



# FCC TEST REPORT (15.407)

**REPORT NO.:** RF971208L04-1

**MODEL NO.:** WAP610N

**RECEIVED:** Dec. 08, 2008

**TESTED:** Mar. 23 ~ Mar. 26, 2009

**ISSUED:** Apr. 02, 2009

**APPLICANT:** Cisco-Linksys LLC

**ADDRESS:** 121 Theory Drive Irvine, CA 92617 (USA)

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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## 1. CERTIFICATION

**PRODUCT:** Wireless-N Access Point with Dual-Band

**MODEL:** WAP610N

**BRAND:** Linksys

**APPLICANT:** Cisco-Linksys LLC

**TEST SAMPLE:** ENGINEERING SAMPLE

**TESTED:** Mar. 23 ~ Mar. 26, 2009

**STANDARDS:** FCC Part 15, Subpart E (Section 15.407)

ANSI C63.4-2003

The above equipment (Model: WAP610N) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** : Polly Chien , DATE : Apr. 02, 2009  
Polly Chien / Specialist

**TECHNICAL  
ACCEPTANCE** : Long Chen , DATE : Apr. 02, 2009  
Responsible for RF      Long Chen / Senior Engineer

**APPROVED BY** : Gary Chang , DATE : Apr. 02, 2009  
Gary Chang / Assistant Manager



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## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -18.38dB at 0.927MHz.
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -1.14dB at 10460.00MHz.
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~ 1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Wireless-N Access Point with Dual-Band
<b>MODEL NO.</b>	WAP610N
<b>FCC ID</b>	Q87-WAP610N
<b>POWER SUPPLY</b>	12Vdc from AC adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps Draft 802.11n: up to 300.0Mbps
<b>FREQUENCY RANGE</b>	<b>5.0GHz:</b> 5180.0 ~ 5240.0MHz
<b>NUMBER OF CHANNEL</b>	<b>5.0GHz:</b> 4 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz)
<b>OUTPUT POWER</b>	26.991mW for 5180.0 ~ 5240.0MHz
<b>ANTENNA TYPE</b>	Refer to note as below
<b>DATA CABLE</b>	1.5m non-shielded RJ45 cable without core
<b>I/O PORTS</b>	RJ45
<b>ASSOCIATED DEVICES</b>	Adapter

#### NOTE:

1. The EUT is a Wireless-N Access Point with Dual-Band. The functions of EUT listed as below:

	TEST STANDARD	REFERENCE REPORT
<b>WLAN 802.11b/g, draft 802.11n</b>	FCC Part 15, Subpart C (Section 15.247)	RF971208L04
<b>WLAN 802.11a, draft 802.11n (5745~5825 MHz)</b>	FCC Part 15, Subpart E (Section 15.407)	RF971208L04-1
<b>WLAN 802.11a, draft 802.11n (5180~ 5240MHz)</b>		



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2. The EUT was powered by the following adapter:

<b>brand:</b>	BesTec
<b>Model:</b>	EA0121WAA
<b>Input:</b>	100-240Vac, 50-60Hz, 0.5A
<b>Output:</b>	12Vdc, 1A Max
<b>Power Line:</b>	1.8m non-shielded cable without core

3. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2412~2462	5180~5240	5745~5825
802.11b	✓		
802.11g	✓		
802.11a		✓	✓
Draft 802.11n (20MHz)	✓	✓	✓
Draft 802.11n (40MHz)	✓	✓	✓

4. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and three receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	2TX
802.11a	2TX
Draft 802.11n (20MHz)	2TX
Draft 802.11n (40MHz)	2TX

5. The following antennas are used in this EUT.

TYPE	CONNECTOR	GAIN (dBi)	
		2.4GHz	5.0GHz
PIFA (TX & RX)	NA	1.00	1.28
Printed (RX only)	NA	1.58	1.45

6. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 DESCRIPTION OF TEST MODES

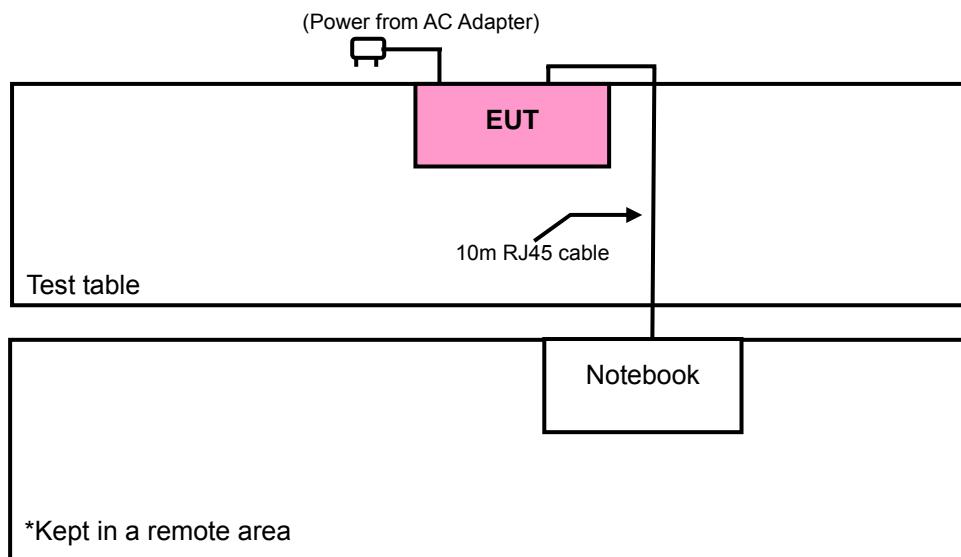
4 channels are provided for 802.11a, draft 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

2 channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190MHz	46	5230MHz

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





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### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where

RE≥1G: Radiated Emission above 1GHz

RE&lt;1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

#### RADIATED EMISSION TEST (ABOVE 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	Draft 802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0

#### RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	40	OFDM	BPSK	6.0

#### POWER LINE CONDUCTED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	40	OFDM	BPSK	6.0



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**BANDEDGE MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	36, 48	OFDM	BPSK	6.0
-	Draft 802.11n (20MHz)	36 to 48	36, 48	OFDM	BPSK	7.2
-	Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	Draft 802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	Draft 802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0



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### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart E (15.407)**

**ANSI C63.4-2003**

All test items have been performed and recorded as per the above standards.

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP05L	12130898320	E2K24CLNS

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m UTP RJ 45 cable

**NOTE 1:** All power cords of the above support units are non shielded (1.8m).

**NOTE 2:** Item 1 acted as a communication partner to transfer data.



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## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB<sub>u</sub>V/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### 4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dB <sub>u</sub> V/m) *NOTE 3
	PK	PK
5150 ~ 5250	-27	68.3

**NOTE:** The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m}, \text{ where } P \text{ is the eirp (Watts).}$$



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#### 4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	May 28, 2008	May 27, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Aug. 08, 2008	Aug. 07, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 25, 2008	Apr. 24, 2009
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Aug. 06, 2008	Aug. 05, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170148	Jul. 03, 2008	Jul. 02, 2009
Preamplifier Agilent	8449B	3008A01911	Sep. 10, 2008	Sep. 09, 2009
Preamplifier Agilent	8447D	2944A10638	Dec. 26, 2008	Dec. 25, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218190/4 231241/4	May 20, 2008	May 19, 2009
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 09, 2008	Aug. 08, 2009
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 27, 2008	Aug. 26, 2009

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Chamber 9.  
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.  
4. The FCC Site Registration No. is 460141.  
5. The IC Site Registration No. is IC 7450F-4.



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#### 4.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

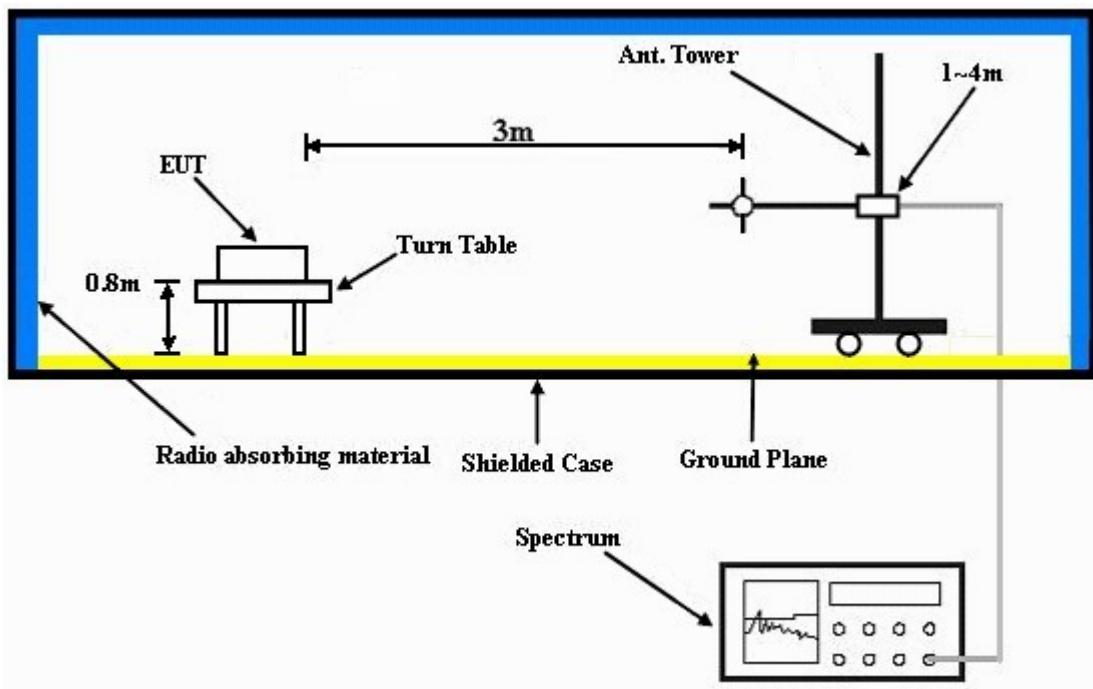
##### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.6 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.7 EUT OPERATING CONDITION

- a. Placed the EUT on a testing table.
- b. Prepared notebook computer and placed it outside of testing area to act as communication partner for EUT.
- c. The EUT ran a test program (provided by manufacturer) to enable all functions under transmission condition continuously at specific channel frequency.
- d. The necessary accessories enable the EUT in full functions.



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#### 4.1.8 TEST RESULTS

##### 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 36		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.21 PK	74.00	-7.79	1.20 H	224	26.46	39.75
2	5150.00	41.65 AV	54.00	-12.35	1.20 H	224	1.90	39.75
3	*5180.00	103.32 PK			1.20 H	224	63.57	39.75
4	*5180.00	92.62 AV			1.20 H	224	52.87	39.75
5	#10360.00	66.41 PK	68.30	-1.89	1.29 H	166	15.76	50.65

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.49 PK	74.00	-5.51	1.06 V	206	28.74	39.75
2	5150.00	41.89 AV	54.00	-12.11	1.06 V	206	2.14	39.75
3	*5180.00	106.69 PK			1.06 V	206	66.94	39.75
4	*5180.00	96.20 AV			1.06 V	206	56.45	39.75
5	#10360.00	65.06 PK	68.30	-3.24	1.09 V	299	14.41	50.65

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. “#”: The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	102.66 PK			1.21 H	225	62.91	39.75
2	*5200.00	91.98 AV			1.21 H	225	52.23	39.75
3	#10400.00	64.70 PK	68.30	-3.60	1.06 H	129	13.95	50.75

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	106.46 PK			1.04 V	192	66.71	39.75
2	*5200.00	96.13 AV			1.04 V	192	56.38	39.75
3	#10400.00	66.95 PK	68.30	-1.35	1.16 V	300	16.20	50.75

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 48		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	102.83 PK			1.22 H	226	62.99	39.84
2	*5240.00	92.06 AV			1.22 H	226	52.22	39.84
3	5350.00	53.69 PK	74.00	-20.31	1.22 H	226	13.64	40.05
4	5350.00	39.90 AV	54.00	-14.10	1.22 H	226	-0.15	40.05
5	#10480.00	64.83 PK	68.30	-3.47	1.09 H	126	13.95	50.88
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	106.23 PK			1.03 V	189	66.39	39.84
2	*5240.00	95.91 AV			1.03 V	189	56.07	39.84
3	5350.00	53.98 PK	74.00	-20.02	1.03 V	189	13.93	40.05
4	5350.00	40.22 AV	54.00	-13.78	1.03 V	189	0.17	40.05
5	#10480.00	64.56 PK	68.30	-3.74	1.04 V	216	13.68	50.88

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



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## DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 36		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.15 PK	74.00	-15.85	1.00 H	229	18.40	39.75
2	5150.00	39.05 AV	54.00	-14.95	1.00 H	229	-0.70	39.75
3	*5180.00	101.24 PK			1.00 H	229	61.49	39.75
4	*5180.00	90.47 AV			1.00 H	229	50.72	39.75
5	#10360.00	60.52 PK	68.30	-7.78	1.14 H	56	9.87	50.65

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.45 PK	74.00	-20.55	1.04 V	193	13.70	39.75
2	5150.00	41.24 AV	54.00	-12.76	1.04 V	193	1.49	39.75
3	*5180.00	104.16 PK			1.04 V	193	64.41	39.75
4	*5180.00	94.15 AV			1.04 V	193	54.40	39.75
5	#10360.00	64.08 PK	68.30	-4.22	1.45 V	308	13.43	50.65

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. “#”: The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1000hPa	TESTED BY	Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	100.40 PK			1.24 H	226	60.65	39.75
2	*5200.00	90.41 AV			1.24 H	226	50.66	39.75
3	#10400.00	63.59 PK	68.30	-4.71	1.23 H	125	12.84	50.75

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	103.42 PK			1.06 V	193	63.67	39.75
2	*5200.00	93.01 AV			1.06 V	193	53.26	39.75
3	#10400.00	62.01 PK	68.30	-6.29	1.20 V	114	11.26	50.75

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 48		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	100.95 PK			1.21 H	225	61.11	39.84
2	*5240.00	90.96 AV			1.21 H	225	51.12	39.84
3	5350.00	55.84 PK	74.00	-18.16	1.21 H	225	15.80	40.05
4	5350.00	40.25 AV	54.00	-13.75	1.21 H	225	0.20	40.05
5	#10480.00	62.76 PK	68.30	-5.54	1.17 H	132	11.88	50.88
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	104.14 PK			1.14 V	183	64.30	39.84
2	*5240.00	93.82 AV			1.14 V	183	53.98	39.84
3	5350.00	56.29 PK	74.00	-17.71	1.14 V	183	16.24	40.05
4	5350.00	40.84 AV	54.00	-13.16	1.14 V	183	0.79	40.05
5	#10480.00	62.55 PK	68.30	-5.75	1.13 V	104	11.67	50.88

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



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## DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 38		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.62 PK	74.00	-18.38	1.21 H	224	15.87	39.75
2	5150.00	40.25 AV	54.00	-13.75	1.21 H	224	0.50	39.75
3	*5190.00	98.08 PK			1.21 H	224	58.33	39.75
4	*5190.00	87.30 AV			1.21 H	224	47.55	39.75
5	#10380.00	60.98 PK	68.30	-7.32	1.21 H	59	10.28	50.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.19 PK	74.00	-12.81	1.04 V	196	21.44	39.75
2	5150.00	42.80 AV	54.00	-11.20	1.04 V	196	3.05	39.75
3	*5190.00	102.97 PK			1.04 V	196	63.22	39.75
4	*5190.00	92.05 AV			1.04 V	196	52.30	39.75
5	#10380.00	60.92 PK	68.30	-7.38	1.19 V	5	10.22	50.70

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. “#”: The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL		
CHANNEL		Channel 46		FREQUENCY RANGE 1 ~ 40GHz
INPUT POWER (SYSTEM)		120Vac, 60 Hz		DETECTOR FUNCTION Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH 1000hPa		TESTED BY Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	100.78 PK			1.10 H	230	60.96	39.82
2	*5230.00	89.88 AV			1.10 H	230	50.06	39.82
3	5350.00	55.64 PK	74.00	-18.36	1.10 H	230	15.59	40.05
4	5350.00	40.31 AV	54.00	-13.69	1.10 H	230	0.27	40.05
5	#10460.00	65.32 PK	68.30	-2.98	1.06 H	125	14.47	50.85
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	102.96 PK			1.02 V	190	63.14	39.82
2	*5230.00	92.37 AV			1.02 V	190	52.55	39.82
3	5350.00	55.92 PK	74.00	-18.08	1.02 V	190	15.87	40.05
4	5350.00	40.69 AV	54.00	-13.31	1.02 V	190	0.64	40.05
5	#10460.00	67.16 PK	68.30	-1.14	1.11 V	297	16.31	50.85

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency.
6. "#": The radiated frequency is out the restricted band.



**BELOW 1GHz WORST-CASE DATA : 802.11a OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL		
<b>CHANNEL</b>		Channel 40		<b>FREQUENCY RANGE</b> Below 1000MHz
<b>INPUT POWER (SYSTEM)</b>		120Vac, 60 Hz		<b>DETECTOR FUNCTION</b> Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>		23deg. C, 70%RH 999hPa		<b>TESTED BY</b> Lori Chiu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	164.06	40.34 QP	43.50	-3.16	1.75 H	259	26.94	13.40
2	216.55	38.59 QP	46.00	-7.41	1.50 H	277	27.26	11.33
3	249.60	44.08 QP	46.00	-1.92	1.00 H	238	31.27	12.81
4	500.42	37.76 QP	46.00	-8.24	1.75 H	199	18.51	19.25
5	751.23	39.49 QP	46.00	-6.51	1.00 H	151	15.51	23.98
6	875.67	40.85 QP	46.00	-5.15	1.50 H	313	14.97	25.88
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	41.57	38.39 QP	40.00	-1.61	1.00 V	10	25.91	12.48
2	103.78	41.71 QP	43.50	-1.79	1.25 V	256	31.92	9.79
3	249.60	38.53 QP	46.00	-7.47	1.00 V	121	25.71	12.81
4	500.42	37.70 QP	46.00	-8.30	1.00 V	199	18.45	19.25
5	751.23	35.98 QP	46.00	-10.02	1.25 V	220	12.01	23.98
6	875.67	38.67 QP	46.00	-7.33	1.00 V	175	12.79	25.88

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

**NOTE:** 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 19, 2008	Nov. 18, 2009
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 31, 2008	Dec. 30, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 13, 2008	Jun. 12, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Dec. 04, 2008	Dec. 03, 2009
Software ADT	ADT_Cond_V7.3.7	NA	NA	NA

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Shielded Room 1.  
3. The VCCI Site Registration No. is C-2040.



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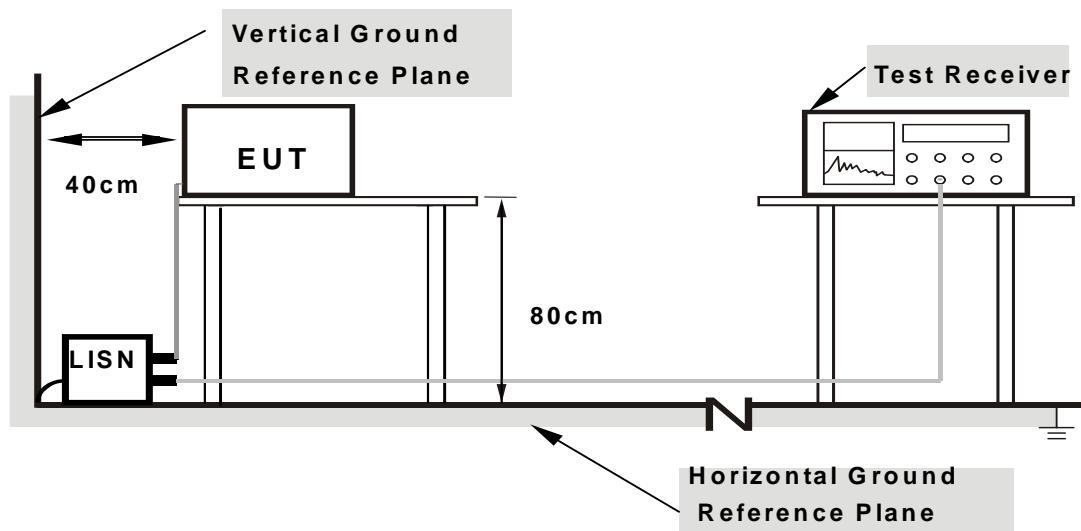
#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

## 4.2.7 TEST RESULTS

## CONDUCTED WORST-CASE DATA : 802.11a OFDM MODULATION

EUT TEST CONDITION			MEASUREMENT DETAIL		
CHANNEL		Channel 40			PHASE
MODULATION TYPE		BPSK			INPUT POWER
TRANSFER RATE		6Mbps			6dB BANDWIDTH
ENVIRONMENTAL CONDITIONS		23deg. C, 69%RH, 1021hPa			TESTED BY
					Sun Lin

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.13	37.33	-	37.46	-	63.74	53.74	-26.28	-
2	0.244	0.13	38.09	-	38.22	-	61.97	51.97	-23.75	-
3	<b>0.927</b>	<b>0.18</b>	<b>37.44</b>	-	<b>37.62</b>	-	<b>56.00</b>	<b>46.00</b>	<b>-18.38</b>	-
4	1.281	0.19	34.47	-	34.66	-	56.00	46.00	-21.34	-
5	2.152	0.24	33.29	-	33.53	-	56.00	46.00	-22.47	-
6	3.176	0.31	31.57	-	31.88	-	56.00	46.00	-24.12	-

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

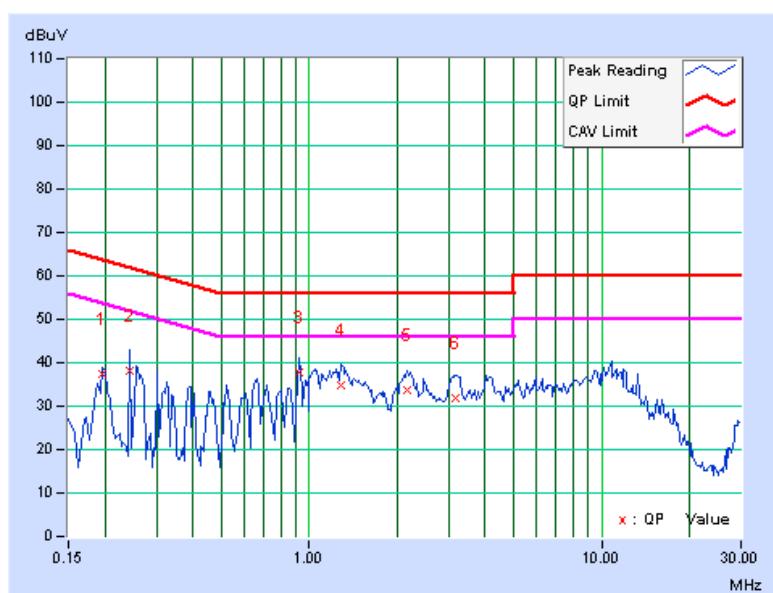
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

3. The emission levels of other frequencies were very low against the limit.

4. Margin value = Emission level - Limit value

5. Correction factor = Insertion loss + Cable loss

6. Emission Level = Correction Factor + Reading Value.

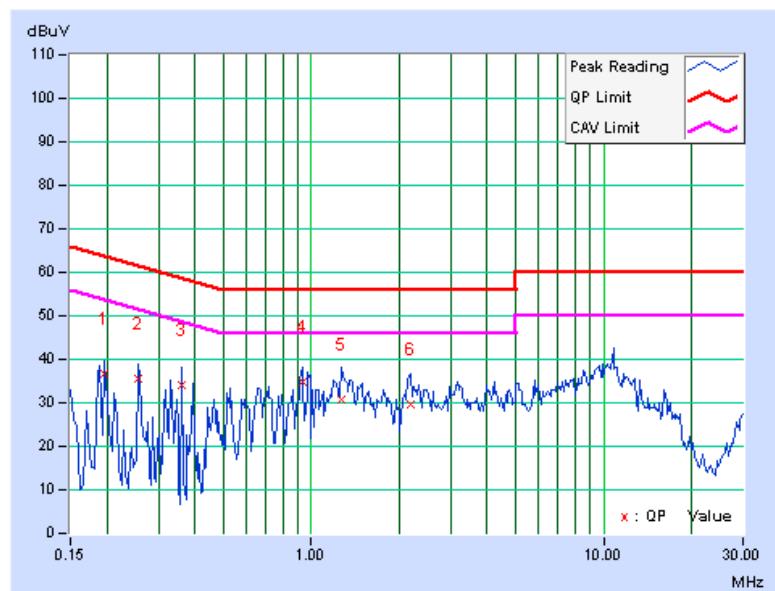


EUT TEST CONDITION			MEASUREMENT DETAIL	
CHANNEL	Channel 40		PHASE	Line 2
MODULATION TYPE	BPSK		INPUT POWER	120Vac, 60Hz
TRANSFER RATE	6Mbps		6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH, 1021hPa		TESTED BY	Sun Lin

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.15	36.69	-	36.84	-	63.74	53.74	-26.90	-
2	0.255	0.15	35.23	-	35.38	-	61.58	51.58	-26.19	-
3	0.361	0.16	33.79	-	33.95	-	58.71	48.71	-24.76	-
4	0.931	0.20	34.47	-	34.67	-	56.00	46.00	-21.33	-
5	1.273	0.21	30.54	-	30.75	-	56.00	46.00	-25.25	-
6	2.184	0.26	29.49	-	29.75	-	56.00	46.00	-26.25	-

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





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### 4.3 PEAK TRANSMIT POWER MEASUREMENT

#### 4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

**NOTE:** Where B is the 26dB emission bandwidth in MHz.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
High Speed Peak Power Meter	ML2495A	0824012	Aug. 04, 2008	Aug. 03, 2009
Power Sensor	MA2411B	0738138	Aug. 04, 2008	Aug. 03, 2009

**NOTE:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 26dB bandwidth of emission.

#### 4.3.3 TEST PROCEDURE

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

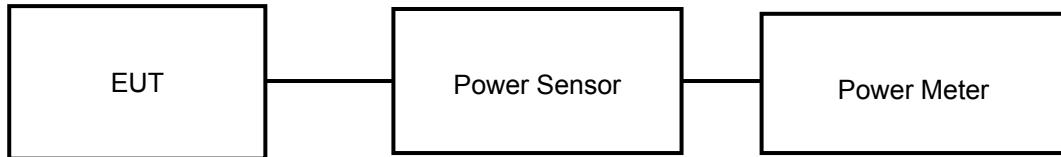


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#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



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#### 4.3.7 TEST RESULTS

##### PEAK POWER OUTPUT: 802.11a OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	11.11	11.08	25.735	14.11	17	PASS
40	5200	11.54	11.05	26.991	14.31	17	PASS
48	5240	11.07	11.09	25.647	14.09	17	PASS

##### DRAFT 802.11n (20MHz) OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	9.58	9.59	18.177	12.60	17	PASS
40	5200	10.06	9.52	19.093	12.81	17	PASS
48	5240	9.54	9.56	18.031	12.56	17	PASS



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**DRAFT 802.11n (40MHz) OFDM MODULATION**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	15.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 1021hPa
<b>TESTED BY</b>	Brad Wu		

<b>CHAN.</b>	<b>CHAN. FREQ. (MHz)</b>	<b>PEAK POWER OUTPUT (dBm)</b>		<b>TOTAL PEAK POWER (mW)</b>	<b>TOTAL PEAK POWER (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS / FAIL</b>
		<b>CHAIN 0</b>	<b>CHAIN 1</b>				
38	5190	9.04	9.10	16.145	12.08	17	PASS
46	5230	9.08	9.13	16.276	12.12	17	PASS

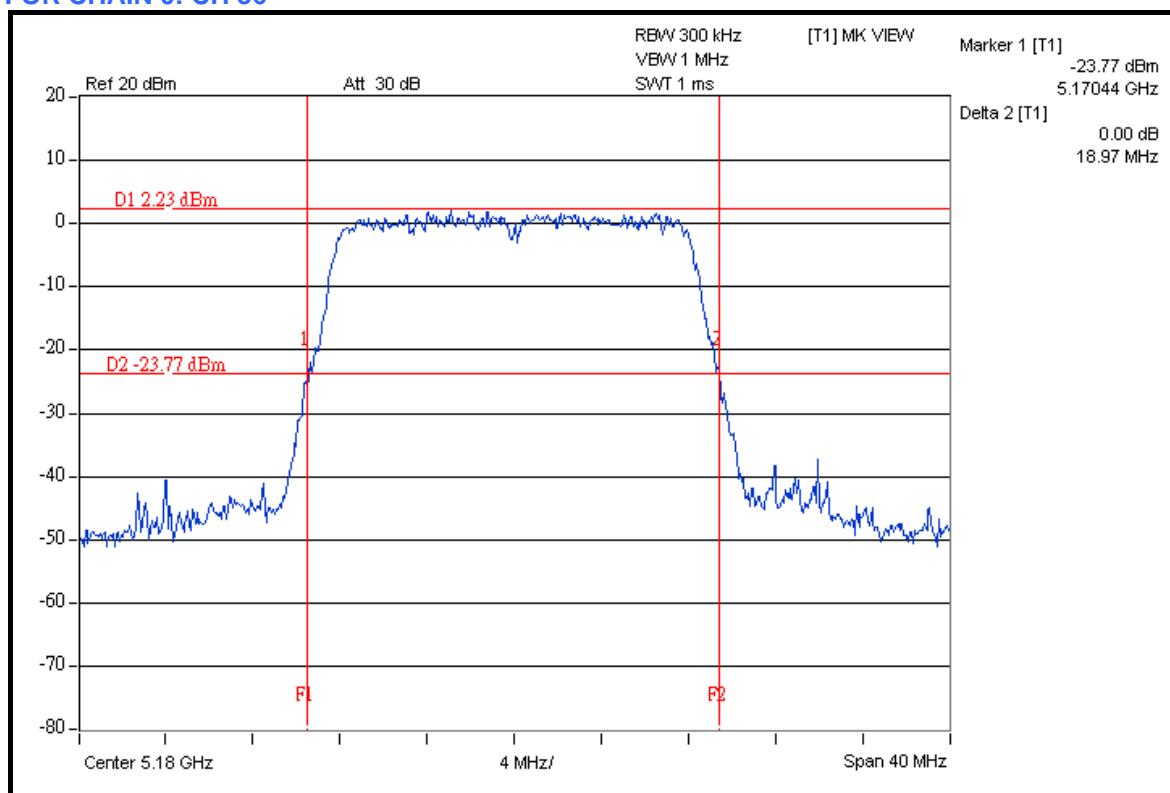
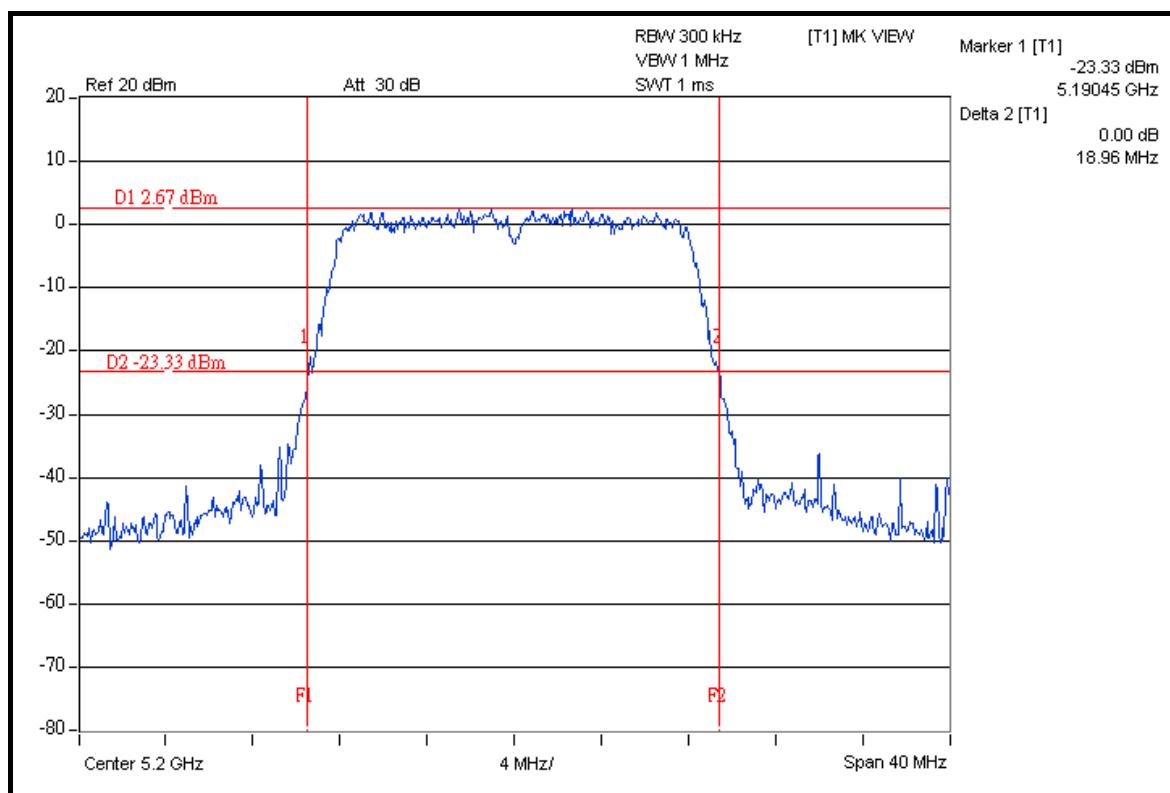


