)	2.9	5.19
5700	Scan 5.69 GHz – 5.75 GHz	7.0	5.20
5680	Scan 5.65 GHz – 5.75 GHz (turbo)	5.3	5.21

Plot 5.1



1 SA
AVG

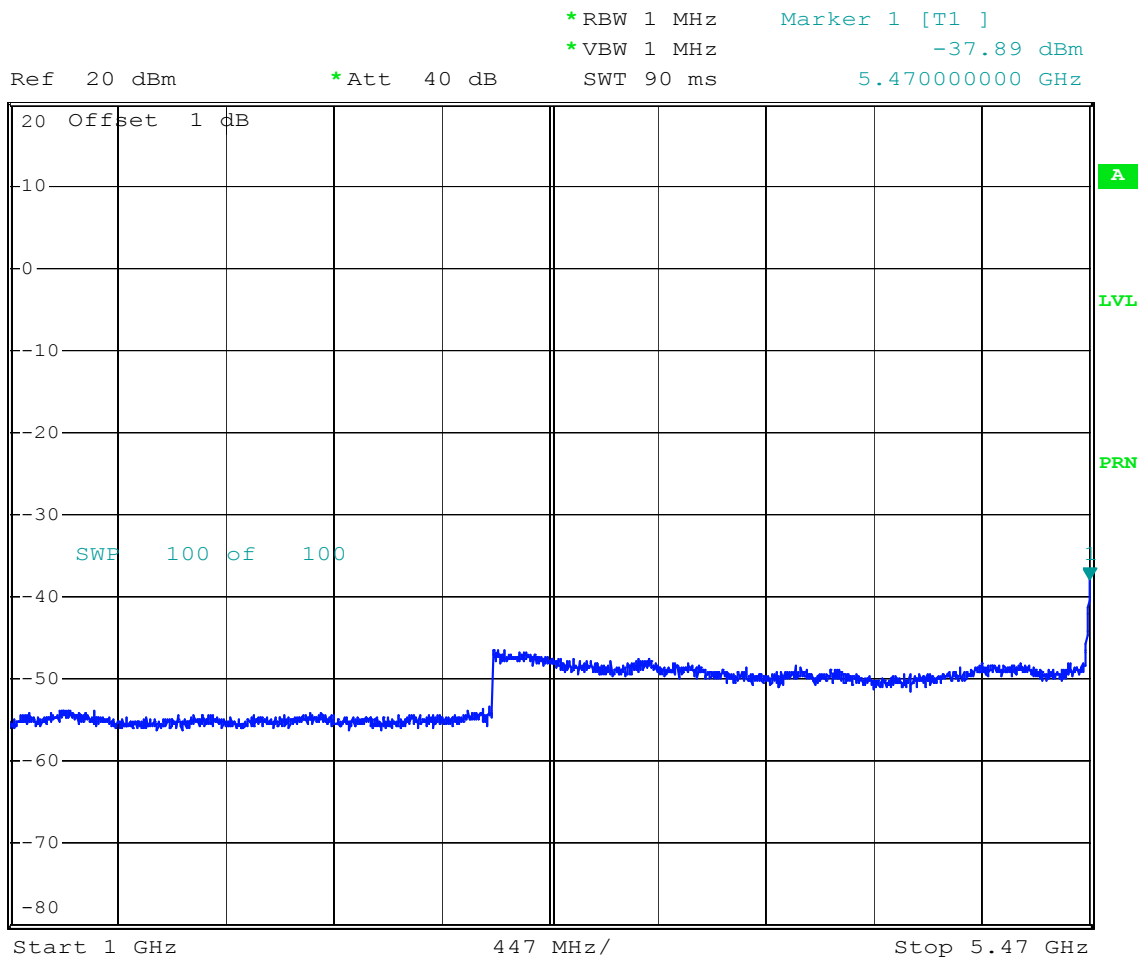


Comment: Out-of-band emissions, 5500 MHz, 6 Mbps
Date: 19.DEC.2005 16:39:50

Plot 5.2



1 SA
AVG

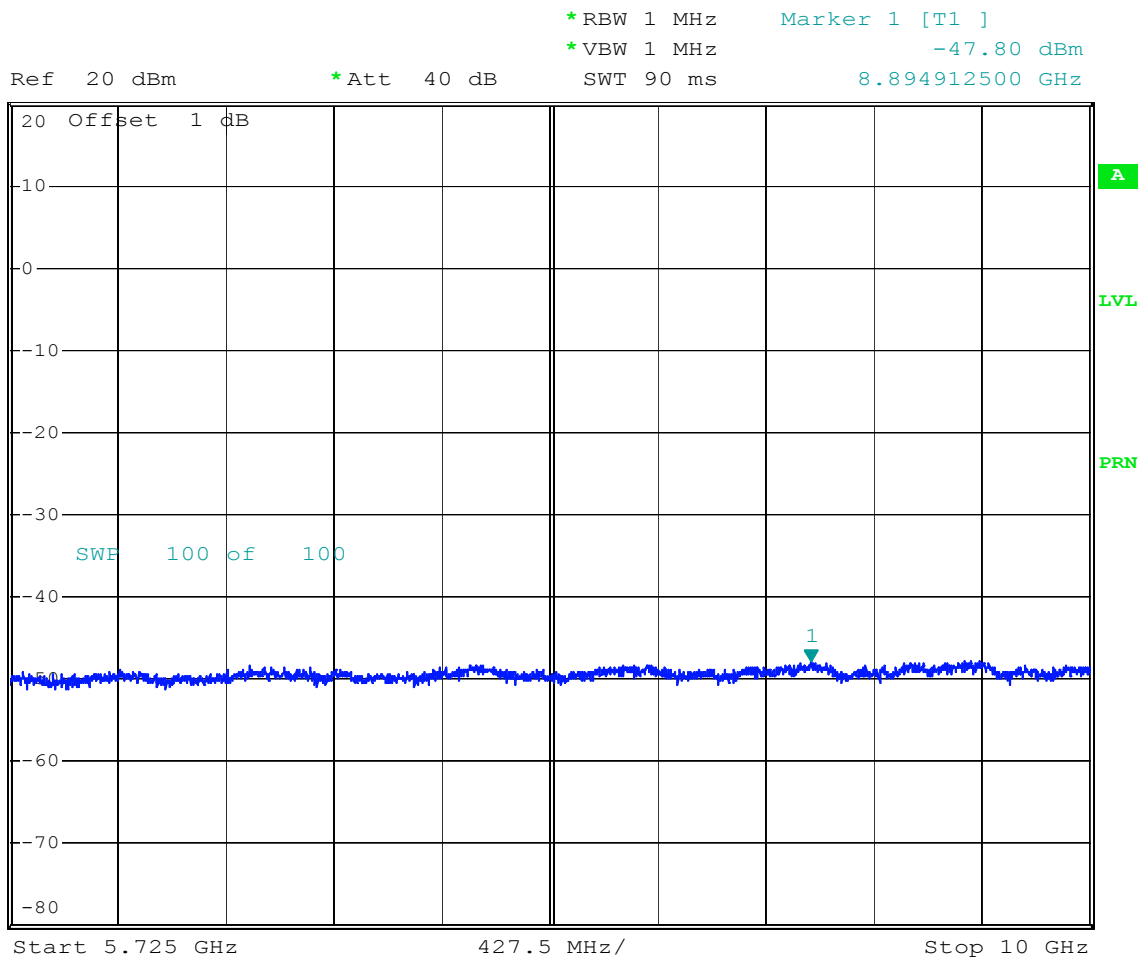


Comment: Out-of-band emissions, 5500 MHz, 6 Mbps
Date: 19.DEC.2005 16:41:32

Plot 5.3



1 SA
AVG

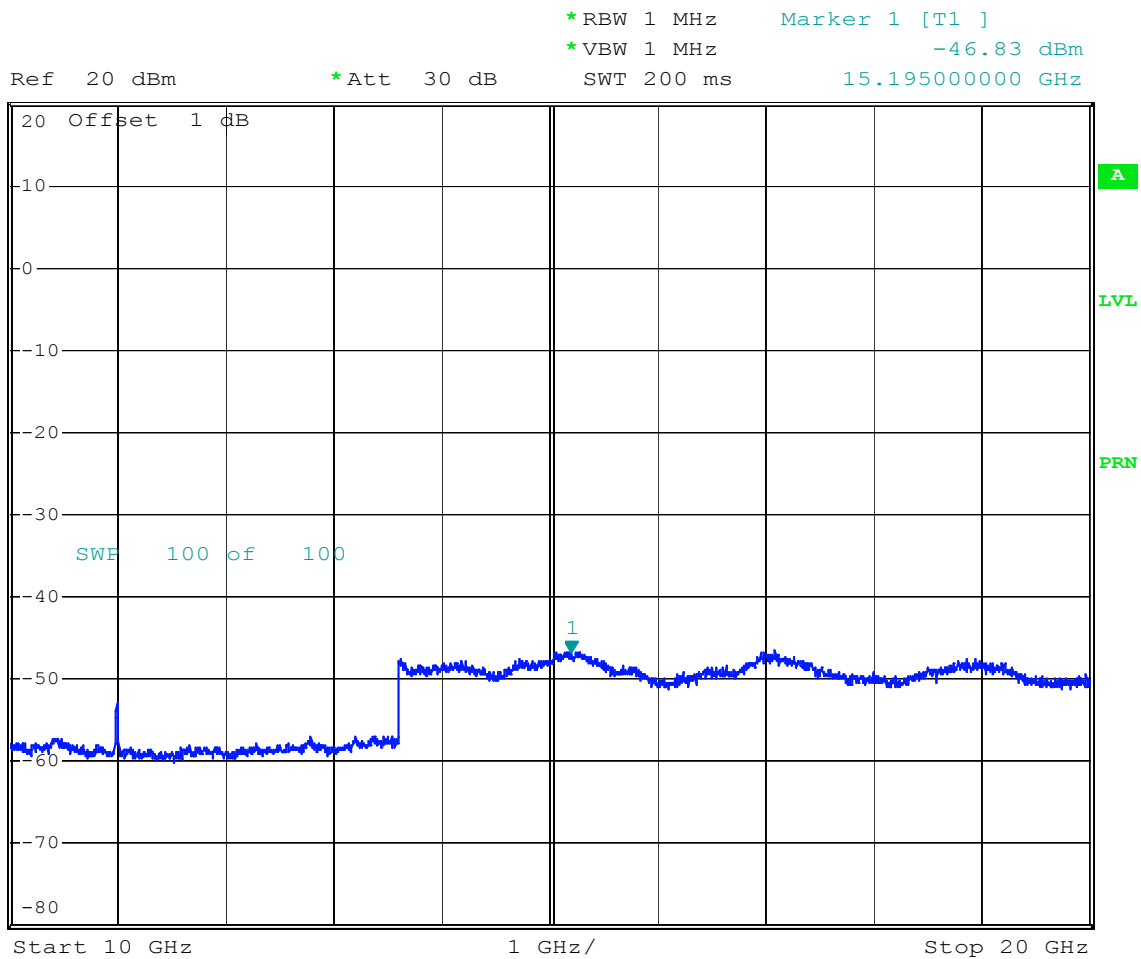


Comment: Out-of-band emissions, 5500 MHz, 6 Mbps
Date: 19.DEC.2005 16:54:24

Plot 5.4



1 SA
AVG

