



SPORTON International Inc.

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FCC RADIO TEST REPORT

Applicant's company	D-Link Co.
Applicant Address	No.289, Shinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.
FCC ID	KA2WA160B1
Manufacturer's company	Alpha Networks Inc.
Manufacturer Address	1.No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C. 2.Jiekou Administration Zone, Canghan Town, Dongguan City, Guangdong Province, China

Product Name	Xtreme N Dual Band USB Adapter
Brand Name	D-Link
Model Name	DWA-160
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Nov. 26, 2007
Final Test Date	Feb. 02, 2008
Submission Type	Original Equipment
Operating Mode	Client (without radar detection function)



Statement

Test result included is only for the 802.11a (5150 ~ 5350MHz / 5470 ~ 5725MHz) of the product.

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

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

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

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



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1. CERTIFICATE OF COMPLIANCE

Product Name : Xtreme N Dual Band USB Adapter
Brand Name : D-Link
Model Name : DWA-160
Applicant : D-Link Co.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 26, 2007 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

A handwritten signature in blue ink, appearing to read 'Wayne Hsu 2/25/08', is written over a horizontal line.

Wayne Hsu

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	6.24 dB
4.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	1.94 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.40 dB
4.5	15.407(a)	Peak Excursion	Complies	8.47 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.51 dB
4.7	15.407(b)	Band Edge Emissions	Complies	2.86 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (1TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	11a: 19
Channel Band Width (99%)	11a: 24.61 MHz
Conducted Output Power	Band 1: 15.06 dBm ; Band 2: 16.56 dBm ; Band 3: 15.15 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)		Two (TX)	
	20 MHz	40 MHz	20 MHz	40 MHz
802.11a	V	X	X	X

3.2. Accessories

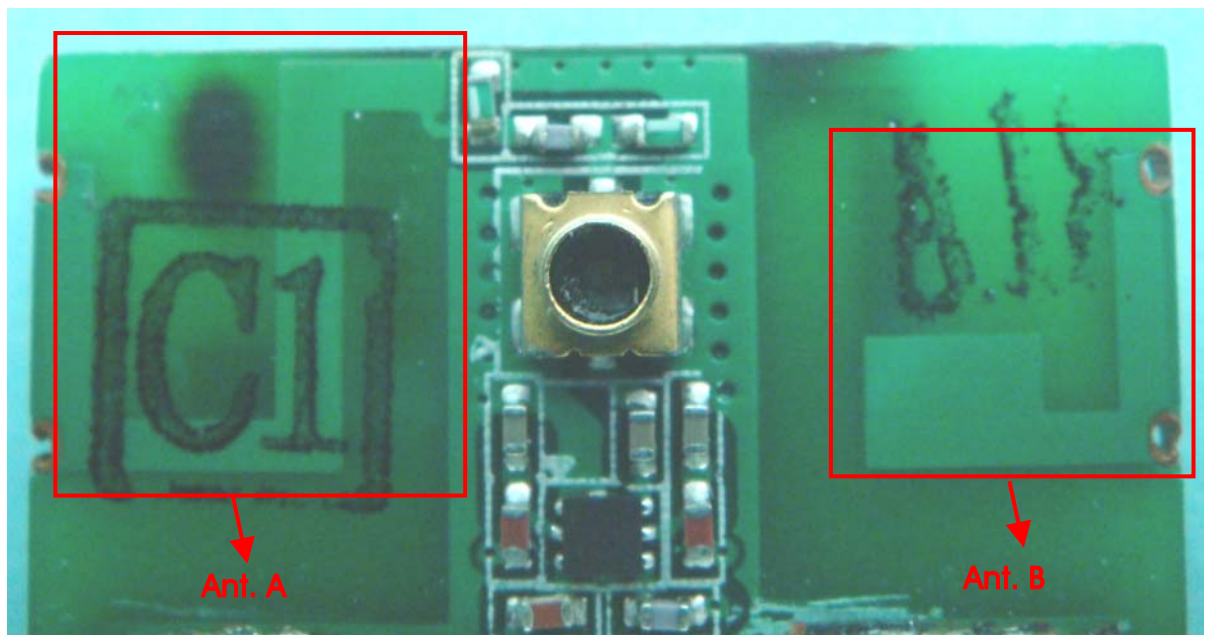
Others
USB Cable: 1.4m, Shielded

3.3. Table for Filed Antenna

For 5GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A	Wha Yu	N/A	Printed Antenna	N/A	3.88	TX / RX Ant.
B	Wha Yu	N/A	Printed Antenna	N/A	3.88	RX Ant.

Note : The EUT has two antennas.



3.4. Table for Carrier Frequencies

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	40	5200 MHz	48	5240 MHz
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	56	5280 MHz	64	5320 MHz
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	104	5520 MHz	128	5640 MHz
	108	5540 MHz	132	5660 MHz
	112	5560 MHz	136	5680 MHz
	116	5580 MHz	140	5700 MHz
	120	5600 MHz		

3.5. Table for Test Modes

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

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Conducted Emission	Normal Link / Mode 2	Auto	-	A
Max. Conducted Output Power	Band 1~2/BPSK	6Mbps	36/40/48/52/60/64	A
	Band 3/BPSK	6Mbps	100/120/140	A
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion	Band 1~2/BPSK	6Mbps	36/40/48/52/60/64	A
	Band 3/BPSK	6Mbps	100/120/140	A
Radiated Emission Below 1GHz	Normal Link / Mode 2	Auto	-	A
Radiated Emission Above 1GHz	Band 1~2/BPSK	6Mbps	36/40/48/52/60/64	A
	Band 3/BPSK	6Mbps	100/120/140	A
Band Edge Emission	Band 1~2/BPSK	6Mbps	36/40/48/52/60/64	A
	Band 3/BPSK	6Mbps	100/140	A
Frequency Stability	Un-modulation	-	52	A

The following test modes were performed for all tests:

Mode 1: Dongle mode

Mode 2: Dongle +USB Cable mode

Cause "mode 2" generated the worst test result, it was reported as final data.

3.6. Table for Testing Locations

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

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

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Mouse	QSKY	Lx-619B	DoC
Modem	ACEEX	DM1414	IFAXDM1414
Printer	EPSON	LQ-300	DoC
Wireless AP	Planex	GW-AP54SGX	DoC

3.8. Table for Parameters of Test Software Setting

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

Power Parameters of IEEE 802.11a

Test Software Version	QA					
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz
IEEE 802.11a	05	04	02	05	06	05
Frequency	5500 MHz		5600 MHz		5700 MHz	
IEEE 802.11a	09		0A		09	

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating "H" pattern was used as the test software.

The program was executed as follows :

- a. Turn on the power of all equipment.
- b. The NB sends "H" messages to the panel, and the panel displays "H" patterns on the screen.
- c. The NB sends "H" messages to the printer, then the printer prints them on the paper.
- d. The NB sends "H" messages to the modem.
- e. Repeat the steps from b to d.

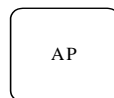
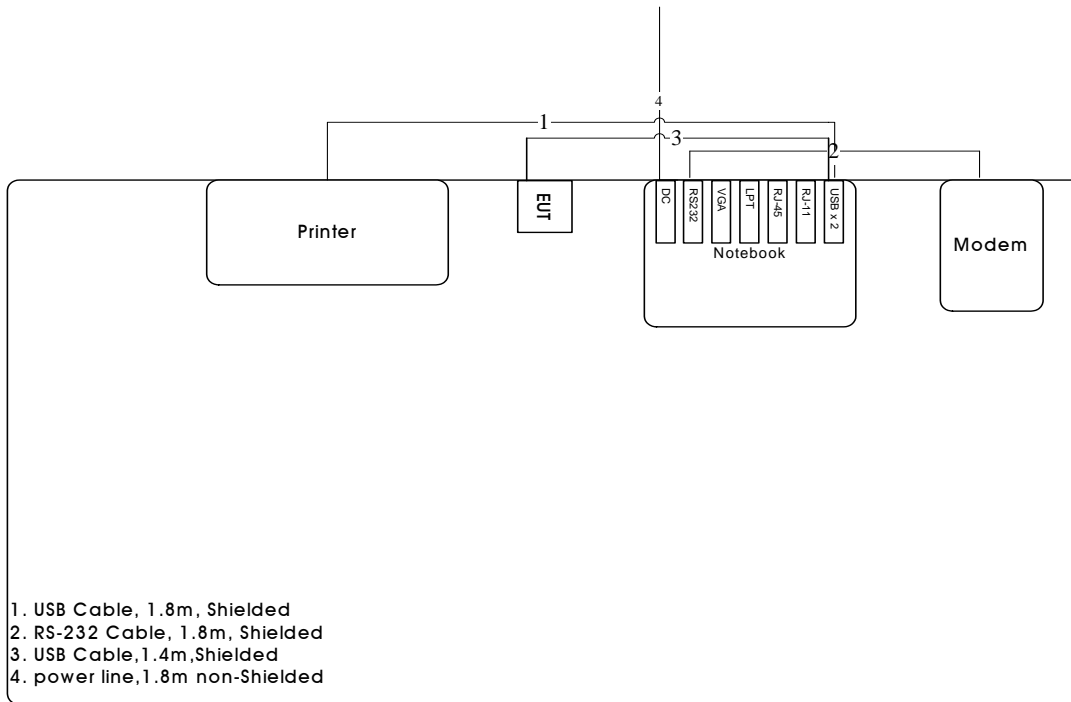
At the same time, "QA" was executed to control the EUT continuously transmit RF signal.