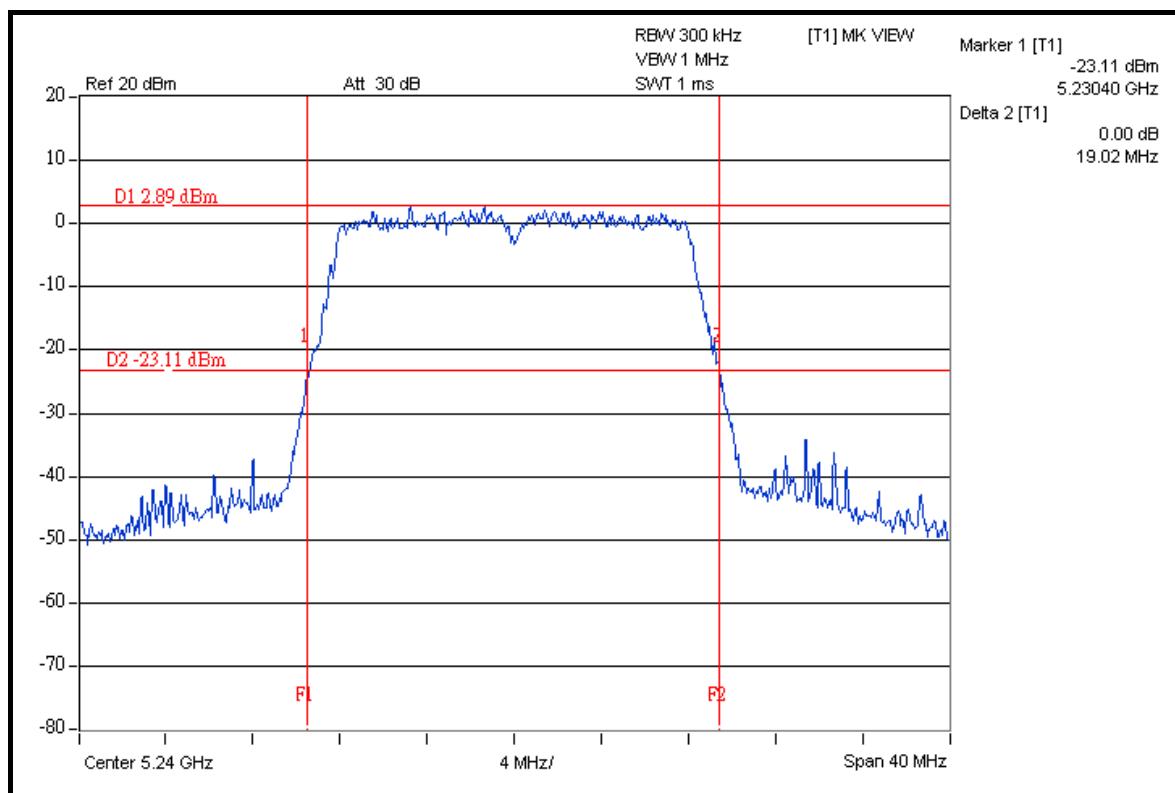
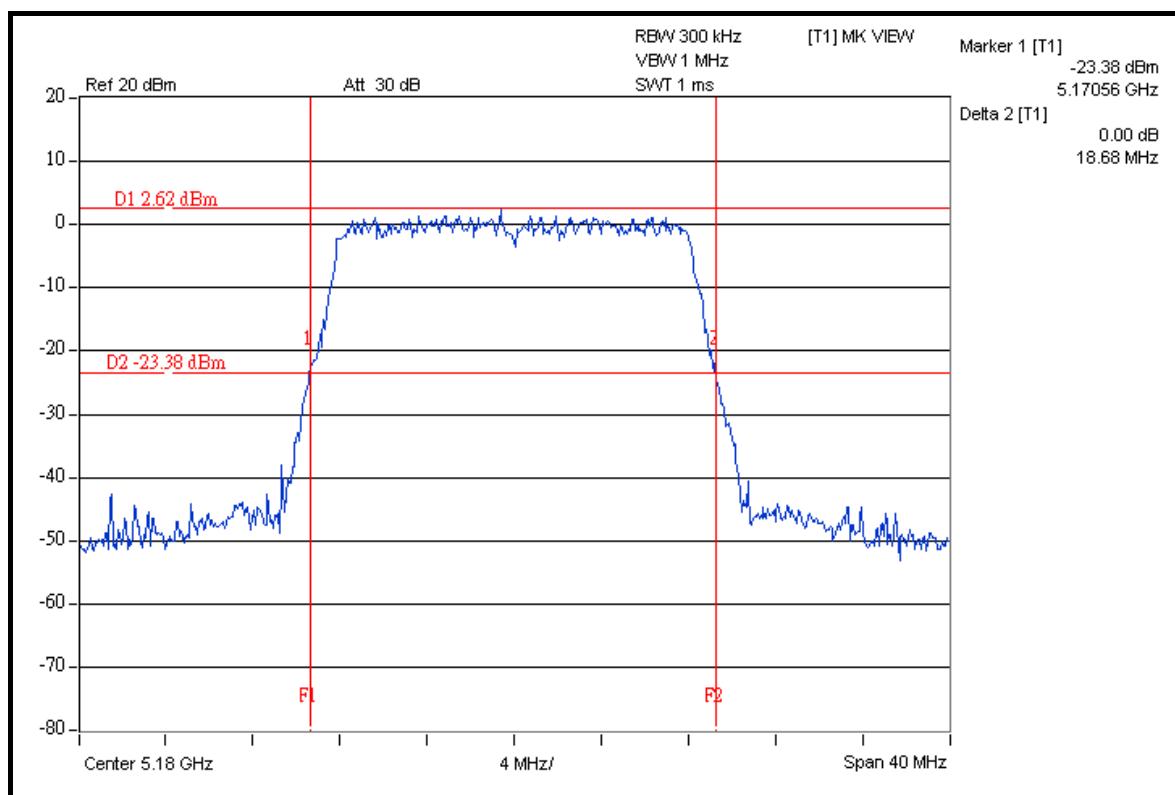
A D T

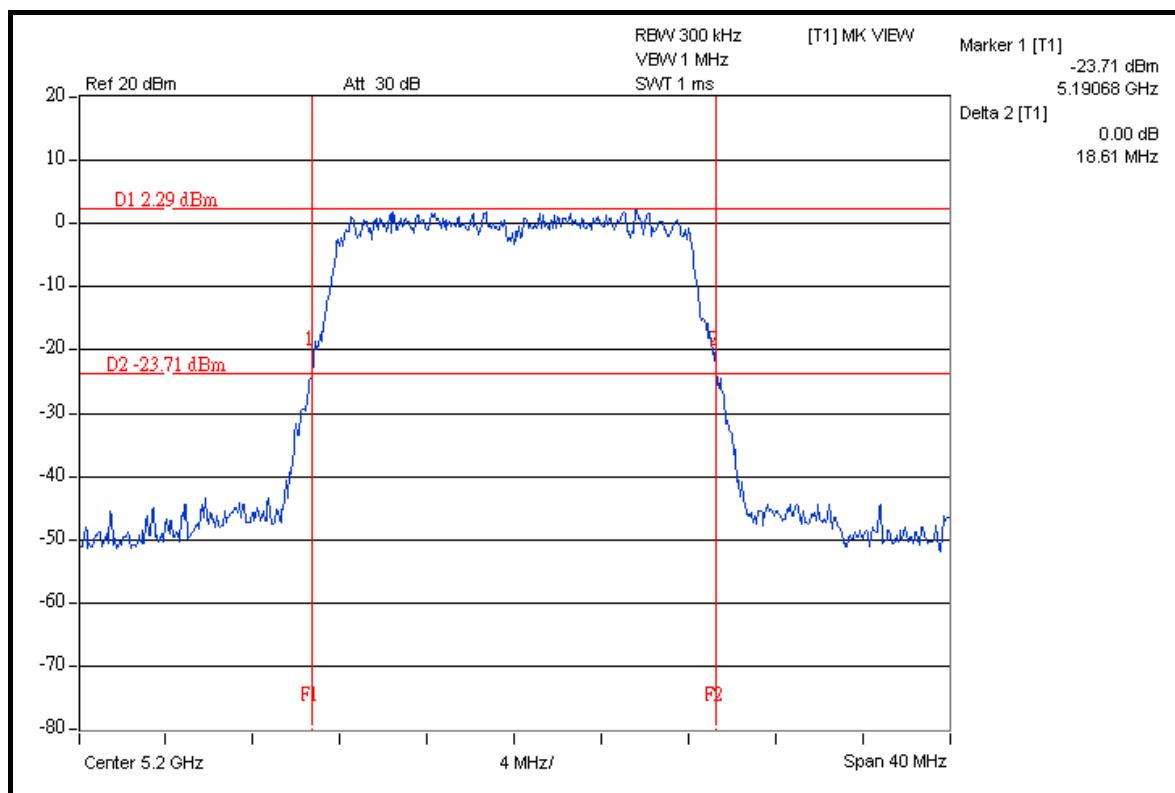
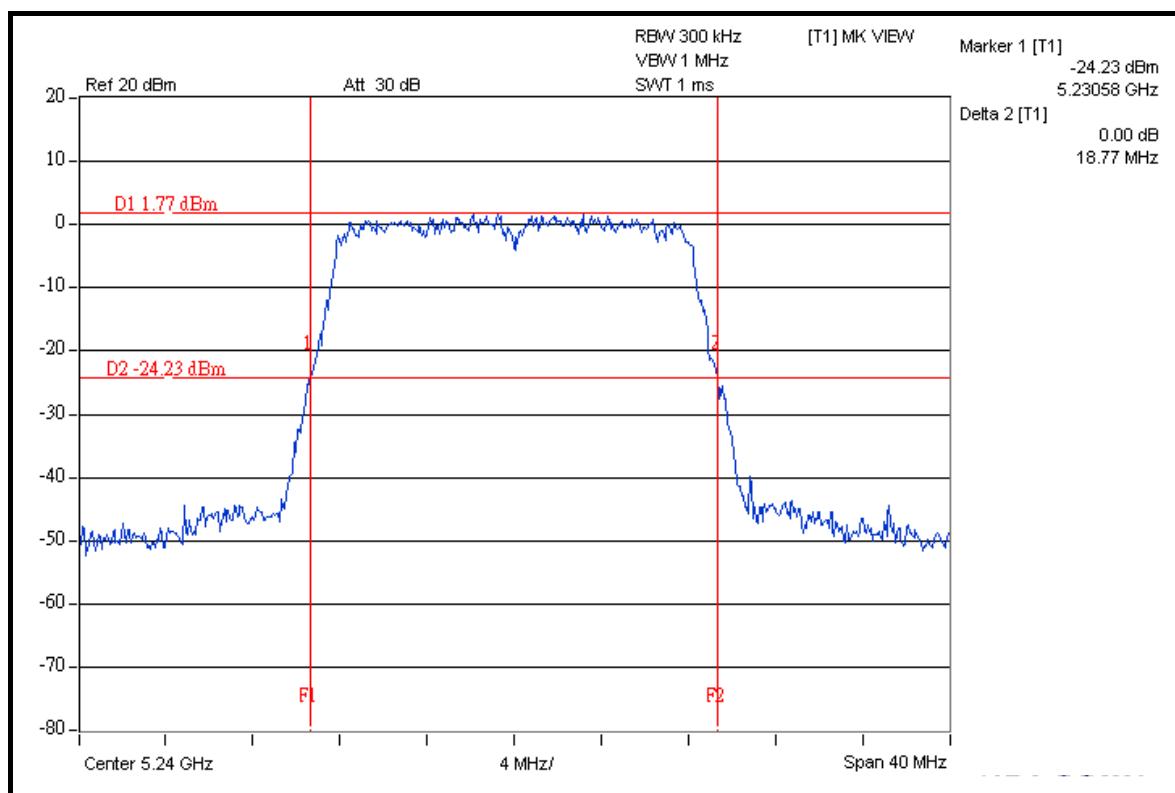
**26dB OCCUPIED BANDWIDTH: 802.11a OFDM MODULATION**

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
36	5180	18.97	18.68	PASS
40	5200	18.96	18.61	PASS
48	5240	19.02	18.77	PASS

**FOR CHAIN 0: CH 36**

**CH 40**


**CH 48**

**FOR CHAIN 1: CH 36**


**CH 40**

**CH 48**


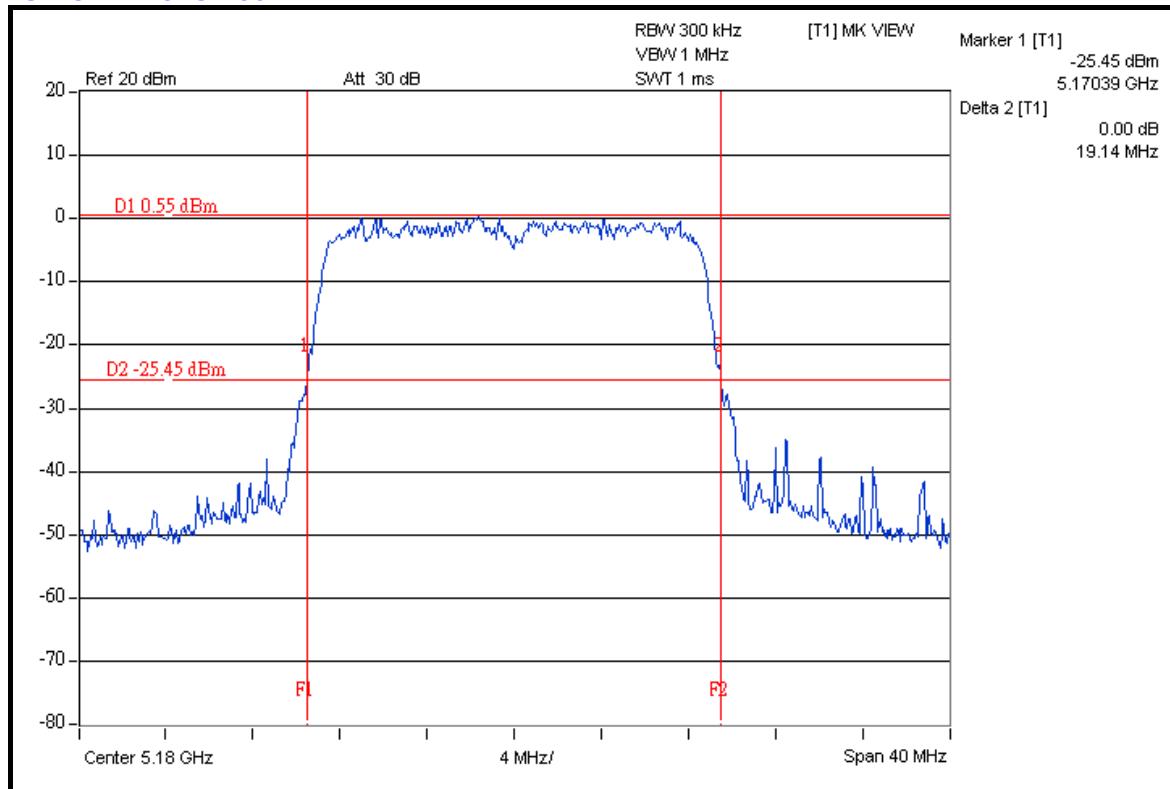
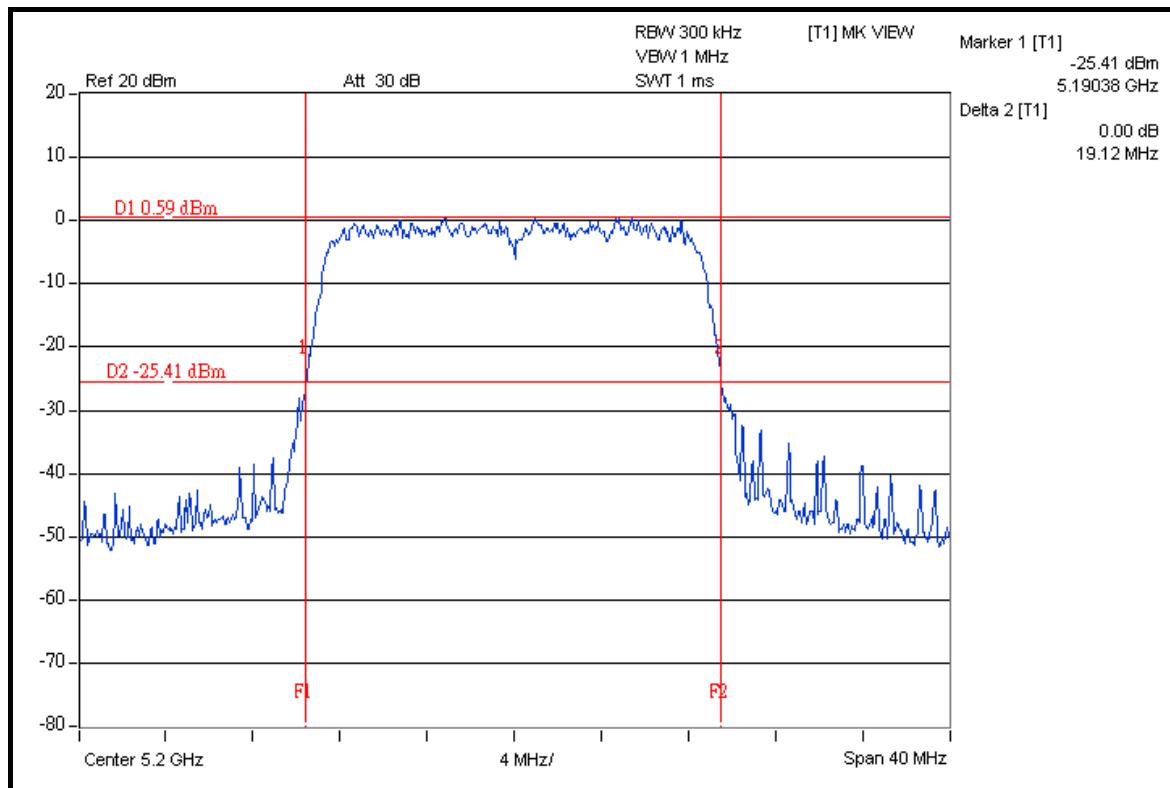


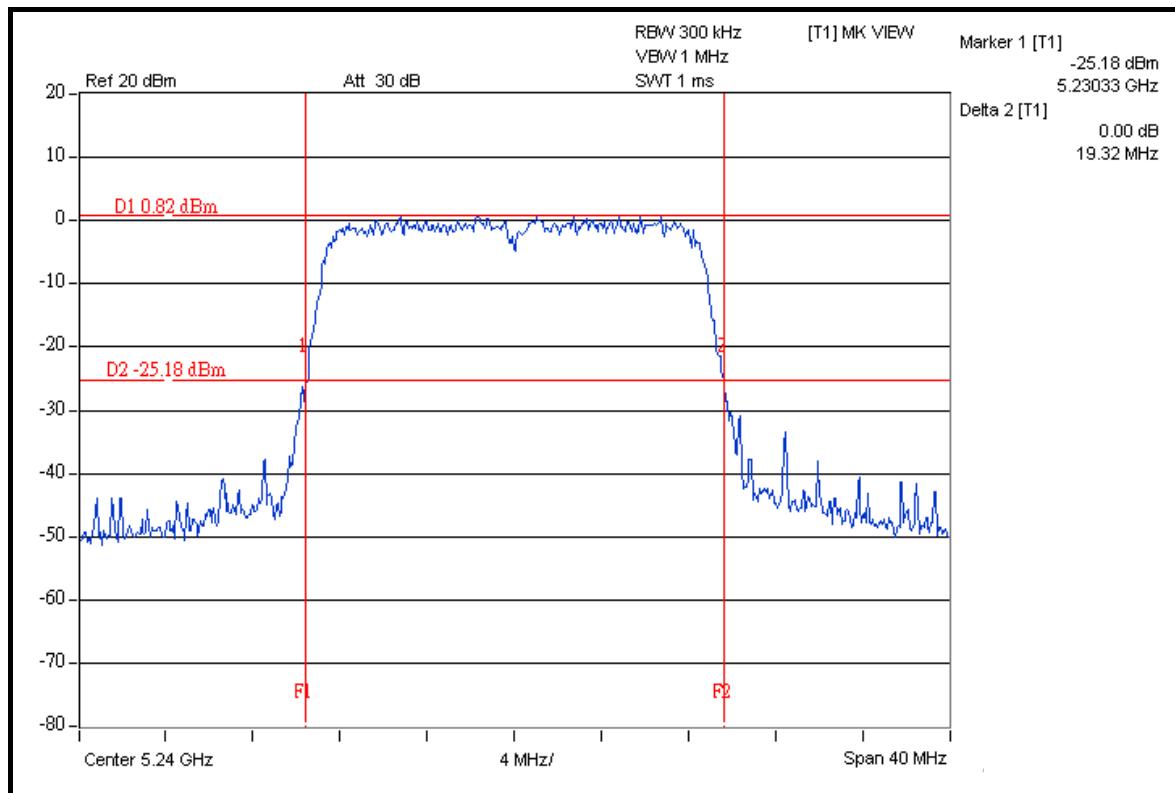
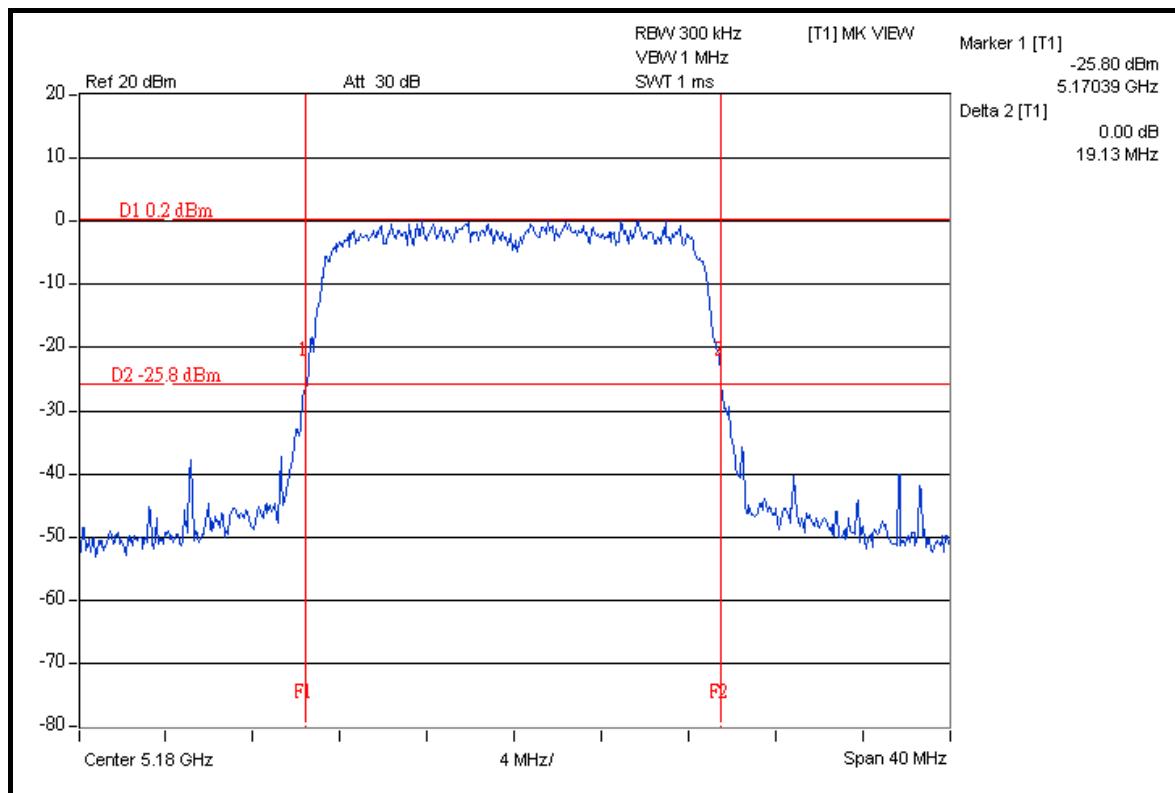
A D T

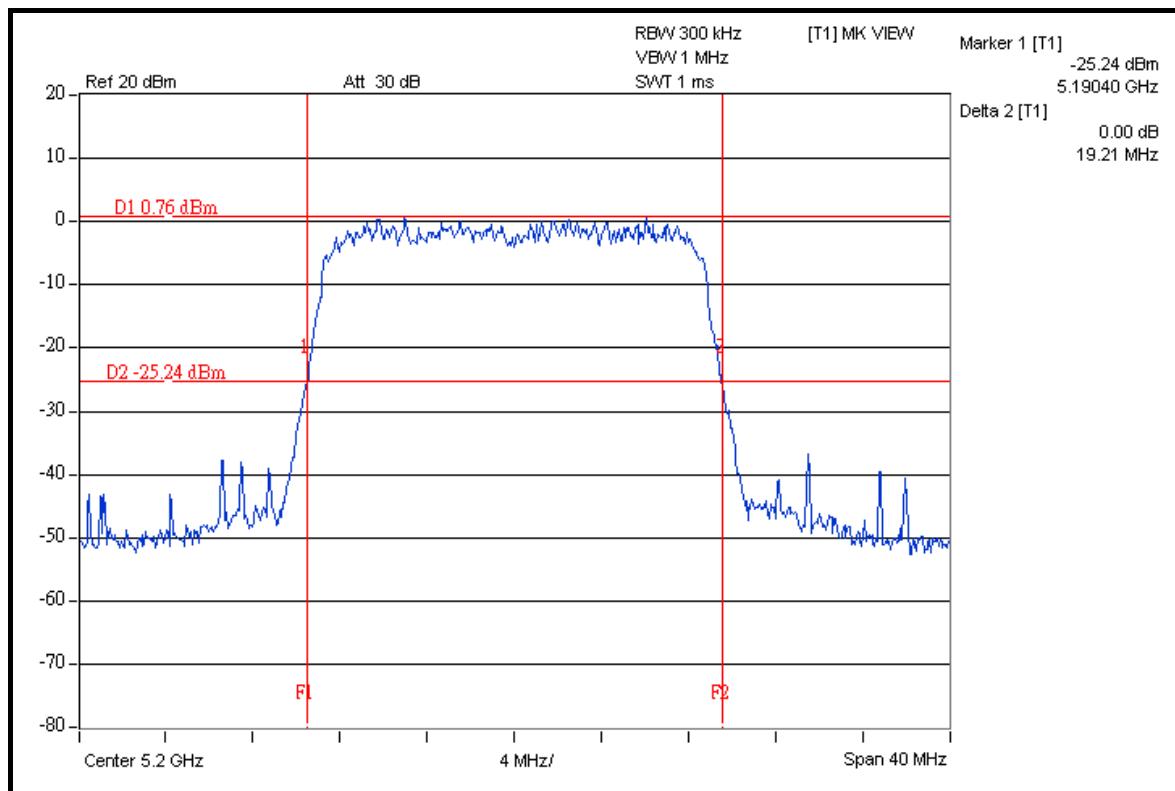
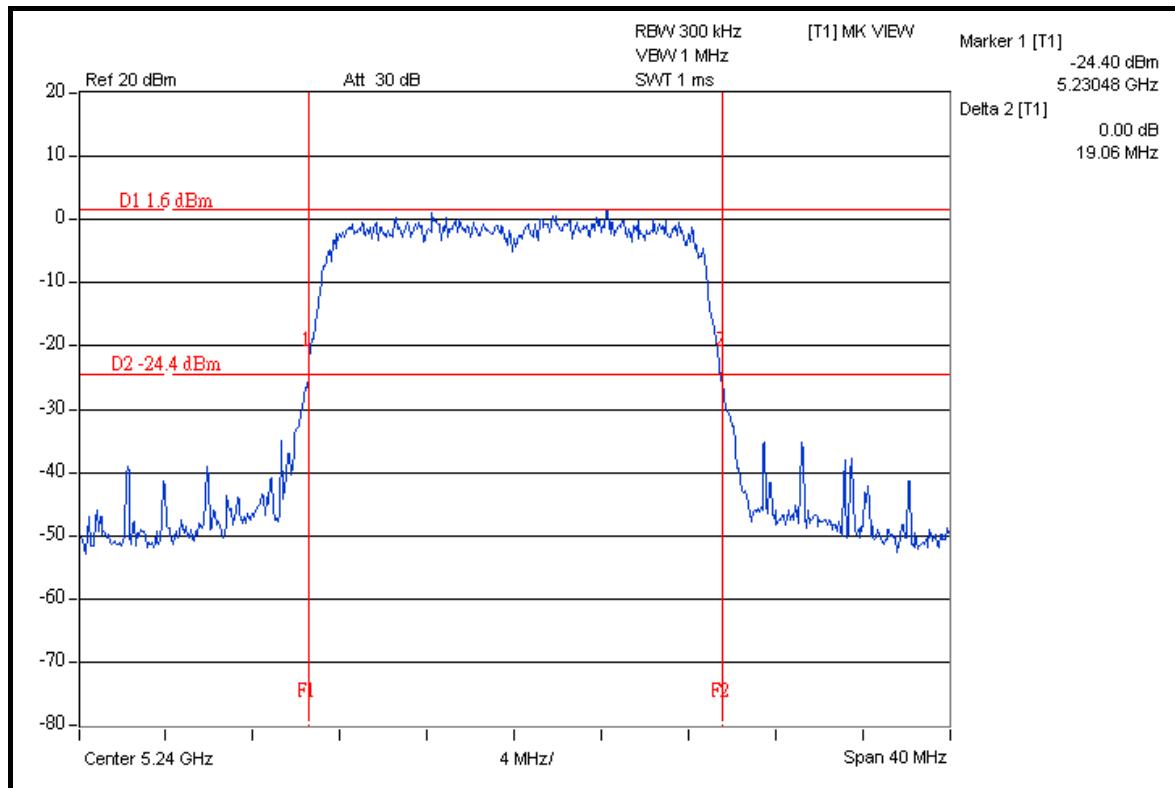
**DRAFT 802.11n (20MHz) OFDM MODULATION**

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
36	5180	19.14	19.13	PASS
40	5200	19.12	19.21	PASS
48	5240	19.32	19.06	PASS

**FOR CHAIN 0: CH 36**

**CH 40**


**CH 48**

**FOR CHAIN 1: CH 36**


**CH 40**

**CH 48**


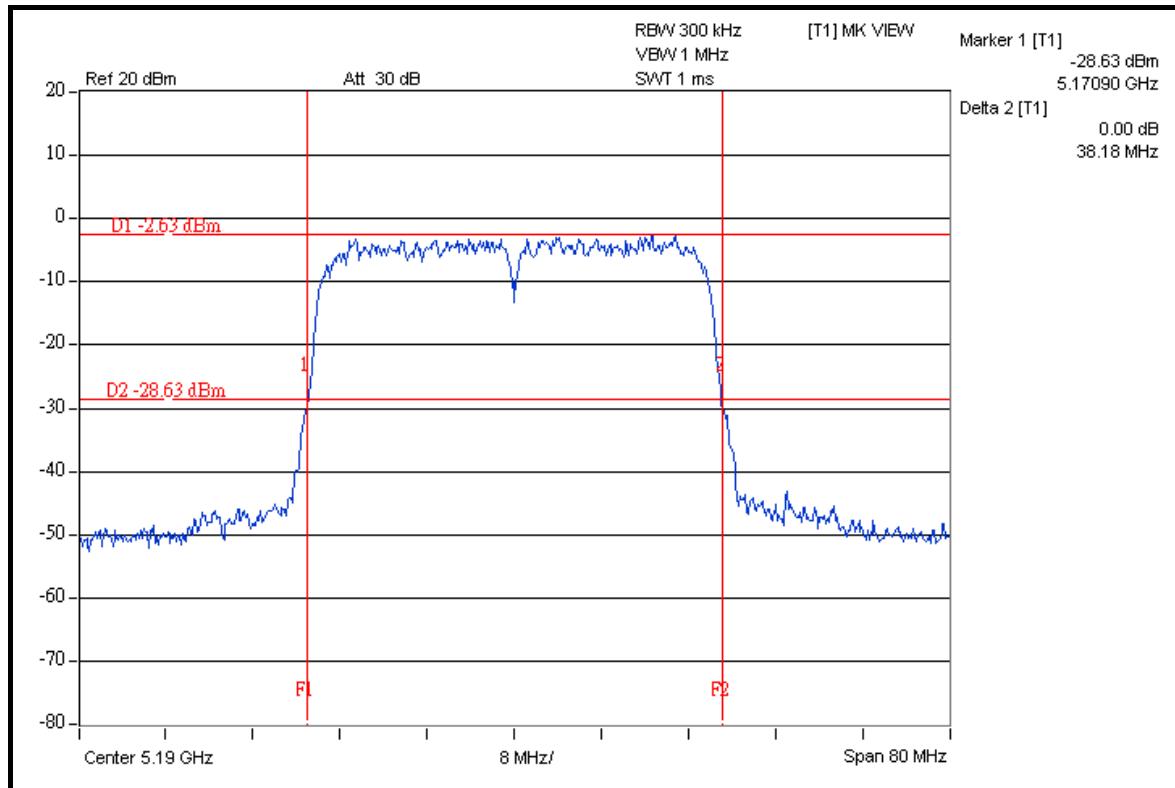
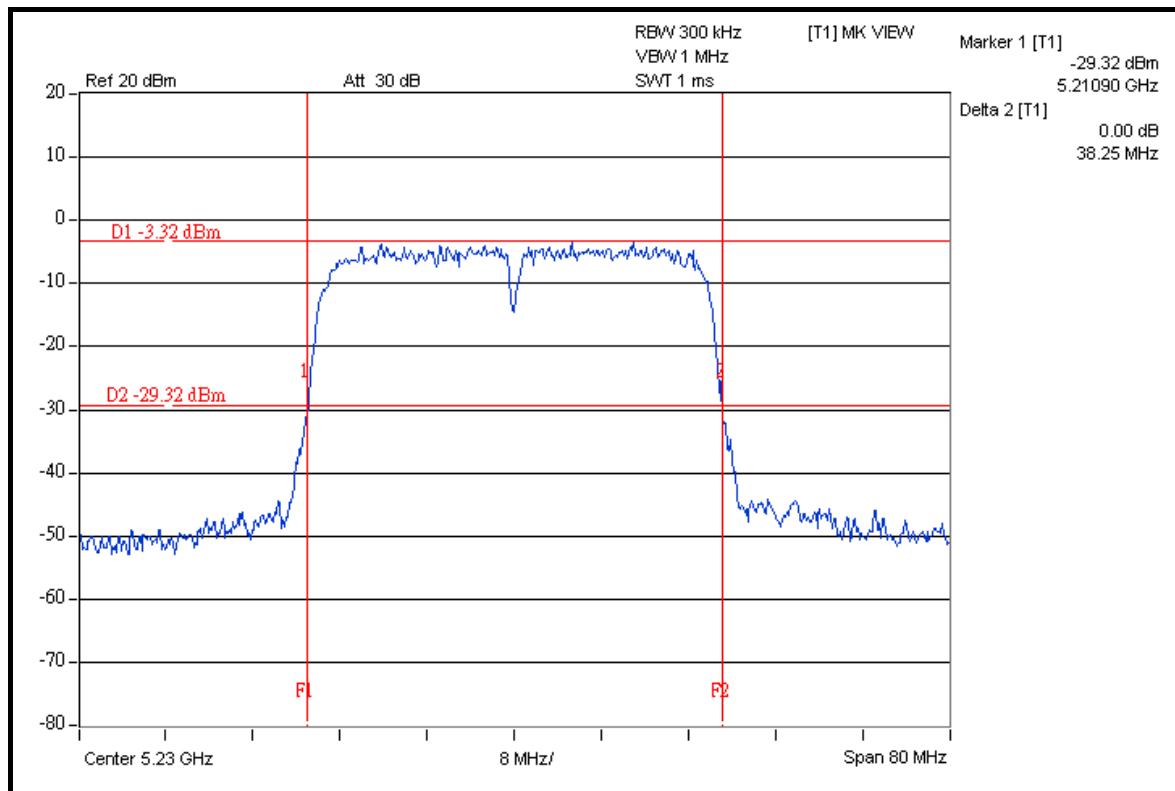


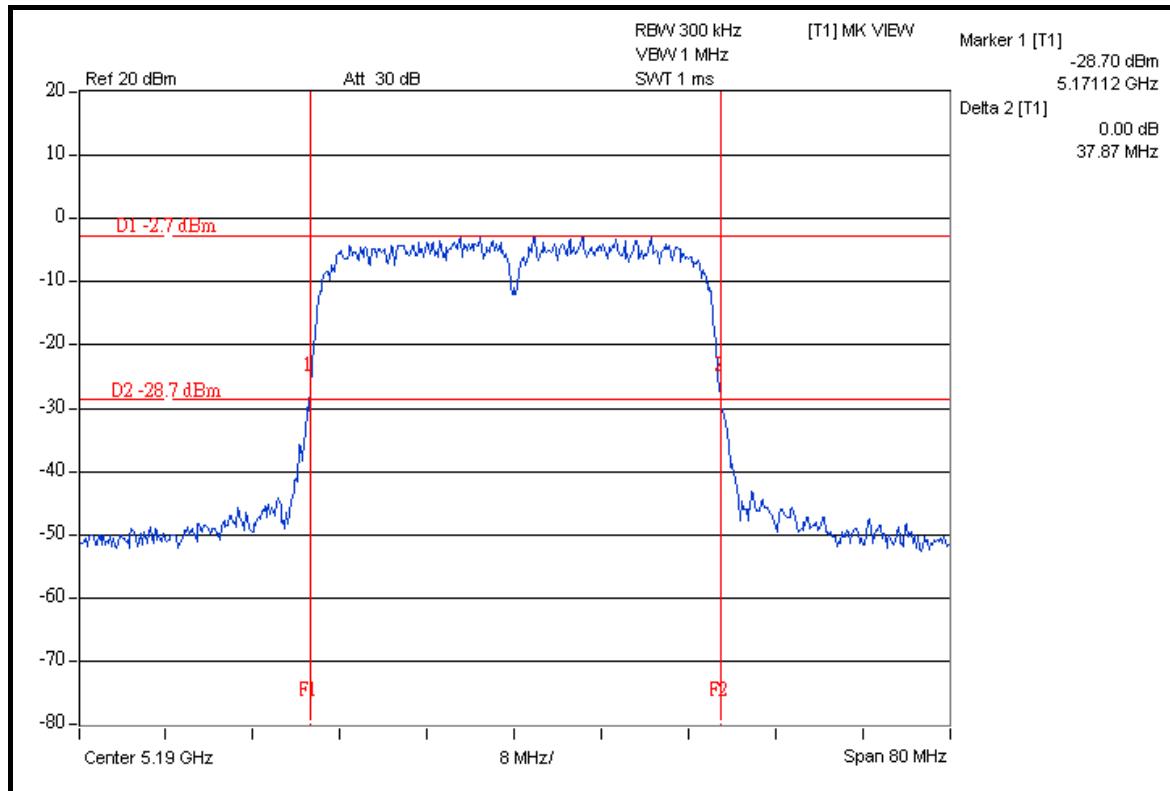
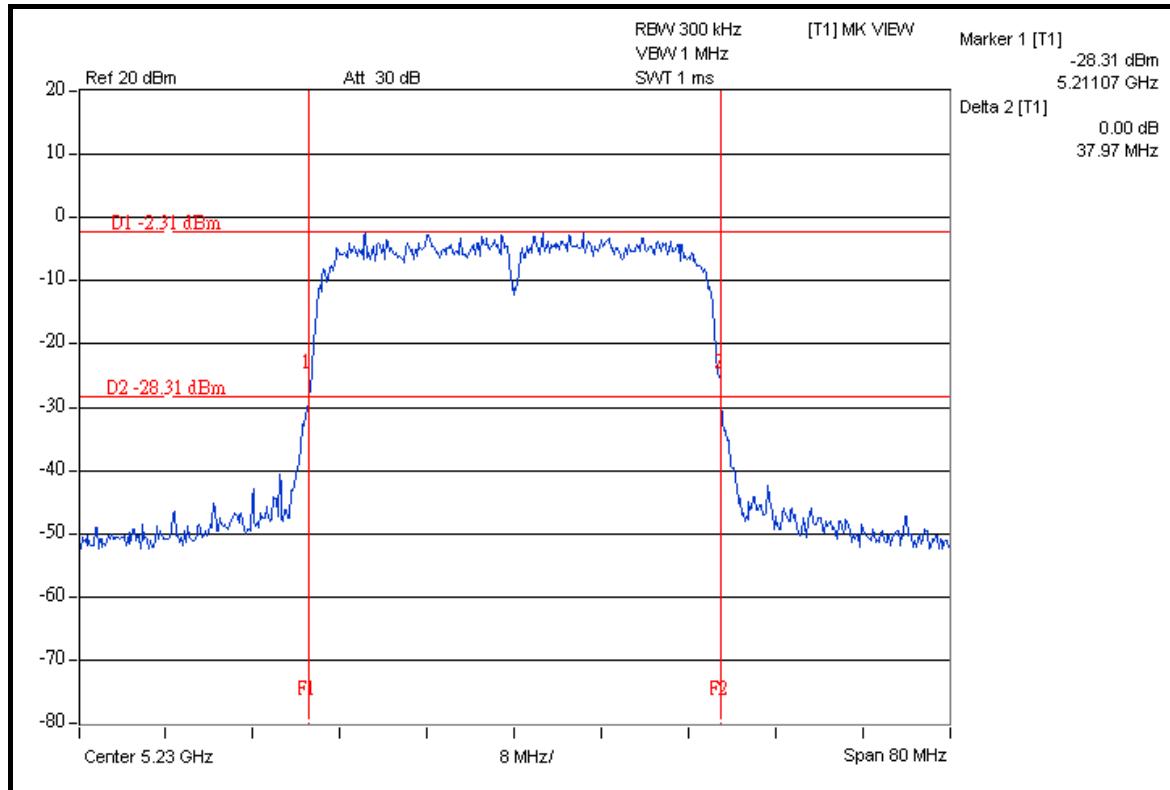
A D T

**DRAFT 802.11n (40MHz) OFDM MODULATION**

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
38	5190	38.18	37.87	PASS
46	5230	38.25	37.97	PASS

**FOR CHAIN 0: CH 38**

**CH 46**


**FOR CHAIN 1: CH 38**

**CH 46**




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## 4.4 PEAK POWER EXCURSION MEASUREMENT

### 4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	13dB

### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

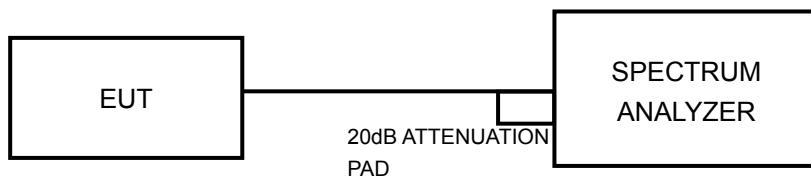
### 4.4.3 TEST PROCEDURE

- a. The transmitter output was connected to the spectrum analyzer.
- b. Set the spectrum bandwidth span to view the entire spectrum.
- c. Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).
- d. The differences between Trace1 and Trace 2 in any 1MHz band at f1 to f2 range were recorded and showed to another trace.

#### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



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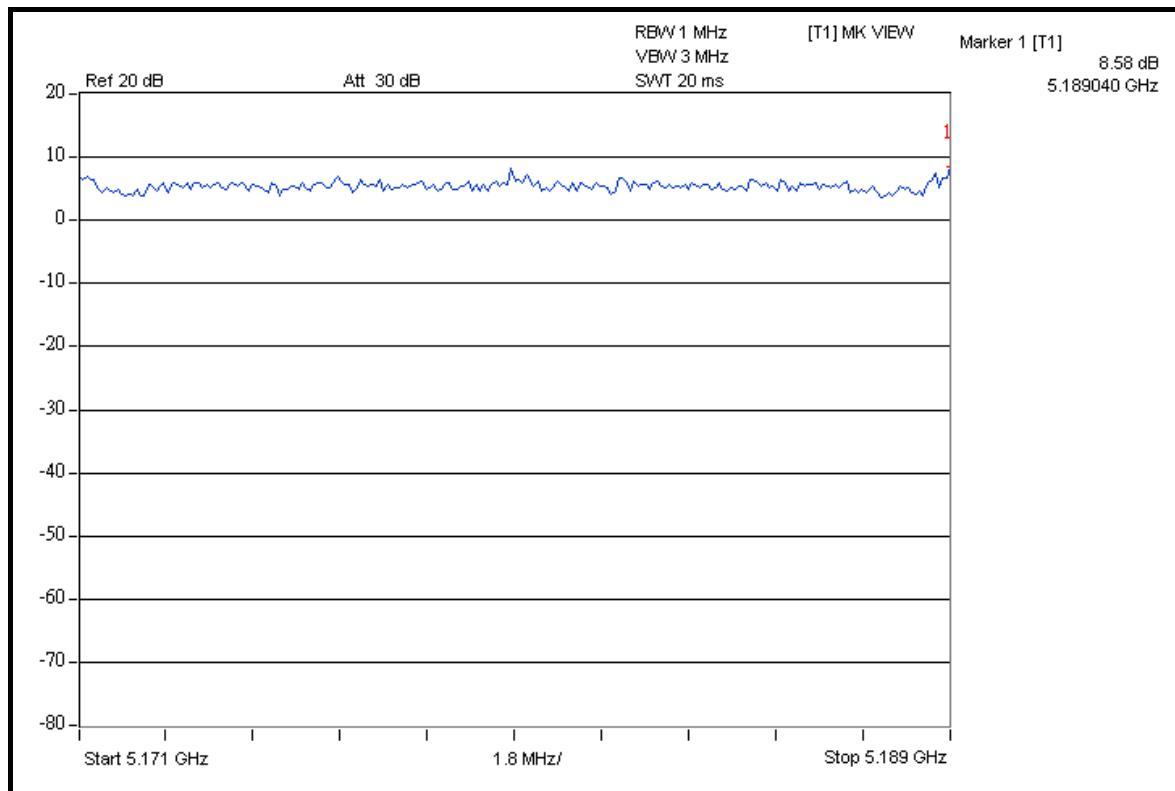
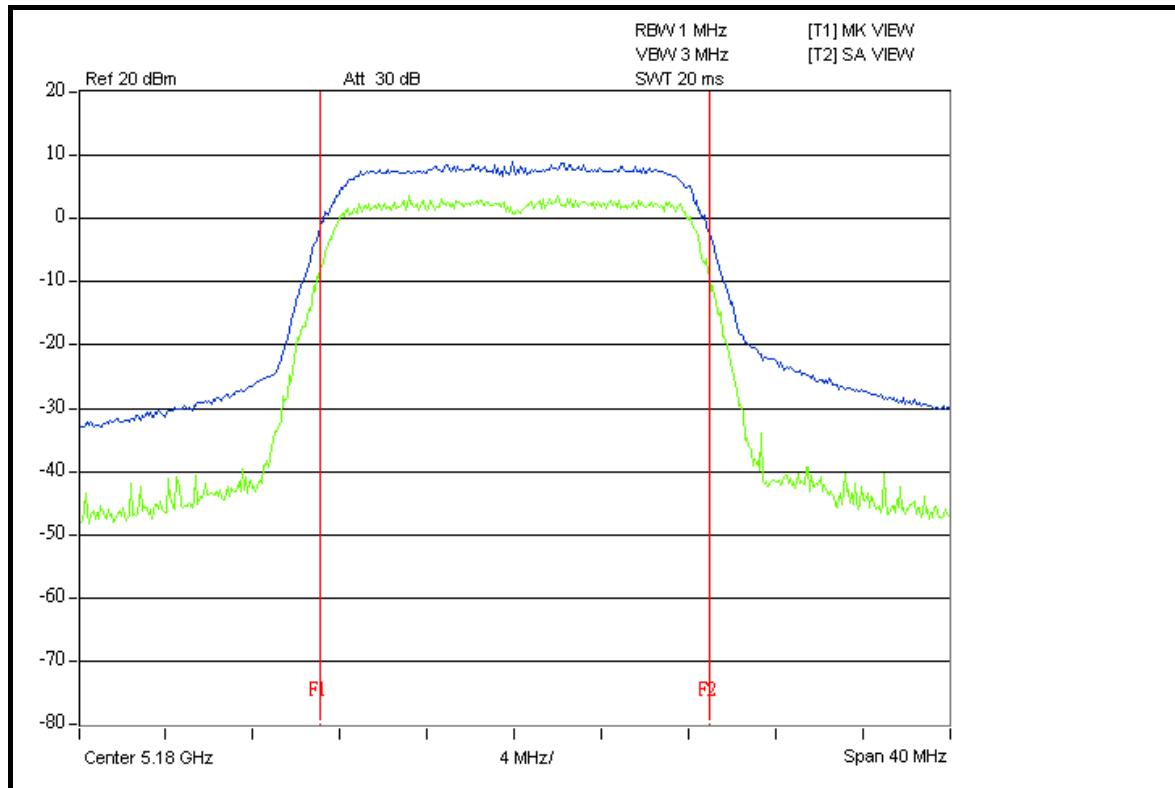
#### 4.4.7 TEST RESULTS

##### 802.11a OFDM MODULATION

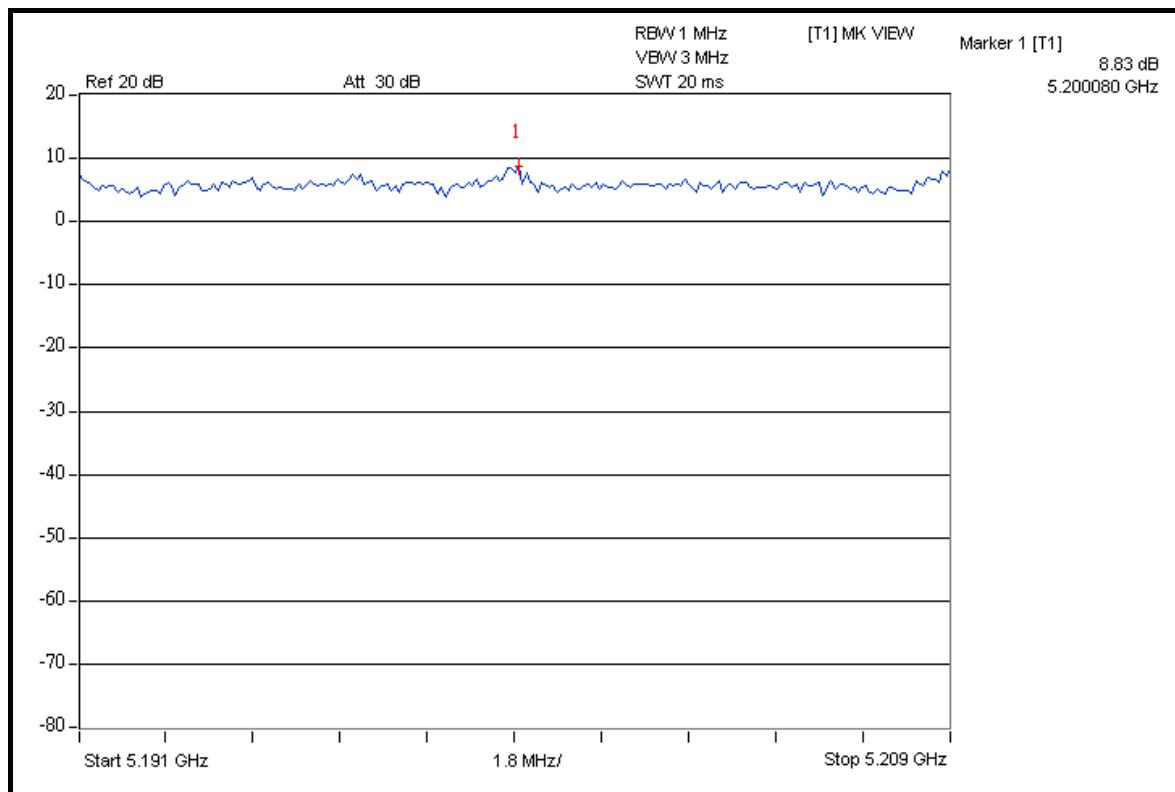
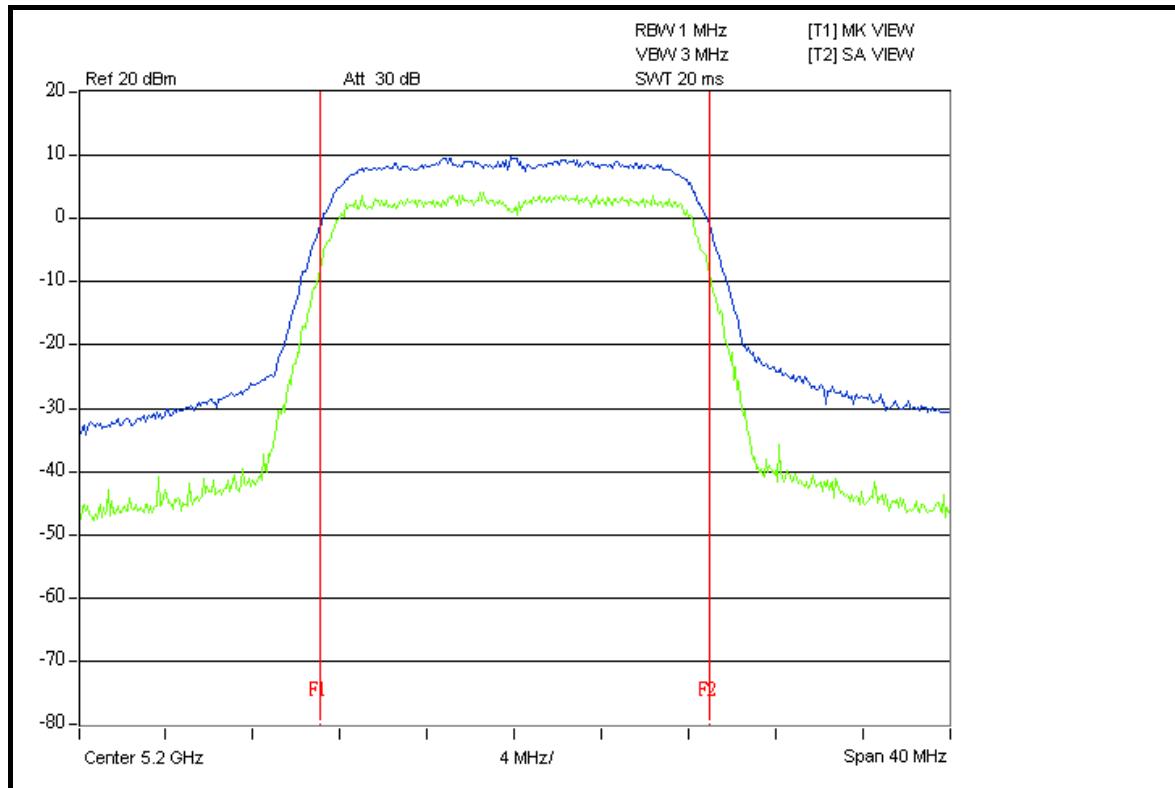
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
36	5180	8.58	8.32	13	PASS
40	5200	8.83	8.97	13	PASS
48	5240	8.49	8.42	13	PASS

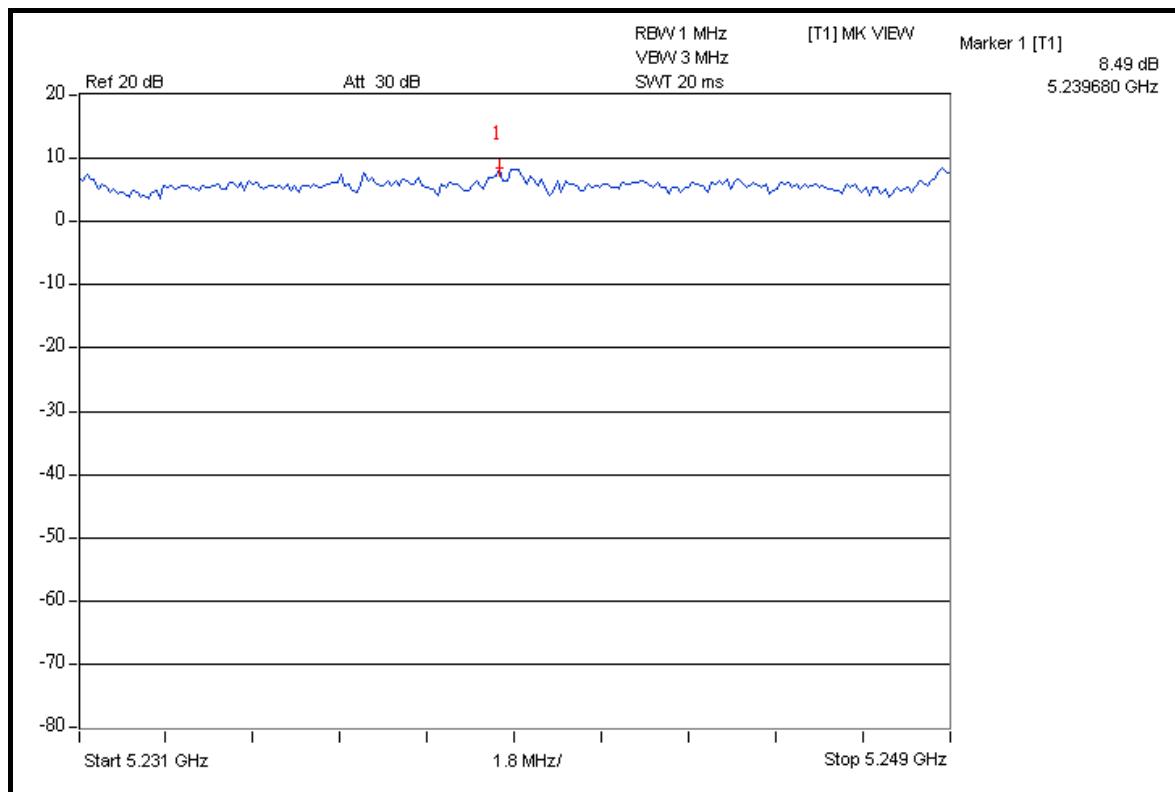
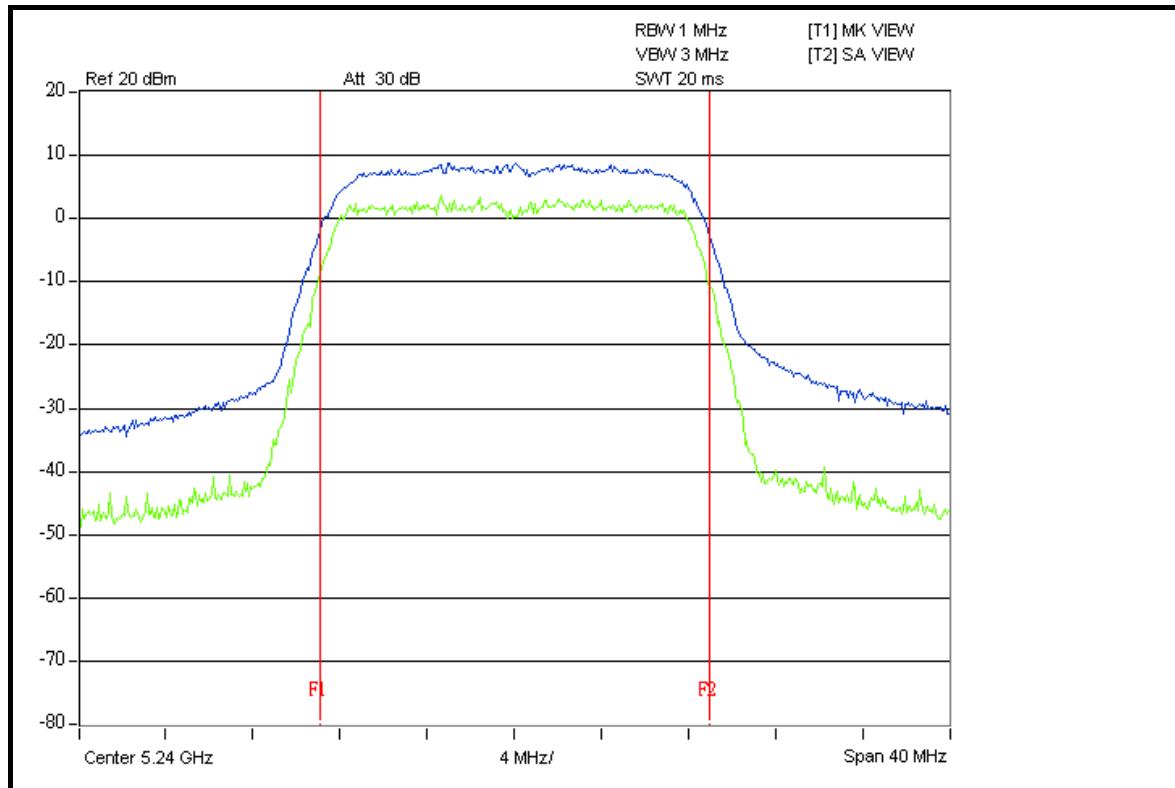
## FOR CHAIN 0: CH 36

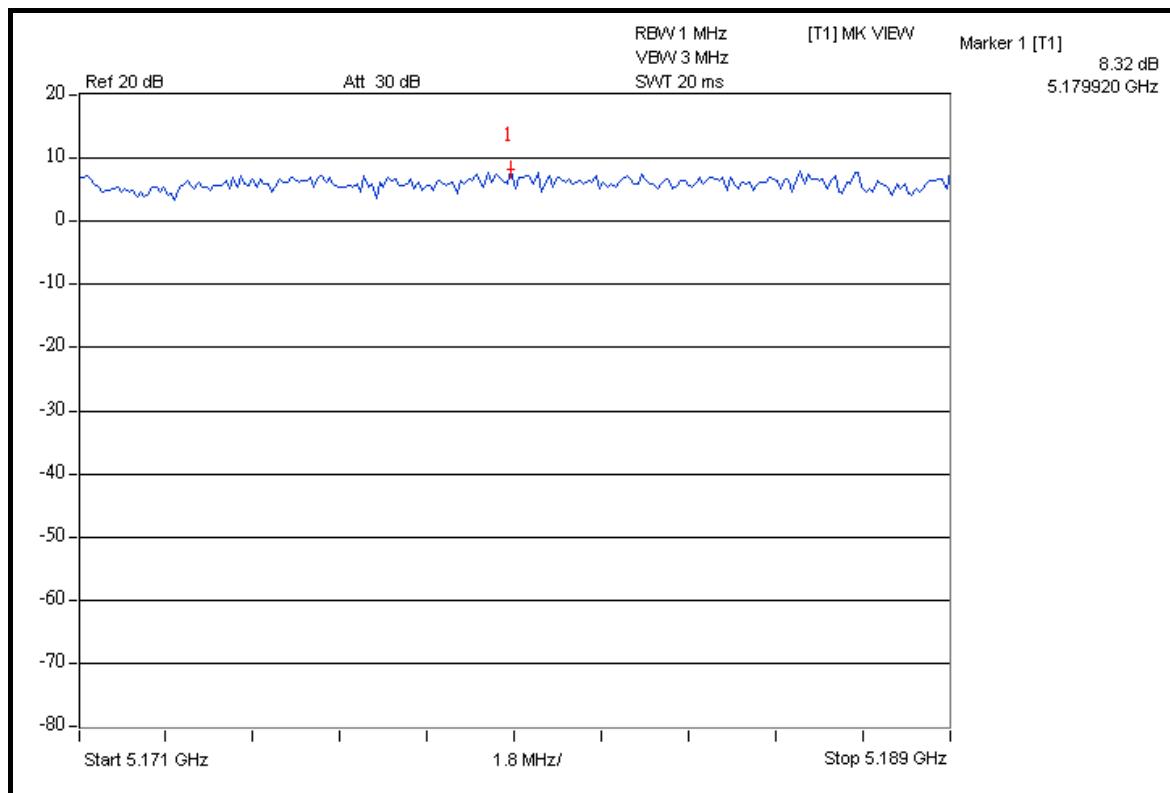
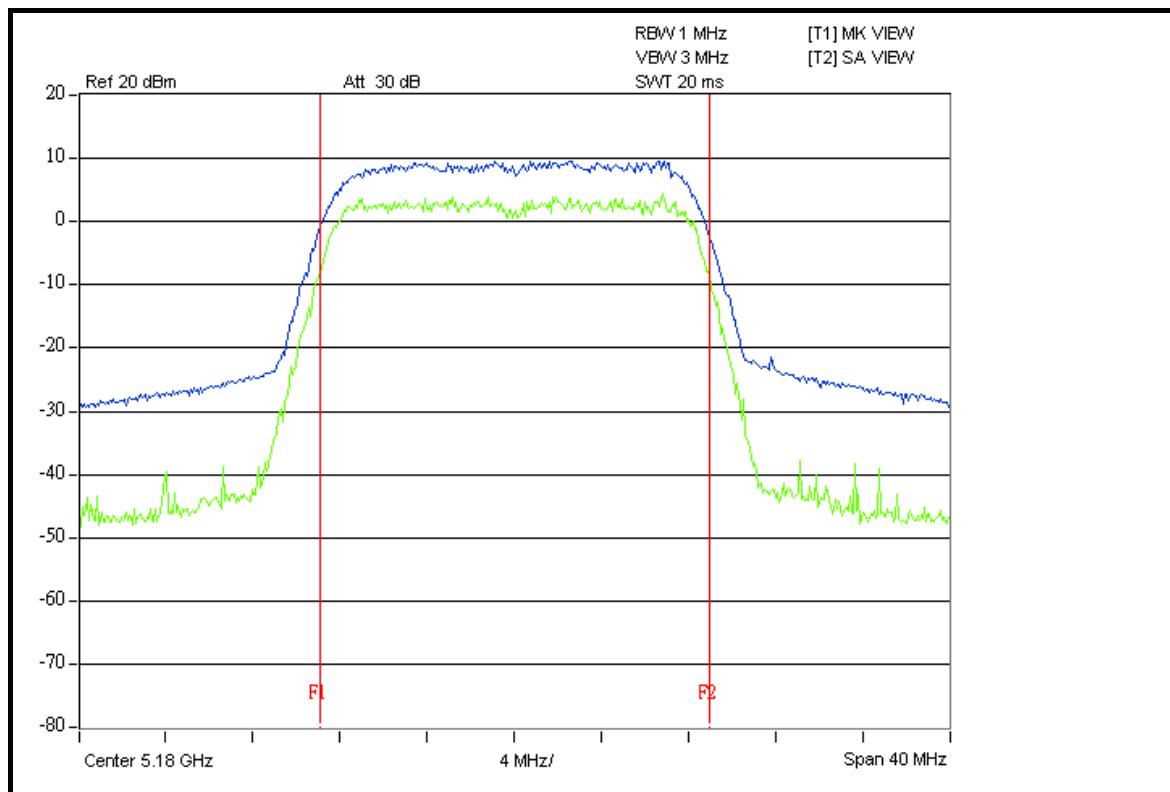


CH 40

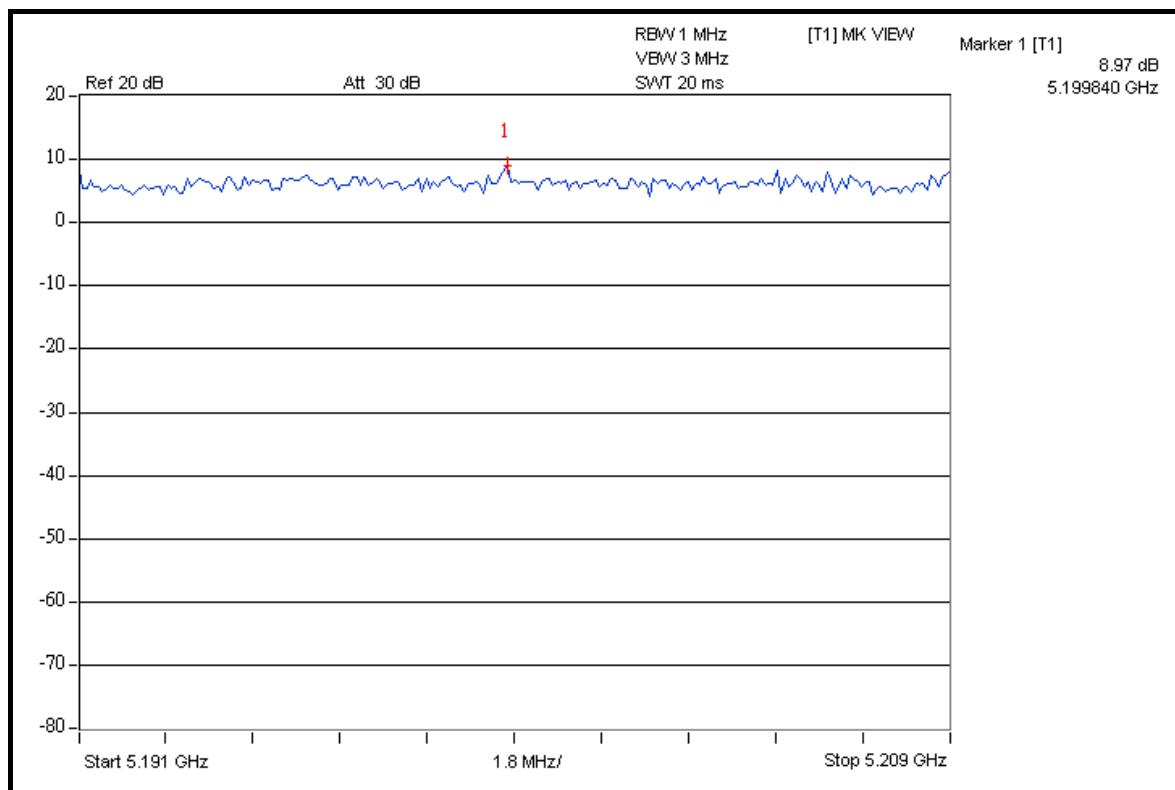
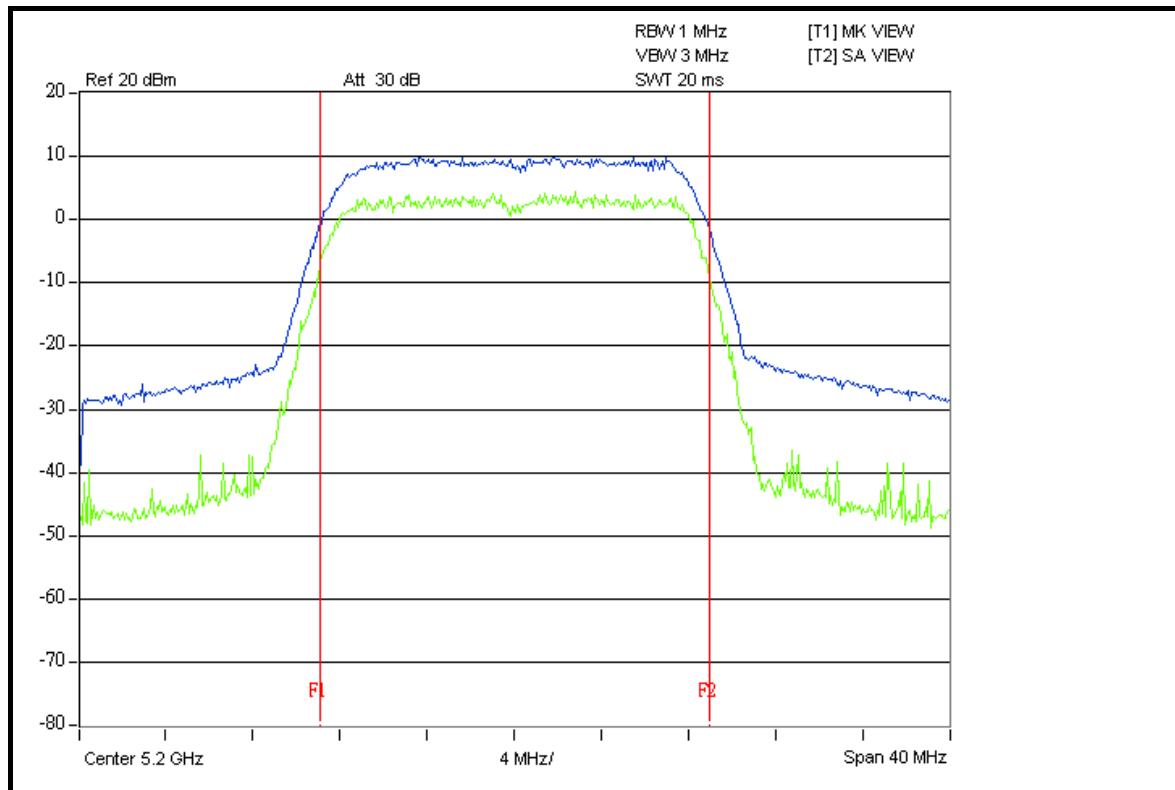