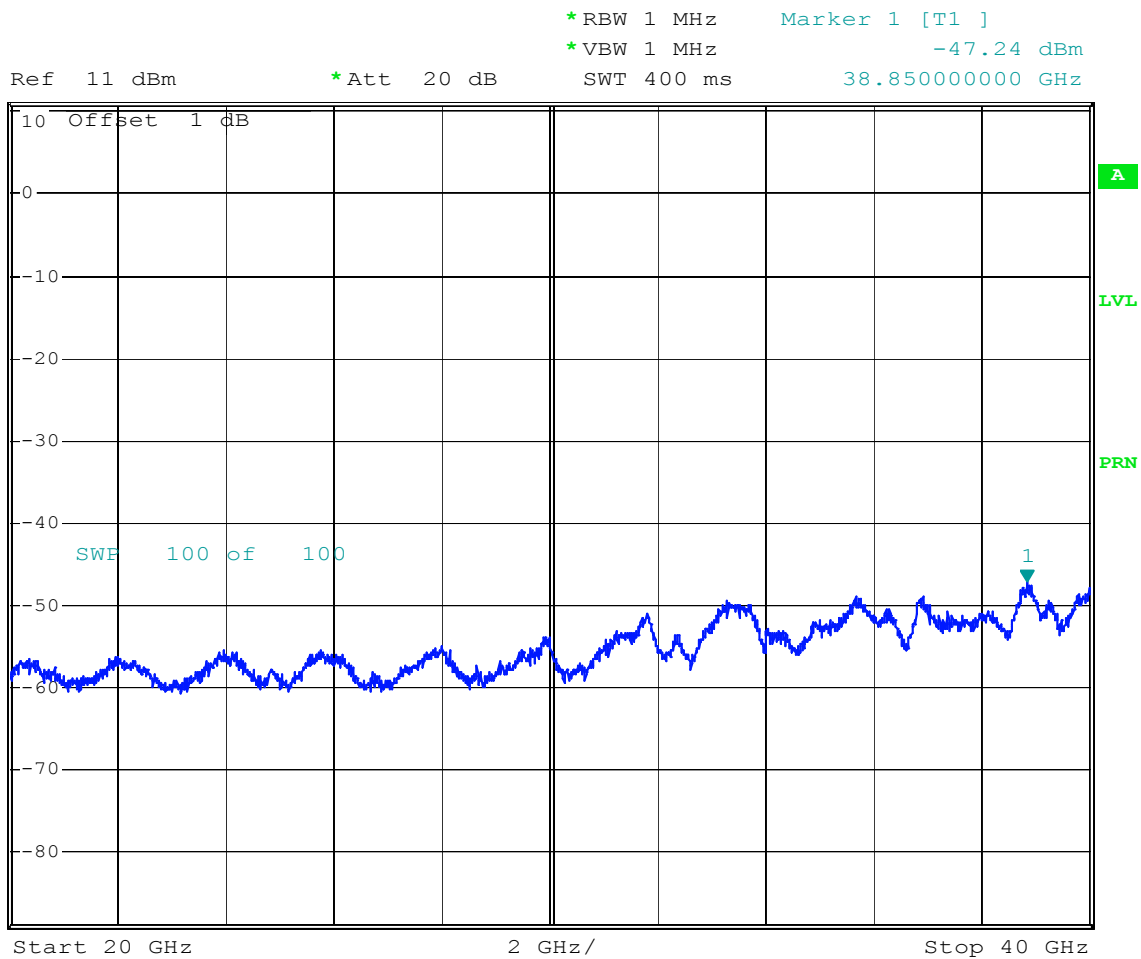


Comment: Out-of-band emissions, 5500 MHz, 6 Mbps
 Date: 19.DEC.2005 16:52:53

Plot 5.5



1 SA
AVG

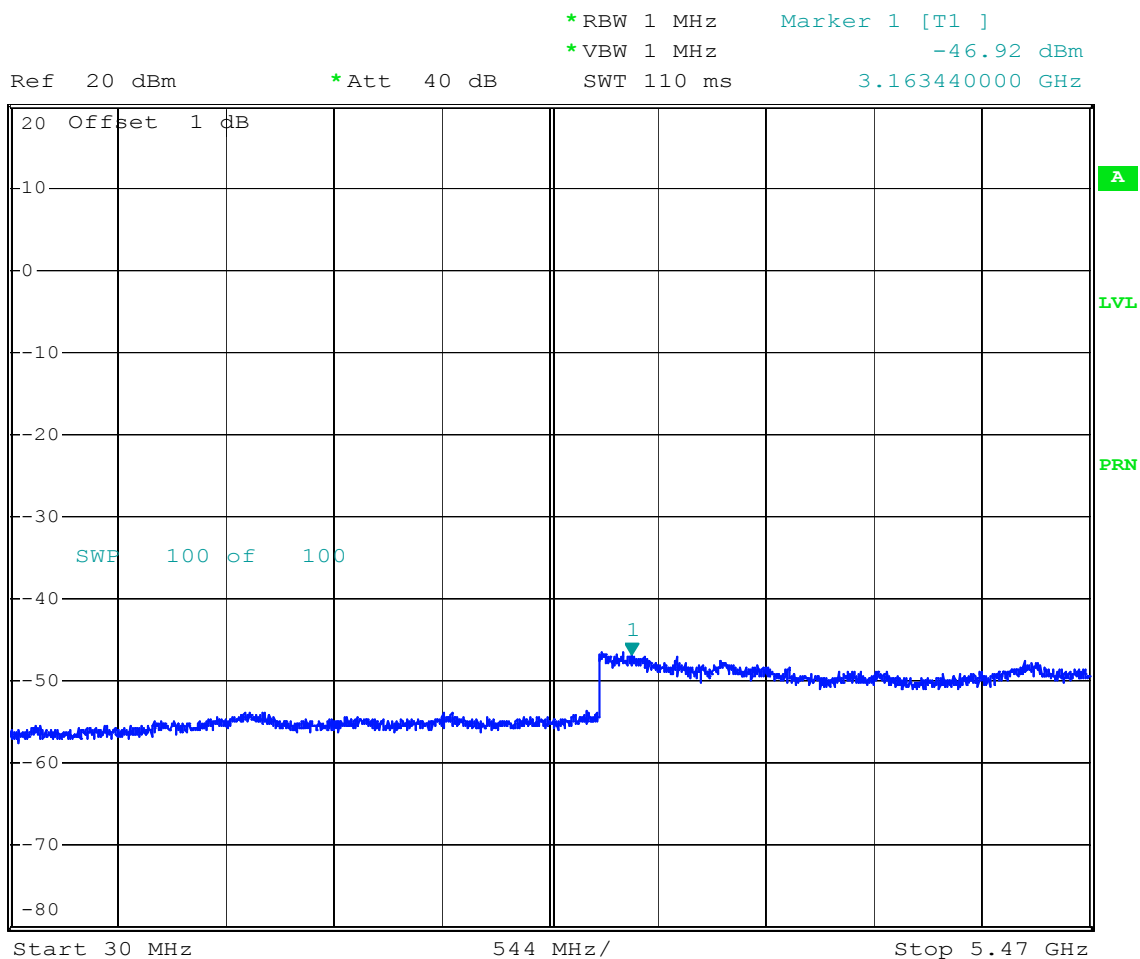


Comment: Out-of-band emissions, 5500 MHz, 6 Mbps
Date: 19.DEC.2005 16:56:26

Plot 5.6



1 SA
AVG

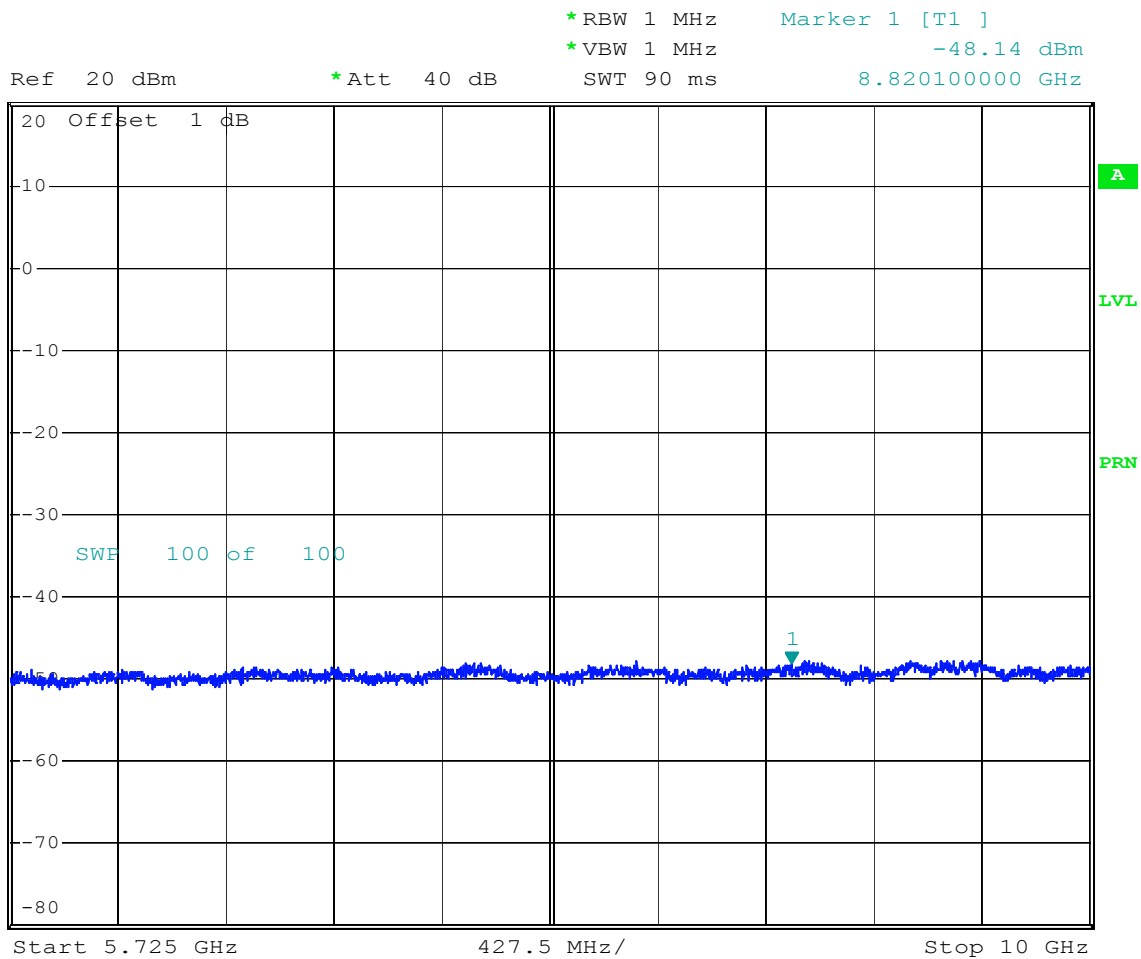


Comment: Out-of-band emissions, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 16:58:21

Plot 5.7



1 SA
AVG

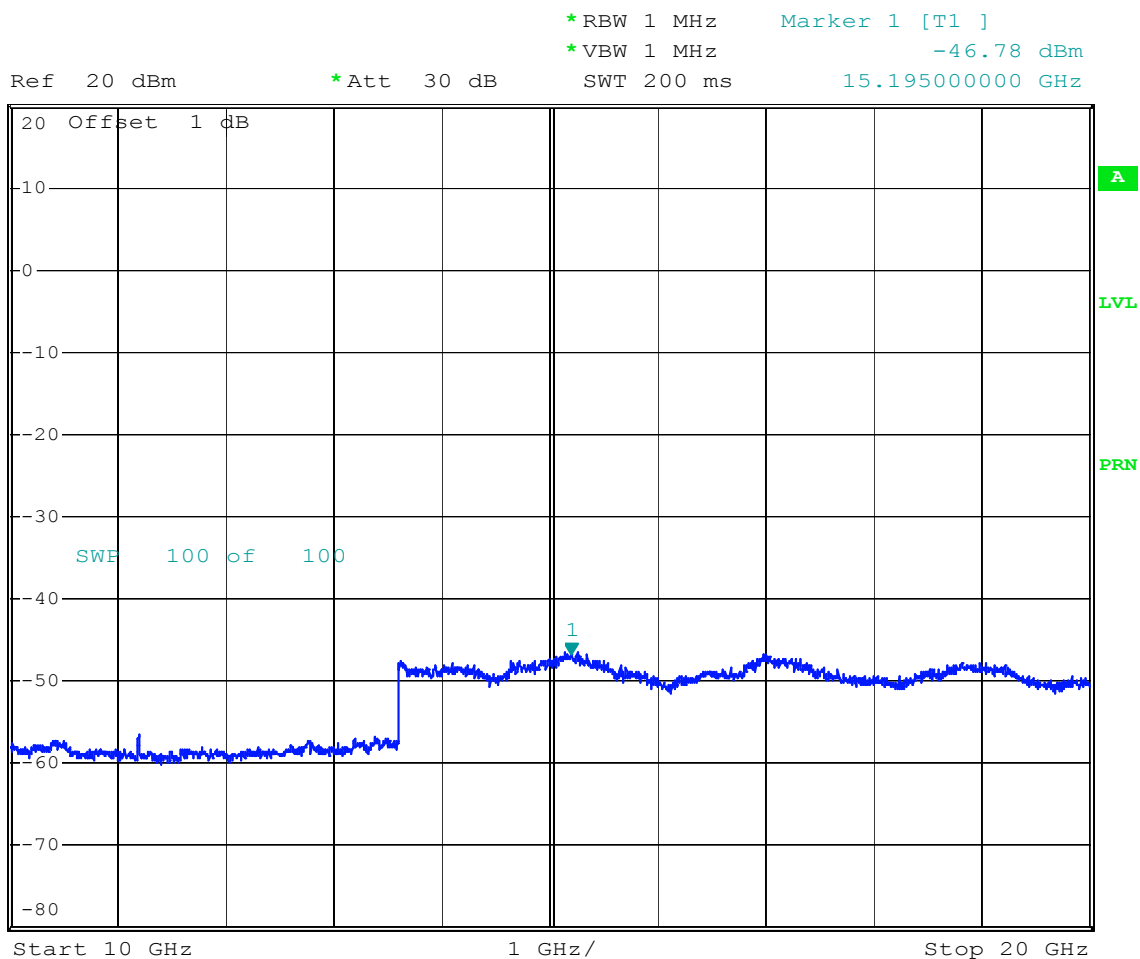


Comment: Out-of-band emissions, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 16:59:20