Executed "ping.exe" to link with the remote workstation to receive and transmit signal by WLAN.

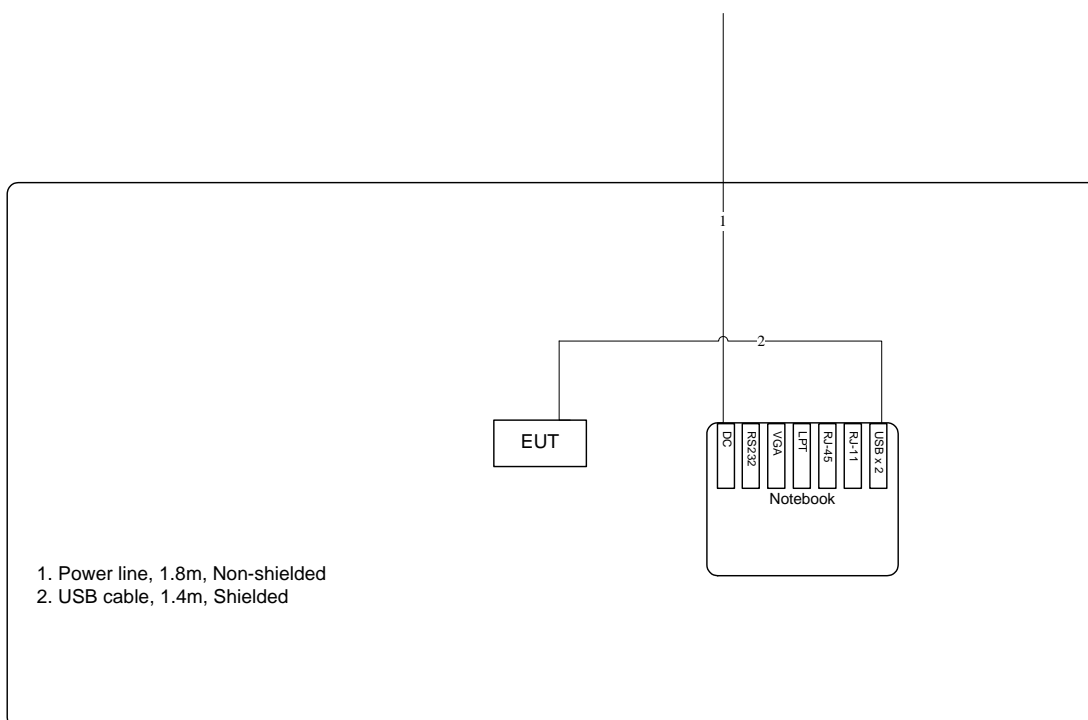
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration

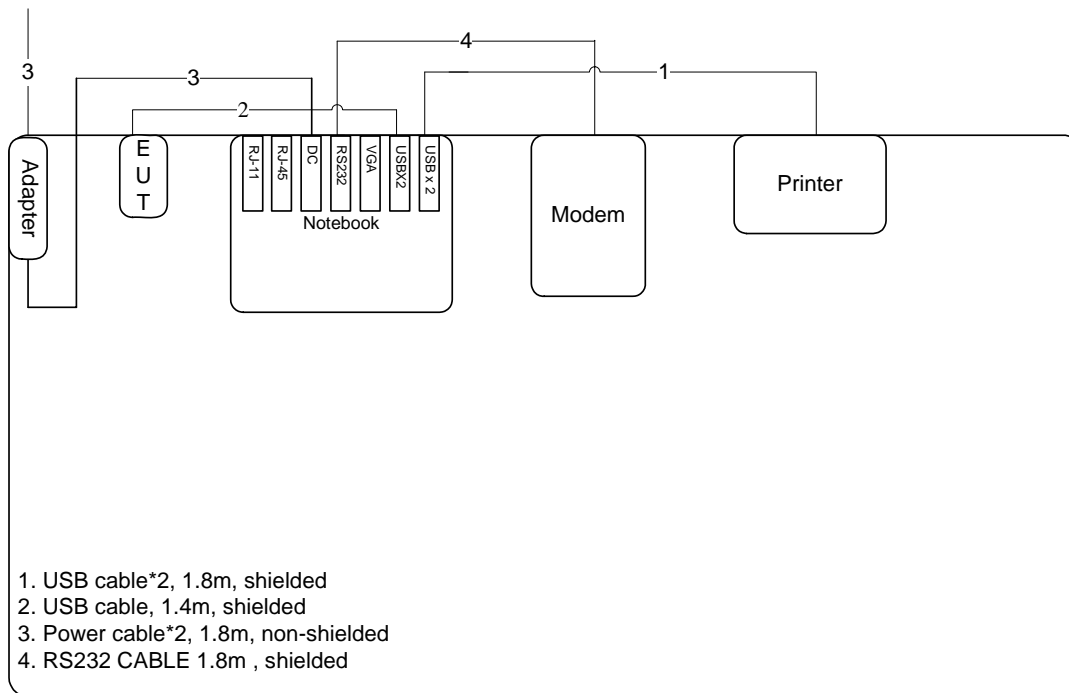
Test Configuration: 9KHz~1GHz



Test Configuration: above 1GHz



3.9.2. AC Power Line Conduction Emissions Test Configuration



AP

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

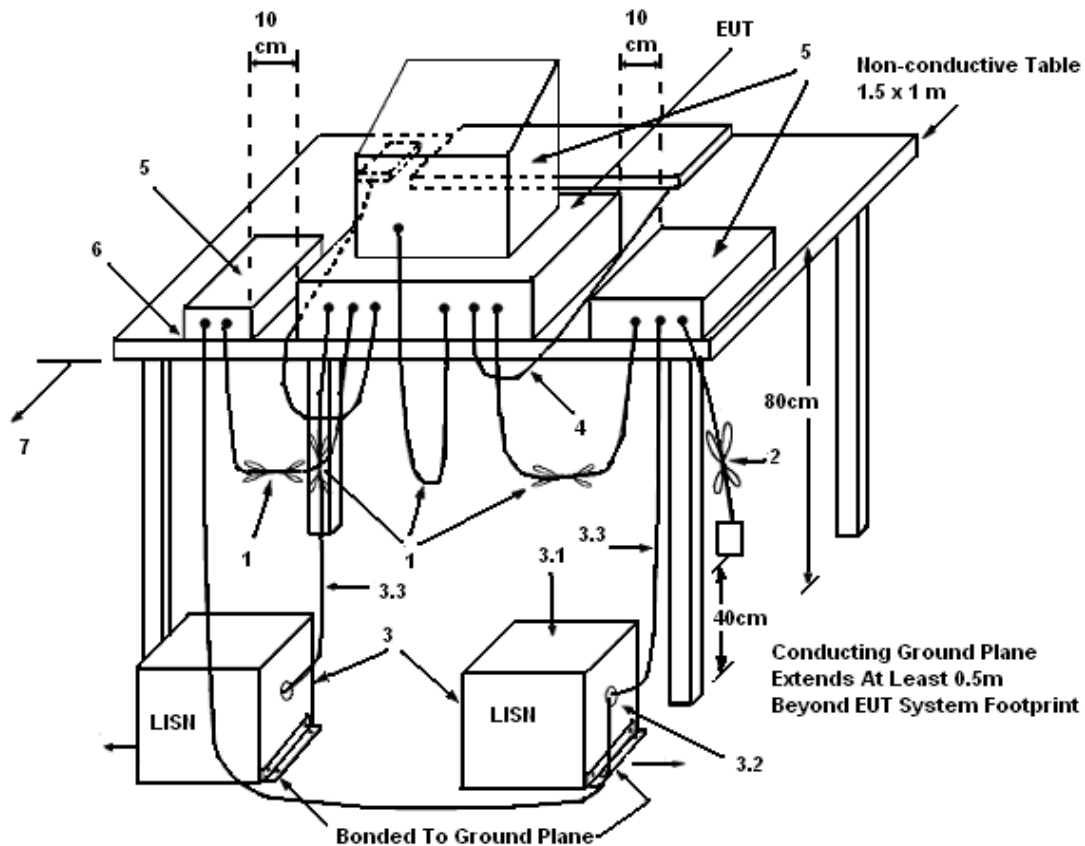
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
 - (3.1) All other equipment powered from additional LISN(s).
 - (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