CH 48

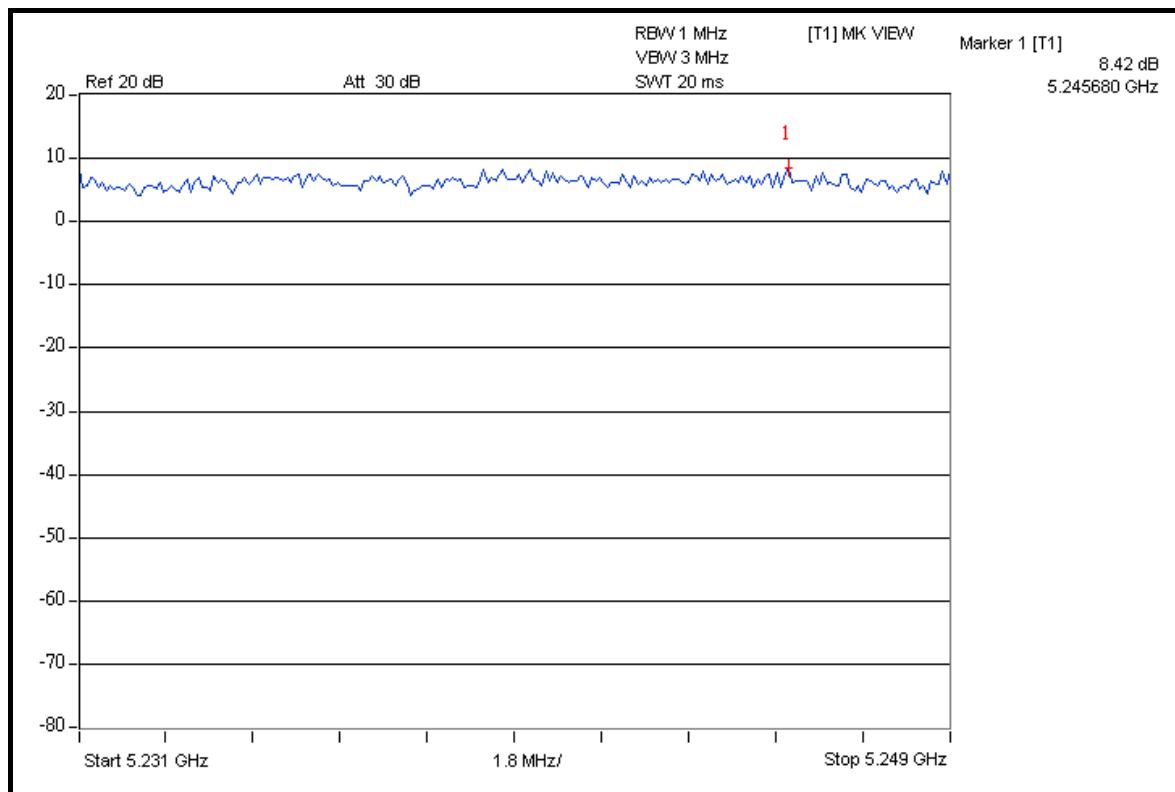
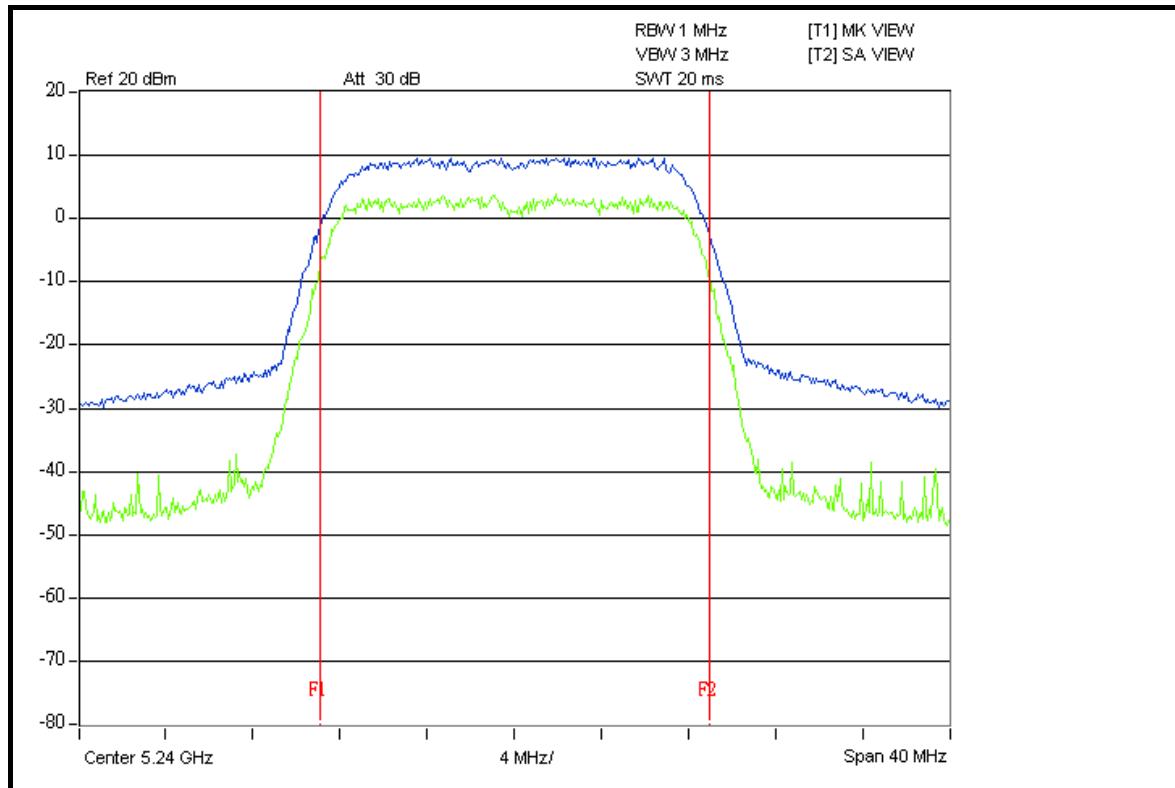


**FOR CHAIN 1: CH 36**


## CH 40



CH 48



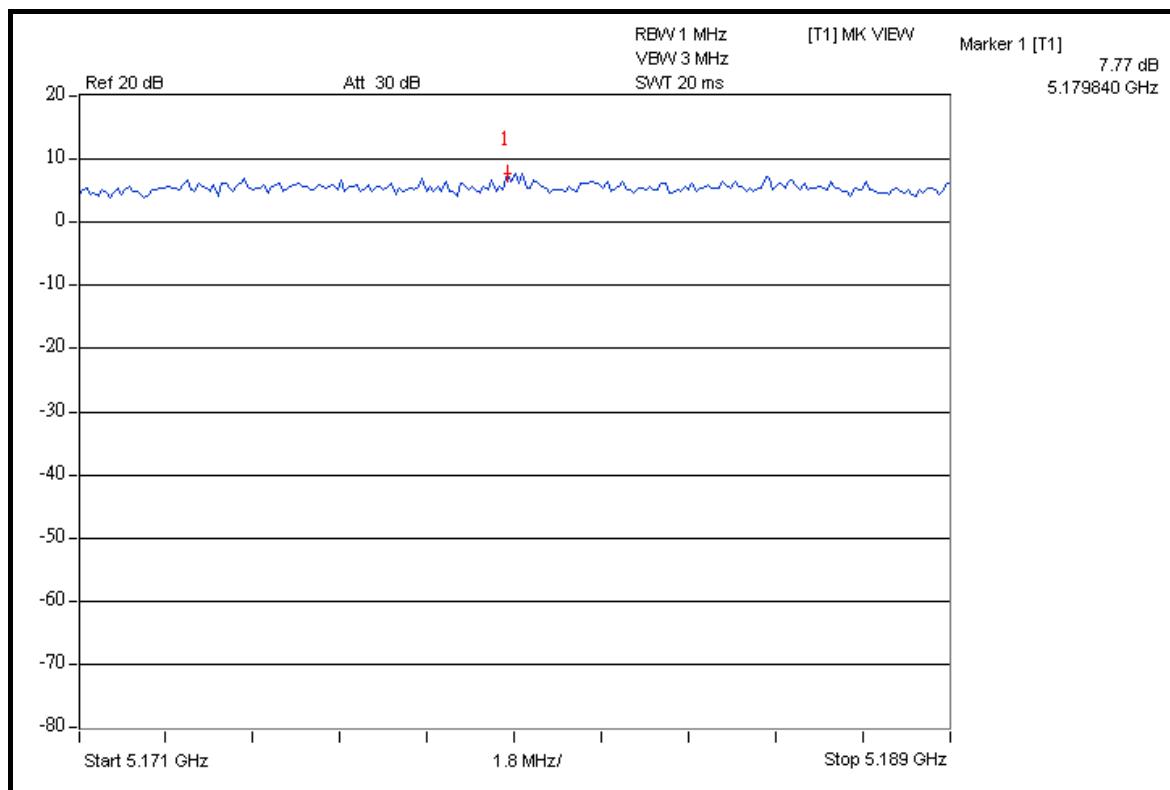
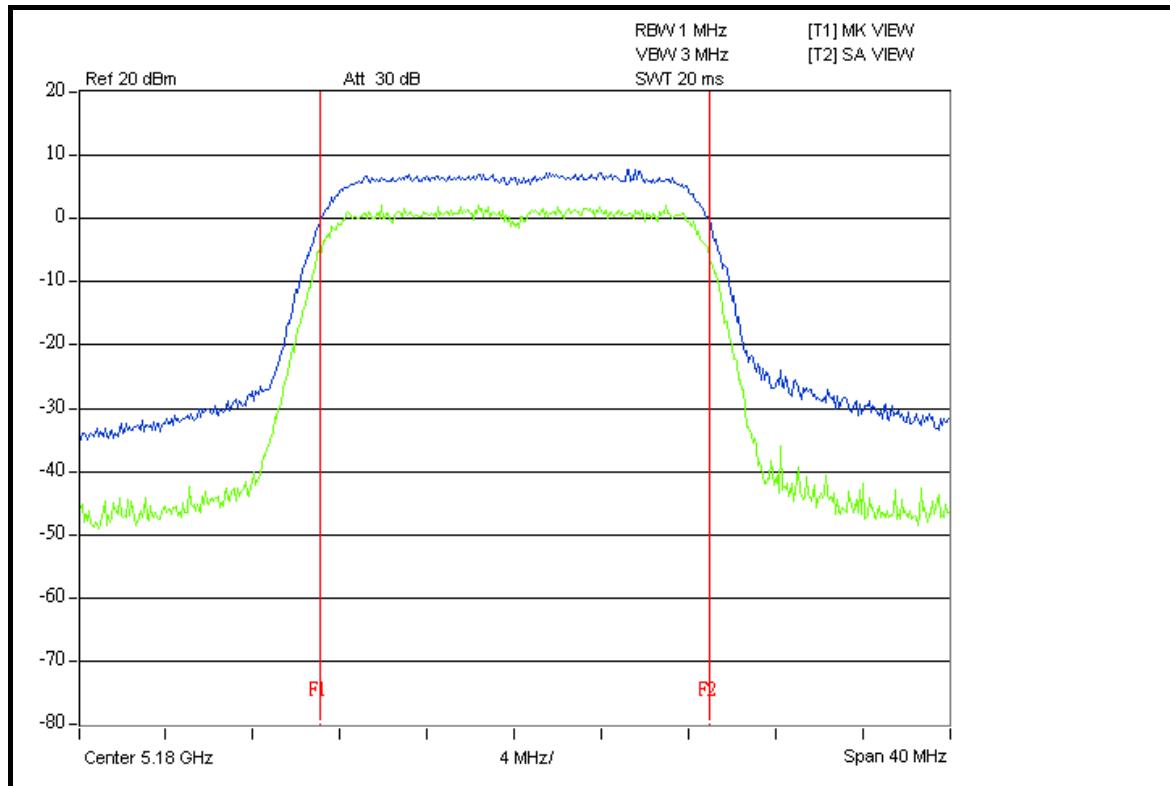


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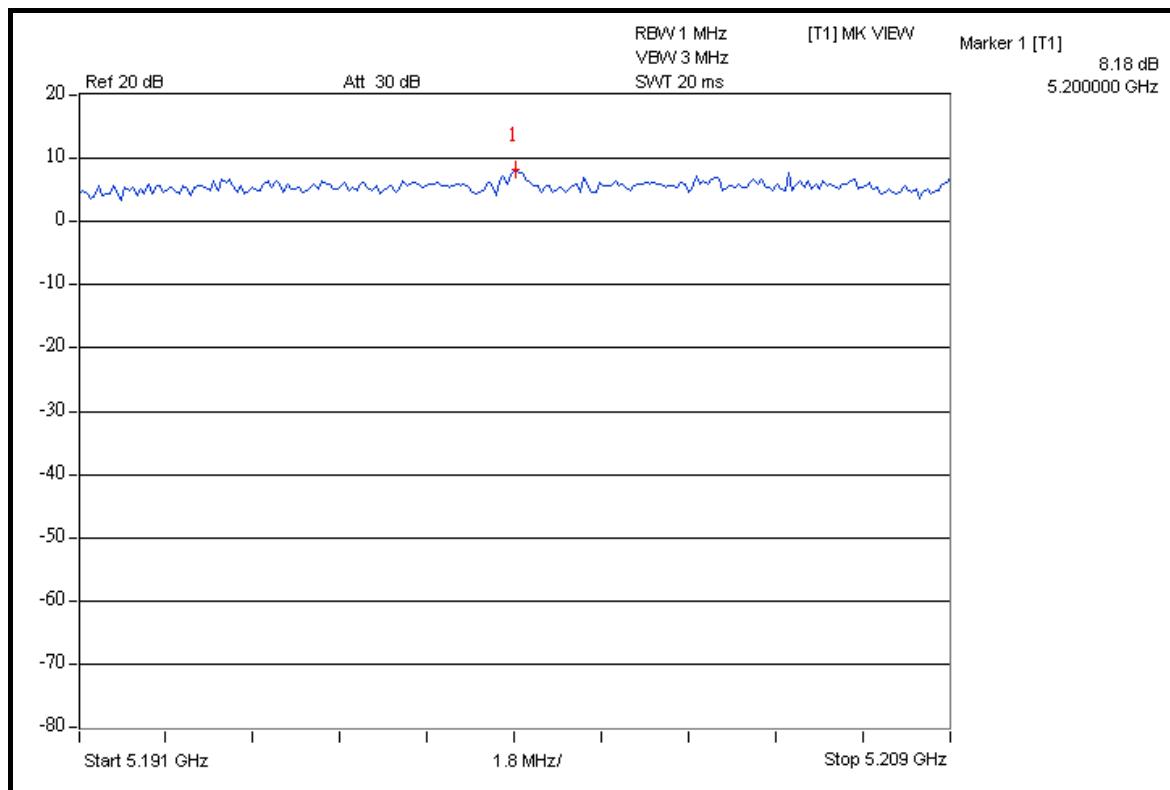
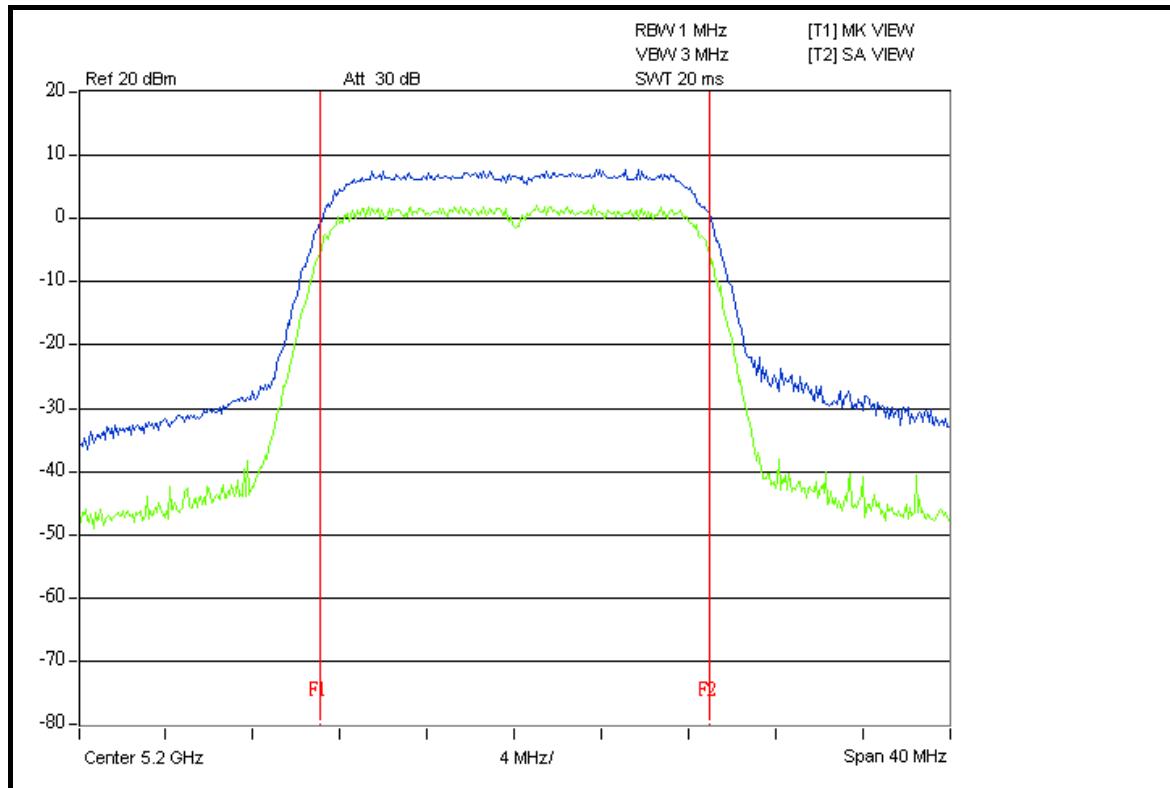
**DRAFT 802.11n (20MHz) OFDM MODULATION**

MODULATION TYPE	BPSK	TRANSFER RATE	7.2Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

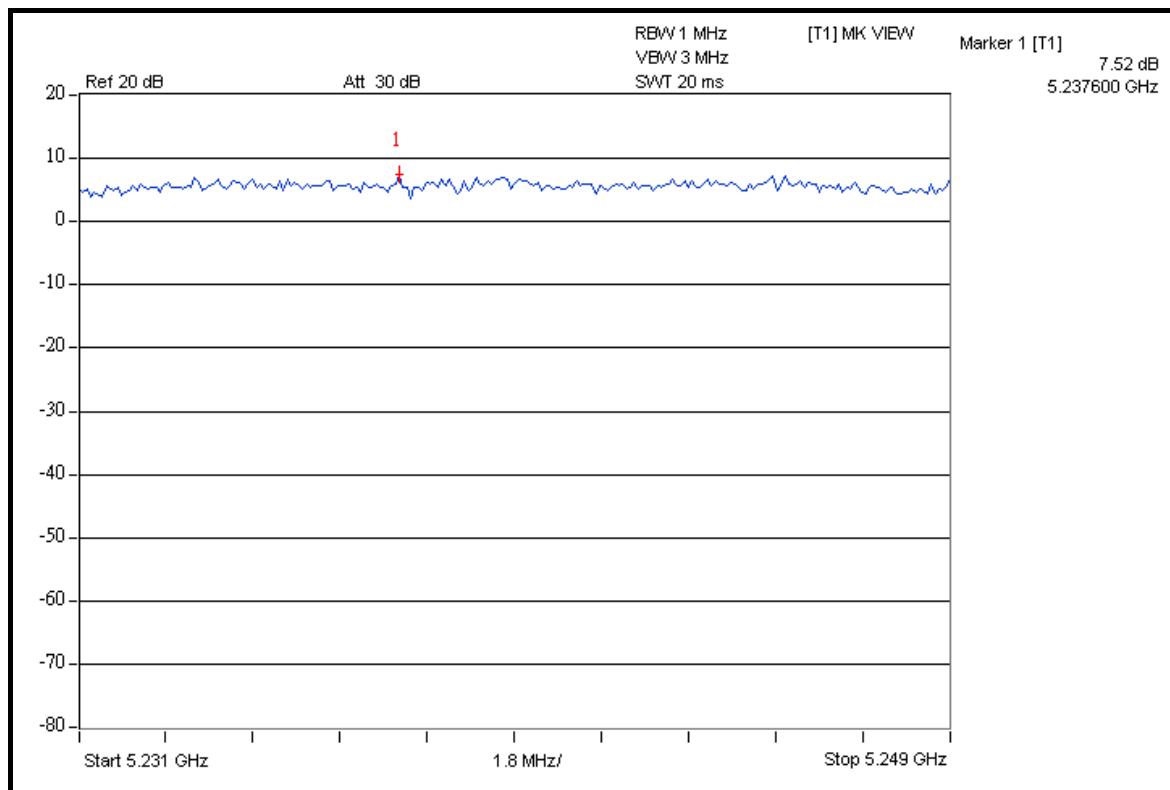
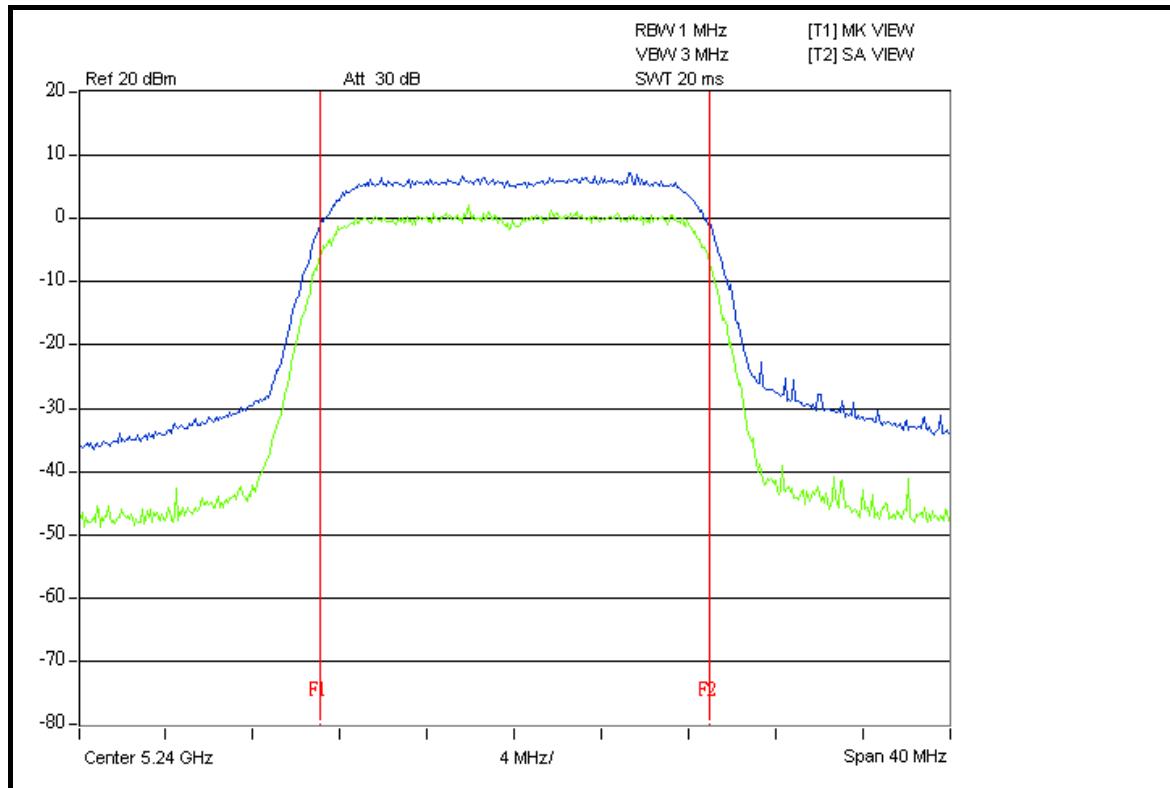
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
36	5180	7.77	8.13	13	PASS
40	5200	8.18	8.05	13	PASS
48	5240	7.52	8.58	13	PASS

**FOR CHAIN 0: CH 36**


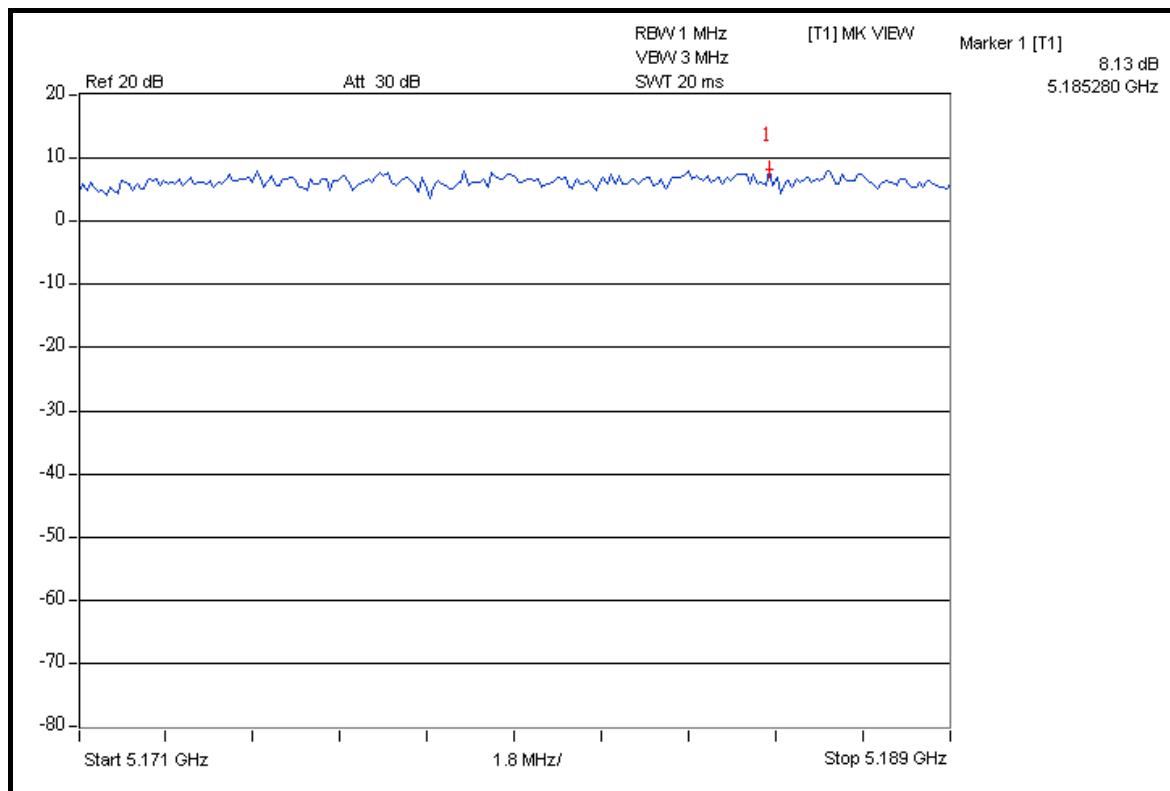
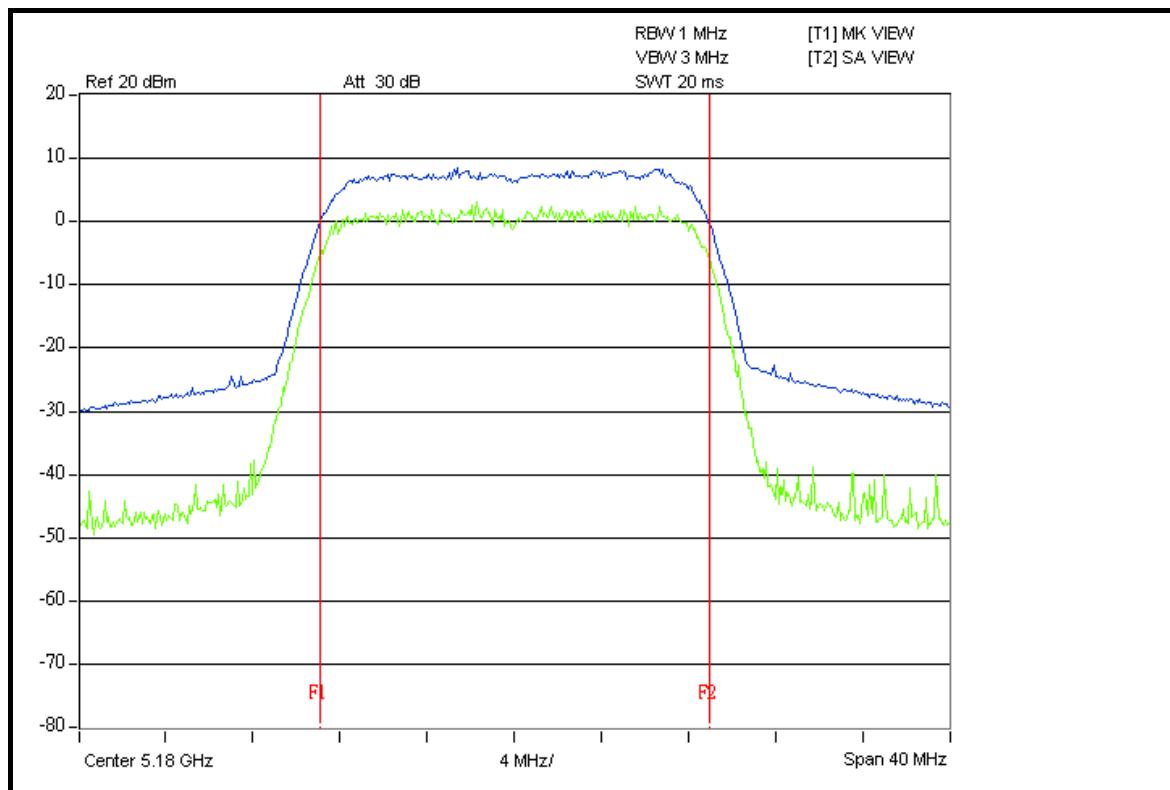
CH 40



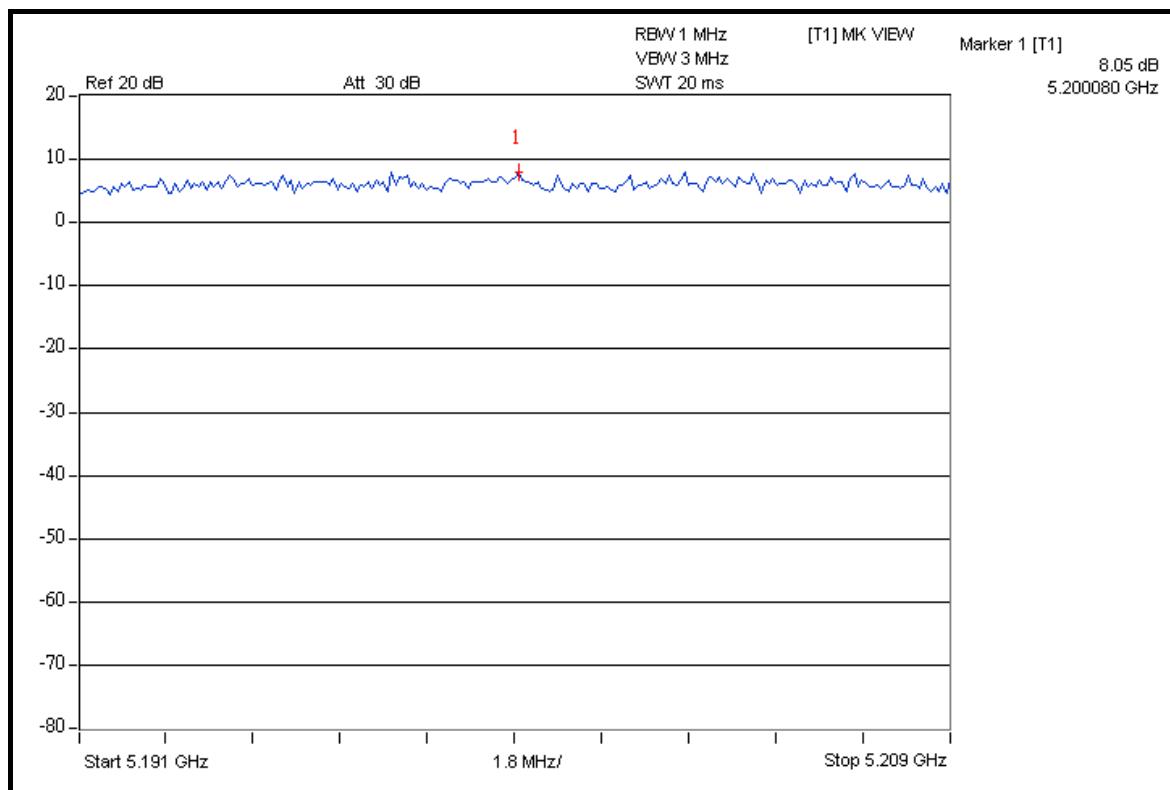
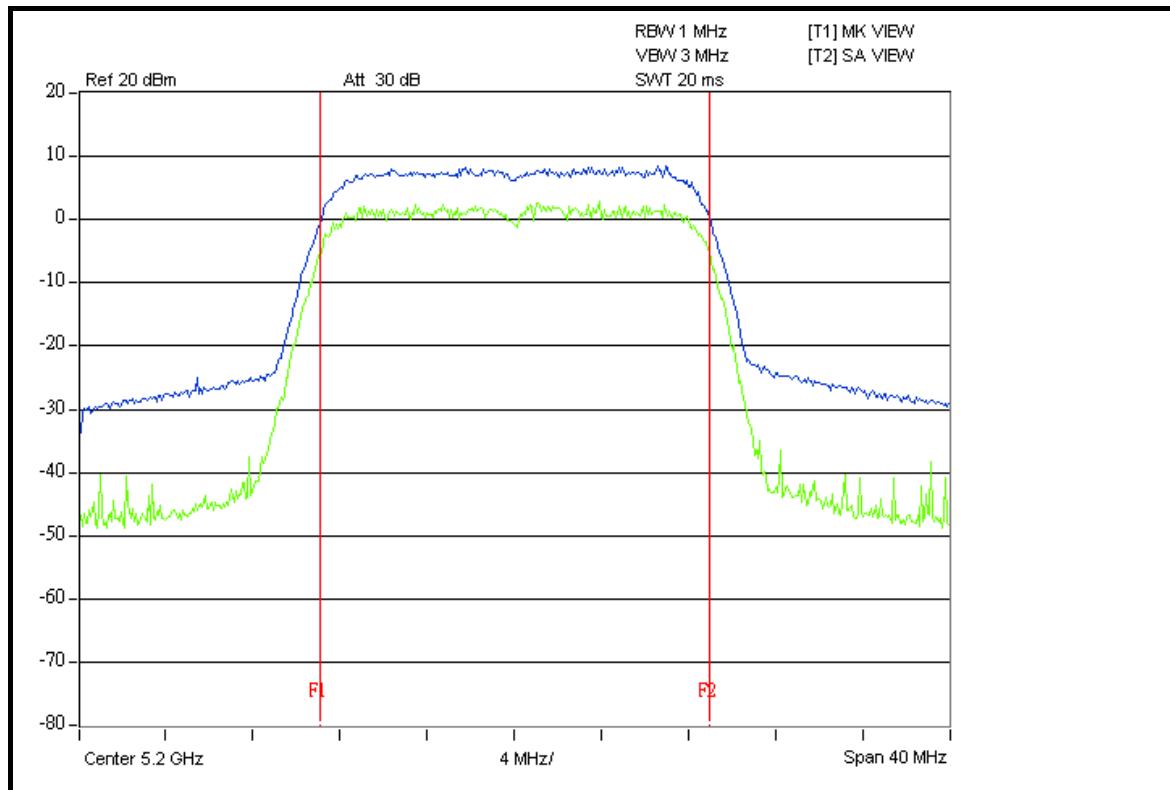
CH 48