Plot 5.8



1 SA
AVG

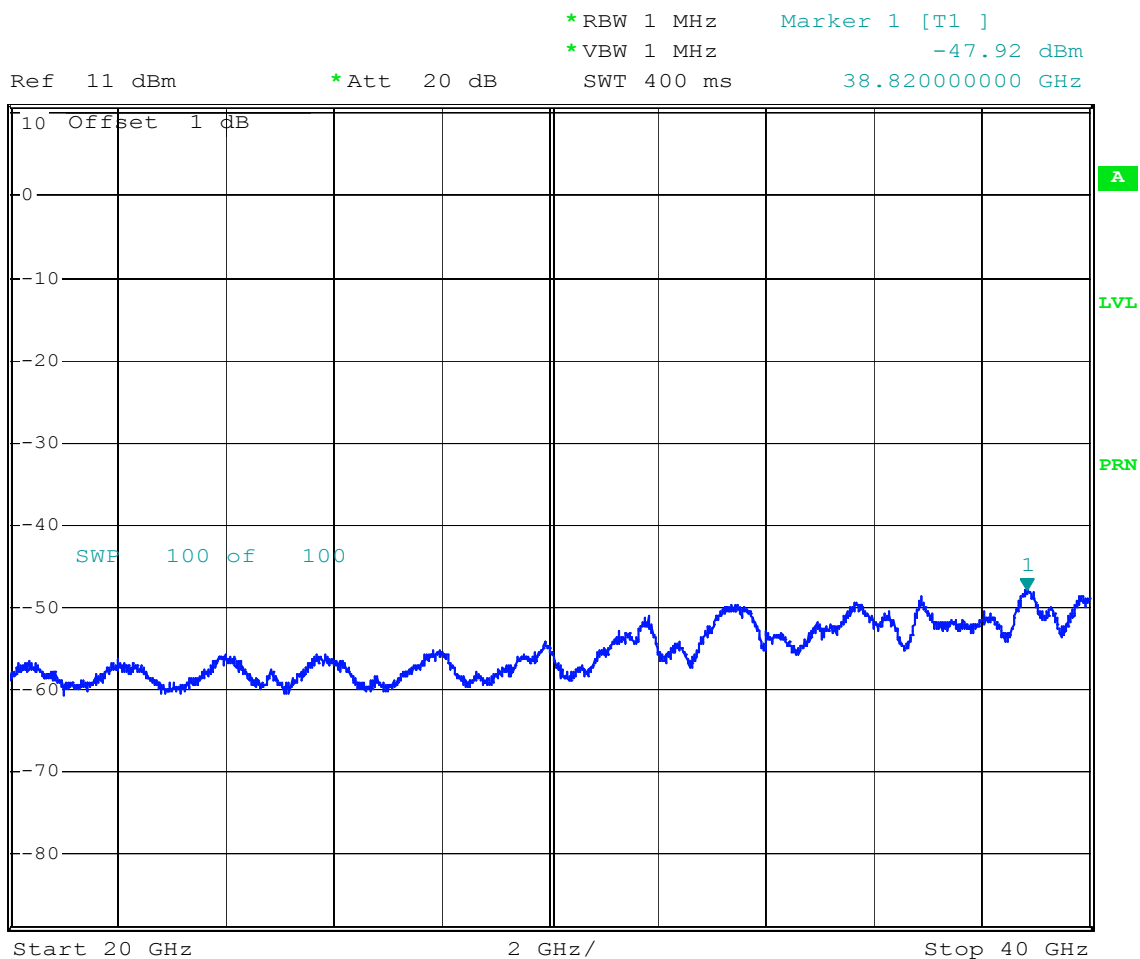


Comment: Out-of-band emissions, 5600 MHz, 6 Mbps
 Date: 19.DEC.2005 17:02:03

Plot 5.9



1 SA
AVG

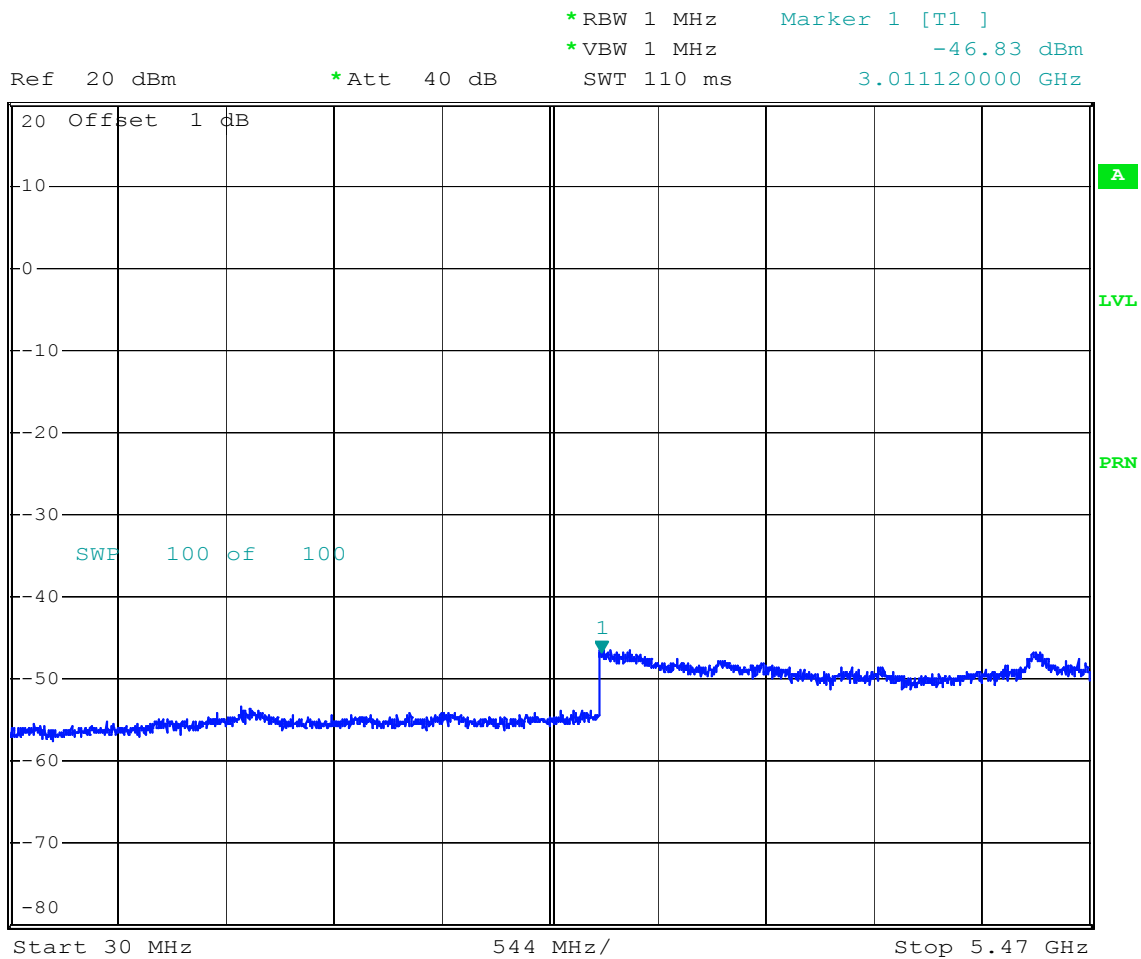


Comment: Out-of-band emissions, 5600 MHz, 6 Mbps
Date: 19.DEC.2005 17:05:56

Plot 5.10



1 SA
AVG

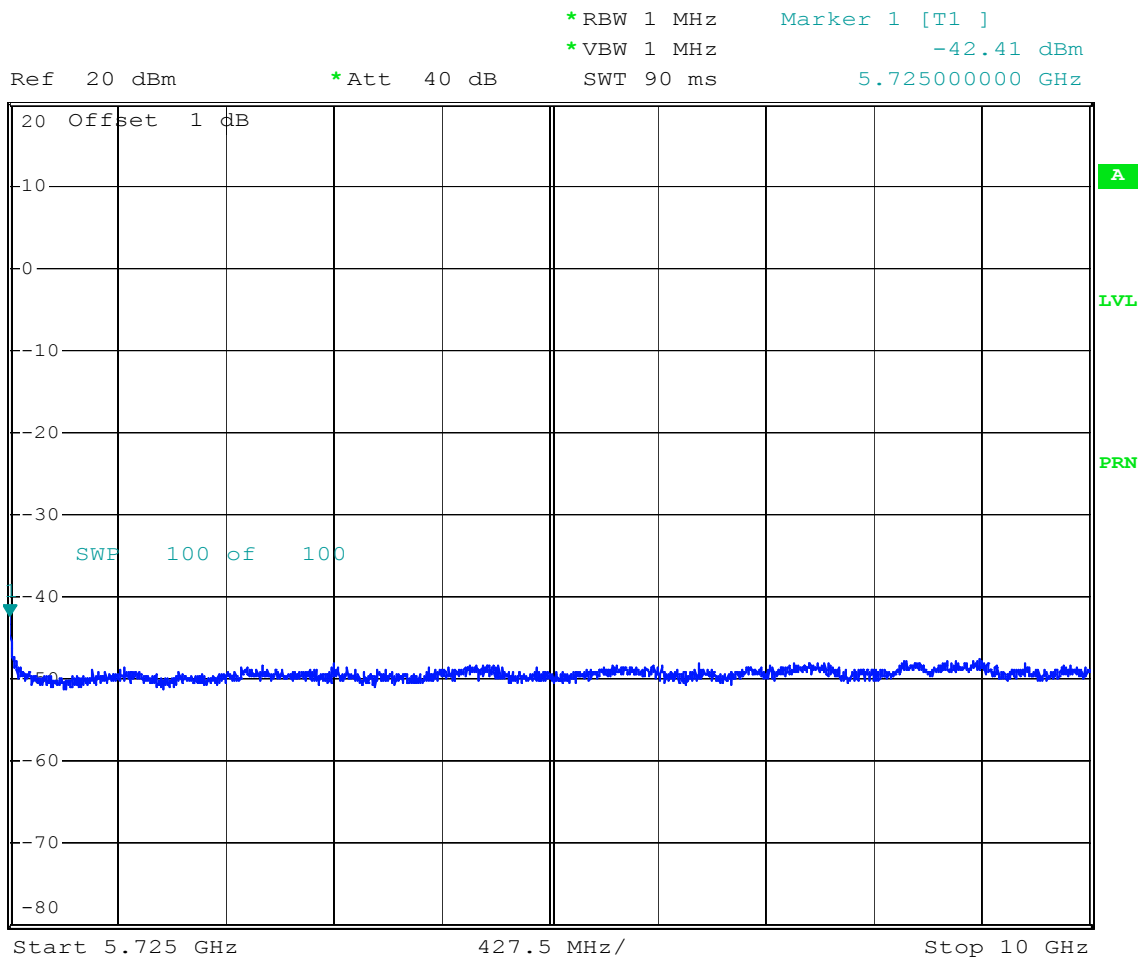


Comment: Out-of-band emissions, 5700 MHz, 6 Mbps
 Date: 19.DEC.2005 17:07:44

Plot 5.11



1 SA
AVG

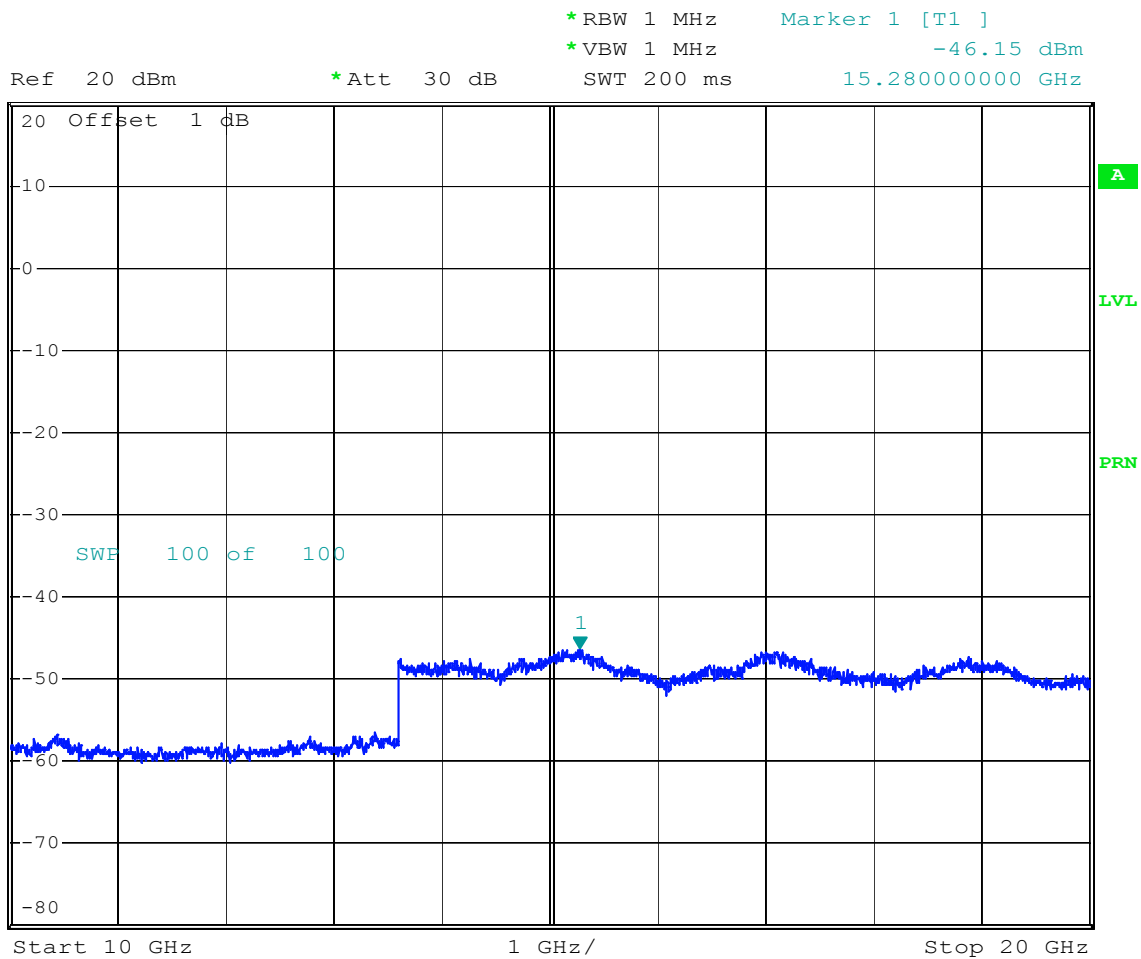


Comment: Out-of-band emissions, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 17:08:56

Plot 5.12



1 SA
AVG

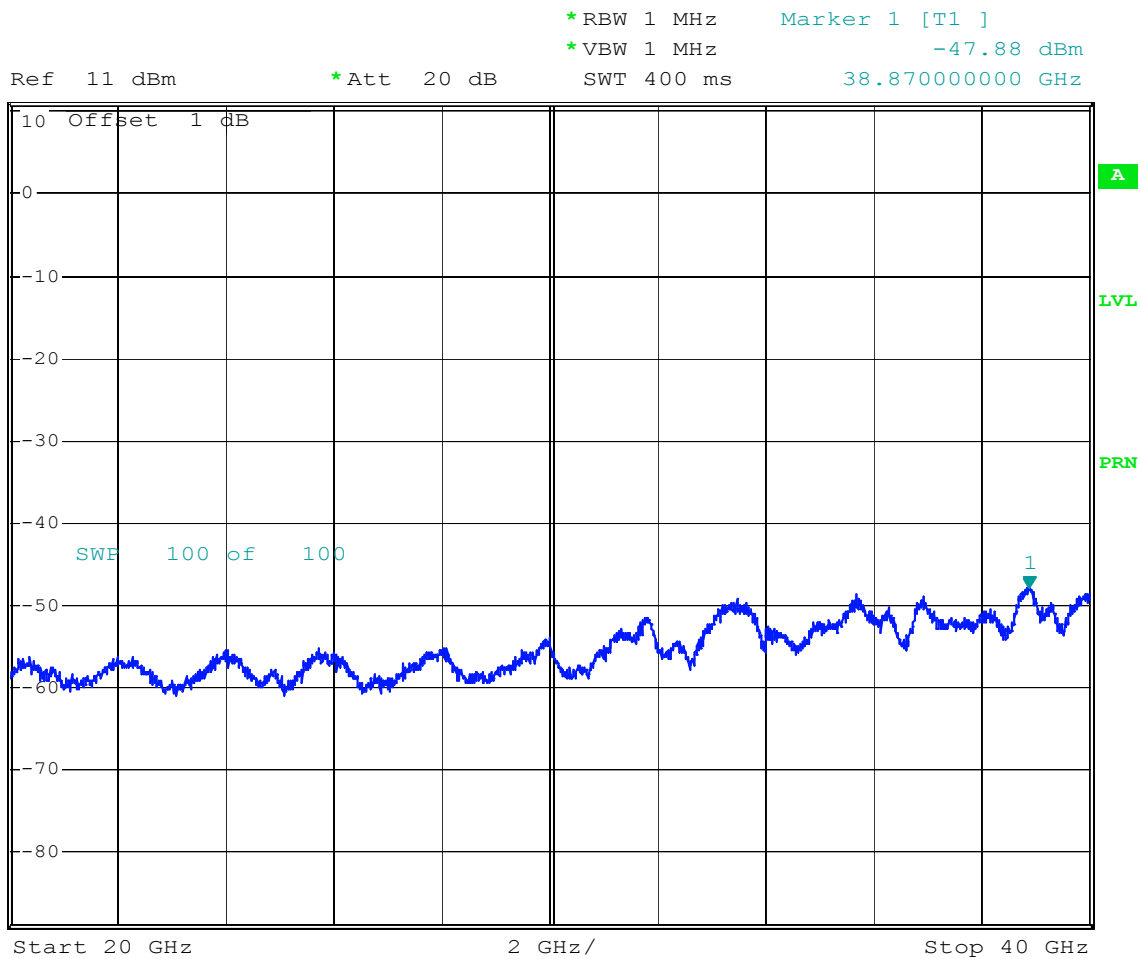


Comment: Out-of-band emissions, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 17:10:21

