MEASUREMENT REPORT of 802.11a/b/g Wireless Cardbus Adapter (Super AG)

Applicant	**:**	Trinity Security System, Inc.
EUT	**:**	802.11a/b/g Wireless Cardbus Adapter (Super AG)
Model No.	**:**	IPN-W100CB
FCC ID	**:**	UOH-IPNW100CB

Tested by :

Training Research Co., Ltd.

TEL : 886-2-26935155 FAX : 886-2-26934440

No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (2003) as a reference. All test were conducted by ***Training Research Co., Ltd.***, 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart B (Declaration of Conformity) and E Section 15.407.

Applicant	**:**	Trinity Security System, Inc.
Applicant address	**:**	Alte Building Higashikanda Chiyoda-kuTokyo, 101-0031 Japan
FCC ID	**:**	UOH-IPNW100CB
Report No.	**:**	C5115060723
Test Date	**:**	November 29, 2006

Prepared by: Jack Tsai *Jack Tsai*

Approved by: Frank Tsai *Frank Tsai*

Conditions of issue :

(1) ***This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.***

(2) ***This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.***

(3) ***This test report, measurements made by TRC are traceable to the NIST only Conducted and Radiated Method.***

NVLAP LAB CODE 200174-0

Federal Communications Commission

Declaration of Conformity

for the following equipment:

Product name : 802.11a/b/g Wireless Cardbus Adapter (Super AG)
Trade name : T-SS
Model name : IPN-W100CB

Is herewith confirmed and found to comply with the requirements of CFR 47 part15 Subpart B - Unintentional Radiators regulation. The results of electromagnetic mission evaluation are shown in the report number : C5115060723

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation

Manufacturer	*USA local representative*
Company name: CAMEO COMMUNICATIONS, INC.	To be determined
Computer address: 6F, No.22, Chung Shin Rd., Hsi-Chih, Taipei 221, Taiwan	
ZIP / Postal code 221	
Contact person: Jason Chang	
Title: Wireless Comm. R&D Dept Manager	
Internet e-mail address: jason_chang@mail.cameo.com.tw	
Tel / Fax: 886-2-26499800 / 886-2-26499984	

Tables of Contents

Ⅰ. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of applicant in support that the certification in accordance with Part 2 Subpart J and Part 15 Subpart A, B and E of the Commission's Rules and Regulations.

1.2 Description of EUT

FCC ID	**:**	UOH-IPNW100CB
Product Name	**:**	802.11a/b/g Wireless Cardbus Adapter (Super AG)
Model Name	**:**	IPN-W100CB
Frequency Range	**:**	5.150GHz ~ 5.250GHz
Operating Frequency	**:**	5.180GHz ~ 5.240GHz (IEEE 802.11a)
		5.190GHz ~ 5.230GHz (IEEE 802.11 Super a)
Channel Spacing	**:**	5MHz
Support Channel	**:**	13 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK, OFDM
Power Type	**:**	Powered by PCMCIA interface of client's device

1.3 Test method

1. Insert the EUT into the PCMCIA bus of the notebook computer.
2. Using the notebook computer and software provided by the manufacturer to control EUT. The software is operated under the Windows to control the EUT in the mode of continuous transmission; the test is performed under the specific conditions.
3. Set different channel and data rate being tested and repeat the procedures above.
   (a) Radiated for Intentional test:
   making EUT to the mode of continuous transmission
   (b) Conducted and Radiated for Unintentional test:
   making EUT to the linking (RX/TX) mode with far support equipments

1.4 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

Notebook	**:**	**IBM Think Pad X20**
Model No.	:	2662-11T
Serial No.	:	FX-1192200/09
FCC ID	:	N/A, DoC Approved
BSMI	:	3892B565
Adaptor	**:**	**IBM**
Model No.	:	PA2450U
Serial No.	:	02K6654
FCC ID	:	N/A, DoC Approved
Power type	:	I/P: 100 ~ 240vac, 50 ~ 60 Hz, 0.5A ~ 1.2A; O/P: 16Vdc, 4.5A
Power cord	:	Non-shielded, 1.80m length, Plastic, with ferrite core
Printer	**:**	**EPSON**
Model No.	:	B241A
Serial No.	:	FAPY155090
FCC ID	:	N/A, DoC Approved
BSMI	:	R33126
Power type	:	Switching adaptor
Power cord	:	Non-shielded, 198cm length, No ferrite core
Data cable	:	Shielded, 1.50m length, No ferrite core
USB Gamepad	**:**	**Rockfire**
Model No.	:	QF-337uv
Serial No.	:	10600545, KR91379759
FCC ID	:	None (CE approval)
BSMI	:	3862A574
Power type	:	By computer
Data Cable	:	Shielded, 1.81m length, Plastic, with ferrite core

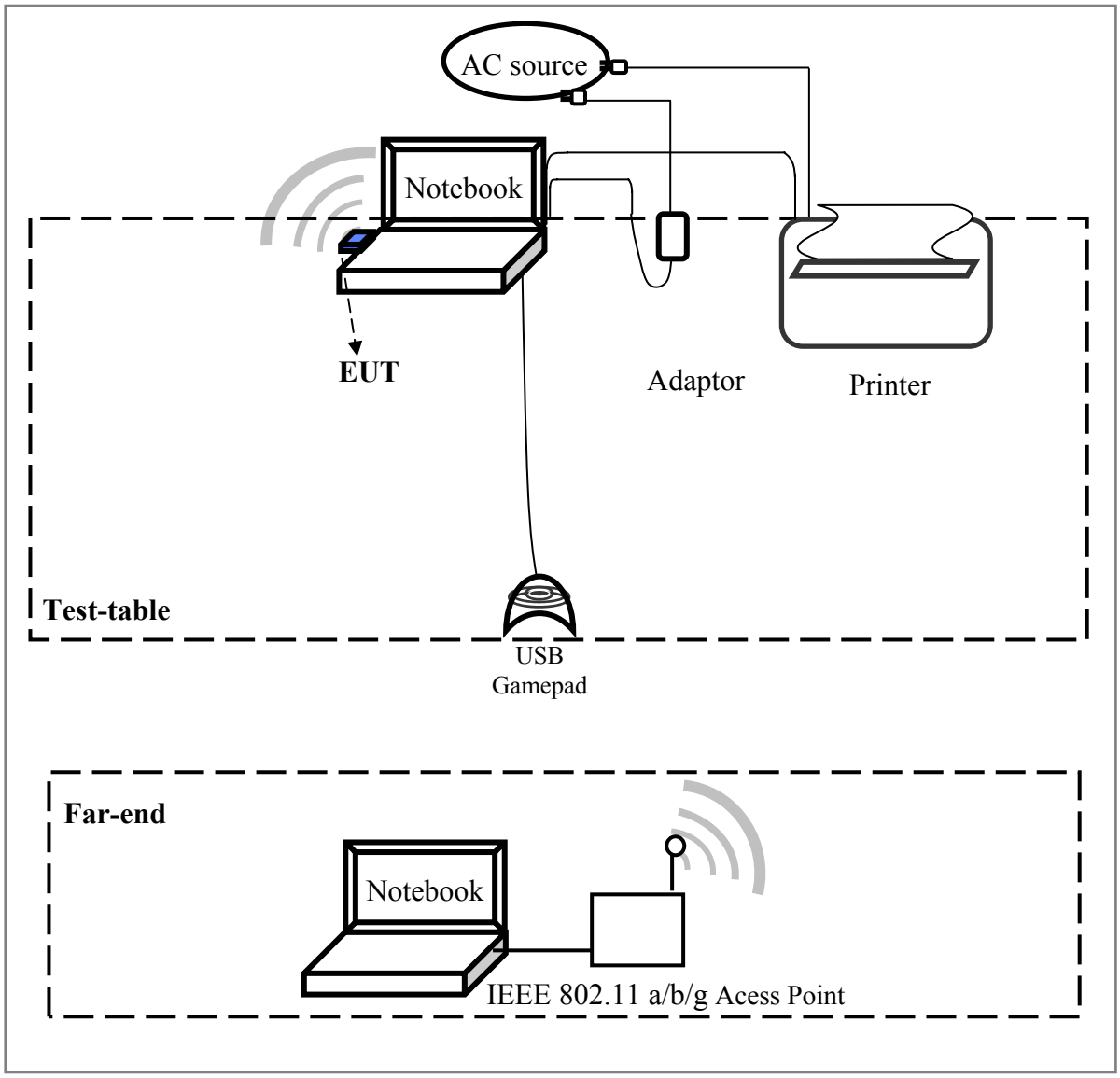
Notebook	**:**	**TWINHEAD**
Model No.	:	N222S8
Serial No.	:	SY3261000988
FCC ID	:	N/A, DoC Approved
BSMI	:	71001018
Adaptor	**:**	**LISHIN INTERNATIONAL ENTERPRISE CORP.**
Model No.	:	LSE9802A2060
Serial No.	:	A20231065818
BSMI	:	3882B381
Power type	:	I/P: 100 ~ 240Vac, 50/ 60 Hz, 1.5A；O/P: 20Vdc, 3A 60W Max.
Power cord	:	Non-shielded, 180cm length, No ferrite core (between adaptor and AC source) Non-shielded, 150cm length, with ferrite core (between NB and adaptor)

IEEE 802.11 a/b/g Acess Point : Cisco Systems Inc.

Model No.	:	AIR-AP1131AG-A-K9
Serial No.	:	FTX1032T0S1
FCC ID	:	LDK102054
IC	:	2461B-102054

1.5 Configuration of System Under Test

1.5.1 Conducted Test



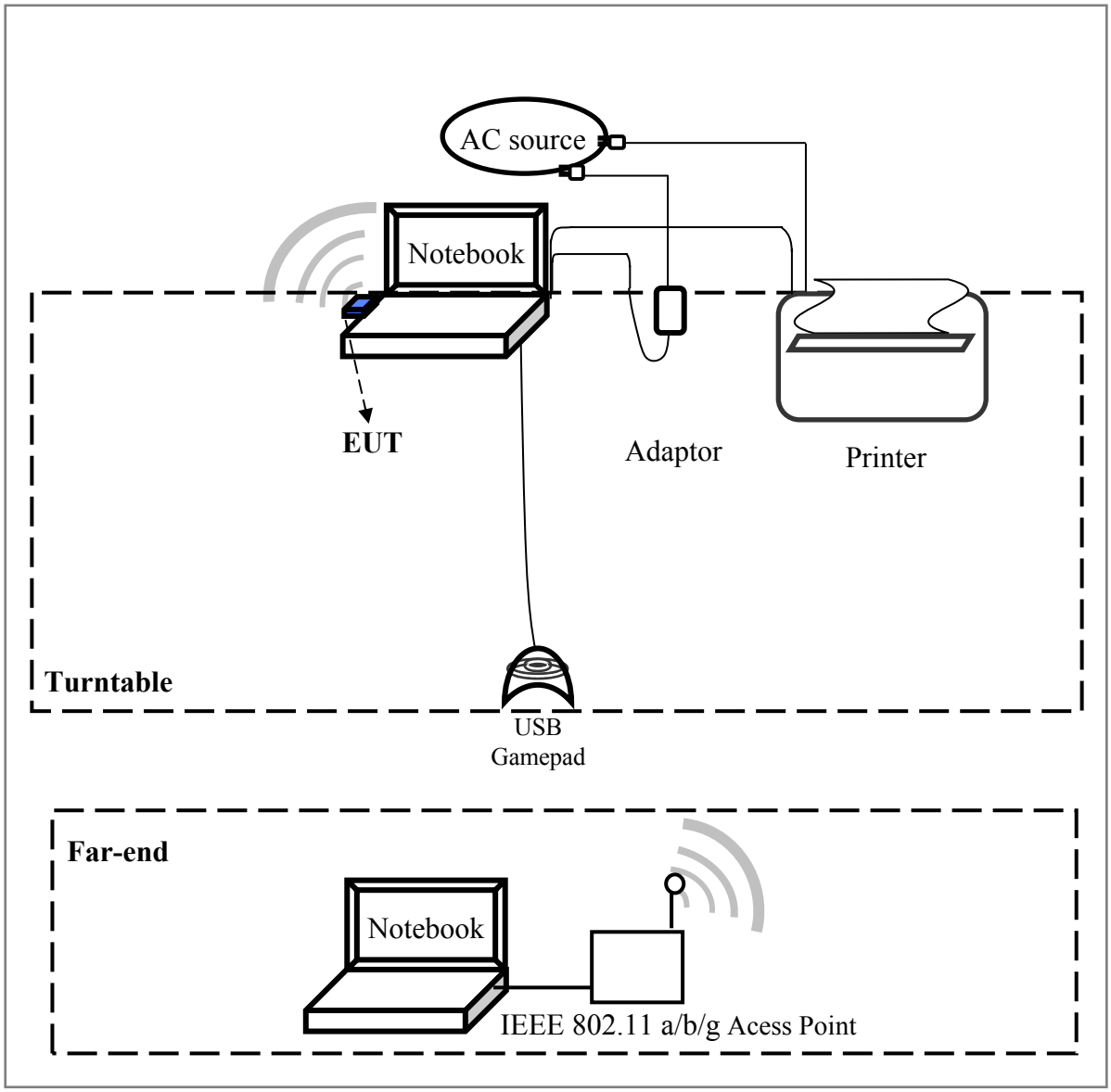
Connections of Computer:

*Parallel Port --- a printer

*USB Port --- a USB gamepad

*PCMCIA Port --- **EUT**

1.5.2 Radiated Test



The tests below are carried with the EUT transmitter set at high power mode. The EUT is forced to select of output power level and channel number by LAN port.

The setting up procedure was recorded in 1.3 test method.

1.6 Verify the Frequency and Channel

Channel	Frequency (GHz)
36	5.180
37	5.185
38	5.190
39	5.195
40	5.200
41	5.205
42	5.210
43	5.215
44	5.220
45	5.225
46	5.230
47	5.235
48	5.240

Note:

1. This is for confirming that all frequencies are in 5.180GHz to 5.240GHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz
   (The locations of these frequencies one near the top, one near the middle and one near the bottom.)
3. After test, the EUT operating frequencies are in 5.180GHz to 5.240GHz.(IEEE 802.11a) So all the items as followed in testing report are need to test these three frequencies:
   Lowest: Channel – 36; Middle: Channel – 40; Highest: Channel – 48.
4. The EUT operating frequencies are in 5.190GHz to 5.230GHz.(IEEE 802.11 Super a) So all the items as followed in testing report are need to test these three frequencies:
   Lowest: Channel – 38; Middle: Channel – 40; Highest: Channel – 46.

1.7 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (2003) and the pre-setup was written on 1.3 test method, the detail setup was written on each test item.

1.8 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Anechoic Chamber (FCC Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

No. 255 Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.9 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, they were set in high power and continuously transmitting mode that controlled by computer. The lowest; middle and highest channels of EUT were all tested. The setting up procedure is recorded on 1.3 test method.

II. Section 15.101(a): Equipment authorization of unintentional radiators

The EUT equipped with a LAN interface and should be operated with the computer. It was categorized to *Class B personal computers and peripherals* as cannot be operated stand-alone. The authorization requires **Declaration of Conformity (DoC)** and the items required such as Section15.107 (Conducted limits) and Section15.109 (Radiated emission limits) is same as Section15.207 and 15.403(b)(6).

III. Section 15.203: Antenna requirement

The EUT has an integrated antenna permanently attached on the PCB, which inside the housing. In addition, there is no external antenna or connector employed. The antenna requirement stated in Sectation15.203 is inapplicable to this EUT.

VI. Section 15.407(b)(6): Power Line Conducted Emissions for AC Powered Units

4.1 Test Condition & Setup

The power line conducted emission measurements were performed in an anechoic chamber. The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak and average detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.3

There is a test condition apply in this test item, the test procedure description as <1.3>. Three channels were tested, one in the lowest (CH36), one in the middle (CH40) and the other in highest (CH48) for IEEE 802.11a and one in the lowest (CH38), one in the middle (CH40) and the other in highest (CH46) for IEEE 802.11 Super a. The setting up procedure is recorded on <1.3>

4.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
LISN (EUT)	LISN-01	TRC	99-05	12/10/06
LISN (Support E.)	LISN-01	TRC	9912-03, 04	02/26/07
Pre-amplifier	15542 ZFL-500	Mini – Circuits	0 0117	05/20/07
6dB Attenuator	MCL BW-S6W2	Mini – Circuits	9915 – Conducted	05/20/07
10dB Attenuator	A5542 VAT010	Mini – Circuits	0215 – Conducted	05/20/07
Coaxial Cable (2.0 meter)	A30A30-0058-50FS-2M	Jyebao	SMA-08	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	Jyebao	SMA-09	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-01	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-02	05/20/07
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	05/20/07

4.3 Test Result of Power Line Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions on the LIVE and NETURAL conductors of the EUT power cord. Show as follows.

Test Conditions: Temperature : 25 °C Humidity : 73 % RH

Test mode: Standby mode

Power Connected Emissions					*Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	745.000	36.11	---	---	56.00	46.00	-9.89
	1198.000	42.29	---	---	56.00	46.00	-3.71
	1613.000	40.13	---	---	56.00	46.00	-5.87
	3126.000	37.41	---	---	56.00	46.00	-8.59
	10190.000	39.48	---	---	60.00	50.00	-10.52
	14880.000	40.71	---	---	60.00	50.00	-9.29
Line 2	1102.000	40.97	---	---	56.00	46.00	-5.03
	1208.000	40.03	---	---	56.00	46.00	-5.97
	2394.000	38.25	---	---	56.00	46.00	-7.75
	8270.000	38.98	---	---	60.00	50.00	-11.02
	10190.000	39.72	---	---	60.00	50.00	-10.28
	14580.000	39.24	---	---	60.00	50.00	-10.76

NOTE:

(1)Margin = Peak Amplitude – Limit, *The reading amplitudes are all under limit.*

(2)A "+" sign in the margin column means the emission is OVER the Class B Limit and "–" sign of means UNDER the Class B limit

Test mode: IEEE 802.11a Channel 36

Power Connected Emissions					*Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	158.000	53.18	---	---	65.77	55.77	-2.59
	274.000	43.91	---	---	62.46	52.46	-8.55
	575.000	43.55	---	---	56.00	46.00	-2.45
	928.000	39.29	---	---	56.00	46.00	-6.71
	1645.000	36.65	---	---	56.00	46.00	-9.35
	3638.000	35.03	---	---	56.00	46.00	-10.97
Line 2	172.000	51.81	---	---	65.37	55.37	-3.56
	466.000	39.90	---	---	56.97	46.97	-7.07
	561.000	41.45	---	---	56.00	46.00	-4.55
	1187.000	44.14	---	---	56.00	46.00	-1.86
	2506.000	39.31	---	---	56.00	46.00	-6.69
	4619.000	35.62	---	---	56.00	46.00	-10.38

Test mode: IEEE 802.11a Channel 40

Power Connected Emissions					*Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	156.000	54.26	---	---	65.83	55.83	-1.57
	308.000	45.33	---	---	61.49	51.49	-6.16
	547.000	43.89	---	---	56.00	46.00	-2.11
	824.000	41.47	---	---	56.00	46.00	-4.53
	1123.000	39.12	---	---	56.00	46.00	-6.88
	2051.000	37.95	---	---	56.00	46.00	-8.05
Line 2	224.000	44.89	---	---	63.89	53.89	-9.00
	558.000	40.08	---	---	56.00	46.00	-5.92
	817.000	40.92	---	---	56.00	46.00	-5.08
	1091.000	41.82	---	---	56.00	46.00	-4.18
	1385.000	43.53	---	---	56.00	46.00	-2.47
	3030.000	38.96	---	---	56.00	46.00	-7.04

Test mode: IEEE 802.11a Channel 48

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	294.000	43.25	---	---	61.89	51.89	-8.64
	461.000	44.00	---	---	57.11	47.11	-3.11
	563.000	43.89	---	---	56.00	46.00	-2.11
	1372.000	37.83	---	---	56.00	46.00	-8.17
	1696.000	37.90	---	---	56.00	46.00	-8.10
	4053.000	36.83	---	---	56.00	46.00	-9.17
Line 2	224.000	44.14	---	---	63.89	53.89	-9.75
	587.000	41.04	---	---	56.00	46.00	-4.96
	1113.000	42.17	---	---	56.00	46.00	-3.83
	1437.000	41.82	---	---	56.00	46.00	-4.18
	2201.000	40.34	---	---	56.00	46.00	-5.66
	2793.000	39.29	---	---	56.00	46.00	-6.71

Test mode: IEEE 802.11 Super a Channel 38

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	161.000	52.85	---	---	65.69	55.69	-2.84
	285.000	43.15	---	---	62.14	52.14	-8.99
	547.000	42.66	---	---	56.00	46.00	-3.34
	902.000	40.27	---	---	56.00	46.00	-5.73
	998.000	39.32	---	---	56.00	46.00	-6.68
	1836.000	35.95	---	---	56.00	46.00	-10.05
Line 2	161.000	53.91	---	---	65.69	55.69	-1.78
	236.000	43.64	---	---	63.54	53.54	-9.90
	569.000	42.26	---	---	56.00	46.00	-3.74
	1398.000	42.12	---	---	56.00	46.00	-3.88
	2351.000	39.79	---	---	56.00	46.00	-6.21
	2741.000	41.47	---	---	56.00	46.00	-4.53

Test mode: IEEE 802.11 Super a Channel 40

Power Connected Emissions					*Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	158.000	53.68	---	---	65.77	55.77	-2.09
	257.000	43.20	---	---	62.94	52.94	-9.74
	563.000	43.20	---	---	56.00	46.00	-2.80
	1696.000	37.71	---	---	56.00	46.00	-8.29
	5940.000	37.04	---	---	60.00	50.00	-12.96
	19320.000	33.59	---	---	60.00	50.00	-16.41
Line 2	175.000	50.69	---	---	65.29	55.29	-4.60
	461.000	39.15	---	---	57.11	47.11	-7.96
	563.000	41.42	---	---	56.00	46.00	-4.58
	1123.000	42.01	---	---	56.00	46.00	-3.99
	1613.000	41.84	---	---	56.00	46.00	-4.16
	2977.000	40.47	---	---	56.00	46.00	-5.53

Test mode: IEEE 802.11 Super a Channel 46

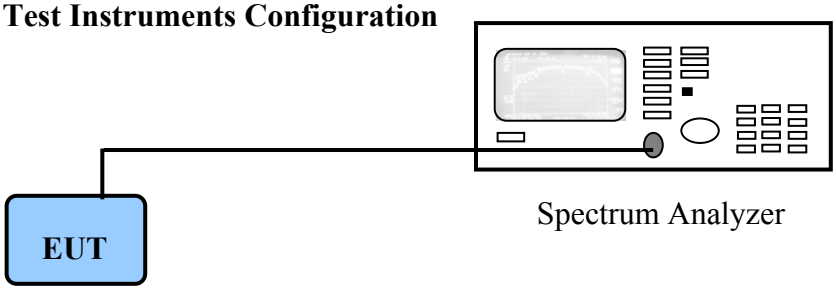
Power Connected Emissions					*FCC Class B*		
Conductor	*Frequency (KHz)*	*Peak (dBμV)*	*QP (dBμV)*	*Average (dBμV)*	*QP-limit (dBμV)*	*AVG-limit (dBμV)*	*Margin (dB)*
Line 1	269.000	43.70	---	---	62.60	52.60	-8.90
	447.000	42.87	---	---	57.51	47.51	-4.64
	569.000	43.48	---	---	56.00	46.00	-2.52
	767.000	40.24	---	---	56.00	46.00	-5.76
	1924.000	36.94	---	---	56.00	46.00	-9.06
	3221.000	35.45	---	---	56.00	46.00	-10.55
Line 2	345.000	38.48	---	---	60.43	50.43	-11.95
	569.000	40.62	---	---	56.00	46.00	-5.38
	802.000	41.40	---	---	56.00	46.00	-4.60
	1372.000	42.55	---	---	56.00	46.00	-3.45
	1766.000	41.06	---	---	56.00	46.00	-4.94
	3030.000	40.38	---	---	56.00	46.00	-5.62

V. Section 15.407(a): Bandwidth for Unlicensed National Information Infrastructure.

5.1 Test Condition & Setup

The transmitter bandwidth measurements were performed by the contact manner. The EUT was set to transmit continuously, also various channels were investigated to find the maximum occupied bandwidth. The output of the EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency is observed by the spectrum analyzer with RBW 300kHz and VBW 1MHz.

5.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

5.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	02/15/07

5.4 Test Result of Bandwidth

IEEE 802.11a

Channel	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	24.80	17.30
40	24.70	17.30
46	24.80	17.30

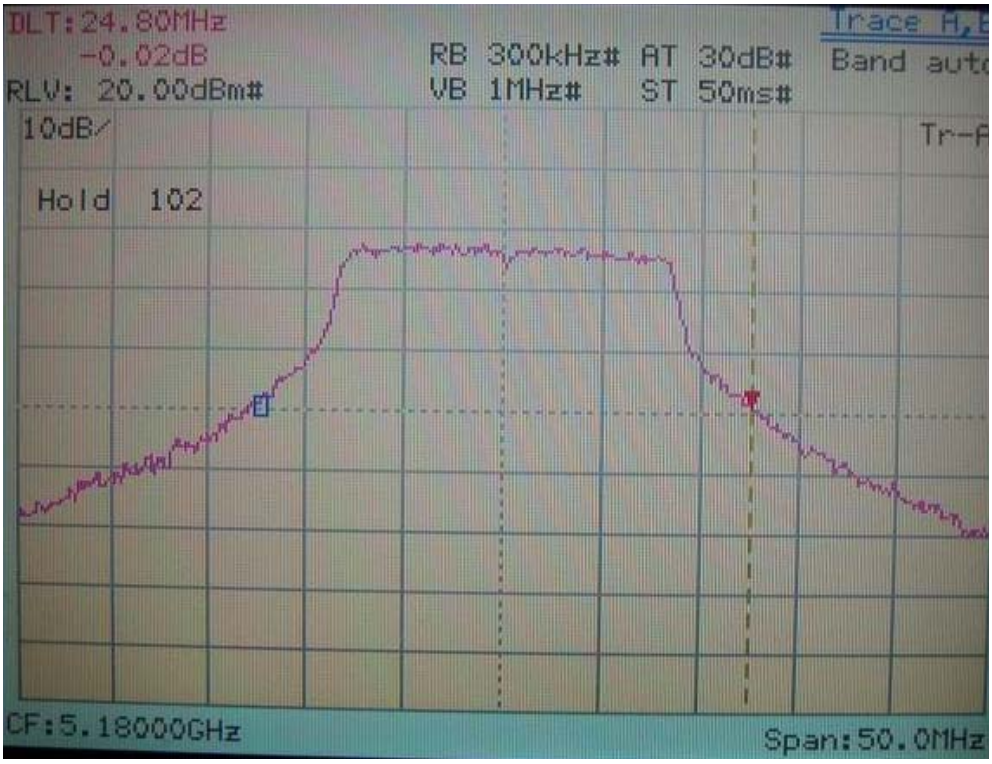
IEEE 802.11 Super a

Channel	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	44.70	33.50
40	44.70	33.40
46	44.80	33.40

Note: 1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we'd made the measurement with the spectrum analyzer's resolution bandwidth *(RBW)=300kHz* and set the *span>>RBW*. The results show the measured 26dB and 99% Occupied bandwidth.