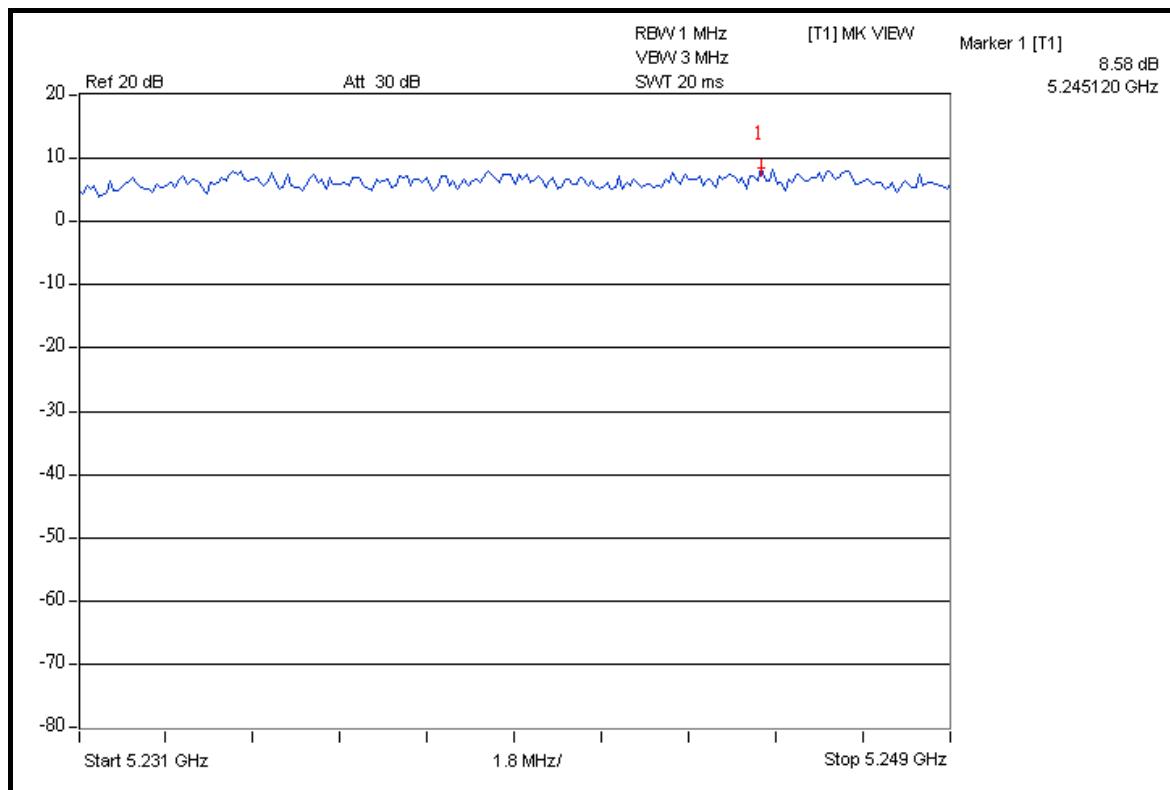
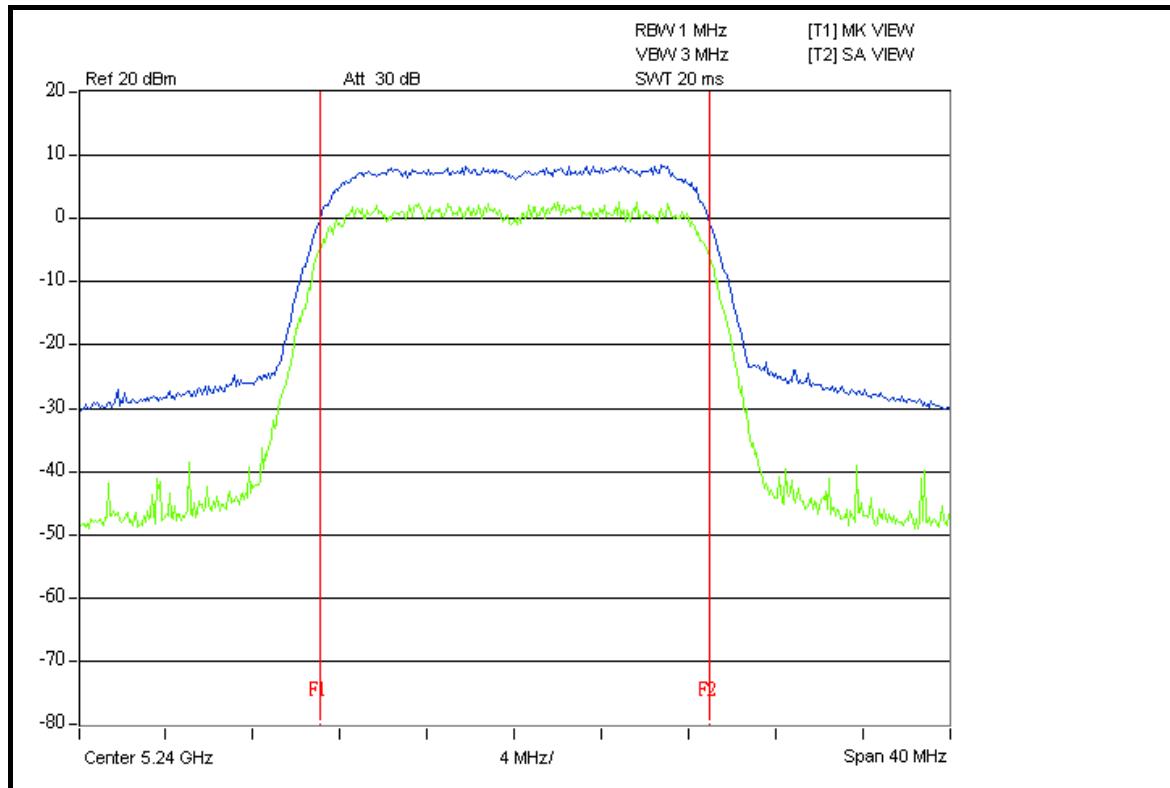
FOR CHAIN 1: CH 36



CH 40



CH 48



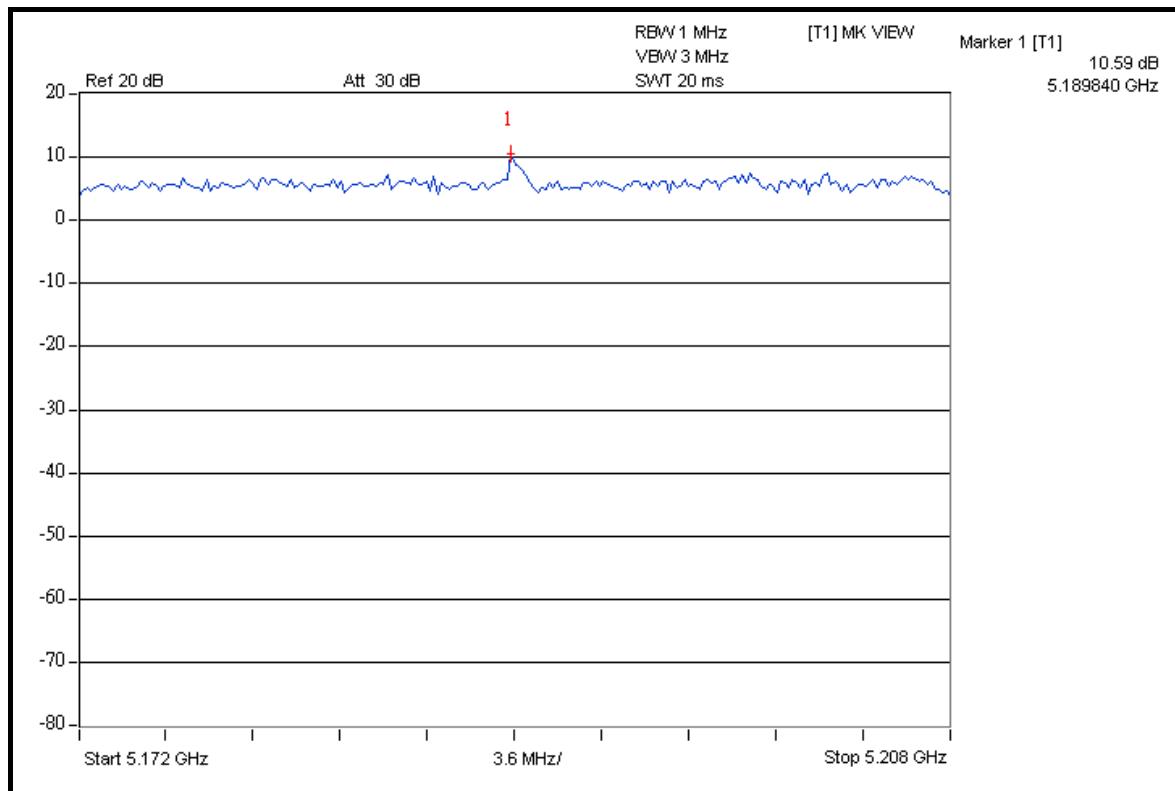
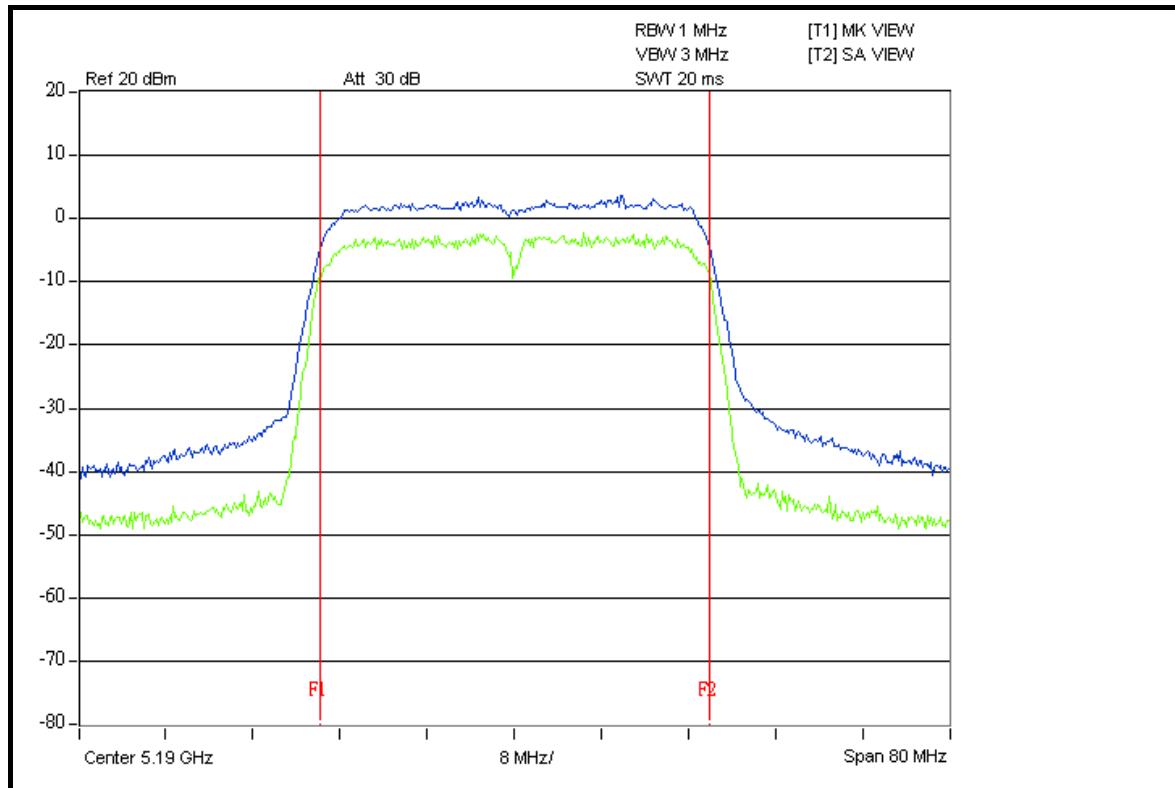


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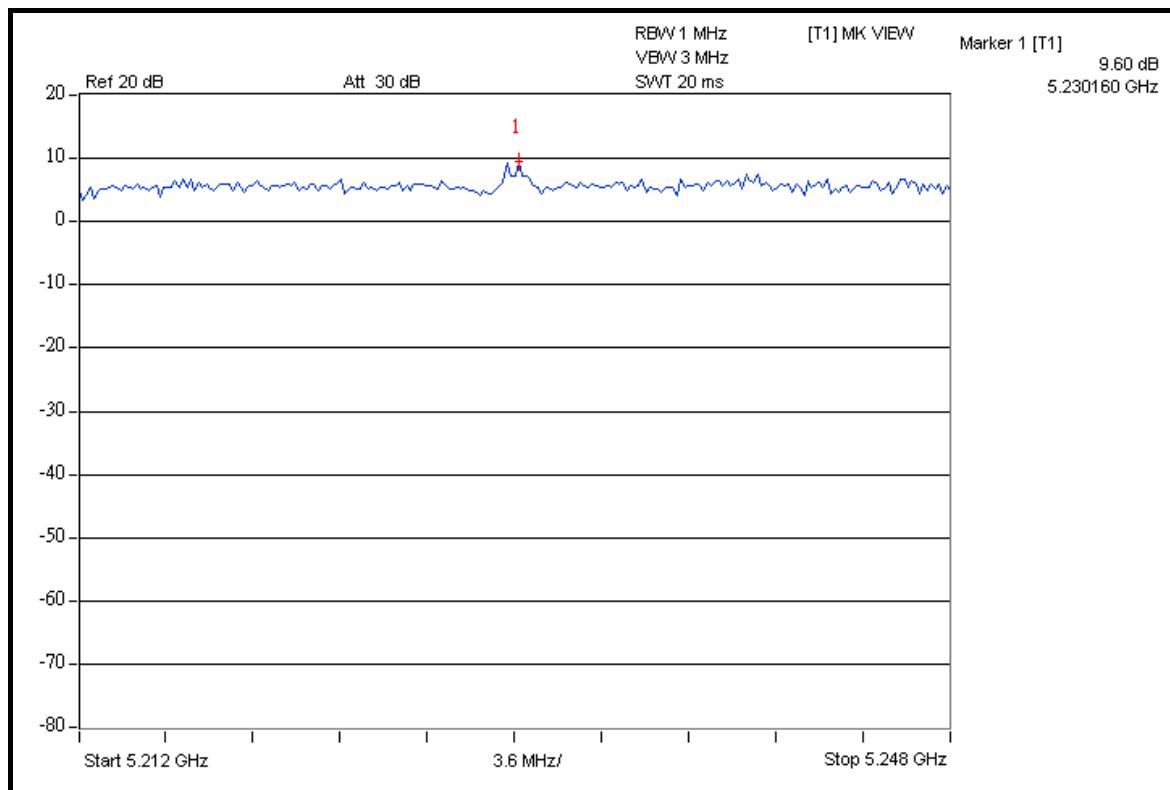
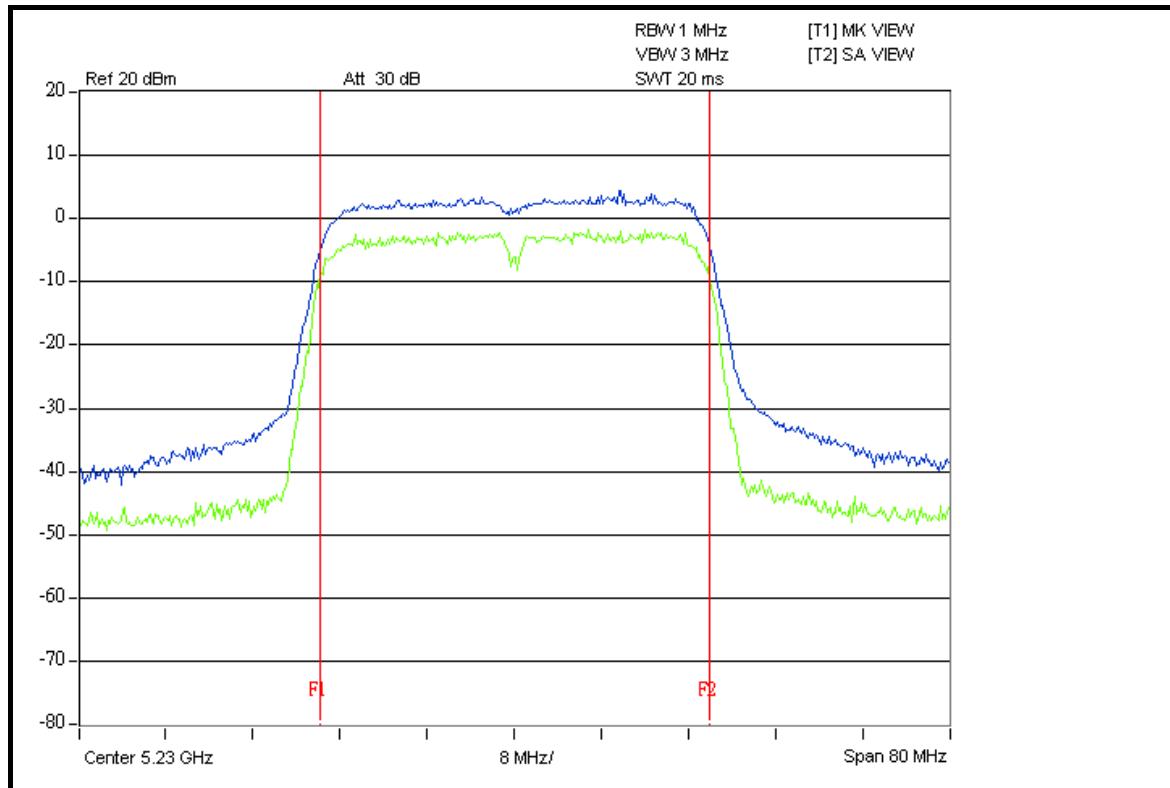
**DRAFT 802.11n (40MHz) OFDM MODULATION**

MODULATION TYPE	BPSK	TRANSFER RATE	15.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

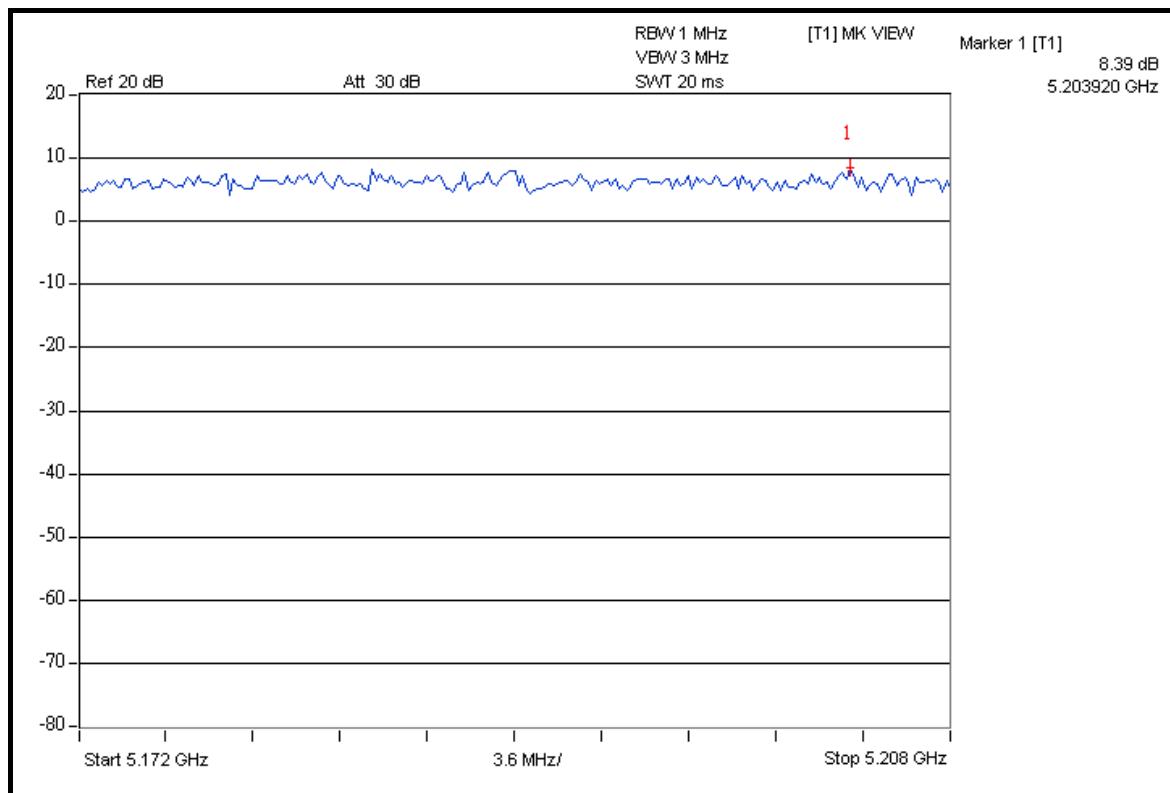
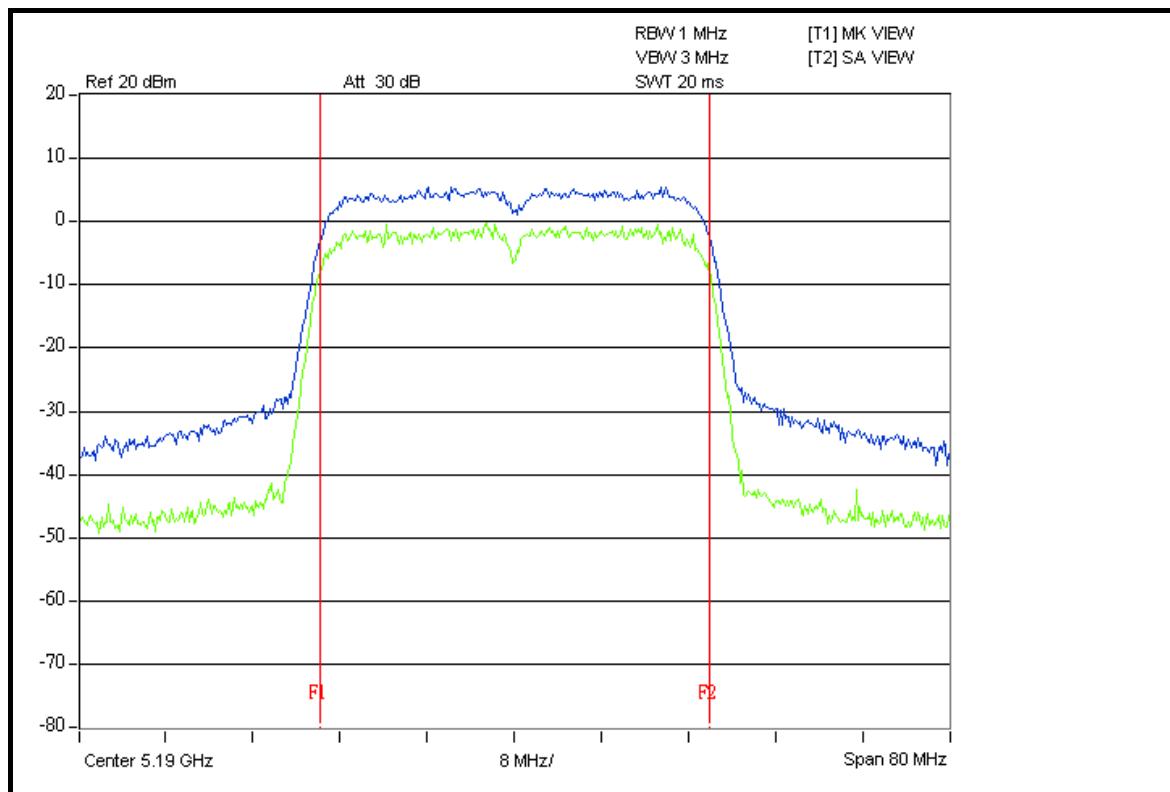
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
		CHAIN 0	CHAIN 1		
38	5190	10.59	8.39	13	PASS
46	5230	9.60	9.88	13	PASS

**FOR CHAIN 0: CH 38**


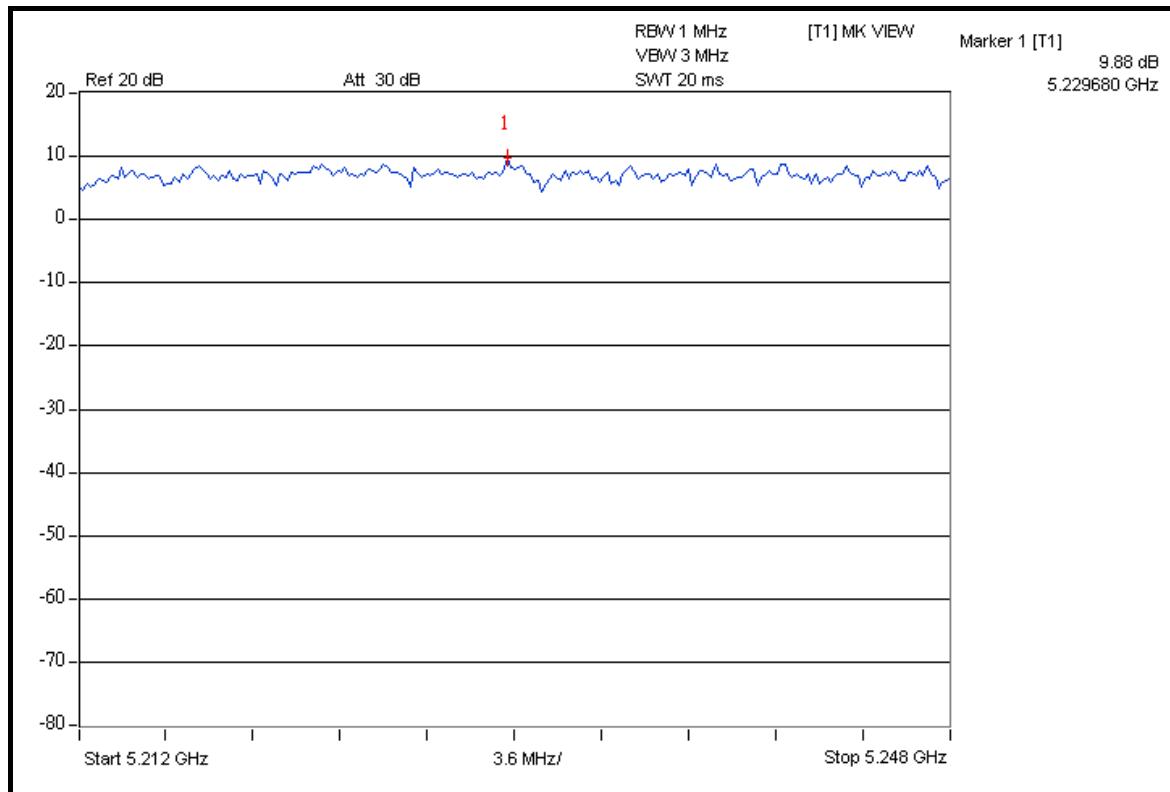
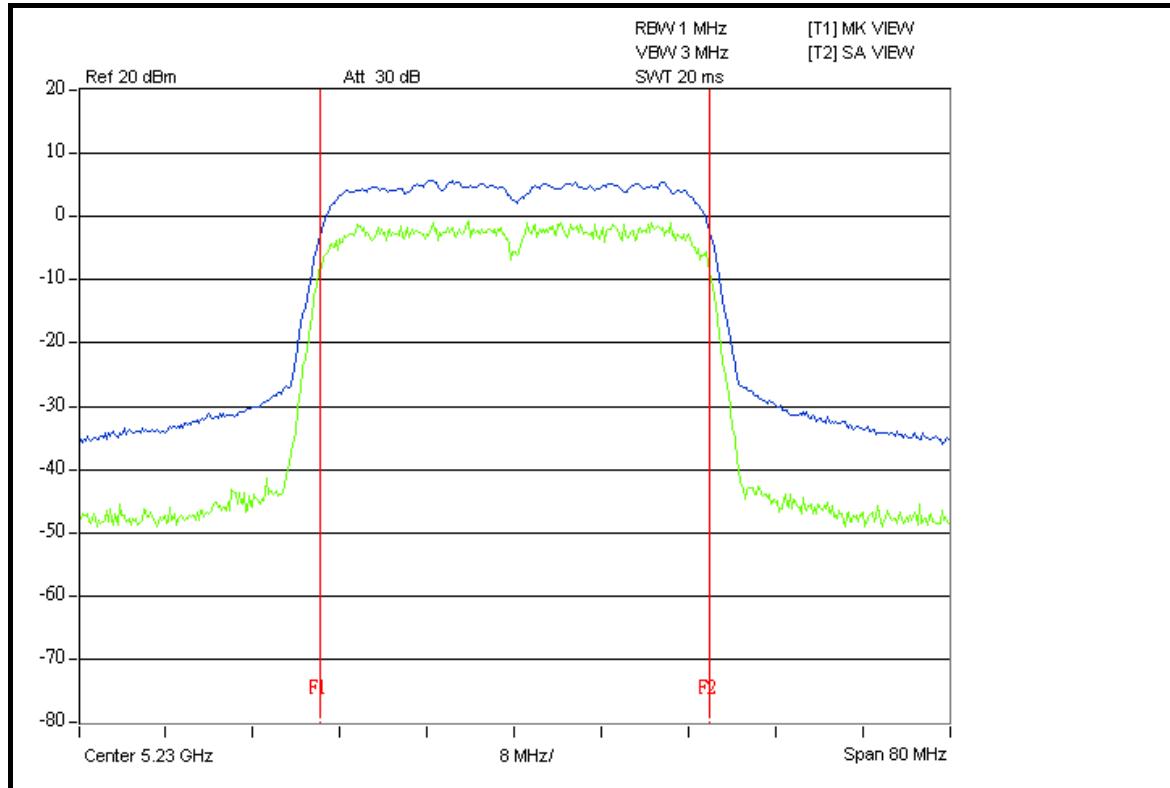
## CH 46



FOR CHAIN 1: CH 38



CH 46





## 4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.5.3 TEST PROCEDURES

- a. The transmitter output was connected to the spectrum analyzer.
- b. Set RBW = 1MHz, VBW = 3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

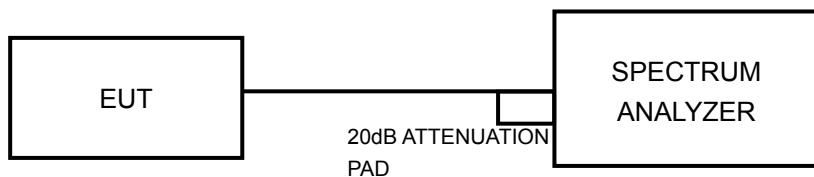


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#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.5.5 TEST SETUP



#### 4.5.6 EUT OPERATING CONDITIONS

Same as 5.3.6.



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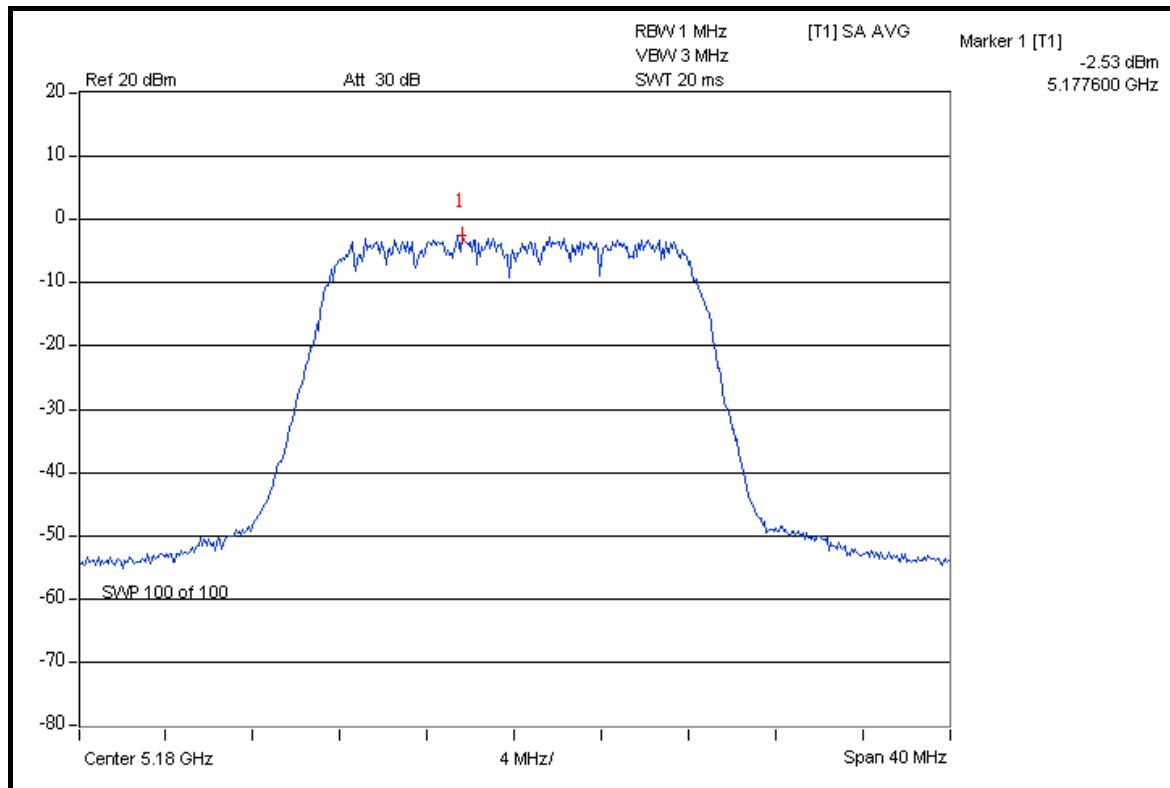
#### 4.5.7 TEST RESULTS

##### 802.11a OFDM MODULATION

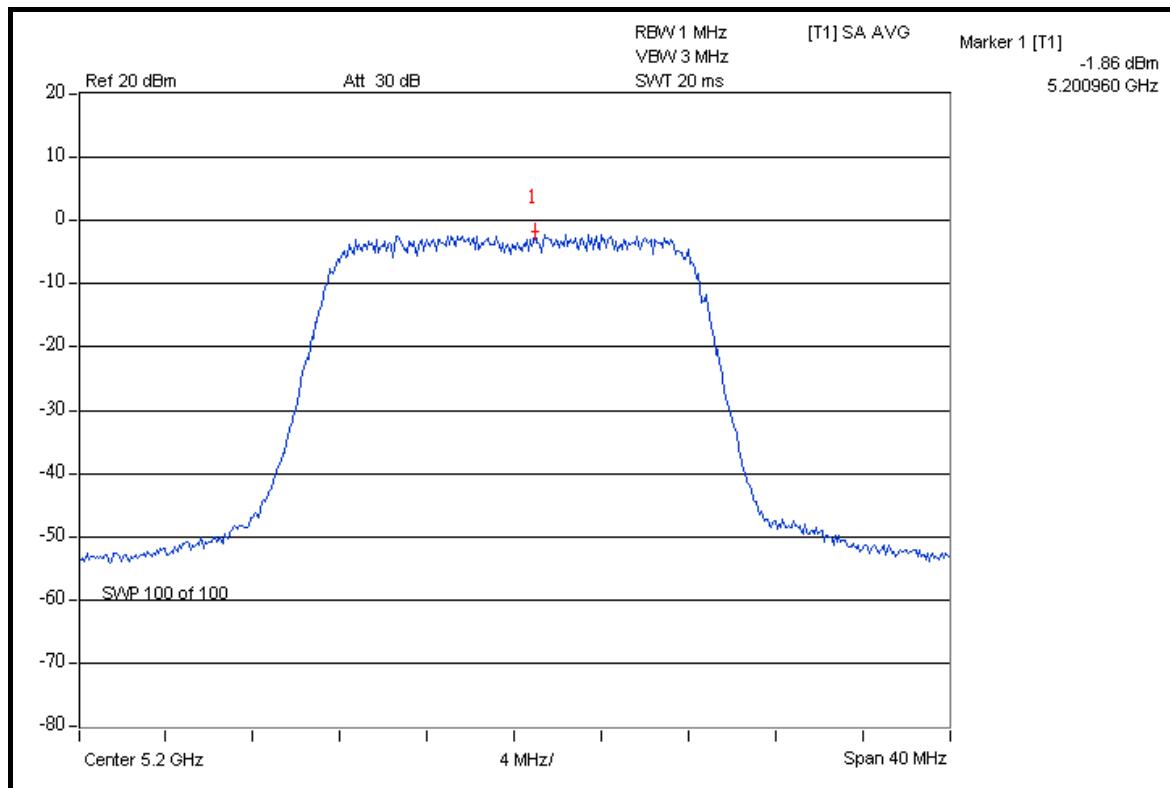
MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	25 deg.C, 65 %RH, 1021hPa
TESTED BY	Brad Wu		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	-2.53	-3.63	0.992	-0.03	4	PASS
40	5200	-1.86	-3.85	1.064	0.27	4	PASS
48	5240	-2.40	-3.59	1.013	0.06	4	PASS