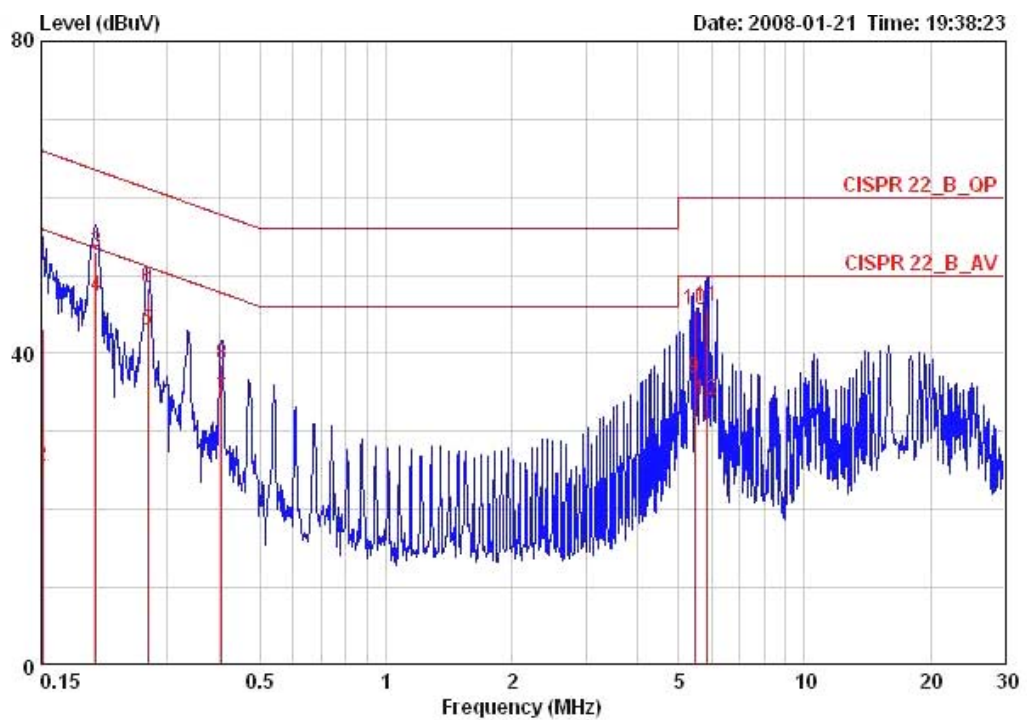
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

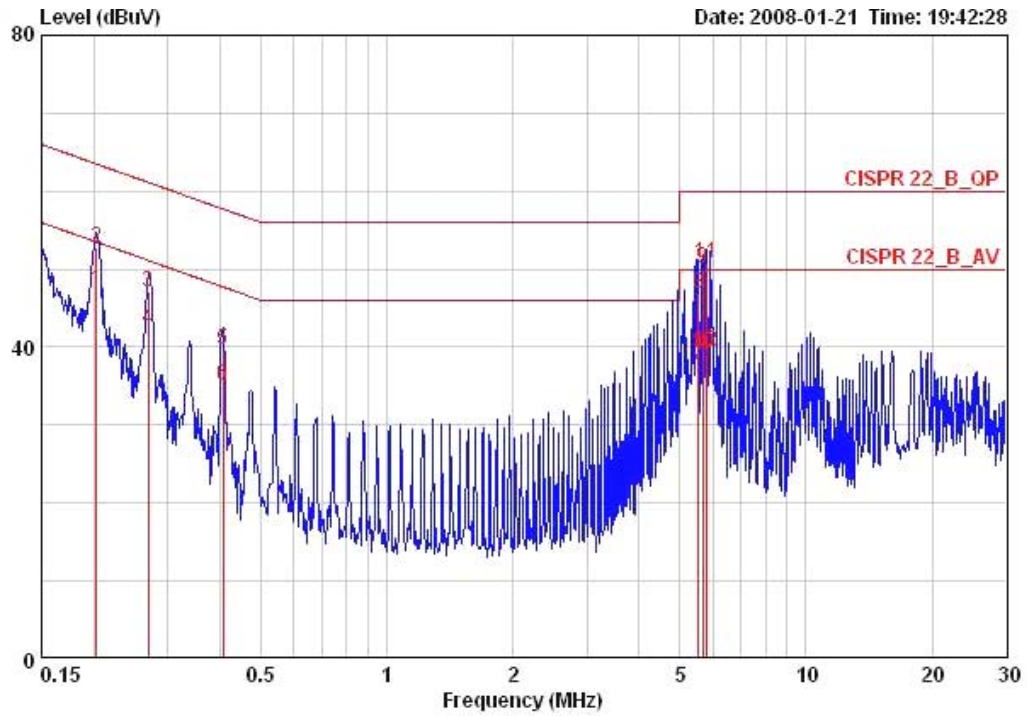
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	54%
Test Engineer	Cloud Peng	Phase	Line
Configuration	Mode 2		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15080	43.16	-22.80	65.96	42.76	0.20	0.20	QP	LINE
2	0.15080	25.44	-30.52	55.96	25.04	0.20	0.20	AVERAGE	LINE
3	0.20289	52.89	-10.60	63.49	52.59	0.10	0.20	QP	LINE
4	0.20289	47.25	-6.24	53.49	46.95	0.10	0.20	AVERAGE	LINE
5	0.27009	43.02	-8.10	51.12	42.72	0.10	0.20	AVERAGE	LINE
6	0.27009	48.48	-12.64	61.12	48.18	0.10	0.20	QP	LINE
7	0.40400	34.15	-13.63	47.77	33.85	0.10	0.20	AVERAGE	LINE
8	0.40400	38.68	-19.10	57.77	38.38	0.10	0.20	QP	LINE
9	5.467	36.80	-13.20	50.00	36.48	0.02	0.30	AVERAGE	LINE
10	5.467	45.60	-14.40	60.00	45.28	0.02	0.30	QP	LINE
11	5.867	45.95	-14.05	60.00	45.62	0.03	0.30	QP	LINE
12	5.867	33.96	-16.04	50.00	33.63	0.03	0.30	AVERAGE	LINE

Temperature	23°C	Humidity	54%
Test Engineer	Cloud Peng	Phase	Neutral
Configuration	Mode 2		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.20289	47.23	-6.26	53.49	46.83	0.20	0.20	AVERAGE	NEUTRAL
2	0.20289	52.68	-10.81	63.49	52.28	0.20	0.20	QP	NEUTRAL
3	0.27009	47.17	-13.95	61.12	46.80	0.17	0.20	QP	NEUTRAL
4	0.27009	42.33	-8.79	51.12	41.96	0.17	0.20	AVERAGE	NEUTRAL
5	0.40615	39.77	-17.96	57.73	39.47	0.10	0.20	QP	NEUTRAL
6	0.40615	35.07	-12.66	47.73	34.77	0.10	0.20	AVERAGE	NEUTRAL
7	5.551	37.82	-12.18	50.00	37.42	0.10	0.30	AVERAGE	NEUTRAL
8	5.551	46.96	-13.04	60.00	46.56	0.10	0.30	QP	NEUTRAL
9	5.683	50.08	-9.92	60.00	49.68	0.10	0.30	QP	NEUTRAL
10	5.683	39.31	-10.69	50.00	38.91	0.10	0.30	AVERAGE	NEUTRAL
11	5.813	50.87	-9.13	60.00	50.47	0.10	0.30	QP	NEUTRAL
12	5.813	39.43	-10.57	50.00	39.03	0.10	0.30	AVERAGE	NEUTRAL

Note:

$$\text{Level} = \text{Read Level} + \text{LISN Factor} + \text{Cable Loss}$$

4.2. 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

4.2.2. Measuring Instruments and Setting

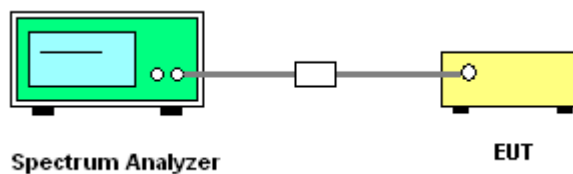
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.
4. Measuring multiple antennas, the connector is required to link with Power Meter through a combiner.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