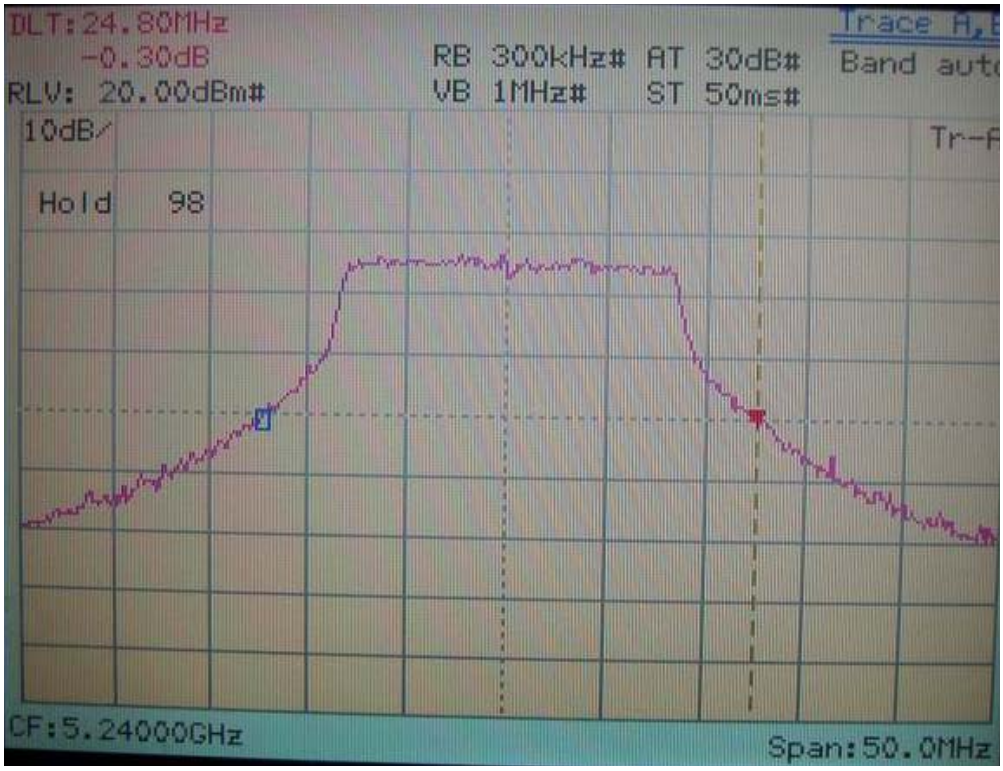
2. The attachments show these on the following pages.

26dB Bandwidth of Channel CH36 IEEE 802.11a , 5180MHz

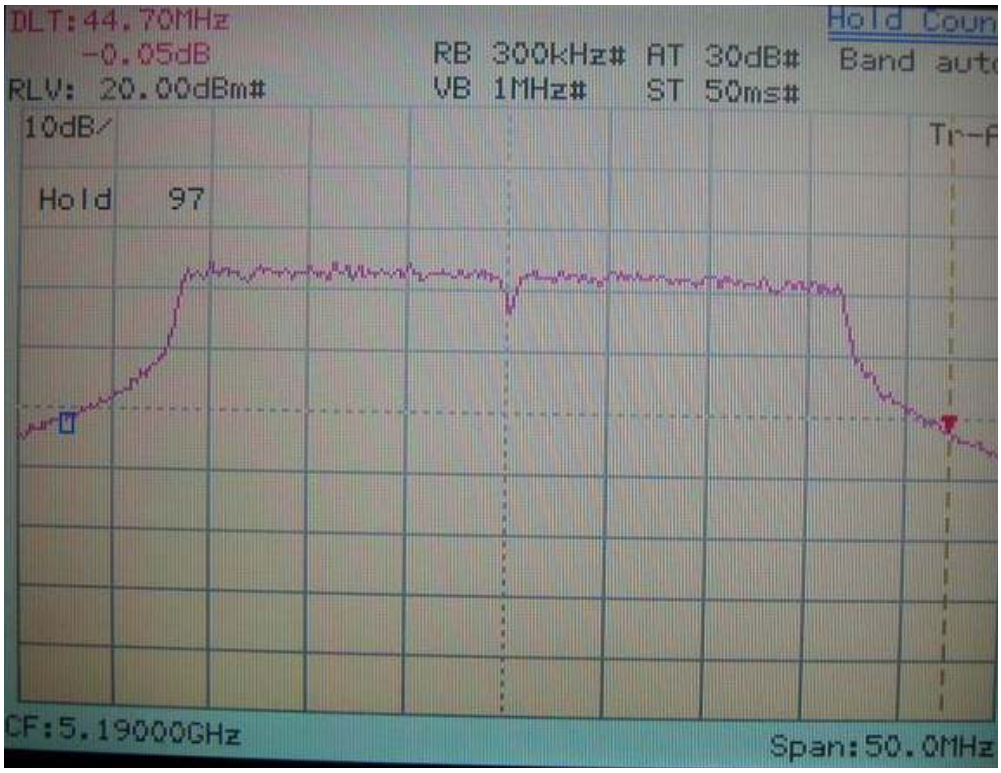


26dB Bandwidth of Channel CH40 IEEE 802.11a , 5200MHz

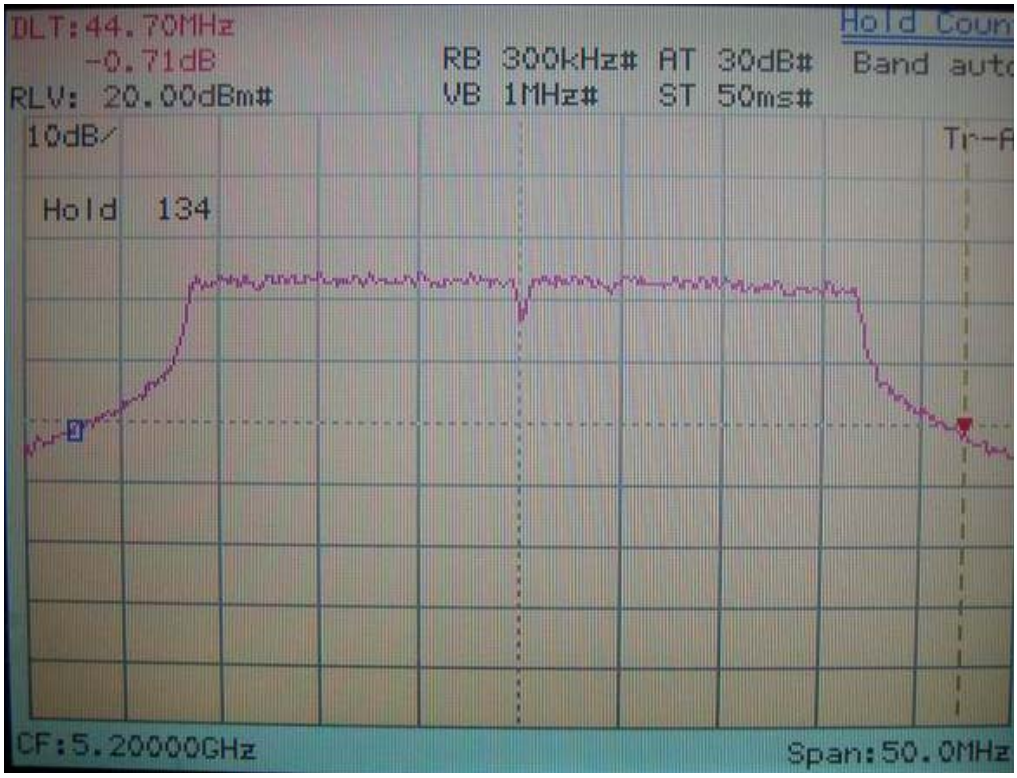
26dB Bandwidth of Channel CH48 IEEE 802.11a , 5240MHz



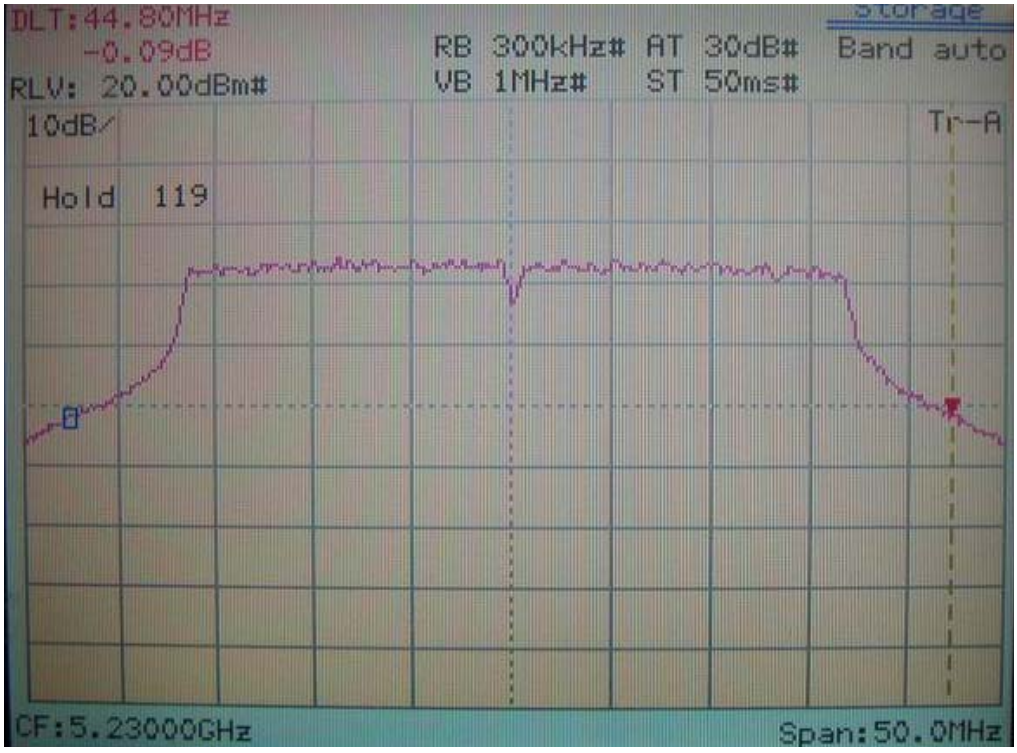
26dB Bandwidth of Channel CH38 IEEE 802.11 Super a , 5190MHz



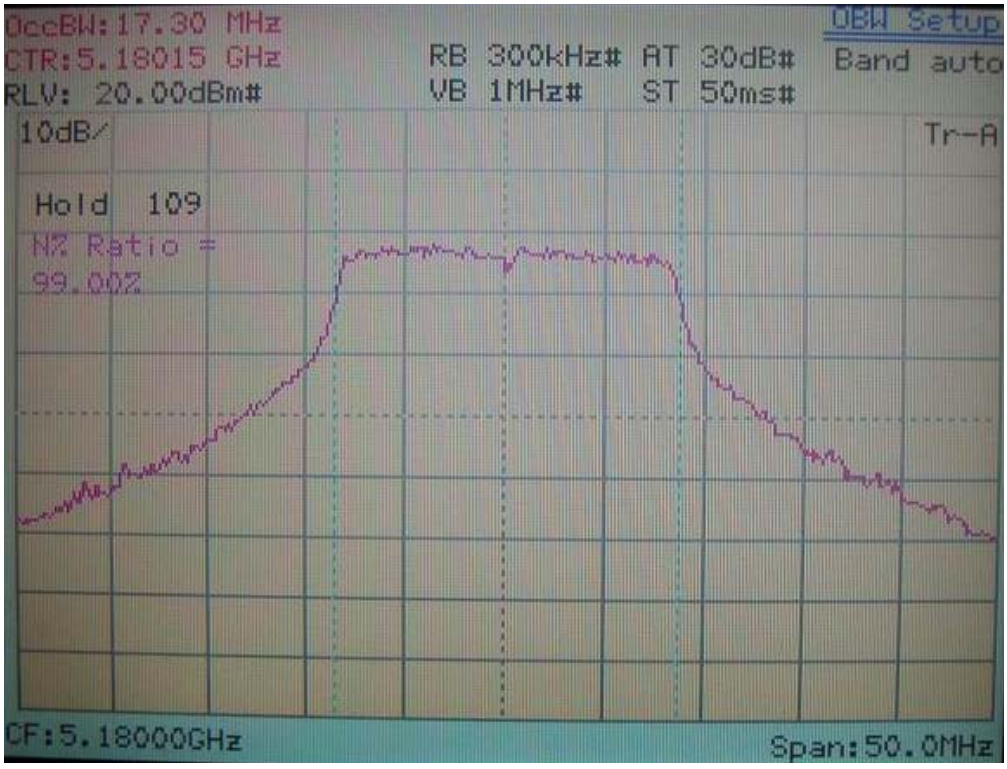
26dB Bandwidth of Channel CH40 IEEE 802.11 Super a , 5200MHz



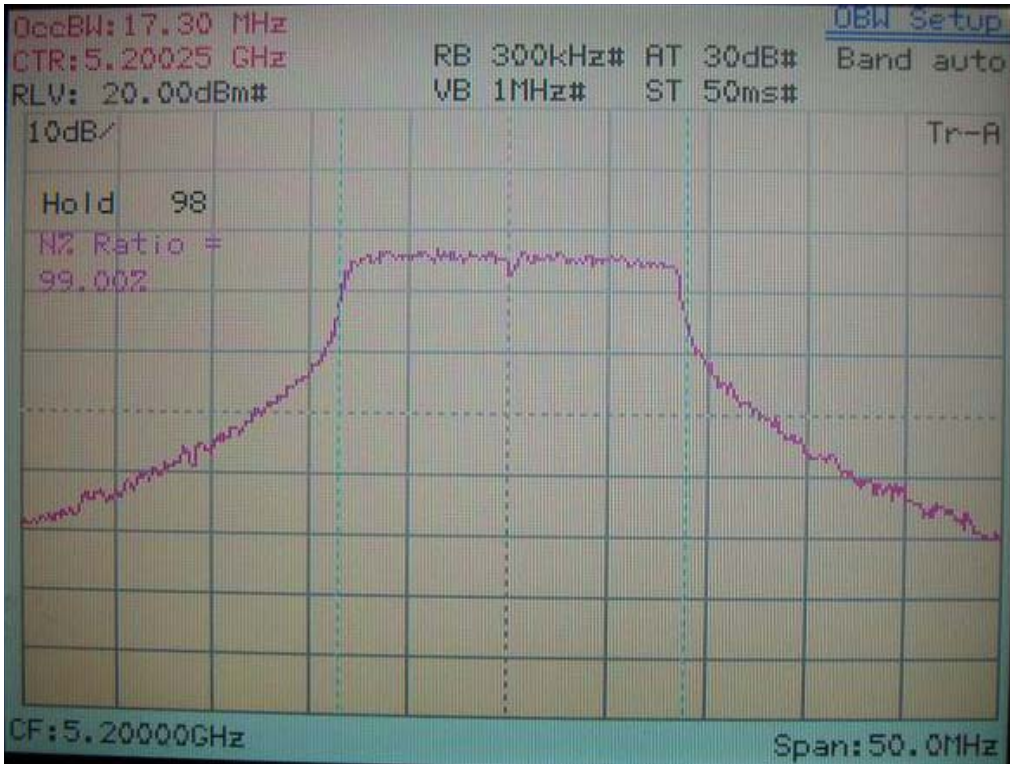
26dB Bandwidth of Channel CH46 IEEE 802.11 Super a , 5230MHz



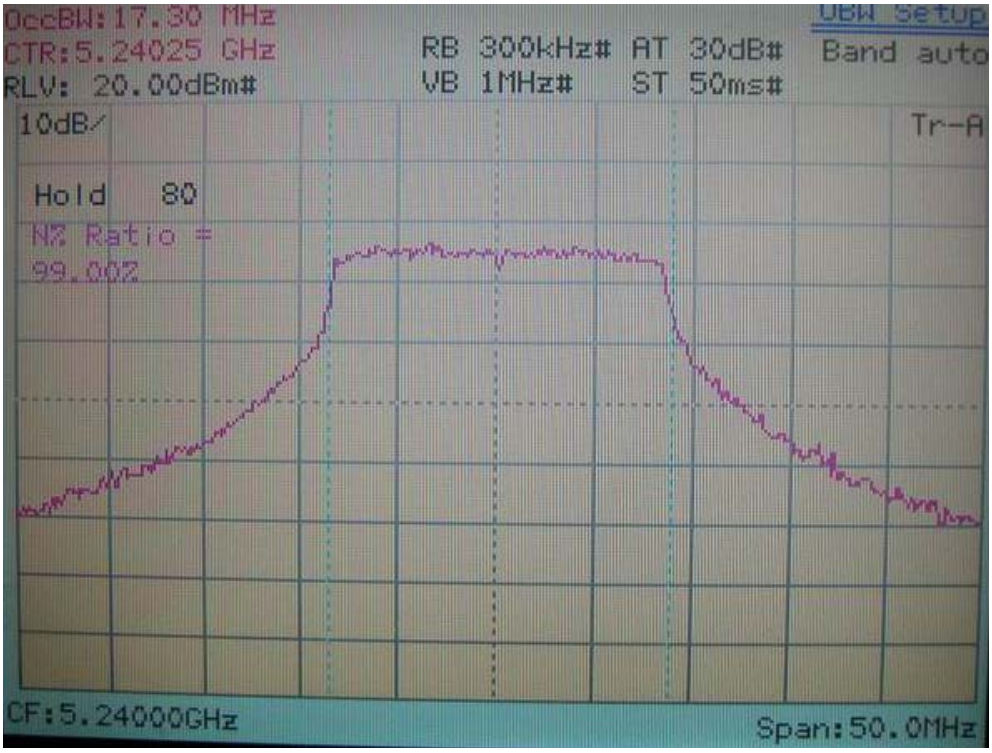
99% Occupied Bandwidth of Channel CH36 IEEE 802.11a , 5180MHz



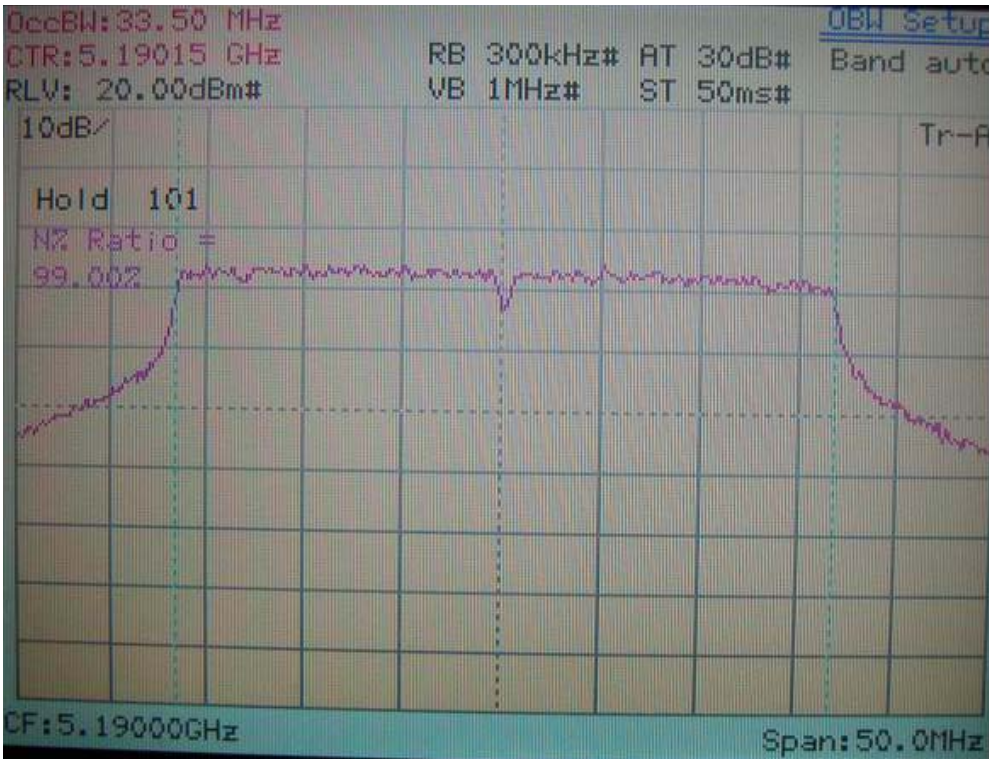
99% Occupied Bandwidth of Channel CH40 IEEE 802.11a , 5200MHz



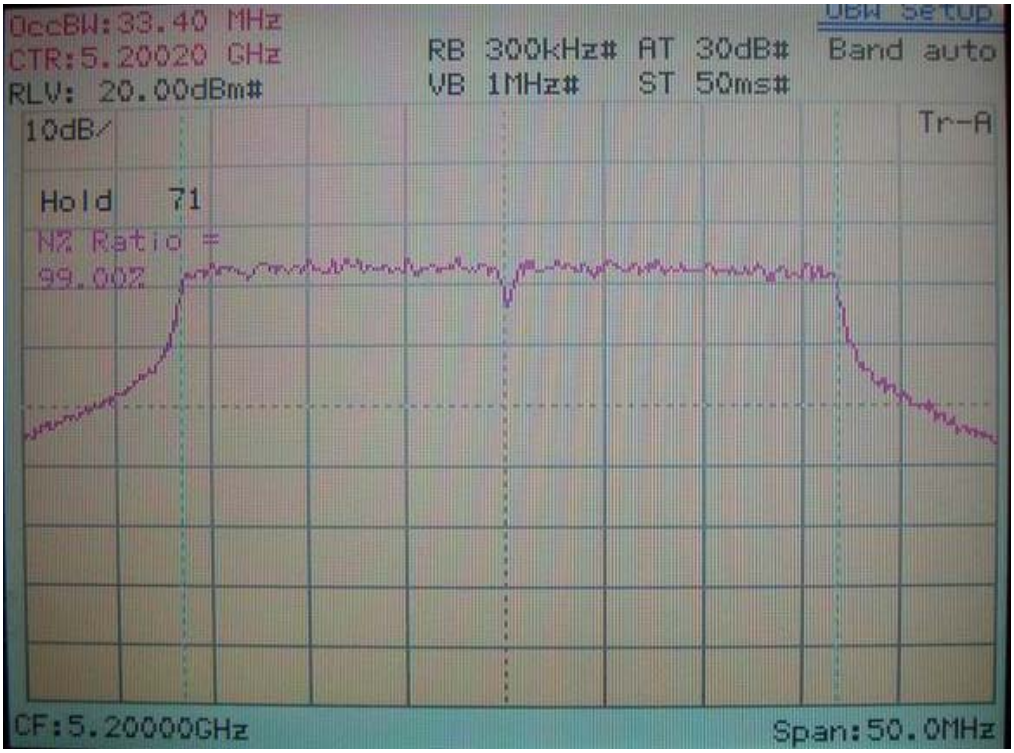
99% Occupied Bandwidth of Channel CH48 IEEE 802.11a , 5240MHz



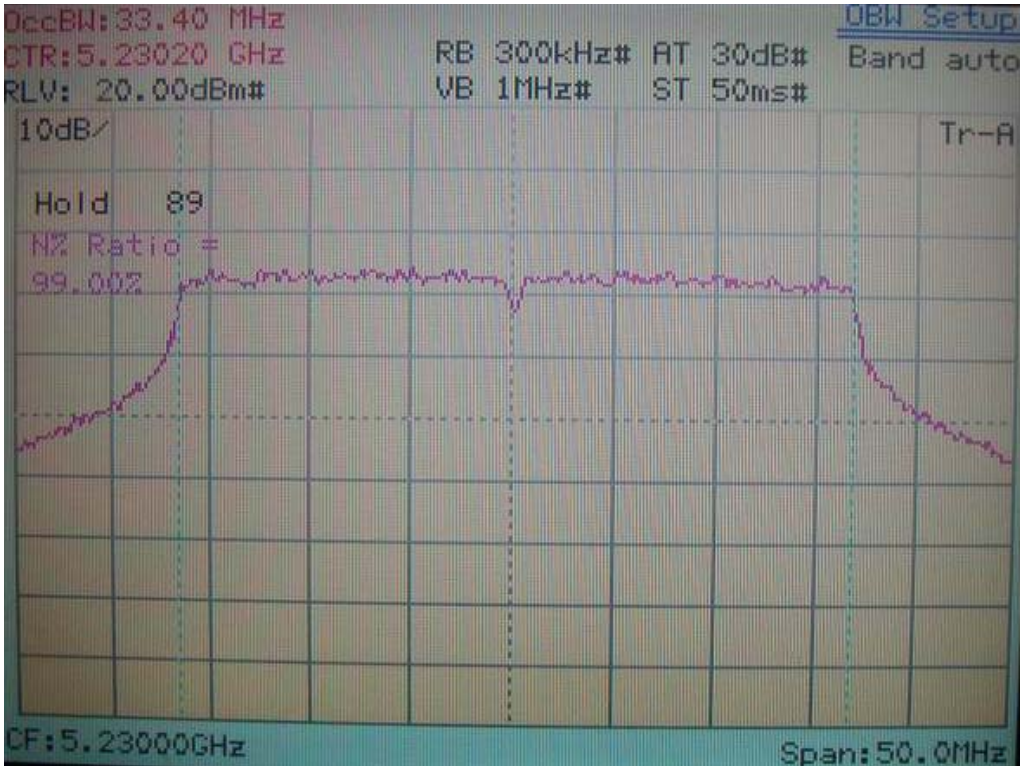
99% Occupied Bandwidth of Channel CH38 IEEE 802.11 Super a , 5190MHz



99% Occupied Bandwidth of Channel CH40 IEEE 802.11 Super a , 5200MHz



99% Occupied Bandwidth of Channel CH46 IEEE 802.11 Super a , 5230MHz



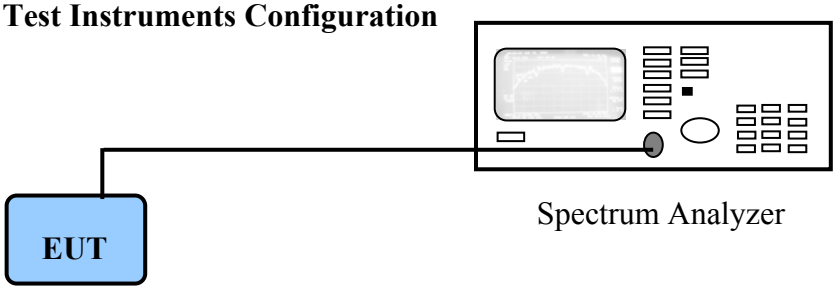
VI. Section 15.407(a)(1): Maximum Conducted Output Power

6.1 Test Condition & Setup

The test is performed accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.(FCC Public Notice DA02-2138A1)

The transmitter output operates continuously therefore Method # 3 is used.

6.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

1. The output of the transmitter is connected to the Spectrum Analyzer.
2. The calibration is performed before every test. The values of the output power of the EUT will shown in the dBm directly are the transmitter output maximum power. Recording as follows.