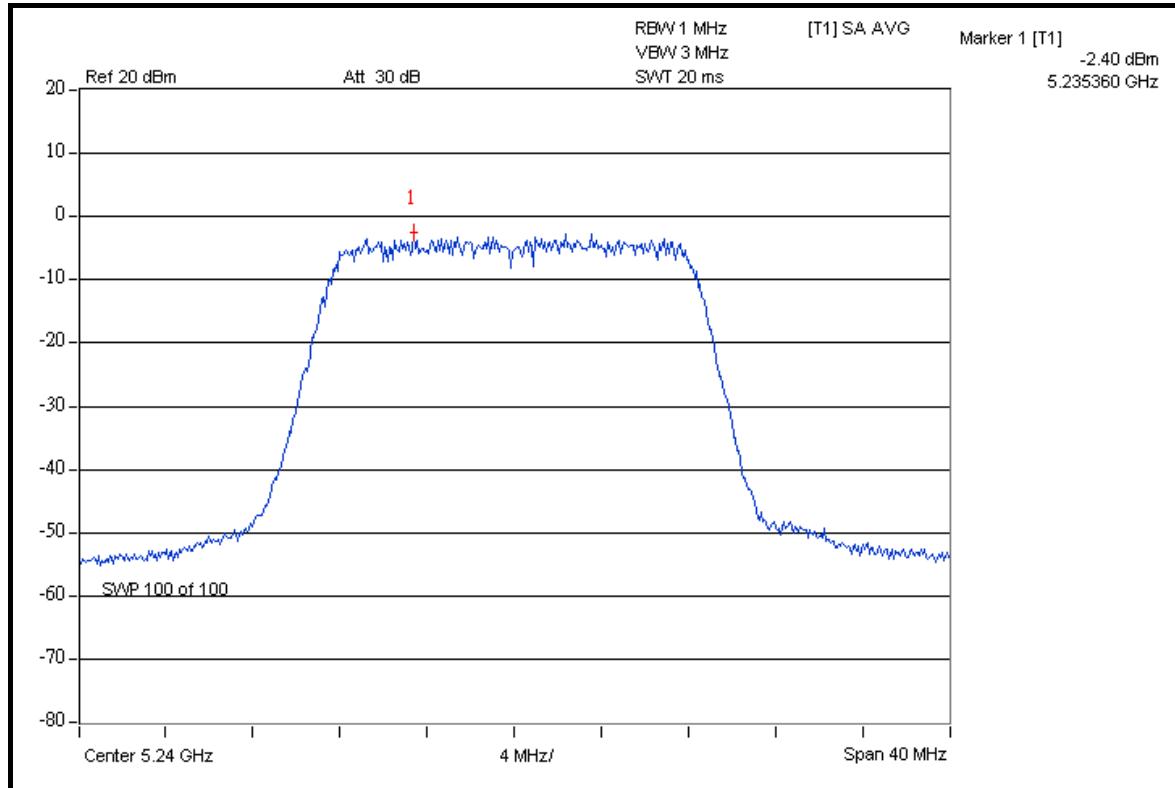
FOR CHAIN 0: CH 36



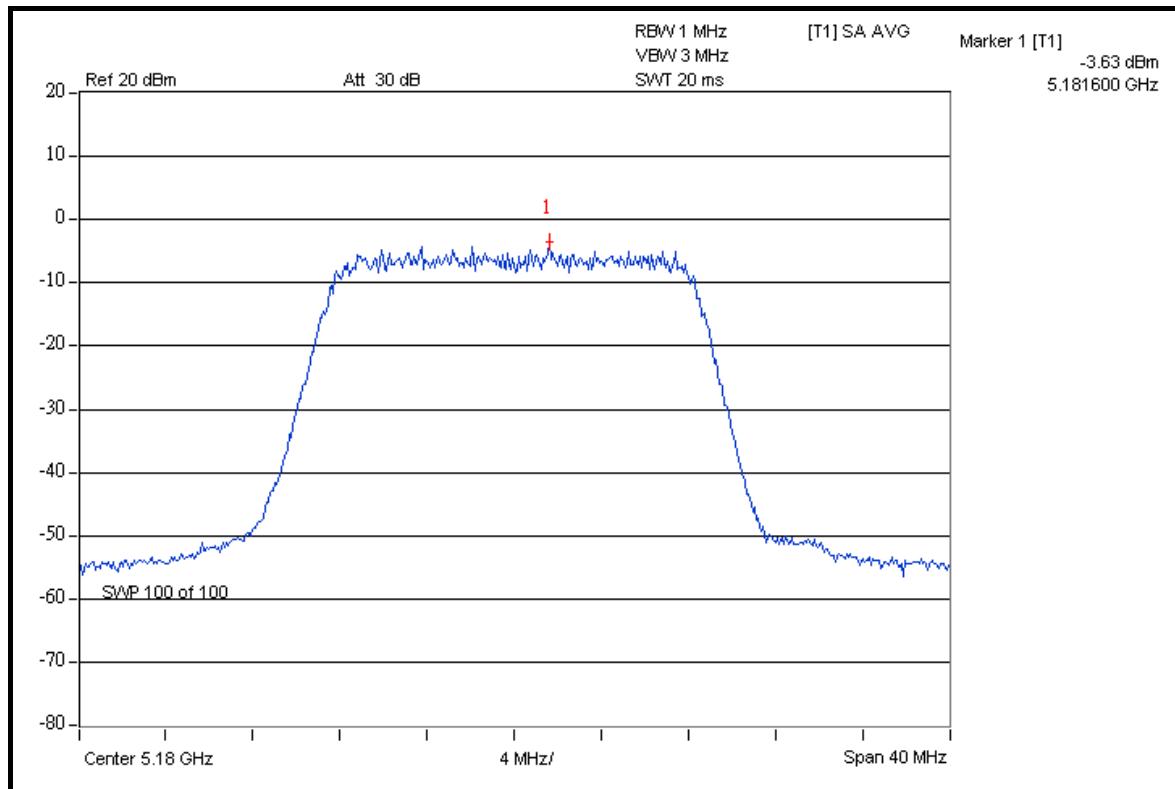
CH 40



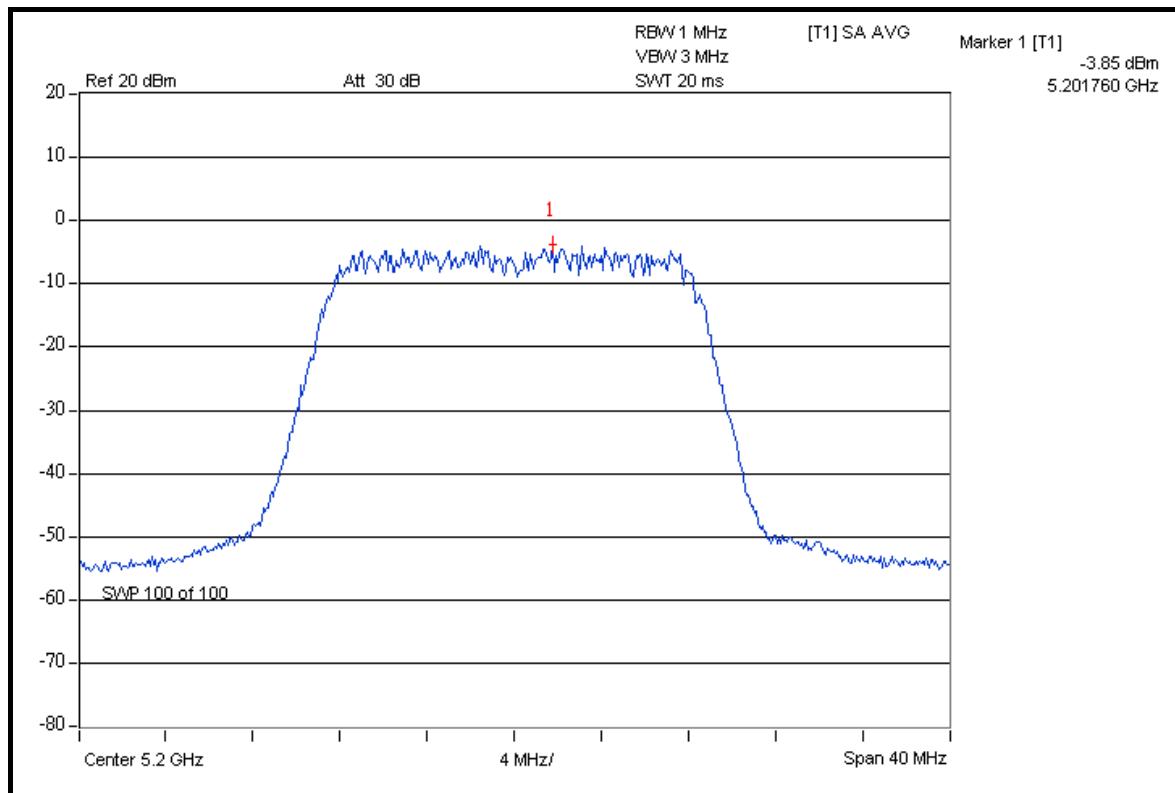
## CH 48



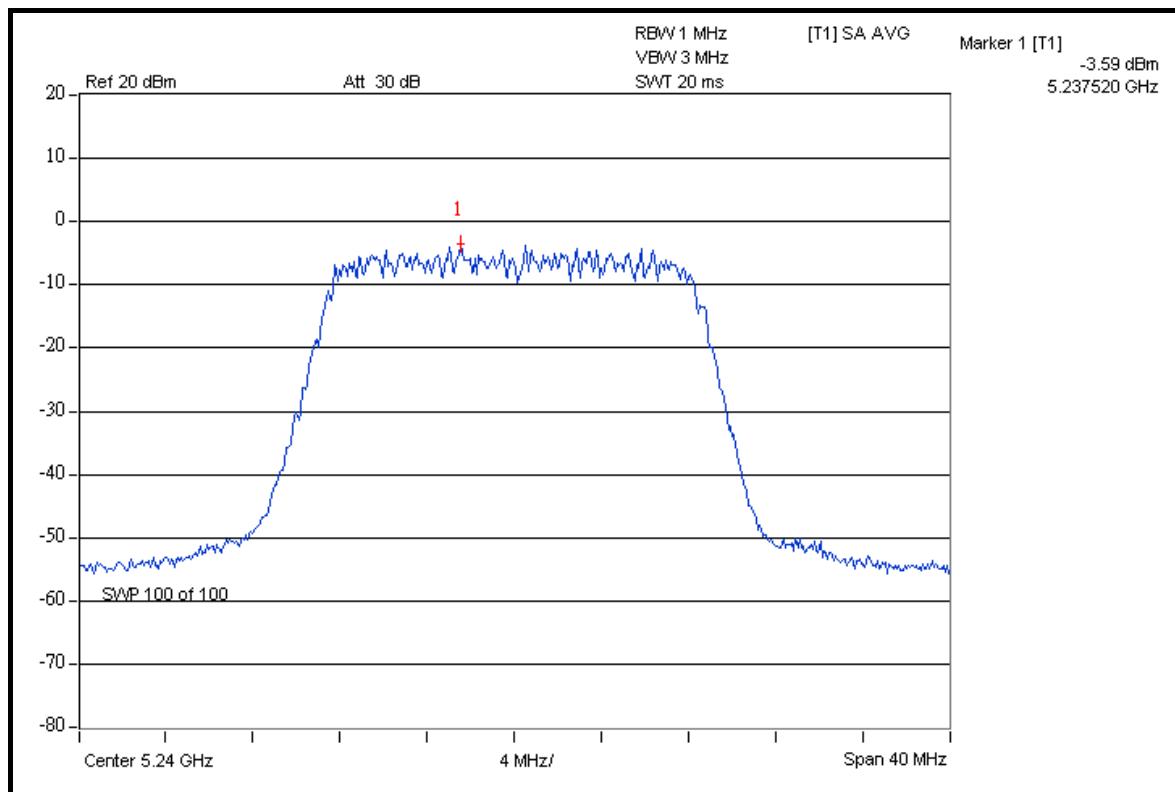
## FOR CHAIN 1: CH 36



CH 40



CH 48





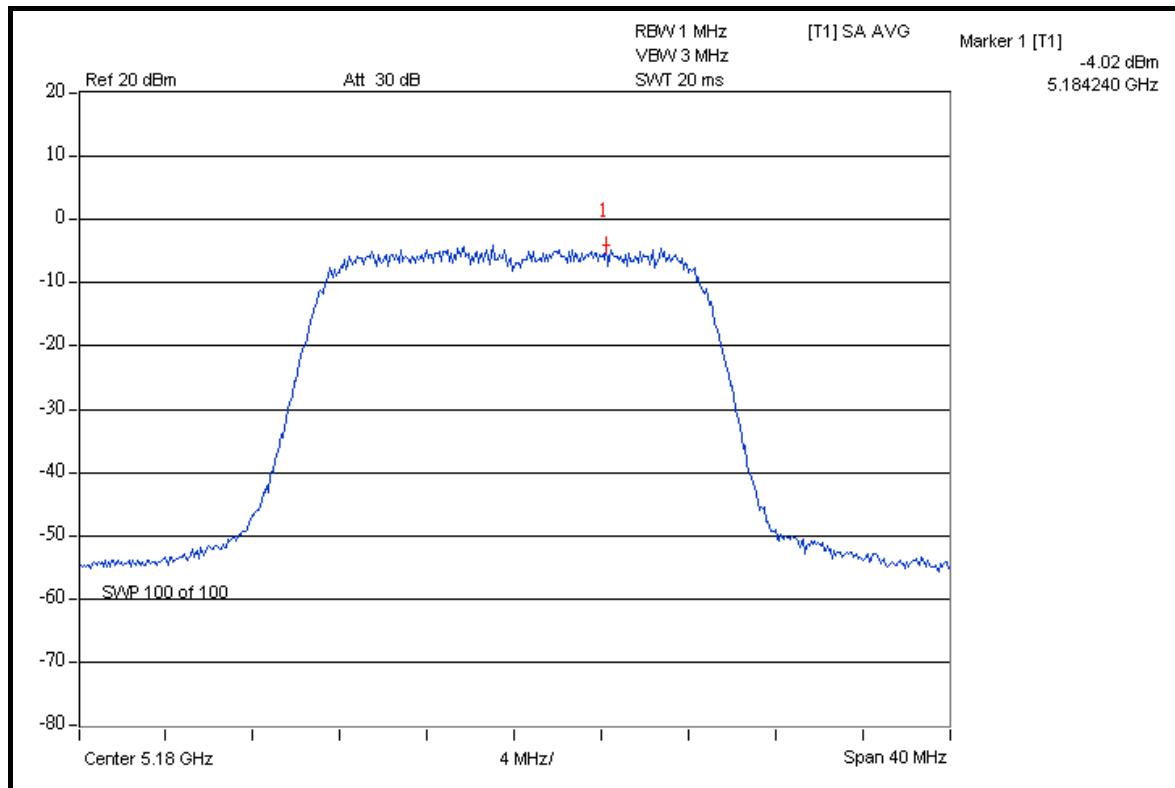
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**DRAFT 802.11n (20MHz) OFDM MODULATION**

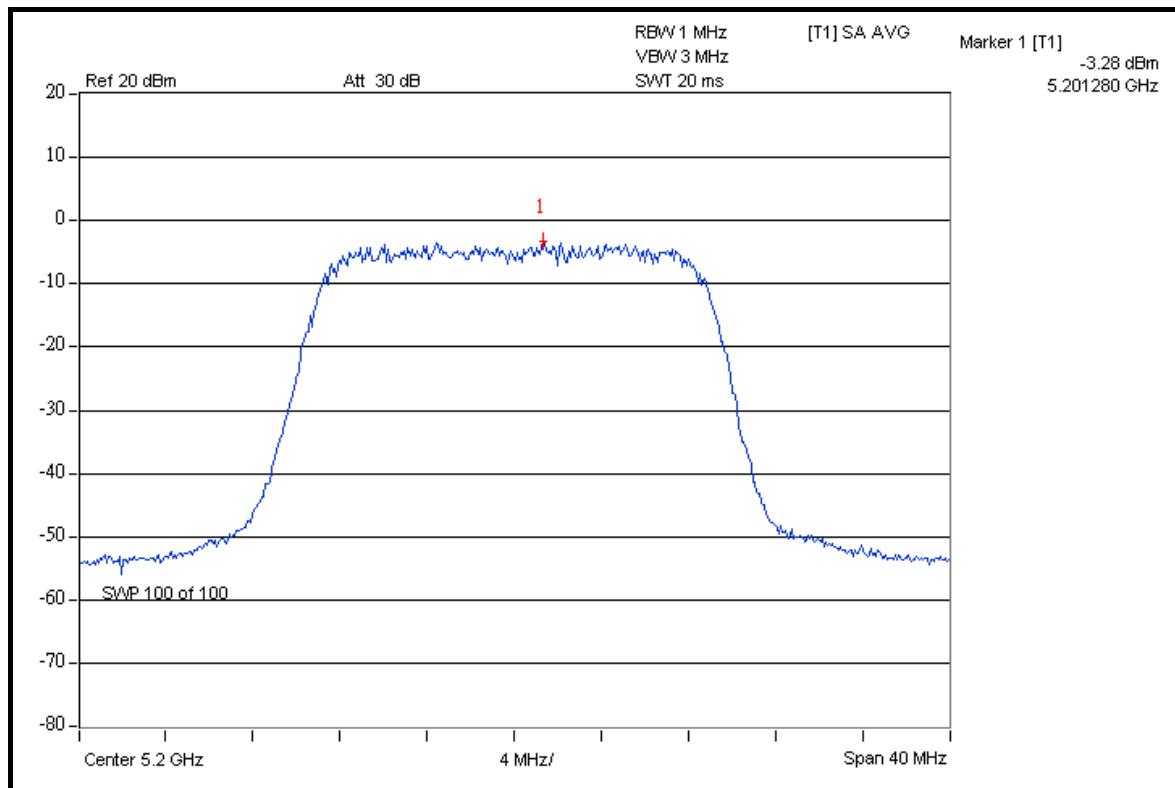
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	7.2Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 1021hPa
<b>TESTED BY</b>	Brad Wu		

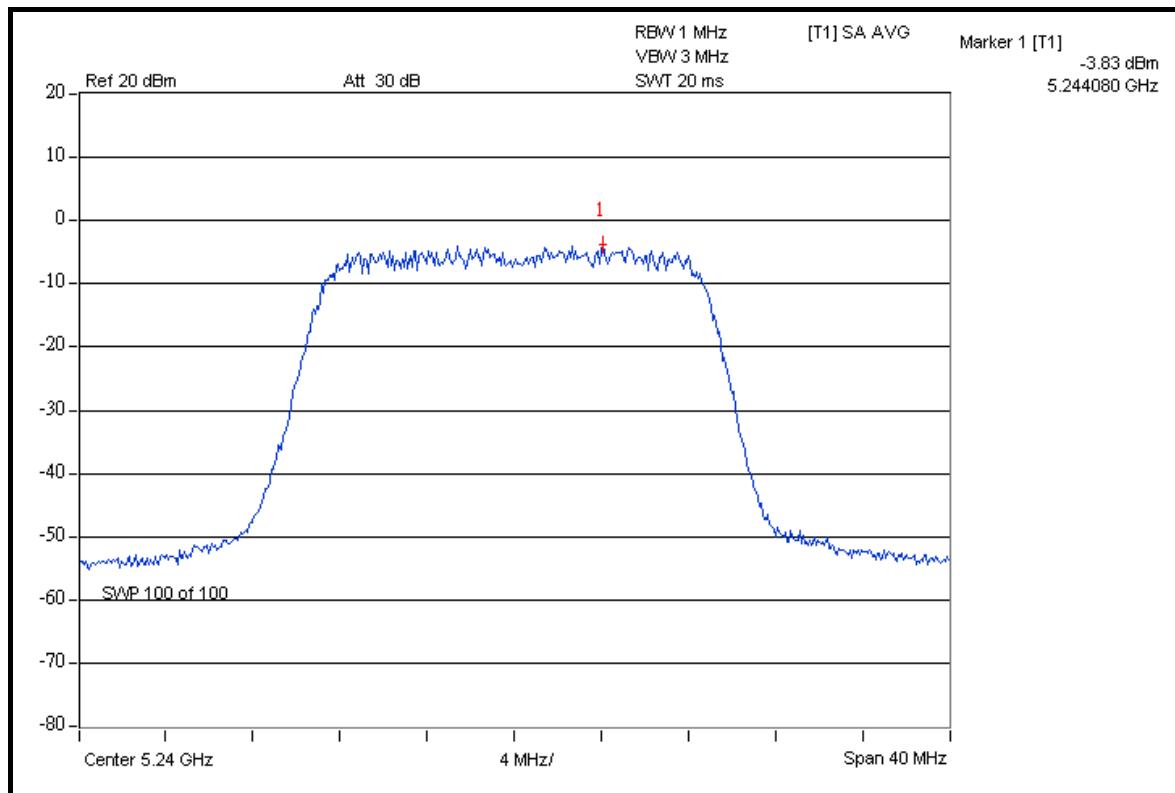
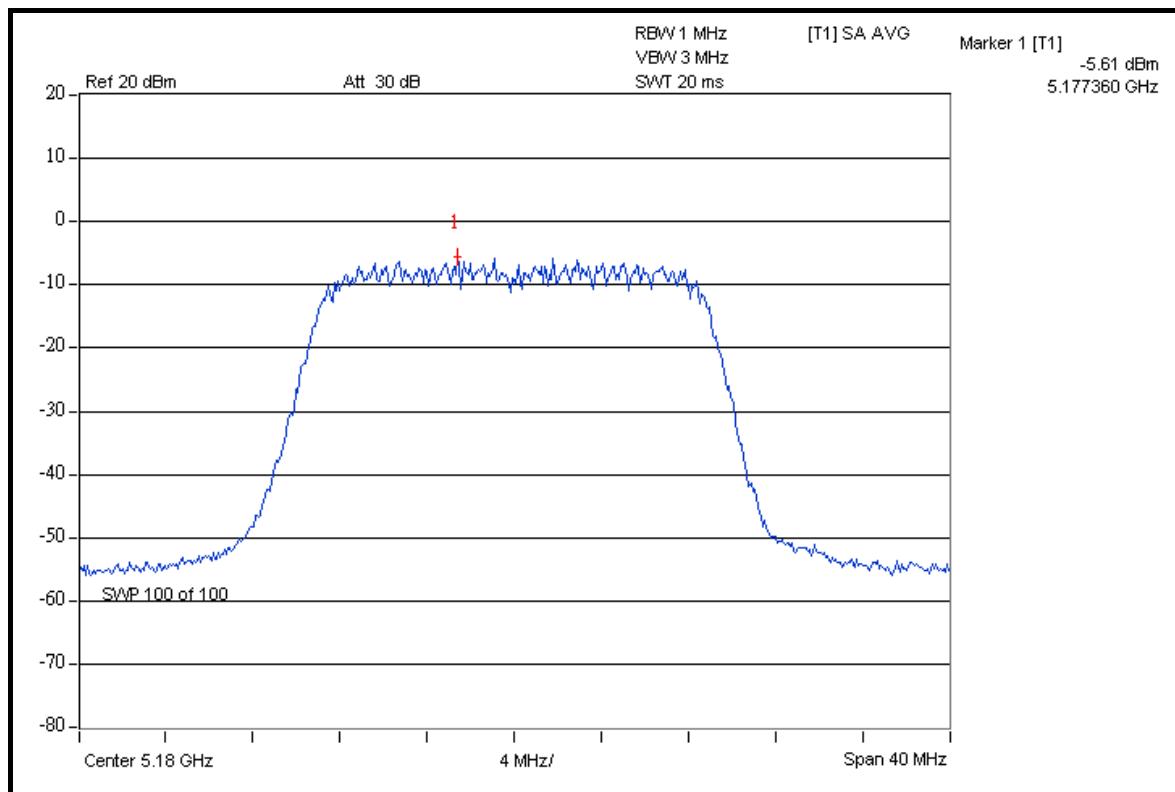
<b>CHAN.</b>	<b>CHAN. FREQ. (MHz)</b>	<b>RF POWER LEVEL IN 1MHz BW (dBm)</b>		<b>TOTAL POWER DENSITY (mW)</b>	<b>TOTAL POWER DENSITY (dBm)</b>	<b>MAX. LIMIT (dBm)</b>	<b>PASS / FAIL</b>
		<b>CHAIN 0</b>	<b>CHAIN 1</b>				
36	5180	-4.02	-5.61	0.671	-1.73	4	PASS
40	5200	-3.28	-5.64	0.743	-1.29	4	PASS
48	5240	-3.83	-5.43	0.724	-1.40	4	PASS

FOR CHAIN 0: CH 36

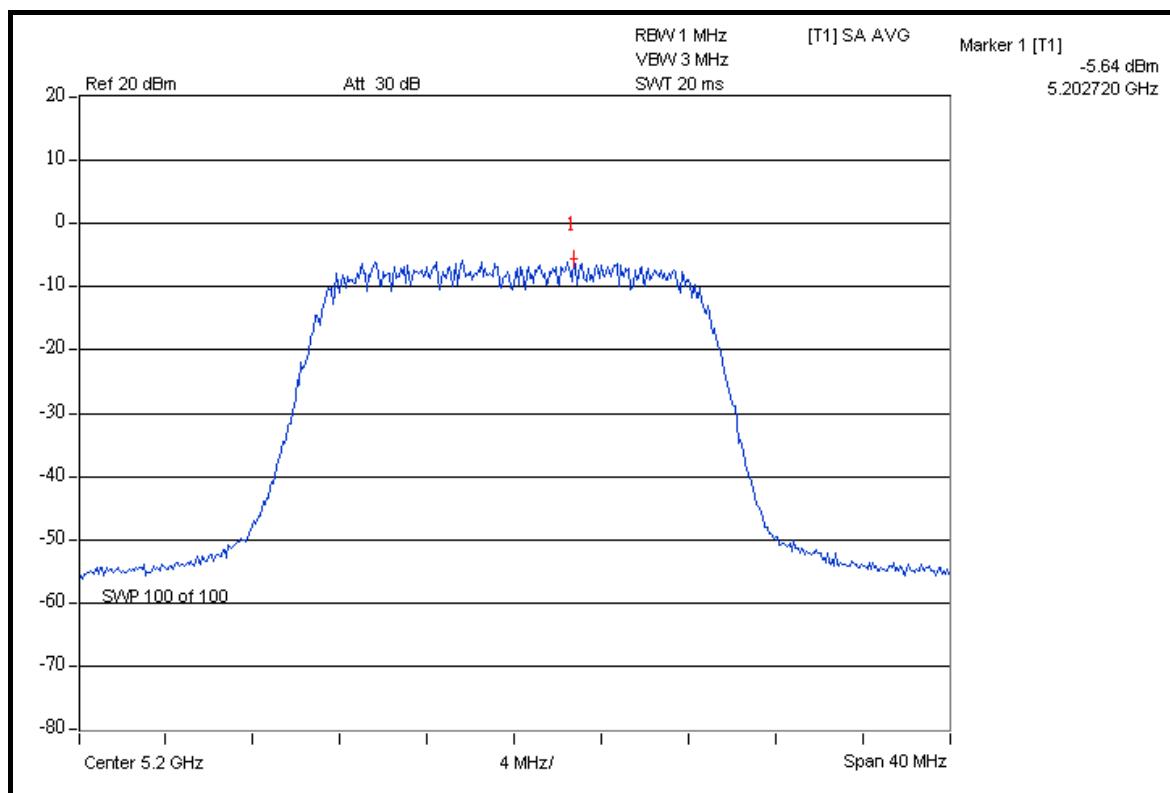


CH 40

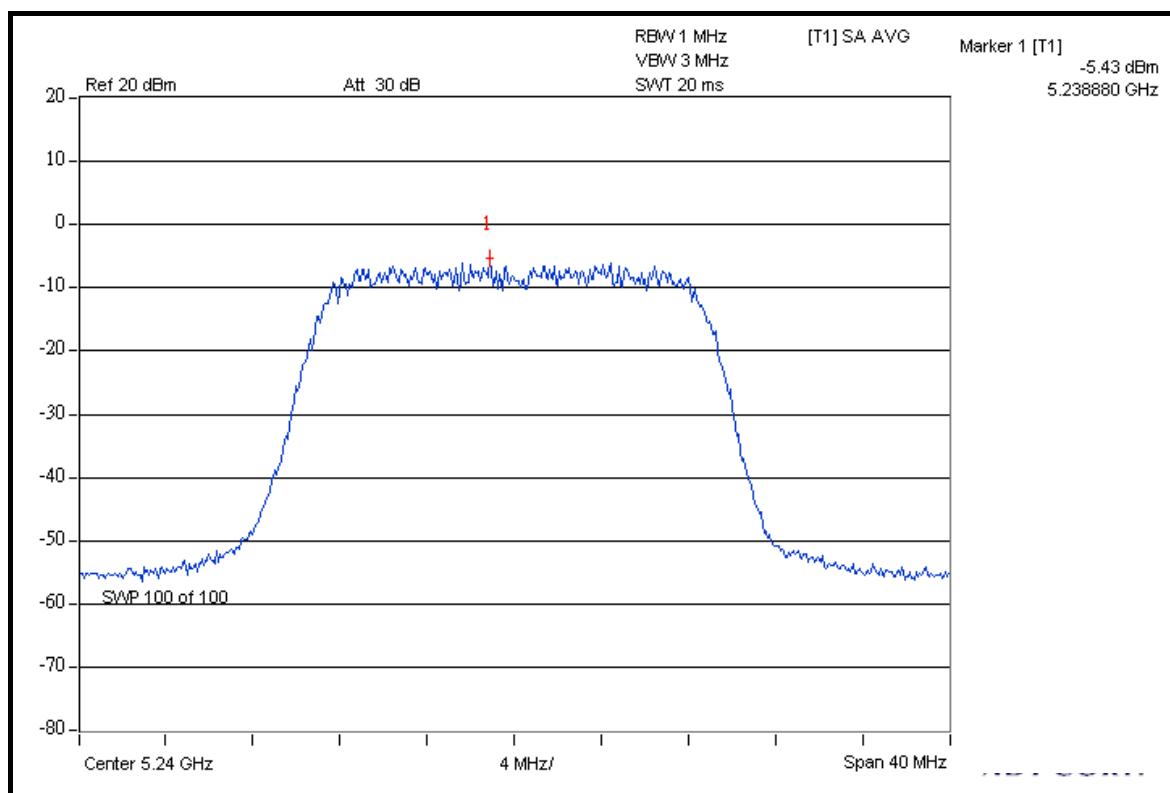


**CH 48**

**FOR CHAIN 1: CH 36**


CH 40



CH 48





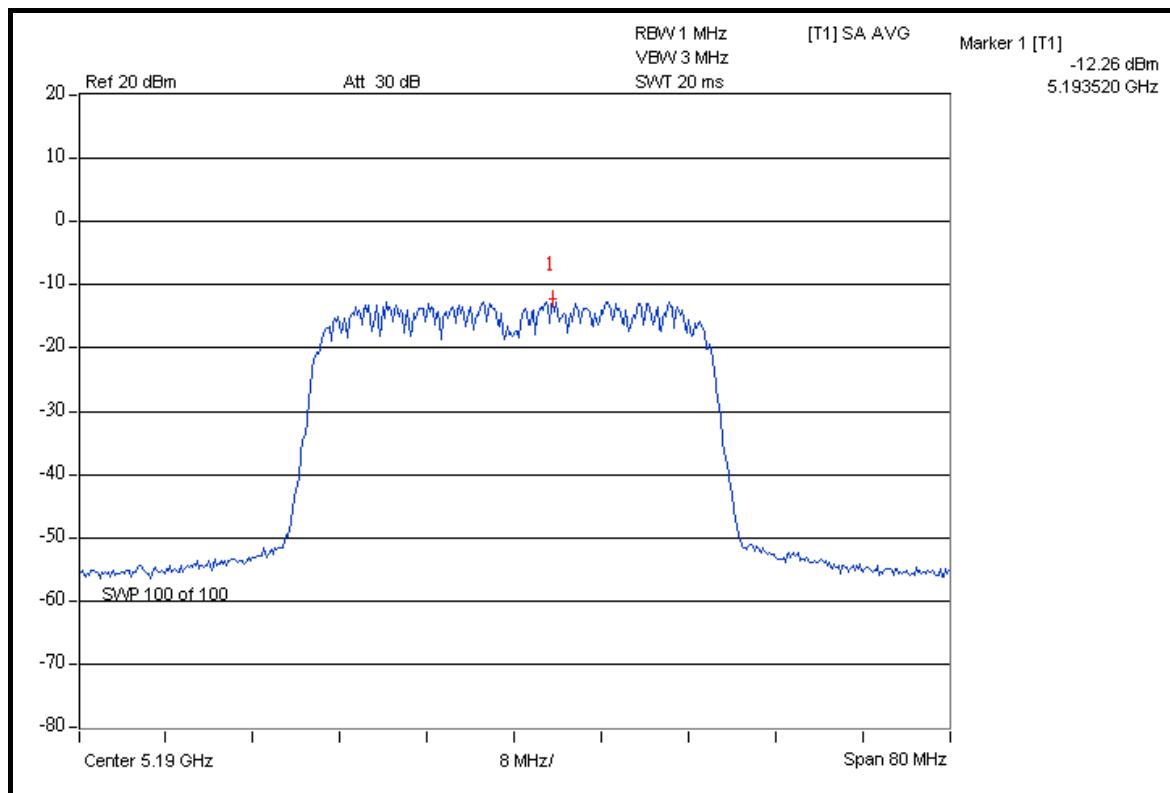
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**DRAFT 802.11n (40MHz) OFDM MODULATION**