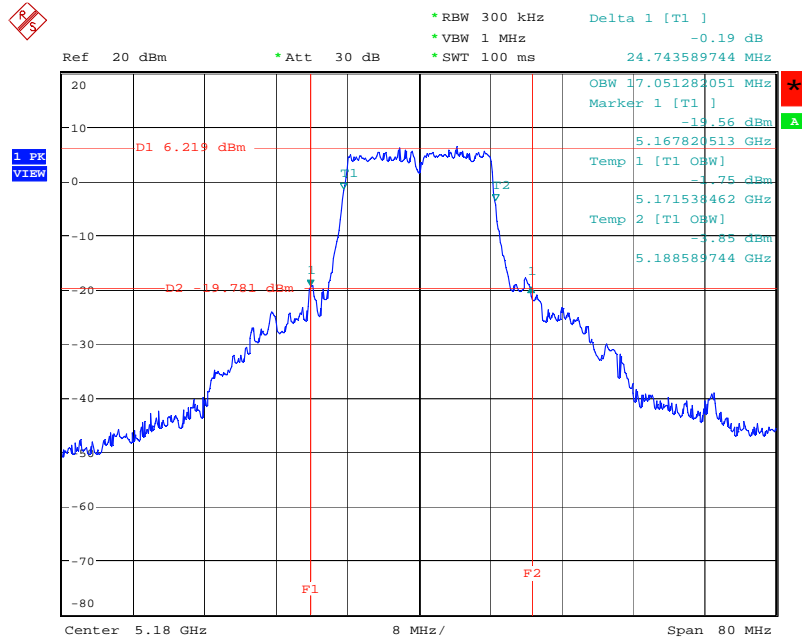
4.2.7. Test Result of 99% Occupied Bandwidth

Temperature	24°C	Humidity	56%
Test Engineer	Jacky Ho	Configurations	802.11a

Configuration IEEE 802.11a Ant. A

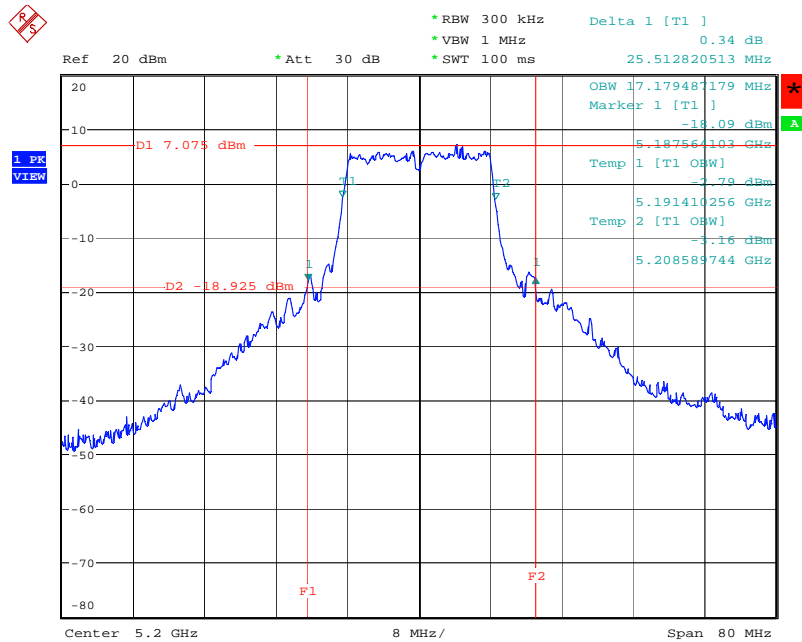
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	24.74	17.05
40	5200 MHz	25.51	17.17
48	5240 MHz	26.53	17.30
52	5260 MHz	38.97	22.43
60	5300 MHz	40.51	24.61
64	5320 MHz	37.05	18.33
100	5500 MHz	34.61	17.94
120	5600 MHz	38.71	21.15
140	5700 MHz	37.56	20.64