6.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	02/15/07

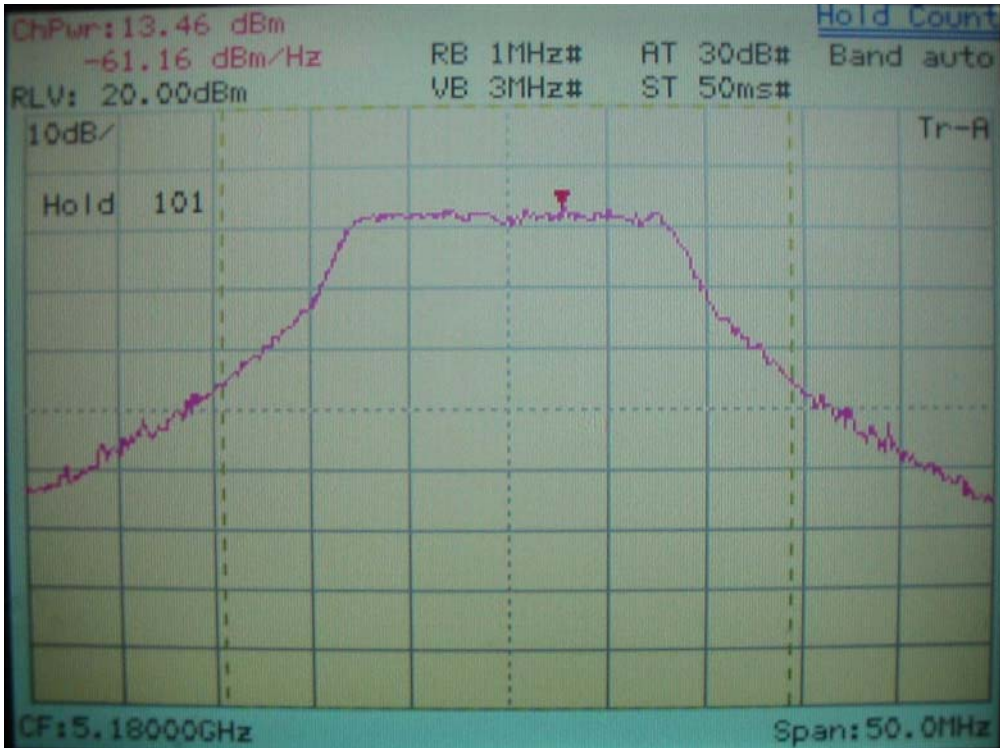
6.4 Test Result

Formula:
RF Output of EUT + |Cable Loss| = Output Maximum Power

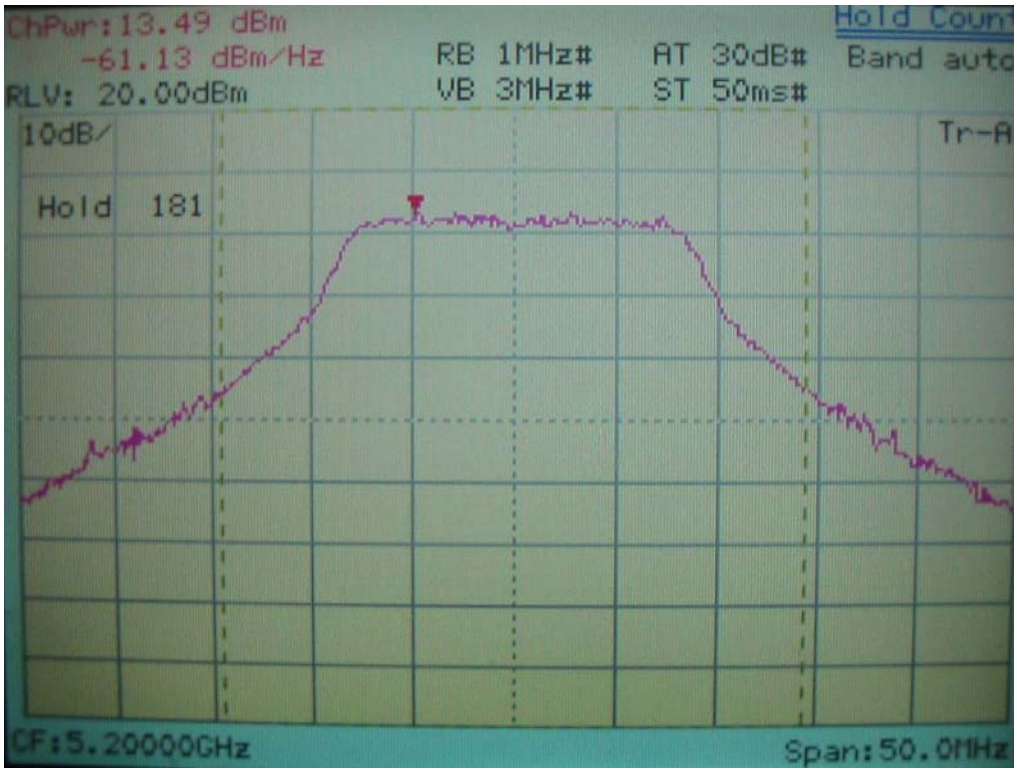
Channel	RF Output	Cable Loss	Output Maximum Power	
	dBm	dBm	dBm	mW
802.11a CH36	13.46	1.00	14.46	27.93
802.11a CH40	13.49	1.00	14.49	28.12
802.11a CH48	13.49	1.00	14.49	28.12
802.11 Super a CH38	13.62	1.00	14.62	28.97
802.11 Super a CH40	13.53	1.00	14.53	28.38
802.11 Super a CH46	13.58	1.00	14.58	28.71

Limit: For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz.

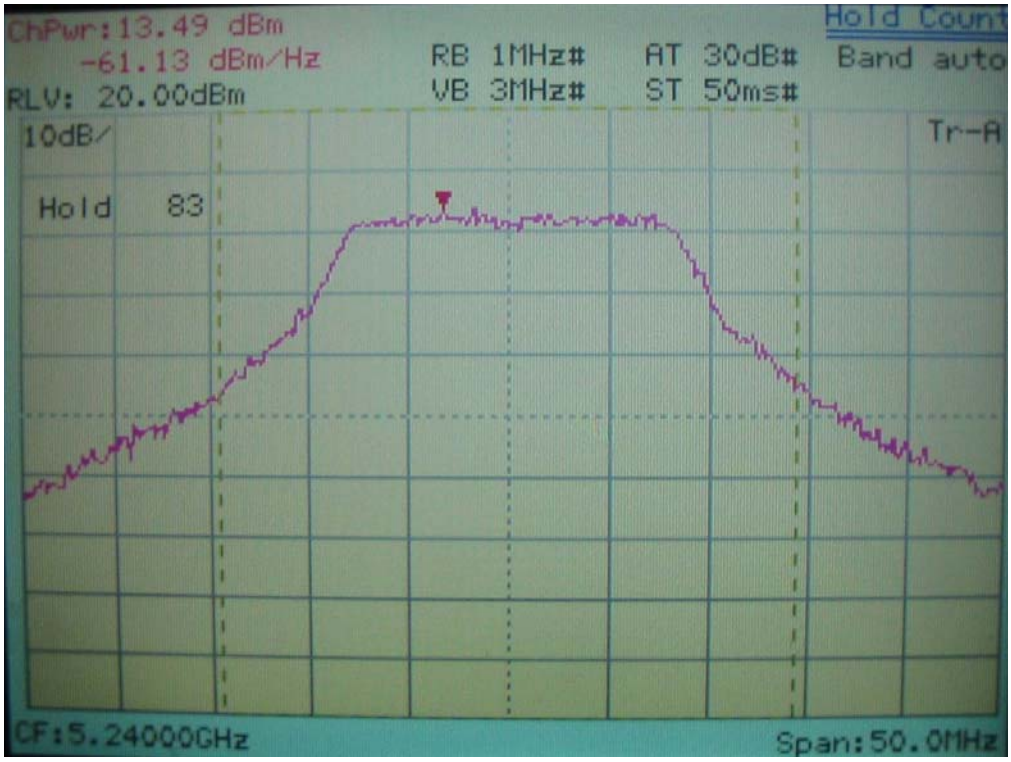
Power Spectral Density for IEEE 802.11a Channel 36, 5180MHz



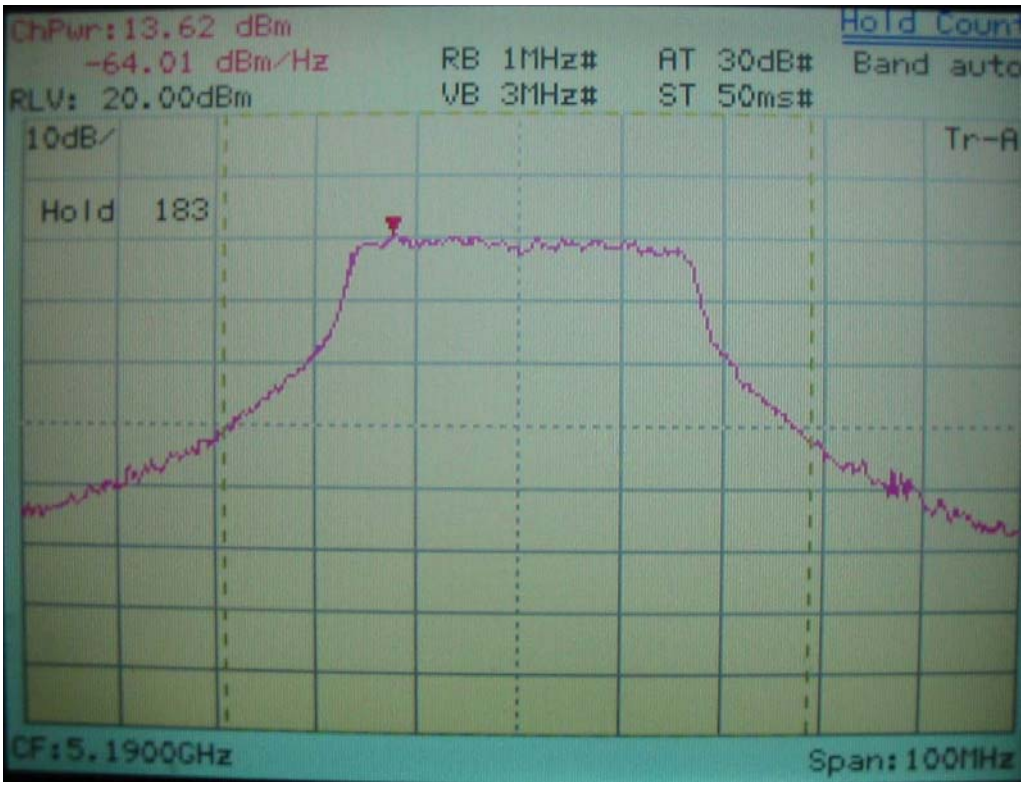
Power Spectral Density for IEEE 802.11a Channel 40, 5200MHz



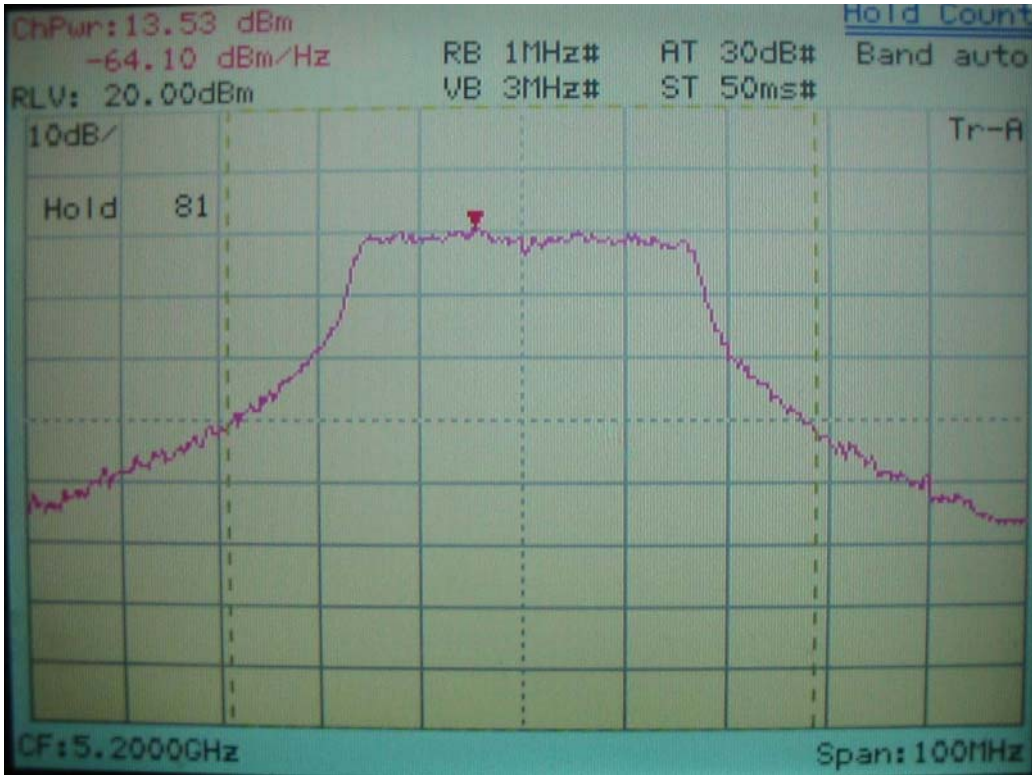
Power Spectral Density for IEEE 802.11a Channel 48, 5240MHz



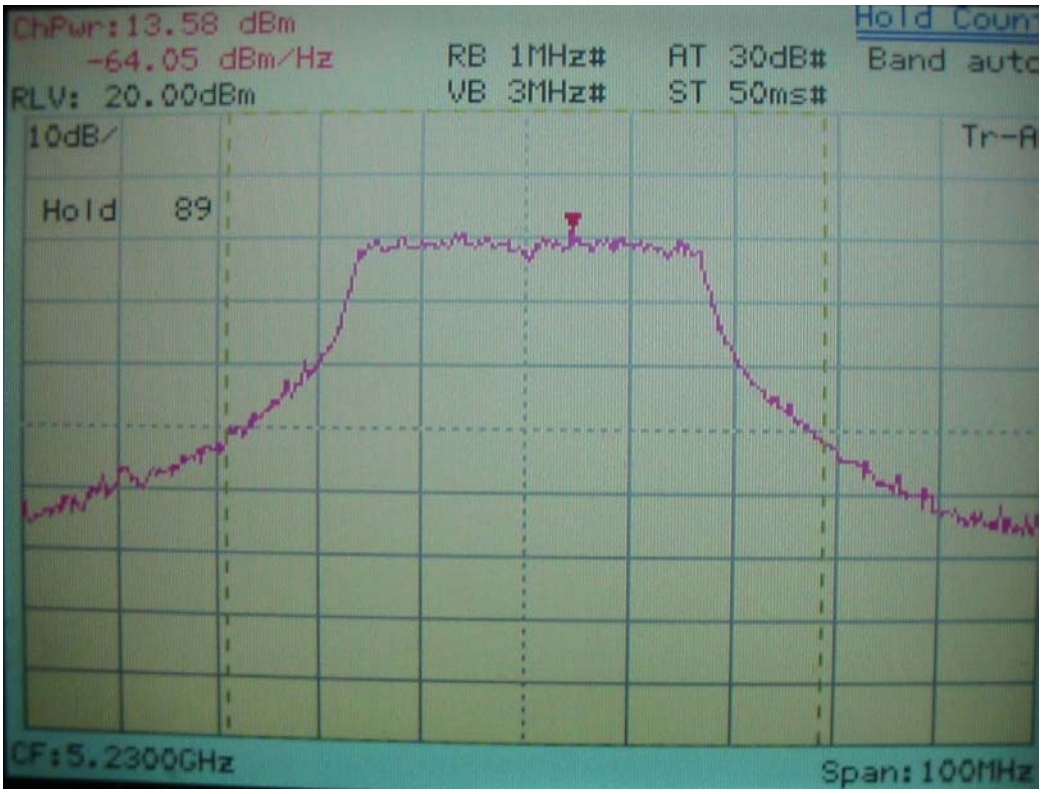
Power Spectral Density for IEEE 802.11 Super a Channel 38, 5190MHz



Power Spectral Density for IEEE 802.11 Super a Channel 40, 5200MHz



Power Spectral Density for IEEE 802.11 Super a Channel 46, 5230MHz



VII. Section 15.407 (b)(6), (b)(7): Spurious Emissions (Radiated)

7.1 Test Condition & Setup

We'd performed the test by the *radiated emission* skill: The EUT was placed in an anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions was noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we'd set the spectrum analyzer's 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30MHz to 1000MHz using an Hewlett Packard 85460A EMI Receiver, SCHWARZECK whole range Small Biconical Antenna (Model No.: UBAA9114 & BBVU9135) is used to measure frequency from 30 MHz to 1GHz. The final test is used the HP 85460A spectrum and 8564E spectrum was examined from 1GHz to 40GHz using an Hewlett Packard Spectrum Analyzer, EMCO/HP Horn Antenna (Model 3115 / 84125-80008/84125-80001) for 1G –40GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 40GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 120KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 40GHz) and the analyzer was operated in the maximum hold mode. There is a test condition applies in this test item, the test procedure description as the following:

Three channels were tested, one in the lowest (CH36), one in the middle (CH40) and the other in highest (CH48) for IEEE 802.11a and one in the lowest (CH38), one in the middle (CH40) and the other in highest (CH46) for IEEE 802.11 Super a. The setting up procedure is recorded on <1.3>

With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the 5150 ~ 5250 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBμV/m) is determined by algebraically adding the measured reading in dBμV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBμV) + Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

For frequency between 1GHz to 40GHz

FIa (dBμV/m) = FIr (dBμV) + Correction Factor

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain) + Switching Box Loss

7.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	02/17/07
Pre-amplifier	PA1F	TRC	1FAC	05/20/07
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/07
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/07
Spectrum Analyzer	8564E	HP	3720A00840	02/07/07
Microwave Preamplifier	84125C	HP	US36433002	02/07/07
Horn Antenna	3115	EMCO	9104-3668	01/23/07
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	02/09/07
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	02/09/07
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	01/26/07
Pre-amplifier	PA2F	TRC	2F1GZ	06/20/07
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	06/20/07
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	06/20/07

7.3 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following.

Test Conditions: Temperature : 23 ° C Humidity : 68 % RH

Test mode: Standby mode for 30MHz to 1GHz [Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
178.53	38.09	1.00	295	-3.79	34.30	43.50	-9.20
200.96	37.83	1.00	41	-3.50	34.33	43.50	-9.17
268.26	45.04	1.00	185	-4.26	40.78	46.00	-5.22
365.26	38.23	1.00	235	-2.24	35.99	46.00	-10.01
459.83	34.19	1.00	277	1.13	35.32	46.00	-10.68
729.61	23.27	1.00	234	9.82	33.09	46.00	-12.91

Test mode: Standby mode for 30MHz to 1GHz [Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
88.20	32.21	1.00	285	0.10	32.31	43.50	-11.19
119.72	32.17	1.00	31	-2.20	29.97	43.50	-13.53
459.23	34.07	1.00	175	1.11	35.18	46.00	-10.82
499.84	32.04	1.00	161	2.28	34.32	46.00	-11.68
729.61	29.18	1.00	218	9.82	39.00	46.00	-7.00
833.28	25.24	1.00	29	12.73	37.97	46.00	-8.03

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain) + Switching Box Loss

Test mode: Standby mode for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
13835.00	1.00	92	32.41	---	18.67	51.08	---	73.96	53.96	-2.88
21839.17	1.00	8	49.16	---	2.83	51.99	---	73.96	53.96	-1.97
26152.92	1.00	100	51.16	---	1.00	52.16	---	73.96	53.96	-1.80
30291.25	1.00	192	49.84	---	2.77	52.61	---	73.96	53.96	-1.35
31883.12	1.00	239	47.66	---	5.11	52.77	---	73.96	53.96	-1.19
35291.87	1.00	120	48.83	---	4.27	53.10	---	73.96	53.96	-0.86

Test mode: Standby mode for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
13735.83	1.00	320	31.58	---	19.24	50.82	---	73.96	53.96	-3.14
18435.62	1.00	320	49.50	---	1.50	51.00	---	73.96	53.96	-2.96
26181.25	1.00	120	50.33	---	1.61	51.94	---	73.96	53.96	-2.02
27580.00	1.00	287	51.83	---	0.64	52.47	---	73.96	53.96	-1.49
29593.75	1.00	140	49.16	---	3.52	52.68	---	73.96	53.96	-1.28
37778.12	1.00	150	49.83	---	3.32	53.15	---	73.96	53.96	-0.81

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF radiated emissions levels do comply with the limit both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

Test mode: IEEE 802.11a CH36 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
119.12	32.23	1.00	140	-2.18	30.05	43.50	-13.45
133.06	38.85	1.00	203	-2.73	36.12	43.50	-7.38
167.01	37.05	1.00	73	-3.72	33.33	43.50	-10.17
200.36	41.04	1.00	63	-3.47	37.57	43.50	-5.93
233.70	43.21	1.00	87	-4.08	39.13	46.00	-6.87
798.12	22.71	1.00	48	11.93	34.64	46.00	-11.36

Test mode: IEEE 802.11a CH36 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
50.61	33.68	1.00	217	-3.79	29.89	40.00	-10.11
118.51	34.70	1.00	306	-2.16	32.54	43.50	-10.96
146.40	33.96	1.00	194	-3.36	30.60	43.50	-12.90
167.62	34.62	1.00	17	-3.74	30.88	43.50	-12.62
233.70	37.87	1.00	75	-4.08	33.79	46.00	-12.21
797.51	24.68	1.00	78	11.91	36.59	46.00	-9.41

Test mode: IEEE 802.11a CH36 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5500.00	1.00	69	34.33	---	16.24	50.57	---	73.96	53.96	-3.39
8022.17	1.00	274	36.61	---	10.89	47.50	---	73.96	53.96	-6.46
15541.83	1.00	72	42.77	---	5.98	48.75	---	73.96	53.96	-5.21
25901.46	1.00	173	48.66	---	0.64	49.30	---	73.96	53.96	-4.66
31078.75	1.00	199	48.34	---	3.08	51.42	---	73.96	53.96	-2.54
36259.37	1.00	74	46.84	---	3.79	50.63	---	73.96	53.96	-3.33

Test mode: IEEE 802.11a CH36 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5450.00	1.00	360	34.84	---	16.10	50.94	---	73.96	53.96	-3.02
7356.67	1.00	346	37.94	---	10.40	48.34	---	73.96	53.96	-5.62
15541.83	1.00	298	42.10	---	5.98	48.08	---	73.96	53.96	-5.88
25901.46	1.00	22	49.00	---	0.64	49.64	---	73.96	53.96	-4.32
31078.75	1.00	31	46.67	---	3.08	49.75	---	73.96	53.96	-4.21
36259.37	1.00	234	47.84	---	3.79	51.63	---	73.96	53.96	-2.33

Test mode: IEEE 802.11a CH40 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
167.01	31.85	1.00	61	-3.72	28.13	43.50	-15.37
182.17	33.92	1.00	61	-3.77	30.15	43.50	-13.35
200.36	40.97	1.00	78	-3.47	37.50	43.50	-6.00
234.31	40.49	1.00	336	-4.08	36.41	46.00	-9.59
259.16	35.12	1.00	295	-4.21	30.91	46.00	-15.09
941.19	22.78	1.00	237	15.57	38.35	46.00	-7.65

Test mode: IEEE 802.11a CH40 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
88.81	31.30	1.00	166	-0.05	31.25	43.50	-12.25
117.30	34.64	1.00	299	-2.12	32.52	43.50	-10.98
233.09	38.25	1.00	92	-4.09	34.16	46.00	-11.84
577.44	31.51	1.00	298	5.51	37.02	46.00	-8.98
798.73	24.83	1.00	104	11.95	36.78	46.00	-9.22
941.19	21.81	1.00	45	15.57	37.38	46.00	-8.62

Test mode: IEEE 802.11a CH40 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5720.83	1.00	216	34.33	---	16.53	50.86	---	73.96	53.96	-3.10
7412.58	1.00	192	37.44	---	10.38	47.82	---	73.96	53.96	-6.14
15594.92	1.00	274	43.27	---	5.90	49.17	---	73.96	53.96	-4.79
26000.62	1.00	162	48.33	---	1.30	49.63	---	73.96	53.96	-4.33
31202.50	1.00	31	47.33	---	3.22	50.55	---	73.96	53.96	-3.41
36400.00	1.00	234	46.67	---	3.65	50.32	---	73.96	53.96	-3.64

Test mode: IEEE 802.11a CH40 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5712.50	1.00	83	35.33	---	16.52	51.85	---	73.96	53.96	-2.11
8016.67	1.00	132	36.94	---	10.87	47.81	---	73.96	53.96	-6.15
15594.92	1.00	208	42.44	---	5.90	48.34	---	73.96	53.96	-5.62
26000.62	1.00	9	47.83	---	1.30	49.13	---	73.96	53.96	-4.83
31202.50	1.00	139	47.50	---	3.22	50.72	---	73.96	53.96	-3.24
36400.00	1.00	42	46.83	---	3.65	50.48	---	73.96	53.96	-3.48

Test mode: IEEE 802.11a CH48 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
167.62	35.03	1.00	27	-3.74	31.29	43.50	-12.21
200.36	39.41	1.00	102	-3.47	35.94	43.50	-7.56
233.70	41.12	1.00	278	-4.08	37.04	46.00	-8.96
798.12	22.62	1.00	55	11.93	34.55	46.00	-11.45
899.36	22.01	1.00	72	14.73	36.74	46.00	-9.26
941.19	22.62	1.00	230	15.57	38.19	46.00	-7.81

Test mode: IEEE 802.11a CH48 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
50.61	25.98	1.00	172	3.79	29.77	40.00	-10.23
118.51	32.98	1.00	296	-2.16	30.82	43.50	-12.68
167.01	32.83	1.00	94	-3.72	29.11	43.50	-14.39
233.70	36.99	1.00	84	-4.08	32.91	46.00	-13.09
797.51	25.32	1.00	225	11.91	37.23	46.00	-8.77
941.19	21.38	1.00	149	15.57	36.95	46.00	-9.05

Test mode: IEEE 802.11a CH48 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5629.17	1.00	268	35.50	---	16.41	51.91	---	73.96	53.96	-2.05
7197.17	1.00	203	37.77	---	9.88	47.65	---	73.96	53.96	-6.31
15721.50	1.00	208	44.61	---	6.05	50.66	---	73.96	53.96	-3.30
26202.50	1.00	120	49.67	---	1.59	51.26	---	73.96	53.96	-2.70
31438.75	1.00	44	47.00	---	4.15	51.15	---	73.96	53.96	-2.81
36681.25	1.00	360	47.33	---	3.23	50.56	---	73.96	53.96	-3.40

Test mode: IEEE 802.11a CH48 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude*		*Correction Factor*	*Corrected Amplitude*		*Limit*		*Margin*
			Peak / Ave.			*Peak / Ave.*		*Peak / Ave.*		
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
3995.83	1.00	163	35.17	---	14.03	49.20	---	73.96	53.96	-4.76
8021.25	1.00	121	36.61	---	10.89	47.50	---	73.96	53.96	-6.46
15721.50	1.00	211	46.11	---	6.05	52.16	---	73.96	53.96	-1.80
26202.50	1.00	187	49.67	---	1.59	51.26	---	73.96	53.96	-2.70
31438.75	1.00	249	45.67	---	4.15	49.82	---	73.96	53.96	-4.14
36681.25	1.00	318	47.67	---	3.23	50.90	---	73.96	53.96	-3.06

Test mode: IEEE 802.11 Super a CH38 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
156.10	34.14	1.00	31	-3.54	30.60	43.50	-12.90
167.01	36.79	1.00	78	-3.72	33.07	43.50	-10.43
200.96	41.62	1.00	109	-3.50	38.12	43.50	-5.38
234.31	41.33	1.00	20	-4.08	37.25	46.00	-8.75
370.11	32.41	1.00	312	-2.28	30.13	46.00	-15.87
990.30	21.79	1.00	144	17.08	38.87	54.00	-15.13

Test mode: IEEE 802.11 Super a CH38 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
117.91	33.06	1.00	24	-2.14	30.92	43.50	-12.58
167.01	38.51	1.00	71	-3.72	34.79	43.50	-8.71
182.17	33.10	1.00	17	-3.77	29.33	43.50	-14.17
200.36	32.99	1.00	7	-3.47	29.52	43.50	-13.98
233.70	35.90	1.00	104	-4.08	31.82	46.00	-14.18
798.12	24.61	1.00	75	11.93	36.54	46.00	-9.46

Test mode: IEEE 802.11 Super a CH38 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5637.50	1.00	141	34.00	---	16.42	50.42	---	73.96	53.96	-3.54
8098.25	1.00	278	36.60	---	11.25	47.85	---	73.96	53.96	-6.11
15570.42	1.00	269	41.78	---	5.93	47.71	---	73.96	53.96	-6.25
25951.04	1.00	261	48.83	---	0.81	49.64	---	73.96	53.96	-4.32
31140.62	1.00	200	46.84	---	3.37	50.21	---	73.96	53.96	-3.75
36332.50	1.00	162	46.83	---	3.74	50.57	---	73.96	53.96	-3.39

Test mode: IEEE 802.11 Super a CH38 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5516.67	1.00	22	34.50	---	16.26	50.76	---	73.96	53.96	-3.20
8173.42	1.00	85	36.44	---	11.23	47.67	---	73.96	53.96	-6.29
15570.42	1.00	201	41.78	---	5.93	47.71	---	73.96	53.96	-6.25
25951.04	1.00	215	49.33	---	0.81	50.14	---	73.96	53.96	-3.82
31140.62	1.00	195	47.34	---	3.37	50.71	---	73.96	53.96	-3.25
36332.50	1.00	80	47.33	---	3.74	51.07	---	73.96	53.96	-2.89

Test mode: IEEE 802.11 Super a CH40 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
167.62	37.88	1.00	92	-3.74	34.14	43.50	-9.36
200.36	41.69	1.00	61	-3.47	38.22	43.50	-5.28
225.21	38.84	1.00	221	-4.07	34.77	46.00	-11.23
233.70	39.42	1.00	48	-4.08	35.34	46.00	-10.66
267.04	37.20	1.00	295	-4.26	32.94	46.00	-13.06
941.19	22.98	1.00	232	15.57	38.55	46.00	-7.45

Test mode: IEEE 802.11 Super a CH40 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
39.70	23.05	1.00	178	5.57	28.62	40.00	-11.38
118.51	32.00	1.00	273	-2.16	29.84	43.50	-13.66
167.01	36.37	1.00	199	-3.72	32.65	43.50	-10.85
200.96	34.21	1.00	40	-3.50	30.71	43.50	-12.79
234.31	36.04	1.00	67	-4.08	31.96	46.00	-14.04
798.73	25.63	1.00	65	11.95	37.58	46.00	-8.42