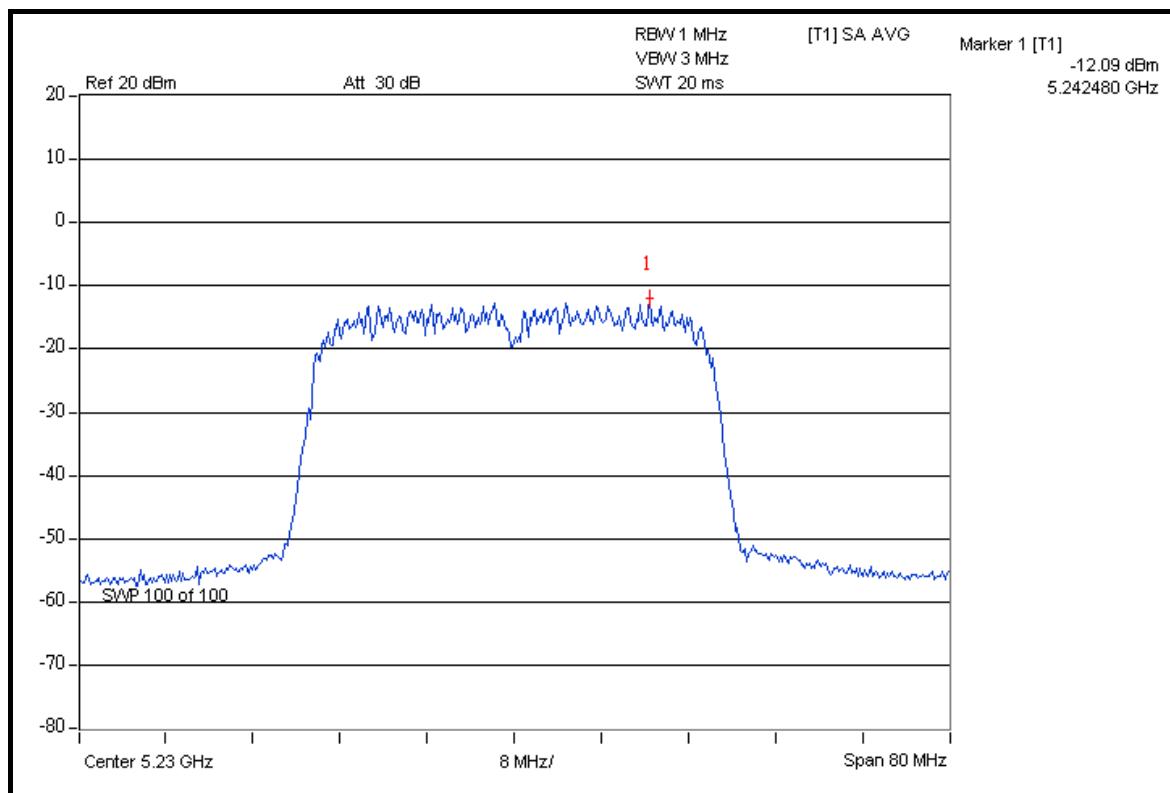
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	15.0Mbps
<b>INPUT POWER</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 1021hPa
<b>TESTED BY</b>	Brad Wu		

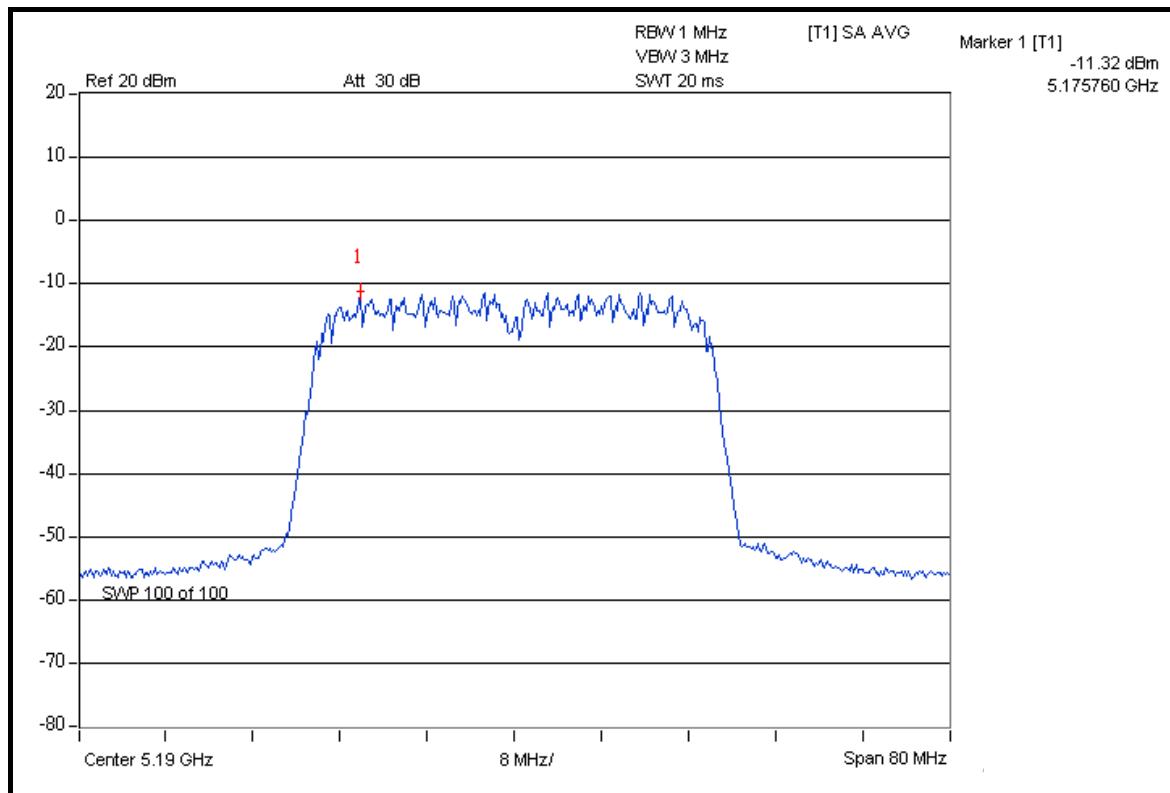
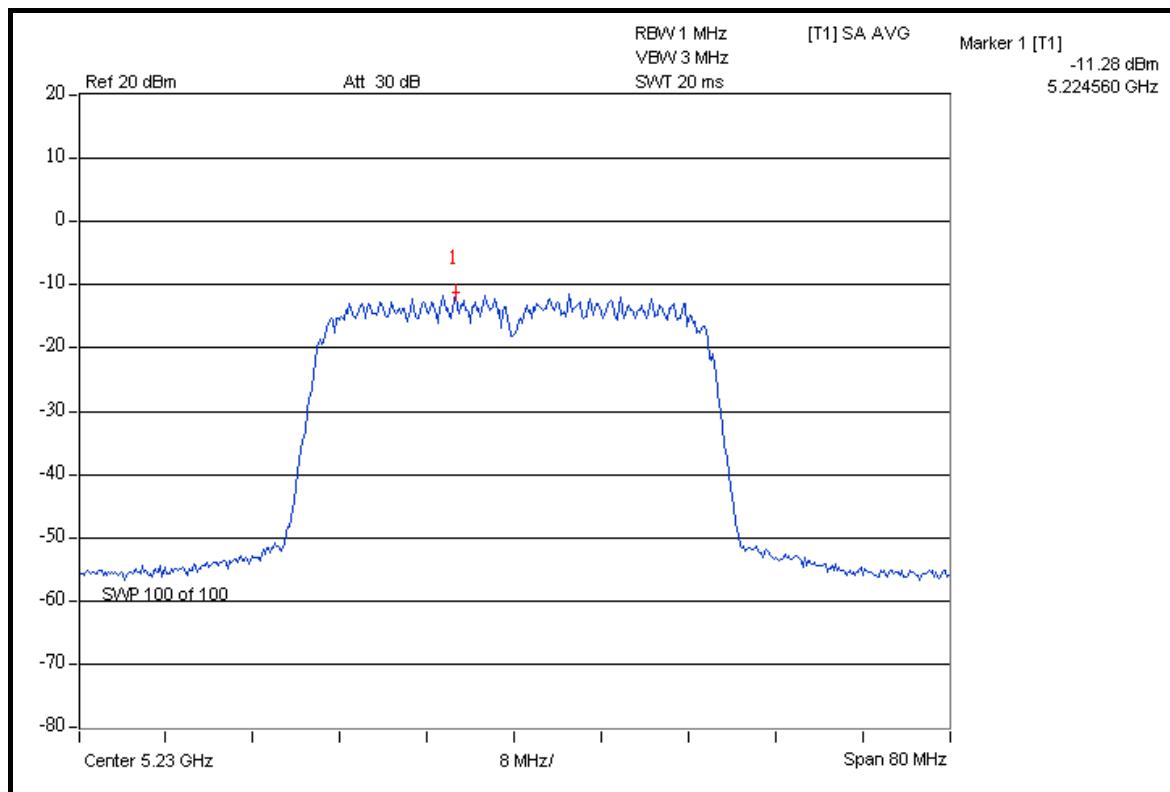
<b>CHAN.</b>	<b>CHAN. FREQ. (MHz)</b>	<b>RF POWER LEVEL IN 1MHz BW (dBm)</b>		<b>TOTAL POWER DENSITY (mW)</b>	<b>TOTAL POWER DENSITY (dBm)</b>	<b>MAX. LIMIT (dBm)</b>	<b>PASS / FAIL</b>
		<b>CHAIN 0</b>	<b>CHAIN 1</b>				
38	5190	-12.26	-11.32	0.133	-8.75	4	PASS
46	5230	-12.09	-11.28	0.136	-8.66	4	PASS

FOR CHAIN 0: CH 38



CH 46



**FOR CHAIN 1: CH 38**

**CH 46**




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## 4.6 FREQUENCY STABILITY

### 4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within the band of operation frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
ANRITSU SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 28, 2008	Jun. 27, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

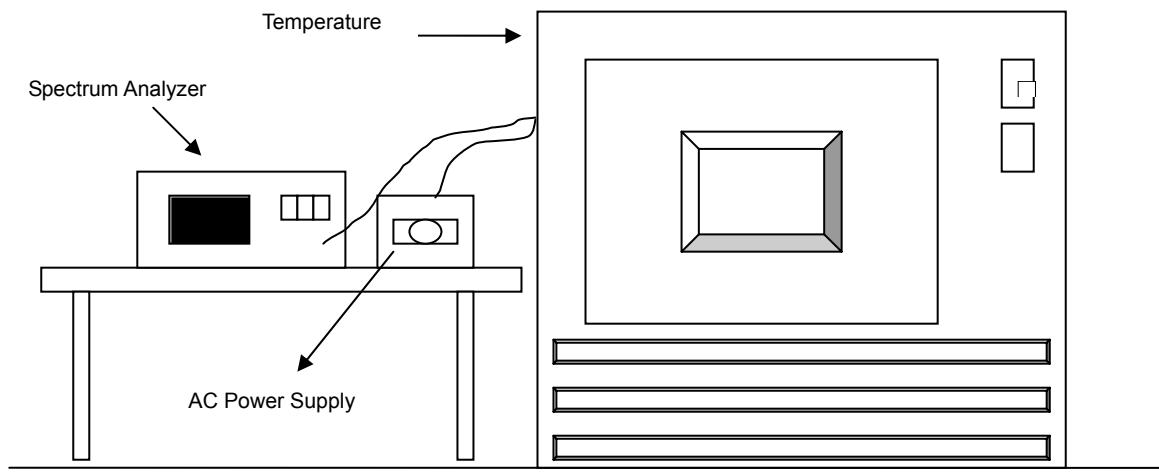
### 4.6.3 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

#### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.6.5 TEST SETUP



#### 4.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6.



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#### 4.6.7 TEST RESULTS

OPERATING FREQUENCY: 5200MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5199.939272	-0.0011678	5199.939291	-0.0011675	5199.939481	-0.0011638	5199.939691	-0.0011598
	110.0	5199.939358	-0.0011662	5199.939057	-0.0011720	5199.939156	-0.0011701	5199.939555	-0.0011624
	93.5	5199.939383	-0.0011657	5199.939490	-0.0011637	5199.939932	-0.0011552	5199.939592	-0.0011617
40	126.5	5199.939547	-0.0011626	5199.939783	-0.0011580	5199.939891	-0.0011559	5199.939444	-0.0011645
	110.0	5199.939124	-0.0011707	5199.939257	-0.0011681	5199.939000	-0.0011731	5199.939327	-0.0011668
	93.5	5199.939308	-0.0011672	5199.939332	-0.0011667	5199.939152	-0.0011702	5199.939246	-0.0011683
30	126.5	5199.939402	-0.0011653	5199.939703	-0.0011596	5199.939618	-0.0011612	5199.939566	-0.0011622
	110.0	5199.939281	-0.0011677	5199.939482	-0.0011638	5199.939220	-0.0011688	5199.939044	-0.0011722
	93.5	5199.939473	-0.0011640	5199.939397	-0.0011654	5199.939619	-0.0011612	5199.939882	-0.0011561
20	126.5	5199.939473	-0.0011640	5199.939391	-0.0011656	5199.939574	-0.0011620	5199.939430	-0.0011648
	110.0	5199.939873	-0.0011563	5199.939308	-0.0011672	5199.939607	-0.0011614	5199.939732	-0.0011590
	93.5	5199.939391	-0.0011656	5199.939470	-0.0011640	5199.939668	-0.0011602	5199.939620	-0.0011612
10	126.5	5199.938981	-0.0011734	5199.939138	-0.0011704	5199.939170	-0.0011698	5199.939072	-0.0011717
	110.0	5199.939590	-0.0011617	5199.939402	-0.0011653	5199.939509	-0.0011633	5199.939402	-0.0011653
	93.5	5199.939613	-0.0011613	5199.939716	-0.0011593	5199.939538	-0.0011627	5199.939689	-0.0011598
0	126.5	5199.939439	-0.0011646	5199.939223	-0.0011688	5199.939414	-0.0011651	5199.939472	-0.0011640
	110.0	5199.939198	-0.0011693	5199.939123	-0.0011707	5199.939016	-0.0011728	5199.938930	-0.0011744
	93.5	5199.939534	-0.0011628	5199.939431	-0.0011648	5199.939402	-0.0011653	5199.939532	-0.0011628
-10	126.5	5199.939606	-0.0011614	5199.939473	-0.0011640	5199.939762	-0.0011584	5199.939492	-0.0011636
	110.0	5199.939560	-0.0011623	5199.939192	-0.0011694	5199.939835	-0.0011570	5199.939824	-0.0011572
	93.5	5199.939169	-0.0011698	5199.939478	-0.0011639	5199.939084	-0.0011715	5199.939231	-0.0011686
-20	126.5	5199.939354	-0.0011663	5199.939607	-0.0011614	5199.939601	-0.0011615	5199.939520	-0.0011631
	110.0	5199.939333	-0.0011667	5199.939360	-0.0011662	5199.939150	-0.0011702	5199.939644	-0.0011607
	93.5	5199.939889	-0.0011560	5199.939545	-0.0011626	5199.939210	-0.0011690	5199.939380	-0.0011658
-30	126.5	5199.939335	-0.0011666	5199.939394	-0.0011655	5199.939523	-0.0011630	5199.939347	-0.0011664
	110.0	5199.939395	-0.0011655	5199.938862	-0.0011757	5199.939634	-0.0011609	5199.939367	-0.0011660
	93.5	5199.939489	-0.0011637	5199.939125	-0.0011707	5199.938966	-0.0011737	5199.939355	-0.0011662



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## 4.7 BAND EDGES MEASUREMENT

### 4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	May 28, 2008	May 27, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Aug. 08, 2008	Aug. 07, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Apr. 25, 2008	Apr. 24, 2009
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Aug. 06, 2008	Aug. 05, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170148	Jul. 03, 2008	Jul. 02, 2009
Preamplifier Agilent	8449B	3008A01911	Sep. 10, 2008	Sep. 09, 2009
Preamplifier Agilent	8447D	2944A10638	Dec. 26, 2008	Dec. 25, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218190/4 231241/4	May 20, 2008	May 19, 2009
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 09, 2008	Aug. 08, 2009
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Aug. 27, 2008	Aug. 26, 2009

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.



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#### 4.7.2 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. Set both RBW and VBW of spectrum analyzer to 1MHz and 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz

#### 4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.



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#### 4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.25GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Peak RBW = 1MHz, VBW = 3MHz) are attached on the following pages.

### 802.11a OFDM MODULATION

#### Channel 36 (5180MHz)

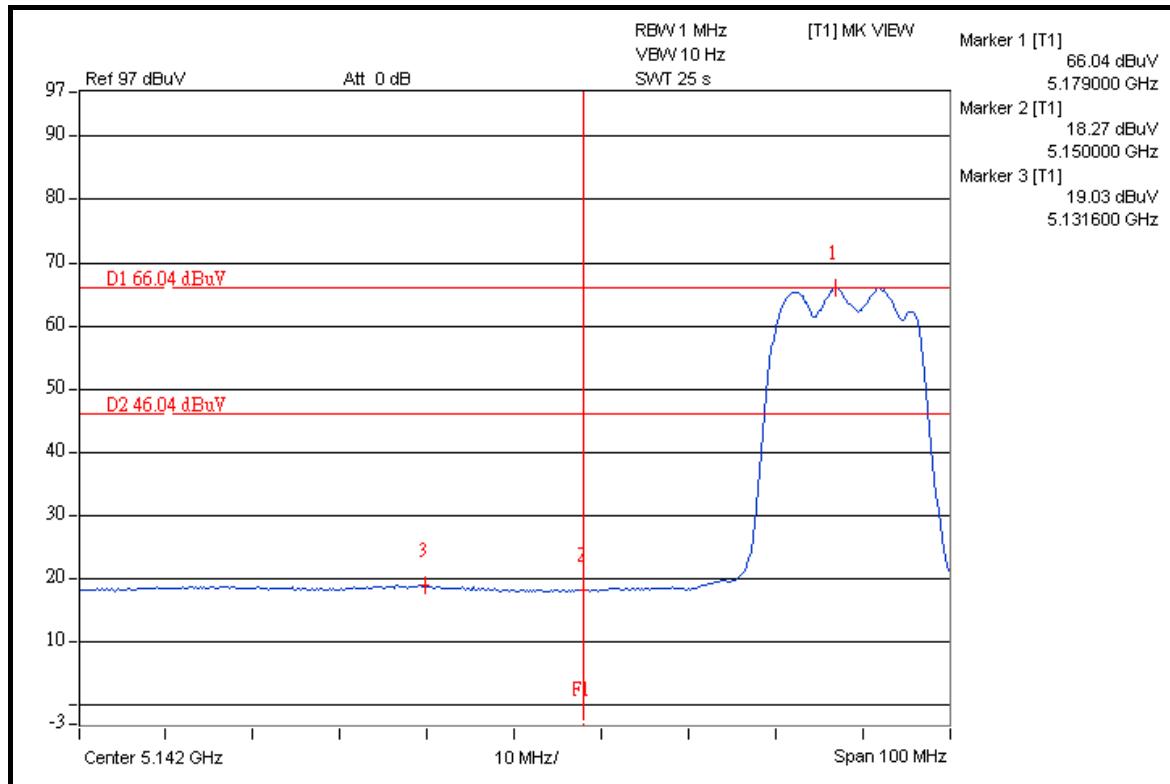
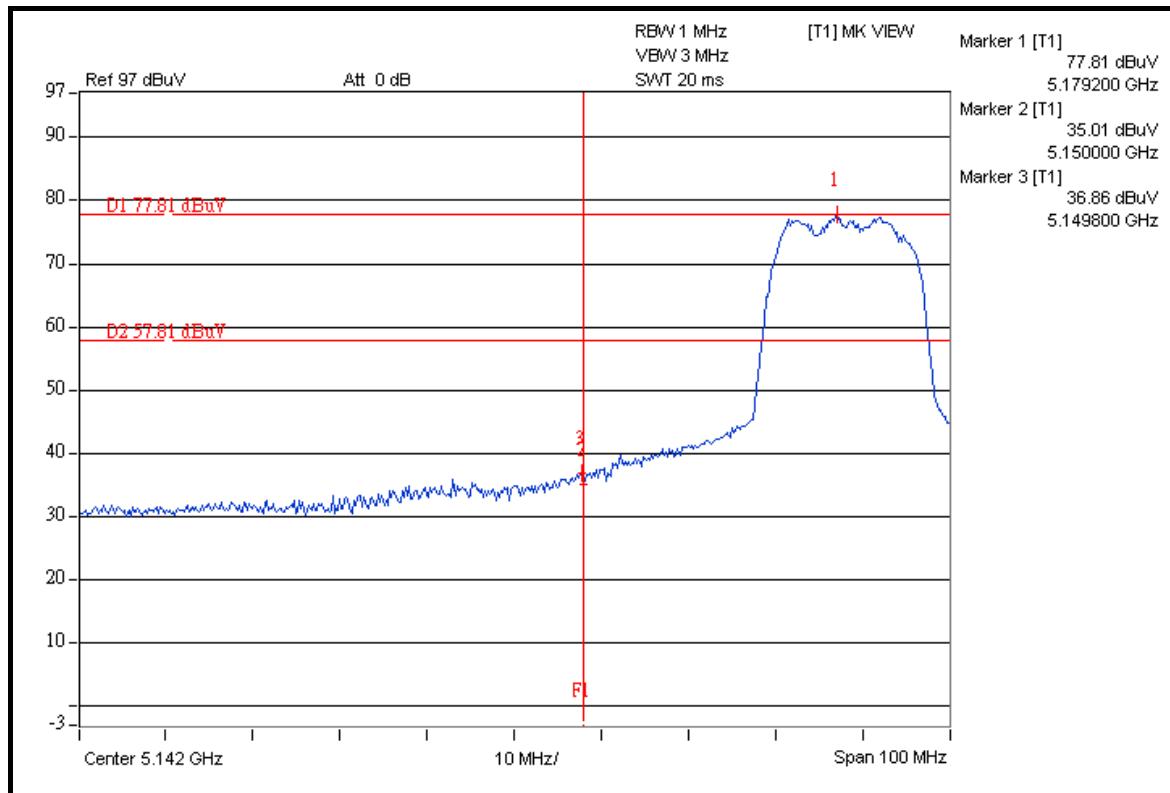
The band edge emission plot on the next page shows 40.95dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 106.69dBuV/m (Peak), so the maximum field strength in restrict band is  $106.69 - 40.95 = 65.74$ dBuV/m which is under 74dBuV/m limit.

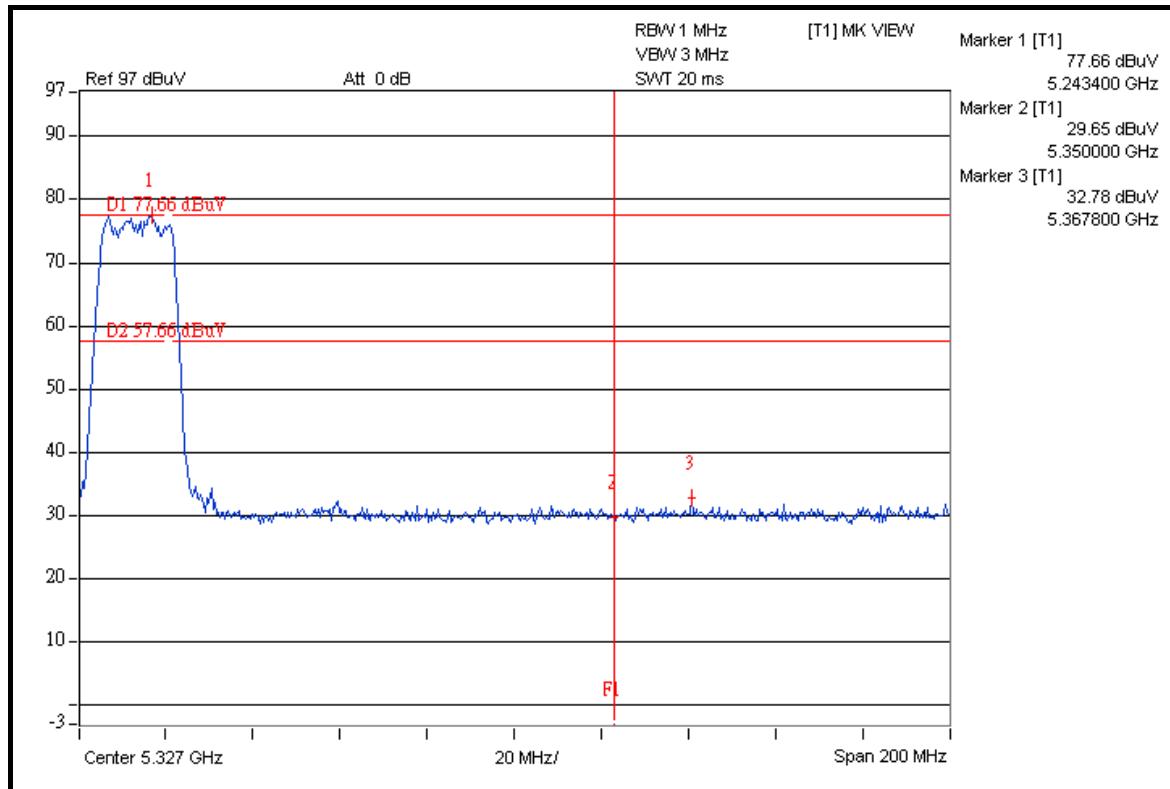
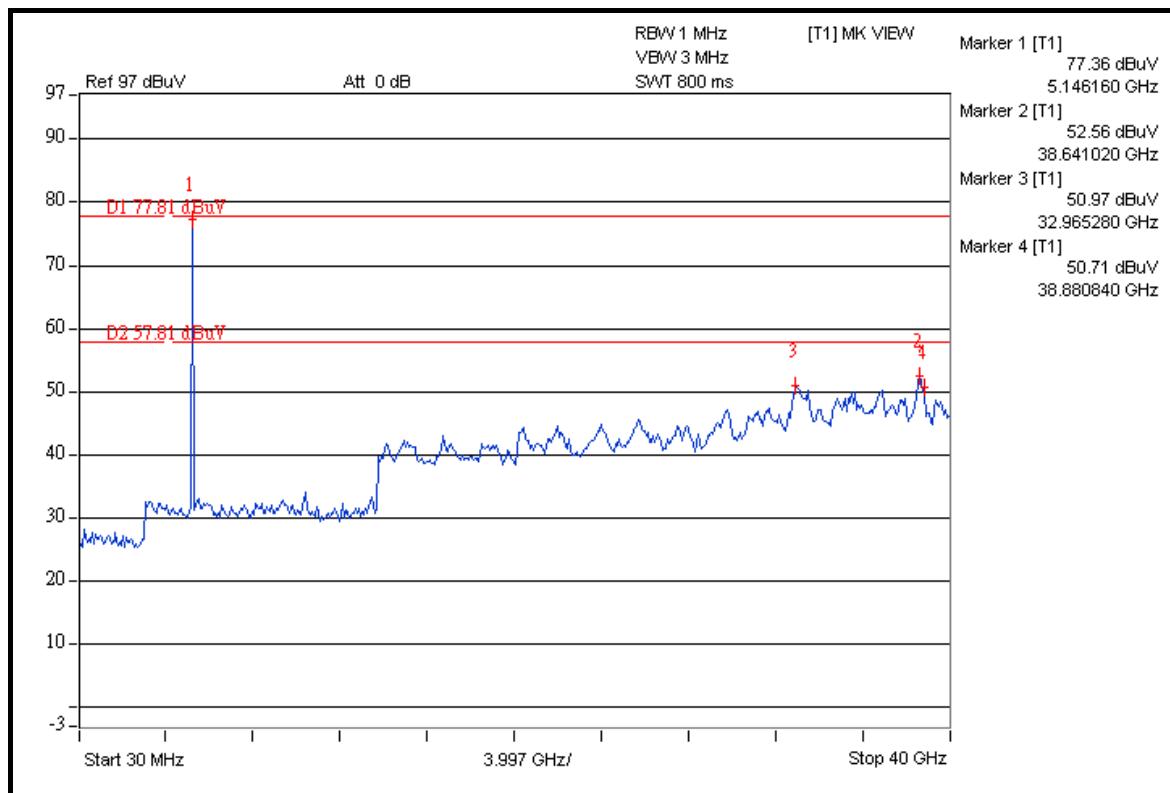
The band edge emission plot on the next page shows 47.01dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 96.20dBuV/m (Average), so the maximum field strength in restrict band is  $96.20 - 47.01 = 49.19$ dBuV/m which is under 54dBuV/m limit.

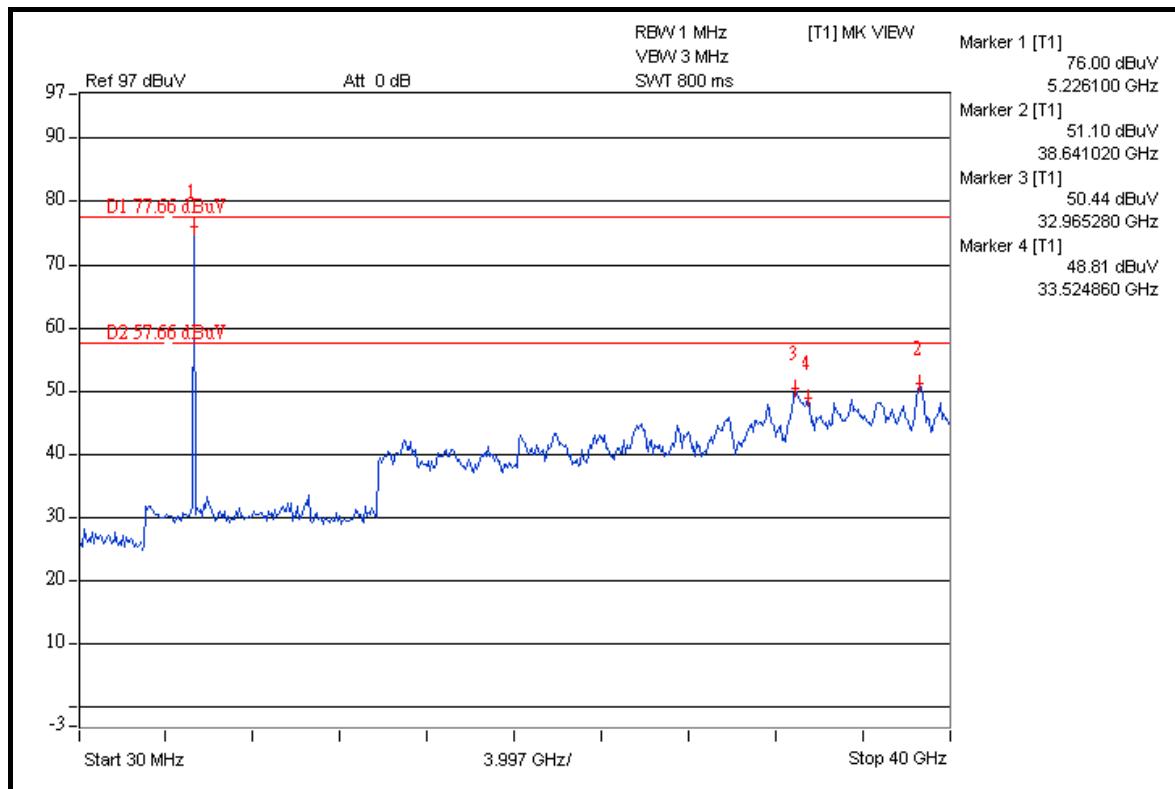
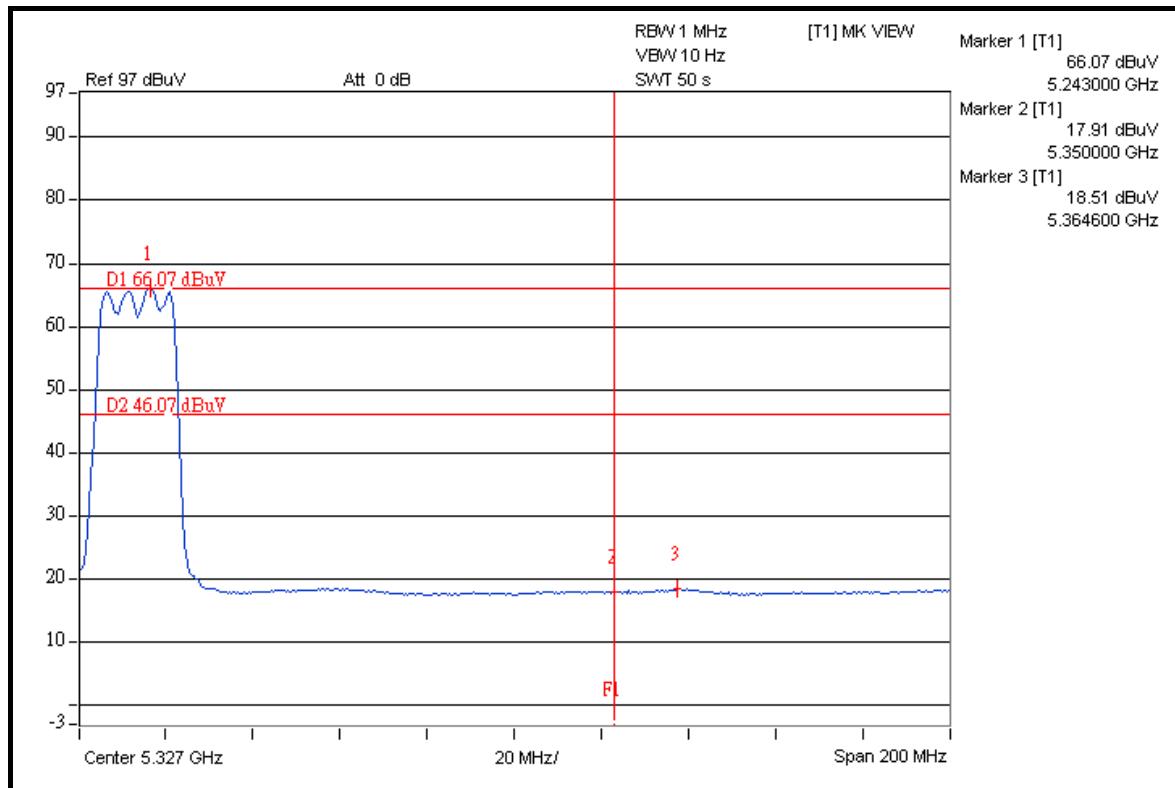
#### Channel 48 (5240MHz)

The band edge emission plot on the next second page shows 44.88dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 106.23dBuV/m (Peak), so the maximum field strength in restrict band is  $106.23 - 44.88 = 61.35$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 47.56dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 95.91dBuV/m (Average), so the maximum field strength in restrict band is  $95.91 - 47.56 = 48.35$ dBuV/m which is under 54dBuV/m limit.