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5180 MHz



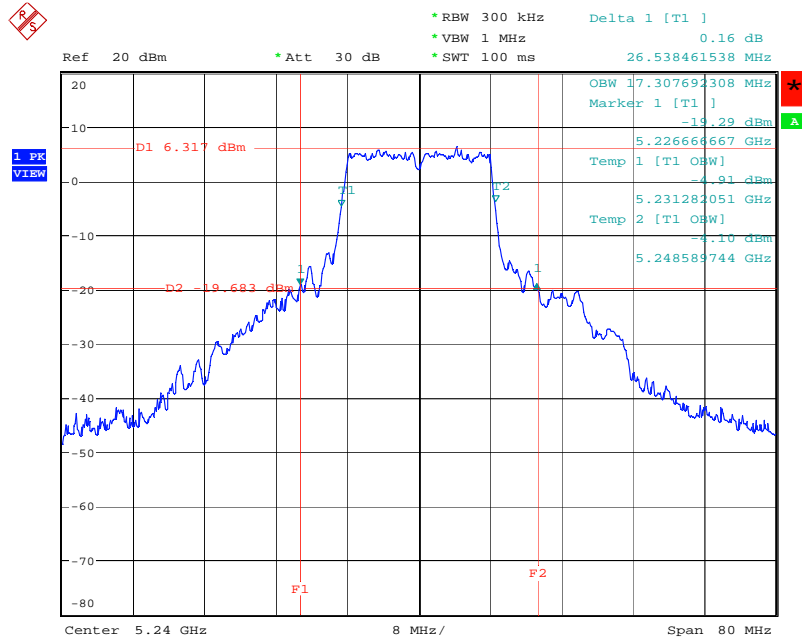
Date: 2.FEB.2008 12:28:21

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5200 MHz



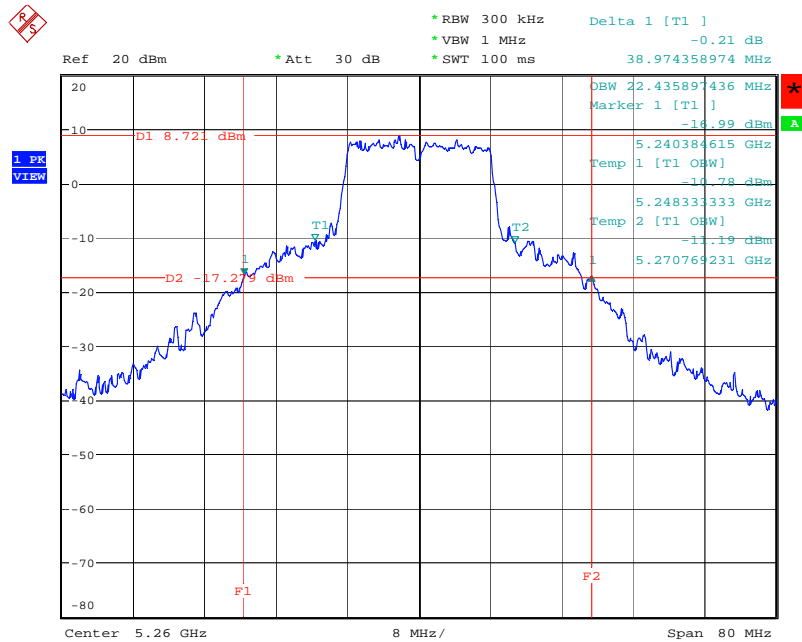
Date: 2.FEB.2008 12:30:31

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5240 MHz



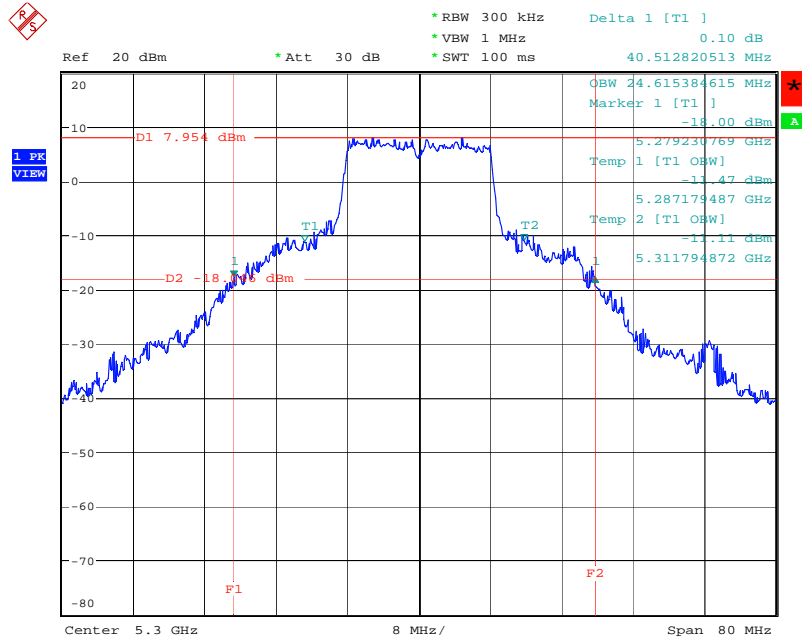
Date: 2.FEB.2008 12:33:24

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5260 MHz



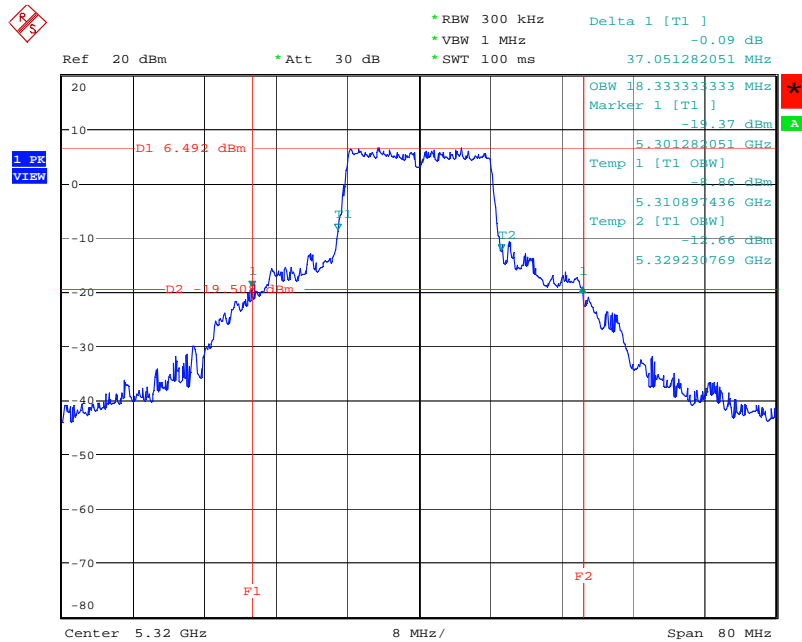
Date: 2.FEB.2008 12:35:26

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5300 MHz



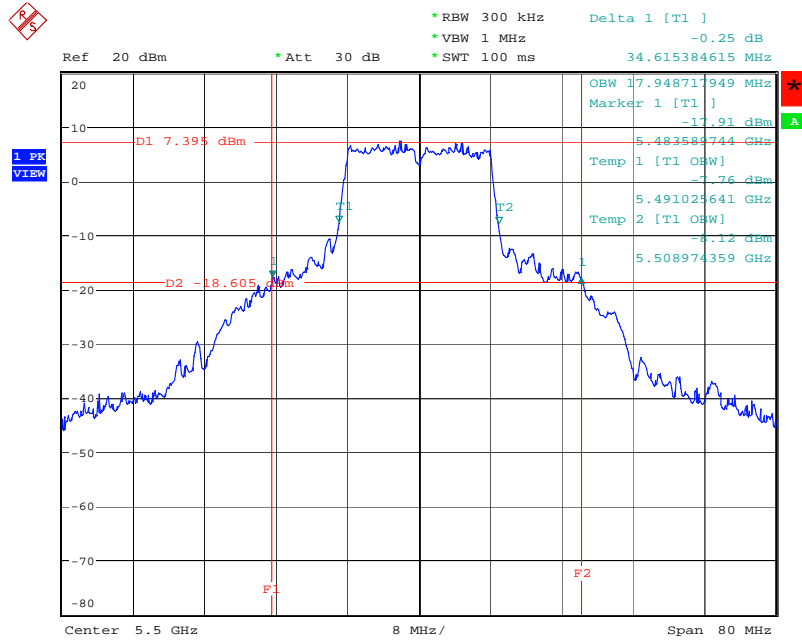
Date: 2.FEB.2008 12:37:25

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5320 MHz



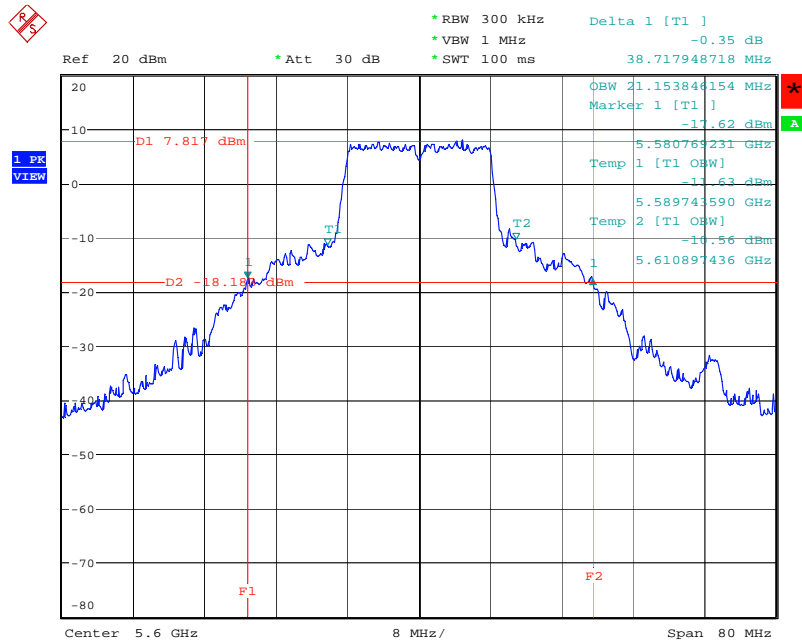
Date: 2.FEB.2008 13:42:50

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5500 MHz



Date: 2.FEB.2008 12:39:09

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. A / 5600 MHz



Date: 2.FEB.2008 12:41:05

4.3. Maximum Conducted Output Power Measurement

4.3.1. 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 (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.470-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log B$. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W (30dBm) or $17 \text{ dBm} + 10\log B$. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power and peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

4.3.2. Measuring Instruments and Setting

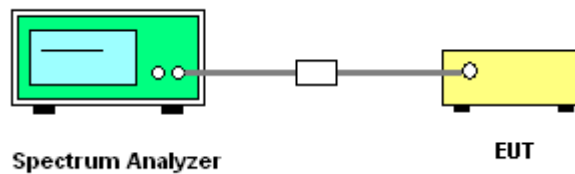
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	Sample
Trace	Average
Sweep Time	Auto

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with FCC Conference Call, June 10, 2003.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

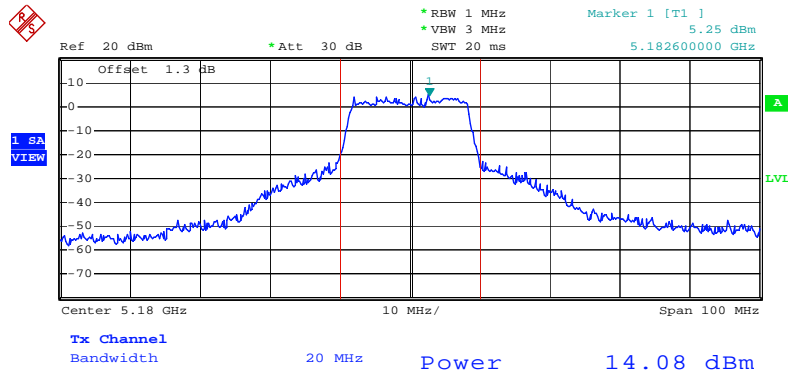
4.3.7. Test Result of Maximum Conducted Output Power

Temperature	24°C	Humidity	56%
Test Engineer	Jacky Ho	Configurations	802.11a

Configuration IEEE 802.11a Ant. A

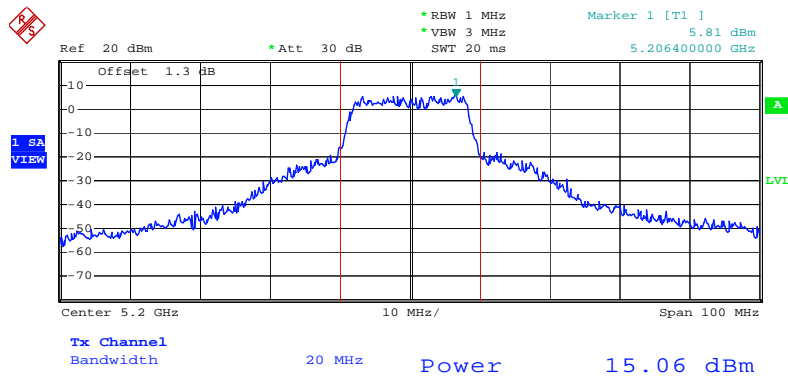
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	14.08	17.00	Complies
40	5200 MHz	15.06	17.00	Complies
48	5240 MHz	14.55	17.00	Complies
52	5260 MHz	15.10	24.00	Complies
60	5300 MHz	16.56	24.00	Complies
64	5320 MHz	13.71	24.00	Complies
100	5500 MHz	14.42	24.00	Complies
120	5600 MHz	15.15	24.00	Complies
140	5700 MHz	14.18	24.00	Complies