Plot 5.13

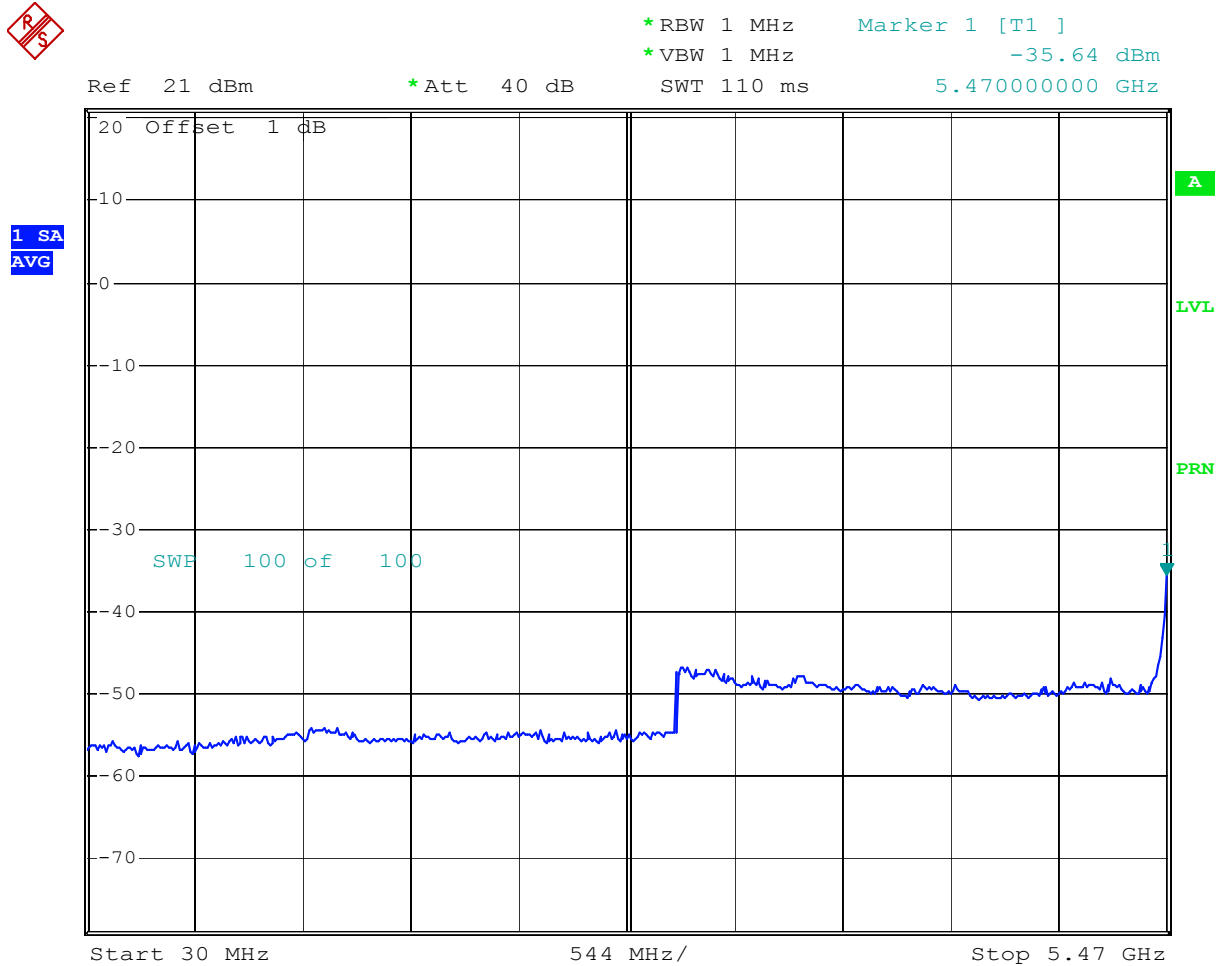


1 SA
AVG



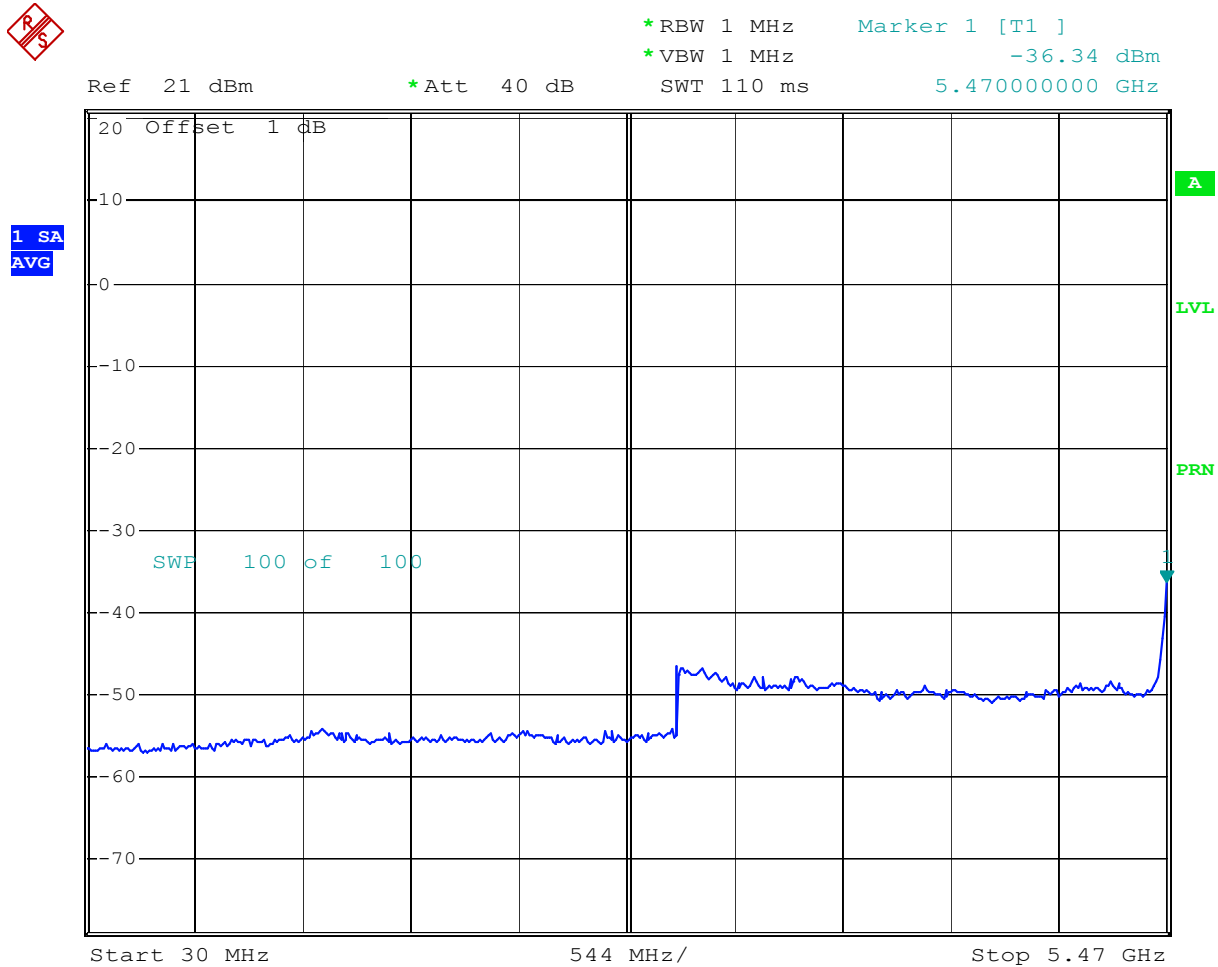
Comment: Out-of-band emissions, 5700 MHz, 6 Mbps
Date: 19.DEC.2005 17:12:01

Plot 5.14



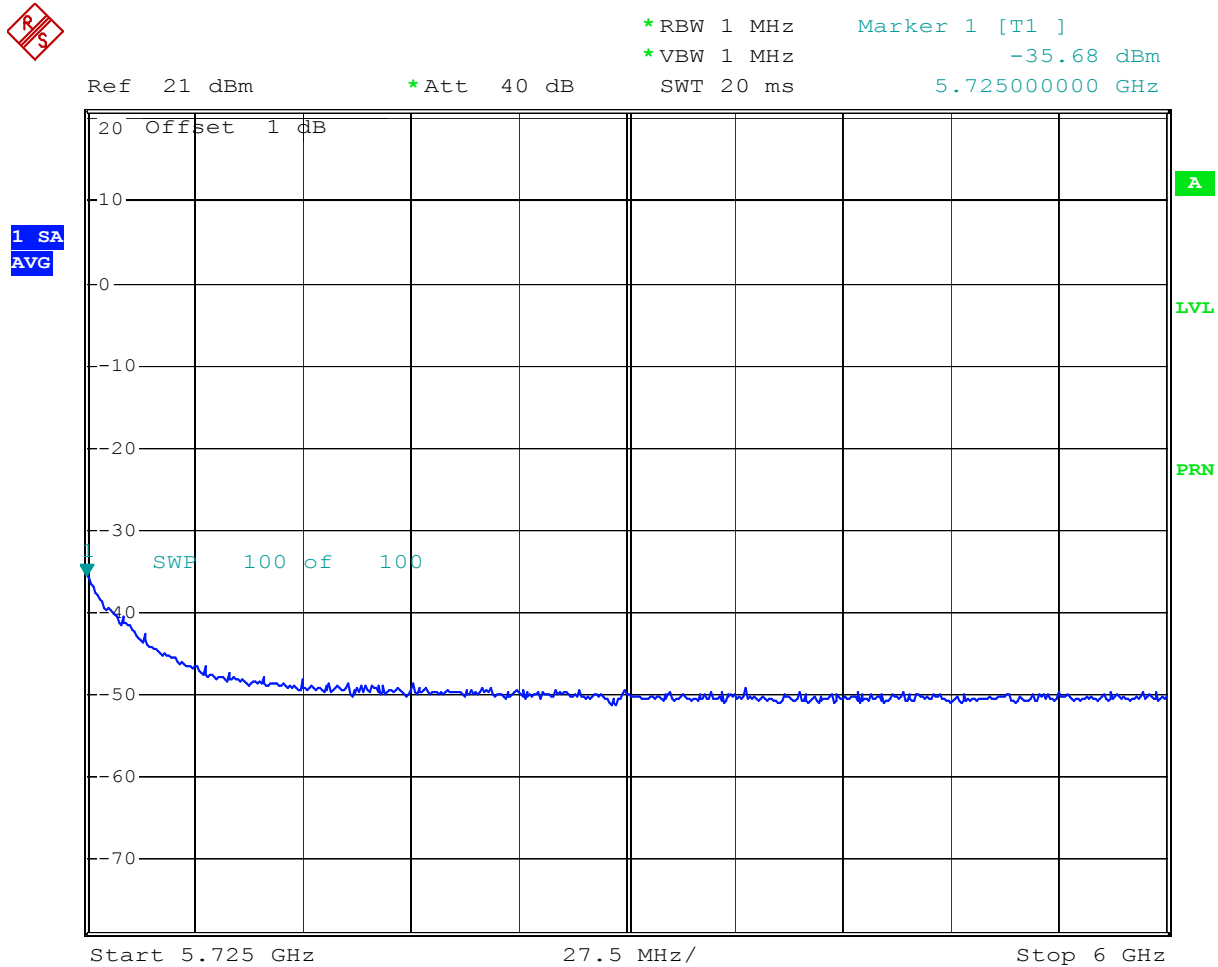
Comment: Out-of-band emissions, 5520 MHz, turbo mode, 72 Mbps
Date: 20.JAN.2006 09:21:55

Plot 5.15



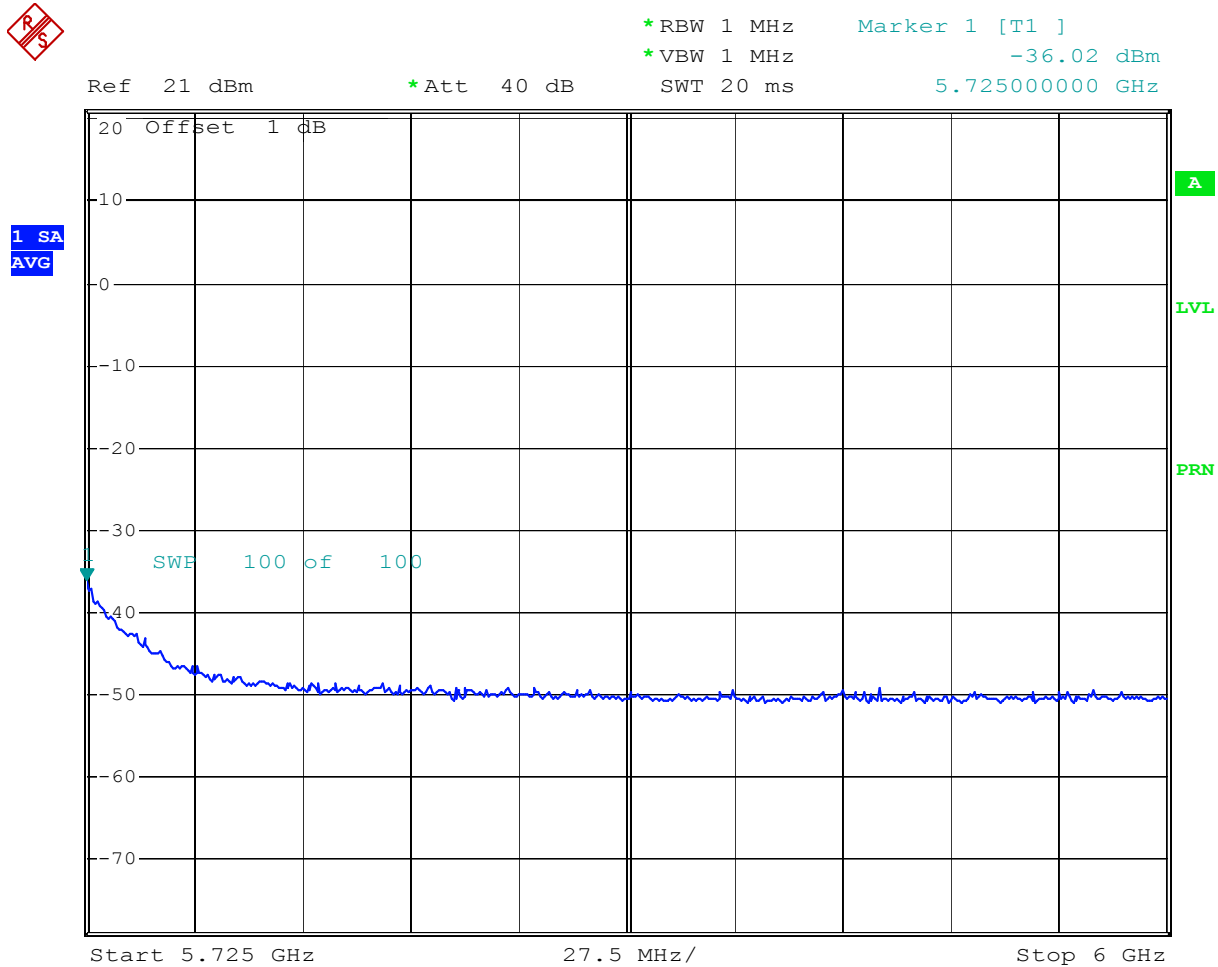
Comment: Out-of-band emissions, 5520 MHz, turbo mode, 108 Mbps
 Date: 20.JAN.2006 09:32:41

Plot 5.16



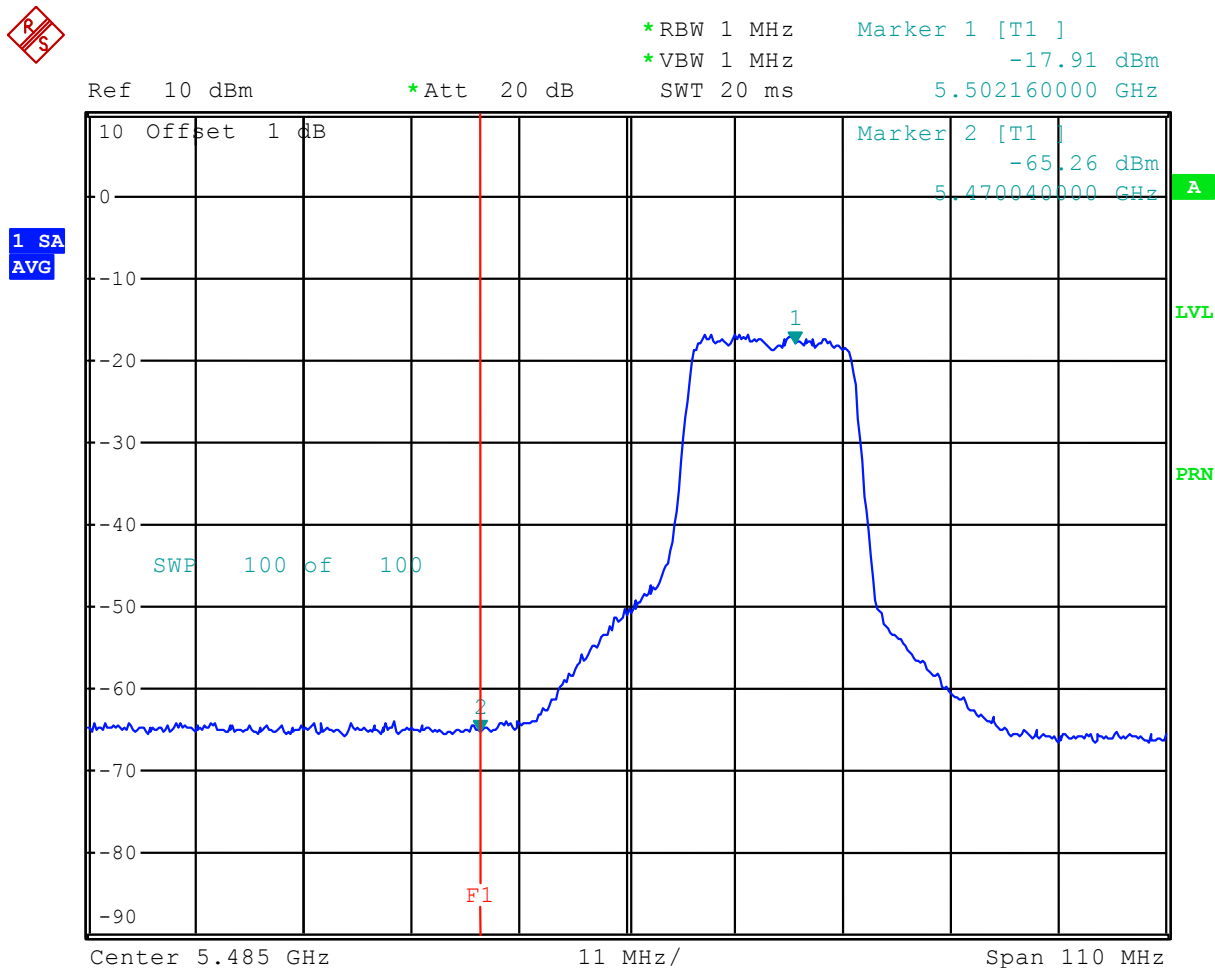
Comment: Out-of-band emissions, 5680 MHz, turbo mode, 72 Mbps
Date: 20.JAN.2006 09:37:28