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## DRAFT 802.11n (20MHz) OFDM MODULATION

### Channel 36 (5180MHz)

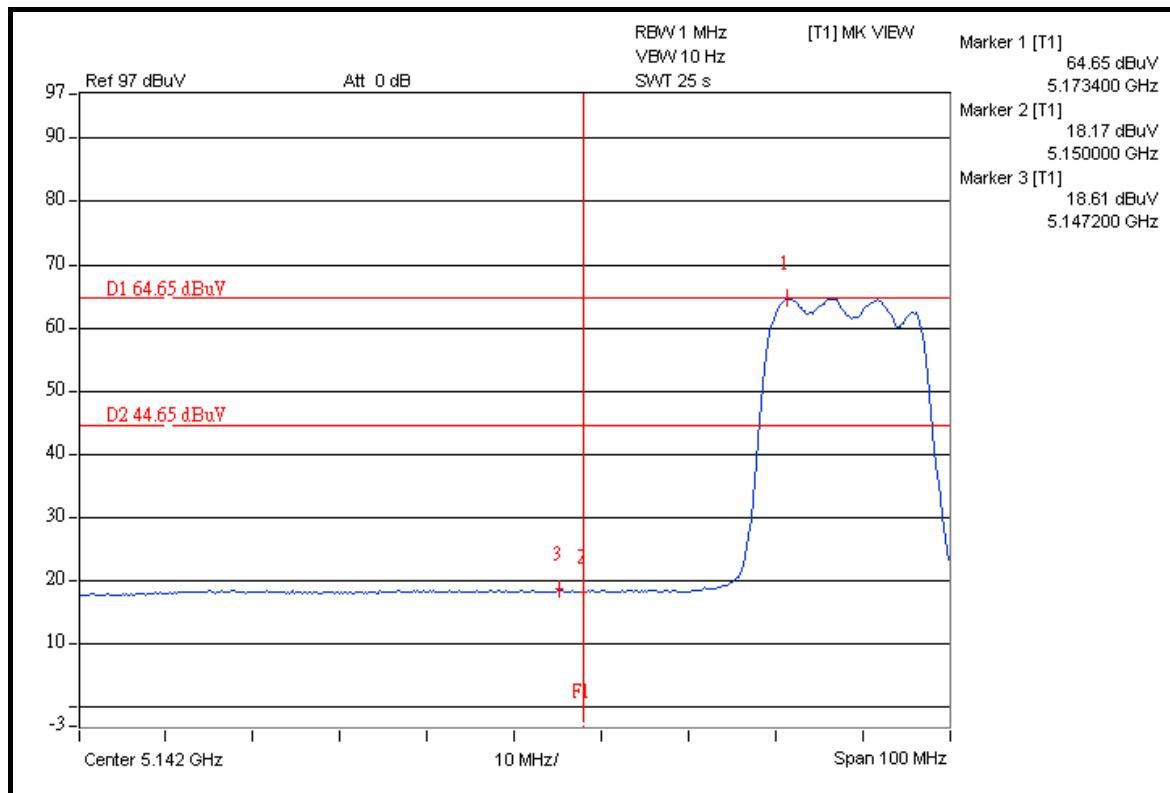
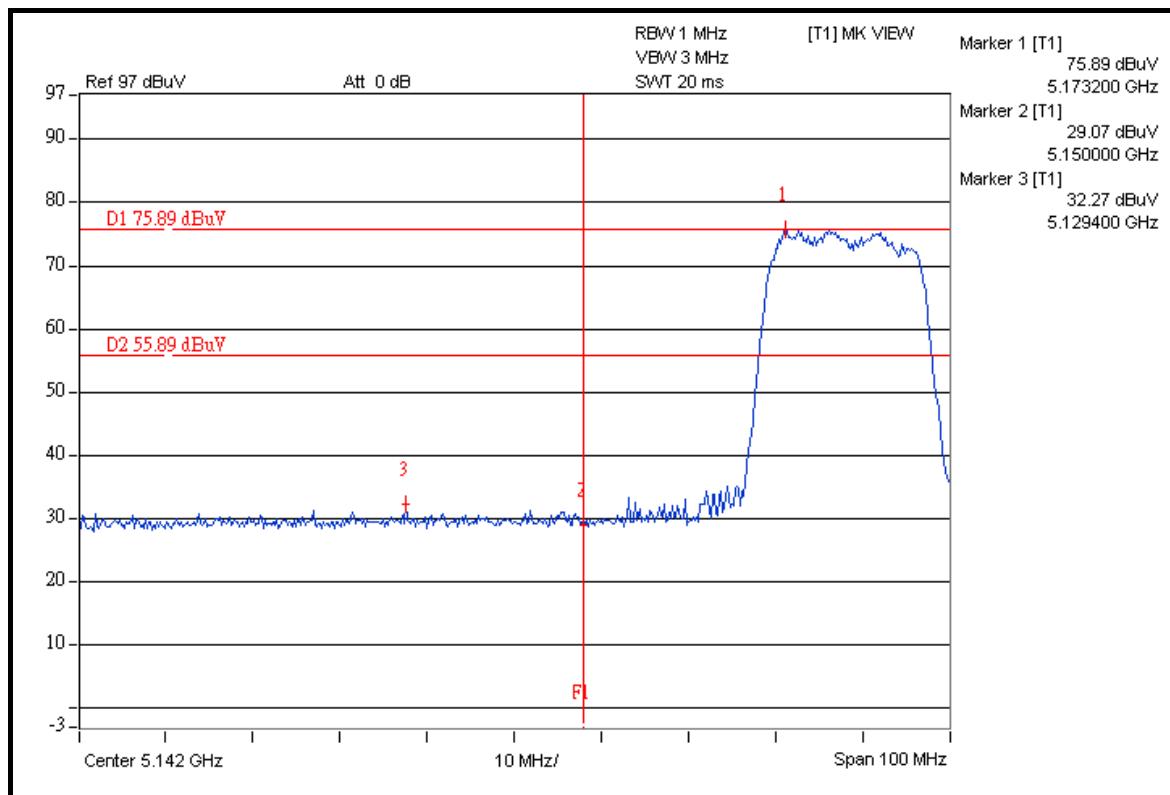
The band edge emission plot on the next page shows 43.62dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 104.16dBuV/m (Peak), so the maximum field strength in restrict band is  $104.16 - 43.62 = 60.54$ dBuV/m which is under 74dBuV/m limit.

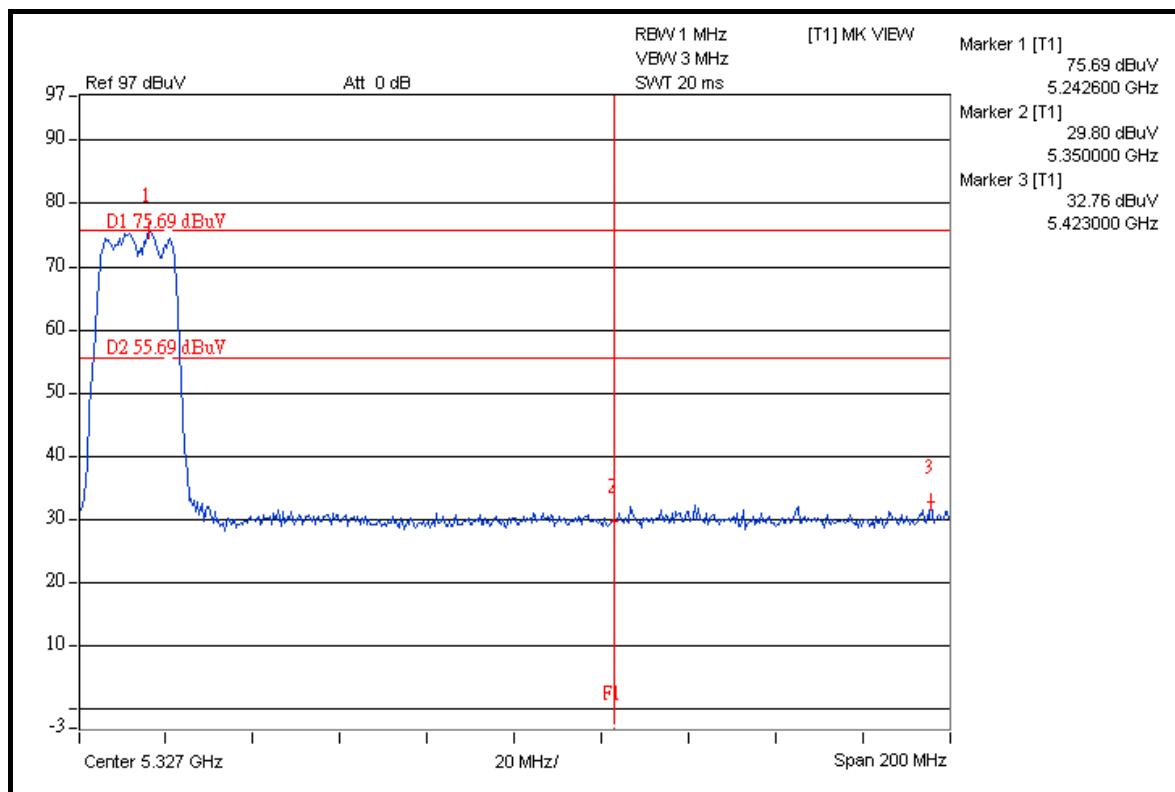
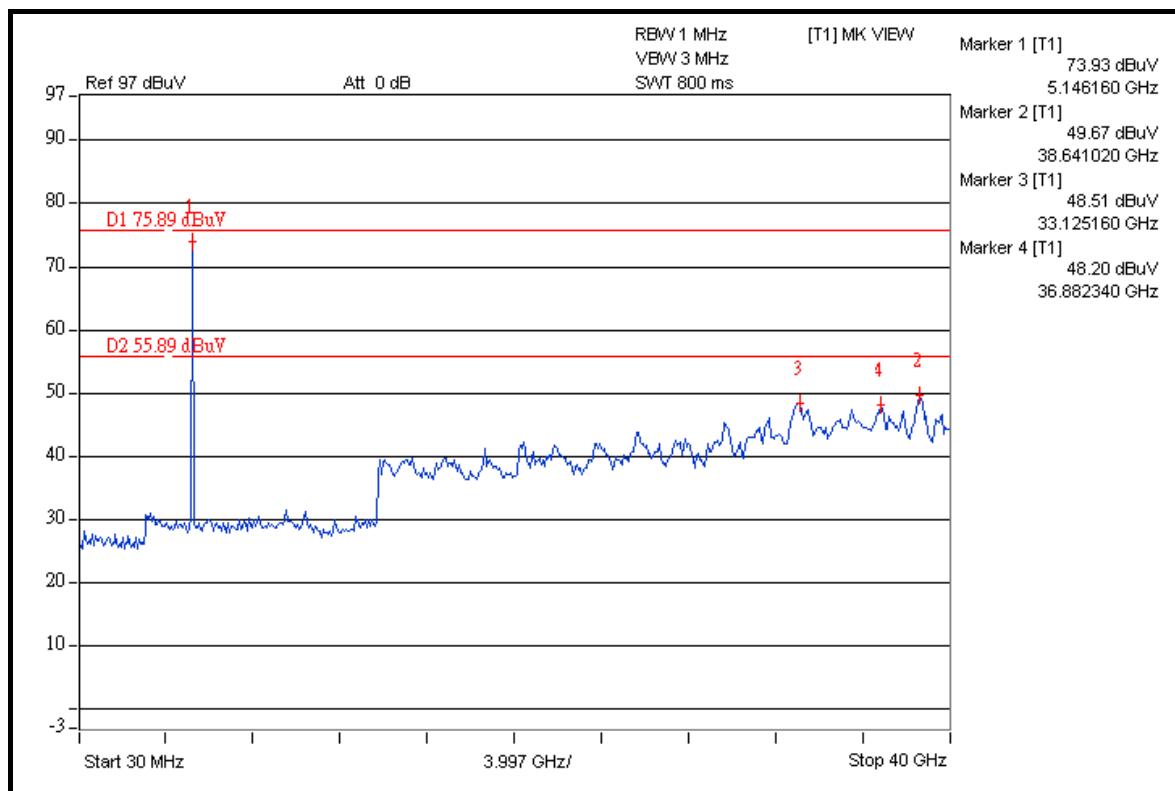
The band edge emission plot on the next page shows 46.04dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 36 is 94.15dBuV/m (Average), so the maximum field strength in restrict band is  $94.15 - 46.04 = 48.11$ dBuV/m which is under 54dBuV/m limit.

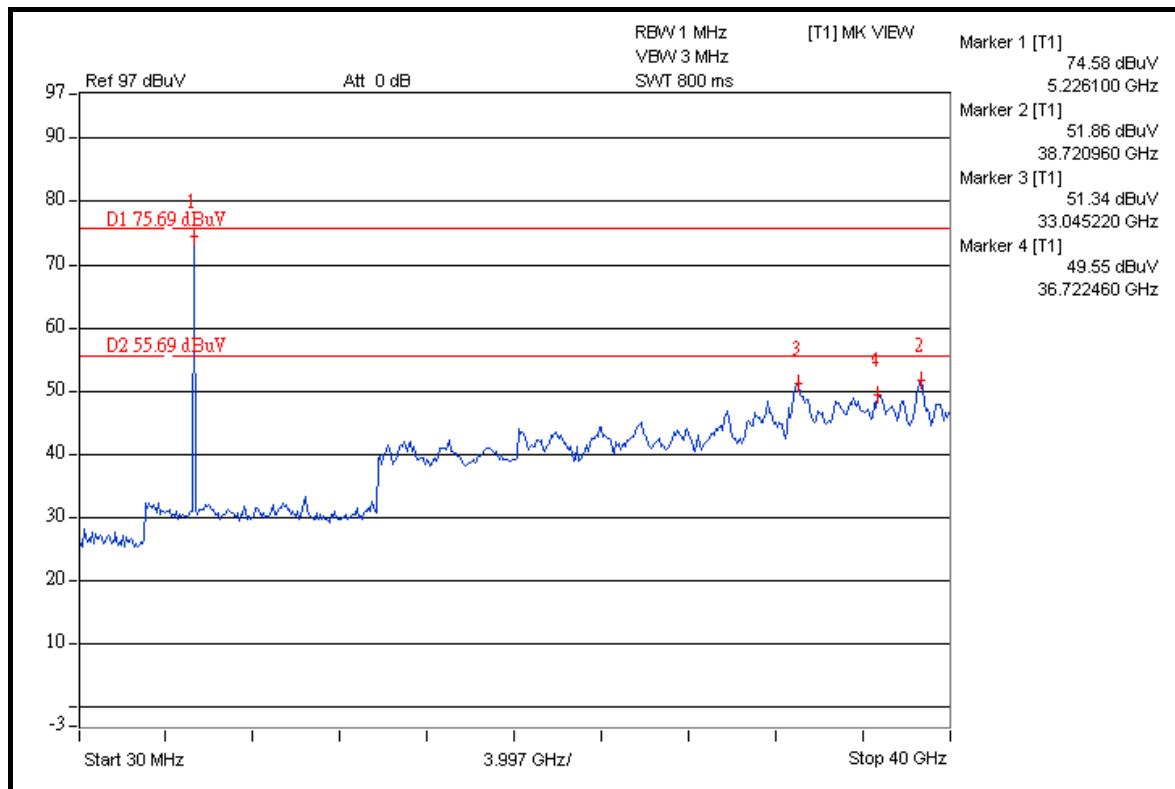
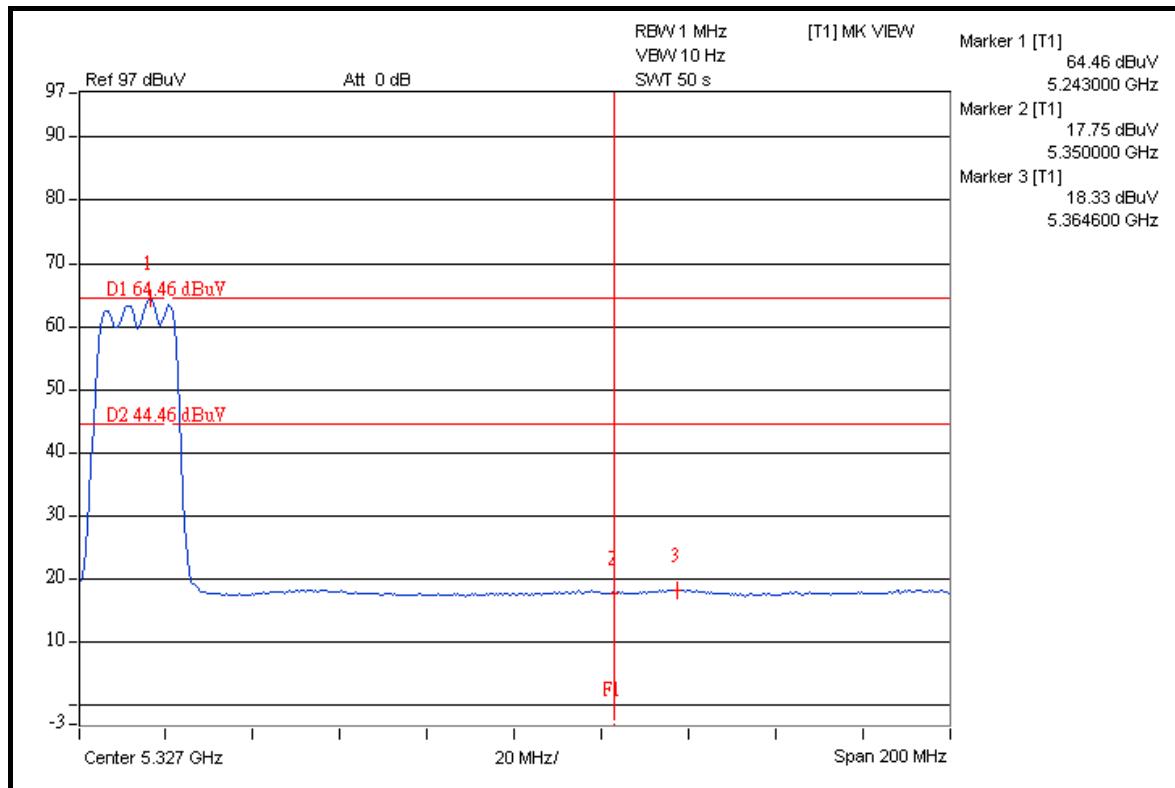
### Channel 48 (5240MHz)

The band edge emission plot on the next second page shows 42.93dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 104.14dBuV/m (Peak), so the maximum field strength in restrict band is  $104.14 - 42.93 = 61.21$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 46.13dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 48 is 93.82dBuV/m (Average), so the maximum field strength in restrict band is  $93.82 - 46.13 = 47.69$ dBuV/m which is under 54dBuV/m limit.









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## DRAFT 802.11n (40MHz) OFDM MODULATION

### Channel 38 (5190MHz)

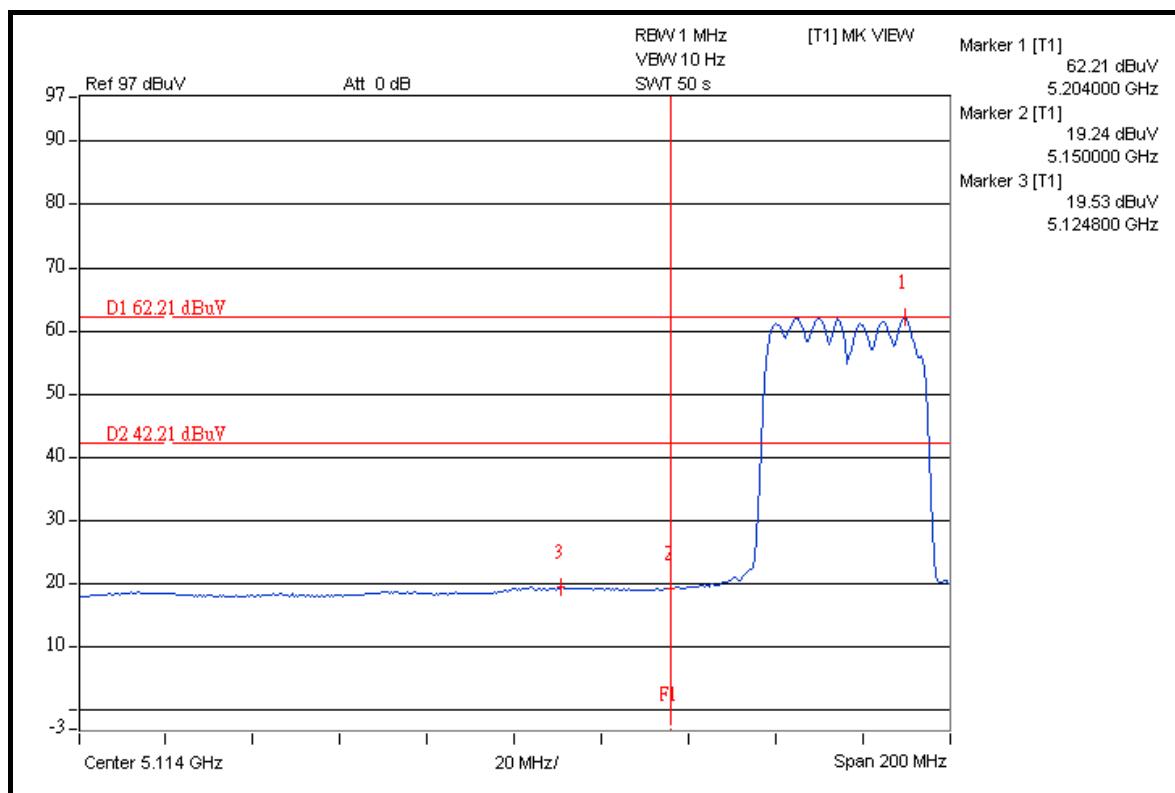
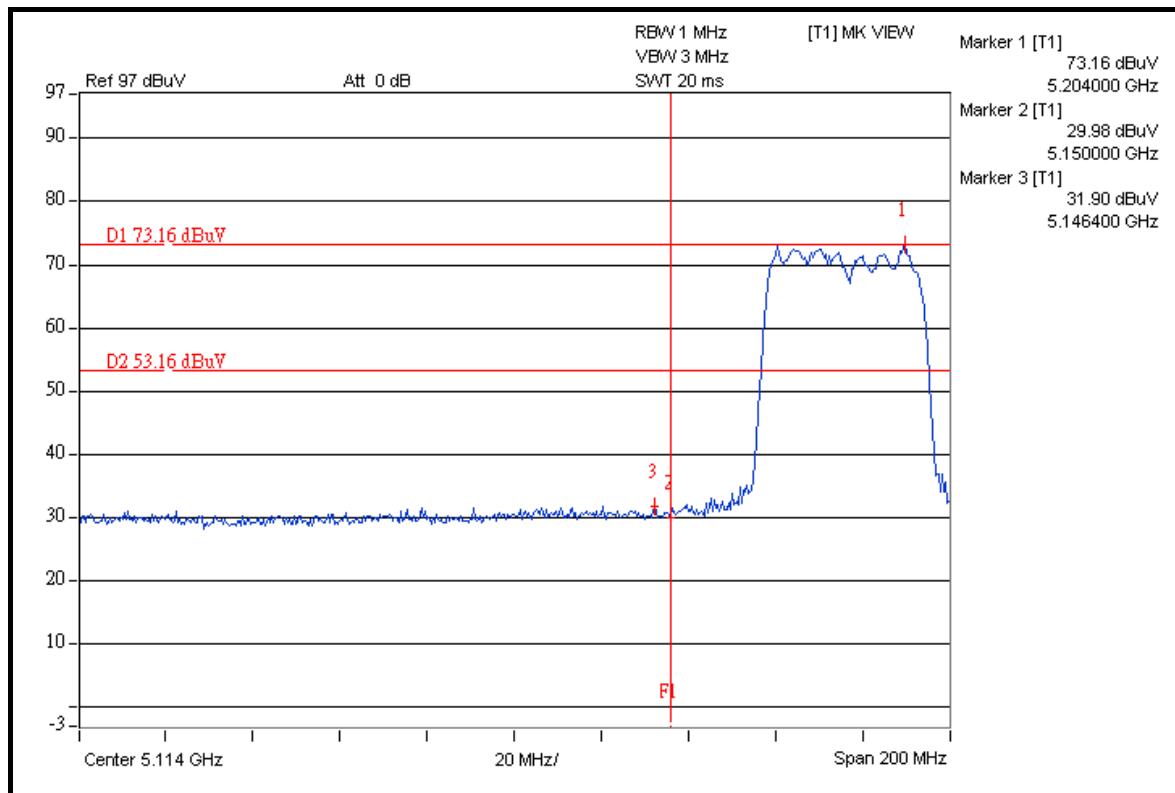
The band edge emission plot on the next page shows 41.26dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 38 is 102.97dBuV/m (Peak), so the maximum field strength in restrict band is  $102.97 - 41.26 = 61.71$ dBuV/m which is under 74dBuV/m limit.

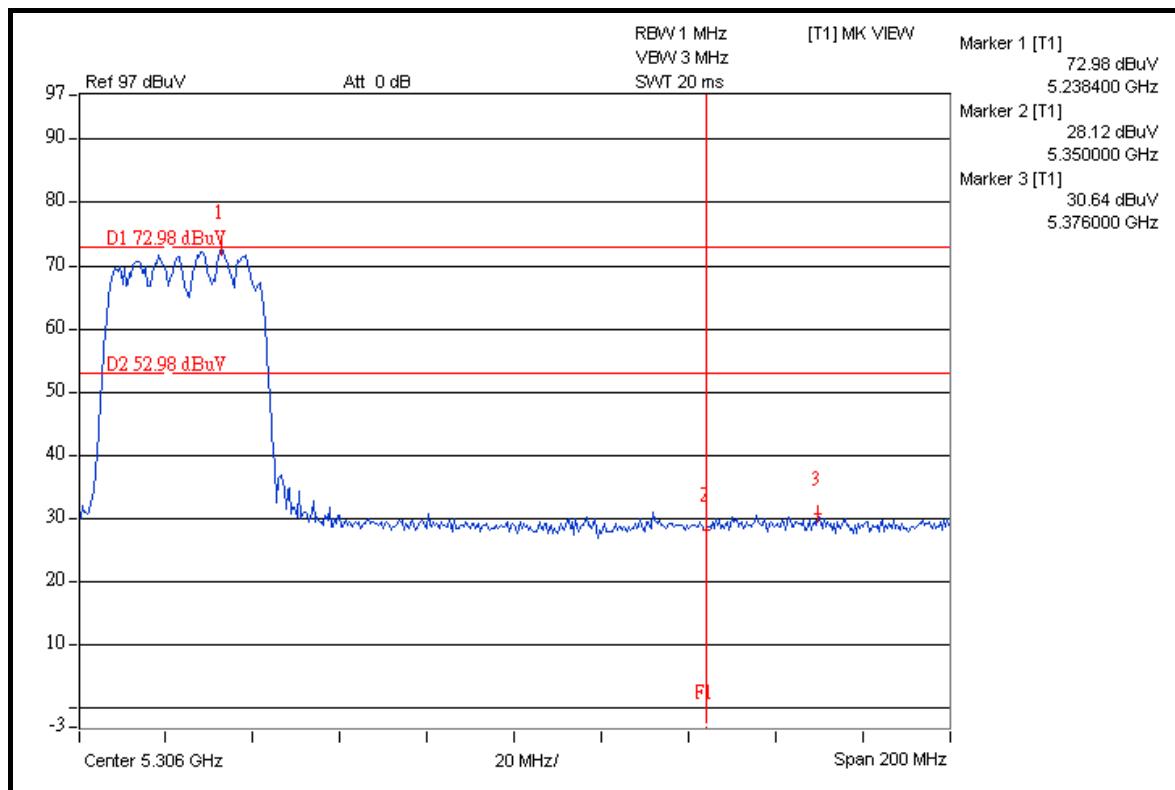
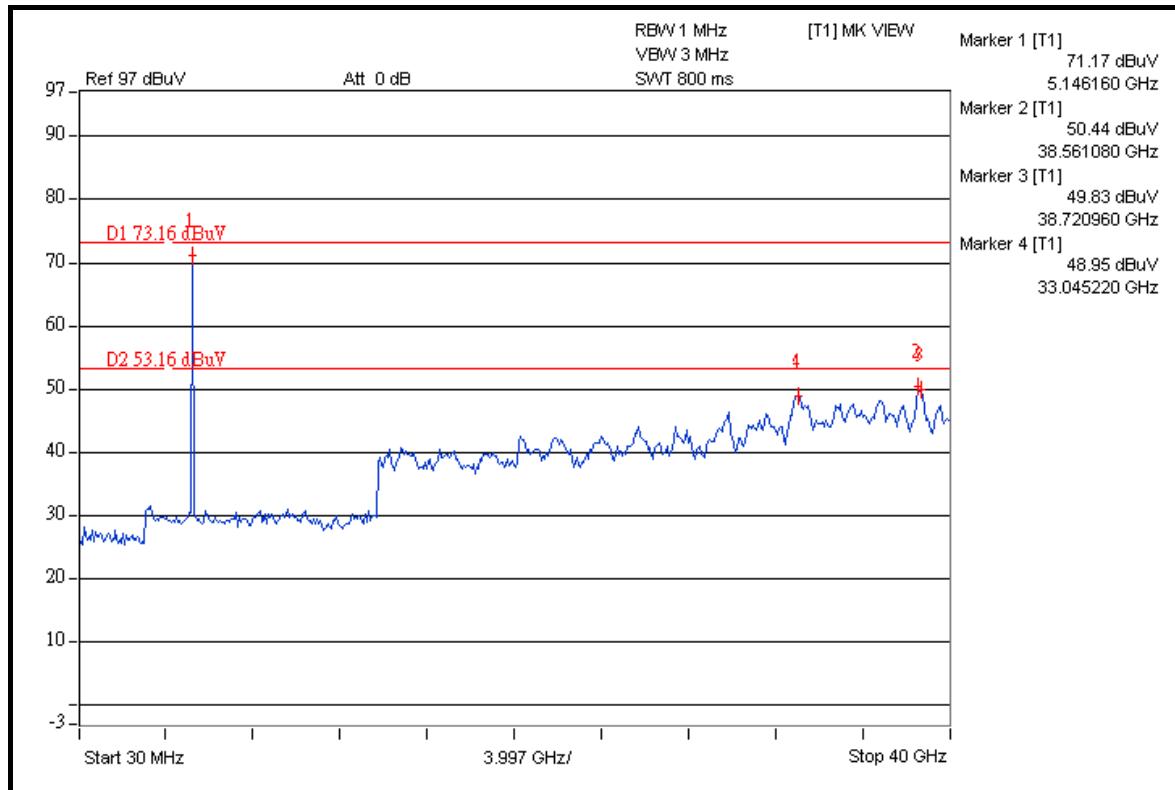
The band edge emission plot on the next page shows 42.68dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 38 is 92.05dBuV/m (Average), so the maximum field strength in restrict band is  $92.05 - 42.68 = 49.37$ dBuV/m which is under 54dBuV/m limit.

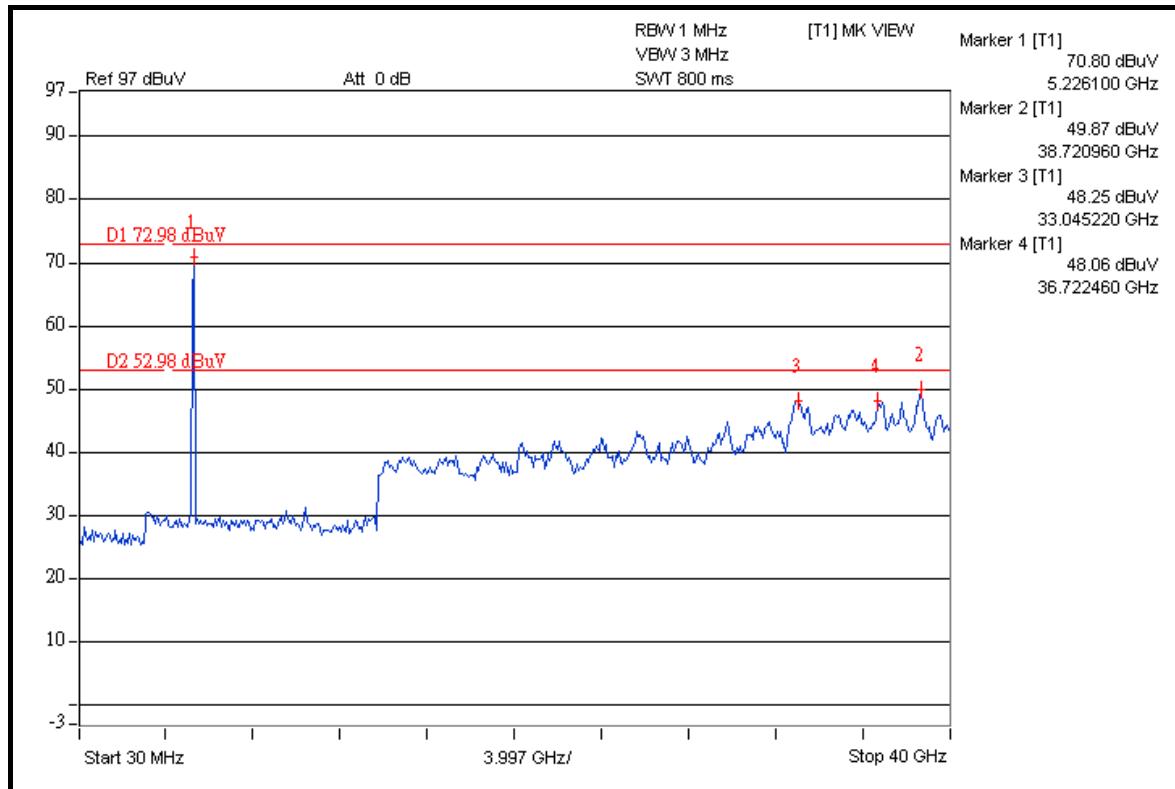
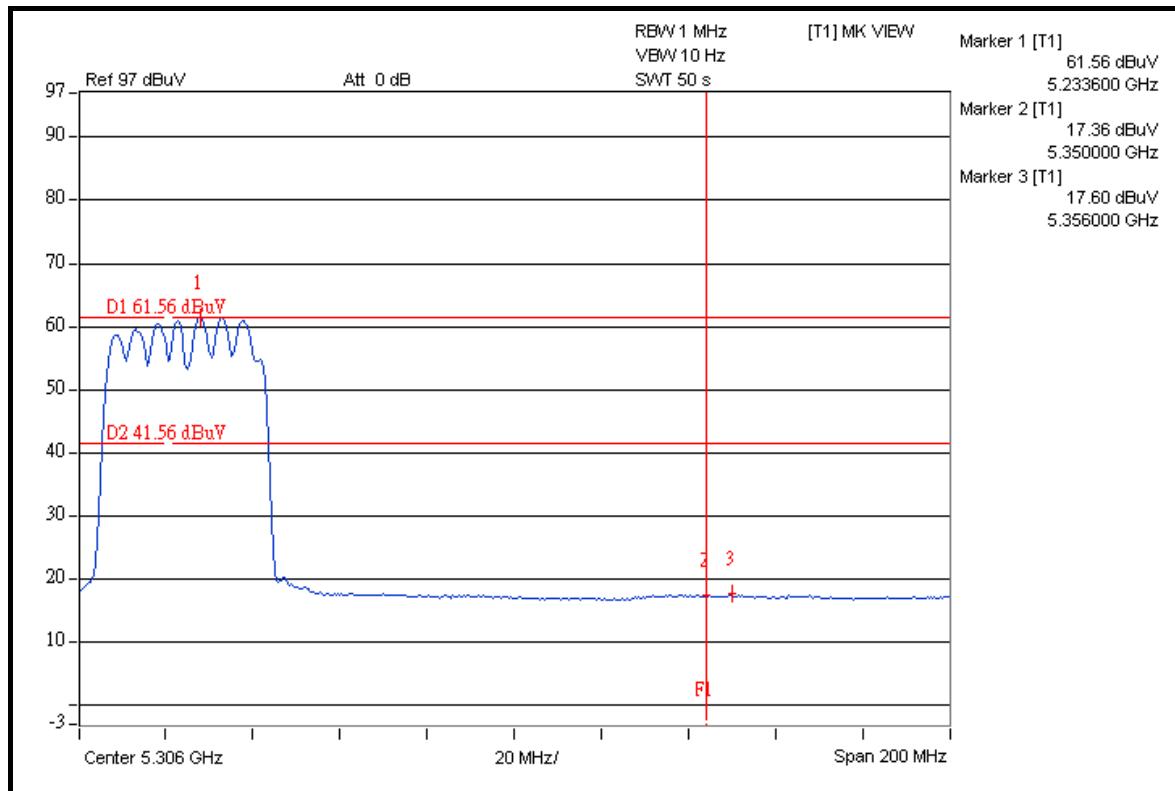
### Channel 46 (5230MHz)

The band edge emission plot on the next second page shows 42.34dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 46 is 102.96dBuV/m (Peak), so the maximum field strength in restrict band is  $102.96 - 42.34 = 60.62$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 43.96dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 46 is 92.37dBuV/m (Average), so the maximum field strength in restrict band is  $92.37 - 43.96 = 48.41$ dBuV/m which is under 54dBuV/m limit.









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## 4.8 ANTENNA REQUIREMENT

### 4.8.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.407(a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.8.2 ANTENNA CONNECTED CONSTRUCTION

The antennas used in this product are PIFA antenna and Printed antenna without connector. The maximum gain of the antenna is 1.45dBi.



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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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## 6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	GOST-ASIA(MOU)
<b>Russia</b>	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

[www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml). If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**  
Tel: 886-2-26052180  
Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**  
Tel: 886-3-5935343  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**  
Tel: 886-3-3183232  
Fax: 886-3-3185050

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site also.



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## **7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**