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5180 MHz



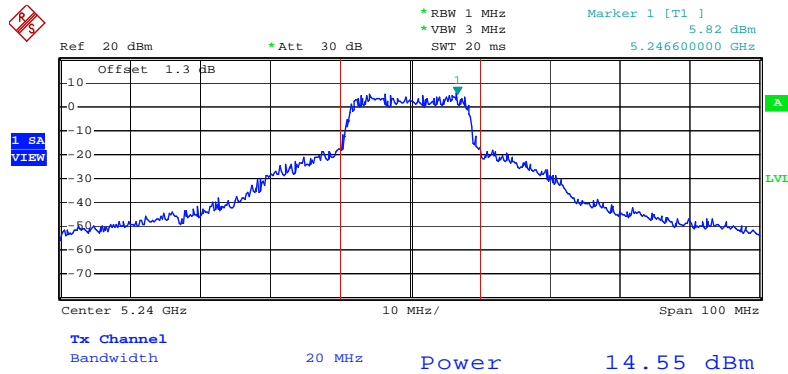
Date: 2.FEB.2008 07:52:37

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5200 MHz



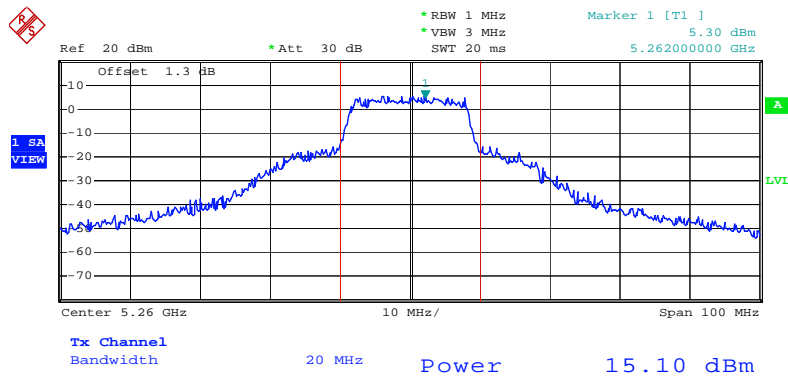
Date: 2.FEB.2008 07:53:50

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5240 MHz



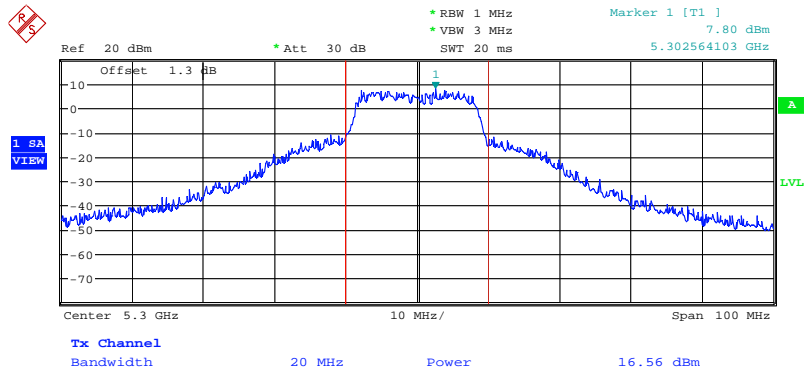
Date: 2.FEB.2008 07:55:06

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5260 MHz



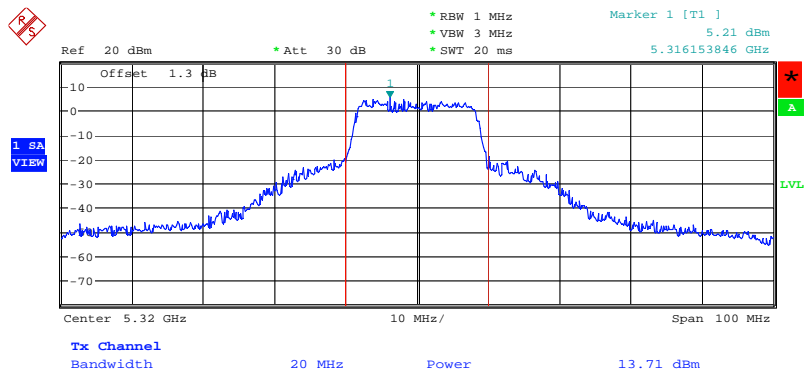
Date: 2.FEB.2008 07:56:23

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5300 MHz



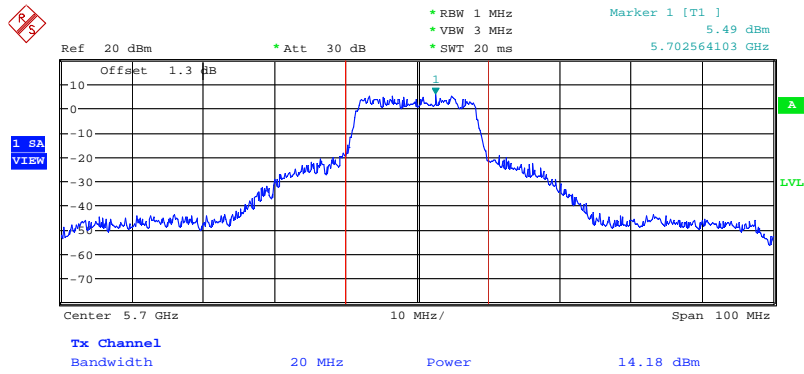
Date: 2.FEB.2008 08:08:21

Channel Output Power Plot on Configuration IEEE 802.11 a Ant. A / 5320 MHz



Date: 2.FEB.2008 13:20:53

Channel Output Power Plot on Configuration IEEE 802.11a Ant. A / 5700 MHz



Date: 2.FEB.2008 13:19:13

4.4. Power Spectral Density Measurement

4.4.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5470-5725	11

4.4.2. Measuring Instruments and Setting

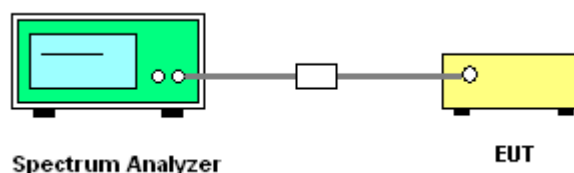
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz. Set Detector to Peak, Trace to Max Hold. Mark the frequency with maximum peak power as the center of the display of the spectrum.
3. Measuring multiple antennas, the connector is required to link with Power Meter through a combiner.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

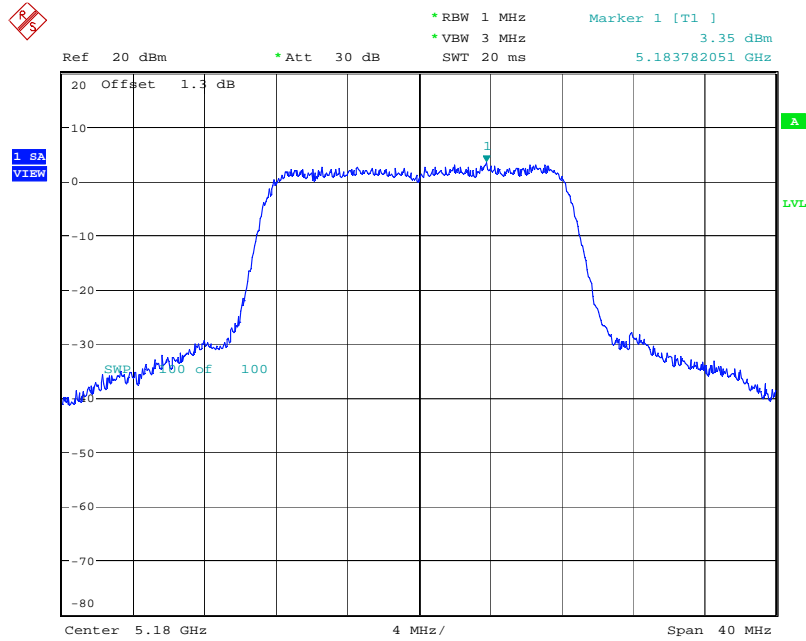
4.4.7. Test Result of Power Spectral Density