Plot 5.17



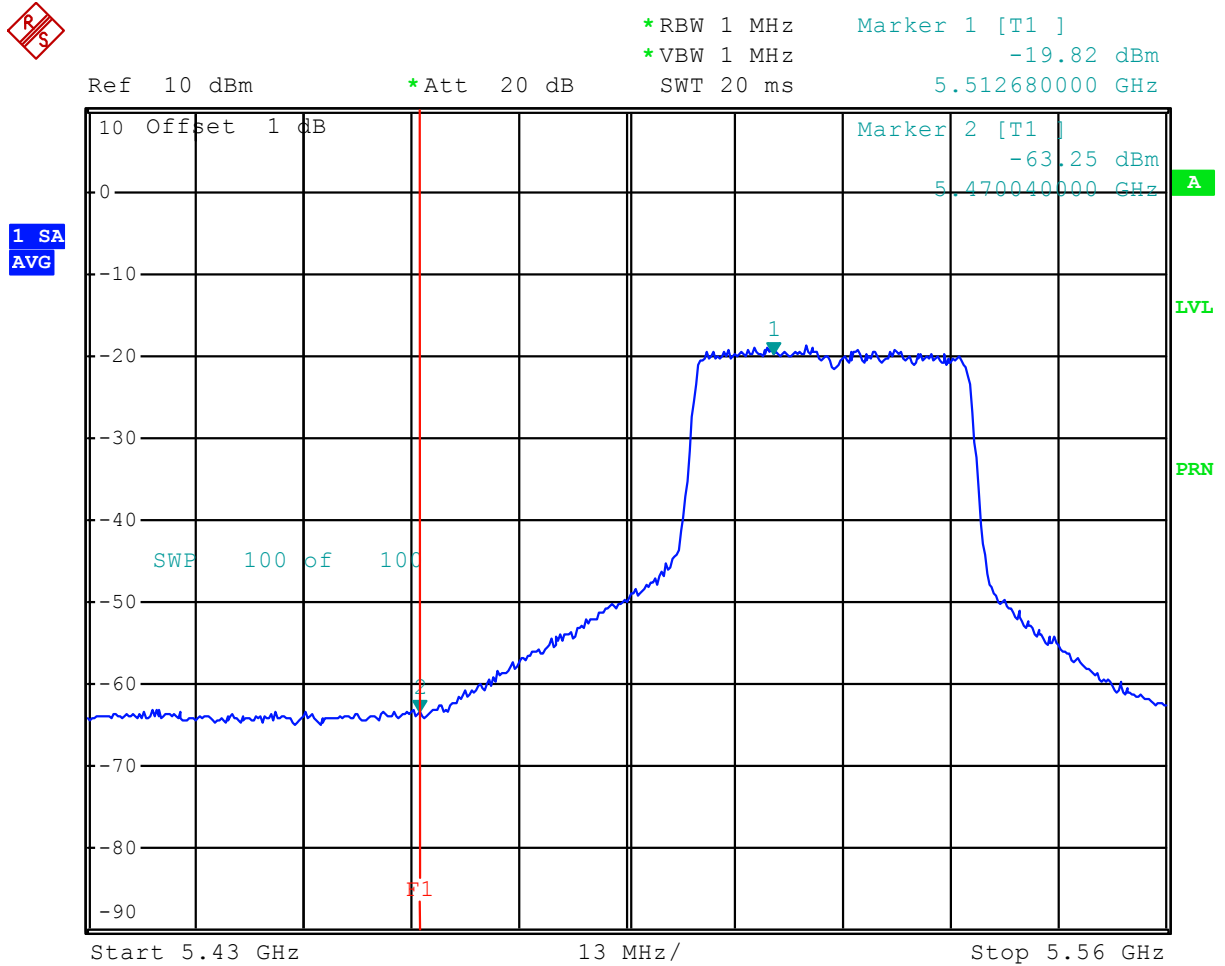
Comment: Out-of-band emissions, 5680 MHz, turbo mode, 108 Mbps
 Date: 20.JAN.2006 09:34:52

Minimum Power Plot 5.18



Comment: Out-of-band emissions, 5500 MHz, 6 Mbps, minimum power
Date: 17.JAN.2006 18:28:41

Minimum Power Plot 5.19

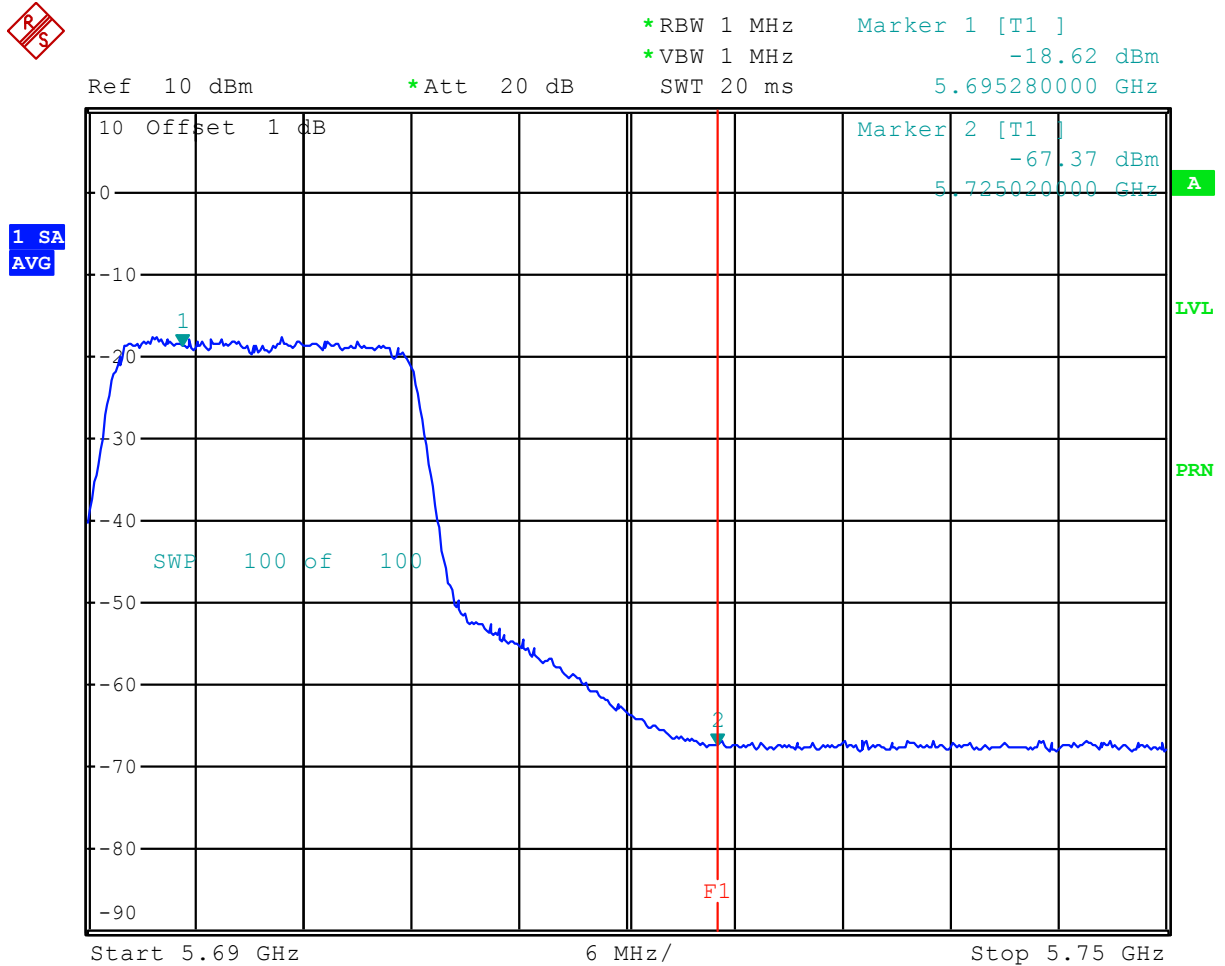


Comment: Out-of-band emissions, 5520 MHz, turbo, 72 Mbps, minimum pow

Comment: er

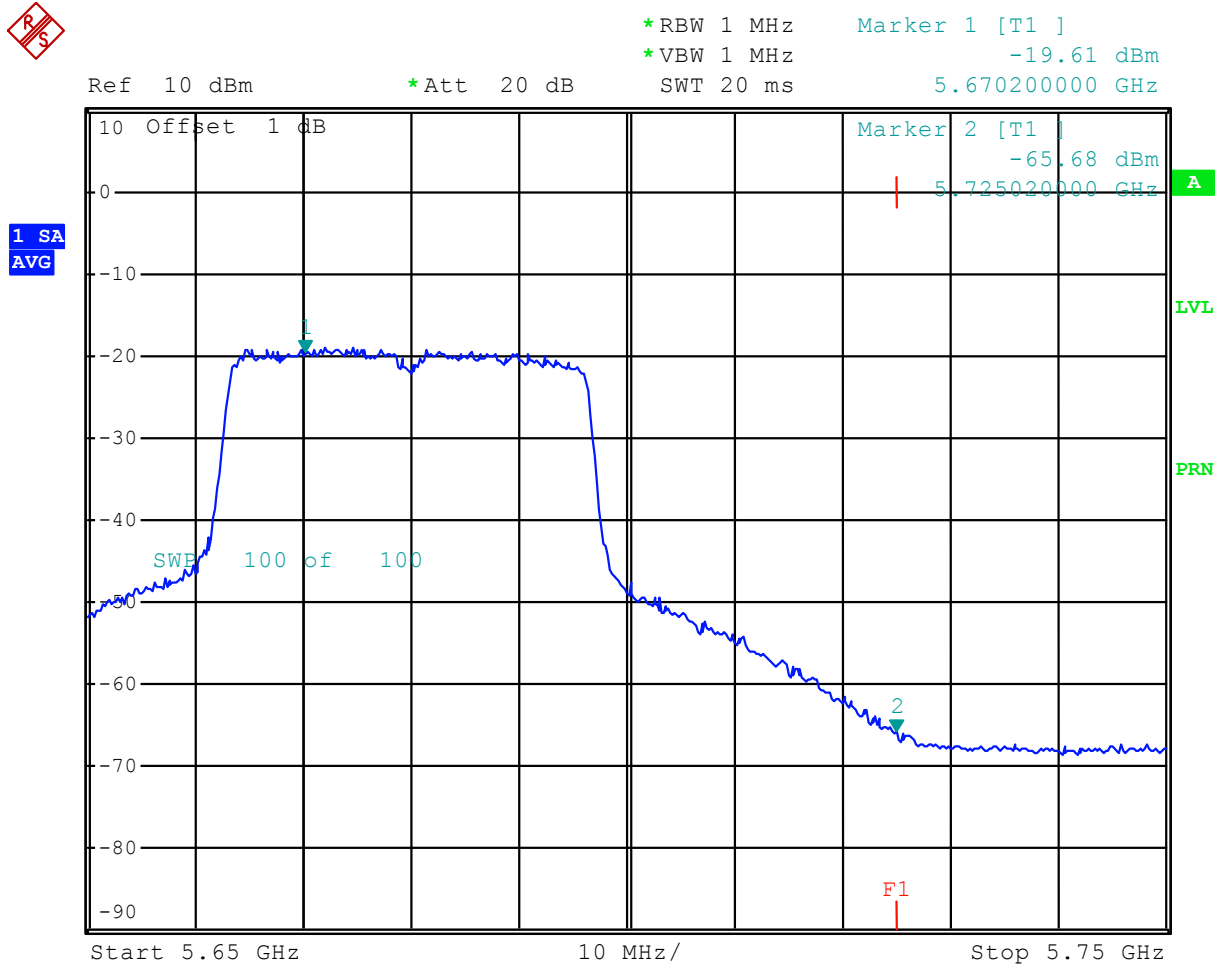
Date: 17.JAN.2006 18:23:57

Minimum Power Plot 5.20



Comment: Out-of-band emissions, 5700 MHz, 6 Mbps, minimum power
Date: 17.JAN.2006 18:15:11

Minimum Power Plot 5.21



Comment: Out-of-band emissions, 5680 MHz, turbo, 72 Mbps, minimum pow

Comment: er

Date: 17.JAN.2006 18:18:38

4.6 Radiated Emissions above 1 GHz FCC Rules: 15.407(b)(3)(7), 15.205, 15.209

Requirement

All emissions outside of the 5.47 –5.725 GHz band shall not exceed an EIRP of –27 dBm/MHz.

Note: Except for emissions in restricted bands, that corresponds to the field strength level of 68.3 dB(μV/m) at 3 m distance when measure with 1 MHz resolution bandwidth.

Emissions in restricted bands shall not exceed 15.209 limits.

Procedure

Radiated emission measurements were performed from 30 MHz to 40,000 MHz. Spectrum Analyzer Resolution Bandwidth is 1 MHz for frequencies above 1000 MHz.

The EUT is placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 m unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance.

Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

Since the EUT passed out-of-band (spurious) antenna conducted emission test, the only radiated emission measurements in the restricted bands were performed.

Field Strength Calculation

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength in dB(μV/m)

RA = Receiver Amplitude (including preamplifier) in dB(μV)

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB(1/m)

AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antenna factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to Intertek corresponding level in μV/m.

RA = 52.0 dB(μV); CF = 1.6 dB; AF = 7.4 dB(1/m); AG = 29.0 dB

FS = 52 + 7.4 + 1.6 - 29 = 32 dB(μV/m)

Level in μV/m = Common Antilogarithm [(32 dB(μV/m)/20)] = 39.8 μV/m

Result

The data listed on the following tables list the significant emission frequencies, the limit and the margin of compliance. The EUT passed by 3.1 dB.

The data listed on the following tables were the only emissions found in the investigation up to 40 GHz. No other emissions were found above the system noise floor, which is at least 6 dB below the regulatory limit.

No emissions from the fundamental transmit frequencies were detected in the restricted bands listed in FCC section 15.205.

All radiated spurious emissions in the restricted bands, including the emissions in the adjacent channels, are below the limits listed in FCC section 15.205.



Internal Antenna

EUT: AP 4000		Test Date: January 11, 2006		Standard		FCC 15.407(b)(3)(6)(7)			
Test Mode: Tx,		Engineer: AK.		Test Distance		3		meter	
Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant. Pol. H/V	Ant. Factor dB(1/m)	CF dB	DCF dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB

5.5 GHz, 5.52 GHz

11000	37.0	Peak	V	38.5	-12.4	0	63.1	74	-10.9
11000	24.8	Ave.	V	38.5	-12.4	0	50.9	54	-3.1
11040	36.5	Peak	V	38.5	-12.5	0	62.5	74	-11.5
11040	24.3	Ave.	V	38.5	-12.5	0	50.3	54	-3.7
16500	27.1	Ave.	V/H	40.0	-8.7	0	58.4	68.3	-9.9
16560	26.7	Ave.	V/H	40.0	-7.5	0	59.2	68.3	-9.1
22000	54.2	Peak	V/H	40.4	-47.8	0	46.8	74	-27.2
22000	39.6	Ave.	V/H	40.4	-47.8	0	32.2	54	-21.8
22080	54.8	Peak	V/H	40.4	-47.8	0	47.4	74	-26.6
22080	40.2	Ave.	V/H	40.4	-47.8	0	32.8	54	-21.2
27500	41.3	Ave.	V/H	40.4	-45.9	0	35.8	68.3	-32.5
27600	41.6	Ave.	V/H	40.4	-45.0	0	37.0	68.3	-31.3
33000	42.3	Ave.	V/H	43.5	-32.3	0	53.5	68.3	-14.8
33120	43.2	Ave.	V/H	43.5	-30.5	0	56.2	68.3	-12.1
38500	42.8	Ave.	V/H	44.8	-27.6	0	60.0	68.3	-8.3
38640	43.0	Ave.	V/H	44.8	-25.8	0	62.0	68.3	-6.3

5.6 GHz

11200	36.4	Peak	V	38.5	-12.0	0	62.9	74	-11.1
11200	24.1	Ave.	V	38.5	-12.0	0	50.6	54	-3.4
16800	27.1	Ave.	V/H	40.0	-10.4	0	56.7	68.3	-11.6
22400	54.4	Peak	V/H	40.4	-47.4	0	47.4	74	-26.6
22400	39.9	Ave.	V/H	40.4	-47.4	0	32.9	54	-21.1
28000	41.3	Ave.	V/H	40.4	-46.5	0	35.2	68.3	-33.1
33600	44.0	Ave.	V/H	43.5	-33.5	0	54.0	68.3	-14.3
39200	43.6	Ave.	V/H	44.8	-26.2	0	62.2	68.3	-6.1