Test mode: IEEE 802.11 Super a CH40 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5904.17	1.00	9	34.16	---	16.77	50.93	---	73.96	53.96	-3.03
7589.50	1.00	228	36.94	---	10.85	47.79	---	73.96	53.96	-6.17
15599.00	1.00	266	42.94	---	5.89	48.83	---	73.96	53.96	-5.13
26000.62	1.00	165	48.17	---	1.30	49.47	---	73.96	53.96	-4.49
31202.50	1.00	171	47.00	---	3.22	50.22	---	73.96	53.96	-3.74
36400.00	1.00	292	47.67	---	3.65	51.32	---	73.96	53.96	-2.64

Test mode: IEEE 802.11 Super a CH40 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5858.33	1.00	0	34.50	---	16.71	51.21	---	73.96	53.96	-2.75
7222.83	1.00	252	37.77	---	10.02	47.79	---	73.96	53.96	-6.17
15599.00	1.00	242	41.27	---	5.89	47.16	---	73.96	53.96	-6.80
26000.62	1.00	335	48.83	---	1.30	50.13	---	73.96	53.96	-3.83
31202.50	1.00	284	46.83	---	3.22	50.05	---	73.96	53.96	-3.91
36400.00	1.00	248	47.17	---	3.65	50.82	---	73.96	53.96	-3.14

Test mode: IEEE 802.11 Super a CH46 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
167.01	37.48	1.00	94	-3.72	33.76	43.50	-9.74
200.96	38.98	1.00	313	-3.50	35.48	43.50	-8.02
233.70	42.03	1.00	296	-4.08	37.95	46.00	-8.05
249.46	33.95	1.00	195	-3.55	30.40	46.00	-15.60
314.33	33.88	1.00	168	-3.16	30.72	46.00	-15.28
941.19	23.93	1.00	309	15.57	39.50	46.00	-6.50

Test mode: IEEE 802.11 Super a CH46 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
117.91	31.87	1.00	275	-2.14	29.73	43.50	-13.77
167.01	37.26	1.00	48	-3.72	33.54	43.50	-9.96
234.31	35.97	1.00	71	-4.08	31.89	46.00	-14.11
459.83	29.23	1.00	166	1.13	30.36	46.00	-15.64
797.51	25.09	1.00	73	11.91	37.00	46.00	-9.00
941.19	22.48	1.00	291	15.57	38.05	46.00	-7.95

Test mode: IEEE 802.11 Super a CH46 for 1GHz to 40GHz [Horizontal]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5908.33	1.00	125	34.17	---	16.77	50.94	---	73.96	53.96	-3.02
7073.42	1.00	252	37.27	---	9.55	46.82	---	73.96	53.96	-7.14
15692.92	1.00	199	42.44	---	5.99	48.43	---	73.96	53.96	-5.53
26149.37	1.00	197	50.33	---	0.92	51.25	---	73.96	53.96	-2.71
31382.50	1.00	268	46.00	---	4.10	50.10	---	73.96	53.96	-3.86
36608.12	1.00	44	47.00	---	3.40	50.40	---	73.96	53.96	-3.56

Test mode: IEEE 802.11 Super a CH46 for 1GHz to 40GHz [Vertical]

Frequency	*Ant. H.*	*Table*	*Amplitude Peak / Ave.*		*Correction Factor*	*Corrected Amplitude Peak / Ave.*		*Limit Peak / Ave.*		*Margin*
MHz	*m*	*degree*	*dBμV*		*dB/m*	*dBμV/m*		*dBμV/m*		*dB*
5533.33	1.00	259	34.67	---	16.28	50.95	---	73.96	53.96	-3.01
7562.00	1.00	320	36.60	---	10.66	47.26	---	73.96	53.96	-6.70
15692.92	1.00	167	40.44	---	5.99	46.43	---	73.96	53.96	-7.53
26149.37	1.00	37	50.17	---	0.92	51.09	---	73.96	53.96	-2.87
31382.50	1.00	44	45.84	---	4.10	49.94	---	73.96	53.96	-4.02
36608.12	1.00	279	47.33	---	3.40	50.73	---	73.96	53.96	-3.23

XIII. Section 15.247(d): Power Spectral Density

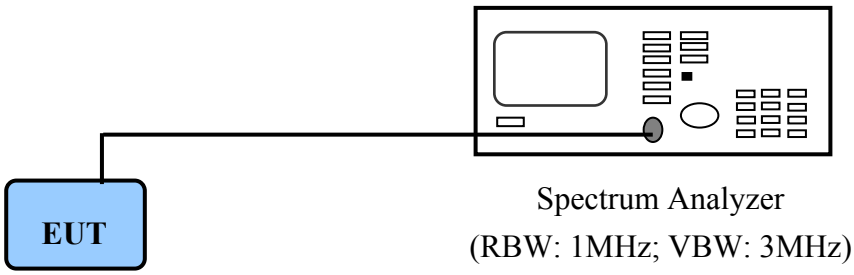
8.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

The test is performed accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.(FCC Public Notice DA02-2138A1)

The transmitter output operates continuously therefore Method # 1 is used.

8.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

8.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	02/15/07

8.4 Test Result of Power spectral density

The following table shows a summary of the test results of the Power Spectral Density.

IEEE 802.11a

Channel	*Ppr (dBm)*	*Cable Loss (dB)*	*Ppq (dBm)*	*Limit (dBm/MHz)*	*Margin (dB)*
CH 36	0.16	3.30	3.46	4.00	-0.54
CH 40	0.24	3.30	3.54	4.00	-0.46
CH 48	0.18	3.30	3.48	4.00	-0.52

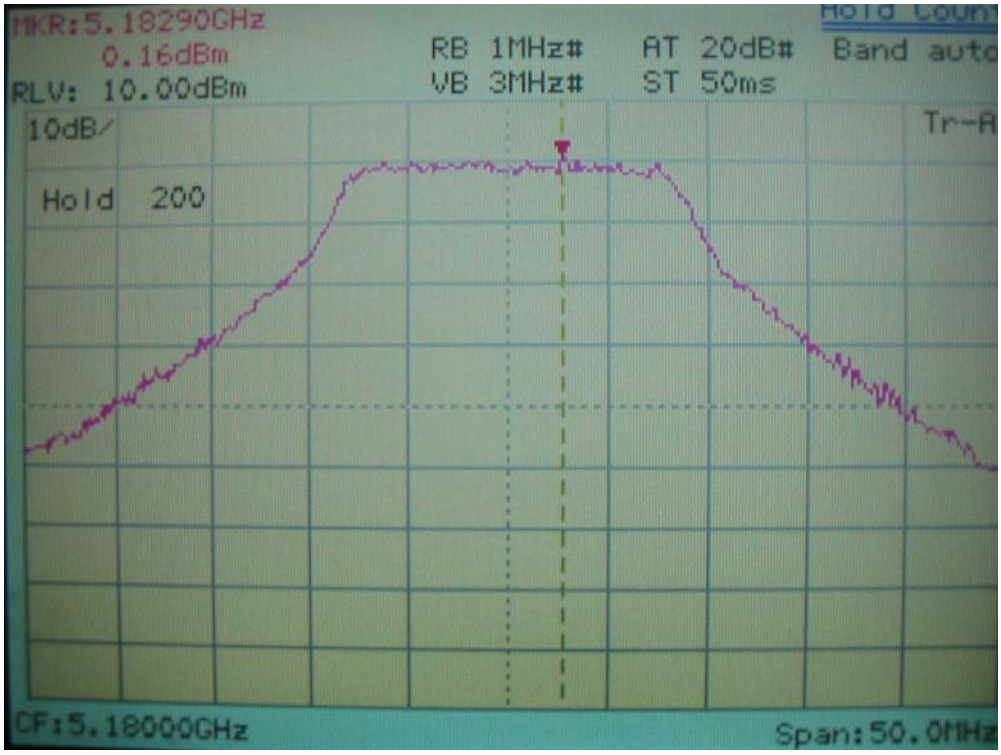
IEEE 802.11 Super a

Channel	*Ppr (dBm)*	*Cable Loss (dB)*	*Ppq (dBm)*	*Limit (dBm/MHz)*	*Margin (dB)*
CH 38	-1.80	3.30	1.50	4.00	-2.50
CH 40	-2.27	3.30	1.03	4.00	-2.97
CH 46	-2.09	3.30	1.21	4.00	-2.79

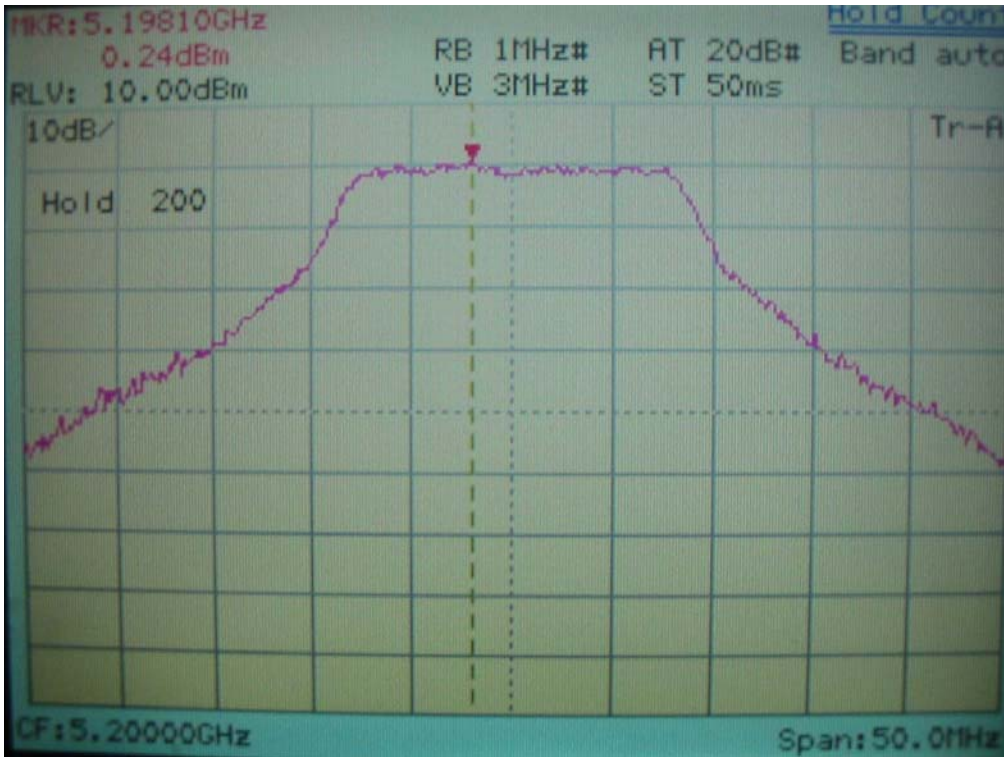
Note:

1. The following pages show the results of spectrum reading.
2. Ppr: spectrum read power density (using peak search mode),
   Ppq: actual peak power density in the spread spectrum band.
3. Ppq = Ppr + Cable Loss

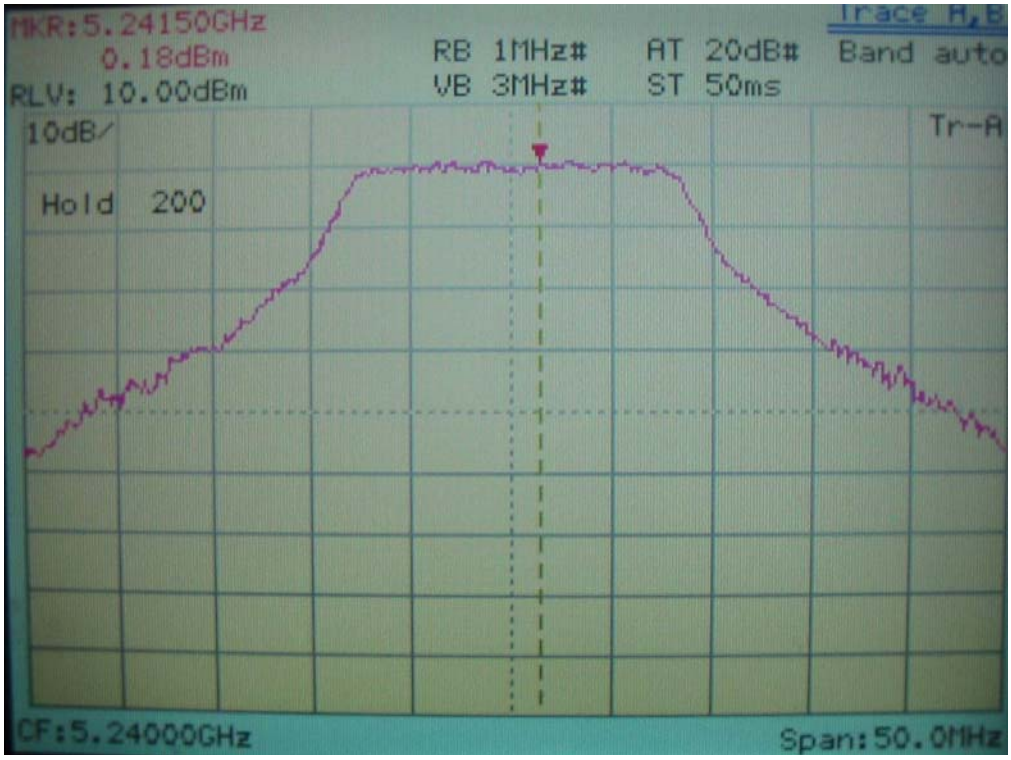
Power Spectral Density for IEEE 802.11a Channel 36, 5180MHz



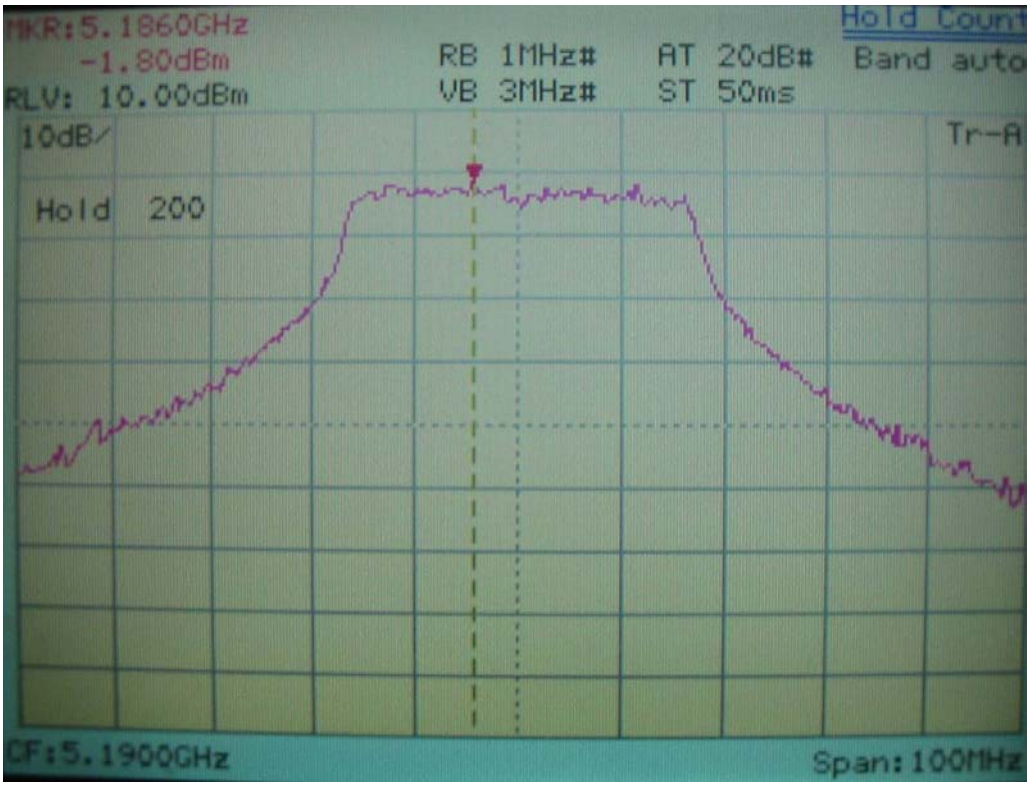
Power Spectral Density for IEEE 802.11a Channel 40, 5200MHz



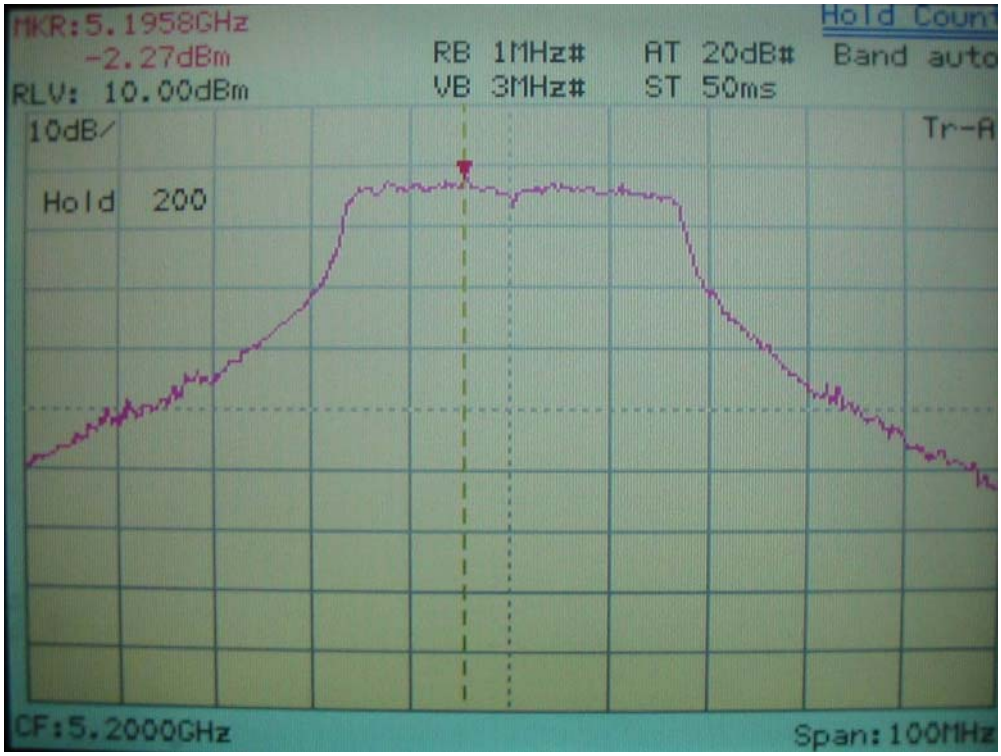
Power Spectral Density for IEEE 802.11a Channel 48, 5240MHz



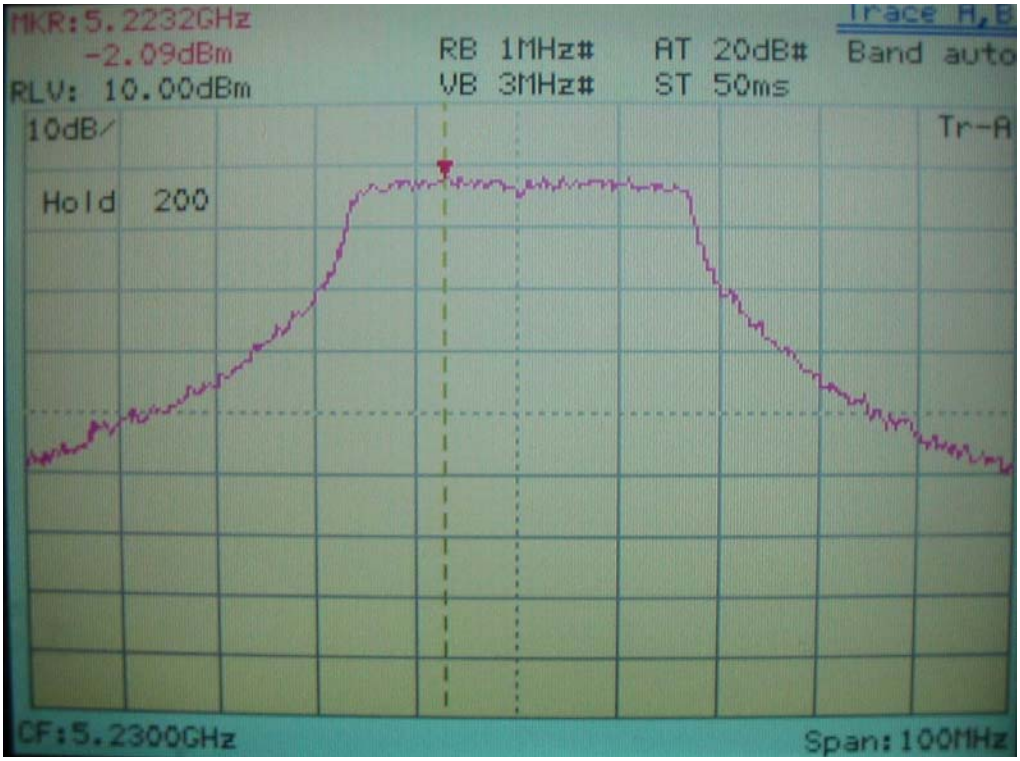
Power Spectral Density for IEEE 802.11 Super a Channel 38, 5190MHz



Power Spectral Density for IEEE 802.11 Super a Channel 40, 5200MHz



Power Spectral Density for IEEE 802.11 Super a Channel 46, 5230MHz



IX. Section 15.407(a)(6): Peak Excursion Measurement

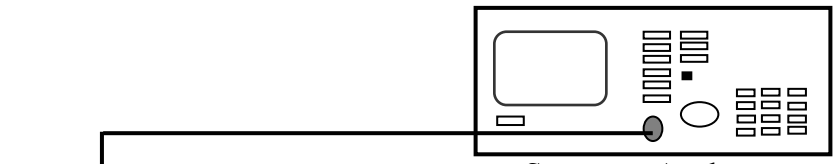
9.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

The test is performed accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.(FCC Public Notice DA02-2138A1)

The transmitter output operates continuously therefore 2nd trace of Method # 3 is used.

9.2 Test Instruments Configuration



Spectrum Analyzer
(Trace #1: RBW: 1MHz; VBW: 3MHz) Peak Trace
(Trace #2: RBW: 1MHz; VBW: 300kHz) Avg. Trace

PC to control the EUT at maximal power output and channel number and set antenna kit

9.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	02/15/07

9.4 Test Result of Peak Excursion

The following table shows a summary of the test results of the Peak Excursion.

IEEE 802.11a

Channel	*Peak Excursion (dB)*	*Limit (dB)*	*Margin (dB)*
CH 36	7.22	13.00	-5.78
CH 40	7.56	13.00	-5.44
CH 48	8.31	13.00	-4.69

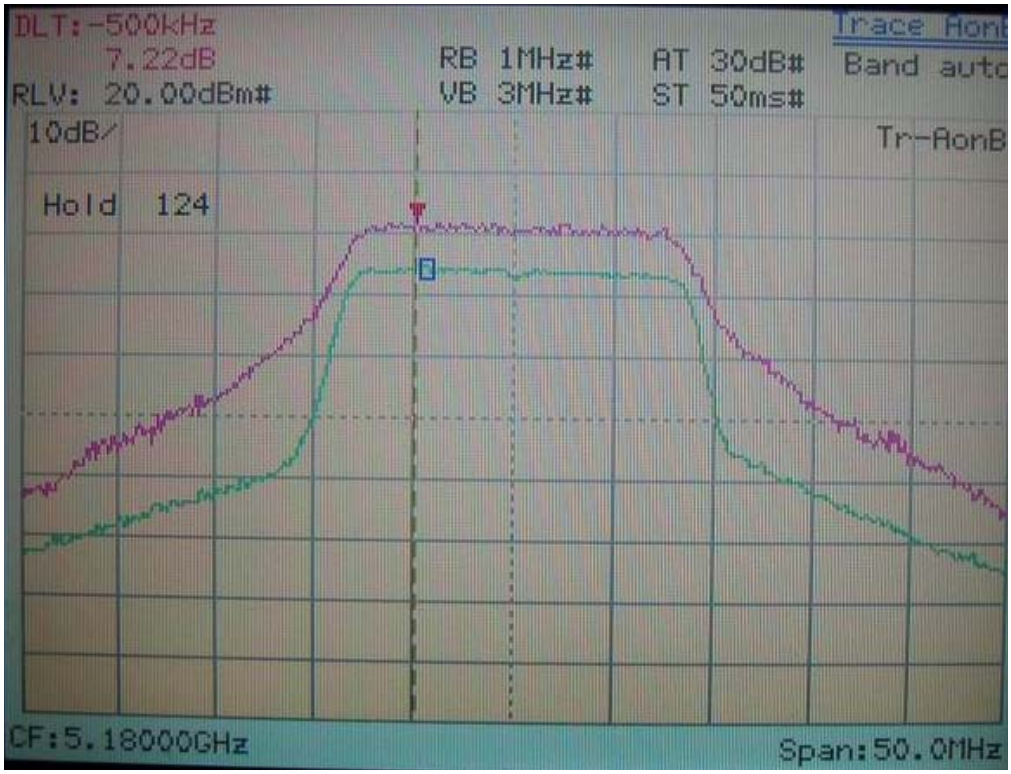
IEEE 802.11 Super a

Channel	*Peak Excursion (dB)*	*Limit (dB)*	*Margin (dB)*
CH 38	7.67	13.00	-5.33
CH 40	7.77	13.00	-5.23
CH 46	7.40	13.00	-5.60

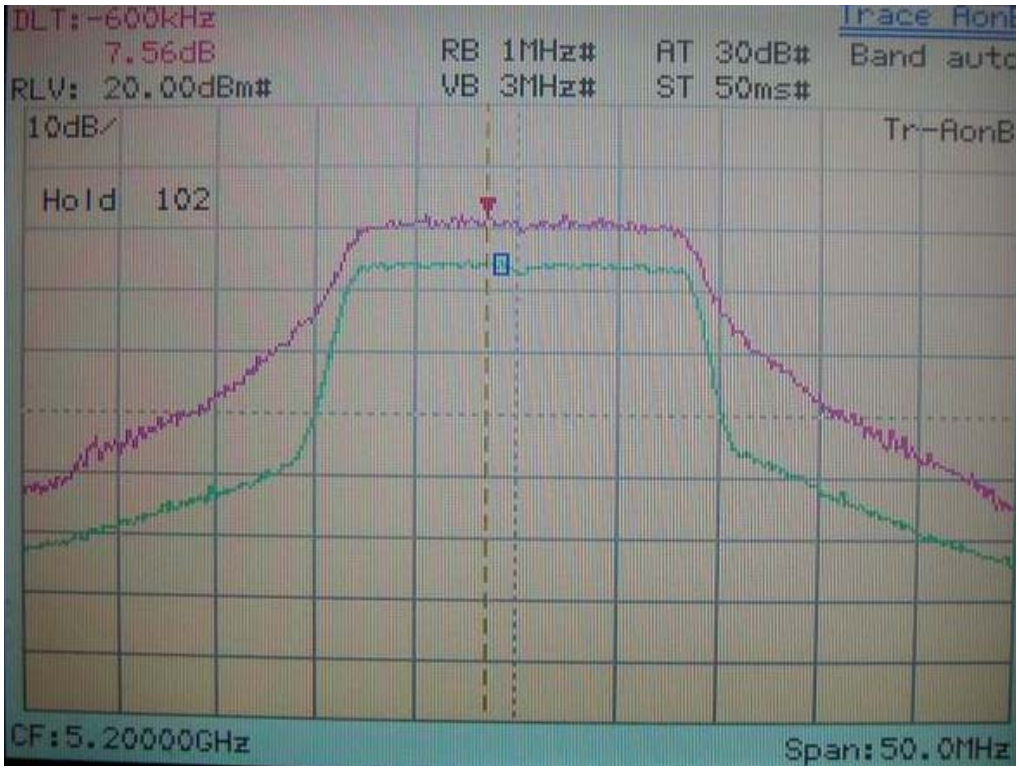
Note:

1. The following pages show the results of spectrum reading.

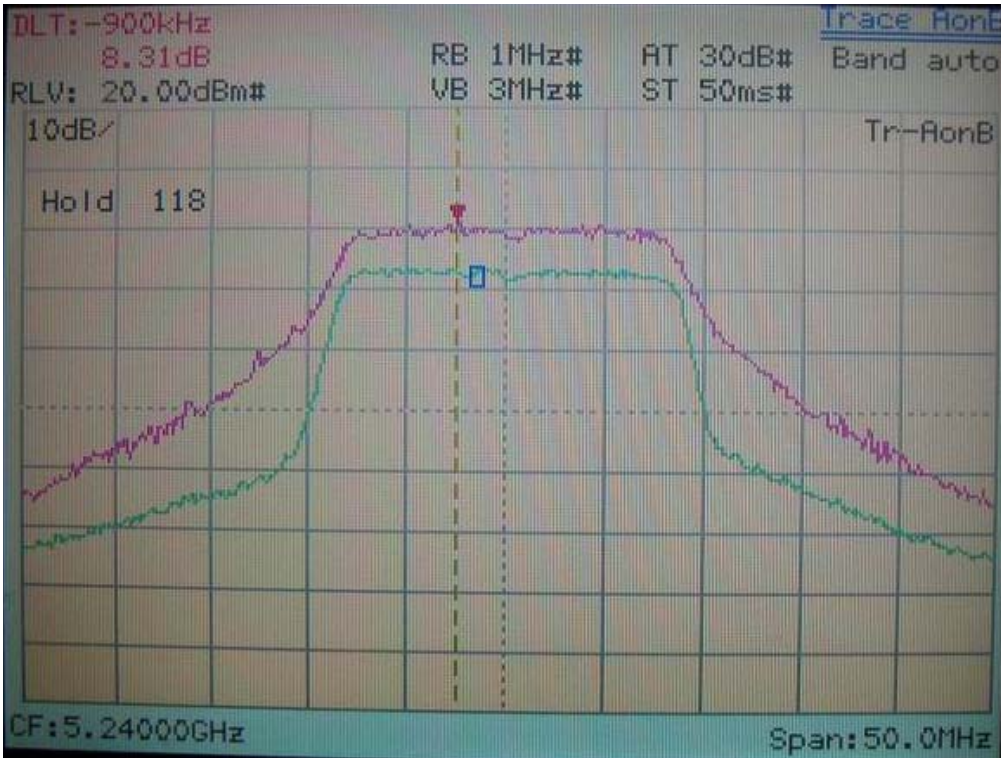
IEEE 802.11a Channel 36, 5180MHz



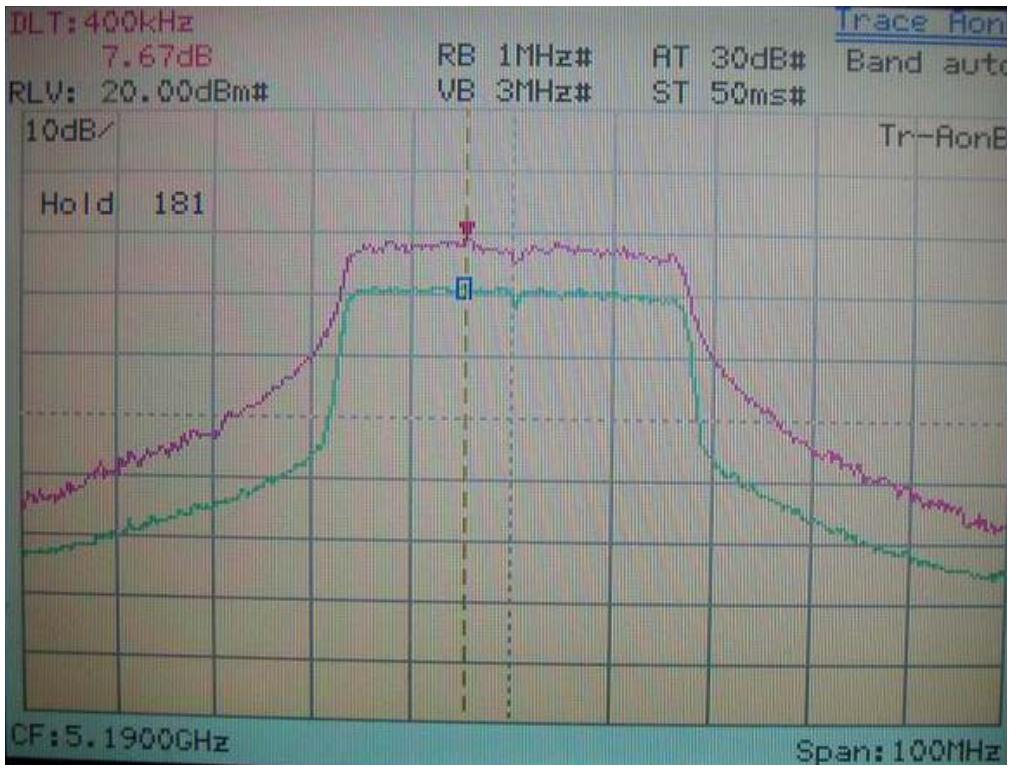
IEEE 802.11a Channel 40, 5200MHz



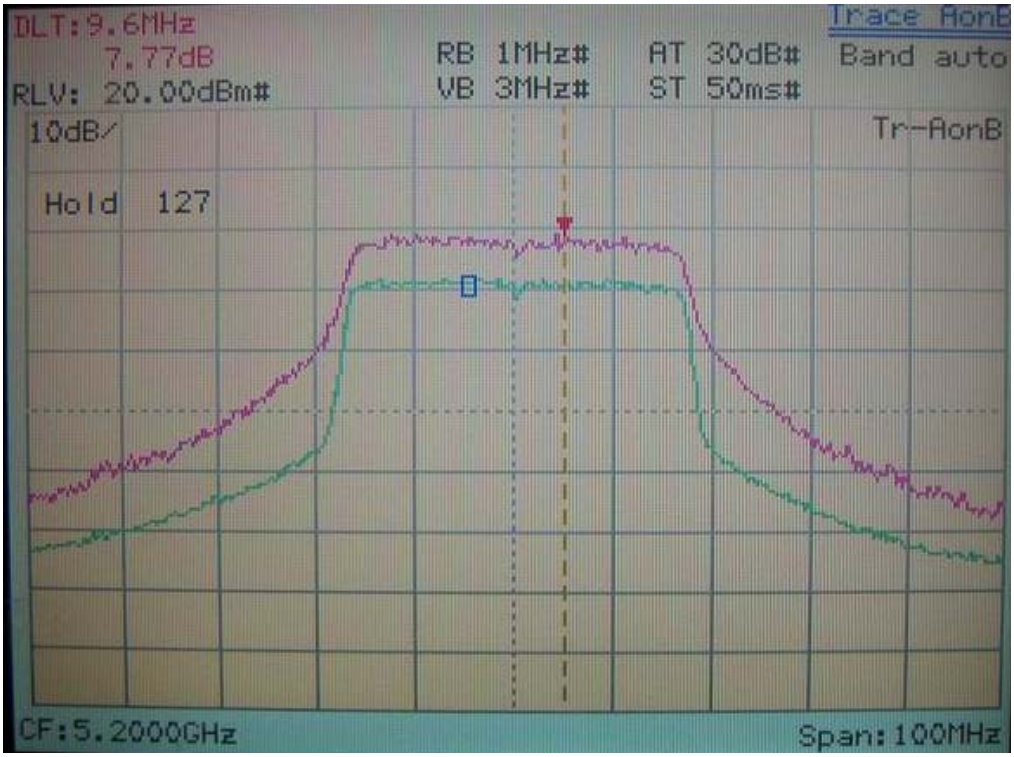
IEEE 802.11a Channel 48, 5240MHz



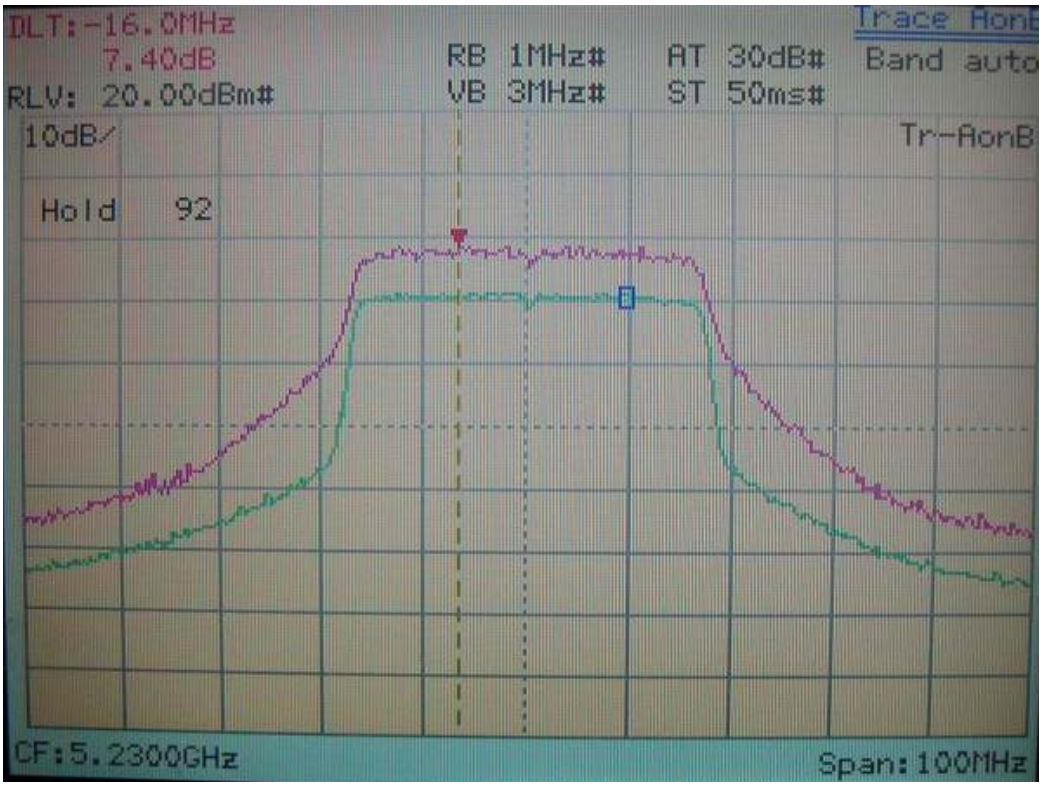
IEEE 802.11 Super a Channel 38, 5190MHz



IEEE 802.11 Super a Channel 40, 5200MHz



IEEE 802.11 Super a Channel 46, 5230MHz



X. Section 15.407(b)(1), (b)(7): Undesirable Emission and Bandedge

10.1 Undesirable Emission

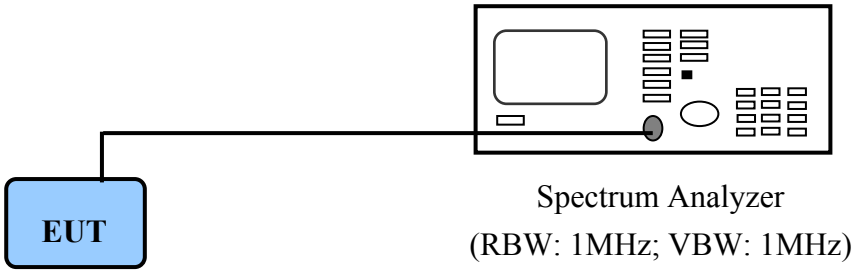
Limited: For transmitters operating in the 5.15 - 5.25 GHz band shall not exceed an EIRP of -27 dBm / MHz.

10.1.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

We perform this section by the conducted manner, the RBW is set to RBW= VBW= 1MHz. We'd made the observation up to 40GHz and the criterion is all the harmonic/spurious emissions must be -27dBm/MHz below the highest emission level measured.

10.1.2 Test Instruments Configuration



PC to control the EUT at maximal power output and channel number and set antenna kit

10.1.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	8564E	HP	3720A00840	02/07/07

10.1.4 Test Result of Undesirable Emission

IEEE 802.11a

Channel	*Max Read Value (dBm/MHz)*	*Cable Loss (dB)*	*Correction Value (dBm/MHz)*	*Limit (dBm/MHz)*	*Margin (dB)*
CH 36	-41.83	3.30	-38.53	-27.00	-11.53
CH 40	-40.67	3.30	-37.37	-27.00	-10.37
CH 48	-39.17	3.30	-35.87	-27.00	-8.87

IEEE 802.11 Super a

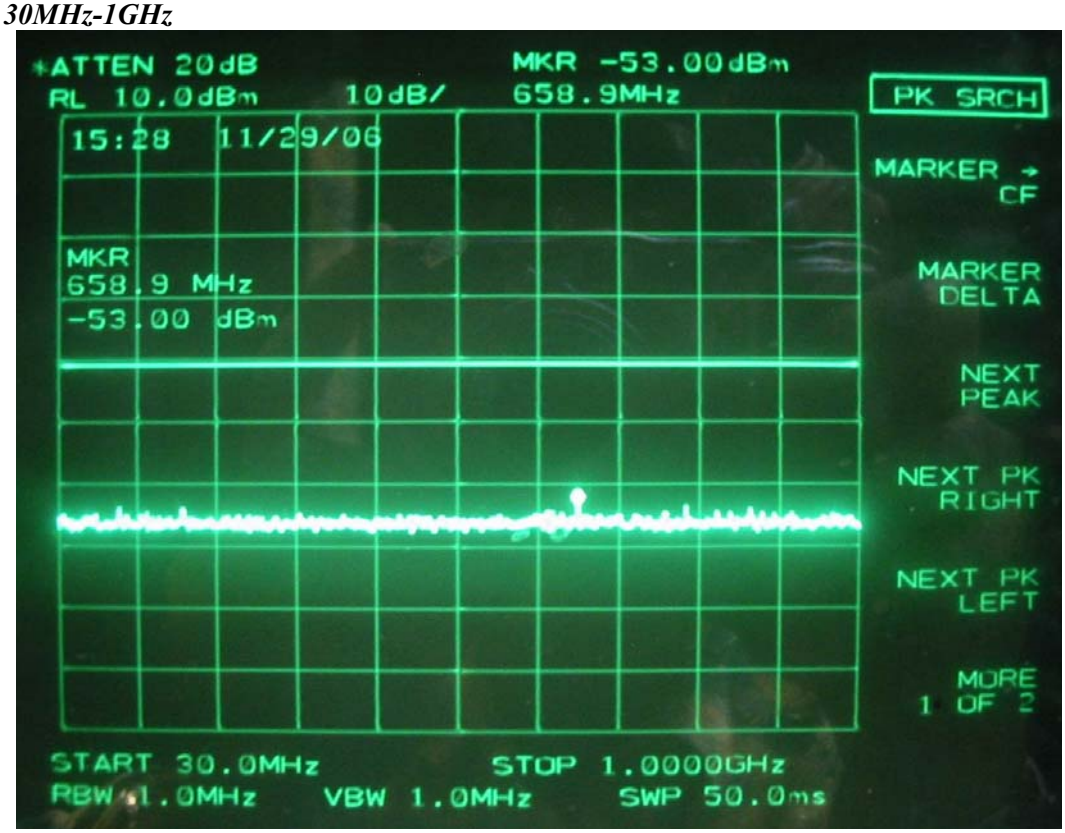
Channel	*Max Read Value (dBm/MHz)*	*Cable Loss (dB)*	*Correction Value (dBm/MHz)*	*Limit (dBm/MHz)*	*Margin (dB)*
CH 38	-41.00	3.30	-37.70	-27.00	-10.70
CH 40	-41.17	3.30	-37.87	-27.00	-10.87
CH 46	-40.83	3.30	-37.53	-27.00	-10.53

Note:

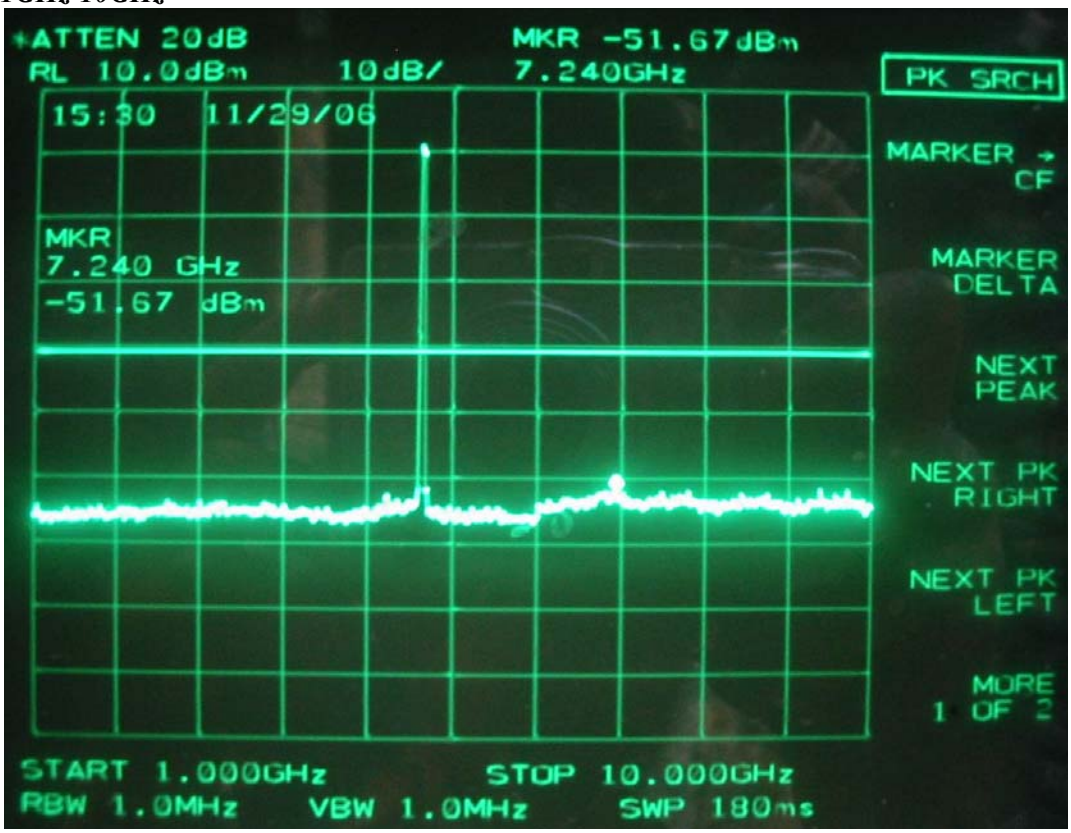
1. The following pages show the results of spectrum reading.
2. Correction Value: spectrum read power density (using peak search mode),
   Correction Value: actual peak power density in the spread spectrum band.
3. Correction Value = Max Read Value + Cable Loss