Temperature	24°C	Humidity	56%
Test Engineer	Jacky Ho	Configurations	802.11a

Configuration IEEE 802.11a Ant. A

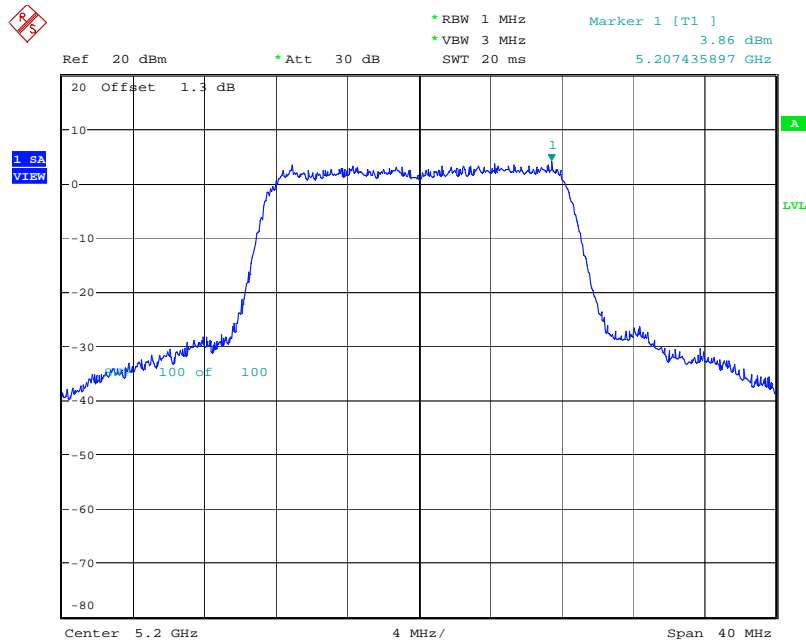
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	3.35	4.00	Complies
40	5200 MHz	3.86	4.00	Complies
48	5240 MHz	3.35	4.00	Complies
52	5260 MHz	4.88	11.00	Complies
60	5300 MHz	5.26	11.00	Complies
64	5320 MHz	3.40	11.00	Complies
100	5500 MHz	4.41	11.00	Complies
120	5600 MHz	4.99	11.00	Complies
140	5700 MHz	5.00	11.00	Complies