5.68 GHz, 5.7 GHz

11360	35.7	Peak	V	38.5	-13.3	0	60.9	74	-13.1
11360	23.9	Ave.	V	38.5	-13.3	0	49.1	54	-4.9
11400	36.3	Peak	V	38.5	-13	0	61.8	74	-12.2
11400	24.1	Ave.	V	38.5	-13	0	49.6	54	-4.4
17040	28.6	Ave.	V/H	40.0	-6.8	0	61.8	68.3	-6.5
17100	28.5	Ave.	V/H	40.0	-6.5	0	62.0	68.3	-6.3
22720	54.4	Peak	V/H	40.4	-45.2	0	49.6	74	-24.4
22720	40.5	Ave.	V/H	40.4	-45.2	0	35.7	54	-18.3
22800	55.2	Peak	V/H	40.6	-44.3	0	51.5	74	-22.5
22800	41.2	Ave.	V/H	40.6	-44.3	0	37.5	54	-16.5
28400	41.5	Ave.	V/H	40.6	-46.5	0	35.6	68.3	-32.7
28500	41.6	Ave.	V/H	40.6	-43.7	0	38.5	68.3	-29.8
34080	43.2	Ave.	V/H	43.5	-30.4	0	56.3	68.3	-12.0
34200	43.7	Ave.	V/H	43.5	-27.6	0	59.6	68.3	-8.7
39760	43.9	Ave.	V/H	43.8	-26.2	0	61.5	68.3	-6.8
39900	44.3	Ave.	V/H	44.0	-24.6	0	63.7	68.3	-4.6

Only the second harmonic was detected above the noise floor. All other emissions are the noise floor which at least 4 dB below the limit



Omni Directional Antenna, model: 5054-OA-10

EUT: AP 4000		Test Date: January 11, 2006		Standard		FCC 15.407(b)(3)(6)(7)			
Test Mode: Tx,		Engineer: AK.		Test Distance		3		meter	
Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant. Pol. H/V	Ant. Factor dB(1/m)	CF dB	DCF dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB

5.5 GHz, 5.52 GHz

11000	36.6	Peak	V	38.5	-12.4	0	62.7	74	-11.3
11000	24.0	Ave.	V	38.5	-12.4	0	50.1	54	-3.9
11040	36.1	Peak	V	38.5	-12.5	0	62.1	74	-11.9
11040	23.8	Ave.	V	38.5	-12.5	0	49.8	54	-4.2
16500	27.1	Ave.	V/H	40.0	-8.7	0	58.4	68.3	-9.9
16560	26.7	Ave.	V/H	40.0	-7.5	0	59.2	68.3	-9.1
22000	54.2	Peak	V/H	40.4	-47.8	0	46.8	74	-27.2
22000	39.6	Ave.	V/H	40.4	-47.8	0	32.2	54	-21.8
22080	54.8	Peak	V/H	40.4	-47.8	0	47.4	74	-26.6
22080	40.2	Ave.	V/H	40.4	-47.8	0	32.8	54	-21.2
27500	41.3	Ave.	V/H	40.4	-45.9	0	35.8	68.3	-32.5
27600	41.6	Ave.	V/H	40.4	-45.0	0	37.0	68.3	-31.3
33000	42.3	Ave.	V/H	43.5	-32.3	0	53.5	68.3	-14.8
33120	43.2	Ave.	V/H	43.5	-30.5	0	56.2	68.3	-12.1
38500	42.8	Ave.	V/H	44.8	-27.6	0	60.0	68.3	-8.3
38640	43.0	Ave.	V/H	44.8	-25.8	0	62.0	68.3	-6.3

5.6 GHz

11200	35.9	Peak	V	38.5	-12.0	0	62.4	74	-11.6
11200	23.7	Ave.	V	38.5	-12.0	0	50.2	54	-3.8
16800	27.1	Ave.	V/H	40.0	-10.4	0	56.7	68.3	-11.6
22400	54.4	Peak	V/H	40.4	-47.4	0	47.4	74	-26.6
22400	39.9	Ave.	V/H	40.4	-47.4	0	32.9	54	-21.1
28000	41.3	Ave.	V/H	40.4	-46.5	0	35.2	68.3	-33.1
33600	44.0	Ave.	V/H	43.5	-33.5	0	54.0	68.3	-14.3
39200	43.6	Ave.	V/H	44.8	-26.2	0	62.2	68.3	-6.1

5.68 GHz, 5.7 GHz

11360	36.4	Peak	V	38.5	-13.3	0	61.6	74	-12.4
11360	24.1	Ave.	V	38.5	-13.3	0	49.3	54	-4.7
11400	36.1	Peak	V	38.5	-13.0	0	61.6	74	-12.4
11400	23.8	Ave.	V	38.5	-13.0	0	49.3	54	-4.7
17040	28.6	Ave.	V/H	40.0	-6.8	0	61.8	68.3	-6.5
17100	28.5	Ave.	V/H	40.0	-6.5	0	62.0	68.3	-6.3
22720	54.4	Peak	V/H	40.4	-45.2	0	49.6	74	-24.4
22720	40.5	Ave.	V/H	40.4	-45.2	0	35.7	54	-18.3
22800	55.2	Peak	V/H	40.6	-44.3	0	51.5	74	-22.5
22800	41.2	Ave.	V/H	40.6	-44.3	0	37.5	54	-16.5
28400	41.5	Ave.	V/H	40.6	-46.5	0	35.6	68.3	-32.7
28500	41.6	Ave.	V/H	40.6	-43.7	0	38.5	68.3	-29.8
34080	43.2	Ave.	V/H	43.5	-30.4	0	56.3	68.3	-12.0
34200	43.7	Ave.	V/H	43.5	-27.6	0	59.6	68.3	-8.7
39760	43.9	Ave.	V/H	43.8	-26.2	0	61.5	68.3	-6.8
39900	44.3	Ave.	V/H	44.0	-24.6	0	63.7	68.3	-4.6

Only the second harmonic was detected above the noise floor. All other emissions are the noise floor which at least 4 dB below the limit

Sector Antenna, model: 5054-SA60-17

EUT: AP 4000		Test Date: January 11, 2006		Standard		FCC 15.407(b)(3)(6)(7)			
Test Mode: Tx,		Engineer: AK.		Test Distance		3		meter	
Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant. Pol. H/V	Ant. Factor dB(1/m)	CF dB	DCF dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB

5.5 GHz, 5.52 GHz

11000	36.0	Peak	V	38.5	-12.4	0	62.1	74	-11.9
11000	23.4	Ave.	V	38.5	-12.4	0	49.5	54	-4.5
11040	36.3	Peak	V	38.5	-12.5	0	62.3	74	-11.7
11040	23.2	Ave.	V	38.5	-12.5	0	49.2	54	-4.8
16500	27.1	Ave.	V/H	40.0	-8.7	0	58.4	68.3	-9.9
16560	26.7	Ave.	V/H	40.0	-7.5	0	59.2	68.3	-9.1
22000	54.2	Peak	V/H	40.4	-47.8	0	46.8	74	-27.2
22000	39.6	Ave.	V/H	40.4	-47.8	0	32.2	54	-21.8
22080	54.8	Peak	V/H	40.4	-47.8	0	47.4	74	-26.6
22080	40.2	Ave.	V/H	40.4	-47.8	0	32.8	54	-21.2
27500	41.3	Ave.	V/H	40.4	-45.9	0	35.8	68.3	-32.5
27600	41.6	Ave.	V/H	40.4	-45.0	0	37.0	68.3	-31.3
33000	42.3	Ave.	V/H	43.5	-32.3	0	53.5	68.3	-14.8
33120	43.2	Ave.	V/H	43.5	-30.5	0	56.2	68.3	-12.1
38500	42.8	Ave.	V/H	44.8	-27.6	0	60.0	68.3	-8.3
38640	43.0	Ave.	V/H	44.8	-25.8	0	62.0	68.3	-6.3

5.6 GHz

11200	35.7	Peak	V	38.5	-12.0	0	62.2	74	-11.8
11200	23.3	Ave.	V	38.5	-12.0	0	49.8	54	-4.2
16800	27.1	Ave.	V/H	40.0	-10.4	0	56.7	68.3	-11.6
22400	54.4	Peak	V/H	40.4	-47.4	0	47.4	74	-26.6
22400	39.9	Ave.	V/H	40.4	-47.4	0	32.9	54	-21.1
28000	41.3	Ave.	V/H	40.4	-46.5	0	35.2	68.3	-33.1
33600	44.0	Ave.	V/H	43.5	-33.5	0	54.0	68.3	-14.3
39200	43.6	Ave.	V/H	44.8	-26.2	0	62.2	68.3	-6.1

5.68 GHz, 5.7 GHz

11360	36.2	Peak	V	38.5	-13.3	0	61.4	74	-12.6
11360	23.7	Ave.	V	38.5	-13.3	0	48.9	54	-5.1
11400	35.9	Peak	V	38.5	-13.0	0	61.4	74	-12.6
11400	23.4	Ave.	V	38.5	-13.0	0	48.9	54	-5.1
17040	28.6	Ave.	V/H	40.0	-6.8	0	61.8	68.3	-6.5
17100	28.5	Ave.	V/H	40.0	-6.5	0	62.0	68.3	-6.3
22720	54.4	Peak	V/H	40.4	-45.2	0	49.6	74	-24.4
22720	40.5	Ave.	V/H	40.4	-45.2	0	35.7	54	-18.3
22800	55.2	Peak	V/H	40.6	-44.3	0	51.5	74	-22.5
22800	41.2	Ave.	V/H	40.6	-44.3	0	37.5	54	-16.5
28400	41.5	Ave.	V/H	40.6	-46.5	0	35.6	68.3	-32.7
28500	41.6	Ave.	V/H	40.6	-43.7	0	38.5	68.3	-29.8
34080	43.2	Ave.	V/H	43.5	-30.4	0	56.3	68.3	-12.0
34200	43.7	Ave.	V/H	43.5	-27.6	0	59.6	68.3	-8.7
39760	43.9	Ave.	V/H	43.8	-26.2	0	61.5	68.3	-6.8
39900	44.3	Ave.	V/H	44.0	-24.6	0	63.7	68.3	-4.6

Only the second harmonic was detected above the noise floor. All other emissions are the noise floor which at least 4 dB below the limit



2 Foot Flat Panel Antenna, model: FPA 5250D24N

EUT: AP 4000		Test Date: January 11, 2006		Standard		FCC 15.407(b)(3)(6)(7)			
Test Mode: Tx,		Engineer: AK.		Test Distance		3		meter	
Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant. Pol. H/V	Ant. Factor dB(1/m)	CF dB	DCF dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB

5.5 GHz, 5.52 GHz

11000	34.5	Peak	V	38.5	-12.4	0	60.6	74	-13.4
11000	22.3	Ave.	V	38.5	-12.4	0	48.4	54	-5.6
11040	34.4	Peak	V	38.5	-12.5	0	60.4	74	-13.6
11040	22.1	Ave.	V	38.5	-12.5	0	48.1	54	-5.9
16500	27.1	Ave.	V/H	40.0	-8.7	0	58.4	68.3	-9.9
16560	26.7	Ave.	V/H	40.0	-7.5	0	59.2	68.3	-9.1
22000	54.2	Peak	V/H	40.4	-47.8	0	46.8	74	-27.2
22000	39.6	Ave.	V/H	40.4	-47.8	0	32.2	54	-21.8
22080	54.8	Peak	V/H	40.4	-47.8	0	47.4	74	-26.6
22080	40.2	Ave.	V/H	40.4	-47.8	0	32.8	54	-21.2
27500	41.3	Ave.	V/H	40.4	-45.9	0	35.8	68.3	-32.5
27600	41.6	Ave.	V/H	40.4	-45.0	0	37.0	68.3	-31.3
33000	42.3	Ave.	V/H	43.5	-32.3	0	53.5	68.3	-14.8
33120	43.2	Ave.	V/H	43.5	-30.5	0	56.2	68.3	-12.1
38500	42.8	Ave.	V/H	44.8	-27.6	0	60.0	68.3	-8.3
38640	43.0	Ave.	V/H	44.8	-25.8	0	62.0	68.3	-6.3

5.6 GHz

11200	34.5	Peak	V	38.5	-12.0	0	61.0	74	-13.0
11200	22.0	Ave.	V	38.5	-12.0	0	48.5	54	-5.5
16800	27.1	Ave.	V/H	40.0	-10.4	0	56.7	68.3	-11.6
22400	54.4	Peak	V/H	40.4	-47.4	0	47.4	74	-26.6
22400	39.9	Ave.	V/H	40.4	-47.4	0	32.9	54	-21.1
28000	41.3	Ave.	V/H	40.4	-46.5	0	35.2	68.3	-33.1
33600	44.0	Ave.	V/H	43.5	-33.5	0	54.0	68.3	-14.3
39200	43.6	Ave.	V/H	44.8	-26.2	0	62.2	68.3	-6.1

5.68 GHz, 5.7 GHz

11360	34.8	Peak	V	38.5	-13.3	0	60.0	74	-14.0
11360	22.3	Ave.	V	38.5	-13.3	0	47.5	54	-6.5
11400	35.1	Peak	V	38.5	-13.0	0	60.6	74	-13.4
11400	23.1	Ave.	V	38.5	-13.0	0	48.6	54	-5.4
17040	28.6	Ave.	V/H	40.0	-6.8	0	61.8	68.3	-6.5
17100	28.5	Ave.	V/H	40.0	-6.5	0	62.0	68.3	-6.3
22720	54.4	Peak	V/H	40.4	-45.2	0	49.6	74	-24.4
22720	40.5	Ave.	V/H	40.4	-45.2	0	35.7	54	-18.3
22800	55.2	Peak	V/H	40.6	-44.3	0	51.5	74	-22.5
22800	41.2	Ave.	V/H	40.6	-44.3	0	37.5	54	-16.5
28400	41.5	Ave.	V/H	40.6	-46.5	0	35.6	68.3	-32.7
28500	41.6	Ave.	V/H	40.6	-43.7	0	38.5	68.3	-29.8
34080	43.2	Ave.	V/H	43.5	-30.4	0	56.3	68.3	-12.0
34200	43.7	Ave.	V/H	43.5	-27.6	0	59.6	68.3	-8.7
39760	43.9	Ave.	V/H	43.8	-26.2	0	61.5	68.3	-6.8
39900	44.3	Ave.	V/H	44.0	-24.6	0	63.7	68.3	-4.6

Only the second harmonic was detected above the noise floor. All other emissions are the noise floor which at least 4 dB below the limit



8 Foot Parabolic Antenna, model: 200167

EUT: AP 4000		Test Date: January 11, 2006		Standard		FCC 15.407(b)(3)(6)(7)			
Test Mode: Tx,		Engineer: AK.		Test Distance		3		meter	
Frequency MHz	Reading dB(μV)	Detector P/A/Q	Ant. Pol. H/V	Ant. Factor dB(1/m)	CF dB	DCF dB	Net dB(μV/m)	Limit @3m dB(μV/m)	Margin dB

5.5 GHz, 5.52 GHz

11000	33.4	Peak	V/H	38.5	-12.4	0	59.5	74	-14.5
11000	21.0	Ave.	V/H	38.5	-12.4	0	47.1	54	-6.9
11040	34.0	Peak	V/H	38.5	-12.5	0	60.0	74	-14.0
11040	21.2	Ave.	V/H	38.5	-12.5	0	47.2	54	-6.8
16500	27.1	Ave.	V/H	40.0	-8.7	0	58.4	68.3	-9.9
16560	26.7	Ave.	V/H	40.0	-7.5	0	59.2	68.3	-9.1
22000	54.2	Peak	V/H	40.4	-47.8	0	46.8	74	-27.2
22000	39.6	Ave.	V/H	40.4	-47.8	0	32.2	54	-21.8
22080	54.8	Peak	V/H	40.4	-47.8	0	47.4	74	-26.6
22080	40.2	Ave.	V/H	40.4	-47.8	0	32.8	54	-21.2
27500	41.3	Ave.	V/H	40.4	-45.9	0	35.8	68.3	-32.5
27600	41.6	Ave.	V/H	40.4	-45.0	0	37.0	68.3	-31.3
33000	42.3	Ave.	V/H	43.5	-32.3	0	53.5	68.3	-14.8
33120	43.2	Ave.	V/H	43.5	-30.5	0	56.2	68.3	-12.1
38500	42.8	Ave.	V/H	44.8	-27.6	0	60.0	68.3	-8.3
38640	43.0	Ave.	V/H	44.8	-25.8	0	62.0	68.3	-6.3