IEEE 802.11a Channel 36, 5180MHz

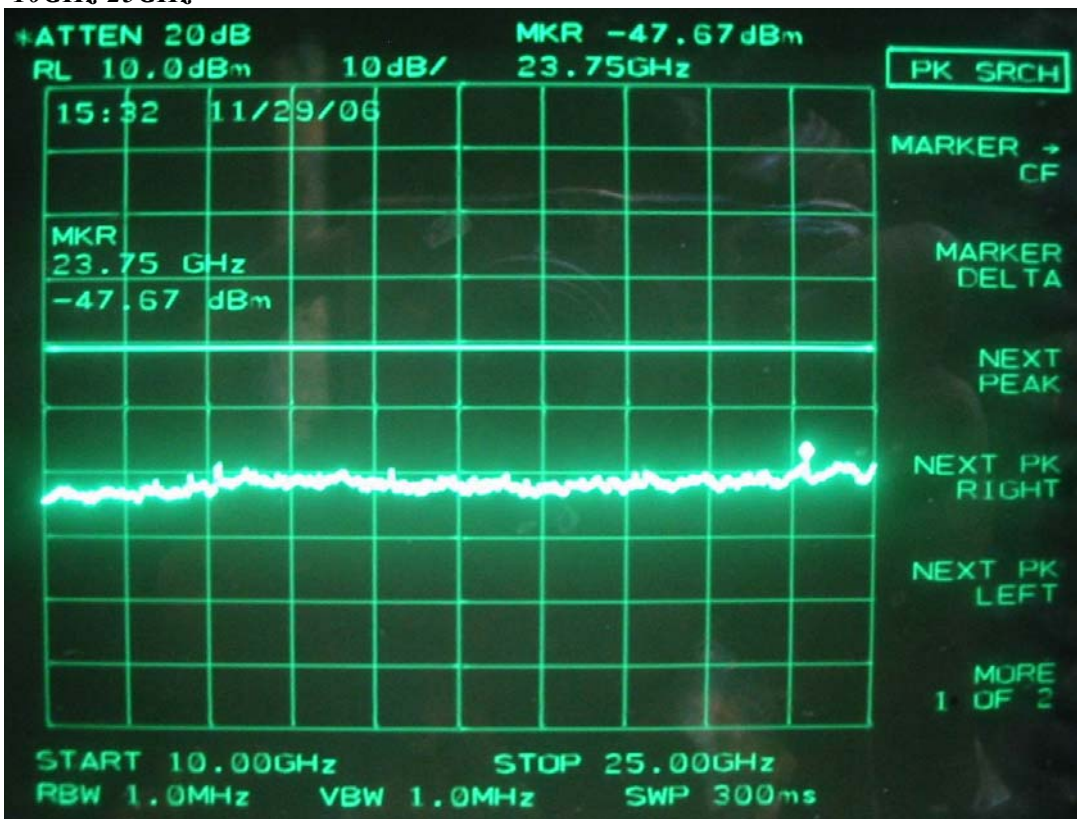
30MHz-1GHz



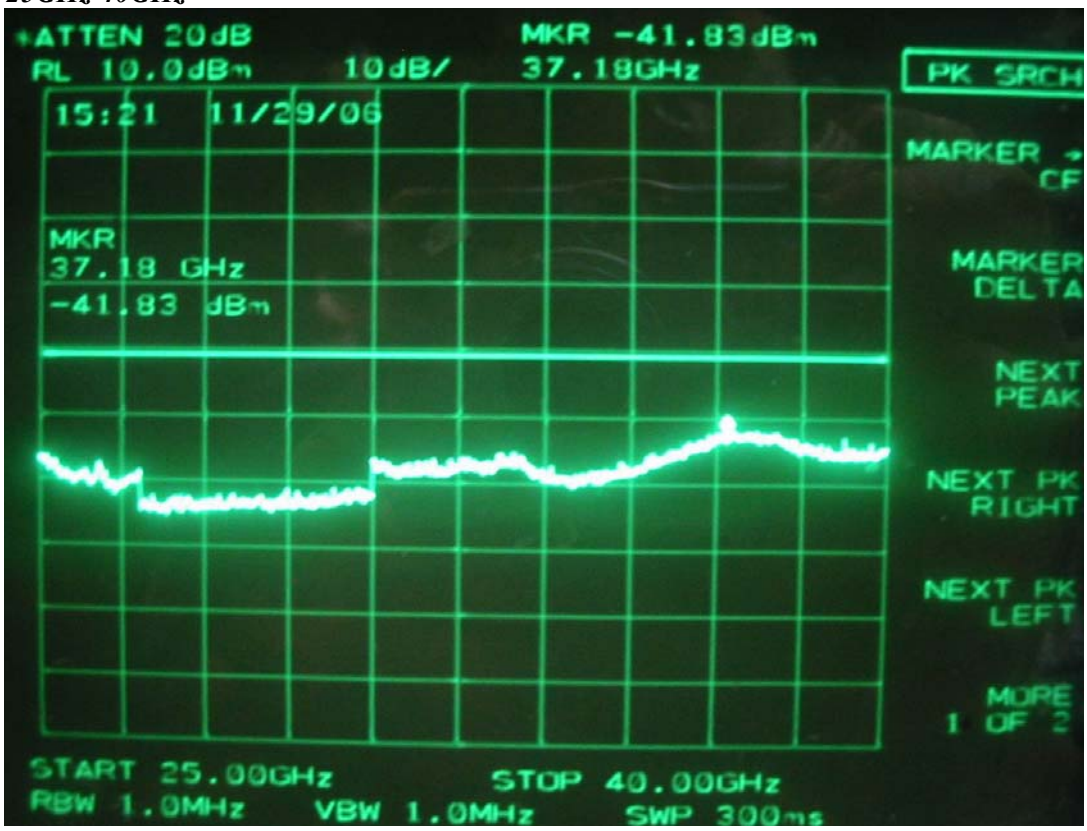
1GHz-10GHz



10GHz-25GHz

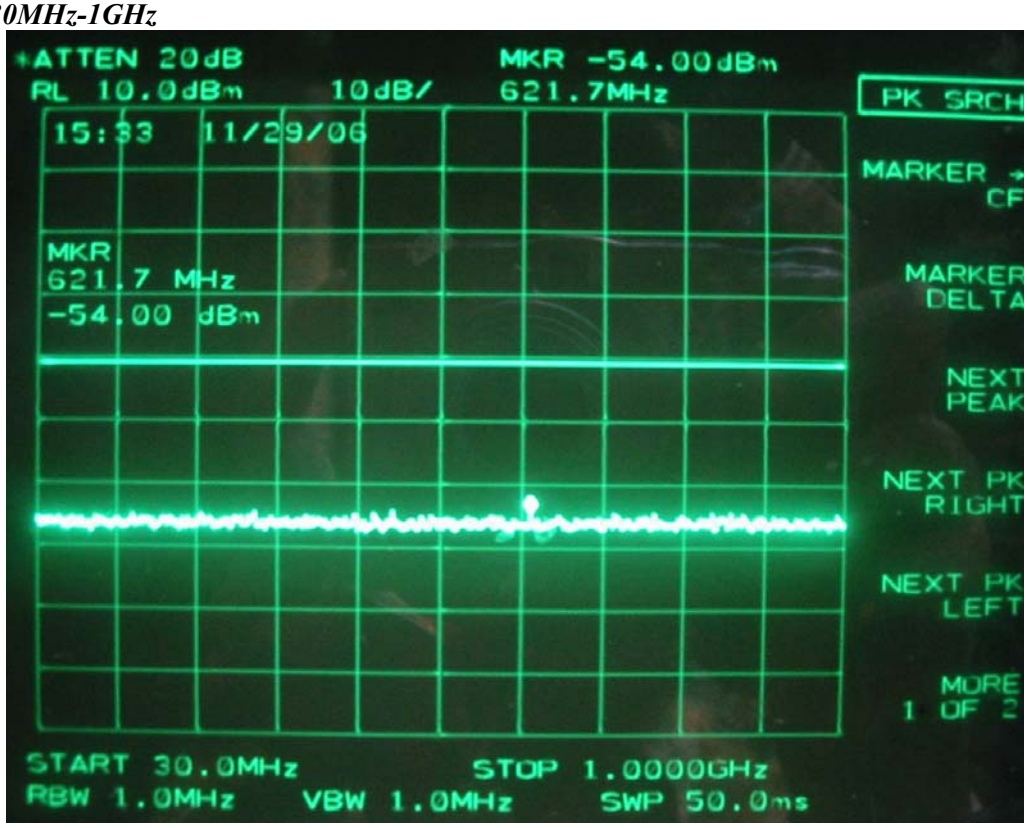


25GHz-40GHz

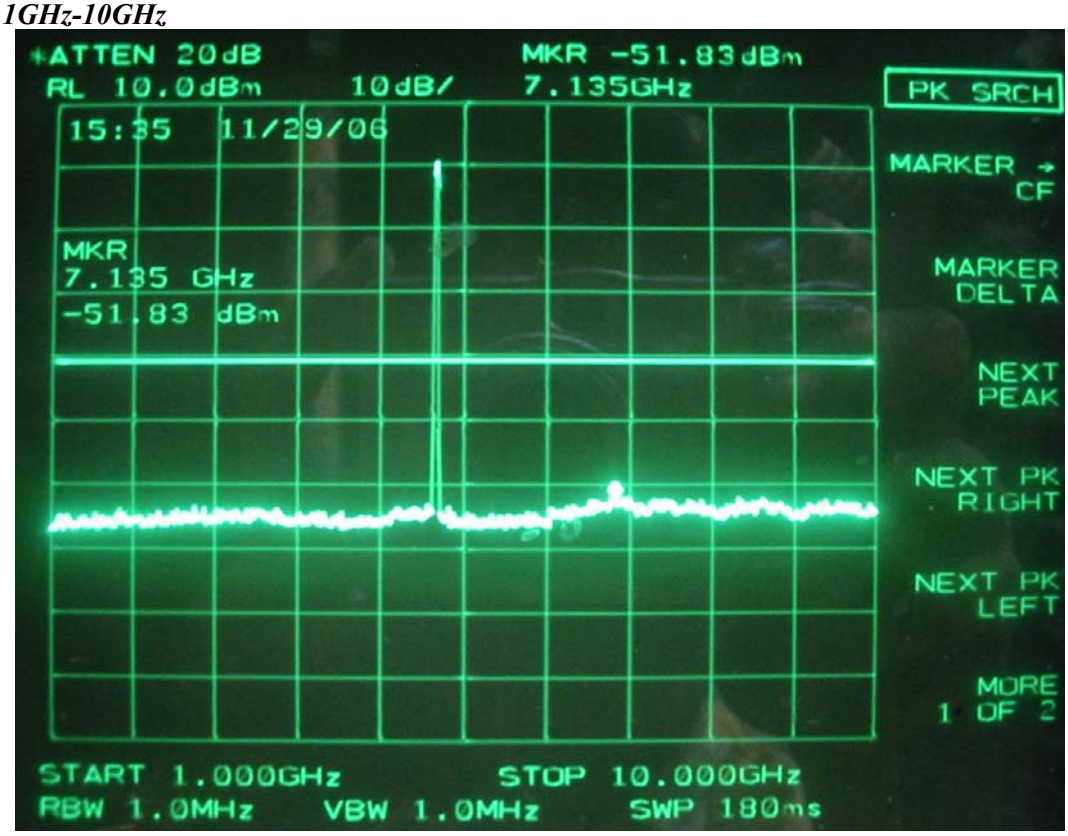


IEEE 802.11a Channel 40, 5200MHz

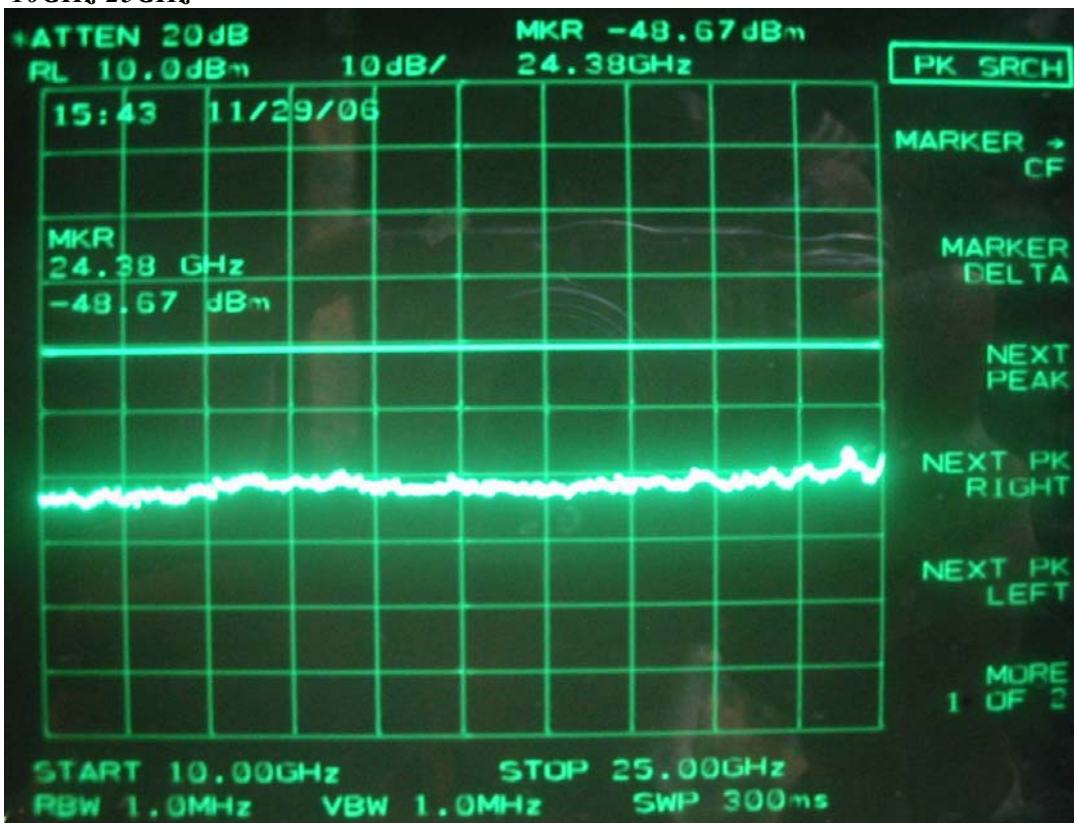
30MHz-1GHz



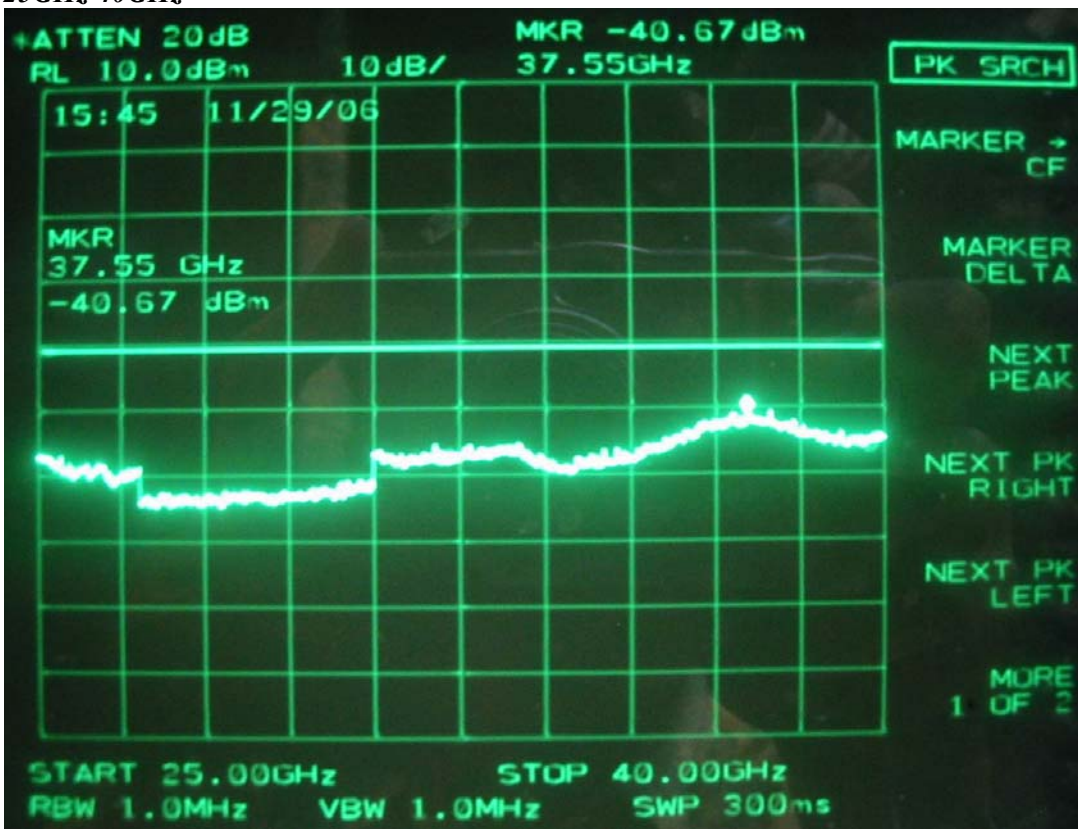
1GHz-10GHz



10GHz-25GHz

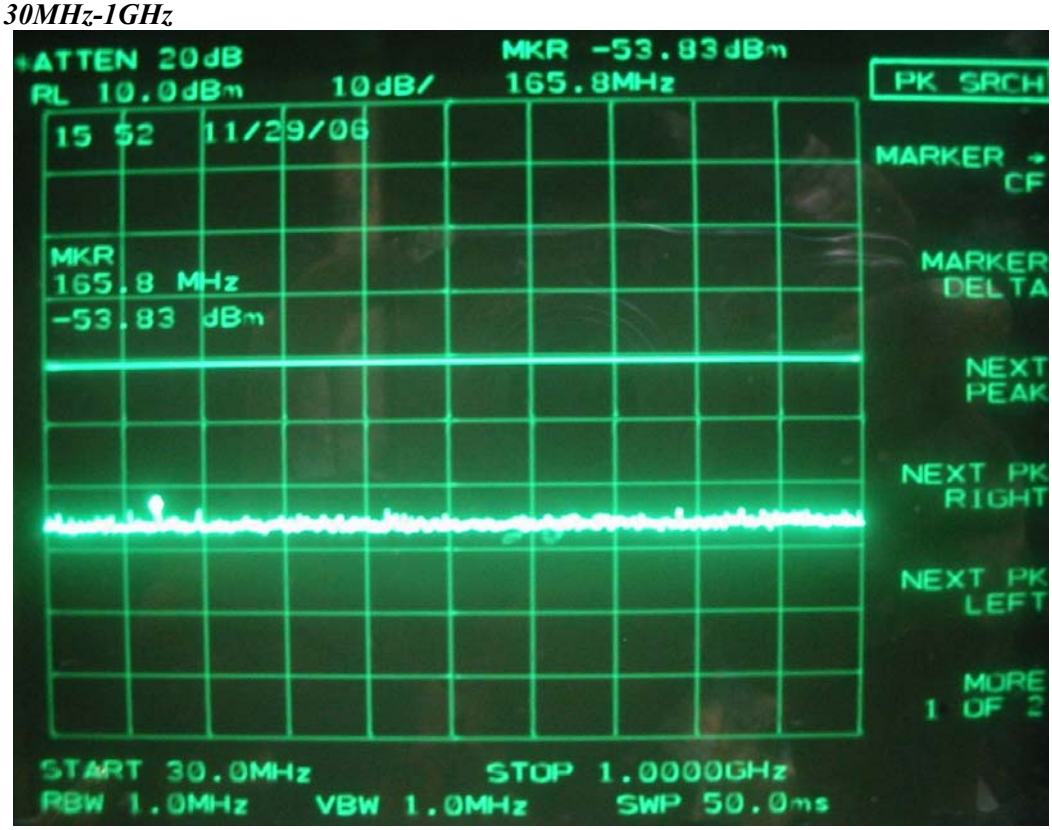


25GHz-40GHz

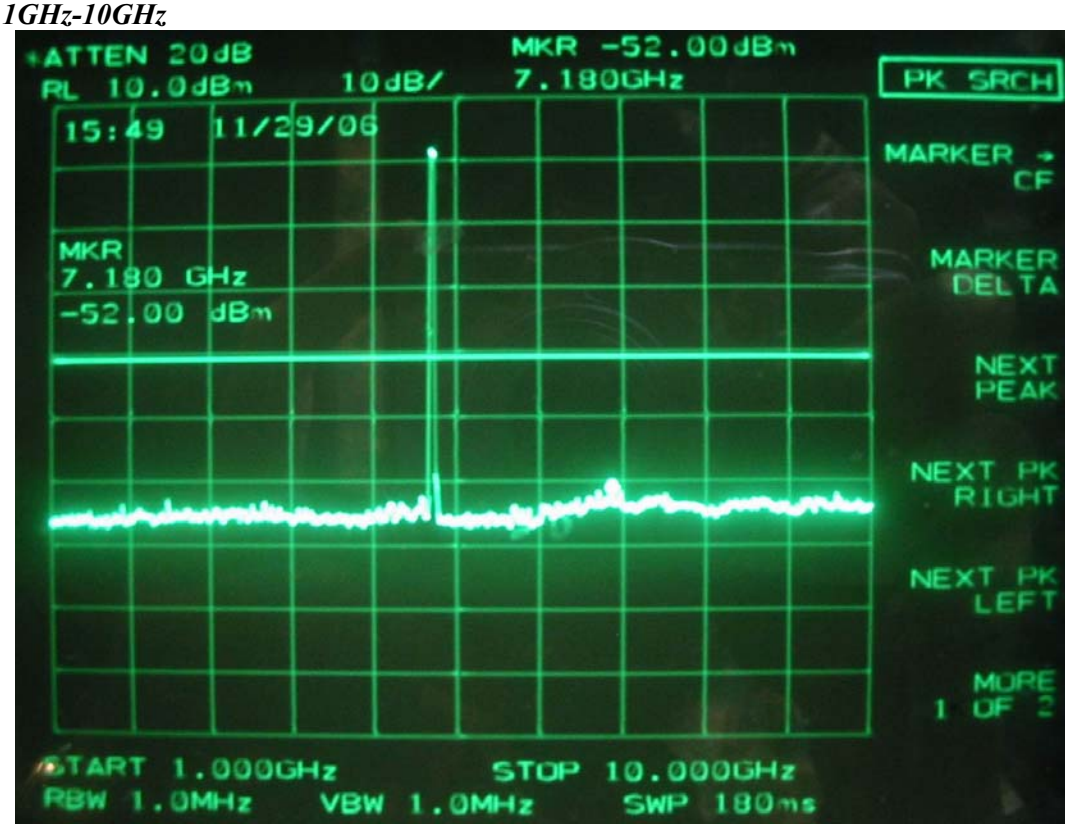


IEEE 802.11a Channel 48, 5240MHz

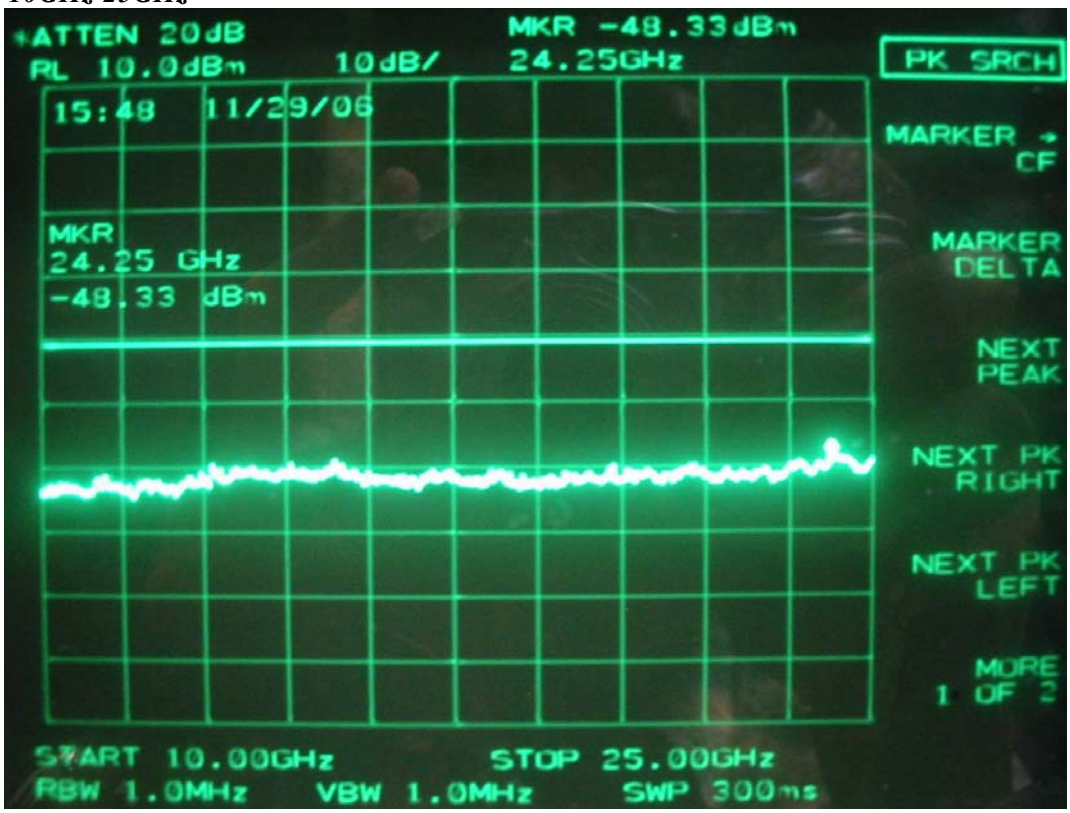
30MHz-1GHz



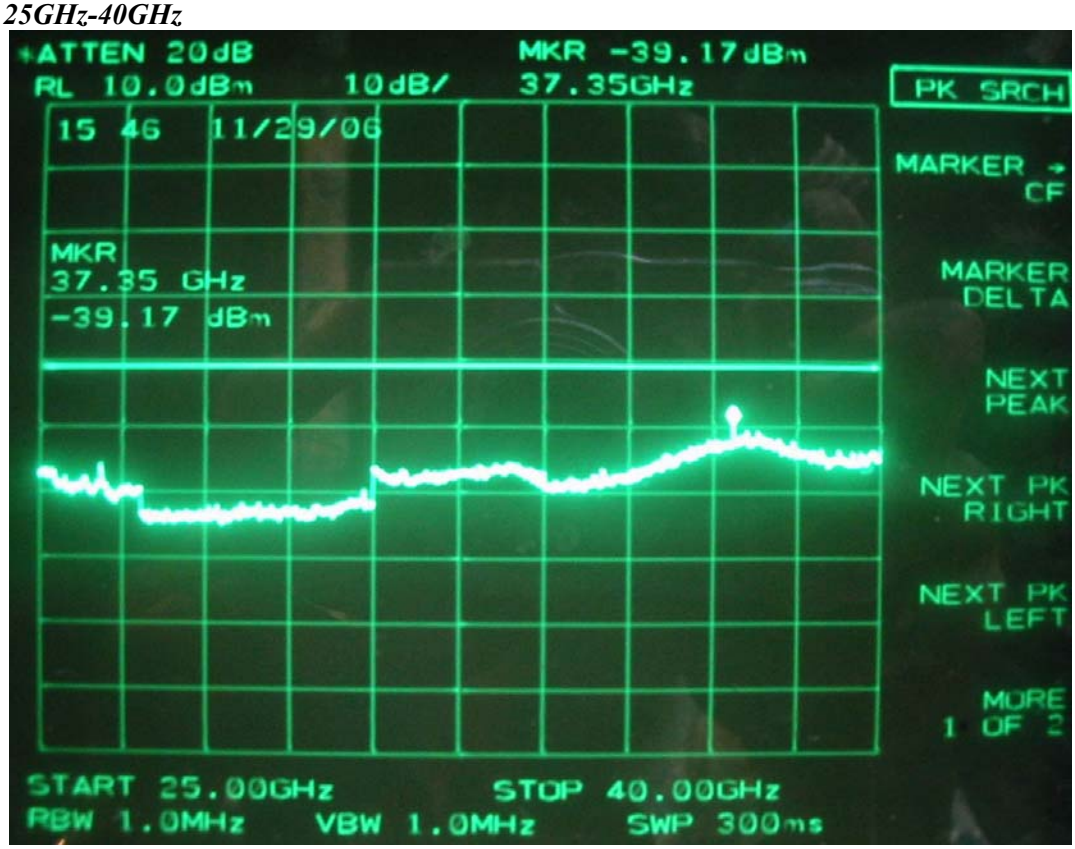
1GHz-10GHz



10GHz-25GHz

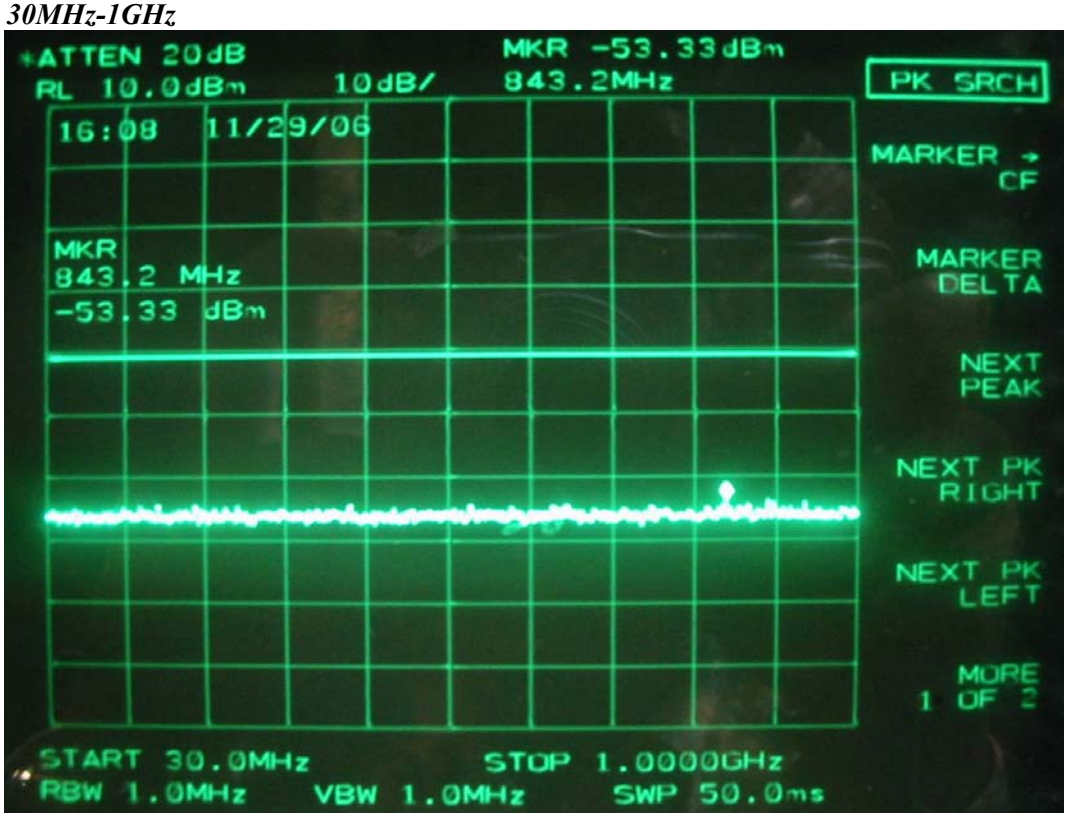


25GHz-40GHz

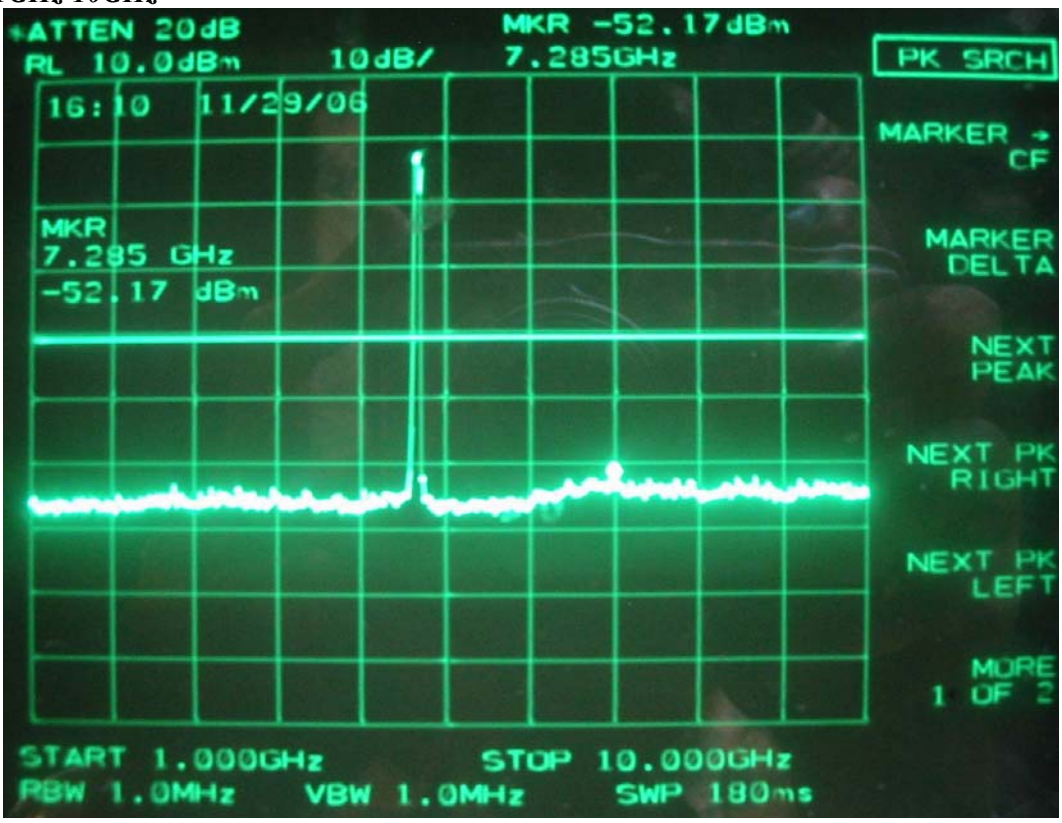


IEEE 802.11 Super a Channel 38, 5190MHz

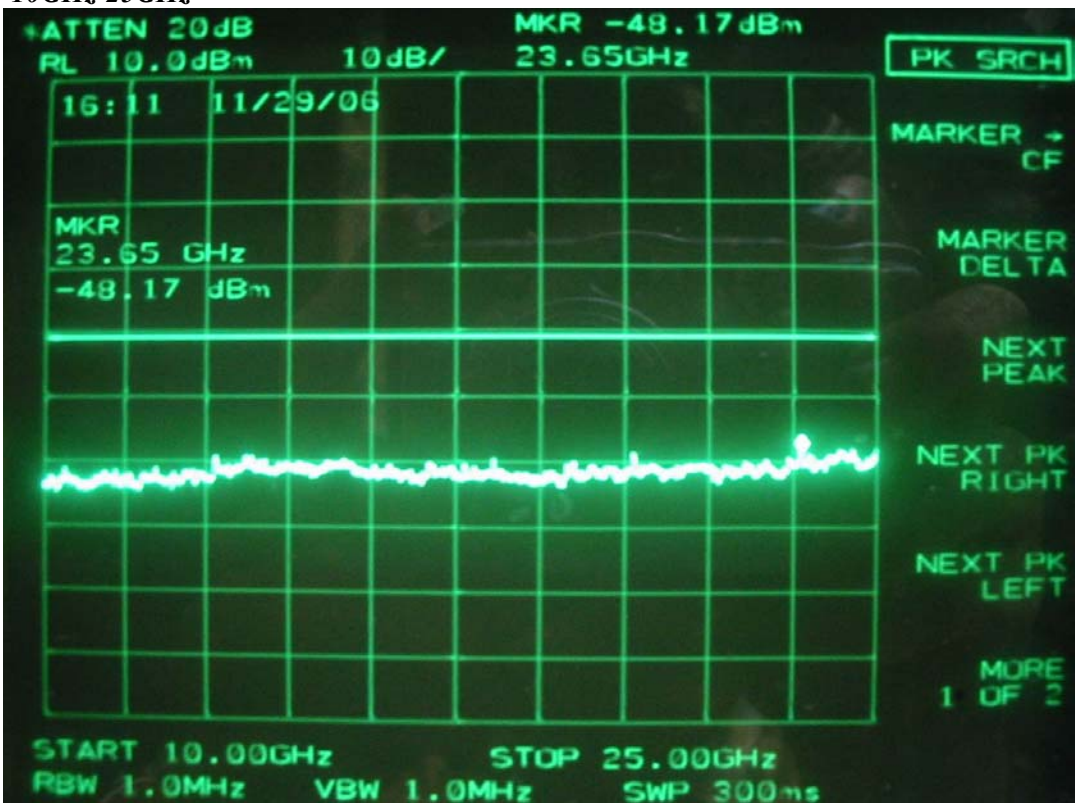
30MHz-1GHz



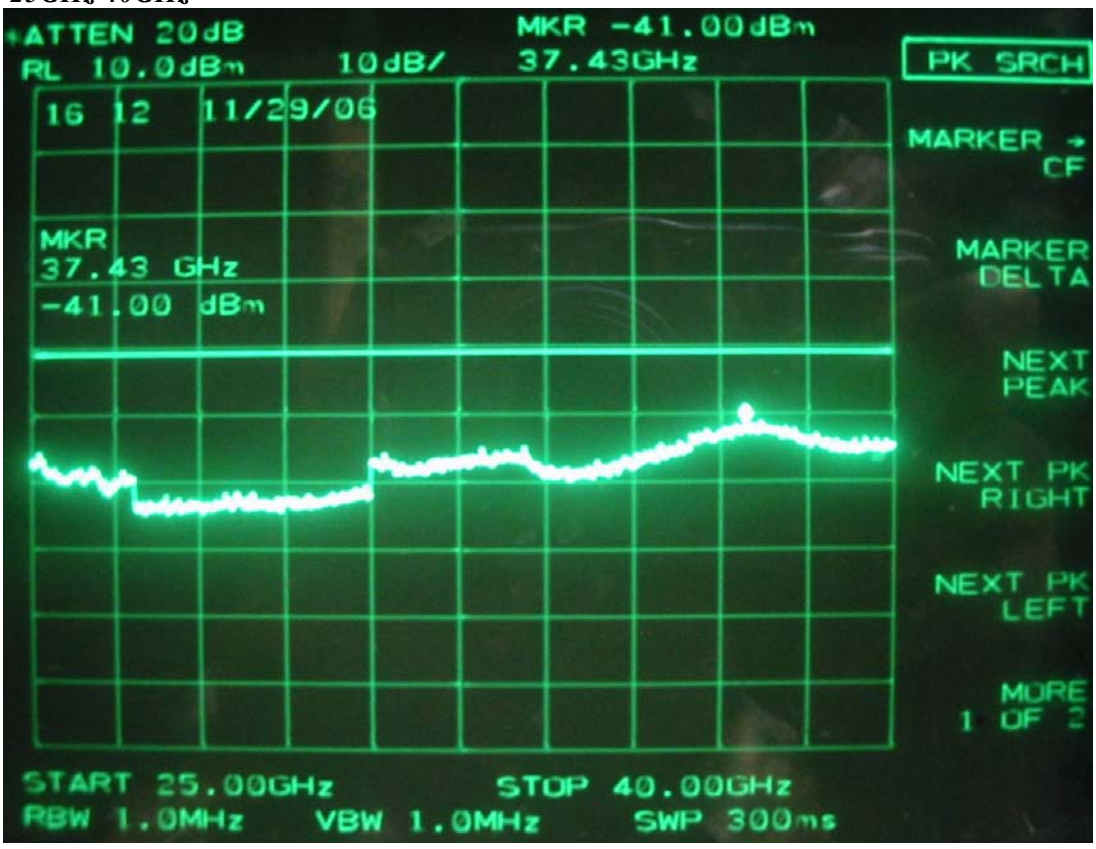
1GHz-10GHz



10GHz-25GHz

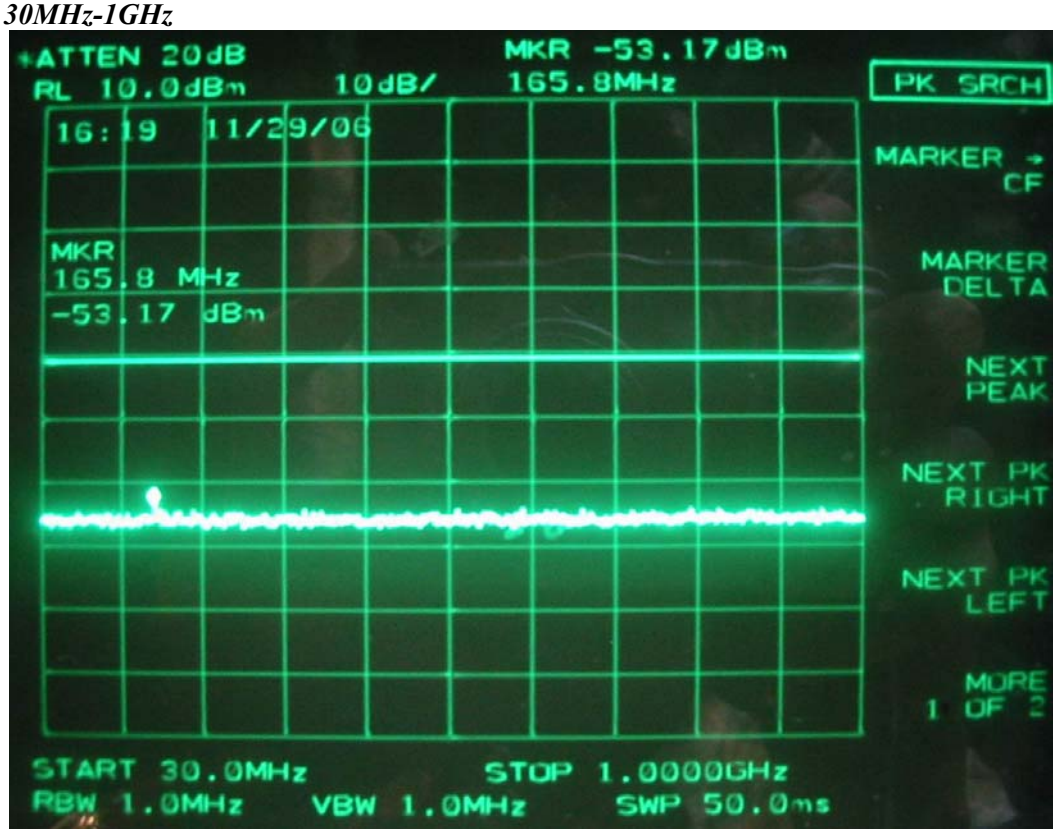


25GHz-40GHz

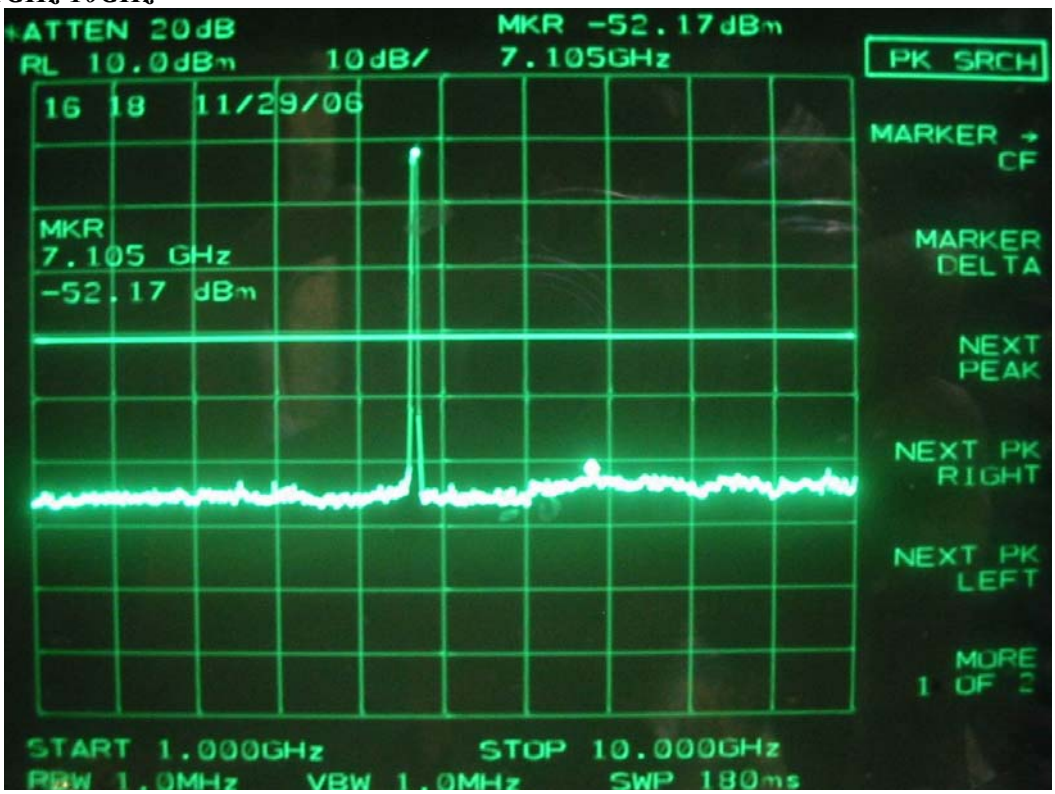