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5180 MHz



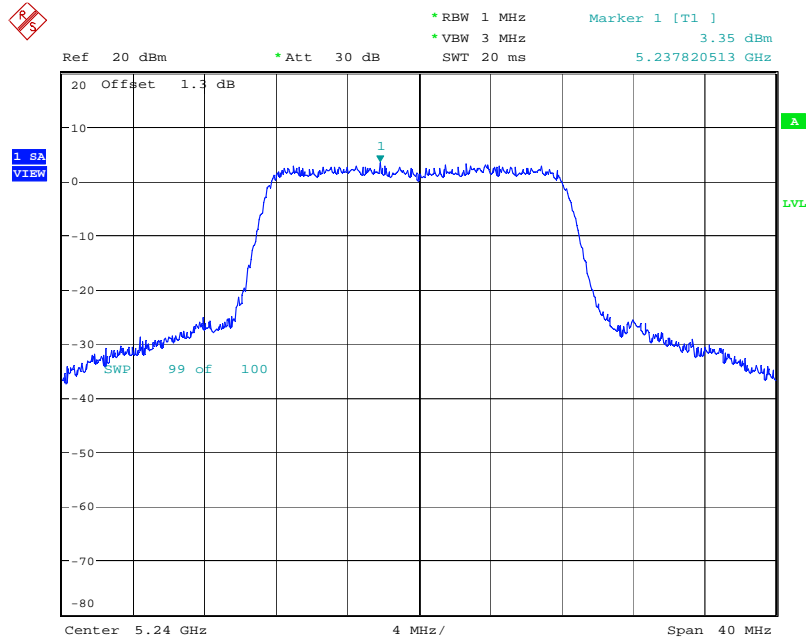
Date: 2.FEB.2008 12:28:28

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5200 MHz



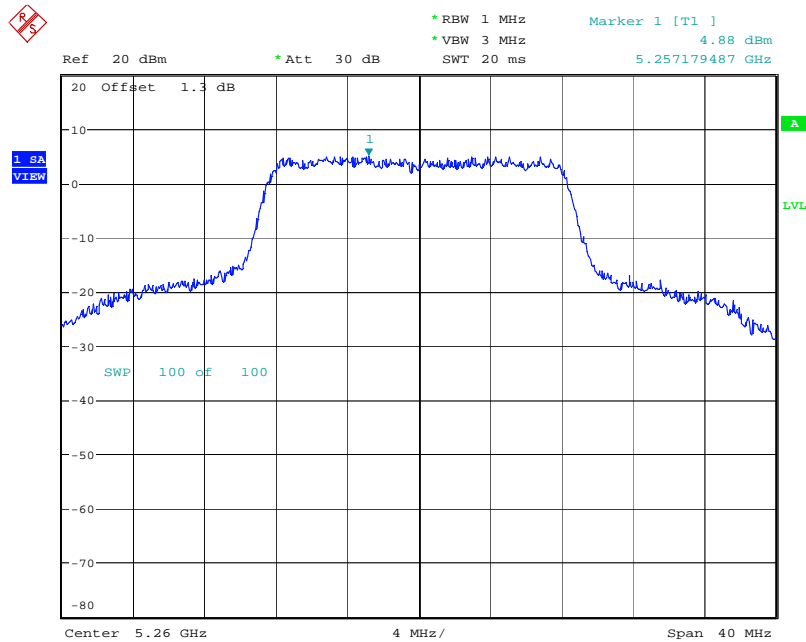
Date: 2.FEB.2008 12:30:39

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5240 MHz



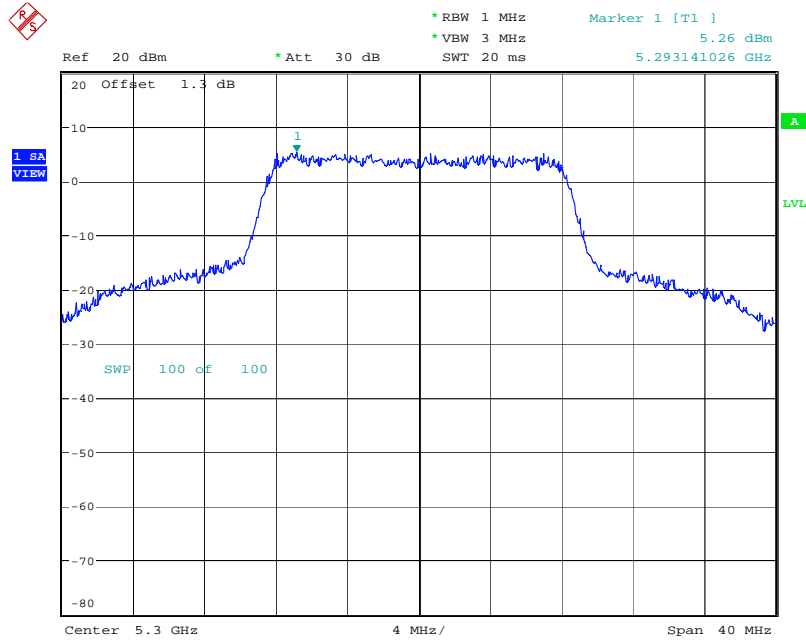
Date: 2.FEB.2008 12:33:31

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5260 MHz



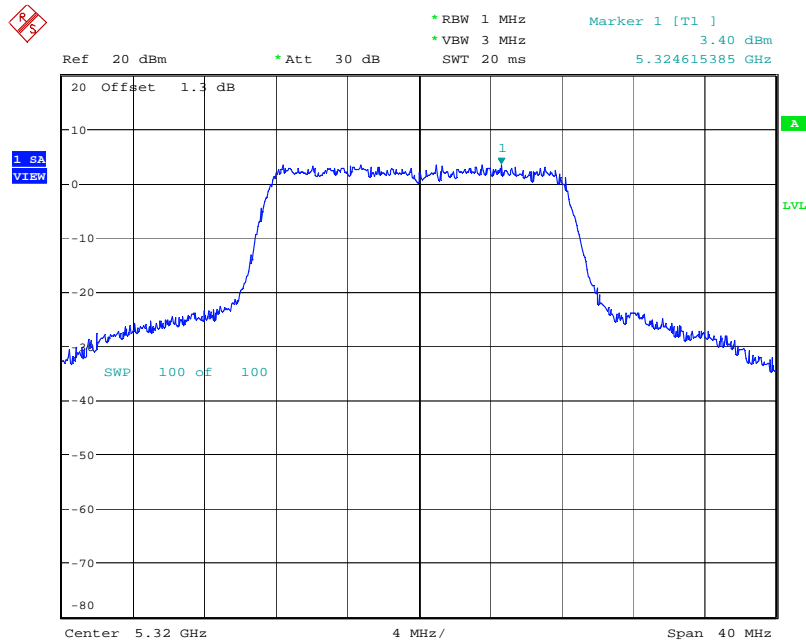
Date: 2.FEB.2008 12:35:33

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5300 MHz



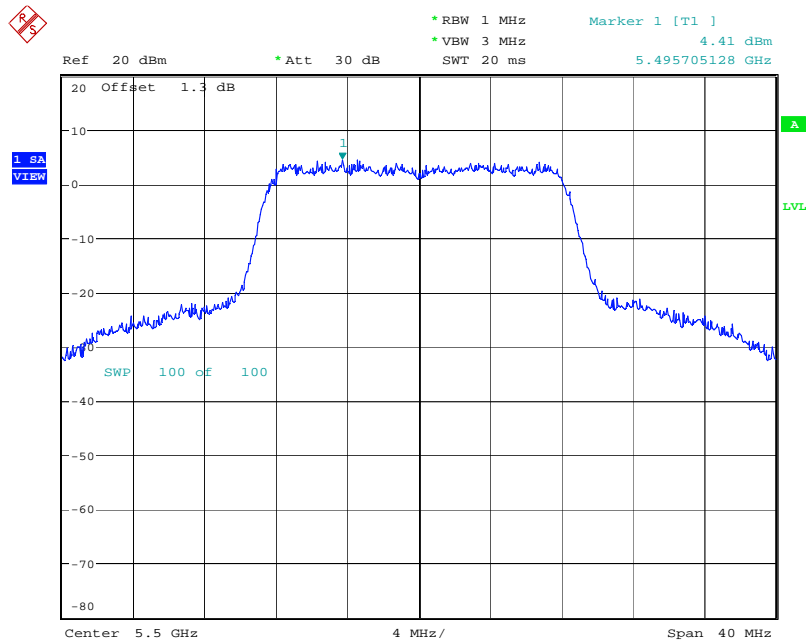
Date: 2.FEB.2008 12:37:33

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5320 MHz



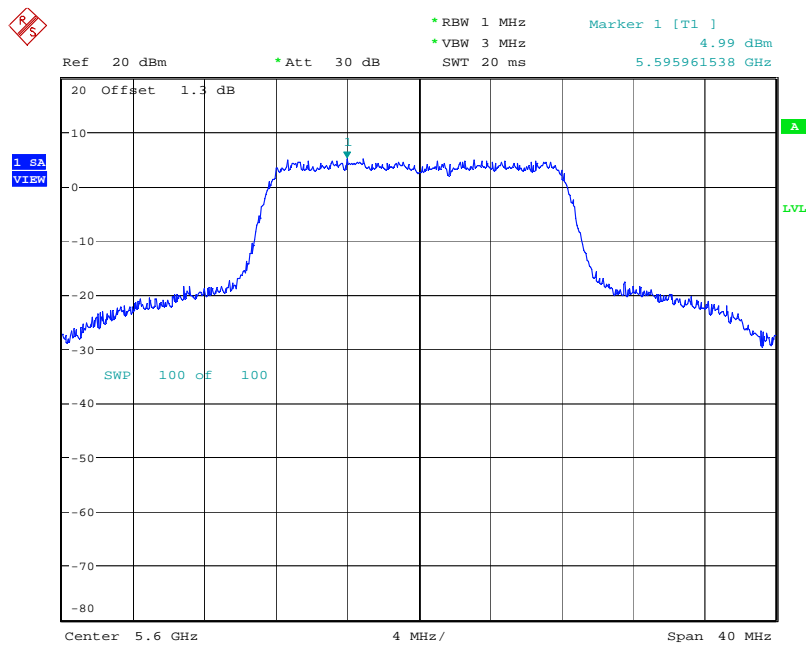
Date: 3.FEB.2008 14:56:34

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5500 MHz



Date: 2.FEB.2008 12:39:17

Power Density Plot on Configuration IEEE 802.11a Ant. A / 5600 MHz



Date: 2.FEB.2008 12:41:14

4.5. Peak Excursion Measurement

4.5.1. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

4.5.2. Measuring Instruments and Setting

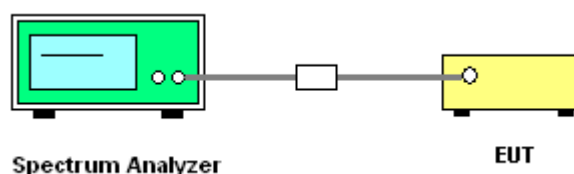
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VB	3000 kHz (Peak Trace) / 300 kHz (Average Trace)
Detector	Peak (Peak Trace) / Sample (Average Trace)
Trace	Max Hold
Sweep Time	60s

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 dB for all frequencies across the emissions bandwidth. Submit a plot.
3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
4. Average Trace: Method #3—video averaging with max hold--and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to "free run". Set RBW = 1 MHz. Set VBW $\geq 1/T$ (IEEE 802.11a VBW = 300kHz $\geq 1/4 \mu s$). Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.
5. Measuring multiple antennas, the connector is required to link with Power Meter through a combiner.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

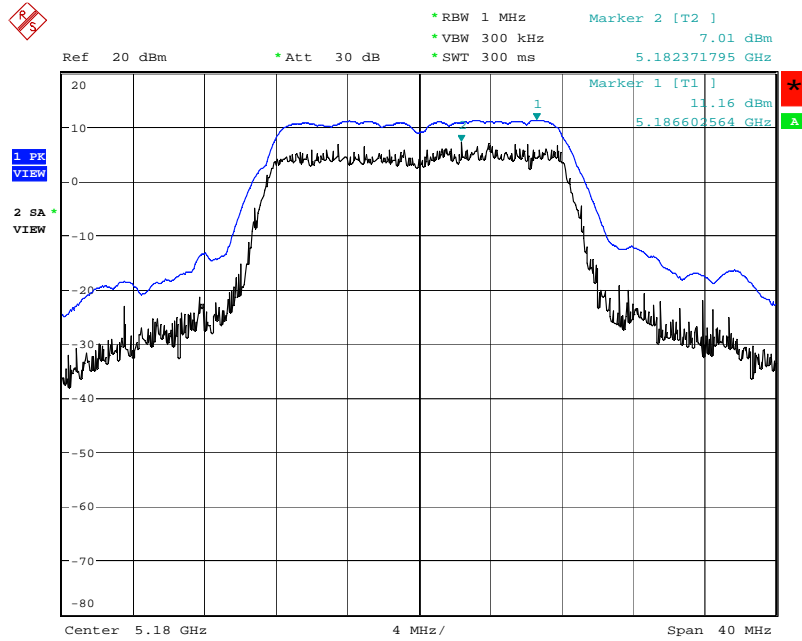
4.5.7. Test Result of Peak Excursion

Temperature	24°C	Humidity	56%
Test Engineer	Jacky Ho	Configurations	802.11a

Configuration IEEE 802.11a Ant. A

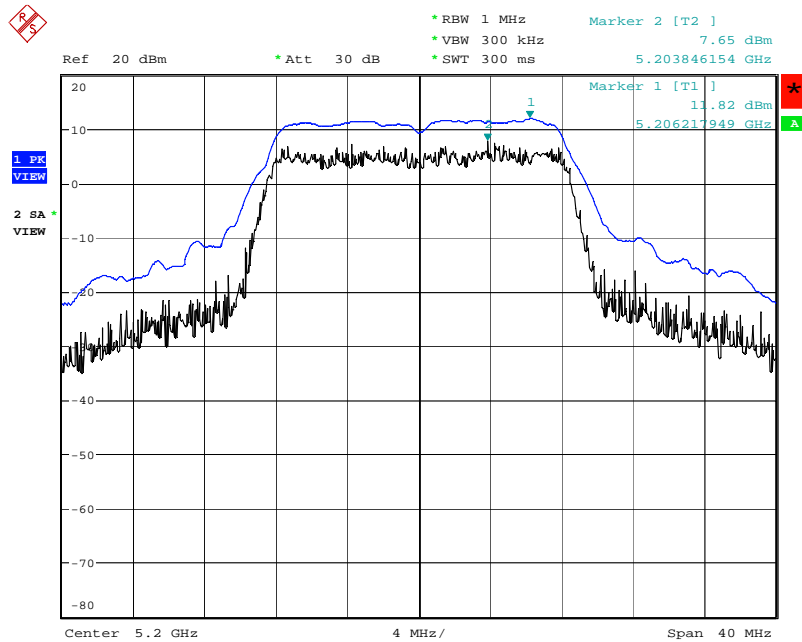
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	4.15	13	Complies
40	5200 MHz	4.17	13	Complies
48	5240 MHz	4.29	13	Complies
52	5260 MHz	4.53	13	Complies
60	5300 MHz	4.23	13	Complies
64	5320 MHz	4.40	13	Complies
100	5500 MHz	3.70	13	Complies
120	5600 MHz	4.43	13	Complies
140	5700 MHz	4.37	13	Complies

Peak Excursion Plot on Configuration IEEE 802.11a Ant. A / 5180 MHz



Date: 2.FEB.2008 12:29:15

Peak Excursion Plot on Configuration IEEE 802.11a Ant. A / 5200 MHz



Date: 2.FEB.2008 12:31:25