5.6 GHz

11200	33.5	Peak	V	38.5	-12.0	0	60.0	74	-14.0
11200	21.5	Ave.	V	38.5	-12.0	0	48.0	54	-6.0
16800	27.1	Ave.	V/H	40.0	-10.4	0	56.7	68.3	-11.6
22400	54.4	Peak	V/H	40.4	-47.4	0	47.4	74	-26.6
22400	39.9	Ave.	V/H	40.4	-47.4	0	32.9	54	-21.1
28000	41.3	Ave.	V/H	40.4	-46.5	0	35.2	68.3	-33.1
33600	44.0	Ave.	V/H	43.5	-33.5	0	54.0	68.3	-14.3
39200	43.6	Ave.	V/H	44.8	-26.2	0	62.2	68.3	-6.1

5.68 GHz, 5.7 GHz

11360	34.4	Peak	V	38.5	-13.3	0	59.6	74	-14.4
11360	22.1	Ave.	V	38.5	-13.3	0	47.3	54	-6.7
11400	34.6	Peak	V	38.5	-13.0	0	60.1	74	-13.9
11400	22.4	Ave.	V	38.5	-13.0	0	47.9	54	-6.1
17040	28.6	Ave.	V/H	40.0	-6.8	0	61.8	68.3	-6.5
17100	28.5	Ave.	V/H	40.0	-6.5	0	62.0	68.3	-6.3
22720	54.4	Peak	V/H	40.4	-45.2	0	49.6	74	-24.4
22720	40.5	Ave.	V/H	40.4	-45.2	0	35.7	54	-18.3
22800	55.2	Peak	V/H	40.6	-44.3	0	51.5	74	-22.5
22800	41.2	Ave.	V/H	40.6	-44.3	0	37.5	54	-16.5
28400	41.5	Ave.	V/H	40.6	-46.5	0	35.6	68.3	-32.7
28500	41.6	Ave.	V/H	40.6	-43.7	0	38.5	68.3	-29.8
34080	43.2	Ave.	V/H	43.5	-30.4	0	56.3	68.3	-12.0
34200	43.7	Ave.	V/H	43.5	-27.6	0	59.6	68.3	-8.7
39760	43.9	Ave.	V/H	43.8	-26.2	0	61.5	68.3	-6.8
39900	44.3	Ave.	V/H	44.0	-24.6	0	63.7	68.3	-4.6

All emissions are the noise floor which at least 4 dB below the limit

4.7 Radiated Emissions below 1 GHz
FCC Ref: 15.209

Procedure

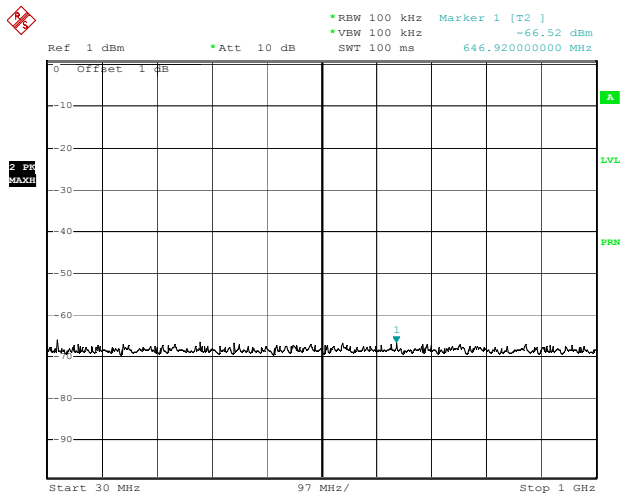
Radiated emission measurements were performed from 30 MHz to 1000 MHz. Spectrum Analyzer Resolution Bandwidth is 100 kHz or greater. See also section 4.6 for the test procedure and field strength calculation.

Prior final testing, antenna conducted emissions (peak) were measured in the 30 MHz to 1000 MHz frequency range with the Spectrum Analyzer Resolution Bandwidth of 100 kHz. The result, presented on the next page, shows that in this range no emissions were detected above the noise floor level which is less than -66 dBm. This level corresponds to the field strength level of less than 30 dB(μ V/m) at 3 m. That is at least 10 dB below the 15.209 Limit. Therefore, an antenna may not radiate in this frequency range, and there is no reason to perform radiated emission measurements with all antennas.

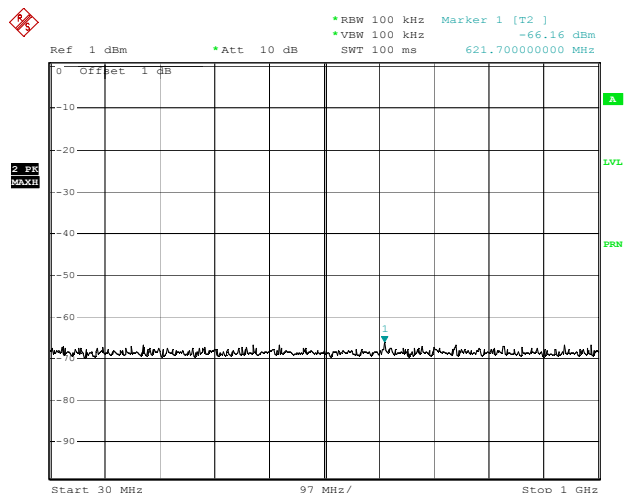
Therefore, radiated emissions were performed with one low gain antenna only with the EUT setup to transmit maximum power on three fundamental frequencies (5.5 GHz, 5.6 GHz, 5.7 GHz,).

Result

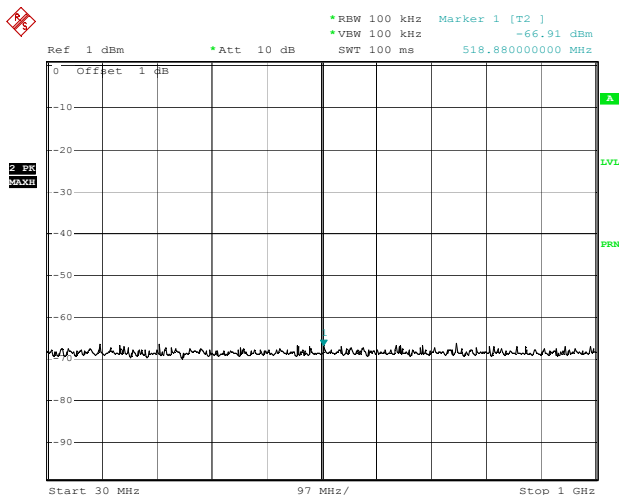
The result is presented on the following pages.
The EUT passed by 6.7dB



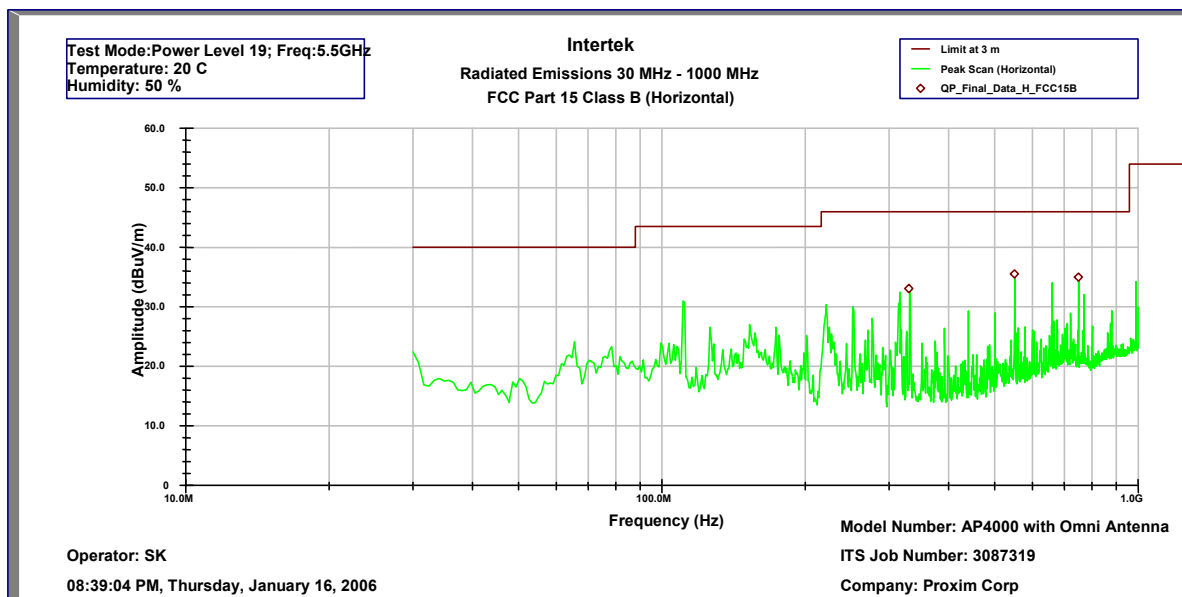
Comment: Out-of-band emissions, 5500 MHz
Date: 25.JAN.2006 09:58:51



Comment: Out-of-band emissions, 5600 MHz
Date: 25.JAN.2006 10:00:41



Comment: Out-of-band emissions, 5700 MHz
Date: 25.JAN.2006 10:02:35



Intertek
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (QP-Horizontal)

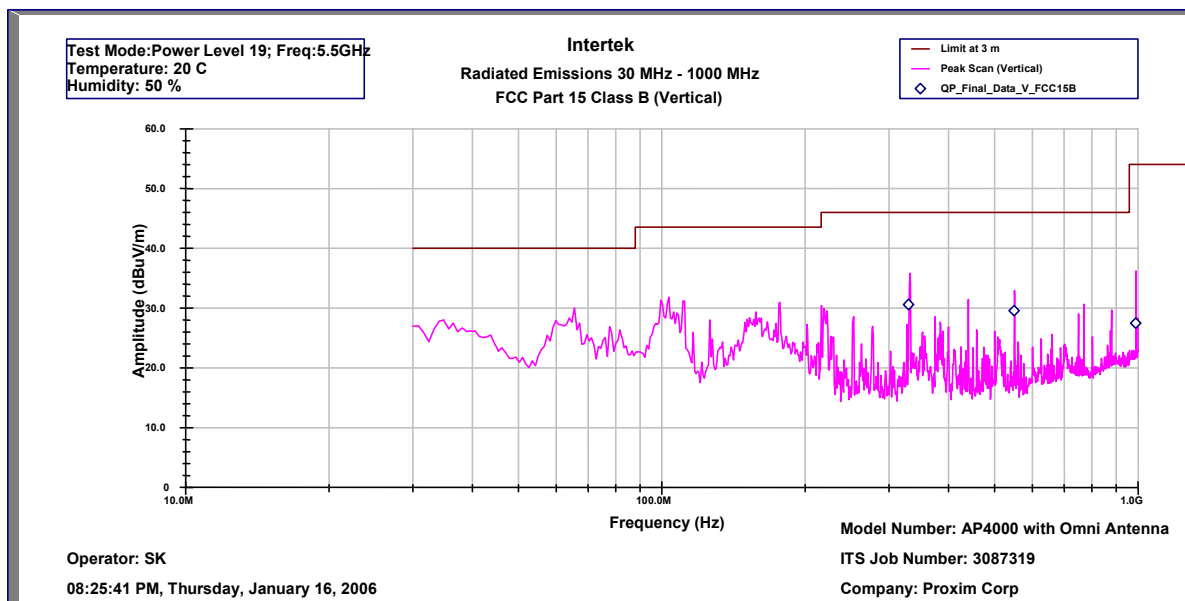
Operator: SK

Model Number: AP4000 with Omni Antenna
ITS Job Number: 3087319
Company: Proxim Corp

08:39:04 PM, Thursday, January 16, 2006

Frequency	Quasi Pk FS	Limit@3m	Margin	RA	AG	CF	AF	Atten
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)	dB
330.0	33.0	46.0	-13.0	44.9	32.2	2.7	14.7	3.0
550.0	35.5	46.0	-10.5	41.8	32.5	3.6	19.6	3.0
750.0	35.0	46.0	-11.0	38.2	32.5	4.1	22.2	3.0

Test Mode: Power Level 19; Freq: 5.5 GHz
Temperature: 20 C
Humidity: 50 %



Intertek
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (QP-Vertical)

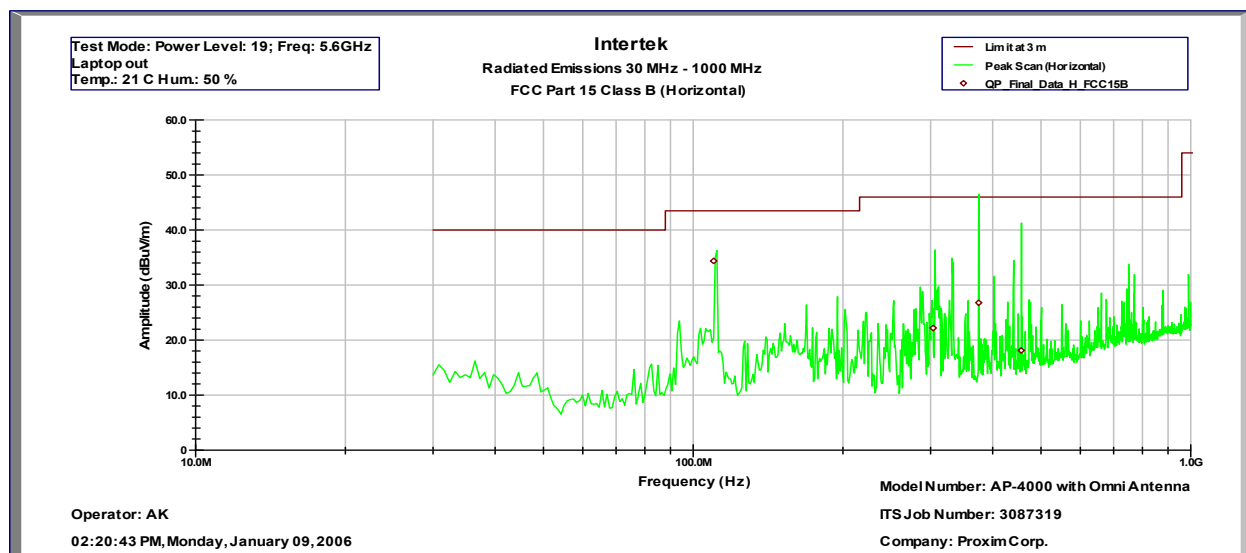
Operator: SK

Model Number: AP4000 with Omni Antenna
ITS Job Number: 3087319
Company: Proxim Corp

08:25:41 PM, Thursday, January 16, 2006

Frequency	Quasi Pk FS	Limit@3	Margin	RA	AG	CF	AF	Atten
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)	dB
330.0	30.6	46.0	-15.4	43.1	32.2	2.7	14.1	3.0
550.0	29.6	46.0	-16.4	37.6	32.5	3.6	17.8	3.0
990.0	27.5	54.0	-26.5	28.0	31.2	5.3	22.3	3.0

Test Mode: Power Level 19; Freq: 5.5 GHz
Temperature: 20 C
Humidity: 50 %



Intertek
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (QP-Horizontal)

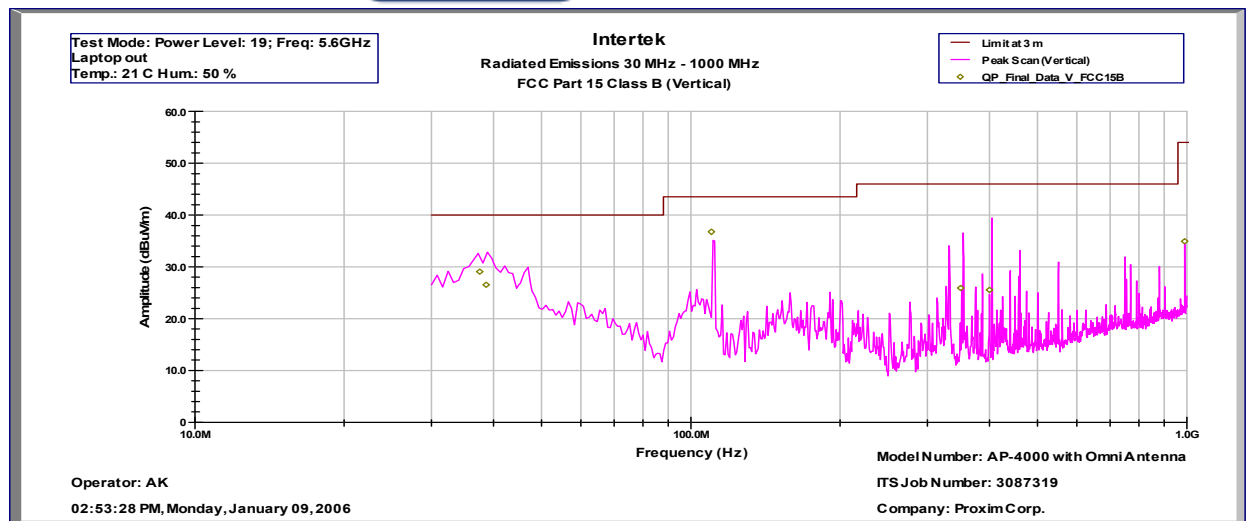
Operator: AK

02:20:42 PM, Monday, January 09, 2006

Model Number: AP-4000 with Omni Antenna
ITS Job Number: 3087319
Company: Proxim Corp.