IEEE 802.11 Super a Channel 40, 5200MHz

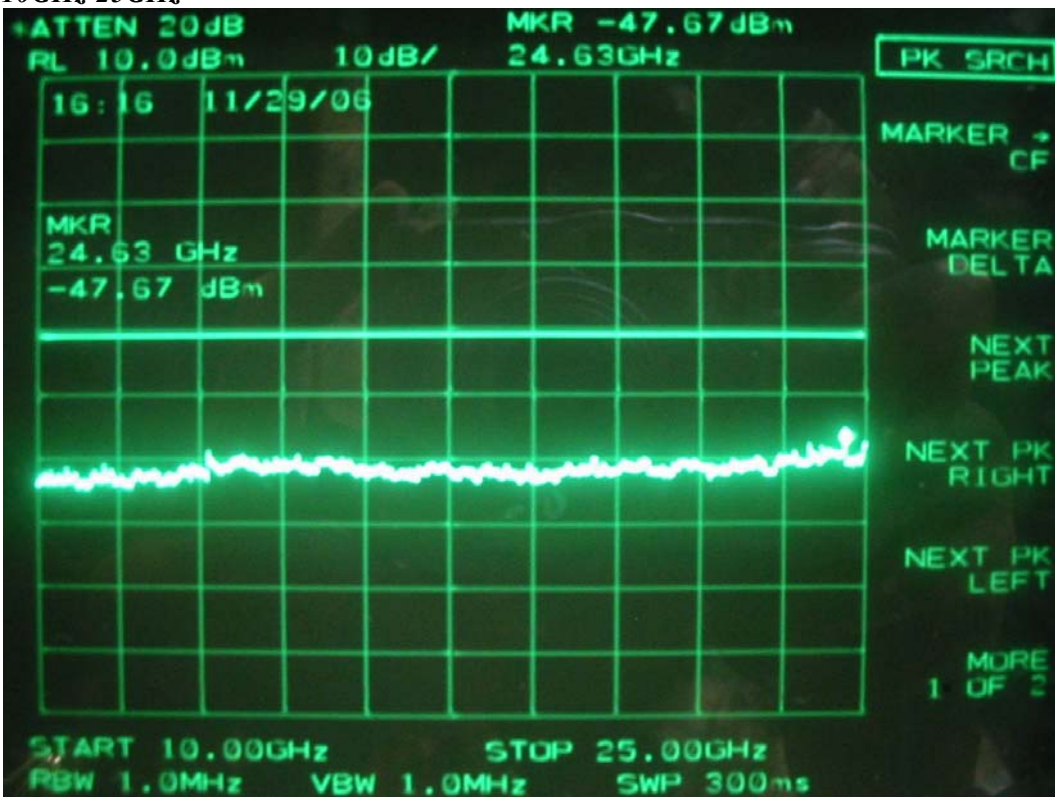
30MHz-1GHz



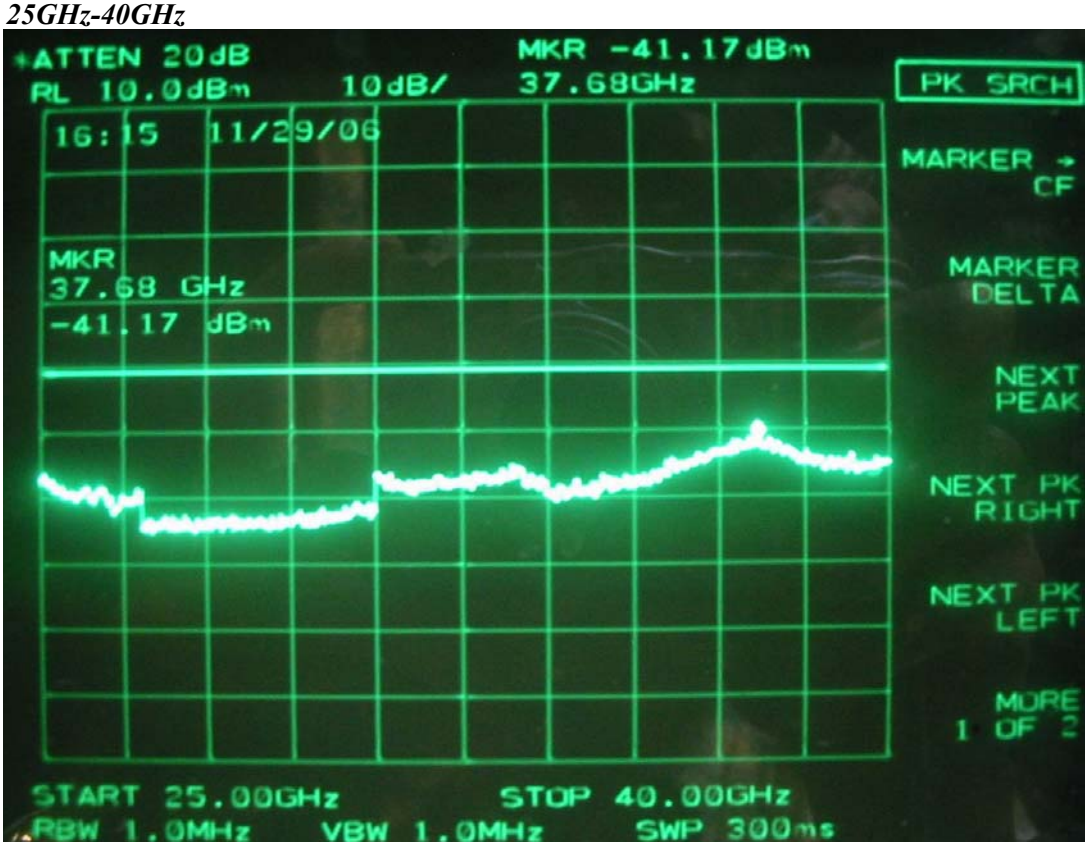
1GHz-10GHz



10GHz-25GHz

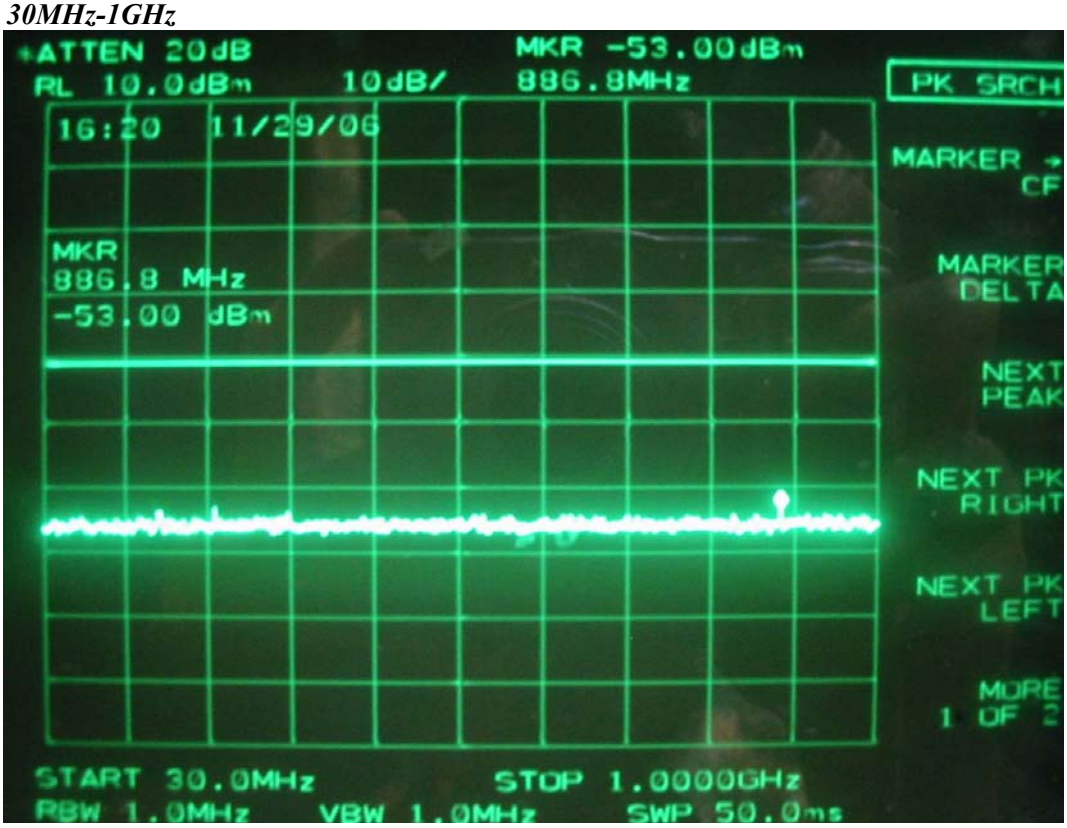


25GHz-40GHz

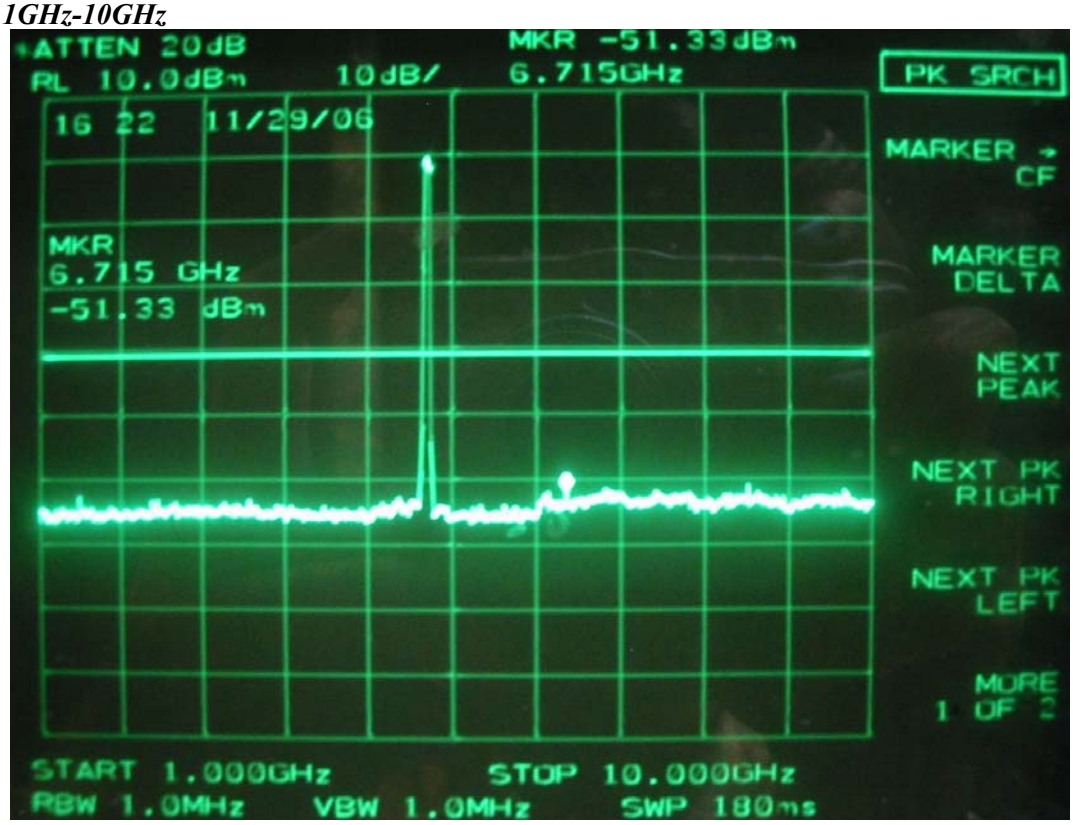


IEEE 802.11 Super a Channel 46, 5230MHz

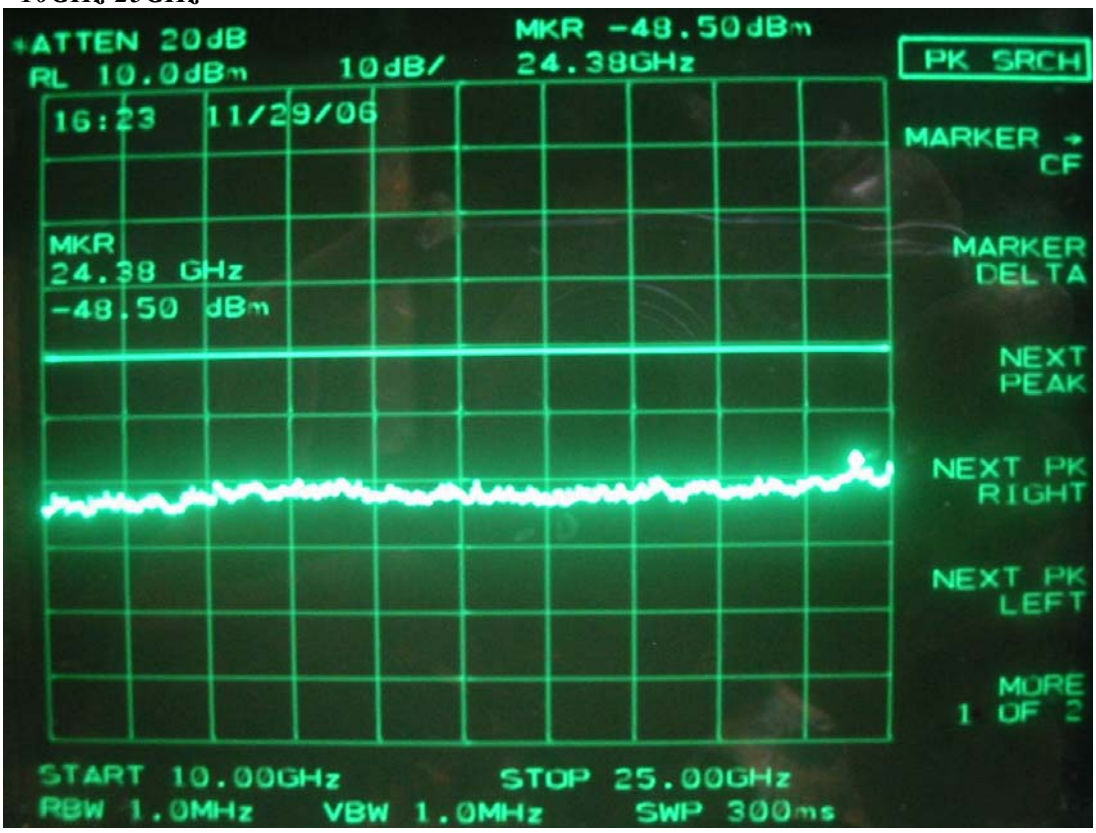
30MHz-1GHz



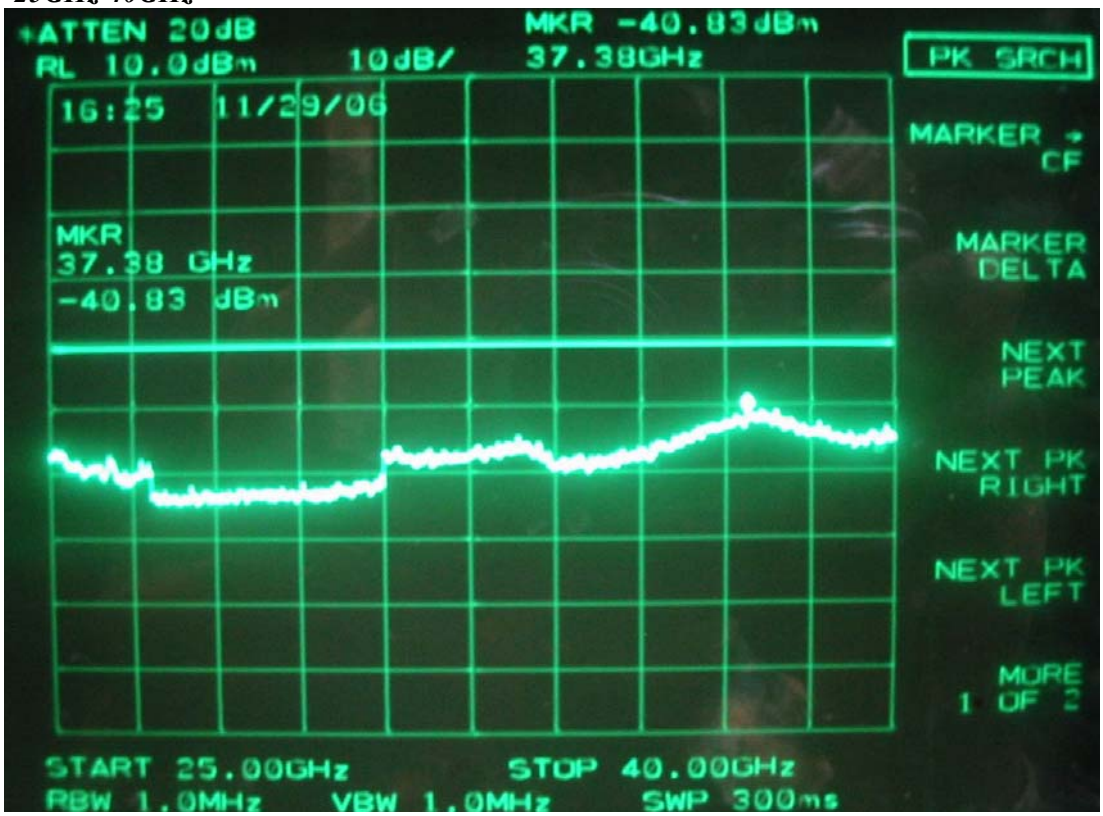
1GHz-10GHz



10GHz-25GHz



25GHz-40GHz



10.2 Bandedge

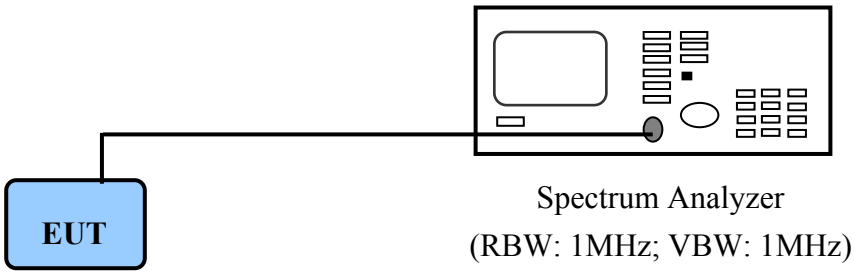
Limit: The provisions of Section 15.205 apply to intentional radiators operating under this section.

10.2.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

We perform this section by the conducted manner. If the emissions fall in the restricted bands stated in the Part15.205(a) must also comply with the radiated emission limits specified in Part15.209(a). (Peak mode: RBW=VBW=1MHz, Average mode: RBW=1MHz; VBW=10Hz)
The following pages show our observations referring to the channel lowest and highest respectively.

10.2.2 Test Instruments Configuration



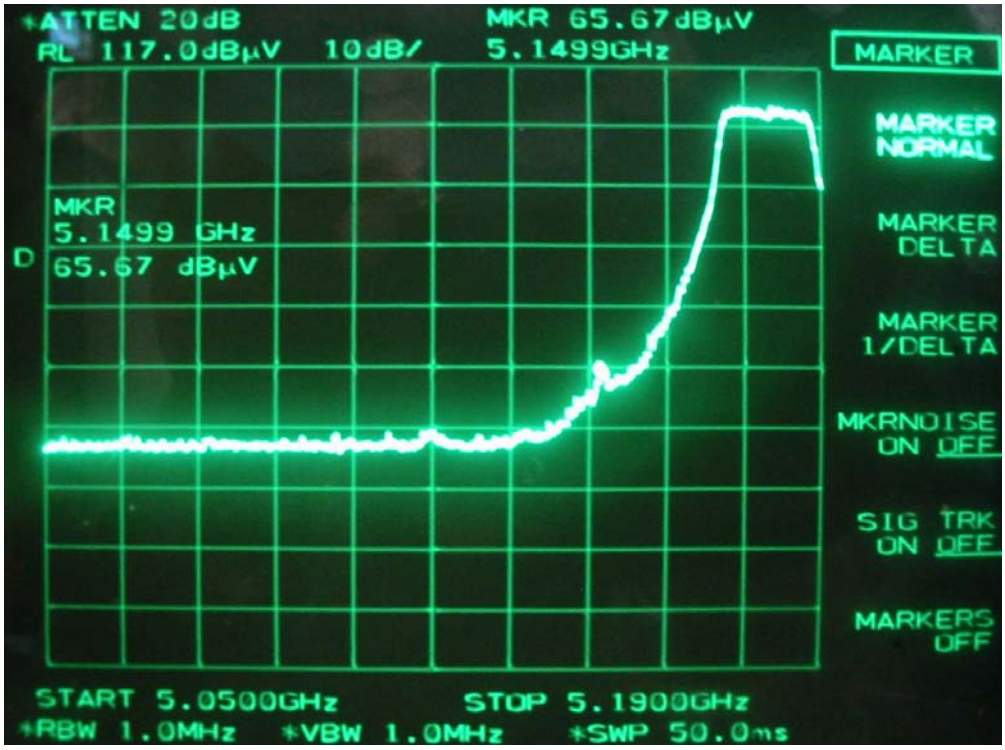
PC to control the EUT at maximal power output and channel number and set antenna kit

10.2.3 List of Test Instruments

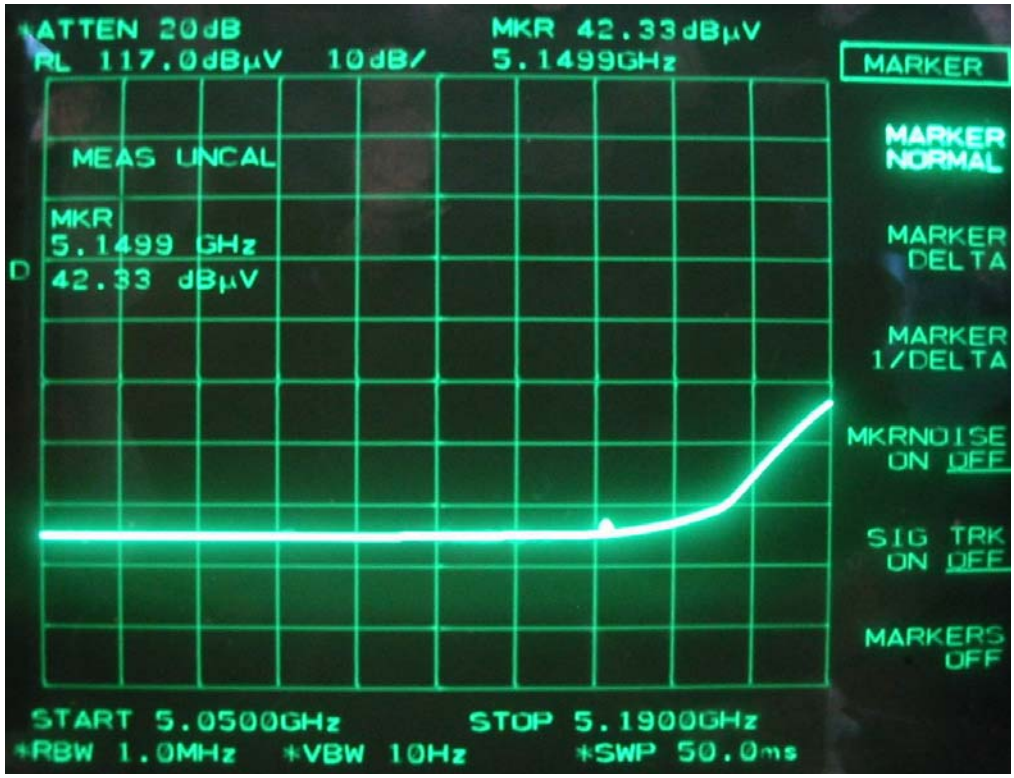
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	8564E	HP	3720A00840	02/07/07

10.2.4 Test Result of Bandedge

Channel 36 of IEEE 802.11a

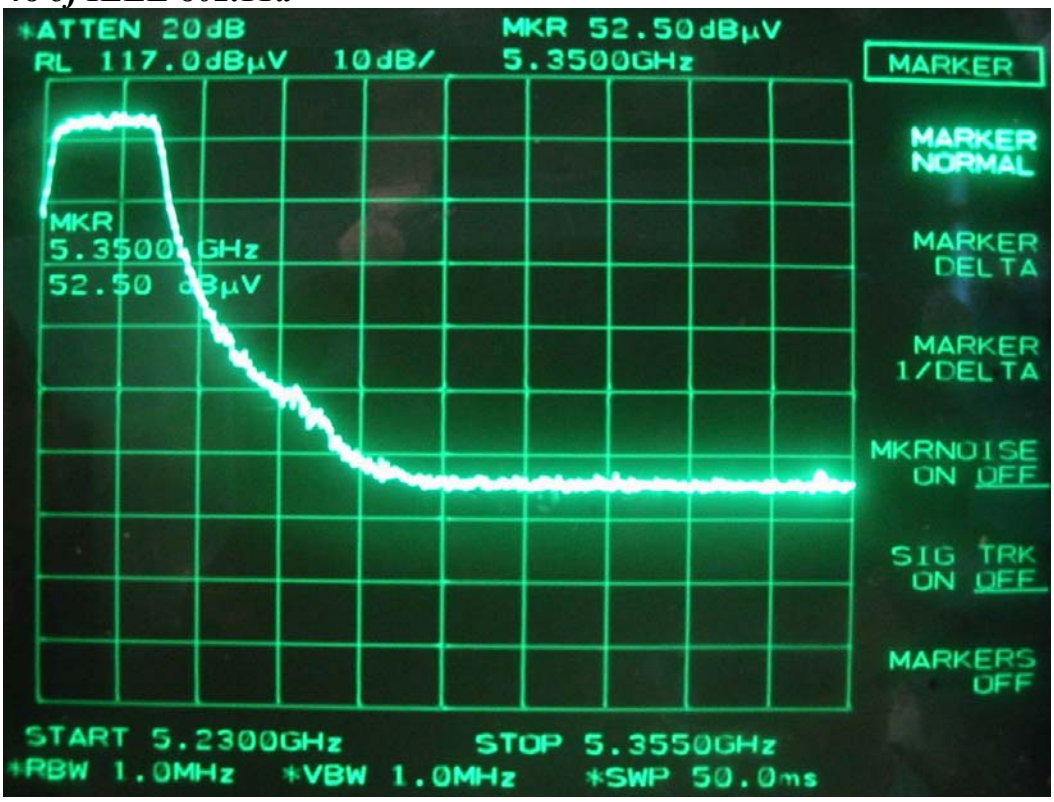


Peak

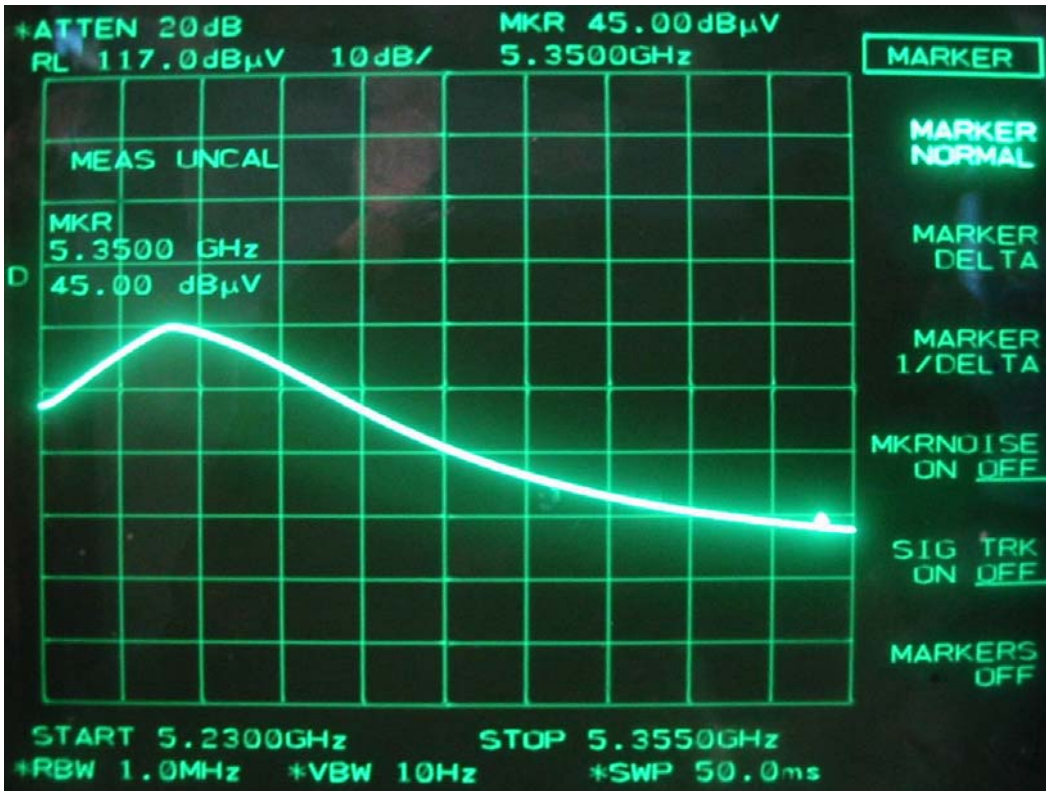


Avg

Channel 48 of IEEE 802.11a



Peak



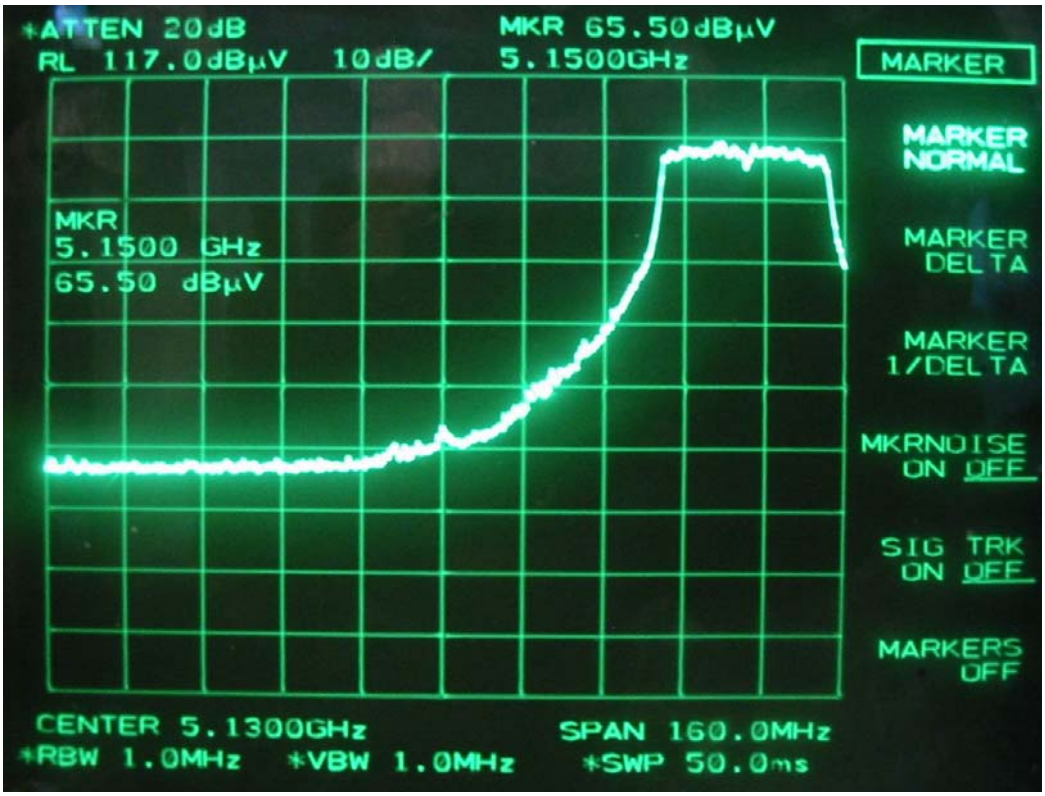
Avg

This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channels 36 and 48.

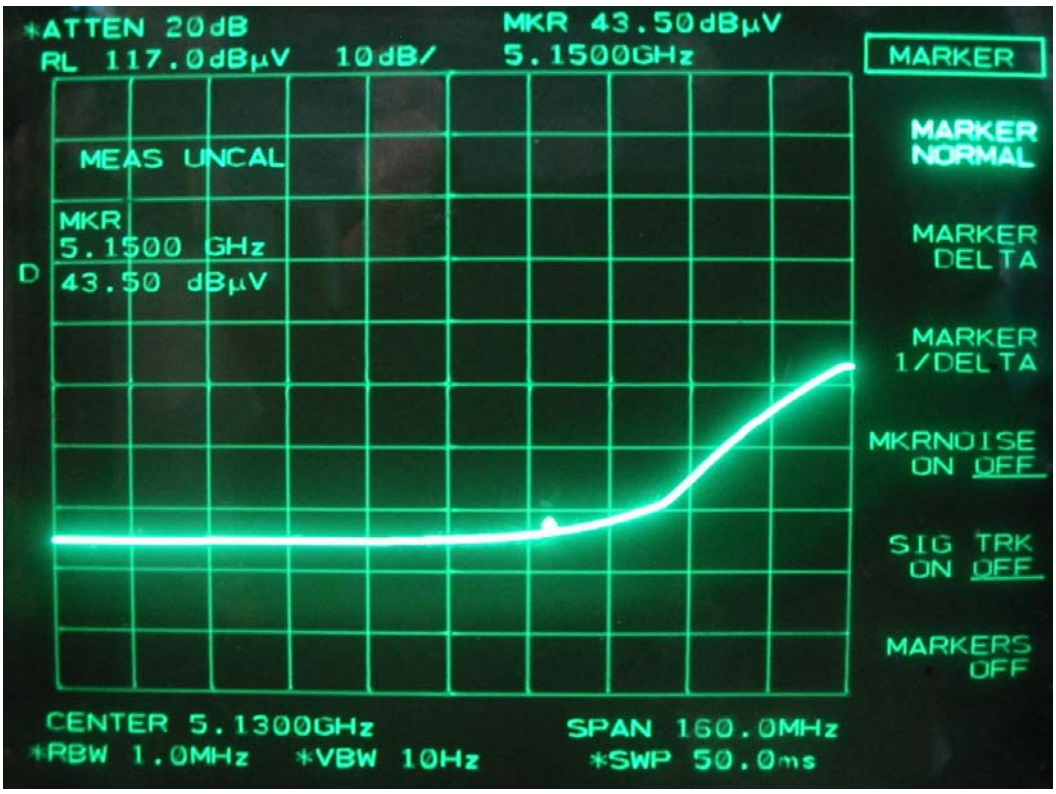
The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below.

Frequency	***Amplitude***		***Cable Loss***	***Corrected Amplitude***		***Limit***		***Margin***
	Peak / Ave.			***Peak / Ave.***		***Peak / Ave.***		
MHz	***dBμV***		***dB***	***dBμV/m***		***dBμV/m***		***dB***
5149.90	65.67	42.33	3.30	62.37	39.03	73.96	53.96	-11.59
5350.00	52.50	45.00	3.30	49.20	41.70	73.96	53.96	-12.26

Channel 38 of IEEE 802.11 Super a

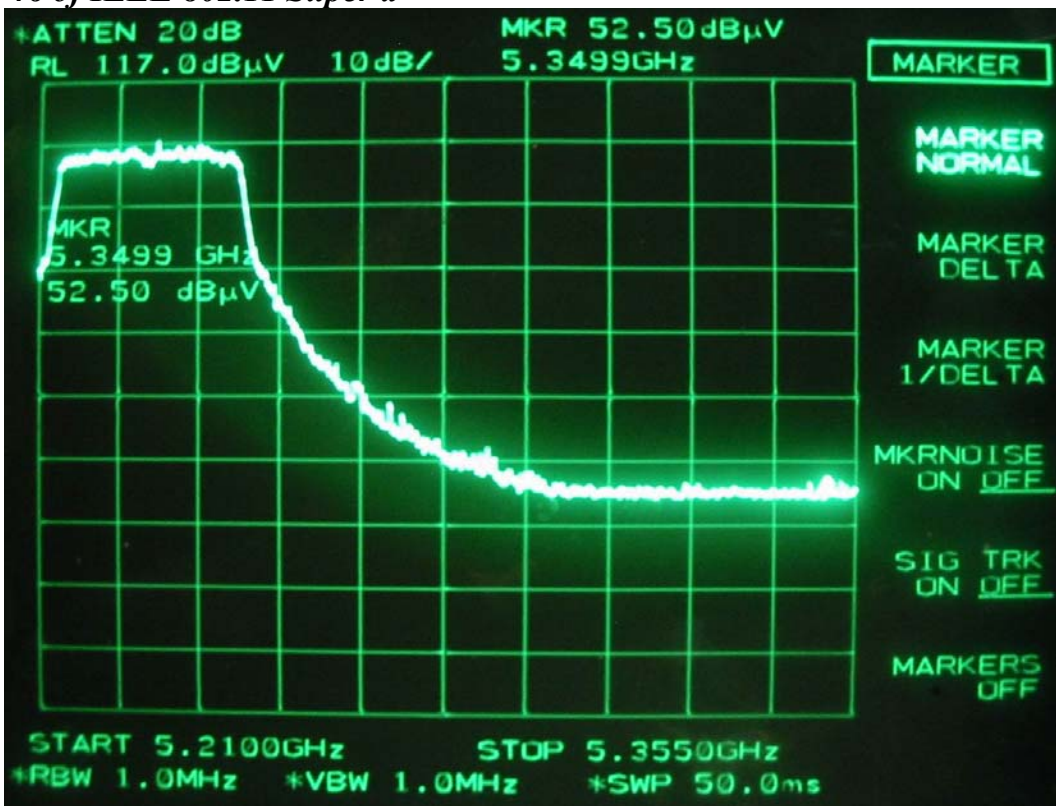


Peak



Avg

Channel 46 of IEEE 802.11 Super a



Peak

Avg

This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channels 38 and 46.

The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below.

Frequency	***Amplitude*** ***Peak / Ave.***		***Cable Loss***	***Corrected Amplitude*** ***Peak / Ave.***		***Limit*** ***Peak / Ave.***		***Margin***
MHz	***dBμV***		***dB***	***dBμV/m***		***dBμV/m***		***dB***
5150.00	65.50	43.50	3.30	62.20	40.20	73.96	53.96	-11.76
5349.90	52.50	47.00	3.30	49.20	43.70	73.96	53.96	-10.26

XI. Section 15.407(g)(1): Frequency Stability Tolerance Measurement

11.1 Rules and Specification Limits

Limit: Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or IEEE802.11a specification.

The frequency tolerance of the transmitter shall be ±20 ppm (IEEE802.11a specification).

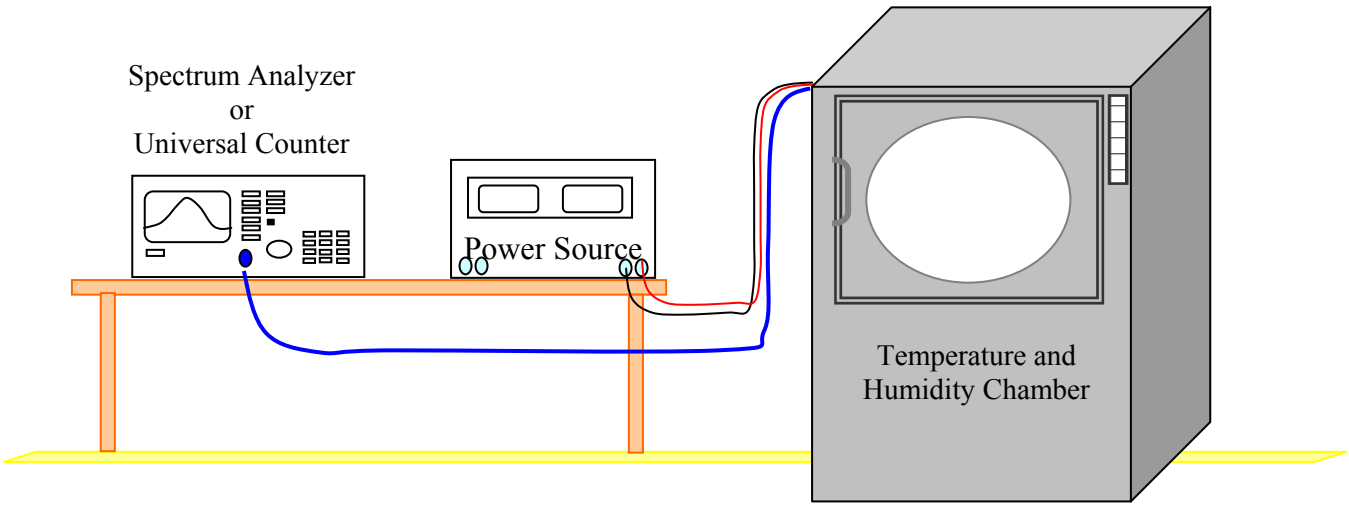
11.2 Measurement Condition & Setup with Temperature Variation

1. Place the EUT in the chamber, powered in its normal operation.
2. Set the temperature of the chamber -30 degree Centigrade. Allow the equipment to stabilize at that temperature.
3. Measured the carrier frequency (un-modulation) using preamplifier and frequency counter/ Spectrum Analyzer.
4. Repeated procedures 1 to 3 from -20 to 50 degree Centigrade at internals of 10 degree.

11.3 List of Measurement Instruments with Temperature Variation List of test Instrument

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	02/15/07
Universal Counter	5313A	HP	356A11550	12/07/07
Temperature and Humidity Chamber	THS-ML1	King Son	240	12/30/06

11.4 Measurement Configuration of Temperature Variation Test:



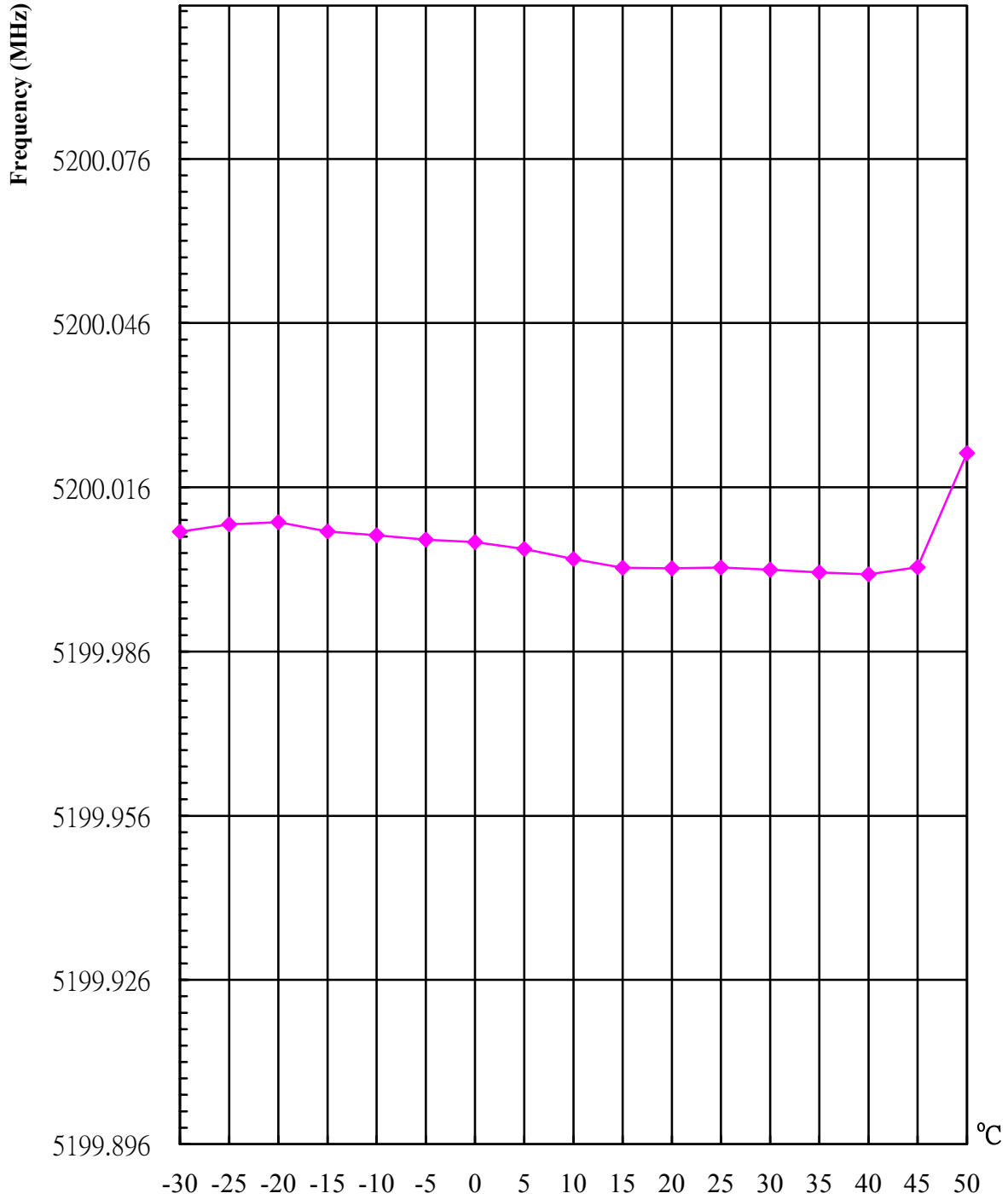
11.5 Measurement Result with Temperature Variation

A table is presented which illustrates compliance with the rule where the center frequency is 5200.000000MHz.

Temperature Variation Table

Temperature (Centigrade)	*Frequency (MHz)*
-30	5200.00788
-25	5200.00920
-20	5200.00964
-15	5200.00792
-10	5200.00724
-5	5200.00644
0	5200.00596
5	5200.00472
10	5200.00288
15	5200.00128
20	5200.00120
25	5200.00136
30	5200.00096
35	5200.00046
40	5200.00008
45	5200.00142
50	5200.02224
Max Deviation (MHz)	0.02224
Max Tolerance (ppm)	4.3

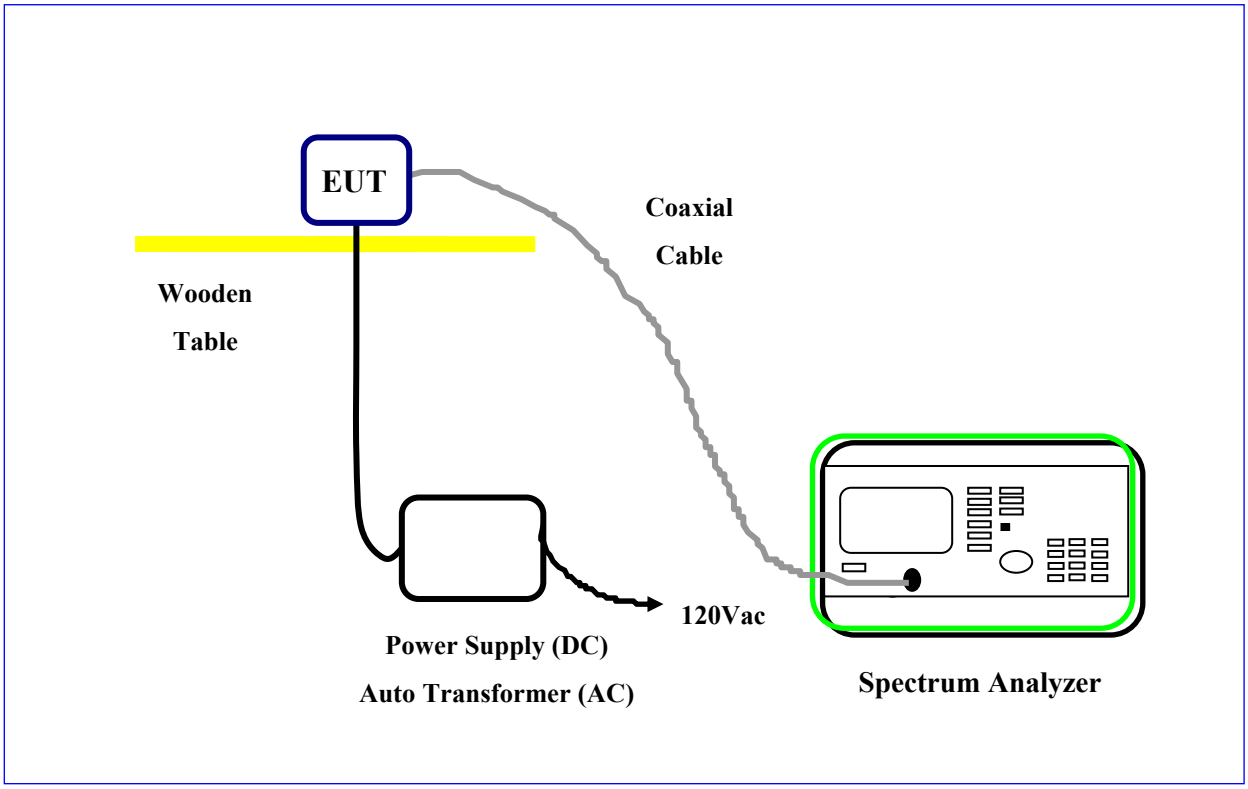
Temperatuer Variation Vs. Frequency



11.6 Measurement Condition & Setup with Voltage Variation

1. Attached the power line of the power supply to the power position of the EUT.
2. Tuned the output power level to power source 85 %, 100%, 115% of the normal operation power of EUT.
3. Recorded the frequency with a frequency counter / .Spectrum Analyzer

11.7 Configuration of Voltage Variation Test



11.8 Measurement Result with Voltage Variation

Frequency Stability of Voltage Variation Measurement Table

Supply Voltage (Volt)	*Frequency (MHz)*
102 (85%)	5200.00144
120 (100%)	5200.00132
138 (115%)	5200.00128
Max Deviation (MHz)	0.00144
Max Tolerance (ppm)	0.3