Frequency	Quasi Pk FS	Limit@3m	Margin	RA	AG	CF	AF	Atten
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)	dB
110	34.4	43.5	-9.1	55.3	32.3	1.5	6.9	3
304	22.2	46	-23.8	35.1	32.2	2.5	13.8	3
375	26.8	46	-19.2	37.5	32.3	2.9	15.6	3
457	18.1	46	-27.9	27.1	32.3	3.2	17.2	3

Test Mode: Power Level: 19; Freq: 5.6 GHz
Laptop out
Temp.: 21 C Hum.: 50 %



Intertek

Radiated Emissions 30 MHz - 1000 MHz

FCC Part 15 Class B (QP-Vertical)

Operator: AK

02:53:28 PM, Monday, January 09, 2006

Model Number: AP-4000 with Omni Antenna

ITS Job Number: 3087319

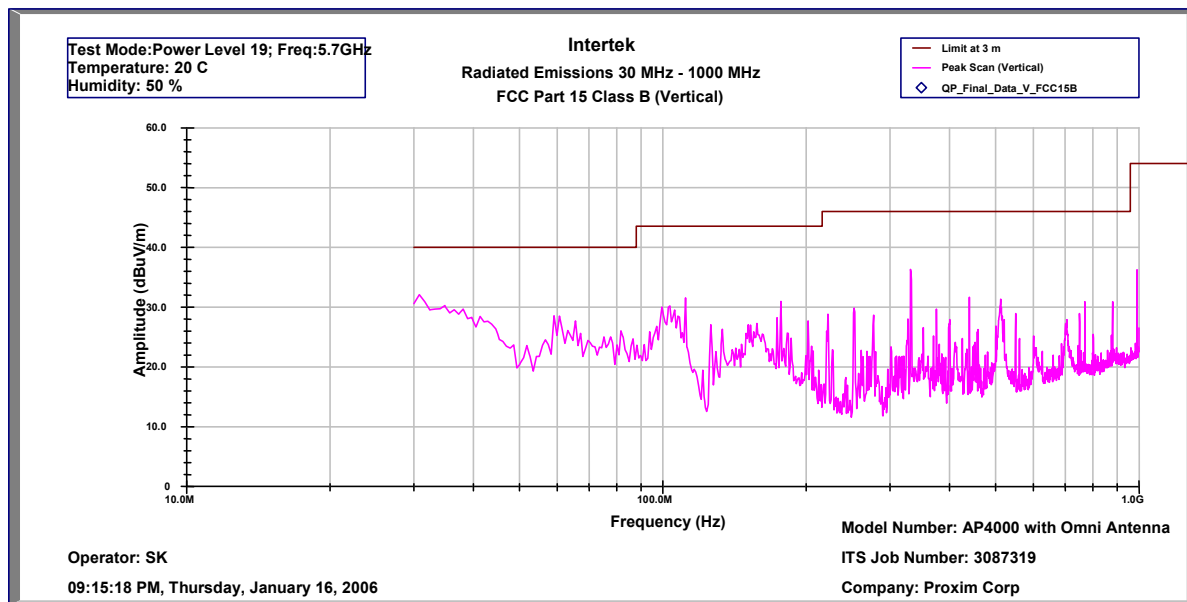
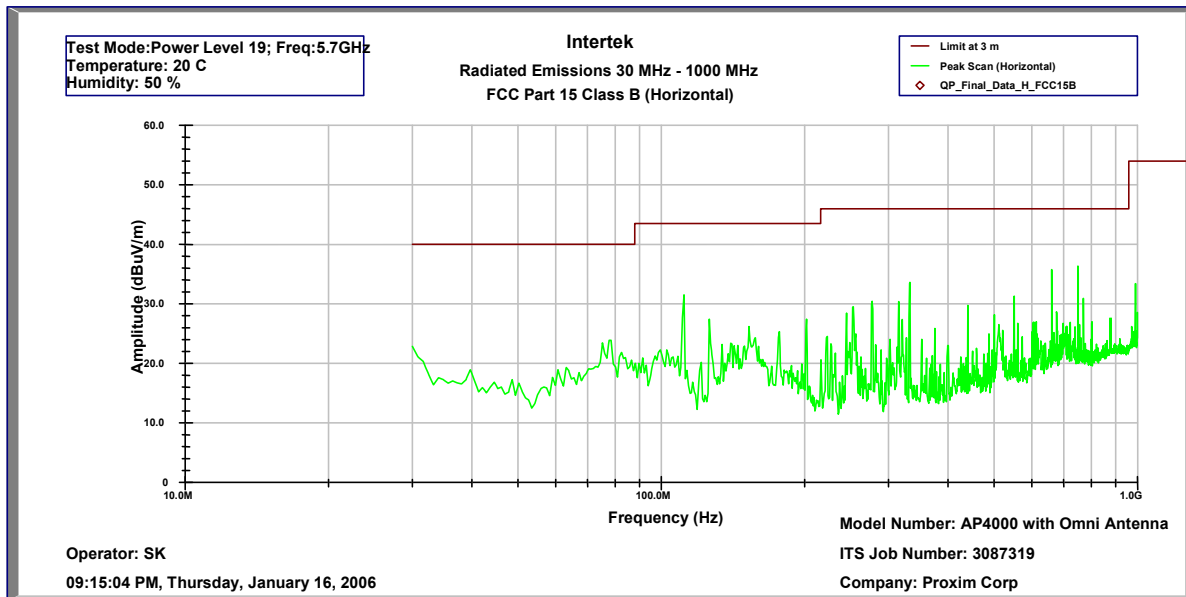
Company: Proxim Corp.

Frequency	Quasi Pk FS	Limit@3	Margin	RA	AG	CF	AF	Atten
MHz	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB(1/m)	dB
37.5	29.1	40	-10.9	49.1	32.4	0.8	8.5	3
38.7	26.6	40	-13.4	47	32.4	0.8	8.1	3
110.0	36.8	43.5	-6.7	58.1	32.3	1.4	6.5	3
350.0	25.9	46	-20.1	37.7	32.2	2.8	14.7	3
400.0	25.5	46	-20.5	36.6	32.3	3.0	15.2	3
990.0	34.9	54	-19.1	35.5	31.2	5.3	22.3	3

Test Mode: Power Level: 19; Freq: 5.6 GHz

Laptop out

Temp.: 21 C Hum.: 50 %



4.8 AC Line Conducted Emission FCC Rule 15.207:

Requirement

The following line conducted emission limits apply to Class B devices:

Frequency Band MHz	Class B Limit dB (μV)	
	Quasi-Peak	Average
0.15-0.50	66 to 56 Decreases linearly with the logarithm of the frequency	56 to 46 Decreases linearly with the logarithm of the frequency
0.50-5.00	56	46
5.00-30.00	60	50

Note: At the transition frequency the lower limit applies.

Test Procedure

These measurements were performed in accordance with the test arrangements and methods defined in ANSI C63-4 (2003).

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. A LISN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. A LISN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the LISN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

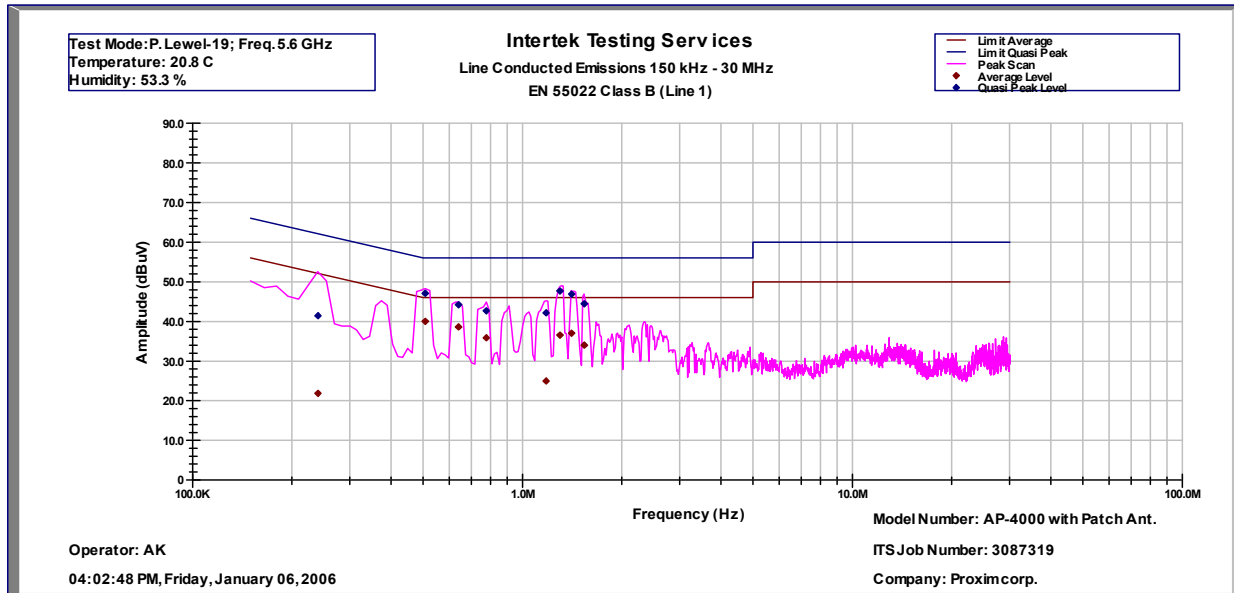


Floor standing EUTs are placed on a horizontal metal ground plane and isolated from the ground plane by 3 to 12 mm of insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Test Result

The test result is presented on the following pages.

The EUT passed by 5.7 dB



Intertek Testing Services

Line Conducted Emissions 150 kHz - 30 MHz

EN 55022 Class B (Line 1)

Operator: AK

Model Number: AP-4000 with Patch Ant.

ITS Job Number: 3087319

04:02:48 PM, Friday, January 06, 2006

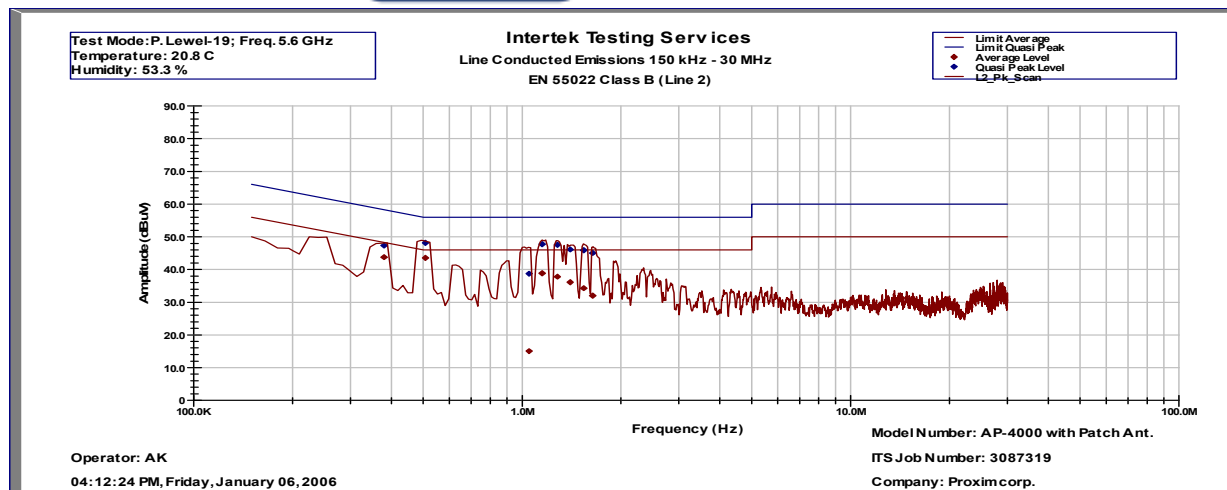
Company: Proxim corp.

Frequency	Av Level	QP Level	Av Limit	QP Limit	Av Margin	QP Margin
MHz	(dBuV)	(dBuV)	(dBuV)	(dBuV)	dB	dB
0.24	21.8	41.4	53.4	63.4	-31.6	-22.0
0.51	40.0	47.1	46	56	-6.0	-8.9
0.64	38.6	44.2	46	56	-7.4	-11.8
0.78	35.9	42.7	46	56	-10.1	-13.3
1.18	25.0	42.2	46	56	-21.0	-13.8
1.30	36.5	47.7	46	56	-9.5	-8.3
1.41	37.0	46.9	46	56	-9.0	-9.1
1.54	34.0	44.4	46	56	-12.0	-11.6

Test Mode: P. Lewel-19; Freq. 5.6 GHz

Temperature: 20.8 C

Humidity: 53.3 %



Intertek Testing Services
 Line Conducted Emissions 150 kHz - 30 MHz
 EN 55022 Class B (Line 2)

Operator: AK

04:12:24 PM, Friday, January 06, 2006

Model Number: AP-4000 with Patch Ant.

ITS Job Number: 3087319

Company: Proxim corp.

Frequency	Av Level	QP Level	Av Limit	QP Limit	Av Margin	QP Margin
MHz	(dBuV)	(dBuV)	(dBuV)	(dBuV)	dB	dB
0.38	43.8	47.3	49.4	59.4	-5.7	-12.1
0.51	43.5	48.1	46	56	-2.5	-7.9
1.05	15.0	38.7	46	56	-31.0	-17.3
1.15	38.8	47.7	46	56	-7.2	-8.3
1.28	37.8	47.5	46	56	-8.2	-8.5
1.40	36.1	46.1	46	56	-9.9	-9.9
1.54	34.3	45.9	46	56	-11.7	-10.1
1.64	32.0	45.0	46	56	-14.0	-11.0

Test Mode: P. Lewel-19; Freq. 5.6 GHz
 Temperature: 20.8 C
 Humidity: 53.3 %

5.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. INTERVAL	CAL. DUE
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	09/12/06
Spectrum Analyzer	R & S	FSP40	036612004	12	03/10/06
Signal Generator	Hewlett Packard	83732A	3222A00119	12	03/21/06
BI-Log Antenna	EMCO	3143	9509-1160	12	11/29/06
Horn Antenna	EMCO	3115	8812-3049	12	04/29/06
Horn Antenna	EMCO	3160-09	Not Labeled	#	#
Horn Antenna	EMCO	3160-10	Not Labeled	#	#
Pre-Amplifier	Sonoma Inst.	310	185634	12	07/05/06
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	03/29/06
Pre-Amplifier	Miteq	JSD44-1800-40000-30-5P	1071636	12	08/18/06
LISN	FCC	FCC-LISN-50-50-M-H	2011	12	04/21/06

No Calibration required

6.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / 3087319 & 3090394	DC	January 31, 2006	Original document